Air Quality Permitting
Technical Memorandum

Permit to Construct No. 777-00307

Concrete Placing Co. Inc.
Portable Concrete Batch Plant

Prepared By:

Dustin Holloway
Permit Writer

Project No. P-020013

Date Prepared:

July 22, 2002

Permit Status:

FINAL

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, *Rules for the Control of Air Pollution in Idaho*, for issuing permits to construct (PTC).

PROJECT DESCRIPTION

Concrete Placing Co. Inc. (CPC) is proposing to commence construction of a portable concrete-batching facility. CPC is requesting a PTC be issued to cover the operations of the concrete-batching facility in both attainment and nonattainment areas throughout the state of Idaho. Note that the standard PTC for a portable concrete-batching facility also includes provisions for collocated operations in attainment areas with one other portable source (i.e., rock crusher, hot-mix asphalt (HMA), or concrete batch plant). The concrete batch plant's maximum hourly throughput is 400 cubic yards per hour (cy/hr). The facility includes a 365-kilowatt (kW), diesel-fired, electrical generator set.

SUMMARY OF EVENTS

April 25, 2002	DEQ received an application from CPC for a concrete-batching facility.
June 11, 2002	The application was determined complete.
June 25, 2002	The facility held a public informational meeting.
June 26, 2002	The facility was granted preconstruction approval in accordance with IDAPA 58.01.01.213.

DISCUSSION

1. Process Description

Concrete is produced by combining water, sand and gravel, and Portland cement. A portable concrete batch plant consists of storage bins for the sand and gravel, a storage silo for the cement, weigh bins that weigh each component, a conveyor, a water supply, and a control panel. Sand and gravel are either produced onsite or purchased elsewhere. Typically, three or four different sizes of gravel and one or two different sizes of sand are stock piles for varying job specifications. Cement is delivered by truck and pneumatically transferred to its storage silo. A filter is mounted on the silo to capture cement as air is displaced from the silo. For this source category, the filter is considered process equipment primarily, and air pollution control equipment secondarily. Power to run the facility is provided by the local utility, or a gasoline- or diesel-fired generator.

After all the storage bins are filled, the production process begins when sand and gravel are drop-fed into their respective weigh bins. When a pre-determined amount of each is weighed, the sand and gravel are drop-fed onto an inclined conveyor, which transfers the mixture into a cement truck. A predetermined amount of cement is also weighed and drop-fed through a rubber chute into the cement truck. The rubber chute directs the cement and provides a measure of dust control. Sometimes, a separate baghouse is used to capture cement dust from the cement weigh bin. Water is then added, and the components are mixed in the truck on the way to the job site.

The standard PTC requested will allow this concrete-batching facility to collocate and simultaneously operate with one other portable plant (i.e., rock crusher, HMA, or concrete batch plant) in attainment areas. It is important to note that during collocated operations, this concrete-batching facility becomes part of a single, larger source engaged in the production of either concrete, aggregate, and/or asphalt, depending upon which type of portable plant the concrete-batching facility is collocated with. While collocated, the two portable plants are now considered to be one source, and the emissions of this single source is the sum of the emissions from the two portable plants. This single, larger source must comply with all applicable federal, state, and local requirements. To maintain compliance, specific requirements and limitations have been included in the standard PTC for this concrete-batching facility for collocated operations. As described in the following sections of this technical memorandum, specific conservative assumptions and calculations were made to determine these standard PTC collocation requirements. For this reason, the permit for the other portable plant with which this concrete-batching facility will collocate must also contain specific collocation requirements based on the same conservative assumptions and calculations used in this standard PTC.

2. Equipment Listing

The analysis upon which this facility is permitted assumes the following equipment would be used:

2.1 Portable Concrete Batch Plant

Manufacturer:	Erie Strayer
Model:	MG-12CP
Maximum Capacity:	400 cy/yr

2.2 Cement Storage Silo Filter

Stack Height:	37 feet (ft)
Stack Area:	3.4 ft^2
Exit Air Flowrate:	11,000 actual cubic feet per meter (acfm) (side discharge)
Capture Efficiency:	99%

2.4 Generator

Manufacturer/Model:	Caterpillar 3406B
Rated Power Output:	365 kW
Stack Diameter:	0.56 ft
Stack Height:	15 ft
Exhaust Gas Flowrate:	3,013 actual cubic feet per minute
Exhaust Gas Temperature:	1029°F
Fuel Type:	diesel
Fuel Usage:	26.0 gallons per hour

When collocated, this concrete batch plant becomes part of a single, larger source that produces either concrete, aggregate, and/or asphalt, depending upon which type of portable plant the concrete batch plant is collocated with. The equipment used by this single, larger source would include the concrete batch plant equipment listed above plus the equipment of the other portable plant. To see an equipment description for the other portable plant, see the corresponding permitting files for that plant.

3. Area Classification

The concrete-batching facility is a portable source and may operate in attainment and unclassifiable areas throughout the state of Idaho.

4. Emission Estimates

Emissions were estimated using emissions factors from AP-42 Section 11.2 and the 99% rated efficiency of the filter. The resulting emissions are 0.65 pound per hour (lb/hr) of particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10})

5. Modeling Results

5.1 Point Sources

Preliminary modeling using Screen3 resulted in high impacts and would have severely limited the hours of operation. A more refined model was run by Kevin Schilling using ISC to determine if the concentrations violated any ambient air quality standards. A technical memorandum showing the ISC modeling results is attached as an appendix. The modeled results show that the facility will not violate any ambient air quality standards when operating in attainment or unclassifiable areas.

5.2 Collocated Operations

For collocated operations in attainment areas, operation of the concrete batch plant and its generator (if used) are limited as needed so that the modeled impacts will be half of the available allowable ambient impact. Likewise for collocated operations, the modeled impacts of the other portable facility will also be limited to half of the available allowable, ambient impact so that the combined emissions of the two collocated sources will remain within the National Ambient Air Quality Standards (NAAQS). Using the 24-hour NAAQS standard for PM_{10} (attainment area) as an example, one half of the allowable available impact would be equal to 25 micrograms per cubic meter ($\mu g/m^3$), as follows:

$$25\ \mu g/m^3 = 0.5 \times [150\ \mu g/m^3 - 100\ \mu g/m^3],$$

where 150 $\mu g/m^3$ is the 24-hour average standard and 100 $\mu g/m^3$ is the conservative statewide 24-hour average background value. Then operation of the concrete batch plant and its generator (if used) would be limited as needed, based on the specific ambient impact modeling, so that the modeled 24-hour concentration does not exceed 25 $\mu g/m^3$ at or beyond the facility's property boundary. This approach is designed to result in acceptable operational limits for most collocation situations. In cases where these limits are too restrictive, a site-specific analysis and permit amendment may be completed.

The maximum 24-hour PM_{10} concentration from the batch plant is 31 $\mu g/m^3$ and the maximum annual concentration is 17.2 $\mu g/m^3$. The allowable 24-hour concentration is 25 $\mu g/m^3$ and the allowable annual concentration 10 $\mu g/m^3$ when the facility is collocated. The allowable hours of operation are 19 hours per day (hr/day) and 5,090 hours per year (hr/yr). These rates operating limits will assure that the NAAQS are not exceeded.

5.3 PM_{10} Nonattainment Areas

The allowable 24-hour concentration in PM_{10} nonattainment areas is 5 μg/m^3 and the annual allowable concentration is 1 μg/m^3. The allowable hours of operation to meet these requirements in PM_{10} nonattainment areas when operating at maximum capacity are 3.8 hr/day and 509 hr/yr.

6. Permit Requirements

The allowable throughput of the concrete batch plant is the allowable hours of operation at maximum capacity multiplied by the maximum capacity of the plant for each applicable operating scenario. This will assure that the facility will not violate any ambient air quality standards.

7. Facility Classification

This plant is not a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. Portable concrete batch plants are not designated facilities as defined in IDAPA 58.01.01.006.27. Concrete batch plants are not subject to federal New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation. The Standard Industrial Code for concrete batch plants is 3273. The AIRS facility classification for this facility is "SM" because the uncontrolled potential to emit is greater than 100 tons per year (T/yr).

8. Regulatory Review

The following rules and regulations have been reviewed for this permit analysis:

IDAPA 58.01.01.201 - Permit to Construct

IDAPA 58.01.01.202 - Application Procedures

IDAPA 58.01.01.203 - Permit Requirements for New and Modified Stationary Sources

IDAPA 58.01.01.209 - Procedures for Issuing Permits

IDAPA 58.01.01.211 - Conditions for Permits to Construct

IDAPA 58.01.01.212 - Obligation to Comply

IDAPA 58.01.01.577 - Ambient PM_{10} Air Quality Standard

IDAPA 58.01.01.625 - Visible Emissions

IDAPA 58.01.01.650 - Rules for Control of Fugitive Dust

9. Permit Coordination

This concrete-batching plant is not a major facility as defined by IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10, and it is not an NSPS-affected facility. Therefore, coordination with the Operating Permit Section is not necessary.

10. AIRS Information

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP [c]	PSD [d]	NSPS [e] (Part 60)	NESHAP [f] (Part 61)	MACT [g] (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2 [h]	B						Portable
NO_x [i]	B						Portable
CO [j]	B						Portable
PM_{10} [k]	SM						Portable
PT (Particulate) [l]	SM						
VOC [m]							Portable
THAP (Total HAPs) [n]							
			APPLICABLE SUBPART				

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

[c] State Implementation Plan

[d] Prevention of Significant Deterioration

[e] New Source Performance Standards

[f] National Emission Standards for Hazardous Air Pollutants

[g] Maximum Achievable Control Technology

[h] sulfur dioxide

[i] nitrogen oxides

[j] carbon monoxide

[k] particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

[l] particulate matter

[m] volatile organic compounds

[n] hazardous air pollutants

FEES

The permittee is subject to a processing fee of $500 for a general permit in accordance with IDAPA 58.01.01.225. This fee was paid on August 12, 2002.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommends CPC be issued a PTC for a portable concrete-batching facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

DH/DS/bh Project No. P-020013 G:\AIR PERMITS\P T C\CONCRETE PLACING\P-020013 TM.DOC

cc: Boise Regional Office
Joan Lechtenberg, Air Quality Division

APPENDIX

Modeling

Concrete Batch Plant, Portable

MEMORANDUM

TO: Dustin Holloway, Air Quality Engineer, Air Quality Division

FROM: Kevin Schilling, Air Quality Scientist, State Office of Technical Services

SUBJECT: Modeling review for Concrete Placing Co.

DATE: July 29, 2002

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1. SUMMARY:

A series of atmospheric dispersion modeling runs were conducted for emissions from a portable cement batch plant operated by Concrete Placing Co. The analyses involved only modeling stack emissions; fugitive emission sources were not included in the modeling assessments. Meteorological data from four different locations were used to account for different areas where the plants could operate. The analyses indicated that emissions from the sources included in the dispersion analyses will not cause or significantly contribute to a violation of an ambient air quality standard, as required by IDAPA 58.01.01.203.02.

2. DISCUSSION:

2.1 Introduction and Regulatory Requirements for Modeling

On April 25, 2002, DEQ received a PTC application from Concrete Placing Co. for a portable cement plant. Per IDAPA 58.01.01.203.02, no PTC can be granted unless the applicant demonstrates to the satisfaction of DEQ that emissions from the new source or modification "would not cause or significantly contribute to a violation of any ambient air quality standard." Atmospheric dispersion modeling was performed by DEQ to fulfill these requirements.

2.2 Applicable Air Quality Impact Limits and Required Analyses

Portable facilities could operate in any area of the state. If estimated maximum ambient air impacts from the emissions sources at a facility exceed the "significant contribution" levels of IDAPA 58.01.01.006.93, then DEQ modeling guidance requires a full impact analysis. A full impact analysis for attainment area pollutants requires adding ambient impacts from facility-wide emissions to a DEQ approved background concentration value that is appropriate for each criteria pollutant at the facility location. The resulting maximum ambient air concentration is then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 1. Table 1 also specifies the modeled value that must be used for comparison to the NAAQS.

Emissions from new sources must also comply with toxic air pollutant (TAP) requirements of IDAPA 58.01.01.210. No modeling analysis was needed to demonstrate compliance with TAP requirements because emissions from Concrete Placing Co. were below all screening emissions levels (ELs).

2.3 Background Concentrations

Applicable background concentrations are shown in Table 2. State wide background values were used for all criteria pollutants except particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). A conservatively high 24-hour PM_{10} background value of 100 $\mu g/m^3$ was used to account for locations where elevated PM_{10} concentrations were measured. The formaldehyde AACC is an increment standard rather than a total air concentration standard. Therefore, background concentrations are not applicable.

Table 1. Applicable Regulatory Limits

Pollutant	Averaging Period	Regulatory Limit[a] ($\mu g/m^3$)[b]	Modeled Value Used[c]
Nitrogen dioxide (NO_2)	Annual	100[d]	Maximum 1st highest[e]
Sulfur Dioxide (SO_2)	3-hour	1,300[f]	Maximum 2nd highest[e]
	24-hour	365[f]	Maximum 2nd highest[e]
	Annual	80[d]	Maximum 1st highest[e]
Carbon monoxide (CO)	1-hour	40,000[f]	Maximum 2nd highest[e]
	8-hour	10,000[f]	Maximum 2nd highest[e]
PM_{10}[g]	24-hour	150[f]	Maximum 6th highest[e]
	Annual	50[d]	Maximum 1st highest[e]
Lead (Pb)	Quarterly	1.5[d]	Maximum 1st highest[e]
Formaldehyde (CH_2O)	Annual	0.077[d] 0.77[dh]	Maximum 1st highest[e]

a. IDAPA 58.01.01.577
b. Micrograms per cubic meter
c. When using five years of meteorological data
d. Not to be exceeded
e. At any receptor
f. Not to be exceeded more than once per year
g. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
h. Applicable for short-term sources (less than five years)

Table 2. Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
Nitrogen dioxide (NO_2)	Annual	40
Sulfur dioxide (SO_2)	3-hour	374
	24-hour	120
	Annual	18.3
Carbon monoxide (CO)	1-hour	11,450
	8-hour	5,130
PM_{10}[b]	24-hour	100
	Annual	30

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

2.4 Modeling Impact Assessment

The ambient air impact analysis was performed by DEQ using the model ISC - Version 02035. Table 3 provides a summary of the modeling parameters used in the DEQ analysis.

Tables 4 and 5 provide quantities of emissions and other emissions parameters.

A significant impact analysis was initially performed to determine if emissions from the facility would "significantly contribute" to pollutant concentrations in ambient air, as per IDAPA 58.01.01.006.93. A full impact analysis was then performed for emissions from the facilities that were estimated to have an ambient impact exceeding "significant contribution" levels. The full impact analysis involved adding the impacts from modeling the facility's emissions to background concentrations.

Table 3. Modeling Parameters

Parameter	Description/Values	Documentation/Additional Description
Model	ISCST3	Version 99020
Meteorological data	Boise, Pocatello, Spokane, Lewiston	1987-1991 for Boise, Pocatello, and Spokane 1992-1997 (not including 1996) for Lewiston
Model options	Regulatory Default	
Land use	Rural	Based on typical location of these facilities
Terrain	Simple	Assume flat terrain
Building downwash	none	Assume negligible downwash
Receptor grids (See Figure 1)	Grid 1	25 meter spacing 300 meters from facility
Facility location (UTM)	Easting: portable	
	Northing: portable	

Table 4. Pollutant Emissions Rates Used for Modeling

Source	Maximum Hourly Emissions Rate[a] pounds per hour (lb/hr)				Hourly Rate Used for Annual Modeling[b] (lb/hr)				
Pollutant	PM_{10}[c]	SO_2[d]	NO_x[e]	CO[f]	PM_{10}	SO_2	NO_x	CO	CH_2O[g]
Baghouse	1.61	0.0	NM[h]	0.0	1.61	0.0	0.0	NM[h]	0.0
Generator	0.1	0.7	NM[h]	1.4	0.1	0.7	6.3	NM[h]	NM[i]

a. Emissions rate used for 24-hour, 8-hr, 3-hr, and 1-hr averaging periods
b. Emissions rate used for annual averaging period
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
d. Sulfur dioxide
e. Oxides of nitrogen
f. Carbon monoxide
g. Formaldehyde
h. Not modeled because there is no standard associated with the specified averaging period
i. Not modeled because emissions are less than the TAP EL

Table 5. Emissions and Stack Parameters

Source	Source Type	Stack Height (m)[a]	Stack Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
Baghouse	Point	11.3	0.63	ambient	0.001[d]
Generator	Point	4.6	0.17	827	62

a. Meters
b. Kelvin
c. Meters per second
d. Flow rate set at 0.001 to account for the presence of a rain cap over the stack

3. MODELING RESULTS:

Modeled ambient air impact results from the significant impact analysis are provided in Table 6. The attachment provides results for each modeling run. Emissions from Concrete Placing Co. resulted in ambient impacts exceeding "significant contribution" levels for 24-hour SO_2 and all averaging times for PM_{10}, so a full impact analysis was performed for those averaging times.

Table 6. Significant Impact Analysis for Criteria Pollutants (Facility-wide Emissions)

Pollutant	Averaging Period	Ambient concentration (μg/m³)[a]	Significant Contribution[b] (μg/m³)	Full Impact Analysis Required (Y or N)
Nitrogen dioxide (NO_2)	Annual	8.7[c]	1.0	N
Sulfur dioxide (SO_2)	3-hour	12.9[d]	25	N
	24-hour	7.1[d]	5	Y
	Annual	0.97[c]	1.0	N
Carbon monoxide (CO)	1-hour	36[d]	2,000	N
	8-hour	21[d]	500	N
PM_{10}[e]	24-hour	78[f]	5	Y
	Annual	17.2[c]	1.0	Y

a. Micrograms per cubic meter
b. Significant contribution level as per IDAPA 58.01.01.006.93
c. Maximum 1st highest modeled value at any receptor
d. Maximum 2nd highest modeled value at any receptor
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
f. Maximum 6th highest modeled value at any receptor

When the 24-hour PM_{10} modeled impact for Concrete Placing Co. was added to the background value of 100 μg/m³, the resulting impact exceeded the 150 μg/m³ NAAQS. The emissions rate was originally calculated by assuming that the baghouse continuously emits PM_{10} for 24 hours at the maximum rate guaranteed by the manufacturer. This is a very conservative assumption because emissions will actually occur only when cement is handled by the weigh hopper or mixer. Emissions were recalculated for this source using an emissions factor for the weigh hopper and mixer from AP-42, Section 11.12, an estimated 99% control efficiency for the baghouse, and the maximum cement throughput of 400 cubic yards per hour. The recalculated emissions rate was 0.65 lb PM_{10}/hr compared to the previous emission rate of 1.61 lb PM_{10}/hr. The resulting PM_{10} 24-hour ambient impact changed from 78 μg/m³ to 31 μg/m³.

Results of the full impact analysis are presented in Table 7 and indicate that operation of the facility as described in the PTC application will not cause or significantly contribute to a violation of an applicable NAAQS.

Table 7. Full Impact Analysis for Criteria Pollutants (Facility-wide Emissions)

Pollutant	Averaging Period	Ambient Conc. (μg/m³)[a]	Background Conc. (μg/m³)	Total Ambient Conc. (μg/m³)	Regulatory Limit[b] (μg/m³)	Compliant (Y or N)
SO_2	24-hour	7.1[c]	120	127	365	Y
PM_{10}[d]	24-hour	31[e]	100	131	150	Y
	Annual	17.2[f]	30	47	30	Y

a. Concentration in micrograms per cubic meter
b. IDAPA 58.01.01.577
c. Maximum 2th highest modeled value at any receptor
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
e. Maximum 6th highest modeled value at any receptor
f. Maximum 1st highest modeled value at any receptor

Electronic copies of the modeling analysis are saved on disk. Table 8 provides a summary of the files used in the modeling analysis. The permitting engineer has reviewed this modeling memo to ensure consistency with the PTC and technical memorandum.

Table 8. Dispersion Modeling Files

Type of File	Description	File Name
Met Data	Lewiston, Spokane, Boise, Pocatello	
BEEST Input Files	Files for cement plant	CementXXXXXXXXXXXX.BST
	Files using Lewiston met data	XXXXXLewistonXXX.BST
	Files using Spokane met data	XXXXXSpokXXX.BST
	Files using Pocatello met data	XXXXXPocyXXX.BST
	Files using Boise met data	XXXXXBoiseXXX.BST
	Files for annual model	XXXXXXXXXXXAnnYY.BST (YY is the year)
Each BST file has the following type of files associated with it:		
	Input file for BPIP program	.PIP
	BPIP output file	.TAB
	Concise BPIP output file	.SUM
	BEE-Line file containing direction specific building dimensions	.SO
	ISCST3 input file for each pollutant	.DTA
	ISCST3 output list file for each pollutant	.LST
	User summary output file for each pollutant	.USF
	Master graphics output file for each pollutant	.GRF

KS: G:\Technical Services\Modeling\Schilling\Concrete Placing\Concrete Placing Tech Memo.doc

ATTACHMENT

ATMOSPHERIC DISPERSION MODELING RESULTS

Idaho Department of Environmental Quality
Office of Technical Services

CALCULATION SHEET

Sheet 1 of 3

Project: Concrete Placing Co. Work Order: ______ File No. ______

Title of Calculation: Modeling Prepared By: K. Schilling Date: 7/9/02

Item: Model Results Checked By: ______ Date: ______

Using Boise Met data

Max 6th highest 24-hr conc PM-10 = 32.6 ug/m3
Max 2nd highest 3-hr conc SO_2 = 12.4 ug/m3
Max 2nd highest 24-hr conc SO_2 = 6.77 ug/m3
Max 2nd highest 1-hr conc CO = [35.5] ug/m3
Max 2nd highest 8-hr conc CO = 19.7 ug/m3

Annual
PM-10 : 1987 = 6.78; 1988 = 6.70; 1989 = 6.77; 1990 = 7.33; 1991 = 6.58
NOx : 1987 = 7.26; 1988 = 8.12; 1989 = 6.96; 1990 = 7.31; 1991 = 8.31
SO_2 : 1987 = 0.807; 1988 = 0.902; 1989 = 0.773; 1990 = 0.812; 1991 = 0.923

Using Pocy Met Data

Max 6th highest 24-hr conc PM-10 = 23.6 ug/m3
Max 2nd highest 3-hr conc SO_2 = [12.9] ug/m3
Max 2nd highest 24-hr conc SO_2 = 6.98 ug/m3
Max 2nd highest 1-hr conc CO = 28.9 ug/m3
Max 2nd highest 8-hr conc CO = [21.2] ug/m3

Annual
PM-10 : 1987 = 4.94; 1988 = 5.82; 1989 = 4.80; 1990 = 4.88; 1991 = 4.97
NOx : 1987 = 7.59; 1988 = 8.45; 1989 = [8.70]; 1990 = 8.30; 1991 = 8.59
SO_2 : 1987 = 0.843; 1988 = 0.938; 1989 = [0.967]; 1990 = 0.923; 1991 = 0.954

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CALCULATION SHEET

Sheet 2 of 3

Project: Concrete Placing Co Work Order: ______ File No.: ______

Title of Calculation: Modeling Prepared By: K. Schilling Date: 7/9/02

Item: Model Results Checked By: ______ Date: ______

Using Spokane Met Data

Max 6th highest 24-hr Conc PM-10 = 34.6 ug/m3
Max 2nd highest 3-hr Conc SO_2 = 12.7 ug/m3
Max 2nd highest 24-hr Conc SO_2 = 6.72 ug/m3
Max 2nd highest 1-hr Conc CO = 30.5 ug/m3
Max 2nd highest 8-hr Conc CO = 19.7 ug/m3

Annual:
PM-10 : 1987 = 4.51 ; 1988 = 4.13 ; 1989 = 4.51 ; 1990 = 4.48 ; 1991 = 5.24
NO_x : 1987 = 6.70 ; 1988 = 7.65 ; 1989 = 6.33 ; 1990 = 8.21 ; 1991 = 6.23
SO_2 ; 1987 = 0.677 ; 1988 = 0.850 ; 1989 = 0.704 ; 1990 = 0.704 ; 1991 = 0.692

Using Lewiston Met Data

Max 6th highest 24-hr Conc PM-10 = 78.0 ug/m3
Max 2nd highest 3-hr Conc SO_2 = 12.1 ug/m3
Max 2nd highest 24-hr Conc SO_2 = 7.08 ug/m3
Max 2nd highest 1-hr Conc CO = 33.5 ug/m3
Max 2nd highest 8-hr Conc CO = 20.6 ug/m3

Annual
PM-10 : 1992 = 17.1 ; 1993 = 16.3 ; 1994 = 17.2 ; 1995 = 13.7 ; 1997 = 14.4
NOx : 1992 = 6.25 ; 1993 = 6.49 ; 1994 = 7.08 ; 1995 = 5.63 ; 1997 = 7.67
SO_2 : 1992 = 0.694 ; 1993 = 0.721 ; 1994 = 0.786 ; 1995 = 0.626 ; 1997 = 0.852

24 hr PM-10 if operate 16 hr/day : 4 am - 8 pm

10-01-01

Idaho Department of Environmental Quality
Office of Technical Services

CALCULATION SHEET

Sheet 3 of 3

Project: Concrete Placing Co — Work Order: — File No.:

Title of Calculation: Modeling — Prepared By: K. Schilling — Date: 7/9/02

Item: Model Results — Checked By: — Date:

Using Lewiston Data and AP-42 emission factor

0.0024 lb/Ton for weigh hopper
0.078 lb/Ton for mixer
0.0804 lb/Ton

400 cy/hr
4024 lb/cy

$$\frac{400\ cy}{hr}\left|\frac{4024\ lb}{cy}\right|\frac{Ton}{2000\ lb}\left|\frac{0.0804\ lb}{ton}\right|(1-0.99) = 0.647\ lb/hr$$

PM-10 maximum 6th highest 24-hour conc = 31.3 $\mu g/m^3$.

10-01-01