



**Air Quality Permitting
Technical Memorandum**

September 26, 2002

Permit to Construct No. 777-00230

WOODS CRUSHING AND HAULING, INC.
Hot-mix Asphalt Plant
Portable

Project No. P-020111

Prepared by:

Tom Anderson, Permit Writer

FINAL PERMIT

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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

Woods Crushing and Hauling, Inc. is proposing to modify a portable hot-mix asphalt (HMA) plant to be operated in both attainment and nonattainment areas within the state of Idaho. Note that the Standard PTC for a portable HMA plant also includes provisions for collocated operations in attainment areas with one other portable source (i.e., rock crusher, HMA, or concrete batch plant). The HMA's maximum hourly throughput is 250 tons per hour (T/hr) and the facility includes a 455 horsepower (hp) electrical generator set. The HMA facility will be initially located near Sandpoint, Idaho.

SUMMARY OF EVENTS

- May 23, 2002 The Department of Environmental Quality received an application from Woods Crushing and Hauling, Inc. modify PTC No. 777-00230. The modifications would include incorporating measured stack flow rates and temperatures and adding collocation language.
- July 19, 2002 The application was determined complete

TECHNICAL ANALYSIS

1. Process Description

The facility is a portable drum-mix HMA plant used for the production of asphaltic concrete. The dryer burner is permitted to be fired on No. 2 fuel oil only.

The Standard PTC requested will allow this HMA facility to collocate and simultaneously operate with one other portable plant (i.e., rock crusher, HMA plant, and/or concrete batch plant) in attainment areas. It is important to note that during collocated operations, this HMA plant is then part of a single, larger source engaged in the production of either asphalt, concrete and/or aggregate, depending upon which type of portable plant the HMA plant 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 HMA plant 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 HMA plant will collocate must also contain specific collocation requirements based on the same conservative assumptions and calculations used in this standard PTC.

2. Equipment Listing

This standard permit analysis includes the following equipment as submitted in the application:

2.1 Portable HMA Plant

Manufacturer/Model: Boeing
 Type: Drum-mix
 Throughput Capacity: 250 T/hr
 Burner Fuel Type: No.2 distillate (diesel)
 Dryer heat Input: 70 MMBtu/hr

2.2 Air Pollution Control Device

Type: Venturi Wet Scrubber/Lazy stack de-mister
 Manufacturer: Custom
 Model: N/A

2.3 HMA Stack Information

Stack Height: 25 ft
 Stack Diameter: 4 ft
 Exhaust Gas Flow rate: 24,261 actual cubic feet per minute (acfm)
 Stack Exhaust Temp: 136°F

2.4 Generator

Manufacturer/Model: Cat
 Rated Power Output: 455 hp
 Fuel Type: diesel
 Fuel Usage: 40.6 gallons per hour (gal/hr)
 Stack Height: 12 ft
 Stack Diameter: 0.85 ft
 Exhaust Gas Flow rate: 4,647 acfm
 Stack Exhaust Temp: 893°F

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

4. Emission Estimates

Excel Spreadsheet

DEQ developed a spreadsheet to estimate emissions from HMA facilities using emissions factors from AP-42, Section 11.1, 12/00 edition. The spreadsheet is capable of estimating emissions from both batch plants and drum-mix plants. Two spreadsheets were created for this facility, one to determine the allowable production rates when located in the same location less than five years, and one to determine the allowable production rates when located in the same location longer than five years. The burner fuels that can be used in this spreadsheet include No. 2 diesel fuel, natural gas, and propane. HMA emissions when burning natural gas and No. 2 diesel fuel are estimated using emissions factors from AP-42 section 11.1. If an electrical generator is used, the emissions are estimated from AP-42, Section 3.3 and 3.4, 10/96 edition. The spreadsheet can estimate emissions from all diesel generators and from gasoline generators smaller than 250 hp. When using diesel generators up to 600 hp the spreadsheet uses the power rating of the engine to estimate emissions, and for diesel generators larger than 600 hp the spreadsheet uses fuel consumption to estimate emissions. Toxic pollutant emissions from the dryer and generator are also estimated with this spreadsheet. The emission estimates for this facility assume 250 T/hr throughput to a drum-mix HMA plant, one No. 2 diesel-fired dryer, one diesel-fired electrical generator set rated at 455 hp, and fugitive dust emissions from specified sources (see the spreadsheet).

5. Modeling

Modeling of the asphalt plant stack emissions and the electrical generator set emissions was conducted using EPA-approved SCREEN3 computer-run model. The maximum one-hour impact from the dryer stack was calculated to be $12.28 \mu\text{g}/\text{m}^3$ using a 1 lb/hr unity emission rate input to the model. The maximum one-hour impact from the electrical generator set was calculated to be $18.33 \mu\text{g}/\text{m}^3$, also using a 1 lb/hr unity input. The spreadsheet calculates the ambient impact for each air pollutant (PM, PM₁₀, NO_x, SO₂, CO, and applicable toxic pollutants) based on the calculated pound-per-hour emission rate, averaging periods and background concentrations. The spreadsheet solves for the most-limiting pollutant in attainment areas and gives appropriate operational limits, which protects the applicable National Ambient Air Quality Standards (NAAQS) as defined in IDAPA 58.01.01.577. In addition, the spreadsheet also calculates the most-limiting pollutant in nonattainment areas and gives operational limits to protect applicable significant contribution requirements as defined in IDAPA 58.01.01.006.89. All SCREEN modeling output files are presented as Appendix B of this memo. Spreadsheet impact calculations and results are presented as Appendix A.

By using these spreadsheets, the facilities daily and annual emissions of PM, PM₁₀, NO_x, SO₂, CO, and applicable toxic pollutants are limited by the dryer and generator fuel type requirements, the dryer air pollution control device operational requirements, the daily and annual throughput limits, and by the generator hourly and annual operational limits. Daily and annual recordkeeping of production and hours of operation generate the information required to determine compliance with all applicable standards, therefore, no emission rate limitations, other than the grain-loading standard required by 40 CFR 60.92, need to appear in the permit. Also, no further monitoring or recordkeeping is required to demonstrate compliance with any applicable daily or annual emission rate limitations.

For collocated operations in attainment areas, operation of the HMA plant and its generator are 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 $25 \mu\text{g}/\text{m}^3$, as follows:

$$25 \mu\text{g}/\text{m}^3 = 0.5 \times [150 \mu\text{g}/\text{m}^3 - 100 \mu\text{g}/\text{m}^3],$$

where $150 \mu\text{g}/\text{m}^3$ is the 24-hour average standard and $100 \mu\text{g}/\text{m}^3$ is the conservative statewide 24-hour average background value. Then operation of the HMA plant and its generator would be limited as needed, based on the specific ambient impact modeling, so that the modeled 24-hour concentration does not exceed $25 \mu\text{g}/\text{m}^3$ 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.

6. Process Weight Rate Limitations

IDAPA 58.01.01.701.01 allows that no person shall emit to the atmosphere from any process or process equipment commencing operation on or after October 1, 1979, particulate matter in excess of the amount shown by the equation found in IDAPA 58.01.01.701.01.b. With a process weight of 500,000 lb/hr, the allowable emission rate given by this equation for this facility is 29.14 lb/hr. The facility completed the emission testing required by 40 CFR 60.93 on August 21, 2001. The measured controlled emission rate from the dryer stack is 5.48 lb/hr, therefore the emission requirements of IDAPA 58.01.01.701 have been satisfied by the issuance of this permit requiring the use of the air pollution control device (venturi wet scrubber) that was in operation during this emission test.

7. Permit Requirements

7.1 Attainment and Unclassifiable Areas

The maximum annual throughput of the HMA plant is limited so that the emissions from the facility remain below 99 T/yr, or so that the NAAQS and Acceptable Ambient Concentration for a Carcinogen (AACCs) are not violated, whichever is more stringent. Daily throughput is restricted so that the NAAQS and Acceptable Ambient Concentration (AACs) are not violated. The allowable ambient impacts are the difference between the NAAQS, AAC, or AACC standards and the applicable background concentrations for each particular standard when the facility is located in an attainment or unclassifiable area. For attainment and unclassifiable areas the most-limiting pollutant for the 24-hour standards is PM_{10} . The most-limiting pollutant for annual standards is formaldehyde unless the facility is operating as a short-term source. When operating as a short-term source in an attainment or unclassifiable area, the most-limiting pollutant for annual standards is CO.

7.2 Collocation in Attainment and Unclassifiable Areas

The maximum annual throughput of the HMA plant when collocated is limited so that the PTE is less than 49.5 T/yr, or so that the ambient impact is half of the allowable impact, whichever is more stringent. The allowable ambient impacts when collocated are half of the difference between the NAAQS standards and the applicable background concentrations for each particular standard, or half of the AAC or AACC standards. For attainment and unclassifiable areas, the most-limiting pollutant for the 24-hour standards is PM₁₀. The most-limiting pollutant for annual standards is formaldehyde, unless the facility is operating as a short-term source. When operating as a short-term source in an attainment or unclassifiable area, the most-limiting pollutant for annual standards is CO.

7.3 PM₁₀ Nonattainment Areas

The maximum allowable annual throughput of the HMA plant when located in a PM₁₀ nonattainment area is either the throughput allowed in attainment areas or the throughput that results in ambient concentrations that are less than the significant contributions, whichever is more stringent. For PM₁₀ nonattainment areas, the most-limiting pollutant for the 24-hour standards is PM₁₀. The most-limiting pollutant for annual standards is formaldehyde, unless the facility is operating as a short-term source. When operating as a short-term source in a PM₁₀ nonattainment area, the most-limiting pollutant for annual standards is PM₁₀.

7.4 CO Nonattainment Areas

The maximum allowable annual throughput of the HMA plant when located in a CO nonattainment area is either the throughput allowed in attainment areas or the throughput that results in ambient concentrations that are less than the significant contributions, whichever is more stringent. For CO nonattainment areas, the most-limiting pollutant for the 24-hour standards is PM₁₀. The most-limiting pollutant for annual standards is formaldehyde, unless the facility is operating as a short-term source. When operating as a short-term source in an attainment or unclassifiable area, the most-limiting pollutant for annual standards is CO.

8. Facility Classification

HMA 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 Standard Industrial Classification code for this HMA facility is 2951. The AIRS facility classification for this facility is "SM" because the uncontrolled potential to emit is greater than 100 T/yr.

9. Regulatory Review

The following rules and regulations were reviewed for this permit analysis:

- a. IDAPA 58.01.01.201 Permit to Construct
- b. IDAPA 58.01.01.202 Application Procedures
- c. IDAPA 58.01.01.203 Permit Requirements for New and Modified Stationary Sources
- d. IDAPA 58.01.01.209 Procedures for Issuing Permits

- e. IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards
- f. IDAPA 58.01.01.211 Conditions for Permits to Construct
- g. IDAPA 58.01.01.212 Obligation to Comply
- h. IDAPA 58.01.01.577 Ambient Air Quality Standards
- i. IDAPA 58.01.01.625 Visible Emissions
- j. IDAPA 58.01.01.650 Rules for Control of Fugitive Dust
- k. IDAPA 58.01.01.701 Process Weight Rate
- l. IDAPA 58.01.01.725 Rules for Sulfur Content of Fuels
- m. IDAPA 58.01.01.805 Rules for the Control of HMA Plants

This facility is an affected facility and is subject to regulation in accordance with 40 CFR Part 60, Subpart I, "Standards of Performance for HMA Facilities." Emissions testing required by Subpart I was completed on August 21, 2001, however, DEQ has not approved the test results.

9. Permit Coordination

This HMA facility is not a major facility as defined by IDAPA 16.01.01.006.55 and IDAPA 58.01.01.008.10. However, the applicant has indicated that it is a New Source Performance Standards-affected facility (40 CFR Part 60, Subpart I), and as such, it is a Tier I source as defined by IDAPA 58.01.01.006.104(b). In accordance with IDAPA 58.01.01.301.02(b), these Tier I sources not located at major facilities do not require a Tier I operating permit until June 1, 2001, unless an earlier date is required by an applicable standard or EPA determines that no Tier I operating permit is required.

10. AIRS Information

Table 5.1 AIRS/AFS^a FACILITY-WIDE CLASSIFICATION^b DATA ENTRY FORM

AIR PROGRAM	SIP ^c	PSD ^d	NSPS ^e (Part 60)	NESHAP ^f (Part 61)	MACT ^g (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
POLLUTANT							
SO ₂ ^h	B						
No _x ⁱ	B						
CO ^j	SM						
PM ₁₀ ^k	B						
PT (Particulate) ^l	B		B				
VOC ^m	B						
THAP (Total HAPs) ⁿ	SM						
			APPLICABLE SUBPART				
			I				

^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 NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

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).

^c State Implementation Plan

^d Prevention of Significant Deterioration

^e New Source Performance Standards

^f National Emission Standards for Hazardous Air Pollutants

^g Maximum Achievable Control Technology

^h Sulfur Dioxide

ⁱ Nitrogen Oxides

^j Carbon Monoxide

^k Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

^l Particulate Matter

^m Volatile Organic Compounds

ⁿ Hazardous Air Pollutants

FEES

This PTC is a general permit and is subject to a processing fee of \$500. This fee must be paid prior to issuance of the final PTC. Any PTC application received after June 30, 2002 is subject to an application fee of \$1,000.

RECOMMENDATION

Based on review of application materials and state and federal rules and regulations, staff recommends Woods Crushing and Hauling, Inc. be issued a PTC to modify portable HMA No. 777-00230. No public comment period is recommended, no entity has requested a comment period, and the project does not involve Prevention of Significant Deterioration PTC requirements.

TA/DS/sd Project No. P-020111

G:\AIR QUALITY\STATIONARY SOURCE\SS LTD\PTC\WOODS CRUSHING HAULING\FINAL PRE\IP-020111 TECH MEMO.DOC

cc: Tom Harman, Coeur d' Alene Regional Office
Sherry Davis, Air Quality Division

APPENDIX A
WOODS CRUSHING AND HAULING, INC.
SCREEN MODELING RESULTS

07/08/02

15:04:01

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

Woods C & H Generator

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	3.6576
STK INSIDE DIAM (M)	=	0.2591
STK EXIT VELOCITY (M/S)	=	41.6019
STK GAS EXIT TEMP (K)	=	751.4833
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 = 4.176 M**4/S**3; MOM. FLUX = 11.331 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

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

DIST	CONC		U10M	USTK	MIX HT	PLUME	SIGMA
(M)	(UG/M**3)	STAB	(M/S)	(M/S)	(M)	HT (M)	Y (M)
Z (M)	DWASH						
1.	0.000	1	1.0	1.0	320.0	66.24	1.88
1.85	NO						

Generator.OUT

100.	18.33	4	20.0	20.0	6400.0	6.79	8.24
4.72	NO						
200.	15.46	4	8.0	8.0	2560.0	11.48	15.72
8.79	NO						
300.	12.21	4	5.0	5.0	1600.0	16.17	22.89
12.61	NO						
400.	10.23	4	4.5	4.5	1440.0	17.57	29.72
15.78	NO						
500.	8.689	4	3.5	3.5	1120.0	21.54	36.51
19.00	NO						
600.	7.574	4	3.0	3.0	960.0	24.52	43.13
22.03	NO						
700.	6.688	4	2.5	2.5	800.0	28.69	49.71
25.08	NO						
800.	6.045	4	2.5	2.5	800.0	28.69	56.03
27.72	NO						
900.	5.469	4	2.0	2.0	640.0	34.95	62.53
30.79	NO						
1000.	5.053	4	2.0	2.0	640.0	34.95	68.71
33.32	NO						
1100.	4.649	4	2.0	2.0	640.0	34.95	74.85
35.28	NO						
1200.	4.284	4	2.0	2.0	640.0	34.95	80.93
37.18	NO						
1300.	4.301	6	1.5	1.5	10000.0	38.36	44.17
19.22	NO						
1400.	4.513	6	1.0	1.0	10000.0	43.38	47.43
20.66	NO						
1500.	4.705	6	1.0	1.0	10000.0	43.38	50.33
21.31	NO						
1600.	4.866	6	1.0	1.0	10000.0	43.38	53.22
21.94	NO						
1700.	4.998	6	1.0	1.0	10000.0	43.38	56.10
22.58	NO						
1800.	5.102	6	1.0	1.0	10000.0	43.38	58.97
23.20	NO						
1900.	5.183	6	1.0	1.0	10000.0	43.38	61.83
23.82	NO						
2000.	5.243	6	1.0	1.0	10000.0	43.38	64.68
24.42	NO						
2100.	5.248	6	1.0	1.0	10000.0	43.38	67.52
24.94	NO						
2200.	5.241	6	1.0	1.0	10000.0	43.38	70.35
25.45	NO						
2300.	5.224	6	1.0	1.0	10000.0	43.38	73.16
25.95	NO						
2400.	5.199	6	1.0	1.0	10000.0	43.38	75.97
26.45	NO						

2500.	5.166	6	1.0	1.0	10000.0	43.38	78.77
26.93	NO						
2600.	5.128	6	1.0	1.0	10000.0	43.38	81.56
27.41	NO						
2700.	5.085	6	1.0	1.0	10000.0	43.38	84.34
27.89	NO						
2800.	5.037	6	1.0	1.0	10000.0	43.38	87.11
28.35	NO						
2900.	4.986	6	1.0	1.0	10000.0	43.38	89.87
28.81	NO						
3000.	4.932	6	1.0	1.0	10000.0	43.38	92.62
29.27	NO						
3500.	4.591	6	1.0	1.0	10000.0	43.38	106.26
31.12	NO						
4000.	4.265	6	1.0	1.0	10000.0	43.38	119.71
32.86	NO						
4500.	3.964	6	1.0	1.0	10000.0	43.38	132.99
34.49	NO						
5000.	3.691	6	1.0	1.0	10000.0	43.38	146.11
36.04	NO						

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 100. 18.33 4 20.0 20.0 6400.0 6.79 8.24
 4.72 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	18.33	100.	0.

07/08/02

15:01:41

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

Woods C & H Scrubber Stack

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
 EMISSION RATE (G/S) = 0.126000
 STACK HEIGHT (M) = 7.6200
 STK INSIDE DIAM (M) = 1.2192
 STK EXIT VELOCITY (M/S) = 9.8076
 STK GAS EXIT TEMP (K) = 330.9278
 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 = 4.080 M**4/S**3; MOM. FLUX = 31.664 M**4/S**2.

*** FULL METEOROLOGY ***

 *** SCREEN AUTOMATED DISTANCES ***

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

DIST	CONC		U10M	USTK	MIX HT	PLUME	SIGMA
(M)	(UG/M**3)	STAB	(M/S)	(M/S)	(M)	HT (M)	Y (M)
1.	0.000	1	1.0	1.0	320.0	69.13	2.31
2.28	NO						

Scrubber.OUT

100.	11.25	4	20.0	20.0	6400.0	8.23	8.24
4.72	NO						
200.	10.60	4	15.0	15.0	4800.0	9.66	15.61
8.58	NO						
300.	8.833	4	8.0	8.0	2560.0	14.64	22.72
12.29	NO						
400.	7.691	4	5.0	5.0	1600.0	19.92	29.66
15.67	NO						
500.	6.935	4	4.0	4.0	1280.0	23.00	36.41
18.82	NO						
600.	6.268	4	3.5	3.5	1120.0	25.19	43.01
21.80	NO						
700.	5.717	4	3.0	3.0	960.0	28.12	49.54
24.74	NO						
800.	5.255	4	2.5	2.5	800.0	32.22	56.02
27.69	NO						
900.	4.829	4	2.5	2.5	800.0	32.22	62.28
30.29	NO						
1000.	4.512	4	2.0	2.0	640.0	38.37	68.69
33.27	NO						
1100.	4.204	4	2.0	2.0	640.0	38.37	74.83
35.24	NO						
1200.	3.913	4	2.0	2.0	640.0	38.37	80.92
37.15	NO						
1300.	3.647	4	1.5	1.5	480.0	48.62	87.31
39.77	NO						
1400.	3.501	5	1.0	1.0	10000.0	55.12	70.53
29.99	NO						
1500.	3.566	5	1.0	1.0	10000.0	55.12	74.94
31.05	NO						
1600.	3.606	5	1.0	1.0	10000.0	55.12	79.32
32.10	NO						
1700.	3.625	5	1.0	1.0	10000.0	55.12	83.68
33.13	NO						
1800.	3.733	6	1.0	1.0	10000.0	47.04	58.95
23.16	NO						
1900.	3.854	6	1.0	1.0	10000.0	47.04	61.81
23.77	NO						
2000.	3.957	6	1.0	1.0	10000.0	47.04	64.66
24.38	NO						
2100.	4.008	6	1.0	1.0	10000.0	47.04	67.50
24.90	NO						
2200.	4.046	6	1.0	1.0	10000.0	47.04	70.33
25.41	NO						
2300.	4.074	6	1.0	1.0	10000.0	47.04	73.15
25.91	NO						
2400.	4.093	6	1.0	1.0	10000.0	47.04	75.96
26.41	NO						

Scrubber.OUT

2500.	4.103	6	1.0	1.0	10000.0	47.04	78.76
26.90	NO						
2600.	4.105	6	1.0	1.0	10000.0	47.04	81.55
27.38	NO						
2700.	4.102	6	1.0	1.0	10000.0	47.04	84.33
27.85	NO						
2800.	4.092	6	1.0	1.0	10000.0	47.04	87.10
28.32	NO						
2900.	4.078	6	1.0	1.0	10000.0	47.04	89.86
28.78	NO						
3000.	4.059	6	1.0	1.0	10000.0	47.04	92.61
29.23	NO						
3500.	3.866	6	1.0	1.0	10000.0	47.04	106.25
31.09	NO						
4000.	3.656	6	1.0	1.0	10000.0	47.04	119.70
32.83	NO						
4500.	3.448	6	1.0	1.0	10000.0	47.04	132.98
34.46	NO						
5000.	3.248	6	1.0	1.0	10000.0	47.04	146.11
36.01	NO						

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

125.	12.28	4	20.0	20.0	6400.0	8.23	10.19
5.75	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	----- 12.28	----- 125.	----- 0.

APPENDIX B
WOODS CRUSHING AND HAULING, INC.
SPREADSHEETS

Standard Hot-Mix Asphalt Spreadsheet with TAPS

INPUT SECTION - enter info in highlighted areas only

Company: Woods Crabbles and Hauling Inc.
 Permit Engineer: Tim Anderson
 Date: 7/23/02
 Short Duration Source Analysis

Enter the HMA Plant Type: B (A - Batch Mix Hot Mix Asphalt Plant)
 (B - Drum Mix Hot Mix Asphalt Plant)

Dryer Fuel Type: B (A - Natural Gas or Propane-Fired Dryer)
 (B - Oil-Fired Dryer)
 (C - Propane-Fired Dryer)
 (A - Baghouse)
 (B - Wet Scrubber)

Pelletize Control Equipment: B (B - Wet Scrubber)

Enter Dryer Stack Flow Rate: 24,261 actual cubic feet per minute (acfm)
 Enter Dryer Stack Temperature: 136 temperature (F)
 Enter Dryer Stack Moisture: 18.00 moisture wt % (Default 18 wt%)
 Enter Dryer Stack Pressure: 29.92 stack pressure (Default 29.92 "Hg)
 Calculated Corrected Flow Rate: 17,623 dry standard cubic feet per minute (dscfm)

Enter HMA Maximum Capacity: 250 Twhr/(Asphalt Throughput)

Enter HMA Mediated Concentration: 12.28 ug/m³, (1-yr concentration @ 1 lb/hr)

Does Plant Require a Generator? Y or N
 Enter Generator Size: 455 hp
 Enter Units: A (A - Horsepower or B - Kilowatts)

Calculated Generator Size: 455.00 Horsepower

Enter Generator Fuel Type: A (A - Diesel-Fired Generator)
 (B - Gasoline-Fired)

Calculated Generator Heat Output: 40.6
 5.52 MMbtu/hr

Enter gen. mediated concentrations: 18.33 ug/m³, (1-yr concentration @ 1 lb/hr)

Enter Annual Emission Limit: 100 T/yr
 Note: Use 100 T/yr for Title V Limitation
 Use 250 T/yr for PSD Limitation
 For the standard HMA permit, use 100 T/yr.

Emission Factors

Emission Factors For Generators

Large Diesel Generators (>600 HP)		Sulfur Content (%)	
lb/HP-hr	lb/MMBtu		
NOx	0.024		0.5
SOx	0.004045		
CO	5.50E-03		
PM	0.0007		

Small Diesel Generators (<600 HP)		Small Gasoline Generators (<250 HP)	
lb/HP-hr	lb/MMBtu	lb/HP-hr	lb/MMBtu
NOx	0.031	NOx	0.011
SOx	2.05E-03	SOx	5.91E-04
CO	6.68E-03	CO	0.439
PM10	2.20E-03	PM10	7.21E-04

Emissions Factors For HMA Dryers

Batch Mix Dryers (lb/ton of HMA)		Drum Mix Dryers (lb/ton of HMA)	
Nat. Gas	No. 2 Fuel Oil	Nat. Gas	No. 2 Fuel Oil
NOx	0.025	NOx	0.028
SOx	0.0046	SOx	0.0034
CO	0.4	CO	0.13
PM with Baghouse	0.042	PM with Baghouse	0.033
PM with Scrubber	0.14	PM with Scrubber	0.045

Uncontrolled PM		Uncontrolled PM	
lb/HP-hr	lb/MMBtu	lb/HP-hr	lb/MMBtu
NOx	0.011	NOx	0.011
SOx	5.91E-04	SOx	5.91E-04
CO	0.439	CO	0.439
PM10	7.21E-04	PM10	7.21E-04

State Wide Background Concentrations for Criteria Air Pollutants

	1-yr	3-yr	8-yr	24-yr	Annual
PM-10				100	32.7
CO	11400		5130		40
NOx		543		144	23.5
SOx					

Parameters used in the Fugitive Emissions Calculations

Parameter	Value
Mean Wind Speed (U)	10 mph
Material Moisture Content (M)	2.2 %
Particle Size Multiplier (R)	0.35 dimensionless
PM-10 (<10 um)	0.00302 lb/T
PM-10 (<18 um)	0.00531 lb/T

Notes: ¹ EF = 4*0.0032*(U/5)^1.3*(M/2)^1.4
 Drop-Point Equation, Rating "A", AP-42, 5th Ed. p.13.2.4-3
 Assumptions: Wind Speed = 10 mph; Moisture = 2.5%; and
 Aggregate = 94% of product.

Allowable Concentrations for Criteria Pollutants

	1-yr	3-yr	8-yr	24-yr	Annual
PM-10				150	50
CO	40000		10000		
NOx					100
SOx				385	60

Significant Contributions

	1-yr	3-yr	8-yr	24-yr	Annual
PM-10				5	1
SOx				5	1
NOx					1
CO	2000				50.1

Attainment Areas	
Tons per Year	1,392,820
Tons per Day	4,792
Generator Hours per Day	19.2
Generator Hours per Year	6,971

Attainment Areas when Collocated	
Tons per Year	898,410
Tons per Day	2,396
Generator Hours per Day	9.6
Generator Hours per Year	2,796

NonAttainment Areas				
	PM10 area	CO area	SO2 Area	NOx
Tons per Year	174,922	1,392,820	No Standard PTC	84,661
Tons per Day	479	Same as Attainment		Same as Attainment
Generator Hours per Day	1.9	Same as Attainment		Same as Attainment
Generator Hours per Year	700	Same as Attainment		256.2

PM10 Limit	
gridscf	0.04

Most Limiting Pollutant for 24-hour NAAQS and AAC in Attainment Areas (including collocation)	
PM10	

Most Limiting Pollutant for 100 T/yr	
CO	

Most Limiting Pollutant for Annual NAAQS and AACC in Attainment Areas (including collocation)	
FALSE	

Most Limiting Pollutant in PM10 nonattainment areas for 24-hour standards	
PM10	

Most Limiting Pollutant in PM10 nonattainment areas for annual standards	
PM10	

Most Limiting Pollutant in CO nonattainment areas for 24-hour standards	
Same as Attainment Area	

Most Limiting Pollutant in CO nonattainment areas for annual standards	
Same as Attainment Area	

EMISSIONS CALCULATIONS

Pollutant	DRYER STACK	
	Emission Factor (Uncontrolled) [-] lb/ton	Emission Rate (Controlled) [-] lb/hr
Total PM	28.00	7,000.00
PM10		11.3
CO	0.130	32.30
NOx	0.055	13.75
SO2	0.011	2.75

HMA emission factors for CO, NOx, SO2 and PM & PM-10 are from AP-42 Section 11.1. For modeling PM is assumed to be PM10

Pollutant	Modeled Concentrations (Modeled Only)			
	1-hr	3-hr	8-hr	24-hr
PM10	--	--	--	63
SO2	--	46	--	20
NOx	--	--	--	34
CO	455	--	318	--

Pollutant	Allowable Hours of Operation to Maintain NAAQS in Attainment Areas			
	1-hr	3-hr	8-hr	24-hr
PM10	--	--	--	19
SO2	--	3.0	--	24
NOx	--	--	--	8760
CO	1.0	--	8.0	--

Pollutant	Allowable Hours of Operation to Maintain NAAQS when Collocated			
	1-hr	3-hr	8-hr	24-hr
PM10	--	--	--	10
SO2	--	3.0	--	24
NOx	--	--	--	7686
CO	1.0	--	8.0	--

PM Emission Factor for Plant Load-Out (lb/Ton)	0.00359037
PM Emission Factor for Silo Filling (lb/Ton)	0.002870893
PM rate from Plant Load-Out (lb/hr)	0.90
PM rate from Silo Filling (lb/hr)	0.72

Pollutant	GENERATOR STACK	
	Emission Factor (Uncontrolled) [-] lb/tp-hr	Emission Rate (Controlled) [-] lb/hr
PM10	2.20E-03	1.00
CO	6.68E-03	3.04
NOx	3.10E-02	14.11
SO2	2.03E-03	0.93

Pollutant	Allowable Hours of Operation in Non-Attainment Areas			
	1-hr	3-hr	8-hr	24-hr
PM10	--	--	--	700
SO2	--	1.84	--	5.9
NOx	--	--	--	256
CO	1.000	--	8.00	--

Pollutant	Ton per Year Emissions for Attainment and Non-Attainment Areas	
	Unlimited T/yr	Allowable Throughput (T/yr)
PM	83	8760.0
SO2	16	8760.0
NOx	122.0	7108.2
CO	156	5571.3

Pollutant	Ton per Year Emissions for Collocation in Attainment Areas	
	Unlimited Hours	Allowable Throughput (T/yr)
PM	83	5221.8
SO2	16	1305438
NOx	122	2190000
CO	156	886530

NEGATIVE EMISSION CALCULATIONS FOR ATTAINMENT AREA		
Source	PM	PM10
Pre-Dryer Source Emissions (lb/hr)		
Loader -> Cold Aggregate Bin	1.3	0.5
Cold Aggregate Bin -> Conveyor	1.3	0.5
Conveyor -> Drum Dryer	1.3	0.5
Total Pre-Dryer Source Emissions	3.8	1.4
Post-Dryer Source Emissions		
Screening Process	#N/A	#N/A
Screen -> Hot Bins	#N/A	#N/A
Hot Bins -> Weigh Hopper	#N/A	#N/A
Weigh Hopper -> Pkg Mill	#N/A	#N/A
Total Post-Dryer Source Emissions	#N/A	#N/A
Scavenger Control Efficiency	#N/A	#N/A
Total Uncontrolled Emissions (lb/hr)	3.8	1.4
Total Uncontrolled Emissions (T/yr)	16.5	6.2
Total Controlled Emissions (lb/hr)	3.8	1.4
Total Controlled Emissions (T/yr)	16.5	6.2

Emissions Analysis for Carcinogenic Pollutants

Pollutant	HMA Emission Factor, lb/ton	Generator Emission Factor, lb/MMBtu	Dryer Emission Rate, lb/hr	Generator Emission Rate, lb/hr	EL Standard, lb/hr	Actual Annual Ambient Conc., ug/m3	AACC, ug/m3 (annual average)	Annual Hours of Operation to Meet AACC or EL	Annual Tonnage Limit to Meet AACC
Arsenic	5.60E-07		1.40E-04		1.56E-06	2.15E-04	2.30E-03	8,760	2,190,000
								8,760	2,190,000
Nickel								8,760	2,190,000
AP-42	6.30E-05		1.58E-02		2.70E-05	2.42E-02	4.20E-02	8,760	2,190,000
Lab analysis	1.23E-05		3.07E-03		2.70E-05	4.72E-03		8,760	2,190,000
								8,760	2,190,000
Cadmium	4.10E-07		1.03E-04		0.0000037	1.57E-04	5.6E-03	8,760	2,190,000
								8,760	2,190,000
Hexavalent Chromium*	4.5E-07		1.13E-04		0.00000056	1.73E-04	8.30E-04	8,760	2,190,000
								8,760	2,190,000
Acetaldehyde	0.0013	2.52E-05	3.25E-01	1.39E-04	3E-03	4.99E-01	9.5E+00	8,760	2,190,000
								8,760	2,190,000
Benzene*	0.00039	7.76E-04	9.75E-02	4.29E-03	8.0E-04	1.59E-01	1.2E+00	8,760	2,190,000
								8,760	2,190,000
Formaldehyde*	3.1E-03	7.9E-05	7.75E-01	4.36E-04	5.1E-04	1.19E+00	7.7E-01	5,665	1,416,317
								8,760	2,190,000
Benzo(a)pyrene	9.8E-09	2.6E-07	2.45E-06	1.42E-06	2E-06	7.01E-06	3E-03	8,760	2,190,000
								8,760	2,190,000
Beryllium	0.00E+00				2.80E-05		0.042	#VALUE!	#VALUE!

Maximum Allowable Hr/Yr	Maximum Allowable T/Yr
5,665	1,416,317

* Note: Hexavalent chromium, nickel, formaldehyde and benzene emission factors are identical to that analyzed for #2 fuel oil in standard PTC review.

Source: AP-42, 12/00, Tables 11.1-10 and 11.1-12, and 3.4-3 and 3.4-4.

Emissions Analysis for Non-Carcinogenic Pollutants

Pollutant	Emission Factor, lb/ton	Generator Emission Factor, lb/MMBtu	Dryer Emissions lb/hr	Generator Emissions lb/hr	EL Standard, lb/hr	Actual 24 hr. Ambient Conc., ug/m3	AAC, ug/m3 (24 Hour average)	Allowable Hours of Operation
Phosphorous	2.80E-05		7.00E-03	0.00E+00	0.007	3.44E-02	5	24
Silver	4.80E-07		1.20E-04	0.00E+00	0.007	5.89E-04	5	24
Zinc	6.10E-05		1.53E-02	0.00E+00	0.667	7.49E-02	500	24
Chromium	5.50E-06		1.38E-03	0.00E+00	0.033	6.75E-03	25	24
Copper	3.10E-06		7.75E-04	0.00E+00	0.013	3.81E-03	10	24
Manganese	7.7E-06		1.93E-03	0.00E+00	0.067	9.46E-03	50	24
Mercury	2.6E-06		6.50E-04	0.00E+00	0.0001	3.19E-03	1	24
Acrolein	2.6E-05	7.9E-06	6.50E-03	4.35E-05	0.017	3.22E-02	13	24
Methyl Ethyl Ketone	2E-05		5.00E-03	0.00E+00	0.007	2.46E-02	6	24
Propionaldehyde	0.00013		3.25E-02	0.00E+00	0.0287	1.60E-01	22	24
Quinone	0.00016		4.00E-02	0.00E+00	0.027	1.96E-01	20	24
Toluene	0.0029	2.81E-04	7.25E-01	1.55E-03	25	3.57E+00	18,750	24
Acetone	0.00083		2.08E-01	0.00E+00	1.33	1.02E+00	1,000	24
Crotonaldehyde	8.6E-05		2.15E-02	0.00E+00	0.38	1.06E-01	285	24
Valeraldehyde	6.7E-05		1.68E-02	0.00E+00	11.7	8.23E-02	8,750	24
Ethylbenzene	0.00024		6.00E-02	0.00E+00	29	2.95E-01	21,750	24
Methyl chloroform	4.8E-05		1.20E-02	0.00E+00	127	5.89E-02	95,500	24
Xylene	0.0002	1.93E-04	5.00E-02	1.07E-03	29	2.53E-01	21,750	24
Naphthalene	0.00065	1.30E-04	1.63E-01	7.18E-04	3.33	8.03E-01	2,500	24
Selenium	3.50E-07		8.75E-05	0.00E+00	1.30E-02	4.30E-04	10	24
Thallium	4.10E-09		1.03E-06	0.00E+00	0.007	5.03E-06	5	24
Antimony	1.80E-07		4.50E-05	0.00E+00	0.033	2.21E-04	25	24
Barium	5.80E-06		1.45E-03	0.00E+00	0.033	7.12E-03	25	24
Hexane	0.00092		2.30E-01	0.00E+00	12	1.13E+00	9,000	24
Heptane	9.40E-03		2.35E+00	0.00E+00	109	1.15E+01	82,000	24
Pentane	2.10E-04		5.25E-02	0.00E+00	0.033	2.58E-01	25	24

Maximum Allowable Hours of Operation

Source: AP-42, 12/00, Tables 11.1-10 and 11.1-12.