September 15, 2000

MEMORANDUM

TO: Stephen West, Administrator
Boise Regional Office

FROM: Eric Antrim
Engineer-In-Training
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 stockpiled 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

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Montana Tank Works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>350</td>
</tr>
<tr>
<td>Maximum Capacity (cy/hr)</td>
<td>100</td>
</tr>
</tbody>
</table>

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 \( \mu g/m^3 \) 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:

- **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; and
- **IDAPA 58.01.01.650** 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

cc: DEQ State Office
    Boise Regional Office
Appendix A

Emission Estimate Calculations

Concrete Batch Plant
**Concrete Batch Plant Information**

- Facility Production Capacity: 150 [-] yd³/hr
- Maximum Annual Hours of Operation: 8,760 [-] hr/yr
- Cement Site:
  - Modeled 1-hr Concentration: 78 [-] µg/m³, at emission rate of 1 lb/hr
  - Baghouse Control Eff. %: 99.90%
- Cement Hopper:
  - Modeled 1-hr Concentration: 0 [-] µg/m³, at emission rate of 1 lb/hr
  - Baghouse Control Eff. %: 99.90%
- Generator Set Information:
  - Generator? (Y/N): N

**Background Concentrations**

<table>
<thead>
<tr>
<th></th>
<th>1 hr</th>
<th>8 hr</th>
<th>24 hr</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>1140</td>
<td>520</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>NOX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SOX</td>
<td>543</td>
<td>144</td>
<td>235</td>
<td></td>
</tr>
</tbody>
</table>

**Inputs to Permit to Construct (PTC)**

**Section B: "Attainment Area When Not Collared"**

- **Section B.1.1 Facility Throughput Limits:**
  - Annual Throughput Limit: (Collected) yd³/yr
  - Daily Throughput Limit: (Collected) yd³/yr

- **Section B.1.3 Generator Hours of Operation:**
  - Annual Hours of Operation: (Collected) hr/year
  - Daily Hours of Operation: (Collected) hr/day

**Section C: "Attainment Area When Collared"**

- **Section C.1.3 Facility Throughput Limits:**
  - Annual Throughput Limit: 657,000 yd³/yr
  - Daily Throughput Limit: 657,000 yd³/yr

- **Section C.1.4 Generator Hours of Operation:**
  - Annual Hours of Operation: (NA) hr/year
  - Daily Hours of Operation: (NA) hr/day

**Section D: "Non-Attainment Area"**

- **Section D.1.1 Facility Throughput Limits:**
  - Annual Throughput Limit: (Collected) yd³/yr
  - Daily Throughput Limit: (Collected) yd³/yr

- **Section D.1.3 Generator Hours of Operation:**
  - Annual Hours of Operation: (Collected) hr/year
  - Daily Hours of Operation: (Collected) hr/day

**Conversion Factor:** 0

**Permit Limits Table**

<table>
<thead>
<tr>
<th></th>
<th>Non-Attainment Area</th>
<th>Attainment Area</th>
<th>Collapsed Attainment Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 yd³/hr</td>
<td>150 yd³/hr</td>
<td>150 yd³/hr</td>
</tr>
<tr>
<td></td>
<td>24 hr/batch</td>
<td>24 hr/batch</td>
<td>24 hr/batch</td>
</tr>
<tr>
<td></td>
<td>(Collected) yd³/day</td>
<td>(Collected) yd³/day</td>
<td>(Collected) yd³/day</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Non-Attainment Area</th>
<th>Attainment Area</th>
<th>Collapsed Attainment Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 yd³/hr</td>
<td>150 yd³/hr</td>
<td>150 yd³/hr</td>
</tr>
<tr>
<td></td>
<td>24 hr/batch</td>
<td>24 hr/batch</td>
<td>24 hr/batch</td>
</tr>
<tr>
<td></td>
<td>(Collected) yd³/day</td>
<td>(Collected) yd³/day</td>
<td>(Collected) yd³/day</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**Limits:**

- **CO:** 502.3 lb/Standard hr/day
- **CO:** 5.4 lb/Standard hr/day

**Date:** 3-11-1996

**Engineer:** Eric Antin

**File:** BATCH WK4
<table>
<thead>
<tr>
<th>Generator</th>
<th>Permitted Controlled Emission Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM10</td>
<td>0.00 lb/hr 0.00 Tn/hr</td>
</tr>
<tr>
<td>CO</td>
<td>0.00 lb/hr 0.00 Tn/hr</td>
</tr>
<tr>
<td>SO2</td>
<td>0.00 lb/hr 0.00 Tn/hr</td>
</tr>
<tr>
<td>NOx</td>
<td>0.00 lb/hr 0.00 Tn/hr</td>
</tr>
<tr>
<td>TCO</td>
<td>0.00 lb/hr 0.00 Tn/hr</td>
</tr>
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</table>

Concrete Batch Plant Source:

| PM10 | 0.115 lb/hr | 0.00 Tn/hr |

<table>
<thead>
<tr>
<th>Potential to Emit</th>
<th>Uncontrolled</th>
<th>Controlled</th>
<th>PM10</th>
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<tr>
<td>lb/hr</td>
<td>lb/hr</td>
<td>lb/hr</td>
<td>lb/hr</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
<td>B</td>
<td></td>
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<table>
<thead>
<tr>
<th>Source</th>
<th>PM10</th>
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</thead>
<tbody>
<tr>
<td>Facility</td>
<td>0.0</td>
</tr>
<tr>
<td>Emissions</td>
<td>0.0</td>
</tr>
<tr>
<td>Hours of Operation</td>
<td>24 h</td>
</tr>
<tr>
<td>Total PM10</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generator</th>
<th>Concrete Batch Plant Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM10</td>
<td>0.115 lb/hr 0.00 Tn/hr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generator &amp; Site</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generator &amp; Site</th>
<th>Applicable Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generator &amp; Site</th>
<th>Hours of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generator &amp; Site</th>
<th>Calculated Annual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generator &amp; Site</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>
### Non-Attainment Areas

#### Concrete, Refractory Dust Sources

| Source | PM-10 Emissions | PM-10 Totals | PM-10 Background | PM-10 Removal | PM-10 Emission
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-10</td>
<td>2.95</td>
<td>19.5</td>
<td>16.6</td>
<td>0.35</td>
<td>16.25</td>
</tr>
<tr>
<td>CO</td>
<td>3.8</td>
<td>1.5</td>
<td>1.1</td>
<td>0.2</td>
<td>0.9</td>
</tr>
<tr>
<td>SO_2</td>
<td>44</td>
<td>14.1</td>
<td>10.1</td>
<td>2</td>
<td>12.1</td>
</tr>
<tr>
<td>NO_x</td>
<td>14.1</td>
<td>44</td>
<td>10.1</td>
<td>2</td>
<td>12.1</td>
</tr>
</tbody>
</table>

### Emission Factors

- PM-10: 0.25
- CO: 0.05
- SO_2: 0.09
- NO_x: 0.07

### Calculated and Estimated Emissions

| Source | Calculated Emissions | Estimated Emissions | Emission Factor | Backlog
|--------|----------------------|---------------------|-----------------|---------|
| PM-10  | 2.95                 | 19.5                | 0.25            | 16.6
| CO     | 3.8                  | 1.5                 | 0.05            | 1.1
| SO_2   | 44                   | 14.1                | 0.09            | 10.1
| NO_x   | 14.1                 | 44                  | 0.07            | 10.1

### Emission Rates

- PM-10: 1.75 lb/day
- CO: 0.4 lb/day
- SO_2: 0.8 lb/day
- NO_x: 0.4 lb/day

### Calculated and Estimated Emission Rates

| Source | Calculated Emission Rate | Estimated Emission Rate | Emission Factor | Backlog
|--------|---------------------------|-------------------------|-----------------|---------|
| PM-10  | 1.75 lb/day               | 1.75 lb/day             | 0.25            | 16.6
| CO     | 0.4 lb/day                | 0.4 lb/day              | 0.05            | 1.1
| SO_2   | 0.8 lb/day                | 0.8 lb/day              | 0.09            | 10.1
| NO_x   | 0.4 lb/day                | 0.4 lb/day              | 0.07            | 10.1

### Non-Attainment Areas - Calculated Emissions

- PM-10: 16.6 lb/day
- CO: 1.1 lb/day
- SO_2: 10.1 lb/day
- NO_x: 10.1 lb/day

### BBC Emission

- PM-10: 0.05 lb/day
- CO: 0.02 lb/day
- SO_2: 0.07 lb/day
- NO_x: 0.07 lb/day

### Background Concentrations

- PM-10: 0.02 lb/day
- CO: 0.02 lb/day
- SO_2: 0.02 lb/day
- NO_x: 0.02 lb/day

---

**Note:** Emission calculations include uncorrected point source emissions.

**Important Data:**

- PM-10: 16.6 lb/day
- CO: 1.1 lb/day
- SO_2: 10.1 lb/day
- NO_x: 10.1 lb/day

**Additional Information:**

- PM-10: 80 percentage
- CO: 90 percentage
- SO_2: 95 percentage
- NO_x: 98 percentage

**Emission Factors:**

- PM-10: 0.25
- CO: 0.05
- SO_2: 0.09
- NO_x: 0.07

**Emission Rates:**

- PM-10: 1.75 lb/day
- CO: 0.4 lb/day
- SO_2: 0.8 lb/day
- NO_x: 0.4 lb/day

**Calculated Emissions:**

- PM-10: 16.6 lb/day
- CO: 1.1 lb/day
- SO_2: 10.1 lb/day
- NO_x: 10.1 lb/day

**Estimated Emissions:**

- PM-10: 16.6 lb/day
- CO: 1.1 lb/day
- SO_2: 10.1 lb/day
- NO_x: 10.1 lb/day
Appendix B

Modeling

Concrete Batch Plant
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Rowland Bros Inc

SIMPLE TERRAIN INPUTS:

<table>
<thead>
<tr>
<th>Source Type</th>
<th>Emission Rate (G/S)</th>
<th>Stack Height (M)</th>
<th>Stack Inside Diam (M)</th>
<th>Stack Exit Velocity (M/S)</th>
<th>Stack Gas Exit Temp (K)</th>
<th>Ambient Air Temp (K)</th>
<th>Receptor Height (M)</th>
<th>Urban/Rural Option</th>
<th>Building Height (M)</th>
<th>Min Horiz Bldg Dim (M)</th>
<th>Max Horiz Bldg Dim (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINT</td>
<td>0.126000</td>
<td>16.7640</td>
<td>0.7620</td>
<td>0.0467</td>
<td>294.2611</td>
<td>293.1500</td>
<td>0.0000</td>
<td>RURAL</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

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 ***

<table>
<thead>
<tr>
<th>Dist</th>
<th>Conc (UG/M**3)</th>
<th>Stab U10M (M/S)</th>
<th>Ustk Mix ht (M)</th>
<th>Plume Sigma</th>
<th>Sigma (M)</th>
<th>Dwash</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.00</td>
<td>38.90</td>
<td>1.0</td>
<td>1.0</td>
<td>320.0</td>
<td>14.65</td>
<td>13.28</td>
</tr>
<tr>
<td>100.</td>
<td>72.92</td>
<td>2.0</td>
<td>2.0</td>
<td>320.0</td>
<td>14.65</td>
<td>19.27</td>
</tr>
</tbody>
</table>

Maximum 1-HR Concentration At Or Beyond 46. M:

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-Sire 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 ***
*****************************************************************************

<table>
<thead>
<tr>
<th>CALCULATION PROCEDURE</th>
<th>MAX CONC (UG/M**3)</th>
<th>DIST TO MAX (M)</th>
<th>TERRAIN HT (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMPLE TERRAIN</td>
<td>77.76</td>
<td>143.</td>
<td>0.</td>
</tr>
</tbody>
</table>

470 ft
Appendix C

AIRS Database Update Form
# Abbreviated AIRS Data Entry Sheet - Concrete Batch Plant

**Name of Facility:** Rowland Brothers Incorporated  
**AIRS/Permit #:** 777-00268  
**Permit Issue Date:** September 15, 2000

<table>
<thead>
<tr>
<th>Source/Emissions Unit Name</th>
<th>SCC #</th>
<th>Air Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flyash/Cement to Silo</td>
<td>30501199</td>
<td>SIP</td>
</tr>
<tr>
<td>Agg Handling/Piles</td>
<td>30500204</td>
<td>SIP</td>
</tr>
<tr>
<td>Transit Mix Truck Loading</td>
<td>30501110</td>
<td>SIP</td>
</tr>
<tr>
<td>Fugitives</td>
<td>30588801</td>
<td>SIP</td>
</tr>
<tr>
<td>Property Boundary</td>
<td>30588801</td>
<td>SIP</td>
</tr>
</tbody>
</table>

**RETURN TO PAT RAYNE**  
AIRS-PT.LST (9/95)