# Air Quality Permitting
# Statement of Basis

**June 8, 2007**

## Permit to Construct No. P-2007.0025

## Bear River Zeolite
## Preston, ID

## Facility ID No. 041-00010

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AIR QUALITY DIVISION

**Final**

# Table of Contents

# Acronyms, Units, and Chemical Nomenclatures

| | |
|---|---|
| AIRS | Aerometric Information Retrieval System |
| AQCR | Air Quality Control Region |
| ASTM | American Society for Testing and Materials |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| DEQ | Department of Environmental Quality |
| EPA | U.S. Environmental Protection Agency |
| IDAPA | a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act |
| MMBtu | million British thermal units |
| $NO_2$ | nitrogen dioxides |
| NSPS | New Source Performance Standards |
| Pb | lead |
| $PM_{10}$ | particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers |
| ppb | parts per billion |
| ppm | parts per million |
| PTC | permit to construct |
| SM | Synthetic Minor |
| SOx | sulfur oxides |
| T/hr | tons per hour |
| T/yr | tons per year |
| UTM | Universal Transverse Mercator |
| VOC | volatile organic compound |

## 1. 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.

## 2. FACILITY DESCRIPTION

Bear River Zeolite Company is a mining facility located near Preston. The facility mines zeolite ore and transfers it to crushing equipment where the zeolite is crushed, screened, and dried.

## 3. FACILITY / AREA CLASSIFICATION

Bear River Zeolite is classified as a synthetic minor facility because of Bear River Zeolite's potential to emit is limited to less than major source thresholds. The AIRS classification is SM.

The facility is located within AQCR 61 and UTM zone 12. The facility is located in Fremont County which is designated as unclassifiable for all regulated criteria pollutants ($PM_{10}$, CO, $NO_X$, $SO_2$, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at Bear River Zeolite. This required information is entered into the EPA AIRs database.

## 4. APPLICATION SCOPE

This Permit to Construct (PTC) is a modification to add a 15 tons per hour (T/hr) roller mill controlled by a cyclone vented baghouse, install two 0.75 MMBtu dryers that will replace the existing 1.0 MMBtu dryer, remove Allis Chalmer Tube Mill emission unit, and remove all diesel generators.

### *4.1 Application Chronology*

| | |
|---|---|
| February 15, 2007 | DEQ received application |
| February 20, 2007 | Bear River Zeolite withdrew application |
| February 28, 2007 | DEQ received application resubmission |
| March 28, 2007 | DEQ determined the application complete |
| April 26, 2007 | Received modeling analysis and peer review |
| May 29, 2007 | Received processing fee |
| June 8, 2007 | Issued Final Permit |

## 5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action:

### *5.1 Equipment Listing*

**Table 5.1 SUMMARY OF REGULATED SOURCES**

| Permit Section | Source Description | Emissions Control |
|---|---|---|
| 2 | **Crushers, Mills, and Screens**<br>Primary Crusher<br>Manufacturer/Type: Portec Inc., Pioneer Division-Jaw<br>Date of Manufacturer: 1973<br>Maximum Capacity: 300 T/hr | None |
| | Cone Crusher - (Bldg No. 1)<br>Manufacturer/Type: Nordberg Mfg. Co.-Cone<br>Date of Manufacturer: 1958<br>Maximum Capacity: 100 T/hr<br><br>Kohlberg Screen<br>Capacity: 254 T/hr<br>Size: 5ft. by 12 ft. | Contained in a building and emissions are vented through baghouse No. 1. |
| | Hammer Mill - (Bldg No. 2)<br>Manufacturer/Type: Philadelphia-Hammer Mill<br>Date of Manufacture: N/A<br>Maximum Capacity: 10 T/hr<br><br>Midwest Screen<br>Capacity: 154 T/yr<br>Size: 4 ft. by 8 ft.<br><br>2 Sweeco Screens<br>Size: 4 ft. diameter | Contained in a building and emissions are vented through baghouse No. 3 |
| | Hammer Mill - (Bldg No. 3)<br>Manufacturer/Type: Jeffries-Hammer Mill<br>Date of Manufacturer: N/A<br>Maximum Capacity: 50 T/hr<br><br>2 Midwest Multi Vibe Screens<br>Size: 5 ft. by 7 ft. | Contained in a building and emissions are vented through baghouse No. 4 |
| | Fine Products Mill – (Bldg No. 4)<br>Sweeco Screen<br>Size: 18 ft. diameter<br><br>Sweeco Screen<br>Size: 4 ft. diameter<br><br>Sweeco Screen<br>Size: 30 ft. diameter<br><br>Alston Power - Roller Mill<br>Manufacturer: Alston Power<br>Date of Manufacturer: 1979<br>Maximum Capacity: 15 T/hr | Contained in a building and emissions are vented through baghouse No. 5<br><br>Emissions are vented through a cyclone filter then to baghouse No. 6 |
| 3 | **Zeolite Dryers**<br>Manufacturer: Shop Made (5'x30' Drum)<br>Rated Heat Input: 750,000 Btu/hr<br>Fuel Type: Propane | Baghouse No. 2 |
| 4 | **Mining Operations** | Fugitive Dust Control |

## *5.2 Emissions Inventory*

The applicant estimated crushing equipment emissions using AP-42 emissions factors for crushed stone processing. For sources in buildings the applicant assumed a 70 percent particulate matter control efficiency for the building. For sources whose emissions are vented to baghouses the applicant used a control efficiency of 99.5% for $PM_{10}$. This is the weighted average of the emissions factors for particulate matter emissions from 0-2.5, 2.5-6, and 6-10 micrometers based on the percent by mass of each size speciation listed in AP-42 Table B.2-3. Emissions from the propane fired dryers were estimated using AP-42 emission factors for combustion sources plus an estimate for the particulate matter emissions from the baghouse. Fugitive emissions from mining sources were estimated by the applicant using AP-42 emissions factors for drilling, blasting, truck loading, and vehicle traffic. Tables summarize the emissions from Bear River Zeolite.

**Table 5.2 CRITERIA POLLUTANT EMISSIONS ESTIMATE**

| Source Description | Pollutants | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $PM_{10}$ | | $NO_2$ | | $SO_x$ | | CO | | VOC | | Pb | |
| | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| Building No. 1 – Primary Crushing | 0.80 | 3.51 | | | | | | | | | | |
| Zeolite Dryers | 0.37 | 1.65 | $2.29x10^{-01}$ | 1 | $3.28x10^{-04}$ | $1.44x10^{-03}$ | $3.12x10^{-02}$ | 0.14 | $8.19x10^{-03}$ | 0.04 | $7.35x10^{-07}$ | $3.22x10^{-06}$ |
| Building No. 2 | 0.51 | 2.23 | | | | | | | | | | |
| Building No. 3 | 0.32 | 1.39 | | | | | | | | | | |
| Building No. 4 - Fine Products Mill | 0.45 | 1.99 | | | | | | | | | | |
| Alston Power Roller Mill | 0.53 | 2.31 | | | | | | | | | | |
| **Total Point Source Emissions** | **2.98** | **13.08** | **$2.29x10^{-01}$** | **1** | **$3.28x10^{-04}$** | **$1.44x10^{-03}$** | **$3.12x10^{-02}$** | **0.14** | **$8.19x10^{-03}$** | **0.04** | **$7.35x10^{-07}$** | **$3.22x10^{-06}$** |

**Table 5.3 FUGITIVE DUST EMISSIONS ESTIMATE**

| Source Description | $PM_{10}$ | |
|---|---|---|
| | lb/hr | T/yr |
| Baghouse # 1 | 0.81 | 3.50 |
| Baghouse # 2 (Dryers) | 0.38 | 1.65 |
| Baghouse # 3 | 0.51 | 2.24 |
| Baghouse # 4 | 0.31 | 1.39 |
| Baghouse # 5 | 0.45 | 1.99 |
| Baghouse # 6 | 0.53 | 2.31 |
| Process Building 1 | 0.58 | 0.51 |
| Process Building 2 | 0.17 | 0.73 |
| Process Building 3 | 0.59 | 1.03 |
| Process Building 4 | 1.09 | 4.76 |
| Jaw Crusher | 0.08 | 0.02 |
| Outside Material Transfer | 0.73 | 3.19 |
| Mine Site Drilling | 0.08 | 0.33 |
| Mine Site Blasting | 1.52 | 6.67 |
| Rock Truck Loading | 0.04 | 0.18 |
| Vehicle Traffic | 3.96 | 17.35 |
| **Total Emissions** | **7.82** | **47.86** |

## 5.3 Modeling

The applicant modeled the facility-wide $PM_{10}$ and lead emissions. The resulting concentrations are summarized in the following table. A detailed modeling analysis is contained in Appendix A.

**Table 5.5 CRITERIA POLLUTANT MODELING RESULTS**

| Pollutant | Averaging Period | Facility Ambient Concentration ($\mu g/m^3$) | Total Ambient Concentration ($\mu g/m^3$) | NAAQS ($\mu g/m^3$) | Percent of NAAQS |
|---|---|---|---|---|---|
| $PM_{10}$ | 24-hour | 49.53 | 122.53 | 150 | 81.69 |
| | Annual | 4.43 | 26 | 50 | 60.87 |
| Lead | Quarterly | $1.35x10^{-05}$ | 0.03 | 1.5 | 2.00 |

## 5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201.....Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203.....Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

IDAPA 58.01.01.210.....Demonstration of Preconstruction Compliance with Toxic Standards

The applicant has demonstrated compliance for all TAPs identified in the permit application.

IDAPA 58.01.01.224.....Permit to Construct Application Fee

The applicant satisfied the PTC application fee requirement by submitting a fee of $1,000.00 at the time the original application was submitted, February 15, 2007.

IDAPA 58.01.01.225.....Permit to Construct Processing Fee

There is a net decrease of emissions from the facility; therefore, the associated processing fee is $500.00 for minimal engineering analysis. No permit to construct can be issued without first paying the required processing fee.

40 CFR 60 Subpart OOO .....Rules for Standards of Performance for Nonmetallic Mineral Processing Plants

This facility is subject to the performance standards for none metallic mineral processing plants in accordance with 40 CFR 60.670(a)(1). These standards include opacity requirements for each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, and storage bin at the facility. Additionally, there are grain loading requirements for any vent associated with a building which encloses any equipment affected by Subpart OOO. This facility modification includes the addition of a roller mill.

40 CFR 60.670 .....Applicability and designation of affected facility

This applied to this facility as a fixed nonmetallic mineral processing plants with crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck loading station. Based on the information provided to DEQ describing the mining

process of the zeolite mineral by Bear River Zeolite, DEQ has determined that NSPS is applicable to the facility by the definition of 40 CFR 60.671 "*Nonmetallic mineral* means any of the following minerals or any mixture of which the majority is any of the following minerals: (a) Crushed and Broken Stone."

40 CFR 60.671 .....Definitions

The definition of 40 CFR 60.671 applies to this facility as a fixed nonmetallic mineral processing plants with crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck loading station.

40 CFR 60.672 .....Standards for particulate matter

40 CFR 60.672(a) through (c) and 40 CFR 60.672 (e) through (g), applies to this facility as a fixed nonmetallic mineral processing plants with crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck loading station. The facility shall not discharge any particulate matter in excess of 0.05 g/dscm (0.022 gr/dscf) and exhibit greater than 7% opacity. Fugitive and belt transfer point emissions from the facility shall not exceed 10% opacity. The facility shall not discharge into the atmosphere from any crusher, at which a capture system is not used, fugitive emissions which exhibit greater than 15% opacity.

40 CFR 60.673 .....Reconstruction

These provisions do not apply to the facility because they are not reconstructing.

40 CFR 60.674 .....Monitoring of operations

Bear River does not use wet scrubbers to control emissions. This section does not apply.

40 CFR 60.675 .....Test methods and procedures

40 CFR 60.675(a) through (e), 40 CFR 60.675(g), and 40 CFR 60.675(h), apply to this facility as a fixed nonmetallic mineral processing plants with crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck loading station.

40 CFR 60.676 .....Reporting and record keeping

In accordance with 40 CFR 60.676(e), 40 CFR 60.676(f), 40 CFR 60.676(h), 40 CFR 60.676(i), and 40 CFR 60.676(j), these apply to this facility as a fixed nonmetallic mineral processing plants with crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck loading station.

In accordance with 40 CFR 60.675(b), EPA Method 5 or 17 shall be used to determine compliance with 40 CFR 60.672(a) "The permittee shall not discharge from any affected facility and any affected stack emissions which contain particulate matter in excess of 0.05 g/dscm (0.022 gr/dscf) and exhibit greater than 7% opacity in accordance with 40 CFR 60.672(a)(1) and (2)."

## *5.5 Permit Conditions Review*

This section describes only those permit conditions that have been revised, modified or deleted as a result of this permit action. All other permit conditions remain unchanged.

### CRUSHING OPERATIONS

**Permit Condition 2.3**
Permit Condition 2.3 incorporates former permit conditions 2.3, 2.4, 2.6, 2.7 (from PTC No. P-040310 issued September 20, 2005) and all other applicable NSPS provisions of 40 CFR 60, Subpart OOO.

**Permit Condition 2.9**
Permit Condition 2.9 incorporates former permit conditions (from PTC No. P-040310 issued September 20, 2005) 2.11 and 2.14 and all other applicable NSPS provisions of 40 CFR 60, Subpart OOO.

### GENERATORS

Former permit section 3 (from PTC No. P-040310 issued September 20, 2005) has been deleted since the facility is now operating on line power and will not be using generators.

### ZEOLITE DRYERS

Former permit condition 3.4 and 3.9 (from PTC No. P-040310 issued September 20, 2005) have been removed because the facility has tested the mercury content of the ore. The mercury analysis of October 3, 2005 stated the mercury content of the ore was 0.005 ppm, which is 5 ppb, significantly below 50 ppb required by the previous permit, therefore; the facility has satisfactorily meet the mercury testing and concentration requirement.

### MINING OPERATIONS

None of the provisions associated with the operation and monitoring of the mining operations have been revised, modified or deleted as a result of this permit action.

## 6. PERMIT FEES

This facility is subject to the $1,000 application fee for PTCs in accordance with IDAPA 58.01.01.224. The facility paid the $1,000 application fee on February 15, 2007 with original application submission. Additionally, this facility is subject to a PTC processing fee of $1,000 for modification to existing source with an increase of emissions of less then one (1) ton per year in accordance with IDAPA 58.01.01.225. This fee was paid on May 29, 2007.

**Table 6.1 PTC PROCESSING FEE TABLE**

| Emissions Inventory | | | |
|---|---|---|---|
| **Pollutant** | **Previous Annual Emissions (T/yr)** | **Current Annual Emissions (T/yr)** | **Annual Emissions Change (T/yr)** |
| $NO_X$ | 93.7 | 1.007 | -92.693 |
| $SO_2$ | 6.1 | 1.44E-03 | -6.09856 |
| CO | 20.1 | 0.137 | -19.963 |
| $PM_{10}$ | 79.7 | 47.86 | -31.84 |
| VOC | 7.4 | 0 | -7.4 |
| Lead | N/A | 3.22E-06 | 3.22E-06 |
| TAPS/HAPS | N/A | 7.67E-03 | 0.00767 |
| Total: | 207 | 49.01311 | **-157.987** |
| Fee Due | **$1,000.00** | | |

## 7. PERMIT REVIEW

### *7.1 Regional Review of Draft Permit*

A draft permit was submitted to Pocatello Regional Office and for peer review on April 26, 2007. Pocatello Regional Office recommended removing the provisions related to mercury emissions testing because the mercury analysis of October 3, 2005, stated the mercury content of the ore was 0.005 ppm, which is 5 ppb, significantly below 50 ppb required by the previous permit, therefore; the facility has satisfactorily met the mercury testing requirement.

### *7.2 Facility Review of Draft Permit*

A draft permit was submitted to Bear River Zeolite on May 17, 2007. The facility had no comments.

### *7.3 Public Comment*

An opportunity for public comment period on the PTC application was provided from April, 5, 2007, to April 19, 2007, in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and no requests for a public comment period on DEQ's proposed action.

## 8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that Bear River Zeolite be issued a Final PTC No.P-2007.0025 for the facility modification. No entity has requested a comment period, and the project does not involve PSD requirements.

JP/slm Permit No. P-2007.0025

# Appendix A

# AIRS Information

# P-2007.0025

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

**Facility Name:** **Bear River Zeolite**
**Facility Location:** **Preston, Idaho**
**AIRS Number:** **041-00010**

| AIR PROGRAM POLLUTANT | SIP | PSD | NSPS (Part 60) | NESHAP (Part 61) | MACT (Part 63) | SM80 | TITLE V | AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment |
|---|---|---|---|---|---|---|---|---|
| **$SO_2$** | B | | | | | | | U |
| **$NO_x$** | B | | | | | | | U |
| **CO** | B | | | | | | | U |
| **$PM_{10}$** | SM | | | | | | SM | U |
| **PT (Particulate)** | SM | | | | | | | U |
| **VOC** | B | | | | | | | U |
| **THAP (Total HAPs)** | B | | | | | | | |
| | | | **APPLICABLE SUBPART** | | | | | |
| | | | OOO | | | | | |

[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 HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

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).

# Appendix B

# Emissions Inventory

# P-2007.0025

## Emission Factors - Crushed Stone Processing Operations
## Bear River Zeolite Company

| Source | SCC | Uncontrolled PM (lb/ton) | Uncontrolled PM10 (lb/ton) |
|---|---|---|---|
| Screening | 3-05-020-02-03 | 3.94E-02 | 1.50E-02 |
| Primary Crushing | 3-05-020-01 | 7.00E-04 | 2.67E-04 |
| Secondary Crushing | 3-05-020-02 | 6.30E-03 | 2.40E-03 |
| Tertiary Crushing | 3-05-020-03 | 6.30E-03 | 2.40E-03 |
| Fines Crushing | 3-05-020-05 | 3.94E-02 | 1.50E-02 |
| Fines Screening | 3-05-020-21 | 1.86E-01 | 7.10E-02 |
| Transfer Point | 3-05-020-06 | 3.70E-03 | 1.40E-03 |

Emission Factors From AP42 Table 11.19.2-2.
When Only One Pollutant Was Listed, the Following Conversion Factors Were Used:
TSP = PM10 × 2.1 and TSP = PM × 0.8

Drop Point Emission Factor from Equation 1, AP42 13.2.4:
Mean Wind Speed (U) = 10 mph
Moisture Content (M) = 2.5%
Particle Size Multiplier (k) =
PM10 = 0.35
TSP = 0.74
PM = TSP/0.8 = 0.925

$$EF\left(\frac{lb}{ton}\right) = (k \times 0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

**Process Emission Estimates**
**Bear River Zeolite**
**Preston, Idaho**

**Building 1 Primary Crushing and Screening**

| Source | Production Rate Maximum (lb/hr) | Production Rate Annual tons/yr | Emission Factors PM (lb/ton) | Emission Factors PM10 (lb/ton) | PM (lb/hr) | PM (tons/yr) | PM10 (lb/hr) | PM10 (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| Cone Crusher | 100 | 175,200 | 7.00E-04 | 2.67E-04 | 7.00E-02 | 6.13E-02 | 2.67E-02 | 2.34E-02 |
| Primary Screen | 100 | 175,200 | 3.94E-02 | 1.50E-02 | 3.94 | 3.45 | 1.50 | 1.31 |
| 3 Transfers | 100 | 175,200 | 3.70E-03 | 1.40E-03 | 1.11 | 0.97 | 0.42 | 0.37 |
| Total Uncontroled | | | | | 5.120 | 4.485 | 1.947 | 1.705 |
| Total 70% Control | | | | | 1.536 | 1.346 | 0.584 | 0.512 |

**Building 2 Coarse Products Building**

| Source | Production Rate Maximum (lb/hr) | Production Rate Annual tons/yr | Emission Factors PM (lb/ton) | Emission Factors PM10 (lb/ton) | PM (lb/hr) | PM (tons/yr) | PM10 (lb/hr) | PM10 (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| Philadelphia Hammer Mill | 10 | 87,600 | 6.30E-03 | 2.40E-03 | 6.30E-02 | 0.276 | 2.40E-02 | 0.105 |
| 4 × 8 Screen Plant | 10 | 87,600 | 3.94E-02 | 1.50E-02 | 0.394 | 1.726 | 0.150 | 0.657 |
| 4' Sweeco Screen | 10 | 87,600 | 3.94E-02 | 1.50E-02 | 0.394 | 1.726 | 0.150 | 0.657 |
| 4' Sweeco Screen | 10 | 87,600 | 3.94E-02 | 1.50E-02 | 0.394 | 1.726 | 0.150 | 0.657 |
| 6 Transfers | 10 | 87,600 | 3.70E-03 | 1.40E-03 | 0.222 | 0.972 | 0.084 | 0.368 |
| Total Uncontroled | | | | | 1.467 | 6.425 | 0.558 | 2.444 |
| Total 70% Control | | | | | 0.440 | 1.928 | 0.167 | 0.733 |

**Building 3 Jeffries Hammer Mill**

| Source | Production Rate Maximum (lb/hr) | Production Rate Annual tons/yr | Emission Factors PM (lb/ton) | Emission Factors PM10 (lb/ton) | PM (lb/hr) | PM (tons/yr) | PM10 (lb/hr) | PM10 (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| Jeffries Hammer Mill | 50 | 175,200 | 6.30E-03 | 2.40E-03 | 0.315 | 0.552 | 0.120 | 0.210 |
| 5 × 7 Screen Plant | 50 | 175,200 | 3.94E-02 | 1.50E-02 | 1.970 | 3.451 | 0.750 | 1.314 |
| 5 × 7 Screen Plant | 50 | 175,200 | 3.94E-02 | 1.50E-02 | 1.970 | 3.451 | 0.750 | 1.314 |
| 5 Transfers | 50 | 175,200 | 3.70E-03 | 1.40E-03 | 0.925 | 1.621 | 0.350 | 0.613 |
| Total Uncontroled | | | | | 5.180 | 9.075 | 1.970 | 3.451 |
| Total 70% Control | | | | | 1.554 | 2.723 | 0.591 | 1.035 |

**Building 4 Fine Products Building**

| Source | Production Rate Maximum (lb/hr) | Production Rate Annual tons/yr | Emission Factors PM (lb/ton) | Emission Factors PM10 (lb/ton) | PM (lb/hr) | PM (tons/yr) | PM10 (lb/hr) | PM10 (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| 3.5 × 10.5 Screen Plant | 10 | 87,600 | 1.86E-01 | 7.10E-02 | 1.860 | 8.147 | 0.710 | 3.110 |
| 3.5 × 10.5 Screen Plant | 10 | 87,600 | 1.86E-01 | 7.10E-02 | 1.860 | 8.147 | 0.710 | 3.110 |
| 18" Sweeco Screen | 10 | 87,600 | 1.86E-01 | 7.10E-02 | 1.860 | 8.147 | 0.710 | 3.110 |
| 4' Sweeco Screen | 10 | 87,600 | 1.86E-01 | 7.10E-02 | 1.860 | 8.147 | 0.710 | 3.110 |
| 30" Sweeco Screen | 10 | 87,600 | 1.86E-01 | 7.10E-02 | 1.860 | 8.147 | 0.710 | 3.110 |
| 5 Transfers | 10 | 87,600 | 3.70E-03 | 1.40E-03 | 0.185 | 0.810 | 0.070 | 0.307 |
| Total Uncontroled | | | | | 9.485 | 41.544 | 3.620 | 15.856 |
| Total 70% Control | | | | | 2.846 | 12.463 | 1.086 | 4.757 |

**Unenclosed Process Emissions**

| Source | Production Rate Maximum (lb/hr) | Production Rate Annual tons/yr | Emission Factors PM (lb/ton) | Emission Factors PM10 (lb/ton) | PM (lb/hr) | PM (tons/yr) | PM10 (lb/hr) | PM10 (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| Jaw Crusher | 300 | 175,200 | 7.00E-04 | 2.67E-04 | 0.210 | 0.061 | 0.080 | 0.023 |
| Outside Transfers (18) | 20 | 175,200 | 5.33E-03 | 2.02E-03 | 1.919 | 8.404 | 0.727 | 3.185 |

**Drilling and Blasting Emissions**

| Emission Source | Emission Factors TSP (lb/ton mined) | Emission Factors PM (lb/ton mined) | Emission Factors PM10 (lb/ton mined) | Potential Emissions PM (lb/hr) | Potential Emissions PM (tons/yr) | Potential Emissions PM-10 (lb/hr) | Potential Emissions PM-10 (tons/yr) |
|---|---|---|---|---|---|---|---|
| Drilling | 0.0080 | 0.0100 | 0.0038 | 0.2000 | 0.8760 | 0.0762 | 0.3337 |
| Blasting | 0.1600 | 0.2000 | 0.0762 | 4.0000 | 17.5200 | 1.5238 | 6.6743 |
| | | | **Total** | **4.2000** | **18.3960** | **1.6000** | **7.0080** |

**Fugitive Emissions From Vehicle Traffic:**

| Vehicle | s | S | W | w | p | Emission Factor PM (lb/VMT) | Emission Factor $PM_{10}$ (lb/VMT) | Potential Emissions PM (lb/hr) | Potential Emissions PM (tons/yr) | Potential Emissions $PM_{10}$ (lb/hr) | Potential Emissions $PM_{10}$ (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rock Truck | 9.6 | 5 | 27.5 | 6 | 90 | 3.423 | 1.232 | 5.135 | 22.490 | 1.848 | 8.096 |
| Product Truck | 10 | 5 | 22.5 | 10 | 90 | 4.000 | 1.440 | 5.867 | 25.697 | 2.112 | 9.251 |
| | | | | | | | **TOTAL** | **11.002** | **48.187** | **3.961** | **17.347** |

| | Mine Road | Access Road |
|---|---|---|
| Round Trip Distance (miles) | 1.5 | 1.1 |
| Tons Hauled per Round Trip | 20 | 15 |
| Potential Tons Hauled per hour | 20 | 20 |
| Potential Round Trips per hour | 1.00 | 1.33 |
| Actual Tons Hauled per hour | 1.1416 | 1.1416 |
| Actual Round Trips per hour | 0.0571 | 0.0761 |

$$E = k(5.9)\left(\frac{s}{12}\right)\left(\frac{S}{30}\right)\left(\frac{W}{3}\right)^{0.7}\left(\frac{w}{4}\right)^{0.5}\left(\frac{365-p}{365}\right) = \text{lb/VMT}$$

E = emission factor in pounds per Vehicle Mile Traveled.
k = particle size multiplier = 1.0 for PM and 0.36 for $PM_{10}$
s = silt content %
S = mean vehicle speed (mph)
W = mean vehicle weight (tons)
w = mean number of wheels
p = number of days with at least 0.01 inches of precipitation per year

**Emission Factors - Propane and Natural Gas Combustion**
**Bear River Zeolite Company**

| | Emission Factors N. G./Propane | Potential Emissions 0.75 MMBtu Dryers (2) | | |
|---|---|---|---|---|
| Criteria Pollutants | (lb/MMBtu) | (lb/hr) | (T/yr) | |
| PM-10 | 4.37E-03 | 6.555E-03 | 0.029 | |
| SO2 | 2.19E-04 | 3.285E-04 | 1.44E-03 | |
| NO2 | 1.53E-01 | 2.295E-01 | 1.005 | |
| CO | 2.08E-02 | 3.120E-02 | 0.137 | |
| VOC | 5.46E-03 | 8.190E-03 | 0.036 | |
| Lead | 4.90E-07 | 7.350E-07 | 3.22E-06 | |
| Non-Criteria Pollutants with a Significant Threshold | | | | |
| PM | 6.53E-03 | 9.80E-03 | 0.043 | Emission Screening Level (EL) (lb/hr) |
| Beryllium | 1.18E-08 | 1.77E-08 | 7.75E-08 | |
| Mercury | 2.55E-07 | 3.83E-07 | 1.68E-06 | |
| Non-Carcinogenic TAPs | | | | |
| Barium | 4.31E-06 | 6.47E-06 | 2.83E-05 | 0.033 |
| Chromium | 1.37E-06 | 2.06E-06 | 9.00E-06 | 0.0333 |
| Cobalt | 8.24E-08 | 1.24E-07 | 5.41E-07 | 0.007 |
| Copper | 8.33E-07 | 1.25E-06 | 5.47E-06 | 0.013 |
| Dichlorobenzene | 1.18E-06 | 1.77E-06 | 7.75E-06 | 20 |
| Fluorene | 2.75E-09 | 4.13E-09 | 1.81E-08 | 0.133 |
| Hexane | 1.76E-03 | 2.64E-03 | 1.16E-02 | 12 |
| Manganese | 3.73E-07 | 5.60E-07 | 2.45E-06 | 0.067 |
| Mercury | 2.55E-07 | 3.83E-07 | 1.68E-06 | 0.003 |
| Molybdenum | 1.08E-06 | 1.62E-06 | 7.10E-06 | 0.33 |
| Napthalene | 5.98E-07 | 8.97E-07 | 3.93E-06 | 3.33 |
| Pentane | 2.55E-03 | 3.83E-03 | 1.68E-02 | 118 |
| Selenium | 2.35E-08 | 3.53E-08 | 1.54E-07 | 0.013 |
| Toluene | 3.33E-06 | 5.00E-06 | 2.19E-05 | 25 |
| Vanadium | 2.25E-06 | 3.38E-06 | 1.48E-05 | 0.025 |
| Zinc | 2.84E-05 | 4.26E-05 | 1.87E-04 | 0.667 |
| Carcinogenic TAPs | | | | |
| Arsenic | 1.97E-07 | 2.96E-07 | 1.29E-06 | 1.50E-06 |
| Benzene | 2.06E-06 | 3.09E-06 | 1.35E-05 | 8.00E-04 |
| Benzo(a)pyrene | 1.18E-08 | 1.77E-08 | 7.75E-08 | 2.00E-06 |
| Beryllium | 1.18E-09 | 1.77E-09 | 7.75E-09 | 2.80E-05 |
| Cadmium | 1.08E-06 | 1.62E-06 | 7.10E-06 | 3.70E-06 |
| Formaldehyde | 7.35E-05 | 1.10E-04 | 4.83E-04 | 5.10E-04 |
| 3-Methylchloranthrene | 1.76E-09 | 2.64E-09 | 1.16E-08 | 2.50E-06 |
| Nickel | 2.06E-06 | 3.09E-06 | 1.35E-05 | 2.70E-05 |
| PAH's | 1.76E-09 | 2.64E-09 | 1.16E-08 | 2.00E-06 |
| Benzo(a)anthracene | <1.76E-09 | | | N/A |
| Benzo(b)fluoranthene | <1.76E-09 | | | N/A |
| Benzo(k)fluoranthene | <1.76E-09 | | | N/A |
| Chrysene | <1.76E-09 | | | N/A |
| Dibenzo(a,h)anthracene | <1.76E-09 | | | N/A |
| Indeno(1,2,3-cd)pyrene | <1.76E-09 | | | N/A |
| Benzo(a)pyrene | <1.76E-09 | | | N/A |

**Stack Emission Estimates**
**Bear River Zeolite**
**Preston, Idaho**

**Baghouse Emissions**

| Baghouse ID | Description | Exhaust Flow (dscf/m) | Emissions PM (lb/hr) | PM (tons/yr) | PM10 (lb/hr) | PM10 (tons/yr) |
|---|---|---|---|---|---|---|
| BGH1 | Primary Crushing Circuit | 4,997.3 | 0.942 | 4.128 | 0.801 | 3.508 |
| BGH2 | 0.75 MMBtu Dryers | 2,345.7 | 0.442 | 1.937 | 0.376 | 1.647 |
| BGH3 | Philadelphia Hammer Mill | 3,186.3 | 0.601 | 2.632 | 0.511 | 2.237 |
| BGH4 | Jeffries *Hammer Mill* | 1,983.3 | 0.374 | 1.638 | 0.318 | 1.392 |
| BGH5 | Fine Products | 2,829.7 | 0.534 | 2.337 | 0.454 | 1.987 |
| BGH6 | Alston Hammer Mill | 3,294.0 | 0.621 | 2.721 | 0.528 | 2.313 |

**Zeolite Dryer Emissions**

| Criteria Pollutants | Emission Factors (lb/MMBtu) | Potential Emissions 0.75 MMBtu Dryers (2) (lb/hr) | (T/yr) |
|---|---|---|---|
| PM | 0.022 gr/dscf | 0.442 | 1.937 |
| PM-10 | 85% of PM | 0.376 | 1.647 |
| SO2 | 2.19E-04 | 3.285E-04 | 1.44E-03 |
| NO2 | 1.53E-01 | 2.295E-01 | 1.005 |
| CO | 2.08E-02 | 3.120E-02 | 0.137 |
| VOC | 5.46E-03 | 8.190E-03 | 0.036 |
| Lead | 4.90E-07 | 7.350E-07 | 3.22E-06 |

# Appendix C

# Modeling Review

# P-2007.0025

***M E M O R A N D U M***

**DATE:** April 27, 2007

**TO:** Jonathon Pettit, Air Quality Analyst, Air Program

**FROM:** Darrin Mehr, Air Quality Analyst, Air Program

**PROJECT NUMBER:** P-2007.0025

**SUBJECT:** Modeling Review for Bear River Zeolite Permit to Construct Modification for the Installation of a 15-Ton Per Hour Roller Mill and Two Dryers at Their Facility Near Preston, Idaho.

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## 1.0 Summary

Bear River Zeolite (BRZ) submitted a Permit to Construct (PTC) application for a proposed modification of the facility's permit on February 28, 2007. This submittal replaces an earlier PTC application received on February 15, 2007 (P-2007.0020). Modeling was conducted by Spidell and Associates, on behalf of BRZ.

The facility was issued Tier II Operating Permit No. T2-040422, on March 8, 2005.

This permit application requests the following:

- Authorization to construct a new 15 ton per hour (T/hr) roller mill that will be controlled by a cyclone in series with a baghouse.
- Replacing a single material dryer rated at 1.0 million British Thermal units per hour (MMBtu/hr) with two material dryers each rated at 0.75 MMBtu/hr.
- All generators on-site that were to be used for emergency back-up power supply are to be removed from the facility.

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. 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** |
| The two proposed zeolite dryers are rated at 0.75 MMBtu/hr each, are fired on propane, and exhaust to Baghouse #2. | $PM_{10}$ emissions were assumed to be controlled by a baghouse (fabric filtration system). |
| The proposed roller mill was evaluated at a 15 ton per hour capacity, and was assumed to be controlled by a cyclone in series with Baghouse #6. | $PM_{10}$ emissions were assumed to be controlled by a baghouse. |
| Ambient impacts due to facility-wide $PM_{10}$ emissions were not predicted to be near either the 24-hour or the annual $PM_{10}$ NAAQS. | Source or activity-specific $PM_{10}$ emission rate limitations are not recommended based on the results of the ambient impact analyses. |

# 2.0 Background Information

## *2.1 Applicable Air Quality Impact Limits and Modeling Requirements*

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

### *2.1.1 Area Classification*

The BRZ facility is located in Franklin County, designated as an attainment or unclassifiable area for sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), carbon monoxide (CO), lead (Pb), ozone ($O_3$), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers ($PM_{10}$). There are no Class I areas within 10 kilometers of the facility.

### *2.1.2 Significant and Full Impact Analyses*

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, 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.

**Table 2. CRITERIA AIR POLLUTANTS 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 | 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] |

a. IDAPA 58.01.01.006.90
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 TAPs Analyses*

There are no increases in TAPs emissions from the proposed modification. Therefore, per IDAPA 58.01.01.210, additional analyses are not required to demonstrate compliance with the toxic air pollutant (TAP) increments.

## 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 and were based on rural agricultural area default values.

**Table 3. BACKGROUND CONCENTRATIONS**

| Pollutant | Averaging Period | Background Concentration ($\mu g/m^3$)[a] |
|---|---|---|
| $PM_{10}$[b] | 24-hour | 73 |
| | Annual | 26 |

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

# 3.0 Modeling Impact Assessment

## 3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the DEQ verification analyses.

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

| Table 4. MODELING PARAMETERS | | |
|---|---|---|
| ***Parameter*** | *Description/ Values* | *Documentation/Additional Description* |
| Model | AERMOD | AERMOD, Version 07026 |
| Meteorological data | 1) 1987-1991 Pocatello Surface Data And 1987-1991 Boise Upper Air Data<br><br>2) 2003 Soda Springs Surface And Upper Air Data | Spidell and Associates used Pocatello surface meteorological data and Boise Airport upper air meteorological data for 1987-1991.<br><br>This data was processed in AERMET. DEQ did not re-run the raw data in AERMET.<br><br>DEQ provided Spidell and Associates with a pre-processed file of meteorological data collected at the Monsanto facility near Soda Springs, Idaho. The data was for the year 2003. |
| Land Use (urban or rural) | Rural | Urban area surface heating was not used in this analysis based on the land use at the site. |
| Terrain | Considered | 3-dimensional receptor coordinates were utilized. Each receptor was assigned an elevation. Digital elevation map (DEM) data was used as the basis for the coordinate locations and elevations.<br><br>Spidell and Associates processed the receptor data in AERMAP to identify hill-heights. DEQ did not re-import the DEM files or re-run AERMAP. |
| Building downwash | Downwash algorithm | Building dimensions obtained from modeling files submitted, and BPIP-PRIME and AERMOD were used to evaluate downwash effects. |
| Receptor grid | Grid 1 | 25 meter spacing from fenceline out to 100 meters |
| | Grid 2 | 50 meter spacing from 100 meters out to 600 meters |
| | Grid 3 | 100 meter spacing from 600 meters out to 1,200 meters |
| | Grid 4 | 200 meter spacing from 1,200 meters out to 2,000 meters |

### *3.1.1 Modeling protocol*

A protocol was submitted by Spidell and Associates to DEQ prior to submission of the AERMOD modeling demonstration on December 22, 2006. DEQ approval, with comments, was issued by Kevin Schilling, Stationary Source Modeling Coordinator, on January 12, 2007.

Modeling was conducted using methods required by the State of Idaho Air Quality Modeling Guideline and the modeling protocol.

### *3.1.2 Model Selection*

AERMOD, Version 07026, was used by Spidell and Associates to conduct the final ambient air impact analyses for this project, which is the current regulatory guideline model.

### *3.1.3 Meteorological Data*

BRZ utilized two data sets of meteorological information for the analysis. The first set was a five-year data set spanning 1987 through 1991, and used Pocatello airport surface data and Boise airport upper air data. The second data set was a 2003 Soda Springs using information collected at the Monsanto Corporation site. DEQ provided the Soda Springs data set to Spidell and Associates to combine with the Pocatello/Boise data set to adequately assess the ambient impacts at the Bear River Zeolite site.

This was deemed necessary because the Bear River Zeolite facility is situated in a unique location just

northwest of Glendale Reservoir in a canyon with the draw running north to south. The Monsanto facility is located on a valley floor with mountainous terrain on the east and west sides of the valley, so this is a closer match to the actual meteorological conditions expected at the BRZ site. The Soda Springs data was provided in a pre-processed format.

Spidell and Associates split the area surrounding the Pocatello airport into 4 sectors to select the surface characteristic values for the Pocatello surface data. Table 5 lists the albedo, surface roughness length, and Bowen ratio values used as input to AERMET, for processing the modeling analyses meteorological data. These coefficients were selected by Spidell and Associates according to the EPA guidance in the AERMOD Implementation Guidance, dated September 27, 2005, and the AERMET User's Guide. A weighted average of the land use type within each sector was not employed.

Land surrounding the Pocatello airport was assumed to be a mix of cultivated land and grassland. Average moisture conditions were assumed. Sector 1, from 30 degrees (º) to 70 º, and Sector 3, from 185º to 280º were assumed to be entirely grassland. Sector 2, from 70º to 185º, and Sector 4, from 280º to 30º were assumed to be entirely cultivated land.

Table 5. AERMET ALBEDO, BOWEN RATIO, AND SURFACE ROUGHNESS LENGTH COEFFICIENTS

| Sector (degrees) | | Sector Use | Winter | | | Spring | | | Summer | | | Fall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | End | | $\alpha$[a] | $\beta$[b] | $z_0$[c] | $\alpha$ | $\beta$ | $z_0$ | $\alpha$ | $\beta$ | $z_0$ | $\alpha$ | $\beta$ | $z_0$ |
| 30 | 70 | Grass land | 0.6 | 1.5 | 0.001 | 0.18 | 0.4 | 0.05 | 0.18 | 0.8 | 0.1 | 0.2 | 1.0 | 0.01 |
| 70 | 185 | Cultivated land | 0.6 | 1.5 | 0.01 | 0.14 | 0.3 | 0.03 | 0.2 | 0.5 | 0.2 | 0.18 | 0.7 | 0.05 |
| 185 | 280 | Grass land | 0.6 | 1.5 | 0.001 | 0.18 | 0.4 | 0.05 | 0.18 | 0.8 | 0.1 | 0.2 | 1.0 | 0.01 |
| 280 | 30 | Cultivated land | 0.6 | 1.5 | 0.01 | 0.14 | 0.3 | 0.03 | 0.2 | 0.5 | 0.2 | 0.18 | 0.7 | 0.05 |

[a.] Albedo
[b.] Bowen ratio
[c.] Surface roughness length

### 3.1.4 Terrain Effects

The modeling analyses submitted by BRZ considered elevated terrain. The elevation was assigned to each receptor. Elevations of emission sources, buildings, and receptors were not regenerated from DEM files for DEQ's verification analyses.

### 3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to satellite images of the site obtained from the Google Earth internet site to confirm the facility layout. A scaled facility plot plan was not submitted in February 28, 2007 submittal. The application contained a copy of the Building Profile Input Program (BPIP) file facility layout used in the analysis.

### 3.1.6 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program-PRIME (BPIP-PRIME) was used by the applicant to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for AERMOD. AERMOD identified the effects of structure-induced downwash on predicted ambient impacts.

### 3.1.7 Ambient Air Boundary

Ambient air was specified to exist around the facility's production plant and mine area. The land is controlled and monitored by BRZ. Unauthorized visitor access is discouraged by plant personnel and a gated private access road. The facility is bordered by posted private agricultural land and steep terrain. This ambient air boundary is adequate for this modeling analysis.

### *3.1.8 Receptor Network*

The receptor grids used by ConAgra met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ verification analyses were conducted using the same receptor grid.

## 3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for DEQ verification modeling:

- All modeled criteria air pollutant emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or requested permit allowable emission rates.

Table 6 lists the $PM_{10}$ air pollutant emissions rates for sources included in the dispersion modeling analyses for short term and annual averaging periods, respectively. Daily emissions were modeled by BRZ for 24 hours. Annual emissions were modeled over 8,760 hours per year.

**Table 6. MODELED CRITERIA POLLUTANT SHORT-TERM AND ANNUAL EMISSIONS RATES**

| Source ID | Description | Emission Rates (lb/hr[a]) | | | |
|---|---|---|---|---|---|
| | | **$PM_{10}$[b], 24-hr avg and annual** | **$SO_2$[c], 3-hr avg and 24-hr avg, and annual** | **CO[d], 1-hr avg and 8-hr avg** | **Lead, Quarterly avg** |
| BGH1 | | 0.801 | 0 | 0 | 0 |
| BGH2 | New Zeolite Dryers – 0.75 MMBtu/hr each controlled by Baghouse #2 | 0.376 | 3.29E-04 | 0.23 | 7.35E-07 |
| BGH3 | | 0.511 | 0 | 0 | 0 |
| BGH4 | | 0.318 | 0 | 0 | 0 |
| BGH5 | | 0.454 | 0 | 0 | 0 |
| BGH6 | New 15 Ton/hr Roller Mill controlled by a cyclone and baghouse in series | 0.528 | 0 | 0 | 0 |
| JCR1 | Jaw Crusher | 0.080 | 0 | 0 | 0 |
| BLDG1 | Primary Crushing Bldg | 0.584 | 0 | 0 | 0 |
| BLDG2 | Coarse Products Bldg | 0.167 | 0 | 0 | 0 |
| BLDG3 | Jeffries Hammer Mill Bldg | 0.591 | 0 | 0 | 0 |
| BLDG4 | Fine Products Bldg | 1.135 | 0 | 0 | 0 |
| TPFUG | Transfer Point Fugitives | 0.727 | 0 | 0 | 0 |

[a.] Pounds per hour
[b.] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers, 24-hour averaging period
[c.] Sulfur dioxide
[d.] Carbon monoxide

## 3. 3 Emission Release Parameters

Table 7 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Table 8 provides the parameters used to model the fugitive $PM_{10}$ sources as volume sources. The jaw crusher (JCR1) and material transfer fugitives

(TPFUG) are unenclosed fugitive sources, and emissions that are emitted from volume sources BLDG1, BLDG2, BLDG3, and BLDG4 are enclosed within buildings. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation for the verification of these parameters was not required.

Table 7. POINT SOURCE STACK PARAMETERS

| ***Release Point*** | **Release Point Description** | **Stack Height (m)[a]** | **Modeled Stack Diameter (m)** | **Stack Gas Temp (K)[b]** | **Stack Gas Flow Velocity (m/sec)[c]** |
|---|---|---|---|---|---|
| BGH1 | | 2.21 | 0.689 | 294.3 | 7.71 |
| BGH2 | New Zeolite Dryers – 0.75 MMBtu/hr each controlled by Baghouse #2 | 2.44 | 0.399 | 344.3 | 10.77 |
| BGH3 | | 6.71 | 0.360 | 294.3 | 0.001[d] |
| BGH4 | | 2.74 | 0.381 | 294.3 | 9.11 |
| BGH5 | | 1.89 | 0.372 | 294.3 | 14.97 |
| BGH6 | New 15 Ton/hr Roller Mill controlled by a cyclone and baghouse in series | 6.10 | 0.372 | 294.3 | 17.38 |

[a.] Meters
[b] Kelvin
[c.] Meters per second
[d] Horizontal release

TABLE 8. VOLUME SOURCE RELEASE PARAMETERS

| **Release Point** | **Description** | **Release Height (m[a])** | **Horizontal Dimension (m)** | **Vertical Dimension (m)** |
|---|---|---|---|---|
| JCR1 | Jaw Crusher | 1.83 | 0.25 | 1.7 |
| BLDG1 | Primary Crushing Bldg | 4.27 | 1.42 | 3.97 |
| BLDG2 | Coarse Products Bldg | 3.05 | 2.98 | 2.84 |
| BLDG3 | Jeffries Hammer Mill Bldg | 3.05 | 1.56 | 2.84 |
| BLDG4 | Fine Products Bldg | 3.05 | 3.19 | 2.84 |
| TPFUG | Transfer Point Fugitives | 6.1 | 12.76 | 5.67 |

[a.] Meters
[b.]

## 3.4 Results for Significant Impact Analysis

A significant contribution analysis was submitted for this application. The significant impact analysis used the most conservative approach by modeling facility-wide emissions for all criteria air pollutants regulated by a NAAQS. BRZ modeled the requested emissions of $PM_{10}$, CO, $SO_2$, $NO_2$, and lead, for all NAAQS averaging periods, and annual $NO_2$ emissions that are associated with the entire facility instead of just the emissions related to the modification.

DEQ re-ran the 24-hour $PM_{10}$ emission scenario for the significant impact analysis using the Pocatello/Boise meteorological data. DEQ's results matched the ambient impacts presented by BRZ. DEQ did not re-run the modeling scenario using the Soda Springs meteorological data and did not perform any verification modeling for the other criteria air pollutants due to their low emission rates.

Lead emissions were estimated in the application to be 3.22E-06 tons per year (T/yr). This value is well below the current thresholds of 100 pounds per month or 0.6 T/yr. Lead emissions do not require modeling for this modification project. Similarly, emission rates of $SO_2$ and CO were also below the modeling thresholds. DEQ did not review the significant impact analyses of these pollutants in-depth.

**Table 10. RESULTS OF SIGNIFICANT CONTRIBUTION IMPACT ANALYSES**

| Pollutant | Averaging Period | Predicted Ambient Impact ($\mu g/m^3$)[a] | Significant Contribution Level ($\mu g/m^3$) | Full Impact Analysis Required? |
|---|---|---|---|---|
| $PM_{10}$[b] | 24-hour | 65.29 (65.29)[d, e] | 5.0 | Yes |
| | Annual | 4.43[f] | 1.0 | Yes |
| $NO_2$[c] | Annual | 0.083[e] | 1.0 | No |

[a] Micrograms per cubic meter
[b] Particulate matter with a mean aerodynamic diameter of 10 microns or less
[c] Nitrogen dioxide
[d] Values in parentheses were obtained from DEQ verification modeling
[e] Ambient impact obtained using Pocatello/Boise meteorological data
[f] Ambient impact obtained using Soda Springs meteorological data

## 3.5 Results for Full Impact Analysis

The results of BRZ's full impact analysis are listed in Table 11.

BRZ's modeling demonstration utilized both a single year meteorological dataset for 2003 for the Soda Springs area and a full five-year meteorological dataset for Pocatello (surface) and Boise (upper air). This approach followed the recommendation of Kevin Schilling, Modeling Coordinator, as described in the modeling protocol approval letter. Ambient impacts of $PM_{10}$ were below applicable NAAQS.

**Table 11. RESULTS OF FULL IMPACT ANALYSES**

| 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[b] ($\mu g/m^3$) | Percent of NAAQS |
|---|---|---|---|---|---|---|
| $PM_{10}$[c] | 24-hour | 49.5 | 73 | 122.5 | 150 | 81.7% |
| | Annual | 4.4 | 26 | 30.4 | 50 | 60.8% |

[a] Micrograms per cubic meter
[b.] National ambient air quality standards
[c.] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

# 4.0 Conclusions

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.