Statement of Basis

Concrete Batch Operations General Permit

Hooker Creek Industries, LLC
American Falls, Idaho
Facility ID No. 777-00505

Permit to Construct P-2011.0093
Project No. 60831

May 13, 2011
Eric Clark
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 for non-carcinogens
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
BMP	best management practices
Btu	British thermal units
Btu/lb	British thermal units per pound
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CBP	concrete batch plant
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
cy/day	cubic yard per day
cy/hr	cubic yard per hour
cy/yr	cubic yard per year
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EF	Emission Factor
EI	Emission Inventory
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
g/kW-hr	gram per kilowatt hour
gr	grain (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hp	horsepower
hr/yr	hours per year
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
kW	kilowatts
lb/cy	pound per cubic yard
lb/10^3 gal	pound per thousand gallons
lb/gal	pound per gallon
lb/hr	pounds per hour
lb/MMBtu	pound per million British thermal unit
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf/hr	million standard cubic feet per hour
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NSCR	Non-Selective Reduction Catalyst
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide

NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PAH	polyaromatic hydrocarbons
PC	permit condition
PERF	Portable Equipment Relocation Form
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SCL	significant contribution limits
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
T/yr	tons per consecutive 12-calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TCEQ	Texas Commission on Environmental Quality
UTM	Universal Transverse Mercator
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Hooker Creek Companies, LLC. is a portable truck mix concrete batch plant that consists of the following: aggregate stockpiles, a cement storage silo, a cement supplement (flyash) storage silo, a weigh batcher, conveyors and an electric power supply. The facility combines aggregate, flyash and cement, and transfers the mixture into a truck along with a measured amount of water for in-transit mixing of the concrete. Electrical power will be supplied to the facility via one electric generator powered by a 197 bhp rated engine. A 3.8 MMBtu/hr heat input rating for the boiler is used to heat the water in cold weather prior to use for the mixing of concrete.

Application Scope

This permit is the initial PTC for a portable Concrete Batch Plant.

Application Chronology

March 9, 2011	A PTC application and combined application and processing fee ($1,500) were received.
April 7, 2011	P-2011.0093 project 60831 application was deemed complete.
May 13, 2011	Final permit and statement of basis were issued.

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 CONCRETE BATCH PLANT AND CONTROL DEVICE INFORMATION[a]

Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
Concrete Batch Plant – Truck Mix Manufacturer: Con E Co Model: Lowpro 10 Maximum capacity: 130 cy/hr Maximum production: 1,000 cy/day and 150,000 cy/year	Cement Storage Silo Baghouse No. 1[c]: Manufacturer: Con E Co Model: Lowpro 10 30 bags 0.42' x 6.42' baghouse Cement Supplement Storage Silo Flyash Baghouse No. 2[a]: Manufacturer: Con E Co Model: Lowpro 10 30 bags 0.42' x 6.42' baghouse Load-out Boot Boot shroud plus cement tube Material Transfer Point Water Sprays or Equivalent Best Management Practices Sprays and other suppressants	Baghouse No. 1 stack Stack height: 23 feet Exit diameter:≥3.28 feet Exit air flow rate: 1,500 ft/min Exit Temperature: Ambient Control efficiency: 99% Baghouse No. 2 stack Stack height: 43.5 feet Exit diameter: ≥3.28 feet Exit air flow rate: 1,500 ft/min Exit Temperature: Ambient Control efficiency: 99% Load-out Boot: Control efficiency: 95% Materials Transfer: Control Efficiency: 75%
Natural Gas Heater (or equivalent[b]) Maximum Rating: 3.8 MMBtu/hr Maximum Fuel Usage: 0.745 MMscf/yr	None	Stack height: ≥16.4 feet Stack diameter 11.8 inches Exit Velocity: 49.2 ft/sec
Diesel Engine (or equivalent[b]) Maximum Rating : 197 bhp Construction Date: 2000 EPA Certification: 1	none	Stack height: ≥15.1 feet Stack diameter 5.11 inches Exit Velocity: 147.6 ft/sec

a. Note that this table is for informational purposes only and the actual operation at the facility may deviate slightly.
b. "or equivalent" is defined as equipment which has an equivalent or less brake horsepower than listed in this table, which does not result in an increase in emissions, and which does not result in the emission of a toxic air pollutant not previously emitted.
c. Both the storage silo baghouse and supplement storage silo flyash baghouse are considered process equipment and therefore there is no associated control efficiency. Controlled PM_{10} emission factors were used when determining PTE and for modeling purposes.

Emissions Inventories

The emissions inventory for this portable concrete batch plant was developed by DEQ and is based on AP-42 Section 11.12 emission factors for central-mix and truck-mix concrete batch plants and the following assumptions: 130 cy per hour concrete production capacity and concrete production limits of 1,000 cy per day and 150,000 cy per year. Baghouse/cartridge filter capture efficiencies were presumed to be 99.0% in DEQ's generic emissions estimation.

The emissions analysis developed by DEQ, at most, assumes one central-mix or truck-mix concrete batch plant, a 3.8 MMBtu/hr propane water heater and one diesel-fired internal combustion engine (197 bhp) are used. All possible equipment may not be included in the facility specific emissions inventory. Only equipment identified within the application material will be included in the inventory. AP-42 Sections 3.3 and 3.4 (10/96) were used to determine both criteria and TAPs emissions from the diesel-fired engine. AP-42 Section 1.4 (9/98) was used to calculate emissions from the propane boiler.

Fugitive emissions of particulate matter (PM), PM_{10} and $PM_{2.5}$ from batch plant material transfer points were assumed to be controlled by manual water sprays, sprinklers, or spray bars, or an equivalent method (e.g., enclosing the entire process inside a building) that reduce the emissions by an estimated 75%. The assumed 75% control efficiency is based on the Western Regional Air Partnership Fugitive Dust Handbook. According to the Handbook, water suppressant of material handling can range from 50-90% control. Assuming the average of 70% and including another 5% due to Best Management Practices required by the permit allow for 75% control to be a conservative estimate.

Aggregate is washed before delivery to the batch plant site, and water is used on-site to control the temperature of the aggregate. Particulate matter and PM_{10} emissions from the weigh batcher transfer point are controlled by a baghouse/cartridge, and truck mix load-out emissions are controlled by a boot. Capture efficiency of the truck mix load-out boot or equivalent was estimated at 95%.

Controlled emissions of particulate toxic air pollutants (TAPs) were estimated based on the presence of a baghouse on the cement/cement supplement silos, a baghouses/cartridge on the weigh batcher, and 95% control for truck load-out emissions. Hexavalent chromium content was estimated at 20% of total chromium for cement, and 30% of total chromium for the cement supplement/fly ash. The hexavalent chromium percentages were taken from a University of North Dakota study, by the Energy and Environmental Research Center, Center for Air Toxic Metals. The two tables listed below compare uncontrolled and controlled emissions. Lead emissions are shown in Table 4. Detailed emissions calculations can be found in Appendix A of this document.

Table 2 UNCONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit			Emission Factor[a]	PM_{10}	
			lb/cy	lb/hr	T/yr
Aggregate delivery to ground storage*	Hourly Throughput cy/hr	**130**	0.0031	0.403	0.233
Sand delivery to ground storage*	Annual Throughput cy/yr	**150,000**	0.0007	0.091	0.053
Aggregate transfer to conveyor*			0.0031	0.403	0.233
Sand transfer to conveyor*			0.0007	0.091	0.053
Aggregate transfer to elevated storage*			0.0031	0.403	0.233
Sand transfer to elevated storage*			0.0007	0.091	0.053
Cement delivery to Silo (controlled EF because baghouse is process equipment)			0.0001	0.013	0.008
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)			0.0002	0.026	0.015
Weigh hopper loading (sand & aggregate batcher loading)			0.0040	0.520	0.300
Truck mix loading, Table 11.12-2 (0.278 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0784 lb/cy)			0.0784	10.192	5.880
Total, Point Sources				**10.751**	**6.203**
Total, Process Fugitives				**1.482**	**0.858**

a. The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2 (6/06), typical composition per cubic yard of concrete (1,865 lbs aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4,024 lbs/cy), and closely match Table 11.12-5 values (6/06) when rounded to the same number of figures. AP-42 lists the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control levels input on the right hand side of the table.

* Considered fugitive for facility classification purposes.

Table 3 CONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit	Control Assumption	PM_{10}	
	%	lb/hr	T/yr
Aggregate delivery to ground storage*	75	0.101	0.058
Sand delivery to ground storage*	75	0.023	0.013
Aggregate transfer to conveyor*	75	0.101	0.058
Sand transfer to conveyor*	75	0.023	0.013
Aggregate transfer to elevated storage*	75	0.101	0.058
Sand transfer to elevated storage*	75	0.023	0.013
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0[a]	0.013	0.008
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0[a]	0.026	0.015
Weigh hopper loading (sand & aggregate batcher loading)	99	0.005	0.003
Truck mix loading, Table 11.12-2 (0.278 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0784 lb/cy)	95	0.51	0.294
Total, Point Sources		**0.554**	**0.32**
Total, Process Fugitives		**0.372**	**0.213**

* Considered fugitive for facility classification purposes.

a. Cement / Cement Supplement Baghouses are considered process equipment

Table 4 LEAD EMISSIONS ESTIMATES UNCONTROLLED/CONTROLLED

Emissions Unit	Emission Factor	Lead	
	lb/ton	**lb/hr**	**T/yr**
Cement Delivery to silo (controlled EF because baghouse is process equipment)	1.09E-08	5.89E-07[a]	2.58E-06[d]
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	5.20E-07	4.18E-06[b]	1.83E-05[d]
Truck load-out*	3.62E-06	1.12E-05[c]	4.92E-05[e]
Total, Point sources		1.60E-05	2.09E-05
Total, Process Fugitives		1.12E-05	4.92E-05

*Considered fugitive for facility classification purposes.
a. lb/hr = EF * pounds cement x max hourly production rate /2000 lb/T, where cement is 491 pounds per AP-42 Table 11.12-2 (6/06)
b. lb/hr = EF * pounds cement x max hourly production rate /2000 lb/T, where supplement cement is 73 pounds per AP-42 Table 11.12-2 (6/06)
c. lb/hr = EF * pounds cement x max hourly production rate /2000 lb/T, where cement is 491 pounds + 73 pounds supplement per AP-42 Table 11.12-2 x 95% efficiency. The EF is assumed to be uncontrolled. (6/06)
d. T/yr = EF * pounds cement x hourly production rate x 8,760 hr/yr /2000 lb/T / 2000 lb/T, where cement is 491 pounds or 73 pounds supplement per AP-42 Table 11.12-2. (6/06)
e. T/yr = EF * pounds cement x hourly production rate x 8,760 hr/yr /2000 lb/T / 2000 lb/T, where cement is 491 pounds + 73 pounds supplement per AP-42 Table 11.12-2 x 95% efficiency. The EF is assumed to be uncontrolled. (6/06)

Emissions Inventory for 3.8 MMBtu/hr Water Heater

Hooker Creek Companies, LLC has a 3.8 MMBtu/hr Natural Gas water heater. The heater will be used on a limited basis and requires an hours of operation limit. The usage is restricted to a maximum of 200 hr/yr. This also equates to a fuel usage limit of 0.745 MMscf/yr. The following emissions are reflective of that annual use. Note that the boiler does not have any control devices associated with it.

Table 5 UNCONTROLLED CRITERIA POLLUTANTS FROM NATURAL GAS BOILER

Pollutant	Emissions Factor[a]	Emissions[b]	
	lb/10^3 gal	lb/hr	T/yr
PM_{10}	7.6	0.028	0.008
SO_x	0.6	0.002	0.001
NO_x	100	0.373	0.112
CO	84	0.313	0.094
VOC	5.5	0.020	0.006
Lead	0.0005	0.0000000	0.0000000
Total		**0.736**	**0.221**

a. AP-42 Section 1.4 (7/98) is the source of all emission factors.
b. 1,020 MMBtu/MMscf which equated to 4.90E03 MMscf/hr and 600 hr/yr was used in the emissions calculation.

Emissions Inventory for Certified Engines

Emissions are based on a worst-case scenario using diesel fuel in a Tier 1, 197 bhp engine. The following equation was used to determine the fuel use rate from the fuel heating value and average brake-specific fuel consumption (BSFC). Note that the fuel heating value applied is based on AP-42 Sections 3.3 and 3.4 values of 19,300 Btu/lb and a density of 7.1 lb/gal. The maximum fuel use rate was converted into MMBtu/hr and multiplied by a given emission factor in lb/MMBtu to obtain and emission rate in lb/hr.

$$\max fuel = \frac{(rating * BSFC)}{(fuelheatingvalue)} = \frac{(197bhp * 7{,}000Btu/hp-hr)}{(137{,}030Btu/gal)} = 10.06 gal/hr$$

Emission factors are derived from one of three sources: 1) If the engine is uncertified, AP-42 factors from Sections 3.3 and 3.4 (10/96) were applied; 2) If the engine is certified as Tier 1-3 or Blue Sky engine, 40 CFR 89 factors were applied; 3) For the more recent Tier 4 engines, 40 CFR 1039 factors were applied.

Table 6 UNCONTROLLED CRITERIA POLLUTANTS FROM 197 bhp DIESEL ENGINE

Pollutant	Emissions Factor[a]	Emissions	
	lb/MMBtu	**lb/hr**	**T/yr**
PM_{10}	0.127	0.175	0.05
SO_2	0.0015	0.002	0.001
NO_x	2.161	2.98	0.89
CO	2.68	3.692	1.11
VOC	0.305	0.421	0.89
Total		**7.27**	**2.94**

a. All of the emission factors were derived from 40 CFR 89, Subpart B, Table 1. The emission standards within the table were converted from g/hp-hr to lb/MMBtu using the following equation: g/hp-hr x (lb/453g) x (hp-hr/7000 Btu) x 10^6 Btu/MMBtu = lb/MMBtu.

Emissions Inventory for Transfer Points

Determining emissions from a concrete batch plant also includes transfer emissions from the number of drop points throughout the process. The PM_{10} emissions from Truck-Mix loading operations are defined by an equation which includes the wind speed at each drop point and the moisture content of cement and cement supplement and a number of exponents and constants defined by AP-42 Equation 11.12-1(6/06). An average value of wind speed and moisture content are 7 mph and 6%, respectively[1]. The following equation of particulate emissions is specific to PM_{10}. The resulting emissions were used to determine a factor to help evaluate wind speed variations in AERMOD modeling.

$$E = k(0.0032) * \left[\frac{U^a}{M^b}\right] + c$$

Where:
k = particle size multiplier
a = exponent
b = exponent
c = constant
U = mean wind speed
M = moisture content

The second transfer emissions calculations were used to determine conveyor emissions. For both coarse and fine aggregate to a conveyor. It was assumed that 82% or 164 cy/hr of the concrete produced was aggregate. This percentage was based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for

[1] 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO). 4.17 % and 1.77% were the average percentages for sand and aggregate respectively. These values are based on EPA tests conducted at Cheney Enterprises. The percentages used in AP-42 are typical for most concrete batching operations.

a total of 4,024 lb concrete as defined by AP-42 Table 11.12-5 (06/06). The fine and coarse aggregate contributions were separated into 36% and 46% of the total concrete production[2]. Employing emission factors from AP-42 Table 11.12-5 (6/06) for conveyor transfer and assuming 75% control efficiency as stated earlier for conveyor transfer PM_{10} emissions were calculated for each transfer point. For both fine and coarse aggregate the facility has 5 transfer points. Table 8 shows the transfer emissions estimates.

Table 7 TRANSFER POINT EMISSIONS FOR PM_{10}

Pollutant	Emission Factor lb/cy	# of Transfer Pts[a]	Emissions lb/hr	Emissions T/yr
Fine PM_{10}	0.0007	5	0.123	0.0709
Coarse PM_{10}	0.0031	5	0.695	0.4011
Total			**0.818**	**0.472**

a. Transfer points were identified in the application material submitted by the permittee.

Table 8 FACILITY WIDE CRITERIA POLLUTANT EMISSION ESTIMATES

Emissions Unit	PM_{10}	SO_2	NO_x	CO	VOC	Lead
	T/yr	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**
Concrete Batch Plant	0.32	--	--	--	--	0.0000
Propane Boiler	0.008	0.001	0.11	0.09	0.01	0.00000
Diesel Fired Engine	0.05	0.00	0.89	1.11	0.89	--
Transfer Points	0.47	--	--	--	--	--
Total	**0.85**	**0.00**	**1.00**	**1.20**	**0.90**	**0.00**

A summary of the estimated controlled emissions of toxic air pollutants (TAP) is provided in the Emissions Inventory within Appendix A. The emission estimates are total summation values of each unit used at the facility which are outlined in the previous table.

Ambient Air Quality Impact Analyses

A circular grid with 5.0 meter receptor spacing, extending out to 100 meters was used in the non-site-specific modeling performed by DEQ. To establish a setback distance, the following procedure was followed for various production levels and operational configurations:

1. Trigger values for the modeling analyses were determined (see Appendix C for details). These are values, when combined with background concentrations, indicated an exceedance of a standard. They were calculated by subtracting the background value from the standard (because the model does not specifically include background in the results). The following are trigger values:

Table 9 AMBIENT AIR IMPACT ANALYSIS TRIGGER VALUES

Pollutants	Averaging Period	Trigger Value ($\mu g/m^3$)
PM_{10}	24-hr	77
	Annual	24
SO_2	3-hr	1266
	24-hr	339
	Annual	72
CO	1-hr	36400
	8-hr	7700
NO_2	Annual	83

2. For each operational configuration scenario, pollutant, averaging period, and meteorological data set, all receptors with concentrations equal or greater than the trigger value were plotted. This effectively gave a plot of receptors where the standard could be exceeded for that pollutant and averaging period.

[2] The percentages of coarse and fine aggregate are based on the AP-42 concrete composition. One cubic yard of concrete as defined by AP-42 is 4024 total pounds. Similarly, coarse aggregate is 1865 pounds or 46% of the total and sand (fine) aggregate is 1428 pounds or 36%.

3. The controlling receptor for each pollutant, averaging period, and meteorological data set was identified. First, the receptor having a concentration in excess of the trigger value that was the furthest from any emissions source was identified. The controlling receptor was the next furthest downwind receptor from that point.

4. The minimum setback distance was then calculated. This was the furthest distance between an emissions point and the controlling receptor.

The applicant has demonstrated compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard so long as the setback distance and other permit conditions are complied with. The applicant has also demonstrated compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

Because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in $PM_{2.5}$ and PM_{10} nonattainment areas, this portable facility is not permitted for operation in nonattainment areas.

Permit to Construct (IDAPA 58.01.01.201)

The proposed project does not meet the permit to construct exemption criteria in IDAPA 58.01.01.220–223.

A concrete batch plant with associated internal combustion engine and boiler are not categorically exempt and therefore do not meet the criteria of IDAPA 58.01.01.221 or 222. As a result, a permit to construct is required in accordance with IDAPA 58.01.01.201. 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)

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 are not applicable to this permitting action.

Registration Procedures & Requirements for Portable Equipment (IDAPA 58.01.01.500)

Portable equipment needs to be registered within 90 days after permit issuance and DEQ must be notified at least 10 days prior to relocation. This requirement is assured by Permit Condition 15.

Visible Emissions (IDAPA 58.01.01.625)

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 7 and 10.

Rules For Control of Fugitive Dust (IDAPA 650-651)

All sources of fugitive dust emissions at the facility are subject to the State of Idaho rules for controlling fugitive dust. Reasonable precautions shall be taken to prevent particulate matter from becoming airborne. This requirement is assured by Permit Condition 6.

Rules For Control of Odors (IDAPA 58.01.01.775-776)

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. This requirement is assured by Permit Conditions 11 and 12.

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

The facility is not classified as a major facility as defined in IDAPA 58.01.01.008.10. The facility is a synthetic minor facility, because without limits on the potential to emit, the emissions of regulated air pollutants the facility would exceed major source thresholds. Therefore, the requirements of IDAPA 58.01.01.300–399 are not applicable to this permitting action.

PSD Classification (40 CFR 52.21 and IDAPA 205)

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

NSPS Applicability (40 CFR 60)

The facility is not subject to the requirements of 40 CFR 60 Subpart IIII – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, and 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

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

§ 60.4200 Am I subject to this Subpart?

(a) The provisions of this Subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section. For the purposes of this Subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:

(i) Manufactured after April 1, 2006 and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.

(b) The provisions of this Subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this Subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this Subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this Subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this Subpart as described in 40 CFR part 1068, Subpart C (or the exemptions described in 40 CFR part 89, Subpart J and 40 CFR part 94, Subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

The 197 bhp IC engine was constructed, modified or reconstructed in 2000, which is prior to July 11, 2005. Therefore, the engine is not subject to the Subpart.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

This Concrete Batch plant does not emit or have the potential to emit more than 10 tons or more per year of any HAP, or 25 tons or more per year of any combination of HAPs. Major source Maximum Achievable Control Technology (MACT) requirements therefore do not apply to this facility.

Area source MACT requirements that would apply to the IC engines include Subpart ZZZZ:

40 CFR 63, Subpart ZZZZ............National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

§ 63.6585 Am I subject to this Subpart?
You are subject to this Subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(c) An area source of HAP emissions is a source that is not a major source.

All engines used with this general CBP plant are subject to 40 CFR 63, Subpart ZZZZ as they are all stationary engines operating at a HAP emissions area source. HAP emissions are defined under section 112(b) of the Clean Air Act. Diesel IC engines emit several of the pollutants listed in the section and are therefore consider HAP emissions sources.

§ 63.6595 When do I have to comply with this Subpart?

*(a)(1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, **or an existing stationary CI RICE located at an area source of HAP emissions**, you must comply with the applicable emission limitations and operating limitations no later than May 3, 2013.*

The applicable IC engine must be in compliance with the Subpart no later than May 3, 2013.

§ 63.6600 What emission limitations and operating limitations must I meet if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?

The applicable IC engine is not operating at a major source for HAP emissions. Therefore there are no applicable emission and operating limitations under this section.

§ 63.6601 What emission limitations must I meet if I own or operate a 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP and less than 500 brake HP located at a major source of HAP emissions?

The applicable IC engine is not operating at a major source for HAP emissions and the engine is not a 4-stroke lean burn spark ignition. Therefore there are no applicable emission and operating limitations under this section.

§ 63.6602 What emission limitations must I meet if I own or operate an existing stationary CI RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions?

The applicable IC engine is not operating at a major source for HAP emissions. Therefore there are no applicable emission and operating limitations under this section.

§ 63.6603 What emission limitations and operating limitations must I meet if I own or operate an existing stationary CI RICE located at an area source of HAP emissions?

Compliance with the numerical emission limitations established in this Subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this Subpart.

(a) If you own or operate an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this Subpart and the operating limitations in Table 2b to this Subpart which apply to you.

Table 2b does not apply as it refers only to engines located at major source facilities. Table 2d, however, identifies those limitations required by area sources to comply with the Subpart. The specifics of Table 2d requires that the permittee either perform regular maintenance on the applicable engine such as changing oil and filters every 1,000 operating hours or requiring performance tests to meet certain CO or formaldehyde concentrations or reduction of emissions by a minimum of 70%. The brake horsepower of the engine dictates what limitations are required. Table 4 identifies the tests methods the permittee much conduct to demonstrate compliance.

§ 63.6604 What fuel requirements must I meet if I own or operate an existing stationary CI RICE?

If you own or operate an existing non-emergency CI stationary RICE with a site rating of more than 300 brake HP with a displacement of less than 30 liters per cylinder that uses diesel fuel, you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for non-road diesel fuel.

This requirement states that only engines with a rating greater than 300 bhp must meet 40 CFR 80.510(b). However, one of the requirements of this general permit is that all diesel burning emission units on site must meet 40 CFR 80.510(b) requirements regardless of rating.

§ 63.6605 What are my general requirements for complying with this Subpart?

(a) You must be in compliance with the emission limitations and operating limitations in this Subpart that apply to you at all times.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

When operating the applicable IC engine(s), they be operated in a manner that is consistent with reducing emissions and compliance with appropriate limitations applies at all times.

§ 63.6610 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?

The applicable IC engine is not operating at a major source for HAP emissions. Therefore there is no applicable initial performance test date requirement under this section.

§ 63.6611 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a 4SLB SI stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions?

The applicable IC engine is not operating at a major source for HAP emissions nor is the engine(s) a 4-stroke slow burn spark ignition unit. Therefore there is no applicable initial performance test date requirement under this section.

§ 63.6612 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions?

If you own or operate an existing CI stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary CI RICE located at an area source of HAP emissions you are subject to the requirements of this section.

(a) You must conduct any initial performance test or other initial compliance demonstration according to Tables 4 and 5 to this Subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).

(b) An owner or operator is not required to conduct an initial performance test on a unit for which a performance test has been previously conducted, but the test must meet all of the conditions described in paragraphs (b)(1) through (4) of this section.

(1) The test must have been conducted using the same methods specified in this Subpart, and these methods must have been followed correctly.

(2) The test must not be older than 2 years.

(3) The test must be reviewed and accepted by the Administrator.

(4) Either no process or equipment changes must have been made since the test was performed, or the owner or operator must be able to demonstrate that the results of the performance test, with or without adjustments, reliably demonstrate compliance despite process or equipment changes.

The applicable engine(s) must conduct an initial performance test or compliance demonstration 180 days following May 3, 2013, the compliance date. An initial test is not required if a previous test was conducted and meets all the criteria set forth in section (b) of 63.6612.

§ 63.6615 When must I conduct subsequent performance tests?

If you must comply with the emission limitations and operating limitations, you must conduct subsequent performance tests as specified in Table 3 of this Subpart.

According to Table 3, all subsequent tests are only necessary for engines of greater than 500 bhp. The frequencies at which the tests must be performed are dependent on the usage of the engine. If the engine is operated as a limited use engine it must be tested every 5 years or 8,760 hours, whichever is comes first. Limited use is defined as less than 100 hr/yr. Therefore all subsequent tests of limited use engines will be every 5 years. If the engine is not limited use testing every 3 years or 8,760 hours, whichever is comes first.

§ 63.6620 What performance tests and other procedures must I use?

(a) You must conduct each performance test in Tables 3 and 4 of this Subpart that applies to you.

(b) Each performance test must be conducted according to the requirements that this Subpart specifies in Table 4 to this Subpart. If you own or operate a non-operational stationary RICE that is subject to performance testing, you do not need to start up the engine solely to conduct the performance test. Owners and operators of a non-operational engine can conduct the performance test when the engine is started up again.

(d) You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour.

(e)(1) You must use Equation 1 of this section to determine compliance with the percent reduction requirement:

$$\frac{C_i - C_o}{C_i} \times 100 = R \qquad \text{(Eq. 1)}$$

Where:

C_i= concentration of CO or formaldehyde at the control device inlet,

C_o= concentration of CO or formaldehyde at the control device outlet, and

R = percent reduction of CO or formaldehyde emissions.

(2) You must normalize the carbon monoxide (CO) or formaldehyde concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen, or an equivalent percent carbon dioxide (CO_2). If pollutant concentrations are to be corrected to 15 percent oxygen and CO_2concentration is measured in lieu of oxygen concentration measurement, a CO_2correction factor is needed. Calculate the CO_2correction factor as described in paragraphs (e)(2)(i) through (iii) of this section.

(i) Calculate the fuel-specific $F_o$value for the fuel burned during the test using values obtained from Method 19, section 5.2, and the following equation:

$$F_o = \frac{0.209\, F_d}{F_c} \qquad \text{(Eq. 2)}$$

Where:

F_o= Fuel factor based on the ratio of oxygen volume to the ultimate CO_2volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is oxygen, percent/100.

F_d= Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm^3/J ($dscf/10^6$ Btu).

F_c= Ratio of the volume of CO_2 produced to the gross calorific value of the fuel from Method 19, dsm^3/J (dscf/10^6 Btu).

(ii) Calculate the CO_2 correction factor for correcting measurement data to 15 percent oxygen, as follows:

$$X_{CO_2} = \frac{5.9}{F_o} \qquad \text{(Eq. 3)}$$

Where:

X_{co2}= CO_2 correction factor, percent.

5.9 = 20.9 percent O_2−15 percent O_2, the defined O_2 correction value, percent.

(iii) Calculate the NO_X and SO_2 gas concentrations adjusted to 15 percent O_2 using CO_2 as follows:

$$C_{adj} = C_d \frac{X_{CO_2}}{\%CO_2} \qquad \text{(Eq. 4)}$$

Where:

$\%CO_2$= Measured CO_2 concentration measured, dry basis, percent.

(f) If you comply with the emission limitation to reduce CO and you are not using an oxidation catalyst, if you comply with the emission limitation to reduce formaldehyde and you are not using NSCR, or if you comply with the emission limitation to limit the concentration of formaldehyde in the stationary RICE exhaust and you are not using an oxidation catalyst or NSCR, you must petition the Administrator for operating limitations to be established during the initial performance test and continuously monitored thereafter; or for approval of no operating limitations. You must not conduct the initial performance test until after the petition has been approved by the Administrator.

(g) If you petition the Administrator for approval of operating limitations, your petition must include the information described in paragraphs (g)(1) through (5) of this section.

(1) Identification of the specific parameters you propose to use as operating limitations;

(2) A discussion of the relationship between these parameters and HAP emissions, identifying how HAP emissions change with changes in these parameters, and how limitations on these parameters will serve to limit HAP emissions;

(3) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(4) A discussion identifying the methods you will use to measure and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(5) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(h) If you petition the Administrator for approval of no operating limitations, your petition must include the information described in paragraphs (h)(1) through (7) of this section.

(1) Identification of the parameters associated with operation of the stationary RICE and any emission control device which could change intentionally (e.g., operator adjustment, automatic controller adjustment, etc.) or unintentionally (e.g., wear and tear, error, etc.) on a routine basis or over time;

(2) A discussion of the relationship, if any, between changes in the parameters and changes in HAP emissions;

(3) For the parameters which could change in such a way as to increase HAP emissions, a discussion of whether establishing limitations on the parameters would serve to limit HAP emissions;

(4) For the parameters which could change in such a way as to increase HAP emissions, a discussion of how you could establish upper and/or lower values for the parameters which would establish limits on the parameters in operating limitations;

(5) For the parameters, a discussion identifying the methods you could use to measure them and the instruments you could use to monitor them, as well as the relative accuracy and precision of the methods and instruments;

(6) For the parameters, a discussion identifying the frequency and methods for recalibrating the instruments you could use to monitor them; and

(7) A discussion of why, from your point of view, it is infeasible or unreasonable to adopt the parameters as operating limitations.

(i) The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accurate in percentage of true value must be provided.

This section lays out the criteria under which each performance test must be conducted. Note that depending on the method selected by the permittee some of the requirements of this section may or may not apply. For example, if the percent reduction option is chosen section (e) applies, otherwise it can be ignored by the permittee. Similarly with section (f), only if compliance is demonstrated without use of a NSCR or oxidation catalyst does it apply.

§ 63.6625 What are my monitoring, installation, collection, operation, and maintenance requirements?

(e) If you own or operate an existing stationary RICE with a site rating of less than 100 brake HP located at a major source of HAP emissions, an existing stationary emergency RICE, or an existing stationary RICE located at an area source of HAP emissions not subject to any numerical emission standards shown in Table 2d to this Subpart, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

(g) If you own or operate an existing non-emergency CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (g)(2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska not accessible by the FAHS do not have to meet the requirements of paragraph (g) in this section.

(1) Install a closed crankcase ventilation system that prevents crankcase emissions from being emitted to the atmosphere, or

(2) Install an open crankcase filtration emission control system that reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates, and metals.

(h) If you operate a new or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this Subpart apply.

(i) If you own or operate a stationary engine that is subject to the work, operation or management practices in items 1, 2, or 4 of Table 2c to this Subpart or in items 1 or 4 of Table 2d to this Subpart, you have the option of

utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this Subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this Subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil before continuing to use the engine. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

If the applicable engine is less than 100 bhp only maintenance and manufacturer's guidelines are required to minimize emissions. If the engine is greater than or equal to 300 bhp and does not have a closed crankcase ventilation system, it is required to install either a closed ventilation system or an open filtration crankcase system. Additionally, startup time is limited to a maximum of 30 minutes. Lastly, if the engine is less than 100 bhp, the permittee has the option to perform an oil analysis program in lieu of regular oil changes.

§ 63.6630 How do I demonstrate initial compliance with the emission limitations and operating limitations?

(a) You must demonstrate initial compliance with each emission and operating limitation that applies to you according to Table 5 of this Subpart.

(b) During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this Subpart that applies to you.

(c) You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.

This requires the permittee to conduct an initial performance test or compliance demonstration and submit notification of compliance.

§ 63.6640 How do I demonstrate continuous compliance with the emission limitations and operating limitations?

(a) You must demonstrate continuous compliance with each emission limitation and operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this Subpart that apply to you according to methods specified in Table 6 to this Subpart.

(b) You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this Subpart that apply to you. These instances are deviations from the emission and operating limitations in this Subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.

Table 6 of the Subpart lays out the testing schedules and maintenance requirements discussed in previous sections of the Subpart. All of these requirements are accounted for earlier permit conditions. Reporting is also including into the permit under 40 CFR 63.6650.

§ 63.6645 What notifications must I submit and when?

(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following;

(2) An existing stationary CI RICE located at an area source of HAP emissions.

(5) This requirement does not apply if you own or operate an existing stationary CI RICE less than 100 HP, an existing stationary emergency CI RICE, or an existing stationary CI RICE that is not subject to any numerical emission standards.

(g) If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).

(h) If you are required to conduct a performance test or other initial compliance demonstration as specified in Tables 4 and 5 to this Subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).

(1) For each initial compliance demonstration required in Table 5 to this Subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.

(2) For each initial compliance demonstration required in Table 5 to this Subpart that includes a performance test conducted according to the requirements in Table 3 to this Subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).

The permittee responsible for the applicable engine(s) are required to submit a Notification of Compliance Status 30 days following the initial compliance demonstration or the notification along with test results 60 days following the initial performance test. Additionally, if a test is required, the permittee must also submit a Notification of Intent to conduct a performance test at least 60 days prior to the scheduled testing date.

§ 63.6650 What reports must I submit and when?

(b) Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report by the date in Table 7 of this Subpart and according to the requirements in paragraphs (b)(1) through (b)(9) of this section.

(1) For semiannual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on June 30 or December 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §63.6595.

(2) For semiannual Compliance reports, the first Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date that is specified for your affected source in §63.6595.

(3) For semiannual Compliance reports, each subsequent Compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) For semiannual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each stationary RICE that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6 (a)(3)(iii)(A), you may submit the first and subsequent Compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (b)(4) of this section.

(6) For annual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on December 31.

(7) For annual Compliance reports, the first Compliance report must be postmarked or delivered no later than January 31 following the end of the first calendar year after the compliance date that is specified for your affected source in §63.6595.

(8) For annual Compliance reports, each subsequent Compliance report must cover the annual reporting period from January 1 through December 31.

(9) For annual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than January 31.

(c) The Compliance report must contain the information in paragraphs (c)(1) through (6) of this section.

(1) Company name and address.

(2) Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.

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

(4) If you had a startup, shutdown, or malfunction during the reporting period, the compliance report must include the information in §63.10(d)(5)(i).

(5) If there are no deviations from any emission or operating limitations that apply to you, a statement that there were no deviations from the emission or operating limitations during the reporting period.

The reports that must be maintained in accordance with the Subpart are stated in this section. The permittee is required to submit both semi-annual and annual Compliance reports if the engine is greater than 300 bhp (see Table 7 of the subpart for further details). Specific due dates are stated and the contents of each reports is included.

§ 63.6655 What records must I keep?

(a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.

(1) A copy of each notification and report that you submitted to comply with this Subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted.

(2) Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment.

(3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).

(4) Records of all required maintenance performed on the air pollution control and monitoring equipment.

(5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(e) You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE;

(3) An existing stationary CI RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this Subpart.

The permittee is required to maintain records of all required notifications, each malfunction, all performance tests and results, any required maintenance and any corrective action that was taken.

§ 63.6660 In what form and how long must I keep my records?

(c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

All records must be kept by the permittee for a minimum of five (5) years for each record.

CAM Applicability (40 CFR 64)

The facility is not classified as a major source (refer to Title V Classification section). Because the facility does not require a Title V permit, the requirements of CAM are not applicable.

Permit Conditions Review

This section describes the permit conditions for this initial permit.

<u>**Scope**</u>

Purpose

<u>Permit Condition 1.</u>

States that the purpose is to permit a concrete batch plant

<u>Permit Condition 2.</u>

The table in this condition outlines those regulated sources within the permit.

<u>**Facility-wide Conditions**</u>

Fuel Specifications

<u>Permit Condition 3.</u>

This condition identifies the allowable fuels that may be combusted in the water heater(s). The restriction of sulfur content is to maintain consistency between the water heater(s) and engine as there is a restriction of sulfur content in accordance with 40 CFR 60.4207 and 40 CFR 80.510(b). To minimize setback distances the sulfur content may not exceed 15 ppm standard for use of this general CBP permit when using diesel fuel. However, the water heater used by Hooker Creek only operates on natural gas.

<u>Permit Condition 4.</u>

This condition identifies the allowable fuels that may be combusted in the engine(s). The restriction of sulfur content is to maintain consistency between the boiler and engine as there is a restriction of sulfur content in accordance with 40 CFR 60.4207 and 40 CFR 80.510(b). Also, the inclusion of the minimum cetane index and maximum aromatic content is in accordance with 40 CFR 80.510(b).

Fuel Monitoring and Recordkeeping

<u>Permit Condition 5.</u>

The permittee needs to maintain documentation each time fuel is received to demonstrate compliance with the sulfur content limitation.

Fugitive Dust Control

<u>Permit Condition 6.</u>

This condition requires that the permittee perform visible emissions checks on see/no see basis to verify that fugitive emissions are not extending beyond the property boundary. If visible emissions are seen, corrective action must be taken. Reasonable control requirements for fugitive dust are needed at any potential site. Permit conditions requires that the plant must take corrective action where practical to control fugitive dust when operating.

<u>Permit Condition 7.</u>

More fugitive dust control is required by implementing Best Management Practices. Visible emissions are determined by a see/no see basis at the facility boundary. If visible emissions are present, the permittee must take appropriate action to correct the problem or perform a Method 22 test. The methods provided in this condition are options that the permittee may use to control any dust problems.

Fugitive Dust Control Monitoring & Recordkeeping

<u>Permit Condition 8.</u>

Requires the permittee to conduct inspections each day that the plant is operating to assess the control of fugitive emissions and specifies corrective actions to take if fugitive dust is not reasonably controlled.

Visible Emissions

Permit Condition 9.

The condition is in accordance with the opacity limit of 20% as stated by IDAPA 58.01.01.625.

Visible Emissions Monitoring & Recordkeeping

Permit Condition 10.

Visible emissions and/or opacity monitoring is required on a monthly basis. This includes a see/no see evaluation of baghouse stacks. If there are any visible emissions, corrective actions must be taken within 24 hours. If the problem persists, a Method 9 opacity test must be performed in accordance to IDAPA 58.01.01.130-136. Records of all inspections need to be maintained as well.

Odors

Permit Condition 11.

The permittee must operate in accordance with IDAPA 58.01.01.776.01 to minimize odors associated with the facility.

Permit Condition 12.

Maintaining records of odor complaints, and corrective action taken demonstrates compliance with this condition.

Nonattainment Areas

Permit Condition 13.

The concrete batch plant cannot relocate and operate in any nonattainment area. Operations within a nonattainment area were not included in the modeling compliance analysis. Therefore, it is not permitted with this general CBP permit. See the associated modeling memo.

Co-location

Permit Condition 14.

The concrete batch plant may only co-locate with one (1) rock crushing facility. Co-location is defined as being within 1,000 ft of the nearest emission unit. This includes the concrete batch plant, silos and the center of any stockpile.

Reporting Requirements

Permit Condition 15.

When relocating to another site, the permittee must submit a Portable Equipment Relocation Form (PERF) within 10 days of desired moving date in accordance with IDAPA 58.01.01.500. A scaled plot must also be included with the PERF form.

Subpart A General Provisions

Permit Condition 16.

This set of general provisions applies because the engine(s) associated with the CBP is an affected source in accordance with 40 CFR 63, Subpart ZZZZ National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

Incorporation by Reference

Permit Condition 17.

If there is any discrepancy between this permit and the NSPS standard this condition states that the federal standards shall govern.

Concrete Batch Plant

Description

Permit Condition 18.

The process description is provided to outline the activity at the facility.

Permit Condition 19.

The table in this condition outlines the associated emission control devices for each regulated unit.

Emissions Limits

Permit Condition 20.

The emissions limits for a natural gas water heater are listed in IDAPA 58.01.01.676. Specifically, the permittee shall not discharge PM to the atmosphere from any fuel-burning equipment source in excess of 0.050 gr/dscf of effluent gas corrected to 3% oxygen by volume for liquid or 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume for gaseous fuels.

Operating Requirements

Permit Condition 21.

Limits the finished concrete production and required setback for any future site. A setback distance from the property boundary was used in the ambient air quality impact analysis to demonstrate compliance with NAAQS and TAP increments. Because the equipment is portable and the location may be changed from its initial location, compliance with a minimum setback distance limit is required. The setback distances are based on a number of criteria which include the use of an engine, control devices such as baghouses, boot enclosures, water ring and other suppressants.

One of the biggest drivers when establishing the setback distances was truck loadout. It is accepted by the DEQ that a boot enclosure alone provides 95% control. This acceptance is based on several previously issued permits that demonstrated through manufacturer information. To increase the flexibility of the general permit and allow for small setback distances the permittee has the option to increase the loadout control to 99%. The permittee can increase the control efficiency to 99% in one of two ways; either 1) route all loadout emissions to a baghouse or 2) equip the boot enclosure with a water-fog-ring spray system. A BACT analysis done by the Texas Commission of Environmental Quality (TCEQ) in 2006 suggested that the appropriate control efficiency for the water ring was 85%. Multiply (1-95%) and (1-85%) returns a value of .0075. 1- .0075 = .9925 or 99.25%. Therefore adding the water fog ring to the boot enclosure obtains 99% control efficiency for truck loadout.

The fugitive dust control ranges from 75% to 95%. The additional 20% is obtained by mandating the enclosing of aggregate/sand piles with three-sided barriers and covering piles or adding additional suppressants.

Setback distances of both line power and engine use are included in the condition. This allows for the facility to move from one site that requires an engine for power to another site in which line power is available without requiring a permit revision.

Permit Condition 22.

This condition requires that all operations may only occur during daylight hours and for a maximum of 10 hours each day. This was added to limit the setback distance in Permit Condition 20.

Permit Condition 23.

General restrictions were applied to the water heater(s) when in use. The associated water heater requires an annual fuel usage limit to demonstrate compliance with the NAAQS standards. The limit in this condition is based on a 3.8 MMBtu/hr maximum water heater and running 200 hr/yr. AP-42 Section 1.3 (9/98) assumes 1,020 MMBtu/10^3 gal which equates to 3.73e^{-03} MMscf/hr for a 3.8 MMBtu/hr boiler. That hourly rate is multiplied by 200 hr/yr to obtain 0.745 MMscf per year.

Permit Condition 24.

A baghouse filter/cartridge system must be installed on any storage silo and all control equipment must be operated with a developed procedures document. This is required to control particulate emissions and demonstrate compliance with NAAQS standards.

Permit Condition 25.

A water spray bar or equivalent must be installed and all control equipment must be operated with a developed procedures document. This is required to control particulate emissions and demonstrate compliance with NAAQS standards.

Permit Condition 26.

Within 60 days of start up, the permittee needs to develop a procedures document outlining operations and maintenance schedules. This procedure must be submitted to the appropriate regional DEQ office for review. This is to demonstrate that all required control equipment is being operated and maintained properly. Also any change whether it is done by the facility or requested by DEQ must be submitted to DEQ within 15 days of the change.

Permit Condition 27.

Truck loadout emissions must be controlled to a minimum of 95% efficiency. This is achieved by requiring a shroud or boot enclosure.

Monitoring & Recordkeeping Requirements

Permit Condition 28.

Concrete production monitoring is required daily, monthly and annually. This is necessary to demonstrate compliance with the production limits.

Permit Condition 29.

Setback monitoring is required to demonstrate compliance with the setback distance requirements. This must be done each time the CBP relocates or anytime the layout has changed. Also, atmospheric characteristics must be documented to verify that assumed emission factors during the analysis to accurate for the location of the plant.

Permit Condition 30.

Each month the water heater's fuel usage needs to be recorded and summed for the previous consecutive 12 months to demonstrate compliance with the annual fuel limit.

Compression Ignition Internal Combustion Engines

Process Description

Permit Condition 31.

This condition provides a brief synopsis of the engine(s) used by the facility.

Operating Requirements

Permit Condition 32.

This condition states that the facility must install and operate an IC engine that is tier certified and that documentation stating such is maintained onsite.

Permit Condition 33.

This condition is included to limit the engine(s) to use that equates to the emissions produced by a 197 bhp, Tier 1 engine operating 600 hours/yr. All calculated hours assume that each engine is operating 10 hours/day.

Monitoring & Recordkeeping

Permit Condition 34.

Each month the permittee must record the operational time of the engine. The annual usage needs to be summed over a consecutive 12 month period to demonstrate compliance with the annual hourly limit.

NESHAP 40 CFR 63, Subpart ZZZZ Requirements

Permit Condition 35.

The compliance for all engines subject to 40 CFR 63, Subpart ZZZZ at area sources is May 3, 2013. This condition makes the permittee aware of what date they need to be in compliance.

Emission Limits

Permit Condition 36.

Various emission and operational limitations are placed on applicable engines depending on their brake horsepower. For example, if an engine is less than or equal to 300 bhp only regular maintenance is required. Similarly, engines greater than 300 bhp up to 500 bhp are required to demonstrate they have either reduced emissions by 70% or have a CO concentration less than or equal to 49 ppmvd at 15% O_2. Finally, engines larger than 500 bhp must reduce emissions by 70% or emit a CO concentration less than or equal to 23 ppmvd at 15% O_2. This condition includes these requirements in accordance with 40 CFR 63.6603(a).

Operating Requirements

Permit Condition 37.

This condition states that the maintenance shall be conducted in a manner that minimizes emissions. They are only required to do what is necessary to meet the appropriate emission or operational limitations. This condition is in accordance with 40 CFR 63.6605(b).

Permit Condition 38.

Start-up time of the applicable engine(s) may not exceed 30 minutes. Following start-up all applicable limitations must be complied with. This condition is in accordance with 40 CFR 63.6625(h).

Permit Condition 39.

Rather than regularly changing oil every 1,000 hours as required by the Subpart, the facility has the option of implementing an oil analysis program. The analysis must be performed at the same frequency of the oil changes. If the oil meets certain criteria, such as a total base number of less than 30% of new oil, viscosity change of less than 20% from new and the percent water content by volume is greater than 0.5%, it does not need to be changed. This is in accordance with 40 CFR 63.6625(i).

Monitoring & Recordkeeping

Permit Condition 40.

The permittee is required to maintain records of all required notifications, each malfunction, all performance tests and results, any required maintenance and any corrective action that was taken.

All records must be kept by the permittee for a minimum of five (5) years for each record.

Notification & Reporting

Permit Condition 41.

This condition requires that the permittee submit a Notification of Compliance Status either 30 days after the initial compliance demonstration described in Table 4 of the Subpart of 60 days following the initial performance test also described in Table 4 of the Subpart. If a test is required, the permittee also must submit a Notification of Intent at least 60 days prior to the scheduled testing date. This condition is in accordance with 40 CFR 63.6645(g-h).

Permit Condition 42.

All reports and notifications need to be sent to the EPA and the appropriate DEQ Regional Office. This condition provides the mailing address.

General Provisions

General Compliance

Permit Condition 43.

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

Permit Condition 44.

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

Permit Condition 45.

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.

Inspection & Entry

Permit Condition 46.

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

Construction & Operation Notification

Permit Condition 47.

The construction and operation notification provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.

Performance Testing

Permit Condition 48.

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

Permit Condition 49.

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

Permit Condition 50.

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.

Monitoring & Recordkeeping

Permit Condition 51.

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.

Excess Emissions

Permit Condition 52.

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

Certification

Permit Condition 53.

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

False Statements

Permit Condition 54.

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

Tampering

Permit Condition 55.

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

Transferability

Permit Condition 56.

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

Severability

Permit Condition 57.

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. 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

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

Facility Information 5/4/11 14:10

Company:	Hooker Creek Companies, Inc.
Facility ID:	777-00505
Permit No.:	P-2011.0093 Proj 60831
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	Coneco/Lowpro 10

Assumptions Implied or Stated in Application:

See control assumptions

Truck Mix (T) or Central Mix (C: T

INCREASE IN Production[1]

Maximum Hourly Production Rate	130	cy/hr		Per manufacturer
Proposed Daily Production Rate	1,000	cy/day	7.69	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate	150,000	cy/year		
Cement Storage Silo Capacity	4540	ft³ of aerated cement		
Cement Storage Silo Large Compartment Capacity for cement only	65%	of the silo capacity		
Cement Storage Silo small Compartment Capacity for cement or ash	35%	of the silo capacity		

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Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Change in PM_{10} Emissions due to this PTC

Emissions Point	$PM_{2.5}$ Emission Factor[1] (lb/cy)		PM_{10} Emission Factor[2] (lb/cy)		Controlled Emission Rate $PM_{2.5}$, Max.	Controlled Emission Rate PM_{10}, Max.	Controlled Emission Rate $PM_{2.5}$, 24-hour average		Controlled Emission Rate PM_{10}, 24-hour average		Controlled Emission Rate $PM_{2.5}$, annual average		Controlled Emission Rate PM_{10}, annual average		Control Assumptions:	
	Controlled	Uncontrolled	Controlled	Uncontrolled	lb/hr [3]	lb/hr [3]	lb/hr[4]	lb/day[4]	lb/hr[4]	lb/day[4]	lb/hr[5]	T/yr[5]	lb/hr[5]	T/yr[5]		
Aggregate delivery to ground storage		0.00096		0.0031	0.03	0.10	0.01	0.24	0.032	0.78	4.11E-03	1.80E-02	0.013	0.058	75%	Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.00025		0.0007	0.01	0.02	2.60E-03	0.06	0.007	0.18	1.07E-03	4.69E-03	0.003	0.013	75%	Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.00096		0.0031	0.03	0.10	0.01	0.24	0.032	0.78	4.11E-03	1.80E-02	0.013	0.058	75%	Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.00025		0.0007	0.01	0.02	2.60E-03	0.06	0.007	0.18	1.07E-03	4.69E-03	0.003	0.013	75%	Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.00096		0.0031	0.03	0.10	0.01	0.24	0.032	0.78	4.11E-03	1.80E-02	0.013	0.058	75%	Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.00025		0.0007	0.01	0.02	2.60E-03	0.06	0.007	0.18	1.07E-03	4.69E-03	0.003	0.013	75%	Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	**0.0003**		**0.0001**		3.90E-02	1.08E-02	**1.25E-02**	3.00E-01	**3.48E-03**	8.35E-02	5.14E-03	2.25E-02	1.43E-03	**6.26E-03**	0.00%	Baghouse is process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	**0.000045**		**0.0002**		5.85E-03	2.32E-02	**1.88E-03**	4.50E-02	**7.45E-03**	1.79E-01	7.71E-04	3.38E-03	3.06E-03	**1.34E-02**	0.00%	Baghouse is process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher loading)		**0.001185**		**0.0040**	1.54E-03	5.14E-03	**4.94E-04**	1.19E-02	**1.65E-03**	3.95E-02	2.03E-04	8.89E-04	6.77E-04	**2.96E-03**	99.0%	Sealed boot (vents back to silo) or baghouse.
Truck mix loading,Table 11.12-2, "0.278 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0784 lb/cy		**0.023**		**0.0784**	1.50E-01	0.51	**0.05**	1.15	**0.16**	3.92	1.97E-02	8.63E-02	0.07	**0.29**	95.0%	Boot, enclosure, or equivalent or baghouse or boot w/water ring
Central mix loading,Table 11.12-2, "0.134 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0378 lb/cy		**0.0000**		**0.0000**	0.00E+00	0.00	**0.00**	0.00	**0.00**	0.00	0.00E+00	0.00E+00	0.00	**0.00**	99.0%	Baghouse control
Point Sources Total Emissions		**2.45E-02**		**8.26E-02**	**1.96E-01**	**5.49E-01**	**6.28E-02**	**1.51E+00**	**1.76E-01**	**4.22E+00**	**2.58E-02**	**1.13E-01**	**7.23E-02**	**3.17E-01**		
Process Fugitive Emissions		0.00363		0.0114	0.12	0.37	0.04	0.91	0.12	2.85	0.02	0.07	0.05	0.21		
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Windblown Dust)				0.0940		0.92	0.10	2.41	0.29	7.07			0.12	0.53		

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[7]		Controlled EF	at 1,138,800 cy/yr	T/yr
Facility Classification Total PM[6]		**8.40E-03**		**4.78E+00**
Facility Classification Total PM10[6,8]		**4.21E-03**		**2.40E+00**

1 The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-5, 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%.

[2] The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, typical composition per cubic yard of concrete (1865 lb aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4024 lb/cy), and closely match Table 11.12-5 values (version 6/06) when rounded to the same number of figures. AP-42 lists the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control levels input on the right hand side of the table.

[3] Max. hourly rate includes reductions associated with control assumptions.

[4] Hourly emissions rate (24-hr average) = Max.hourly emissions rate x (hrs per day) / 24.
Daily emissions rate = max emissions rate (1-hr average) x proposed hrs/day.

[5] Annual average hourly emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) / (8760 hr/yr).
Annual emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) /(2000 lb/T)

[6] Controlled EFs for PM = 0.0002 (cement silo) + 0.0003 (flyash silo) +0.0079(weigh batcher)
for PM10 = 0.0001 (cement silo) + 0.0002 (flyash silo) +0.0040 (weigh batcher)

7 Emissions for Facility Classification are based on baghouses as process equipment, 24-hr day, 8760 hr/yr = 3,120 cy/day, and 1,138,800 cy/yr

[8] Emissions for Facility Classification do not include truck mix loading emissions; this is typically considered a fugitive emission source for concrete batch plants.

Lead emissions			Increase in Emissions from this PTC				Emissions for Facility Classification	
Emissions Point	Lead Emission Factor[1] (lb/ton of material loaded)		Emission Rate, Max.	Emissions for Comparison with DEQ Modeling Threshold		Emission Rate, Quarterly Avg.		
	Controlled with fabric filter	Uncontrolled	lb/hr, 1-hr avg.[2]	lb/month[3]	T/yr[4]	lb/hr qtrly avg[5]		T/yr
Cement delivery to silo[2]	**1.09E-08**	7.36E-07	3.48E-07	8.14E-05	4.01E-04	1.11E-07	Point Source	1.52E-06
Cement supplement delivery to Silo[3]	**5.20E-07**	ND	2.47E-06	5.77E-04	2.85E-03	7.91E-07	Point Source	1.08E-05
Truck Loadout (with 99.9% control) [8]		**3.62E-06**	6.64E-06	1.55E-03	7.66E-03	2.13E-06	Fugitive	[illegible]
[illegible]		0.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total			**9.45E-06**	**2.21E-03**	**0.011**		**Point Sources**	**1.23E-05**
DEQ Modeling Threshold				100	0.6			
Modeling Required?				No	No			

[1] The emissions factors are from AP-42, Table 11.12-8 (version 06/06)
[2] Max. hourly rate = EF x pound of cement/yc³ of concrete x max. hourly concrete production rate/(2000 lb/T
[3] lb/mo = EF x pound of material/yc³ of concrete x max. daily concrete production rate x (365/12)/(2000 lb/T
[4] T/yr = EF x pound of material/yc³ of concrete x max. annual concrete production rate/(2000 lb/T
[5] lb/hr, qtrly avg = lb/mo x 3 months per qtr / (8760/4)hrs per qtr

Toxic Air Pollutant (TAPs) EMISSIONS INVENTORY, Concrete Batch Plant

5/4/2011 14:10

Facility Information

Company:	Hooker Creek Companies, Inc.
Facility ID:	777-00505
Permit No.:	P-2011.0093 Proj 60831
Source Type:	Portable Concrete Batch Plant
Manufacturer:	Coneco/Lowpro 10

Emissions estimates are based on EFs in AP-42, Table 11.12-8 (version 06/06) and the following composition of one yard of concrete:

Coarse aggregate		1865 pounds
Sand		1428 pounds
Cement		491 pounds
Cement supplement		73 pounds
Water		20 gallons
Concrete		**4024 pounds**

Truck Mix Loadout Factor: 1

Central Mix Batching Factor: 0

DEQ EI VERIFICATION WORKSHEET Version 032007
Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Increase in Production

Maximum Hourly Production Rate:	130	cy/hr	
Proposed Daily Production Rate:	1,000	cy/day	
Proposed Maximum Annual Production Rate:	150,000	cy/year	

Uncontrolled (Unlimited Production Rate)

	24 hrs/day,
3,120 cy/day	7 day/wk,
1,138,800 cy/year	52 wks/year

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

Emissions Point	Arsenic EF (lb/ton of material loaded)		Beryllium EF (lb/ton of material loaded)		Cadmium EF (lb/ton of material loaded)		Chromium EF (lb/ton of material loaded)		Manganese EF (lb/ton of material loaded)		Nickel EF (lb/ton of material loaded)		Phosphorus EF (lb/ton of material loaded)		Selenium EF (lb/ton of material loaded)		Chromium VI
	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Percent of total Cr that is Cr+6
Cement delivery to silo (with baghouse)	**4.24E-09**	1.66E-06	**4.86E-10**	1.79E-08	**4.86E-10**	2.34E-07	**2.90E-08**	2.52E-07	**1.17E-07**	2.02E-04	**4.18E-08**	1.76E-05	ND	**1.18E-05**	ND	ND	**20%**
Cement supplement delivery to Silo (with baghouse)	**1.00E-06**	ND	**9.04E-08**	ND	**1.98E-08**	ND	**1.22E-06**	ND	**2.56E-07**	ND	**2.28E-06**	ND	**3.54E-06**	ND	**7.24E-08**	ND	**30%**
Truck Loadout (no boot or shroud)	1.16E-06	**3.04E-06**	1.04E-07	**2.44E-07**	9.06E-09	**3.42E-08**	4.10E-06	**1.14E-05**	2.09E-05	**6.12E-05**	4.76E-06	**1.19E-05**	1.23E-05	**3.84E-05**	1.13E-07	**2.62E-06**	**21.29%**
Central Mix Batching (NO boot or shroud)	0.00E+00	**0.00E+00**	ND	ND	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	ND	ND	**21.29%**

UNCONTROLLED TAP EMISSIONS **Note: Includes baghouses as process equipment.** **3,120 cy/day, and 1,138,800 cy/yr**

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement delivery to silo (with baghouse)	1.35E-07	5.93E-07	1.55E-08	6.79E-08	1.55E-08	6.79E-08	9.26E-07	3.52E-05	3.73E-06	1.64E-05	1.33E-06	5.84E-06	3.77E-04	1.65E-03	ND	ND	1.85E-07		
Cement supplement delivery to Silo (with baghouse)	4.75E-06	2.08E-05	4.29E-07	1.88E-06	9.40E-08	4.12E-07	5.79E-06	2.54E-05	1.21E-06	5.32E-06	1.08E-05	4.74E-05	1.68E-05	7.36E-05	3.44E-07	1.50E-06	1.74E-06		
Truck Loadout (NO baghouse)	1.11E-04	4.88E-04	8.95E-06	3.92E-05	1.25E-06	5.49E-06	4.18E-04	1.83E-03	2.24E-03	9.83E-03	4.36E-04	1.91E-03	1.41E-03	6.17E-03	9.60E-05	4.21E-04	8.90E-05		
Central Mix Batching (NO boot or shroud)	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	Facility Classification: Total Annual HAPs Emissions	
Sources Total	**1.16E-04**	5.10E-04	**9.39E-06**	4.11E-05	**1.36E-06**	5.97E-06	**4.25E-04**	1.89E-03	**2.25E-03**	9.85E-03	**4.48E-04**	1.96E-03	**1.80E-03**	7.89E-03	**9.64E-05**	4.22E-04	**9.09E-05**	**2.26E-02**	**Tons per year**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
EXCEEDS EL?	**Yes**		No		No		No		No		**Yes**		No		No		**Yes**		

CONTROLLED TAP EMISSIONS **Note: Includes baghouses as process equipment.** **1,000 cy/day, and 150,000 cy/year**

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement delivery to silo (with baghouse)[1]	1.78E-08	7.81E-08	2.04E-09	8.95E-09	2.04E-09	8.95E-09	2.97E-07	5.34E-07	1.20E-06	2.15E-06	1.76E-07	7.70E-07	ND	ND	ND	ND	2.44E-08		
Cement supplement delivery to Silo (with baghouse)2	6.25E-07	2.74E-06	5.65E-08	2.47E-07	1.24E-08	5.42E-08	1.25E-05	3.34E-06	2.62E-06	7.01E-07	1.43E-06	6.24E-06	3.62E-05	9.69E-06	1.10E-07	1.98E-07	2.29E-07		
Truck Loadout (with baghouse)	7.34E-07	3.21E-06	5.89E-08	2.58E-07	8.26E-09	3.62E-08	6.70E-06	1.21E-05	3.60E-05	6.47E-05	2.87E-06	1.26E-05	2.26E-05	4.06E-05	1.54E-06	2.77E-06	5.86E-07	**95.00%**	Boot, enclosure, or equivalent or baghouse or boot w/water ring
Central Mix Batching (WITH boot or shroud)	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	99.00%	
Sources Total	**1.38E-06**	6.03E-06	**1.17E-07**	5.14E-07	**2.27E-08**	9.93E-08	**1.95E-05**	1.59E-05	**3.98E-05**	6.76E-05	**4.47E-06**	1.96E-05	**5.88E-05**	5.03E-05	**1.65E-06**	2.97E-06	**8.39E-07**	**1.63E-04**	**Tons per year**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
Percent of EL	91.79%		0.42%		0.61%		0.06%		0.0119%		16.57%		0.84%		0.0127%		149.86%		
EXCEEDS EL?	**No**		No		No		No		No		No		No		No		**Yes**		

[1] lb/hr, annual average = EF x pound of cement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr = EF x pound of cement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton / 24 hr/day

[2] lb/hr, annual average = EF x pound of cement supplement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of cement supplement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton

[3] lb/hr, annual average = EF x pound of (cement + cement supplement) / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of (cement + cement supplement) / Yd3 of concrete x daily concrete production

[4] T/yr = lb/hr, annual avg x 8760 hr/yr x (1T/2000 lb)

[5] T/yr = EF x pound of cement, or cement supplement, or cement + cement supplement x annual concrete production rate /2000 lb/ton / 2000 lb/ton

NATURAL GAS COMBUSTION, AP-42 SECTION 1.4 (7/98)

Enter 0 in the hr/day and hr/yr cells if there is no natural gas boiler

3.8 MMBtu/hr / 1,020 MMBtu/MMscf = 3.73E-03 MMscf/hr

Operating Assumptions: **10** hr/day, **200** hr/yr

Fuel Use: **0.037 MMscf/day**, **0.745 MMscf/year**

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/MMscf	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	100	3.73E-01	3.73E-02	3.73E-02	1	T/yr	No	7	T/yr	No
CO	84	3.13E-01	3.13E-02	3.13E-02	14	lb/hr	No	70	lb/hr	No
PM10	7.6	2.83E-02	2.83E-03	3.19E-01	0.2	lb/hr	No	0.9	lb/hr	No
		2.83E-02	2.83E-03		1	T/yr	No	7	T/yr	No
PM2.5	7.6	2.83E-02	2.83E-03	1.16E-01						
		2.83E-02	2.83E-03							
SOx	0.6	2.24E-03	2.24E-04	2.24E-04	0.2	lb/hr	No	0.9	lb/hr	No
		2.24E-03	2.24E-04		1	T/yr	No	7	T/yr	No
VOC	5.5	2.05E-02	2.05E-03	2.05E-03	40	T/yr	No			
Lead	0.0005	1.86E-06	1.86E-07	1.09E-02	0.6	T/yr	No			
Lead, continued			5.37E-03	lb/quarter	10	lb/mo	No			
		TOTAL	7.37E-02	T/yr						

Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/MMscf	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
2-Methylnaphthalene	2.40E-05	**2.04E-09**	**4.66E-11**	9.10E-05	No
3-Methylchloranthrene	1.80E-06	**1.53E-10**	**3.50E-12**	2.50E-06	No
7,12-Dimethylbenz(a)anthrace	1.60E-05	2.48E-08	2.48E-09		
Acenaphthene	1.80E-06	**1.53E-10**	**3.50E-12**	9.10E-05	No
Acenaphthylene	1.80E-06	**1.53E-10**	**3.50E-12**	9.10E-05	No
Anthracene	2.40E-06	**2.04E-10**	**4.66E-12**	9.10E-05	No
Benzo(a)anthracene	1.80E-06	**1.53E-10**	**3.50E-12**	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	**1.02E-10**	**2.33E-12**	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	**1.53E-10**	**3.50E-12**		See POM
Benzo(g,h,i)perylene	1.20E-06	**1.02E-10**	**2.33E-12**	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	**1.53E-10**	**3.50E-12**		See POM
Chrysene	1.80E-06	**1.53E-10**	**3.50E-12**		See POM
Dibenzo(a,h)anthracene	1.20E-06	**1.02E-10**	**2.33E-12**		See POM
Dichlorobenzene	1.20E-03	**1.02E-07**	**2.33E-09**	9.10E-05	No
Fluoranthene	3.00E-06	**2.55E-10**	**5.83E-12**	9.10E-05	No
Fluorene	2.80E-06	**2.38E-10**	**5.44E-12**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	**1.53E-10**	**3.50E-12**		See POM
Naphthalene	6.10E-04	1.89E-05	1.89E-06	3.33	No
Naphthalene	6.10E-04	**5.19E-08**	**1.18E-09**	9.10E-05	No
Phenanathrene	1.70E-05	**1.45E-09**	**3.30E-11**	9.10E-05	No
Pyrene	5.00E-06	**4.25E-10**	**9.71E-12**	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH Group	**9.70E-10**	**2.21E-11**	2.00E-06	No
Non-PAH HAPs					
Benzene	2.10E-03	**1.79E-07**	**4.08E-09**	8.00E-04	No
Formaldehyde	7.50E-02	**6.38E-06**	**1.46E-07**	5.10E-04	No
Hexane	1.80E+00	2.79E-03	2.79E-04	12	No
Toluene	3.40E-03	5.28E-06	5.28E-07	25	No
Non-HAP Organic Compounds					
Butane	2.10E+00	3.26E-03	3.26E-04		
Ethane	3.10E+00	4.81E-03	4.81E-04		
Pentane	2.60E+00	4.04E-03	4.04E-04	118	No
Propane	1.60E+00	2.48E-03	2.48E-04		
Metals (HAPs)					
Arsenic	2.00E-04	**1.70E-08**	**3.88E-10**	1.50E-06	No
Barium	4.40E-03	6.83E-06	6.83E-07	0.033	No
Beryllium	1.20E-05	**1.02E-09**	**2.33E-11**	2.80E-05	No
Cadmium	1.10E-03	**9.36E-08**	**2.14E-09**	3.70E-06	No
Chromium	1.40E-03	2.17E-06	2.17E-07	0.033	No
Cobalt	8.40E-05	1.30E-07	1.30E-08	0.0033	No
Copper	8.50E-04	1.32E-06	1.32E-07	0.013	No
Manganese	3.80E-04	5.90E-07	5.90E-08	0.067	No
Mercury	2.60E-04	4.04E-07	4.04E-08	0.003	No
Molybdenum	1.10E-03	1.71E-06	1.71E-07	0.333	No
Nickel	2.10E-03	**1.79E-07**	**4.08E-09**	2.70E-05	No
Selenium	2.40E-05	3.73E-08	3.73E-09	0.013	No
Vanadium	2.30E-03	3.57E-06	3.57E-07	0.003	No
Zinc	2.90E-02	4.50E-05	4.50E-06	0.667	No

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

Case-by-Case Modeling Thresholds may be used ONLY with DEQ Approval

TOTAL CBP + BOILER EMISSIONS (POINT SOURCES, T/YR)	0.52

Facility: Hooker Creek Companies, Inc.
5/4/2011 14:10 **Permit/Facility ID:** P-2011.0093 F777-00505 User Input Weight % Sulfur = 0.0015% SO2 EF = 1.01 x S

Fuel Type Toggle =	1	197 hp Engine
Fuel Consumption Rate	10.06 gal/hr	
Calculated MMBtu/hr	1.3790 MMBtu/hr	
Max Daily Operation	10 hr/day	
Max Annual Operation	600 hrs/yr	

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM[b]	0.1	0.138	0.04	
PM-10 (total)[d]	0.127	0.175	0.052	
P.M.-2.5	0.127	0.175	0.05	
CO[b]	2.68	3.692	1.11	
NOx[b]	2.161	2.980	0.89	
SO_2[b] (total SOx presumed SO2)	0.001515	0.002	0.001	
VOC[b] (total TOC--> VOCs)	0.305	0.421	0.128	
Lead				
HCl[d]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	7.67E-04	1.06E-03	3.17E-04	7.24E-05
Acrolein[c]	9.25E-05	1.28E-04	3.83E-05	5.31E-05
Benzene[c,e]	9.33E-04	1.29E-03	3.86E-04	8.81E-05
1,3-Butadiene[c,e]	3.91E-05			
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	1.63E-03	4.88E-04	1.11E-04
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	5.64E-04	1.69E-04	2.35E-04
Xylene[c,e]	2.85E-04	3.93E-04	1.18E-04	1.64E-04
PAH, Total		2.32E-04		1.59E-05
POM (7-PAH Group)		4.73E-06	1.42E-06	3.24E-07

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	1.42E-06	1.96E-06	5.87E-07	1.34E-07
Acenaphthylene[c1]	5.06E-06	6.98E-06	2.09E-06	4.78E-07
Anthracene[c1]	1.87E-06	2.58E-06	7.74E-07	1.77E-07
Benzo(a)anthracene[c1]	1.68E-06	2.32E-06	6.95E-07	1.59E-07
Benzo(a)pyrene[c1,e]	1.88E-07	2.59E-07	7.78E-08	1.78E-08
Benzo(b)fluoranthene[c1]	9.91E-08	1.37E-07	4.10E-08	9.36E-09
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	4.89E-07	6.74E-07	2.02E-07	4.62E-08
Benzo(k)fluoranthene[c1]	1.55E-07	2.14E-07	6.41E-08	1.46E-08
Chrysene[c1]	3.53E-07	4.87E-07	1.46E-07	3.33E-08
Dibenzo(a,h)anthracene[c1]	5.83E-07	8.04E-07	2.41E-07	5.51E-08
Dichlorobenzene				
Fluoranthene[c1]	7.61E-06	1.05E-05	3.15E-06	7.19E-07
Fluorene[c1]	2.92E-05	4.03E-05	1.21E-05	2.76E-06
Indeno(1,2,3-cd)pyrene[c1]	3.75E-07	5.17E-07	1.55E-07	3.54E-08
Naphthalene[c1,e]	8.46E-05	1.17E-04	3.51E-05	8.01E-06
Perylene				
Phenanthrene[c1]	2.94E-05	4.05E-05	1.22E-05	2.78E-06
Pyrene[c1]	4.78E-06	6.59E-06	1.98E-06	4.51E-07
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96
c) AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96
d) (reserved)
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Fuel Type Toggle =	1	0 hp Engine
Fuel Consumption Rate	0.00 gal/hr	
Calculated MMBtu/hr	0.0000 MMBtu/hr	
Max Daily Operation	24 hr/day	
Max Annual Operation	0 hrs/yr	

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM[b]	0.1	0.000	0.00	
PM-10 (total)[d]	0.000	0.000	0.000	
P.M.-2.5	0	0.000	0.00	
CO[b]	0.00	0.000	0.00	
NOx[b]	0.000	0.000	0.00	
SO_2[b] (total SOx presumed SO2)	0.001515	0.000	0.000	
VOC[b] (total TOC--> VOCs)	0.000	0.000	0.000	
Lead				
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	2.52E-05	0.00E+00	0.00E+00	0.00E+00
Acrolein[c]	7.88E-06	0.00E+00	0.00E+00	0.00E+00
Benzene[c,e]	7.76E-04	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	0.00E+00	0.00E+00	0.00E+00
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[c,e]	1.93E-04	0.00E+00	0.00E+00	0.00E+00
PAH, Total		0.00E+00		0.00E+00
POM (7-PAH Group)		0.00E+00	0.00E+00	0.00E+00

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene[c1]	9.23E-06	0.00E+00	0.00E+00	0.00E+00
Anthracene[c1]	1.23E-06	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene[c1]	6.22E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene[c1,e]	2.57E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene[c1]	1.11E-06	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	5.56E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene[c1]	2.18E-07	0.00E+00	0.00E+00	0.00E+00
Chrysene[c1]	1.53E-06	0.00E+00	0.00E+00	0.00E+00
Dibenzo(a,h)anthracene[c1]	3.46E-07	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	0.00E+00	0.00E+00	0.00E+00
Fluorene[c1]	1.28E-05	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	0.00E+00	0.00E+00	0.00E+00
Naphthalene[c1,e]	1.30E-04	0.00E+00	0.00E+00	0.00E+00
Perylene				
Phenanthrene[c1]	4.08E-05	0.00E+00	0.00E+00	0.00E+00
Pyrene[c1]	3.71E-06	0.00E+00	0.00E+00	0.00E+00
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42

b) AP-42, Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines, 10/96

c) AP-42, Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines Emission Factor Rating E, 10/96

c1) AP-42, Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96

d) AP-42, Table 3.4-2, Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines Emission Factor Rating E, 10/96

e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutant	Total Emissions (lb/hr)	Total Emissions (T/yr)	Pollutant	Total Emissions (lb/hr)	Total Emissions (T/yr)
PM [b]	0.138	0.04	**PAH HAPs**		
PM-10 (total) [d]	0.175	0.05	2-Methylnaphthalene		
P.M.-2.5	0.175	0.05	3-Methylchloranthrene[e]		
CO [b]	3.692	1.11	Acenaphthene[c1]	1.96E-06	5.87E-07
NOx[b]	2.980	0.89	Acenaphthylene[c1]	6.98E-06	2.09E-06
SO_2 [b] (total SOx presumed SO2)	0.002	0.00	Anthracene[c1]	2.58E-06	7.74E-07
VOC [b] (total TOC--> VOCs)	0.421	0.13	Benzo(a)anthracene[c1]	2.32E-06	6.95E-07
Lead			Benzo(a)pyrene[c1,e]	2.59E-07	7.78E-08
HCl [e]			Benzo(b)fluoranthene[c1]	1.37E-07	4.10E-08
Dioxins[e]			Benzo(e)pyrene		
2,3,7,8-TCDD			Benzo(g,h,l)perylene[c1]	6.74E-07	2.02E-07
Total TCDD			Benzo(k)fluoranthene[c1]	2.14E-07	6.41E-08
1,2,3,7,8-PeCDD			Chrysene[c1]	4.87E-07	1.46E-07
Total PeCDD			Dibenzo(a,h)anthracene[c1]	8.04E-07	2.41E-07
1,2,3,4,7,8-HxCDD[c]			Dichlorobenzene		
1,2,3,6,7,8-HxCDD			Fluoranthene[c1]	1.05E-05	3.15E-06
1,2,3,7,8,9-HxCDD[c]			Fluorene[c1]	4.03E-05	1.21E-05
Total HxCDD			Indeno(1,2,3-cd)pyrene[c1]	5.17E-07	1.55E-07
1,2,3,4,6,7,8-Hp-CDD[c]			Naphthalene[c1,e]	1.17E-04	3.51E-05
Total HpCDD[c]			Perylene		
Octa CDD[c]			Phenanthrene[c1]	4.05E-05	1.22E-05
Total PCDD[c]			Pyrene[c1]	6.59E-06	1.98E-06
Furans[e]			**Non-HAP Organic Compounds**		
2,3,7,8-TCDF			Acetone[e]		
Total TCDF[c]			Benzaldehyde		
1,2,3,7,8-PeCDF			Butane		
2,3,4,7,8-PeCDF			Butyraldehyde		
Total PeCDF[c]			Crotonaldehyde[e]		
1,2,3,4,7,8-HxCDF			Ethylene		
1,2,3,6,7,8-HxCDF			Heptane		
2,3,4,6,7,8-HxCDF			Hexanal		
1,2,3,7,8,9-HxCDF			Isovaleraldehyde		
Total HxCDF[c]			2-Methyl-1-pentene		
1,2,3,4,6,7,8-HpCDF			2-Methyl-2-butene		
1,2,3,4,7,8,9-HpCDF			3-Methylpentane		
Total HpCDF[c]			1-Pentene		
Octa CDF[c]			n-Pentane		
Total PCDF[c]			Valeraldehyde		
Total PCDD/PCDF[c]			**Metals**		
Non-PAH HAPs			Antimony[e]		
Acetaldehyde[c]	1.06E-03	3.17E-04	Arsenic[e]		
Acrolein[c]	1.28E-04	3.83E-05	Barium[e]		
Benzene[c,e]	1.29E-03	3.86E-04	Beryllium[e]		
1,3-Butadiene[c,e]			Cadmium[e]		
Ethylbenzene[e]			Chromium[e]		
Formaldehyde[c,e]	1.63E-03	4.88E-04	Cobalt[e]		
Hexane[e]			Copper[e]		
Isooctane			Hexavalent Chromium[e]		
Methyl Ethyl Ketone[e]			Manganese[e]		
Pentane[e]			Mercury[e]		
Propionaldehyde[e]			Molybdenum[e]		
Quinone[e]			Nickel[e]		
Methyl chloroform[e]			Phosphorus[e]		
Toluene[c,e]	5.64E-04	1.69E-04	Silver[e]		
Xylene[c,e]	3.93E-04	1.18E-04	Selenium[e]		
			Thallium[e]		
PAH, Total	2.32E-04	1.59E-05	Vanadium[e]		
POM (7-PAH Group)	4.73E-06	1.42E-06	Zinc[e]		

Facility:	**Hooker Creek Companies, Inc.**			
5/4/2011 14:10	**Permit/Facility ID:**	**777-00505**	**P-2011.0093 Proj 60831**	

Max Hourly Production	130 cy/hr	**82%** T/hr is Aggregate =	107 cy/hr
Max Daily Production	1,000 cy/day	82% T/hr is Aggregate =	820 cy/day
Max Annual Production	150,000 cy/yr	82% T/hr is Aggregate =	123,000 cy/yr

Aggregate is considered both coarse and fine (sand).The 82% is based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete

Truck Mix Operations Drop Points, AP-42 11-12 (06/06)

$E = k\ (0.0032)\ x(U^a\ /\ M^b)+c$ = 5.81E-02 | 2.32E-02 lb/ton for PM10 | 3.48E-03 lb/ton for PM2.5

k = particle size multiplier	0.8 for PM	0.32 for PM10	0.048 for PM2.5
a = exponent	1.75 for PM	1.75 for PM10	1.75 for PM2.5
b = exponent	0.3 for PM	0.3 for PM10	0.3 for PM2.5
c = constant	0.013 for PM	0.0052 for PM10	0.00078 for PM2.5
U = mean wind speed =	7 mph		
M = moisture content =	6 %		

Mean wind spped: 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO).

Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises Cement plant in Roanoke, VA, 1994. (AP-42 11-12 06/06).

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	mph/ E@10mph
Cat 1:	1.54	0.77	1.72	6.75E-03	0.2907	1.01E-03	0.2907
Cat 2:	3.09	2.32	5.18	1.58E-02	0.6819	2.38E-03	0.6819
Cat 3:	5.14	4.12	9.20	3.43E-02	1.4771	5.15E-03	1.4771
Cat 4:	8.23	6.69	14.95	7.32E-02	3.153	1.10E-02	3.153
Cat 5:	10.80	9.52	21.28	1.31E-01	5.658	1.97E-02	5.658
Cat 6:	14.00	12.40	27.74	2.06E-01	8.861	3.09E-02	8.861

Central Mix Operations Drop Points, AP-42 11-12 (06/06)

$E = k\ (0.0032)\ x(U^a\ /\ M^b)+c$ = 1.77E-03 | 1.20E-03 lb/ton for PM10 | 2.46E-04 lb/ton for PM2.5

k = particle size multiplier	0.19 for PM	0.13 for PM10	0.03 for PM2.5
a = exponent	0.95 for PM	0.45 for PM10	0.45 for PM2.5
b = exponent	0.9 for PM	0.9 for PM10	0.9 for PM2.5
c = constant	0.001 for PM	0.001 for PM10	0.0002 for PM2.5
U = mean wind speed =	7 mph		
M = moisture content =	6 %		

Mean wind spped: 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO).

Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.11E-03	0.9223	2.24E-04	0.9126
Cat 2:	3.09	2.32	5.18	1.87E-03	1.5598	2.40E-04	0.9763
Cat 3:	5.14	4.12	9.20	2.13E-03	1.7760	2.52E-04	1.0245
Cat 4:	8.23	6.69	14.95	2.41E-03	2.006	2.65E-04	1.0761
Cat 5:	10.80	9.52	21.28	2.65E-03	2.208	2.76E-04	1.1213
Cat 6:	14.00	12.40	27.74	2.86E-03	2.381	2.85E-04	1.1603

Conveyor and Scalping Screen Emission Points

Moisture/Control %:

Aggregate for CBP typically stabilizes between 5-6% by weight--> Apply additional **25%** control to lb/hr, etc. for the higher moisture.

Sand aggregate for CBPs is **36%**

Coarse aggregate for CBPs is **46%**

Fine Aggegate (Sand) Transfer to Conveyor

Transfer from truck to conveyor: 107 cy/hr | 2 Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0015	0.052	0.017	3.00E-02	6.84E-03	0.104	0.033	5.99E-02	1.37E-02
PM-10 (total)	7.00E-04	0.024	0.008	1.40E-02	3.19E-03	0.048	0.016	2.80E-02	6.38E-03
PM-2.5 (total)	2.25E-04	0.008	0.002	4.49E-03	1.97E-02	0.016	0.005	8.99E-03	3.94E-02

Coarse Aggegate Transfer to Conveyor

Transfer from truck to conveyor: 107 cy/hr | 2 Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0064	0.287	0.092	1.66E-01	3.78E-02	0.574	0.184	3.31E-01	7.56E-02
PM-10 (total)	3.10E-03	0.139	0.045	8.02E-02	1.83E-02	0.278	0.089	1.60E-01	3.66E-02
PM-2.5 (total)	9.60E-04	0.043	0.331	2.48E-02	1.09E-01	0.086	0.662	4.97E-02	2.18E-01

Final Concrete Batch Plant Emissions Inventory

Listed Below are the emissions estimates for the units selected.

Company:	Hooker Creek Companies, Inc.
Facility ID:	777-00505
Permit No.:	P-2011.0093 Proj 60831
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	Coneco/Lowpro 10

Production

Maximum Hourly Production Rate:	130	cy/hr
Proposed Daily Production Rate:	1000	cy/day
Proposed Maximum Annual Production Rate:	150000	cy/year

Tons/year

Emissions Units		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	Truck Mix	0.113	0.32	NA	NA	NA	NA	1.23E-05	
Water Heater/Boiler:	3.8 MMBtu/hr Natural Gas	0.000	0.000	0.000	0.000	0.000	0.000	0.00E+00	
Diesel Engine*:	197 bhp, Tier 1 engine	0.05	0.05	0.00	0.89	1.11	0.13	NA	
	Transfer/Drop Points	0.059	0.19	NA	NA	NA	NA	NA	
	Totals	**0.22**	**0.56**	**0.00**	**0.89**	**1.11**	**0.13**	**1.23E-05**	**2.02E-03**

Pounds/hour

		PM2.5	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	Truck Mix	0.026	0.07	NA	NA	NA	NA	9.45E-06	
Water Heater/Boiler:	3.8 MMBtu/hr Natural Gas	0.064	0.118	0.008	0.714	0.179	0.020	4.50E-05	
Diesel Engine*:	197 bhp, Tier 1 engine	0.052	0.05	0.00	2.98	3.69	0.42	NA	
	Transfer/Drop Points	0.667	0.10	NA	NA	NA	NA	NA	
	Totals	**0.81**	**0.35**	**0.01**	**3.69**	**3.87**	**0.44**	**5.45E-05**	**3.68E-03**

* The Large engine may run : There is no large engine. hr/yr

* The Small engine may run : 600 hr/yr

HAPS & TAPS Emissions Inventory

Metals	HAP	TAP	lb/hr	T/yr	Averaging Period	EL lb/hr	Exceeded?
Arsenic	X	X	1.39E-06	6.03E-06	Annual	1.50E-06	No
Barium		X	6.83E-06	6.83E-07	24-hour	3.30E-02	No
Beryllium	X	X	1.18E-07	5.14E-07	Annual	2.80E-05	No
Cadmium	X	X	1.16E-07	1.01E-07	Annual	3.70E-06	No
Cobalt	X	X	1.30E-07	1.30E-08	24-hour	3.30E-03	No
Copper		X	1.32E-06	1.32E-07	24-hour	1.30E-02	No
Chromium	X	X	5.87E-06	2.17E-07	24-hour	3.30E-02	No
Manganese	X	X	4.04E-05	6.76E-05	24-hour	3.33E-01	No
Mercury	X	X	4.04E-07	4.04E-08	24-hour	3.00E-03	No
Molybdenum		X	1.71E-06	1.71E-07	24-hour	2.70E-05	No
Nickel	X	X	4.65E-06	1.96E-05	Annual	2.70E-05	No
Phosphorus	X	X	5.88E-05	5.03E-05	24-hour	7.00E-03	No
Selenium	X	X	1.69E-06	2.97E-06	24-hour	1.30E-02	No
Vanadium		X	3.57E-06	3.57E-07	24-hour	3.00E-03	No
Zinc		X	4.50E-05	4.50E-06	24-hour	6.67E-01	No
Chromium VI	X	X	8.39E-07	3.68E-06	Annual	5.60E-07	Yes
Non PAH Organic Compunds							
Pentane		X	2.48E-03	2.48E-04	24-hour	118	No
Methyl Ethyl Ketone		X	0.00E+00	0.00E+00	24-hour	39.3	No
Non-PAH HAPs							
Acetaldehyde	X	X	7.24E-05	3.17E-04	Annual	3.00E-03	No
Acrolein	X	X	5.31E-05	3.83E-05	24-hour	1.70E-02	No
Benzene	X	X	8.83E-05	3.86E-04	Annual	8.00E-04	No
1,3 - Butadiene	X	X	0.00E+00	0.00E+00	Annual	2.40E-05	No
Ethyl Benzene	X	X	0.00E+00	0.00E+00	24-hour	29	No
Formaldehyde	X	X	1.18E-04	4.88E-04	Annual	5.10E-04	No
Hexane	X	X	2.79E-03	2.79E-04	24-hour	12	No
Isooctane	X		0.00E+00	0.00E+00	NA	NA	NA
Methyl Chloroform	X	X	0.00E+00	0.00E+00	24-hour	127	No
Propionaldehyde	X	X	0.00E+00	0.00E+00	24-hour	2.87E-02	No
Quinone	X	X	0.00E+00	0.00E+00	24-hour	2.70E-02	No
Toluene	X	X	2.40E-04	1.70E-04	24-hour	25	No
o-Xylene	X	X	1.64E-04	1.18E-04	24-hour	7.00E-03	No
PAH HAPs							
2-Methylnaphthalene	X	X	2.04E-09	4.66E-11	Annual	9.10E-05	No
3-Methylchloranthrene	X	X	1.53E-10	3.50E-12	Annual	2.50E-06	No
7,12-Dimethylbenz(a)anthracene	X		2.48E-08	2.48E-09	NA	NA	NA
Acenaphthene	X	X	1.34E-07	5.87E-07	Annual	9.10E-05	No
Acenaphthylene	X	X	4.78E-07	2.09E-06	Annual	9.10E-05	No
Anthracene	X	X	1.77E-07	7.74E-07	Annual	9.10E-05	No
Benzo(a)anthracene	X	X	1.59E-07	6.95E-07	Annual	9.10E-05	No
Benzo(a)pyrene	X	X	1.79E-08	7.78E-08	Annual	2.00E-06	No
Benzo(b)fluoranthene	X	X	9.51E-09	4.10E-08	Annual	2.00E-06	No
Benzo(e)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(g,h,i)perylene	X	X	4.63E-08	2.02E-07	Annual	9.10E-05	No
Benzo(k)fluoranthene	X	X	1.48E-08	6.41E-08	Annual	2.00E-06	No
Chrysene	X	X	3.35E-08	1.46E-07	Annual	2.00E-06	No
Dibenzo(a,h)anthracene	X	X	5.52E-08	2.41E-07	Annual	2.00E-06	No
Dichlorobenzene	X	X	1.02E-07	2.33E-09	Annual	9.10E-05	No
Fluoranthene	X	X	7.19E-07	3.15E-06	Annual	9.10E-05	No
Fluorene	X	X	2.76E-06	1.21E-05	Annual	9.10E-05	No
Indeno(1,2,3-cd)pyrene	X	X	3.56E-08	1.55E-07	Annual	2.00E-06	No
Naphthalene	X	X	2.69E-05	3.70E-05	24-hour	3.33	No
Naphthalene	X	X	5.19E-08	1.18E-09	24-hour	9.10E-05	No
Perylene	X		0.00E+00	0.00E+00	NA	NA	NA
Phenanathrene	X	X	2.78E-06	1.22E-05	Annual	9.10E-05	No
Pyrene	X	X	4.52E-07	1.98E-06	Annual	9.10E-05	No
Polycyclic Organic Matter (POM)	X	X	3.25E-07	1.42E-06	Annual	2.00E-06	No

Total HAPs Emissions: 3.68E-03 2.02E-03 4.88E-04

APPENDIX B – PERMIT FEES

All associated permitting fees were paid when the application was submitted. The total cost of the Concrete Batch General Permit is $1,500. That includes a $1,000 application fee and $500 processing fee.

Per Section 224 of the Rules, all PTC applications are subject to an application fee of $1000.
Per Section 225 of the Rules, General PTC permits are subject to a processing fee of $500. The definition of General permit per the Rules: "no facility-specific requirements (defined as a source category specific permit for which the Department has developed standard emission limitations, operating requirements, monitoring and recordkeeping requirements, and that require minimal engineering analysis. General permit facilities may include portable concrete batch plants, portable hot-mix asphalt plants and portable rock crushing plants.)"

APPENDIX C – AMBIENT AIR QUALITY ANALYSIS

MEMORANDUM

DATE: May 4, 2011

TO: Eric Clark, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT: P-2011.0093 PROJ60831 PTC Application for the Hooker Creek Companies, LLC., portable concrete batch plant

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs)

1.0 Summary

Hooker Creek Companies, LLC (Hooker Creek) submitted a Permit to Construct (PTC) application for their portable concrete batch plant (CBP) proposed to be operated in Idaho. Non-site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with the CBP were performed by DEQ to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]). Hooker Creek submitted applicable information and data enabling DEQ to perform non-site-specific ambient air impact analyses.

DEQ performed non-site-specific air quality impact analyses to assure compliance with air quality standards for the proposed Hooker Creek CBP. Results from DEQ's atmospheric dispersion modeling were used to establish minimum setback distances between emissions points and the ambient air boundary of the site (typically the property boundary of the site). The submitted information, in combination with DEQ's air quality analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted criteria pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at all locations outside of the required setback distance (closest distance from pollutant emissions points to the ambient air boundary); showed that impacts of Toxic Air Pollutants (TAPs) were below applicable increments at all locations outside of the required setback distances. Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information, in combination with DEQ's analyses, 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 CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Maximum concrete throughput does not exceed 1,000 yd^3/day and 150,000 yd^3/year.	Short-term and annual modeling was performed assuming these rates.
Maintain a 189 meter (620 foot) setback distance between emissions points and the nearest ambient air boundary. If generators are not operated the required setback is 56 meters (184 feet).	This setback distance is necessary to assure compliance with applicable air quality standards, primarily 1-hour NO_2 when using diesel-fired generators and 24-hour $PM_{2.5}$ when not using generators.
The CBP will not locate to a site where there are co-contributing emissions sources such as other CBPs, hot mix asphalt plants, or rock crushing plants within 305 meters (1,000 feet) of emissions points, except as noted below for a rock crushing plant. However, NAAQS compliance is assured for the CBP with a co-contributing rock crushing plant, provided it is not operated during any day when the CBP is operated and the annual actual throughput of the rock crushing plant is less than 500,000 ton/year.	Emissions are considered co-contributing if they occur within 305 meters (1,000 feet) of each other. Once the CBP is established at a specific site, that facility is not responsible for controlling other facilities from moving in nearby, provided they are not on the same property. Neighboring facilities moving in after the CBP is established would be required to account for the CBP impacts for their permitting analyses.
DEQ Modeling staff determined that NAAQS compliance is assured for a CBP operating simultaneously (both within a given day) with a crushing plant, provided CBP daily throughput for that day is limited to half that normally allowed.	Decreased CBP throughput will offset potential impacts of a nearby crushing plant.
Diesel engine powering a generator: powered by engine rated at ≤197 bph; is EPA Tier 1 Certified or better; operates up to10 hours/day during daylight hours only.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for this source.
Fugitive emissions from aggregate/sand handling and vehicle traffic are controlled to a moderate degree.	Control of aggregate/sand transfers and handling are controlled by over 75% from base conditions of 1.77% moisture content for aggregate and 4.17% moisture content for sand.
The batch plant may not locate in any non-attainment areas.	All analyses performed assumed the facility will be located in areas attaining air quality standards.
Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	Established setback distances may increase if emissions used in the impact analyses were increased.
Stack heights for the generators, boiler, and baghouses are as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memo.
NAAQS compliance is assured provided stack parameters of exhaust temperature and flow rate are not less than about 75 percent of values listed in this memorandum.	Higher temperatures and flow rates increase plume rise, allowing the plume to disperse to a larger degree before impacting ground level.

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.

2.1.1 Area Classification

The CBP will be a portable facility. The CBP will only locate in areas designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed facility exceed the significant impact levels (SILs) of Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules), then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves 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 2. Table 2 also lists SILs and specifies the modeled value that must be used for comparison to the NAAQS.

New NO_2 and SO_2 short-term standards have recently been promulgated by EPA. The standards became applicable for permitting purposes in Idaho when they were incorporated by reference *sine die* into Idaho Air Rules (Spring 2011). The analyses performed accounted for the new standards.

DEQ used non-site-specific full impact analyses to demonstrate compliance with Idaho Air Rules Section 203.02. Established setback distances are minimal distances between any emissions points and the ambient air boundary (usually the property boundary) needed to assure compliance with standards, considering the impact of the CBP, any co-contributing sources, and a conservative background value.

2.1.3 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 TAPs from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

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

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines T-RACT is used to control emissions of carcinogenic TAPs, then modeled concentrations of 10 times the AACC are considered acceptable, as per Idaho Air Rules Section 210.12.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	Annual	0.3	15[i]	Mean of maximum 1st highest[j]
	24-hour	1.2	35[k]	Mean of maximum 1st highest[j]
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[m]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[m]
Sulfur Dioxide (SO_2)	Annual	1.0	80[n]	Maximum 1st highest[m]
	24-hour	5	365[l]	Maximum 2nd highest[m]
	3-hour	25	1,300[l]	Maximum 2nd highest[m]
	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[n]	Maximum 1st highest[m]
	1-hour	4 ppb[o] (7.5 $\mu g/m^3$)	100 ppb[r] (188 $\mu g/m^3$)	Mean of maximum 8th highest[s]
Lead (Pb)	Quarterly	NA	1.5[n]	Maximum 1st highest[m]
	3-month[t]	NA	0.15[n]	Maximum 1st highest[m]

a. Idaho Air Rules Section 006 (definition for significant contribution).
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers.
f. Never expected to be exceeded more than once in any calendar year.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year average of annual concentration.
j. Mean (of 5 years of data) of the maximum of 1st highest maximum modeled concentrations at any modeled receptor for each year of meteorological data modeled. The monitoring design value is used for background concentrations for $PM_{2.5}$ analyses. This approach is also used for the significant impact analysis.
k. 3-year average of the upper 98th percentile of 24-hour concentrations.
l. Not to be exceeded more than once per year.
m. Concentration at any modeled receptor.
n. Not to be exceeded in any calendar year.
o. Interim SIL established by EPA policy memorandum.
p. 3-year average of the upper 99th percentile of the distribution of maximum daily 1-hour concentrations.
q. Mean (of 5 years of data) of the maximum of 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year average of maximum modeled 1-hour impacts for each year is used.
r. 3-year average of the upper 98th percentile of the distribution of maximum daily 1-hour concentrations.
s. Mean (of 5 years of data) of the maximum of 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year average of maximum modeled 1-hour impacts for each year is used.
t. 3-month rolling average.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for rural Idaho areas for all pollutants except 1-hour NO_2.

Background concentrations, other than $PM_{2.5}$, 1-hour NO_2, and 1-hour SO_2, were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are

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1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review*

available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations in the DEQ non-site-specific analyses were based on DEQ default values for rural/agricultural areas for all pollutants except for $PM_{2.5}$ and 1-hour averaged NO_2.

Background $PM_{2.5}$ concentrations were based on monitoring performed in Idaho for small town or rural areas. Certain areas with elevated concentrations because of unique situations were excluded from this assessment. Unique situations include periodic impacts from forest fires and areas where the meteorology combines with the topography to frequently cause stagnant air conditions. The monitoring 24-hour design value was used for each location where monitoring data were considered. The design value is the 98^{th} percentile of the 24-hour monitored values. Where more than one year of monitoring data were available, the average of the 98^{th} percentile value was used for up to three of the most recent years.

The final 24-hour background value used was the mean value from all locations assessed. The same general method was used for the annual $PM_{2.5}$ background, except the design value is the maximum annual average monitored value and the background was taken as the mean of all locations plus two times the standard deviation. A value of two times the standard deviation was not added to the 24-hour mean value. DEQ determined use of the mean value was adequately conservative because: 1) the maximum modeled value at each receptor was used as the design value rather than the 5-year average of the 8^{th} highest for each year; 2) the low probability that conditions causing the high background levels on a given day will coincide with days associated with the high modeled concentrations.

Background concentrations for 1-hour NO_2 were based on monitoring data collected between January 2009 and June 2010, in Meridian, Idaho. A separate background value was used for each hour of the day, based on the 2^{nd} highest value monitored for that hour. Hourly 1-hour NO_2 background concentrations are given in Table 4.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
$PM_{2.5}$[c]	24-hour	21.3
	Annual	10.1
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	1-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Dispersion Modeling. Memorandum to Mary Anderson, March 14, 2003.

Table 4. BACKGROUND 1-HOUR NO_2 CONCENTRATIONS					
Hour	Concentration ($\mu g/m^3$)[a]	Hour	Concentration ($\mu g/m^3$)[a]	Hour	Concentration ($\mu g/m^3$)[a]
1	50.0	9	54.9	17	58.4
2	49.8	10	51.5	18	61.8
3	45.7	11	54.9	19	70.4
4	48.4	12	48.1	20	85.9
5	56.7	13	41.2	21	84.1
6	54.9	14	44.6	22	75.5
7	56.7	15	48.1	23	63.5
8	63.5	16	48.1	24	49.8

a. 2[nd] highest monitored value, in micrograms per cubic meter, over the monitored period was used for each hour.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 Overview of Analyses

The proposed project is a portable CBP, including the use of portable diesel-fired generators.

Because of the portable nature of the CBP, DEQ performed non-site-specific modeling to establish setback distances between locations of emissions points and the ambient air boundary of the CBP. Setback distances were established for two scenarios: 1) the CBP operating with diesel generators providing power; 2) the CBP operating without diesel generators.

DEQ performed non-site-specific analyses that were determined to be reasonably representative of the proposed CBP, and the results demonstrated compliance with applicable air quality standards to DEQ's satisfaction, provided the established setback distances are maintained.

Table 5 provides a brief description of parameters used in the DEQ modeling analyses.

Table 5. MODELING PARAMETERS		
Parameter	Description/Values	Documentation/Addition Description[a]
General Facility Location	Portable	Can only locate in attainment or unclassifiable areas.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 09292.
Meteorological Data	Multiple Data Sets	See Section 3.1.4.
Terrain	Flat	The analyses assumed flat terrain for the immediate area.
Building Downwash	Considered	Downwash was accounted for the generator structures and a trailer mounted office.
Receptor Grid	Grid 1	5-meter spacing along the property boundary out 100 meters.
	Grid 2	10-meter spacing out to 200 meters.

3.1.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ staff performed non-site-specific air quality impact analyses rather than the applicant. The portable nature of the CBP dictated the non-site-specific methods, with results used to establish setback distances between locations of emissions points and the ambient air boundary for the plant. Non-site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline*.

3.1.3 Model Selection

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

AERMOD 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 affects on dispersion
- New vertical profiles of wind, turbulence, and temperature

AERMOD was used for the DEQ analyses to evaluate impacts of the CBP.

AERMOD did not have a post processor to calculate the 1-hour NO_2 design value at the time these analyses were performed. The modeling design value for each modeled receptor is the 5-year mean of the 98^{th} percentile of maximum daily 1-hour NO_2 concentrations. To enable the design value to be calculated, DEQ set AERMOD to write post files of 1-hour concentrations for each hour and each receptor. DEQ then ran the NO_2 post processor NO2Post, available from Oris BEE-Line software, to calculate design values for each receptor location.

DEQ also set AERMOD to use the Plume Volume Molar Ratio Method (PVMRM) program to better account for NO/NO_2/ozone chemistry. Section 3.1.4 provides a description of parameters and data used for PVMRM.

3.1.4 Data and Parameters used for Modeling 1-Hour NO_2 with PVMRM

PVMRM was used with AERMOD to provide a more refined estimate of 1-hour NO_2 concentrations at specific receptors. Table 6 lists the data and parameters used for PVMRM. Hourly ozone data were used in PVMRM to estimate the conversion of NO to NO_2. Ozone data from the 2007 study, *Ozone and its Precursors in the Treasure Valley, Idaho,* were used for modeling (Final Report, May 2008, Desert Research Institute). Hourly data from Parma, Idaho, were collected from June 27, 2007 through October 12, 2007. These data were sorted by hour and then the mean and 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 used as input to PVMRM. This method is reasonably conservative because it does not account for seasonal variation in ozone concentrations, and the Parma data were collected during the time of year when maximum ozone concentrations are expected.

An NO_2/NOx ratio for NOx emissions is also used in PVMRM. NO_2/NOx ratios for the generator engines were calculated using a method established in Texas Natural Resource Conservation Commission (TNRCC) rules for Permits by Rule for Turbines and Engines (Chapter 106, subchapter W, §106.511, §106.512).

Table 6. PARAMETERS AND DATA FOR PVMRM		
Parameter	**Value**	**Source/Comments**
NO_2/NOx ratio for Emissions	0.223 for 197 bhp engine; 0.2 for boiler	Based on guidance from Texas.
Ambient Equilibrium for NO_2/NOx	0.90	Default value.
Ozone Concentrations	Value specified for each hour modeled	Based on values from Parma, Idaho, during a 2007 ozone study.

3.1.5 Meteorological Data

Because of the portable nature of CBPs, DEQ used seven different meteorological datasets from various locations in Idaho to assure compliance with applicable standards for the non-site-specific analyses. Table 7 lists the meteorological datasets used in the air impact analyses.

Table 7. METEOROLOGICAL DATA SETS USED IN MODELING ANALYSES		
Surface Data	**Upper Air Data**	**Years**
Boise	Boise	2001-2005
Aberdeen	Boise	2001-2005
Idaho Falls	Boise	2000-2004
Minidoka	Boise	2000-2004
Soda Springs	Boise	2004-2008
Lewiston	Spokane, Wa	1992-1995, 1997
Sandpoint	Spokane, Wa	2002-2006

Use of representative meteorological data is of greater concern when using AERMOD than when using ISCST3. This is because AERMOD uses site-specific surface characteristics to more accurately account for turbulence. To account for this uncertainty, the following measures were taken:

- Use the maximum of 2^{nd} high modeled concentration to evaluate compliance with the 24-hour PM_{10} standard, rather than the maximum of 6^{th} high modeled concentration typically used when modeling a five-year meteorological dataset to demonstrate that the standard will not be exceeded more than once per year on average over a three year period.

- Use the maximum of 1^{st} high modeled concentration to evaluate compliance with all pollutants and averaging times, except for 24-hour PM_{10} and 1-hour NO_2.

- The standard design value was used for 1-hour NO_2. The design value is the 5-year average of the 98^{th} percentile of the annual distribution of maximum 1-hour modeled concentrations. The background NO_2 concentrations were conservatively based on monitoring data collected from Meridian, Idaho, near an interstate highway.

3.1.6 Terrain Effects

Terrain effects on dispersion were not considered in the non-site-specific analyses. Assuming flat terrain is not a critical limitation of the analyses because most emissions points associated with CBPs are near ground-level and the immediate surrounding area is typically flat for dispersion modeling purposes. Emissions sources near ground-level typically have maximum pollutant impacts near the source, minimizing the potential affect of surrounding terrain to influence the magnitude of maximum modeled impacts.

3.1.7 Facility Layout

DEQ's analyses used a conservative generic facility layout. This was done because the specific layout will vary depending upon product needs and specific characteristics of the site and equipment. To provide conservative results, DEQ used a tight grouping of emissions sources. Sources were positioned within 2.5 meters of the center of the facility.

3.1.8 Building Downwash

Potential downwash effects were accounted for by assuming the presence of a trailer-mounted office, represented in the model by a 6 meter by 6 meter structure, 4.1 meters high. Downwash effects caused by the generator housing were accounted for by including the generator structure as a building with dimensions of 3.0 meter by 2.0 meter by 2.0 meter high.

Downwash effects from other structures at the site were not accounted for because of the following:

- Determining a building configuration is extremely difficult given the portable nature of the facility.
- Much of the equipment is porous with regard to wind, thereby minimizing downwash effects.

3.1.9 Ambient Air Boundary

DEQ's non-site-specific analyses, using a generic facility layout, were used to generate minimum setback distances between emissions points and the property boundary or the established boundary to ambient air (if not the same as the property boundary). Ambient air is any area where the general public (anyone not under direct control of the plant) has access. The issued permit will specify throughput restrictions and an emissions point setback from ambient air.

3.1.10 Receptor Network and Generation of Setback Distances

Setback distances were determined by first modeling the plant using a dense receptor grid. Results were then reviewed to find the receptor furthest from any emissions source that shows an exceedance of the standard when combined with a background value. The setback distance was calculated as the maximum distance between the next furthest receptor and any emissions point.

A circular grid with 5.0 meter receptor spacing, extending out to at least 100 meters, was used in the non-site-specific modeling performed by DEQ. To establish a setback distance, the following procedure was followed for the requested production level and operational configuration:

1) Trigger values for the modeling analyses were determined. These are values, when combined with background concentrations, indicated an exceedance of a standard. They were calculated

by subtracting the background value from the standard (because the model does not specifically include background in the results). The following are trigger values:

PM_{10}	24-hour	77 $\mu g/m^3$
$PM_{2.5}$	24-hour	13.7 $\mu g/m^3$
	annual	4.9 $\mu g/m^3$
SO_2	1-hour	162 $\mu g/m^3$
	24-hour	339 $\mu g/m^3$
	annual	72 $\mu g/m^3$
CO	1-hour	36400 $\mu g/m^3$
	8-hour	7700 $\mu g/m^3$
NO_2	1-hour	variable background value
	annual	83 $\mu g/m^3$

Background values that vary by hour of day were used for 1-hour NO_2 modeling. Background was added to NO_2 modeling values within the NO2POST program, so final concentration values included background. Therefore, the trigger value used for 1-hour NO_2 was the 188 $\mu g/m^3$ standard.

2) For the operational configuration, pollutant, averaging period, and meteorological data set, all receptors with concentrations equal or greater than the trigger value were plotted. This effectively gave a plot of receptors where the standard could be exceeded for that pollutant and averaging period.

3) The controlling receptor for each pollutant, averaging period, and meteorological data set was identified. First, the receptor having a concentration in excess of the trigger value that was the furthest from any emissions source was identified. The controlling receptor was the next furthest downwind receptor from that point.

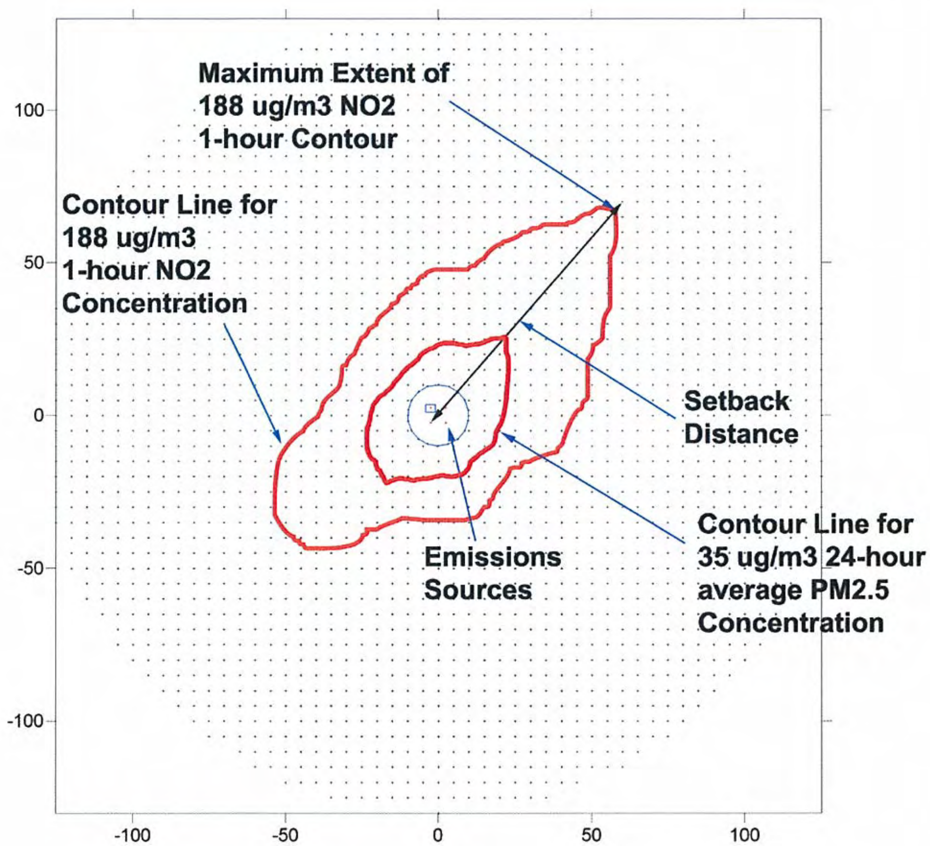
4) The minimum setback distance was calculated. This was the furthest distance between an emissions point and the controlling receptor.

Figure 1 shows an example of how setback distances are determined for a specific modeling run. Emissions points are grouped in a cluster at the center within a 5.0 meter square area. The inner contour line shows the extent of modeled concentrations exceeding the 24-hour $PM_{2.5}$ NAAQS. The outer-most contour line shows modeled 1-hour NO_2 design value concentrations that exceed the NAAQS. The point on the contour line that is the furthest from the emissions points is identified, and then the controlling receptor is identified as the next furthest receptor beyond that point. The setback distance is determined from the coordinates of the controlling receptor according to the following (with the center of the emissions sources group at 0.0 m Northing and 0.0 m Easting):

$$\text{Distance} = \sqrt{\left(\left|\text{Northing Coordinate}\right| + 3\right)^2 + \left(\left|\text{Easting Coordinate}\right| + 3\right)^2}$$

The factor of 3 in the equation accounts for an emissions point located on the opposite side of the facility center from where the maximum impact is (at -2.5 meters Easting, -2.5 meters Northing if the maximum setback distance is in the direction of positive easting and northing coordinates).

Figure 1 - Determination of Setback Distance for a Modeling Run



3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs were calculated for the proposed CBP production rate and operational configuration for various applicable averaging periods.

3.2.1 Criteria Pollutant Emissions Rates

Table 8 lists criteria pollutant emissions rates used in the DEQ non-site-specific modeling analyses for the CBP production rate, operational configuration, and for all applicable averaging periods. Attachment 1 provides additional details of DEQ emissions calculations used in the modeling analyses.

Fugitive particulate emissions from handling of aggregate materials for the CBP plant were designated as emissions point AGG&SND and AGGTOSTO in the model to account for transfers at near ground-level and transfers to elevated storage, respectively. Two ground-level transfers were included for the source: 1) transfer of aggregate and sand from truck unloading to a storage pile; 2) transfer of aggregate and sand from the storage pile to a hopper. One transfer was included for aggregate and sand transfer to elevated storage. Emissions rates are a function of wind speed and were varied in the model according to wind speed. Attachment 1 provides details on emissions calculations for wind speed categories.

Table 8. EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr)
			130 cy/hr[a] 1,000 cy/day 150,000 cy/yr
NGBOILER – propane boiler ≤ 3.8 MMbtu/hr	PM_{10}/ $PM_{2.5}$	24-hour	0.02831[b]
		Annual	0.001551[b]
	CO	1-hour 8-hour	0.3129
	SO_2	1-hour	0.002235
		24-hour	0.002235[b]
		Annual	0.0001225[b]
	NOx	1-hour	0.3726[b]
		Annual	0.02041[b]
SILO – cement storage silo	$PM_{2.5}$	24-hour	0.001519
		Annual	0.0006243
	PM_{10}	24-hour	0.003478
SUPSILO – cement supplement storage silo	$PM_{2.5}$	24-hour	0.002030
		Annual	0.0008344
	PM_{10}	24-hour	0.007454
WEIGHOP – aggregate weigh hopper loading. - controlled by baghouse	$PM_{2.5}$	24-hour	0.0002493
		annual	0.0001025
	PM_{10}	24-hour	0.001646
TRUCKLOD – truck loadout. - controlled by boot	$PM_{2.5}$	24-hour	0.02938
		Annual	0.01208
	PM_{10}	24-hour	0.06714
GEN1 – electrical generator - 197 hp diesel engine - 10 hr/day, 600 hr/yr - 0.0015% sulfur diesel - Tier 1 certified	$PM_{2.5}$	24-hour	0.1749[b]
		Annual	0.02875[b]
	PM_{10}	24-hour	0.1749[b]
	CO	1-hour 8-hour	3.692[b]
	SO_2	1-hour	0.002391[b]
		24-hour	0.002391[b]
		Annual	0.0003930[b]
	NOx	1-hour	2.980[b]
		Annual	0.4899[b]
AGG&SAND[b] – aggregate/sand handling at ground level	$PM_{2.5}$	24-hour	0.01185
		Annual	0.004869
	PM_{10}	24-hour	0.07824
AGGTOSTO[b] – aggregate/sand to elevated storage	$PM_{2.5}$	24-hour	0.005923
		Annual	0.002434
	PM_{10}	24-hour	0.03912

a. Cubic yards of concrete per hour, day, or year.

b. Emissions modeled for 10 hours/day. Emissions rate for annual modeling calculated by dividing annual emissions by 3,650 hr/yr (10 hr/day for 365 day/yr).

b. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

3.2.2 TAP Emissions Rates

Operation of the proposed CBP will result in an increase in allowable emissions of TAPs. Table 9 lists the increase in TAPs for the proposed plant. Table 10 is a summary of TAP emissions and a comparison to the applicable ELs. Modeling was required for arsenic and chromium 6+ since emissions exceeded the ELs.

Table 9. TAP EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions for 150,000 ton HMA/yr (lb/hr)**
NGBOILER – propane boiler < 3.8 MMbtu/hr	Arsenic	period	4.082E-8[a]
	Cadmium	period	2.245E-7[a]
	Chromium 6+	period	0.0[a]
	Nickel	period	4.286E-7[a]
	Benzene	period	4.286E-7[a]
	Formaldehyde	period	1.531E-5[a]
	POM	period	2.327E-9[a]
	PAH (naphthalene)	period	1.228E-7[a]
SILO – cement storage silo	Arsenic	period	1.782E-8[b]
	Cadmium	period	2.043E-9[b]
	Nickle	period	1.757E-7[b]
	Chromium 6+	period	2.438E-8[b]
SUPSILO – cement supplement storage silo	Arsenic	period	6.250E-7[b]
	Cadmium	period	1.238E-8[b]
	Nickle	period	1.425E-6[b]
	Chromium 6+	period	2.288E-7[b]
TRUCKLOD – truck loadout. - controlled by boot	Arsenic	period	7.342E-7[b]
	Cadmium	period	8.257E-9[b]
	Nickle	period	2.873E-6[b]
	Chromium 6+	period	5.861E-7[b]
GEN[b] – electrical generator	Benzene	period	2.115E-4[c]
	Formaldehyde	period	2.676E-4[c]
	POM	period	7.783E-7[c]
	PAH (naphthalene)	period	1.922E-5[c]

a. Based on 200 hr/yr operation. Modeled for 10 hr/day, 365 day/yr. Calculated by multiplying lb/hr value in DEQ CBP spreadsheet (based on annual emissions divided by 8760 hr/yr) by 24 hr / 10 hr.

b. Based on allowable throughput of 150,000 cy/year.

c. Based on 600 hr/yr operation (daytime 10 hr/day operation only). Calculated by multiplying lb/hr value in DEQ CBP spreadsheet by 24 hr / 10 hr.

Table 10. SUMMARY OF FACILITY-WIDE TAP EMISSIONS USED FOR MODELING				
TAP	**Averaging Period**	**Emissions**	**EL**	**Modeling Required (> EL)**
Arsenic	period	1.4E-6	1.5E-6	No
Benzene	period	8.8E-5	8.0E-4	No
Cadmium	period	1.2E-7	3.7E-6	No
Chromium 6+	period	8.4E-7	5.6E-7	Yes
Formaldehyde	period	1.2E-4	5.1E-4	No
Nickel	period	4.7E-6	2.7E-5	No
PAH(naphthalene)	period	8.1E-6	9.1E-5	No
POM	period	3.3E-7	2.0E-6	No

a. Emissions for NGBOILER and GEN based on annual average value (value in Table 9 multiplied by 10 hr / 24 hr).

3.3 Emission Release Parameters and Plant Criteria

Table 11 lists the characteristics of the Hooker Creek CBP used in DEQ's non-site-specific air impact analyses.

Table 12 provides emissions release parameters for the analyses including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1.

Table 11. CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES

Parameter	Value or Description
Concrete Throughput Rates	130 cy/hr, 1,000 cy/day, 150,000 cy/yr
Co-Contributing Sources	The emissions points of the CBP are not located within 1,000 feet of other permittable emissions sources. A rock crushing plant could be operated at the site provided it is not operated during any day when the CBP is operated and annual throughput is less than 500,000 ton/yr. Alternatively, a rock crusher could be operated simultaneously (both operating in a given day) with the CBP provided the CBP throughput for that day does not exceed a value of half that otherwise allowed.
Cement and Supplement Storage Silo	Emissions captured and controlled by a baghouse
Silo Stack Parameters	Stack height $\geq$5.0 m, stack diameter $\approx$ 1 m.
Aggregate Weigh Hopper Loading Stack Parameters	Stack height $\geq$3.0 m, stack diameter $\approx$ 1 m.
Hot Water Boiler	Stack height $\geq$5.0 m, stack diameter $\approx$ 0.3 m, gas temp $\geq$450 K, flow velocity $\geq$10.5 m/sec.
Electrical Power	Line power or diesel-fired generators with the following characteristics: 1) a generator powered by an engine less than 197 bhp, EPA Tier 1 Certified, burning 0.0015% sulfur fuel, operating less than 10 hr/day during daylight hours only. Other generators or combination of generators can be used provided emissions are not greater than those modeled for these sources.
Generator Stack Parameters	Stack height $\geq$4.6 m, stack diameter $\approx$ 0.13 m, gas temp $\geq$734 K, flow velocity $\geq$45 m/sec.
Frontend Loader Transfers at ground level	$\leq$2 transfers for any given quantity of material processed. Typically involves: 1) aggregate and sand to storage pile; 2) aggregate and sand from pile to hopper. Assume a moderate level of emissions control.
Aggregate/Sand Transfers to Elevated Storage	$\leq$1 transfers for any given quantity of material processed. Assume a moderate level of emissions control.

3.4 Results for Cumulative NAAQS Impact Analyses and TAPs Analyses

DEQ determined required setback distances from the non-site-specific modeling results for each proposed operating scenario, criteria pollutant and TAP, and averaging period. Setback distances are the closest distance between the ambient air boundary and the emissions release point of any emissions source (silo baghouse vent, weigh hopper loading baghouse stack, boot controlled truck loadout, boiler stack, or aggregate bins). Setback distances to assure compliance with 1-hour NO_2 were by far the most controlling for the scenario of operating diesel generators, with a 189 meter setback needed. When diesel generators are not operated at the CBP site, a setback of only 56 meters is needed to assure compliance, with 24-hour $PM_{2.5}$ driving the result. Attachment 2 provides a summary of setback distances for specific pollutants and meteorological datasets.

Table 12. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	**Source Type**	**Stack Height (m)**[a]	**Modeled Diameter (m)**	**Stack Gas Temp. (K)**[b]	**Stack Gas Flow Velocity (m/sec)**[c]
NGBOILER	Point	5.0	0.3	450	10.5
SILO	Point	5.0	1.0	Ambient	0.001[d]
SUPSILO	Point	5.0	1.0	Ambient	0.001[d]
WEIGHOP	Point	3.0	1.0	Ambient	0.001[d]
GEN1	Point	4.57	0.126	734	44.6
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
AGG&SAND	Volume	2.0	2.33	0.70	
AGGTOSTO	Volume	5.0	1.40	1.91	
TRUCKLOD	Volume	5.0	1.40	1.91	

a. Meters
b. Kelvin
c. Meters per second
d. Set at 0.001 to minimize plume vertical momentum because of a raincapped or horizontal release.

3.5 Locating with Other Facilities/Equipment

The air impact analyses performed by DEQ assume there are no other emissions sources in the immediate area that measurably contribute to pollutant concentrations in a way not adequately accounted for by the background concentrations used. Such emissions sources could include a rock crushing plant, a hot mix asphalt plant, another CBP, or other permitted facility. DEQ modeling staff established a rule-of-thumb distance of 1,000 feet from emissions sources at the CBP where emissions from a nearby facility would need to be considered in the air impact analyses for the CBP. Emissions sources located beyond 1,000 feet are considered to be too distant to have a measureable impact on receptors substantially impacted by the CBP.

CBPs commonly co-locate with rock crushing plants. Since the 1-hour NO_2, followed by 24-hour PM_{10} and $PM_{2.5}$ impacts, are the governing criteria for the Hooker Creek CBP (governing for criteria pollutants – contributions of TAPs from other facilities are not considered in permitting analyses for the CBP), simultaneously operation on an annual basis is not a large concern. DEQ modeling staff determined NAAQS compliance is still assured when a rock crushing plant co-locates with the CBP, provided the CBP does not operate during any day when the rock crushing plant is operating and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons. DEQ modeling staff also determined NAAQS compliance is assured when operating the CBP during the same day as the rock crushing plant, provided the throughput of the CBP is half that assumed for the modeling analyses used to generate setback distances for the scenario of no co-location.

4.0 Conclusions

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

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

CBP Modeled Emissions Rates

Setback requirements are linked to throughput levels and the equipment configuration.

Power Generator

The application indicated a diesel engine may be operated at the CBP to power electrical generators: 1) an EPA Tier 1 certified 197 bhp diesel engine operating up to 10 hr/day during daylight hours only. Emissions estimates were calculated assuming the engine will combust diesel with a maximum 0.0015% sulfur content. Emissions were modeled as occurring only between 6 am and 6 pm; 0.0 lb/hr was modeled for other time periods.

Emissions for 197 bhp Tier 1 EPA Certified diesel engine: $PM_{2.5}$, PM_{10}, and NOx emissions based on emissions standards in 40 CFR 85:

PM assumed to be equal to $PM_{2.5}$ and PM_{10}, 130 ≤ kW ≤ 560, PM = 0.54 g/kW-hr

hourly

$$\frac{0.54\text{ g } PM_{10}, PM_{2.5}}{\text{kW - hr}} \times \frac{\text{kW}}{1.341\text{ hp}} \times 197\text{ hp} \times \frac{\text{lb}}{453.59\text{ g}} = \frac{0.1749\text{ lb}}{\text{hr}}$$

annual

$$\frac{0.1749\text{ lb } PM_{10}, PM_{2.5}}{\text{hr}} \times \frac{600\text{ hr}}{3650\text{ hr}} = \frac{0.02875\text{ lb}}{\text{hr}}$$

NOx equal to, 130 ≤ kW ≤ 225, NOx = 9.2 g/kW-hr

hourly

$$\frac{9.2\text{ g NOx}}{\text{kW - hr}} \times \frac{\text{kW}}{1.341\text{ hp}} \times 197\text{ hp} \times \frac{\text{lb}}{453.59\text{ g}} = \frac{2.980\text{ lb}}{\text{hr}}$$

annual

$$\frac{2.980\text{ lb NOx}}{\text{hr}} \times \frac{600\text{ hr}}{3650\text{ hr}} = \frac{0.4899\text{ lb}}{\text{hr}}$$

SO_2 emissions are based on the sulfur content of the fuel and were calculated according to the factor in Table 3.4-1 of AP-42: 8.09E-3S lb SO_2 / hp-hr, where S is the percent sulfur in the fuel

hourly

$$\frac{8.09\text{E-3 } (0.0015)\text{ lb}}{\text{hp - hr}} \times 197\text{ hp} = \frac{0.002391\text{ lb}}{\text{Hr}}$$

annual

$$\frac{0.002391\text{ lb } SO_2}{\text{hr}} \times \frac{600\text{ hr}}{3650\text{ hr}} = \frac{0.0003930\text{ lb}}{\text{hr}}$$

Aggregate and Sand Handling Emissions

Emissions from aggregate and sand handling were calculated for the following transfers: 1) ground level transfers including transfers to a storage pile and transfers to the CBP hopper; 2) transfers to elevated storage.

PM_{10} and $PM_{2.5}$ emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

$$E = k(0.0032)\left[\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\right] \quad \text{lb/ton}$$

Where:

k	=	0.35 for PM_{10} and 0.053 for $PM_{2.5}$
M	=	1.77% for aggregate and 4.17% for sand
U	=	wind speed (mph)

In the model, emissions are varied as a function of windspeed, with the base emissions entered for a windspeed of 10 mph.

upper windspeeds for 6 categories: 1.54, 3.09, 5.14, 8.23, 10.8 m/sec

Median windspeed for each category (1 m/sec = 2.237 mph)

Cat 1: (0 + 1.54)/2 = 0.77 m/sec ➤ 1.72 mph
Cat 2: (1.54 + 3.09)/2 = 2.32 m/sec ➤ 5.18 mph
Cat 3: (3.09 + 5.14)/2 = 4.12 m/sec ➤ 9.20 mph
Cat 4: (5.14 + 8.23)/2 = 6.69 m/sec ➤ 14.95 mph
Cat 5: (8.23 + 10.8)/2 = 9.52 m/sec ➤ 21.28 mph
Cat 6: (10.8 + 14)/2 = 12.4 m/sec ➤ 27.74 mph

Base $PM_{2.5}$ factor for aggregate – use 10 mph wind:

$$0.053\,(0.0032)\frac{(10/5)^{1.3}}{(1.77/2)^{1.4}} = 4.955\ E-3 \quad \text{lb/ton}$$

PM_{10} emissions were calculated in the same manner but are not presented here.

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (2.012 E-4) = 5.026 E-5 lb/ton
Factor = 5.026 E-5 / 4.955 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (2.012 E-4) = 2.107 E-4 lb/ton
Factor = 2.107 E-4 / 4.955 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (2.012 E-4) = 4.446 E-4 lb/ton
Factor = 4.446 E-4 / 4.955 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (2.012 E-4) = 8.358 E-4 lb/ton
Factor = 8.358 E-4 / 4.955 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (2.012 E-4) = 1.323 E-3 lb/ton
Factor = 1.323 E-3 / 4.955 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (2.012 E-4) = 1.867 E-3 lb/ton
Factor = 1.867 E-3 / 4.955 E-4 = 3.768

1 yd^3 of concrete ≈ 4024 lbs, consisting of:

1865 lbs aggregate
1428 lbs sand
491 lbs cement
73 lbs supplement
20 gal of water

Fraction of aggregate = 1865 lb / 4024 lb = 0.4635

Base $PM_{2.5}$ factor for aggregate in terms of lb/yd^3

$$\frac{4.955\text{ E-4 lb }PM_{2.5}}{\text{ton}} \times \frac{0.4635\text{ ton agg}}{\text{ton concrete}} \times \frac{\text{ton}}{2000\text{ lb}} \times \frac{4024\text{ lb conc.}}{yd^3} = \frac{4.621\text{ E-4 lb }PM_{2.5}}{yd^3}$$

Assume moderate fugitive dust controls reduce emissions by an additional 75%.
Base controlled PM_{10} factor in terms of lb/yd^3

$$\frac{4.621\text{ E-4 lb }PM_{2.5}}{yd^3} \times (1-0.75) = \frac{1.155\text{ E-4 lb }PM_{2.5}}{yd^3}$$

Using the same process for sand handling, the $PM_{2.5}$ controlled emissions factor is 2.665 E-5 lb $PM_{2.5}$/yd^3

There are two ground level transfers of aggregate and sand: 1) transfer to a storage pile; 2) transfer from a pile to the hopper.

For the operational scenario for 1,000 cy/day concrete and 150,000 cy/year concrete, $PM_{2.5}$ emissions from aggregate and sand transfers at ground level are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \times \frac{2\text{ transfers}}{} \times \frac{1000\ yd^3}{\text{day}} \times \frac{\text{day}}{24\text{ hour}} = \frac{0.01185\text{ lb }PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \times \frac{2\text{ transfers}}{} \times \frac{150000\ yd^3}{\text{year}} \times \frac{\text{year}}{8760\text{ hour}} = \frac{0.004869\text{ lb }PM_{2.5}}{\text{hr}}$$

These sources were modeled as a single volume source with a 10-meter square area, 3.0 meters thick, with a release height of 2.0 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 10 m / 4.3 = 2.33 m

σ_{zo} = 3 m / 4.3 = 0.7 m

There is one elevated transfer of aggregate and sand: 1) transfer to elevated storage bin.

For the operational scenario for 1,000 cy/day concrete and 150,000 cy/year concrete, emissions from aggregate and sand transfers to elevated storage are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-3 lb}}{yd^3\text{ - transfer}} \times \frac{1\text{ transfers}}{} \times \frac{1000\ yd^3}{\text{day}} \times \frac{\text{day}}{24\text{ hour}} = \frac{0.005923\text{ lb }PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$:

1.155 E-4 lb + 2.665 E-5 lb	1 transfers	150000 yd^3	year	=	0.002434 lb $PM_{2.5}$
yd^3 - transfer		year	8760 hour		hr

These sources were modeled as a single volume source on or adjacent to a 6-meter square building, 4.1 meters high (corresponding approximately to two trailer-mounted offices, with a release height of 5.0 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 6 m / 4.3 = 1.40 m

σ_{zo} = 4.1 m / 2.15 = 1.91 m

Truck Loading

Base PM_{10} factor: 0.278 lb PM_{10} / ton - uncontrolled
Base $PM_{2.5}$ factor: 0.050 lb $PM_{2.5}$ / ton - uncontrolled
DEQ permitting staff assume 95% control by a well designed boot

Fraction of cement and supplement = (491 lb + 73 lb) / 4024 lb = 0.1402

Base uncontrolled $PM_{2.5}$ factor in terms of lb/yd^3

0.050 lb $PM_{2.5}$	0.1402 ton cem/sup	ton	4024 lb conc.	=	1.410 E-2 lb $PM_{2.5}$
ton	ton concrete	2000 lb	yd^3		yd^3

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

1.410 E-2 lb $PM_{2.5}$	(1-0.95)	=	7.052 E-4 lb $PM_{2.5}$ for boot system
yd^3			yd^3

Daily $PM_{2.5}$ Emissions

7.052 E-4 lb $PM_{2.5}$	1000 yd^3	day	=	0.02938 lb $PM_{2.5}$
yd^3	day	24 hour		hr

Annual $PM_{2.5}$ Emissions

7.052 E-4 lb $PM_{2.5}$	150,000 yd^3	yr	=	0.01208 lb $PM_{2.5}$
yd^3	yr	8760 hr		hr

Weigh Hopper Loading

Base PM_{10} factor: 0.0024 lb PM_{10} / ton uncontrolled
$PM_{2.5}$ base factor of 3.634 E-4 lb/ton uncontrolled based on $PM_{2.5}$/PM_{10} ratio of k factors in material handling equation.
Assume controls to reduce emissions by 99% and vent to atmosphere through stack

Fraction of aggregate and sand = (1865 lb + 1428 lb) / 4024 lb = 0.8183

Base uncontrolled $PM_{2.5}$ factor in terms of lb/yd^3

3.634 E-4 lb $PM_{2.5}$	0.8183 ton agg/sand	ton	4024 lb conc.	=	5.984 E-4 lb $PM_{2.5}$
ton	ton concrete	2000 lb	yd^3		yd^3

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

5.984 E-4 lb $PM_{2.5}$	(1-0.99)	=	5.984 E-6 lb $PM_{2.5}$
yd^3			yd^3

Daily $PM_{2.5}$ Emissions

5.984 E-6 lb $PM_{2.5}$	1000 yd^3	day	=	2.493 E-4 lb $PM_{2.5}$
yd^3	day	24-hour		hr

Annual $PM_{2.5}$ Emissions

5.984 E-6 lb $PM_{2.5}$	150,000 yd^3	yr	=	1.025 E-4 lb $PM_{2.5}$
yd^3	yr	8760 hr		hr

Loading of Cement Silo

Base PM_{10} factor of 0.00034 lb/ton for operations controlled by a fabric filter.

A $PM_{2.5}$ factor of 1.485E-4 lb/ton was calculated based on the assumption that 15% of PM emissions are $PM_{2.5}$. (0.00099 lb/ton)(0.15) = 1.485E-4 lb/ton

Fraction of cement = 491 lb / 4024 lb = 0.1220

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

1.485E-4 lb $PM_{2.5}$	0.1220 ton cement	ton	4024 lb conc.	=	3.646 E-5 lb $PM_{2.5}$
ton	ton concrete	2000 lb	yd^3		yd^3

Daily $PM_{2.5}$ Emissions

3.646 E-5 lb $PM_{2.5}$	1000 yd^3	day	=	0.001519 lb $PM_{2.5}$
yd^3	day	24-hour		hr

Annual $PM_{2.5}$ Emissions

3.646 E-5 lb $PM_{2.5}$	150,000 yd^3	yr	=	0.0006243 lb $PM_{2.5}$
yd^3	yr	8760 hr		hr

Loading of Cement Supplement Silo

Base PM_{10} factor of 0.0049 lb/ton for operations controlled by a fabric filter.

A $PM_{2.5}$ factor of 0.001335 lb/ton was calculated based on the assumption that 15% of PM emissions are $PM_{2.5}$. (0.0089 lb/ton)(0.15) = 0.001335 lb/ton

Fraction of supplement = 73 lb / 4024 lb = 0.01814

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{0.001335 \text{ lb } PM_{2.5}}{\text{ton}} \left| \frac{0.01814 \text{ ton cement}}{\text{ton concrete}} \right| \frac{\text{ton}}{2000 \text{ lb}} \left| \frac{4024 \text{ lb conc.}}{yd^3} \right. = \frac{4.873 \text{ E-5 lb } PM_{2.5}}{yd^3}$$

Daily $PM_{2.5}$ Emissions

$$\frac{4.873 \text{ E-5 lb } PM_{2.5}}{yd^3} \left| \frac{1000 \, yd^3}{\text{day}} \right| \frac{\text{day}}{\text{24-hour}} = \frac{0.002030 \text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$ Emissions

$$\frac{4.873 \text{ E-5 lb } PM_{2.5}}{yd^3} \left| \frac{150{,}000 \, yd^3}{\text{yr}} \right| \frac{\text{yr}}{8760 \text{ hr}} = \frac{0.0008344 \text{ lb } PM_{2.5}}{\text{hr}}$$

Natural Gas Boiler

Hot water boiler fueled by natural gas: 3.8 MMbtu/hr. Emissions calculated from DEQ CBP spreadsheet.

CBP Modeling Parameters

Cement and Supplement Silo Filling Baghouse Stacks

Release height = 5.0 meters; effective diameter of release area = 1.0 meters; typical stack gas temperature = ambient; typical flow velocity = 0.001 meters/second (set to minimize plume momentum for horizontal or capped release).

Weigh Hopper Baghouse Stack

Release height = 3.0 meters; effective diameter of release area = 1.0 meters; typical stack gas temperature = ambient; typical flow velocity = 0.001 meters/second (set to minimize plume momentum for horizontal or capped release).

Truck Loadout

Modeled as a volume source released at 5.0 meters adjacent to a building 6 meters X 6 meters, 4.1 meters high representing a trailer-mounted office.

Initial dispersion coefficients:

σ_{y0} = 6 m / 4.3 = 1.40 m

σ_{z0} = 4.1 m / 2.15 = 1.91 m

Aggregate/Sand Transfers at Ground Level

Release emissions in model from a 10 m X 10 m area 3 m high, released at 2.0 m

Initial dispersion coefficients:

σ_{y0} = 10 m / 4.3 = 2.33 m

σ_{z0} = 3 m / 4.3 = 0.70 m

Aggregate/Sand Transfers to Elevated Storage

Modeled as a volume source released at 5.0 meters adjacent to a building 6 meters X 6 meters, 4.1 meters high representing a trailer-mounted office.

Initial dispersion coefficients:

σ_{y0} = 6 m / 4.3 = 1.40 m

σ_{z0} = 4.1 m / 2.15 = 1.91 m

Hot Water Boiler

Release height = 5.0 meters; effective diameter of release area = 0.3 meters;
typical stack gas temperature = 450; typical flow velocity = 10.5 meters/second.

Power Generator

Stack gas temperatures and flow rates are often overestimated by permit applicants, likely because values reported by manufacturers are often based on values measured at the exhaust manifold rather than at the point of release to the atmosphere.

DEQ modeled all generator emissions at an exit gas temperature of 700 K. Exhaust flows were calculated using the following formula from the State of Washington Department of Ecology (Washington State Department of Ecology. *Suitability of Diesel-Powered Emergency Generators for Air Quality General Order of Approval: Evaluation of Control Technology, Ambient Impacts, and Potential Approval Criteria.* June 23, 2006):

$$\text{Flow} = 0.284\ m^3/(\text{sec}\cdot 100\ \text{hp})$$

The stack diameter was set such that the flow velocity was 44.6 meters/second (as per WA guidance).

The final point source parameters for the 197 hp engine were as follows:

Stack height = 4.57 m; stack diameter = 0.126 meters; stack gas temperature = 734 K; flow velocity = 44.6 meters/second.

ATTACHMENT 2

SETBACK DISTANCES FOR SPECIFIC POLLUTANTS, AVERAGING TIMES, AND METEOROLOGICAL DATASETS

Short-Term Modeling Results for 1000 cy/day throughput - generator

		Critical Receptor x coodinate meters	y coordinate meters	setback meters
NO2 1-hour				
Soda Springs Met		30	80	89.31965
Minidoka Met		-130	-130	188.0904
Idaho Falls Met	>	70	20	76.53757
Lewiston Met	>	70	20	76.53757
Aberdeen Met	>	70	20	76.53757
Boise Met	>	70	20	76.53757
Sandpoint Met		-55	-80	101.2571
Required Setback				188.0904

Short-Term Modeling Results for 1000 cy/day throughput Generator on Site

	Critical Receptor x coodinate meters	y coordinate meters	setback meters
PM2.5 24-hour			
Soda Springs Met	-10	-50	54.57105
Minidoka Met	-45	-35	61.22091
Idaho Falls Met	10	-50	54.57105
Lewiston Met	35	20	44.41846
Aberdeen Met	-15	-45	51.26402
Boise Met	-15	15	25.45584
Sandpoint Met	-25	-50	59.94164
Required Setback			61.22091

	Critical Receptor x coodinate meters	y coordinate meters	setback meters
PM10 24-hour			
Minidoka Met	-30	25	43.27817
Idaho Falls Met	10	-25	30.8707
Sandpoint Met	-15	-35	42.04759
Required Setback			43.27817

Annual Modeling Results for 150,000 cy/yr throughput Generator on Site

		Critical Receptor x coodinate meters	y coordinate meters	setback meters	
PM2.5 Annual					
PM2.5 Annual	max = 2.74	0	0	4.242641	03,04
NOx Annual					
Minidoka Met	max = 0.095	0	0	4.242641	03,04
SO2 Annual					
Minidoka Met	max = 0.75	0	0	4.242641	03,04

Short-Term Modeling Results for 1000 cy/day throughput - no generator

		Critical Receptor x coodinate meters	y coordinate meters	setback meters
NO2 1-hour				
Minidoka Met	max = 160	0	0	4.242641

Short-Term Modeling Results for 1000 cy/day throughput No Generator on Site

	Critical Receptor x coodinate meters	y coordinate meters	setback meters
PM2.5 24-hour			
Soda Springs Met	-10	-50	54.57105
Minidoka Met	-25	-30	43.27817
Idaho Falls Met	5	-50	53.60037
Lewiston Met	35	20	44.41846
Aberdeen Met	-15	-45	51.26402
Boise Met	-15	15	25.45584
Sandpoint Met	-25	-45	55.56978
Required Setback			55.56978

Short-Term Modeling Results for 1000 cy/day throughput No Generator on Site

	Critical Receptor x coodinate meters	y coordinate meters	setback meters
PM10 24-hour			
Minidoka Met	-30	25	43.27817
Idaho Falls Met	10	-25	30.8707
Sandpoint Met	-15	-30	37.58989
Required Setback			43.27817

TAPs Modeling Results for 150,000 cy/yr throughput - Setback - generator and no generator

		Critical Receptor x coodinate meters	y coordinate meters	setback meters
Chromium 6+ AACC = 8.3 E-5				
Minidoka Met	period	15	10	22.2036