State of Idaho
Department of Environmental Quality
Air Quality Division

AIR QUALITY PERMIT
STATEMENT OF BASIS

Permit to Construct No. P-2009.0076

Final

Americrete Ready Mix dba G&B Redi-Mix

Portable

Facility ID No. 777-00462

July 2, 2009

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.

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Acronyms, Units, and Chemical Nomenclature

AAC	acceptable ambient concentration
AACC	acceptable ambient concentration for carcinogens
AIRS	Aerometric Information Retrieval System
BMP	Best management practices
Btu/hr	British thermal units per hour (MM: Million)
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	carbon monoxide
cy/day	cubic yards per calendar day
cy/hr	cubic yards per hour
cy/yr	cubic yards per year
DEQ	Department of Environmental Quality
EL	screening emissions levels
HAP	hazardous air pollutant
hr/yr	hours per consecutive 12-calendar month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/cy	pounds per cubic yard
lb/hr	pounds per hour
lb/ton	pounds per ton
MACT	Maximum Achievable Control Technology
$\mu g/m^3$	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operations and maintenance
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
SIP	State Implementation Plan
SO_2	sulfur dioxide
TAP	toxic air pollutant
T/yr	tons per year
VOC	volatile organic compound

1. FACILITY INFORMATION

1.1 Facility Description

The facility is a portable truck mix concrete batch plant consisting of aggregate stockpiles, a cement storage silo, a cement supplement (flyash) storage silo, a weigh batcher, and conveyors. 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. Electric power will be supplied to the facility from the local power grid. A 5.0 MMBtu/hr boiler heats the water in cold weather prior to use for the concrete.

1.2 Permitting Action and Facility Permitting History

This permit is the initial PTC for this facility.

2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY

2.1 Application Scope

Americrete Ready Mix dba G&B Redi-Mix (G&B Redi-Mix) has applied for a PTC to operate a portable concrete batch plant with a permitted throughput limit of 500,000 cubic yards per year.

2.2 Application Chronology

May 5, 2009	DEQ received application
May 8, 2009	DEQ deemed the application to be complete
May 20, 2009	Initial application was withdrawn
June 5, 2009	DEQ received updated application
June 12, 2009	DEQ deemed updated application complete
July 2, 2009	DEQ issued the new PTC

3. TECHNICAL ANALYSIS

3.1 Concrete Batch Plant

Table 3.1 CONCRETE BATCH PLANT INFORMATION

Emissions Unit Description	Control Device Description
Cement Storage Silo	Baghouse
Cement Supplement Storage Silo	Baghouse
Weigh Batcher	Water spray bar around feed boot
Truck Loading	Boot plus a cement tube
Materials Transfer (Fugitives)	Water Sprays or Equivalent
5.0 MMBtu/hr water heater	None

3.2 Emissions Inventory

The emissions were estimated using the DEQ Concrete Batch Plant Spreadsheet. Controlled emissions estimates are based on the use of the control devices and maximum production limits for those units listed in Table 3.1. The emission factors listed are from AP-42, Table 11.12.5 (06/06). All hourly uncontrolled emissions are determined by multiplying the emission factor (lb/cy) with maximum hourly production (120 cy/hr). The controlled emissions are determined by multiplying 1- assumed control assumption percentage for standard modeling. Annual values are calculated similarly with 500,000 cy/yr replacing the 120 cy/hr. Tables 3.2 and 3.3 listed below compare uncontrolled and controlled emissions.

Lead emissions are shown in Table 3.4. It should be noted that all emissions calculations illustrated in this section represent all future locations the CBP may relocate. Those specific to 211 Kit Ave in Caldwell can be seen in Appendix C within the site specific modeling memo.

Table 3.2 UNCONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit	Emission Factor	PM_{10}	
	lb/cy	lb/hr	T/yr
Aggregate delivery to ground storage*	0.0031	0.372	0.775
Sand delivery to ground storage*	0.0007	0.084	0.175
Aggregate transfer to conveyor*	0.0031	0.372	0.775
Sand transfer to conveyor*	0.0007	0.084	0.175
Aggregate transfer to elevated storage*	0.0031	0.372	0.775
Sand transfer to elevated storage*	0.0007	0.084	0.175
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0.0001	0.012	0.025
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0.0002	0.024	0.050
Weigh hopper loading (sand & aggregate batcher loading)	0.0040	0.480	1.000
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	9.408	19.600
Total, Point Sources	**0.0827**	**9.924**	**20.675**
Total, Process Fugitives	**0.0114**	**1.368**	**2.850**

*** Considered fugitive for facility classification purposes.**

Table 3.3 CONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit	Control Assumption	PM_{10}	
	%	lb/hr	T/yr
Aggregate delivery to ground storage*	75	0.093	0.194
Sand delivery to ground storage*	75	0.021	0.044
Aggregate transfer to conveyor*	75	0.093	0.194
Sand transfer to conveyor*	75	0.021	0.044
Aggregate transfer to elevated storage*	75	0.093	0.194
Sand transfer to elevated storage*	75	0.021	0.044
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0	0.012	0.025
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0	0.024	0.050
Weigh hopper loading (sand & aggregate batcher loading)	95	0.024	0.050
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	0.470	0.980
Total, Point Sources		**0.530**	**1.105**
Total, Process Fugitives		**0.342**	**0.714**

*** Considered fugitive for facility classification purposes.**

Table 3.4 LEAD EMISSIONS ESTIMATES UNCONTROLLED/CONTROLLED

Emissions Unit	Emission Factor	Lead	
	lb/ton	lb/hr	lb/yr
Cement Delivery to silo (controlled EF because baghouse is process equipment)	1.09E-08	3.21E-07[a]	3.21E-07
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	5.20E-07	2.28E-06[b]	2.28E-06
Truck load-out*	3.62E-06	1.23E-04[c]	6.13E-06[d]
Total, Point Sources		**2.60E-06**	**2.60E-06**
Total, Process Fugitives		**1.23E-04**	**6.13E-06**

*** 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

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

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.

d. 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 following two Tables (3.5 and 3.6) illustrate the uncontrolled and controlled HAP and TAP emissions for the concrete batch facility. The daily and annual averages are the summation of cement delivery to the silo, the supplementary cement to the silo and the truck load-out. Both cement deliveries contain baghouses while the truck load-out has a 95% efficient water spray bar around a feed boot. For further detail on the emissions see Appendix B.

Table 3.5 UNCONTROLLED TAP AND HAP EMISSIONS SUMMARY

TAPs	HAPs	24-hour Total	Annual Total
		lb/hr	T/yr
Arsenic	Arsenic	1.07E-04[a]	4.70E-04
Beryllium	Beryllium	8.67E-06	3.80E-05
Cadmium	Cadmium	1.26E-06	5.51E-06
Chromium	Chromium	3.92E-04	1.75E-03
Manganese	Manganese	2.08E-03	9.09E-03
Nickel	Nickel	4.14E-04[a]	1.81E-03
Phosphorus	Phosphorus	1.66E-03	7.28E-03
Selenium	Selenium	8.90E-05	3.90E-04
Chromium VI[b]	Chromium VI[b]	8.39E-05[a]	--

a. Exceeded the screen EI and was necessary to model.

b Chromium is a HAP. Chromium VI is not specifically listed as a HAP by itself.

Table 3.6 CONTROLLED TAP AND HAP EMISSIONS SUMMARY

TAPs	HAPs	24-hour Total	Annual Total
		lb/hr	T/yr
Arsenic	Arsenic	4.59E-06[a]	2.01E-05
Beryllium	Beryllium	3.92E-07	1.71E-06
Cadmium	Cadmium	7.56E-08	3.31E-07
Chromium	Chromium	2.80E-05	5.31E-05
Manganese	Manganese	5.73E-05	2.25E-04
Nickel	Nickel	1.49E-05	6.53E-05
Phosphorus	Phosphorus	8.46E-05	1.68E-04
Selenium	Selenium	2.38E-06	9.90E-06
Chromium VI[b]	Chromium VI[b]	2.80E-06[b]	--

a. Exceeded the screen EI and was necessary to model.

b Chromium is a HAP. Chromium VI is not specifically listed as a HAP by itself.

Emissions Inventory for 5.0 MMBtu/hr Boiler

The G&B Redi-Mix plant also has a 5.0 MMBtu/hr natural gas-fired boiler for water heating purposes. The boiler will be used on a limited basis and because of that the facility has requested an operation hour limit. The usage is restricted to a maximum of 4,000 hr/yr. The following emissions are reflective of that annual use. Note that the boiler does not have any control devices associated with it.

Table 3.7 UNCONTROLLED CRITERIA POLLUTANTS FROM BOILER

Pollutant	Emissions Factor[a]	Emissions[b]	
	lb/MMscf	lb/hr	T/yr
NO_2	100	0.490	0.980
CO	84	0.412	0.824
PM_{10}	7.6	0.037	0.074
SO_x	0.6	0.003	0.006
VOC	5.5	0.027	0.054
Lead	.0005	0.0000025	0.0000050
Total		**0.969**	**1.938**

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 4,000 hr/yr was used in the emissions calculation.

Facility-Wide Emissions

Table 3.8 FACILITY-WIDE EMISSIONS

Pollutant	Emissions	
	lb/hr	T/yr
NO_2	0.490	0.980
CO	0.412	0.824
PM_{10}	0.567[a]	1.179[a]
SO_x	0.003	0.006
VOC	0.027	0.054
Lead	0.003[a]	0.036[a]
Total	**1.502**	**3.079**

a. Includes all point sources emissions for the concrete batch plant and the boiler

3.3 Ambient Air Quality Impact Analysis

Based on the emissions inventory, the potential emission rate of PM_{10} from this concrete batch plant from point sources and fugitive sources was estimated at 0.41 lb/hr and 1.81 T/yr. These levels exceed the published DEQ modeling threshold (Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002) for PM_{10} of 0.2 lb/hr and 1.0 T/yr.

The DEQ generic modeling results (Table 3.9) demonstrated that for the production rate limits and setbacks that were modeled—and that will be imposed on the operations for this concrete batch plant—the PM_{10} emissions from the concrete batch plant combined with background concentrations would be less than the 24-hr PM_{10} NAAQS.

Table 3.9 CRITERIA FOR USING DEQ'S GENERIC CONCRETE BATCH PLANT MODELING RESULTS FOR AIR IMPACT ANALYSES

Parameter	DEQ Model				Proposed Project	Comments
Concrete batch plant type and capacity	Truck mix (redi-mix or dry mix) or Central mix				Truck mix	Meets
Operation in any PM_{10} nonattainment area	Not proposed				Not proposed	Meets
Presence of an electric generator	No generator. Line power is available.				Not proposed	Meets
No Collocation. Minimum distance from nearest edge of any emissions source to any other source of emissions, including another concrete batch plant, hot mix asphalt plant, or rock crushing plant	200 m (656 ft)				Collocated operations not proposed	Meets
Number of cement and/or cement supplement storage silos	Not limited. The model layout assumes all silo emissions are from the same point, and that cement/supplement is not transferred between storage silos.					Meets
Maximum daily concrete production (cy/day)	**1,500**	**2,400**	**3,600**	**4,800**	2,400 cy/day	Meets
Minimum Setback Distance Minimum distance from nearest edge of any emissions source to a receptor.[a]	**40 m (131 ft)**	**60 m (197 ft)**	**100 m (328 ft)**	**150 m (492 ft)**	300 ft	Meets
Maximum annual concrete production (cy/year)	300,000	400,000	500,000	500,000	500,000 cy/yr	Meets
Cement and supplement storage silo baghouse(s) Minimum stack height (height above ground) Minimum PM/PM_{10} control	10 meters (32.8 ft) 99%				Cement silo 60ft Flyash silo 33ft	Meets
Weigh hopper loading baghouse, or equivalent Minimum stack height (height above ground) Minimum PM/PM_{10} control	10 meters (32.8 ft) 99%				Boot vented back to silo	Meets
Truck-mix loadout or Central Mix loading. Minimum PM/PM_{10} control.	95% Boot enclosure, shroud, water sprays, or baghouse/cartridge filter				Boot plus cement tube	Meets
Transfer Point Fugitives. Minimum PM/PM_{10} control.	75% Water sprays, enclosures, shrouds, or aggregate/sand is damp on an as-received basis and used before significantly drying out. BMPs – No visible emissions leaving property boundaries				BMPs	Meets

[a] The minimum setback distance shall be defined as the minimum distance from the nearest edge of any emissions source to any area outside of a building where the general public has access. This distance shall be measured from the nearest edge of any stockpile, silo, weigh batcher, transfer point, or conveyor associated with this concrete batch plant.

By using DEQ's generic modeling approach for concrete batch plants, G&B Redi-Mix is required to have a minimum setback from the property boundary depending on maximum concrete daily production. The proposed project meets all the recommended parameters of generic modeling.

Fugitive emissions from traffic and wind erosion from stockpiles are not considered in DEQ's generic modeling; emissions from these sources are controlled through the use of Best Management Practices (BMP) contained in the permit.

Uncontrolled TAP emissions estimates in Table 3.5 of arsenic, nickel, and chromium VI exceeded the applicable emissions screening level (EL). The controlled emissions estimate in Table 3.6 of nickel was below the applicable EL. However, controlled emissions estimates for arsenic and chromium VI still exceeded the acceptable EL. These two metals were modeled to demonstrate compliance with the TAP increments was demonstrated. Using the controlled ambient concentration is an option for demonstrating compliance in accordance with IDAPA 58.01.01.210.08, and the generic modeling conducted in the development of the TAP rules indicates that if an emissions rate is below the EL, then the controlled ambient concentrations are expected to be below the AAC and AACC.

G&B Redi-Mix has demonstrated compliance to DEQ's satisfaction that emissions from the concrete batch plant will not cause or significantly contribute to a violation of any ambient air quality standard. G&B Redi-Mix has also demonstrated compliance to DEQ's satisfaction that an emissions increase due to this permitting action will not exceed any AAC or AACC for TAPs. Compliance was demonstrated using DEQ's generic modeling analysis. See Appendix C for 211 N. Kit Ave analysis results.

Table 3.10 FULL IMPACT ANALYSIS RESULTS FOR PM_{10}

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Ambient Impact (µg/m³)	NAAQS[a] (µg/m³)	Percent of NAAQS
PM_{10}	24-hour (Maximum 6th high)	53.3	73	126.3	150	84.2%
	Annual (Maximum 1st high)	5.53	26	31.5	50	63.1%

Note: These concentrations and corresponding percentages are based on the DEQ generic modeling criteria for CBPs. Also, these are based on 3,600 cy/day and 500,000 cy/yr production. The Kit Ave site is restricted to 2,400 cy/day and 300,000 cy/yr. See Appendix C for further details.

Table 3.11 FULL IMPACT ANALYSIS RESULTS FOR TAPS

Pollutant	Average Period	Concentration (µg/m³)	Regulatory AAC/AACC (µg/m³)	Percent of Limit
Arsenic	Annual	4.38E-05	2.3E-04	39.1 %
Nickel	Annual	2.98E-05	8.3E-05	35.9%
Chromium VI[b]	Annual	1.53E-04	4.23E-03	3.6%

Note: AACs are in units of milligrams per meter cubed whereas AACCs are in units of micrograms per meter cubed. Convert AACs from milligrams per meter cubed to micrograms per meter cubed.

4. REGULATORY REVIEW

4.1 Attainment Designation (40 CFR 81.313)

The facility is a portable facility and can be located in any attainment or unclassified area.

4.2 Permit to Construct (IDAPA 58.01.01.201)

A PTC is required for this facility because it is the construction of a new facility with estimated PM_{10} emissions is 3.07 tons per year, which exceeds the exemption level of 1.5 tons per year.

4.3 Tier II Operating Permit (IDAPA 58.01.01.401)

A Tier II operating permit is not required for this facility.

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

This source does not emit more than the Title V threshold of any applicable air pollutant, so it is not a Title V source. This is a true minor source facility.

4.5 PSD Classification (40 CFR 52.21)

This facility is not a PSD source.

4.6 NSPS Applicability (40 CFR 60)

There are no NSPS regulations that apply to this facility.

The provisions of Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants, do not apply to stand-alone screening operations at concrete batch plants without crushers or grinding mills. The concrete batch plant is therefore not subject to this NSPS.

The concrete batch plant will be powered by the electrical grid. The concrete batch plant is therefore not subject to 40 CFR 60, Subpart IIII – Standard of Performance for stationary Compression Ignition Internal Combustion Engines.

Subpart Dc is not applicable to the boiler because it is rated at 5.0 MMBtu, which is less than the minimum applicable rate of 10 MMBtu/hr.

4.7 NESHAP Applicability (40 CFR 61)

There are no NESHAP regulations that apply to this facility.

4.8 MACT Applicability (40 CFR 63)

There are no MACT regulations that apply to this facility.

4.9 CAM Applicability (40 CFR 64)

CAM does not apply to non-Title V sources.

4.10 Permit Conditions Review

This section describes the permit conditions for this initial permit that have been added as a result of this permitting action.

Permit Conditions 1.2 and 2.2

Describe the emission sources and emission controls that shall be operated as part of this concrete batch plant. Demonstration of compliance with NAAQS and TAPs rules was based on emissions estimated using the capture efficiencies associated with these controls. Applicability of DEQ's generic modeling analysis was also determined based on the descriptions of these controls.

Permit Condition 2.3:

Limits visible emissions from the concrete batch plant. Compliance with this limit is demonstrated by monitoring and recordkeeping requirements in Permit Condition 2.17.

Permit Conditions 2.4 and 2.5:

Limits the concrete production to 2400 cy/day at the initial Caldwell location. An initial setback distance of 66 feet from the property boundary has been assessed for G&B Redi-Mix based on the concrete production limit. Compliance with carcinogenic TAPs requirements in the generic modeling for this setback distance was based upon the controlled production levels of 2400 cy/day and 300,000 cy/yr. An annual production limit is therefore required in accordance with IDAPA 58.01.01.210.08.c. Compliance with the production limit is demonstrated by monitoring the concrete production as required by Permit Condition 2.14.

Permit Conditions 2.6 and 2.7

Limits to production and required setback are determined for any future sites. These rates and distances are based on DEQ generic modeling criteria. A table was added to allow some flexibility for hourly and annual production depending on the current setback distance.

Permit Condition 2.8

This condition requires the permittee to develop a baghouse and filter system procedures document for maintenance and inspection of baghouses. Once the manual is developed a copy should be sent to the DEQ Boise regional office. Quarterly see/no see inspections are necessary per the 3.07 T/yr emitted as instructed by DEQ internal guidance,

Permit Condition 2.9

The permittee shall install and operate the baghouses and the water sprays (or equivalent control method) in accordance with the procedures document.

Permit Condition 2.10

Any fugitive emissions at the property boundary will be determined on a see/no see basis at 211 N. Kit Ave. This condition is required because of the facility's close proximity to Snake River Paints to the north. Also, the size of the lot of the facility is 300 by 300 feet suggesting fugitive dust may be more of a problem to surrounding neighbors.

Permit Conditions 2.11

Reasonable control requirements for fugitive dust are set at 211 N. Kit Ave. and any future sites. It states that the plant may not operate unless an efficient fugitive dust control system is in place.

Permit Condition 2.12

Further fugitive dust control requirements are stated for 211 N. Kit Ave. Strategies need to be implemented immediately upon visible emissions exiting the property boundary. Corrective action must be taken immediately and a Method 22 visible emissions test may need to be conducted.

Permit Condition 2.13

Per the facility's request an operational limit to the natural gas boiler was set to 4,000 hr/yr.

Permit Condition 2.14

The permittee is required to physically measure the concrete production rate on a daily and an annual basis to demonstrate compliance with the limits in Permit Condition 2.4 and 2.6.

Permit Condition 2.15

The permittee is required to physically measure the setback distance whenever the plant is moved or the layout is changed such that emissions sources are closer to a property boundary to demonstrate compliance with the limits in Permit Condition 2.5 and 2.7.

Permit Condition 2.16

The permittee is required to calculate monthly and annual usage of boiler to demonstrate compliance with Permit Condition 2.14.

Permit Condition 2.17

The permittee is required to conduct inspection and monitoring to insure compliance with opacity limits in Permit Condition 2.3. Recordkeeping of the results of each inspection and when corrective measures are implemented is also required.

Permit Condition 2.18

Requires the permittee to conduct inspections each day that the plant is operating to assess the control of fugitive emissions and specifies actions to take as a result of such inspections.

Permit Condition 2.19

Prohibits operation of the concrete batch plant in any PM_{10} nonattainment area. IDAPA 58.01.01.006 defines a "significant contribution" as any increase in ambient concentrations that would exceed 5.0 $\mu g/m^3$ (24-hr average) or 1.0 $\mu g/m^3$ (annual average). The generic modeling analysis used to demonstrate preconstruction compliance with NAAQS for this concrete batch plant predicted that PM_{10} impacts to ambient air quality would exceed these levels. In any nonattainment area, concrete batch plant operations would therefore result in a significant contribution. Should the permittee desire to operate in any PM_{10} nonattainment area, the permittee shall submit a PTC application to modify this permit.

Permit Condition 2.20

No other facility, not even a rock crusher can co-locate at the 211 N. Kit Ave site.

Permit Condition 2.21

Prohibits the concrete batch plant from collocating with any other non-permitted source of emissions. It may co-locate with one (1) permitted rock crushing unit but cannot operate them simultaneous. No emission source or activity has been requested in addition to the concrete batch plant and has not been considered for the purposes of DEQ's generic modeling analysis. This limit is necessary to ensure compliance with the 24-hour PM_{10} NAAQS.

Permit Condition 2.22

Reporting is required to relocate the concrete batch plant, including providing information necessary to demonstrate compliance with the minimum setback limits in Permit Condition 2.7.

5. PERMIT FEES

Table 5.1 lists the processing fee associated with this permitting action. The facility is subject to a processing fee of $2,500 because it's permitted emissions between one ton per year but less than 10 tons per year. Refer to the chronology for fee receipt dates. The fee calculation does not include fugitive emissions per IDAPA 58.01.01.225.

Table 5.1 PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM_{10}	3.07	0	3.07
VOC	0.0	0	0.0
HAPS	0.0	0	0.0
Total:	**3.07**	**0**	**3.07**
Fee Due	**$ 2500.00**		

6. PUBLIC COMMENT

An opportunity for public comment period on the PTC application was provided from June 11 to June 26, 2009, 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.

Appendix A – AIRS Information

AIRS/AFS Facility-wide Classification – Data Form

Facility Name: Americrete Ready Mix dba G&B Redi-Mix

Facility Location: Portable, initially at 211 N. Kit Ave., Caldwell

Facility ID: 777-00462 **Date:** 6/12/2009

Project/Permit No.: P-2009.0076 **Completed By:** Eric Clark

☐ Check if there are no changes to the facility-wide classification resulting from this action. (compare to form with last permit)
Comments:

☐ Yes, this facility is an SM80 source.

Identify the facility's area classification as A (attainment), N (nonattainment), or U (unclassified) for the following pollutants:

	SO2	PM10	VOC
Area Classification:	U	U	U

DO NOT LEAVE ANY BLANK

Check one of the following:

☒ **SIP** [0] - Yes, this facility is subject to SIP requirements. (do not use if facility is Title V)
OR
☐ **Title V** [V] - Yes, this facility is subject to Title V requirements. (If yes, do not also use SIP listed above.)

For SIP or TV, identify the classification (A, SM, B, C, or ND) for the pollutants listed below. Leave box blank if pollutant is not applicable to facility.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	B	B	B	B	B	B	B

☐ **PSD** [6] - Yes, this facility has a PSD permit.

If yes, identify the pollutant(s) listed below that apply to PSD. Leave box blank if pollutant does not apply to PSD.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NSR - NAA** [7] - Yes, this facility is subject to NSR nonattainment area (IDAPA 58.01.01.204) requirements.

Note: As of 9/12/08, Idaho has no facility in this category.

If yes, identify the pollutant(s) listed below that apply to NSR-NAA. Leave box blank if pollutant does not apply to NSR - NAA.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NESHAP** [8] - Yes, this facility is subject to NESHAP (Part 61) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

☐ **NSPS** [9] - Yes, this facility is subject to NSPS (Part 60) requirements.

If yes, what CFR Subpart(s) is applicable?

If yes, identify the pollutant(s) regulated by the subpart(s) listed above. Leave box blank if pollutant does not apply to the NSPS.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **MACT** [M] - Yes, this facility is subject to MACT (Part 63) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

Appendix B – Emissions Inventory

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

Facility Information 5/14/09 12:19

Company:	**Americrete dba G&B Ready Mix**
Facility ID:	**777-00384**
Permit No.:	**P-2009.0063**
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	**Vince-Hagen**

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	**120**	cy/hr		Per manufacturer
Proposed Daily Production Rate	**1,440**	cy/day	**12.00**	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate	**500,000**	cy/year		
Cement Storage Silo Capacity	4540	ft^3 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: Purple 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_{10} Emission Factor[1] (lb/cy)		Controlled Emission Rate, Max.	Controlled Emission Rate, 24-hour average		Controlled Emission Rate, annual average			
	Controlled	Uncontrolled	lb/hr[2]	lb/hr[3]	lb/day[3]	lb/hr[4]	T/yr[4]	Control Assumptions:	
Aggregate delivery to ground storage		0.0031	0.09	0.047	1.12	0.044	0.194	75%	Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.0007	0.02	0.011	0.25	0.010	0.044	75%	Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.0031	0.09	0.047	1.12	0.044	0.194	75%	Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.0007	0.02	0.011	0.25	0.010	0.044	75%	Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.0031	0.09	0.047	1.12	0.044	0.194	75%	Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.0007	0.02	0.011	0.25	0.010	0.044	75%	Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	**0.0001**		1.00E-02	**5.01E-03**	1.20E-01	4.76E-03	**2.09E-02**	**0.00%**	Baghouse is process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	**0.0002**		2.15E-02	**1.07E-02**	2.57E-01	1.02E-02	**4.47E-02**	**0.00%**	Baghouse is process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher loading)		**0.0040**	2.37E-02	**1.19E-02**	2.85E-01	1.13E-02	**4.94E-02**	**95.0%**	Water spray bar around feed boot
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**	0.47	**0.24**	5.64	0.22	**0.98**	**95.0%**	Boot plus cement tube
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**	0.00	**0.00**	0.00	0.00	**0.00**	99.00%	[illegible]
Point Sources Total Emissions		**8.26E-02**	**5.26E-01**	**2.63E-01**	6.31E+00	**2.50E-01**	**1.09E+00**		
Process Fugitive Emissions		0.0114	0.34	0.17	4.11	0.16	0.71		
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Windblown Dust)		0.0940	0.87	0.43	10.41	0.41	1.81		

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[6]		Controlled EF	at 1,051,200 cy/yr	T/yr
Facility Classification Total PM[5]		**8.40E-03**		**4.42E+00**
Facility Classification Total PM10[5,7]		**4.21E-03**		**2.22E+00**

[1] 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.

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

[3] 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

[4] 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)

[5] 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)

[6] Emissions for Facility Classification are based on baghouses as process equipment, 24-hr day, 8760 hr/yr = 2,880 cy/day, and 1,051,200 cy/yr

[7] 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**	[illegible]	3.21E-07	1.17E-04	1.34E-03	1.61E-07	Point Source	1.41E-06
Cement supplement delivery to Silo [3]	**5.20E-07**	[illegible]	2.28E-06	8.31E-04	9.49E-03	1.14E-06	Point Source	9.98E-06
Truck Loadout (with 99.9% control)[7]		**3.62E-06**	6.13E-06	2.24E-03	2.55E-02	3.06E-06	Fugitive	
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]			
Total			**8.72E-06**	**3.18E-03**	**0.036**		**Point Sources**	**1.14E-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/yd[3] of concrete x max. hourly concrete production rate/(2000 lb/T)
[3] lb/mo = EF x pound of material/yd[3] of concrete x max. daily concrete production rate x (365/12)/(2000 lb/T
[4] T/yr = EF x pound of material/yd[3] 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

Figure B1 – Criteria Pollutant Emissions for the Concrete Batch Plant

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

5/14/2009 12:19

Facility Information

Company:	Americrete dba G&B Ready Mix
Facility ID:	777-00384
Permit No.:	P-2009.0063
Source Type:	Portable Concrete Batch Plant
Manufacturer:	Vince-Hagen

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

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Tip: Purple 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:	120	cy/hr	
Proposed Daily Production Rate:	1,440	cy/day	
Proposed Maximum Annual Production Rate:	500,000	cy/year	

Uncontrolled (Unlimited Production Rate)

	24 hrs/day,
2,880 cy/day	7 day/wk,
1,051,200 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		4.86E-10		4.86E-10		2.90E-08		1.17E-07		4.18E-08			1.18E-05			20%
Cement supplement delivery to Silo (with baghouse)	1.00E-08		9.04E-08		1.98E-08		1.22E-06		2.56E-07		2.28E-06		3.54E-06		7.24E-08		30%
Truck Loadout (no boot or shroud)		3.04E-06		2.44E-07		3.42E-08		1.14E-05		6.12E-05		1.19E-05		3.84E-05		2.62E-06	21.29%
Central Mix Batching (NO boot or shroud)		0.00E+00				0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00			21.29%

UNCONTROLLED TAP EMISSIONS — **Note: Includes baghouses as process equipment.** — **2,880 cy/day, and 1,051,200 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)	1.25E-07	5.47E-07	1.43E-08	6.27E-08	1.43E-08	6.27E-08	8.54E-07	3.25E-05	3.45E-06	1.51E-05	1.23E-06	5.39E-06	3.48E-04	1.52E-03	ND	ND	1.71E-07		
Cement supplement delivery to Silo (with baghouse)	4.38E-06	1.92E-05	3.96E-07	1.73E-06	8.67E-08	3.80E-07	5.34E-06	2.34E-05	1.12E-06	4.91E-06	9.99E-06	4.37E-05	1.55E-05	6.79E-05	3.17E-07	1.39E-06	1.60E-06		
Truck Loadout (no baghouse)	1.03E-04	4.51E-04	8.26E-06	3.62E-05	1.16E-06	5.07E-05	3.86E-04	1.69E-03	2.07E-03	9.07E-03	4.03E-04	1.76E-03	1.30E-03	5.69E-03	8.87E-05	3.88E-04	8.21E-05		
Sources Total	**1.07E-04**	4.70E-04	**8.67E-06**	3.80E-05	**1.26E-06**	5.51E-06	**3.92E-04**	1.75E-03	**2.08E-03**	9.09E-03	**4.14E-04**	1.81E-03	**1.66E-03**	7.29E-03	**8.90E-05**	3.90E-04	**8.39E-05**	**2.08E-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.** — **1,440 cy/day, and 500,000 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]	5.94E-08	2.60E-07	6.81E-09	2.98E-08	6.81E-09	2.98E-08	4.27E-07	1.78E-06	1.72E-06	7.18E-06	5.86E-07	2.57E-06	ND	ND	ND	ND	8.13E-08		
Cement supplement delivery to Silo (with baghouse)2	2.08E-06	9.13E-06	1.88E-07	8.25E-07	4.13E-08	1.81E-07	1.80E-05	1.11E-05	3.77E-06	2.34E-06	4.75E-06	2.08E-05	5.21E-05	3.23E-05	1.59E-07	6.61E-07	7.63E-07		
Truck Loadout (with baghouse)	2.45E-06	1.07E-05	1.96E-07	8.60E-07	2.75E-08	1.21E-07	9.64E-06	4.02E-05	5.18E-05	2.16E-04	9.50E-06	4.19E-05	3.25E-05	1.36E-04	2.22E-06	9.24E-06	1.95E-06	95.00%	Water spray bar around feed boot
Sources Total	**4.59E-06**	2.01E-05	**3.92E-07**	1.71E-06	**7.56E-08**	3.31E-07	**2.80E-05**	5.31E-05	**5.73E-05**	2.25E-04	**1.49E-05**	6.53E-05	**8.46E-05**	1.68E-04	**2.38E-06**	9.90E-06	**2.80E-06**	**8.43E-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	305.95%		1.40%		2.04%		0.08%		0.0172%		55.23%		1.21%		0.0183%		499.55%		
EXCEEDS EL?	**Yes**		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

TAPs DEQ 9 -- DEQ CBP - Truck or Central Mix EL_52009 USE APP EFFICIENCIES

Figure B2 – TAPs Emissions for the Concrete Batch Plant

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

5 MMBtu/hr / 1,020 MMBtu/MMscf = 4.90E-03 MMscf/hr

Operating Assumptions. **24** hr/day

4,000 hr/yr

Fuel Use:

0.118 MMscf/day

19.608 MMscf/year

Criteria Air Pollutants	Emission Factor	Emissions		Facility-Wide Emissions (T/yr)	Modeling Threshold		Modeling Required ?	Modeling Threshold		Modeling Required ?
	lb/MMscf	lb/hr	T/yr		2002 Guidance			Case-by-Case		
NO2	100	4.90E-01	9.80E-01	9.80E-01	1	T/yr	No	7	T/yr	No
CO	84	4.12E-01	8.24E-01	8.24E-01	14	lb/hr	No	70	lb/hr	No
PM10	7.6	3.73E-02	7.45E-02	1.17E+00	0.2	lb/hr	No	0.9	lb/hr	No
		3.73E-02	7.45E-02		1	T/yr	No	7	T/yr	No
SOx	0.6	2.94E-03	5.88E-03	5.88E-03	0.2	lb/hr	No	0.9	lb/hr	No
		2.94E-03	5.88E-03		1	T/yr	No	7	T/yr	No
VOC	5.5	2.70E-02	5.39E-02	5.39E-02	40	T/yr	No			
Lead	0.0005	2.45E-06	4.90E-06	3.64E-02	0.6	T/yr	No			
Lead, continued			2.45E-03	lb/quarter	**10**	lb/mo	No			
		TOTAL	1.94E+00	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	EL (lb/hr)	
PAH HAPs				
2-Methylnaphthalene	2.40E-05	**5.37E-08**	9.10E-05	No
3-Methylchloranthrene	1.80E-06	**4.03E-09**	2.50E-06	No
Acenaphthene	1.80E-06	**4.03E-09**	9.10E-05	No
Acenaphthylene	1.80E-06	**4.03E-09**	9.10E-05	No
Anthracene	2.40E-06	**5.37E-09**	9.10E-05	No
Benzo(a)anthracene	1.80E-06	**4.03E-09**	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	**2.69E-09**	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	**4.03E-09**		See POM
Benzo(g,h,i)perylene	1.20E-06	**2.69E-09**	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	**4.03E-09**		See POM
Chrysene	1.80E-06	**4.03E-09**		See POM
Dibenzo(a,h)anthracene	1.20E-06	**2.69E-09**		See POM
Dichlorobenzene	1.20E-03	**2.69E-06**	9.10E-05	No
Fluoranthene	3.00E-06	**6.72E-09**	9.10E-05	No
Fluorene	2.80E-06	**6.27E-09**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	**4.03E-09**		See POM
Naphthalene	6.10E-04	1.37E-06	3.33	No
Naphthalene	6.10E-04	**1.37E-06**	9.10E-05	No
Phenanathrene	1.70E-05	**3.81E-08**	9.10E-05	No
Pyrene	5.00E-06	**1.12E-08**	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH G	**2.55E-08**	2.00E-06	No
Non-PAH HAPs				
Benzene	2.10E-03	**4.70E-06**	8.00E-04	No
Formaldehyde	7.50E-02	**1.68E-04**	5.10E-04	No
Hexane	1.80E+00	8.82E-03	12	No
Toluene	3.40E-03	1.67E-05	25	No
Non-HAP Organic Compounds				
7,12-Dimethylbenz(a)anthrac	1.60E-05	7.84E-08		
Butane	2.10E+00	1.03E-02		
Ethane	3.10E+00	1.52E-02		
Pentane	2.60E+00	1.27E-02	118	No
Propane	1.60E+00	7.84E-03		
Metals (HAPs)				
Arsenic	2.00E-04	**4.48E-07**	1.50E-06	No
Barium	4.40E-03	2.16E-05	0.033	No
Beryllium	1.20E-05	**2.69E-08**	2.80E-05	No
Cadmium	1.10E-03	**2.46E-06**	3.70E-06	No
Chromium	1.40E-03	6.86E-06	0.033	No
Cobalt	8.40E-05	4.12E-07	0.0033	No
Copper	8.50E-04	4.17E-06	0.013	No
Manganese	3.80E-04	1.86E-06	0.067	No
Mercury	2.60E-04	1.27E-06	0.003	No
Molybdenum	1.10E-03	5.39E-06	0.333	No
Nickel	2.10E-03	**4.70E-06**	2.70E-05	No
Selenium	2.40E-05	1.18E-07	0.013	No
Vanadium	2.30E-03	1.13E-05	0.003	No
Zinc	2.90E-02	1.42E-04	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 FACILITY_WIDE EMISSIONS (POINT SOURCES, T/YR)

3.07 Tons per year for PROCESSING FEE DETERMINATION

Figure B3 – Criteria Pollutant and TAP/HAP Emissions for 5.0 MMBtu/hr natural gas boiler. Facility wide emissions are also included here.

Appendix C – Ambient Air Quality Impact Analysis

MEMORANDUM

DATE: June 16, 2009

TO: Eric Clark, Air Quality Engineer, Air Quality Division

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

PROJECT NUMBER: P-2009.0076 (resubmittal of withdrawn Project No. P-2009.0063)

SUBJECT: **Pre-Application Modeling Review for Americrete Ready Mix dba G&B Ready Mix, Nampa, Facility ID. 777-00384**
Project: Initial PTC for a Concrete Batch Plant:
Portable Operations and Operations at 211 N. Kit Avenue, Caldwell

1.0 Summary

Americrete Ready Mix (dba G&B Ready Mix) submitted a Permit to Construct (PTC) application on May 5, 2009 for an existing unpermitted 120 cubic yard per hour (cy/hr) portable concrete batch plant (CBP) to be operated in Idaho. A natural gas-fired hot water boiler rated at 5 MMBtu/hr or less may be used to heat process water for the concrete batch plant during cold weather. The May 5, 2009 application was predicated on using DEQ's modeling for a generic concrete batch plant to demonstrate preconstruction compliance. During the application review, however, it was determined that the size of G&B's property and the facility layout at 211 N. Kit Avenue did not meet the minimum setback distances required to use the "generic" modeling for that location.

To expedite this permitting action, DEQ conducted site-specific dispersion modeling for operations at 211 N. Kit Avenue, based on information provided by G&B and an emission inventory developed by DEQ. G&B was notified by DEQ on June 4, 2009 that compliance had been demonstrated based on concrete production of 2,400 cubic yards per day and 300,000 cubic yards per year, with operation of the ~5 MMBtu/hr natural gas fired boiler for 24 hours per day and 4,000 hours per year. Based on this information, G&B resubmitted their PTC application on June 5, 2009.

<u>Use of Generic Modeling was Pre-Approved for Locations with Sufficient Setback Distance</u>. Application materials received by DEQ on May 5, 2009 (Project No. P-2009.0063, which was withdrawn on May 20, 2009) included a completed copy of the *Air Dispersion Modeling Protocol: Request to use DEQ Generic Modeling Results to Demonstrate Preconstruction Compliance with Idaho Air Quality Rules.* This protocol was developed by DEQ as part of a streamlined permitting approach for concrete batch plants. For this streamlined approach, DEQ conducted dispersion modeling for a typical concrete batch plant layout for a range of daily and annual concrete production rates. If a proposed concrete batch plant project meets the criteria specified in the protocol, the applicant may be allowed to use the DEQ modeling results in lieu of conducting dispersion modeling. This provides preconstruction assurance that the proposed project will comply with the applicable National Ambient Air Quality Standards (NAAQS) and state toxic air pollutant (TAP) rules. At the same time, this approach reduces the level of effort for DEQ's review of such applications, the cost and resources needed for the applicant to prepare the PTC application, and can result in a significant reduction in the time needed to review and process the application.

Based on the information provided by the applicant in their request to use the generic modeling (the pre-application "modeling protocol" review), DEQ determined that the project met the criteria for using DEQ's "generic" modeling to demonstrate preconstruction compliance with ambient air quality standards.

In the May 5, 2009 submittal, the applicant requested concrete production limits of a maximum of 2,400 cubic yards per day and 400,000 cubic yards per year. Collocation with another facility was not requested. A copy of that request is included as Attachment 1 to this memo. The emission inventory included with the June 5, 2009 application was based on producing a maximum of 500,000 cubic yards per year, which is the maximum amount allowed under the "generic" modeling analysis.

The proposed project differs from the minimum requirements in the following way:

- A natural-gas fired boiler rated at 5.0 million British thermal units per hour (MMBtu/hr) or less may be used to heat the process water (water to be mixed with the dry cement and aggregate) during cold weather. Operation of the boiler is proposed for a maximum of 24 hours per day and 4,000 hours per year.

DEQ estimated the potential additional ambient impact from this single additional small source as described in Section 1.1 below, and determined that additional modeling was not required. Based on the results of that evaluation, combined with the DEQ modeling analysis for a "generic" portable concrete batch plant, DEQ determined that the predicted pollutant concentrations from emissions associated with the facility, when combined with representative background concentrations, were below applicable ambient air quality standards at all locations outside the "facility's property boundary." For this portable facility, the actual property boundary must include the area defined by the applicable minimum setback, which is set based on the maximum daily concrete production at that location. The DEQ modeling analysis for a "generic" concrete batch plant is included as Attachment 5 to this memo.

<u>Site-Specific Modeling for CBP Operations at 211 N. Kit Avenue, Caldwell</u>. DEQ developed the emissions inventory and conducted site-specific modeling for operating this at this location. This small parcel measures approximately 300 ft by 300 ft, and the location of the equipment does not meet the minimum setback requirements required to use DEQ's generic modeling to demonstrate "preconstruction" compliance with applicable air quality standards. The modeling analyses were based on facility information received on May 5, 2009 and supplemental site-specific information provided by G&B's Rick Bengston on an updated plot plan and in a June 2, 2009 phone call with Cheryl Robinson.

The modeling results demonstrated that the ambient impacts from this facility (24-hour and annual PM_{10}, arsenic, nickel, and hexavalent chromium) will not exceed applicable standards if:

- Concrete production is limited to a maximum of 2,400 cubic yards per day and 300,000 cubic yards per year, and
- The natural gas boiler used to heat process water for the concrete batch plant is rated at a heat input capacity of 5 MMBtu/hr or less, and is operated for a maximum of 4,000 hours per year.

<u>Conclusions</u>. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the proposed project were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]).

A technical review of the submitted information to support air quality analyses was conducted by DEQ. DEQ staff performed the air impact analyses. 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 either a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at the property boundary for operations at 211 N. Kit Avenue, and at all locations outside of the required setback distance (closest distance from pollutant emission points to the property boundary) for operations at any other location.

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

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Production Limits Daily concrete production is limited based on the setback distance available at that location, but should not exceed 2,400 cy/day. At 211 N. Kit Avenue: Daily concrete production should not exceed 2,400 cy/day.	The setback for each modeled daily production rate is defined by the minimum distance needed to meet the 24-hour PM_{10} NAAQS.
Production Limits, cont. Annual concrete production is limited based on the setback distance available at that location, but should at no time exceed a maximum of 500,000 cy/yr. At 211 N. Kit Avenue: Annual concrete production at this location should not exceed 300,000 cy/yr.	Preconstruction compliance with state toxic air pollutant (TAP) rules was demonstrated using controlled carcinogenic TAP emissions, so per IDAPA 58.01.01.210.08, an emission limit must be imposed. The annual production limit inherently limits the annual TAPs emissions, so a pollutant-specific pound per hour or pound per year limit is not needed.
Process Water Heater • Fueled by natural gas, exclusively; • Rated at 5 MMBtu/hr or less; and • Operations should be limited to 4,000 hours per year. Daily limit not needed based on compliance demonstration for 24 hr/day operations.	Limit ground-level short-term concentrations of SO_x and annual NO_2 and SOx emissions. Modeling of CO, NO_2, and SOx ambient impacts was not required based on keeping emissions below DEQ modeling threshold (by limiting the hours or operation and restricting the fuel to natural gas).
Emission Controls Operational requirements for particulate matter control ensure a high level of control is consistently achieved and maintained for point source emissions. Fugitives – Material Handling Drop Points, Conveyors, and Screens. Rigorous implementation of best management practices to control these emissions must be required.	Modeled point source emissions reflect a high level of control, i.e., baghouse/ cartridge filters for silos, and a boot or equivalent for truck loadout and weigh batcher emissions. Modeled emission rates presumed a minimum of 75% control compared to uncontrolled emissions.
Stack Parameters Stack parameters used in the modeling analysis are representative of the parameters described in the application.	The dispersion characteristics and resulting estimated ambient impact depend on these stack parameters. Pre-application approval to use the DEQ "generic" modeling analysis was based in part on the similarity of the facility stack parameters with the modeled parameters. Modeling for operations at the 211 N. Kit Avenue site was based on the stack parameters provided in the application.
Co-Location No other pollutant-emitting facility (e.g., a crusher, another concrete batch plant, or a hot mix asphalt plant) will be located within 200 meters (656 feet) of this concrete batch plant. At 211 N. Kit Avenue: Under this permit, no other pollutant-emitting facility (e.g., a crusher, another concrete batch plant, or a hot mix asphalt plant) may be located or operated on this site.	Emissions sources are considered co-contributing if they are located within 200 meters (656 feet) of this batch plant. Co-contributing sources of PM_{10} were not considered in the modeling analyses. Co-contributing sources of PM_{10} were not considered in the modeling analyses. The Kit Avenue site is in relatively close proximity to Crookham Seed Company (a source of PM_{10} emissions) and Snake River Trailers (also a source of PM_{10} emissions). Using "typical" rural/agricultural PM_{10} background levels, the ambient impact from this CBP was about 95.9% of the 24-hr PM_{10} NAAQS and about 70.6% of the annual PM_{10} NAAQS.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Operation in Attainment Areas Only No operations in PM_{10} or $PM_{2.5}$ nonattainment areas.	New sources in a nonattainment area must not "significantly contribute" to the violation of the NAAQS. IDAPA 58.01.01.006 defines a PM_{10} impact increase of 5 $\mu g/m^3$ (24-hour average) or 1 $\mu g/m^3$ (annual average) as a "significant contribution." The predicted ambient impacts for each of the modeled daily and annual concrete production rates exceed these thresholds. The EPA has not yet defined a significant contribution level for $PM_{2.5}$ (use PM_{10} as a surrogate).

1.1 Modeling Evaluation for Additional Small Source to "Generic" Modeling

1.1.1 Comparison of CO, NO_2, and SO_x Emissions with DEQ Modeling Thresholds

The DEQ generic modeling was conducted only for PM_{10} because there are typically no emissions of carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur oxides (SO_x) from concrete batch plant operations served by line power.

The hourly and annual emissions from the boiler were calculated by DEQ based on operating a 5 MMBtu/hr natural gas-fired boiler for 24 hr/day and 4,000 hr/yr (see Attachment 2 to this memo). As shown in Table 2, emissions of CO, NO_2, and SO_x from the proposed project do not exceed DEQ modeling thresholds.

Additional modeling for these criteria pollutant emissions from the boiler is not required.

Table 2. COMPARISON OF EMISSIONS WITH MODELING THRESHOLDS						
	CO		**NO_2**		**SOx**	
	lb/hr, 1-hour average	**T/yr**	**lb/hr, 1-hour average**	**T/yr**	**lb/hr, 1-hour average**	**T/yr**
<u>Proposed Operations</u>: Max 5.0 MMBtu Nat gas Boiler 24 hr/day, 4,000 hr/yr	0.41	0.82	0.49	0.98	2.9E-03	5.9E-03
DEQ Modeling Threshold [a]	**14 lb/hr** 70 lb/hr	n/a	n/a	1 T/yr	**0.2 lb/hr** 0.9 lb/hr	1 T/yr
Modeling Required?	**No**	**n/a**	**n/a**	**No**	**No**	**No**

[a] The top number listed is from the State of Idaho Air Quality Modeling Guideline, Doc. ID AQ-011 (Revision 1, December 31, 2002). The bottom number listed is a value that may be used on a case-by-case basis only with DEQ review and approval.

1.1.2 Estimated Change to "Generic" PM_{10} Modeled Ambient Impacts

<u>*Additional Emissions from the Boiler*</u>

The worst-case hourly PM_{10} emissions from the boiler were calculated by DEQ based on operating a 5 MMBtu/hr natural gas-fired boiler for 24 hr/day and 4,000 hr/yr (see Attachment 2 to this memo), and converted to 24-hour and annual averages based on the requested hours of operation:

5 MMBtu/hr Boiler → 3.73E-02 $lb/hr_{1\text{-hour average}}$

Boiler @ 24 hr/day, 4,000 hr/yr: 3.73E-02 $lb/hr_{24\text{-hr avg}}$ 1.70E-02 $lb/hr_{Annual\ avg}$

Estimated Change to Ambient Impact

The potential increase in the ambient impact was estimated by presuming a linear relationship between the emission rate and the ambient PM_{10} impact predicted for the modeled daily concrete production rates and the maximum annual production rates up to 500,000 cy/year. As shown in Table 3, the total estimated ambient impacts including the proposed operation of the boiler, combined with representative background concentrations, are well below the NAAQS.

Table 3. ESTIMATED PM_{10} AMBIENT IMPACT INCLUDING BOILER								
Pollutant	**Modeled Emissions (lb/hr)** [a]	**Modeled Impact (μg/m³)** [b]	**Linear Factor (μg/m³ per lb/hr)**	**Boiler Emissions (lb/hr)**	**Additional Ambient Impact (μg/m³)**	**Background (μg/m³)** [b]	**Total Ambient Impact (μg/m³)**	**Percent of NAAQS** [d]
Proposed Operations								
PM_{10} (24-hr avg)	0.437 (1,500 cy/day)	40.1 (63.2)	91.8	3.73E-02	3.42	73	116.5	77.7%
	0.705 (2,400 cy/day)	50.8 (79.8)	72.1	3.73E-02	2.69	73	126.5	84.3%
PM_{10} (annual avg)	0.238 (300,000 cy/yr)	7.8 (11.2)	32.8	1.22E-03	0.040	26	33.84	67.7%
	0.323 (400,000 cy/yr)	7.6 (10.8)	22.4	1.22E-03	0.027	26	33.63	67.3%
	0.400 (500,000 cy/yr)	5.53 [c]	13.8	1.22E-03	0.017	26	31.55	63.1%

[a] See Tables 6A and 6B of the attached DEQ modeling analysis for a "generic" concrete batch plant.

[b] See Table 8 of the attached "generic" modeling analysis. 24-hr ISCST3 results (in parentheses) were converted to "equivalent" AERMOD results by multiplying by (53.3/83.8) = 0.636. Annual ISCST3 result (in parentheses) were converted by multiplying by (5.53/7.91) = 0.699

[c] AERMOD result for 500,000 cy/year.

[d] 24-hour PM_{10} NAAQS = 150 μg/m³, Annual PM_{10} NAAQS = 50 μg/m³.

1.1.2 Estimated Change to "Generic" TAPs Modeled Ambient Impacts

Additional Emissions from the Boiler

DEQ estimated the TAPs emissions from the natural gas-fired boiler using AP-42 Section 1.4 emission factors, and calculated the 24-hour and annual pound per hour averages based on the requested 24 hr/day and 4,000 hr/yr operations. As shown in the spreadsheet (see Attachment 2 to this memo), none of the TAPs emissions from the boiler exceeded the applicable screening emission level increment. In accordance with Section 210.08 of the Rules, no further compliance demonstration is required. However, because "controlled" TAPs emissions were used to demonstrate compliance, DEQ must include an emission limit in the permit per Section 210.08.c of the Rules. An operational or production limit can be used as a surrogate emission limit.

Estimated Change to Ambient Impact

Emissions of arsenic, hexavalent chromium, and nickel were modeled for the concrete batch plant, although only emissions of arsenic and hexavalent chromium exceeded the screening emission levels. Combustion of natural gas in the boiler is expected to emit arsenic but not hexavalent chromium. The potential increase in the ambient impact from the boiler operations was estimated by presuming a linear relationship between the emission rate and the ambient impact predicted for the modeled annual production rates of 300,000/400,000/500,000 cubic yards per year. As shown in Table 4, the total estimated ambient impact for arsenic, including the proposed operation of the boiler, is well below the applicable acceptable ambient concentration for carcinogens (AACC).

Table 4. ESTIMATED TAPS AMBIENT IMPACT INCLUDING BOILER								
Pollutant	**Modeled Emissions (lb/hr)** [a]	**Modeled Impact ($\mu g/m^3$)** [b]	**Linear Factor ($\mu g/m^3$ per lb/hr)**	**Boiler Emissions ($lb/hr_{annual\ avg}$)**	**Additional Ambient Impact ($\mu g/m^3$)**	**Total Ambient Impact ($\mu g/m^3$)**	**AACC ($\mu g/m^3$)**	**Percent of AACC**
Arsenic (annual avg)	2.75E-06 (300,000 cy/yr)	7.51E-05	27.3	4.48E-07	1.22E-05	8.73E-05	2.30E-04	37.97%
Arsenic (annual avg)	3.68E-06 (400,000 cy/yr)	8.79E-05	23.9	4.48E-07	1.07E-05	9.86E-05	2.30E-04	42.87%
Arsenic (annual avg)	4.59E-06 (500,000 cy/yr) 100 meter setback	6.78E-05	14.8	4.48E-07	6.62E-06	7.44E-05	2.30E-04	32.36%
Arsenic (annual avg)	4.59E-06 (500,000 cy/yr) 150 meter setback	4.38E-05	9.54	4.48E-07	1.22E-05	5.60E-05	2.30E-04	37.97%

[a] See Tables 7A and 7B of the attached "generic" modeling analysis)

[b] See Table 9 of the attached "generic" modeling analysis. ISCST3 results were used to demonstrate compliance.

2.0 Background Information – Site-Specific Model: 211 N. Kit Avenue, Caldwell

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance for operations at 211 N. Kit Avenue in Caldwell. Approximate UTM coordinates at the center of this parcel are 523.86 km Northing and 4,835.39 km Easting, in UTM Zone 11.

2.1.1 Area Classification

The property at 211 N. Kit Avenue in Caldwell is located in Canyon County, which is designated as an attainment or unclassifiable area for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone, particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and sulfur oxides (SO_x). There are no Class I areas within 10 kilometers of this location.

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 new facility exceed the significant contribution levels (SCLs) of Section 006.102 of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho (Idaho Air Rules), then a cumulative impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. 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 5. The SCLs and the modeled value that must be used for comparison to the NAAQS are also listed in Table 5.

Table 5. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$[k]	Annual	Not established	15	Use PM_{10} as surrogate
	24-hour	Not established	35	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[h]
Sulfur Dioxides (SO_x)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[l]	Maximum 2nd highest[h]
	3-hour	25	1,300[l]	Maximum 2nd highest[h]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
Lead (Pb)	Quarterly	NA	0.15[i]	Maximum 1st highest[h]

Table 5. APPLICABLE REGULATORY LIMITS				
Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]

[a] Idaho Air Rules Section 006.102
[b] Micrograms per cubic meter
[c] Idaho Air Rules Section 577 for criteria pollutants
[d] The maximum 1st highest modeled value is always used for significant impact analysis
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
[g] Never expected to be exceeded in any calendar year
[h] Concentration at any modeled receptor
[i] Never expected to be exceeded more than once in any calendar year
[j] Concentration at any modeled receptor when using five years of meteorological data
[k] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
[l] Not to be exceeded more than once per year

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into regulation. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

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

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

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

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Appropriate background concentrations for the property at 211 N. Kit Avenue in Caldwell are shown in Table 6.

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. The Kit Avenue site is located in a relatively small light industrial area with agricultural uses to the west and north, and primarily residential uses to the east and south. Background concentrations for this location were based on DEQ default values for rural/agricultural areas.

Table 6. BACKGROUND CONCENTRATIONS

POLLUTANT	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
	Annual	26
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	3-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.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 Overview of Analyses

DEQ staff performed the air quality analyses in support of the submitted permit application. A brief description of parameters used in the modeling analyses is provided in Table 7.

Table 7. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description[a]
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 07026
Meteorological data	Boise: 1988-1992	National Weather Service surface data and upper air data from the Boise airport.
Terrain	Flat	The analyses assumed relatively flat terrain for the immediate area.
Building downwash	Considered	Receptor, building, and emissions source elevations were set to zero (flat terrain). Building and stack heights on the property were provided by the applicant. Locations of buildings on adjacent properties were estimated based on Google Earth map. Heights of adjacent buildings were estimated by DEQ.
Receptor Grid	Fenceline Grid	5-meter spacing along the property boundary.

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

Table 7. MODELING PARAMETERS		
Parameter	Description/Values	Documentation/Addition Description[a]
	Grid 1	10-meter spacing out to 100 meters
	Grid 2	20-meter spacing out to 300 meters

3.1.2 Modeling Protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ staff performed the air quality analyses. Modeling was generally conducted using data described in the protocol and methods described in the *State of Idaho Air Quality Modeling Guideline.*

3.1.3 Model Selection

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

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

AERMOD offers the following improvements over ISCST3:

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

AERMOD was used for the DEQ analyses for this project.

3.1.4 Meteorological Data

The Kit Avenue property in Caldwell is located about 25 miles to the west-northwest from the National Weather Service station at the Boise airport. DEQ determined that the National Weather Service surface and upper air meteorological data collected from 1988 through 1992 at the Boise airport were the best representative data available at this time. These meteorological data were previously processed through AERMET—the meteorological data preprocessor for AERMOD—by Geomatrix (now Environ staff) under contract to DEQ.

3.1.5 Terrain Effects

Terrain effects on dispersion were not considered in these site-specific analyses. DEQ determined that presuming flat terrain was an appropriate assumption because most emissions sources associated with this HMA plant are near ground-level. Using the elevation tool in Google Earth, DEQ confirmed that the surrounding area is relatively 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 on the magnitude of the maximum modeled impacts. Base elevations for all receptors, stacks, and buildings were set to zero.

3.1.6 Facility Layout

The facility layout at 211 N. Kit Avenue is shown in Figure 3-1. The layout was used for the dispersion modeling, and was based on a sketched plot plan and measured distances provided by the applicant, supplemented by a Google Earth aerial photo dated October 28, 2002.

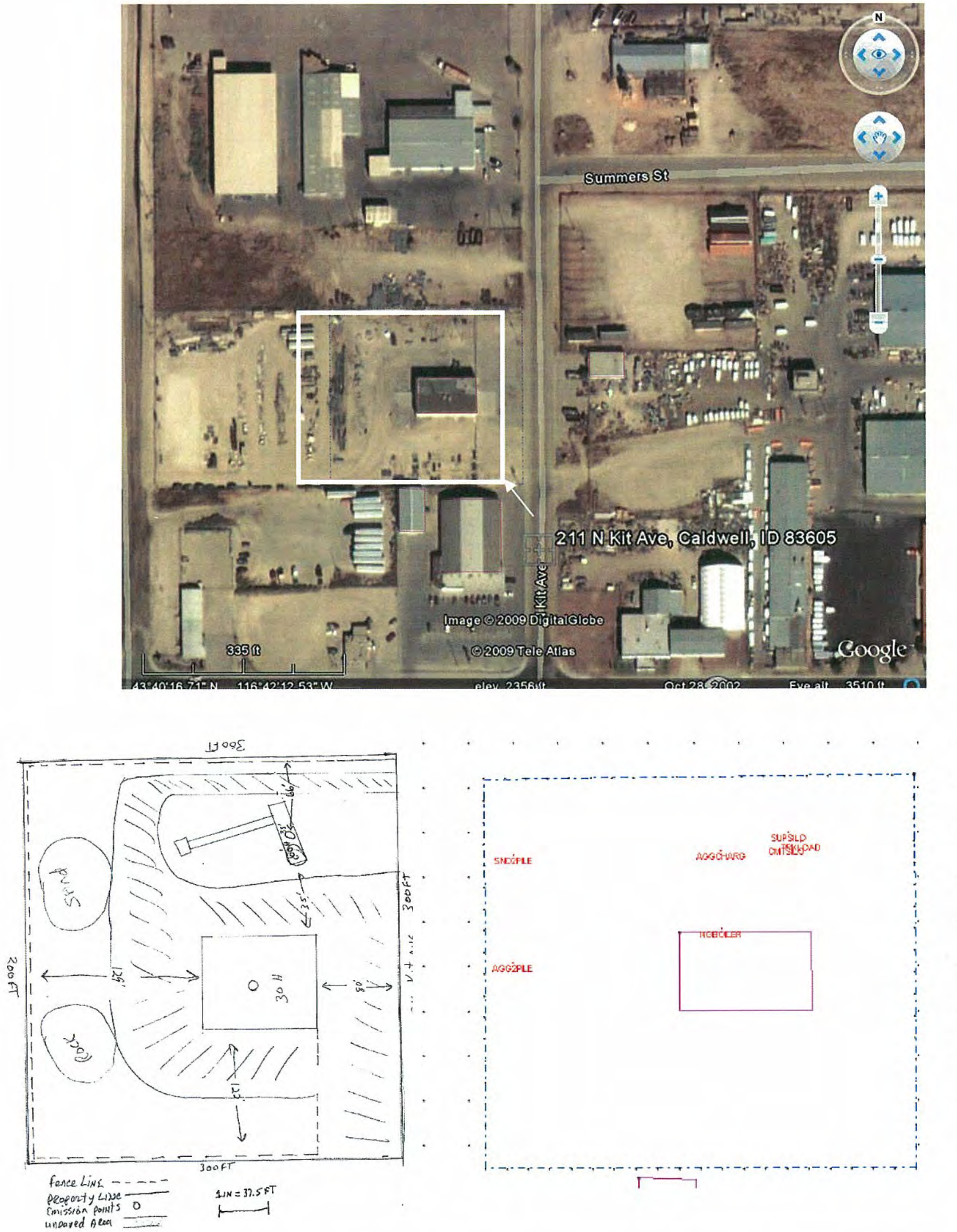


Figure 3-1. FACILITY LAYOUT AT 211 N KIT AVENUE, CALDWELL

3.1.7 Building Downwash

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

3.1.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." For area sources, the ambient air boundary is typically defined as the property boundary. The concrete batch plant operations at 211 N. Kit Avenue are on a small 300 ft by 300 ft parcel where it is reasonable to presume that facility personnel could prevent public access during facility operations. Based on this rationale, the property boundary was used as the ambient air boundary for the dispersion modeling.

3.1.9 Receptor Network and Generation of Setback Distances

The receptor grid used for these modeling analyses used a very tight 5-meter spacing for receptors along the fenceline, with 10-meter square grid spacing from the fenceline to a distance of 100 meters, and 20-meter spacing from 100 meters to 300 meters. The receptor grid met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*.

3.2 Emission Rates

Emissions rates used in the modeling analyses were estimated using a DEQ spreadsheet developed for concrete batch plants (see Attachments 2 and 3 of this memo). A typical layout for a Vince Hagan HS-Series concrete batch plant is shown in Figure 3-2.

Figure 3-2. VINCE HAGAN HS-SERIES HAGANATOR DECUMULATOR (TYPICAL)

Source: http://www.vincehagan.com/files/HSbrochure.pdf, accessed by DEQ on June 16, 2009

Emission points used in the dispersion modeling for this HS-series concrete batch plant included:

- NGBOILER, a 5 MMBtu/hr natural gas-fired boiler operating for 24 hrs/day and 4,000 hrs per year. Emissions are uncontrolled. As discussed in Section 1 of this memo, the emissions of other criteria pollutants from this source were below DEQ modeling thresholds.
- CMTSILO, the in-truss cement silo dust collector stack. Uses a controlled emission factor.
- SUPSILO, a cement supplement silo dust collector stack. Uses a controlled emission factor.
- SND2PILE, emissions from truck unloading of sand to pile storage, assumes 75% control.
- AGG2PILE, emissions from truck unloading of aggregate to pile storage, assumes 75% control.
- AGGCHARG, front end loader drop of sand and aggregate into hopper, assumes 75% control.
- TRKLOAD, loadout chute for dry mix cement, cement supplement, sand, and aggregate. Weigh batcher emissions are also vented to the loadout chute. Assumes 95% control due to boot or enclosed chute.

Because the transfer point is located very near the ground, the drop height from the hopper to the conveyor is relatively small, and water sprays are provided, emissions from this point were neglected.

As described above, it was assumed that implementation of moderate control measures will reduce fugitive emissions by 75 percent compared to uncontrolled emissions. Emissions from each of the volume sources were varied with wind speed in the model, with wind speeds ranging from 0 to 14 meters per second (m/sec). Six wind speed categories were used for modeling: 1.54 m/sec, 3.09 m/sec, 5.14 m/sec, 8.23 m/sec, and 10.8 m/sec, where 1 m/sec = 2.237 miles per hour (mph). These corresponded to wind speed categories used within AERMOD.

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

3.2.1 Criteria Pollutant Emissions Rates

Criteria pollutant emissions rates used in the modeling analyses for both long-term and short-term averaging periods are shown in Table 8.

Table 8. EMISSIONS RATES USED FOR FULL NAAQS IMPACT MODELING

Source ID	PM_{10} 24-hr avg. (lb/hr)	PM_{10} Annual avg. (lb/hr)
Point Sources		
NGBOILER	3.70E-02	1.70E-02
CMTSILO	8.35E-03	2.86E-03
SUPSILO	1.79E-02	6.12E-03
Volume Sources		
SND2PILE	1.80E-02	6.00E-03
AGG2PILE	7.80E-02	2.70E-02
AGGCHARG	9.60E-02	3.30E-02
TRKLOAD	4.10E-01	1.37E-01

3.2.2 TAP Emissions Rates

TAP emissions associated with operation of the concrete batch plant operations are shown in Table 9. These values were multiplied by a factor of 1E+06 when input to the model, to avoid errors associated with computations using very small numbers. The table includes only those TAPs where total emissions exceeded emissions screening levels of Idaho Air Rules Sections 585 and 586.

Table 9. EMISSIONS RATES USED FOR TAPS IMPACT MODELING			
Source ID	**Arsenic (lb/hr)**	**Nickel (lb/hr)**	**Chromium VI (lb/hr)**
Point Sources			
NGBOILER	4.48E-07	4.70E-06	0.00E+00
CMTSILO	3.56E-08	3.51E-07	4.88E-08
SUPSILO	1.25E-06	2.85E-06	4.58E-07
Volume Sources			
SND2PILE	---	---	---
AGG2PILE	---	---	---
AGGCHARG	---	---	---
TRKLOAD	1.47E-06	5.75E-06	1.17E-06

3.3 Emission Release Parameters

Emissions release parameters for the analyses including stack height, stack diameter, exhaust temperature, and exhaust velocity are shown in Table 10. Emissions from the natural gas-fired boiler stack and silo baghouse/dust collector stacks were modeled as point sources. Emissions from material transfers were modeled as volume sources. Release parameters for the volume sources were based on the following:

- SND2PILE. Sand to pile 20 m x 20 m x 5 m high. No credit was taken for the concrete barriers located on the west and south sides of the pile storage area.
- AGG2PILE. Aggregate to pile 20 m x 20 m x 5 m high. No credit was taken for the concrete barriers located on the west and south sides of the pile storage area.
- AGGCHARG. Aggregate & sand hopper charging, creating a volume source 20m x 20m x 10 m high.
- TRKLOAD. Truck loadout (combined emissions with batcher), creating a volume source 20 m x 20 m x 10 m high.

The initial lateral dimension (σ_{yo}) and initial vertical dimensions (σ_{zo}) for volume sources were calculated based on modeling guidance as follows:

For each single volume source: σ_{yo} = length of side divided by 4.3. (20 m / 4.3 = 4.65)

For each surface-based source: σ_{zo} = vertical dimension divided by 2.15. (5 m /2.15 = 2.33)

For each elevated source not on or adjacent to a building: σ_{zo} = vertical dimension divided by 4.3. (10 m /4.3 = 2.33)

Table 10. EMISSIONS RELEASE PARAMETERS								
Source ID	**Easting (x) (m)**	**Northing (y) (m)**	**Stack Height (ft)**	**Temperature**		**Exit Velocity (m/s)**	**Stack Diameter (ft)**	**Stack Orientation**
				(K)	**(°F)**			
Point Sources								
NGBOILER	156.24	158.42	34	449.82	350	0.001	0.83	Raincap
CMTSILO	170.79	177	60	298	76.73	0.001	2.58	Vertical, uncapped
SUPSILO	171.14	180	33	298	76.73	0.001	2.58	Vertical, uncapped
Volume Sources								
	Easting (x) (m)	**Northing (y) (m)**	**Release Height (ft)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**		**Initial Vertical Dispersion Coefficient σ_{z0} (m)**		
SND2PILE	110	175	8.20	4.65		2.33		
AGG2PILE	109.78	150.86	8.20	4.65		2.33		
AGGCHARG	156.12	175.91	12	4.65		2.33		
TRKLOAD	173.86	177.98	14.5	4.65		2.33		
ft = feet °F = degrees Fahrenheit K = Kelvin								

3.4 Results for Full NAAQS Impact Analyses

DEQ performed a site-specific cumulative NAAQS impact analyses to evaluate compliance with applicable standards for PM_{10}, the only criteria pollutant required to be modeled. The maximum ambient concentrations predicted for each year of the meteorological data set are shown in micrograms per cubic meter ($\mu g/m^3$) in Table 11.

Table 11. AERMOD RESULTS, BOISE MET DATA 1988 - 1992						
Pollutant	**Averaging Period**	**Maximum Modeled Ambient Concentrations ($\mu g/m^3$) [a]**				
		1988	**1989**	**1990**	**1991**	**1992**
PM_{10} [b]	24 hour	71.66	67.77	69.30	67.94	**79.86**
		70.90	67.68	68.15	67.72	**78.15**
		68.60	66.61	66.90	66.11	**77.56**
		67.66	66.60	66.69	65.95	**73.29**
		66.07	62.99	64.54	63.64	67.28
		62.68	60.09	60.90	61.61	65.59
	Annual	**9.26**	9.10	9.05	8.10	9.12

a. Micrograms per cubic meter.

b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

Results of the cumulative NAAQS impact analyses are provided in Table 12. A graphic showing the 24-hr PM_{10} results for the 1988 met data is included as Attachment 4.

Table 12. RESULTS FOR FULL IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Maximum Modeled Concentration ($\mu g/m^3$)**	**Background Concentration ($\mu g/m^3$)**	**Total Ambient Impact ($\mu g/m^3$)**	**NAAQS[a] ($\mu g/m^3$)**	**Percent of NAAQS**
PM_{10}	24-hour (Maximum 6th high)	70.9	73	143.9	150	95.9%
	Annual (Maximum 1st high)	9.3	26	35.3	50	70.6%

a. Defined in Idaho Air Rules Section 577

3.5 Results for TAPs Analyses

DEQ performed a TAPs impact analyses to evaluate compliance with applicable increments for arsenic, nickel, and hexavalent chromium. The maximum ambient concentrations predicted for each year of the meteorological data set are shown in micrograms per cubic meter ($\mu g/m^3$) in Table 13.

Table 13. AERMOD RESULTS, BOISE MET DATA 1988 - 1992						
Pollutant	Averaging Period	Maximum Modeled Ambient Concentrations ($\mu g/m^3$) [a]				
		1988	1989	1990	1991	1992
Arsenic	Annual	**88.83**	87.46	87.02	76.82	86.67
Nickel	Annual	**371.4**	366.5	363.7	324.2	361.3
Chromium (VI)	Annual	**67.76**	66.38	66.17	57.99	66.08

[a] Micrograms per cubic meter.

[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

As described above, the TAPs emission levels were multiplied by a factor of 1 x 10^6 to avoid modeling computations using very small values. The maximum modeled ambient concentration for each TAP for any year of the meteorological data sets (shown in Table 13) was multiplied by a factor of 1 x 10^{-6} for comparison with the applicable standard. Results of the TAPs impact analyses are provided in Table 14.

Table 14. RESULTS OF TAP ANALYSES				
TAP	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[a]	AACC[b] ($\mu g/m^3$)	Percent of AACC
Arsenic	Annual (Maximum 1st high)	8.8E-05	2.3E-04	38%
Nickel	Annual (Maximum 1st high)	3.7E-04	4.2E-03	8.8%
Chromium (VI)	Annual (Maximum 1st high)	6.8E-05	8.3E-05	82%

[a] Micrograms per cubic meter

[b] Acceptable Ambient Concentration for a Carcinogen

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 air quality standard.

Concrete Batch Plant (CBP) Streamlined Air Quality Permitting

DISPERSION MODELING PROTOCOL: REQUEST TO USE DEQ GENERIC MODELING RESULTS TO DEMONSTRATE PRECONSTRUCTION COMPLIANCE WITH IDAHO AIR QUALITY RULES

Proposed Project: **Portable Concrete Batch Plant:** **120** CY/HR **500,000** CY/YR

Location (identify initial location): **211 N. Kit Avenue, Caldwell, Idaho**
(Street address, city, county)

The proposed project will meet all of the criteria specified below as noted, and Applicant agrees to accept permit conditions requiring continuing compliance with the physical parameters and setback distance(s) described in Table 1.

Applicant is requesting that the DEQ emission inventory and generic model results be used to demonstrate preconstruction compliance with the National Ambient Air Quality Standards (NAAQS) and state-regulated toxic air pollutant (TAP) increments for this project.

If this modeling protocol is approved by DEQ, no modeling analysis will be submitted with the PTC application for this project.

In accordance with IDAPA 58.01.01.225, permit processing fees will be based on the requested maximum annual emissions for this project. An emissions inventory (EI) based on the plant's capacity and proposed maximum annual operations will be included with the application, and will comply with the following:

a. Emissions will be calculated using EPA AP-42 factors and good engineering judgment.
b. Fugitive emissions sources will be included in the EI, except for emissions resulting from vehicle traffic and wind erosion from storage piles.
c. The level of emissions control assumed for each source will be clearly specified.
d. Cr+6 will be presumed to comprise 20% of the total chromium emissions from cement silo filling, and 30% of the total chromium emissions from cement supplement (flyash) silo filling.

The original signed copy of this modeling protocol and a copy of the DEQ approval shall be submitted with the PTC application for this project.

I certify that based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Lance Thueson	Americrete Ready mix	208-466-2503
Print Name	Company	Telephone/E-mail
[signature]	President	5/5/09
Signature	Title/Position	Date

Table 1. CRITERIA FOR USING DEQ's CBP GENERIC MODELING RESULTS FOR PRECONSTRUCTION PERMITTING AIR IMPACT ANALYSES

Parameter	DEQ Generic Modeling Assumptions	Proposed Project
Operations:		
Operation in any nonattainment area	Not proposed.	**Not proposed.**
No Co-Located Operations[a]	≤ 200 meters (656 feet)	**No collocation.**
Concrete Batch Plant:		
Concrete batch plant type	Truck mix (redi-mix or dry mix) or Central mix	**Dry Mix (Truck Mix)**

DEQ NOTE: Length and width of parcel at 211 N. Kit Avenue are ~300 feet. Cement silo stack is located about 66 feet from the northern property boundary. Does not qualify for "generic" modeling. "Generic" modeling may be used, however, for any other site with sufficient setback distance.

Concrete Batch Plant (CBP) Streamlined Air Quality Permitting

DISPERSION MODELING PROTOCOL: REQUEST TO USE DEQ GENERIC MODELING RESULTS TO DEMONSTRATE PRECONSTRUCTION COMPLIANCE WITH IDAHO AIR QUALITY RULES

Table 1. CRITERIA FOR USING DEQ's CBP GENERIC MODELING RESULTS FOR PRECONSTRUCTION PERMITTING AIR IMPACT ANALYSES

Parameter	DEQ Generic Modeling Assumptions				Proposed Project
Water Heater	Natural gas-fired or Diesel-fired: Rating, hours, and fuel use may vary but emissions must not exceed DEQ modeling thresholds. Use DEQ spreadsheet to determine maximum daily and annual use.				Natural gas: **2.5 to 5 MMBtu/hr** 24 hr/day 4,000 hr/yr ____ MMscf/day ____ MMscf/yr Diesel: Max: ____ % by weight sulfur ____ hr/day ____ hr/yr ____ gal/day ____ gal/yr
CBP Power supply.	No generator. Line power is available.				**No generator.**
Number of cement and/or cement supplement (e.g., flyash) storage silos	Not limited. The model layout assumes all silo emissions are from the same point, and that cement/supplement is not transferred between storage silos.				
Max concrete production (cubic yards/day)	1,500	2,400	3,600	4,800	**Current Site: Max 2,400**
Minimum Setback Distance[a]	40 m (131 ft)	60 m (197 ft)	100 m (328 ft)	150 m (492 ft)	**Current Site: Max 300'**
Maximum annual concrete production (cy/year)	300,000	400,000	400,000	500,000	**500,000**
Point Source Emissions Controls and Stack Parameters:					
Cement and supplement storage silo baghouse(s)	Stack Height ≥ 10 meters (32.8 ft) Minimum PM/PM_{10} control: 99%				**Cement silo 60 ft** **Flyash silo 33 ft**
Weigh hopper loading baghouse or equivalent	Stack Height: ≥ 10 m (32.8 ft) Minimum PM/PM_{10} control: 99%				**Boot, vented back to silo**
Truck-mix loadout or Central mix loading	Boot enclosure, shroud, water sprays, or baghouse/cartridge filter Minimum PM/PM_{10} control: 95%				**Boot plus cement tube**
Fugitive Emissions:					
Transfer Point Fugitives	BMPs. No visible emissions leaving property boundary. (see/no see compliance demonstration) 75% control: water sprays, enclosures, shrouds, or aggregate/sand is damp on an as-received basis and used before significantly drying out.				**BMPs.**

[a] CBP is considered to be co-located if the minimum distance FROM any other emissions source TO any silo baghouse stack, truck or central mix loading point, or weight batcher transfer point is less than or equal to 200 meters (656 feet).

[b] Minimum distance from any silo baghouse stack, truck or central mix loading point, or weight batcher to any area outside of a building where the public has access.

Please submit a signed copy of this form to:

Air Quality Modeling
Attn: Cheryl Robinson/Kevin Schilling
Idaho Department of Environmental Quality
1410 N. Hilton
BOISE ID 83706

Or, to expedite DEQ receipt and processing, you may send a faxed or scanned copy of the signed form to:

Fax No.: 208.373.0340, Attn: Cheryl Robinson/Kevin Schilling
Email to both: Cheryl.Robinson@deq.idaho.gov and
Kevin.Schilling@deq.idaho.gov

ATTACHMENT 2. EMISSION INVENTORY: 5 MMBTU/HR PROCESS WATER BOILER

AMERICRETE dba G&B Ready Mix, Nampa

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

5 MMBtu/hr / 1,020 MMBtu/MMscf = 4.90E-03 MMscf/hr

Operating Assumptions: 24 hr/day; 4,000 hr/yr

Fuel Use:
0.118 MMscf/day
19.608 MMscf/year

Criteria Air Pollutants	Emission Factor	Emissions			Modeling Threshold		Modeling Required ?	Modeling Threshold		Modeling Required ?
	lb/MMscf	lb/hr	T/yr		2002 Guidance			Case-by-Case		
NO2	100	4.90E-01	9.80E-01		1	T/yr	No	7	T/yr	No
CO	84	4.12E-01	8.24E-01		14	lb/hr	No	70	lb/hr	No
PM10	7.6	3.73E-02	7.45E-02		0.2	lb/hr	No	0.9	lb/hr	No
		3.73E-02	7.45E-02		1	T/yr	No	7	T/yr	No
SOx	0.6	2.94E-03	5.88E-03		0.2	lb/hr	No	0.9	lb/hr	No
		2.94E-03	5.88E-03		1	T/yr	No	7	T/yr	No
VOC	5.5	2.70E-02	5.39E-02		40	T/yr	No			
Lead	0.0005	2.45E-06	4.90E-06		0.6	T/yr	No			
Lead, continued			2.45E-03	lb/quarter	**10**	lb/mo	No			
		TOTAL	1.94E+00	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	EL (lb/hr)	
PAH HAPs				
2-Methylnaphthalene	2.40E-05	**5.37E-08**	9.10E-05	No
3-Methylchloranthrene	1.80E-06	**4.03E-09**	2.50E-06	No
Acenaphthene	1.80E-06	**4.03E-09**	9.10E-05	No
Acenaphthylene	1.80E-06	**4.03E-09**	9.10E-05	No
Anthracene	2.40E-06	**5.37E-09**	9.10E-05	No
Benzo(a)anthracene	1.80E-06	**4.03E-09**	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	**2.69E-09**	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	**4.03E-09**		See POM
Benzo(g,h,i)perylene	1.20E-06	**2.69E-09**	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	**4.03E-09**		See POM
Chrysene	1.80E-06	**4.03E-09**		See POM
Dibenzo(a,h)anthracene	1.20E-06	**2.69E-09**		See POM
Dichlorobenzene	1.20E-03	**2.69E-06**	9.10E-05	No
Fluoranthene	3.00E-06	**6.72E-09**	9.10E-05	No
Fluorene	2.80E-06	**6.27E-09**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	**4.03E-09**		See POM
Naphthalene	6.10E-04	1.37E-06	3.33	No
Naphthalene	6.10E-04	**1.37E-06**	9.10E-05	No
Phenanathrene	1.70E-05	**3.81E-08**	9.10E-05	No
Pyrene	5.00E-06	**1.12E-08**	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH	**2.55E-08**	2.00E-06	No
Non-PAH HAPs				
Benzene	2.10E-03	**4.70E-06**	8.00E-04	No
Formaldehyde	7.50E-02	**1.68E-04**	5.10E-04	No
Hexane	1.80E+00	8.82E-03	12	No
Toluene	3.40E-03	1.67E-05	25	No
Non-HAP Organic Compounds				
7,12-Dimethylbenz(a)anthra	1.60E-05	7.84E-08		
Butane	2.10E+00	1.03E-02		
Ethane	3.10E+00	1.52E-02		
Pentane	2.60E+00	1.27E-02	118	No
Propane	1.60E+00	7.84E-03		
Metals (HAPs)				
Arsenic	2.00E-04	**4.48E-07**	1.50E-06	No
Barium	4.40E-03	2.16E-05	0.033	No
Beryllium	1.20E-05	**2.69E-08**	2.80E-05	No
Cadmium	1.10E-03	**2.46E-06**	3.70E-06	No
Chromium	1.40E-03	6.86E-06	0.033	No
Cobalt	8.40E-05	4.12E-07	0.0033	No
Copper	8.50E-04	4.17E-06	0.013	No
Manganese	3.80E-04	1.86E-06	0.067	No
Mercury	2.60E-04	1.27E-06	0.003	No
Molybdenum	1.10E-03	5.39E-06	0.333	No
Nickel	2.10E-03	**4.70E-06**	2.70E-05	No
Selenium	2.40E-05	1.18E-07	0.013	No
Vanadium	2.30E-03	1.13E-05	0.003	No
Zinc	2.90E-02	1.42E-04	0.667	No

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

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

ATTACHMENT 3. EMISSION INVENTORY: CBP 2400 CY/DAY & 300,000 CY/YEAR

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

Facility Information 6/16/09 18:47

Company:	**Americrete dba G&B Ready Mix**
Facility ID:	**777-00384**
Permit No.:	**P-2009.xxxx (resubmittal for withdrawn P-2009.0063)**
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	**Vince-Hagen**

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:	**120**	cy/hr		Per manufacturer
Proposed Daily Production Rate:	**2,400**	cy/day	**20.00**	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate:	**300,000**	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		

DEQ EI VERIFICATION WORKSHEET v. 032007

Tip: Purple 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_{10} Emission Factor[1] (lb/cy)		Controlled Emission Rate, Max.	Controlled Emission Rate, 24-hour average		Controlled Emission Rate, annual average		Control Assumptions:	
	Controlled	Uncontrolled	lb/hr [2]	lb/hr[3]	lb/day[3]	lb/hr[4]	T/yr[4]		
Aggregate delivery to ground storage		0.0031	0.09	0.078	1.86	0.027	0.116	75%	Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.0007	0.02	0.018	0.42	0.006	0.026	75%	Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.0031	0.09	0.078	1.86	0.027	0.116	75%	Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.0007	0.02	0.018	0.42	0.006	0.026	75%	Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.0031	0.09	0.078	1.86	0.027	0.116	75%	Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.0007	0.02	0.018	0.42	0.006	0.026	75%	Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	**0.0001**		1.00E-02	**8.35E-03**	2.00E-01	2.86E-03	**1.25E-02**	**0.00%**	Baghouse is process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	**0.0002**		2.15E-02	**1.79E-02**	4.29E-01	6.12E-03	**2.68E-02**	**0.00%**	Baghouse is process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher loading)		**0.0040**	2.37E-02	**1.98E-02**	4.74E-01	6.77E-03	**2.96E-02**	**95.0%**	Water spray bar around feed boot
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**	0.47	**0.39**	9.41	0.13	**0.59**	**95.0%**	Boot plus cement tube
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**	0.00	**0.00**	0.00	0.00	**0.00**	99.00%	Baghouse control
Point Sources Total Emissions		**8.26E-02**	**5.26E-01**	**4.38E-01**	1.05E+01	**1.50E-01**	**6.57E-01**		
Process Fugitive Emissions		0.0114	0.34	0.29	6.85	0.10	0.43		
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Windblown Dust)		0.0940	0.87	0.72	17.36	0.25	1.08		

Neglected in the modeling analyses due to very low drop height onto conveyor and transfer point very near ground level.

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[6]		Controlled EF	at 1,051,200 cy/yr	T/yr
Facility Classification Total PM[5]		**8.40E-03**		**4.42E+00**
Facility Classification Total PM10[5,7]		**4.21E-03**		**2.22E+00**

[1] 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 ... 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 ar... s are based on the assumed control levels input on the right hand side of the table.

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

[3] 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.

[4] 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)

[5] 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)

[6] Emissions for Facility Classification are based on baghouses as process equipment, 24-hr day, 8760 hr/yr = 2,880 cy/day, and 1,051,200 cy/yr

[7] 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	3.21E-07	1.95E-04	8.03E-04	2.68E-07	Point Source	1.41E-06
Cement supplement delivery to Silo [3]	**5.20E-07**	ND	2.28E-06	1.39E-03	5.69E-03	1.90E-06	Point Source	9.98E-06
Truck Loadout (with 99.9% control) [7]		**3.62E-06**	6.13E-06	3.73E-03	1.53E-02	5.10E-06	Fugitive	
Central Mix (with 100% control)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Fugitive	
Total			**8.72E-06**	**5.31E-03**	**0.022**		**Point Sources**	**1.14E-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/yd³ of concrete x max. daily concrete production rate x (365/12)/(2000 lb/T

[4] T/yr = EF x pound of material/yd³ 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

Facility Information

Company:	Americrete dba G&B Ready Mix
Facility ID:	777-00384
Permit No.:	P-2009.xxxx (resubmittal for withdrawn P-2009.0063)
Source Type:	Portable Concrete Batch Plant
Manufacturer:	Vince-Hagen

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: Purple 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:	120	cy/hr	
Proposed Daily Production Rate:	2,400	cy/day	
Proposed Maximum Annual Production Rate:	300,000	cy/year	

Uncontrolled (Unlimited Production Rate)

	24 hrs/day,
2,880 cy/day	7 day/wk,
1,051,200 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	1.68E-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	4.78E-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.** — **2,880 cy/day, and 1,051,200 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)	1.25E-07	5.47E-07	1.43E-08	6.27E-08	1.43E-08	6.27E-08	8.54E-07	3.25E-05	3.45E-06	1.51E-05	1.23E-06	5.39E-06	3.48E-04	1.52E-03	ND	ND	1.71E-07		
Cement supplement delivery to Silo (with baghouse)	4.38E-06	1.92E-05	3.96E-07	1.73E-06	8.67E-08	3.80E-07	5.34E-06	2.34E-05	1.12E-06	4.91E-06	9.99E-06	4.37E-05	1.55E-05	6.79E-05	3.17E-07	1.39E-06	1.60E-06		
Truck Loadout (NO baghouse)	1.03E-04	4.51E-04	8.26E-06	3.62E-05	1.16E-06	5.07E-06	3.86E-04	1.69E-03	2.07E-03	9.07E-03	4.03E-04	1.76E-03	1.30E-03	5.69E-03	8.87E-05	3.88E-04	8.21E-05		
[illegible]	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	[illegible]	[illegible]	
Sources Total	**1.07E-04**	4.70E-04	**8.67E-06**	3.80E-05	**1.26E-06**	5.51E-06	**3.92E-04**	1.75E-03	**2.08E-03**	9.09E-03	**4.14E-04**	1.81E-03	**1.66E-03**	7.28E-03	**8.90E-05**	3.90E-04	**8.39E-05**	**2.08E-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.** — **2,400 cy/day, and 300,000 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]	3.56E-08	1.56E-07	4.09E-09	1.79E-08	4.09E-09	1.79E-08	7.12E-07	1.07E-06	2.87E-06	4.31E-06	3.51E-07	1.54E-06	ND	ND	ND	ND	4.88E-08		
Cement supplement delivery to Silo (with baghouse)2	1.25E-06	5.48E-06	1.13E-07	4.95E-07	2.48E-08	1.08E-07	3.00E-05	6.68E-06	6.28E-06	1.40E-06	2.85E-06	1.25E-05	8.69E-05	1.94E-05	2.64E-07	3.96E-07	4.58E-07		
Truck Loadout (with baghouse)	1.47E-06	6.43E-06	1.18E-07	5.16E-07	1.65E-08	7.23E-08	1.61E-05	2.41E-05	8.63E-05	1.29E-04	5.75E-06	2.52E-05	5.41E-05	8.12E-05	3.69E-06	5.54E-06	1.17E-06	95.00%	Water spray bar around feed boot
[illegible]	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	0.00E+00	[illegible]	[illegible]
Sources Total	**2.75E-06**	1.21E-05	**2.35E-07**	1.03E-06	**4.54E-08**	1.99E-07	**4.67E-05**	3.19E-05	**9.54E-05**	1.35E-04	**8.95E-06**	3.92E-05	**1.41E-04**	1.01E-04	**3.96E-06**	5.94E-06	**1.68E-06**	**3.26E-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	183.57%		0.84%		1.23%		0.14%		0.0287%		33.14%		2.02%		0.0304%		299.73%		
EXCEEDS EL?	**Yes**		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

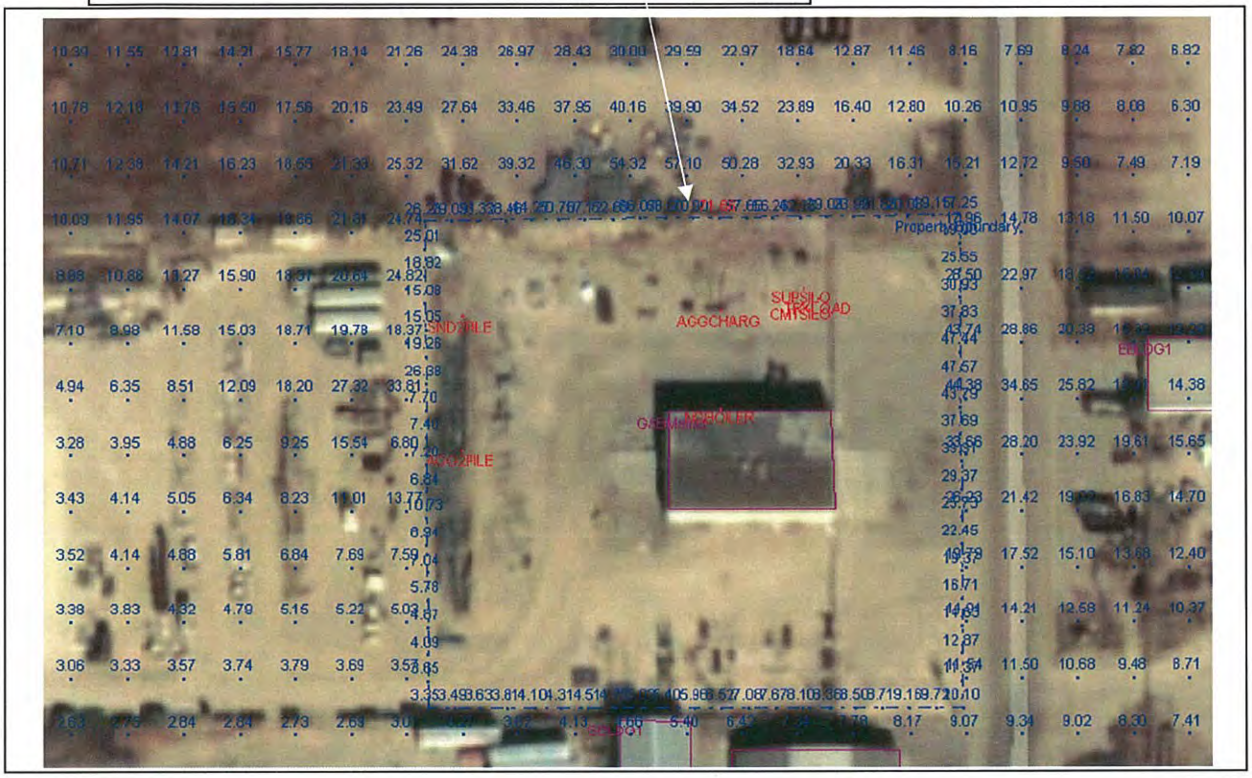
[4] T/yr = lb/hr, annual avg x 8760 hr/yr x (1T/2000 lb)

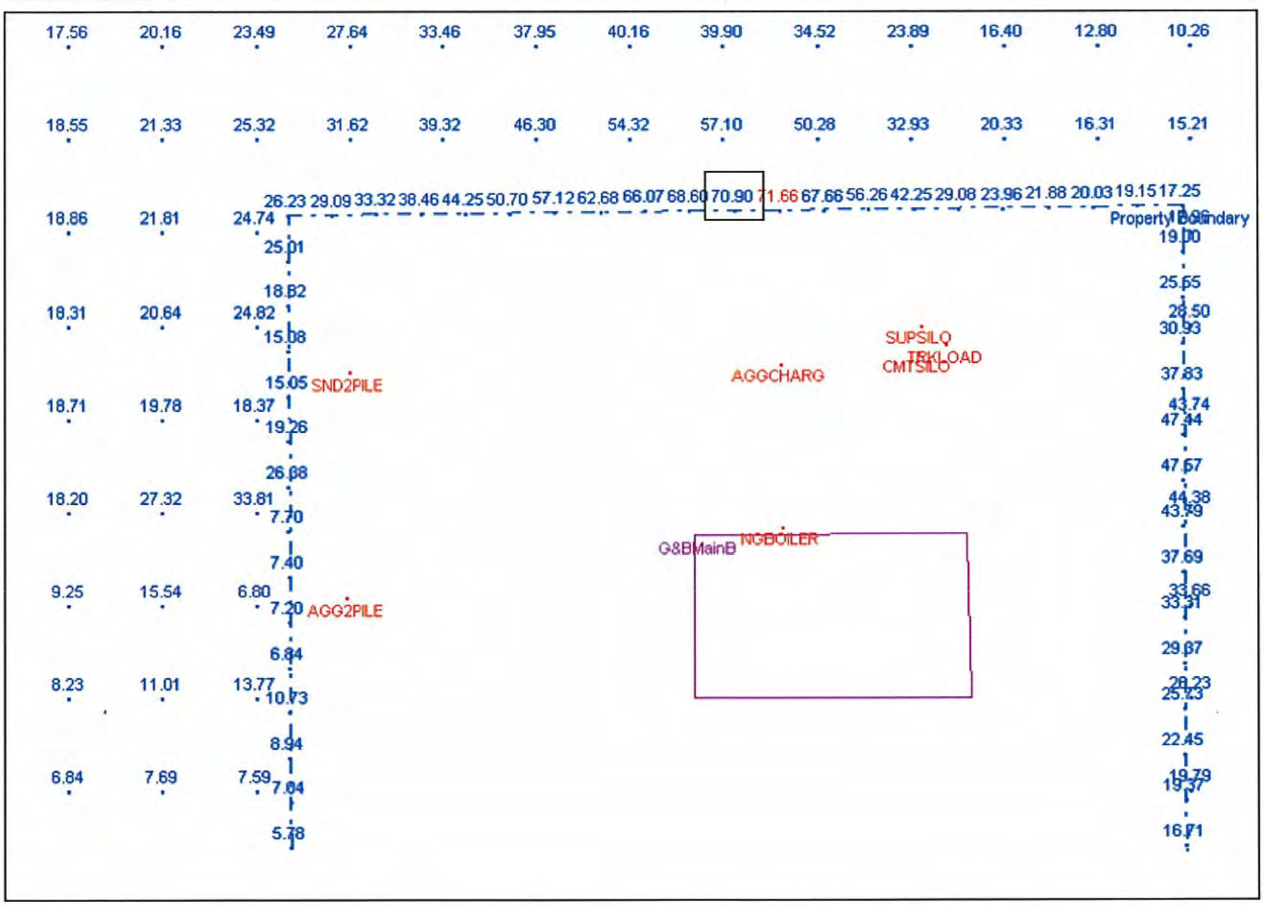
[5] T/yr = EF x pound of cement, or cement supplement, or cement + cement supplement x annual concrete production rate /2000 lb/ton / 2000 lb/ton

ATTACHMENT 4. 24-HR AVERAGE PM_{10} IMPACTS CBP 2400 CY/DAY (MODEL YR 1988)

Maximum 6[th] highest (1988-1992) = 70.90 μg/m[3]

N





ATTACHMENT 5. MODELING ANALYSIS MEMO FOR GENERIC CONCRETE BATCH PLANT

MEMORANDUM

DATE: September 18, 2007

Prepared by: Cheryl Robinson, P.E., Staff Engineer/Permit Writer, Air Quality Division

Reviewed by: Kevin Schilling, Modeling Coordinator, Air Quality Division

SUBJECT: Portable Concrete Batch Plants – Generic Modeling Results for Typical Plant

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1. Summary

Most ready-mix concrete batch plants share many characteristics with each other such as equipment design, fugitive dust control practices, emissions quantities for a given processing rate, general facility layout, and emission release parameters. These shared characteristics allow the development of generic methods to assess the air quality impact of these batch plants. The appropriateness of using generic methods is particularly justifiable for ready-mix concrete batch plants because most are permitted as portable sources, and specific equipment configurations will change somewhat from site to site.

1.1 Generic Modeling Applicability

Use of this generic method to demonstrate preconstruction compliance with National Ambient Air Quality Standards (NAAQS) and Idaho toxic air pollutant (TAP) rules from operation of concrete batch plants is designed to generate reasonably conservative results, and may not be applicable to all batch plants.

The key criteria for determining the applicability of the generic modeling results are summarized in Table 1. In cases where the proposed operations differ from these assumptions (e.g., stack heights are lower, or emissions controls do not meet the minimum criteria), the applicant shall provide additional explanation in their modeling protocol to justify use of the generic modeling results. This information, along with DEQ's approval of the modeling protocol shall be included in the statement of basis for the permit.

The appropriateness of this method to specific conditions will be made on a case-by-case basis considering the following:

- Equipment used at the batch plant, especially considering the type and effectiveness of emissions control equipment and practices.
- Proposed location for the facility, considering the presence of any sensitive receptors near the property boundary and the distance from pollutant emitting equipment to the property boundary.
- The presence of other pollutant emitting activities occurring at the site, including collocation with another concrete batch plant, rock crushing equipment and/or hot mix asphalt plants.

Table 1. CRITERIA FOR USING DEQ's CONCRETE BATCH PLANT GENERIC MODELING RESULTS FOR AIR IMPACT ANALYSES

Parameter	DEQ Generic Modeling Assumptions			
Concrete batch plant type and capacity	Truck mix (redi-mix or dry mix) or Central mix Maximum 300 cy per hour capacity			
Operation in any PM_{10} nonattainment area	Not proposed.			
Presence of an electric generator.	No generator. Line power is available.			
No Collocation. Minimum distance from nearest edge of any emissions source to any other source of emissions, including another concrete batch plant, hot mix asphalt plant, or rock crushing plant.	200 meters (656 feet)			
Number of cement and/or cement supplement storage silos	Not limited. The model layout assumes all silo emissions are from the same point, and that cement/supplement is not transferred between storage silos.			
Maximum daily concrete production (cy/day)	1,500	2,400	3,600	4,800
Minimum Setback Distance. Minimum distance from nearest edge of any emissions source to any area outside of a building where the general public has access.[a]	**40 m (131 ft)**	**60 m (197 ft)**	**100 m (328 ft)**	**150 m (492 ft)**
Maximum annual concrete production (cy/year)	300,000	400,000	500,000	500,000
Cement and supplement storage silo baghouse(s) Minimum stack height (height above ground) Minimum PM/PM_{10} control	10 meters (32.8 ft) 99%			
Weigh hopper loading baghouse, or equivalent Minimum stack height (height above ground) Minimum PM/PM_{10} control	10 meters (32.8 ft) 99%			
Truck-mix loadout or Central Mix loading. Minimum PM/PM_{10} control.	95% Boot enclosure, shroud, water sprays, or baghouse/cartridge filter			
Transfer Point Fugitives. Minimum PM/PM_{10} control.	75% Water sprays, enclosures, shrouds, or aggregate/sand is damp on an as-received basis and used before significantly drying out.			

[a] The general public will be considered to have access to any facility area that is not fenced, posted with no trespassing signs and regularly patrolled or observable by facility staff during plant operations, or separated from the facility by a natural barrier such as a steep cliff. This distance shall be measured from the nearest edge of any storage pile, silo, weigh batcher, transfer point, or conveyor associated with this concrete batch plant.

1.2 Applicable Permit Conditions

The following permit conditions should be included in any permit using the generic modeling to demonstrate preconstruction compliance with NAAQS and TAPs:

- A prohibition on operating this plant in any PM_{10} nonattainment area. IDAPA 58.01.01.006 defines a PM_{10} impact increase of 5 µg/m3 (24-hour average) or 1 µg/m3 (annual average) as a "significant contribution." The predicted ambient impacts for each of the modeled daily and annual production rates exceed these thresholds.
- Daily concrete production limits based on the setback distance available that day. The setback for each modeled daily production rate is defined by the minimum distance needed to meet the 24-hour PM_{10} NAAQS standard.

- Annual concrete production limits based on the setback distance available at any location. Preconstruction compliance with state TAPs rules was demonstrated using controlled TAPs emissions, so per IDAPA 58.01.01.210.08, an emission limit must be imposed. The production limit inherently limits the TAPs emissions, so a pollutant-specific lb/yr limit is not needed.
- O & M manual and operational requirements that will ensure that a high level of control is consistently achieved and maintained for baghouse/cartridge filters and for control of fugitive emissions from material transfer points.

2. 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 concrete batch plant is a portable facility that may operate in any attainment or unclassifiable area anywhere in the State of Idaho.

2.1.2 Significant and Full Impact Analyses

If estimated maximum criteria pollutant impacts to ambient air from the emissions sources at this facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions 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 National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

The generic modeling does not currently include emissions from any generators (line power is required to be available), so PM10 and lead are the only criteria pollutants emitted by this facility.

Table 2. CRITERIA AIR POLLUTANTS APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] (μg/m³)[b]	Regulatory Limit[c] (μg/m³)	Modeled Value Used[d]
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon Monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

a. IDAPA 58.01.01.006
b. Micrograms per cubic meter
c. IDAPA 58.01.01.577 for criteria pollutants
d. The maximum 1st highest modeled value is always used for significant impact analysis
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
f. Never expected to be exceeded in any calendar year
g. Concentration at any modeled receptor
h. Never expected to be exceeded more than once in any calendar year
i. Concentration at any modeled receptor when using five years of meteorological data
j. Not to be exceeded more than once per year

2.1.3 *Toxic Air Pollutant Analyses*

Toxic Air Pollutant (TAP) requirements for PTCs are specified in IDAPA 58.01.01.210. If the increase associated with a new source or modification exceeds screening emission levels (ELs) contained in IDAPA 58.01.01.585 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 listed in IDAPA 58.01.01.585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) listed in IDAPA 58.01.01.586, then compliance with TAP requirements has been demonstrated.

2.2 *Background Concentrations*

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in these analyses are listed in Table 3. These are the default rural/agricultural background concentrations, which were used because concrete batch plants are typically located outside of urban areas.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration (µg/m3)[a]
PM_{10}[b]	24-hour	73
	annual	26
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO2)	3-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO2)	Annual	17

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

3. Modeling Impact Assessment

3.1 *Modeling Methodology*

3.1.1 *Model Selection and Key Parameters*

Atmospheric dispersion modeling was used to evaluate the air quality impacts from point sources and process fugitive sources. Table 4 provides a summary of the model selection and modeling parameters used in the modeling analyses.

Table 4. MODELING PARAMETERS

Parameter	Description/ Values	Documentation/Additional Description
Model	AERMOD, Version 04300	The Gaussian dispersion model AMS/EPA Regulatory Model (AERMOD) was run for a single case (3,600 cy/day, 500,000 cy/year, with a 100-meter ambient air boundary). This case was used to demonstrate that ambient impacts predicted using AERMOD are lower than impacts predicted using ISCST3 for the same emission points and parameters. This is consistent with results reported by the EPA, which found that AERMOD typically predicted lower concentrations than ISCST3 for rural, low-level stacks; and short term urban, low-level stacks.[2]

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

[2] U.S. EPA, Comparison of Regulatory Design Concentrations, AERMOD vs. ISCST3, CTDMPLUS, ISC-PRIME, Staff Report, EPA-454/R-03-002, June 2003 (see page 29).

Table 4. MODELING PARAMETERS		
Parameter	**Description/ Values**	**Documentation/Additional Description**
Model	ISCST3, Version 02035	Due to DEQ schedule and resource constraints, and because ISCST3 results are generally higher (conservative) than AERMOD for these types of near-field analyses, DEQ determined that the Industrial Source Complex Short Term (ISCST3), air dispersion model was acceptable at this time for predicting ambient impacts for all cases.
Meteorolog-ical data	Surface Data & Upper Air Data Boise, Idaho 1988-1992 (AERMOD) 1987-1991 (ISCST3)	Previous DEQ analyses showed that using Boise meteorological data generated the highest modeled values at typical concrete batch plant "fenceline" distances, in part because of the well-defined prevailing wind direction at the Boise monitoring location. For the AERMOD run, AERMET pulled the station anemometer height of 6.1 meters directly from the met data files. For the ISCST3 runs, the station anemometer height of 6.1 meters was used.
Land Use (urban or rural)	Rural	Urban area surface heating was not used in this analysis based on typical land use at concrete batch plant locations.
Terrain	Flat/Level	Flat (level) terrain was used because the results must be reasonably applicable to all locations for this portable facility. Maximum impacts from near ground-level emissions sources, such as those at typical concrete batch plants, are very near the emissions source. This assumption was deemed to be appropriate and is not a substantial limitation of this method.
Building downwash	Considered	To account for plume downwash effects from any buildings present, or equipment that may cause downwash, a 20-meter square building, 10 meters tall and positioned at the center of the plant layout, was used as a representation of structures associated with this concrete batch plant. For ISCST3, the building profile input program (BPIP) was used. The PRIME algorithm was not used because building cavity effects are not expected to be significant.
Receptor grid	Grid 1	10-meter spacing along a"fenceline" described by a circle with a radius of 40, 60, 100, or 150 meters.
	Grid 2	25-meter spacing for distances between the "fenceline" and 200 meters.
	Grid 3	50 meter spacing for distances between 200 meters and 500 meters.

3.1.2 *Facility Layout and Ambient Air Boundary ("Fenceline")*

Portable concrete batch plants are somewhat unique compared to other stationary sources in that the equipment layout may change at each new location. Because of this, a generic approach that reflects a typical batch plant layout is appropriate. The layout used for the modeling is shown in Figure 3-1.

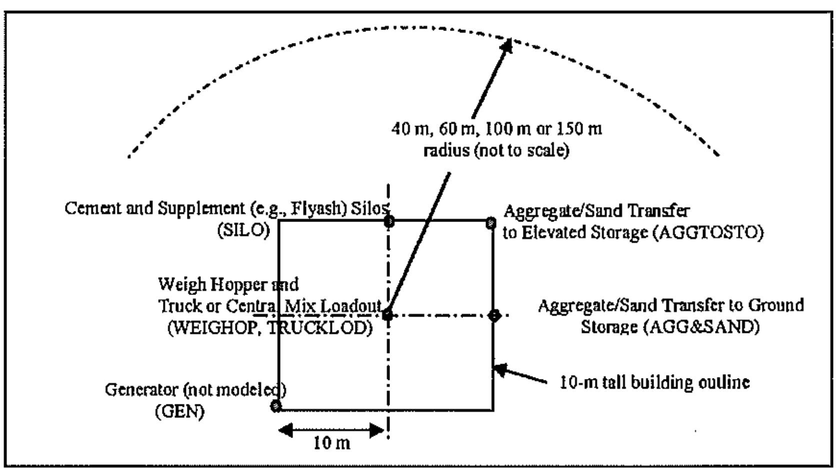

Figure 3-1. Typical Concrete Batch Plant Modeling Layout

For the generic modeling, the ambient air boundary or "fenceline" was taken to be along the perimeter of a circle with a radius of 40, 60, 100, and 150 meters from the center of a 20 meter by 20 meter "typical" plant layout shown in Figure 3-1. The boundaries of the 10-meter tall building added to the model to account for plume downwash effects are also defined by this 20 meter by 20 meter square.

3.1.3 Emissions Release Parameters

Emissions from the handling of aggregate/sand and tuck loading were each modeled as volume sources. Table 5 provides parameters used for modeling these sources as well as point source parameters.

Emissions from the handling of aggregate and sand to ground storage and from ground storage to a ground-level conveyor were modeled together as a volume source in a 20-meter square area at the center of the plant. A 2-meter release height was used to represent the average transfer height. Emissions from conveyor transfer to elevated storage were modeled as an elevated volume source on the 20-meter square building, using a 5-meter release height.

Standard modeling guidance for volume sources on or adjacent to structures suggests setting initial dispersion coefficients as follows:

$$\sigma_{y0} = \text{horizontal dimension} / 4.3$$
$$\sigma_{z0} = \text{vertical dimension} / 2.15$$

Miscellaneous ground-level aggregate and sand handling was assumed to occur from activities in a 20-meter square area. Standard modeling guidance for volume sources not on or adjacent to structures suggests setting initial dispersion coefficients as follows:

$$\sigma_{y0} = \text{horizontal dimension} / 4.3$$
$$\sigma_{z0} = \text{vertical dimension} / 4.3$$

Point sources were conservatively modeled in the generic analyses assuming a horizontal release or a rain-capped stack. A stack gas exit velocity of 0.001 meters per second was used to eliminate momentum-induced plume rise, which would only occur from an uninterrupted vertical release.

Table 5. EMISSIONS RELEASE PARAMETERS FOR SOURCES

Source	UTM Coord. (m)		Stack Height (m)[a]	Stack Gas Temp. (K)[b]	Stack Dia. (m)	Flow Rate (m/sec)[c]
Point Sources						
	Easting	Northing				
Silo baghouse(s) stack	0	10	10	0, 298.15[d]	1.0	0.001[e]
Weigh hopper baghouse stack	0	0	10	0, 298.15[d]	1.0	0.001[e]
Volume Sources						
Source	**UTM Coord. (m)**		**Release Height (m)**	**Initial Horizontal Coefficient σ_{y0} (m)**	**Initial Vertical Coefficient σ_{z0} (m)**	
	Easting	Northing				
Aggregate/sand transfers at ground level	10	10	2	4.65	0.70	
Aggregate/sand transfers at elevated level	10	0	5	4.65	4.65	
Truck loading	0	0	5	4.65	4.65	

a. Meters
b. Kelvin
c. Meters per second
d. When a value of 0 K is used, the AERMOD model uses the ambient air temperature. This value was set to 77 degrees Fahrenheit (298.15 K) for the ISCST3 runs. This is not expected to result in a measurable difference in the ambient impact results.
e. Set to 0.001 m/sec for a horizontal release or release from a rain-capped vertical stack.

3.1.4 *Wind Speed Adjustments for Fugitive Emissions*

The dispersion model AERMOD has an option by which emissions can be varied as a function of wind speed. There are six wind speed categories, and adjustment factors can be assigned for each category. Emissions for each hour modeled are calculated by multiplying the base rate by the appropriate adjustment factor, as determined by the wind speed specified for the hour within the meteorological data file.

For the AERMOD run, base emissions rates were calculated using a wind speed of 10 miles per hour. Wind speed adjustment factors were then developed for each of the six wind speed categories corresponding to the default wind speed categories within the model. The mean wind speed of each category was calculated, and emissions associated with that mean wind speed were calculated. An adjustment factor was calculated for each wind speed category by dividing the emissions rate for that category by the base emissions rate calculated at a 10 mile per hour wind speed. Table 6 summarizes the wind speed categories and the calculated adjustment factors.

Table 6. WIND SPEED ADJUSTMENT FACTORS FOR MATERIAL HANDLING EMISSIONS

Wind Speed Category	ISCST3 Default Upper Wind Speed for Category (m/sec[a])	Median Wind Speed for Category (m/sec (mph[b]))	Emissions Rate for Category (lb/ton[c])	Adjustment Factor[d]
1	1.54	0.77 (1.72)	3.32E-4	0.101
2	3.09	2.32 (5.18)	1.39E-3	0.425
3	5.14	4.12(9.20)	2.94E-3	0.897
4	8.23	6.69 (14.95)	5.52E-3	1.69
5	10.8	9.52 (21.28)	8.73E-3	2.67
6	Not Defined	12.4[e] (27.74)	1.23E-2	3.77

[a] Meters per second

[b] Miles per hour

[c] Pounds of emissions per ton of material handled

[d] Calculated by dividing the emissions rate for the category by the emissions rate for a 10 mph wind (3.27E-3 lb/ton)

[e] An upper value wind speed of 14 m/sec was used, based on highest values observed in the meteorological files used in the modeling analyses.

3.2 *Emission Rates*

The emissions inventories (EIs) used for the generic modeling were based on AP-42 Section 11.12 (dated 06/06) emission factors for a truck-mix concrete batch plant. Based on AP-42 factors, estimated emissions from central mix plants would be the same, except that emissions from loadout to a central mixer are expected to be lower.

Hexavalent chromium [Cr+6 or Cr(VI)] was presumed to comprise 20% of the total chromium emissions from cement silo filling, 30% of the total chromium emissions from cement supplement (e.g., flyash) silo filling, and 21.3% of the total chromium emissions from truck loadout.

Point source emissions from the cement and flyash storage silos were presumed to be controlled by baghouses or cartridge filters with minimum capture efficiencies of 99%.

Uncontrolled fugitive emissions of PM_{10} from material transfer points were based on minimum moisture contents taken from AP-42 Table 11.12-2 of 1.77% for aggregate and 4.17% for sand. Fugitive emissions from material transfer points were assumed to be further controlled by 1) receiving sand and aggregate in a wetted condition and using the stockpile before significant drying out occurs, and/or 2) using manual water sprays or water spray bars to control fugitive emissions that reduce the uncontrolled emissions by an estimated 75%.

Fugitive emissions from truck mix loadout or central mixer loading are controlled by a boot, shroud, or water sprays that reduce the uncontrolled emissions by an estimated 95%.

Fugitive emissions resulting from vehicle traffic and wind erosion from storage piles were excluded from the analysis.

Uncontrolled emissions of TAPs from cement and flyash silo filling and truck mix loadout were based on operation of a 300 cy per hour concrete batch plant for 8,760 hours per year. Cement and flyash silo baghouses/cartridge filters were treated as process equipment, i.e., the uncontrolled TAPs emissions from these sources have been reduced by the capture efficiency associated with the baghouse/cartridge filters.

Emissions were estimated for each of the four daily and annual production combinations (described above in Table 1). The 24-hour and annual average PM_{10} emission rates for each case, and the values used for the modeled source input are summarized in Tables 6A and 6B. The emission rates used for the AERMOD analysis were developed using the equations contained in Section 11.12 of AP-42, rather than using the emission factors from Table 11.12-5, so differ slightly due to rounding or as noted in the table. A sample detailed emissions calculation worksheet is included as Attachment 1 to this memorandum.

Table 6A. EMISSIONS RATES FOR SOURCES - PM_{10}

Source	Emission Factor	Control	ISCST3 1,500 cy/day[b] 300,000 cy/yr[b]		ISCST3 2,400 cy/day 400,000 cy/yr	
	lb/cy[a]		lb/hr_{24}[c]	lb/hr_{YR}[c]	lb/hr_{24}	lb/hr_{YR}
Aggregate to ground	0.0031	75%	0.048	0.027	0.078	0.035
Sand to ground	0.0007	75%	0.011	0.006	0.018	0.008
Aggregate to conveyor	0.0031	75%	0.048	0.027	0.078	0.035
Sand to conveyor	0.0007	75%	0.011	0.006	0.018	0.008
AGG&SAND			**0.119**	**0.065**	**0.190**	**0.086**
Aggregate to elevated storage	0.0031	75%	0.048	0.027	0.078	0.035
Sand to elevated storage	0.0007	75%	0.011	0.006	0.018	0.008
AGGTOSTO			**0.059**	**0.033**	**0.095**	**0.043**
Cement to silo (controlled)	0.0001	--	5.22E-03	2.86E-03	8.35E-03	3.81E-03
Flyash to silo (controlled)	0.0002	--	1.12E-02	6.12E-03	1.79E-02	8.16E-03
SILO			**1.64E-02**	**8.98E-03**	**2.62E-02**	**1.20E-02**
Weigh hopper baghouse stack	0.0040	99%	2.47E-03	1.35E-03	3.95E-03	1.80E-03
WEIGHOP			**2.47E-03**	**1.35E-03**	**3.95E-03**	**1.80E-03**
Truck loadout	0.0784	95%	0.24	0.13	0.39	0.18
TRUCKLOD			**0.24**	**0.13**	**0.39**	**0.18**

[a] Pounds per cubic yard of concrete.
[b] Cubic yards of concrete per day and per year.
[c] Pounds per hour on a 24-hour average and annual average.

Table 6B. EMISSIONS RATES FOR SOURCES - PM_{10}

Source	Emission Factor	Control	AERMOD 3,600 cy/day [b]	ISCST3 3,600 cy/day	ISCST3 4,800 cy/day	AERMOD 500,000 cy/yr [b]	ISCST3 500,000 cy/yr [b]
	lb/cy [a]		lb/hr_{24}	lb/hr_{24} [c]	lb/hr_{24} [c]	lb/hr_{YR}	lb/hr_{YR}
Aggregate to ground	0.0031	75%		0.116	0.155		0.044
Sand to ground	0.0007	75%		0.026	0.035		0.010
Aggregate to conveyor	0.0031	75%		0.116	0.155		0.044
Sand to conveyor	0.0007	75%		0.026	0.035		0.010
AGG&SAND			**0.2814**	**0.285**	**0.380**	**0.1071**	**0.109**
Aggregate to elevated storage	0.0031	75%		0.116	0.155		0.044
Sand to elevated storage	0.0007	75%		0.026	0.035		0.010
AGGTOSTO			**0.1407**	**0.143**	**0.190**	**0.0535**	**0.054**
Cement to silo (controlled)	0.0001	--		1.25E-02	1.67E-02		4.76E-03
Flyash to silo (controlled)	0.0002	--		2.68E-02	3.58E-02		1.02E-02
SILO			**3.939E-02**[g]	**3.93E-02**	**5.25E-02**	**1.497E-02**[g]	**1.50E-02**
Weigh hopper baghouse stack **WEIGHOP**	0.0040	99%	**2.964E-02**[h]	**5.93E-03**	**7.90E-03**	**1.128E-02**[h]	**2.26E-03**
Truck loadout **TRUCKLOD**	0.0784	95%	**0.588**	**0.59**	**0.78**	**0.2234**	**0.22**

[a] Pounds per cubic yard of concrete.
[b] Cubic yards of concrete per day and per year.
[c] Pounds per hour on a 24-hour average and annual average.

The AERMOD analysis for a 300 cy/hr concrete batch plant demonstrated preconstruction compliance for TAPs using uncontrolled emissions and a 100-meter fenceline radius. The uncontrolled emissions, however, were estimated using an older version of AP-42 Table 11.12-8. Using AP-42 factors from the most recent 06/06 edition, uncontrolled emissions of all TAPs for a 300 cy/hr plant were below the applicable screening emission level except for arsenic, nickel, and hexavalent chromium (see page 2 of the example calculation in Attachment 1. Each of these TAPs is a carcinogen, and is subject to an annual AACC. For the ISCST3 analyses, dispersion modeling was done for the controlled emissions of each of these three TAPs. The controlled TAPs emissions used in the ISCST3 analyses are summarized in Tables 7A and 7B.

Table 7A. EMISSIONS RATES FOR SOURCES – CONTROLLED TAPs EMISSIONS

Modeling Case	ISCST3 300,000 cy/yr			ISCST3 400,000 cy/yr		
Pollutant	**Arsenic**	**Nickel**	**Cr (VI)**	**Arsenic**	**Nickel**	**Cr (VI)**
Source	lb/hr_{YR} [a]	lb/hr_{YR}	lb/hr_{YR}	lb/hr_{YR}	lb/hr_{YR}	lb/hr_{YR}
Cement delivery to silo (with baghouse)	3.56E-08	3.51E-07	4.88E-08	4.75E-08	4.69E-07	6.50E-08
Supplement delivery to silo (with baghouse)	1.25E-06	2.85E-06	4.58E-07	1.67E-06	3.80E-06	6.10E-07
SILO	**1.286E-06**	**3.004E-06**	**5.068E-07**	**1.718E-06**	**4.269E-06**	**6.75E-07**
Truck loadout: Cement and supplement delivery to silo (no controls) **TRUCKLOD**	**1.47E-06**	**5.75E-06**	**1.17E-06**	**1.96E-06**	**7.66E-06**	**1.56E-06**

[a] Pounds per hour, annual average.

Table 7B. EMISSIONS RATES FOR SOURCES – CONTROLLED TAPs EMISSIONS						
Modeling Case	ISCST3 **500,000 cy/yr**			**[Reserved]**		
Pollutant	**Arsenic**	**Nickel**	**Cr (VI)**	**Arsenic**	**Nickel**	**Cr (VI)**
Source	lb/hr_{YR} [a]	lb/hr_{YR}	lb/hr_{YR}	lb/hr_{YR}	lb/hr_{YR}	lb/hr_{YR}
Cement delivery to silo (with baghouse)	5.94E-08	5.86E-07	8.13E-08			
Supplement delivery to silo (with baghouse)	2.08E-06	4.75E-06	7.63E-07			
SILO	**2.139E-06**	**5.33E-06**	**8.443E-07**			
Truck loadout: Cement and supplement delivery to silo (no controls) **TRUCKLOD**	**2.45E-06**	**9.58E-06**	**1.95E-06**			

a. Pounds per hour, annual average.

3.3 Results for Significant and Full Impact Analyses

A significant contribution analysis was not submitted for this application. Aspen submitted a full impact analysis for the proposed modification project. The results of the facility-wide modeling for criteria pollutants are shown in Table 8.

Table 8. RESULTS OF FULL IMPACT ANALYSES – PM_{10}

Pollutant	Averaging Period	Modeled Design Concentration[a] ($\mu g/m^3$)[b]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact[a] ($\mu g/m^3$)	NAAQS[c] ($\mu g/m^3$)	Percent of NAAQS
ISCST3 Case 1. Low Production:			1,500 cy/day, 300,000 cy/yr, Fenceline at radius of 40 meters			
PM_{10}[d]	24-hour	63.2	73	136.2	150	90.8% (73.2%)[e]
	Annual	11.2	26	37.2	50	74.4%
ISCST3 Case 2. Moderate Production:			2,400 cy/day, 400,000 cy/yr, Fenceline at radius of 60 meters			
PM_{10}[d]	24-hour	79.8	73	152.8	150	102% (82.1%)[e]
	Annual	10.8	26	36.8	50	73.4%
AERMOD Case 3. Moderate Production:			**3,600 cy/day, 500,000 cy/yr, Fenceline at radius of 100 meters**			
PM_{10}[d]	24-hour	53.3	73	126	150	**84.2%**
	Annual	5.53	26	31.5	50	**63.1%**
ISCST3 Case 3. Moderate Production:			**3,600 cy/day, 500,000 cy/yr, Fenceline at radius of 100 meters**			
PM_{10}[d]	24-hour	83.8	73	156.8	150	**104.5% (84.2%)**[e]
	Annual	7.91	26	33.9	50	**67.8%**
ISCST3 Case 4. High Production:			4,800 cy/day, 500,000 cy/yr, Fenceline at radius of 150 meters			
PM_{10}[d]	24-hour	73.8	73	146.8	150	97.9% (78.9%)[e]
	Annual	4.86	26	30.9	50	61.7%

a. Maximum 6^{th} highest value (24-hour standard) for five years of meteorological data.
b. Micrograms per cubic meter
c. National ambient air quality standards
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
e. AERMOD results for Case 3 indicate that using the currently approved AERMOD model would result in significantly lower predicted ambient impact than the ISCST3 analysis (about 20% lower, based on Case No.3 results). The estimated ambient impact for this case had AERMOD been run instead of ISCST3 is shown in brackets. This result was deemed acceptable to demonstrate preconstruction compliance with the 24-hr PM_{10} NAAQS standard.

The results of the ISCST3 results for the controlled ambient impact for TAPs emissions are shown in Table 9.

Table 9. RESULTS OF TAPs ANALYSIS - CONTROLLED EMISSIONS				
TAP	**Averaging Period**	**Modeled Design Concentration[a] ($\mu g/m^3$)[b]**	**AACC[c] ($\mu g/m^3$)**	**Percent of AACC**
Case 1	**1,500 cy/day**	**300,000 cy/year**	**40 meters**	
Arsenic	Annual	7.51E-05	2.3E-04	32.7%
Chromium (VI)	Annual	4.54E-05	8.3E-05	54.7%
Nickel	Annual	2.67E-04	4.23E-03	6.4%
Case 2	**2,400 cy/day**	**400,000 cy/year**	**60 meters**	
Arsenic	Annual	8.79E-05	2.3E-04	38.2%
Chromium (VI)	Annual	6.10E-05	8.3E-05	73.5%
Nickel	Annual	3.12E-04	4.23E-03	7.4%
Case 3	**3,600 cy/day**	**500,000 cy/year**	**100 meters**	
Arsenic	Annual	6.78E-05	2.3E-04	29.5%
Chromium (VI)	Annual	4.63E-05	8.3E-05	55.8%
Nickel	Annual	2.38E-04	4.23E-03	5.6%
Case 4	**4,800 cy/day**	**500,000 cy/year**	**150 meters**	
Arsenic	Annual	4.38E-05	2.3E-04	39.1%
Nickel	Annual	2.98E-05	8.3E-05	35.9%
Chromium (VI)	Annual	1.53E-04	4.23E-03	3.6%

a. Maximum 1st highest value for five years of meteorological data.
b. Micrograms per cubic meter
c. Acceptable ambient concentration for carcinogens

4.0 Conclusions

The ambient air impact analysis conducted by DEQ demonstrated to DEQ's satisfaction that emissions from a concrete batch plant facility that meets the criteria specified in Table 1 will not cause or significantly contribute to a violation of any air quality standard.

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

3/20/2007 17:37

Facility Information

Company:	DEQ GENERIC MODEL - 3,600 cy/day and 500,000 cy/year
Facility ID:	777-xxxxxx
Permit No.:	P-2007.xxxx
Source Type:	Portable Concrete Batch Plant
Manufacturer:	0

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: Purple 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	300	cy/hr
Proposed Daily Production Rate	3,600	cy/day
Proposed Maximum Annual Production Rate	500,000	cy/year

Uncontrolled (Unlimited Production Rate)

7,200 cy/day	24 hrs/day,
	7 day/wk,
2,628,000 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	[illegible]	4.86E-10	[illegible]	4.86E-10	[illegible]	2.90E-08	[illegible]	1.17E-07	[illegible]	4.18E-08	[illegible]	ND	1.18E-06	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	[illegible]	2.56E-07	[illegible]	2.28E-06	[illegible]	3.54E-06	ND	7.24E-08	ND	30%
Truck Loadout (no boot or shroud)	[illegible]	3.04E-06	[illegible]	2.44E-07	[illegible]	3.42E-08	[illegible]	1.14E-05	[illegible]	6.12E-05	[illegible]	1.19E-05	[illegible]	3.84E-06	[illegible]	2.62E-06	21.29%
Central Mix Batching (NO boot or shroud)	[illegible]	0.00E+00	ND	ND	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	0.00E+00	ND	ND	21.29%

UNCONTROLLED TAP EMISSIONS — **Note: Includes baghouses as process equipment.** — **7,200 cy/day, and 2,628,000 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)	3.12E-07	1.37E-06	3.58E-08	1.57E-07	3.58E-08	1.57E-07	2.14E-06	8.13E-06	8.62E-06	3.77E-05	3.08E-06	1.35E-05	8.69E-04	3.81E-03	ND	ND	4.27E-07
Cement supplement delivery to Silo (with baghouse)	1.10E-05	4.80E-05	9.90E-07	4.34E-06	2.17E-07	9.50E-07	1.34E-05	5.85E-05	2.80E-06	1.23E-05	2.50E-05	1.09E-04	3.88E-05	1.70E-04	7.93E-07	3.47E-06	4.01E-06
Truck Loadout (NO boot or shroud)	2.57E-04	1.13E-03	2.06E-05	9.04E-05	2.89E-06	1.27E-05	9.64E-04	4.22E-03	5.18E-03	2.27E-02	1.01E-03	4.41E-03	3.25E-03	1.42E-02	2.22E-04	9.71E-04	2.05E-04
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
Sources Total	**2.68E-04**	1.18E-03	**2.17E-05**	9.49E-05	**3.15E-06**	1.38E-05	**9.80E-04**	4.30E-03	**5.19E-03**	2.27E-02	**1.03E-03**	4.53E-03	**4.16E-03**	1.82E-02	**2.22E-04**	9.74E-04	**2.10E-04**
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

Facility Classification: Total Annual HAPs Emissions: **5.21E-02** Tons per year

2.1394E-06 5.33E-06 8.443E-07

CONTROLLED TAP EMISSIONS — **Note: Includes baghouses as process equipment.** — **3,600 cy/day, and 500,000 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]	5.94E-08	2.60E-07	6.81E-09	2.98E-08	6.81E-09	2.98E-08	1.07E-06	1.78E-06	4.31E-06	7.18E-06	5.86E-07	2.57E-06	ND	ND	ND	ND	8.13E-08
Cement supplement delivery to Silo (with baghouse)2	2.08E-06	9.13E-06	1.88E-07	8.25E-07	4.13E-08	1.81E-07	4.49E-05	1.11E-05	9.43E-06	2.34E-06	4.75E-06	2.08E-05	1.30E-04	3.23E-05	3.96E-07	6.61E-07	7.63E-07
Truck Loadout (WITH boot or shroud)	2.45E-06	1.07E-05	1.96E-07	8.60E-07	2.75E-08	1.21E-07	2.41E-05	4.02E-05	1.29E-04	2.16E-04	9.58E-06	4.19E-05	8.12E-05	1.35E-04	5.54E-06	9.24E-06	1.95E-06
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
Sources Total	**4.59E-06**	2.01E-05	**3.92E-07**	1.71E-06	**7.56E-08**	3.31E-07	**7.01E-05**	5.31E-05	**1.43E-04**	2.25E-04	**1.49E-05**	6.53E-05	**2.12E-04**	1.68E-04	**5.94E-06**	9.90E-06	**2.80E-06**
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	305.95%		1.40%		2.04%		0.21%		0.0430%		55.23%		3.02%		0.0457%		499.55%
EXCEEDS EL?	Yes		No		No		No		No		No		No		No		Yes

Truck Loadout: 95.00% Control: Automatic boot or equivalent
Central Mix Batching: 95.00% Control: Automatic boot or equivalent
Sources Total: **5.43E-04** Tons per year

[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

Attachment 2.
"Fenceline" Radius Calculations

Concrete Batch Plant - Typical Plant Layout Modeling 3/9/2007

"Fenceline" or Ambient Air Boundary Coordinates

Radians = deg * Pi/180
x = Xoffset + c cos (Angle)
y= Yoffset + c sin(Angle)

CASE 1, 40 meter RADIUS
Radius c 40 (meters)
Origin Offset 0 (meters)
Origin Offset 0 (meters)

Angle (degrees)	EAST (x)	NORTH (y)
10	39.39	6.95
20	37.59	13.68
30	34.64	20.00
40	30.64	25.71
50	25.71	30.64
60	20.00	34.64
70	13.68	37.59
80	6.95	39.39
90	0.00	40.00
100	-6.95	39.39
110	-13.68	37.59
120	-20.00	34.64
130	-25.71	30.64
140	-30.64	25.71
150	-34.64	20.00
160	-37.59	13.68
170	-39.39	6.95
180	-40.00	0.00
190	-39.39	-6.95
200	-37.59	-13.68
210	-34.64	-20.00
220	-30.64	-25.71
230	-25.71	-30.64
240	-20.00	-34.64
250	-13.68	-37.59
260	-6.95	-39.39
270	0.00	-40.00
280	6.95	-39.39
290	13.68	-37.59
300	20.00	-34.64
310	25.71	-30.64
320	30.64	-25.71
330	34.64	-20.00
340	37.59	-13.68
350	39.39	-6.95
360	40.00	0.00

CASE 2, 60 meter RADIUS
Radius c 60 (meters)
Origin Offset 0 (meters)
Origin Offset 0 (meters)

Angle (degrees)	EAST (x)	NORTH (y)
10	59.09	10.42
20	56.38	20.52
30	51.96	30.00
40	45.96	38.57
50	38.57	45.96
60	30.00	51.96
70	20.52	56.38
80	10.42	59.09
90	0.00	60.00
100	-10.42	59.09
110	-20.52	56.38
120	-30.00	51.96
130	-38.57	45.96
140	-45.96	38.57
150	-51.96	30.00
160	-56.38	20.52
170	-59.09	10.42
180	-60.00	0.00
190	-59.09	-10.42
200	-56.38	-20.52
210	-51.96	-30.00
220	-45.96	-38.57
230	-38.57	-45.96
240	-30.00	-51.96
250	-20.52	-56.38
260	-10.42	-59.09
270	0.00	-60.00
280	10.42	-59.09
290	20.52	-56.38
300	30.00	-51.96
310	38.57	-45.96
320	45.96	-38.57
330	51.96	-30.00
340	56.38	-20.52
350	59.09	-10.42
360	60.00	0.00

CASE 3, 100 meter RADIUS
Radius c 75 (meters)
Origin Offset 0 (meters)
Origin Offset 0 (meters)

Angle (degrees)	EAST (x)	NORTH (y)
10	73.86	13.02
20	70.48	25.65
30	64.95	37.50
40	57.45	48.21
50	48.21	57.45
60	37.50	64.95
70	25.65	70.48
80	13.02	73.86
90	0.00	75.00
100	-13.02	73.86
110	-25.65	70.48
120	-37.50	64.95
130	-48.21	57.45
140	-57.45	48.21
150	-64.95	37.50
160	-70.48	25.65
170	-73.86	13.02
180	-75.00	0.00
190	-73.86	-13.02
200	-70.48	-25.65
210	-64.95	-37.50
220	-57.45	-48.21
230	-48.21	-57.45
240	-37.50	-64.95
250	-25.65	-70.48
260	-13.02	-73.86
270	0.00	-75.00
280	13.02	-73.86
290	25.65	-70.48
300	37.50	-64.95
310	48.21	-57.45
320	57.45	-48.21
330	64.95	-37.50
340	70.48	-25.65
350	73.86	-13.02
360	75.00	0.00

CASE 4, 125 meter RADIUS
Radius c 125 (meters)
Origin Offset : 0 (meters)
Origin Offset · 0 (meters)

Angle (degrees)	EAST (x)	NORTH (y)
10	123.10	21.71
20	117.46	42.75
30	108.25	62.50
40	95.76	80.35
50	80.35	95.76
60	62.50	108.25
70	42.75	117.46
80	21.71	123.10
90	0.00	125.00
100	-21.71	123.10
110	-42.75	117.46
120	-62.50	108.25
130	-80.35	95.76
140	-95.76	80.35
150	-108.25	62.50
160	-117.46	42.75
170	-123.10	21.71
180	-125.00	0.00
190	-123.10	-21.71
200	-117.46	-42.75
210	-108.25	-62.50
220	-95.76	-80.35
230	-80.35	-95.76
240	-62.50	-108.25
250	-42.75	-117.46
260	-21.71	-123.10
270	0.00	-125.00
280	21.71	-123.10
290	42.75	-117.46
300	62.50	-108.25
310	80.35	-95.76
320	95.76	-80.35
330	108.25	-62.50
340	117.46	-42.75
350	123.10	-21.71
360	125.00	0.00