

September 15, 2000

**MEMORANDUM**

TO: Stephen West, Administrator  
Boise Regional Office

FROM: Eric Antrim  
Engineer-In-Training *EDA*  
State Technical Services Office

SUBJECT: PERMIT TO CONSTRUCT TECHNICAL ANALYSIS  
P-000085, Rowland Brothers Incorporated, McCall  
(Concrete Batch Plant, PTC No. 777-00268)

**PURPOSE**

The purpose for 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**

Rowland Brothers Incorporated has requested a PTC for a concrete batch plant in McCall. The concrete batch plant operates without a generator using electricity supplied by an electric utility. The owners have no intention of ever moving the plant to another location. The PTC does not allow the plant to relocate. The PTC also does not allow another plant to locate at the site (i.e., collocate).

**SUMMARY OF EVENTS**

On July 17, 2000, the Idaho Department of Environmental Quality (DEQ) received a Permit to Construct application from Rowland Brothers Incorporated for the Concreted Batch Plant located in McCall. On August 1, 2000, this application was determined incomplete and a letter was sent to you requesting additional information. On August 22, 2000, DEQ received the requested information. On September 14, 2000, the application was determined complete.

**DISCUSSION**

1. **Process Description**

Concrete is produced by combining water, sand and gravel, and Portland cement. A 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 on site or purchased elsewhere. Typically, three or four different sizes of gravel and one or two different sizes of sand are stockpiles for varying job specifications. Cement is delivered by truck and pneumatically transferred to its storage silo. A baghouse is mounted above the silo to capture cement as air is displaced in the silo. For this source category, the baghouse is considered process equipment primarily, and air pollution control equipment secondarily. Power to run the facility is provided by the local utility.

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 is drop-fed onto an inclined conveyor which transfers the mixture into a cement truck. A pre-determined 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. Water is then added, and the components are mixed in the truck on the way to the job site.

The PTC requested will not allow this concrete batching facility to collocate and simultaneously operate with any portable plant (i.e., rock crusher, hot-mix asphalt, or concrete batch plant).

2. Equipment Listing

2.1 Portable Concrete Batch Plant

Manufacturer	Montana Tank Works
Model	350
Maximum Capacity (cy/hr)	100

2.2 Cement Storage Silo Baghouse

Stack Height (ft)	55
Stack Diameter (ft)	2.5
Exit Air Flowrate (acfm)	45
Capture Efficiency	99.9

3. Emission Estimates

A spreadsheet has been developed specifically for concrete batching facilities to determine their potential to emit (PTE). PTE is used to determine if Prevention of Significant Deterioration (PSD) or Title V Operating Permit requirements apply. In determining PTE, the spreadsheet uses production data supplied by the applicant and emission factors from EPA's AP-42. For this concrete batching facility, PTE is based on emissions from the cement storage silo baghouse. Because these facilities are not designated facilities or NSPS-affected facilities, fugitive emissions from concrete batch plants do not count toward determining PTE. This facility's PTE is 0.5 tons per any consecutive 12-month period (0.5 T/yr) of particulate matter with an aerodynamic diameter of ten micrometers or less (PM10).

There are no throughput limits for this facility. The spreadsheet used to determine this, and the PTE, is included as Appendix A of this document.

4. Modeling

The EPA-approved SCREEN3 model was used in this analysis using stack data provided by the applicant to predict the impact the baghouse emissions may have on the ambient air. The output file from this model is included as Appendix B. A one (1) pound-per-hour emission rate was input into the model which calculated a maximum 1-hour concentration of 77.76  $\mu\text{g}/\text{m}^3$  for the cement silo baghouse. This information was input into the spreadsheet which calculated the allowable throughput.

5. Facility Classification

This facility 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 (NESHAPS) regulation. The SIC code for concrete batch plants is 3273. The AIRS facility classification for this facility is "B" because the uncontrolled potential to emit is less than (100 T/yr). The spreadsheet included as Appendix A automatically determines the facility classification.

6. Area Classification

This facility is located in Valley county which is an attainment or unclassifiable area for all pollutants.

7. Regulatory Review

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

<u>IDAPA 58.01.01.201</u>	Permit to Construct;
<u>IDAPA 58.01.01.202</u>	Application Procedures;
<u>IDAPA 58.01.01.203</u>	Permit Requirements for New and Modified Stationary Sources;
<u>IDAPA 58.01.01.209</u>	Procedures for Issuing Permits;
<u>IDAPA 58.01.01.211</u>	Conditions for Permits to Construct;
<u>IDAPA 58.01.01.212</u>	Obligation to Comply;
<u>IDAPA 58.01.01.577</u>	Ambient PM-10 Air Quality Standard;
<u>IDAPA 58.01.01.625</u>	Visible Emissions; and
<u>IDAPA 58.01.01.650</u>	Rules for Control of Fugitive Dust.

8. Permit Requirements

8.1 Emission Limits

The concrete batch plant's emissions are limited to 20% opacity, and visible emissions leaving the plant boundary are restricted to occurring less than three noncontinuous minutes in any one hour period. The facility is required to reasonably control fugitive emissions.

8.2 Operating Requirements

The facility must create an operations and maintenance manual to describe the operation and maintenance of the cement storage silo baghouse.

9. Permit Coordination

This concrete batching facility 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

Since each of these facilities is considered a new facility for AIRS purposes, an update to the AIRS data base is required. The information necessary to update the data base is included as Appendix C of this technical analysis.

FEES

The facility is not a major facility as defined in IDAPA 58.01.01.008.10. Therefore, registration and registration fees in accordance with IDAPA 58.01.01.526 are not applicable..

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommend that Rowland Brothers Incorporated be issued PTC No. 777-00268 for the Concrete Batch Plant in McCall, Idaho. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

EA/bm

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cc: DEQ State Office  
Boise Regional Office

# **Appendix A**

## ***Emission Estimate Calculations***

### ***Concrete Batch Plant***

Company Name: Rowland Brothers Inc  
 Permit No.: 777-xxxxx  
 Project: STANDARD SREADSHEET CONCRETE BATCH PLANTS

Engineer: Eric Antrim  
 Date: 9/11/00  
 File: BATCH WK4

Ton per Year Emission Limit: 100 [-] Tons/yr.  
 Concrete Batch Plant Information  
 Facility Production Capacity: 150 [-] yd/hr  
 Maximum Annual Hours of Operation: 8,760 [-] hr/yr  
 Cement Silo:  
 Modeled 1-hr Concentration: 78 [-] µg/m<sup>3</sup>, at emission rate of 1 lb/hr  
 Baghouse Control Effic.: 99.90% %  
 Cement Hopper:  
 Modeled 1-hr Concentration: 0 [-] µg/m<sup>3</sup>, at emission rate of 1 lb/hr  
 Baghouse Control Effic.: 99.00% %  
 Generator Set Information  
 Generator? (Y/N) N

Conversion Factor  
0

Background Concentrations	1-hr	3-hr	8-hr	24-hr	Annual
PM <sub>10</sub>				46	32.7
CO	31400		5130		
NO <sub>x</sub>		543		144	40
SO <sub>x</sub>					23.5
TOC					

INPUTS TO PERMIT TO CONSTRUCT (PTC)	Value	Units
Section B. "Attainment Area When Not Collocated"		
Section B.1 Facility Throughput Limits:		
Annual Throughput Limit	Estimated	yd/yr
Daily Throughput Limit	Estimated	yd/day
Annual Throughput Limit	Estimated	yd/day
Annual Hours of Operation	NA	hr/year
Daily Hours of Operation	NA	hr/day
Section B.1.3 Generator Hours of Operation:		
Annual Throughput Limit	657,000	yd/yr
Daily Throughput Limit	Estimated	yd/day
Annual Throughput Limit	657,000	yd/day
Annual Hours of Operation	NA	hr/year
Daily Hours of Operation	NA	hr/day
Section C. "Nonattainment Area When Collocated"		
Section C.1.3 Facility Throughput Limits:		
Annual Throughput Limit	Estimated	yd/yr
Daily Throughput Limit	Estimated	yd/day
Annual Throughput Limit	Estimated	yd/day
Annual Hours of Operation	NA	hr/year
Daily Hours of Operation	NA	hr/day
Section C.1.4 Generator Hours of Operation:		
Annual Throughput Limit	Estimated	yd/yr
Daily Throughput Limit	Estimated	yd/day
Annual Throughput Limit	Estimated	yd/day
Annual Hours of Operation	NA	hr/year
Daily Hours of Operation	NA	hr/day
Section D. "Nonattainment Area"		
Section D.1.1 Facility Throughput Limits:		
Annual Throughput Limit	Estimated	yd/yr
Daily Throughput Limit	Estimated	yd/day
Annual Throughput Limit	Estimated	yd/day
Annual Hours of Operation	NA	hr/year
Daily Hours of Operation	NA	hr/day
Section D.1.3 Generator Hours of Operation:		
Annual Throughput Limit	Estimated	yd/yr
Daily Throughput Limit	Estimated	yd/day
Annual Throughput Limit	Estimated	yd/day
Annual Hours of Operation	NA	hr/year
Daily Hours of Operation	NA	hr/day

PERMIT LIMITS TABLE

Production Rate:	Non-Attainment Area	Attainment Area	Collocated Attainment Area
Operational Schedule:	150 yd/hr	150 yd/hr	150 yd/hr
Throughput Limits:	240 hr/day	24.0 hr/day	24.0 hr/day
Limiting Pollutant:	CO	CO	CO
AIRQS Facility Classification:	B	B	B
	Estimated	Estimated	Estimated
	8,760 hr/year	8,760 hr/year	8,760 hr/year
	yd/yr	yd/yr	yd/yr
	4,380 hr/yr	4,380 hr/yr	4,380 hr/yr
	657,000 yd/yr	657,000 yd/yr	657,000 yd/yr
	60,000	60,000	60,000
	hr/yr	hr/yr	hr/yr
	3,000	3,000	3,000
	hr/yr	hr/yr	hr/yr
	8,000	8,000	8,000
	hr/yr	hr/yr	hr/yr
	CO 1-hr Standard	CO 1-hr Standard	CO 1-hr Standard
	CO 8-hr Standard	CO 8-hr Standard	CO 8-hr Standard
	CO 24-hr Standard	CO 24-hr Standard	CO 24-hr Standard
	CO Annual Standard	CO Annual Standard	CO Annual Standard

**OUTPUT**  
 POTENTIAL TO EXCEED EMISSIONS ANALYSIS USING AMBIENT AIR QUALITY STANDARDS  
 Attainment/Non-Attainment Area

Generator		Permitted Controlled Emission Rates	
Pollutant	PM <sub>10</sub>	0.00 lbs/hr	0.00 Tons/Yr
	CO	0.00 lbs/hr	0.00 Tons/Yr
	NO <sub>x</sub>	0.00 lbs/hr	0.00 Tons/Yr
	SO <sub>x</sub>	0.00 lbs/hr	0.00 Tons/Yr
	TOC	0.00 lbs/hr	0.00 Tons/Yr
Concrete Batching Plant Sources		0.1155 lbs/hr	0.506 Tons/Yr

Potential to Emit:	Uncontrolled	Controlled	PM <sub>10</sub>	Classification
	0.5 Tons/Yr	0.5 Tons/Yr		B

<b>Enforceable Limits:</b>	150 yd/hr	8,760 hr/year
<b>Operational Schedule:</b>	24.0 hr/day	
<b>Throughput Limits:</b>	Unlimited	8,760 yd/year
<b>Limiting Pollutant:</b>	None	

**ATTAINMENT/NON-CLASSIFIABLE AREAS**  
 Concrete Batching Plant Sources

Source	PM <sub>10</sub> Emission Factor (lb/hr)	Pre-Baghouse Emissions (lb/hr)	Post-Baghouse Emissions (lb/hr)	PM <sub>10</sub> Emissions (Tons/Yr)	Class
Concrete Silo Loading (Pre-mix)	0.07	10.5	46.0	8,760 lbs/yr	Green
Weight Hopper Loading (Cement)				8,760 lbs/yr	
<b>Total</b>		21.0	92.0		

**Generator and Concrete Batching Plant Sources Emissions**

Pollutant	Generator Emission Rate (lb/hr)	Generator Emissions (Tons/Yr)	Hours of Operation		AAQS		AAQS		Permitted Emissions (Tons/Yr)	Classification
			Uncontrolled	Controlled	Hours of Operation	Hours of Operation	Uncontrolled	Controlled		
PM <sub>10</sub>	0.00	0.00	24.0	8,760	0.00	0.51	0.00	0.51	0.00	B
CO	0.00	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	B
NO <sub>x</sub>	0.00	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	B
SO <sub>x</sub>	0.00	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	B
TOC	0.00	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	B

Pollutant	Ambient Air Concentration w/ Background Values (ug/m <sup>3</sup> )		Annual
	1-hr	24-hr	
PM <sub>10</sub>	11.40	5.130	35
CO			40
NO <sub>x</sub>			24
SO <sub>2</sub>			
TSS			

NON-ATTAINMENT AREAS

Source	PM <sub>10</sub> Emission Factor		Pre-Batchhouse		Batchhouse		Post-Batchhouse	
	PM <sub>10</sub> Emission Factor	PM <sub>10</sub> Emission						
Wagon Loading (Process)	0.07	45.99	0.07	45.99	99.90%	0.011	0.45	
Wagon Loading (General)	0.07	45.99	0.07	45.99	99.90%	0.011	0.45	
<b>Total</b>		<b>91.98</b>		<b>91.98</b>		<b>0.022</b>	<b>0.90</b>	

GENERATOR AND CONCRETE BATCHING PLANT SOURCE EMISSION - Non-Attainment Area

Pollutant	Generator Emission Rate	Hours of Operation	AQGS		Permitted Impacts		100 TPD Calculated Emissions	
			Hours of Operation	Hours of Operation	Calculated	Permitted	Calculated	Permitted
PM <sub>10</sub>	0.00	24.0	0.00	0.00	0.00	0.00	0.00	0.00
CO	0.00	24.0	0.00	0.00	0.00	0.00	0.00	0.00
NO <sub>x</sub>	0.00	24.0	0.00	0.00	0.00	0.00	0.00	0.00
SO <sub>2</sub>	0.00	24.0	0.00	0.00	0.00	0.00	0.00	0.00
TSS	0.00	24.0	0.00	0.00	0.00	0.00	0.00	0.00

Notes: 1. TPD calculations include concrete batching plant source emissions

2. CO 1-hr Averaging Period

3. SO<sub>2</sub> 1-hr Averaging Period

4. AQGS 1-hr Averaging Period

\*\* Assumes ambient TSP concentrations exceed NAAQS in PM<sub>10</sub> Non-Attainment Area.

Attainment Area - Calculated Units - Calculations

Pollutant	Calculated Ambient Air Quality Standards - Calculations		Annual (50% Attainment)
	1-hr	24-hr	
PM <sub>10</sub>	11.40	5.130	35
CO			40
NO <sub>x</sub>			24
SO <sub>2</sub>			
TSS			

Background Concentration - Attainment Non-Classifiable Area (ug/m<sup>3</sup>)

Pollutant	Background Concentration		Annual
	1-hr	24-hr	
PM <sub>10</sub>	11.40	5.130	35
CO			40
NO <sub>x</sub>			24
SO <sub>2</sub>			
TSS			

# **Appendix B**

## ***Modeling***

### ***Concrete Batch Plant***

09/11/00  
08:09:13

\*\*\* SCREEN3 MODEL RUN \*\*\*  
\*\*\* VERSION DATED 96043 \*\*\*

Rowland Bros Inc

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT	
EMISSION RATE (G/S)	=	0.126000	1 lb/hr
STACK HEIGHT (M)	=	16.7640	55'
STK INSIDE DIAM (M)	=	0.7620	2.5'
STK EXIT VELOCITY (M/S)	=	0.0467	45 acfm (100 cy/hr)
STK GAS EXIT TEMP (K)	=	294.2611	70 °F
AMBIENT AIR TEMP (K)	=	293.1500	
RECEPTOR HEIGHT (M)	=	0.0000	
URBAN/RURAL OPTION	=	RURAL	
BUILDING HEIGHT (M)	=	0.0000	
MIN HORIZ BLDG DIM (M)	=	0.0000	
MAX HORIZ BLDG DIM (M)	=	0.0000	

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.  
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M\*\*4/S\*\*3; MOM. FLUX = 0.000 M\*\*4/S\*\*2.

\*\*\* FULL METEOROLOGY \*\*\*

\*\*\*\*\*  
\*\*\* SCREEN AUTOMATED DISTANCES \*\*\*  
\*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
46.	38.90	1	1.0	1.0	320.0	14.65	13.28	6.66	NO
100.	72.92	2	1.0	1.0	320.0	14.65	19.27	10.60	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 46. M:  
 470' 143. 77.76 3 1.0 1.1 320.0 14.65 17.45 10.39 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)  
 DWASH=NO MEANS NO BUILDING DOWNWASH USED  
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED  
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED  
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3\*LB

\*\*\* INVERSION BREAK-UP FUMIGATION CALC. \*\*\*  
 CONC (UG/M\*\*3) = 0.000

DIST TO MAX (M) = 100.00

DIST TO MAX IS < 2000. M. CONC SET = 0.0

\*\*\*\*\*  
\*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
\*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
----- SIMPLE TERRAIN	----- 77.76	----- 143. <i>470 ft</i>	----- 0.

# **Appendix C**

## ***AIRS Database Update Form***

