

June 26, 2000

## MEMORANDUM

**TO:** Stephen West, Regional Administrator  
Boise Regional Office

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

**SUBJECT:** **PERMIT TO CONSTRUCT TECHNICAL ANALYSIS**  
P-000058, Rambo Crushing Company Inc., Portable  
(Standard Rock Crusher Permit to Construct No. 777-00169; Including Aggregate,  
Asphalt, and Concrete Production when Collocated in Attainment Areas)

### PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing Permits to Construct (PTC).

### PROJECT DESCRIPTION

Rambo Crushing Company is proposing to modify a portable rock crushing facility. Rambo Crushing Company is requesting a PTC be issued to cover the operations of the rock crushing facility in both attainment and nonattainment areas throughout the state of Idaho. Note that the Standard PTC for a portable rock crusher also includes provisions for collocated operations in attainment areas with one (1) other portable source (i.e., rock crusher, hot-mix asphalt, or concrete batch plant). The rock crushing facility's maximum hourly production rate is one hundred and fifty-six tons per hour (156 T/hr). The facility includes a nine hundred-kilowatt (900-kW), diesel-fired, electrical generator.

### SUMMARY OF EVENTS

On April 18, 2000, the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) received a PTC application. The application was determined complete on May 25, 2000.

### DISCUSSION

#### 1. Process Description

The majority of rock crushing facilities in Idaho mine rock deposits from pits using front-end loaders. However, rock may also be mined from quarries by drilling and blasting or dredged from stream beds. Rock crushing facilities generally produce three to four sizes of aggregate by employing a series of crushers and screens.

The rock is transferred to a vibrating grizzly to segregate large from small material. The large material is conveyed to the primary crusher (usually a jaw or gyratory crusher) where it is reduced to 3 to 12 inches in diameter. The crushed material is transferred to the primary screen where it is separated into two or three size ranges. The oversized material is conveyed to a secondary crusher, and the smaller material is transferred to a tertiary crusher or is stockpiled. The secondary crusher (usually a gyratory or cone crusher) reduces the material to roughly 1 to 4 inches in diameter. The material is rescreened. The oversized

Particulate matter (PM) emissions are generated at all points of crushing, screening, and material transfer. The use of water spray is the most common method used to control particulate emissions. If an electrical generation unit is used, the combustion of fuel also results in PM emissions, as well as, oxides of nitrogen (NO<sub>x</sub>), oxides of sulfur (SO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOCs). Fugitive PM emissions are generated by the mining activities, the aggregate storage piles, and front-end loader and truck traffic.

The Standard PTC requested will allow this rock crushing facility to collocate and simultaneously operate with one (1) other portable plant (i.e., rock crusher, hot-mix asphalt, or concrete batch plant) in attainment areas. It is important to note that during collocated operations, this crusher is then part of a single, larger source engaged in the production of either hot-mix asphalt, concrete, and/or aggregate; depending upon which type of portable plant the crusher 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 rock crusher 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 rock crusher 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 permit was based assumed that the following equipment would be used:

### 2.1 Primary Crusher

Manufacturer/Type:	Cedarapids/16"X48" Primary Jaw Crusher
Date of Manufacture:	1958
Maximum Capacity:	950 tons/hr

### 2.2 Secondary Crusher

Manufacturer/Type:	Cedarapids/30"X41" Secondary Roll Crusher
Date of Manufacture:	1958
Maximum Capacity:	950 tons/hr

### 2.3 Tertiary Crusher

Manufacturer/Type:	Symons/4 Foot Secondary Cone Crusher
Date of Manufacture:	1958
Maximum Capacity:	950 tons/hr

### 2.4 Additional Crusher(s)

Manufacturer/Type:	Eljay/54" Secondary Cone Crusher
Date of Manufacture:	1958
Maximum Capacity:	600 tons/hr

### 2.5 Generator

Manufacturer:	Caterpillar
Model:	D-399
Serial Number:	35B1067
Rated Power Output(kW):	900kW
Fuel Type ( gasoline/diesel):	diesel
Fuel Usage (gal/hr):	72 gal/hr
Stack Diameter(ft):	0.5
Stack Height(ft):	13.5
Exhaust Flared(acfm):	6,400
Exhaust Temperature(°F):	103

When collocated, this crusher is then part of a single, larger source that produces either hot-mix asphalt, concrete, and/or aggregate; depending upon which type of portable plant the crusher is collocated with. The equipment used by this single, larger source would include the crusher 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 rock crushing facility is a portable source and may operate in both attainment and nonattainment areas throughout Idaho.

### 4. Emission Estimates

Emission estimates to determine the potential to emit (PTE) for aggregate processing and handling are conservatively determined using a spreadsheet specifically developed for rock crushing facilities. The spreadsheet has been developed using emission factors from AP-42, Table 11.19.2-2, 1/95 Edition, to estimate the facility's emissions from crushers, screens, and transfer points. Fugitive emissions from sources that are not affected facilities, pursuant to 40 CFR 60.670, are not included in determining PTE. Likewise for collocated operations; fugitive emissions from hot-mix asphalt plant sources that are not affected facilities, pursuant to 40 CFR 60.90, are not included in determining PTE. PTE is used to determine if prevention of significant deterioration (PSD) or Title V Operating Permit requirements apply to the facility. Emissions from generators are also determined by the spreadsheet using emission factors from AP-42, Tables 3.3-2 and 3.4-2, 1/95 Edition. These emissions are included in the determination of PTE. Crusher, screen, and transfer point emissions are not limited to specific pound-per-hour or ton-per-year emission rates because of the margin of error inherent in the emission estimates, which are not source-specific, but rather are applicable to the broader source category of crushed stone processing. Generator emissions are not limited to specific emission rates either.

For collocated operations, a conservative approach is taken by limiting the emissions of each of the collocated units to half of the levels allowed when operating alone. Then the

combined emissions of the two collocated sources will be within the allowable levels. See the information below for a more detailed description. This approach is designed to result in acceptable throughput limits for most collocation situations. In cases where the throughput limits are too restrictive, a site-specific analysis and permit amendment may be completed.

This facility's uncontrolled and controlled PTE is three hundred and twenty-nine tons per any consecutive 12-month period (T/yr) and ninety-nine T/yr, respectively. The emission estimates are included as Appendix A. The following narrative briefly explains the methods and assumptions used in the development of the source-specific spreadsheet.

### **ATTAINMENT AREA OPERATIONS**

The spreadsheet inherently limits emissions below certain triggering levels (i.e., PSD and Title V thresholds) by limiting maximum throughput. If a generator is not used, throughput is solely limited to limit a facility's PTE to 99 T/yr of PM emissions. If a generator is used, throughput is limited based on the most limiting pollutant or pollutants (i.e., the pollutant whose emission rate is closest to 99 T/yr). The spreadsheet calculations incorporate the following to determine the throughput limit: the maximum hourly throughput of the primary crusher, the total number of crushers, the capacity of the generator (if used), the ambient impact from the generator, and the generator's fuel type and fuel consumption rate.

In the standard permit, two throughput limit options are available for attainment area operations. One is for an annual limit (annual is any consecutive 12-month period), and the other is for a daily and annual limit. The annual limit option is chosen only to limit emissions to 99 T/yr or less. The daily and annual limit option is chosen to protect a 24-hour ambient standard, an annual ambient standard, and to limit emissions to 99 T/yr. Depending on the circumstances, one or both options may be required.

### **NONATTAINMENT AREA OPERATIONS**

For facilities that operate in a nonattainment area, throughput is limited to protect the standard(s) for which the area is designated as nonattainment. For example, when these facilities operate in a particulate matter with an aerodynamic diameter of less than or equal to a nominal ten (10) microns (PM-10) nonattainment area, throughput is, or may have to be, limited on a daily basis to protect the 24-hour standard, or annually to protect the annual standard. In either case, the spreadsheet automatically calculates the allowable throughput that protects these standards. When a generator is used, the spreadsheet takes into account its ambient impact and limits throughput accordingly. If the impacts are not significant, the spreadsheet limits throughput to keep emissions at or below 99 T/yr.

In the standard permit, two throughput options are available to choose from for operations in a nonattainment area. The first option states the rock crushing facility cannot operate in any PM-10 nonattainment area or proposed PM-10 nonattainment area without DEQ approval. The choice of this option is obvious. The second option is a daily and annual throughput limit. Imposing this limit not only protects the 24-hour limit and annual limit, but also ensures facility emissions will not exceed 99 T/yr.

### **COLLOCATED OPERATIONS IN ATTAINMENT AREAS**

Standard PTCs will only allow collocation with one (1) other portable source (i.e., rock crusher, hot-mix asphalt, or concrete batch plant) which has also received a Standard PTC that specifically allows collocation. When a combination of one portable crusher unit and one other portable unit are operated at a single location, the emissions of both units must be added together when determining PTE. Consistent with the approach taken for attainment area operations, the spreadsheet inherently limits the combined emissions of the two portable units to below certain triggering levels (i.e., PSD and Title V thresholds) by limiting the maximum throughput of each. For collocated operations, half of the attainment area triggering levels are used as limits for calculating throughput for each source. The crusher throughput is then established based on the most limiting pollutant or pollutants (i.e., the pollutant whose emission rate is closest to 49.5 T/yr). The spreadsheet calculations incorporate the following to determine the throughput limit: the maximum hourly throughput of the primary crusher, the total number of crushers, the capacity of the generator (if used), the ambient impact from the generator, and the generator's fuel type and fuel consumption rate.

In the standard permit, two throughput limit options are available for collocated attainment area operations. One is for an annual limit (annual is any consecutive 12-month period), and the other is for a daily and annual limit. The annual limit option is chosen only to limit the combined emissions to 99 T/yr or less. The daily and annual limit option is chosen to protect a 24-hour ambient standard, an annual ambient standard, and to limit emissions to 99 T/yr. Depending on the circumstances, one or both options may be required.

#### **FUGITIVE EMISSIONS AT THE PROPERTY BOUNDARY**

In order to ensure the air quality at and beyond the facility boundary is not further degraded, the standard permit requires that no visible emissions cross the facility boundary. It is assumed if no emissions visibly cross the boundary, the air quality is protected and not further degraded. The permit requirement is offered in lieu of fugitive dust modeling.

#### **5. Modeling**

Estimated emissions due to aggregate crushing and handling are expected to vary considerably from the facility's actual emissions. Modeling results would reflect the emission estimates with an added level of conservatism built into the modeling. Because of the degree of uncertainty involved in the emissions estimate, modeling of fugitive dust emissions was not conducted. However, to ensure no ambient air quality standard will be violated due to emissions generated by crushing, screening, aggregate handling, and fugitive sources; the permit requires that emissions from these sources not be seen leaving the property boundary for more than three (3) minutes in any sixty (60) minute period. If visible emissions are not seen crossing the property boundary, no significant impact on ambient air quality nor a violation of National Ambient Air Quality Standards (NAAQS) will occur.

If a generator is used to provide power to the facility, an ambient impact analysis must be performed to ensure its emissions do not cause or contribute to a violation of any applicable ambient air quality standard. Normally, the EPA-approved SCREEN3 modeling program is used to predict the ambient impact from the generator. The spreadsheet then uses the modeling result and calculates a throughput limit based on the proposed operating area (attainment, nonattainment, or collocated attainment). For collocated operations, the crusher generator operation is 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 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  $32 \mu\text{g}/\text{m}^3$ , as follows:

$$32 \mu\text{g}/\text{m}^3 = 0.5 \times [150 \mu\text{g}/\text{m}^3 - 86 \mu\text{g}/\text{m}^3],$$

where  $150 \mu\text{g}/\text{m}^3$  is the 24-hour average standard and  $86 \mu\text{g}/\text{m}^3$  is the conservative statewide 24-hour average background value. Then the generator operations would be limited as needed, based on the specific ambient impact modeling for this generator, so that its modeled 24-hour concentration does not exceed  $32 \mu\text{g}/\text{m}^3$  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. If a generator is used, the modeling estimates are included as Appendix B.

#### 6. Facility Classification

Rock crushing plants (including collocated operations producing asphalt, concrete, and aggregate) are not designated facilities, as defined in IDAPA 16.01.01.006.27. This facility is not a major facility as defined in IDAPA 16.01.01.006.55 and IDAPA 16.01.01.008.10. The SIC code for this rock crushing facility is 1442, "Construction Sand and Gravel." The AIRS facility classification for this facility is "A2" because the uncontrolled PTE is greater than 100 T/yr.

#### 7. Regulatory Review

The following rules and/or regulations have been reviewed in this permit analysis:

<u>IDAPA 16.01.01.201</u>	Permit to Construct;
<u>IDAPA 16.01.01.202</u>	Application Procedures;
<u>IDAPA 16.01.01.203</u>	Permit Requirements for New and Modified Stationary Sources;
<u>IDAPA 16.01.01.209</u>	Procedures for Issuing Permits;
<u>IDAPA 16.01.01.211</u>	Conditions for Permits to Construct;
<u>IDAPA 16.01.01.212</u>	Obligation to Comply;
<u>IDAPA 16.01.01.577</u>	Ambient PM-10 Air Quality Standard;
<u>IDAPA 16.01.01.625</u>	Visible Emissions;
<u>IDAPA 16.01.01.650</u>	Rules for Control of Fugitive Dust; and
<u>IDAPA 16.01.01.728.02</u>	Distillate Fuel Oil.

With regard to 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants, this is not an affected facility per the applicant's permit application.

8. Permit Coordination

This facility is not a major facility as defined by IDAPA 16.01.01.006.55 and IDAPA 16.01.01.008.10, and it is not an NSPS-affected facility. Therefore, coordination with the Operating Permit Section is not necessary.

9. 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 16.01.01.008.10. Therefore, registration and registration fees, according to IDAPA 16.01.01.526, are not applicable.

**RECOMMENDATION**

Based on review of application materials and all applicable state and federal rules and regulations, staff recommend that Bryan C. Rambo Crushing Company Incorporated be issued a PTC for a portable rock crushing facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD PTC requirements.

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cc:	P. Rayne, AFS	Twin Falls RO
	T. Trumbull, AQP	Pocatello RO
	R. Wilkosz, AQP	Idaho Falls RO
	Coeur d'Alene RO	Database/Source File (777-00169)
	Lewiston RO	Eric Antrim, TSO
	Boise RO	RO Source File
	RO COF	Bryan C. Rambo Crushing Co., Inc.

# **Appendix A**

*Emission Estimate Calculations*

*P-000058*

*Bryan C. Rambo Crushing Company, Inc., Nampa*

**DATA ENTRY**

Company Name: Bryan C. Rambo Crushing Company, Incorpo Engineer: Eric Arntan  
 Project: Portable Crusher Date: 07/14/99  
 PTC #: 777-00169 Filename: 000058.WK4

**Crusher Facility Information**

Facility Production Capacity: 958 [-] tons/hr  
 Applicant's Requested Hours of Operatio: 24 [-] hrs/day  
 Estimated Throughput: 8,768 [-] tons/yr  
 Maximum Hours of Operatio: 8,768 [-] hrs/yr  
 Maximum Throughput: 8,322,000 [-] tons/yr  
 Number of Crushers: 4

Annual Threshold Emission A: (A = <100 Tons/yr; Below Title V Threshold)  
 Selected Emission Limitation: (B = <250 Tons/yr; PSD Threshold)  
 100 Tons/yr

Generator Information  
 Generator (Y/N): Y  
 Generator Size: 910 [-] kW 1206.63 Conversion Factor

Unit: B (A = Horsepower) (B = Kilowatts)  
 Fuel Type: A (A = Diesel-Fired Generator) (B = Gasoline-Fired/Dual-Fired Generator)

Fuel Usage: 75 [-] gal/hr  
 Fuel Heating Value: 3,401,625 [-] MMBtu/hr  
 Modeled 1-hr Concentration: 146 [-] ug/m3, at emission rate of 1 lb/yr

**Disp. Path Emission Factors**

Material Moisture Content (M)	10 [-] mph
Particle Size Multiplier (Q)	2.5 [-] %
PM<sub>10</sub> (<10 µm)	0.35 [-] dimensionless
PM<sub>2.5</sub> (<2.5 µm)	0.74 [-] dimensionless
PM<sub>10</sub> (<10 µm)	0.0010 [-] lb/ton
PM<sub>2.5</sub> (<2.5 µm)	0.0033 [-] lb/ton
PM<sub>10</sub> (<10 µm)	0.0067 [-] lb/ton

Notes: PM = (0\*0.0032\*(0.95)^1.3/(0.027)^1.4)\*0.8

**INPUTS TO PERMIT TO CONSTRUCT (PTC)**

Section	Value	Units
Section A.2 Operating Requirements		
Section A.2.1 Number of Crushers	4	
Section A.2.1 Number of Generators	1	
Section A.2.1 Size of Generators	900	[-] kW
Section B.1 Alignment Area When Not Collocated		
Section B.1.1 Facility Throughput Limits	1,164,699	T/yr
Section B.1.3 Generator Hours of Operation	4,267	hrs/yr
Section C.1 Alignment Area When Collocated		
Section C.1.3 Facility Throughput Limits	682,310	T/yr
Section C.1.3 Generator Hours of Operation	2,194	hrs/yr
Section D.1 Nonalignment Area		
Section D.1.1 Facility Throughput Limits	NA	
Section D.1.3 Generator Hours of Operation	NA	
Section E.1 Facility Throughput Limits	1,365,389	T/yr
Section E.1.3 Generator Hours of Operation	3,848	hrs/yr
Section F.1 Facility Throughput Limits	10.5	hrs/day
Section F.1.3 Generator Hours of Operation		

**Background Concentrations - Alignment/Non-Alignment Area (ug/m3)**

Parameter	1-hr	3-hr	8-hr	24-hr	Annual
PM					
PM<sub>10</sub>	11,400	5,130	86.0	86.0	32.7
NO<sub>x</sub>		543	144	144	40.0
SO<sub>x</sub>					33.5
TOC					

PERMIT LIMITS TABLE

Crusher	Attainment Area		Non-Attainment Area		Calculated Allowance Area		CO 1-yr Standard micrograms/lr	SO2 3-yr standard lb/yr	CO 8-hr Standard lb/8-hr
	T/day	MMT/yr	T/day	MMT/yr	T/day	MMT/yr			
Operating Requirements	21,800	1.36	10,015	1.31	21,800	0.69			
Operating Requirements	34.0	2.27	10.5	2.24	34.0	2.134	60.0	3.0	8.0
Generator	None	None	None	None	None	None			
AB3 Facility Classification	A1								

OUTPUT

Potential to Exmit - Based on Applicant's Data

Crusher, Screens & Transfer Points	Uncontrolled Emissions	Controlled Emissions
PM-10	2,802 tons/yr	601 tons/yr
Generator	761 tons/yr	228 tons/yr
PM	1.0 tons/yr	3.0 tons/yr
PM-10	0.9 tons/yr	0.9 tons/yr
CO	12.1 tons/yr	12.1 tons/yr
NOx	46.2 tons/yr	46.2 tons/yr
SOx	7.5 tons/yr	7.5 tons/yr
TOC	1.3 tons/yr	1.3 tons/yr
Total Crusher & Generator	2,003 tons/yr	602 tons/yr
PM-10	761 tons/yr	229 tons/yr
PTE Summary	2,003.1 [-] T/yr of PM	601.7 [-] T/yr of PM
Enforceable Limits - Based on Requested Operations		
Generator - Operation	74.0 lbs/day	4,760 lbs/yr
Crusher - Production	22,800 T/day	8,321 MMT/yr
AB3 Facility Classification:	A1	

Potential to Exmit - Emissions Analysis Using Ambient Air Quality Standards

Assumptions: Plant operations limited by NAAQS from generator emissions, and Crusher emissions back-calculated to yield 99 Tons/yr of emissions.

Crusher	Uncontrolled Emissions		Controlled Emissions		Crusher	Uncontrolled Emissions		Controlled Emissions	
	T/day	MMT/yr	T/day	MMT/yr		PM-10	T/day	MMT/yr	T/day
PM-10	328	37 tons/yr	98	37 tons/yr	PM-10	328	37 tons/yr	98	37 tons/yr
Generator	761	2.27	228	0.69	Generator	761	2.27	228	0.69
PM	1.0	0.5 tons/yr	0.5	0.5 tons/yr	PM	1.0	0.5 tons/yr	0.5	0.5 tons/yr
PM-10	0.9	0.4 tons/yr	0.4	0.4 tons/yr	PM-10	0.9	0.4 tons/yr	0.4	0.4 tons/yr
CO	12.1	5.9 tons/yr	5.9	5.9 tons/yr	CO	12.1	5.9 tons/yr	5.9	5.9 tons/yr
NOx	46.2	22.5 tons/yr	22.5	22.5 tons/yr	NOx	46.2	22.5 tons/yr	22.5	22.5 tons/yr
SOx	7.5	3.7 tons/yr	3.7	3.7 tons/yr	SOx	7.5	3.7 tons/yr	3.7	3.7 tons/yr
TOC	1.3	0.7 tons/yr	0.7	0.7 tons/yr	TOC	1.3	0.7 tons/yr	0.7	0.7 tons/yr
Total Crusher & Generator	2,003	99 tons/yr	602	38 tons/yr	Totals:	329	99 tons/yr	329	99 tons/yr
PM-10	761	38 tons/yr	229	38 tons/yr	PM-10	761	38 tons/yr	229	38 tons/yr
PTE Summary	2,003.1 [-] T/yr of PM	99.0 [-] T/yr of PM	601.7 [-] T/yr of PM	38.0 [-] T/yr of PM	PTE Summary	328.9 [-] T/yr of PM	99.0 [-] T/yr of PM	328.9 [-] T/yr of PM	38.0 [-] T/yr of PM
Enforceable Limits - Attainment Areas					Enforceable Limits - Non-Attainment Areas				
Generator - Operation	74.0 lbs/day	4,760 lbs/yr	4,267 lbs/day	1,571 MMT/yr	Generator	74.0 lbs/day	4,267 lbs/yr	3,848 lbs/day	1,417 MMT/yr
Crusher - Production	22,800 T/day	8,321 MMT/yr	1.36 T/day	0.5 MMT/yr	Crusher	22,800 T/day	8,321 MMT/yr	10,015 T/day	3,848 MMT/yr
AB3 Facility Classification:	A1								

EMISSION ANALYSIS BASED ON APPLICANT'S DATA

Generator Emissions	Generator Emissions		Applicant's Data		Generator Emissions		Modeled Air Concentrations			
	Generator Emission Factor (-) lb/MMBtu	Generator Emission Rate (-) lb/hr	Hours of Operation (-) hr/day	lb/day	lb/day	lb/day	Calculated 24-hr Impact (-) ug/m3	Calculated Annual Impact (-) ug/m3	Calculated Annual Impact (-) Other	Annual
PM10	0.0697	24.0	24.0	5.69	8,760	1.04	NS	NS	402.1	35.0
CO	0.8100	24.0	24.0	66.13	8,760	17.07	169.9	31.2	282.1	97.4
NOx	3.1000	24.0	24.0	233.08	8,760	46.19	123.2	106.3	726.1	163.2
SO2	0.3050	24.0	24.0	7.35	8,760	1.49	1.49	20.1	726.1	41.6
TOC	0.1000	24.0	24.0	8.16	8,760	1.49	1.49	20.1	726.1	41.6

Generator Emissions	Generator Emissions Regulatory Analysis		Near-Attainment Area Significant Contribution		Ambient Air Concentrations w/ Background Values (ug/m3)			
	BRC Evaluation	Significant Contribution Emission Rates	24-hr	Annual	1-hr	3-hr	8-hr	Annual
PM	BRC (2.3 T/yr)	No	24-hr	Annual	1-hr	3-hr	8-hr	Annual
PM10	BRC (1.3 T/yr)	No	24-hr	Annual	1-hr	3-hr	8-hr	Annual
CO	Above BRC (10 T/yr)	No	Significant	2000 ug/m3 (8-hour)	11,802	5,412	769	244.3
NOx	Above BRC (4 T/yr)	Significant	24-hr	Annual	1-hr	3-hr	8-hr	Annual
SO2	Above BRC (4 T/yr)	No	Significant	2000 ug/m3 (8-hour)	11,802	5,412	769	244.3
TOC	Above BRC (4 T/yr)	No	Significant	2000 ug/m3 (8-hour)	11,802	5,412	769	244.3

Rock Crusher Emissions	Crushers		Screens		Transfer Points		Total Emissions
	No. 1 & 2	No. 3 & 4	No. 1 & 2	No. 3 & 4	No. 1 & 14	No. 15 & 28	
No. Units	2	2	2	2	14	14	475
Throughput (-) T/hr/unit	950	713	950	713	950	950	475
Operation Schedule (-) hrs/day	24	24	8.32	6.24	8.32	4.16	4.16
Throughput (-) MM T/yr/unit	8,768	8,768	70%	70%	70%	70%	70%
Control Efficiency	70%	70%	70%	70%	70%	70%	70%
PM10	0.0003	0.0024	0.0150	0.0710	0.0020	0.0020	0.0020
Uncontrolled Emissions (-) lb/hr	0.51	3.42	28.50	101.18	26.84	26.84	173.9
Controlled Emissions (-) lb/hr	0.15	1.03	8.55	30.35	8.05	8.05	53.2
Uncontrolled Emissions (-) T/yr	2.2	15.0	124.8	443.1	117.5	117.5	58.8
Controlled Emissions (-) T/yr	0.7	4.5	37.4	132.9	35.3	35.3	228.4
PM	0.0007	0.0063	0.0394	0.1864	0.0053	0.0053	0.0053
Uncontrolled Emissions (-) lb/hr	1.33	8.98	74.81	265.58	70.93	70.93	457.1
Controlled Emissions (-) lb/hr	0.40	2.69	21.44	79.68	21.28	21.28	137.1
Uncontrolled Emissions (-) T/yr	5.8	39.3	377.7	1163.3	310.7	310.7	2002.1
Controlled Emissions (-) T/yr	1.7	11.8	98.3	349.0	93.2	93.2	600.6

Notes:  
 1. Number of Screens = Number of Crushers  
 2. Number of Transfer Points = 7 \* (Number of Crushers)  
 3. Emission Factors from AP-42, Table 11.19.2-2. Where factors were given for one pollutant, the following conversion factors were used:  
 TSP = PM10 \* 2.1; TSP = PM10 \* 8  
 Hourly values are based on maximum daily production rates given above. Annual values are based on throughput values given above.

Pollutant	Generator Emissions		Crusher Emissions (Controlled)		TOTAL EMISSIONS	
	lb/day	T/yr	lb/day	T/yr	lb/day	T/yr
PM	2.60	1.94	379.11	600.6	381.71	602.5
PM10	4.68	0.85	1751.8	228.4	1927.2	279.3
CO	66.13	17.07	66.13	66.13	132.26	132.26
NOx	233.08	46.19	233.08	233.08	466.16	466.16
SO2	41.35	7.35	41.35	41.35	82.70	82.70
TOC	8.16	1.49	8.16	8.16	16.32	16.32

Enforceable Limits	Generator - Operation		Crusher - Production	
	lb/day	T/yr	lb/day	MAN/yr
Generator - Operation	24.0	8,760	8.32	MAN/yr
Crusher - Production	22,800	8.32	8.32	MAN/yr

Crusher Plant Emissions Calculations and Impact Estimates

EMISSION ANALYSIS - BASED ON AMBIENT AIR QUALITY STANDARDS  
Emissions limited to less than:  
100 Tons/yr

Pollutant	Generator Emission Factor (=) lb/MT/HR	Generator Emission Rate (=) lb/yr	Hours of Operation		AAQS	Calculated Impacts		Allowable Impacts		Maximum Throughput (=) MM T/Year
			(=) hr/day	(=) hr/yr		(=) hr/day	(=) hr/yr	(=) hr/day	(=) hr/yr	
PM-10	0.0697	0.19	24.0	8,760	N/A	8,760	8,760	24.0	8,760	3.39
CO	0.8100	2.76	N/A	N/A	1.0	2,760	2,760	24.0	8,760	5.88
NOx	3.1000	10.55	24.0	8,760	8.0	8,760	8,760	24.0	8,760	22.50
SOx	0.1050	1.72	24.0	8,760	3.0	8,760	8,760	24.0	8,760	3.67
TOC	0.1000	0.34	N/A	N/A	N/A	8,760	8,760	24.0	8,760	0.73

Based On Inferred SCREEN3 Data

Pollutant	Calculated 24 hr Impact (=) lb/yr	Calculated Annual Impact (=) lb/yr	Hours of Operation		AAQS	Calculated Impacts		Allowable Impacts		Maximum Throughput (=) MM T/Year
			(=) hr/day	(=) hr/yr		(=) hr/day	(=) hr/yr	(=) hr/day	(=) hr/yr	
PM-10	11.4	15.7	403	11,802	1.0	11,802	11,802	24.0	8,760	33.3
CO	160.9	403	283	769	N/A	769	769	24.0	8,760	5.88
NOx	615.8	60.0	283	769	8.0	769	769	24.0	8,760	22.50
SOx	190.3	9.8	226	619	3.0	619	619	24.0	8,760	3.67
TOC	19.9	1.9	226	619	N/A	619	619	24.0	8,760	0.73

No. Units Throughput (=) T/yr/Unit	Emission Factor (=) lb/MT/HR	Uncontrolled Emissions (=) lb/yr	Controlled Emissions (=) lb/yr	Control Efficiency (%)	Transfer Points		Total Emissions	Allowable Hours of Operation w/ Emissions <100 T/yr	
					Screen 1	Screen 2		Generator	Generator
14	0.0024	0.0336	0.0336	100%	14	14	14	14	14
950	713	676,350	676,350	100%	950	950	950	950	950
1,346	1,097	1,471,822	1,471,822	100%	1,346	1,346	1,346	1,346	1,346
1,437	70%	1,005,900	331,926	70%	70%	70%	331,926	3,796	3,780
0.0003	0.0024	0.0072	0.0072	100%	0.0020	0.0020	0.0020	1444	1437
0.51	3.42	1,756.2	1,756.2	100%	26.84	26.84	26.84	457.1	457.1
0.15	1.03	154.5	154.5	100%	8.05	8.05	8.05	137.1	137.1
0.4	2.5	1,020	1,020	100%	19.3	19.3	19.3	328.3	328.3
0.1	0.7	70	70	100%	5.8	5.8	5.8	98.5	98.5
0.0007	0.0063	0.0441	0.0441	100%	0.0053	0.0053	0.0053	1444	1437
1.33	8.98	12,143.4	12,143.4	100%	70.93	70.93	70.93	457.1	457.1
0.40	2.69	1,075.6	1,075.6	100%	21.28	21.28	21.28	328.3	328.3
1.0	6.4	6,400	6,400	100%	50.9	50.9	50.9	328.3	328.3
0.3	1.9	570	570	100%	15.3	15.3	15.3	98.5	98.5

- TPY calculations include crusher, screen and transfer point emissions.
- CO 1-hr Averaging Period
- CO 8-hr Averaging Period
- SO<sub>x</sub> 3-hr Averaging Period

Daily and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentrations). This is, the generator hours of operation have been back-calculated from AAQS values. The crusher particulate emissions (controlled) are then used to back-calculate crusher operational times, assuming 99 Tons/yr less generator emissions.

Maximum daily production rates are based on the maximum number of hours (crusher) that will yield a total of 99 Tons/yr, multiplied by the maximum daily production rate.

Hourly emission values are based on maximum daily production rates, given above.

Annual emission values are based on the maximum throughput values given above.

EMISSION ANALYSIS - BASED ON AMBIENT AIR QUALITY STANDARDS  
Emissions limited to less than:  
100 Tons/yr

Pollutant	Generator Emission Factor (=) lb/tp-hr	Generator Emission Rate (=) lb/hr	Hours of Operation		Calculated Impacts		Allowable Impacts		Maximum Throughput (=) MMT/Year
			(=) hr/day	(=) hr/yr	Hours of Operation (=) hr/yr	Hours of Operation (=) hr/yr	Generator Hours of Operation (=) hr/yr	Crusher Hours of Operation (=) hr/yr	
PM <sub>10</sub>	0.0697	0.24	NS	NS	3,848	3,848	1,437	99,000	1.37
PM <sub>2.5</sub>	0.0573	0.19	NS	NS	3,848	3,848	1,437	27,860	3.59
CO	0.8100	2.76	NS	NS	1.0	1.0	1.0	5.30	
NO <sub>x</sub>	3.1000	10.55	NS	NS	4,267	4,267	1,437	20,229	
SO <sub>x</sub>	0.1020	1.71	NS	NS	24.0	24.0	1,437	3,320	
TOC	0.1000	0.34	NS	NS	3.0	3.0	1,437	0.65	

Based On Filtered SCREENING Data

Pollutant	Calculated 24-hr Impact (=) lb/day	Calculated Annual Impact (=) lb/yr	Hours of Operation		Calculated Impacts		Allowable Impacts	
			(=) hr/day	(=) hr/yr	Hours of Operation (=) hr/yr	Hours of Operation (=) hr/yr	Generator Hours of Operation (=) hr/yr	Crusher Hours of Operation (=) hr/yr
PM <sub>10</sub>	NS	NS	1-hr	11,802	3-hr	8-hr	24-hr	Annual
CO	70.7	14.1	402	282	769	188	33.3	94
NO <sub>x</sub>	376.5	54.1	226	226	769	188	33.3	94
SO <sub>x</sub>	44.1	8.8	226	226	769	188	33.3	94
TOC	8.7	1.7	226	226	769	188	33.3	94

No. Units Throughput (=) T/yr(ual) Throughput (=) MMT/yr(ual) Operation Schedule (=) hrs/yr Control Efficiency	Crushers		Screens		Transfer Points		Total Emissions	Allowable Hours of Operation w/ Emissions <100 T/yr w/ Generator
	Nos. 1, 2, 3	Nos. 3, 4	Nos. 1, 2	Nos. 3, 4	Nos. 1, 14	Nos. 15, 28		
Emission Factor	0.0003	0.0024	0.0150	0.0710	0.0020	0.0070	0.0070	
Uncontrolled Emissions (=) lb/hr	0.51	3.42	28.50	101.18	26.84	13.42	173.9	
Controlled Emissions (=) lb/hr	0.15	1.03	8.55	30.35	8.05	4.03	52.2	
Uncontrolled Emissions (=) T/yr	0.4	2.5	20.5	72.7	19.3	9.6	124.9	
Controlled Emissions (=) T/yr	0.1	0.7	6.1	21.8	5.8	2.9	37.5	
Emission Factor	0.0007	0.0063	0.0394	0.1864	0.0033	0.0033	0.0033	
Uncontrolled Emissions (=) lb/hr	1.33	8.98	74.81	265.58	70.93	35.46	457.1	
Controlled Emissions (=) lb/hr	0.40	2.69	22.44	79.68	21.28	10.64	137.1	
Uncontrolled Emissions (=) T/yr	1.0	6.5	53.8	190.9	51.0	25.5	328.5	
Controlled Emissions (=) T/yr	0.3	1.9	16.1	57.3	15.3	7.6	98.5	

- Notes:
- TPY calculations include crusher, screen and transfer point emissions.
  - CO 1-hr Averaging Period
  - SO<sub>x</sub> 1-hr Averaging Period
  - Daily and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentrations). That is, the generator hours of operation have been back-calculated from AQRS values. The crusher particulate emissions (controlled) are then used to back-calculate crusher operational limits, assuming 99 Tons/yr less generator emissions.
  - Maximum throughput values are based on the minimum number of hours (crusher) that will yield a total of 99 Tons/yr, multiplied by the maximum daily production rates.
  - Hourly emission values are based on maximum daily production rates, given above.
  - Annual emission values are based on the maximum throughput values given above.
  - Non-attainment Area hour of operation calculations assume TSP emissions are non-attainment in PM<sub>10</sub> non-attainment areas. Therefore, operation is limited by significant impact limits.

Attainment Area - Collocated Units - Calculations

Pollutant	Collocated Ambient Air Concentrations - Attainment Area Calculations (12, 3, 6, 9, & 12 hr samples are calculated for collection)				Annual to Achieve (49.1 TPD)
	1-hr	3-hr	6-hr	24-hr	
PM <sub>10</sub>					
CO	11,894	2,153			
NO <sub>x</sub>					
SO <sub>x</sub>		153		10	44.1
LOC					

Pollutant	Background Concentrations - Attainment/Non-Classifiable Area (ppb)			
	1-hr	3-hr	6-hr	Annual
PM <sub>10</sub>				32.7
CO	11,900		5,190	
NO <sub>x</sub>				48.0
SO <sub>x</sub>		543		23.5
LOC				

# **Appendix B**

## ***Modeling Results***

***P-000058***

***Bryan C. Rambo Crushing Company, Inc., Nampa***

6/16/00

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6:22:47

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

Bryan C. Rambo Crushing Company, Incorporated

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT  
 EMISSION RATE (G/S) = 0.126000  
 STACK HEIGHT (M) = 4.1148  
 STK INSIDE DIAM (M) = 0.1524  
 STK EXIT VELOCITY (M/S) = 16.2487  
 STK GAS EXIT TEMP (K) = 312.5944  
 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 = 0.058 M\*\*4/S\*\*3; MOM. FLUX = 1.438 M\*\*4/S\*\*2.

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

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

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

A	DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGM Z (M)
8	1.	0.000	1	1.0	1.0	320.0	11.54	0.96	0.8
8	100.	137.5	3	1.5	1.5	480.0	9.07	12.54	7.5
6	200.	122.3	4	1.0	1.0	320.0	11.54	15.71	8.7

8	300.	92.45	4	1.0	1.0	320.0	11.54	22.71	12.2
	NO								
6	400.	69.90	6	1.0	1.0	10000.0	13.64	14.89	7.5
	NO								
3	500.	75.77	6	1.0	1.0	10000.0	13.64	18.17	8.8
	NO								
6	600.	74.29	6	1.0	1.0	10000.0	13.64	21.41	10.0
	NO								
6	700.	69.52	6	1.0	1.0	10000.0	13.64	24.61	11.2
	NO								
8	800.	63.48	6	1.0	1.0	10000.0	13.64	27.77	12.2
	NO								
6	900.	57.68	6	1.0	1.0	10000.0	13.64	30.90	13.2
	NO								
2	1000.	52.38	6	1.0	1.0	10000.0	13.64	33.99	14.2
	NO								
7	1100.	47.68	6	1.0	1.0	10000.0	13.64	37.06	15.0
	NO								
9	1200.	43.54	6	1.0	1.0	10000.0	13.64	40.11	15.8
	NO								
9	1300.	39.90	6	1.0	1.0	10000.0	13.64	43.13	16.6
	NO								
7	1400.	36.69	6	1.0	1.0	10000.0	13.64	46.13	17.4
	NO								
3	1500.	33.86	6	1.0	1.0	10000.0	13.64	49.11	18.2
	NO								
8	1600.	31.35	6	1.0	1.0	10000.0	13.64	52.07	18.9
	NO								
0	1700.	29.12	6	1.0	1.0	10000.0	13.64	55.01	19.7
	NO								
2	1800.	27.13	6	1.0	1.0	10000.0	13.64	57.93	20.4
	NO								
1	1900.	25.34	6	1.0	1.0	10000.0	13.64	60.84	21.1
	NO								
0	2000.	23.74	6	1.0	1.0	10000.0	13.64	63.73	21.8
	NO								
8	2100.	22.35	6	1.0	1.0	10000.0	13.64	66.61	22.3
	NO								
4	2200.	21.09	6	1.0	1.0	10000.0	13.64	69.48	22.9
	NO								
0	2300.	19.94	6	1.0	1.0	10000.0	13.64	72.33	23.5
	NO								
4	2400.	18.89	6	1.0	1.0	10000.0	13.64	75.17	24.0
	NO								
8	2500.	17.94	6	1.0	1.0	10000.0	13.64	78.00	24.5
	NO								
0	2600.	17.06	6	1.0	1.0	10000.0	13.64	80.81	25.1
	NO								
2	2700.	16.25	6	1.0	1.0	10000.0	13.64	83.61	25.6
	NO								
	2800.	15.50	6	1.0	1.0	10000.0	13.64	86.41	26.1

2	NO								
	2900.	14.81	6	1.0	1.0	10000.0	13.64	89.19	26.6
2	NO								
	3000.	14.17	6	1.0	1.0	10000.0	13.64	91.96	27.1
1	NO								
	3500.	11.68	6	1.0	1.0	10000.0	13.64	105.69	29.1
1	NO								
	4000.	9.864	6	1.0	1.0	10000.0	13.64	119.20	30.9
6	NO								
	4500.	8.487	6	1.0	1.0	10000.0	13.64	132.53	32.6
9	NO								
	5000.	7.413	6	1.0	1.0	10000.0	13.64	145.70	34.3
2	NO								
	5500.	6.555	6	1.0	1.0	10000.0	13.64	158.71	35.8
6	NO								
	6000.	5.856	6	1.0	1.0	10000.0	13.64	171.60	37.3
3	NO								
	6500.	5.278	6	1.0	1.0	10000.0	13.64	184.36	38.7
4	NO								
	7000.	4.792	6	1.0	1.0	10000.0	13.64	197.01	40.0
9	NO								
	7500.	4.393	6	1.0	1.0	10000.0	13.64	209.56	41.2
5	NO								
	8000.	4.049	6	1.0	1.0	10000.0	13.64	222.00	42.3
7	NO								
	8500.	3.750	6	1.0	1.0	10000.0	13.64	234.36	43.4
4	NO								
	9000.	3.488	6	1.0	1.0	10000.0	13.64	246.62	44.4
8	NO								
	9500.	3.257	6	1.0	1.0	10000.0	13.64	258.81	45.4
9	NO								
	10000.	3.052	6	1.0	1.0	10000.0	13.64	270.92	46.4
6	NO								
	15000.	1.822	6	1.0	1.0	10000.0	13.64	388.44	54.9
5	NO								
	20000.	1.293	6	1.0	1.0	10000.0	13.64	500.96	60.3
6	NO								
	25000.	0.9912	6	1.0	1.0	10000.0	13.64	609.76	64.9
1	NO								
	30000.	0.7978	6	1.0	1.0	10000.0	13.64	715.59	68.8
9	NO								
	40000.	0.5750	6	1.0	1.0	10000.0	13.64	920.23	74.5
4	NO								
	50000.	0.4463	6	1.0	1.0	10000.0	13.64	1117.43	79.2
4	NO								

	MAXIMUM	1-HR CONCENTRATION AT OR BEYOND			1. M:				
	70.	146.0	3	2.0	2.0	640.0	7.83	9.14	5.5
4	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

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
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CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
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SIMPLE TERRAIN	146.0	70.	0.

# **Appendix C**

## ***AIRS Information***

***P-000058***

***Bryan C. Rambo Crushing Company, Inc., Nampa***

**ABBREVIATED AIRS DATA ENTRY SHEET - ROCK CRUSHERS**

Name of Facility: Bryan C. Rambo Crushing Company, Inc.

AIRS/Permit #: 777-00169

Permit Issue Date: July 1, 2000

<u>*Source/Emissions Unit Name (25 spcs)</u> (Please use name as indicated in permit)	<u>SCC #</u> (8 digit #)	<u>Air Program</u> (SIP/NESHAP/NSPS/PSD)
--	-----------------------------	---

<u>* Rock Crushers</u>	<u>30502510</u>	<u>SIP</u>
<u>Diesel Generator</u>	<u>20200401</u>	<u>SIP</u>
<u>Transfer/Screen/Convey</u>	<u>30502503</u>	<u>SIP</u>
<u>Fugitives</u>	<u>30588801</u>	<u>SIP</u>
<u>Property Boundary</u>	<u>30588801</u>	<u>SIP</u>

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