Statement of Basis

Permit to Construct No. P-2021.0051
Project ID 62734

AZEK Building Products
Boise, Idaho

Facility ID 001-00372

Final

February 1, 2022

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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.

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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
CAM	Compliance Assurance Monitoring
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GACT	Generally Available Control Technology
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HDPE	high-density polyethylene
hr/yr	hours per consecutive 12 calendar month period
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
LDPE	low-density polyethylene
m	meters
MACT	Maximum Achievable Control Technology
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
psig	pounds per square inch gauge

PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PVC	polyvinyl chloride
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
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

AZEK Building Products (AZEK) is located at 1001 E. Gowen Road in Boise on roughly fifty acres of land and is occupied by two existing structures. A 347,000 square foot building will be used for production and office space and a 4,950 square foot building will be used for truck tarping. AZEK is proposing to install process equipment for the manufacture of composite deck boards. The existing facility includes two large gas-fired space-heating units, three radiant heating systems, twelve gas-fired duct furnaces, and five gas-fired air conditioning units. AZEK plans to remove one of the large gas-fired space-heating units from the facility prior to commencement of operations. The larger of the three radiant heating systems will remain at the facility, but will not be used.

Raw Material Loading

Raw material for extrusion will be pneumatically loaded from truck and railcars into bin-vented silos. The bin vents situated on top of the silos are integral to the process. Air within the silo is displaced by the added material, and must be allowed to exit. Forcing the displaced air through filtered bin vents prevents substantial material loss, particularly for fine and lightweight materials.

Wood flour (also referred to as “wood fiber”) will be unloaded from trucks inside of the proposed truck house and pneumatically conveyed to the appropriate storage silos. The truck house enclosure allows for recapture of particulates emitted during unloading via implementation of a baghouse dust collector. This emissions control is considered integral to the operation due to its role in substantially reducing loss of raw material.

Raw Material Blending

Wood/high-density polyethylene (HDPE) materials from the respective silos are pneumatically conveyed to complex blending systems which mix the raw ingredients at the appropriate concentrations for extrusion into deck boards. Particulate emissions from the wood/HDPE material blending systems are vented to baghouse dust collectors. Particulate emissions controls implemented on the wood/HDPE blending systems are considered integral to reclaiming lost material which is reintroduced to the process as raw material.

Pellet Mills

Blended wood/HDPE material will be pneumatically conveyed from the blending systems to one of six pellet mills. Pellet mills compress blended raw material into pellets at low heat relative to extrusion, improving extrusion efficiency. Once the pellets have been formed, they are air-cooled in pellet mill coolers. This air is exhausted through a filtered cyclone separator which reintroduces collected particulates to the pellet mill. The filtered cyclone for each pellet mill is considered integral to reclaiming material. Cooled pellets are pneumatically conveyed to the wood/HDPE extrusion lines.

Wood/HDPE Extrusion Lines

Blended wood/HDPE material will be pneumatically conveyed from the blending systems to each extrusion line. Each extrusion process line starts by drying the blended mix first through two hot air dryers, then through a static desiccant dryer. Particulate emissions are vented from the hot air dryers to a baghouse dust collector. Particulate emissions controls implemented on the wood/HDPE extrusion line dryers are considered integral to reclaiming lost material which is reintroduced to the process as raw material.

Dried material will then be processed through the extruder. The molten blend is forced through a mold, at which point it is water-cooled until it harden into its final shape. The HDPE extrusion process generates VOC and HAP/TAP emissions. These extrusion emissions will not be controlled, but will vent from the building through powered roof exhausts.

The hardened material is cut to a specified length of 8, 12, 16, or 24 feet by an enclosed reciprocating saw. If emissions generated by saw cutting are not adequately vented out of the enclosure, the mechanical saw equipment will become clogged and inoperable. For this reason, as well as reclamation, particulate emissions controls for the wood/HDPE extrusion line saws are integral to the process.

PVC Extrusion Lines

Blended PVC material will be pneumatically conveyed to each extrusion line. Brabender feeder systems convey raw material into the extruders at each extrusion line. Particulate emissions from all the feeders vent to a single baghouse dust collector. Particulate emissions controls implemented on the PVC feeder system are considered integral to reclaiming lost material which is reintroduced to the process as raw material.

Blended material will then be processed through the extruder. The molten blend is forced through a mold, at which point it is cooled until it hardens into its final shape. The PVC extrusion process generates VOC emissions. These emissions will not be controlled, but will vent from the building through powered roof exhausts.

The hardened material is cut to a specified length by an enclosed heat knife. No appreciable VOC emissions are generated from the heat knife due to its low operating temperature relative to extrusion.

Regrind

Waste product is occasionally generated during startup and shutdown of the line, or when there is a malfunction or testing in one of the extrusion process lines. This material will be stockpiled with like material and eventually reground to be reintroduced into the process as raw material. Wood/HDPE and PVC waste materials will be ground separately and pneumatically conveyed to the appropriate storage silo from the grinder. Particulate emissions generated from each grinder will be vented to separate baghouse dust collectors. Particulate emissions controls implemented on the grinders are considered integral to reclaiming lost material which is reintroduced to the process as raw material.

Pulverizing

Recycled HDPE and low-density polyethylene (LDPE) plastics will be loaded into one of six pulverizers, reducing the material to approximately ¼ inch flakes. The pulverized mixture is pneumatically conveyed to the appropriate storage silo for use as raw material. Particulate emissions from the pulverizers are vented to a single baghouse dust collector. Particulate emissions controls implemented on the pulverizers are considered integral to reclaiming lost material which is reintroduced to the process as raw material.

Permitting History

This is the initial PTC for a new facility thus there is no permitting history.

Application Scope

This permit is the initial PTC for this facility.

The applicant has proposed to:

- Install and operate twenty extrusion lines. Ten extrusion lines will be for composite wood and HDPE deck boards, and ten extrusion lines for polyvinyl chloride (PVC) deck boards;
- Install and operate six pellet mills;
- Install and operate twenty six outdoor storage silos;
- Install and operate one truck house for unloading wood flour;
- Install and operate four wood/HDPE material blending systems;
- Install and operate two grinders for recycling waste material;
- Install and operate six pulverizers for processing recycled polyethylene plastic material;
- Install and operate five direct-fired gas makeup heaters and two indirect-fired gas makeup heaters.
- Install and operate eleven dust collectors of various sizes for capturing particulate emissions.

Application Chronology

October 26, 2021	DEQ received an application.
October 29, 2021	DEQ received an application fee.
November 5 – November 22, 2021	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
November 29, 2021	DEQ determined that the application was complete.
January 12, 2022	DEQ made available the draft permit and statement of basis for peer and regional office review.
January 19, 2022	DEQ made available the draft permit and statement of basis for applicant review.
January 26, 2022	DEQ received the permit processing fee.
February 1, 2022	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment
Wood Lines 1 - 5: Wood/HDPE Extrusion Lines (includes drying and saw cutting) Max Hourly Throughput: 15,000 lb/hr Max Annual Throughput: 65,700 T/yr	Baghouse Dust Collector (DC01): Manufacturer: Schenck Process Model: 144LST196 FILTER Design Flow: 24,000 cfm Filter: PTFE Membrane Bag PM_{10} control efficiency: 99.98%
Wood Lines 6 - 10: Wood/HDPE Extrusion Lines (includes drying and saw cutting) Max Hourly Throughput: 15,000 lb/hr Max Annual Throughput: 65,700 T/yr	Baghouse Dust Collector (DC02): Manufacturer: Schenck Process Model: 144LST196 FILTER Design Flow: 24,000 cfm Filter: PTFE Membrane Bag PM_{10} control efficiency: 99.98%
Wood Blend System 1: Wood/HDPE mix blending system for Wood Lines 1 -5 Max Hourly Throughput: 10,000 lb/hr Max Annual Throughput: 32,850 T/yr	Baghouse Dust Collector (DC03): Manufacturer: Schenck Process Model: 2M2F8 FILTER Design Flow: 5,600 cfm Filter: Megabond Media Cartridge PM_{10} control efficiency: 99.99%
Wood Blend System 2: Wood/HDPE mix blending system for Wood Lines 1 -5 Max Hourly Throughput: 10,000 lb/hr Max Annual Throughput: 32,850 T/yr	Baghouse Dust Collector (DC04): Manufacturer: Schenck Process Model: 2M2F8 FILTER Design Flow: 5,600 cfm Filter: Megabond Media Cartridge PM_{10} control efficiency: 99.99%
Wood Blend System 3: Wood/HDPE mix blending system for Wood Lines 6 -10 Max Hourly Throughput: 10,000 lb/hr Max Annual Throughput: 32,850 T/yr	Baghouse Dust Collector (DC05): Manufacturer: Schenck Process Model: 2M2F8 FILTER Design Flow: 5,600 cfm Filter: Megabond Media Cartridge PM_{10} control efficiency: 99.99%
Wood Blend System 4: Wood/HDPE mix blending system for Wood Lines 6 -10 Max Hourly Throughput: 10,000 lb/hr Max Annual Throughput: 32,850 T/yr	Baghouse Dust Collector (DC06): Manufacturer: Schenck Process Model: 2M2F8 FILTER Design Flow: 5,600 cfm Filter: Megabond Media Cartridge PM_{10} control efficiency: 99.99%
PVC Lines 1 - 5: PVC Extrusion Lines 1 – 5 (includes feeders) Max Hourly Throughput: 9,250 lb/hr Max Annual Throughput: 40,515 T/yr	Baghouse Dust Collector (DC07): Manufacturer: Schenck Process Model: 2M2F8 FILTER Design Flow: 3,500 cfm Filter: Megabond Media Cartridge PM_{10} control efficiency: 99.99%
PVC Lines 6 - 10: PVC Extrusion Lines 6 – 10 (includes feeders) Max Hourly Throughput: 9,250 lb/hr Max Annual Throughput: 40,515 T/yr	
Wood Regrind: Grinder for waste wood/HDPE product Max Hourly Throughput: 3,000 lb/hr Max Annual Throughput: 365 T/yr	Baghouse Dust Collector (DC08): Manufacturer: Weima Model: 144AST10 Design Flow: 15,000 cfm Filter: 16 oz. polyester filter bag PM_{10} control efficiency: 99.9%
PVC Regrind: Grinder for waste PVC product Max Hourly Throughput: 1,850 lb/hr Max Annual Throughput: 365 T/yr	Baghouse Dust Collector (DC09): Manufacturer: Weima Model: FMC 200-6A Design Flow: 6,000 cfm Filter: CA-140 Cartridge PM_{10} control efficiency: 99.9%

Sources	Control Equipment
Truck House: Unloading wood flour/fiber from trucks Max Hourly Throughput: 60,000 lb/hr Max Annual Throughput: 59,154 T/yr	Baghouse Dust Collector (DC10): Manufacturer: Schenck Process Model: 144LST196 FILTER Design Flow: 24,000 cfm Filter: PTFE Membrane Bag PM_{10} control efficiency: 99.98%
Pulverizers 1 - 6: Pulverizers for recycled HDPE/LDPE Max Hourly Throughput: 19,800 lb/hr Max Annual Throughput: 86,724 T/yr	Baghouse Dust Collector (DC11): Manufacturer: Schenck Process Model: 144RPT308 FILTER Design Flow: 30,000 cfm Filter: PTFE Membrane Bag PM_{10} control efficiency: 99.98%
Pellet Mills 1 - 6: Exhaust Air from Pellet Mill Coolers Max Hourly Throughput: 48,000 lb/hr Max Annual Throughput: 131,400 T/yr	Filtered Cyclone Separators (CS01 – CS06): Manufacturer: Simatek Model: JM 32/45-04 4T2-R Design Flow: 5,720 cfm Filter: PP 400 ASY Bag PM_{10} control efficiency: 99%
Wood Storage Silos 1 - 12: Bin-vented storage of wood/HDPE extrusion raw materials Max Hourly Throughput: 360,000 lb/hr Max Annual Throughput: 132,370 T/yr	Bin Vents (BV15 – BV26): BV15 & BV16 control the 18' wood silos BV17 – BV26 control the 14' wood silos Manufacturer: Schenck Process Model: 39RTC32 Filter: Polipleet Cartridge PM_{10} control efficiency: 99.98%
PVC Storage Silos 1 - 14: Bin-vented storage of PVCextrusion raw materials Max Hourly Throughput: 360,300 lb/hr Max Annual Throughput: 82,420 T/yr	Bin Vents (BV01- BV06 & BV09 – BV14): Manufacturer: HorizonPSI Model: Q5-41SFT36-15S Filter: Sidewinder Filter PM_{10} control efficiency: 99.99% Bin Vents (BV07 – BV08): Manufacturer: HorizonPSI Model: Q5-41SFT36-15S Filter: 16 oz. polyester filter bag PM_{10} control efficiency: 99.9%
Radiant Heater 1 (RH-1): Manufacturer: Solaronics Suntube Model: STG-75-30B Heat Input: 0.075 MMBtu/hr Fuel: Natural Gas	None
Radiant Heater 1 (RH-2): Manufacturer: CORAYVAC Model: CRVB-6 Heat Input: 0.48 MMBtu/hr Fuel: Natural Gas	None
Floor-Mounted Space Heater (ATU-2): Manufacturer: Industrial Airsystems Model: 600/100 Heat Input: 1.25 MMBtu/hr Fuel: Natural Gas	None
Floor-Mounted Space Heater (ATU-4): Manufacturer: Industrial Airsystems Model: 600/100 Heat Input: 1.25 MMBtu/hr Fuel: Natural Gas	None
Duct Furnaces (DF-1 – DF-10, DF-12): Manufacturer: Reznor Model: HXE Heat Input: 4.4 MMBtu/hr total (0.4 MMBtu/hr each) Fuel: Natural Gas	None

Sources	Control Equipment
Air Conditioning Units (AC-1 and AC-5): Manufacturer: Lennox Model: GCS16-953 Heat Input: 0.2 MMBtu/hr each Fuel: Natural Gas	None
Air Conditioning Unit (AC-2): Manufacturer: Lennox Model: GCS16-1353 Heat Input: 0.27 MMBtu/hr Fuel: Natural Gas	None
Air Conditioning Units (AC-3 and AC-4): Manufacturer: Lennox Model: GCS16-513-125 Heat Input: 0.125 MMBtu/hr each Fuel: Natural Gas	None
Makeup Direct-Fired Units (MAU-1 – MAU-4, MAU -8): Manufacturer: Greenheck Model: DGX-122 Heat Input: 4.84 MMBtu/hr total (0.97 MMBtu/hr each) Fuel: Natural Gas	None
Makeup Indirect-Fired Unit (MAU-11): Manufacturer: Greenheck Model: IGX-P109-H12 Heat Input: 0.133 MMBtu/hr Fuel: Natural Gas	None
Makeup Indirect-Fired Unit (MAU-12): Manufacturer: Greenheck Model: IGX-P109-H12 Heat Input: 0.089 MMBtu/hr Fuel: Natural Gas	None

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 large gas-fired space heating unit, two radiant heating systems, eleven gas-fired duct furnaces, five gas-fired air conditioning units, five direct-fired makeup air units, two indirect-fired makeup air units, ten composite wood/HDPE extrusion lines, four HDPE blending systems, ten PVC extrusion lines, twenty six silos, composite wood/HDPE regrind and PVC regrinding, six polyethylene pulverizers, and six pellet mills at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant and HAP PTE were based on emission factors from AP-42 Chapter 1.4 and Chapter 6.6, Journal of the Air & Waste Management Association “Development of Emission Factors for Polyethylene Processing”, Journal of Vinyl & Additive Technology “Process Emissions for Vinyl Pipe Industry”, WebFIRE for wood and PVC silos, operation of 8,760 hours per year, and process information specific to the facility for this proposed project. All of the control equipment at the facility (baghouses and bin vents) are considered integral to the design for reclamation of product and proper function of the equipment.

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 facility 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
	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources					
Natural Gas Combustion	0.44	0.035	5.77	4.85	0.00
Wood Extrusion[(a)]	0.20	0.00	0.00	0.00	2.77
PVC Extrusion	0.007	0.00	0.00	0.00	5.10
Material Loading/Unloading[(b)]	0.044	0.00	0.00	0.00	0.00
Regrind	0.005	0.00	0.00	0.00	0.00
Pulverizing	0.017	0.00	0.00	0.00	0.00
Total, Point Sources	**0.71**	**0.035**	**5.77**	**4.85**	**7.87**

a) Includes wood/HDPE extrusion lines 1 – 10 (drying, extrusion, saw cutting), wood/HDPE blending systems 1 – 4, and composite wood/HDPE pellet mills 1 - 6.
b) Includes all storage silos and truck house.

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 facility uncontrolled Potential to Emit is based upon a worst-case for operation of the facility of 8,760 hr/yr.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

Hazardous Air Pollutants	PTE (T/yr)
2-Methylnaphthalene	1.39E-06
3-Methylcholanthrene	1.04E-07
7,12-Dimethylbenz(a)anthracene	9.23E-07
Acenaphthene	1.04E-07
Acenaphthylene	1.04E-07
Acrolein	2.63E-03
Acetaldehyde	5.26E-03
Anthracene	1.39E-07
Benz(a)anthracene	1.04E-07
Benzene	1.21E-04
Benzo(a)pyrene	6.93E-08
Benzo(b)fluoranthene	1.04E-07
Benzo(g,h,i)perylene	6.93E-08
Benzo(k)fluoranthene	1.04E-07
Chrysene	1.04E-07
Dibenzo(a,h)anthracene	6.93E-08
Dichlorobenzene	6.93E-05
Fluoranthene	1.73E-07
Fluorene	1.62E-07
Formaldehyde	1.22E-02

Hazardous Air Pollutants	PTE (T/yr)
Hexane	1.04E-01
Indeno(1,2,3-cd)pyrene	1.04E-07
Methyl ethyl ketone	6.57E-03
Naphthalene	3.52E-05
Phenanathrene	9.81E-07
Propionaldehyde	2.63E-03
Pyrene	2.89E-07
Toluene	1.96E-04
Arsenic	1.15E-05
Beryllium	6.93E-07
Cadmium	6.35E-05
Chromium	8.08E-05
Cobalt	4.85E-06
Manganese	2.19E-05
Mercury	1.50E-05
Nickel	1.21E-04
Selenium	1.39E-06
Total	**0.13**

Pre-Project Potential to Emit

This is a new facility. Therefore, pre-project emissions are set to zero for all criteria pollutants.

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 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 4 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)]
Natural Gas Combustion	0.10	0.44	0.008	0.035	1.32	5.77	1.11	4.85	0.00	0.00
Wood Extrusion[(c)]	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.63	2.77
PVC Extrusion	0.002	0.007	0.00	0.00	0.00	0.00	0.00	0.00	1.17	5.10
Material Loading/Unloading[(d)]	0.17	0.044	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Regrind	0.001	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pulverizing	0.004	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post Project Totals	**0.29**	**0.71**	**0.01**	**0.04**	**1.32**	**5.77**	**1.11**	**4.85**	**1.80**	**7.87**

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.
c) Includes wood/HDPE extrusion lines 1 – 10 (drying, extrusion, saw cutting), wood/HDPE blending systems 1 – 4, and composite wood/HDPE pellet mills 1 - 6.
d) Includes all storage silos and truck house.

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 5 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 Potential to Emit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post Project Potential to Emit	0.29	0.71	0.01	0.04	1.32	5.77	1.11	4.85	1.80	7.87
Changes in Potential to Emit	**0.29**	**0.71**	**0.01**	**0.04**	**1.32**	**5.77**	**1.11**	**4.85**	**1.80**	**7.87**

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.

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acrolein	0.00E-03	6.00E-04	6.00E-04	0.017	No
Dichlorobenzene	0.00E-03	1.58E-05	1.58E-05	20	No
Hexane	0.00E-03	2.37E-02	2.37E-02	12	No
Pentane	0.00E-03	3.43E-02	3.43E-02	118	No
Toluene	0.00E-03	4.48E-05	4.48E-05	25	No
Barium	0.00E-03	5.80E-05	5.80E-05	0.033	No
Chromium	0.00E-03	1.84E-05	1.84E-05	0.033	No
Cobalt	0.00E-03	1.11E-06	1.11E-06	0.0033	No
Copper	0.00E-03	1.12E-05	1.12E-05	0.067	No
Manganese	0.00E-03	5.01E-06	5.01E-06	0.067	No
Methyl ethyl ketone	0.00E-03	1.50E-03	1.50E-03	39.3	No
Molybdenum	0.00E-03	1.45E-05	1.45E-05	0.333	No
Propionaldehyde	0.00E-03	6.00E-04	6.00E-04	0.0287	No
Selenium	0.00E-03	3.16E-07	3.16E-07	0.013	No
Vanadium	0.00E-03	3.03E-05	3.03E-05	0.003	No
Zinc	0.00E-03	3.82E-04	3.82E-04	0.667	No

All changes in emissions rates for non-carcinogenic TAP were below EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of 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 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
3-Methylcholanthrene	0.00E-03	2.37E-08	2.37E-08	2.5E-06	No
Acetaldehyde	0.00E-03	1.20E-03	1.20E-03	3.0E-03	No
Benzene	0.00E-03	2.77E-05	2.77E-05	8.0E-04	No
Formaldehyde	0.00E-03	2.79E-03	2.79E-03	5.1E-04	Yes
Naphthalene	0.00E-03	8.04E-06	8.04E-06	9.10E-05	No
Arsenic	0.00E-03	2.64E-06	2.64E-06	1.5E-06	Yes
Beryllium	0.00E-03	1.58E-07	1.58E-07	2.8E-05	No
Cadmium	0.00E-03	1.45E-05	1.45E-05	3.7E-06	Yes
Nickel	0.00E-03	2.77E-05	2.77E-05	2.7E-05	Yes
POM	0.00E-03	1.50E-07	1.50E-07	2.0E-06	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 arsenic, cadmium, formaldehyde, and nickel because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP 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 8 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (T/yr)
2-Methylnaphthalene	1.39E-06
3-Methylcholanthrene	1.04E-07
7,12-Dimethylbenz(a)anthracene	9.23E-07
Acenaphthene	1.04E-07
Acenaphthylene	1.04E-07
Acrolein	2.63E-03
Acetaldehyde	5.26E-03
Anthracene	1.39E-07
Benz(a)anthracene	1.04E-07
Benzene	1.21E-04
Benzo(a)pyrene	6.93E-08
Benzo(b)fluoranthene	1.04E-07
Benzo(g,h,i)perylene	6.93E-08
Benzo(k)fluoranthene	1.04E-07
Chrysene	1.04E-07
Dibenzo(a,h)anthracene	6.93E-08
Dichlorobenzene	6.93E-05
Fluoranthene	1.73E-07
Fluorene	1.62E-07
Formaldehyde	1.22E-02
Hexane	1.04E-01
Indeno(1,2,3-cd)pyrene	1.04E-07

Hazardous Air Pollutants	PTE (T/yr)
Methyl ethyl ketone	6.57E-03
Naphthalene	3.52E-05
Phenanathrene	9.81E-07
Propionaldehyde	2.63E-03
Pyrene	2.89E-07
Toluene	1.96E-04
Arsenic	1.15E-05
Beryllium	6.93E-07
Cadmium	6.35E-05
Chromium	8.08E-05
Cobalt	4.85E-06
Manganese	2.19E-05
Mercury	1.50E-05
Nickel	1.21E-04
Selenium	1.39E-06
Totals	**0.13**

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of TAP from this project exceeded 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.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

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 Ada 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 HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

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

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 9 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	0.71	0.71	**100**	B
PM_{10}	0.71	0.71	**100**	B
$PM_{2.5}$	0.71	0.71	**100**	B
SO_2	0.04	0.04	**100**	B
NO_X	5.77	5.77	**100**	B
CO	4.85	4.85	**100**	B
VOC	7.87	7.87	**100**	B
HAP (single)	0.10	0.10	**10**	B
Total HAPs	0.13	0.13	**25**	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 source. 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 Condition 2.2.

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}, $PM_{2.5}$, SO_2, NO_X, CO, and VOC 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 not subject to any NSPS requirements 40 CFR Part 60.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT/GACT Applicability (40 CFR 63)

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

The facility is not subject to Subpart DDDD – National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products, and Subpart WWWW – National Emission Standards for Hazardous Air Pollutants: Reinforced Plastic Composites Production Source because it is a minor source of HAPs.

Permit Conditions Review

This section describes the permit conditions for this initial permit.

Permit Condition 2.1

This permit condition requires an O&M manual for the baghouses at the facility to ensure proper operation to control emissions.

Permit Condition 2.2

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity.

Permit Condition 2.3

This permit condition requires a quarterly facility wide visible emission inspection and corrective action if required.

Permit Condition 2.4

This permit condition is for reasonable control of fugitive emissions at the facility.

Permit Condition 2.5

This permit condition requires a quarterly facility wide fugitive emission inspection and corrective action if required.

Permit Condition 2.6

This permit condition requires that odors not be allowed in such quantities as to cause air pollution in accordance with IDAPA 58.01.01.776.01.

Permit Condition 2.7

The permittee is required to record all odor complaints and take corrective action if required.

Permit Condition 3.1

This permit condition is a process description of the wood/HDPE extrusion lines.

Permit Condition 3.2

Table 3.1 is a description of the wood/HDPE extrusion lines and the associated control devices.

Permit Condition 3.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ and VOCs associated with the ten wood/HDPE extrusion lines based on the emission inventory as submitted by the Applicant.

Permit Condition 3.4

This permit condition establishes the throughput limits for the wood/HDPE extrusion lines based on the emission inventory as submitted by the Applicant.

Permit Condition 3.5

This permit condition requires that the permittee install baghouses to control emissions from the ten wood/HDPE extrusion lines to meet the emission limits in permit condition 3.3.

Permit Condition 3.6

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the baghouses.

Permit Condition 3.7

This permit condition ensures that the baghouses be operational anytime that the wood/HDPE extrusion lines are operating.

Permit Condition 3.8

This permit condition requires throughput monitoring for the wood/HDPE extrusion lines to demonstrate compliance with the throughput limits.

Permit Condition 3.9

This permit condition requires pressure drop monitoring across the baghouses to demonstrate compliance with the requirement that the baghouses be operational anytime the wood/HDPE extrusion lines are operating.

Permit Condition 4.1

This permit condition is a process description of the wood/HDPE blend systems.

Permit Condition 4.2

Table 4.1 is a description of the wood/HDPE blend systems and the associated control devices.

Permit Condition 4.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ associated with the four wood/HDPE blend systems based on the emission inventory as submitted by the Applicant.

Permit Condition 4.4

This permit condition establishes the throughput limits for the wood/HDPE blend systems based on the emission inventory as submitted by the Applicant.

Permit Condition 4.5

This permit condition requires that the permittee install baghouses to control emissions from the four wood/HDPE blend systems to meet the emission limits in permit condition 4.3.

Permit Condition 4.6

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the baghouses.

Permit Condition 4.7

This permit condition ensures that the baghouses be operational anytime that the wood/HDPE blend systems are operating.

Permit Condition 4.8

This permit condition requires throughput monitoring for the wood/HDPE blend systems to demonstrate compliance with the throughput limits.

Permit Condition 4.9

This permit condition requires pressure drop monitoring across the baghouses to demonstrate compliance with the requirement that the baghouses be operational anytime the wood/HDPE blend systems are operating.

Permit Condition 5.1

This permit condition is a process description of the PVC extrusion lines.

Permit Condition 5.2

Table 5.1 is a description of the PVC extrusion lines and the associated control devices.

Permit Condition 5.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ and VOCs associated with the ten PVC extrusion lines based on the emission inventory as submitted by the Applicant.

Permit Condition 5.4

This permit condition establishes the throughput limits for the PVC extrusion lines based on the emission inventory as submitted by the Applicant.

Permit Condition 5.5

This permit condition requires that the permittee install baghouses to control emissions from the ten PVC extrusion lines to meet the emission limits in permit condition 5.3.

Permit Condition 5.6

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the baghouses.

Permit Condition 5.7

This permit condition ensures that the baghouses be operational anytime that the PVC extrusion lines are operating.

Permit Condition 5.8

This permit condition requires throughput monitoring for the PVC extrusion lines to demonstrate compliance with the throughput limits.

Permit Condition 5.9

This permit condition requires pressure drop monitoring across the baghouses to demonstrate compliance with the requirement that the baghouses be operational anytime the PVC extrusion lines are operating.

Permit Condition 6.1

This permit condition is a process description of the wood/PVC regrind systems.

Permit Condition 6.2

Table 6.1 is a description of the wood/PVC regrind systems and the associated control devices.

Permit Condition 6.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ associated with the wood regrind and PVC regrind systems based on the emission inventory as submitted by the Applicant.

Permit Condition 6.4

This permit condition requires that the permittee install baghouses to control emissions from the wood and PVC regrind systems to meet the emission limits in permit condition 6.3.

Permit Condition 6.5

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the baghouses.

Permit Condition 6.6

This permit condition ensures that the baghouses be operational anytime that the wood and/or PVC regrind systems are operating.

Permit Condition 6.7

This permit condition requires monitoring for the wood and PVC regrind systems to demonstrate compliance with the emission limits based on the amount of dust collected and the efficiency of the dust collectors.

Permit Condition 6.8

This permit condition requires pressure drop monitoring across the baghouses to demonstrate compliance with the requirement that the baghouses be operational anytime the wood and PVC regrind systems are operating.

Permit Condition 7.1

This permit condition is a process description of the pulverizers.

Permit Condition 7.2

Table 7.1 is a description of the six pulverizers and the associated control device.

Permit Condition 7.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ associated with the six pulverizers based on the emission inventory as submitted by the Applicant.

Permit Condition 7.4

This permit condition establishes the throughput limits for the pulverizers based on the emission inventory as submitted by the Applicant.

Permit Condition 7.5

This permit condition requires that the permittee install a baghouse to control emissions from the six pulverizers to meet the emission limits in permit condition 7.3.

Permit Condition 7.6

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the baghouse.

Permit Condition 7.7

This permit condition ensures that the baghouse be operational anytime that the pulverizers are operating.

Permit Condition 7.8

This permit condition requires throughput monitoring for the six pulverizers to demonstrate compliance with the throughput limits.

Permit Condition 7.9

This permit condition requires pressure drop monitoring across the baghouse to demonstrate compliance with the requirement that the baghouse be operational anytime the pulverizers are operating.

Permit Condition 8.1

This permit condition is a process description of the truck house.

Permit Condition 8.2

Table 8.1 is a description of the truck house and the associated control device.

Permit Condition 8.3

This permit condition establishes the emission limits for $PM_{2.5}$/PM_{10} associated with the truck house based on the emission inventory as submitted by the Applicant.

Permit Condition 8.4

This permit condition establishes the throughput limits for the truck house based on the emission inventory as submitted by the Applicant.

Permit Condition 8.5

This permit condition requires that the permittee install a baghouse to control emissions from the truck house to meet the emission limits in permit condition 8.3.

Permit Condition 8.6

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the baghouse.

Permit Condition 8.7

This permit condition ensures that the baghouse be operational anytime that the truck house are operating.

Permit Condition 8.8

This permit condition requires throughput monitoring for the truck house to demonstrate compliance with the throughput limits.

Permit Condition 8.9

This permit condition requires pressure drop monitoring across the baghouse to demonstrate compliance with the requirement that the baghouse be operational anytime the truck house is operating.

Permit Condition 9.1

This permit condition is a process description of the pellet mills.

Permit Condition 9.2

Table 9.1 is a description of the pellet mills and the associated control devices.

Permit Condition 9.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ associated with the six pellet mills based on the emission inventory as submitted by the Applicant.

Permit Condition 9.4

This permit condition establishes the throughput limits for the pellet mills based on the emission inventory as submitted by the Applicant.

Permit Condition 9.5

This permit condition requires that the permittee install filtered cyclones to control emissions from six pellet mills to meet the emission limits in permit condition 9.3.

Permit Condition 9.6

This permit condition requires that the permittee install a pressure drop monitoring device to ensure proper operation of the filtered cylcones.

Permit Condition 9.7

This permit condition ensures that the filtered cyclones be operational anytime that the pellet mills are operating.

Permit Condition 9.8

This permit condition requires throughput monitoring for the pellet mills to demonstrate compliance with the throughput limits.

Permit Condition 9.9

This permit condition requires pressure drop monitoring across the filtered cyclones to demonstrate compliance with the requirement that the filtered cyclones be operational anytime the pellet mills are operating.

Permit Condition 10.1

This permit condition is a process description of the storage silos.

Permit Condition 10.2

Table 9.1 is a description of the storage silos and the associated control devices.

Permit Condition 10.3

This permit condition establishes the emission limits for $PM_{2.5}/PM_{10}$ associated with the storage silos based on the emission inventory as submitted by the Applicant.

Permit Condition 10.4

This permit condition establishes the throughput limits for the PVC storage silos based on the emission inventory as submitted by the Applicant.

Permit Condition 10.5

This permit condition establishes the throughput limits for the wood storage silos based on the emission inventory as submitted by the Applicant.

Permit Condition 10.6

This permit condition requires that the permittee install bin vents to control emissions from storage silos to meet the emission limits in permit condition 9.3.

Permit Condition 10.7

This permit condition requires throughput monitoring for the PVC storage silos to demonstrate compliance with the throughput limits.

Permit Condition 10.8

This permit condition requires throughput monitoring for the wood storage silos to demonstrate compliance with the throughput limits.

Permit Condition 11.1

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 11.2

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 11.3

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Permit Condition 11.4

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Permit Condition 11.5

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Permit Condition 11.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.01 and 211.03.

Permit Condition 11.7

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Permit Condition 11.8

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Permit Condition 11.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 60 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Permit Condition 11.10

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Permit Condition 11.11

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Permit Condition 11.12

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Permit Condition 11.13

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Permit Condition 11.14

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Permit Condition 11.15

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Permit Condition 11.16

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

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

Source	Annual Emissions (TPY)					
	$PM_{2.5}/PM_{10}$	VOC	NO_x	CO	SO_2	Lead (Pb)
Natural Gas Combustion	0.44	0.00	5.77	4.85	3.46E-02	2.89E-05
Wood Extrusion	2.00E-01	2.77	0.00	0.00	0.00	0.00
PVC Extrusion	6.73E-03	5.10	0.00	0.00	0.00	0.00
Material Loading/Unloading	4.37E-02	0.00	0.00	0.00	0.00	0.00
Regrind	5.07E-03	0.00	0.00	0.00	0.00	0.00
Pulverizing	1.73E-02	0.00	0.00	0.00	0.00	0.00
Total	**0.71**	**7.88**	**5.77**	**4.85**	**3.46E-02**	**2.89E-05**

Phase	Description	Notes	Control Device	Max Throughput (lbs/hr)	Max Throughput (lbs/yr)	Max Throughput (tons/yr)	PM EF (lbs/ton) Controlled	VOC EF (lbs/ton)	PM EF (lbs/ton) Uncontrolled	Potential to Emit (Includes Fugitive Emissions)									
										TPY				lb/day				lb/hr	
										Actual/Controlled		Uncontrolled		Actual/Controlled		Uncontrolled		Actual/Controlled		Uncontrolled	
										$PM_{2.5}/PM_{10}$	VOC	$PM_{2.5}/PM_{10}$	VOC	$PM_{2.5}/PM_{10}$	VOC	$PM_{2.5}/PM_{10}$	VOC	$PM_{2.5}/PM_{10}$	VOC	$PM_{2.5}/PM_{10}$	VOC
1	Wood Line 1	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC01	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 2	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC01	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 3	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC01	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 4	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC01	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 5	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC01	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 6	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC02	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 7	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC02	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 8	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC02	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 9	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC02	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.519	8.53E-04	0.063	8.53E-04	0.063
1	Wood Line 10	Wood/HDPE Extrusion (includes pellet drying and saw cutting)	DC02	3,000	26,280,000	13,140	5.69E-04	0.042	5.69E-04	3.74E-03	0.28	3.74E-03	0.28	2.05E-02	1.52	2.05E-02	1.52	8.53E-04	0.06	8.53E-04	0.06
2	**PVC Line 1**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 2**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 3**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 4**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 5**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 6**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 7**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 8**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 9**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
2	**PVC Line 10**	**PVC Extrusion**	**None**	**1,850**	**16,206,000**	**8,103**	**1.66E-04**	**0.13**	**1.66E-04**	**6.73E-04**	**0.51**	**6.73E-04**	**0.51**	**3.69E-03**	**2.80**	**3.69E-03**	**2.80**	**1.54E-04**	**0.12**	**1.54E-04**	**0.12**
1	Wood Blend System 1	Wood/HDPE mix blending system for lines 1 - 5	DC03	10,000	65,700,000	32,850	7.0E-05	0.00	7.0E-05	1.15E-03	0.00	1.15E-03	0.00	8.44E-03	0.00	8.44E-03	0.00	3.52E-04	0.00	3.52E-04	0.00
1	Wood Blend System 2	Wood/HDPE mix blending system for lines 1 - 5	DC04	10,000	65,700,000	32,850	7.0E-05	0.00	7.0E-05	1.15E-03	0.00	1.15E-03	0.00	8.44E-03	0.00	8.44E-03	0.00	3.52E-04	0.00	3.52E-04	0.00
1	Wood Blend System 3	Wood/HDPE mix blending system for lines 6 - 10	DC05	10,000	65,700,000	32,850	7.0E-05	0.00	7.0E-05	1.15E-03	0.00	1.15E-03	0.00	8.44E-03	0.00	8.44E-03	0.00	3.52E-04	0.00	3.52E-04	0.00
1	Wood Blend System 4	Wood/HDPE mix blending system for lines 6 - 10	DC06	10,000	65,700,000	32,850	7.0E-05	0.00	7.0E-05	1.15E-03	0.00	1.15E-03	0.00	8.44E-03	0.00	8.44E-03	0.00	3.52E-04	0.00	3.52E-04	0.00
1	Truck House	Unloading wood flour	DC10	60,000	118,308,278	59,154	6.0E-06	0.00	6.0E-06	1.79E-04	0.00	1.79E-04	0.00	4.35E-03	0.00	4.35E-03	0.00	1.81E-04	0.00	1.81E-04	0.00
2	**PVC Silos (14'ϕ)**	**Bin-vented storage of raw materials**	**BV01-BV14**	**360,300**	**164,840,260**	**82,420**	**8.0E-04**	**0.00**	**8.0E-04**	**3.30E-02**	**0.00**	**3.30E-02**	**0.00**	**3.46E+00**	**0.00**	**3.46E+00**	**0.00**	**1.44E-01**	**0.00**	**1.44E-01**	**0.00**
1	Wood Silos (18'ϕ - Wood Flour)	Bin-vented storage of raw material (wood fiber)	BV15-BV16	120,000	118,308,278	59,154	1.6E-04	0.00	1.6E-04	4.73E-03	0.00	4.73E-03	0.00	2.30E-01	0.00	2.30E-01	0.00	9.60E-03	0.00	9.60E-03	0.00
1	Wood Silos (14'ϕ)	Bin-vented storage of raw materials (ABDV, TAL, SPHERA, HDPE Flake,	BV17-BV26	240,000	146,431,454	73,216	1.6E-04	0.00	1.6E-04	5.86E-03	0.00	5.86E-03	0.00	4.61E-01	0.00	4.61E-01	0.00	1.92E-02	0.00	1.92E-02	0.00
1	Pulverizer 1	Pulverizer for recycled HDPE/LDPE	DC11	3,300	28,908,000	14,454	4.0E-04	0.00	4.0E-04	2.89E-03	0.00	2.89E-03	0.00	1.58E-02	0.00	1.58E-02	0.00	6.60E-04	0.00	6.60E-04	0.00
1	Pulverizer 2	Pulverizer for recycled HDPE/LDPE	DC11	3,300	28,908,000	14,454	4.0E-04	0.00	4.0E-04	2.89E-03	0.00	2.89E-03	0.00	1.58E-02	0.00	1.58E-02	0.00	6.60E-04	0.00	6.60E-04	0.00
1	Pulverizer 3	Pulverizer for recycled HDPE/LDPE	DC11	3,300	28,908,000	14,454	4.0E-04	0.00	4.0E-04	2.89E-03	0.00	2.89E-03	0.00	1.58E-02	0.00	1.58E-02	0.00	6.60E-04	0.00	6.60E-04	0.00
1	Pulverizer 4	Pulverizer for recycled HDPE/LDPE	DC11	3,300	28,908,000	14,454	4.0E-04	0.00	4.0E-04	2.89E-03	0.00	2.89E-03	0.00	1.58E-02	0.00	1.58E-02	0.00	6.60E-04	0.00	6.60E-04	0.00
1	Pulverizer 5	Pulverizer for recycled HDPE/LDPE	DC11	3,300	28,908,000	14,454	4.0E-04	0.00	4.0E-04	2.89E-03	0.00	2.89E-03	0.00	1.58E-02	0.00	1.58E-02	0.00	6.60E-04	0.00	6.60E-04	0.00
1	Pulverizer 6	Pulverizer for recycled HDPE/LDPE	DC11	3,300	28,908,000	14,454	4.0E-04	0.00	4.0E-04	2.89E-03	0.00	2.89E-03	0.00	1.58E-02	0.00	1.58E-02	0.00	6.60E-04	0.00	6.60E-04	0.00
1	Wood Regrind	Grinder for waste wood/HDPE product (EF is lb/day)	DC08	EF is lbs/day---------->		365	8.75E-03	0.00	8.75E-03	1.60E-03	0.00	1.60E-03	0.00	8.75E-03	0.00	8.75E-03	0.00	3.64E-04	0.00	3.64E-04	0.00
2	**PVC Regrind**	**Grinder for waste PVC product (EF is lb/day)**	**DC09**	**EF is lbs/day----------> ----->**		**365**	**1.90E-02**	**0.00**	**1.90E-02**	**3.47E-03**	**0.00**	**3.47E-03**	**0.00**	**1.90E-02**	**0.00**	**1.90E-02**	**0.00**	**7.93E-04**	**0.00**	**7.93E-04**	**0.00**
	Pellet Mill 1	**Exhaust air from Wood/HDPE pellet mill coolers**	**CS01**	**8,000**	**43,800,000**	**21,900**	**2.4E-03**	**0.00**	**2.4E-03**	**2.63E-02**	**0.00**	**2.63E-02**	**0.00**	**2.30E-01**	**0.00**	**2.40E-03**	**0.00**	**9.6E-03**	**0.00**	**1.00E-04**	**0.00**
	Pellet Mill 2	**Exhaust air from Wood/HDPE pellet mill coolers**	**CS02**	**8,000**	**43,800,000**	**21,900**	**2.4E-03**	**0.00**	**2.4E-03**	**2.63E-02**	**0.00**	**2.63E-02**	**0.00**	**2.30E-01**	**0.00**	**2.40E-03**	**0.00**	**9.6E-03**	**0.00**	**1.00E-04**	**0.00**
	Pellet Mill 3	**Exhaust air from Wood/HDPE pellet mill coolers**	**CS03**	**8,000**	**43,800,000**	**21,900**	**2.4E-03**	**0.00**	**2.4E-03**	**2.63E-02**	**0.00**	**2.63E-02**	**0.00**	**2.30E-01**	**0.00**	**2.40E-03**	**0.00**	**9.6E-03**	**0.00**	**1.00E-04**	**0.00**
	Pellet Mill 4	**Exhaust air from Wood/HDPE pellet mill coolers**	**CS04**	**8,000**	**43,800,000**	**21,900**	**2.4E-03**	**0.00**	**2.4E-03**	**2.63E-02**	**0.00**	**2.63E-02**	**0.00**	**2.30E-01**	**0.00**	**2.40E-03**	**0.00**	**9.6E-03**	**0.00**	**1.00E-04**	**0.00**
	Pellet Mill 5	**Exhaust air from Wood/HDPE pellet mill coolers**	**CS05**	**8,000**	**43,800,000**	**21,900**	**2.4E-03**	**0.00**	**2.4E-03**	**2.63E-02**	**0.00**	**2.63E-02**	**0.00**	**2.30E-01**	**0.00**	**2.40E-03**	**0.00**	**9.6E-03**	**0.00**	**1.00E-04**	**0.00**
	Pellet Mill 6	**Exhaust air from Wood/HDPE pellet mill coolers**	**CS06**	**8,000**	**43,800,000**	**21,900**	**2.4E-03**	**0.00**	**2.4E-03**	**2.63E-02**	**0.00**	**2.63E-02**	**0.00**	**2.30E-01**	**0.00**	**2.40E-03**	**0.00**	**9.6E-03**	**0.00**	**1.00E-04**	**0.00**
									Facility PTE	**0.27**	**7.88**	**0.27**	**7.88**	**5.94**	**43.16**	**4.57**	**43.16**	**0.25**	**1.80**	**0.19**	**1.80**

Truck House:	Truck unloading of wood flour		
	Control device integral to design for preventing loss of product		
PM	6.05E-06	lbs PM/ton	Controlled @ 99.98%
VOC	0	lbs VOC/ton	Engineering judgement (no heat applied during loading)
Grinding Systems:	Regrind of waste material for reintroduction into process as raw material		
	Control device integral to design for reclamation		
PM	1.90E-02	lbs PM/day	PVC, Controlled @ 99.9% (Dust Collector)
	8.75E-03	lbs PM/day	Wood, Controlled @ 99.9% (Dust Collector)
VOC	0	lbs VOC/day	Engineering judgement (no heat applied during grinding)
Wood/HDPE Extrusion Lines:	Pellet drying, extrusion, cutting		
	Control device integral to design for reclamation and proper function of equipment		
PMc	5.21E-04	lbs PM/ton	(0.0156 ft/cut) x (1 cut/12 ft) x (2000 lbs/ton) x (1-0.9998) - Saw cutting controlled @ 99.98%
PMd	4.80E-05	lbs PM/ton	Wood line dryers EF - Controlled @ 99.98%
PM	0.00057	lbs PM/ton	Sum of PMc & PMd - Controlled @ 99.98%
VOC	0.0422	lbs VOC/ton	Table 7, "Development of Emission Factors for Polyethylene Processing", Barlow et al., *Journal of the Air & Waste Management Association* , June 1996, Vol. 46
HAPs/TAPs	0.0004	lbs HAP/ton	Table 7, "Development of Emission Factors for Polyethylene Processing", Barlow et al., *Journal of the Air & Waste Management Association* , June 1996, Vol. 46
Silos:	Storage silos for raw material		
	Control device integral to design for preventing loss of product		
PM	1.60E-04	lbs PM/ton	WebFIRE - FID: 12811 - Wood Silos, Controlled (Integral)
	8.00E-04	lbs PM/ton	WebFIRE - FID: 12811 - PVC Silos, Controlled (Integral)
VOC	0	lbs VOC/ton	Engineering judgement (no heat applied during storage)
PVC Extrusion Lines:	Feeding, extrusion		
	Control device integral to design for reclamation		
PM	1.66E-04	lbs PM/ton	PVC Feeders - Controlled @ 99.99%
VOC	0.1260	lbs VOC/ton	"Process Emissions for Vinyl Pipe Industry", D.A. Ernes and J.P. Griffin, Journal of Vinyl & Additive Technology, September 1996, Vol. 2, No. 3
HAPs/TAPs	0	lbs HAPS/ton	"Process Emissions for Vinyl Pipe Industry", D.A. Ernes and J.P. Griffin, Journal of Vinyl & Additive Technology, September 1996, Vol. 2, No. 3
Note:	*PVC deck boards are cut with a heat knife at 270-280 °F. No VOC emissions below 300 °F per AZEK based upon industry knowledge .*		
Wood/HDPE Blend Tower:	Blending wood/HDPE extrusion mix		
	Control device integral to design for reclamation		
PM	7.03E-01	lbs PM/ton	Uncontrolled
	7.03E-05	lbs PM/ton	Controlled @ 99.99%
VOC	0	lbs VOC/ton	Engineering judgement (no heat applied during blending)
Pulverizer:	Pulverizing recycled HDPE/LDPE for use as raw material		
	Control device integral to design for reclamation		
PM	4.00E-04	lb PM/ton	Controlled @ 99.98%
VOC	0	lb VOC/ton	Engineering judgement (no heat applied during pulverizing)
Pellet Mills:	Formation of pellets from blended raw material		
	Control device integral to design for reclamation and preventing loss of product		
PM	2.40E-03	lbs PM/ton	WebFIRE - FID: 8812 - Controlled @ 99% by Cyclone (Integral)
VOC	0	lbs VOC/ton	Engineering judgement (low heat relative to extrusion)

Total HAPs/TAPs - Emission Calculations

Polyethylene Extrusion (All Wood/HDPE Lines)

Formaldehyde	0.06	lb/MM lb	0.0001	lb/ton
Acrolein	*0.02*	lb/MM lb	0.00004	lb/ton
Acetaldehyde	0.04	lb/MM lb	0.0001	lb/ton
Propionaldehyde	0.02	lb/MM lb	0.00004	lb/ton
Methyl ethyl ketone	0.05	lb/MM lb	0.000100	lb/ton
Total HAPs/TAPs	0.19	lb/MM lb	0.000380	lb/ton

Emissions Factor Source:

HDPE "Development of Emission Factors for Polyethylene Processing", Barlow et al., *Journal of the Air & Waste Management Association* , June 1996, Vol. 46

Total Polyethylene Extrusion Throughput

131,400 tons/yr

Natural Gas Combustion

Formaldehyde 0.075 lb/MM scf

Max Annual Natural Gas Usage

115 MM scf/year

HAPs/TAPs Emissions

Substance	tons/yr	lbs/day	lbs/hr	Carcinogen?	EL (lb/hr)	Exceeds EL?
Formaldehyde (Nat. Gas)	***4.33E-03***	***0.024***	***0.00099***	***Y***	***5.10E-04***	***Y***
Formaldehyde (Extrusion)	***7.88E-03***	***0.043***	***0.00180***	***Y***	***5.10E-04***	***Y***
Formaldehyde (Total)	***1.22E-02***	***0.067***	***0.00279***	***Y***	***5.10E-04***	***Y***
Acrolein	*2.63E-03*	0.0144	0.00060	N	1.70E-02	N
Acetaldehyde	5.26E-03	0.0288	0.00120	Y	3.00E-03	N
Propionaldehyde	2.63E-03	0.0144	0.00060	N	2.87E-02	N
Methyl ethyl ketone	6.57E-03	0.036	0.00150	N	3.93E+01	N
Other HAPs from Natural Gas Combustion	1.05E-01	0.57	0.02389	N	--	N
Total HAPs/TAPs	1.34E-01	7.34E-01	3.06E-02	--	--	--

Maximum Natural Gas Usage at Facility													
Equipment Type	**Equipment ID**	**Ex/Pr**	**Manufacturer**	**Model No**	**Flue/Chimney Diam (in)**	**Flue/Chimney Height Above Roof (ft)**	**Release Height from Base (ft)**	**Vertical (V), Rain-Capped Vertical (C), or Horizontal (H)**	**Stack CFM**	**Input (MBH)**	**Formaldehyde Emissions (lb/hr)**	**Output (MBH)**	**Efficiency**
Floor-mounted Heater	ATU-2	Ex	Industrial Airsystems	600/100	10	6.0	46.0	C	214	1,250	9.19E-05	1,000	80%
Floor-mounted Heater	ATU-4	Ex	Industrial Airsystems	600/100	10	6.0	32.0	C	214	1,250	9.19E-05	1,000	80%
Radiant Heater (Maintenance)	RH-1	Ex	Solaronics Suntube	STG-75-30B	4	3.5		C	41	75	5.51E-06	68	90%
Radiant Heater (Truck Wash)	RH-2	Ex	CORAYVAC	CRVB-6	4	--	21.0	H	170	480	3.53E-05		90%
Duct Furnace	DF-1	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-2	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-3	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-4	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-5	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-6	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-7	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-8	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-9	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-10	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Duct Furnace	DF-12	Ex	Reznor	HXE	6	3.5	43.5	C	69	400	2.94E-05	308	77%
Air Conditioning Unit	AC-1	Ex	Lennox	GCS16-953	5x6	2.8	28.8	H	34	200	1.47E-05	160	80%
Air Conditioning Unit	AC-2	Ex	Lennox	GCS16-1353	5x6	3.3	29.3	H	46	270	1.99E-05	216	80%
Air Conditioning Unit	AC-3	Ex	Lennox	GCS16-513-125	5x6	2.7	28.7	H	21	125	9.19E-06	95	76%
Air Conditioning Unit	AC-4	Ex	Lennox	GCS16-513-125	5x6	2.7	28.7	H	21	125	9.19E-06	95	76%
Air Conditioning Unit	AC-5	Ex	Lennox	GCS16-953	5x6	2.8	28.8	H	34	200	1.47E-05	160	80%
Make-up Air Unit	MAU-1	Pr	Greenheck	DGX-122	37	5.6	31.6	C	8,950	969	7.12E-05	891	92%
Make-up Air Unit	MAU-2	Pr	Greenheck	DGX-122	37	5.6	31.6	C	8,950	969	7.12E-05	891	92%
Make-up Air Unit	MAU-3	Pr	Greenheck	DGX-122	48	11.0	37.0	C	28,500	969	7.12E-05	891	92%
Make-up Air Unit	MAU-4	Pr	Greenheck	DGX-122	48	11.0	37.0	C	28,500	969	7.12E-05	891	92%
Make-up Air Unit	MAU-8	Pr	Greenheck	DGX-122	48	11.0	37.0	C	28,500	969	7.12E-05	891	92%
Make-up Air Unit	MAU-11	Pr	Greenheck	IGX-P109-H12	4	0.0	45.0	C	23	133	9.81E-06	107	80%
Make-up Air Unit	MAU-12	Pr	Greenheck	IGX-P109-H12	4	0.0	45.0	C	15	89	6.54E-06	71	80%
										Max Hourly NG Usage (MBH)	13,440	--	
										Max Hourly NG Usage (MMBH)	13.440	--	
										Max Hourly NG Usage (MM scf/hr)	1.32E-02	9.88E-04	<-- Total (lb/hr)
										Max Hourly NG Usage (MM scf/year)	**115.43**	**4.33E-03**	<-- Total (TPY)

From AP-42 Chapter 1.4

CAS No.	Pollutant	Emission Factor (lb/MM scf)	Emission Factor Rating	HAP?	POM?	Max Emission (lb/hr)	Max Emission (TPY)	EL (lb/hr)	Exceeds EL?	Carcinogen?
91-57-6	2-Methylnaphthalene	2.40E-05	D	Y	Y	3.16E-07	1.39E-06	--	N	--
56-49-5	3-Methylcholanthrene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	2.50E-06	N	Y
	7,12-Dimethylbenz(a)anthracene	1.60E-05	E	Y	Y	2.11E-07	9.23E-07	--	N	--
83-32-9	Acenaphthene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
203-96-8	Acenaphthylene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
120-12-7	Anthracene	2.40E-06	E	Y	Y	3.16E-08	1.39E-07	--	N	--
56-55-3	Benzo(a)anthracene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
71-43-2	Benzene	2.10E-03	B	Y	N	2.77E-05	1.21E-04	8.00E-04	N	Y
50-32-8	Benzo(a)pyrene	1.20E-06	E	Y	Y	1.58E-08	6.93E-08	2.00E-06	N	Y
205-99-2	Benzo(b)fluoranthene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
191-24-2	Benzo(g,h,i)perylene	1.20E-06	E	Y	Y	1.58E-08	6.93E-08	--	N	--
207-08-9	Benzo(k)fluoranthene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
106-97-8	Butane	2.10E+00	E	N	N	2.77E-02	1.21E-01	--	N	--
218-01-9	Chrysene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
53-70-3	Dibenzo(a,h)anthracene	1.20E-06	E	Y	Y	1.58E-08	6.93E-08	--	N	--
25321-22-6	Dichlorobenzene	1.20E-03	E	Y	N	1.58E-05	6.93E-05	2.00E+01	N	N
74-84-0	Ethane	3.10E+00	E	N	N	4.08E-02	1.79E-01	--	N	--
206-44-0	Fluoranthene	3.00E-06	E	Y	Y	3.95E-08	1.73E-07	--	N	--
86-73-7	Fluorene	2.80E-06	E	Y	Y	3.69E-08	1.62E-07	--	N	--
50-00-0	***Formaldehyde***	***7.50E-02***	***B***	***Y***	***N***	***9.88E-04***	***4.33E-03***	***5.10E-04***	***Y***	***Y***
110-54-3	Hexane	1.80E+00	E	Y	N	2.37E-02	1.04E-01	1.20E+01	N	N
193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-06	E	Y	Y	2.37E-08	1.04E-07	--	N	--
91-20-3	Naphthalene	6.10E-04	E	Y	N	8.04E-06	3.52E-05	9.10E-05	N	N
109-66-0	Pentane	2.60E+00	E	N	N	3.43E-02	1.50E-01	1.18E+02	N	N
85-01-8	Phenanathrene	1.70E-05	D	Y	Y	2.24E-07	9.81E-07	--	N	--
74-98-6	Propane	1.60E+00	E	N	N	2.11E-02	9.23E-02	--	N	--
129-00-0	Pyrene	5.00E-06	E	Y	Y	6.59E-08	2.89E-07	--	N	--
108-88-3	Toluene	3.40E-03	C	Y	N	4.48E-05	1.96E-04	2.50E+01	N	N
7440-38-2	***Arsenic***	***2.00E-04***	***E***	***Y***	***N***	***2.64E-06***	***1.15E-05***	***1.50E-06***	***Y***	***Y***
7440-39-3	Barium	4.40E-03	D	N	N	5.80E-05	2.54E-04	3.30E-02	N	N
7440-41-7	Beryllium	1.20E-05	E	Y	N	1.58E-07	6.93E-07	2.80E-05	N	Y
7440-43-9	***Cadmium***	***1.10E-03***	***D***	***Y***	***N***	***1.45E-05***	***6.35E-05***	***3.70E-06***	***Y***	***Y***
7440-47-3	Chromium	1.40E-03	D	Y	N	1.84E-05	8.08E-05	3.30E-02	N	N
7440-48-4	Cobalt	8.40E-05	D	Y	N	1.11E-06	4.85E-06	3.30E-03	N	N
7440-50-8	Copper	8.50E-04	C	N	N	1.12E-05	4.91E-05	6.70E-02	N	N
7439-96-5	Manganese	3.80E-04	D	Y	N	5.01E-06	2.19E-05	6.70E-02	N	N
7439-97-6	Mercury	2.60E-04	D	Y	N	3.43E-06	1.50E-05	--	N	--
7439-98-7	Molybdenum	1.10E-03	D	N	N	1.45E-05	6.35E-05	3.33E-01	N	N
7440-02-0	***Nickel***	***2.10E-03***	***C***	***Y***	***N***	***2.77E-05***	***1.21E-04***	***2.70E-05***	***Y***	***Y***
7782-49-2	Selenium	2.40E-05	E	Y	N	3.16E-07	1.39E-06	1.30E-02	N	N
7440-62-2	Vanadium	2.30E-03	D	N	N	3.03E-05	1.33E-04	3.00E-03	N	N
7440-66-6	Zinc	2.90E-02	E	N	N	3.82E-04	1.67E-03	6.67E-01	N	N
---	POM	1.14E-05	E	N	N	1.50E-07	6.58E-07	2.00E-06	N	N
					Total POM	**1.16E-06**	**5.09E-06**			
					Total HAPs	**2.49E-02**	**1.09E-01**			

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

M E M O R A N D U M

DATE: January 25, 2022

TO: Kelli Wetzel, Permit Writer, Air Program

FROM: Darrin Mehr, Air Quality Dispersion Modeling Analyst, Air Program
Kevin Schilling, Air Quality Dispersion Modeling Supervisor, Air Program

PROJECT: P-2021.0051 PROJ 62734, Permit Application to Construct a New Composite Deck Board Manufacturing Facility in Boise, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) Related to Air Quality Impact Analyses

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Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
ACFM	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ARM	Ambient Ratio Method
ASOS	Automated Surface Observing System
AZEK	AZEK Building Products
bhp	Brake horsepower
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
ft	Feet
ft/sec	Feet per second
GEP	Good Engineering Practice
HAP	Hazardous Air Pollutant
HDPE	High density polyethylene
hr	Hour
HVAC	Heating, Ventilation, and Air Conditioning
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
lb/hr	Pounds per hour
m	Meters
m/sec	Meters per second
MACT	Maximum Achievable Control Technology
MERPs	Modeled Emission Rates for Precursors
MMBtu	Million British Thermal Units
MMscf/year	Million standard cubic feet per year
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen

NSPS	New Source Performance Standards
NSR	New Source Review
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
NWS	National Weather Service
O_3	Ozone
OLM	Ozone Limiting Method
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion
PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
PVC	Polyvinyl chloride
scf/day	Standard cubic feet per day
scf/hr	Standard cubic feet per hour
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
STONE	STONE Environmental, Engineering & Science (permitting and modeling consultant)
TAP	Toxic Air Pollutant
tons/year	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOCs	Volatile Organic Compounds
wscf/MMBtu	Wet standard cubic feet per million British thermal unit
^oF	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

AZEK Building Products (AZEK) submitted a Permit to Construct (PTC) application for a proposed facility to manufacture composite deck boards. The facility will be located on a property parcel with two existing structures that will house the AZEK facility. The existing structures contain existing natural gas-fired heating units and fan-powered rooftop exhaust stacks that will be utilized for the AZEK facility. AZEK will install additional natural gas-fired air makeup heaters, the composite deck board processing equipment, and raw material storage silos. The manufacturing process will include extrusion lines for deck boards, outdoor storage silos for raw materials, a truck unloading structure, raw material blending systems, and recycled material grinding and pulverizing equipment.

AZEK was issued PTC P-2021.0012 Project 62600 on August 13, 2021. The current project addresses several changes in the design of the facility and will replace the Project 62600 PTC as the initial facility-wide PTC. The current project adds six pellet mills, increases throughputs for the PVC extrusion and regrind by 218%, increases PVC storage silo throughputs, and reflects the final HVAC emissions units and stack layout that will be used by AZEK. Six existing fan-assisted rooftop vents will be removed from service.

Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho *Air Rules* Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho *Air Rules* Section 203.02 and 203.03.

STONE Environmental, Engineering & Science (STONE), AZEK's permitting consultant, prepared the PTC application and performed ambient air impact analyses for this project. DEQ review of submitted data and analyses (and any DEQ verification analyses) summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission 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, when appropriately

combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.

Criteria/Assumption/Result	Explanation/Consideration
General Emission Rates. Emission rates used in the air impact analyses and applicability evaluation, as listed in this memorandum, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period. Emissions of SO_2, CO, NO_x, PM_{10}, and $PM_{2.5}$, and lead (Pb) were below the BRC or established modeling applicability thresholds.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses. PM_{10} and $PM_{2.5}$ process emissions were limited to levels below BRC thresholds based on the application of high control efficiencies for the emission control systems.
Air Impact Analyses for TAP[g] Emissions. The emission increases for the project that exceeded the TAP screening emissions level (EL) were limited to arsenic, cadmium, formaldehyde, and nickel.	The design values for all modeled TAPs were below the allowable TAP increments and no limitations are recommended based on the TAPs impact analyses.
Natural Gas Combustion TAPs and criteria air pollutant emission rates for natural gas combustion were based on rated heat input capacity for each unit and 8,760 hours per year.	Natural gas fuel throughput was unlimited by any capacity, hours/day, or hours/year assumptions for each emissions unit. Operating limitations are not necessary.

Summary of Submittals and Actions

August 13, 2021	DEQ issued PTC P-2012.0012 Project 62600.
October 26, 2021	DEQ received a PTC application from AZEK to replace the August 13, 2021 PTC.
October 30, 2021	Regulatory start date.
November 29, 2021	DEQ declared the application complete.

2.0 Background Information

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

2.1 Project Description

AZEK will construct a composite deck board manufacturing facility at a vacant retail distribution warehouse in Boise, Idaho. AZEK will use existing natural gas-fired heating units including:

- 2 space heating units
- 3 radiant heating heaters
- 12 duct furnaces, and
- 5 air conditioning units.

AZEK will install the following processes and equipment:

- 20 deck board extrusion lines with 10 lines to produce composite wood and HDPE deck boards and 10 lines to produce PVC deck boards
- 6 pellet mills with coolers
- 26 outdoor storage silos
- 1 truck house for unloading wood flour material
- 6 recycled polyethylene plastic pulverizers
- 2 recycled waste material grinders
- Emission control systems will be used to control emissions of 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 ($PM_{2.5}$) from the processes listed above
- 5 natural gas-fired direct contact makeup air heaters, and
- 2 natural gas-fired indirect contact makeup air heaters.

2.2 Facility Location and Area Classification

The facility is located in Ada County, Idaho (Easting: 567,000 m; Northing: 4,821,300 m; UTM Zone 11) or (43.6388° latitude; -116.4402° longitude). 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), PM_{10}, and $PM_{2.5}$. The area operates under the Northern Ada County limited maintenance plans for CO and PM_{10}.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho *Air Rules*[1] 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:

> ***02. 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

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho *Air Rules* Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho *Air Rules* Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho *Air Rules* Section 203.02. The 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 in accordance with methods outlined in Appendix W. 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 emission 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.

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 potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), 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 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 an exceedance of NAAQS, a culpability analysis can determine if this exceedance is due to emissions from the proposed project. The permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho *Air Rules* Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[2]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or

other level determined to be inconsequential to NAAQS compliance; or c) 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 d) 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.

Table 2. APPLICABLE REGULATORY LIMITS.

Pollutant	Averaging Period	Significant Impact Levels[a] (µg/m^3)[b]	Regulatory Limit[c] (µg/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	0.2	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 µg/m^3)	75 ppb[p] (196 µg/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 µg/m^3)	100 ppb[s] (188 µg/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]	70 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.

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 Section 210, if the total project-wide emission 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 emission 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. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the facility were estimated by STONE for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater

than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Modeling Protocol

A modeling protocol was not submitted to DEQ for this project. The ambient impact analyses were conducted based on the modeling protocol submitted by STONE on February 12, 2021, and DEQ's March 5, 2021, conditional modeling protocol approval letter for the Project 62600 PTC. The air impact modeling analyses were generally conducted using data and methods identified in the modeling protocol and prescribed by the DEQ *Air Modeling Guideline*.[3]

3.1.2 Modeling Applicability and Modeled Criteria Pollutant Emission Rates

If a project would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho *Air Rules* as "significant," then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho *Air Rules* Section 221.01 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.[2]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho *Air Rules* Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analysis 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.

The BRC exemption cannot generally be used to exempt a project from a pollutant-specific NAAQS compliance demonstration where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit. However, in this instance, if post-project facility-wide emissions of the criteria pollutant are also below BRC thresholds, then a NAAQS compliance demonstration is not required.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS. DEQ recently revised emission *de minimis* threshold levels[2], below which project-specific air impact modeling is not necessary to confidently demonstrate NAAQS compliance. Revised thresholds are a function of the Significant Emission Rates (SERs) defined in Idaho *Air Rules* Section 005.108. The SERs are expressed as annual emission rates. To use SERs for NAAQS with short-term averaging periods, the SER is divided by 8,760 hours/year and compared to maximum hourly emissions for 1-hour standards or maximum daily emissions divided by 24 for 24-hour standards.

DEQ also developed SIL thresholds for modification projects where facility-wide emissions exceed SER-based thresholds; emissions less than these rates are reasonably assured to have impacts less than the applicable SIL. SIL thresholds were developed by DEQ using dispersion modeling analyses of a generic facility with one point source. If emissions from affected units/processes exceed SIL modeling thresholds, then air impact modeling is required for permitting.

Table 3 summarizes applicability to NAAQS compliance demonstration requirements and project-specific air impact modeling analyses. The modeling applicability threshold for a new facility is established as the

1/4th of the SER (or 1/4th of the SER divided by 8,760 hour/year for NAAQS with an averaging period less than annual), and these thresholds will be applied to the AZEK project.

Table 3. APPLICABILITY OF NAAQS COMPLIANCE DEMONSTRATION REQUIREMENTS AND PROJECT-SPECIFIC AIR IMPACT MODELING ANALYSES

Pollutant and Averaging Period	BRC Exemption from NAAQS Compliance Demonstration			Project-Specific Impact Analysis Applicability		
	Annual PTE for Permit Applicability[a] (tons/year)	BRC Level[b] (tons/year)	NAAQS Compliance Demonstration Required?	Total Project Emission Increase	Modeling Threshold (SER/4)[c]	Project-Specific Modeling Required?
PM_{10} 24-hour	0.71	1.5	No	NA	0.86 lb/hour	No
$PM_{2.5}$ 24-hour	0.71	1.0	No	NA	0.57 lb/hour	No
$PM_{2.5}$ annual				NA	2.5 tons/year	No
NO_2 1-hour	5.77	4.0	Yes	1.32 lb/hour[d]	2.28 lb/hour	No
NO_2 annual				5.77 ton/year	10 ton/year	No
SO_2 1-hour	0.035	4.0	No	NA	2.28 lb/hour	No
SO_2 3-hour				NA	2.28 lb/hour	No
CO 1- hour	4.85	10	No	NA	5.7 lb/hour (84 lb/hour SIL-based)[e]	No
CO 8-hour	4.85	10	No	NA	5.7 lb/hour (26 lb/hour SIL-based)[e]	No
O_3 8-hour[f]	7.88	4.0	Yes[g]	NA	Threshold value not established	No[g]
Pb 3-month	2.9E-05	0.06	No	NA	24.7 lb/month	No

a. Calculated potential to Emit (PTC) for permit applicability purposes. Fugitive emissions are not considered in the BRC evaluation unless required by federal rule. Note that permit applicability is based only on annual emission rates.
b. Below Regulatory Concern (BRC) thresholds in tons/year.
c. The project-specific air impact modeling threshold for a new facility is 1/4th of the Significant Emission Rate (SER). For NAAQS with a 1-hour averaging period, this value is converted to pounds and divided by 8,760 hour/year to generate a pound/hour threshold.
d. Maximum hourly emissions including emergency generator engines.
e. SIL-based CO modeling threshold may be used if the ¼ SER threshold is exceeded.
f. VOC emissions are evaluated for ozone impact.
g. See section below on secondary formation from precursor emissions.

Ambient impact analyses are not required for the rolling 3-month average lead, 1-hour and 3-hour SO_2, 24-hour PM_{10}, 24-hour and annual $PM_{2.5}$, and 1-hour and 8-hour CO standards based on the emissions remaining below the annual BRC threshold.

Project-specific air impact modeling analyses were not required for 1-hour and annual NO_2 standards because emissions were below the modeling thresholds based on 1/4th the SERs.

Compliance demonstration requirements for secondary formation of ozone and $PM_{2.5}$ due to VOCs, NO_x, and SO_2 precursor emissions are discussed below.

Secondary Formation Ambient Impacts Due to Precursor Emissions

EPA issued final Modeled Emission Rates as Precursors (MERPs) guidance[4] that may be used for Tier 1 compliance demonstrations using default minimum MERP values specific to regions within the U.S. The guidance establishes the applicability criteria and methods to evaluate secondary impacts for this project. EPA has modeled hypothetical sources for secondary formation of $PM_{2.5}$ and ozone, including two new

sources in Idaho that are not included in the final MERPs guidance pointed out above. Hypothetical source data can be accessed at: https://www.epa.gov/scram/merps-view-qlik.

An 8-hour ozone SIL compliance demonstration for secondary formation of ozone from VOCs and/or NO_x precursor emissions is triggered by an emission increase of either pollutant greater than the significant emission rate (SER) of 40 tons/year, as specified in Section 006.108 of the Idaho *Air Rules*. Only ozone precursor(s) with potential annual emissions exceeding the SER are required to be included in the SIL analysis. The project's annual emission increase of NO_x was estimated at 5.77 tons/year and annual emissions increase of VOCs was estimated at listed at 7.88 tons/year. The requested potential annual emission rates of NOx and VOCs are both below the SERs of 40 tons/year for each pollutant. A compliance demonstration for the 8-hour ozone SIL is not required for this project.

Secondary formation of $PM_{2.5}$ is caused by NO_x and SO_2 precursor emissions. The project's emission increases of NO_x and SO_2 precursor emissions were listed in the emission inventory estimated at 5.77 tons/year of NO_x and 0.035 tons/year of SO_2. EPA issued revised draft guidance[5] on ozone and $PM_{2.5}$ modeling on September 20, 2021. The revised guidance requires secondary formation of $PM_{2.5}$ due to NO_x and SO_2 precursor emissions to be estimated and added to the predicted impacts attributed to direct emissions of $PM_{2.5}$ regardless of whether either or both precursor emission rates are below the SERs if direct $PM_{2.5}$ emissions exceed the SER of 10 tons/year. Potential direct $PM_{2.5}$ emissions are 0.71 tons/year for this project which is below the 10 tons/year SER, and neither a primary or secondary $PM_{2.5}$ SIL or NAAQS ambient impact analysis is required.

3.1.3 TAPs Modeling Applicability

TAP emissions regulated under Section 210 of the Idaho *Air Rules* are only applicable for new or modified sources constructed after July 1, 1995. TAP emission increases for the project, for those TAPs with an increase exceeding the ELs of Idaho *Air Rules* Section 585 or 586, are subject to impact modeling unless exempted from modeling pursuant to Section 210.20 of the Idaho *Air Rules*.

Emissions of carcinogenic TAPs that exceeded the ELs specified in Section 586 included arsenic, cadmium, formaldehyde, and nickel. The project's arsenic, cadmium, and nickel emission increases were attributed to combustion of natural gas in space heating emission units. Emission increases of formaldehyde were attributed to natural gas combustion in space heating units and deck board extrusion process equipment. The project's facility-wide emissions of TAPs that exceeded the ELs are listed in Table 4.

Table 4. CARCINOGENIC TAPs MODELING APPLICABILITY

Pollutant	Facility-wide Potential Emissions (lb/hr)	TAP EL (lb/hr)	Percent of EL (%)
Formaldehyde	2.79E-03	5.10E-04	547%
Arsenic	2.64E-06	1.50E-06	176%
Cadmium	1.45E-05	3.70E-06	392%
Nickel	2.77E-05	2.70E-05	103%

The modeled TAP emission rates are listed in Table 5.

Table 5. CARCINOGENIC TOXIC AIR POLLUTANT EMISSION RATES					
Emissions Point	**Description**	**Arsenic (lb/hr)**	**Cadmium (lb/hr)**	**Formal-dehyde (lb/hr)**	**Nickel (lb/hr)**
STACK01	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0	0	1.00E-04	0
STACK02	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0	0	1.00E-04	0
STACK04	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK05	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK06	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK08	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0	0	1.00E-04	0
STACK09	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0	0	1.00E-04	0
STACK10	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0	0	1.00E-04	0
STACK12	Roof Exhaust - Wood Lines 6 - 10, MAU-1 & MAU-2 - Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK13	Roof Exhaust - Wood Lines 6 - 10, MAU-1 & MAU-2 - Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK14	Roof Exhaust - Wood Lines 6 - 10, MAU-1 & MAU-2 - Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK15	Roof Exhaust - Wood Lines 6 - 10, MAU-1 & MAU-2 - Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK17	Roof Exhaust - Wood Lines 6 - 10, MAU-1 & MAU-2 - Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK18	Roof Exhaust - Wood Lines 6 - 10, MAU-1 & MAU-2 - Bldg 1 Tier 2	4.21E-08	2.32E-07	1.16E-04	4.42E-07
STACK20	Roof Exhaust - Wood Lines 1 – 5 - Bldg 1 Tier 2	0	0	1.00E-04	0
STACK22	Roof Exhaust - Wood Lines 1 – 5 - Bldg 1 Tier 2	0	0	1.00E-04	0
STACK23	Roof Exhaust - Wood Lines 1 – 5 - Bldg 1 Tier 2	0	0	1.00E-04	0
STACK24	Roof Exhaust - Wood Lines 1 – 5 - Bldg 1 Tier 2	0	0	1.00E-04	0
STACK25	Duct Furnace - DF-1 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK26	Duct Furnace - DF-2 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK27	Duct Furnace - DF-3 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK28	Duct Furnace - DF-4 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK29	Duct Furnace - DF-5 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK30	Duct Furnace - DF-6 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK31	Duct Furnace - DF-7 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK32	Duct Furnace - DF-8 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK33	Duct Furnace - DF-9 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK34	Duct Furnace - DF-10 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK36	Duct Furnace - DF-12 - Bldg 1 Tier 2	7.85E-08	4.32E-07	2.94E-05	8.24E-07
STACK37	Radiant Heater - RH-1 - Bldg 1 Tier 1	1.46E-08	8.03E-08	5.48E-06	1.53E-07
STACK38	Radiant Heater - RH-2 - Bldg 2 Tier 1	9.42E-08	5.18E-07	3.53E-05	9.89E-07
STACK39	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK40	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK41	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK42	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK43	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK44	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK45	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK46	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK47	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK48	Roof Exhaust - MAU-3, MAU-4, & MAU-8 - Bldg 1 Tier 3	5.69E-08	3.13E-07	2.13E-05	5.98E-07
STACK49	Roof Exhaust - AC-1 - Bldg 1 Tier 1	3.92E-08	2.15E-07	1.47E-05	4.11E-07
STACK50	Roof Exhaust - AC-5 - Bldg 1 Tier 1	3.92E-08	2.15E-07	1.47E-05	4.11E-07
STACK51	Roof Exhaust - AC-4 - Bldg 1 Tier 1	2.46E-08	1.35E-07	9.21E-06	2.58E-07

Table 5. CARCINOGENIC TOXIC AIR POLLUTANT EMISSION RATES					
Emissions Point	**Description**	**Arsenic (lb/hr)**	**Cadmium (lb/hr)**	**Formal-dehyde (lb/hr)**	**Nickel (lb/hr)**
STACK52	Roof Exhaust - AC-3 - Bldg 1 Tier 1	2.46E-08	1.35E-07	9.21E-06	2.58E-07
STACK53	Roof Exhaust - AC-2 - Bldg 1 Tier 1	5.29E-08	2.91E-07	1.98E-05	5.56E-07
STACK54	Floor-Mounted Heater - ATU-2 - Bldg 1 Tier 2	2.45E-07	1.35E-06	9.19E-05	2.57E-06
STACK55	Floor-Mounted Heater - ATU-4 - Bldg 1 Tier 3	2.45E-07	1.35E-06	9.19E-05	2.57E-06
STACK61	Floor-Mounted Heater - MAU-11 - Bldg 1 Tier 2	2.62E-08	1.44E-07	9.84E-06	2.76E-07
STACK62	Floor-Mounted Heater - MAU-12 - Bldg 1 Tier 3	1.74E-08	9.55E-08	6.51E-06	1.82E-07

3.1.4 Emission Release Parameters

Table 5 lists the emission release parameters, including stack height, exhaust temperature, exhaust velocity, and stack diameter for the modeled point sources. Values are listed in metric units first and in English units below in parentheses.

Table 5. POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES)								
Model ID	**Description**	**UTM Coordinates NAD83 datum, Zone 11[a]**		**Stack Height m (ft)**	**Stack Exhaust Temperature K (ºF)**	**Stack Exhaust Velocity m/sec (ft/sec)**	**Stack Diameter m (ft)**	**Release Orientation**
		Easting-X m	**Northing-Y m**					
STACK01	Roof Exhaust (Wood Lines 1-5)	566,987.17	4,821,283.91	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default[b]
STACK02	Roof Exhaust (Wood Lines 1-5)	567,018.21	4,821,276.82	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK04	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,070.18	4,821,264.69	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK05	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,074.69	4,821,284.17	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK06	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,046.13	4,821,290.67	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK08	Roof Exhaust (Wood Lines 1-5)	566,991.47	4,821,303.09	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK09	Roof Exhaust (Wood Lines 1-5)	566,995.99	4,821,322.57	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK10	Roof Exhaust (Wood Lines 1-5)	567,027.03	4,821,315.47	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK12	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,085.52	4,821,302.17	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK13	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,090.03	4,821,321.66	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK14	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,054.95	4,821,329.64	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK15	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,059.46	4,821,349.12	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default

Table 5. POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES)								
Model ID	**Description**	**UTM Coordinates NAD83 datum, Zone 11[a]**		**Stack Height m (ft)**	**Stack Exhaust Temperature K (ºF)**	**Stack Exhaust Velocity m/sec (ft/sec)**	**Stack Diameter m (ft)**	**Release Orientation**
		Easting-X m	**Northing-Y m**					
STACK17	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,091.67	4,821,360.24	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK18	Roof Exhaust (Wood Lines 6-10, Makeup Air Heaters 1 & 2)	567,031.55	4,821,334.96	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK20	Roof Exhaust (Wood Lines 1-5)	567,039.93	4,821,372.06	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK22	Roof Exhaust (Wood Lines 1-5)	567,004.80	4,821,361.53	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK23	Roof Exhaust (Wood Lines 1-5)	567,013.61	4,821,377.97	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK24	Roof Exhaust (Wood Lines 1-5)	566,890.01	4,821,416.54	13.89 (45.57)	291.48 (65)	3.045 (10.0)	0.94 (3.08)	Default
STACK25	Duct Furnace DF-1	566,892.50	4,821,415.64	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK26	Duct Furnace DF-2	566,889.06	4,821,399.56	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK27	Duct Furnace DF-3	566,891.76	4,821,398.97	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK28	Duct Furnace DF-4	566,949.40	4,821,402.63	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK29	Duct Furnace DF-5	566,951.88	4,821,402.04	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK30	Duct Furnace DF-6	566,948.44	4,821,385.96	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK31	Duct Furnace DF-7	566,951.15	4,821,385.37	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK32	Duct Furnace DF-8	567,035.31	4,821,384.67	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK33	Duct Furnace DF-9	567,038.02	4,821,384.08	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK34	Duct Furnace DF-10	567,079.85	4,821,374.31	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK36	Duct Furnace DF-12	566,982.23	4,821,351.12	13.26 (43.50)	422.04 (300)	0.893 (2.93)	0.15 (0.49)	Raincap
STACK37	Radiant Heater RH-1	566,822.75	4,821,228.90	8.99 (29.49)	322.04 (120)	1.164 (3.82)	0.10 (0.33)	Raincap
STACK38	Radiant Heater RH-2	567,054.95	4,821,329.64	6.4 (21.0)	322.04 (120)	4.948 (16.23)	0.10 (0.33)	Horizontal
STACK39	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	567,057.58	4,821,223.22	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK40	Roof Exhaust (Makeup Air Heaters 3,4 & 8)	567,050.27	4,821,191.37	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK41	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	567,043.59	4,821,162.92	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK42	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	567,034.51	4,821,240.58	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap

Table 5. POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES)								
Model ID	**Description**	**UTM Coordinates NAD83 datum, Zone 11[a]**		**Stack Height m (ft)**	**Stack Exhaust Temperature K (ºF)**	**Stack Exhaust Velocity m/sec (ft/sec)**	**Stack Diameter m (ft)**	**Release Orientation**
		Easting-X m	**Northing-Y m**					
STACK43	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	567,021.39	4,821,183.06	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK44	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	567,005.27	4,821,247.38	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK45	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	566,991.84	4,821,220.40	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK46	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	566,982.60	4,821,179.89	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK47	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	566,983.00	4,821,252.40	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK48	Roof Exhaust (Makeup Air Heaters 3, 4 & 8)	566,969.65	4,821,195.19	17.07 (56.0)	291.48 (65)	5.761 (18.90)	1.22 (4.0)	Raincap
STACK49	Air Conditioning Unit AC-1	566,983.68	4,821,364.41	8.76 (28.74)	422.04 (300)	0.42 (1.36)	0.16 (0.52)	Horizontal
STACK50	Air Conditioning Unit AC-5	566,990.11	4,821,394.09	8.76 (28.74)	422.04 (300)	0.42 (1.36)	0.16 (0.52)	Horizontal
STACK51	Air Conditioning Unit AC-4	566,990.97	4,821,397.49	8.74 (28.67)	422.04 (300)	0.26 (0.84)	0.16 (0.52)	Horizontal
STACK52	Air Conditioning Unit AC-3	566,988.20	4,821,406.10	8.74 (28.67)	422.04 (300)	0.26 (0.84)	0.16 (0.52)	Horizontal
STACK53	Air Conditioning Unit AC-2	566,994.22	4,821,410.17	8.92 (29.27)	422.04 (300)	0.56 (1.84)	0.16 (0.52)	Horizontal
STACK54	Floor-Mounted Heater - ATU-2	567,075.38	4,821,350.82	14.02 (46.00)	422.04 (300)	0.997 (3.27)	0.25 (0.82)	Raincap
STACK55	Floor-Mounted Heater - ATU-4	566,875.16	4,821,398.19	9.75 (32.0)	422.04 (300)	0.997 (3.27)	0.25 (0.82)	Raincap
STACK61	Floor-Mounted Heater - MAU11	567,082.99	4,821,375.27	12.19 (40.0)	422.04 (300)	0.666 (1.19)	0.10 (0.33)	Raincap
STACK62	Floor-Mounted Heater – MAU12	567,060.52	4,821,153.52	13.72 (45.0)	422.04 (300)	0.444 (1.46)	0.10 (0.33)	Raincap

a. Universal Transverse Mercator, North American Datum of 1983, Zone 11.
b. Default = uninterrupted vertical release orientation.

3.1.5 Emission Release Parameter Justification

Building 1 houses the office space and the primary manufacturing processes. Building 1 emission points include:

- natural gas-fired heating units throughout the building with dedicated exhaust stacks (model IDs STACK25 through STACK34, STACK36 through STACK38, STACK54 and STACK55, and STACK61 and STACK62;
- a collection of 10 rooftop mounted exhaust fans (model IDs STACK39 through STACK48) venting emissions from three air makeup units;

- a collection of 9 rooftop-mounted exhaust fans (model IDs STACK04 - STACK06, STACK12 - STACK15, and STACK17 through STACK18) that vent process TAPs emissions (formaldehyde) from the extrusion lines and natural gas combustion emissions from two air makeup heaters that vent into the interior of the building in the extrusion line process area; and
- a collection of 9 rooftop mounted exhaust fans (model IDs STACK01 - STACK02, STACK08 - STACK10, STACK20, and STACK22 through STACK24) venting process TAPs emissions from the extrusion lines.

Building 2 is a separate detached structure that will be used for truck tarping and has a single natural gas-fired radiant heater with a direct exhaust vent (model ID STACK38).

Rooftop Exhaust Fans (model IDs STACK01 - STACK02, STACK 04 - STACK06, STACK08 - STACK10, STACK12 - STACK15, STACK 17 -STACK18, STACK20, STACK22 - STACK24)

The 18 fan-powered rooftop exhaust vents are identical Aerovent Model 30L422-BD40C units. A manufacturer's specification brochure from Aerovent was submitted to substantiate release parameters. Each stack is equipped exhausts uninterrupted in a vertical orientation, which is confirmed by the manufacturer's brochure. The stack release diameter of 30 inches is supported by the brochure. STONE modeled an exhaust volumetric flow rate of 4,478 ACFM, which is 49% of the listed flow rate of 9,500 ACFM at a 0.125 inches static pressure drop. The modeled exit temperature was 65°F to represent the temperature conditions within the building.

Release heights for these stacks were each 45.6 feet above grade, given the building roofline tier height is 40 feet above grade, this provides a height of 5.6 feet height above roofline. The Aerovent brochure supports this release height above the roofline. Because stack base elevations are set below the building base elevation, the modeled stack release heights are conservative.

Rooftop Exhaust Fans (model IDs STACK39 through STACK48)

The 10 fan-powered rooftop exhaust vents are identical Aerovent Model 48R632 RREH units. A manufacturer's specification brochure from Aerovent was submitted to substantiate release parameters. Each stack is equipped with a raincap, which is confirmed by brochure. The stack release diameter of 48 inches is supported by the brochure. STONE modeled an exhaust volumetric flow rate of 14,270 ACFM, which is 49% of the listed flow rate of 29,030 ACFM at 0.125 inches static pressure drop. The modeled exit temperature was 65°F to represent the temperature conditions within the building.

Release heights for these stacks were each 56 feet above grade, given the building roofline tier height is 45 feet above grade, this provides a height of 11 feet height above roofline. The Aerovent brochure indicates the lower lip of the raincap is 8.5 feet. Because stack base elevations are set below the building base elevation, the modeled stack release heights are accurate or conservative.

Natural Gas-Fired-Fired Heating Equipment

Duct furnaces DF-1 through DF-2 (Model IDs STACK25 through STACK36)
Radiant Heaters RH-1 (STACK37) and RH-2 (STACK38)
Air Conditioning Units AC-1 through AC-5) (STACK49 through STACK53)
Floor Mounted Heaters ATU-2 (STACK54)

Manufacturer's specification brochures were submitted for the natural gas-fired emissions units. All stacks for these units are individual stacks that exhaust either with a horizontal orientation or are equipped

with a raincap. Exit temperatures for radiant heaters were assumed to be 120°F and the stack exit temperatures for all duct furnaces, air conditioning units, and the floor mounted heater were assumed to be 300°F based on the 80% combustion efficiency of these emissions units. DEQ determined these are reasonable values. Exit velocities appeared to be reasonable or conservative.

DEQ noted that the modeled stack exit diameters for the 12 duct furnaces, radiant heater RH-1, and floor-mounted heater ATU-2 matched the submitted substantiation documentation. The modeled stack diameters for radiant heater RH-2 and air conditioning units AC-1 through AC-5 appeared reasonable.

Stack release heights for these sources appeared reasonable and appropriate for exhaust stacks located on rooftops. Stack base elevations established using AERMAP appeared to have set stack base elevations below base elevations for Buildings 1 and 2, resulting in a conservative effect on modeled impacts.

Floor Mounted Heaters ATU-4 (STACK55)
Makeup Air Units MAU-11 (STACK 61) and MAU-12 (STACK 62)

The current permitting project added a floor-mounted heater that matched floor-mounted heater ATU-2 and two new makeup air heating units to the facility layout. Each emission unit is equipped with a dedicated stack to exhaust natural gas combustion emissions.

All three stacks were modeled as point sources equipped with a raincap. DEQ did not review the release parameters in detail. Modeled release heights appeared to be appropriate for the building tier height where each stack will be located. The exit temperature was assumed to be 300˚F which matched the modeled exit temperature for other dedicated combustion exhaust stacks for duct furnaces and the other floor-mounted heater. The modeled exit velocities were reasonable or conservative and any vertical momentum buoyancy caused by the exhaust velocity was minimized by modeling each stack as capped.

DEQ concluded that the release parameters used in the air impact modeling analyses were adequately substantiated and applied appropriately.

3.2 Background Concentrations

Cumulative NAAQS analyses were not performed for this project and use of ambient background concentrations was not required.

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 Impact Analyses

STONE performed the project-specific air pollutant emission inventory and air impact analyses that were submitted with the application. The submitted information/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 6 provides a brief description of parameters used in the modeling analyses.

Table 6. MODELING PARAMETERS.		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Boise, Idaho	The area is an attainment or unclassified area for all criteria pollutants. The area operates under maintenance plans for PM_{10} and CO.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Boise airport surface data with Boise upper air data	This is a five-year data set covering 2014-2018. See Section 3.3.4 of this memorandum for additional details of the meteorological data.
Terrain	Considered	1 arc second National Elevation Dataset (NED) files were acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all emission points and receptors. See Section 3.3.5 for more details.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD. See Section 3.3.6.
Receptor Grid	**TAPs Analyses Grid**	
	Grid 1	25-meter spacing along the ambient air boundary.
	Grid 2	25-meter spacing in an 800-meter by 800-meter rectangular grid centered on the facility. The receptor grid is oriented to align with West Gowen Road.
	Grid 3	100-meter spacing in a 2,600-meter by 2,600-meter rectangular grid centered on Grid 2.

3.3.2 Modeling Protocol

STONE submitted a modeling protocol to DEQ on February 12, 2021, on behalf of AZEK. DEQ issued a conditional modeling protocol approval letter on March 5, 2021. The conditional modeling protocol approval was issued based on the emission estimates available at that time. Changes to the modeling requirements for the initial PTC project (Project 62600, issued August 13, 2021) were caused by inclusion of natural gas-fired space heating emission units and a refinement of PM_{10} and $PM_{2.5}$ control efficiencies for process emission control systems in the submitted permit application.

The current project (Project 62734) was conducted under the March 5, 2021, conditional modeling protocol and February 12, 2021, modeling protocol.

The air impact modeling analyses were generally conducted using data and methods described in the modeling protocol and the DEQ *Air Modeling Guideline.*[3]

3.3.3 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the modeling protocol and the DEQ *Air Quality Modeling Guideline*[3].

3.3.4 Model Selection

Idaho *Air Rules* Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. 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 it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 19191 was used by STONE for the modeling analyses to evaluate impacts of the

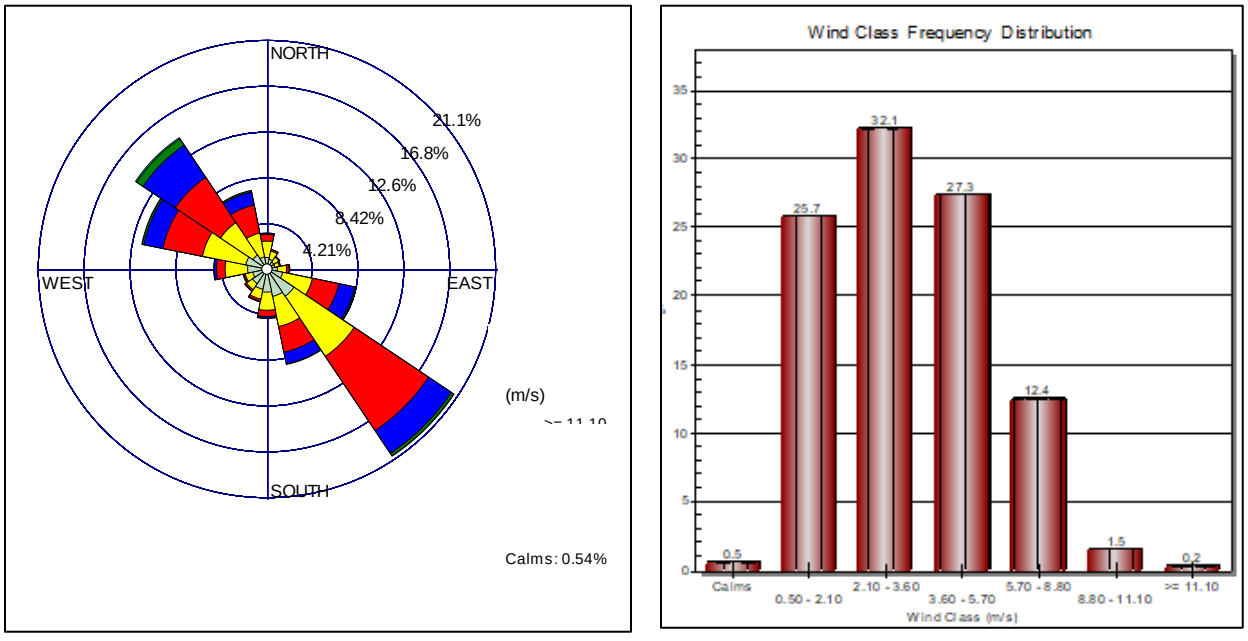
facility. This version was the current version at the time the DEQ modeling protocol and initial Project 62600 permit application was received by DEQ.

3.3.5 Meteorological Data

DEQ processed a meteorological dataset from data collected at the Boise airport (KBOI) for a five-year data period covering the years 2014-2018. National Weather Service (Station ID 726810-24131) data and one-minute ASOS data from the Boise NCDC site for 2014-2018 were used for surface meteorological data. Upper air soundings required by AERMET were obtained from the Boise airport station (site ID 24131). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on the last thirty years of Boise precipitation data. Conditions were determined to be "wet" for 2014 and 2017, and "average" for 2015, 2016, and 2018. Average moisture content is defined as within a 30 percentile of the 30-year mean of 11.3 inches of precipitation. Continuous snow cover was determined to exist only during 2016. Calms were 0.54% of the data, and 0.72 % of the data were missing from the 5-year record. The average wind speed was 3.6 meters/sec.

Figure 2 shows a wind rose and wind speed histogram of the Boise 2014-2018 data. AERMINUTE version 15272 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 19191 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The "adjust u star" (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. DEQ provided meteorological data to STONE, and STONE used the meteorological data with the ADJ_U* option enabled. DEQ determined that these data are adequately representative of the meteorology at the AZEK facility site in Boise, Idaho, for minor source permitting.

Figure 2. BOISE AIRPORT WIND ROSE AND WIND SPEED HISTOGRAM (2014-2018)



3.3.6 Effects of Terrain on Modeled Impacts

The ambient air impact analyses used terrain data extracted from four United States Geological Survey (USGS) National Elevation Dataset (NED) files with 1 arc second (30-meter) resolution. Terrain data coverage for the four terrain data files was extensive, covering 13,600 square miles. The terrain preprocessor AERMAP version 18081 was used by STONE to extract the elevations from the NED file 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 emission plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 3 shows the receptor grid coverage overlaid on a Google Earth terrain image (receptor locations are represented by circles).

DEQ determined the treatment of terrain was appropriate for the ambient air impact analyses.

Figure 3. AZEK Receptor Grid Coverage Overlaid on Google earth Image



3.3.7 Facility Layout and Building Downwash

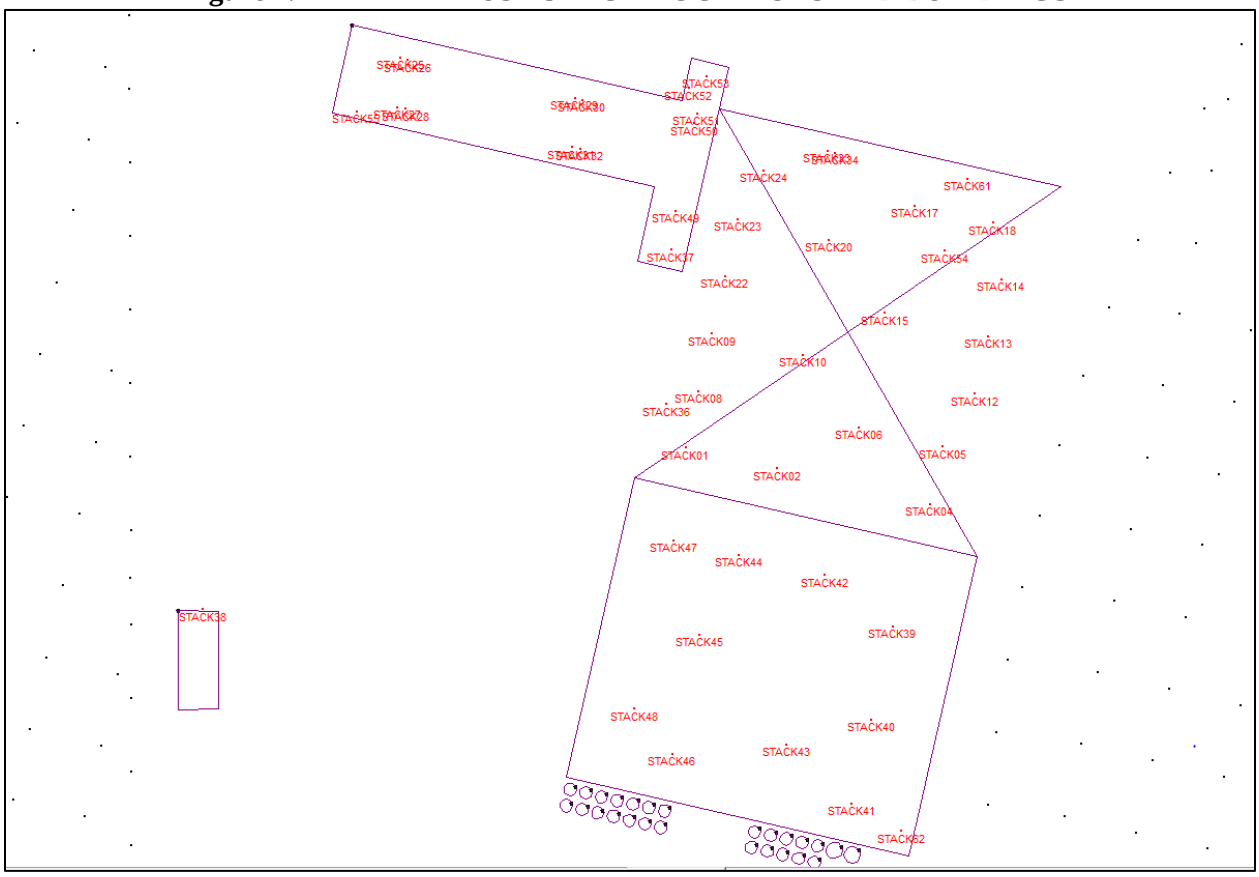
DEQ verified proper identification of the site location, emission point locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to site plan diagrams, including diagrams for existing HVAC sources, submitted with the permit application. Aerial photographic images and measurement tools on Google Earth (available at

https://www.google.com/earth) were also used to assure that horizontal coordinates were reasonably accurately represented for existing structures dimensions, sources, and ambient air boundary locations. Emission points and structure layout are shown in Figure 4.

STONE used a structure height of 80 feet for all outdoor storage silos. AZEK requested authorization to construct silos of this height from the Federal Aviation Administration and if approval is not granted, silo heights will be either 62 or 66 feet in height. Applying structure heights of 80 feet is conservative or accurate.

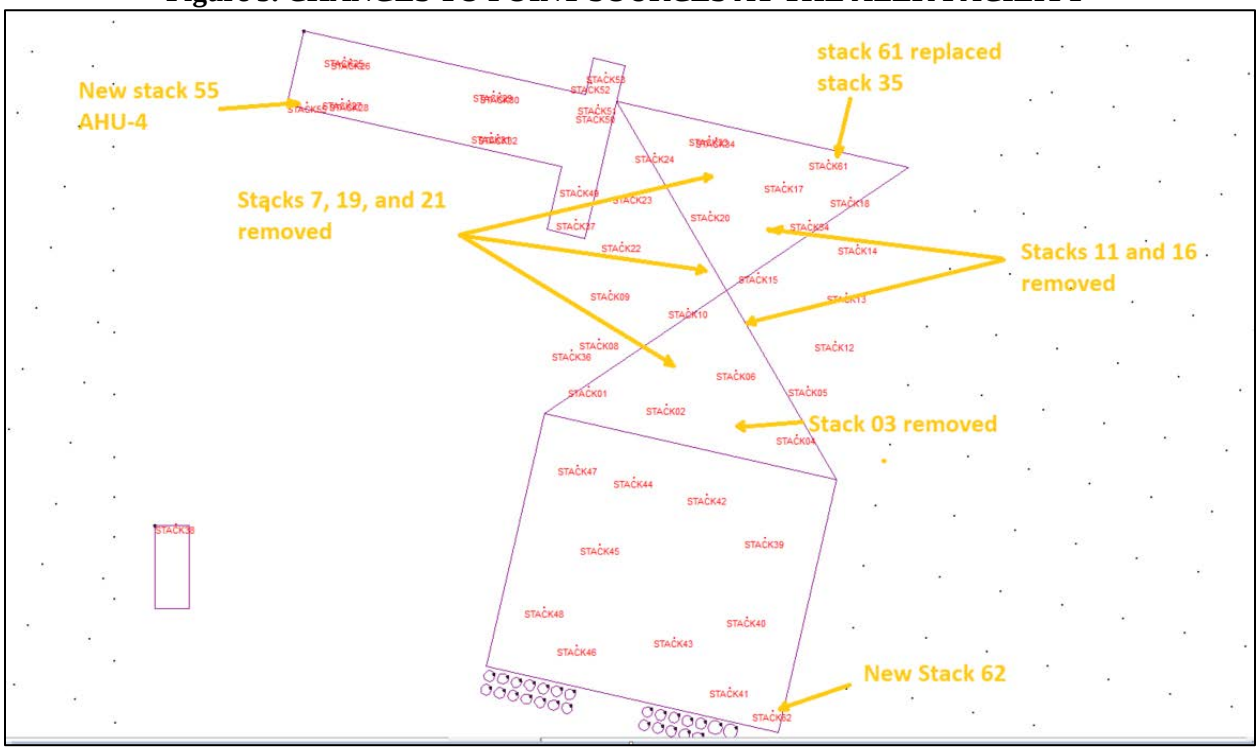
The area of the main production building housing the extrusion lines was not represented with a traditional rectangular perimeter in BPIP. This building tier was represented by two triangular areas. See Figure 4. DEQ performed a sensitivity run using the rectangular perimeter outline that actually represents the rectangular shape of this structure and determined that ambient impacts did not increase using the corrected BPIP setup.

Figure 4. AZEK EXHAUST STACK LOCATIONS AND BUILDINGS



The ambient impact analyses reflect changes to release points for the facility based on revisions to the project shown in Figure 5.

Figure 5. CHANGES TO POINT SOURCES AT THE AZEK FACILITY



Stack base elevations for some exhaust stacks were set below the building base elevation, which does not preserve the stack release height above the roofline, referred to as the modeled building tier height. The reduced "effective" release heights are expected to cause more conservative (higher) predicted ambient impacts. See Figures 6 and 7.

Potential downwash effects on emission plumes were accounted for in the model by using building dimensions and locations. Dimensions and orientation of the structures were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD. DEQ determined STONE adequately evaluated building downwash effects in the ambient impact analyses.

FIGURE 6. VIEW OF STACKS AND STRUCTURES

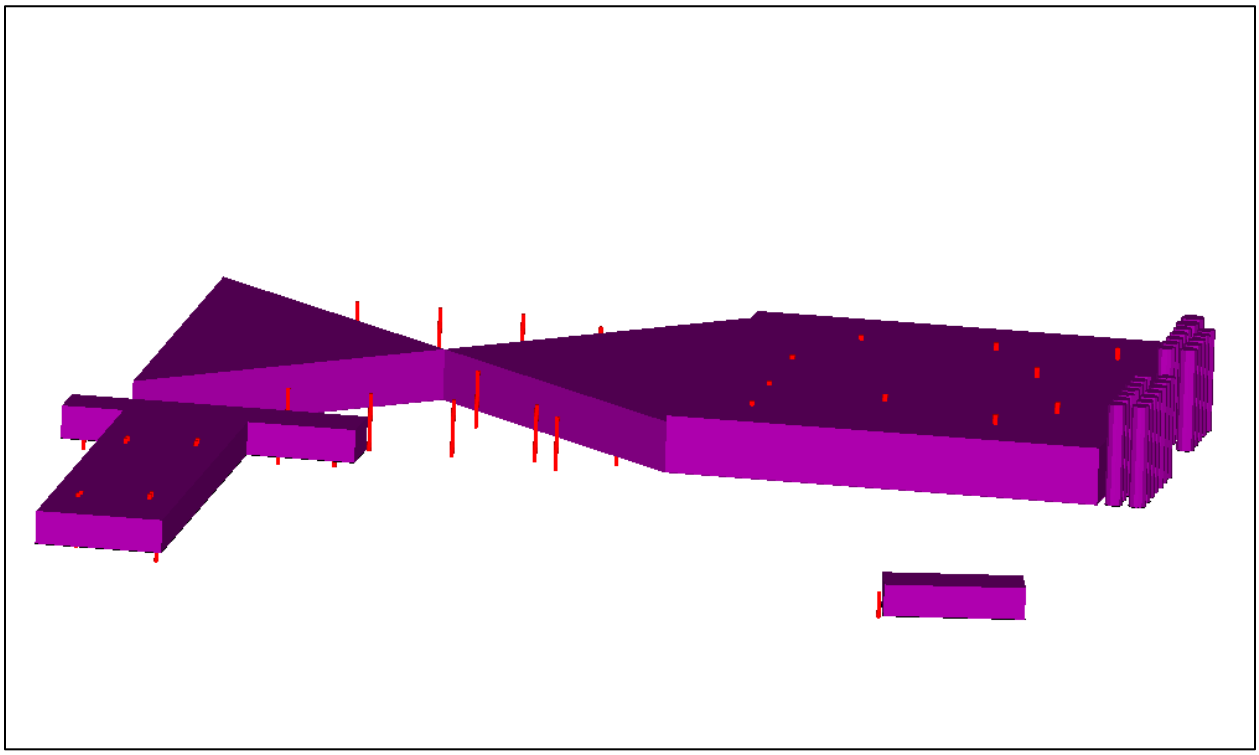
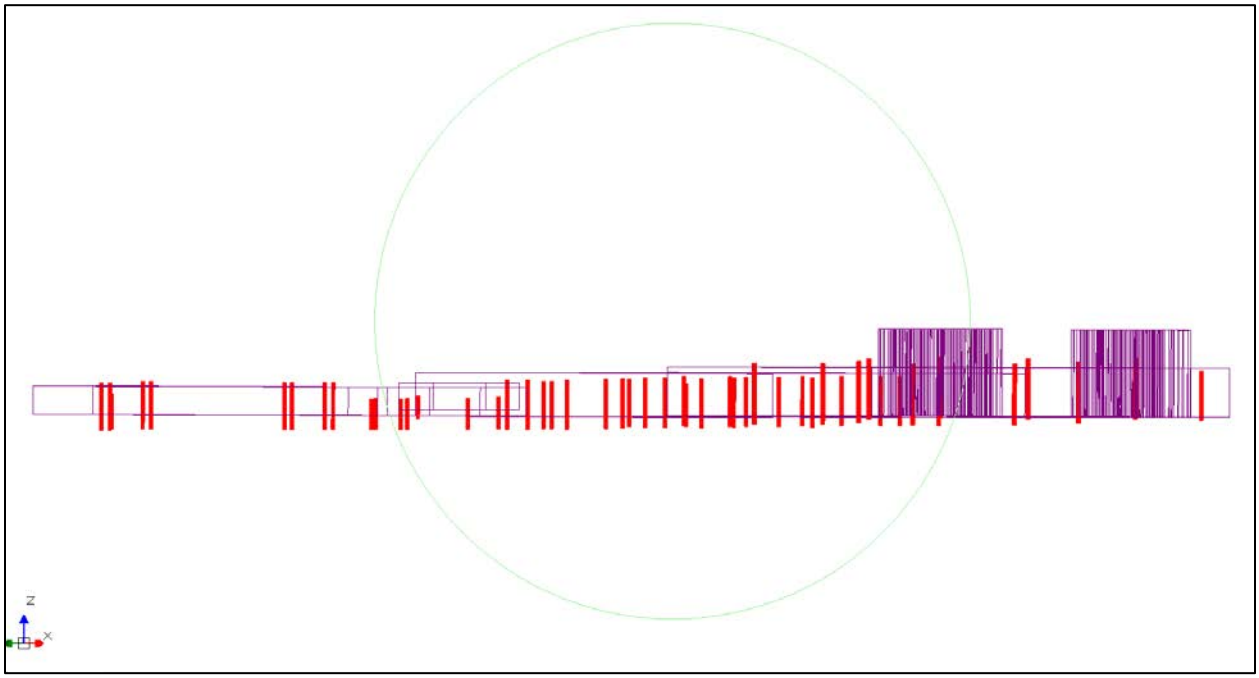


Figure 7. SIDE VIEW OF EXHAUST STACKS AND STRUCTURES VIEWED FROM THE SOUTHWEST

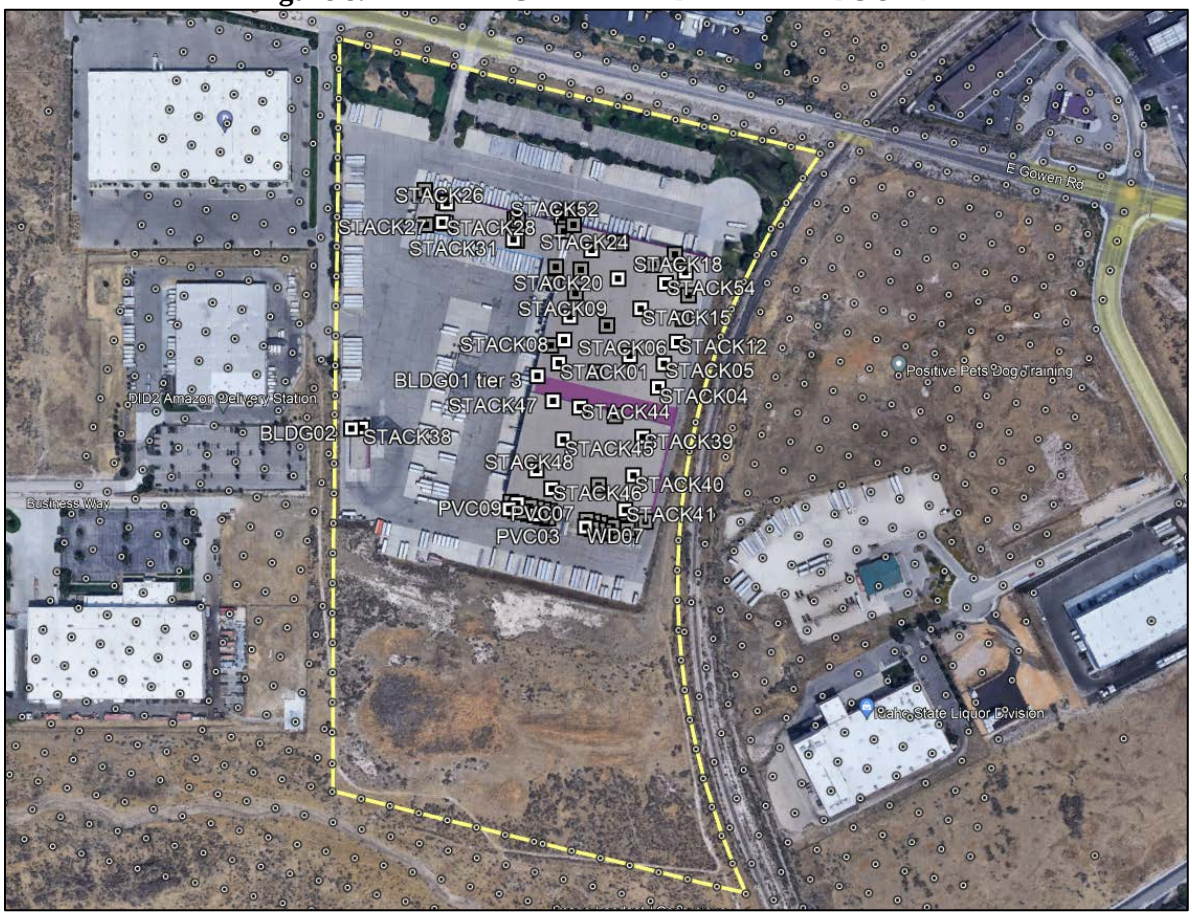


3.3.8 Ambient Air Boundary

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." The ambient air boundary was located at the facility's leased property boundary perimeter. The ambient air boundary justification described posting of "no trespassing" signs at the two road entrance points, at property corners, and at intervals of every 500 feet to discourage public access. AZEK staff will monitor the facility property external to the buildings when outdoor activities are performed. DEQ determined the methods used to preclude public access to the areas not treated as ambient air are acceptable, per Section 6.5 of the DEQ *Air Modeling Guideline*[3].

The modeled ambient air boundary outlined in yellow is shown in Figure 8.

Figure 8. AZEK FACILITY AMBIENT AIR BOUNDARY

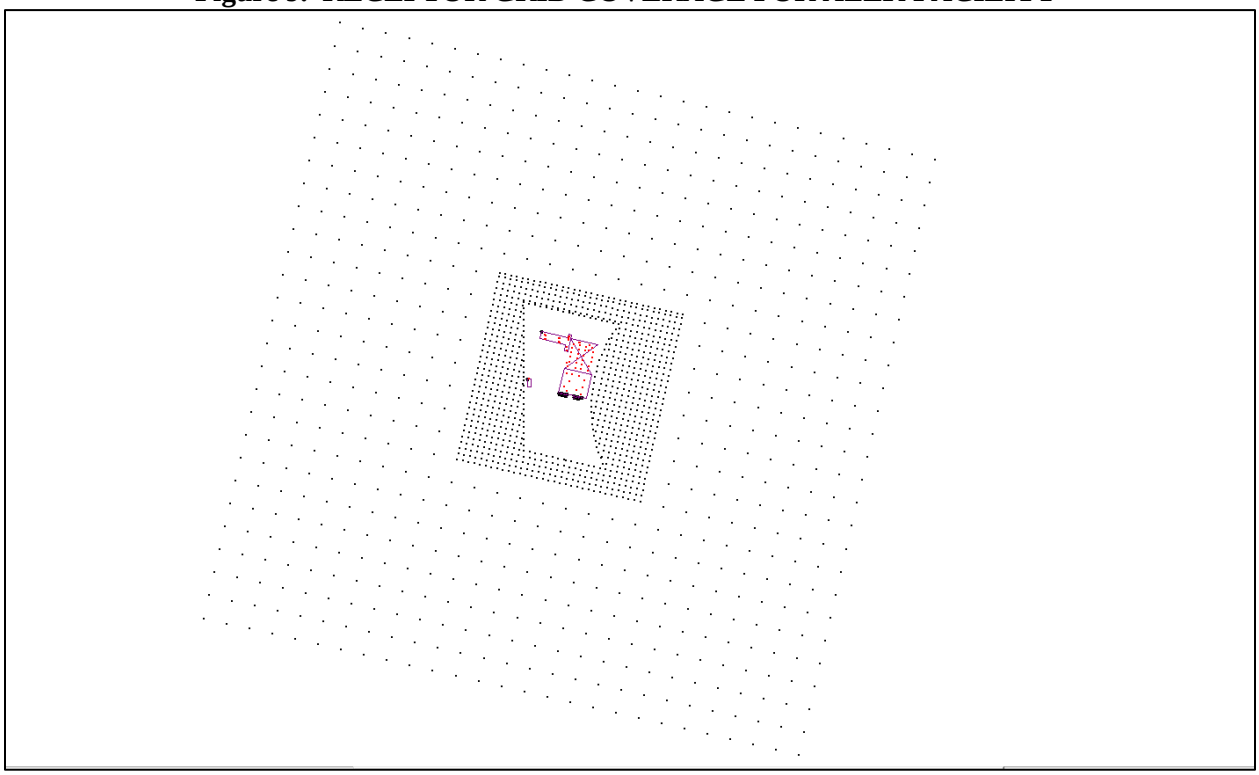


3.3.9 Receptor Network

The TAPs analyses used the full receptor grid. Table 6 describes the receptor network used in the submitted modeling analyses. The receptor grid contained 1,514 receptors and provided coverage of a 2.6-kilometer by 2.6-kilometer area, or 6.8 square kilometers. The impact analyses receptor grid is shown in Figure 9.

The receptor grids provided adequate resolution of the maximum design concentrations for the project. A refinement of the receptor grid density was not necessary based on the margin of compliance of the TAPs design impacts with the allowable increments. Impacts dropped off sharply with increasing distance from the facility's sources. The receptor grids used met the minimum recommendations specified in the DEQ *Air Quality Modeling Guideline*[3] and were effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

Figure 9. RECEPTOR GRID COVERAGE FOR AZEK FACILITY



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.

All sources modeled at the facility are below GEP stack height. Consideration of downwash caused by nearby buildings was required and STONE included all buildings in the model setup that were located near the emission sources.

4.0 SIL, NAAQS, and TAPs Impact Modeling Results

4.1 Results for SIL and NAAQS Analyses

4.1.1 Significant Impact Level Analysis

SIL analyses were not required for this project based on the DEQ modeling threshold exemptions and requested allowable emissions.

4.1.2 Cumulative NAAQS Impact Analysis

Cumulative NAAQS analyses were not required for this project based on the DEQ modeling threshold exemptions and requested allowable emissions.

4.2 Results for TAPs Impact Analyses

4.2.1 Review of Submitted TAP Analyses

Emissions of non-carcinogenic TAPs did not exceed the ELs of Section 585 of the Idaho Air Rules. Emissions of arsenic, cadmium, formaldehyde, and nickel carcinogenic TAPs exceeded the ELs specified in Section 586 of the Idaho Air Rules. Ambient impact analyses were submitted for the formaldehyde emissions and results are provided in Table 7. Ambient impact analyses were not submitted for the arsenic, cadmium, and nickel emissions. The formaldehyde TAP design value was well below the allowable increment.

Table 7. TAP IMPACT ANALYSES RESULTS

TAP	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)[a]	AACC[b] ($\mu g/m^3$)	Percent of AACC
Formaldehyde	Annual	0.01432	0.077	18.6%

a. Micrograms per cubic meter.

b. Acceptable ambient concentration for carcinogens. Modeled impact and AACC represent an 8,760-hour averaged concentration.

4.2.2 DEQ TAPs Verification Analyses

The project's final emissions inventory included TAPs emission rates for arsenic, cadmium, and nickel that exceeded the Section 586 ELs. DEQ conducted verification analyses to quantify the predicted ambient impacts for these pollutants for comparison to the TAP increments.

The permit application's formaldehyde impact analysis model setup was used for the verification analyses. Arsenic, cadmium, and nickel emissions are attributed to natural gas combustion sources only. The application's formaldehyde impacts were based on process extrusion and natural gas combustion

emissions. The process extrusion formaldehyde emissions were assumed to be emitted from 18 roof top exhaust stacks (model IDs):

- STACK02 - STACK06,
- STACK08 - STACK10,
- STACK12 - STACK15,
- STACK17 - STACK18,
- STACK20,
- STACK22 - STACK24.

STONE assumed the natural gas combustion emissions from makeup air units MAU1 and MAU2 would be emitted from half of the fan-assisted rooftop exhaust vents in the area of the building where MAU1 and MAU2 provide direct-fired space heating. The vents selected by STONE are located closest to the eastern ambient air boundary in an area where the distance between the stacks and ambient air boundary is the shortest.

The process extrusion formaldehyde emissions were subtracted from the application's modeled emission rates for the following stacks to isolate natural gas combustion formaldehyde emissions:

- STACK04 - STACK06,
- STACK 12 - STACK15,
- STACK17 - STACK18.

The natural gas combustion formaldehyde emission rate was reduced to 1.58E-05 lb/hr for each of these stacks and zero emissions were modeled for the other stacks that were assumed to only emit process extrusion formaldehyde emissions.

TAPs emissions for all natural gas-fired emissions units used an identical emission factor for each TAP. As a result, the arsenic, cadmium, and nickel ambient impacts may be determined using an ambient impact based on formaldehyde emissions for natural gas combustion only and scaling the design impact by the ratio of the arsenic, cadmium, and nickel emission factor to the formaldehyde emission factor.

The modeled emissions rates for natural gas combustion are listed in Table 8. The predicted impact was then scaled by the ratio of the other TAPs emission factor (arsenic, cadmium, and nickel) to the formaldehyde emission factor, as presented Table 9. The design impact was predicted to occur at an ambient air boundary receptor on the east side of the facility as shown in Figure 10. Arsenic, cadmium, and nickel design impacts are presented in Table 10 and were well below the TAP increments.

Table 8. CARCINOGENIC TOXIC AIR POLLUTANT EMISSION RATES

Emissions Point	Description	Formaldehyde (lb/hr)
STACK01	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK02	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK04	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK05	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK06	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK08	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK09	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK10	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK12	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05

Table 8. CARCINOGENIC TOXIC AIR POLLUTANT EMISSION RATES		
Emissions Point	**Description**	**Formaldehyde (lb/hr)**
STACK13	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK14	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK15	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK17	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK18	Roof Exhaust---Wood Lines 6 - 10, MAU-1 & MAU-2---Bldg 1 Tier 2	1.58E-05
STACK20	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK22	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK23	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK24	Roof Exhaust---Wood Lines 1 - 5---Bldg 1 Tier 2	0
STACK25	Duct Furnace---DF-1---Bldg 1 Tier 2	2.94E-05
STACK26	Duct Furnace---DF-2---Bldg 1 Tier 2	2.94E-05
STACK27	Duct Furnace---DF-3---Bldg 1 Tier 2	2.94E-05
STACK28	Duct Furnace---DF-4---Bldg 1 Tier 2	2.94E-05
STACK29	Duct Furnace---DF-5---Bldg 1 Tier 2	2.94E-05
STACK30	Duct Furnace---DF-6---Bldg 1 Tier 2	2.94E-05
STACK31	Duct Furnace---DF-7---Bldg 1 Tier 2	2.94E-05
STACK32	Duct Furnace---DF-8---Bldg 1 Tier 2	2.94E-05
STACK33	Duct Furnace---DF-9---Bldg 1 Tier 2	2.94E-05
STACK34	Duct Furnace---DF-10---Bldg 1 Tier 2	2.94E-05
STACK36	Duct Furnace---DF-12---Bldg 1 Tier 2	2.94E-05
STACK37	Radiant Heater---RH-1---Bldg 1 Tier 1	5.48E-06
STACK38	Radiant Heater---RH-2---Bldg 2 Tier 1	3.53E-05
STACK39	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK40	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK41	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK42	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK43	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK44	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK45	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK46	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK47	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK48	Roof Exhaust---MAU-3, MAU-4, & MAU-8---Bldg 1 Tier 3	2.13E-05
STACK49	Roof Exhaust---AC-1---Bldg 1 Tier 1	1.47E-05
STACK50	Roof Exhaust---AC-5---Bldg 1 Tier 1	1.47E-05
STACK51	Roof Exhaust---AC-4---Bldg 1 Tier 1	9.21E-06
STACK52	Roof Exhaust---AC-3---Bldg 1 Tier 1	9.21E-06
STACK53	Roof Exhaust---AC-2---Bldg 1 Tier 1	1.98E-05
STACK54	Floor-Mounted Heater---ATU-2---Bldg 1 Tier 2	9.19E-05
STACK55	Floor-Mounted Heater---ATU-4---Bldg 1 Tier 3	9.19E-05
STACK61	Floor-Mounted Heater---MAU-11---Bldg 1 Tier 2	9.84E-06
STACK62	Floor-Mounted Heater---MAU-12---Bldg 1 Tier 3	6.51E-06

[a.] Pounds per hour.

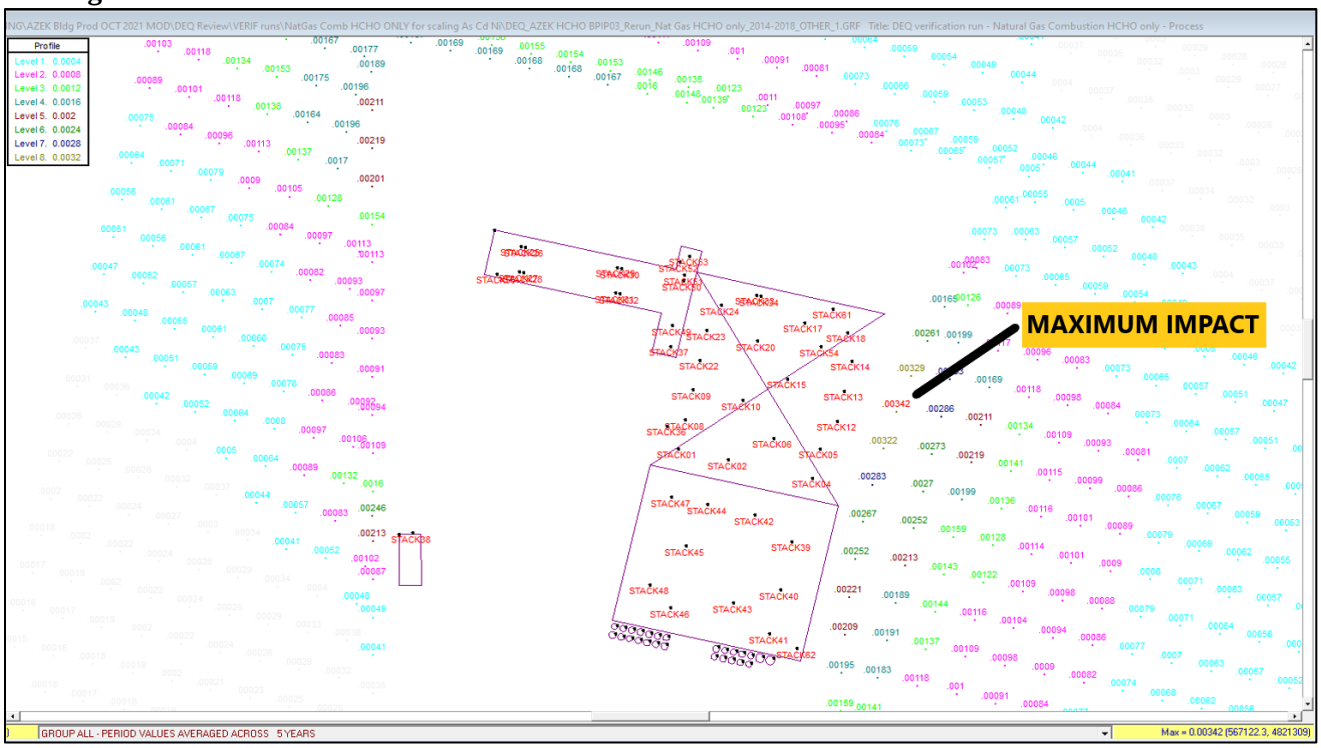
Table 9. DEQ VERIFICATION TAP IMPACT ANALYSES SCALING FACTORS		
TAP Pollutant	**Emission Factor (lb/MMscf)**	**Ratio of TAP Factor to Formaldehyde Factor**
Formaldehyde	7.5E-02	
Arsenic	2.0E-04	0.00267
Cadmium	1.1E-03	0.01467
Nickel	2.1E-03	0.02800

[a.] Pounds million standard cubic feet.

Table 10. DEQ VERIFICATION TAP IMPACT ANALYSES RESULTS				
TAP Pollutant	**Averaging Period**	**Maximum Modeled Impact ($\mu g/m^3$)[a]**	**AACC[b] ($\mu g/m^3$)**	**Percent of AACC**
Formaldehyde (natural gas combustion only)	Annual	0.00429	--	--
Arsenic	Annual	1.15E-05	2.3E-04	5%
Cadmium	Annual	6.29E-05	5.6E-04	11%
Nickel	Annual	1.20E-04	4.2E-03	3%

a. Micrograms per cubic meter.
b. Acceptable ambient concentration for carcinogens. Modeled impact and AACC represent an 8,760-hour averaged concentration.

Figure 10. NATURAL GAS COMBUSTION FORMALDEHYDE MAXIMUM IMPACTS



5.0 Conclusions

The information submitted with the PTC application demonstrated to DEQ's satisfaction that emissions from the AZEK Building Products facility, located in Boise, will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

References

1. IDAPA 58.01.01 et. al., Rules for the Control of Air Pollution in Idaho. Available at https://adminrules.idaho.gov/rules/current/58/580101.pdf.

2. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

3. *Idaho Guideline for Performing Air Quality Impact Analyses*. Stationary Source Program. Air Quality Division. Idaho Department of Environmental Quality. July 2021. Available at https://www.deq.idaho.gov/permits/air-quality-permitting.

4. *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program.* United States Environmental Protection Agency, Office of Air Quality Planning and Standards. April 30, 2019. EPA-454_R-19-003. Available at https://www3.epa.gov/ttn/scram/guidance/guide/EPA-454_R-19-003.pdf.

5. *Revised DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling*. United States Environmental Protection Agency, Office of Air Quality Planning and Standards. September 20, 2021. EPA-454-P-21-001. Available at: https://www.epa.gov/system/files/documents/2021-09/revised_draft_guidance_for_o3_pm25_permit_modeling.pdf.

APPENDIX C – FACILITY DRAFT COMMENTS

The facility had no comments on the draft permit on January 21, 2022.

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:	**AZEK Building Products**
Address:	**1001 E. Gowen Road**
City:	**Boise**
State:	**ID**
Zip Code:	**83716**
Facility Contact:	**Jesse Mandoki**
Title:	**Director, Environmental Health and**
AIRS No.:	**001-00372**

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	5.8	0	5.8
SO_2	0.0	0	0.0
CO	4.9	0	4.9
PM10	0.7	0	0.7
VOC	7.9	0	7.9
Total:	0.0	0	**19.2**
Fee Due	**$ 5,000.00**		

Comments: