Statement of Basis

Permit to Construct No. P-2012.0041
Project ID 61081

Basalite Concrete Products
Meridian, Idaho

Facility ID 001-00292

Final

December 18, 2012

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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.

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
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
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
lb/hr	pounds per hour
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_x	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
PAH	polyaromatic hydrocarbons
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
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SO_2	sulfur dioxide
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Basalite Concrete Products (Basalite) brings in raw materials in various amounts. These materials are mixed in recipe specific batches to form concrete based products including but not limited to concrete masonry units, segmented retaining wall units, interlocking paver units, garden line product units, and water revetment erosion control units. Mixes are formed in molds, which are then heated with steam to cure as final products. Final product is stored at the facility property until units are shipped state-wide as well as to bordering states.

Emission points are primarily the raw material intake points, a small percentage of the material transfer or handling points are not fully enclosed, two cement storage silos, and one flyash/supplement storage silo, five aggregate storage silos, crushing and screening operations, and two 5 MMBtu/hr natural gas fired vaporizers that provide heat for curing the molded concrete based products inside eight ovens.

The crushing and screening operation handles reclaimed materials (molded concrete product not up to specification) for reuse in the product development process. Only white pumice reclaim is crushed in the crusher. The crushing and screening occur in an enclosed building, with the emissions from the crusher, the screening operation, and some material transfers controlled by a baghouse inside that building.

Permitting History

This is the initial PTC for an existing facility that was constructed in 1977, thus there is no permitting history.

Application Scope

This permit is the initial PTC for a molded concrete block manufacturing facility.

Application Chronology

July 9, 2012	DEQ received an application and an application fee.
July 16- July 31, 2012	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
August 6, 2012	DEQ received supplemental information from the applicant.
August 9, 2012	DEQ received supplemental information from the applicant.
August 9, 2012	DEQ determined that the application was complete.
August 15, 2012	DEQ received supplemental information from the applicant describing the material flow and venting for Silos #1 through #5 (pumice and reclaim).
August 31, 2012	DEQ made available the draft permit and statement of basis for peer and regional office review.
September 26, 2012	DEQ received supplemental information from the applicant consultant (JBR).
October 4, 2012	DEQ made available the draft permit and statement of basis for applicant review.
October 17, 2012	DEQ received the permit processing fee.
December 17, 2012	DEQ issued the final PTC to the facility.
January 14, 2013	DEQ issued the final statement of basis to the facility.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment	Emission Point ID No.
Raw Material Storage Silos: Line A Cement Silo Line B Cement Silo Line A/B Fly Ash Silo	None	Line A Cement Silo Vent Parameters: Stack exit height: 39.2 ft Exit diameter: 3.3 ft Exit velocity: 0.001 meter per second (m/s) Exit temperature: Ambient Line B Cement Silo Vent Parameters: Stack exit height: 42.2 ft Exit diameter: 3.3 ft Exit velocity: 0.001 m/s Exit temperature: Ambient Line A/B Fly Ash Silo Vent Parameters: Stack exit height: 36.2 ft Exit diameter: 3.3 ft Exit velocity: 0.001 m/s Exit temperature: Ambient
Batching Operations:	None	Building Ventilation
Concrete Curing Ovens: Line No. 1 Vaporizer (used for Line A Block Machine) Manufacturer: Kemo Systems Model: 50/4B Construction date: 1998 Heat input rating: 5 MMBtu/hr Fuel: Natural gas Line No. 2 Vaporizer (used for Line B Block Machine) Manufacturer: Kemo Systems Model: 50/4B Construction date: 2000 Heat input rating: 5 MMBtu/hr Fuel: Natural gas	None	Vent parameters: There are 16 vents used as emission points related to the curing ovens. Each vent is with the following parameters: Stack exit height: 23.1 ft Exit diameter: 0.88 ft Exit Velocity: 4.52 m/s Exit temperature: 130°F
Crusher: Manufacturer: Cedarapids (for the roll and Jaw crushers) Model: 60X16DD (Roll); LFMC 800 6 (Jaw) Serial No.: 34991 (Roll); 53 (Jaw) Maximum Capacity (Jaw): 15 T/hr Maximum Capacity (Roll): 30 T/hr Crusher is powered by electricity	Baghouse: Manufacturer: Emtrol Model No.: 36BV360 Number of bags: 36 Air to Cloth ratio: 8 to 1 PM_{10} control efficiency: 99.9%	Vent parameters: The baghouse is enclosed in a three sided building. All emissions associated with the baghouse are released into the atmosphere via the fourth open building side.

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit (PTE) 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 vaporizer ovens, cement and fly ash supplement silos, roll crusher, jaw crusher, railcar, and fugitive emissions operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, greenhouse gases (GHG), HAP/TAP PTE were based on emission factors from AP-42, operation of 8,760 hours per year, and process information specific to the facility for this proposed project. Vaporizer ovens emission estimates were derived from AP-42, Section 1.4 (Natural Gas Combustion), Table 2, Small Boiler < 100 MMBtu/hr (uncontrolled.) The PM_{10} and $PM_{2.5}$ emissions rates from the cement and fly ash supplement silos were calculated using emission factors (EF) in lb/ton of material handled from AP-42, Table 11.12-2, and the percentage of PM that is considered to be PM2.5 that was used is based on AP-42, Table B-2.2, Category 3. It was established that the fraction that is $PM_{2.5}$ is 15%. The HAP/TAP emissions estimates were based on EFs from AP-42, Table 11.12-8 (Version 06/06). The GHG emissions were derived from 40 CFR Part 98, Subpart A, Table A-1. The carbon dioxide equivalent (CO_2e) is provided in metric tons whereby 2,204.6 pounds equal to one ton. The PM_{10} emission factors for the roll and jaw crushers are derived from AP-42, Section 11.19-2, Crushed Stone Processing and Pulverized Mineral Processing. Particulate fugitive EFs from aggregate handling, belt conveyors, storage piles, screening are obtained from AP-42, Sections 13.2.3 and 13.2.4.

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 all operations, uncontrolled Potential to Emit is based upon a worst-case for operation of the facility of 8,760 hr/yr (24 hr/day x 365 day/yr).

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

	$PM_{10}/PM_{2.5}$	SO_2	NOx	CO	VOC	CO_2e
Source	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**
Point Sources						
Vaporizer #1	0.034	0.003	0.450	0.378	0.025	1971.5
Vaporizer #2	0.034	0.003	0.450	0.378	0.025	
Cement silo –Line A	5.30E-03	N/A	0.00	N/A	N/A	N/A
Cement silo –Line B	5.30E-03	N/A	0.00	N/A	N/A	N/A
Supplement Silo Line A&B	0.076	N/A	0.00	N/A	N/A	N/A
Roll Crusher	1.78E-04	N/A	N/A	N/A	N/A	N/A
Jaw Crusher	1.78E-04	N/A	N/A	N/A	N/A	N/A
Railcar Emissions routed to Baghouse	6.94E-04	N/A	0.00	N/A	N/A	N/A
Total Point Source Emissions	**0.156**	**0.006**	**0.90**	**0.756**	**0.050**	**1971.5**

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 facility-wide operations, uncontrolled Potential to Emit is based upon a worst-case of 8,760 hr/yr (24 hr/day x 365 day/yr). Then, the worst-case maximum HAP Potential to Emit was determined for the facility. See Appendix A for detailed calculations.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

Hazardous Air Pollutants	PTE (T/yr)
Individual HAP	1.62E-02
Facility-Wide Total HAPs	1.75E-02

Pre-Project Potential to Emit

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

This is an existing facility. However, since this is the first time the facility is receiving a permit, pre-project emissions are set to zero for all criteria pollutants.

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

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e	
	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]	lb/hr[a]	T/yr[b]
Vaporizer Oven #1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vaporizer Oven #2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement silo – Line A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement silo – Line B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Supplement Silo – Line A & B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roll crusher	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jaw crusher	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Railcar Emissions Routed to Baghouse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed PTE Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Project Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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

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

Post Project Potential to Emit

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

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

Table 5 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$[c]		SO_2		NO_x		CO		VOC		CO_2e	
	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]	lb/hr[a]	T/yr[b]
Vaporizer Oven #1	0.037	0.034	0.001	0.003	0.490	0.450	0.412	0.378	0.027	0.025	1,971.5	
Vaporizer Oven #2	0.037	0.034	0.001	0.003	0.490	0.450	0.412	0.378	0.027	0.025		
Cement silo – Line A	1.70E-03	5.30E-03	--	--	--	--	--	--	--	--	--	
Cement silo – Line B	1.70E-03	5.30E-03	--	--	--	--	--	--	--	--	--	
Supplement Silo – Line A & B	0.025	0.076	--	--	--	--	--	--	--	--	--	
Roll crusher	7.20E-04	1.78E-04	--	--	--	--	--	--	--	--	--	
Jaw crusher	3.60E-04	1.78E-04	--	--	--	--	--	--	--	--	--	
Railcar Emissions Routed to Baghouse	2.94E-03	6.94E-04	--	--	--	--	--	--	--	--	--	
Post Project Totals	**0.106**	**0.156**	**0.002**	**0.005**	**0.980**	**0.900**	**0.824**	**0.756**	**0.054**	**0.050**	**1,971.5**	

Change in Potential to Emit

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

Table 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
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	0.00	0.00
Post Project Potential to Emit	0.106	0.156	0.002	0.005	0.980	0.900	0.824	0.756	0.054	0.050	1,971.5	
Changes in Potential to Emit	**0.054**	**0.156**	**0.002**	**0.005**	**0.980**	**0.900**	**0.824**	**0.756**	**0.054**	**0.050**	**1,971.5**	

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 7 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)
Ammonium Sulfamate	0.00E-03	1.58E-06	1.58E-06	6.67E-01	No
Amorphous Silica	0.00E-03	2.84E-06	2.84E-06	6.67E-01	No
Barium	0.00E-03	4.31E-05	4.31E-05	3.3E-02	No
Chromium	0.00E-03	1.62E-05	1.62E-05	3.3E-02	No
Cobalt	0.00E-03	8.24E-07	8.24E-07	3.3E-03	No
Copper	0.00E-03	8.33E-06	8.33E-06	6.7E-02	No
Hexane	0.00E-03	1.76E-02	1.76E-02	1.2E+01	No
Iron Oxide	0.00E-03	6.30E-05	6.30E-05	3.3E-01	No
Manganese	0.00E-03	6.18E-06	6.18E-06	3.33E-01	No
Molybdenum	0.00E-03	1.08E-05	1.08E-05	3.33E-01	No
Naphthalene	0.00E-03	5.98E-06	5.98E-06	2.00E-06	No
Pentane	0.00E-03	2.55E-02	2.55E-02	1.18E+2	No
Phosphorous	0.00E-03	1.36E-04	1.36E-04	7.0E-03	No
Selenium	0.00E-03	5.97E-07	5.97E-07	1.3E-02	No
Vanadium	0.00E-03	2.25E-05	2.25E-05	3.0E-03	No
Toluene	0.00E-03	3.33E-05	3.33E-05	2.5E+01	No
Zinc	0.00E-03	2.84E-04	2.84E-04	6.67E-01	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

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

Table 8 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)
Arsenic	0.00E-03	4.01E-06	4.01E-06	1.50E-06	Yes
Benzene	0.00E-03	4.32E-06	4.32E-06	8.00E-04	No
Beryllium	0.00E-03	3.50E-07	3.50E-07	2.80E-05	No
Cadmium	0.00E-03	4.00E-06	4.00E-06	3.70E-06	Yes
Chromium VI	0.00E-03	1.39E-06	1.39E-06	5.60E-07	Yes
Formaldehyde	0.00E-03	1.54E-04	1.54E-04	5.10E-04	No
Naphthalene	0.00E-03	1.25E-06	1.25E-06	9.10E-05	No
Nickel	0.00E-03	1.27E-05	1.27E-05	2.70E-05	No
POM (7-PAH)[a]	0.00E-03	2.34E-08	2.34E-08	2.00E-06	No
Total PAHs	0.00E-03	3.90E-06	3.90E-06	9.10E-05	Yes

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, and chromium VI because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The post project potential to emit for HAP pollutants from an individual HAP is 0.0162 T/yr and for aggregate HAP is 0.0175 T/yr from all emissions units at the facility as submitted by the applicant and verified by DEQ staff, which are less than the major source thresholds for HAP emissions. See Appendix A for the calculations of these emissions for each emissions unit.

Ambient Air Quality Impact Analyses

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 facility has an uncontrolled potential to emit for PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, and VOC are less than the Major Source thresholds of 100 T/yr for each pollutant. In addition, the facility has uncontrolled potential HAP emissions of less than the Major Source threshold of 10 T/yr and for all HAP combined less than the Major Source threshold of 25 T/yr. Therefore, this facility is not designated as a Synthetic Minor facility.

The facility's Aerometric Information Retrieval System (AIRS) is 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.

Other Rules as Applicable (IDAPA 58.01.01.776)

IDAPA 58.01.01.776..... Control of Odors

Section 776.01 states that no person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. These requirements are assured by Permit Conditions 2.5 and 2.13.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 ..... Visible Emissions

The sources of opacity emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is included as Permit Conditions 2.3 and 2.15.

Standards for New Sources (IDAPA 58.01.01.676)

IDAPA 58.01.01.676 ..... Standards for New Sources

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or more, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Conditions 2.4 and 2.7.

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 any criteria pollutant (i.e., PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, 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. Also, the GHG emissions from the facility don't exceed 100,000 T/yr. 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/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)

Subpart OOO—Standards of Performance for Nonmetallic Mineral Processing Plants

§ 60.670 Applicability and designation of affected facility.

(a)(1) Except as provided in paragraphs (a)(2), (b), (c), and (d) of this section, the provisions of this subpart are applicable to the following affected facilities in fixed or portable nonmetallic mineral processing plants: each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station. Also, crushers and grinding mills at hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in recycled asphalt pavement and subsequent affected facilities up to, but not including, the first storage silo or bin are subject to the provisions of this subpart.

(2) The provisions of this subpart do not apply to the following operations: All facilities located in underground mines; plants without crushers or grinding mills above ground; and wet material processing operations (as defined in §60.671).

(b) An affected facility that is subject to the provisions of subparts F or I of this part or that follows in the plant process any facility subject to the provisions of subparts F or I of this part is not subject to the provisions of this subpart.

(c) Facilities at the following plants are not subject to the provisions of this subpart:

(1) Fixed sand and gravel plants and crushed stone plants with capacities, as defined in §60.671, of 23 megagrams per hour (25 tons per hour) or less;

(2) Portable sand and gravel plants and crushed stone plants with capacities, as defined in §60.671, of 136 megagrams per hour (150 tons per hour) or less; and

(3) Common clay plants and pumice plants with capacities, as defined in §60.671, of 9 megagrams per hour (10 tons per hour) or less.

(d)(1) When an existing facility is replaced by a piece of equipment of equal or smaller size, as defined in §60.671, having the same function as the existing facility, and there is no increase in the amount of emissions, the new facility is exempt from the provisions of §§60.672, 60.674, and 60.675 except as provided for in paragraph (d)(3) of this section.

(2) An owner or operator complying with paragraph (d)(1) of this section shall submit the information required in §60.676(a).

(3) An owner or operator replacing all existing facilities in a production line with new facilities does not qualify for the exemption described in paragraph (d)(1) of this section and must comply with the provisions of §§60.672, 60.674 and 60.675.

(e) An affected facility under paragraph (a) of this section that commences construction, modification, or reconstruction after August 31, 1983, is subject to the requirements of this part.

(f) Table 1 of this subpart specifies the provisions of subpart A of this part 60 that do not apply to owners and operators of affected facilities subject to this subpart or that apply with certain exceptions.

The rock crushing operated by Basalite is not subpart to 40 CFR 60, Subpart OOO because of 60.670(c)(1) and 60.670(e). Section 60.670(a)(1) states that there are exceptions to applicability under subsections (b), (c) and (d). The jaw crusher has a maximum capacity of less than 25 T/hr. It is only 15 T/hr. Therefore, under subsection (c) it is not subject to the subpart. In addition, subsection (e) states that an affected source as defined in (a) is one that commenced constructed after August 31, 1983. The roll crusher was installed and be operational since 1977. Thus, it too is not an affected source and not subject to the subpart.

Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

§ 60.40c Applicability and delegation of authority.

(a) Except as provided in paragraphs (d), (e), (f), and (g) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).

The steam generating vaporizers were built on 1998 and 2000, respectively. However, per the name plate on both units, the maximum design heat input capacity is not between 10 and 100 MMBtu/hr. Rather, they are both only 5 MMBtu/hr. Therefore, the subpart does not apply to Basalite.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

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

Permit Conditions Review

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

Initial Permit Condition 2.1 – 2.2

These two conditions provide a process description of the facility. This includes the type of operations performed by Basalite and all the emission units on site. Permit Condition 2.2 is a table that describes all the specifications of each emission unit and corresponding control device, where applicable.

Emission Limits

Initial Permit Condition 2.3

This permit condition ensures the visible emissions from crusher stack, or any other stack or vent will not exceed 20% opacity. Compliance with visible emission requirements is assured by following the operating, monitoring and recordkeeping requirements in Permit Condition 2.11 and 2.15.

Initial Permit Condition 2.4

The fuel burning equipment of IDAPA 58.01.01.675 applies to the two 5.0 MMBtu/hr vaporizer ovens existing at the facility. The PM emissions limits shall not be in excess of 0.015 gr/dscf of effluent gas for each oven corrected to 3% oxygen by volume for gas. Since the vaporizer ovens are combusting only natural gas in accordance with Permit Condition 2.7, this permit condition will be assured.

Initial Permit Condition 2.5

This condition ensures that odors are mitigated as much as possible in accordance with IDAPA 58.01.01.776.01. Compliance with the odor requirements under Permit Condition 2.4 is assured by following the operating, monitoring and recordkeeping requirements in Permit Condition 2.13.

Operating Requirements

Initial Permit Condition 2.6

All reasonable precautions shall be taken to prevent PM from becoming airborne in accordance with the fugitive dust requirements of Permit Condition 2. 6 and IDAPA 58.01.01.650-651. Compliance with the fugitive requirements under Permit Condition 2.6 (fugitive emissions) is assured by following the operating, monitoring and recordkeeping requirements listed in Permit Conditions 2.12 (fugitive dust monitoring).

During the facility review of the draft permit the permittee requested to combine the emission units from this process into one comprehensive condition under Permit Condition 2.3. DEQ discussed this request with JBR (Basalite's consultant) and determined that DEQ can't combine the opacity requirements from point sources with those of fugitive sources. Fugitive source emissions in IDAPA 58.01.01.793.02 don't require the opacity reader to be certified. However, the opacity requirements under Permit Condition 2.3 requires the permittee be certified to read opacity.

Initial Permit Condition 2.8

This permit condition ensures the maximum amount of natural gas fuel burned in the vaporizer ovens will not exceed 18 million standard cubic feet per any consecutive 12-calendar month (MMscf/yr). The annual limit is included in the PTC to limit the TAP emissions of arsenic, cadmium, and chromium VI because these pollutants are considered TAPs and their emissions exceeded the emissions level found in IDAPA 58.01.01.586. Compliance with this permit condition is assured by Permit Condition 2.16 (fuel burning throughput monitoring.)

Initial Permit Condition 2.9

This condition provides an annual aggregated material usage limit of gravel, red cinder, black cinder, gold pumice, white pumice, sand, and reclaim aggregate. Compliance with this permit condition is assured by Permit Condition 2.14.

Initial Permit Condition 2.10

This condition provides an annual cement and flyash throughput usage limit at the facility in Line A Cement Silo, Line B Cement Silo, and Line A & B Cement Supplement (Flyash) Silo. The annual limits were included in the PTC to limit the TAP emissions of arsenic, cadmium, and chromium VI because the emission rates of these TAPs exceeded the emissions levels found in IDAPA 58.01.01.586. Compliance with this permit condition is assured by Permit Condition 2.14 (Cement and Flyash Silo Throughput Limits.)

Initial Permit Condition 2.11

Permit Condition 2.11 has been added to require the permittee to install a baghouse to control PM_{10} and PM emissions from the crusher stack at the facility. This permit condition requires the permittee to develop a baghouse procedures document for the inspection and operation of the baghouse. The document must be a permittee developed document independent of the manufacturer supplied operating manual but may include summaries of procedures included in the manufacturer supplied operating manual. Baghouse is expected to be highly effective in controlling particulates from this process, provided they are operated and maintained according to manufacturer specifications and periodically inspected. If any visible emissions were present from the baghouse stack, the permittee must realize that a corrective action must be taken to fix the baghouse and a description of the correction action must be taken. At a minimum the baghouse procedures document must include procedures to determine if bags are ruptured and procedures to determine if bags are not appropriately secured in place. The permittee is required to maintain records of the results of each baghouse inspection in accordance with Monitoring and Recordkeeping requirements in the General Provisions of this permit.

General Provisions

Initial Permit Condition 3.1

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.

Initial Permit Condition 3.2

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.

Initial Permit Condition 3.3

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.

Initial Permit Condition 3.4

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

Initial Permit Condition 3.5

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.

Initial Permit Condition 3.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.03.

Initial Permit Condition 3.7

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.

Initial Permit Condition 3.8

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.

Initial Permit Condition 3.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Initial Permit Condition 3.10

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.

Initial Permit Condition 3.11

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.

Initial Permit Condition 3.12

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

Initial Permit Condition 3.13

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

Initial Permit Condition 3.14

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

Initial Permit Condition 3.15

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

Initial Permit Condition 3.16

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 were no comments on the application and 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

IDEQ PTC Forms

Facility Wide Potential to Emit Emission Inventory

Table 1. PRE PROJECT POTENTIAL TO EMIT FOR NSR REGULATED POLLUTANTS

*** Assumed to be Zero because this is the initial PTC for the facility.**

Table 2. POST PROJECT MAXIMUM POTENTIAL TO EMIT FOR NSR REGULATED POLLUTANTS

	Critieria Pollutant Emission Summary														
	NOx Emissions		CO Emissions		PM-10 Emissions		SOx Emissions		VOC Emissions		Lead Emissions		PM-2.5 Emissions		GHG Emissions
Description	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Vaporizer #1	0.490	0.450	0.412	0.378	0.037	0.034	0.003	0.003	0.027	0.025	2.45E-06	2.25E-06	0.037	0.034	1,971.46
Vaporizer #2	0.490	0.450	0.412	0.378	0.037	0.034	0.003	0.003	0.027	0.025	2.45E-06	2.25E-06	0.037	0.034	
Cement Silo - Line A	N/A	N/A	N/A	N/A	1.70E-03	5.30E-03	N/A	N/A	N/A	N/A	5.45E-08	1.70E-07	6.75E-04	2.11E-03	
Cement Silo - Line B	N/A	N/A	N/A	N/A	1.70E-03	5.30E-03	N/A	N/A	N/A	N/A	5.45E-08	1.70E-07	6.75E-04	2.11E-03	
Supplement Silo - Line A & B	N/A	N/A	N/A	N/A	0.025	0.076	N/A	N/A	N/A	N/A	2.60E-06	8.11E-06	6.68E-03	2.08E-02	
Roll Crusher	N/A	N/A	N/A	N/A	7.20E-04	1.04E-04	N/A	N/A	N/A	N/A	N/A	N/A	1.04E-04	1.04E-04	
Jaw Crusher	N/A	N/A	N/A	N/A	3.60E-04	1.04E-04	N/A	N/A	N/A	N/A	N/A	N/A	1.04E-04	1.04E-04	
Railcar Emissions Routed to Baghouse	N/A	N/A	N/A	N/A	2.94E-03	4.60E-04	N/A	N/A	N/A	N/A	N/A	N/A	4.60E-04	4.60E-04	
Proposed PTE Total (excluding fugitives)	**0.980**	**0.900**	**0.824**	**0.756**	**0.106**	**0.156**	**0.006**	**0.005**	**0.054**	**0.050**	**7.61E-06**	**1.30E-05**	**0.083**	**0.094**	**1,971.46**
Fugitives	N/A	N/A	N/A	N/A	0.391	0.109	N/A	N/A	N/A	N/A	N/A	N/A	0.109	2.293	

NSR Regulated air Pollutants are defined[1] as: Particulate Matter (PM-10, PM-2.5), Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone (VOC), Sulfur Dioxide, all pollutants regulated by NSPS (40 CFR 60)(i.e. TRS, fluoride, sulfuric acid mist) & Class I & Class II Ozone Depleting Substances (40 CFR 82)(i.e. CFC, HCFC, Halon, etc.) The Gem State facility is not a source of any pollutants regulated by NSPS other than NSR regulated air pollutants, nor is the facility a source of Class I or Class II Ozone Depleting Substances

** See spreadsheets prepared by JBR (included in Appendix E of the permit application for further information regarding emission factors and calculation assumptions.

IDEQ PTC Forms

Facility Wide Potential to Emit Emission Inventory

Table 3. UNCONTROLLED POTENTIAL TO EMIT FOR NSR REGULATED POLLUTANTS

	Critieria Pollutant Emission Summary														
	NOx Emissions		CO Emissions		PM-10 Emissions		SOx Emissions		VOC Emissions		Lead Emissions		PM-25 Emissions		GHG Emissions
Description	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Vaporizer #1	0.490	2.147	0.412	1.804	0.037	0.163	0.003	0.013	0.027	0.118	1.20E-08	5.26E-08	0.037	0.163	4,703.17
Vaporizer #2	0.490	2.147	0.412	1.804	0.037	0.163	0.003	0.013	0.027	0.118	1.20E-08	5.26E-08	0.037	0.163	
Cement Silo - Line A	N/A	N/A	N/A	N/A	2.35	10.29	N/A	N/A	N/A	N/A	3.68E-06	1.61E-05	0.35	1.54	
Cement Silo - Line B	N/A	N/A	N/A	N/A	2.35	10.29	N/A	N/A	N/A	N/A	3.68E-06	1.61E-05	0.35	1.54	
Supplement Silo - Line A & B	N/A	N/A	N/A	N/A	5.50	24.09	N/A	N/A	N/A	N/A	2.60E-06	1.14E-05	0.83	3.61	
Roll Crusher	N/A	N/A	N/A	N/A	7.20E-02	1.04E-02	N/A	N/A	N/A	N/A	N/A	N/A	7.20E-02	1.04E-02	
Jaw Crusher	N/A	N/A	N/A	N/A	3.60E-02	1.04E-02	N/A	N/A	N/A	N/A	N/A	N/A	3.60E-02	1.04E-02	
Railcar Emissions Routed to Baghouse	N/A	N/A	N/A	N/A	2.94E-01	4.60E-02	N/A	N/A	N/A	N/A	N/A	N/A	2.94E-01	4.60E-02	
Proposed PTE Total (excluding fugitives)	**0.980**	**4.294**	**0.824**	**3.607**	**10.677**	**45.069**	**0.006**	**0.026**	**0.054**	**0.236**	**9.98E-06**	**4.37E-05**	**2.007**	**7.095**	**4,703.17**
Fugitives	N/A	N/A	N/A	N/A	0.013	No	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

** See spreadsheets prepared by JBR (included in Appendix E of the permit application for further information regarding emission factors and calculation assumptions.

IDEQ PTC Forms

Toxic Air Pollutant Emissions Inventory

Part 1. PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

NON-CARCINOGENS

Pollutant	CAS #	TAP Emissions (lb/hr)	Pre-Project TAP Emissions (lb/hr)	Difference (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	TAP Emissions (tpy)
Barium	7440-39-3	4.31E-05	0.00E+00	4.31E-05	3.30E-02	No	3.96E-05
Chromium	7440-47-3	1.62E-05	0.00E+00	1.62E-05	3.30E-02	No	3.25E-05
Cobalt	7440-48-4	8.24E-07	0.00E+00	8.24E-07	3.30E-03	No	7.56E-07
Copper	7440-50-8	8.33E-06	0.00E+00	8.33E-06	6.70E-02	No	7.65E-06
Iron Oxide	1309-37-1	6.30E-05	0.00E+00	6.30E-05	3.33E-01	No	1.64E-05
Hexane	110-54-3	1.76E-02	0.00E+00	1.76E-02	1.20E+01	No	1.62E-02
Manganese	7439-96-5	6.18E-06	0.00E+00	6.18E-06	3.33E-01	No	1.11E-05
Molybdenum	7439-98-7	1.08E-05	0.00E+00	1.08E-05	3.33E-01	No	9.90E-06
Naphthalene	91-20-3	5.98E-06	0.00E+00	5.98E-06	2.00E-06	Yes	5.49E-06
Pentane	109-66-0	2.55E-02	0.00E+00	2.55E-02	1.18E+02	No	2.34E-02
Phosphorous	7723-14-0	1.36E-04	0.00E+00	1.36E-04	7.00E-03	No	4.23E-04
Selenium	7782-49-2	5.97E-07	0.00E+00	5.97E-07	1.30E-02	No	1.35E-06
Vanadium	71-43-2	2.25E-05	0.00E+00	2.25E-05	3.00E-03	No	2.07E-05
Toluene	108-88-3	3.33E-05	0.00E+00	3.33E-05	2.50E+01	No	3.06E-05
Zinc	7440-66-6	2.84E-04	0.00E+00	2.84E-04	6.67E-01	No	2.61E-04

Part 2. PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

CARCINOGENS

Pollutant	CAS #	TAP Emissions (lb/hr)	Pre-Project TAP Emissions (lb/hr)	Difference (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	TAP Emissions (tpy)
Arsenic	7440-38-2	4.00E-06	0.00E+00	4.00E-06	1.50E-06	Yes	1.75E-05
Benzene	71-43-2	4.32E-06	0.00E+00	4.32E-06	8.00E-04	No	1.89E-05
Beryllium	7440-41-7	3.50E-07	0.00E+00	3.50E-07	2.80E-05	No	1.53E-06
Cadmium	7440-43-9	4.00E-06	0.00E+00	4.00E-06	3.70E-06	Yes	1.75E-05
Chromium VI	7440-47-3	1.39E-06	0.00E+00	1.39E-06	5.60E-07	Yes	6.10E-06
Formaldehyde	50-00-0	1.54E-04	0.00E+00	1.54E-04	5.10E-04	No	6.75E-04
Naphthalene	91-20-3	1.25E-06	0.00E+00	1.25E-06	9.10E-05	No	5.49E-06
Nickel	7440-02-0	1.27E-05	0.00E+00	1.27E-05	2.70E-05	No	5.58E-05
POM (7-PAH)	50-32-8	2.34E-08	0.00E+00	2.34E-08	2.00E-06	No	1.03E-07
Total PAHs		1.54E-06	0.00E+00	1.54E-06	2.00E-06	No	6.74E-06

** See spreadsheets prepared by JBR (included in Appendix E of the permit application for further information regarding emission factors and calculation assumptions.

IDEQ PTC Forms
Facility Wide Hazardous Air Pollutant Potential to Emit

HAP MAXIMUM POTENTIAL TO EMIT EMISSIONS SUMMARY

HAP Pollutants	PTE (T/yr)
Chromium	3.25E-05
Cobalt	7.56E-07
Lead	8.45E-06
Hexane*	1.62E-02
Manganese	1.11E-05
Mercury	2.34E-06
Naphthalene	5.49E-06
Phosphorous	4.23E-04
Toluene	3.06E-05
Arsenic	1.75E-05
Benzene	1.89E-05
Beryllium	1.53E-06
Cadmium	1.75E-05
Formaldehyde	6.75E-04
Nickel	5.58E-05
Total PAH	6.74E-06
Total	1.75E-02

* Maximum Individual HAP

** See spreadsheets prepared by JBR (included in Appendix E of the permit application for

Basalite Boise Plant
Initial Permit to Construct - November 2012 Update
Emissions Inventory

Description	Criteria Pollutant Emission Summary - PTE														GHG Emissions
	NO_x Emissions		CO Emissions		PM_{10} Emissions		SO_x Emissions		VOC Emissions		Lead Emissions		$PM_{2.5}$ Emissions		
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Vaporizer #1	0.490	0.450	0.412	0.378	0.037	0.034	0.003	0.003	0.027	0.025	2.45E-06	2.25E-06	0.037	0.034	1971.46
Vaporizer #2	0.490	0.450	0.412	0.378	0.037	0.034	0.003	0.003	0.027	0.025	2.45E-06	2.25E-06	0.037	0.034	
Cement Silo - Line A	N/A	N/A	N/A	N/A	1.70E-03	5.30E-03	N/A	N/A	N/A	N/A	5.45E-08	1.70E-07	6.75E-04	2.11E-03	
Cement Silo - Line B	N/A	N/A	N/A	N/A	1.70E-03	5.30E-03	N/A	N/A	N/A	N/A	5.45E-08	1.70E-07	6.75E-04	2.11E-03	
Supplement Silo - Line A & B	N/A	N/A	N/A	N/A	0.025	0.076	N/A	N/A	N/A	N/A	2.60E-06	8.11E-06	6.68E-03	2.08E-02	
Roll Crusher	N/A	N/A	N/A	N/A	7.20E-04	1.04E-04	N/A	N/A	N/A	N/A	N/A	N/A	1.04E-04	1.04E-04	
Jaw Crusher	N/A	N/A	N/A	N/A	3.60E-04	1.04E-04	N/A	N/A	N/A	N/A	N/A	N/A	1.04E-04	1.04E-04	
Railcar Emissions Routed to Baghouse[1]	N/A	N/A	N/A	N/A	2.94E-03	4.60E-04	N/A	N/A	N/A	N/A	N/A	N/A	4.60E-04	4.60E-04	
Total Point Source Emissions	**0.980**	**0.824**	**0.824**	**0.756**	**0.106**	**0.156**	**0.006**	**0.005**	**0.054**	**0.050**	**7.61E-06**	**1.30E-05**	**0.083**	**0.094**	**1971.46**
Fugitives[2]	N/A	N/A	N/A	N/A	0.391	0.109	N/A	N/A	N/A	N/A	N/A	N/A	0.109	2.293	
Total w/ Fugitives Included	***0.980***	***0.824***	***0.824***	***0.756***	***0.603***	***0.421***	***0.006***	***0.005***	***0.054***	***0.050***	***7.61E-06***	***1.30E-05***	***0.276***	***2.482***	

1. The railcar emissions that are routed to the point source baghouse that have not already been accounted for are as follows: screening operations and conveyance transfer to the screening.
2. The fugitive emissions are determined from all processes outlined in the "Material Inflow" and from screening and to grizzly hopper transfer/loading.

FACILITY POTENTIAL TO EMIT - TAPS

NON-CARCINOGENS							
Pollutant	CAS #	TAP Emissions (lb/hr)	Pre-Project TAP Emissions (lb/hr)	Difference (lb/hr)	Screening Level (lb/hr)	Modeling (Y/N)	TAP Emissions (tpy)
Barium	7440-39-3	4.31E-05	0.00E+00	4.31E-05	3.3E-02	No	3.96E-05
Chromium	7440-47-3	1.62E-05	0.00E+00	1.62E-05	3.3E-02	No	3.25E-05
Cobalt	7440-48-4	8.24E-07	0.00E+00	8.24E-07	3.3E-03	No	7.56E-07
Copper	7440-50-8	8.33E-06	0.00E+00	8.33E-06	6.7E-02	No	7.65E-06
Hexane	110-54-3	1.76E-02	0.00E+00	1.76E-02	1.2E+01	No	1.62E-02
Iron Oxide	1309-37-1	6.30E-05	0.00E+00	6.30E-05	3.3E-01	No	1.64E-05
Manganese	7439-96-5	6.18E-06	0.00E+00	6.18E-06	3.33E-01	No	1.11E-05
Molybdenum	7439-98-7	1.08E-05	0.00E+00	1.08E-05	3.33E-01	No	9.90E-06
Naphthalene	91-20-3	5.98E-06	0.00E+00	5.98E-06	2.00E-06	Yes	5.49E-06
Pentane	109-66-0	2.55E-02	0.00E+00	2.55E-02	1.18E+02	No	2.34E-02
Phosphorous	7723-14-0	1.36E-04	0.00E+00	1.36E-04	7.E-03	No	4.23E-04
Selenium	7782-49-2	5.97E-07	0.00E+00	5.97E-07	1.3E-02	No	1.35E-06
Vanadium	7440-62-2	2.25E-05	0.00E+00	2.25E-05	3.0E-03	No	2.07E-05
Toluene	108-88-3	3.33E-05	0.00E+00	3.33E-05	2.5E+01	No	3.06E-05
Zinc	7440-66-6	2.84E-04	0.00E+00	2.84E-04	6.67E-01	No	2.61E-04

CARCINOGENS							
Pollutant	CAS #	TAP Emissions (lb/hr)[1]	Pre-Project TAP Emissions (lb/hr)	Difference (lb/hr)	Screening Level (lb/hr)	Modeling (Y/N)	TAP Emissions (tpy)
Arsenic	7440-38-2	4.00E-06	0.00E+00	4.00E-06	1.5E-06	Yes	1.75E-05
Benzene	71-43-2	4.32E-06	0.00E+00	4.32E-06	8.0E-04	No	1.89E-05
Beryllium	7440-41-7	3.50E-07	0.00E+00	3.50E-07	2.8E-05	No	1.53E-06
Cadmium	7440-43-9	4.00E-06	0.00E+00	4.00E-06	3.7E-06	Yes	1.75E-05
Chromium VI	7440-47-3	1.39E-06	0.00E+00	1.39E-06	5.6E-07	Yes	6.10E-06
Formaldehyde	50-00-0	1.54E-04	0.00E+00	1.54E-04	5.1E-04	No	6.75E-04
Naphthalene	91-20-3	1.25E-06	0.00E+00	1.25E-06	9.1E-05	No	5.49E-06
Nickel	7440-02-0	1.27E-05	0.0E+00	1.27E-05	2.7E-05	No	5.58E-05
POM (7-PAH)	50-32-8	2.34E-08	0.00E+00	2.34E-08	2.0E-06	No	1.03E-07
Total PAHs		1.54E-06	0.00E+00	1.54E-06	2.00E-06	No	6.74E-06

1. The lb/hr is based on an annual average

FACILITY POTENTIAL TO EMIT - HAPS

	PTE
Individual HAP	1.62E-02
Aggregate HAPs	1.75E-02

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Material Throughputs

Material	2011 Actuals Ton/yr	Projected Throughputs[1]	Delivery	Storage and Transfer
Gravel	8,572	21,430	Truck	Stockpile/Underground Bin
Red Cinder	140	350	Truck	Stockpile/Underground Bin
Black Cinder	140	350	Truck	Stockpile/Underground Bin
Gold Pumice	61	153	Truck	Stockpile/Underground Bin
White Pumice	5,940	14,850	Railcar	Aggregate Silo
Reclaim Aggregate	3,476	8,690	Forklift	Goes to Crusher
Sand	17,938	44,845	Truck	Stockpile/Underground Bin

1. The projected throughput is the 2011 actuals multiplied by 2.5.

Materal Transfer

Material Process	Throughput[1]		Emission factor (lb/Ton)	Uncontrolled Emissions (lb/hr)	Uncontrolled Emissions (Ton/yr)	Emission factor (lb/Ton)	Uncontrolled Emissions (lb/hr)	Uncontrolled Emissions (Ton/yr)
	Ton/hr	Ton/yr[2]	PM_{10}[3]	PM_{10}	PM_{10}	$PM_{2.5}$[4]	$PM_{2.5}$	$PM_{2.5}$
Aggregate/Pumice Delivery to Underground	38	37,133	0.0033	0.13	0.61	1.04E-03	0.04	0.73
Sand Delivery to Underground Storage	38	44,845	0.00099	0.04	0.22	3.15E-04	0.01	0.27
Aggregate or Sand Transfer to Reverse Belt Conveyor	38	81,978	0.0033	0.13	1.35	1.04E-03	0.04	1.61
Aggregate or Sand Transfer to Aggregate Holding Hopper	38	81,978	0.0033	0.13	1.35	1.04E-03	0.04	1.61
Pumice Drop into Aggregate Silos	38	14,850	0.0033	0.13	0.25	1.04E-03	0.04	0.29

Material Process	Controlled Emissions (lb/hr)[5]	Controlled Emissions (Ton/yr)[5]	Controlled Emissions (lb/hr)[5]	Controlled Emissions (Ton/yr)[5]
	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$
Aggregate/Pumice Delivery to Underground	0.06	0.31	0.02	0.37
Sand Delivery to Underground Storage	0.02	0.11	0.01	0.13
Aggregate or Sand Transfer to Reverse Belt Conveyor	0.06	0.68	0.02	0.81
Aggregate or Sand Transfer to Aggregate Holding Hopper	0.06	0.68	0.02	0.81
Pumice Drop into Aggregate Silos	0.06	0.12	0.02	0.15

1. The hourly throughput is based on the unloading capacity of the hopper grizzlies both for truck and railcar unloading.
2. The aggregate annual throughput includes all material types with the exception of white pumice.
Only white pumice is routed to the aggregate silos.
3. All emission factors are derived from AP-42 Section 11.12 - Concrete Batching, Table 2
4. The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, and a percentage of PM that is considered to be $PM_{2.5}$.
The percentage used to establish the EFs were based on AP-42, Appendix B, Table B-2.2, Category 3. It was established that the fraction that is $PM_{2.5}$ is 15%.
5. A control efficiency of 50% was applied because the conveyors themselves are fully enclosed but the transfer point is partially enclosed with a 1 ft drop and wind breaks.

Alternative Material feed from Stockpiles

Alternative Material Feed	Throughput		Emission Factors (lb/ton)		Uncontrolled PM_{10} Emissions		Uncontrolled $PM_{2.5}$ Emissions	
	Ton/hr[1]	Ton/yr[2]	PM_{10}[3]	$PM_{2.5}$[3]	lb/hr	Ton/yr	lb/hr	Ton/yr
Material Grab With Loader	38	10,069	1.11E-03	1.69E-05	4.23E-02	5.60E-03	6.40E-04	8.48E-05
Wind Erosion Sand Pile[4]	N/A	N/A	N/A	N/A	7.37E-02	2.30E-01	2.95E-02	9.20E-02
Wind Erosion Gravel Pile[4]	N/A	N/A	N/A	N/A	8.30E-02	2.59E-01	3.32E-02	1.04E-01
Wind Erosion Black Cinder Pile[4]	N/A	N/A	N/A	N/A	2.98E-03	9.29E-03	1.19E-03	3.72E-03
Wind Erosion Red Cinder Pile[4]	N/A	N/A	N/A	N/A	1.19E-02	3.72E-02	4.77E-03	1.49E-02
Wind Erosion Gold Pumice Pile[4]	N/A	N/A	N/A	N/A	1.08E-02	3.39E-02	4.34E-03	1.35E-02

Alternative Material Feed	Controlled PM_{10} Emissions[5]		Controlled $PM_{2.5}$ Emissions[5]	
	lb/hr	Ton/yr	lb/hr	Ton/yr
Material Grab With Loader	4.23E-02	5.60E-03	6.40E-04	8.48E-05
Wind Erosion Sand Pile	7.37E-03	2.30E-02	2.95E-03	9.20E-03
Wind Erosion Gravel Pile	8.30E-03	2.59E-02	3.32E-03	1.04E-02
Wind Erosion Black Cinder Pile	1.49E-03	4.65E-03	5.96E-04	1.86E-03
Wind Erosion Red Cinder Pile	5.96E-03	1.86E-02	2.38E-03	7.43E-03
Wind Erosion Gold Pumice Pile	5.42E-03	1.69E-02	2.17E-03	6.77E-03

1. The hourly throughput is based on the unloading capacity of the hopper grizzlies both for truck and railcar unloading.
2. The annual throughput for material grab is assumed to be 15% of the maximum total as this is only used as an alternative method when typical operations are not running, excludes the white pumice.
3. The loader emission factors were derived from AP-42, Section 13.2.4 Aggregate Handling & Storage Piles - Equation 1, where k = 0.35 and 0.053 for PM_{10} and $PM_{2.5}$, respectively. U is the average mean speed (7.7 mph) and M is moisture content (3%).
The 3% is based on the average of 4.17 % and 1.77%, the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises Cement plant in Roanoke, VA (AP-42 11-12 06/06).
The average wind speed of 7.7 mph was based on the average speed observed at the Boise Airport from 1996-2006. http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO
4. For wind erosion calculations from the stockpiles please refer to the "Stockpile Calcs" Tab of this worksheet.
5. The control efficiencies are assumed to be 90% when the stokpiles are covered with tarps. This is the case when they are not in use. Only the sand and gravel are currently covered. The black, red and gold material are larger and up against a building.
Therefore, a control efficiency of 50% was applied to them. Note that the material grab with loader assumes no control.

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Storage Pile Calculations				
	Length (ft)[1]	Width (ft)[1]	Area (acres)[1]	Worst Case (acres)[2]
Sand Pile Area	26	40	0.024	0.072
Gravel Pile Area	26	45	0.027	0.081
Gold Pumice Area	3.5	12	0.001	0.003
Black Cinder Area	6	28	0.004	0.012
Red Cinder Area	8.5	18	0.004	0.011

1. The length and width of each stockpile was determined by Basalite on February 29, 2012 actual measurements.
2. The Worst case was determined to be three times that of the actual dimensions.

Wind Eroision Calculations

The following calculation was devevioped by the Mojave Desert Air Quality Management District for material handing, specifically wind erosion from stockpiles.

Emissions = E_f *A

Ef = J * 1.7 * sL/1.5 * 365/235 * I/15 * 365/2000

J = particulate aerodynamic factor (0.5 for PM_{10} and 0.2 for $PM_{2.5}$).

sL = Silt loading % (30 used as default for conservatism).

I = % of days wind speed greater than 12 mph (10 was used).

Wind Erosion Emissions	Uncovered PM_{10} (Ton/yr)	Uncovered $PM_{2.5}$ (Ton/yr)
Sand Pile Area	0.2301	0.0920
Gravel Pile Area	0.2589	0.1035
Gold Pumice Area	0.0093	0.0037
Black Cinder Area	0.0372	0.0149
Red Cinder Area	0.0339	0.0135

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Railcar Crushing Enclosure Area Emissions

Emissions Source	Throughput		Emission Factors (lb/Ton)		Uncontrolled Emissions (lb/hr)		Uncontrolled Emissions (Ton/yr)	
	Ton/hr[1]	Ton/yr[1]	PM_{10}[2]	$PM_{2.5}$[3]	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Jaw Crusher	15	8,690	0.0024	0.0024	0.036	0.036	0.010	0.010
Roll Crusher	30	8,690	0.0024	0.0024	0.072	0.072	0.010	0.010
Screening	30	8,690	0.0087	0.0087	0.261	0.261	0.038	0.038
Aggregate (pumice) Conveyor transfers to screening	30	14,850	0.0011	0.0011	0.033	0.033	0.008	0.008
Aggregate (pumice) Conveyor transfers from screening fines[4]	30	14,850	1.11E-03	1.69E-05	3.34E-02	5.06E-04	8.26E-03	1.25E-04
Aggregate (pumice) Conveyor transfers from screening coarse[4]	30	14,850	1.11E-03	1.69E-05	3.34E-02	5.06E-04	8.26E-03	1.25E-04
Aggregate (pumice) Delivery thru grizzly to ground storage[4]	30	14,850	1.11E-03	1.69E-05	3.34E-02	5.06E-04	8.26E-03	1.25E-04

Emissions Source	Controlled Emissions (lb/hr)		Controlled Emissions (Ton/yr)	
	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Jaw Crusher[5]	3.6E-04	3.6E-04	1.04E-04	1.04E-04
Roll Crusher[5]	7.20E-04	7.20E-04	1.04E-04	1.04E-04
Screening[5]	2.61E-03	2.61E-03	3.78E-04	3.78E-04
Aggregate (pumice) Conveyor transfers to screening[5]	3.30E-04	3.30E-04	8.17E-05	8.17E-05
Aggregate (pumice) Conveyor transfers from screening fines[6]	1.67E-02	2.53E-04	4.13E-03	6.26E-05
Aggregate (pumice) Conveyor transfers from screening coarse[6]	1.67E-02	2.53E-04	4.13E-03	6.26E-05
Aggregate (pumice) Delivery thru grizzly to ground storage[6]	1.67E-02	2.53E-04	4.13E-03	6.26E-05

1. The Ton/hr throughput values are based on the capacity of the crusher and the transfers are maximized to represent the highest throughput. Only reclaim aggregate is crushed (8,690 T/yr).
2. The PM_{10} emission factor is derived from AP-42 Section 11.19-2, Crushed Stone Processing & Pulverized Mineral Processing.
Also, footnote n indicates that teritary crushing factors may be used.
3. For conservatism, it is assumed that $PM_{2.5}$ is equivalent to PM_{10}
4. The conveyor transfer from screening emission factors were derived from AP-42, Section 13.2.4 Aggregate Handling & Storage Piles - Equation 1, where k = 0.35 and 0.053 for PM_{10} and $PM_{2.5}$, respectively.
U is the average mean speed (7.7 mph) and M is moisture content (3%). The 3% is based on the average of 4.17 % and 1.77%, the average percentages for sand and aggegate respectively.
These values are based on EPA tests conducted at Cheney Enterprises Cement plant in Roanoke, VA (AP-42 11-12 06/06).
The average wind speed of 7.7 mph was based on the average speed observed at the Boise Airport from 1996-2006. http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO
5. Both crusher and screening operations are conducted within a building where all particulate emissions are routed to a baghouse. The baghouse is the Emtrol 36-10 BR with a control efficiency of 99%.
6. The transfer of material via conveyance to the aggregate silos is partially enclosed. Typically, a "wall" assumes 25% control. A 50% assumption is conservative seeing as only the top of the conveyors are open.

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Cement and Flyash Silo Emissions

Emissions Source	Throughput[1]		Emission Factor (lb/Ton)		Controlled Emissions (lb/hr)		Controlled Emissions (Ton/yr)	
	T/hr	T/yr	PM_{10}[2]	$PM_{2.5}$[2]	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Line A Cement Silo	5	31,200	3.40E-04	1.35E-04	1.70E-03	6.75E-04	5.30E-03	2.11E-03
Line B Cement Sillo	5	31,200	3.40E-04	1.35E-04	1.70E-03	6.75E-04	5.30E-03	2.11E-03
Line A & B Supplement	5	31,200	4.90E-03	1.34E-03	2.45E-02	6.68E-03	7.64E-02	2.08E-02

1. The throughputs are based on expected operations and 6,240 operating hours.
2. The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, and a percentage of PM that is considered to be $PM_{2.5}$.
The percentage used to establish the EFs were based on AP-42, Appendix B, Table B-2.2, Category 3. It was established that the fraction that is PM_{25} is 15%.

HAP/TAP Emissions from Silos

HAP/TAP Emission Factors from AP-42, Table 11.12-8 (Version 06/06)

Emission Source[1]	Arsenic	Beryllium	Cadmium	Chromium	Manganese	Nickel	Phosphorus	Selenium	Chromium VI[2]	Lead
Cement delivery to silo	4.24E-09	4.86E-10	2.34E-07	2.90E-08	1.17E-07	4.18E-08	1.18E-05	ND	20%	1.09E-08
Cement supplement delivery to Silo	1.00E-06	9.04E-08	1.98E-08	1.22E-06	2.56E-07	2.28E-06	3.54E-06	7.24E-08	30%	5.20E-07

1. All factors are in lb/ton and assume a fabric filter as control.
2. Assumed percentage of Chromium that is Cr+6. This a value that has been accepted by Idaho DEQ in the past and is representative here.

	Arsenic		Beryllium		Cadmium		Chromium	
	lb/hr max	T/yr	lb/hr max	T/yr	lb/hr max	T/yr	lb/hr max	T/yr
Line A Cement Silo	2.12E-08	6.61E-08	2.43E-09	7.58E-09	1.17E-06	3.65E-06	1.45E-07	4.52E-07
Line B Cement Sillo	2.12E-08	6.61E-08	2.43E-09	7.58E-09	1.17E-06	3.65E-06	1.45E-07	4.52E-07
Line A & B Supplement	5.00E-06	1.56E-05	4.52E-07	1.41E-06	9.90E-08	3.09E-07	6.10E-06	1.90E-05
Total	**5.04E-06**	**1.57E-05**	**4.57E-07**	**1.43E-06**	**2.44E-06**	**7.61E-06**	**6.39E-06**	**1.99E-05**

	Manganese		Nickel		Phosphorus		Selenium	
	lb/hr max	T/yr	lb/hr max	T/yr	lb/hr max	T/yr	lb/hr max	T/yr[1]
Line A Cement Silo	5.85E-07	1.83E-06	2.09E-07	6.52E-07	5.90E-05	1.84E-04	0.00E+00	0.00E+00
Line B Cement Sillo	5.85E-07	1.83E-06	2.09E-07	6.52E-07	5.90E-05	1.84E-04	0.00E+00	0.00E+00
Line A & B Supplement	1.28E-06	3.99E-06	1.14E-05	3.56E-05	1.77E-05	5.52E-05	3.62E-07	1.13E-06
Total	**2.45E-06**	**7.64E-06**	**1.18E-05**	**3.69E-05**	**1.36E-04**	**4.23E-04**	**3.62E-07**	**1.13E-06**

	Chromium VI		Lead	
	lb/hr max	T/yr	lb/hr max	T/yr
Line A Cement Silo	2.90E-08	9.05E-08	5.45E-08	1.70E-07
Line B Cement Sillo	2.90E-08	9.05E-08	5.45E-08	1.70E-07
Line A & B Supplement	1.83E-06	5.71E-06	2.60E-06	8.11E-06
Total	**1.89E-06**	**5.89E-06**	**2.71E-06**	**8.45E-06**

1. Selenium is not detectable within the cement. Therefore it is assumed to be zero.

Sunshine Boiler Plant
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STEAM GENERATOR CRITERIA EMISSIONS

Source	MMBtu/hr	MMscf/hr[1]	Hours of Operation[2]	Emission Factors (lb/MMscf)				
				PM_{10}/$PM_{2.5}$[3]	NOx[4]	SO_2[3]	CO[3]	VOC[3]	Pb[3]
Vaporizer #1	6	18	1638	7.6	100	0.6	84	5.5	0.0005
Vaporizer #2	6		1638	7.6	100	0.6	84	5.5	0.0005

1. The total fuel usage is based on actual 2011 consumption of 7.52 MMscf/yr multiplied by a safety factor of 2.5 and rounded up to the nearest integer.
2. The hours of operations are limited to the reported fuel maximum (18 MMscf) of the two vaporizers.
3. Emission factor References for PM_{10}/$PM_{2.5}$, SO_2, VOC & Pb: AP-42 Section 1.4, Natural Gas Combustion - Table 1: Total Particulate includes both filterable & condensable. SO_2 assume 100% conversion
4. Emission factor References for NOx and CO: AP-42 Section 1.4, Natural Gas Combustion - Table 1: Small Boiler < 100 MMBtu (uncontrolled)

Combustion Source	Throughput (MMscf/hr)[1]	Emission Rates											
		PM_{10}/$PM_{2.5}$		NOx		SO_2		CO		VOC		Pb	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Vaporizer #1	4.60E-03	0.037	0.03	0.460	0.46	0.003	2.70E-03	0.412	0.36	0.027	0.02	2.45E-06	2.26E-06
Vaporizer #2	4.60E-03	0.037	0.03	0.460	0.46	0.003	2.70E-03	0.412	0.36	0.027	0.02	2.45E-06	2.26E-06
	Total	0.073	0.07	0.920	0.920	0.006	0.005	0.824	0.722	0.054	0.050	4.89E-06	4.51E-06

1. The throughput of each unit was determined by taking the maximum annual usage of 18 MMscf and dividing it by the twice the annual operating hours

STEAM GENERATOR GREENHOUSE GAS EMISSIONS

Source	MMBtu/hr	MMscf/hr	Emission Factors (lb/MMscf)[1]		
			CO_2	N_2O	CH_4
Vaporizer #1	6	18	120,000	2.2	2.3
Vaporizer #2	6		120,000	2.2	2.3

1. Emission factor references all pollutants is AP-42 Section 1.4, Natural gas Combustion - Table 2.

Source	MMscf/hr	Emission Factors (lb/MMscf)			Global Warming Potentials[1]			CO_2e Totals (metric tpy)[2]		
		CO_2	N_2O	CH_4	CO_2	N_2O	CH_4	CO_2	N_2O	CH_4
Vaporizer #1	18	120,000	2.2	2.3	1	310	21	979.77	5.57	0.39
Vaporizer #2		120,000	2.2	2.3	1	310	21	979.77	5.57	0.39
								1979.54	11.14	0.79
									Total	1971.46

1. The Global Warming Potentials are derived from 40 CFR Part 98, Subpart A, Table A-1
2. The carbon dioxide equivalent is provided in metric tons whereby 2,204.6 pounds equal a ton.

Steam Generator HAPS

Combustion Source	Emission Factors (lb/MMscf)[1]													
	Benzene	Formaldehyde	Hexane	Naphthalene	Toluene	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Manganese	Mercury	Nickel	Selenium	PAH[2]
Vaporizer #1	2.10E-03	7.60E-02	1.8	9.10E-04	3.40E-03	2.00E-04	1.20E-05	1.10E-03	1.40E-03	8.40E-05	3.80E-04	2.60E-04	2.10E-03	2.40E-05	N/A
Vaporizer #2	2.10E-03	7.60E-02	1.8	9.10E-04	3.40E-03	2.00E-04	1.20E-05	1.10E-03	1.40E-03	8.40E-05	3.80E-04	2.60E-04	2.10E-03	2.40E-05	N/A

1. Emission Factor References AP-42, Section 1.4, Table 3. All HAPs are based on EPA Section 112(g) of CAA
2. PAH (polycyclic aromatic hydrocarbons) is a subset of Polycyclic organic matter (POM) which is a HAP. There is no specific emission factor for the total. See table below for associated emissions.

Combustion Source	Throughput (MMscf/hr)[1]	Emission Rates																	
		Benzene		Formaldehyde		Hexane		Naphthalene		Toluene		Arsenic		Beryllium		Cadmium		Chromium	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Vaporizer #1	4.60E-03	1.03E-05	9.45E-06	3.65E-04	3.33E-04	8.82E-03	8.10E-03	2.87E-06	2.70E-06	1.67E-05	1.53E-05	9.80E-07	9.00E-07	5.88E-06	5.40E-06	5.72E-06	4.95E-06	8.61E-06	6.30E-06
Vaporizer #2	4.60E-03	1.03E-05	9.45E-06	3.65E-04	3.33E-04	8.82E-03	8.10E-03	2.87E-06	2.70E-06	1.67E-05	1.53E-05	9.80E-07	9.00E-07	5.88E-06	5.40E-06	5.72E-06	4.95E-06	8.61E-06	6.30E-06
	Total	2.06E-05	1.89E-05	7.31E-04	6.66E-04	1.76E-02	1.62E-02	5.74E-06	5.40E-06	3.33E-05	3.06E-05	1.96E-06	1.81E-06	1.18E-05	1.08E-05	1.14E-05	9.89E-06	1.72E-05	1.26E-05

Combustion Source	Emission Rates											
	Cobalt		Manganese		Mercury		Nickel		Selenium		PAH[1]	Chromium VI[3]
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	lb/hr	tpy
Vaporizer #1	4.12E-07	3.78E-07	1.87E-06	1.71E-06	1.27E-06	1.17E-06	1.03E-05	9.45E-06	1.18E-07	1.08E-07	3.67E-06	2.06E-06	1.03E-07
Vaporizer #2	4.12E-07	3.78E-07	1.82E-06	1.71E-06	1.27E-06	1.17E-06	1.03E-05	9.45E-06	1.18E-07	1.08E-07	3.67E-06	3.37E-06	2.06E-06	1.03E-07
	8.24E-07	7.56E-07	3.70E-06	3.42E-06	2.55E-06	2.34E-06	2.07E-05	1.89E-05	2.36E-07	2.16E-07	7.34E-06	5.74E-06	4.12E-06	2.06E-07	

1. PAH is includes all of the following pollutants: 3-Methylcholanthrene, 7,12-Dimethylbenz(a)anthracene, Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene and Pyrene, Note that naphthalene was not included as it accounted for on its own.

Steam Generator TAPS

CAS No.	Pollutant[2]	SSC's[1]	EF (lb/MMscf)	1-hr Max (lb/hr)
56-49-5	3-Methylcholanthrene	586	1.80E-06	1.78E-08
71-43-2	Benzene	586	2.10E-03	2.08E-05
50-32-8	Benzo(a)pyrene	586	1.20E-06	1.18E-08
50-00-0	Formaldehyde	516	7.60E-02	7.36E-04
110-54-3	Hexane	516	1.80E+00	1.78E-02
91-20-3	Naphthalene	586	9.10E-04	5.88E-06
91-20-3	Naphthalene	586	9.10E-04	5.87E-06
109-66-0	Pentane	585	2.65E+00	2.55E-02
108-88-3	Toluene	585	3.40E-03	3.33E-05
	POM (7-PAH)[1]	POM	N/A	1.12E-07
7440-38-2	Arsenic	586	2.00E-04	1.96E-06
7440-39-3	Barium	586	4.40E-03	4.31E-05
7440-41-7	Beryllium	586	1.20E-05	1.18E-07
7440-43-9	Cadmium	586	1.10E-03	1.08E-05
7440-47-3	Chromium	586	1.40E-03	1.37E-05
7440-47-3	Chromium VI[3]	586	N/A	4.12E-06
7440-48-4	Cobalt	586	8.40E-05	8.24E-07
7440-50-8	Copper	586	8.50E-04	8.33E-06
7439-96-5	Manganese	586	3.80E-04	3.72E-06
7439-97-6	Mercury	586	2.60E-04	2.55E-06
7440-02-0	Molybdenum	586	1.10E-03	1.08E-05
7782-49-2	Nickel	586	2.10E-03	2.06E-05
7440-02-2	Selenium	586	2.40E-05	2.35E-07
7440-66-6	Vanadium	586	2.30E-03	2.25E-05
	Zinc	586	2.90E-02	2.84E-04

1. Polycyclic Organic matter (POM) is considered an aggregated total of the following pollutants: benzo(b)anthracene, benzo(k)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene
2. Note that mercury is no longer a TAP and is now regulated under specific rules
3. Chromium VI is assumed to be 30% of total chromium.

POM(7-PAH)	EF (lb/MMscf)	1-hr Max (lb/hr	Tonlyr
Benzo(a)	1.80E-06	1.78E-08	1.62E-08
Benzo(b)	1.80E-06	1.78E-08	1.62E-08
Benzo(k)	1.80E-06	1.78E-08	1.62E-08
Dibenzo(a,h)	1.20E-06	1.18E-08	1.08E-08
Chrysene	1.80E-06	1.78E-08	1.62E-08
Indeno	1.80E-06	1.78E-08	1.62E-08
Benzo(g,h,i)perylene	1.20E-06	1.18E-08	1.08E-08
	Total		1.12E-07

Coloring Agents

Coloring Types	Throughput[1]		Emission factor (lb/Ton)	Uncontrolled Emissions (lb/hr)	Uncontrolled Emissions (T/yr)	Emission factor (lb/Ton)[2]	Uncontrolled Emissions (lb/hr)	Uncontrolled Emissions (Ton/yr)
	Ton/hr	Ton/yr	PM_{10}[3]	PM_{10}	PM_{10}	$PM_{2.5}$[4]	$PM_{2.5}$	$PM_{2.5}$
110-C Light Red	0.05	44	0.00099	4.95E-05	2.18E-05	3.15E-04	1.58E-05	6.87E-06
130-C Medium Red	0.05	9	0.00099	4.95E-05	4.22E-05	3.15E-04	1.58E-05	1.34E-06
330-C Black	0.05	84	0.00099	4.95E-05	3.18E-06	3.15E-04	1.58E-05	1.01E-06
920-G Yellow	0.05	130	0.00099	4.95E-05	8.44E-05	3.15E-04	1.58E-05	2.06E-06

Coloring Types	Controlled Emissions (lb/hr)[4]	Controlled Emissions (T/yr)[4]	Controlled Emissions (lb/hr)[5]	Controlled Emissions (Ton/yr)[5]
	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$
110-C Light Red[6]	1.49E-05	6.48E-06	4.73E-06	2.07E-06
130-C Medium Red[6]	1.49E-05	1.27E-06	4.73E-06	4.03E-07
330-C Black	1.49E-05	8.48E-06	4.73E-06	3.03E-06
920-G Yellow	1.49E-05	1.83E-05	4.73E-06	5.15E-06

1. The hourly throughput is a worst-case calculation based on a usage of 1000 lb during a minimum of a 10 hour day. Also, the annual throughput is based on a 2011 actual usages multiplied by 5.
2. The coloring agents are in a powered form that is very fine. Therefore, the use of Sand Transfer is appropriate.
3. The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, and a conversion of PM that is considered to be PM_{10}.
The conversion used to establish the EFs were based on AP-42, Appendix B, Table B-2.2, Category 3. It was established that the fraction that is $PM_{2.5}$ is 15%.
4. The control efficiency is assumed to be 70% for the following reasons: the blending process is fully enclosed in a building, there are water bars used to minimize dust within the structure, and there is a secondary filtration system to capture any excess particulate.
5. The red coloring agent does have iron oxide within it, however based on the controls put in place as stated above in it's impact is minimal. Based on the throughput, controls, transfer of the material during the process and the consistency being that of a particulate, the use of an emission factor of 0.0 lb/ton for sand transfer is appropriate. Adding Light and Medium red together equates to 6.45E-06 lb/hr which is the 1-hr maximum

Basalite Boise Plant
Initial Permit to Construct - November 2012 Update
Emissions Inventory

85.882353

STEAM GENERATOR GREENHOUSE GAS EMISSIONS

Source	MMBtu/hr	MMscf/yr	Emission Factors (lb/MMscf)[1]		
			CO_2	N_2O	CH_4
Vaporizor #1	5	18	120,000	2.2	2.3
Vaporizer #2	5		120,000	2.2	2.3

1. Emission factor reference all pollutants is AP-42 Section 1.4, Natural gas Combustion - Table 2.

Source	MMscf/yr	Emission Factors (lb/MMscf)			Global Warming Potentials[1]			CO2e Totals (metric tpy)[2]		
		CO_2	N_2O	CH_4	CO_2	N_2O	CH_4	CO_2	N_2O	CH_4
Vaporizor #1	18	120,000	2.2	2.3	1	310	21	979.77	5.57	0.39
Vaporizer #2		120,000	2.2	2.3	1	310	21	979.77	5.57	0.39
								1959.54	11.14	0.79
									Total	1971.46

1. The Global Warming Potentials are derived from 40 CFR Part 98, Subpart A, Table A-1
2. The carbon dioxide equivalent is provided in metric tons whereby 2,204.6 pounds equal a ton.

Grain Loading Standard Verification	
Unit	Combined Vaporizers
Fuel	Natural Gas
Rated Heat Input (MM Btu/hr)	10.00
PM Emission Rate (lb/hr)[1]	0.08
Exit/Flue Gas Flowrate Calculation	
F_d (Table 19-2, EPA Method 19) (dscf/MM Btu) [2,3]	8,710
Exit flowrate @ 0% O_2: (dscfm)	1,452
Exit flowrate @ 3% O_2: (dscfm)[4]	1,695
Calculated Grain Loading (gr/dscf @ 3% O_2) [5]	0.005
PM Loading Standard (IDAPA 58.01.01.677) (gr/dscf @ 3% 02)	0.015
Compliance w/ PM Loading Standard	**Yes**

1 The emission rate is calculated based on 10 MMBtu/hr / 1,020 MMscf/MMBtu * 7.6 lb/MMscf

2 Appendix A-7 to 40 CFR part 60, Method 19—Determination of sulfur dioxide removal

3 Fd, Volumes of combustion components per unit of heat content (scf/million Btu). Fd for natural gas and biogas is 8,710 dscf/10^6 Btu

4 (Flow $_{3\%}$) = (Flow $_{0\%}$)x (20.9/(20.9 - 3)), where 20.9 = Oxygen concentration in ambient air

5 (Flow (dscfm) x (7,000 gr/lb) x (PM lb/hr) x (60 min/ hr) = gr/dscf

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: December 17, 2012

TO: Harbi Elshafei, Permit Writer, Air Quality Division

FROM: Cheryl Robinson, P.E., Air Quality Engineer/Modeling Analyst, Air Quality Division

PROJECT NUMBER: P-2012.0041 PROJ 61081

SUBJECT: Modeling Review for Basalite Concrete Products Meridian, Facility ID 001-00292
Initial PTC for an Existing Molded Concrete Block Manufacturing Facility

1.0 Summary

On July 9, 2012 DEQ received an application from Basalite Concrete Products (Basalite) for an initial permit to construct (PTC) for their existing facility located in Meridian. The application, emissions inventory, and dispersion modeling were prepared on Basalite's behalf by the Boise office of JBR Environmental Consultants, Inc. (JBR). Information for this project was submitted as follows:

- The submitted dispersion modeling analyses were initially limited to emissions of arsenic, cadmium, hexavalent chromium, and polyaromatic hydrocarbons (PAH) from the sixteen process vents (squirrel vents), and silo filling for cement silos A and B and the flyash silo.
- Supplemental information regarding the crusher baghouse emissions was received on August 6, 2012, and described the baghouse as being enclosed in a three-sided building, with all emissions vented through the open side of the building.
- TAPs emissions from transfer and storage of coloring agents into outdoor stockpiles or underground bins—which had been omitted from the July application--were received on August 9, 2012. In the November 16, 2012 submission, JBR stated that coloring agents are not stored in outdoor stockpiles.
- A more detailed description of the material flow through the four large pumice/reclaim silos was received on August 15, 2012.
- On September 4, DEQ advised JBR of inconsistencies and errors in the submitted emissions inventory for operation of the vaporizers and noted that some sources appeared to be missing from the inventory. Based on combusting a maximum 18 MMscf of natural gas per year (combined) in the two 5 MMBtu/hr units, and operating for 24 hours per day, DEQ advised JBR that modeling was required to demonstrate compliance with the 1-hr NO_2, 24-hr and annual $PM_{2.5}$, and 24-hr PM_{10} NAAQS.
- On September 26, JBR provided supplemental information from the fan manufacturer regarding the fan flow rates.
- Modeling for PM_{10}, $PM_{2.5}$, and 1-hour NO_2 emissions was received on September 26, 2012. There were a number of changes in these modeling analyses compared to previously submitted modeling, e.g., the method of modeling the capped vents was changed (with DEQ approval) from presuming an uncapped vertical stack with 0.001 m/s exit velocity to the non-regulatory beta option in AERMOD for capped sources, and there were different assumptions with regard to operating hours. DEQ identified concerns with the submitted modeling for criteria pollutants, noting potential problems with the way the railroad transfer and crushing emissions were handled, and inconsistencies between the emission inventory and the modeling regarding emissions from outdoor pile storage.

- On November 6, DEQ discussed remaining open items for the modeling analyses with JBR in a telephone conference call, and provided the specifics to JBR via email. On November 16, JBR submitted revised modeling analyses, emissions inventory, and a revised modeling report.

Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]) or Toxic Air Pollutant (TAP) increment (Idaho Air Rules Section 203.03).

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

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
• Total natural gas consumption for the two vaporizers, combined, is limited to 18 MMscf per year. • Cement silo A & B and Line A & B supplement silo fill rates are each limited to: 5 T/hr x 24 hrs = 120 T/day, max 31,200 T/yr. • Railcar deliveries to the grizzly and the total material throughput through any crusher or any screen is limited to: 15 T/hr x 24 hr/day = 360 T/day in the jaw crusher, 30 T/hr x 24 hr/day = 720 T/day, roll crusher 30 T/hr x 24 hr/day = 720 T/day thru any screen. • Truck deliveries of aggregate and pumice to the grizzly are limited to: 38 T/hr x 12 hr/day = 456 T/day, max 81,978 T/yr	• Ambient impacts predicted by full-impact modeling analyses were 78% of the 1-hr NO_2 NAAQS, 89% of the 24-hour PM_{10} NAAQS, and 94% of the 24-hour $PM_{2.5}$ NAAQS. • Modeling for annual NO_2, PM_{10}, and $PM_{2.5}$ was avoided by limiting the total annual natural gas use and annual material throughput. • The demonstration of compliance for 24-hr PM_{10} and $PM_{2.5}$ was based on these daily throughput levels.
• Cement and supplement silo vents must be equipped with PM filters with minimum capture efficiency of 98% for PM_{10} and $PM_{2.5}$. • Emissions from screening of reclaim white pumice, and crushing and screening of the reclaim must occur within a building and must be controlled by a filtration system capable of removing 99% of the PM_{10} and $PM_{2.5}$ • Outdoor stockpiles of sand and aggregate must be covered (e.g., by tarps) when not in active use.	• Modeling for annual PM_{10}, and $PM_{2.5}$ was avoided by presuming these levels of control on particulate emissions. • The demonstration of compliance for 24-hr PM_{10} and $PM_{2.5}$ presumed these levels of control on particulate emissions.
• Truck delivery to underground bins is limited to the hours between 6 am and 6 pm. (11-26-12 modeling report and modeling). • Vaporizer operation is limited to the hours between 7 am and 8 pm (11-26-12 modeling report and modeling for PM_{10}, $PM_{2.5}$, and 9-26-12 modeling report for 1-hr NO_2). • NO_2 combustion emissions are released throughout the multi-hour curing process rather than during a shorter period (e.g., venting steam after curing is complete).	• The demonstration of compliance for 24-hr PM_{10} and $PM_{2.5}$ presumed limited hour-of-day operations. • The demonstration of compliance for the 1-hour NO_2 NAAQS was based on these assumptions presumed limited hour-of-day operations. • Modeling to demonstrate compliance for the 1-hr NO_2 NAAQS presumed that combustion emissions were released throughout the curing process.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
• There are no emissions of fugitive dust from the roof vents serving Silos #1 through #5 (white pumice and reclaim) at any time.	• The facility specifically asserted that there are no PM or TAPs/HAPs emissions associated with filling Silos #1 through #5.
• Granular coloring agents are not delivered to or stored in outdoor storage piles.	• PM and TAPs emissions from truck delivery and conveyor transfers of coloring agents were not modeled. Wind erosion of PM and TAPs from outdoor storage of these materials was not estimated, but would be expected to be greater than the emissions estimated for truck unloading to underground storage.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance for this facility located at 1300 E. Franklin Road in Meridian, Idaho. Approximate UTM coordinates at the center of this parcel are 550.1 km Easting and 4828.2 km Northing, in UTM Zone 11 (WGS84). The base elevation at the facility is approximately 795 m (2,608 ft).

2.1.1 Area Classification

The facility is located within northern Ada County which is designated as an attainment or unclassifiable area for lead (Pb), nitrogen dioxide (NO_2), ozone, particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur oxides (SO_x). The area is in attainment but is being managed under a maintenance plan for carbon monoxide (CO) and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). There are no Class I areas within 10 kilometers of this location.

2.1.2 DEQ Modeling Thresholds

Modeling is typically not required if the changes in estimated criteria pollutant emission rates for a proposed project are below DEQ's modeling thresholds, shown in Table 2. "Case-by-case" thresholds may be used only with prior DEQ approval.

Table 2. DEQ CRITERIA POLLUTANT MODELING THRESHOLDS					
Criteria Air Pollutants	**Averaging Period**	**DEQ Modeling Threshold**			
		Threshold I		**Threshold II (Case-by-Case)**	
PM_{10}	24-hr	0.22	lb/hr	2.6	lb/hr
$PM_{2.5}$	24-hr	0.054	lb/hr	0.63	lb/hr
	Annual	0.35	T/yr	4.1	T/yr
CO	1-hr, 8-hr	15	lb/hr	175	lb/hr
NO_2	1-hour	0.20	lb/hr	2.4	lb/hr
	Annual	1.2	T/yr	14	T/yr
SO_2	1-hr	0.21	lb/hr	2.5	lb/hr
	24-hr	0.22	lb/hr	2.6	lb/hr
	Annual	1.2	T/yr	14	T/yr
Lead	3-month rolling avg	14	lb/mo		

As shown in Table 3, DEQ Level I thresholds should be used for this project.

Table 3. COMPARISON OF PROJECT AND MODELING THRESHOLD PARAMETERS							
	Land Use /Surface Roughness	**Stack Height (m)**	**Stack Dia. (m)**	**Exit Velocity (m/sec)**	**Exit Temp.**	**Distance to Ambient Air (m)**	**Building Downwash**
DEQ Level I Threshold Emissions	Maximum of grassland, conifer forest, and desert shrubland	10	0.3	10	150°F	100 m in all directions	10 m W by 10 m L by 5 m H
DEQ Level II Threshold Emissions	Maximum of grassland, conifer forest, and desert shrubland	15	1.0	20	260°F	100 m in all directions	10 m W by 10 m L by 5 m H
Basalite Combustion Emissions	Grassland/Asphalt	7.01	0.27	4.52	130 °F	Min 38 m to the west.	100 m W by 25 m L by 7.9 m H
Basalite Fugitive PM Emissions	Grassland/Asphalt	Near Ground	N/A	N/A	Ambient	Min 38 m to the west.	100 m W by 25 m L by 7.9 m H

2.1.3 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the existing unpermitted facility exceed the significant contribution levels (SCLs) of Section 006 of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho (Idaho Air Rules), then a cumulative impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02 for Permits to Construct and Section 403.02 for Tier II Operating Permits. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 4. The SCLs and the modeled value that must be used for comparison to the NAAQS are also listed in Table 4.

Table 4. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[c] ($\mu g/m^3$)[b]**	**Regulatory Limit[d] ($\mu g/m^3$)[b]**	**Modeled Value Used[g, h]**
PM_{10}[a]	24-hour	5.0	150[f]	Maximum 6th highest[i]
$PM_{2.5}$[a]	Annual	0.3[b]	15[e]	$PM_{2.5}$ –Maximum 1st high[J]
	24-hour	1.2[b]	35	$PM_{2.5}$ –Maximum 1st high[J]
Carbon monoxide (CO)	8-hour	500	10,000[f]	Maximum 2nd highest
	1-hour	2,000	40,000[f]	Maximum 2nd highest
Sulfur Dioxide (SO_2)	Annual	1.0	80[e]	Maximum 1st highest
	1-hour[o]	EPA Interim: 3 ppb[m] (~7.8 $\mu g/m^3$)	0.075 ppm[m,n] (196 $\mu g/m^3$)	Maximum 4th highest[m]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest
	1-hour[m]	EPA Interim: 4 ppb[l] (7.5 $\mu g/m^3$)	0.100 ppm[l, n] (188 $\mu g/m^3$)	Maximum 8th highest[l]
Lead (Pb)	Rolling 3-month average	NA	0.15[f, k]	Maximum 1st highest

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten (10) or 2.5 micrometers.
[b] Micrograms per cubic meter.

Table 4. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[c] ($\mu g/m^3$)[b]**	**Regulatory Limit[d] ($\mu g/m^3$)[b]**	**Modeled Value Used[g, h]**

[c] SCLs are defined in Idaho Air Rules Section 006. $PM_{2.5}$ SCLs (75 FR 64864, October 20, 2010) were adopted as an Idaho temporary rule effective April 26, 2011. The pending rule will become final and effective upon adjournment of the 2012 legislative session if approved by the Idaho Legislature.

[d] Federal NAAQS (see 40 CFR 50) in effect as of July 1 of each year are incorporated by reference during the legislative session the following spring. See Idaho Air Rules Section 107.

[e] Never expected to be exceeded in any calendar year.

[f] Never expected to be exceeded more than once in any calendar year. The 3-hr and 24-hr SO_2 standards were revoked (see 75 FR 35520, June 22, 2010) but will remain in effect until one year after the effective date (~late 2012) of initial area designations for the new 1-hour SO_2 NAAQS (i.e., in effect until ~late 2013).

[g] Concentration at any modeled receptor.

[h] The maximum 1st highest modeled value is always used for significant impact analyses.

[i] PM_{10} concentration at any modeled receptor when using five years of meteorological data. Use the maximum 2nd highest value for analyses with less than five years of meteorological data or one year of site-specific met data.

[j] $PM_{2.5}$ concentration at any modeled receptor when using a single year of site-specific meteorological data or a concatenated file with five years of meteorological data. EPA recommends using the high 8th high 3-year average monitored value for background, and using the highest 24-hr average and highest annual averages across five years of met data for the modeled result (Steven Page memo, Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS, March 23, 2010).

[k] Pb: The EPA's October 15, 2008 standard became effective in Idaho's NSR program when it was incorporated by reference into the Idaho Air Rules, i.e., when the Idaho Legislature adjourned *sine die* on March 29, 2010.

[l] NO_2 concentration at any modeled receptor when using complete year(s) of site-specific met data or five consecutive years of representative meteorological data. Compliance is based on the 3-year average of the 98th percentile of the annual distribution of 1-hour average daily maximum concentrations. EPA Interim SIL, Page memo, dated June 29, 2010.

[m] SO_2 concentration at any modeled receptor when using complete year of site-specific met data or five consecutive years of representative meteorological data. Compliance is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA Interim SIL, Page memo, dated August 23, 2010.

[n] EPA's February 10, 2010 1-hour NO_2 standard (75 FR 6474) and June 22, 2010 1-hour SO_2 standard (75 FR 35520) became effective in Idaho on April 7, 2011.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1] and are currently being updated. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources.

DEQ's recommended background levels for this project—which is located in a predominantly urban area with no substantial co-contributing facilities located nearby—are shown in Table 5.

Table 5. DEQ RECOMMENDED BACKGROUND CONCENTRATIONS				
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)**	**NAAQS**	**Background Value Reference**
PM_{10}	24-hour	90	150 $\mu g/m^3$	Default: Small Town Suburban, Meridian, 1999 wintertime stagnation episode

[1] Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Table 5. DEQ RECOMMENDED BACKGROUND CONCENTRATIONS				
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)**	**NAAQS**	**Background Value Reference**
$PM_{2.5}$	24-hour	19.3	35 $\mu g/m^3$	Avg of 98th percentile values, St. Luke's, Meridian, 2008-2010
	Annual	6.3	15 $\mu g/m^3$	Avg of annual mean values, St. Luke's, Meridian 2008-2010
Nitrogen dioxide (NO_2)	1-hour	---	100 ppb (188 $\mu g/m^3$)	See attached hour-of-day ozone and NO_2 values
	Annual	12	53 ppb (100 $\mu g/m^3$)	Avg of annual mean values plus 1 sigma, 2006-2008 Bismark, ND
Lead (Pb)	Rolling 3-month average	0.04	0.15 $\mu g/m^3$	Default: Urban (DEQ, 2012)

$\mu g/m^3$ = micrograms per cubic meter 1 sigma = σ = one standard deviation

"Default" values were taken from Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling.* Idaho DEQ, Memorandum to Mary Anderson, March 14, 2003.

2.2.1 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.*

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

In accordance with Section 210.20 of the Idaho Air Rules, a demonstration of compliance with state-only TAPs standards is not required for any TAP that is regulated at the time of permit issuance under 40 CFR Part 60 (New Source Performance Standards [NSPS]), 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants [NESHAP], or 40 CFR Part 63 (NESHAP for Source Categories / MACT standards).

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 Overview of Analyses

JBR performed air quality analyses using AERMOD in support of the submitted permit application. A brief description of parameters used in the modeling analyses is provided in Table 6.

Table 6. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 12060
Meteorological data	Boise Airport 2005-2009	DEQ provided AERMOD-ready surface (.sfc) and upper air profile (.pfl) files for the years 2005-2009 developed using ASOS and NWS surface data and upper air soundings collected at the Boise Airport.
Terrain	NED 1 arc-sec	AERMAP v. 11103, using NED terrain data files (NAD83/WGS84).
Building downwash	BPIP-PRIME v. 04274	Building downwash parameters were calculated using the BPIP PRIME algorithm (version 04274).
Receptor Grid	Receptors	Receptor locations were defined in UTM coordinates (NAD83)
	Nested Square Grids	25-meter (m) spacing along the ambient air boundary 50-m spacing from the facility fence line out to 500 m 100-m spacing from 500 m to 1000 m (1 km) 250-m spacing between 1 km and 2.5 km 500-m spacing between 2.5 km and 5 km

3.1.2 Modeling Protocol and Methodology

A modeling protocol was submitted for this project on May 7, 2012. Modeling analyses received on July 9, 2012, however, used different stack parameters and hour-of-day assumptions, evaluated different pollutants, and used default rural dispersion characteristics rather than characteristics for an urban area, compared to those described in the protocol. During the course of this project, DEQ advised JBR that use of the non-regulatory beta options in AERMOD was approved for modeling horizontal or capped sources. The final modeling received on November 16, 2012 was generally conducted using methods described in the *State of Idaho Air Quality Modeling Guideline*. Default parameters for a single urban area (Meridian) with a population of 75,092 and default surface roughness of 1.0 were used.

3.1.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a one-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer.
- Improved plume rise and buoyancy calculations.
- Improved treatment of terrain effects on dispersion.
- New vertical profiles of wind, turbulence, and temperature.

3.1.4 Meteorological Data

DEQ recommended using the AERMOD-ready meteorological data set for the Boise Airport for the years 2005-2009. These data were processed in December 2011 and include 1-minute ASOS and NWS surface and upper air data collected at the Boise Airport.

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in these analyses. JBR used AERMAP v. 11103 to extract the actual elevation of each receptor and determine the controlling hill height elevation from a tiff file downloaded from the Seamless National Elevation Database (NED). The NED file encompassed the area between -116.502 and -116.121 degrees longitude and 43.500 and 43.750 degrees north latitude (coordinate system ID NAD83).

3.1.6 Facility Layout

The Basalite facility layout is shown in Figure 3-1, taken from Appendix A of the application.

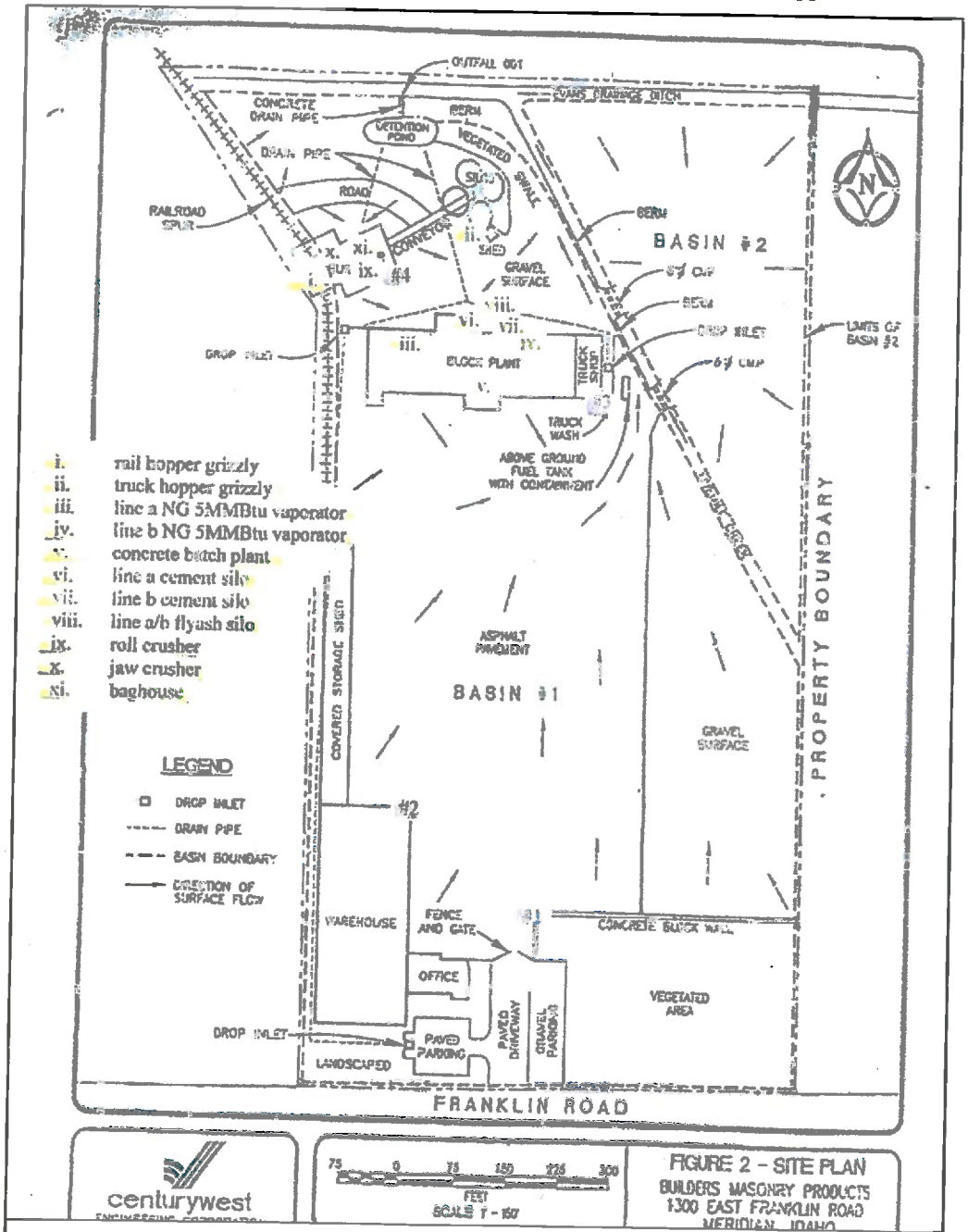


Figure 3-1. BASALITE MERIDIAN FACILITY LAYOUT

3.1.7 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the submitted modeling analyses. The Building Profile Input Program with Plume RIse Model Enhancements (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emission release parameters for input to AERMOD. Building parameters used in the submitted modeling are summarized in Table 7.

Table 7. BUILDING PARAMETERS

Building	Building Height	Base Elevation (m)	UTM Datum NAD83 Zone 11			
			Easting, X (m)	Northing, Y (m)	Easting, X (m)	Northing, Y (m)
Plant, Tier 1	6.1 m (20 ft)	794.83	550097.1	4828440.2	550194.7	4828465.8
			550195.2	4828441.4	550096.2	4828465.0
Plant, Tier 2	7.92 m (26 ft)	794.83	550129.1	4828452.8	550157.3	4828465.8
			550157.3	4828452.8	550129.1	4828465.0
Silo	18.29 m (60 ft)	793.7	550122.5	4828510.5	550149.7	4828518.6
			550129.5	4828527.0	550143.1	4828501.9
Unload	6.1 m (20 ft)	794.3	550083.8	4828510.5	550149.7	4828518.6
			550129.5	4828527.0	550143.1	4828501.9

3.1.8 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." For area sources, the ambient air boundary is typically defined as the property boundary. The property boundary defined by the solid line shown in Figure 3-2 (taken from Appendix A of the application) was used as the ambient air boundary for the dispersion modeling. Note that the circled area shown in the figure was included as part of the property for modeling but is not shown as being included in the facility layout drawing (Figure 3-1 above). In response to DEQ's inquiry regarding this inconsistency, JBR replied in a September 9, 2012 email that the boundary is intermittently fenced, and unfenced areas have signs posted prohibiting access.

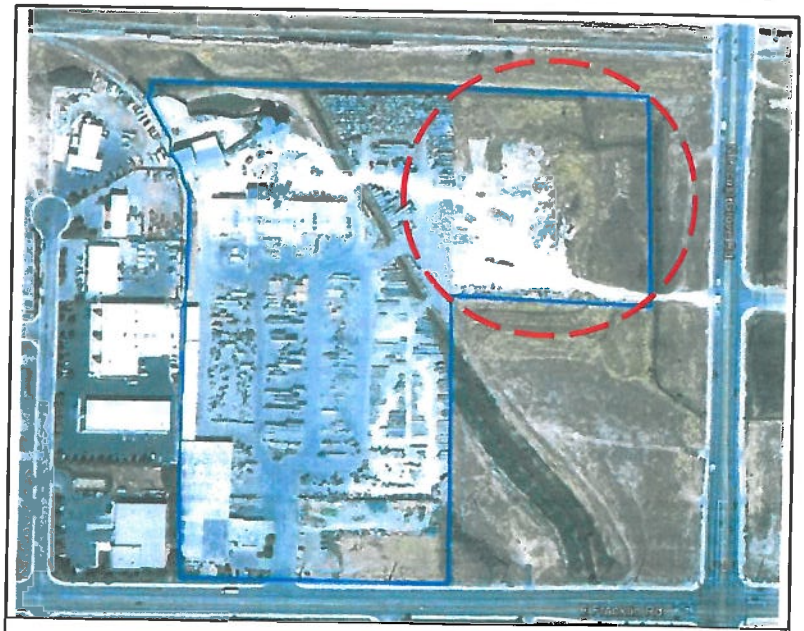


Figure 3-2. BASALITE MERIDIAN – AMBIENT AIR BOUNDARY

3.1.9 Receptor Network

The receptor grids used for the submitted modeling analyses are summarized in Table 6, and shown graphically in Figure 3-3.

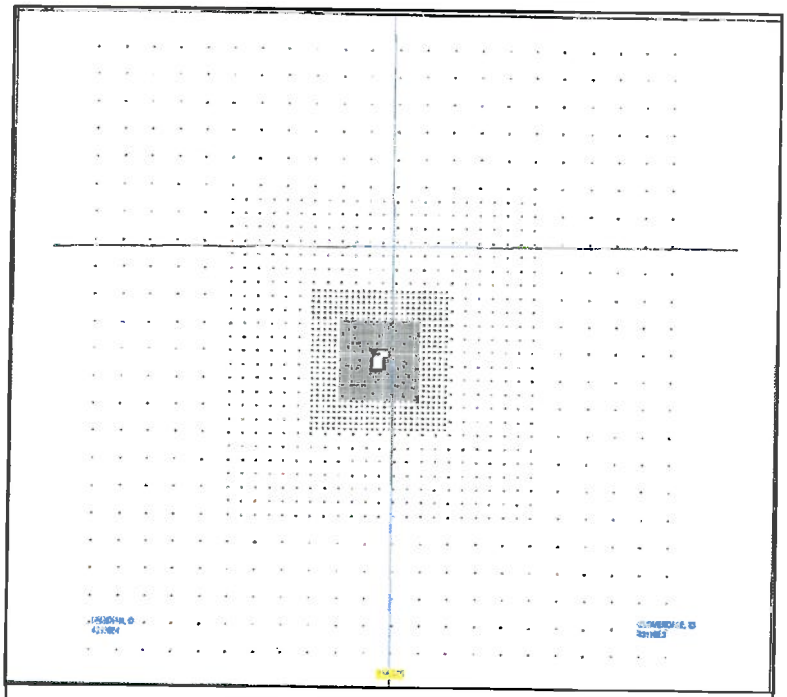


Figure 3-3. AMBIENT AIR RECEPTOR GRID AND DOMAIN

3.2 Emission Release Parameters

Basalite has asserted that there are no particulate emissions from the silo roof vents when filling Silos #1 through #4 (pumice) and Silo #5 (reclaim), based on the material flow and drop heights when filling. The locations of these emission points are shown in Figure 3-4. In supplemental information received by DEQ on August 15, 2012, Basalite's Travis Duvall described their rationale as follows:

> Each of our silo roof partitions (4) has no more than 2 (two) 5" diameter whirlybird roof ventilator fans. The roof partition that contains the roof access door has only 1 (one) 5" diameter whirlybird roof ventilator fan. In addition to these 7 (seven) 5" diameter whirlybird roof fans there is 1 (one) additional 14" diameter whirlybird roof fan atop the roof structure in the middle.
>
> The reclaim/pumice silos rise and top out 56' above ground level. Within the silos, drop levels above the 30' silo wall top level are as follows:
>
> Silo # 1 (pumice) = 4' (+30' = 34' to silo floor)
>
> Silo # 2 (pumice) = 10' (+30' = 40' to silo floor)
>
> Silo # 3 (pumice) = 10' (+30' = 40' to silo floor)
>
> Silo # 4 (pumice) = 10' (+30' = 40' to silo floor)
>
> Silo # 5 (reclaim) = 0' (+30' = 30' to silo floor)
>
> What this means is that if all silos are empty (generally the only time we refill them) and are loaded, aggregate is dropping approximately 30' – 40' down to the bottom. As aggregate hits the bottom (its

final resting point), dust is generated. Dust has approximately 56 +/- vertical feet to rise before the opportunity to escape out of our whirlybird roof vents.

As the silo fills, the final resting point for aggregate and dust generation rises, although the fill must stop when the peak of the aggregate reaches the drop point. On silos #2, #3, #4, the drop point is 15' from the whirlybird fans; on silo #1 the drop point is 22' from the fans, and on silo #5 the drop point is 26' from the fans.

Based on experience and first-hand observation, we have found that most, if not all dust from both reclaim and pumice doesn't have a chance to reach such heights. Dust that does in fact reach heights above the 30' silo wall height is contained within the roof structure and falls back down to operational machinery.

As mentioned before, I personally have never seen dust escape from the 8 (eight) individual whirlybird roof fans atop our aggregate silos. As far as whirlybird roof vents go…"Hot air rises which collects at the peaks of your roof. A slight breeze causes the turbine to turn which sucks the hot air out of the attic space."

Point source emission release parameters used in the September 2012 analyses for NO_2 and November 2012 analyses for emissions of NO_2, PM_{10}, $PM_{2.5}$, and TAPs are shown in Table 7. As described in the application, the two 5 MMBtu natural gas-fired steam vaporizers are located inside the facility's Batch Plant building. The combustion emissions are held with steam in steam pipes for an average of 10+ hours, and then released through 16 roof stacks (8 stacks per steam vaporizer) with "squirrel vent" caps when the molded cement products are cured. Modeling to demonstrate compliance for the 1-hr NO_2 NAAQS presumed that combustion emissions were released throughout the curing process.

Table 7. EMISSION RELEASE PARAMETERS – POINT SOURCES

Source Description	UTM Zone 11 (NAD83)		Base Elevation (m)	Stack Height (m)	Exit Temp	Exit Velocity (m/s)	Stack Diameter	Release Type
	Easting, X (m)	Northing, Y (m)						
SQVENT1	550112.7	4828444.6	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT2	550114.7	4828444.6	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT3	550112.8	4828448.4	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT4	550114.8	4828448.4	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT5	550112.5	4828451.8	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT6	550114.5	4828451.8	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT7	550112.7	4828454.3	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT8	550114.7	4828454.3	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT9	550170.6	4828444.8	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT10	550172.6	4828444.8	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT11	550170.6	4828448.5	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT12	550172.6	4828448.5	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap

Table 7. EMISSION RELEASE PARAMETERS – POINT SOURCES								
Source Description	UTM Zone 11 (NAD83)		Base Elevation (m)	Stack Height (m)	Exit Temp	Exit Velocity (m/s)	Stack Diameter	Release Type
	Easting, X (m)	Northing, Y (m)						
SQVENT13	550170.4	4828451.8	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT14	550172.4	4828451.8	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT15	550170.6	4828454.7	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
SQVENT16	550172.6	4828454.7	794.8	7.01 m (23 ft)	327.6 K (130°F)	4.52	0.27 m (10.5 in)	Raincap
CEMENTA	550141.4	4828468.0	794.8	11.89 m (39 ft)	0 (Ambient)	0.001	1 m (3.28 ft)	Default Roof top vent
CEMENTB	550154.1	4828469.4	794.8	12.8 m (42 ft)	0 (Ambient)	0.001	1 m (3.28 ft)	Default Roof top vent
FLYASH	550148.0	4828467.8	794.8	10.97 m (36 ft)	0 (Ambient)	0.001	1 m (3.28 ft)	Default Roof top vent

m = meters, ft = feet, m/sec= meters per second, K = Kelvin

Emission release parameters for area sources and volume sources are shown in Table 8.

Table 8. EMISSION RELEASE PARAMETERS – AREA AND VOLUME SOURCES							
Area Sources, Source ID	Source Description	UTM Zone 11 (NAD83)		Base Elevation (m)	Release Height	Easterly & Northerly Lengths	Angle from North
		Easting, X (m)	Northing, Y (m)				
PILES	Outdoor Stock Piles, sand and aggregate only	550144.1	4828472.3	794.0	2 m (6.56 ft)	22.86 m (75.0 ft)	0
DELIVERY	Truck Delivery to Grizzly,	550141.7	4828496.2	793.9	0 m (ft)	5.0 m (16.4 ft)	0
Volume Sources, Source ID	**Source Description**	**UTM Zone 11 (NAD83)**		**Base Elevation (m)**	**Release Height**	**Initial Horizontal Dimension (m)**	**Initial Vertical Dimension (m)**
		Easting, X (m)	**Northing, Y (m)**				
CRUSHBLD	Crusher Building Emissions (from open side)	550100.6	4828499	793.9	0 m (ft)	4.27	2.84
RAILCAR1	South side railcar opening	550074.6	4828482	795	0.914 m (3.0 ft)	1.42	2.87
RAILCAR2	North side railcar opening	550071.7	4828500	795	0.914 m (3.0 ft)	1.42	2.87

The modeled emission points and buildings are shown in Figure 3-4 (exported from BEEST to Google Earth) and Figure 3-5 (BEEST graphic).

Figure 3-4. MODELED BASALITE EMISSION POINTS AND BUILDINGS

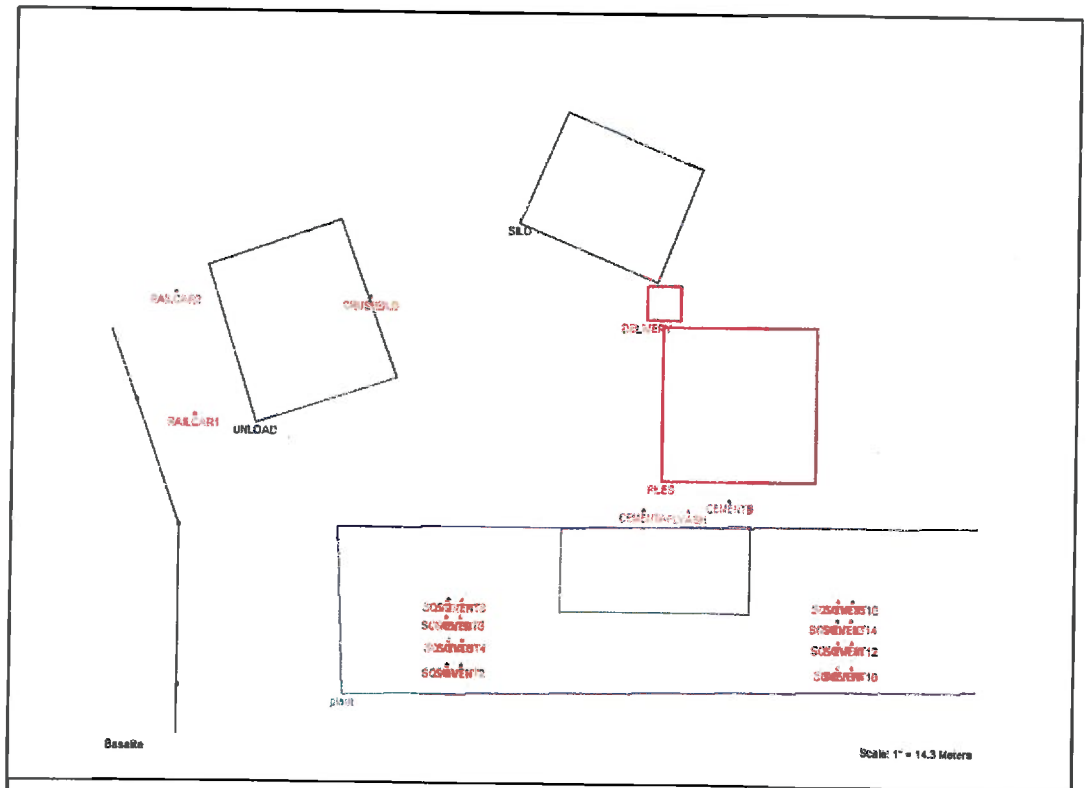


Figure 3-5. MODELED BASALITE EMISSION POINTS AND BUILDINGS (BEEST GRAPHIC)

3.3 Emission Rates

In the application submitted in July 2012, emissions from the two vaporizers were reportedly based on actual 2011 gas consumption of 7.02 MMscf times 2.5 and rounded up to the nearest integer for a total fuel use of 18 MMscf/yr. The hourly rates were then calculated based on operating each vaporizer for 6240 hours per year. DEQ advised JBR that the maximum hours of operation at full capacity should have been 1,836 hours per year for each vaporizer, calculated as follows:

1) Maximum total annual natural gas use equal to 18 MMscf/yr. Using the same emission factors from AP-42, DEQ calculated emissions based on the rated capacity of 5 MMBtu/hr for each vaporizer:

   9 MMscf/yr x 1020 MMBtu/MMscf x hr/5 MMBtu = 1,836 hr/yr operation for each vaporizer

   JBR corrected the emissions inventory and modeling analyses to reflect this information.

Emissions from filling the cement and flyash silos were based on maximum fill rates to each silo of 5 T/hr times 24 hours per day, i.e., a maximum of 120 T/day, and 31,200 T/yr to each silo. JBR's emissions inventory presumes that emissions from the silo vents are controlled by fabric filters with at least 98% control for PM_{10} and $PM_{2.5}$. Although a note in the spreadsheet says that $PM_{2.5}$ was set to 15% of PM_{10} emissions, JBR's estimates were based on presuming $PM_{2.5}$ emissions were equal to 39.7% of PM_{10} emissions for cement and 27.2% of PM_{10} for flyash.

Emission rates and assumptions for criteria pollutants are shown in Table 9.

Table 9. CRITERIA POLLUTANT EMISSION RATES

Description	NO_2 Emissions		CO Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions		SO_2 Emissions		Lead Emissions
	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)
Vaporizer #1 (5 MMBtu/hr, 7 am to 8 pm, 9 MMscf/yr)	0.490 [6.13E-02 through each of 8 vents]	0.450	0.412	0.378	0.037 [4.62E-03 through each of 8 vents]	0.034	0.037 [4.62E-03 through each of 8 vents]	0.034	0.003	0.003	2.45E-06
Vaporizer #2 5 MMBtu/hr, 7 am to 8 pm, 9 MMscf/yr)	0.490 [6.13E-02 through each of 8 vents]	0.450	0.412	0.378	0.037 [4.62E-03 through each of 8 vents]	0.034	0.037 [4.62E-03 through each of 8 vents]	0.034	0.003	0.003	2.45E-06
Cement Silo-Line A (5 T/hr, 31,200 T/yr)	---	---	---	---	1.70E-03	5.30E-03	6.75E-04 (39.7% of PM_{10})	2.11E-03	---	---	5.45E-08
Cement Silo-Line B (5 T/hr, 31,200 T/yr)	---	---	---	---	1.70E-03	5.30E-03	6.75E-04 (39.7% of PM_{10})	2.11E-03	---	---	5.45E-08
Supplement Silo-Line A & B (5 T/hr, 31,200 T/yr)	---	---	---	---	0.025	0.076	6.68E-03 (27.2% of PM_{10})	2.08E-02	---	---	2.60E-06
Proposed PTE Total (excluding fugitives)	0.98	0.90	0.824	0.756	0.102	0.155	0.082	0.093	0.006	0.006	7.61E-06
Roll Crusher (BH, 99% control, 30 T/hr, 8690 TPY)	---	---	---	---	7.20E-04	1.78E-04	1.78E-04	1.78E-04	---	---	---

Table 9. CRITERIA POLLUTANT EMISSION RATES											
Description	NO_2 Emissions		CO Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions		SO_2 Emissions		Lead Emissions
	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)	T/yr	lb/hr (1-hr)
Jaw Crusher (BH, 99% control, 15 T/hr, 8690 TPY)	---	---	---	---	3.69E-04	1.78E-04	1.78E-04	1.78E-04	---	---	---
Screening (BH, 99% control, 30 T/hr, 8690 TPY)	---	---	---	---	2.61E-03	1.04E-04	2.61E-03	1.04E-04	---	---	---
CRUSHBLD	---	---	---	---	3.69E-03	5.87E-04	3.69E-03	5.9E-04	---	---	---
Pumice railcar delivery thru grizzly to underground bin (partial enclosure, 50% control, 30 T/hr, 14,850 TPY)	---	---	---	---	1.67E-02	4.13E-03	2.53E-04 (15% of PM_{10})	6.26E-05 (15% of PM_{10})	---	---	---
Pumice Conveyor tx to screening (BH, 99% control, 30 T/hr, 14,850 TPY)	---	---	---	---	3.30E-04	8.17E-05	3.30E-04 (100% of PM_{10})	8.17E-05 (100% of PM_{10})	---	---	---
Pumice conveyor tx from screening fines (BH, 99% control, 30 T/hr, 14,850 TPY)	---	---	---	---	1.67E-02	4.13E-03	2.53E-04 (15% of PM_{10})	6.26E-05 (15% of PM_{10})	---	---	---
Pumice tx from screening coarse (BH, 99% control, 30 T/hr, 14,850 TPY)	---	---	---	---	1.67E-02	4.13E-03	2.53E-04 (15% of PM_{10})	6.26E-05 (15% of PM_{10})	---	---	---
Total, White Pumice Delivery& Screening	---	---	---	---	0.0504	1.25E-02	1.09E-03	2.70E-04	---	---	---
RAILCAR1/ RAILCAR2, each (30 TPH, 24 hr/day, 14,850 TPY)	---	---	---	---	0.0252	---	5.45E-04	---	---	---	---
Truck delivery to underground bin, aggregate/pumice. (partial enclosure, 50% control, 38 TPH, 6 am to 6 pm, 37,133 TPY)	---	---	---	---	0.063	0.31 (0.031)[a]	0.02 (15% of Total PM, 31.4% of PM_{10})	0.37 (0.040)[b]	---	---	---
Truck delivery to underground bin, Sand. (partial enclosure, 50% control, 38 TPH, 6 am to 6 pm, 44,845 TPY)	---	---	---	---	0.019	0.11 (0.911)[a]	0.006 (15% of Total PM, 31.8% of PM_{10})	0.13 (0.004)[b]	---	---	---
Tx to reverse belt conveyor, aggregate/sand. (partial enclosure, 50% control, 38 TPH, 6 am to 6 pm, 81,978 TPY)	---	---	---	---	0.063	0.68 (0.068)[a]	0.02 (15% of Total PM, 31.8% of PM_{10})	0.81 (0.021)[b]	---	---	---

Table 9. CRITERIA POLLUTANT EMISSION RATES											
Description	**NO_2 Emissions**		**CO Emissions**		**PM_{10} Emissions**		**$PM_{2.5}$ Emissions**		**SO_2 Emissions**		**Lead Emiss-ions**
	lb/hr (1-hr)	**T/yr**	**lb/hr (1-hr)**	**T/yr**	**lb/hr (1-hr)**	**T/yr**	**lb/hr (1-hr)**	**T/yr**	**lb/hr (1-hr)**	**T/yr**	**lb/hr (1-hr)**
Tx to holding hopper, aggregate/sand. (partial enclosure, 50% control, 38 TPH, 6 am to 6 pm, 81,978 TPY)	---	---	---	---	0.063	6.68 (0.068) [a]	0.02 (15% of Total PM, 31.4% of PM_{10})	0.81 (0.021) [b]	---	---	---
Pumice drop into aggregate silos. (partial enclosure, 50% control, 38 TPH, 6 am to 6 pm, 14,850 TPY)	---	---	---	---	0.063	0.12 (0.012) [a]	0.02 (15% of Total PM, 31.4% of PM_{10})	0.15 (0.004) [b]	---	---	---
DELIVERY	---	---	---	---	0.270	1.89 (0.189) [a]	0.08 (0.0846)	2.27 (0.059) [b]	---	---	---
110-C Light Red (partial enclosure, 70% control, 0.5 T/hr, 44 TPY)	---	---	---	---	1.49E-05	6.48E-06	4.73E-06 (15% of Total PM, 31.8% of PM_{10})	2.06E-06	---	---	---
130-C Medium Red (partial enclosure, 70% control, 0.5 T/hr, 9 TPY)	---	---	---	---	1.49E-05	1.27E-06	4.73E-06 (15% of Total PM, 31.8% of PM_{10})	4.03E-07	---	---	---
330-C Black (partial enclosure, 70% control, 0.5 T/hr, 64TPY)	---	---	---	---	1.49E-05	9.48E-06	4.73E-06 (15% of Total PM, 31.8% of PM_{10})	3.02E-06	---	---	---
920-G Yellow (partial enclosure, 70% control, 0.5 T/hr, 130 TPY)	---	---	---	---	1.49E-05	1.93E-05	4.73E-06 (15% of Total PM, 31.8% of PM_{10})	6.15E-06	---	---	---
NOT MODELED, Delivery of granular colorants	---	---	---	---	5.96E-04	3.66E-05	1.89E-05	1.16E-05	---	---	---
Total w/ Fugitives Included	0.98	0.90	0.824	0.756	0.43	2.06 (0.36) [a]	0.174	2.46 (0.153) [b]	0.006	0.006	7.61E-06
DEQ Tier I Modeling Threshold	0.20	1.2	15	---	0.22	---	0.054	0.35	0.21	1.2	14 lb/mo
Modeling Required?	Yes	No	No	---	Yes	---	Yes	No	No	No	No
DEQ Tier II Modeling Threshold	2.4	14	175	---	2.6	---	0.63	4.1	14	2.5	14 lb/mo
Modeling Required?	No	No	No	---	No	---	No	No	No	No	No

[a] Error in JBR spreadsheet, Material Inflow, Column G, divided by 200 instead of 2000 to convert lb/yr to T/yr for "uncontrolled" PM_{10}. The corrected value is shown in parentheses.

[b] Error in JBR spreadsheet, Material Inflow, Column J, multiplied lb/hr by Ton/yr, then divided by 2000 lb/T to convert lb/hr to T/yr for "uncontrolled" $PM_{2.5}$ (units end up as Ton^2/hr-yr). The corrected value is shown in parentheses.

JBR compared facility-wide emissions of toxic air pollutants (TAPs) to the applicable screening emission level (EL). The three carcinogenic TAPs with emissions exceeding the EL are shown in Table 10.

Table 10. MODELED TAPS EMISSION RATES

Source: / Pollutant	Vaporizers (2)	Cement Silos (2)	Supplement (Flyash) Silo	Granular Colorant Truck Delivery to Grizzly	Total	Screening EL (lb/hr)	Modeling Required?
Carcinogens	Maximum 1-hr Emission Rate (lb/hr)	Annual Hourly Average (lb/hr)	Annual Hourly Average (lb/hr)	Maximum 1-hr Emission Rate (lb/hr)			
Arsenic	1.96E-06	4.24E-08	5.00E-06	4.73E-09	7.01E-06	1.5E-06	Yes
Cadmium	1.08E-05	2.34E-06	9.90E-08	---	1.32E-05	3.7E-06	Yes
Chromium VI	4.12E-06	5.80E-08	1.83E-06	---	6.01E-06	5.6E-07	Yes

3.4 Modeling Results

Dispersion modeling results are shown in Table 11 for this project. Modeling results for 1-hr NO_2 were taken from JBR's analyses submitted on September 26, 2012, which were based on a Level 3 analysis using the Plume Volume Molar Ratio Method (PVMRM) option available in AERMOD, and a 24-hour set of ozone and NO_2 concentrations provided by DEQ using Parma 2007 ozone season data and St. Luke's Meridian NO_2 data collected from June 2009 through June 2010 (see attachment). JBR presumed an in-stack NO_2/NOx ratio of 0.2 for each vaporizer, and an NO_2 equilibrium ratio of 0.9.

Modeling results for 24-hr PM_{10}, $PM_{2.5}$, and TAPs were taken from JBR's analyses submitted on November 16, 2012.

Table 11. BASALITE MODELING RESULTS

Pollutant	Averaging Period	Modeled Maximum Ambient Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	AACC Increment ($\mu g/m^3$)	Percent of NAAQS or AACC Increment
PM_{10}	24-hr	44	90	130	150	---	87%
$PM_{2.5}$	24-hr	13.7	19.3	33	35	---	94%
NO_2	1-hr	147.4	Hour-of-day	147.4	188	---	78%
Arsenic	Annual	7.0E-05	---	7.0E-05	---	2.3E-04	30%
Cadmium	Annual	6.0E-05	---	6.0E-05	---	5.6E-04	11%
Chromium VI	Annual	3.0E-05	---	3.0E-05	---	8.3E-05	36%

4.0 Conclusions

The submitted ambient air impact analyses demonstrated to DEQ's satisfaction that ambient air quality impacts from this facility will not cause or significantly contribute to a violation of any air quality standard.

Attachment to Modeling Review

Idaho DEQ Default NO_2 and Ozone Data for PVMRM or OLM analyses for NOx Ambient Impacts

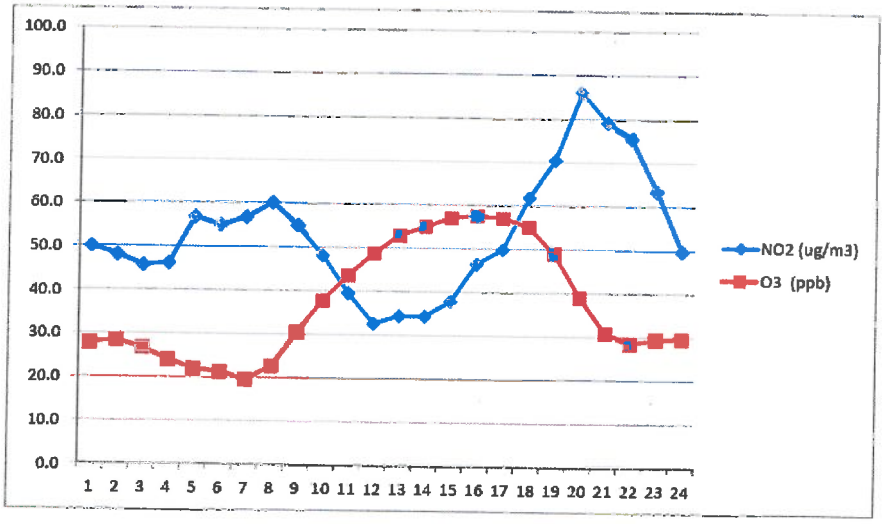
Questions: Contact Kevin Schilling, kevin.schilling@deq.idaho.gov Issue Date: June 16, 2011

PLEASE DO NOT USE THESE DATA FOR PERMITTING ANALYSES WITHOUT PRIOR APPROVAL FROM DEQ

Hour by hour background NO2 data were based on monitoring data collected between June 2009 and June 2010 in Meridian Idaho. A separate background value was generated for each hour of the day, based on the 2nd highest value monitored for that hour in the 1-year dataset.

Hourly ozone data were taken from the 2007 study, Ozone and its Precursors in the Treasure Valley, Idaho (final report, may 2008, Desert Research Institute). Hourly data were collected from Parma Idaho from June 27, 2007 through October 12, 2007. These data were sorted by hour and then the mean and the standard deviation was calculated for each hour across all days. For each hour modeled, a background ozone value equal to the mean plus one standard deviation was generated.

Hour	NO_2 (ug/m3)	O_3 (ppb)
1	50.0	27.9
2	48.1	28.5
3	45.7	26.8
4	46.2	24.1
5	56.7	22.1
6	54.9	21.4
7	56.7	19.7
8	60.1	22.8
9	54.9	30.5
10	48.1	37.8
11	39.5	43.8
12	32.6	48.8
13	34.3	53.0
14	34.3	55.0
15	37.8	57.1
16	46.4	57.6
17	49.8	57.1
18	61.8	55.1
19	70.4	49.0
20	85.9	39.0
21	79.0	30.9
22	75.5	28.5
23	63.5	29.4
24	49.8	29.6



APPENDIX C – PROCESSING FEE

PTC Fee Calculation

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:	**Basalite Concrete Products**
Address:	**1300 Franklin Road**
City:	**Meridian**
State:	**Idaho**
Zip Code:	**83712**
Facility Contact:	**Travis DuVall**
Title:	**Plant Manager**
AIRS No.:	**001-00292**

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	0.9	0	0.9
SO_2	0.0	0	0.0
CO	0.8	0	0.8
PM10	0.2	0	0.2
VOC	0.1	0	0.1
TAPS/HAPS	0.0	0	0.0
Total:	2.0	0	**2.0**
Fee Due	**$2,500.00**		

Comments: The PTC processing fees are determined in accordance with IDAPA 58.01.01.225. The emissions are between one (1) to less than ten (10) T/yr. Therefore, fees are $2,500.00.