

January 10, 2001

MEMORANDUM

TO: Stephen West, Regional Administrator
Boise Regional Office

FROM: Allan Johnson, Air Quality Engineer 
Technical Services Office

SUBJECT: **PERMIT TO CONSTRUCT TECHNICAL ANALYSIS**
P-000709, Washington County Road & Bridge, Portable
(Standard Rock Crusher Permit to Construct No. 777-00279; Including Aggregate, Asphalt, and
Concrete Production when Collocated in Attainment Areas)

PURPOSE

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

PROJECT DESCRIPTION

Washington County Road & Bridge is has commenced construction of a portable rock crushing facility. Washington County Road & Bridge 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 162 tons per hour (T/hr). The facility includes a 460-kilowatt (kW), diesel-fired, electrical generator.

SUMMARY OF EVENTS

On October 26, 2000, the Idaho Department of Environmental Quality (DEQ) received a PTC application. On November 20, 2000, the application was declared complete.

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 material is crushed in a tertiary crusher and rescreened, and the small aggregate is stockpiled.

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_x), oxides of sulfur (SO_x), 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 24-40 Jaw
Date of Manufacture:	1982
Maximum Capacity:	162 tons per hour

2.2 Secondary Crusher

Manufacturer/Type:	Eljay cone
Date of Manufacture:	1982
Maximum Capacity:	162 tons per hour

2.5 Generator

Manufacturer:	Caterpillar
Model:	3412 Prime Power
Rated Power Output(kW):	460
Fuel Type (gasoline/diesel):	Diesel
Fuel Usage (gal/hr):	35.3
Stack Diameter (in):	6
Stack Height (ft):	15
Exhaust Flowrate (acfm):	3938
Exhaust Temperature (°F):	1078

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 102.5 tons per any consecutive 12-month period (T/yr) and 83.7 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 58.01.01.006.27. This facility is not a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. The SIC code for this rock crushing facility is 1442, "Construction Sand and Gravel." The AIRS facility classification for this facility is "SM" because the uncontrolled PTE is greater than 100 T/yr. The "SM" classification stands for "Synthetic Minor," which means that the facility has the potential to emit more than 100 T/yr but is accepting a permit limit to avoid becoming a Title V major facility. The spreadsheet included as Appendix A automatically determines the facility classification.

7. Regulatory Review

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

<u>IDAPA 58.01.01.201</u>	Permit to Construct;
<u>IDAPA 58.01.01.202</u>	Application Procedures;
<u>IDAPA 58.01.01.203</u>	Permit Requirements for New and Modified Stationary Sources;
<u>IDAPA 58.01.01.209</u>	Procedures for Issuing Permits;
<u>IDAPA 58.01.01.211</u>	Conditions for Permits to Construct;
<u>IDAPA 58.01.01.212</u>	Obligation to Comply;
<u>IDAPA 58.01.01.577</u>	Ambient PM-10 Air Quality Standard;
<u>IDAPA 58.01.01.625</u>	Visible Emissions;
<u>IDAPA 58.01.01.650</u>	Rules for Control of Fugitive Dust; and
<u>IDAPA 58.01.01.728.02</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 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.

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 58.01.01.008.10. Therefore, registration and registration fees, according to 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 Washington County Road & Bridge 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: DEQ State Office
 Boise Regional Office

Appendix A

Emission Estimate Calculations

P-000709

Washington County Road & Bridge, Weiser, ID

DATA ENTRY

Company Name: Washington County Road & Bridge
 Project: Portable Crusher
 PTC #: 777-00279
 Engineer: Allan Johnson
 Date: 07-Dec-00
 Filename: 000709.xls

Crusher Facility Information

Facility Production Capacity: 162 [=] tons/hr

Applicant's Requested Hours of Operation: 24 [=] hrs/day
 8,760 [=] hrs/yr
 Estimated Throughput: 1,419,120 [=] tons/yr

Maximum Hours of Operation: 8,760 [=] hrs/yr
 Maximum Throughput: 1,419,120 [=] tons/yr

Number of Crushers: 2

Limitations

Annual Threshold Emission Limit: A (A = <100 Tons/yr, Below Title V Threshold)
 (B = <250 Tons/yr, PSD Threshold)

Selected Emission Limitation: 100 Tons/yr

Generator Information

Generator? (Y/N) Y

Generator Size: 460 616,722 Conversion Factor

Units: B (A = Horsepower)
 (B = Kilowatts)

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

Fuel Usage: 35.3 [=] gal/hr

Fuel Heating Value: 4,803,0945 [=] MMMBtu/hr

Modeled 1-hr Concentrations: 16.47 [=] µg/m³ at emission rate of 1 lb/hr

Disp. Point Emission Factors

Mean Wind Speed (U) 10 [=] mph
 Material Moisture Content (M) 2.5 [=] %
 Particle Size Multiplier (R) 0.35 [=] dimensionless
 PM-10 (<10 µm) 0.74 [=] dimensionless
 PM-2.5 (<2.5 µm) 0.0020 [=] lb/ton
 Emission Factor¹ 0.0053 [=] lb/ton
 PM-10 (<10 µm) 0.0067 [=] lb/ton

Notes: 1 PM = (R*0.0037*(U/3)^1.34(M)^2)^1.420.8

INPUTS TO PERMIT TO CONSTRUCT (PTC)		Value	Units
Section A.2 "Operational Requirements"			
Section A.2.1 N	Number of Crushers	2	
Section A.2.1 N	Number of Generators	1	
Section A.2.1 N	Size of Generators	460	kw
Section B "Ambient Area When Not Collocated"			
Section B.1.1 F	Annual Throughput Limit	1,419,120	T/yr
Section B.1.3 G	Annual Hours of Operation	8,760	hrs/yr
	<<AND/OR>>		
Daily Hours of Operation			
		NA	
Section C "Ambient Area When Collocated"			
Section C.1.3 F	Annual Throughput Limit	709,560	T/yr
Section C.1.4 G	Annual Hours of Operation	5,055	hrs/yr
	<<AND/OR>>		
Daily Hours of Operation			
		NA	
Section D "Nonstationary Area"			
Section D.1.1 F	Annual Throughput Limits	1,419,120	T/yr
Section D.1.3 G	Annual Hours of Operation	4,900	hrs/yr
	<<AND/OR>>		
Daily Hours of Operation			
		13.4	hrs/day

Background Concentrations - Attainment/Non-Attainable Areas (ug/m ³)				
PM	1-hr	3-hr	8-hr	24-hr
PM-10				Annual
CO	11,400		5,130	86.0
NOx				40.0
SO ₂		513		23.5
TOC				144

PERMIT LIMITS TABLE

Attachment Area	PERMIT LIMITS				PERMIT LIMITS			
	Attainment Area		Non-Attainment Area		Attainment Area		Non-Attainment Area	
Cruiser	T/day	MAAT/yr	T/day	MAAT/yr	T/day	MAAT/yr	T/day	MAAT/yr
Operating Requirement	3,888	1,42	2,175	1,42	3,888	0,71	3,888	0,71
Generator	hr/day	hr/yr	hr/day	hr/yr	hr/day	hr/yr	hr/day	hr/yr
Operating Requirement	24.0	8,760	13.4	4,900	24.0	5,035	60.0	8.0
Generator	Contaminant	None	None	None	Contaminant	None	Contaminant	None
Emission Limits	None	None	None	None	None	None	NOx	49.5
AIRS Facility Classification	SM							

OUTPUT

Potential to Emit - Based on Applicant's Data

Cruiser - Screens & Transfer Points	Uncontrolled Emissions		Controlled Emissions	
	PM	PM-10	PM	PM-10
Generator	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr
PM-10	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr
CO	18.0 ton/yr	18.0 ton/yr	18.0 ton/yr	18.0 ton/yr
NOx	83.7 ton/yr	83.7 ton/yr	83.7 ton/yr	83.7 ton/yr
SO ₂	5.5 ton/yr	5.5 ton/yr	5.5 ton/yr	5.5 ton/yr
TOC	6.7 ton/yr	6.7 ton/yr	6.7 ton/yr	6.7 ton/yr
Total Cruiser + Generator	103 ton/yr	103 ton/yr	35 ton/yr	35 ton/yr
PM-10	43 ton/yr	43 ton/yr	17 ton/yr	17 ton/yr
PTE Summary	102.5 [-] T/yr of PM	102.5 [-] T/yr of PM	83.7 [-] T/yr of NOx	83.7 [-] T/yr of NOx
Enforceable Limit - Based on Requested Operations	24.0	24.0	8,760	8,760
Cruiser - Production	3,888	3,888	1,42	1,42
AIRS Facility Classification	SM			

Potential to Emit - Emissions Analysis Using Ambient Air Quality Standards
 Emissions limited to less than: 100 Tons/yr
 Assumptions: Plant operations limited by NAAQS from generator emissions, and
 Cruiser emissions back-calculated to yield 99 Tons/yr of emissions.

Attainment/Non-Attainable Areas	Uncontrolled Emissions		Controlled Emissions		Cruiser	Non-Attainment Area	Uncontrolled Emissions	Controlled Emissions
	PM	PM-10	PM	PM-10				
Generator	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr	Generator	3.3 ton/yr	3.3 ton/yr	
PM-10	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr	5.9 ton/yr	PM-10	3.3 ton/yr	3.3 ton/yr	
CO	18.0 ton/yr	18.0 ton/yr	18.0 ton/yr	18.0 ton/yr	CO	10.1 ton/yr	10.1 ton/yr	
NOx	83.7 ton/yr	83.7 ton/yr	83.7 ton/yr	83.7 ton/yr	NOx	46.8 ton/yr	46.8 ton/yr	
SO ₂	5.5 ton/yr	5.5 ton/yr	5.5 ton/yr	5.5 ton/yr	SO ₂	3.1 ton/yr	3.1 ton/yr	
TOC	6.7 ton/yr	6.7 ton/yr	6.7 ton/yr	6.7 ton/yr	TOC	3.7 ton/yr	3.7 ton/yr	
Total	103 ton/yr	103 ton/yr	35 ton/yr	35 ton/yr	Total	100 ton/yr	32 ton/yr	
PM-10	43 ton/yr	43 ton/yr	17 ton/yr	17 ton/yr	PM-10	40 ton/yr	14 ton/yr	
PTE Summary	102.5 [-] T/yr of PM	102.5 [-] T/yr of PM	83.7 [-] T/yr of NOx	83.7 [-] T/yr of NOx	PTE Summary	99.9 [-] T/yr of PM	46.8 [-] T/yr of NOx	
Enforceable Limit - Attainment Areas	24.0	24.0	8,760	8,760	Enforceable Limit - Non-Attainment Areas	13.4	4,900	
Cruiser	3,888	3,888	1,42	1,42	Cruiser	2,175	1,42	

EMISSION ANALYSIS BASED ON APPLICANT'S DATA

Generator Emissions	Generator Emission Factor [-] lb/tp-hr	Generator Emission Rate [-] lb/hr	Applicant's Data		Generator Emissions		Calculated 24-hr Impact [-] µg/m ³	Total Emissions	Modeled Air Concentrations Based On Entered SCREEN3 Data	
			Hours of Operation [-] hr/day	[-] hr/year	Hours of Operation hr/day	T/yr			Calculated Annual Impact [-] µg/m ³	Calculated Annual Impact [-] Other
PM	0.0022	1.36	24.0	8,760	32.56	3.94	N/A	22.1	N/A	N/A
PM-10	0.0022	1.36	24.0	8,760	32.56	3.94	8.9	6.6	1.8	6.6
CO	0.0067	4.12	24.0	8,760	98.87	18.04	27.1	96.6	5.4	47
NOx	0.0310	19.12	24.0	8,760	438.84	83.74	8.3	22.1	25.2	19
SO ₂	0.0021	1.26	24.0	8,760	30.34	5.34	1.7	6.6	1.7	6.6
TOC	0.0025	1.52	24.0	8,760	36.56	6.67	2.0	29.0	1.7	6.6

Pollutant	BRC Evaluation	Generator Emission Regulatory Analysis Significant Contribution Emission Rates	Non-Attainment Area Significant Ambient Air Concentration		Annual Contribution	Ambient Air Concentrations w/ Background Values (µg/m ³)						
			24-hr	Annual		1-hr	3-hr	6-hr	24-hr	Annual		
PM	Above BRC (2.5 T/yr)	No	(2.5 T/yr)	Significant	5 µg/m ³	1 µg/m ³	11.666	3.62	3.62	3.62	3.62	3.62
PM-10	Above BRC (1.5 T/yr)	No	(1.5 T/yr)	No	2000 µg/m ³	500 µg/m ³	11.666	3.62	3.62	3.62	3.62	3.62
CO	Above BRC (10 T/yr)	No	(10 T/yr)	No	(1-hour)	(4-hour)	152.3	152.3	152.3	152.3	152.3	152.3
NOx	Above BRC (4 T/yr)	Significant	(40 T/yr)				152.3	152.3	152.3	152.3	152.3	152.3
SO ₂	Above BRC (4 T/yr)	No	(40 T/yr)				152.3	152.3	152.3	152.3	152.3	152.3
TOC	Above BRC (4 T/yr)	No	(40 T/yr)				152.3	152.3	152.3	152.3	152.3	152.3

Rock Crusher Emissions	No. Units	Throughput ([-] T/hr/unit) Operational Schedule ([-] hrs/day) Throughput ([-] MM T/yr/unit) Operational Schedule ([-] hrs/yr) Control Efficiency	Crushers		Screens ¹		Transfer Points ²		Total Emissions
			Req. 1 & 2	0	Req. 1 & 2	0	Req. 1 - 7	Req. 8 - 14	
PM-10	2	162 24 1.42 8,760 70%	122	162	122	162	162	81	8.4
PM			0.0024	0.0150	0.0110	0.0020	0.0020	1.14	2.5
			0.09	4.86	0.00	2.29	0.69	0.34	36.7
			0.03	1.46	0.00	0.69	0.10	5.0	11.0
			0.4	21.3	0.0	3.0	1.5	0.0053	1.02
			0.1	6.4	0.0	0.0051	1.81	0.21	96.6
			0.0007	0.0194	0.1864	6.05	13.2	4.0	29.0
			0.23	12.76	0.00	1.81	13.2	4.0	29.0
			0.07	5.59	0.0	26.5	4.0	29.0	29.0
			1.0	16.8	0.0	7.9	4.0	29.0	29.0
			0.3	0.0	0.0	0.0	0.0	0.0	0.0

For information purposes:

Crusher Hours of Operation to Yield 99.0 T/yr Emissions	Generator w/6	Generator w/
	8760	8760
	8760	8760

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 = PM 410 * 1.1; TSP = PM+0.8
 Hourly values are based on maximum daily production rates given above. Annual values are based on throughput values given above.

Pollutant	Generator Emissions		Cruiser Emissions (Controlled)		Total Emissions	
	lb/day	T/yr	lb/day	T/yr	lb/day	T/yr
PM	32.56	5.94	158.8	29.0	191.4	34.9
PM-10	32.56	5.94	60.3	11.0	92.9	17.0
CO	98.87	18.04			98.8	18.0
NOx	458.84	83.74			458.8	83.7
SO2	30.34	5.54			30.3	5.5
TOC	36.56	6.67			36.6	6.7

Enforceable Limits	24.0	lb/day	4,760	lb/yr
Generator - Operation	3,888	lb/day	1,42	MMT/yr
Cruiser - Production				

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

Pollutant	Generator Emission Factor [lb/whp-hr]	Generator Emission Rate [lb/hr]	Hours of Operation		AAQS		Calculated Impacts		Allowable Impacts		Calculated Emissions [lb/year]	Maximum Throughput [MMT/year]
			[hr/day]	[hr/year]	< 100 TPY	Hours of Operation [hr/year]	Generator Hours of Operation [hr/day]	Generator Hours of Operation [hr/year]	Cruiser Hours of Operation [hr/day]	Cruiser Hours of Operation [hr/year]		
PM	0.0022	1.36	N/S	N/S			4,760	24.0			34.92	1.42
PM-10	0.0022	1.36	N/S	N/S			4,760	24.0			16.95	1.42
CO	0.0067	4.12	N/S	N/S			4,760	24.0			18.04	
NOx	0.0210	19.12	N/S	N/S			4,760	24.0			83.74	
SO2	0.0021	1.26	N/S	N/S			4,760	24.0			5.54	
TOC	0.0023	1.53	N/S	N/S			4,760	24.0			6.67	

Pollutant	Generator Emissions			Ambient Air Concentrations w/ Background Values (µg/m ³)				Annual							
	Calculated 24-hr Impact [-] µg/m ³	Calculated Annual Impact [-] µg/m ³	Calculated Impact [-] Other	Based On Entered SCREEN3 Data			24-hr								
				1-hr	3-hr	8-hr									
PM ₁₀	N/S	N/S	1.8	68	5,177	152	25.2								
CO	8.9	27.1	5.4	47	11,468	562	68								
NOx	126.0	25.2	25.2	1.7	562	562	25.2								
SO ₂	8.3	1.7	1.7	1.7	1.7	1.7	1.7								
TOC	10.0	2.0	2.0	2.0	2.0	2.0	2.0								
PM ₁₀	No Units Throughput (-) T/drain) Throughput (-) MM T/Yrain) Operation Schedule (-) hrs/Yr) Control Efficiency	Crushers 2 162 1.42 8,766 70%	Nos. 1 & 2 0 122 1.06 70%	Screen 1 2 162 1.42 70%	Screen 2 0 122 1.06 70%	Transfer Point 1 Nos. 1 - 7 7 162 1.42 70%	Transfer Point 2 Nos. 8 - 14 7 81 0.71 70%	Total Emissions 8.4 2.5 36.7 11.0	Allowable Hours of Operation w/ Emissions <100 T/Yr Generator 8760 Generator 8760 w/ 8760						
										0.0003	0.0024	0.0190	0.0710	0.0020	0.0020
										0.09	0.00	4.86	0.00	2.29	1.14
										0.03	0.00	1.46	0.00	0.69	0.34
0.4	0.0	21.3	0.0	10.8	5.0										
0.1	0.0	6.4	0.0	3.0	1.5										
0.0007	0.0063	0.0194	0.1864	0.0053	0.0053										
0.23	0.00	12.76	0.00	6.05	3.02										
0.07	0.00	3.83	0.00	1.81	0.91										
1.0	0.0	35.9	0.0	26.5	13.2										
0.3	0.0	16.8	0.0	7.9	4.0										
22.1	22.1	22.1	22.1	22.1	22.1										
6.6	6.6	6.6	6.6	6.6	6.6										
96.6	96.6	96.6	96.6	96.6	96.6										
29.0	29.0	29.0	29.0	29.0	29.0										

Notes:
 1. TTY calculations include crusher, screen and transfer point emissions.
 2. CO 1-hr Averaging Period
 3. CO 8-hr Averaging Period
 4. SO₂ 3-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 AQS values. The crusher particulate emissions (controlled) are then used to back-calculate crusher operational lines, assuming 99 Tons/Yr less generator emissions.
 -- Maximum throughput values are based on the minimum number of hours (crushers) 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.

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

Pollutant	Generator Emission Factor [L] lb/tpahr	Generator Emission Rate [L] lb/hr	AAQS		Calculated Impacts		Allowable Impacts		Maximum Throughput
			Hours of Operation [hr/yr]	Hours of Operation [hr/yr]	< 100 TPY-1	< 100 TPY-1	Calculated Emissions [L] lb/yr	Maximum Throughput	
PM	0.0022	1.35	N/S	N/S	8,760	8,760	32.31	1.42	
PM-10	0.0022	1.35	13.4	4,900	8,760	8,760	14.33	1.42	
CO	0.0067	4.12	N/S	N/S	8,760	8,760	10.09		
NOx	0.0310	19.12	N/S	8,760	8,760	8,760	46.84		
SO ₂	0.0021	1.26	24.0	8,760	8,760	8,760	3.10		
TOC	0.0025	1.52	N/S	N/S	8,760	8,760	3.73		

Pollutant	Calculated 24-hr Impact [L] lb/tpahr	Calculated Annual Impact [L] lb/yr	Calculated Impact [L] lb/yr	Based On Emission SCREENS Data		Ambient Air Concentrations w/ Background Values (ug/m ³)	
				1-hr	3-hr	8-hr	24-hr
PM	N/S	N/S	0	11.468	5.177		
PM-10	5.0	1.0	68.1				
CO	15.2	3.0	47.1				
NO _x	70.5	14.1	19.4				
SO ₂	4.7	0.9	1.1				
TOC	5.6	1.1	1.1				

No Units	Crabbers	Screen ¹	Transfer Product ²		Total Emissions	Allowable Hours of Operation w/ Emissions < 100 Tpy ³
			Req. 1 & 2	Req. 7		
Throughput ([-] T/hr/mt)	2	0	7	7	22.1	8760
Throughput ([-] MM T/yr/mt)	162	122	162	81	6.6	
Operation Schedule ([-] hrs/yr)	8,760	1,066	1,422	0.71	96.6	
Control Efficiency	70%	70%	70%	70%	29.0	
Emission Factor ⁴	0.0003	0.0150	0.0020	0.0020	8.4	
Uncontrolled Emissions ([-] lb/hr)	0.09	4.86	2.29	1.14	2.5	8760
Controlled Emissions ([-] lb/hr)	0.03	1.46	0.69	0.34	0.8	
Uncontrolled Emissions ([-] T/yr)	0.4	21.3	10.0	5.0	36.7	
Controlled Emissions ([-] T/yr)	0.1	6.4	3.0	1.5	11.0	
Emission Factor ⁵	0.0007	0.0194	0.0053	0.0053	22.1	
Uncontrolled Emissions ([-] lb/hr)	0.23	12.76	6.05	3.02	6.6	8760
Controlled Emissions ([-] lb/hr)	0.07	3.83	1.81	0.91	2.5	
Uncontrolled Emissions ([-] T/yr)	1.0	35.9	26.5	13.2	96.6	
Controlled Emissions ([-] T/yr)	0.3	16.8	7.9	4.0	29.0	

- Notes:
- TPY calculations include crabber, screen and transfer point emissions.
 - CO 1-hr Averaging Period
 - CO 8-hr Averaging Period
 - SO₂ 3-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 AQS values. The crabber particulate emissions (controlled) are then used to back-calculate crabber operational times, assuming 99 Tons/yr less generator emissions.
- Maximum throughput values are based on the minimum number of hours (crabber) 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 PM₁₀ non-attainment areas. Therefore, operation is limited by significant impact limits.

Attachment Area - Collocated Units - Calculations

Pollutant	Collocated Ambient Air Concentrations - Attachment Area Calculations (1-hr, 3-hr, 8-hr, & 24-hr standards are cut in half for collocation)				Annual (Max. Hours to Achieve 49.5 Tpy)
	1-hr	3-hr	8-hr	24-hr	
PM					
PM-10					
CO	14,212		2,388	333	8.8
NOx					18.8
SO2		360		102	53.4
TOC					

Background Concentrations - Attachment/Non-Classifiable Areas (ug/m3)					
Pollutant	1-hr	3-hr	8-hr	24-hr	Annual
PM					
PM-10				86.0	32.7
CO		11,400	5,130		40.0
NOx					23.5
SO2		543		144	
TOC					

Appendix B

Modeling Results

P-000709

Washington County Road & Bridge, Weiser, ID

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

12/05/00
 09:09:38

Washington County Road & Bridge

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
 EMISSION RATE (G/S) = 0.126000
 STACK HEIGHT (M) = 4.5720
 STK INSIDE DIAM (M) = 0.1524
 STK EXIT VELOCITY (M/S) = 101.8848
 STK GAS EXIT TEMP (K) = 854.2611
 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 = 3.810 M**4/S**3; MOM. FLUX = 20.684 M**4/S**2.

*** FULL METEOROLOGY ***

 *** SCREEN AUTOMATED DISTANCES ***

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

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	63.00	2.34	2.31	NO
100.	16.43	3	10.0	10.0	3200.0	10.42	12.56	7.60	NO
200.	14.53	4	8.0	8.0	2560.0	11.88	15.70	8.75	NO
300.	12.08	4	5.0	5.0	1600.0	16.26	22.86	12.55	NO
400.	10.23	4	4.5	4.5	1440.0	17.56	29.69	15.71	NO
500.	8.831	4	3.5	3.5	1120.0	21.27	36.46	18.91	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 96. 16.47 3 10.0 10.0 3200.0 10.42 12.21 7.39 NO

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

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	16.47	96.	0.

Appendix C

AIRS Information

P-000709

Washington County Road & Bridge, Weiser, ID

ABBREVIATED AIRS DATA ENTRY SHEET - ROCK CRUSHERS

Name of Facility: Washington County Road & Bridge
 AIRS/Permit #: 777-00279
 Permit Issue Date: December 2000

<u>Source/Emissions Unit Name</u> (25 spaces) (Please use name as indicated in permit)	<u>SCC #</u> (8 digit #)	<u>Air Program</u> (SIP/NESHAP/NSPS/PSD)
Rock Crushers	30502510	SIP
Diesel Generator	20200401	SIP
Transfer/Screen/Convey	30502503	SIP
Fugitives	30588801	SIP
Property Boundary	30588801	SIP

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