20.11.41 NMAC
"AUTHORITY-TO-CONSTRUCT"
AIR QUALITY PERMIT APPLICATION

Albuquerque, New Mexico

PREPARED FOR
NEW MEXICO TERMINAL SERVICES, LLC

FEBRUARY 2018

Prepared by

Montrose Air Quality Services, LLC

MONTROSE

Introduction

With this 20.11.41 permit application, New Mexico Terminal Services, LLC (NM Terminal) is submitting an application for a new 400 tph hot mix asphalt (HMA) plant and 133 tph aggregate railcar unloading terminal.

NM Terminal has retained Montrose Air Quality Services, LLC (Montrose) to assist with the permit application. Aggregate used in the asphalt mix will be delivered by railcar and offloaded using a railcar bottom dump hopper, transfer conveyors, and radial telescoping stacker to storage piles. The HMA plant will consist of a feed bin, scalping screen, pug mill, mineral filler silo with auger, drum dryer/mixer, RAP bin, RAP crusher, RAP screen, asphalt cement oil heater, and multiple transfer conveyors. The HMA plant will be powered by commercial line power, so no generators/engines powering the HMA plant will be permit. The location of NM Terminal's Rail Yard HMA plant is near the northwest corner of the intersection of South Broadway and I-25 at 9615 Broadway Blvd SE.

Aggregate material not used in the hot mix asphalt process may be transported off-site by haul truck. Recycled asphalt pavement (RAP) and mineral filler used in the hot asphalt mix will be delivered by haul truck. Hot mix asphalt product will be transported off-site by haul truck.

The proposed operating time for the HMA plant will be 17 hours per day (4 AM to 9 PM) for the months of December through February, 24 hours per day for the months of March through November, 7 days per week, and 8130 hours per year. For the HMA plant, NM Terminal will take site-specific conditions on daily HMA operating throughput. The HMA plant will limit the permitted daily throughput to the following;

Month	Tons Per Day
January	3200
February	3200
March	4000
April	4000
May	4000
June	4400
July	4400
August	4400
September	4400
October	4400
November	4400
December	3200

Table 1 presents the hours of operation for the HMA plant. For the aggregate railcar terminal, operating hours are 24 hours per day, 8130 hours per year.

TABLE 1: HMA Plant Hours of Operation

	Winter	Spring	Summer	Fall
12:00 AM	0	1	1	1
1:00 AM	0	1	1	1
2:00 AM	0	1	1	1
3:00 AM	0	1	1	1
4:00 AM	1	1	1	1
5:00 AM	1	1	1	1
6:00 AM	1	1	1	1
7:00 AM	1	1	1	1
8:00 AM	1	1	1	1
9:00 AM	1	1	1	1
10:00 AM	1	1	1	1
11:00 AM	1	1	1	1
12:00 PM	1	1	1	1
1:00 PM	1	1	1	1
2:00 PM	1	1	1	1
3:00 PM	1	1	1	1
4:00 PM	1	1	1	1
5:00 PM	1	1	1	1
6:00 PM	1	1	1	1
7:00 PM	1	1	1	1
8:00 PM	1	1	1	1
9:00 PM	0	1	1	1
10:00 PM	0	1	1	1
11:00 PM	0	1	1	1

Particulate emissions for this facility will be controlled primarily by limiting annual production. The facility will also utilize baghouses on the lime silo and drum dryer to reduce the amount of particulate emitted from the plant. Furthermore, the use of moisture (water sprays) in material handling procedures and paving/millings/surfactants/watering on roadways will be utilized as controls for particulate emissions.

No startup/shutdown emission rates are expected to be greater than what is proposed for normal operations of the plant. All controls will be operating and functioning correctly prior to the start of production.

If you have any questions regarding this permit application please call Paul Wade of Montrose Air Quality Services, LLC at (505) 830-9680 x6 or Karl Pergola of NM Terminal Services at (505) 459-7776.

The contents of this application packet include:

City of Albuquerque

Environmental Health Department
Air Quality Program

Permit Application Review Fee Instructions

All source registration, authority-to-construct, and operating permit applications for stationary or portable sources shall be charged an application review fee according to the fee schedule in 20.11.2 NMAC. These filing fees are required for both new construction, reconstruction, and permit modifications applications. Qualified small businesses as defined in 20.11.2 NMAC may be eligible to pay one-half of the application review fees and 100% of all applicable federal program review fees.

Please fill out the permit application review fee checklist and submit with a check or money order payable to the "City of Albuquerque Fund 242" and either:

1. be delivered in person to the Albuquerque Environmental Health Department, 3rd floor, Suite 3023 or Suite 3027, Albuquerque-Bernalillo County Government Center, south building, One Civic Plaza NW, Albuquerque, NM or,

2. mailed to Attn: Air Quality Program, Albuquerque Environmental Health Department, P.O. Box 1293, Albuquerque, NM 87103.

The department will provide a receipt of payment to the applicant. The person delivering or filing a submittal shall attach a copy of the receipt of payment to the submittal as proof of payment Application review fees shall not be refunded without the written approval of the manager. If a refund is requested, a reasonable professional service fee to cover the costs of staff time involved in processing such requests shall be assessed. Please refer to 20.11.2 NMAC (effective January 10, 2011) for more detail concerning the "Fees" regulation as this checklist does not relieve the applicant from any applicable requirement of the regulation.

City of Albuquerque

Environmental Health Department
Air Quality Program
Permit Application Review Fee Checklist

Please completely fill out the information in each section. Incompleteness of this checklist may result in the Albuquerque Environmental Health Department not accepting the application review fees. If you should have any questions concerning this checklist, please call 768-1972.

I. COMPANY INFORMATION:

Company Name	New Mexico Terminal Services		
Company Address	9615 Broadway Blvd. SE, Albuquerque, NM 87105		
Facility Name	Railyard HMA Plant		
Facility Address	9615 Broadway Blvd. SE, Albuquerque, NM 87105		
Contact Person	Karl Pergola		
Contact Person Phone Number	(505) 459-7776		
Are these application review fees for an existing permitted source located within the City of Albuquerque or Bernalillo County?		**Yes**	**No**
If yes, what is the permit number associated with this modification?		**Permit #**	
Is this application review fee for a Qualified Small Business as defined in 20.11.2 NMAC? (See Definition of Qualified Small Business on Page 4)		**Yes**	**No**

II. STATIONARY SOURCE APPLICATION REVIEW FEES:

If the application is for a new stationary source facility, please check all that apply. If this application is for a modification to an existing permit please see Section III.

Check All That Apply	Stationary Sources	Review Fee	Program Element
	Air Quality Notifications		
	AQN New Application	$549.00	2801
	AQN Technical Amendment	$300.00	2802
	AQN Transfer of a Prior Authorization	$300.00	2803
X	*Not Applicable*	*See Sections Below*	
	Stationary Source Review Fees (Not Based on Proposed Allowable Emission Rate)		
	Source Registration required by 20.11.40 NMAC	$ 559.00	2401
	A Stationary Source that requires a permit pursuant to 20.11.41 NMAC or other board regulations and are not subject to the below proposed allowable emission rates	$ 1,097.00	2301
X	*Not Applicable*	*See Sections Below*	
	Stationary Source Review Fees (Based on the Proposed Allowable Emission Rate for the single highest fee pollutant)		
	Proposed Allowable Emission Rate Equal to or greater than 1 tpy and less than 5 tpy	$ 823.00	2302
	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	$ 1,646.00	2303
	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	$ 3,291.00	2304
X	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	$ 4,937.00	2305
	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	$ 6,582.00	2306
	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	$8,228.00	2307
	Not Applicable	*See Section Above*	

	Federal Program Review Fees (In addition to the Stationary Source Application Review Fees above)		
	40 CFR 60 - "New Source Performance Standards" (NSPS)	$ 1,097.00	2308
	40 CFR 61 - "Emission Standards for Hazardous Air Pollutants (NESHAPs)	$ 1,097.00	2309
	40 CFR 63 - (NESHAPs) Promulgated Standards	$ 1,097.00	2310
	40 CFR 63 - (NESHAPs) Case-by-Case MACT Review	$ 10,971.00	2311
	20.11.61 NMAC, Prevention of Significant Deterioration (PSD) Permit	$ 5,485.00	2312
	20.11.60 NMAC, Non-Attainment Area Permit	$ 5,485.00	2313
	Not Applicable	*Not Applicable*	

III. MODIFICATION TO EXISTING PERMIT APPLICATION REVIEW FEES:

If the permit application is for a modification to an existing permit, please check all that apply. If this application is for a new stationary source facility, please see Section II.

Check All That Apply	Modifications	Review Fee	Program Element
	Modification Application Review Fees (Not Based on Proposed Allowable Emission Rate)		
	Proposed modification to an existing stationary source that requires a permit pursuant to 20.11.41 NMAC or other board regulations and are not subject to the below proposed allowable emission rates	$ 1,097.00	2321
X	*Not Applicable*	*See Sections Below*	
	Modification Application Review Fees (Based on the Proposed Allowable Emission Rate for the single highest fee pollutant)		
	Proposed Allowable Emission Rate Equal to or greater than 1 tpy and less than 5 tpy	$ 823.00	2322
	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	$ 1,646.00	2323
	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	$ 3,291.00	2324
	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	$ 4,937.00	2325
	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	$ 6,582.00	2326
	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	$ 8,228.00	2327
X	*Not Applicable*	*See Section Above*	
	Major Modifications Review Fees (In addition to the Modification Application Review Fees above)		
	20.11.60 NMAC, Permitting in Non-Attainment Areas	$ 5,485.00	2333
	20.11.61 NMAC, Prevention of Significant Deterioration	$ 5,485.00	2334
X	*Not Applicable*	*Not Applicable*	
	Federal Program Review Fees (This section applies only if a Federal Program Review is triggered by the proposed modification) (These fees are in addition to the Modification and Major Modification Application Review Fees above)		
	40 CFR 60 - "New Source Performance Standards" (NSPS)	$ 1,097.00	2328
	40 CFR 61 - "Emission Standards for Hazardous Air Pollutants (NESHAPs)	$ 1,097.00	2329
	40 CFR 63 - (NESHAPs) Promulgated Standards	$ 1,097.00	2330
	40 CFR 63 - (NESHAPs) Case-by-Case MACT Review	$10,971.00	2331
	20.11.61 NMAC, Prevention of Significant Deterioration (PSD) Permit	$ 5,485.00	2332
	20.11.60 NMAC, Non-Attainment Area Permit	$ 5,485.00	2333
X	*Not Applicable*	*Not Applicable*	

IV. ADMINISTRATIVE AND TECHNICAL REVISION APPLICATION REVIEW FEES:

If the permit application is for an administrative or technical revision of an existing permit issued pursuant to 20.11.41 NMAC, please check one that applies.

Check One	Revision Type	Review Fee	Program Element
	Administrative Revisions	$ 250.00	2340
	Technical Revisions	$ 500.00	2341
X	*Not Applicable*	*See Sections II, III or V*	

V. PORTABLE STATIONARY SOURCE RELOCATION FEES:

If the permit application is for a portable stationary source relocation of an existing permit, please check one that applies.

Check One	Portable Stationary Source Relocation Type	Review Fee	Program Element
	No New Air Dispersion Modeling Required	$ 500.00	2501
	New Air Dispersion Modeling Required	$ 750.00	2502
X	*Not Applicable*	*See Sections II, III or V*	

VI. Please submit a check or money order in the amount shown for the total application review fee.

Section Totals	Review Fee Amount
Section II Total	$4,937.00
Section III Total	$
Section IV Total	$
Section V Total	$
Total Application Review Fee	**$4,937.00**

I, the undersigned, a responsible official of the applicant company, certify that to the best of my knowledge, the information stated on this checklist, give a true and complete representation of the permit application review fees which are being submitted. I also understand that an incorrect submittal of permit application reviews may cause an incompleteness determination of the submitted permit application and that the balance of the appropriate permit application review fees shall be paid in full prior to further processing of the application.

Signed this 23rd **day of** February **20**18

KARL PERGOLA — **Print Name**

MEMBER — **Print Title**

[signature] — **Signature**

Definition of Qualified Small Business as defined in 20.11.2 NMAC:

"Qualified small business" means a business that meets all of the following requirements:

(1) a business that has 100 or fewer employees;
(2) a small business concern as defined by the federal Small Business Act;
(3) a source that emits less than 50 tons per year of any individual regulated air pollutant, or less than 75 tons per year of all regulated air pollutants combined; and
(4) a source that is not a major source or major stationary source.

City of Albuquerque

Environmental Health Department
Air Quality Program

Permit Application Checklist

Any person seeking a permit under 20.11.41 NMAC, Authority-to-Construct Permits, shall do so by filing a written application with the Department. Prior to ruling a submitted application complete each application submitted shall contain the required items listed below. **This checklist must be returned with the application.**

Applications that are ruled incomplete because of missing information will delay any determination or the issuance of the permit. The Department reserves the right to request additional relevant information prior to ruling the application complete in accordance with 20.11.41 NMAC.

All applicants shall:

1. Fill out and submit the *Pre-permit Application Meeting Request* form
   a. X Attach a copy to this application (Phone call used to setup meeting)

2. Attend the pre-permit application meeting
   a. X Attach a copy of the completed *Pre-permit Application Meeting Checklist* to this application

3. Provide public notice to the appropriate parties
   a. X Attach a copy of the completed *Notice of Intent to Construct* form to this form
      i. Neighborhood Association(s): Names provided by city of Albuquerque AQB
      ii. Coalition(s): Names provided by city of Albuquerque AQB

   b. X Attach a copy of the completed *Public Sign Notice Guideline* form

4. Fill out and submit the *Permit Application*. All applications shall:

   A. X be made on a form provided by the Department. Additional text, tables, calculations or clarifying information may also be attached to the form.

   B. X at the time of application, include documentary proof that all applicable permit application review fees have been paid as required by 20 NMAC 11.02. Please refer to the attached permit application worksheet.

   C. X contain the applicant's name, address, and the names and addresses of all other owners or operators of the emission sources.

D. X contain the name, address, and phone number of a person to contact regarding questions about the facility.

E. X indicate the date the application was completed and submitted

F. X contain the company name, which identifies this particular site.

G. X contain a written description of the facility and/or modification including all operations affecting air emissions.

H. X contain the maximum and standard operating schedules for the source after completion of construction or modification in terms of hours per day, days per week, and weeks per year.

I. X provide sufficient information to describe the quantities and nature of any regulated air contaminant (including any amount of a hazardous air pollutant) that the source will emit during:

- Normal operation
- Maximum operation
- Abnormal emissions from malfunction, start-up and shutdown

J. X include anticipated operational needs to allow for reasonable operational scenarios to avoid delays from needing additional permitting in the future.

K. X contain a map, such as a 7.5-minute USGS topographic quadrangle, showing the exact location of the source; and include physical address of the proposed source.

L. X contain an aerial photograph showing the proposed location of each process equipment unit involved in the proposed construction, modification, relocation, or technical revision of the source except for federal agencies or departments involved in national defense or national security as confirmed and agreed to by the department in writing.

M. X contain the UTM zone and UTM coordinates.

N. X include the four digit Standard Industrialized Code (SIC) and the North American Industrial Classification System (NAICS).

O. X contain the types and **potential emission rate** amounts of any regulated air contaminants the new source or modification will emit. Complete appropriate sections of the application; attachments can be used to supplement the application, but not replace it.

P. X contain the types and **controlled** amounts of any regulated air contaminants the new source or modification will emit. Complete appropriate sections of the application; attachments can be used to supplement the application, but not replace it.

Q. X contain the basis or source for each emission rate (include the manufacturer's specification sheets, AP-42 Section sheets, test data, or other data when used as the source).

R. X contain all calculations used to estimate **potential emission rate** and **controlled** emissions.

S. X contain the basis for the estimated control efficiencies and sufficient engineering data for verification of the control equipment operation, including if necessary, design drawings, test reports, and factors which affect the normal operation (e.g. limits to normal operation).

T. X contain fuel data for each existing and/or proposed piece of fuel burning equipment.

U. X contain the anticipated maximum production capacity of the entire facility and the requested production capacity after construction and/or modification.

V. X contain the stack and exhaust gas parameters for all existing and proposed emission stacks.

W. X provide an ambient impact analysis using a atmospheric dispersion model approved by the US Environmental Protection Agency (EPA), and the Department to demonstrate compliance with the ambient air quality standards for the City of Albuquerque and Bernalillo County (See 20.11.01 NMAC). If you are modifying an existing source, the modeling must include the emissions of the entire source to demonstrate the impact the new or modified source(s) will have on existing plant emissions.

X. X contain a preliminary operational plan defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown.

Y. X contain a process flow sheet, including a material balance, of all components of the facility that would be involved in routine operations. Indicate all emission points, including fugitive points.

Z. X contain a full description, including all calculations and the basis for all control efficiencies presented, of the equipment to be used for air pollution control. This shall include a process flow sheet or, if the Department so requires, layout and assembly drawings, design plans, test reports and factors which affect the normal equipment operation, including control and/or process equipment operating limitations.

AA. ☐ contain description of the equipment or methods proposed by the applicant to be used for emission measurement.

BB. X be signed under oath or affirmation by a corporate officer, authorized to bind the company into legal agreements, certifying to the best of his or her knowledge the truth of all information submitted.

Albuquerque Environmental Health Department - Air Quality Program
Please mail this application to **P.O. Box 1293, Albuquerque, NM 87103**
or hand deliver between 8:00am - 5:00pm Monday - Friday to:
3rd Floor, Suite 3023 - One Civic Plaza NW, Albuquerque, New Mexico 87103
(505) 768 – 1972 aqd@cabq.gov (505) 768 - 1977 (Fax)

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

Clearly handwrite or type **Corporate Information** **Submittal Date: 02/23/2018**

1. Company Name New Mexico Terminal Services, LLC 2. Street Address 9615 Broadway Blvd SE Zip 87105

3. Company City Albuquerque 4. Company State NM 5. Company Phone (505) 459-7776. Company Fax (505) 200-2770

7. Company Mailing Address: 9615 Broadway Blvd SE, Albuquerque, NM Zip 87105

8. Company Contact Karl Pergola 9. Phone (505) 459-7776 10. Title: Managing Member

10. E-mail Karl.Pergola@rockhousekp.com

Stationary Source (Facility) Information: [Provide a plot plan (legal description/drawing of facility property) with overlay sketch of facility processes; Location of emission points; Pollutant type and distances to property boundaries]

1. Facility Name: New Mexico Terminal Services 2. Street Address 9615 Broadway Blvd. SE

3. City Albuquerque 4. State NM 5. Facility Phone (505) 459-7776 6. Facility Fax (505) 200-2770

7. Facility Mailing Address (Local) 9615 Broadway Blvd SE, Albuquerque, NM Zip 87105

8. Latitude - Longitude or UTM Coordinates of Facility UTM 347,500E, 3,869,300N, Zone 13, NAD 83

9. Facility Contact Karl Pergola 10. Phone (505) 459-7776 11.Title Managing Member

General Operation Information (if any further information request does not pertain to your facility, write N/A on the line or in the box)

1. Facility Type (description of your facility operations) Hot Mix Asphalt Plant
2. Standard Industrial Classification (SIC 4 digit #) 2951
3. North American Industry Classification System (NAICS Code #) 324121
4. Is facility currently operating in Bernalillo County. NO If yes, date of original construction ___/___/____
   If no, planned startup is 08/31/2018
5. Is facility permanent YES If no, give dates for requested temporary operation - from ___/___/____ through ___/___/____
6. Is facility process equipment new YES If no, give actual or estimated manufacture or installation dates in the Process Equipment Table.
7. Is application for a modification, expansion, or reconstruction (altering process, or adding, or replacing process equipment, etc.) to an existing facility which will result in a change in emissions YES. If yes, give the manufacture date of modified, added, or replacement equipment in the Process Equipment Table modification date column, or the operation changes to existing process/equipment which cause an emission increase.
8. Is facility operation (circle one) [Continuous **Intermittent** Batch]
9. Estimated % of production Jan-Mar 20% Apr-Jun 25% Jul-Sep 29% Oct-Dec 26%

10. Current or requested operating times of facility 24 hrs/day 7 days/wk 4 wks/mo 12 mos/yr

11. Business hrs ______ am/pm to am/pm

12. Will there be special or seasonal operating times other than shown above YES If yes, explain: The hourly throughput for the HMA plant will be 400 tons per hour, with a daily throughput of 4800 tons per day (equivalent to operating 12 hours at maximum hourly throughput) for the months of June through November; a daily throughput of 3200 tons per day (equivalent to operating 8 hours at maximum hourly throughput) for the months of December through February; and a daily throughput of 4000 tons per day (equivalent to operating 10 hours at maximum hourly throughput) for the months of March through May.

13. Raw materials processed Aggregate, mineral filler, recycled asphalt pavement, asphalt cement

14. Saleable item(s) produced Asphalt concrete

15. Permitting Action Being Requested

X New Permit ☐ Permit Modification Current Permit #: ______ ☐ Technical Permit Revision Current Permit #: ☐ Administrative Permit Revision Current Permit #:

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

PROCESS EQUIPMENT TABLE

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu;ft^3;lbs, tons;yd^3,etc.)	Fuel Type
1 Railcar Hopper	TBD	TBD	TBD	TBD	TBD	NA	133.3 ton/hr 1,168,000 ton/yr	NA
2 Rail Hopper Conveyor	TBD	TBD	TBD	TBD	TBD	NA	133.3 ton/hr 1,168,000 ton/yr	NA
3 Rail Telescoping Conveyor	TBD	TBD	TBD	TBD	TBD	NA	133.3 ton/hr 1,168,000 ton/yr	NA
4 Aggregate Storage Piles	NA	NA	NA	NA	TBD	NA	133 3 ton/hr 1,168,000 ton/yr	NA
5 Aggregate Truck Loading	NA	NA	NA	NA	TBD	NA	100 ton/hr 708,000 ton/yr	NA
6. HMA RAP Storage Pile	NA	NA	NA	NA	TBD	NA	140 ton/hr 280,000 ton/yr	NA
7 HMA Cold Aggregate Feed Bins(6)	TBD	TBD	TBD	TBD	TBD	NA	230 ton/hr 460,000 ton/yr	NA
8. HMA Cold Aggregate Feed Bin Conveyor	TBD	TBD	TBD	TBD	TBD	NA	230 ton/hr. 460,000 ton/yr	NA
9. HMA Scalping Screen	TBD	TBD	TBD	TBD	TBD	NA	230 ton/hr. 460,000 ton/yr	NA
10 HMA Scalping Screen Conveyor	TBD	TBD	TBD	TBD	TBD	NA	230 ton/hr. 460,000 ton/yr	NA
11 HMA Pug Mill	TBD	TBD	TBD	TBD	TBD	NA	236 ton/hr. 472,000 ton/yr	NA
12 HMA Scale Conveyor	TBD	TBD	TBD	TBD	TBD	NA	236 ton/hr 472,000 ton/yr	NA
13 HMA Slinger Conveyor	TBD	TBD	TBD	TBD	TBD	NA	236 ton/hr. 472,000 ton/yr	NA
14 HMA RAP Bin	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr. 280,000 ton/yr	NA
15 HMA RAP Crusher	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr 280,000 ton/yr	NA
16 HMA RAP Crusher Conveyor	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr 280,000 ton/yr	NA
17 HMA RAP Screen	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr 280,000 ton/yr	NA
18 HMA RAP Screen Conveyor	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr 280,000 ton/yr	NA
19. HMA RAP Transfer Conveyor	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr. 280,000 ton/yr	NA
20. HMA RAP Transfer Conveyor	TBD	TBD	TBD	TBD	TBD	NA	140 ton/hr 280,000 ton/yr	NA
21. HMA Mineral Filler Silo w/ Baghouse and Auger	TBD	TBD	TBD	TBD	TBD	NA	6 ton/hr. 12,000 ton/yr	NA
22. HMA Drum Dryer/Mixer & Baghouse	TBD	TBD	TBD	TBD	TBD	NA	400 ton/hr 800,000 ton/yr	Fuel Oil, Natural Gas, or Propane

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.) Throughput for cold aggregate, RAP, and mineral filler processing equipment is based on an asphalt concrete mix ratio of 57.5% aggregate / 35% RAP / 1.5% mineral filler. This ratio will change with different asphalt concrete mixes and is not a requested limit on throughput of cold aggregate, RAP, or mineral filler.
Submit information for each unit as an attachment

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

PROCESS EQUIPMENT TABLE

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp,kW,Btu,ft³,lbs, tons;yd³;etc)[1]	Fuel Type
23 HMA Asphalt Incline Conveyor	TBD	TBD	TBD	TBD	TBD	NA	400 ton/hr 800,000 ton/yr	NA
24. HMA Asphalt Silos (3)	TBD	TBD	TBD	TBD	TBD	NA	400 ton/hr 800,000 ton/yr	NA
25 HMA Asphalt Heater	TBD	TBD	TBD	TBD	TBD	NA	2 5 MMBtu/hr 21.900 MMBtu/yr	Low Sulfur Diesel or NG/Propane
26 HMA Asphalt Cement Storage Tanks (2)	TBD	TBD	TBD	TBD	TBD	NA	5206 gal/hr 10,412,148 gal/yr	NA
27 Haul Road Traffic	NA	NA	NA	NA	TBD	NA	27 trucks/hr 73,920 trucks/yr	NA
23 HMA Yard	NA	NA	NA	NA	TBD	NA	400 ton/hr 800,000 ton/yr	NA

1 Basis for Equipment Size or Process Rate (Manufacturers data. Field Observation/Test, etc) The RAP/Concrete plant throughput is based on 200 tons per hour input to the feeders. The RAP/concrete plant will have two (2) feeders, but the total hourly input to the plant will still be limited to 200 tons per hour. The process throughput to the secondary crusher and downstream conveyors from the crusher is 60 percent of the RAP plant throughput or 180 tons per hour.

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

TABLE EXEMPTED SOURCES AND EXEMPTED ACTIVITIES

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu,ft³,lbs, tons;yd³,etc)	Fuel Type
1 NA							HR. YR	
2							HR. YR.	
3							HR. YR	
4							HR YR	
5							HR YR.	
6							HR YR	
7.							HR YR	
8							HR YR	
9							HR YR	
10							HR YR	
11							HR YR	
12							HR YR	
13							HR YR	
14							HR. YR	
15.							HR. YR	

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.)____________________
   Submit information for each unit as an attachment

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
1 Railcar Unload to Hopper - Below Grade	1 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 055 lbs/hr	AP-42 Section 13 2.4 "Aggregate Handling" 2% moisture content and 1 3 MPH wind speed (Low-end of Equation 13.2.4-1 Range)
	1a. tons/yr	tons/yr	tons/yr	tons/yr	0.24 tons/yr	
2 Rail Hopper Conveyor	2 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 40 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	2a. tons/yr	tons/yr	tons/yr	tons/yr	1 75 tons/yr	
3 Rail Telescoping Conveyor	3. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.40 lbs/hr	AP-42 Table 11 19 2-2 "Conveyor Transfer Point Uncontrolled"
	3a tons/yr	tons/yr	tons/yr	tons/yr	1 75 tons/yr	
4 Aggregate Storage Piles	4. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.63 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	4a tons/yr	tons/yr	tons/yr	tons/yr	2.76 tons/yr	
5 HMA Aggregate Truck Loading	5 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.47 lbs/hr	AP-42 Section 13 2.4 "Aggregate Handling" 2% moisture content and 8 5 MPH wind speed
	5a tons/yr	tons/yr	tons/yr	tons/yr	1.67 tons/yr	
6 HMA RAP Storage Pile	6 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 20 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8 5 MPH wind speed plus inherent control of 70% from EPA EIIP Volume II, Chapter 3
	6a. tons/yr	tons/yr	tons/yr	tons/yr	0 87 tons/yr	
7 HMA Cold Aggregate Feed Bin Loading	7 lbs/hr	lbs/hr	lbs/hr	lbs/hr	1 09 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	7a tons/yr	tons/yr	tons/yr	tons/yr	4 76 tons/yr	
8 HMA Cold Aggregate Feed Bin Unloading	8. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.69 lbs/hr	AP-42 Table 11 19 2-2 "Conveyor Transfer Point Uncontrolled"
	8a tons/yr	tons/yr	tons/yr	tons/yr	3.02 tons/yr	
9 HMA Scalping Screen	9 lbs/hr	lbs/hr	lbs/hr	lbs/hr	5 75 lbs/hr	AP-42 Table 11 19 2-2 "Screening Uncontrolled"
	9a tons/yr	tons/yr	tons/yr	tons/yr	25.19 tons/yr	
10 HMA Scalping Screen Unloading to Scalping Screen Conveyor	10 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.69 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	10a tons/yr	tons/yr	tons/yr	tons/yr	3.02 tons/yr	
11 HMA Pug Mill	11 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 71 lbs/hr	AP-42 Table 11 19 2-2 "Conveyor Transfer Point Uncontrolled"
	11a tons/yr	tons/yr	tons/yr	tons/yr	3 10 tons/yr	
12 HMA Pug Mill Unload to Scale Conveyor	12 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 71 lbs/hr	AP-42 Table 11 19 2-2 "Conveyor Transfer Point Uncontrolled"
	12a. tons/yr	tons/yr	tons/yr	tons/yr	3 10 tons/yr	
Totals of Uncontrolled Emissions (1 - 12)	**lbs/hr**	**lbs/hr**	**lbs/hr**	**lbs/hr**	**11.79 lbs/hr**	
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**51.23tons/yr**	

*** If any one (1) of these process units, or combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)**

*** If all of these process units, individually and in combination, have an uncontrolled emission less than or equal to (≤) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
13 HMA Scale Conveyor to Slinger Conveyor	13 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 71 lbs/hr	AP-42 Table 11 19 2-2 "Conveyor Transfer Point Uncontrolled'
	13a tons/yr	tons/yr	tons/yr	tons/yr	3.10 tons/yr	
14 HMA RAP Bin Loading	14 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 20 lbs/hr	AP-42 Section 13 2 4 "Aggregate Handling" 2% moisture content and 8 5 MPH wind speed plus inherent control of 70% from EPA EIIP Volume II, Chapter 3
	14a tons/yr	tons/yr	tons/yr	tons/yr	0 87 tons/yr	
15 HMA RAP Crusher	15 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.76 lbs/hr	AP-42 Table 11 19.2-2 "Tertiary Crushing Uncontrolled"
	15a tons/yr	tons/yr	tons/yr	tons/yr	3 31 tons/yr	
16 HMA RAP Crusher Unloading to RAP Crusher Conveyor	16 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 42 lbs/hr	AP-42 Table 11 19 2-2 'Conveyor Transfer Point Uncontrolled'
	16a tons/yr	tons/yr	tons/yr	tons/yr	1 84 tons/yr	
17 HMA RAP Screen	17 lbs/hr	lbs/hr	lbs/hr	lbs/hr	3 50 lbs/hr	AP-42 Table 11 19 2-2 "Screening Uncontrolled"
	17a tons/yr	tons/yr	tons/yr	tons/yr	15 33 tons/yr	
18 HMA RAP Screen Unloading to RAP Transfer Conveyor	18. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 42 lbs/hr	AP-42 Table 11 19 2-2 'Conveyor Transfer Point Uncontrolled'
	18a tons/yr	tons/yr	tons/yr	tons/yr	1 84 tons/yr	
19 HMA RAP Transfer Conveyor to RAP Transfer Conveyor	19. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 42 lbs/hr	AP-42 Table 11 19 2-2 'Conveyor Transfer Point Uncontrolled'
	19a tons/yr	tons/yr	tons/yr	tons/yr	1.84 tons/yr	
20 HMA RAP Transfer Conveyor to Drum Mixer	20 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.42 lbs/hr	AP-42 Table 11 19 2-2 "Conveyor Transfer Point Uncontrolled"
	20a. tons/yr	tons/yr	tons/yr	tons/yr	1.84 tons/yr	
21 HMA Mineral Filler Silo Loading	21 lbs/hr	lbs/hr	lbs/hr	lbs/hr	18.00 lbs/hr	AP-42 Section 11 12 "Concrete Batching" Table 11.12-2 "Cement Unloading to Elevated Storage Silo"
	21a. tons/yr	tons/yr	tons/yr	tons/yr	18.92 tons/yr	
22 HMA Drum Mixer/Dryer	22 52.0 lbs/hr	22.0 lbs/hr	12 8 lbs/hr	23 2 lbs/hr	11200 lbs/hr	AP-42 Section 11 1 "Hot Mix Asphalt Plants" Table 11 1-3, -4, -7, -8
	22a. 227 8 tons/yr	96.4 tons/yr	56 1 tons/yr	101 6 tons/yr	49056 tons/yr	
23. HMA Drum Mixer Unloading to Asphalt Incline Conveyor	23 0.47 lbs/hr	lbs/hr	4.9 lbs/hr	lbs/hr	0.23 lbs/hr	AP-42 Section 11.1 "Hot Mix Asphalt Plants" Table 11 1-14
	23a. 2 1 tons/yr	tons/yr	21.4 tons/yr	tons/yr	1.03 tons/yr	
24. HMA Asphalt Silo Unloading to Trucks	24 0 54 lbs/hr	lbs/hr	1 7 lbs/hr	lbs/hr	0.21 lbs/hr	AP-42 Section 11.1 "Hot Mix Asphalt Plants" Table 11 1-14
	24a. 2 4 tons/yr	tons/yr	7 3 tons/yr	tons/yr	0.91 tons/yr	
Totals of Uncontrolled Emissions (13 - 24)	**53.0 lbs/hr**	**22.0 lbs/hr**	**19.3 lbs/hr**	**23.2 lbs/hr**	**11225 lbs/hr**	
	232.2 tons/yr	**96.4 tons/yr**	**84.7 tons/yr**	**101.6 tons/yr**	**49107 tons/yr**	

*** If any one (1) of these process units, or combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)**

*** If all of these process units, individually and in combination, have an uncontrolled emission less than or equal to (≤) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*		Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
25 HMA Asphalt Heater	25	0 20 lbs/hr	0.39 lbs/hr	0.027 lbs/hr	0 14 lbs/hr	0 039 lbs/hr	AP-42 1 3 (9/98) "Diesel" or AP-42 1 5 (7/08) "Natural Gas/Propane"
	25a.	0 90 tons/yr	1 71 tons/yr	0 12 tons/yr	0.61 tons/yr	0.17 tons/yr	
26 HMA Asphalt Cement Storage Tanks	26	lbs/hr	lbs/hr	0.035 lbs/hr	lbs/hr	lbs/hr	TANKS 4 0 9d
	26a.	tons/yr	tons/yr	0 15 tons/yr	tons/yr	tons/yr	
27. Haul Road Traffic	27	lbs/hr	lbs/hr	lbs/hr	lbs/hr	53 2 lbs/hr	AP-42 13 2 2 "Unpaved Road" (11/06). AP-42 13 2 1 "Paved Road" (01/11)
	27a	tons/yr	tons/yr	tons/yr	tons/yr	186 3 tons/yr	
28. HMA Yard	28.	0.14 lbs/hr	lbs/hr	0 44 lbs/hr	lbs/hr	lbs/hr	AP-42 Section 11.1.2.5
	28a	0 62 tons/yr	tons/yr	1.9 tons/yr	tons/yr	tons/yr	
Totals of Uncontrolled Emissions (25 - 28)		**0.35 lbs/hr**	**0.39 lbs/hr**	**0.50 lbs/hr**	**0.14 lbs/hr**	**53.25 lbs/hr**	
		1.51 tons/yr	**1.71 tons/yr**	**2.20 tons/yr**	**0.61 tons/yr**	**186.48 tons/yr**	

*** If any one (1) of these process units, or combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)**

*** If all of these process units, individually and in combination, have an uncontrolled emission less than or equal to (≤) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Based on current operations with emission controls OR requested operations with emission controls)

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
1 Railcar Unload to Hopper	1. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.055 lbs/hr	N/A	N/A
	1a. tons/yr	tons/yr	tons/yr	tons/yr	0.24 tons/yr		
2 Rail Hopper Conveyor	2. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.019 lbs/hr	Water spray or Moisture Content	95 33%
	2a. tons/yr	tons/yr	tons/yr	tons/yr	0.082 tons/yr		
3 Rail Telescoping Conveyor	3 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.019 lbs/hr	Water spray or Moisture Content	95 33%
	3a. tons/yr	tons/yr	tons/yr	tons/yr	0.082 tons/yr		
4 Aggregate Storage Pile	4 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 63 lbs/hr	N/A	N/A
	4a. tons/yr	tons/yr	tons/yr	tons/yr	2 76 tons/yr		
5 HMA Aggregate Truck Loading	5 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 47 lbs/hr	N/A	N/A
	5a. tons/yr	tons/yr	tons/yr	tons/yr	1.67 tons/yr		
6. HMA RAP Storage Pile	6 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0 20 lbs/hr	N/A	N/A
	6a. tons/yr	tons/yr	tons/yr	tons/yr	0.20 tons/yr		
7 HMA Cold Aggregate Feed Bin Loading	7 lbs/hr	lbs/hr	lbs/hr	lbs/hr	1 09 lbs/hr	N/A	N/A
	7a. tons/yr	tons/yr	tons/yr	tons/yr	1.09 tons/yr		
8. HMA Cold Aggregate Feed Bin Unloading	8 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.032 lbs/hr	Water spray or Moisture Content	95.33%
	8a. tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
9. HMA Scalping Screen	9. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.51 lbs/hr	Water spray or Moisture Content	91.20%
	9a. tons/yr	tons/yr	tons/yr	tons/yr	0.51 tons/yr		
10 HMA Scalping Screen Unloading to Scalping Screen Conveyor	10. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.032 lbs/hr	Water spray or Moisture Content	95.33%
	10a. tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
11. HMA Pug Mill	11 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.033 lbs/hr	Water spray or Moisture Content	95.33%
	11a. tons/yr	tons/yr	tons/yr	tons/yr	0.033 tons/yr		
12. HMA Pug Mill Unload to Scale Conveyor	12. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.033 lbs/hr	Water spray or Moisture Content	95.33%
	12a. tons/yr	tons/yr	tons/yr	tons/yr	0.033 tons/yr		
Totals of Controlled Emissions (1 - 12)	**lbs/hr**	**lbs/hr**	**lbs/hr**	**lbs/hr**	**3.11 lbs/hr**		
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**6.75 tons/yr**		

1 Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc)
Unit 2, 3, 8-12 – Control efficiency based on AP-42 emission factors [1-(controlled/uncontrolled)]
Submit information for each unit as an attachment

2 Explain and give estimated amounts of any Fugitive Emission associated with facility processes ______

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Based on current operations with emission controls OR requested operations with emission controls)

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
13 HMA Scale Conveyor to Slinger Conveyor	13 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.033 lbs/hr	Water spray or Moisture Content	95 33%
	13a. tons/yr	tons/yr	tons/yr	tons/yr	0.033 tons/yr		
14 HMA RAP Bin Loading	14 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.20 lbs/hr	N/A	N/A
	14a tons/yr	tons/yr	tons/yr	tons/yr	0.20 tons/yr		
15 HMA RAP Crusher	15 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.17 lbs/hr	Water spray or Moisture Content	77 78%
	15a tons/yr	tons/yr	tons/yr	tons/yr	0.17 tons/yr		
16 HMA RAP Crusher Unloading to RAP Crusher Conveyor	16. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.020 lbs/hr	Water spray or Moisture Content	95.33%
	16a tons/yr	tons/yr	tons/yr	tons/yr	0.020 tons/yr		
17 HMA RAP Screen	17 lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.31 lbs/hr	Water spray or Moisture Content	91 20%
	17a tons/yr	tons/yr	tons/yr	tons/yr	0.31 tons/yr		
18 HMA RAP Screen Unloading to RAP Transfer Conveyor	18 lbs/hr	22 0 lbs/hr	12.8 lbs/hr	23 2 lbs/hr	0.020 lbs/hr	Water spray or Moisture Content	95 33%
	18a. tons/yr	24 8 tons/yr	14 4 tons/yr	26 1 tons/yr	0.020 tons/yr		
19 HMA RAP Transfer Conveyor to RAP Transfer Conveyor	19 lbs/hr	lbs/hr	4 9 lbs/hr	lbs/hr	0.020 lbs/hr	Water spray or Moisture Content	95 33%
	19a tons/yr	tons/yr	5 5 tons/yr	tons/yr	0.020 tons/yr		
20. HMA RAP Transfer Conveyor to Drum Mixer	20. lbs/hr	lbs/hr	1 66 lbs/hr	lbs/hr	0 020 lbs/hr	Water spray or Moisture Content	95.33%
	20a tons/yr	tons/yr	1 87 tons/yr	tons/yr	0 020 tons/yr		
21 HMA Mineral Filler Silo Loading	21. lbs/hr	0 39 lbs/hr	0 027 lbs/hr	0.14 lbs/hr	0 18 lbs/hr	Baghouse	99%
	21a. tons/yr	1 71 tons/yr	0 12 tons/yr	0.61 tons/yr	0 043 tons/yr		
22 HMA Drum Mixer/Dryer	22. 52.0 lbs/hr	22 0 lbs/hr	12 8 lbs/hr	23 2 lbs/hr	13 2 lbs/hr	Baghouse	99.88%
	22a. 52.0 tons/yr	22.0 tons/yr	12.8 tons/yr	23 2 tons/yr	13 2 tons/yr		
23 HMA Drum Mixer Unloading to Asphalt Incline Conveyor	23 0.47 lbs/hr	lbs/hr	4 87 lbs/hr	lbs/hr	0 23 lbs/hr	N/A	N/A
	23a. 0.47 tons/yr	tons/yr	4 87 tons/yr	tons/yr	0.23 tons/yr		
24 HMA Asphalt Silo Unloading to Trucks	24. 0.54 lbs/hr	lbs/hr	1 66 lbs/hr	lbs/hr	0.21 lbs/hr	N/A	N/A
	24a. 0.54 tons/yr	tons/yr	1 66 tons/yr	tons/yr	0.21 tons/yr		
Totals of Controlled Emissions (13 - 24)	**53.01 lbs/hr**	**22.00 lbs/hr**	**19.34 lbs/hr**	**23.20 lbs/hr**	**14.61 lbs/hr**		
	53.01 tons/yr	**22.00 tons/yr**	**19.34 tons/yr**	**23.20 tons/yr**	**14.47 tons/yr**		

1 Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.)
Unit 13, 15-20 – Control efficiency based on AP-42 emission factors [1-(controlled/uncontrolled)], Unit 21 % control efficiency is conservative estimate for silo baghouse filter. Unit 22 – % control efficiency is controlled/uncontrolled emission factors from AP-42 Section 11.1.
Submit information for each unit as an attachment

2 Explain and give estimated amounts of any Fugitive Emission associated with facility processes ________

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Authority-to-Construct Permits (20.11.41 NMAC)

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Based on current operations with emission controls OR requested operations with emission controls)

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
25. HMA Asphalt Heater	25 0.20 lbs/hr	0.39 lbs/hr	0 027 lbs/hr	0 14 lbs/hr	0.039 lbs/hr	N/A	N/A
	25a. 0.90 tons/yr	1.71 tons/yr	0.12 tons/yr	0 61 tons/yr	0 17 tons/yr		
26 HMA Asphalt Cement Storage Tanks	26. lbs/hr	lbs/hr	0 029 lbs/hr	lbs/hr	lbs/hr	N/A	N/A
	26a tons/yr	tons/yr	0.13 tons/yr	tons/yr	tons/yr		
27 Haul Road Traffic	27 lbs/hr	lbs/hr	lbs/hr	lbs/hr	8 57 lbs/hr	Unpaved Roads-Surfactants or equivalent, Paved - None	Unpaved - 90% Paved – 0 0%
	27a. tons/yr	tons/yr	tons/yr	tons/yr	9 97 tons/yr		
28 HMA Yard	28. 0 14 lbs/hr	lbs/hr	0.44 lbs/hr	lbs/hr	lbs/hr	N/A	N/A
	28a. 0 14 tons/yr	tons/yr	0 44 tons/yr	tons/yr	tons/yr		
Totals of Controlled Emissions (25 - 28)	**0.35 lbs/hr**	**0.39 lbs/hr**	**0.50 lbs/hr**	**0.14 lbs/hr**	**8.61 lbs/hr**		
	1.04 tons/yr	**1.71 tons/yr**	**0.71 tons/yr**	**0.61 tons/yr**	**10.14tons/yr**		

1 Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.)
Unit 27 "Unpaved Roads" – New Mexico Environmental Department Air Quality Bureau default control efficiency for surfactants or equivalent.
Submit information for each unit as an attachment

2 Explain and give estimated amounts of any Fugitive Emission associated with facility processes ____

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

**<u>TOXIC EMISSIONS</u>

VOLATILE, HAZARDOUS, & VOLATILE HAZARDOUS AIR POLLUTANT EMISSION TABLE

Product Categories (Coatings, Solvents, Thinners, etc.)	Volatile Organic Compound (VOC), Hazardous Air Pollutant (HAP), or Volatile Hazardous Air Pollutant (VHAP) Primary To The Representative As Purchased Product	Chemical Abstract Service Number (CAS) Of VOC, HAP, Or VHAP From Representative As Purchased Product	VOC, HAP, Or VHAP Concentration Of Representative As Purchased Product (pounds/gallon, or %)	1. How were Concentrations Determined (CPDS, MSDS, etc.)	Total Product Purchases For Category	(-)	Quantity Of Product Recovered & Disposed For Category	(=)	Total Product Usage For Category
I NA	NA	NA	NA	NA	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
II					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
III					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
IV					lbs/yr	(-)	lbs/yr	( )	lbs/yr
					gal/yr		gal/yr		gal/yr
V					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
VI					lbs/yr	(-)	lbs/yr	(-)	lbs/yr
					gal/yr		gal/yr		gal/yr
VII					lbs/yr	(-)	lbs/yr	( )	lbs/yr
					gal/yr		gal/yr		gal/yr
VIII					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
IX					lbs/yr	(-)	lbs/yr	(-)	lbs/yr
					gal/yr		gal/yr		gal/yr
X					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
TOTAL >>>>>>>					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr

1. Basis for percent (%) determinations (<u>C</u>ertified <u>P</u>roduct <u>D</u>ata <u>S</u>heets, <u>M</u>aterial <u>S</u>afety <u>D</u>ata <u>S</u>heets, etc.). Submit, as an attachment, information on one (1) product from each Category listed above which best represents the average of all the products purchased in that Category. Copy this Table if additional space is needed (begin numbering with XI., XII., etc.)

****NOTE: A REGISTRATION IS REQUIRED, AT MINIMUM, FOR ANY AMOUNT OF HAP OR VHAP EMISSION. A PERMIT MAY BE REQUIRED FOR THESE EMISSIONS, DETERMINED ON A CASE-BY-CASE EVALUATION.**

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

MATERIAL AND FUEL STORAGE TABLE

(Tanks, barrels, silos, stockpiles, etc.) Copy this table if additional space is needed (begin numbering with 6., 7., etc.)

Storage Equipment	Product Stored	Capacity (bbls - tons gal - acres,etc)	Above or Below Ground	Construction (welded, riveted) & Color	Install Date	Loading Rate	Offloading Rate	True Vapor Pressure	Control Equipment	Seal Type	% Eff.
T1	Hot oil Asphalt Cement	30,000 gal	Above	Welded - Silver	TBD	5000 gal 5,206,074 gal /YR	2603 gal/HR 5,206,074 gal /YR	0 0050 Psia	NA	NA	NA
T2	Hot oil Asphalt Cement	30,000 gal.	Above	Welded - Silver	TBD	5000 gal 5,206,074 gal /YR	2603 gal/HR 5,206,074 gal /YR	0 0050 Psia	NA	NA	NA
T3	Burner Fuel Oil	10,000 gal.	Above	Welded - White	TBD	3000 gal 360,000 gal/YR	360 gal/HR 360,000 gal/ YR	0 00089 Psia	NA	NA	NA
T4	Burner Fuel Oil	10,000 gal	Above	Welded - White	TBD	3000 gal 360,000 gal/YR	360 gal/HR 360,000 gal/ YR	0 00089 Psia	NA	NA	NA
T5	Diesel Fuel	10,000 gal	Above	Welded - White	TBD	3000 gal 170,820 gal/ YR	19 5 gal/HR 170,820 gal/ YR	0 00089 Psia	NA	NA	NA
1	Cold Aggregate Storage Piles	2.5 Acres	Above	NA	TBD	133 3 tons/HR 1,168,000 ton/ YR	133.3 tons/HR 1,168,000 ton/ YR	NA	NA	NA	NA
2.	RAP Storage Piles	1.0 Acres	Above	NA	TBD	140 tons/HR 280,000 ton/ YR	140 tons/HR 280,000 ton/ YR	NA	NA	NA	NA

1. **Basis for Loading/Offloading Rate** (Manufacturers data, Field Observation/Test, etc.) Submit information for each unit as an attachment
   Delivery truck capacity for asphalt cement and fuel deliveries

2. **Basis for Control Equipment % Efficiency** (Manufacturers data, Field Observation/Test, AP-42, etc.) Submit information for each unit as an attachment
   No controls for storage equipment

Applicati… for Air Pollutant Sources in Bernali… County
Source Registration (…11.40 NMAC) and Construction Per…ts (20.11.41 NMAC)

STACK AND EMISSION MEASUREMENT TABLE

If any equipment from the Process Equipment Table (Page 2) is also listed in this Stack Table, use the same numbered line for the Process Equipment unit on both Tables to show the association between the Process Equipment and its Stack. Copy this table if additional space is needed (begin numbering with 6., 7., etc.).

Process Equipment	Pollutant (CO,NOx,TSP, Toluene,etc)	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction	Emission Measurement Equipment Type	Range-Sensitivity-Accuracy-
21. Mineral Filler Silo Baghouse	PM	Baghouse	99%	62.5 ft / 9.4 in	Ambient	39 fps / Horizontal	NA	NA
22. Drum Mixer Baghouse	CO, NOx, SO2, VOC, PM	Baghouse	99.88%	25 ft / 4.5 ft	275° F	65 fps / Vertical	NA	NA
25. HMA Asphalt Heater	CO, NOx, SO2, VOC, PM	NA	NA	8.76 ft / 3.5 in	600° F	17 fps / Vertical	NA	NA

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.) Submit information for each unit as an attachment
Unit 21 – % control efficiency is conservative estimate for silo baghouse filter; Unit 22 – % control efficiency is controlled/uncontrolled emission factors from AP-42 Section 11.1

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting registration or permit.

Signed this 23rd day of February, 20 18

Karl Pergola
Print Name

Managing Member
Print Title

Signature

Attachment A
Facility Process Flow Diagrams and Plot Plan

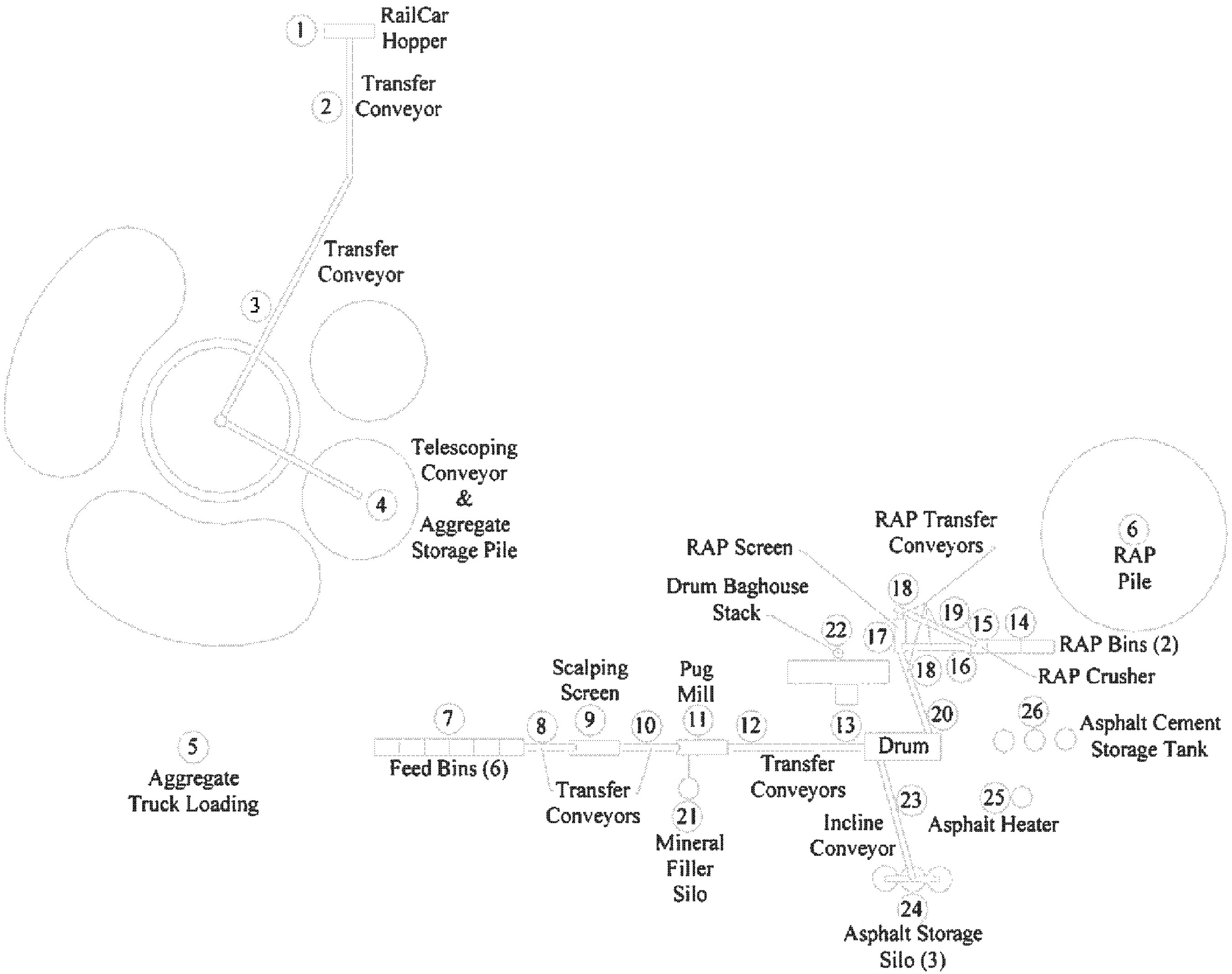

Figure A-1: NM Terminal's HMA Process Flow

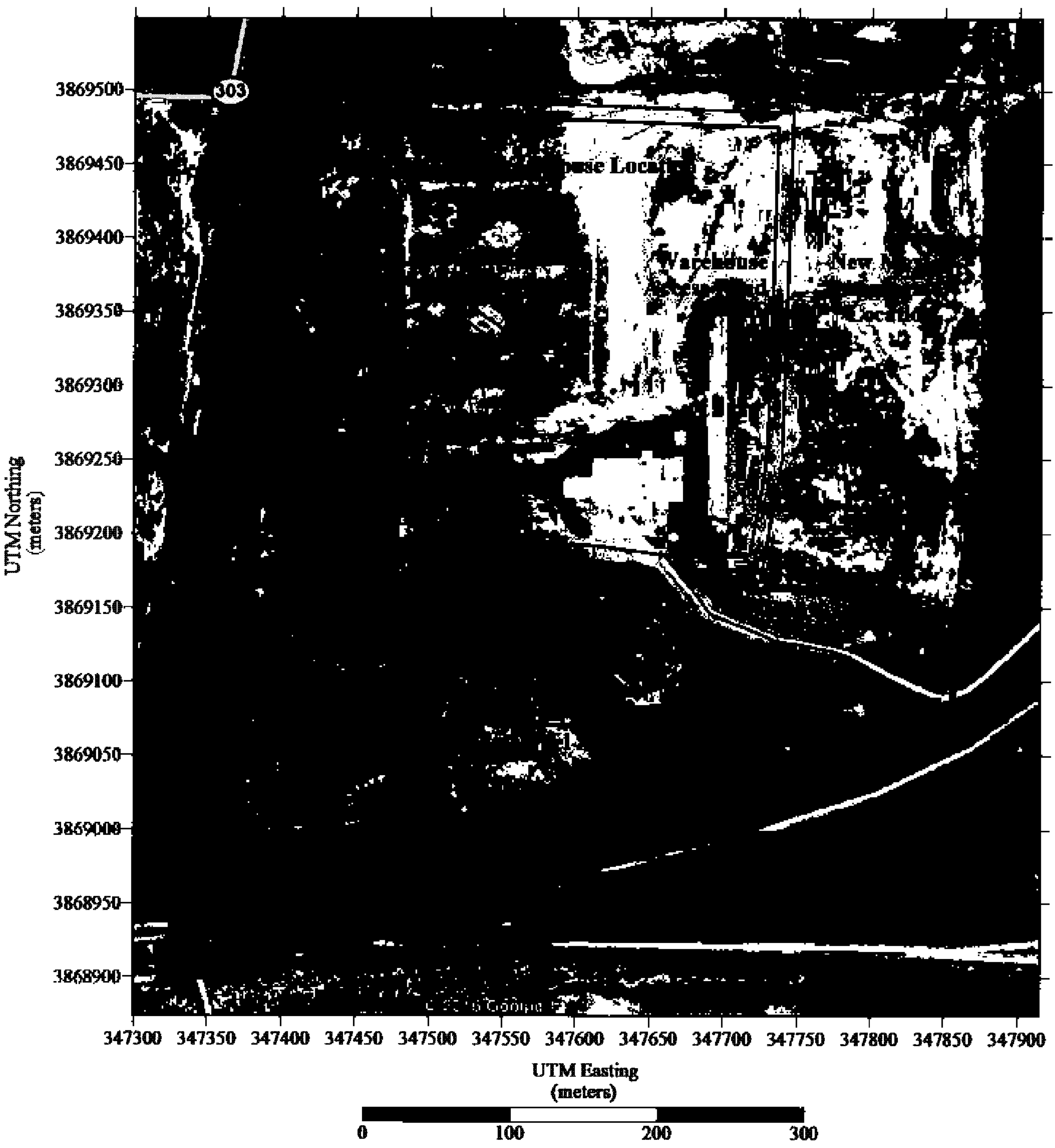

Figure A-2: NM Terminal's Broadway HMA Plant Layout

Attachment B
Emissions Calculations

Pre-Control Particulate Emission Rates

MATERIAL HANDLING ($PM_{2.5}$, PM_{10}, AND TSP)

To estimate material handling pre-control particulate emissions rates for crushing, screening, pug mill and conveyor transfer operations, emission factors were obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Aug. 2004, Section 11.19.2, Table 11.19.2-2. To determine missing $PM_{2.5}$ emission factors, the ratio of 0.35/0.053 from $PM_{10}/PM_{2.5}$ *k* factors found in AP-42 Section 13.2.4 (11/2006) were used.

To estimate material handling pre-control for determining the maximum hourly and annual particulate emission rates for railcar aggregate unloading operations to the underground hopper, used emission equation 1 obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where k (TSP – 0.74, PM_{10} = 0.35, $PM_{2.5}$ – 0.053). Wind speed input was based on AP-42 Section 13.2.4 Equation 1, lowest end value wind speed range of 1.3 miles per hour. The justification for using a wind speed of 1.3 miles per hour is for underground hopper loading which reduces the potential dust generation by reducing direct influence to wind. The NMED default moisture content of 2 percent was input for material moisture content.

To estimate material handling pre-control particulate emission rates for aggregate handling operations (aggregate transfer conveyors/ stacker conveyor to pile/ loading off-site aggregate trucks/ loading feed bins), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the NMED default moisture content of 2 percent.

To estimate material handling pre-control particulate emission rates for RAP handling operations (RAP pile/ loading feed bins), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the NMED default moisture content of 2 percent. Additionally, the emission factors are reduced further because of the inherent properties of RAP with a coating of asphalt which captures small particles within the material. Based on EPA documents "EIIP Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70% (see Attachment C). The equation in AP-42 Section 13.2.4 was multiplied by 0.3 to account for the 70% reduction in emissions due to RAP material properties.

The asphalt will contain 1.5% mineral filler. Pre-control particulate emissions rates for mineral filler silo loading was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary

Point and Area Sources, Fifth Edition, Section 11.12 (06/06), Table 11.12-2 "Cement Unloading to Elevated Storage Silo". To determine missing $PM_{2.5}$ emission factors the ratio of 0.995/0.050 from $TSP/PM_{2.5}$ uncontrolled emission equations found in AP-42 Section 11.12 (06/06), Table 11.12-3 "Cement Unloading to Elevated Storage Silo" was used.

Maximum hourly asphalt production is 400 tons per hours. Virgin aggregate/ RAP/Mineral filler/Asphalt cement ratios used in estimating material handling particulate emission rates is equal to 57.5/35.0/1.5/6.0. These ratios are estimates and ratios may change with mix requirements, these are not requested permit conditions. Maximum hourly railcar aggregate unloading is 133.3 tons per hour and aggregate truck loading is equal to 4 trucks or 100 tons per hour. Uncontrolled annual emissions for tons per year (tpy) were calculated assuming operation for 8760 hours per year.

Aggregate Railcar Unloading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(1.3/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(1.3/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(1.3/5)^{1.3}$ / $(2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00041 lbs/ton;

E_{PM10} (lbs/ton) = 0.00019 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00003 lbs/ton

Aggregate Railcar Transfer Conveyors, Storage Piles, and Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00472 lbs/ton;

E_{PM10} (lbs/ton) = 0.00223 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00034 lbs/ton

RAP Storage Pile and Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$ x 0.3

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$ x 0.3

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$ x 0.3

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$ x 0.3

E_{TSP} (lbs/ton) = 0.00142 lbs/ton;

E_{PM10} (lbs/ton) = 0.00067 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00010 lbs/ton

AP-42 Emission Factors:

All Bin Unloading and Conveyor Transfers = Uncontrolled Conveyor Transfer Point Emission Factor
Crushing – Uncontrolled Tertiary Crushing Emission Factor
Screening – Uncontrolled Screening Emission Factor
Pug Mill – Uncontrolled Conveyor Transfer Point Emission Factor

Material Handling Emission Factors:

Process Unit	TSP Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Uncontrolled Crushing	0.00540	0.00240	0.00036
Uncontrolled Screening	0.02500	0.00870	0.00132
Uncontrolled Screen and Crusher Unloading, Pug Mill Loading and Unloading, Feed Bin Unloading, and Conveyor Transfers	0.00300	0.00110	0.00017
Uncontrolled Railcar Unloading	0.00041	0.00019	0.00003
Uncontrolled Aggregate Storage Piles, Aggregate Feeder Loading	0.00472	0.00223	0.00034
Uncontrolled RAP Storage Piles, RAP Feeder Loading	0.00142	0.00067	0.00010

AP-42 Section 11.12 Table 11.12-2 Uncontrolled Emission Factors:

Process Unit	TSP Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Mineral Filler Silo Loading	0.72	0.46	0.036

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) = Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * 8760 \text{ (hrs/year)}}{2000 \text{ lbs/ton}}$$

Table B-1 Pre-Controlled Material Handling Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
1	Railcar Unload to Hopper	133.3	0.055	0.24	0.026	0.11	0.0039	0.017
2	Rail Hopper Conveyor	133.3	0.40	1.75	0.15	0.64	0.023	0.099
3	Rail Telescoping Conveyor	133.3	0.40	1.75	0.15	0.64	0.023	0.099
4	Aggregate Storage Pile	133.3	0.63	2.76	0.094	0.41	0.014	0.062
5	Aggregate Truck Loading	100.0	0.47	1.67	0.22	0.79	0.034	0.12
6	RAP Storage Piles	140.0	0.20	0.87	0.094	0.41	0.014	0.062
7	Feed Bin Loading	230.0	1.09	4.76	0.51	2.25	0.078	0.34
8	Feed Bin Unloading	230.0	0.69	3.02	0.25	1.11	0.039	0.17
9	Scalping Screen	230.0	5.75	25.19	2.00	8.76	0.30	1.33
10	Scalping Screen Unloading	230.0	0.69	3.02	0.25	1.11	0.039	0.17
11	Pug Mill Load	236.0	0.71	3.10	0.26	1.14	0.040	0.18
12	Pug Mill Unload	236.0	0.71	3.10	0.26	1.14	0.040	0.18
13	Scale Conveyor to Slinger Conveyor	236.0	0.71	3.10	0.26	1.14	0.040	0.18
14	RAP Bin Loading	140.0	0.20	0.87	0.09	0.41	0.014	0.062
15	RAP Crusher	140.0	0.76	3.31	0.34	1.47	0.050	0.22
16	RAP Crusher Unloading	140.0	0.42	1.84	0.15	0.67	0.024	0.10
17	RAP Screen	140.0	3.50	15.33	1.22	5.33	0.18	0.81
18	RAP Screen Unloading	140.0	0.42	1.84	0.15	0.67	0.024	0.10
19	RAP Transfer Conveyor	140.0	0.42	1.84	0.15	0.67	0.024	0.10
20	RAP Transfer Conveyor	140.0	0.42	1.84	0.15	0.67	0.024	0.10
21	Mineral Filler Silo Loading	25.0 Max 6.0 Ave.	18.00	18.92	11.50	12.09	0.90	0.95
		TOTALS	36.63	100.12	18.29	41.66	1.94	5.46

HAUL TRUCK TRAVEL

Haul truck travel emissions were estimated using AP-42, Section 13.2.1 (ver.01/11) "Paved Roads" emission equation and AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. The haul in and out of the plant from will be paved. The haul road around the plant will be unpaved but controlled with surfactants and/or millings and watering. Haul trucks will be used to deliver asphalt cement, mineral filler, RAP, and transport asphalt product. Table B-2 summarizes the emission rate for each haul truck category.

Paved Roads – HMA Plant

AP-42, Section 13.2.1 (ver.01/11) "Paved Roads"

E k(sL)^0.91*(W)^1.02*[1-P/4N] *Annual emissions only include p factor*

k TSP	0.011			
k PM10	0.0022			
k PM25	0.00054			
sL	0.6	road surface silt loading (g/m2) AP-42 Table 13.2.1-2 "Ubiquitous Baseline < 500 ADT		
P = days with precipitation over 0.01 inches	60			
N = number of days in averaging period	365			
Truck weight	27.5	tons		
Haul Truck VMT Paved In	533.1	meter/one way vehicle	0.66266	miles/vehicle
Max. Mineral Filler Truck/hr	0.2	truck/hr		
Max. Asphalt Cement Truck/hr	1.0	truck/hr		
Max. Asphalt Truck/hr	16.0	truck/hr		
Max Aggregate Truck/hr	4.0	truck/hr		
Max RAP Truck/hr	5.6	truck/hr		
Max. Total Truck into Site	**26.8**	**truck/hr**		

	Hourly Max VMT		Annual VMT	
HMA Haul Truck VMT Paved In	15.11	miles/hr	30217	miles/yr
Aggregate Haul Truck VMT Paved In	2.65	miles/hr	18766	miles/yr

		TSP Uncontrolled		
Max. Truck Emissions Paved Road	3.6062	lbs/hr	4.7690	tons/yr
		PM10 Uncontrolled		
	0.7212	lbs/hr	0.9538	tons/yr
		PM2.5 Uncontrolled		
	0.1770	lbs/hr	0.2341	tons/yr

Unpaved Roads – HMA Plant

AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads"

$$E = k * (s/12)^a * (W/3)^b * [(365 - p)/365] * VMT$$

Where k – constant PM2.5 = 0.15
PM10 = 1.5
TSP – 4.9
s = % silt content (Table 13.2.2-1, "Sand and Gravel" 4.8%)
W – mean vehicle weight (27.5 tons)
p = number of days with at least 0.01 in of precip. (NMED Policy = 60 days)
a = Constant PM2.5 = 0.9
PM10 – 0.9
TSP = 0.7
b – Constant PM2.5 = 0.45
PM10 = 0.45
TSP – 0.45

Trucks per Hour
Total Trucks Entrance – 26.8 trucks per hour average
Mineral Filler – 0.2 truck per hour average
Asphalt Cement = 1.0 truck per hour average
Asphalt = 16.0 truck per hour average
Aggregate– 4.0 truck per hour average
RAP – 5.6 truck per hour average

VMT =Vehicle Miles Traveled

Mineral Filler	Unpaved – 0.26246 miles RT; 0.06299 VMT/Hr; 551.8 VMT/Yr
Asphalt Cement	Unpaved – 0.26246 miles RT; 0.25196 VMT/Hr; 2,207.2 VMT/Yr
Asphalt Truck	Unpaved – 0.26246 miles RT; 4.19941 VMT/Hr; 36,786.8 VMT/Yr
Aggregate Truck	Unpaved – 0.17804 miles RT; 0.71216 VMT/Hr; 6,238.5 VMT/Yr
RAP Truck	Unpaved 0.33335 miles RT; 1.86676 VMT/Hr; 16,352.8 VMT/Yr

Reduction in emissions due to precipitation was only accounted for in the annual emission rate. Particulate emission rate per vehicle mile traveled for each particle size category is:

Hourly Emission Rate Factor
TSP – 6.9925 lbs/VMT
PM10 = 1.7821 lbs/VMT
PM2.5 – 0.1782 lbs/VMT

Annual Emission Rate Factor
TSP – 5.8430 lbs/VMT
PM10 – 1.4892 lbs/VMT
PM2.5 = 0.1489 lbs/VMT

Table B-2: Pre-Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
Haul Truck Paved HMA	15.11 miles/hr; 30,217 miles/yr	3.07	2.94	0.61	0.59	0.15	0.14
Haul Truck Paved Aggregate	2.65 miles/hr; 18,766 miles/yr	0.54	1.83	0.11	0.37	0.026	0.090
Mineral Filler Unpaved HMA	0.06299 miles/hr; 551.8 miles/yr	0.44	1.61	0.11	0.41	0.011	0.041
Asphalt Cement Unpaved HMA	0.25196 miles/hr; 2207.2 miles/yr	1.76	6.45	0.45	1.64	0.045	0.16
Asphalt Truck Unpaved HMA	4.19941 miles/hr; 36,786.8 miles/yr	29.36	107.47	7.48	27.39	0.75	2.74
Aggregate Truck Unpaved	0.71216 miles/hr; 6238.5 miles/yr	4.98	18.23	1.27	4.65	0.13	0.46
RAP Truck Unpaved HMA	1.86676 miles/hr; 16,352.8 miles/yr	13.05	47.78	3.33	12.18	0.33	1.22
	Total	53.21	186.30	13.36	47.22	1.44	4.86

DRUM MIX HOT MIX ASPHALT PLANT

Drum mix hot mix asphalt plant uncontrolled emissions were estimated using AP-42, Section 11.1 "Hot Mix Asphalt Plants" (revised 03/04), tables 11.1.3, 7, 8 and 14 emission equations. The drum dryer is permitted to combust either fuel oil or natural gas/propane. The worst-case emission factor from either combusting fuel oil or natural gas/propane was used to estimate emission rates. Hourly emission rates are based on maximum hourly asphalt production (400 tph) and maximum annual emission rates are based on operating 8760 hours per year. To determine missing $PM_{2.5}$ emission factor the sum of uncontrolled filterable from Table 11.1-4 plus uncontrolled organic and inorganic condensable in Table 11.1-3 was used. Silo filling and plant loadout emission factors were calculated using the default value of –0.5 for asphalt volatility and a tank temperature setting of 325° F for HMA mix temperature. Yard emissions were found in AP-42 Section 11.1.2.5. TOC emission equation is 0.0011 lbs/ton of asphalt produced and CO is equal to the TOC emission rate times 0.32. Percent sulfur content of the burner fuel will not exceed 0.5 percent.

Emissions of VOCs (TOCs) from the asphalt cement storage tanks were determined with EPA's TANK 4.0.9d program and the procedures found in EPA's "Emission Factor Documentation for AP-42 Section 11.1 (12/2000) Section 4.4.5" for input to the TANK program.

AP-42 Section 11.1 Table 11.1-3, 7, 8, and 14 Uncontrolled Emission Factors:

Process Unit	Pollutant	Emission Factor (lbs/ton)
Drum Mixer	NO_X	0.055
	CO	0.13
	VOC	0.032
	SO_2	0.058
	TSP	28.0
	PM_{10}	6.5
	$PM_{2.5}$	1.565
Drum Unloading	CO	0.001179981
	TOC	0.012186685
	TSP	0.000585889
	PM_{10}	0.000585889
	$PM_{2.5}$	0.000585889
Silo Loadout	CO	0.001349240
	TOC	0.004158948
	TSP	0.000521937
	PM_{10}	0.000521937
	$PM_{2.5}$	0.000521937
Yard	CO	0.000352
	TOC	0.0011

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) = Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * 8760 \text{ (hrs/year)}}{2000 \text{ lbs/ton}}$$

Table B-3: Pre-Controlled Hot Mix Plant Emission Rates

Process Unit Number	Process Unit Description	Pollutant	Average Hourly Process Rate (tons/hour)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
22	Asphalt Drum Dryer	NO_X	400	22.0	96.4
		CO	400	52.0	227.8
		SO_2	400	23.2	101.6
		VOC	400	12.8	56.1
		TSP	400	11200	49056
		PM_{10}	400	2600	11388
		$PM_{2.5}$	400	626	2742
23	Drum Mixer Unloading	CO	400	0.47	2.07
		TOC	400	4.87	21.35
		TSP	400	0.23	1.03
		PM_{10}	400	0.23	1.03
		$PM_{2.5}$	400	0.23	1.03
24	Asphalt Silo Unloading	CO	400	0.54	2.36
		TOC	400	1.66	7.29
		TSP	400	0.21	0.91
		PM_{10}	400	0.21	0.91
		$PM_{2.5}$	400	0.21	0.91
26	Asphalt Cement Storage Tanks	TOC	60,000 gallons	0.035	0.15
28	YARD	CO	400	0.14	0.62
		TOC	400	0.44	1.93

Controlled Particulate Emission Rates

No controls or emission reductions for combustion emissions (NO_X, CO, SO_2, VOC, or TOC) are proposed for the drum dryer (Units 22), unloading the drum mixer (Unit 23), asphalt silos (Unit 24), asphalt heater (Units 25) with the exception of limiting annual production rates for production equipment.

CONTROLLED MATERIAL HANDLING ($PM_{2.5}$, PM_{10}, AND TSP)

No fugitive dust controls or emission reductions are proposed for the railcar aggregate unloading, aggregate truck loading, aggregate/RAP storage piles, or loading of the cold aggregate/RAP feed bins (Units 1, 4, 5, 6, 7, 14) with the exception of limiting annual production rates.

Fugitive dust control for the aggregate plant transfer conveyor (Units 2, 3) will be controlled with material moisture content and/or enclosure. Fugitive dust control for unloading the cold aggregate feed bins onto the cold aggregate feed bin conveyor (Unit 8) will be controlled, as needed, with enclosures and/or water sprays at the exit of the feed bins. Fugitive dust control for the conveyor transfer from the scalping screen unloading to the scalping screen conveyor (Unit 10) or RAP screen unloading (Unit 18) to the RAP transfer conveyors (Unit 19, 20) will be controlled with material moisture content and/or enclosure. Fugitive dust control for loading and unloading the pug mill (Units 11, 12) will be controlled, as needed, with enclosures and/or water sprays. Fugitive dust control for the HMA plant transfer conveyor (Unit 13) will be controlled with material moisture content and/or enclosure. Fugitive dust control for unloading the RAP crusher onto the RAP crusher conveyor (Unit 16) will be controlled, as needed, with enclosures and/or water sprays at the exit of the RAP crusher. It is estimated that these methods will control to an efficiency of 95.3 percent per AP42 Section 11.19.2, Table 11.19.2-2. Additional emission reductions include limiting annual production rates.

Fugitive dust control for the RAP crusher (Unit 15) will be controlled, as needed, with enclosures and/or water sprays. It is estimated that these methods will control to an efficiency of 77.8 percent for crushing operations per AP42 Section 11.19.2, Table 11.19.2-2. Additional emission reductions include limiting annual production rates.

Fugitive dust control for the scalping screen (Unit 9), and RAP screen (Unit 17) will be controlled, as needed, with enclosures and/or water sprays. It is estimated that these methods will control to an efficiency of 91.2 percent for screening operations per AP42 Section 11.19.2, Table 11.19.2-2. Additional emission reductions include limiting annual production rates.

Particulate emissions from loading the mineral filler silo (Unit 21) will be controlled with a baghouse dust collector on the exhaust vent. This dust collector consists of filter bags and is passive with no fan. It functions only when material is loaded into the silo. The filter bags are cleaned by air pulses at set intervals. Baghouse fines are dropped back into the silo. It is estimated that this method will control to an efficiency of 99 percent or greater based on information from filter bag specifications. Additional emission reductions include limiting annual production rates.

Particulate emissions from the drum dryer/mixer (Unit 22) will be controlled with a baghouse dust collector on the exhaust vent. It is estimated that this method will control to an efficiency of 99.88 percent per AP42 Section 11.1, Table 11.1-3 "controlled emission factor vs. uncontrolled emission factor". Baghouse fines are returned to the drum dryer/mixer via a closed loop system. Additional emission reductions include limiting annual production rates.

No fugitive controls or emission reductions are proposed for unloading the drum dryer/mixer or asphalt silos (Units 23, 24) with the exception of limiting annual production rates. No fugitive controls are proposed for yard emissions (Unit 28) or asphalt storage tanks (Units 26).

To estimate material handling control particulate emissions rates for crushing, screening, pug mill and conveyor transfer operations, emission factors were obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Aug. 2004, Section 11.19.2, Table 11.19.2-2.

To estimate material handling pre-control for determining the maximum hourly and annual particulate emission rates for railcar aggregate unloading operations to the underground hopper, used emission equation 1 obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where k (TSP = 0.74, PM_{10} – 0.35, $PM_{2.5}$ – 0.053). Wind speed input was based on AP-42 Section 13.2.4 Equation 1, lowest end value wind speed range of 1.3 miles per hour. The justification for using a wind speed of 1.3 miles per hour is for underground hopper loading which reduces the potential dust generation by reducing direct influence to wind. The NMED default moisture content of 2 percent was input for material moisture content.

To estimate material handling pre-control particulate emission rates for aggregate handling operations (aggregate transfer conveyors/ stacker conveyor to pile/ loading off-site aggregate trucks/ loading feed bins), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP – 0.74, PM_{10} = 0.35, $PM_{2.5}$ – 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the NMED default moisture content of 2 percent.

To estimate material handling pre-control particulate emission rates for RAP handling operations (RAP pile/ loading feed bins), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the NMED default moisture content of 2 percent. Additionally, the emission factors are reduced further because of the inherent properties of RAP with a coating of asphalt which captures small particles within the material. Based on EPA documents "EIIP Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70%

(see Attachment C). The equation in AP-42 Section 13.2.4 was multiplied by 0.3 to account for the 70% reduction in emissions due to RAP material properties.

The asphalt will contain 1.5% mineral filler. Pre-control particulate emissions rates for mineral filler silo loading was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 11.12 (06/06), Table 11.12-2 "Cement Unloading to Elevated Storage Silo". To determine missing $PM_{2.5}$ emission factors the ratio of 0.995/0.050 from $TSP/PM_{2.5}$ uncontrolled emission equations found in AP-42 Section 11.12 (06/06), Table 11.12-3 "Cement Unloading to Elevated Storage Silo" was used.

Maximum hourly asphalt production is 400 tons per hours. Virgin aggregate/ RAP/Mineral filler/Asphalt cement ratios used in estimating material handling particulate emission rates is equal to 57.5/35.0/1.5/6.0. These ratios are estimates and ratios may change with mix requirements, these are not requested permit conditions. Maximum hourly railcar aggregate unloading is 133.3 tons per hour and aggregate truck loading is equal to 4 trucks or 100 tons per hour. Annual emissions in tons per year (tpy) were calculated assuming an annual production throughput of 800,000 tons of asphalt per year and 1,168,000 tons per year of aggregate material from railcar unloading.

Aggregate Railcar Unloading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = $k \times 0.0032 \times (U/5)^{1.3} / (M/2)^{1.4}$

E_{TSP} (lbs/ton) = $0.74 \times 0.0032 \times (1.3/5)^{1.3} / (2/2)^{1.4}$

E_{PM10} (lbs/ton) = $0.35 \times 0.0032 \times (1.3/5)^{1.3} / (2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = $0.053 \times 0.0032 \times (1.3/5)^{1.3} / (2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00041 lbs/ton;

E_{PM10} (lbs/ton) = 0.00019 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00003 lbs/ton

Aggregate Railcar Transfer Conveyors, Storage Piles, and Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = $k \times 0.0032 \times (U/5)^{1.3} / (M/2)^{1.4}$

E_{TSP} (lbs/ton) = $0.74 \times 0.0032 \times (8.5/5)^{1.3} / (2/2)^{1.4}$

E_{PM10} (lbs/ton) = $0.35 \times 0.0032 \times (8.5/5)^{1.3} / (2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = $0.053 \times 0.0032 \times (8.5/5)^{1.3} / (2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00472 lbs/ton;

E_{PM10} (lbs/ton) = 0.00223 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00034 lbs/ton

RAP Storage Pile and RAP Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$ x 0.3

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$ x 0.3

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$ x 0.3

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$ x 0.3

E_{TSP} (lbs/ton) = 0.00142 lbs/ton;

E_{PM10} (lbs/ton) = 0.00067 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00010 lbs/ton

AP-42 Emission Factors:

Feed Bin Unloading = Controlled Conveyor Transfer Point Emission Factor

Crusher = Controlled Tertiary Crusher Emission Factor

Screen = Controlled Screening Emission Factor

Transfer Conveyor = Controlled Conveyor Transfer Point Emission Factor

Scalping Screen Conveyor = Controlled Conveyor Transfer Point Emission Factor

Pug Mill = Controlled Conveyor Transfer Point Emission Factor

Pug Mill Conveyor = Controlled Conveyor Transfer Point Emission Factor

Material Handling Emission Factors:

Process Unit	TSP Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Feed Bin Unloading	0.00014	0.00005	0.000013
Controlled Crushing	0.00120	0.00054	0.00010
Controlled Screening	0.00220	0.00074	0.00005
Transfer Conveyor	0.00014	0.00005	0.000013
Controlled Screen Unloading and Pug Mill Loading and Unloading	0.00014	0.00005	0.000013
Uncontrolled Railcar Unloading	0.00041	0.00019	0.00003
Aggregate Storage Piles, Aggregate Feeder Loading	0.00472	0.00223	0.00034
RAP Storage Piles, RAP Feeder Loading	0.00142	0.00067	0.00010

AP-42 Section 11.12 Table 11.12-2 Uncontrolled Emission Factors with 99% Control Efficiency:

Process Unit	TSP Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Mineral Filler Silo Loading	0.0072	0.0046	0.00036

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) = Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

$$\text{Emission Rate (tons/year)} = \frac{\text{Hourly Emission Factor (lbs/ton)} * \text{Annual Throughput (ton/year)}}{\text{2000 lbs/ton}}$$

Table B-4 Controlled Material Handling Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
1	Railcar Unload to Hopper	133.3	0.055	0.24	0.026	0.11	0.0039	0.017
2	Rail Hopper Conveyor	133.3	0.019	0.082	0.0061	0.027	0.0017	0.0076
3	Rail Telescoping Conveyor	133.3	0.019	0.082	0.0061	0.027	0.0017	0.0076
4	Aggregate Storage Pile	133.3	0.63	2.76	0.30	1.30	0.045	0.197
5	Aggregate Truck Loading	100.0	0.47	1.67	0.22	0.79	0.034	0.12
6	RAP Storage Piles	140.0	0.20	0.20	0.094	0.094	0.014	0.014
7	Feed Bin Loading	230.0	1.09	1.09	0.51	0.51	0.078	0.078
8	Feed Bin Unloading	230.0	0.032	0.032	0.011	0.011	0.0030	0.0030
9	Scalping Screen	230.0	0.51	0.51	0.17	0.17	0.012	0.012
10	Scalping Screen Unloading	230.0	0.032	0.032	0.011	0.011	0.0030	0.0030
11	Pug Mill Load	236.0	0.033	0.033	0.011	0.011	0.0031	0.0031
12	Pug Mill Unload	236.0	0.033	0.033	0.011	0.011	0.0031	0.0031
13	Scale Conveyor to Slinger Conveyor	236.0	0.033	0.033	0.011	0.011	0.0031	0.0031
14	RAP Bin Loading	140.0	0.20	0.20	0.094	0.094	0.014	0.014
15	RAP Crusher	140.0	0.17	0.17	0.076	0.076	0.014	0.014
16	RAP Crusher Unloading	140.0	0.020	0.020	0.0064	0.0064	0.0018	0.0018
17	RAP Screen	140.0	0.31	0.31	0.10	0.10	0.0070	0.0070
18	RAP Screen Unloading	140.0	0.020	0.020	0.0064	0.0064	0.0018	0.0018
19	RAP Transfer Conveyor	140.0	0.020	0.020	0.0064	0.0064	0.0018	0.0018
20	RAP Transfer Conveyor	140.0	0.020	0.020	0.0064	0.0064	0.0018	0.0018
21	Mineral Filler Silo Loading	25.0 Max 6.0 Ave.	0.18	0.043	0.12	0.028	0.0090	0.0022
		TOTALS	4.08	7.58	1.80	3.42	0.26	0.51

Controlled Haul Truck Travel

Haul truck travel emissions were estimated using AP-42, Section 13.2.1 (ver.01/11) "Paved Roads" emission equation and AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. The haul in and out of the plant from Murray Road will be paved. All other haul roads throughout the plant are unpaved that will be controlled with surfactants, millings, and water. Haul road traffic emission rates controlled by surfactants, millings, and/or water have applied a control efficiency of 90%. Table B-5 summarizes the emission rate for each haul truck category.

Paved Roads – HMA Plant

AP-42, Section 13.2.1 (ver.01/11) "Paved Roads"

E = k(sL)^0.91*(W)^1.02*[1-P/4N] *Annual emissions only include p factor*

k TSP	0.011			
k PM10	0.0022			
k PM25	0.00054			
sL	0.6	road surface silt loading (g/m2) AP-42 Table 13.2.1-2 "Ubiquitous Baseline < 500 ADT		
P – days with precipitation over 0.01 inches	60			
N number of days in averaging period	365			
Truck weight	27.5	tons		
Haul Truck VMT Paved In	533.1	meter/one way vehicle	0.66266	miles/vehicle
Max. Mineral Filler Truck/hr	0.2	truck/hr		
Max. Asphalt Cement Truck/hr	1.0	truck/hr		
Max. Asphalt Truck/hr	16.0	truck/hr		
Max Aggregate Truck/hr	4.0	truck/hr		
Max RAP Truck/hr	5.6	truck/hr		
Max. Total Truck into Site	**26.8**	**truck/hr**		

	Hourly Max VMT		Annual VMT	
HMA Haul Truck VMT Paved In	15.11	miles/hr	30217	miles/yr
Aggregate Haul Truck VMT Paved In	2.65	miles/hr	18766	miles/yr

	TSP Uncontrolled			
Max. Truck Emissions Paved Road Asphalt	3.6062	lbs/hr	4.7690	tons/yr
	PM10 Uncontrolled			
	0.7212	lbs/hr	0.9538	tons/yr
	PM2.5 Uncontrolled			
	0.1770	lbs/hr	0.2341	tons/yr

Unpaved Roads – HMA Plant

AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads"

$$E = k * (s/12)^a * (W/3)^b * [(365 - p)/365] * VMT$$

Where k = constant PM2.5 = 0.15
PM10 = 1.5
TSP = 4.9
s = % silt content (Table 13.2.2-1, "Sand and Gravel" 4.8%)
W = mean vehicle weight (27.5 tons)
p = number of days with at least 0.01 in of precip. (NMED Policy – 60 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
TSP = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
TSP = 0.45

%Control Efficiency = 90%

Trucks per Hour
Total Trucks Entrance = 26.8 trucks per hour average
Mineral Filler – 0.2 truck per hour average
Asphalt Cement = 1.0 truck per hour average
Asphalt = 16.0 truck per hour average
Aggregate= 4.0 truck per hour average
RAP = 5.6 truck per hour average

VMT –Vehicle Miles Traveled

Mineral Filler	Unpaved – 0.26246 miles RT; 0.06299 VMT/Hr; 126.0 VMT/Yr
Asphalt Cement	Unpaved – 0.26246 miles RT; 0.25196 VMT/Hr; 503.9 VMT/Yr
Asphalt Truck	Unpaved 0.26246 miles RT; 4.19941 VMT/Hr; 8398.8 VMT/Yr
Aggregate Truck	Unpaved – 0.17804 miles RT; 0.71216 VMT/Hr; 5042.1 VMT/Yr
RAP Truck	Unpaved 0.33335 miles RT; 1.86676 VMT/Hr; 3733.5 VMT/Yr

Reduction in emissions due to precipitation was only accounted for in the annual emission rate.
Particulate emission rate per vehicle mile traveled for each particle size category is:

<u>Hourly Emission Rate Factor</u>
TSP = 0.69925 lbs/VMT
PM10 – 0.17821 lbs/VMT
PM2.5 = 0.01782 lbs/VMT

<u>Annual Emission Rate Factor</u>
TSP – 0.58430 lbs/VMT
PM10 = 0.14892 lbs/VMT
PM2.5 = 0.01489 lbs/VMT

Table B-5: Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
Haul Truck Paved HMA	15.11 miles/hr; 30,217 miles/yr	3.07	2.94	0.61	0.59	0.15	0.14
Haul Truck Paved Aggregate	2.65 miles/hr; 18,766 miles/yr	0.54	1.83	0.11	0.37	0.026	0.090
Mineral Filler Unpaved HMA	0.06299 miles/hr; 126.0 miles/yr	0.044	0.037	0.011	0.0094	0.0011	0.00094
Asphalt Cement Unpaved HMA	0.25196 miles/hr; 503.9 miles/yr	0.18	0.15	0.045	0.038	0.0045	0.0038
Asphalt Truck Unpaved HMA	4.19941 miles/hr; 8398.8 miles/yr	2.94	2.45	0.75	0.63	0.075	0.063
Aggregate Truck Unpaved	0.71216 miles/hr; 5042.1 miles/yr	0.50	1.47	0.13	0.38	0.013	0.038
RAP Truck Unpaved HMA	1.86676 miles/hr; 3733.5 miles/yr	1.31	1.09	0.33	0.28	0.033	0.028
	Total	8.57	9.97	1.99	2.28	0.30	0.37

Drum Mix Hot Mix Asphalt Plant

Particulate emissions from the drum dryer/mixer (Unit 22) will be controlled with a baghouse dust collector on the exhaust vent. This dust collector consists of filter bags and a fan that draws all the drum mixer exhaust through the dust collector. It is estimated that this method will control to an efficiency of 99.88 percent per AP42 Section 11.1, Table 11.1-3. Additional emission reductions include limiting annual production rates. No fugitive controls are proposed for unloading the drum dryer/mixer or asphalt silos (Units 23, 24) with the exception of limiting annual production rates. No fugitive controls are proposed for yard emissions or asphalt storage tank emissions.

Drum mix hot mix asphalt plant controlled emissions were estimated using AP-42, Section 11.1 "Hot Mix Asphalt Plants" (revised 03/04), tables 11.1-3, -4, -7, -8 and -14 emission rates for all pollutants. The drum dryer is permitted to combust either fuel oil or natural gas/propane. The worst-case emission factor from either combusting fuel oil or natural gas/propane was used to estimate emission rates. Hourly emission rates are based on maximum hourly asphalt production (400 tph) and annual emission rates are based on maximum annual asphalt production (800,000 tpy). PM (TSP, PM_{10}, $PM_{2.5}$) emission rates were estimated using the controlled Total PM emission factor found in Table 11.1-3, Fabric Filter. PM_{10} and $PM_{2.5}$ emission rates were estimated using the controlled Total PM_{10} emission factor found in Table 11.1-3, Fabric Filter. Drum dryer/mixer unloading and silo filling emission factors were calculated using the default value of –0.5 for asphalt volatility and a tank temperature setting of 325° F for HMA mix temperature. Yard emissions were found in AP-42 Section 11.1.2.5. TOC emission equation is 0.0011 lbs/ton of asphalt produced and CO is equal to the TOC emission rate times 0.32. Percent sulfur content of the burner fuel will not exceed 0.5 percent.

Emissions of VOCs (TOCs) from the asphalt cement storage tanks (Unit 26) were determined with EPA's TANK 4.0.9d program and the procedures found in EPA's "Emission Factor Documentation for AP-42 Section 11.1 (12/2000) Section 4.4.5" for input to the TANK program.

AP-42 Section 11.1 Table 11.1-3, 7, 8, and 14 Controlled Emission Factors:

Process Unit	Pollutant	Emission Factor (lbs/ton)
Asphalt Drum	NO_X	0.055
	CO	0.13
	VOC	0.032
	SO_2	0.058
	TSP	0.033
	PM_{10}	0.023
	$PM_{2.5}$	0.023
Drum Unloading	CO	0.001179981
	TOC	0.012186685
	TSP	0.000585889
	PM_{10}	0.000585889
	$PM_{2.5}$	0.000585889
Silo Loadout	CO	0.001349240
	TOC	0.004158948
	TSP	0.000521937
	PM_{10}	0.000521937
	$PM_{2.5}$	0.000521937
Yard	CO	0.000352
	TOC	0.0011

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) – Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

Emission Rate (tons/year) – Emission Factor (lbs/ton) * Annual Process Rate (tons/yr) / 2000 lbs/ton

Table B-6: Controlled Hot Mix Plant Emission Rates

Process Unit Number	Process Unit Description	Pollutant	Process Rate	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
22	Asphalt Drum Dryer	NO_X	400	22.0	22.0
		CO	400	52.0	52.0
		SO_2	400	23.2	23.2
		VOC	400	12.8	12.8
		TSP	400	13.2	13.2
		PM_{10}	400	9.2	9.2
		$PM_{2.5}$	400	9.2	9.2
23	Drum Mixer Unloading	CO	400	0.47	0.47
		TOC	400	4.9	4.9
		TSP	400	0.23	0.23
		PM_{10}	400	0.23	0.23
		$PM_{2.5}$	400	0.23	0.23
24	Asphalt Silo Unloading	CO	400	0.54	0.54
		TOC	400	1.7	1.7
		TSP	400	0.21	0.21
		PM_{10}	400	0.21	0.21
		$PM_{2.5}$	400	0.21	0.21
26	Asphalt Cement Storage Tanks	TOC	60,000 gallons	0.035	0.15
28	YARD	TOC	400	0.44	0.44
		CO	400	0.14	0.14

Fuel Oil-Fired Asphalt Heater

One TBD distillate diesel fuel or natural gas/propane asphalt heater heats the asphalt oil before it is mixed with the aggregate in the drum dryer/mixer. The unit will be rated at 2,500,000 Btu/hr. The estimated hourly diesel fuel usage for the heater is approximately 19.5 gallons per hour (128,000 Btu/gal) and 27.3 gallons per hour for natural gas/propane (91,500 Btu/gal). Emissions of nitrogen oxides (NO_X), carbon monoxides (CO), sulfur dioxide (SO_2), hydrocarbons (VOC) and particulate (PM) are estimated using either AP-42 Section 1.3 "External Combustion Sources" (rev 9/98) or AP-42 Section 1.5 "Liquefied Petroleum Gas Combustion" (7/08), whichever produced the worst-case emission rate. Sulfur content of the diesel fuel is not to exceed 0.05% fuel content. No controls are proposed for the asphalt heater. Uncontrolled annual emissions in tons per year (tpy) were calculated assuming operation of 8760 hours per year. Controlled annual emissions in tons per year (tpy) were calculated assuming operation of 8760 hours per year. The highest resulting pollutant emissions from either the diesel or natural gas/propane were used in the application.

<u>AP-42 Emission Factors: Section 1.3 and 1.5</u>

Diesel Emission Factors

Pollutant	Emission Factor
Nitrogen Oxides	0.02 lbs/gal-hr
Carbon Monoxides	0.005 lbs/gal-hr
Particulate	0.002 lbs/gal-hr
Hydrocarbons	0.00034 lbs/gal-hr
Sulfur Dioxides	0.142S lbs/gal-hr

S – % Fuel Sulfur Content

Natural Gas/ Propane Emission Factors

Pollutant	Emission Factor
Nitrogen Oxides	0.013 lbs/gal-hr
Carbon Monoxides	0.0075 lbs/gal-hr
Particulate	0.0007 lbs/gal-hr
Hydrocarbons	0.001 lbs/gal-hr
Sulfur Dioxides	0.000018 lbs/gal-hr

Emission Rate (lbs/hr) – Emission Factor (lbs/gal-hr) * fuel usage (gal)

The following equation was used to calculate the annual emission rate for each heater pollutant:

Emission Rate (tons/year) – <u>Emission Rate (lbs/hour) * Operating Hour (hrs/year)</u>
2000 lbs/ton

Table B-7: Pre-Controlled Combustion Emission Rates for TBD Diesel Heater

Process Unit Number	Pollutant	Fuel Usage (gal)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
26	NO_X	19.5	0.391	1.711
	CO	19.5	0.098	0.428
	SO_2	19.5	0.139	0.607
	VOC	19.5	0.0066	0.029
	PM	19.5	0.039	0.171

Table B-8: Controlled Combustion Emission Rates for TBD Diesel Heater

Process Unit Number	Pollutant	Fuel Usage (gal)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
26	NO_X	19.5	0.39	1.712
	CO	19.5	0.098	0.43
	SO_2	19.5	0.14	0.61
	VOC	19.5	0.0066	0.029
	PM	19.5	0.039	0.17

Table B-9: Pre-Controlled Combustion Emission Rates for TBD Natural Gas/ Propane Heater

Process Unit Number	Pollutant	Fuel Usage (gal)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
26	NO_X	27.3	0.36	1.56
	CO	27.3	0.20	0.90
	SO_2	27.3	0.00049	0.0022
	VOC	27.3	0.027	0.12
	PM	27.3	0.019	0.084

Table B-10: Controlled Combustion Emission Rates for Natural Gas/ Propane Heater

Process Unit Number	Pollutant	Fuel Usage (gal)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
26	NO_X	27.3	0.36	1.56
	CO	27.3	0.20	0.90
	SO_2	27.3	0.00049	0.0022
	VOC	27.3	0.027	0.12
	PM	27.3	0.019	0.084

Table B-11 Summary of Uncontrolled NOx, CO, SO2, and PM Emission Rates

Uncontrolled Emission Totals															
Unit #	Description	NOx		CO		SO_2		VOC		TSP		PM_{10}		$PM_{2.5}$	
		lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
1	Railcar Unload to Hopper									0.055	0.24	0.026	0.11	0.0039	0.017
2	Rail Hopper Conveyor									0.40	1.75	0.15	0.64	0.023	0.099
3	Rail Telescoping Conveyor									0.40	1.75	0.15	0.64	0.023	0.099
4	Aggregate Storage Pile									0.63	2.76	0.094	0.41	0.014	0.062
5	Aggregate Truck Loading									0.47	1.67	0.22	0.79	0.034	0.12
6	RAP Storage Piles									0.20	0.87	0.094	0.41	0.014	0.062
7	Feed Bin Loading									1.09	4.76	0.51	2.25	0.078	0.34
8	Feed Bin Unloading									0.69	3.02	0.25	1.11	0.039	0.17
9	Scalping Screen									5.75	25.19	2.00	8.76	0.30	1.33
10	Scalping Screen Unloading									0.69	3.02	0.25	1.11	0.039	0.17
11	Pug Mill Load									0.71	3.10	0.26	1.14	0.040	0.18
12	Pug Mill Unload									0.71	3.10	0.26	1.14	0.040	0.18
13	Scale Conveyor to Slinger Conveyor									0.71	3.10	0.26	1.14	0.040	0.18
14	RAP Bin Loading									0.20	0.87	0.094	0.41	0.014	0.062
15	RAP Crusher									0.76	3.31	0.34	1.47	0.050	0.22
16	RAP Crusher Unloading									0.42	1.84	0.15	0.67	0.024	0.10
17	RAP Screen									3.50	15.33	1.22	5.33	0.18	0.81
18	RAP Screen Unloading									0.42	1.84	0.15	0.67	0.024	0.10
19	RAP Transfer Conveyor									0.42	1.84	0.15	0.67	0.024	0.10
20	RAP Transfer Conveyor									0.42	1.84	0.15	0.67	0.024	0.10
21	Mineral Filler Silo Loading									18.00	18.92	11.50	12.09	0.90	0.95
22	Drum Dryer	22.0	96.4	52.0	227.8	23.2	101.6	12.8	56.1	11200	49056	2600	11388	626	2742
23	Drum Mixer Unloading			0.47	2.07			4.87	21.35	0.23	1.03	0.23	1.0	0.23	1.0
24	Asphalt Silo Unloading			0.54	2.36			1.66	7.29	0.21	0.91	0.21	0.91	0.21	0.91
25	Asphalt Heater	0.39	1.71	0.20	0.90	0.14	0.61	0.027	0.12	0.039	0.17	0.039	0.17	0.039	0.17

Table B-11 Summary of Uncontrolled NOx, CO, SO2, and PM Emission Rates

Uncontrolled Emission Totals															
		NOx		CO		SO_2		VOC		TSP		PM_{10}		$PM_{2.5}$	
Unit #	Description	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
26	Asphalt Cement Storage Tank			***	***			0.035	0.15						
27	Haul Road Traffic									53.21	186.30	13.36	47.22	1.44	4.86
28	Yard			0.14	0.62			0.44	1.93						
	Total	22.39	98.07	53.36	233.71	23.34	102.22	19.84	86.90	11289	49341	2632	11478	630	2754

*** Insignificant

Table B-12 Summary of Allowable NOx, CO, SO2, and PM Emission Rates

Allowable Emission Totals															
Unit #	Description	NOx		CO		SO_2		VOC		TSP		PM_{10}		$PM_{2.5}$	
		lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
1	Railcar Unload to Hopper									0.055	0.24	0.026	0.11	0.0039	0.017
2	Rail Hopper Conveyor									0.019	0.082	0.0061	0.027	0.0017	0.0076
3	Rail Telescoping Conveyor									0.019	0.082	0.0061	0.027	0.0017	0.0076
4	Aggregate Storage Pile									0.63	2.76	0.30	1.30	0.045	0.20
5	Aggregate Truck Loading									0.47	1.67	0.22	0.79	0.034	0.12
6	RAP Storage Piles									0.20	0.20	0.094	0.094	0.014	0.014
7	Feed Bin Loading									1.09	1.09	0.51	0.51	0.078	0.078
8	Feed Bin Unloading									0.032	0.032	0.011	0.011	0.0030	0.0030
9	Scalping Screen									0.51	0.51	0.17	0.17	0.012	0.012
10	Scalping Screen Unloading									0.032	0.032	0.011	0.011	0.0030	0.0030
11	Pug Mill Load									0.033	0.033	0.011	0.011	0.0031	0.0031
12	Pug Mill Unload									0.033	0.033	0.011	0.011	0.0031	0.0031
13	Scale Conveyor to Slinger Conveyor									0.033	0.033	0.011	0.011	0.0031	0.0031
14	RAP Bin Loading									0.20	0.20	0.094	0.094	0.014	0.014
15	RAP Crusher									0.17	0.17	0.076	0.076	0.014	0.014
16	RAP Crusher Unloading									0.020	0.020	0.0064	0.0064	0.0018	0.0018
17	RAP Screen									0.31	0.31	0.10	0.10	0.0070	0.0070
18	RAP Screen Unloading									0.020	0.020	0.0064	0.0064	0.0018	0.0018
19	RAP Transfer Conveyor									0.020	0.020	0.0064	0.0064	0.0018	0.0018
20	RAP Transfer Conveyor									0.020	0.020	0.0064	0.0064	0.0018	0.0018
21	Mineral Filler Silo Loading									0.18	0.043	0.12	0.028	0.0090	0.0022
22	Drum Dryer	22.00	22.00	52.00	52.00	23.20	23.20	12.80	12.80	13.20	13.20	9.20	9.20	9.20	9.20
23	Drum Mixer Unloading			0.47	0.47			4.87	4.87	0.23	0.23	0.23	0.23	0.23	0.23
24	Asphalt Silo Unloading			0.54	0.54			1.66	1.66	0.21	0.21	0.21	0.21	0.21	0.21
25	Asphalt Heater	0.39	1.71	0.20	0.90	0.14	0.61	0.027	0.12	0.039	0.17	0.039	0.17	0.039	0.17
26	Asphalt Cement Storage Tank			***	***			0.035	0.15						

Table B-12 Summary of Allowable NOx, CO, SO2, and PM Emission Rates

		Allowable Emission Totals													
		NOx		CO		SO_2		VOC		TSP		PM_{10}		$PM_{2.5}$	
Unit #	Description	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
27	Haul Road Traffic									8.57	9.97	1.99	2.28	0.30	0.37
28	Yard			0.14	0.14			0.44	0.44						
	Total	22.39	23.71	53.36	54.05	23.34	23.81	19.84	20.05	26.33	31.37	13.47	15.51	10.24	10.69

*** Insignificant

Estimates for State Toxic Air Pollutants (Asphalt Fumes)

The Hot Mix Asphalt Plant (HMA) drum dryer/mixer, asphalt silo loading, asphalt silo unloading, yard emissions, and heated asphalt cement storage tank are sources of asphalt fumes listed in the NMED's 20.2.72 NMAC, 502 "Toxic Air Pollutants and Emissions", Table A. Emissions of asphalt fumes from the drum dryer/mixer are based on PM organic condensable emission factors found in AP-42 Section 11.1, Table 11.1-3 (0.12 pounds per ton x 400 tons/hr) from the drum dryer/mixer baghouse stack or 4.8 pounds per hour.

Emissions of asphalt fumes from the asphalt drum unloading (Unit 23), asphalt silo unloading (Unit 24), yard (asphalt transported in asphalt trucks-Unit 28), and hot oil asphalt storage tanks (Unit 26) were based on the assumption that the emissions of concern from the silo filling, silo unloading, hot oil asphalt storage tanks, and yard asphalt fumes sources are the PAH HAPs plus other semi-volatile HAPs from the particulate (PM) organics and the volatile organic HAPs from the Total Organic Compounds (TOC). These two combined make up asphalt fume emissions from the silo filling, silo unloading, hot oil asphalt storage tanks, and yard sources. Using information found in AP-42 Section 11.1, Tables 11.1-14, 15, and 16 were reviewed and the following emission equations or emission factors were used to estimate asphalt fumes emissions from silo filling, silo unloading, hot oil asphalt storage tanks, and yard.

<u>Drum Loadout</u>
Asphalt Fumes $EF = 0.00036(-V)e^{((0.0251)(T+460)-20.43)}$

<u>Silo Filling</u>
Asphalt Fumes $EF = 0.00078(-V)e^{((0.0251)(T+460)-20.43)}$

<u>Asphalt Storage Tanks</u>
Asphalt Fumes EF = VOC emissions from TANKs * 1.3%

<u>Yard</u>
Asphalt Fumes EF = 0.0000165 lbs/ton of asphalt loaded

Silo filling and silo unloading emission factors were calculated using the default value of –0.5 for asphalt volatility and a tank temperature setting of 325° F for HMA mix temperature. Inputting these values in to the equations gives you a pound per ton value of 0.000189 lbs/ton and 0.000087 lbs/ton or asphalt fumes emission rates of 0.075 and 0.035 pounds per hour.

Emissions of asphalt fumes from the Yard were based on 1.5 percent of the TOC emission. Yard emission factors are found in AP-42 Section 11.1.2.5. TOC emission factor is 0.0011 lbs/ton of asphalt produced. Asphalt fumes emissions are 0.0000165 lbs/ton of asphalt produced or 0.0066 pounds per hour (400 tph of asphalt production).

Emissions of asphalt fumes from the asphalt cement storage tanks (Unit 26) were determined with EPA's TANK 4.0.9d program and the procedures found in EPA's "Emission Factor Documentation for AP-42 Section 11.1 (12/2000) Section 4.4.5" for input to the TANK program. The annual VOC emissions for working and breathing losses from two 30,000 gallon tanks were estimated at 306.92 pounds per year or 0.036 pounds per hour. Based on 1.3 percent of the VOC emissions (0.036 pounds per hour total from both tanks), the asphalt fumes emission rate is 0.00046 pounds per hour.

Total asphalt fumes from the HMA plant is 4.92 pounds per hour and 4.92 tons per year.

Estimates for State Toxic Air Pollutants (Calcium Hydroxide)

A potential mineral filler that will be used is lime (calcium hydroxide). Calcium hydroxide is listed in the NMED's 20.2.72 NMAC, 502 "Toxic Air Pollutants and Emissions", Table A. Controlled emissions of lime from the mineral filler silo during loading are 0.18 pounds per hour. The state toxic emission limit is 0.333 pounds per hour.

Estimates for Federal HAPs Air Pollutants

The Hot Mix Asphalt Plant (HMA) drum dryer (Unit 22) and asphalt heater (Unit 25) are sources of HAPs as it appears in Section 112 (b) of the 1990 CAAA. Emissions of HAPs were determined for the drum mixer using AP-42 Section 11.1 Tables 11.1-10, 11.1-12. Emissions of HAPs were determined for the asphalt heaters using AP-42 Section 1.3.

The following tables summarize the HAPs emission rates from the drum mixer and asphalt heater. Total combined HAPs emissions from NM Terminal Railyard HMA is 4.20 pounds per hour and 4.20 tons per year.

Table B-13: HAPs Emission Rates from the Drum Dryer/Mixer
EPA HAPS Emissions Drum Mixer Hot Mix Asphalt Plant with Fabric Filter

Average Hourly Production Rate:	400	tons per hour
Yearly Production Rate:	900000	tons per year

Type of Fuel:	Waste Fuel Oil
Emission Factors	AP-42 Section 11.1 Tables 11.1-10, 11.1-12

Non-PAH HAPS	CAS#		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acetalehyde	75-07-0		1.3E-03	0.520000	0.520000
Acrolein	107-02-8		2.6E-05	0.010400	0.010400
Benzene	71-43-2		3.9E-04	0.156000	0.156000
Ethylbenzene	100-41-4		2.4E-04	0.096000	0.096000
Formaldehyde	50-00-0		3.1E-03	1.240000	1.240000
Hexane	110-54-3		9.2E-04	0.368000	0.368000
Isooctane	540-84-1		4.0E-05	0.016000	0.016000
Methyl Ethyl Ketone	78-93-3		2.0E-05	0.008000	0.008000
Propionaldehyde	123-38-6		1.3E-04	0.052000	0.052000
Quinone	106-51-4		1.6E-04	0.064000	0.064000
Methyl chorlform	71-55-6		4.8E-05	0.019200	0.019200
Toluene	108-88-3		2.9E-03	1.160000	1.160000
Xylene	1330-20-7		2.0E-04	0.080000	0.080000
		Total Non-PAH HAPS	9.5E-03	3.789600	3.789600

PAH HAPS	CAS#		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
2-Methylnaphthalene	91-57-6		1.7E-04	0.068000	0.068000
Acenaphthene	83-32-9		1.4E-06	0.000560	0.000560
Acenaphthylene	208-96-8		2.2E-05	0.008800	0.008800
Anthracene	120-12-7		3.1E-06	0.001240	0.001240
Benzo(a)anthracene	56-55-3		2.1E-07	0.000084	0.000084
Benzo(a)pyrene	50-32-8		9.8E-09	0.000004	0.000004
Benzo(b)fluoranthene	205-99-2		1.0E-07	0.000040	0.000040
Benzo(b)pyrene	192-97-2		1.1E-07	0.000044	0.000044
Benzo(g,h,I)perylene	191-24-2		4.0E-08	0.000016	0.000016
Benzo(k)fluoranthene	207-08-9		4.1E-08	0.000016	0.000016
Chrysene	218-01-9		1.8E-07	0.000072	0.000072
Fluoranthene	206-44-0		6.1E-07	0.000244	0.000244
Fluorene	86-73-7		1.1E-05	0.004400	0.004400
Indeno(1,2,3-cd)pyrene	193-39-5		7.0E-09	0.000003	0.000003
Naphthalene	91-20-3		6.5E-04	0.260000	0.260000
Perylene	198-55-0		8.8E-09	0.000004	0.000004
Phenanthrene	85-01-8		2.3E-05	0.009200	0.009200
Pyrene	129-00-0		3.0E-06	0.001200	0.001200
		Total PAH HAPS	8.8E-04	0.353927	0.353927

HAPS Metals		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Arsenic		5.6E-07	0.000224	0.000224
Beryllium		0.0E+00	0.000000	0.000000
Cadmium		4.1E-07	0.000164	0.000164
Chromium		5.5E-06	0.002200	0.002200
Cobalt		2.6E-08	0.000010	0.000010
Hexavalent Chromium		4.5E-07	0.000180	0.000180
Lead		1.5E-05	0.006000	0.006000
Manganese		7.7E-06	0.003080	0.003080
Mercury		2.6E-06	0.001040	0.001040
Nickel		6.3E-05	0.025200	0.025200
Phosphorus		2.8E-05	0.011200	0.011200
Selenium		3.5E-07	0.000140	0.000140
	Total Metals HAPS	1.2E-04	0.049438	0.049438
	Total HAPS		**4.193**	**4.193**

Table B-14: HAPs Emission Rates from the Asphalt Heater

Btu Rating	2.5	MMBtu/hr	(based on 128000 Btu/gallon)
Fuel Usage:	19.5	gallons/hr	
Btu x 10^-12/hr:	2.5E-06	Btu x10^-12	(based on 128000 Btu/gallon)
Yearly Operating Hours:	8760	hours per year	

Type of Fuel:	Diesel
Emission Factors	AP-42 Section 1.3

Organic Compounds	CAS#		Emission Factor (lbs/10^3 gal)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acenaphthene	83-32-9		2.11E-05	0.000000	0.000002
Acenaphthylene	208-96-8		2.53E-07	0.000000	0.000000
Anthracene	120-12-7		1.22E-06	0.000000	0.000000
Benzene	71-43-2		2.14E-04	0.000004	0.000018
Benzo(a)anthracene	56-55-3		4.01E-06	0.000000	0.000000
Benzo(b,k)fluoranthene	205-99-2		1.48E-06	0.000000	0.000000
Benzo(g,h,l)perylene	191-24-2		2.26E-06	0.000000	0.000000
Chrysene	218-01-9		2.38E-06	0.000000	0.000000
Dibenz(a,h)anthracene			1.67E-06	0.000000	0.000000
Ethylbenzene	100-41-4		6.36E-05	0.000001	0.000005
Fluoranthene	206-44-0		4.84E-06	0.000000	0.000000
Fluorene	86-73-7		4.47E-06	0.000000	0.000000
Formaldehyde	50-00-0		6.10E-02	0.001190	0.005210
Indeno(1,2,3-cd)pyrene	193-39-5		2.14E-06	0.000000	0.000000
Naphthalene	91-20-3		1.13E-03	0.000022	0.000097
Phenanthrene	85-01-8		1.05E-05	0.000000	0.000001
Pyrene	129-00-0		4.25E-06	0.000000	0.000000
Toluene	108-88-3		6.20E-03	0.000121	0.000530
Xylene	1330-20-7		1.09E-04	0.000002	0.000009
		Total Organic Compounds	6.88E-02	0.001341	0.005874

HAPS Metals		Emission Factor (lbs/Btu^12)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Arsenic		4	0.000010	0.000044
Beryllium		3	0.000008	0.000033
Cadmium		3	0.000008	0.000033
Chromium		3	0.000008	0.000033
Lead		9	0.000023	0.000099
Manganese		6	0.000015	0.000066
Mercury		3	0.000008	0.000033
Nickel		3	0.000008	0.000033
Selenium		15	0.000038	0.000164
	Total Metals HAPS	49	0.000123	0.000537
	Total HAPS		**0.00280**	**0.00641**

Attachment C
Emission Calculations Supporting Documents

1.3 Fuel Oil Combustion

1.3.1 General[1-3]

Two major categories of fuel oil are burned by combustion sources: distillate oils and residual oils. These oils are further distinguished by grade numbers, with Nos. 1 and 2 being distillate oils; Nos. 5 and 6 being residual oils; and No. 4 being either distillate oil or a mixture of distillate and residual oils. No. 6 fuel oil is sometimes referred to as Bunker C. Distillate oils are more volatile and less viscous than residual oils. They have negligible nitrogen and ash contents and usually contain less than 0.3 percent sulfur (by weight). Distillate oils are used mainly in domestic and small commercial applications, and include kerosene and diesel fuels. Being more viscous and less volatile than distillate oils, the heavier residual oils (Nos. 5 and 6) may need to be heated for ease of handling and to facilitate proper atomization. Because residual oils are produced from the residue remaining after the lighter fractions (gasoline, kerosene, and distillate oils) have been removed from the crude oil, they contain significant quantities of ash, nitrogen, and sulfur. Residual oils are used mainly in utility, industrial, and large commercial applications.

1.3.2 Firing Practices[4]

The major boiler configurations for fuel oil-fired combustors are watertube, firetube, cast iron, and tubeless design. Boilers are classified according to design and orientation of heat transfer surfaces, burner configuration, and size. These factors can all strongly influence emissions as well as the potential for controlling emissions.

Watertube boilers are used in a variety of applications ranging from supplying large amounts of process steam to providing space heat for industrial facilities. In a watertube boiler, combustion heat is transferred to water flowing through tubes which line the furnace walls and boiler passes. The tube surfaces in the furnace (which houses the burner flame) absorb heat primarily by radiation from the flames. The tube surfaces in the boiler passes (adjacent to the primary furnace) absorb heat primarily by convective heat transfer.

Firetube boilers are used primarily for heating systems, industrial process steam generators, and portable power boilers. In firetube boilers, the hot combustion gases flow through the tubes while the water being heated circulates outside of the tubes. At high pressures and when subjected to large variations in steam demand, firetube units are more susceptible to structural failure than watertube boilers. This is because the high-pressure steam in firetube units is contained by the boiler walls rather than by multiple small-diameter watertubes, which are inherently stronger. As a consequence, firetube boilers are typically small and are used primarily where boiler loads are relatively constant. Nearly all firetube boilers are sold as packaged units because of their relatively small size.

A cast iron boiler is one in which combustion gases rise through a vertical heat exchanger and out through an exhaust duct. Water in the heat exchanger tubes is heated as it moves upward through the tubes. Cast iron boilers produce low pressure steam or hot water, and generally burn oil or natural gas. They are used primarily in the residential and commercial sectors.

Another type of heat transfer configuration used on smaller boilers is the tubeless design. This design incorporates nested pressure vessels with water in between the shells. Combustion gases are fired into the inner pressure vessel and are then sometimes recirculated outside the second vessel.

Table 1.3-1. (cont.)

Firing Configuration (SCC)[a]	SO_2[b]		SO_3[c]		NO_x[d]		CO[e]		Filterable PM[f]	
	Emission Factor (lb/10^3 gal)	EMISSION FACTOR RATING	Emission Factor (lb/10^3 gal)	EMISSION FACTOR RATING	Emission Factor (lb/10^3 gal)	EMISSION FACTOR RATING	Emission Factor (lb/10^3 gal)	EMISSION FACTOR RATING	Emission Factor (lb/10^3 gal)	EMISSION FACTOR RATING
Boilers < 100 Million Btu/hr										
No. 6 oil fired (1-02-004-02/03) (1-03-004-02/03)	157S	A	2S	A	55	A	5	A	9.19(S)+3.22[i]	B
No. 5 oil fired (1-03-004-04)	157S	A	2S	A	55	A	5	A	10[i]	A
No. 4 oil fired (1-03-005-04)	150S	A	2S	A	20	A	5	A	7	B
Distillate oil fired (1-02-005-02/03) (1-03-005-02/03)	142S	A	2S	A	20	A	5	A	2	A
Residential furnace (A2104004/A2104011)	142S	A	2S	A	18	A	5	A	0.4[g]	B

a To convert from lb/103 gal to kg/103 L, multiply by 0.120. SCC = Source Classification Code.
b References 1-2,6-9,14,56-60. S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S 1.
c References 1-2,6-8,16,57-60. S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S = 1.
d References 6-7,15,19,22,56-62. Expressed as NO2. Test results indicate that at least 95% by weight of NOx is NO for all boiler types except residential furnaces, where about 75% is NO. For utility vertical fired boilers use 105 lb/103 gal at full load and normal (>15%) excess air. Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are related to fuel nitrogen content, estimated by the following empirical relationship: lb NO2 /103 gal = 20.54 + 104.39(N), where N is the weight % of nitrogen in the oil. For example, if the fuel is 1% nitrogen, then N = 1.
e References 6-8,14,17-19,56-61. CO emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.
f References 6-8,10,13-15,56-60,62-63. Filterable PM is that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train. Particulate emission factors for residual oil combustion are, on average, a function of fuel oil sulfur content where S is the weight % of sulfur in oil. For example, if fuel oil is 1% sulfur, then S = 1.
g Based on data from new burner designs. Pre-1970's burner designs may emit filterable PM as high as 3.0 1b/103 gal.
h The SO2 emission factor for both no. 2 oil fired and for no. 2 oil fired with LNB/FGR, is 142S, not 157S. Errata dated April 28, 2000. Section corrected May 2010.
i The PM factors for No.6 and No. 5 fuel were reversed. Errata dated April 28, 2000. Section corrected May 2010.

Table 1.3-2. CONDENSABLE PARTICULATE MATTER EMISSION FACTORS FOR OIL COMBUSTION[a]

Firing Configuration[b] (SCC)	Controls	CPM - TOT[c, d]		CPM - IOR[c, d]		CPM - ORG[c, d]	
		Emission Factor ($lb/10^3$ gal)	EMISSION FACTOR RATING	Emission Factor ($lb/10^3$ gal)	EMISSION FACTOR RATING	Emission Factor ($lb/10^3$ gal)	EMISSION FACTOR RATING
No. 2 oil fired (1-01-005-01, 1-02-005-01, 1-03-005-01)	All controls, or uncontrolled	1.3[d, e]	D	65% of CPM-TOT emission factor[c]	D	35% of CPM-TOT emission factor[c]	D
No. 6 oil fired (1-01-004-01/04, 1-02-004-01, 1-03-004-01)	All controls, or uncontrolled	1.5[f]	D	85% of CPM-TOT emission factor[d]	E	15% of CPM-TOT emission factor[d]	E

[a] All condensable PM is assumed to be less than 1.0 micron in diameter.
[b] No data are available for numbers 3, 4, and 5 oil. For number 3 oil, use the factors provided for number 2 oil. For numbers 4 and 5 oil, use the factors provided for number 6 oil.
[c] CPM-TOT = total condensable particulate matter.
CPM-IOR = inorganic condensable particulate matter.
CPM-ORG - organic condensable particulate matter.
[d] To convert to lb/MMBtu of No. 2 oil, divide by 140 $MMBtu/10^3$ gal. To convert to lb/MMBtu of No. 6 oil, divide by 150 $MMBtu/10^3$ gal.
[e] References: 76-78.
[f] References: 79-82.

Table 1.3-3. EMISSION FACTORS FOR TOTAL ORGANIC COMPOUNDS (TOC), METHANE, AND NONMETHANE TOC (NMTOC) FROM UNCONTROLLED FUEL OIL COMBUSTION[a]

EMISSION FACTOR RATING: A

Firing Configuration (SCC)	TOC[b] Emission Factor (lb/10^3 gal)	Methane[b] Emission Factor (lb/10^3 gal)	NMTOC[b] Emission Factor (lb/10^3 gal)
Utility boilers			
No. 6 oil fired, normal firing (1-01-004-01)	1.04	0.28	0.76
No. 6 oil fired, tangential firing (1-01-004-04)	1.04	0.28	0.76
No. 5 oil fired, normal firing (1-01-004-05)	1.04	0.28	0.76
No. 5 oil fired, tangential firing (1-01-004-06)	1.04	0.28	0.76
No. 4 oil fired, normal firing (1-01-005-04)	1.04	0.28	0.76
No. 4 oil fired, tangential firing (1-01-005-05)	1.04	0.28	0.76
Industrial boilers			
No. 6 oil fired (1-02-004-01/02/03)	1.28	1.00	0.28
No. 5 oil fired (1-02-004-04)	1.28	1.00	0.28
Distillate oil fired (1-02-005-01/02/03)	0.252	0.052	0.2
No. 4 oil fired (1-02-005-04)	0.252	0.052	0.2
Commercial/institutional/residential combustors			
No. 6 oil fired (1-03-004-01/02/03)	1.605	0.475	1.13
No. 5 oil fired (1-03-004-04)	1.605	0.475	1.13
Distillate oil fired (1-03-005-01/02/03)	0.556	0.216	0.34
No. 4 oil fired (1-03-005-04)	0.556	0.216	0.34
Residential furnace (A2104004/A2104011)	2.493	1.78	0.713

a To convert from lb/103 gal to kg/103 L, multiply by 0.12. SCC = Source Classification Code.

b References 29-32. Volatile organic compound emissions can increase by several orders of magnitude if the boiler is improperly operated or is not well maintained.

Table 1.3-9. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM FUEL OIL COMBUSTION[a]

Organic Compound	Average Emission Factor[b] (lb/10^3 Gal)	EMISSION FACTOR RATING
Benzene	2.14E-04	C
Ethylbenzene	6.36E-05[c]	E
Formaldehyde[d]	3.30E-02	C
Naphthalene	1.13E-03	C
1,1,1-Trichloroethane	2.36E-04[c]	E
Toluene	6.20E-03	D
o-Xylene	1.09E-04[c]	E
Acenaphthene	2.11E-05	C
Acenaphthylene	2.53E-07	D
Anthracene	1.22E-06	C
Benz(a)anthracene	4.01E-06	C
Benzo(b,k)fluoranthene	1.48E-06	C
Benzo(g,h,i)perylene	2.26E-06	C
Chrysene	2.38E-06	C
Dibenzo(a,h) anthracene	1.67E-06	D
Fluoranthene	4.84E-06	C
Fluorene	4.47E-06	C
Indo(1,2,3-cd)pyrene	2.14E-06	C
Phenanthrene	1.05E-05	C
Pyrene	4.25E-06	C
OCDD	3.10E-09[c]	E

[a] Data are for residual oil fired boilers, Source Classification Codes (SCCs) 1-01-004-01/04.
[b] References 64-72. To convert from lb/10^3 gal to kg/10^3 L, multiply by 0.12.
[c] Based on data from one source test (Reference 67).
[d] The formaldehyde number presented here is based only on data from utilities using No. 6 oil. The number presented in Table 1.3-7 is based on utility, commercial, and industrial boilers.

Table 1.3-10. EMISSION FACTORS FOR TRACE ELEMENTS FROM DISTILLATE FUEL OIL COMBUSTION SOURCES[a]

EMISSION FACTOR RATING: E

Firing Configuration (SCC)	Emission Factor ($lb/10^{12}$ Btu)										
	As	Be	Cd	Cr	Cu	Pb	Hg	Mn	Ni	Se	Zn
Distillate oil fired (1-01-005-01, 1-02-005-01, 1-03-005-01)	4	3	3	3	6	9	3	6	3	15	4

[a] Data are for distillate oil fired boilers, SCC codes 1-01-005-01, 1-02-005-01, and 1-03-005-01. References 29-32, 40-44 and 83. To convert from $lb/10^{12}$ Btu to pg/J, multiply by 0.43.

1.5 Liquefied Petroleum Gas Combustion

1.5.1 General[1]

Liquefied petroleum gas (LPG or LP-gas) consists of propane, propylene, butane, and butylenes; the product used for domestic heating is composed primarily of propane. This gas, obtained mostly from gas wells (but also, to a lesser extent, as a refinery by-product) is stored as a liquid under moderate pressures. There are three grades of LPG available as heating fuels: commercial-grade propane, engine fuel-grade propane (also known as HD-5 propane), and commercial-grade butane. In addition, there are high-purity grades of LPG available for laboratory work and for use as aerosol propellants. Specifications for the various LPG grades are available from the American Society for Testing and Materials and the Gas Processors Association. A typical heating value for commercial-grade propane and HD-5 propane is 90,500 British thermal units per gallon (Btu/gal), after vaporization; for commercial-grade butane, the value is 97,400 Btu/gal.

The largest market for LPG is the domestic/commercial market, followed by the chemical industry (where it is used as a petrochemical feedstock) and the agriculture industry. Propane is also used as an engine fuel as an alternative to gasoline and as a standby fuel for facilities that have interruptible natural gas service contracts.

1.5.2 Firing Practices[2]

The combustion processes that use LPG are very similar to those that use natural gas. Use of LPG in commercial and industrial applications may require a vaporizer to provide the burner with the proper mix of air and fuel. The burner itself will usually have different fuel injector tips as well as different fuel-to-air ratio controller settings than a natural gas burner since the LPG stoichiometric requirements are different than natural gas requirements. LPG is fired as a primary and backup fuel in small commercial and industrial boilers and space heating equipment and can be used to generate heat and process steam for industrial facilities and in most domestic appliances that typically use natural gas.

1.5.3 Emissions[1,3-5]

1.5.3.1 Criteria Pollutants -

LPG is considered a "clean" fuel because it does not produce visible emissions. However, gaseous pollutants such as nitrogen oxides (NO_x), carbon monoxide (CO), and organic compounds are produced as are small amounts of sulfur dioxide (SO_2) and particulate matter (PM). The most significant factors affecting NO_x, CO, and organic emissions are burner design, burner adjustment, boiler operating parameters, and flue gas venting. Improper design, blocking and clogging of the flue vent, and insufficient combustion air result in improper combustion and the emission of aldehydes, CO, hydrocarbons, and other organics. NO_x emissions are a function of a number of variables, including temperature, excess air, fuel and air mixing, and residence time in the combustion zone. The amount of SO_2 emitted is directly proportional to the amount of sulfur in the fuel. PM emissions are very low and result from soot, aerosols formed by condensable emitted species, or boiler scale dislodged during combustion. Emission factors for LPG combustion are presented in Table 1.5-1.

Table 1.5-1 presents emission factors on a volume basis (lb/10^3gal). To convert to an energy basis (lb/MMBtu), divide by a heating value of 91.5 MMBtu/10^3gal for propane and 102 MMBtu/10^3gal for butane.

1.5.3.2 Greenhouse Gases[6-11] -

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions are all produced during LPG combustion. Nearly all of the fuel carbon (99.5 percent) in LPG is converted to CO_2 during the combustion process. This conversion is relatively independent of firing configuration. Although the formation of CO acts to reduce CO_2 emissions, the amount of CO produced is insignificant compared to the amount of CO_2 produced. The majority of the 0.5 percent of fuel carbon not converted to CO_2 is due to incomplete combustion in the fuel stream.

Table 1.5-1. EMISSION FACTORS FOR LPG COMBUSTION[a]

EMISSION FACTOR RATING: E

Pollutant	Butane Emission Factor (lb/10^3 gal)		Propane Emission Factor (lb/10^3 gal)	
	Industrial Boilers[b] (SCC 1-02-010-01)	Commercial Boilers[c] (SCC 1-03-010-01)	Industrial Boilers[b] (SCC 1-02-010-02)	Commercial Boilers[c] (SCC 1-03-010-02)
PM, Filterable[d]	0.2	0.2	0.2	0.2
PM, Condensable	0.6	0.6	0.5	0.5
PM, Total	0.8	0.8	0.7	0.7
SO_2[e]	0.09S	0.09S	0.10S	0.10S
NO_x[f]	15	15	13	13
N_2O[g]	0.9	0.9	0.9	0.9
CO_2[h,j]	14,300	14,300	12,500	12,500
CO	8.4	8.4	7.5	7.5
TOC	1.1	1.1	1.0	1.0
CH_4[k]	0.2	0.2	0.2	0.2

[a] Assumes PM, CO, and TOC emissions are the same, on a heat input basis, as for natural gas combustion. Use heat contents of 91.5 x 10^6 Btu/10^3 gallon for propane, 102 x 10^6 Btu/10^3 gallon for butane, 1020 x 10^6 Btu/10^6 scf for methane when calculating an equivalent heat input basis. For example, the equation for converting from methane's emissions factors to propane's emissions factors is as follows: lb pollutant/10^3 gallons of propane – (lb pollutant /10^6 ft^3 methane) • (91.5 x 10^6 Btu/10^3 gallons of propane) / (1020 x 10^6 Btu/10^6 scf of methane). The NO_x emission factors have been multiplied by a correction factor of 1.5, which is the approximate ratio of propane/butane NO_x emissions to natural gas NO_x emissions. To convert from lb/10^3 gal to kg/10^3 L, multiply by 0.12. SCC = Source Classification Code.

[b] Heat input capacities generally between 10 and 100 million Btu/hour.

[c] Heat input capacities generally between 0.3 and 10 million Btu/hour.

[d] Filterable particulate matter (PM) is that PM collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train. For natural gas, a fuel with similar combustion characteristics, all PM is less than 10 μm in aerodynamic equivalent diameter (PM-10).

[e] S equals the sulfur content expressed in gr/100 ft^3 gas vapor. For example, if the butane sulfur content is 0.18 gr/100 ft^3, the emission factor would be (0.09 x 0.18) = 0.016 lb of SO_2/10^3 gal butane burned.

[f] Expressed as NO_2.

[g] Reference 12.

[h] Assuming 99.5% conversion of fuel carbon to CO_2.

[j] EMISSION FACTOR RATING = C.

[k] Reference 13.

11.1 Hot Mix Asphalt Plants

11.1.1 General[1-3,23, 392-394]

Hot mix asphalt (HMA) paving materials are a mixture of size-graded, high quality aggregate (which can include reclaimed asphalt pavement [RAP]), and liquid asphalt cement, which is heated and mixed in measured quantities to produce HMA. Aggregate and RAP (if used) constitute over 92 percent by weight of the total mixture. Aside from the amount and grade of asphalt cement used, mix characteristics are determined by the relative amounts and types of aggregate and RAP used. A certain percentage of fine aggregate (less than 74 micrometers [µm] in physical diameter) is required for the production of good quality HMA.

Hot mix asphalt paving materials can be manufactured by: (1) batch mix plants, (2) continuous mix (mix outside dryer drum) plants, (3) parallel flow drum mix plants, and (4) counterflow drum mix plants. This order of listing generally reflects the chronological order of development and use within the HMA industry.

In 1996, approximately 500 million tons of HMA were produced at the 3,600 (estimated) active asphalt plants in the United States. Of these 3,600 plants, approximately 2,300 are batch plants, 1,000 are parallel flow drum mix plants, and 300 are counterflow drum mix plants. The total 1996 HMA production from batch and drum mix plants is estimated at about 240 million tons and 260 million tons, respectively. About 85 percent of plants being manufactured today are of the counterflow drum mix design, while batch plants and parallel flow drum mix plants account for 10 percent and 5 percent respectively. Continuous mix plants represent a very small fraction of the plants in use ($\leq$0.5 percent) and, therefore, are not discussed further.

An HMA plant can be constructed as a permanent plant, a skid-mounted (easily relocated) plant, or a portable plant. All plants can have RAP processing capabilities. Virtually all plants being manufactured today have RAP processing capability. Most plants have the capability to use either gaseous fuels (natural gas) or fuel oil. However, based upon Department of Energy and limited State inventory information, between 70 and 90 percent of the HMA is produced using natural gas as the fuel to dry and heat the aggregate.

11.1.1.1 Batch Mix Plants

Figure 11.1-1 shows the batch mix HMA production process. Raw aggregate normally is stockpiled near the production unit. The bulk aggregate moisture content typically stabilizes between 3 to 5 percent by weight.

Processing begins as the aggregate is hauled from the storage piles and is placed in the appropriate hoppers of the cold feed unit. The material is metered from the hoppers onto a conveyer belt and is transported into a rotary dryer (typically gas- or oil-fired). Dryers are equipped with flights designed to shower the aggregate inside the drum to promote drying efficiency.

As the hot aggregate leaves the dryer, it drops into a bucket elevator and is transferred to a set of vibrating screens, where it is classified into as many as four different grades (sizes) and is dropped into individual "hot" bins according to size. At newer facilities, RAP also may be transferred to a separate heated storage bin. To control aggregate size distribution in the final <u>batch</u> mix, the operator opens various hot bins over a weigh hopper until the desired mix and weight are obtained. Concurrent with the aggregate being weighed, liquid asphalt cement is pumped from a heated storage tank to an asphalt bucket, where it is weighed to achieve the desired aggregate-to-asphalt cement ratio in the final mix.

bins or storage silos. The fugitive dust sources associated with drum mix plants are similar to those of batch mix plants with regard to truck traffic and to aggregate material feed and handling operations.

Table 11.1-1 presents emission factors for filterable PM and PM-10, condensable PM, and total PM for batch mix HMA plants. Particle size data for batch mix HMA plants, based on the control technology used, are shown in Table 11.1-2. Table 11.1-3 presents filterable PM and PM-10, condensable PM, and total PM emission factors for drum mix HMA plants. Particle size data for drum mix HMA plants, based on the control technology used, are shown in Table 11.1-4. Tables 11.1-5 and -6 present emission factors for CO, CO_2, NO_x, sulfur dioxide (SO_2), total organic compounds (TOC), formaldehyde, CH_4, and VOC from batch mix plants. Tables 11.1-7 and -8 present emission factors for CO, CO_2, NO_x, SO_2, TOC, CH_4, VOC, and hydrochloric acid (HCl) from drum mix plants. The emission factors for CO, NO_x, and organic compounds represent normal plant operations without scrutiny of the burner design, operation, and maintenance. Information provided in Reference 390 indicates that attention to burner design, periodic evaluation of burner operation, and appropriate maintenance can reduce these emissions. Table 11.1-9 presents organic pollutant emission factors for batch mix plants. Table 11.1-10 presents organic pollutant emission factors for drum mix plants. Tables 11.1-11 and -12 present metals emission factors for batch and drum mix plants, respectively. Table 11.1-13 presents organic pollutant emission factors for hot (asphalt) oil systems.

11.1.2.5 Fugitive Emissions from Production Operations

Emission factors for HMA load-out and silo filling operations can be estimated using the data in Tables 11.1-14, -15, and -16. Table 11.1-14 presents predictive emission factor equations for HMA load-out and silo filling operations. Separate equations are presented for total PM, extractable organic PM (as measured by EPA Method 315), TOC, and CO. For example, to estimate total PM emissions from drum mix or batch mix plant load-out operations using an asphalt loss-on-heating of 0.41 percent and temperature of 290°F, the following calculation is made:

$$
\begin{aligned}
EF &= 0.000181 + 0.00141(-V)e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.000181 + 0.00141(-(-0.41))e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.000181 + 0.00141(0.41)e^{(-1.605)} \\
&= 0.000181 + 0.00141(0.41)(0.2009) \\
&= 0.000181 + 0.000116 \\
&= 0.00030 \text{ lb total PM/ton of asphalt loaded}
\end{aligned}
$$

Tables 11.1-15 and -16 present speciation profiles for organic particulate-based and volatile particulate-based compounds, respectively. The speciation profile shown in Table 11.1-15 can be applied to the extractable organic PM emission factors estimated by the equations in Table 11.1-14 to estimate emission factors for specific organic PM compounds. The speciation profile presented in Table 11.1-16 can be applied to the TOC emission factors estimated by the equations in Table 11.1-14 to estimate emission factors for specific volatile organic compounds. The derivations of the predictive emission factor equations and the speciation profiles can be found in Reference 1.

For example, to estimate TOC emissions from drum mix plant load-out operations using an asphalt loss-on-heating of 0.41 percent and temperature of 290°F, the following calculation is made:

$$
\begin{aligned}
EF &= 0.0172(-V)e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.0172(-(-0.41))e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.0172(0.41)e^{(-1.605)} \\
&= 0.0172(0.41)(0.2009) \\
&= 0.0014 \text{ lb TOC/ton of asphalt loaded}
\end{aligned}
$$

To estimate the benzene emissions from the same operation, use the TOC emission factor calculated above and apply the benzene fraction for load-out emissions from Table 11.1-16:

$$EF = 0.0014\,(0.00052)$$
$$= 7.3 \times 10^{-7} \text{ lb benzene/ton of asphalt loaded}$$

Emissions from asphalt storage tanks can be estimated using the procedures described in AP-42 Section 7.1, Organic Liquid Storage Tanks, and the TANKS software. Site-specific data should be used for storage tank specifications and operating parameters, such as temperature. If site-specific data for Antoine's constants for an average asphalt binder used by the facility are unavailable, the following values for an average liquid asphalt binder can be used:

A = 75,350.06
B = 9.00346

These values should be inserted into the Antoine's equation in the following form:

$$\log_{10} P = \frac{-0.05223A}{T} + B$$

where:

P = vapor pressure, mm Hg
T = absolute temperature, Kelvin

The assumed average liquid molecular weight associated with these Antoine's constants is 1,000 atomic mass units and the average vapor molecular weight is 105. Emission factors estimated using these default values should be assigned a rating of E. Carbon monoxide emissions can be estimated by multiplying the THC emissions calculated by the TANKS program by 0.097 (the ratio of silo filling CO emissions to silo filling TOC emissions).

Vapors from the HMA loaded into transport trucks continue following load-out operations. The TOC emissions for the 8-minute period immediately following load-out (yard emissions) can be estimated using an emission factor of 0.00055 kg/Mg (0.0011 lb/ton) of asphalt loaded. This factor is assigned a rating of E. The derivation of this emission factor is described in Reference 1. Carbon monoxide emissions can be estimated by multiplying the TOC emissions by 0.32 (the ratio of truck load-out CO emissions to truck load-out THC emissions).

11.2.3 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the background report for this section. This and other documents can be found on the CHIEF Web Site at http://www.epa.gov/ttn/chief/, or by calling the Info CHIEF Help Desk at (919)541-1000.

December 2000

- All emission factors were revised and new factors were added. For selected pollutant emissions, separate factors were developed for distilate oil, No. 6 oil and waste oil fired dryers. Dioxin and Furan emission factors were developed for oil fired drum mix plants. Particulate, VOC and CO factors were developed for silo filling, truck load out and post truck load out operations at batch plants and drum mix plants. Organic species profiles were developed for silo filling, truck load out and post truck load out operations.

Table 11.1-3. PARTICULATE MATTER EMISSION FACTORS FOR DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	Filterable PM				Condensable PM[b]				Total PM			
	PM[c]	EMISSION FACTOR RATING	PM-10[d]	EMISSION FACTOR RATING	Inorganic	EMISSION FACTOR RATING	Organic	EMISSION FACTOR RATING	PM[e]	EMISSION FACTOR RATING	PM-10[f]	EMISSION FACTOR RATING
Dryer[g] (SCC 3-05-002-05,-55 to -63)												
Uncontrolled	28[h]	D	6.4	D	0.0074[j]	E	0.058[k]	E	28	D	6.5	D
Venturi or wet scrubber	0.026[m]	A	ND	NA	0.0074[n]	A	0.012[p]	A	0.045	A	ND	NA
Fabric filter	0.014[q]	A	0.0039	C	0.0074[n]	A	0.012[p]	A	0.033	A	0.023	C

[a] Factors are lb/ton of product. SCC = Source Classification Code. ND = no data. NA = not applicable. To convert from lb/ton to kg/Mg, multiply by 0.5.
[b] Condensable PM is that PM collected using an EPA Method 202, Method 5 (analysis of "back-half" or impingers), or equivalent sampling train.
[c] Filterable PM is that PM collected on or before the filter of an EPA Method 5 (or equivalent) sampling train.
[d] Particle size data from Reference 23 were used in conjunction with the filterable PM emission factors shown.
[e] Total PM is the sum of filterable PM, condensable inorganic PM, and condensable organic PM.
[f] Total PM-10 is the sum of filterable PM-10, condensable inorganic PM, and condensable organic PM.
[g] Drum mix dryer fired with natural gas, propane, fuel oil, and waste oil. The data indicate that fuel type does not significantly effect PM emissions.
[h] References 31, 36-38, 340.
[j] Because no data are available for uncontrolled condensable inorganic PM, the emission factor is assumed to be equal to the maximum controlled condensable inorganic PM emission factor.
[k] References 36-37.
[m] Reference 1, Table 4-14. Average of data from 36 facilities. Range: 0.0036 to 0.097 lb/ton. Median: 0.020 lb/ton. Standard deviation: 0.022 lb/ton.
[n] Reference 1, Table 4-14. Average of data from 30 facilities. Range: 0.0012 to 0.027 lb/ton. Median: 0.0051 lb/ton. Standard deviation: 0.0063 lb/ton.
[p] Reference 1, Table 4-14. Average of data from 41 facilities. Range: 0.00035 to 0.074 lb/ton. Median: 0.0046 lb/ton. Standard deviation: 0.016 lb/ton.
[q] Reference 1, Table 4-14. Average of data from 155 facilities. Range: 0.00089 to 0.14 lb/ton. Median: 0.010 lb/ton. Standard deviation: 0.017 lb/ton.

Table 11.1-4. SUMMARY OF PARTICLE SIZE DISTRIBUTION FOR DRUM MIX DRYERS[a]

EMISSION FACTOR RATING: E

Particle Size, µm[b]	Cumulative Mass Less Than or Equal to Stated Size (%)[c]		Emission Factors, lb/ton	
	Uncontrolled[d]	Fabric Filter	Uncontrolled[d]	Fabric Filter
1.0	ND	15[e]	ND	0.0021[e]
2.5	5.5	21[f]	1.5	0.0029[f]
10.0	23	30[g]	6.4	0.0042[g]
15.0	27	35[d]	7.6	0.0049[d]

[a] Emission factor units are lb/ton of HMA produced. Rounded to two significant figures. SCC 3-05-002-05, and 3-05-002-55 to -63. ND = no data available. To convert from lb/ton to kg/Mg, multiply by 0.5.

[b] Aerodynamic diameter.

[c] Applies only to the mass of filterable PM.

[d] Reference 23, Table 3-35. The emission factors are calculated using the particle size data from this reference in conjunction with the filterable PM emission factor shown in Table 11.1-3.

[e] References 214, 229. The emission factors are calculated using the particle size data from these references in conjunction with the filterable PM emission factor shown in Table 11.1-3.

[f] References 23, 214, 229. The emission factors are calculated using the particle size data from these references in conjunction with the filterable PM emission factor shown in Table 11.1-3.

[g] Reference 23, 25, 229. The emission factors are calculated using the particle size data from these references in conjunction with the filterable PM emission factor shown in Table 11.1-3. EMISSION FACTOR RATING: D.

Table 11.1-7. EMISSION FACTORS FOR CO, CO_2, NO_x, AND SO_2 FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	CO[b]	EMISSION FACTOR RATING	CO_2[c]	EMISSION FACTOR RATING	NO_x	EMISSION FACTOR RATING	SO_2[c]	EMISSION FACTOR RATING
Natural gas-fired dryer (SCC 3-05-002-55,-56,-57)	0.13	B	33[d]	A	0.026[e]	D	0.0034[f]	D
No. 2 fuel oil-fired dryer (SCC 3-05-002-58,-59,-60)	0.13	B	33[d]	A	0.055[g]	C	0.011[h]	E
Waste oil-fired dryer (SCC 3-05-002-61,-62,-63)	0.13	B	33[d]	A	0.055[g]	C	0.058[j]	B
Coal-fired dryer[k] (SCC 3-05-002-98)	ND	NA	33[d]	A	ND	NA	0.19[m]	E

[a] Emission factor units are lb per ton of HMA produced. SCC = Source Classification Code. ND = no data available. NA = not applicable. To convert from lb/ton to kg/Mg, multiply by 0.5.

[b] References 25, 44, 48, 50, 149, 154, 197, 214, 229, 254, 339-342, 344, 346, 347, 390. The CO emission factors represent normal plant operations without scrutiny of the burner design, operation, and maintenance. Information is available that indicates that attention to burner design, periodic evaluation of burner operation, and appropriate maintenance can reduce CO emissions. Data for dryers firing natural gas, No. 2 fuel oil, and No. 6 fuel oil were combined to develop a single emission factor because the magnitude of emissions was similar for dryers fired with these fuels.

[c] Emissions of CO_2 and SO_2 can also be estimated based on fuel usage and the fuel combustion emission factors (for the appropriate fuel) presented in AP-42 Chapter 1. The CO_2 emission factors are an average of all available data, regardless of the dryer fuel (emissions were similar from dryers firing any of the various fuels). Fifty percent of the fuel-bound sulfur, up to a maximum (as SO_2) of 0.1 lb/ton of product, is expected to be retained in the product, with the remainder emitted as SO_2.

[d] Reference 1, Table 4-15. Average of data from 180 facilities. Range: 2.6 to 96 lb/ton. Median: 31 lb/ton. Standard deviation: 13 lb/ton.

[e] References 44-45, 48, 209, 341, 342.

[f] References 44-45, 48.

[g] References 25, 50, 153, 214, 229, 344, 346, 347, 352-354.

[h] References 50, 119, 255, 340

[j] References 25, 299, 300, 339, 345, 351, 371-377, 379, 380, 386-388.

[k] Dryer fired with coal and supplemental natural gas or fuel oil.

[m] References 88, 108, 189-190.

Table 11.1-8. EMISSION FACTORS FOR TOC, METHANE, VOC, AND HCl FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	TOC[b]	EMISSION FACTOR RATING	CH_4[c]	EMISSION FACTOR RATING	VOC[d]	EMISSION FACTOR RATING	HCl[e]	EMISSION FACTOR RATING
Natural gas-fired dryer (SCC 3-05-002-55, -56,-57)	0.044[f]	B	0.012	C	0.032	C	ND	NA
No. 2 fuel oil-fired dryer (SCC 3-05-002-58, -59,-60)	0.044[f]	B	0.012	C	0.032	C	ND	NA
Waste oil-fired dryer (SCC 3-05-002-61, -62,-63)	0.044[f]	E	0.012	C	0.032	E	0.00021	D

[a] Emission factor units are lb per ton of HMA produced. SCC = Source Classification Code. ND = no data available. NA = not applicable. To convert from lb/ton to kg/Mg, multiply by 0.5.
[b] TOC equals total hydrocarbons as propane as measured with an EPA Method 25A or equivalent sampling train plus formaldehyde.
[c] References 25, 44-45, 48, 50, 339-340, 355. Factor includes data from natural gas-, No. 2 fuel oil, and waste oil-fired dryers. Methane measured with an EPA Method 18 or equivalent sampling train.
[d] The VOC emission factors are equal to the TOC factors minus the sum of the methane emission factors and the emission factors for compounds with negligible photochemical reactivity shown in Table 11.1-10; differences in values reported are due to rounding.
[e] References 348, 374, 376, 379, 380.
[f] References 25, 44-45, 48, 50, 149, 153-154, 209-212, 214, 241, 242, 339-340, 355.

Table 11.1-10. EMISSION FACTORS FOR ORGANIC POLLUTANT EMISSIONS FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	Pollutant		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
Natural gas-fired dryer with fabric filter[b] (SCC 3-05-002-55, -56,-57)	Non-PAH hazardous air pollutants[c]				
	71-43-2	Benzene[d]	0.00039	A	25,44,45,50, 341, 342, 344-351, 373, 376, 377, 383, 384
	100-41-4	Ethylbenzene	0.00024	D	25,44,45
	50-00-0	Formaldehyde[e]	0.0031	A	25,35,44,45,50, 339-344, 347-349, 371-373, 384, 388
	110-54-3	Hexane	0.00092	E	339-340
	540-84-1	Isooctane (2,2,4-trimethylpentane)	$4.0x10^{-5}$	E	339-340
	71-55-6	Methyl chloroform[f]	$4.8x10^{-5}$	E	35
	108-88-3	Toluene	0.00015	D	35,44,45
	1330-20-7	Xylene	0.00020	D	25,44,45
		Total non-PAH HAPs	0.0051		
	PAH HAPs				
	91-57-6	2-Methylnaphthalene[g]	$7.4x10^{-5}$	D	44,45,48
	83-32-9	Acenaphthene[g]	$1.4x10^{-6}$	E	48
	208-96-8	Acenaphthylene[g]	$8.6x10^{-6}$	D	35,45,48
	120-12-7	Anthracene[g]	$2.2x10^{-7}$	E	35,48
	56-55-3	Benzo(a)anthracene[g]	$2.1x10^{-7}$	E	48
	50-32-8	Benzo(a)pyrene[g]	$9.8x10^{-9}$	E	48
	205-99-2	Benzo(b)fluoranthene[g]	$1.0x10^{-7}$	E	35,48
	192-97-2	Benzo(e)pyrene[g]	$1.1x10^{-7}$	E	48
	191-24-2	Benzo(g,h,i)perylene[g]	$4.0x10^{-8}$	E	48
	207-08-9	Benzo(k)fluoranthene[g]	$4.1x10^{-8}$	E	35,48
	218-01-9	Chrysene[g]	$1.8x10^{-7}$	E	35,48
	206-44-0	Fluoranthene[g]	$6.1x10^{-7}$	D	35,45,48
	86-73-7	Fluorene[g]	$3.8x10^{-6}$	D	35,45,48,163
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	$7.0x10^{-9}$	E	48
	91-20-3	Naphthalene[g]	$9.0x10^{-5}$	D	35,44,45,48,163
	198-55-0	Perylene[g]	$8.8x10^{-9}$	E	48
	85-01-8	Phenanthrene[g]	$7.6x10^{-6}$	D	35,44,45,48,163
	129-00-0	Pyrene[g]	$5.4x10^{-7}$	D	45,48
		Total PAH HAPs	0.00019		

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Natural gas-fired dryer with fabric filter[b] (SCC 3-05-002-55, -56,-57) (cont.)		Total HAPs	0.0053		
		Non-HAP organic compounds			
	106-97-8	Butane	0.00067	E	339
	74-85-1	Ethylene	0.0070	E	339-340
	142-82-5	Heptane	0.0094	E	339-340
	763-29-1	2-Methyl-1-pentene	0.0040	E	339,340
	513-35-9	2-Methyl-2-butene	0.00058	E	339,340
	96-14-0	3-Methylpentane	0.00019	D	339,340
	109-67-1	1-Pentene	0.0022	E	339-340
	109-66-0	n-Pentane	0.00021	E	339-340
		Total non-HAP organics	0.024		
No. 2 fuel oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60)		Non-PAH HAPs[c]			
	71-43-2	Benzene[d]	0.00039	A	25,44,45,50, 341, 342, 344-351, 373, 376, 377, 383, 384
	100-41-4	Ethylbenzene	0.00024	D	25,44,45
	50-00-0	Formaldehyde[e]	0.0031	A	25,35,44,45,50, 339-344, 347-349, 371-373, 384, 388
	110-54-3	Hexane	0.00092	E	339-340
	540-84-1	Isooctane (2,2,4-trimethylpentane)	$4.0x10^{-5}$	E	339-340
	71-55-6	Methyl chloroform[f]	$4.8x10^{-5}$	E	35
	108-88-3	Toluene	0.0029	E	25, 50, 339-340
	1330-20-7	Xylene	0.00020	D	25,44,45
		Total non-PAH HAPs	0.0078		
		PAH HAPs			
	91-57-6	2-Methylnaphthalene[g]	0.00017	E	50
	83-32-9	Acenaphthene[g]	$1.4x10^{-6}$	E	48
	208-96-8	Acenaphthylene[g]	$2.2x10^{-5}$	E	50
	120-12-7	Anthracene[g]	$3.1x10^{-6}$	E	50,162
	56-55-3	Benzo(a)anthracene[g]	$2.1x10^{-7}$	E	48
	50-32-8	Benzo(a)pyrene[g]	$9.8x10^{-9}$	E	48
	205-99-2	Benzo(b)fluoranthene[g]	$1.0x10^{-7}$	E	35,48
	192-97-2	Benzo(e)pyrene[g]	$1.1x10^{-7}$	E	48

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
No. 2 fuel oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60) (cont.)	191-24-2	Benzo(g,h,i)perylene[k]	$4.0x10^{-8}$	E	48
	207-08-9	Benzo(k)fluoranthene[k]	$4.1x10^{-8}$	E	35,48
	218-01-9	Chrysene[k]	$1.8x10^{-7}$	E	35,48
	206-44-0	Fluoranthene[k]	$6.1x10^{-7}$	D	35,45,48
	86-73-7	Fluorene[k]	$1.1x10^{-5}$	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[k]	$7.0x10^{-9}$	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[k]	$8.8x10^{-9}$	E	48
	85-01-8	Phenanthrene[k]	$2.3x10^{-5}$	D	50,162,164
	129-00-0	Pyrene[k]	$3.0x10^{-6}$	E	50
		Total PAH HAPs	0.00088		
		Total HAPs	0.0087		
	Non-HAP organic compounds				
	106-97-8	Butane	0.00067	E	339
	74-85-1	Ethylene	0.0070	E	339-340
	142-82-5	Heptane	0.0094	E	339-340
	763-29-1	2-Methyl-1-pentene	0.0040	E	339,340
	513-35-9	2-Methyl-2-butene	0.00058	E	339,340
	96-14-0	3-Methylpentane	0.00019	D	339,340
	109-67-1	1-Pentene	0.0022	E	339-340
	109-66-0	n-Pentane	0.00021	E	339-340
		Total non-HAP organics	0.024		

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Fuel oil- or waste oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60,-61,-62, -63)		**Dioxins**			
	1746-01-6	2,3,7,8-TCDD[g]	2.1×10^{-13}	E	339
		Total TCDD[g]	9.3×10^{-13}	E	339
	40321-76-4	1,2,3,7,8-PeCDD[g]	3.1×10^{-13}	E	339
		Total PeCDD[g]	2.2×10^{-11}	E	339-340
	39227-28-6	1,2,3,4,7,8-HxCDD[g]	4.2×10^{-13}	E	339
	57653-85-7	1,2,3,6,7,8-HxCDD[g]	1.3×10^{-12}	E	339
	19408-24-3	1,2,3,7,8,9-HxCDD[g]	9.8×10^{-13}	E	339
		Total HxCDD[g]	1.2×10^{-11}	E	339-340
	35822-46-9	1,2,3,4,6,7,8-HpCDD[g]	4.8×10^{-12}	E	339
		Total HpCDD[g]	1.9×10^{-11}	E	339-340
	3268-87-9	Octa CDD[g]	2.5×10^{-11}	E	339
		Total PCDD[g]	7.9×10^{-11}	E	339-340
		Furans			
	51207-31-9	2,3,7,8-TCDF[g]	9.7×10^{-13}	E	339
		Total TCDF[g]	3.7×10^{-12}	E	339-340
		1,2,3,7,8-PeCDF[g]	4.3×10^{-12}	E	339-340
		2,3,4,7,8-PeCDF[g]	8.4×10^{-13}	E	339
		Total PeCDF[g]	8.4×10^{-11}	E	339-340
		1,2,3,4,7,8-HxCDF[g]	4.0×10^{-12}	E	339
		1,2,3,6,7,8-HxCDF[g]	1.2×10^{-12}	E	339
		2,3,4,6,7,8-HxCDF[g]	1.9×10^{-12}	E	339
		1,2,3,7,8,9-HxCDF[g]	8.4×10^{-12}	E	340
		Total HxCDF[g]	1.3×10^{-11}	E	339-340
		1,2,3,4,6,7,8-HpCDF[g]	6.5×10^{-12}	E	339
		1,2,3,4,7,8,9-HpCDF[g]	2.7×10^{-12}	E	339
		Total HpCDF[g]	1.0×10^{-11}	E	339-340
	39001-02-0	Octa CDF[g]	4.8×10^{-12}	E	339
		Total PCDF[g]	4.0×10^{-11}	E	339-340
		Total PCDD/PCDF[g]	1.2×10^{-10}	E	339-340

Table 11.1-10 (cont.)

Process	Pollutant CASRN	Pollutant Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Fuel oil- or waste oil-fired dryer (uncontrolled) (SCC 3-05-002-58, -59,-60,-61,-62, -63)	Hazardous air pollutants[c]				
	Dioxins				
		Total HxCDD[g]	5.4×10^{-12}	E	340
	35822-46-9	1,2,3,4,6,7,8-HpCDD[g]	3.4×10^{-11}	E	340
		Total HpCDD[g]	7.1×10^{-11}	E	340
	3268-87-9	Octa CDD[g]	2.7×10^{-9}	E	340
		Total PCDD[g]	2.8×10^{-9}	E	340
	Furans				
		Total TCDF[g]	3.3×10^{-11}	E	340
		Total PeCDF[g]	7.4×10^{-11}	E	340
		1,2,3,4,7,8-HxCDF[g]	5.4×10^{-12}	E	340
		2,3,4,6,7,8-HxCDF[g]	1.6×10^{-12}	E	340
		Total HxCDF[g]	8.1×10^{-12}	E	340
Fuel oil- or waste oil-fired dryer (uncontrolled) (SCC 3-05-002-58, -59,-60,-61,-62, -63) (cont.)		1,2,3,4,6,7,8-HpCDF[g]	1.1×10^{-11}	E	340
		Total HpCDF[g]	3.8×10^{-11}	E	340
		Total PCDF[g]	1.5×10^{-10}	E	340
		Total PCDD/PCDF[g]	3.0×10^{-9}	E	340

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Waste oil-fired dryer with fabric filter (SCC 3-05-002-61, -62,-63)		Non-PAH HAPs[c]			
	75-07-0	Acetaldehyde	0.0013	E	25
	107-02-8	Acrolein	2.6×10^{-5}	E	25
	71-43-2	Benzene[d]	0.00039	A	25,44,45,50,341,342, 344-351, 373, 376, 377, 383, 384
	100-41-4	Ethylbenzene	0.00024	D	25,44,45
	50-00-0	Formaldehyde[e]	0.0031	A	25,35,44,45,50,339-344,347-349,371-373, 384, 388
	110-54-3	Hexane	0.00092	E	339-340
	540-84-1	Isooctane (2,2,4-trimethylpentane)	4.0×10^{-5}	E	339-340
	78-93-3	Methyl Ethyl Ketone	2.0×10^{-5}	E	25
	123-38-6	Propionaldehyde	0.00013	E	25
	106-51-4	Quinone	0.00016	E	25
	71-55-6	Methyl chloroform[f]	4.8×10^{-5}	E	35
	108-88-3	Toluene	0.0029	E	25, 50, 339-340
	1330-20-7	Xylene	0.00020	D	25,44,45
		Total non-PAH HAPs	0.0095		
		PAH HAPs			
	91-57-6	2-Methylnaphthalene[g]	0.00017	E	50
	83-32-9	Acenaphthene[g]	1.4×10^{-6}	E	48
	208-96-8	Acenaphthylene[g]	2.2×10^{-5}	E	50
	120-12-7	Anthracene[g]	3.1×10^{-6}	E	50,162
	56-55-3	Benzo(a)anthracene[g]	2.1×10^{-7}	E	48
	50-32-8	Benzo(a)pyrene[g]	9.8×10^{-9}	E	48
	205-99-2	Benzo(b)fluoranthene[g]	1.0×10^{-7}	E	35,48
	192-97-2	Benzo(e)pyrene[g]	1.1×10^{-7}	E	48
	191-24-2	Benzo(g,h,i)perylene[g]	4.0×10^{-8}	E	48

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Waste oil-fired dryer with fabric filter (SCC 3-05-002-61, -62,-63) (cont.)	207-08-9	Benzo(k)fluoranthene[g]	4.1×10^{-8}	E	35,48
	218-01-9	Chrysene[g]	1.8×10^{-7}	E	35,48
	206-44-0	Fluoranthene[g]	6.1×10^{-7}	D	35,45,48
	86-73-7	Fluorene[g]	1.1×10^{-5}	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	7.0×10^{-9}	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[g]	8.8×10^{-9}	E	48
	85-01-8	Phenanthrene[g]	2.3×10^{-5}	D	50,162,164
	129-00-0	Pyrene[g]	3.0×10^{-6}	E	50
		Total PAH HAPs	0.00088		
		Total HAPs	0.010		
	Non-HAP organic compounds				
	67-64-1	Acetone[f]	0.00083	E	25
	100-52-7	Benzaldehyde	0.00011	E	25
	106-97-8	Butane	0.00067	E	339
	78-84-2	Butyraldehyde	0.00016	E	25
	4170-30-3	Crotonaldehyde	8.6×10^{-5}	E	25
	74-85-1	Ethylene	0.0070	E	339, 340
	142-82-5	Heptane	0.0094	E	339, 340
	66-25-1	Hexanal	0.00011	E	25
	590-86-3	Isovaleraldehyde	3.2×10^{-5}	E	25
	763-29-1	2-Methyl-1-pentene	0.0040	E	339, 340
	513-35-9	2-Methyl-2-butene	0.00058	E	339, 340
	96-14-0	3-Methylpentane	0.00019	D	339, 340
	109-67-1	1-Pentene	0.0022	E	339, 340
	109-66-0	n-Pentane	0.00021	E	339, 340
	110-62-3	Valeraldehyde	6.7×10^{-5}	E	25
		Total non-HAP organics	0.026		

[a] Emission factor units are lb/ton of hot mix asphalt produced. Table includes data from both parallel flow and counterflow drum mix dryers. Organic compound emissions from counterflow systems are expected to be less than from parallel flow systems, but the available data are insufficient to quantify

Table 11.1-10 (cont.)

accurately the difference in these emissions. CASRN – Chemical Abstracts Service Registry Number. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5.

[b] Tests included dryers that were processing reclaimed asphalt pavement. Because of limited data, the effect of RAP processing on emissions could not be determined.

[c] Hazardous air pollutants (HAP) as defined in the 1990 Clean Air Act Amendments (CAAA).

[d] Based on data from 19 tests. Range: 0.000063 to 0.0012 lb/ton; median: 0.00030; Standard deviation: 0.00031.

[e] Based on data from 21 tests. Range: 0.0030 to 0.014 lb/ton; median: 0.0020; Standard deviation: 0.0036.

[f] Compound has negligible photochemical reactivity.

[g] Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

Table 11.1-12. EMISSION FACTORS FOR METAL EMISSIONS FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	Pollutant	Emission Factor, lb/ton	Emission Factor Rating	Reference Numbers
Fuel oil-fired dryer, uncontrolled (SCC 3-05-002-58, -59,-60)	Arsenic[b]	1.3×10^{-6}	E	340
	Barium	0.00025	E	340
	Beryllium[b]	0.0	E	340
	Cadmium[b]	4.2×10^{-6}	E	340
	Chromium[b]	2.4×10^{-5}	E	340
	Cobalt[b]	1.5×10^{-5}	E	340
	Copper	0.00017	E	340
	Lead[b]	0.00054	E	340
	Manganese[b]	0.00065	E	340
	Nickel[b]	0.0013	E	340
	Phosphorus[b]	0.0012	E	340
	Selenium[b]	2.4×10^{-6}	E	340
	Thallium	2.2×10^{-6}	E	340
	Zinc	0.00018	E	340
Natural gas- or propane-fired dryer, with fabric filter (SCC 3-05-002-55, -56,-57))	Antimony	1.8×10^{-7}	E	339
	Arsenic[b]	5.6×10^{-7}	D	25, 35, 339-340
	Barium	5.8×10^{-6}	E	25, 339-340
	Beryllium[b]	0.0	E	339-340
	Cadmium[b]	4.1×10^{-7}	D	25, 35, 162, 301, 339-340
	Chromium[b]	5.5×10^{-6}	C	25, 162-164, 301, 339-340
	Cobalt[b]	2.6×10^{-8}	E	339-340
	Copper	3.1×10^{-6}	D	25, 162-164, 339-340
	Hexavalent chromium[b]	4.5×10^{-7}	E	163
	Lead[b]	6.2×10^{-7}	E	35
	Manganese[b]	7.7×10^{-6}	D	25, 162-164, 339-340
	Mercury[b]	2.4×10^{-7}	E	35, 163
	Nickel[b]	6.3×10^{-5}	D	25, 163-164, 339-340
	Phosphorus[b]	2.8×10^{-5}	E	25, 339-340
	Silver	4.8×10^{-7}	E	25, 339-340
	Selenium[b]	3.5×10^{-7}	E	339-340
	Thallium	4.1×10^{-9}	E	339-340
	Zinc	6.1×10^{-5}	C	25, 35, 162-164, 339-340

Table 11.1-12 (cont.)

Process	Pollutant	Emission Factor, lb/ton	Emission Factor Rating	Reference Numbers
No. 2 fuel oil-fired dryer or waste oil/drain oil/No. 6 fuel oil-fired dryer, with fabric filter (SCC 3-05-002-58, -59,-60,-61,-62,-63)	Antimony	1.8×10^{-7}	E	339
	Arsenic[b]	5.6×10^{-7}	D	25, 35, 339-340
	Barium	5.8×10^{-6}	E	25, 339-340
	Beryllium[b]	0.0	E	339-340
	Cadmium[b]	4.1×10^{-7}	D	25, 35, 162, 301, 339-340
	Chromium[b]	5.5×10^{-6}	C	25, 162-164, 301, 339-340
	Cobalt[b]	2.6×10^{-8}	E	339-340
	Copper	3.1×10^{-6}	D	25, 162-164, 339-340
	Hexavalent chromium[b]	4.5×10^{-7}	E	163
	Lead[b]	1.5×10^{-5}	C	25, 162, 164, 178-179, 183, 301, 315, 339-340
	Manganese[b]	7.7×10^{-6}	D	25, 162-164, 339-340
	Mercury[b]	2.6×10^{-6}	D	162, 164, 339-340
	Nickel[b]	6.3×10^{-5}	D	25, 163-164, 339-340
	Phosphorus[b]	2.8×10^{-5}	E	25, 339-340
	Silver	4.8×10^{-7}	E	25, 339-340
	Selenium[b]	3.5×10^{-7}	E	339-340
	Thallium	4.1×10^{-9}	E	339-340
	Zinc	6.1×10^{-5}	C	25, 35, 162-164, 339-340

[a] Emission factor units are lb/ton of HMA produced. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5. Emission factors apply to facilities processing virgin aggregate or a combination of virgin aggregate and RAP.

[b] Arsenic, beryllium, cadmium, chromium, hexavalent chromium, cobalt, lead, manganese, mercury, nickel, and selenium compounds are HAPs as defined in the 1990 CAAA. Elemental phosphorus also is a listed HAP, but the phosphorus measured by Method 29 is not elemental phosphorus.

Table 11.1-14. PREDICTIVE EMISSION FACTOR EQUATIONS FOR LOAD-OUT AND SILO FILLING OPERATIONS[a]

EMISSION FACTOR RATING: C

Source	Pollutant	Equation
Drum mix or batch mix plant load-out (SCC 3-05-002-14)	Total PM[b]	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
	Organic PM[c]	$EF = 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
	TOC[d]	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
	CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$
Silo filling (SCC 3-05-002-13)	Total PM[b]	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
	Organic PM[c]	$EF = 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
	TOC[d]	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
	CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

[a] Emission factor units are lb/ton of HMA produced. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5. EF = emission factor; V = asphalt volatility, as determined by ASTM Method D2872-88 "Effects of Heat and Air on a Moving Film of Asphalt (Rolling Thin Film Oven Test - RTFOT)," where a 0.5 percent loss-on-heating is expressed as "-0.5." Regional- or site-specific data for asphalt volatility should be used, whenever possible; otherwise, a default value of -0.5 should be used for V in these equations. T = HMA mix temperature in °F. Site-specific temperature data should be used, whenever possible; otherwise a default temperature of 325°F can be used. Reference 1, Tables 4-27 through 4-31, 4-34 through 4-36, and 4-38 through 4-41.

[b] Total PM, as measured by EPA Method 315 (EPA Method 5 plus the extractable organic particulate from the impingers). Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors.

[c] Extractable organic PM, as measured by EPA Method 315 (methylene chloride extract of EPA Method 5 particulate plus methylene chloride extract of impinger particulate).

[d] TOC as propane, as measured with an EPA Method 25A sampling train or equivalent sampling train.

11.12 CONCRETE BATCHING

11.12-1 Process Description [1-5]

Concrete is composed essentially of water, cement, sand (fine aggregate) and coarse aggregate. Coarse aggregate may consist of gravel, crushed stone or iron blast furnace slag. Some specialty aggregate products could be either heavyweight aggregate (of barite, magnetite, limonite, ilmenite, iron or steel) or lightweight aggregate (with sintered clay, shale, slate, diatomaceous shale, perlite, vermiculite, slag pumice, cinders, or sintered fly ash). Supplementary cementitious materials, also called mineral admixtures or pozzolan minerals may be added to make the concrete mixtures more economical, reduce permeability, increase strength, or influence other concrete properties. Typical examples are natural pozzolans, fly ash, ground granulated blast-furnace slag, and silica fume, which can be used individually with portland or blended cement or in different combinations. Chemical admixtures are usually liquid ingredients that are added to concrete to entrain air, reduce the water required to reach a required slump, retard or accelerate the setting rate, to make the concrete more flowable or other more specialized functions.

Approximately 75 percent of the U.S. concrete manufactured is produced at plants that store, convey, measure and discharge these constituents into trucks for transport to a job site. At most of these plants, sand, aggregate, cement and water are all gravity fed from the weight hopper into the mixer trucks. The concrete is mixed on the way to the site where the concrete is to be poured. At some of these plants, the concrete may also be manufactured in a central mix drum and transferred to a transport truck. Most of the remaining concrete manufactured are products cast in a factory setting. Precast products range from concrete bricks and paving stones to bridge girders, structural components, and panels for cladding. Concrete masonry, another type of manufactured concrete, may be best known for its conventional 8 x 8 x 16-inch block. In a few cases concrete is dry batched or prepared at a building construction site. Figure 11.12-1 is a generalized process diagram for concrete batching.

The raw materials can be delivered to a plant by rail, truck or barge. The cement is transferred to elevated storage silos pneumatically or by bucket elevator. The sand and coarse aggregate are transferred to elevated bins by front end loader, clam shell crane, belt conveyor, or bucket elevator. From these elevated bins, the constituents are fed by gravity or screw conveyor to weigh hoppers, which combine the proper amounts of each material.

11.12-2 Emissions and Controls [6-8]

Particulate matter, consisting primarily of cement and pozzolan dust but including some aggregate and sand dust emissions, is the primary pollutant of concern. In addition, there are emissions of metals that are associated with this particulate matter. All but one of the emission points are fugitive in nature. The only point sources are the transfer of cement and pozzolan material to silos, and these are usually vented to a fabric filter or "sock". Fugitive sources include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. The amount of fugitive emissions generated during the transfer of sand and aggregate depends primarily on the surface moisture content of these materials. The extent of fugitive emission control varies widely from plant to plant. Particulate emission factors for concrete batching are give in Tables 11.12-1 and 11.12-2.

TABLE 11.12-2 (ENGLISH UNITS)
EMISSION FACTORS FOR CONCRETE BATCHING [a]

Source (SCC)	Uncontrolled				Controlled			
	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating
Aggregate transfer [b] (3-05-011-04,-21,23)	0.0069	D	0.0033	D	ND		ND	
Sand transfer [b] (3-05-011-05,22,24)	0.0021	D	0.00099	D	ND		ND	
Cement unloading to elevated storage silo (pneumatic)[c] (3-05-011-07)	0.72	E	0.46	E	0.00099	D	0.00034	D
Cement supplement unloading to elevated storage silo (pneumatic)[d] (3-05-011-17)	3.14	E	1.10	E	0.0089	D	0.0049	E
Weigh hopper loading [e] (3-05-011-08)	0.0051	D	0.0024	D	ND		ND	
Mixer loading (central mix)[f] (3-05-011-09)	0.544 or Eqn. 11.12-1	B	0.134 or Eqn. 11.12-1	B	0.0173 or Eqn. 11.12-1	B	0.0048 or Eqn. 11.12-1	B
Truck loading (truck mix)[g] (3-05-011-10)	0.995	B	0.278	B	0.0568 or Eqn. 11.12-1	B	0.0160 or Eqn. 11.12-1	B
Vehicle traffic (paved roads)	See AP-42 Section 13.2.1							
Vehicle traffic (unpaved roads)	See AP-42 Section 13.2.2							
Wind erosion from aggregate and sand storage piles	See AP-42 Section 13.2.5							

ND – No data

[a] All emission factors are in lb of pollutant per ton of material loaded unless noted otherwise. Loaded material includes course aggregate, sand, cement, cement supplement and the surface moisture associated with these materials. The average material composition of concrete batches presented in references 9 and 10 was 1865 lbs course aggregate, 1428 lbs sand, 491 lbs cement and 73 lbs cement supplement. Approximately 20 gallons of water was added to this solid material to produce 4024 lbs (one cubic yard) of concrete.

[b] Reference 9 and 10. Emission factors are based upon an equation from AP-42, Section 13.2.2, with $k_{PM\text{-}10}$ =.35, k_{PM} = .74, U – 10mph, $M_{aggregate}$ –1.77%, and M_{sand} = 4.17%. These moisture contents of the materials ($M_{aggregate}$ and M_{sand}) are the averages of the values obtained from Reference 9 and Reference 10.

[c] The uncontrolled PM & PM-10 emission factors were developed from Reference 9. The controlled emission factor for PM was developed from References 9, 10, 11, and 12. The controlled emission factor for PM-10 was developed from References 9 and 10.

[d] The controlled PM emission factor was developed from Reference 10 and Reference 12, whereas the controlled PM-10 emission factor was developed from only Reference 10.

[e] Emission factors were developed by using the Aggregate and Sand Transfer Emission Factors in conjunction with the ratio of aggregate and sand used in an average yard^3 of concrete. The unit for these emission factors is lb of pollutant per ton of aggregate and sand.

[f] References 9, 10, and 14. The emission factor units are lb of pollutant per ton of cement and cement supplement. The general factor is the arithmetic mean of all test data.

[g] Reference 9, 10, and 14. The emission factor units are lb of pollutant per ton of cement and cement supplement. The general factor is the arithmetic mean of all test data.

The particulate matter emissions from truck mix and central mix loading operations are calculated in accordance with the values in Tables 11.12-1 or 11.12-2 or by Equation 11.12-1[14] when site specific data are available.

$$E = k\,(0.0032)\left[\frac{U^a}{M^b}\right] + c \qquad \text{Equation 11.12-1}$$

E	=	Emission factor in lbs./ton of cement and cement supplement
k	=	Particle size multiplier (dimensionless)
U	=	Wind speed, miles per hour (mph)
M	=	Minimum moisture (% by weight) of cement and cement supplement
a, b	=	Exponents
c	=	Constant

The parameters for Equation 11.12-1 are summarized in Tables 11.12-3 and 11.12-4.

Table 11.12-3. Equation Parameters for Truck Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.8	1.75	0.3	0.013
	PM_{10}	0.32	1.75	0.3	0.0052
	$PM_{10-2.5}$	0.288	1.75	0.3	0.00468
	$PM_{2.5}$	0.048	1.75	0.3	0.00078
Uncontrolled[1]	Total PM	0.995			
	PM_{10}	0.278			
	$PM_{10-2.5}$	0.228			
	$PM_{2.5}$	0.050			

Table 11.12-4. Equation Parameters for Central Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.19	0.95	0.9	0.0010
	PM_{10}	0.13	0.45	0.9	0.0010
	$PM_{10-2.5}$	0.12	0.45	0.9	0.0009
	$PM_{2.5}$	0.03	0.45	0.9	0.0002
Uncontrolled[1]	Total PM	5.90	0.6	1.3	0.120
	PM_{10}	1.92	0.4	1.3	0.040
	$PM_{10-2.5}$	1.71	0.4	1.3	0.036
	$PM_{2.5}$	0.38	0.4	1.3	0

1. Emission factors expressed in lbs/tons of cement and cement supplement

To convert from units of lbs/ton to units of kilograms per mega gram, the emissions calculated by Equation 11.12-1 should be divided by 2.0.

Particulate emission factors per yard of concrete for an average batch formulation at a typical facility are given in Tables 11.12-4 and 11.12-5. For truck mix loading and central mix loading, the

11.19.2 Crushed Stone Processing and Pulverized Mineral Processing

11.19.2.1 Process Description [24, 25]

Crushed Stone Processing

Major rock types processed by the crushed stone industry include limestone, granite, dolomite, traprock, sandstone, quartz, and quartzite. Minor types include calcareous marl, marble, shell, and slate. Major mineral types processed by the pulverized minerals industry, a subset of the crushed stone processing industry, include calcium carbonate, talc, and barite. Industry classifications vary considerably and, in many cases, do not reflect actual geological definitions.

Rock and crushed stone products generally are loosened by drilling and blasting and then are loaded by power shovel or front-end loader into large haul trucks that transport the material to the processing operations. Techniques used for extraction vary with the nature and location of the deposit. Processing operations may include crushing, screening, size classification, material handling and storage operations. All of these processes can be significant sources of PM and PM-10 emissions if uncontrolled.

Quarried stone normally is delivered to the processing plant by truck and is dumped into a bin. A feeder is used as illustrated in Figure 11.19.2-1. The feeder or screens separate large boulders from finer rocks that do not require primary crushing, thus reducing the load to the primary crusher. Jaw, impactor, or gyratory crushers are usually used for initial reduction. The crusher product, normally 7.5 to 30 centimeters (3 to 12 inches) in diameter, and the grizzly throughs (undersize material) are discharged onto a belt conveyor and usually are conveyed to a surge pile for temporary storage or are sold as coarse aggregates.

The stone from the surge pile is conveyed to a vibrating inclined screen called the scalping screen. This unit separates oversized rock from the smaller stone. The undersized material from the scalping screen is considered to be a product stream and is transported to a storage pile and sold as base material. The stone that is too large to pass through the top deck of the scalping screen is processed in the secondary crusher. Cone crushers are commonly used for secondary crushing (although impact crushers are sometimes used), which typically reduces material to about 2.5 to 10 centimeters (1 to 4 inches). The material (throughs) from the second level of the screen bypasses the secondary crusher because it is sufficiently small for the last crushing step. The output from the secondary crusher and the throughs from the secondary screen are transported by conveyor to the tertiary circuit, which includes a sizing screen and a tertiary crusher.

Tertiary crushing is usually performed using cone crushers or other types of impactor crushers. Oversize material from the top deck of the sizing screen is fed to the tertiary crusher. The tertiary crusher output, which is typically about 0.50 to 2.5 centimeters (3/16th to 1 inch), is returned to the sizing screen. Various product streams with different size gradations are separated in the screening operation. The products are conveyed or trucked directly to finished product bins, to open area stock piles, or to other processing systems such as washing, air separators, and screens and classifiers (for the production of manufactured sand).

Some stone crushing plants produce manufactured sand. This is a small-sized rock product with a maximum size of 0.50 centimeters (3/16 th inch). Crushed stone from the tertiary sizing screen is sized in a vibrating inclined screen (fines screen) with relatively small mesh sizes.

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source[b]	Total Particulate Matter[r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Unloading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

e. Reference 4

f. References 4 and 15

g. Reference 4

h. References 5 and 6

i. References 5, 6, and 15

j. Reference 11

k. Reference 12

l. References 1, 3, 7, and 8

m. References 1, 3, 7, 8, and 15

n. No data available, but emission factors for PM-10 for tertiary crushers can be used as an upper limit for primary or secondary crushing

o. References 2, 3, 7, 8

p. References 2, 3, 7, 8, and 15

q. Reference 15

r. PM emission factors are presented based on PM-100 data in the Background Support Document for Section 11.19.2

s. Emission factors for PM-30 and PM-50 are available in Figures 11.19.2-3 through 11.19.2-6.

13.2.1 Paved Roads

13.2.1.1 General

Particulate emissions occur whenever vehicles travel over a paved surface such as a road or parking lot. Particulate emissions from paved roads are due to direct emissions from vehicles in the form of exhaust, brake wear and tire wear emissions and resuspension of loose material on the road surface. In general terms, resuspended particulate emissions from paved roads originate from, and result in the depletion of, the loose material present on the surface (i.e., the surface loading). In turn, that surface loading is continuously replenished by other sources. At industrial sites, surface loading is replenished by spillage of material and trackout from unpaved roads and staging areas. Figure 13.2.1-1 illustrates several transfer processes occurring on public streets.

Various field studies have found that public streets and highways, as well as roadways at industrial facilities, can be major sources of the atmospheric particulate matter within an area.[1-9] Of particular interest in many parts of the United States are the increased levels of emissions from public paved roads when the equilibrium between deposition and removal processes is upset. This situation can occur for various reasons, including application of granular materials for snow and ice control, mud/dirt carryout from construction activities in the area, and deposition from wind and/or water erosion of surrounding unstabilized areas. In the absence of continuous addition of fresh material (through localized track out or application of antiskid material), paved road surface loading should reach an equilibrium value in which the amount of material resuspended matches the amount replenished. The equilibrium surface loading value depends upon numerous factors. It is believed that the most important factors are: mean speed of vehicles traveling the road; the average daily traffic (ADT); the number of lanes and ADT per lane; the fraction of heavy vehicles (buses and trucks); and the presence/absence of curbs, storm sewers and parking lanes.[10]

The particulate emission factors presented in a previous version of this section of AP-42, dated October 2002, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material. EPA included these sources in the emission factor equation for paved roads since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the paved road emission factor equation only estimates particulate emissions from resuspended road surface material[28]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOVES[29] model. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOVES to estimate particulate emissions from vehicle traffic on paved roads. It also incorporates the decrease in exhaust emissions that has occurred since the paved road emission factor equation was developed. Earlier versions of the paved road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

Table 11.1-10 (cont.)

Process	Pollutant		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
No. 2 fuel oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60) (cont.)	191-24-2	Benzo(g,h,i)perylene[g]	4.0×10^{-8}	E	48
	207-08-9	Benzo(k)fluoranthene[g]	4.1×10^{-8}	E	35,48
	218-01-9	Chrysene[g]	1.8×10^{-7}	E	35,48
	206-44-0	Fluoranthene[g]	6.1×10^{-7}	D	35,45,48
	86-73-7	Fluorene[g]	1.1×10^{-5}	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	7.0×10^{-9}	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[g]	8.8×10^{-9}	E	48
	85-01-8	Phenanthrene[g]	2.3×10^{-5}	D	50,162,164
	129-00-0	Pyrene[g]	3.0×10^{-6}	E	50
		Total PAH HAPs	0.00088		
		Total HAPs	0.0087		
	Non-HAP organic compounds				
	106-97-8	Butane	0.00067	E	339
	74-85-1	Ethylene	0.0070	E	339-340
	142-82-5	Heptane	0.0094	E	339-340
	763-29-1	2-Methyl-1-pentene	0.0040	E	339,340
	513-35-9	2-Methyl-2-butene	0.00058	E	339,340
	96-14-0	3-Methylpentane	0.00019	D	339,340
	109-67-1	1-Pentene	0.0022	E	339-340
	109-66-0	n-Pentane	0.00021	E	339-340
		Total non-HAP organics	0.024		

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Fuel oil- or waste oil-fired dryer (uncontrolled) (SCC 3-05-002-58, -59,-60,-61,-62, -63)		Hazardous air pollutants[c]			
		Dioxins			
		Total HxCDD[g]	5.4×10^{-12}	E	340
	35822-46-9	1,2,3,4,6,7,8-HpCDD[g]	3.4×10^{-11}	E	340
		Total HpCDD[g]	7.1×10^{-11}	E	340
	3268-87-9	Octa CDD[g]	2.7×10^{-9}	E	340
		Total PCDD[g]	2.8×10^{-9}	E	340
		Furans			
		Total TCDF[g]	3.3×10^{-11}	E	340
		Total PeCDF[g]	7.4×10^{-11}	E	340
		1,2,3,4,7,8-HxCDF[g]	5.4×10^{-12}	E	340
		2,3,4,6,7,8-HxCDF[g]	1.6×10^{-12}	E	340
		Total HxCDF[g]	8.1×10^{-12}	E	340
Fuel oil- or waste oil-fired dryer (uncontrolled) (SCC 3-05-002-58, -59,-60,-61,-62, -63) (cont.)		1,2,3,4,6,7,8-HpCDF[g]	1.1×10^{-11}	E	340
		Total HpCDF[g]	3.8×10^{-11}	E	340
		Total PCDF[g]	1.5×10^{-10}	E	340
		Total PCDD/PCDF[g]	3.0×10^{-9}	E	340

Table 11.1-10 (cont.)

Process	Pollutant CASRN	Pollutant Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Waste oil-fired dryer with fabric filter (SCC 3-05-002-61, -62,-63) (cont.)	207-08-9	Benzo(k)fluoranthene[g]	4.1×10^{-8}	E	35,48
	218-01-9	Chrysene[g]	1.8×10^{-7}	E	35,48
	206-44-0	Fluoranthene[g]	6.1×10^{-7}	D	35,45,48
	86-73-7	Fluorene[g]	1.1×10^{-5}	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	7.0×10^{-9}	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[g]	8.8×10^{-5}	E	48
	85-01-8	Phenanthrene[g]	2.3×10^{-5}	D	50,162,164
	129-00-0	Pyrene[g]	3.0×10^{-6}	E	50
		Total PAH HAPs	0.00088		
		Total HAPs	0.010		
	Non-HAP organic compounds				
	67-64-1	Acetone[f]	0.00083	E	25
	100-52-7	Benzaldehyde	0.00011	E	25
	106-97-8	Butane	0.00067	E	339
	78-84-2	Butyraldehyde	0.00016	E	25
	4170-30-3	Crotonaldehyde	8.6×10^{-5}	E	25
	74-85-1	Ethylene	0.0070	E	339, 340
	142-82-5	Heptane	0.0094	E	339, 340
	66-25-1	Hexanal	0.00011	E	25
	590-86-3	Isovaleraldehyde	3.2×10^{-5}	E	25
	763-29-1	2-Methyl-1-pentene	0.0040	E	339, 340
	513-35-9	2-Methyl-2-butene	0.00058	E	339, 340
	96-14-0	3-Methylpentane	0.00019	D	339, 340
	109-67-1	1-Pentene	0.0022	E	339, 340
	109-66-0	n-Pentane	0.00021	E	339, 340
	110-62-3	Valeraldehyde	6.7×10^{-5}	E	25
		Total non-HAP organics	0.026		

[a] Emission factor units are lb/ton of hot mix asphalt produced. Table includes data from both parallel flow and counterflow drum mix dryers. Organic compound emissions from counterflow systems are expected to be less than from parallel flow systems, but the available data are insufficient to quantify

Table 11.1-12. EMISSION FACTORS FOR METAL EMISSIONS FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	Pollutant	Emission Factor, lb/ton	Emission Factor Rating	Reference Numbers
Fuel oil-fired dryer, uncontrolled (SCC 3-05-002-58, -59,-60)	Arsenic[b]	$1.3x10^{-6}$	E	340
	Barium	0.00025	E	340
	Beryllium[b]	0.0	E	340
	Cadmium[b]	$4.2x10^{-6}$	E	340
	Chromium[b]	$2.4x10^{-5}$	E	340
	Cobalt[b]	$1.5x10^{-5}$	E	340
	Copper	0.00017	E	340
	Lead[b]	0.00054	E	340
	Manganese[b]	0.00065	E	340
	Nickel[b]	0.0013	E	340
	Phosphorus[b]	0.0012	E	340
	Selenium[b]	$2.4x10^{-6}$	E	340
	Thallium	$2.2x10^{-6}$	E	340
	Zinc	0.00018	E	340
Natural gas- or propane-fired dryer, with fabric filter (SCC 3-05-002-55, -56,-57))	Antimony	$1.8x10^{-7}$	E	339
	Arsenic[b]	$5.6x10^{-7}$	D	25, 35, 339-340
	Barium	$5.8x10^{-6}$	E	25, 339-340
	Beryllium[b]	0.0	E	339-340
	Cadmium[b]	$4.1x10^{-7}$	D	25, 35, 162, 301, 339-340
	Chromium[b]	$5.5x10^{-6}$	C	25, 162-164, 301, 339-340
	Cobalt[b]	$2.6x10^{-8}$	E	339-340
	Copper	$3.1x10^{-6}$	D	25, 162-164, 339-340
	Hexavalent chromium[b]	$4.5x10^{-7}$	E	163
	Lead[b]	$6.2x10^{-7}$	E	35
	Manganese[b]	$7.7x10^{-6}$	D	25, 162-164, 339-340
	Mercury[b]	$2.4x10^{-7}$	E	35, 163
	Nickel[b]	$6.3x10^{-5}$	D	25, 163-164, 339-340
	Phosphorus[b]	$2.8x10^{-5}$	E	25, 339-340
	Silver	$4.8x10^{-7}$	E	25, 339-340
	Selenium[b]	$3.5x10^{-7}$	E	339-340
	Thallium	$4.1x10^{-9}$	E	339-340
	Zinc	$6.1x10^{-5}$	C	25, 35, 162-164, 339-340

Table 11.1-14. PREDICTIVE EMISSION FACTOR EQUATIONS FOR LOAD-OUT AND SILO FILLING OPERATIONS[a]

EMISSION FACTOR RATING: C

Source	Pollutant	Equation
Drum mix or batch mix plant load-out (SCC 3-05-002-14)	Total PM[b]	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
	Organic PM[c]	$EF = 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
	TOC[d]	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
	CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$
Silo filling (SCC 3-05-002-13)	Total PM[b]	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
	Organic PM[c]	$EF = 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
	TOC[d]	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
	CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

[a] Emission factor units are lb/ton of HMA produced. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5. EF = emission factor; V = asphalt volatility, as determined by ASTM Method D2872-88 "Effects of Heat and Air on a Moving Film of Asphalt (Rolling Thin Film Oven Test - RTFOT)," where a 0.5 percent loss-on-heating is expressed as "-0.5." Regional- or site-specific data for asphalt volatility should be used, whenever possible; otherwise, a default value of -0.5 should be used for V in these equations. T = HMA mix temperature in °F. Site-specific temperature data should be used, whenever possible; otherwise a default temperature of 325°F can be used. Reference 1, Tables 4-27 through 4-31, 4-34 through 4-36, and 4-38 through 4-41.

[b] Total PM, as measured by EPA Method 315 (EPA Method 5 plus the extractable organic particulate from the impingers). Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors.

[c] Extractable organic PM, as measured by EPA Method 315 (methylene chloride extract of EPA Method 5 particulate plus methylene chloride extract of impinger particulate).

[d] TOC as propane, as measured with an EPA Method 25A sampling train or equivalent sampling train.

TABLE 11.12-2 (ENGLISH UNITS)
EMISSION FACTORS FOR CONCRETE BATCHING [a]

Source (SCC)	Uncontrolled				Controlled			
	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating
Aggregate transfer [b] (3-05-011-04,-21,23)	0.0069	D	0.0033	D	ND		ND	
Sand transfer [b] (3-05-011-05,22,24)	0.0021	D	0.00099	D	ND		ND	
Cement unloading to elevated storage silo (pneumatic)[c] (3-05-011-07)	0.72	E	0.46	E	0.00099	D	0.00034	D
Cement supplement unloading to elevated storage silo (pneumatic)[d] (3-05-011-17)	3.14	E	1.10	E	0.0089	D	0.0049	E
Weigh hopper loading [e] (3-05-011-08)	0.0051	D	0.0024	D	ND		ND	
Mixer loading (central mix)[f] (3-05-011-09)	0.544 or Eqn. 11.12-1	B	0.134 or Eqn. 11.12-1	B	0.0173 or Eqn. 11.12-1	B	0.0048 or Eqn. 11.12-1	B
Truck loading (truck mix)[g] (3-05-011-10)	0.995	B	0.278	B	0.0568 or Eqn. 11.12-1	B	0.0160 or Eqn. 11.12-1	B
Vehicle traffic (paved roads)	See AP-42 Section 13.2.1							
Vehicle traffic (unpaved roads)	See AP-42 Section 13.2.2							
Wind erosion from aggregate and sand storage piles	See AP-42 Section 13.2.5							

The particulate matter emissions from truck mix and central mix loading operations are calculated in accordance with the values in Tables 11.12-1 or 11.12-2 or by Equation 11.12-1[14] when site specific data are available.

$$E = k\,(0.0032)\left[\frac{U^a}{M^b}\right] + c \qquad \text{Equation 11.12-1}$$

E	=	Emission factor in lbs./ton of cement and cement supplement
k	=	Particle size multiplier (dimensionless)
U	=	Wind speed, miles per hour (mph)
M	=	Minimum moisture (% by weight) of cement and cement supplement
a, b	=	Exponents
c	=	Constant

The parameters for Equation 11.12-1 are summarized in Tables 11.12-3 and 11.12-4.

Table 11.12-3. Equation Parameters for Truck Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.8	1.75	0.3	0.013
	PM_{10}	0.32	1.75	0.3	0.0052
	$PM_{10-2.5}$	0.288	1.75	0.3	0.00468
	$PM_{2.5}$	0.048	1.75	0.3	0.00078
Uncontrolled[1]	Total PM	0.995			
	PM_{10}	0.278			
	$PM_{10-2.5}$	0.228			
	$PM_{2.5}$	0.050			

Table 11.12-4. Equation Parameters for Central Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.19	0.95	0.9	0.0010
	PM_{10}	0.13	0.45	0.9	0.0010
	$PM_{10-2.5}$	0.12	0.45	0.9	0.0009
	$PM_{2.5}$	0.03	0.45	0.9	0.0002
Uncontrolled[1]	Total PM	5.90	0.6	1.3	0.120
	PM_{10}	1.92	0.4	1.3	0.040
	$PM_{10-2.5}$	1.71	0.4	1.3	0.036
	$PM_{2.5}$	0.38	0.4	1.3	0

1. Emission factors expressed in lbs/tons of cement and cement supplement

To convert from units of lbs/ton to units of kilograms per mega gram, the emissions calculated by Equation 11.12-1 should be divided by 2.0.

Particulate emission factors per yard of concrete for an average batch formulation at a typical facility are given in Tables 11.12-4 and 11.12-5. For truck mix loading and central mix loading, the

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source[b]	Total Particulate Matter[r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Unloading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

13.2.1 Paved Roads

13.2.1.1 General

Particulate emissions occur whenever vehicles travel over a paved surface such as a road or parking lot. Particulate emissions from paved roads are due to direct emissions from vehicles in the form of exhaust, brake wear and tire wear emissions and resuspension of loose material on the road surface. In general terms, resuspended particulate emissions from paved roads originate from, and result in the depletion of, the loose material present on the surface (i.e., the surface loading). In turn, that surface loading is continuously replenished by other sources. At industrial sites, surface loading is replenished by spillage of material and trackout from unpaved roads and staging areas. Figure 13.2.1-1 illustrates several transfer processes occurring on public streets.

Various field studies have found that public streets and highways, as well as roadways at industrial facilities, can be major sources of the atmospheric particulate matter within an area.[1-9] Of particular interest in many parts of the United States are the increased levels of emissions from public paved roads when the equilibrium between deposition and removal processes is upset. This situation can occur for various reasons, including application of granular materials for snow and ice control, mud/dirt carryout from construction activities in the area, and deposition from wind and/or water erosion of surrounding unstabilized areas. In the absence of continuous addition of fresh material (through localized track out or application of antiskid material), paved road surface loading should reach an equilibrium value in which the amount of material resuspended matches the amount replenished. The equilibrium surface loading value depends upon numerous factors. It is believed that the most important factors are: mean speed of vehicles traveling the road; the average daily traffic (ADT); the number of lanes and ADT per lane; the fraction of heavy vehicles (buses and trucks); and the presence/absence of curbs, storm sewers and parking lanes.[10]

The particulate emission factors presented in a previous version of this section of AP-42, dated October 2002, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material. EPA included these sources in the emission factor equation for paved roads since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the paved road emission factor equation only estimates particulate emissions from resuspended road surface material[28]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOVES[29] model. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOVES to estimate particulate emissions from vehicle traffic on paved roads. It also incorporates the decrease in exhaust emissions that has occurred since the paved road emission factor equation was developed. Earlier versions of the paved road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.1.3 Predictive Emission Factor Equations[10,29]

The quantity of particulate emissions from resuspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = k\,(sL)^{0.91} \times (W)^{1.02} \qquad (1)$$

where: E = particulate emission factor (having units matching the units of k),
k = particle size multiplier for particle size range and units of interest (see below),
sL = road surface silt loading (grams per square meter) (g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

It is important to note that Equation 1 calls for the average weight of all vehicles traveling the road. For example, if 99 percent of traffic on the road are 2 ton cars/trucks while the remaining 1 percent consists of 20 ton trucks, then the mean weight "W" is 2.2 tons. More specifically, Equation 1 is *not* intended to be used to calculate a separate emission factor for each vehicle weight class. Instead, only one emission factor should be calculated to represent the "fleet" average weight of all vehicles traveling the road.

The particle size multiplier (k) above varies with aerodynamic size range as shown in Table 13.2.1-1. To determine particulate emissions for a specific particle size range, use the appropriate value of k shown in Table 13.2.1-1.

To obtain the total emissions factor, the emission factors for the exhaust, brake wear and tire wear obtained from either EPA's MOBILE6.2[27] or MOVES2010[29] model should be added to the emissions factor calculated from the empirical equation.

Table 13.2.1-1. PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

Size range[a]	Particle Size Multiplier k[b]		
	g/VKT	g/VMT	lb/VMT
PM-2.5[c]	0.15	0.25	0.00054
PM-10	0.62	1.00	0.0022
PM-15	0.77	1.23	0.0027
PM-30[d]	3.23	5.24	0.011

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers

[b] Units shown are grams per vehicle kilometer traveled (g/VKT), grams per vehicle mile traveled (g/VMT), and pounds per vehicle mile traveled (lb/VMT). The multiplier k includes unit conversions to produce emission factors in the units shown for the indicated size range from the mixed units required in Equation 1.

[c] The k-factors for $PM_{2.5}$ were based on the average $PM_{2.5}$:PM_{10} ratio of test runs in Reference 30.

[d] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

Equation 1 is based on a regression analysis of 83 tests for PM-10.[3, 5-6, 8, 27-29, 31-36] Sources tested include public paved roads, as well as controlled and uncontrolled industrial paved roads. The majority of tests involved freely flowing vehicles traveling at constant speed on relatively level roads. However, 22 tests of slow moving or "stop-and-go" traffic or vehicles under load were available for inclusion in the data base.[32-36] Engine exhaust, tire wear and break wear were subtracted from the emissions measured in the test programs prior to stepwise regression to determine Equation 1.[37, 39] The equations retain the quality rating of A (D for PM-2.5), if applied within the range of source conditions that were tested in developing the equation as follows:

Silt loading:	0.03 - 400 g/m^2 0.04 - 570 grains/square foot (ft^2)
Mean vehicle weight:	1.8 - 38 megagrams (Mg) 2.0 - 42 tons
Mean vehicle speed:	1 - 88 kilometers per hour (kph) 1 - 55 miles per hour (mph)

The upper and lower 95% confidence levels of equation 1 for PM_{10} is best described with equations using an exponents of 1.14 and 0.677 for silt loading and an exponents of 1.19 and 0.85 for weight. Users are cautioned that application of equation 1 outside of the range of variables and operating conditions specified above, e.g., application to roadways or road networks with speeds above 55 mph and average vehicle weights of 42 tons, will result in emission estimates with a higher level of uncertainty. In these situations, users are encouraged to consider an assessment of the impacts of the influence of extrapolation to the overall emissions and alternative methods that are equally or more plausible in light of local emissions data and/or ambient concentration or compositional data.

To retain the quality rating for the emission factor equation when it is applied to a specific paved road, it is necessary that reliable correction parameter values for the specific road in question be determined. With the exception of limited access roadways, which are difficult to sample, the collection and use of site-specific silt loading (sL) data for public paved road emission inventories are strongly recommended. The field and laboratory procedures for determining surface material silt content and surface dust loading are summarized in Appendices C.1 and C.2. In the event that site-specific values cannot be obtained, an appropriate value for a paved public road may be selected from the values in Table 13.2.1-2, but the quality rating of the equation should be reduced by 2 levels.

Equation 1 may be extrapolated to average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual (or other long-term) average emissions are inversely proportional to the frequency of measurable (> 0.254 mm [0.01 inch]) precipitation by application of a precipitation correction term. The precipitation correction term can be applied on a daily or an hourly basis [26, 38].

For the daily basis, Equation 1 becomes:

$$E_{ext} = [\ k\ (sL)^{0.91} \times (W)^{1.02}\ ]\ (1 - P/4N) \qquad (2)$$

where k, sL, W, and S are as defined in Equation 1 and

E_{ext} – annual or other long-term average emission factor in the same units as k,

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N – number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

Note that the assumption leading to Equation 2 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2. However, Equation 2 above incorporates an additional factor of "4" in the denominator to account for the fact that paved roads dry more quickly than unpaved roads and that the precipitation may not occur over the complete 24-hour day.

For the hourly basis, equation 1 becomes:

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02}\,]\,(1 - 1.2P/N) \qquad (3)$$

where k, sL, W, and S are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,

P = number of hours with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N – number of hours in the averaging period (e.g., 8760 for annual, 2124 for season 720 for monthly)

Note: In the hourly moisture correction term (1-1.2P/N) for equation 3, the 1.2 multiplier is applied to account for the residual mitigative effect of moisture. For most applications, this equation will produce satisfactory results. Users should select a time interval to include sufficient "dry" hours such that a reasonable emissions averaging period is evaluated. For the special case where this equation is used to calculate emissions on an hour by hour basis, such as would be done in some emissions modeling situations, the moisture correction term should be modified so that the moisture correction "credit" is applied to the first hours following cessation of precipitation. In this special case, it is suggested that this 20% "credit" be applied on a basis of one hour credit for each hour of precipitation up to a maximum of 12 hours.

Note that the assumption leading to Equation 3 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2.

Figure 13.2.1-2 presents the geographical distribution of "wet" days on an annual basis for the United States. Maps showing this information on a monthly basis are available in the *Climatic Atlas of the United States*[23] . Alternative sources include other Department of Commerce publications (such as local climatological data summaries). The National Climatic Data Center (NCDC) offers several products that provide hourly precipitation data. In particular, NCDC offers *Solar and Meteorological Surface Observation Network 1961-1990* (SAMSON) CD-ROM, which contains 30 years worth of hourly meteorological data for first-order National Weather Service locations. Whatever meteorological data are used, the source of that data and the averaging period should be clearly specified.

It is emphasized that the simple assumption underlying Equations 2 and 3 has not been verified in any rigorous manner. For that reason, the quality ratings for Equations 2 and 3 should be downgraded one letter from the rating that would be applied to Equation 1.

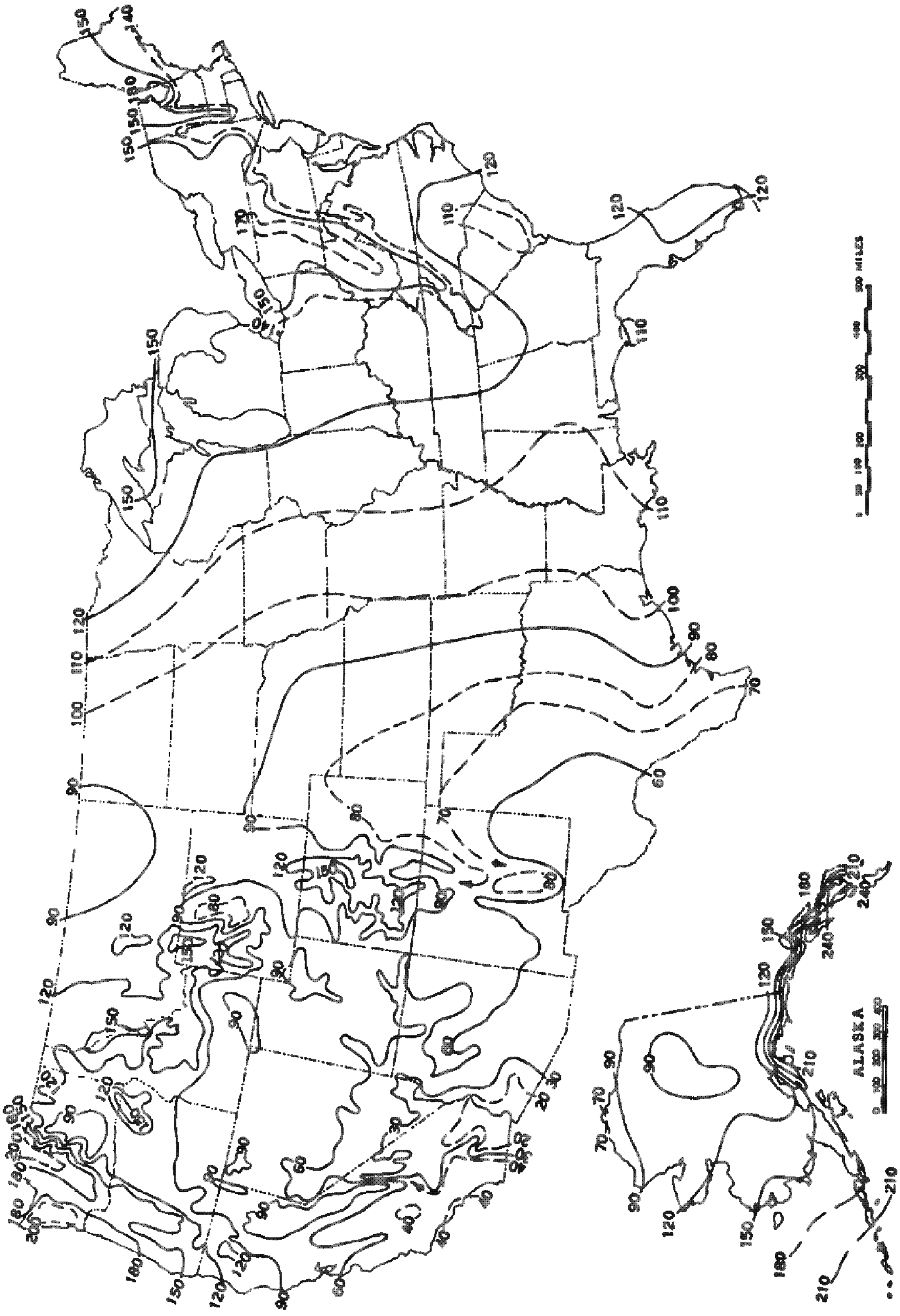

Figure 13.2.1-2. Mean number of days with 0.01 inch or more of precipitation in the United States.

Table 13.2.1-2 presents recommended default silt loadings for normal baseline conditions and for wintertime baseline conditions in areas that experience frozen precipitation with periodic application of antiskid material[24]. The winter baseline is represented as a multiple of the non-winter baseline, depending on the ADT value for the road in question. As shown, a multiplier of 4 is applied for low volume roads (< 500 ADT) to obtain a wintertime baseline silt loading of 4 X 0.6 = 2.4 g/m^2.

Table 13.2.1-2. Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2)

ADT Category	< 500	500-5,000	5,000-10,000	> 10,000
Ubiquitous Baseline g/m^2	0.6	0.2	0.06	0.03 0.015 limited access
Ubiquitous Winter Baseline Multiplier during months with frozen precipitation	X4	X3	X2	X1
Initial peak additive contribution from application of antiskid abrasive (g/m^2)	2	2	2	2
Days to return to baseline conditions (assume linear decay)	7	3	1	0.5

It is suggested that an additional (but temporary) silt loading contribution of 2 g/m^2 occurs with each application of antiskid abrasive for snow/ice control. This was determined based on a typical application rate of 500 lb per lane mile and an initial silt content of 1 % silt content. Ordinary rock salt and other chemical deicers add little to the silt loading, because most of the chemical dissolves during the snow/ice melting process.

To adjust the baseline silt loadings for mud/dirt trackout, the number of trackout points is required. It is recommended that in calculating PM_{10} emissions, six additional miles of road be added for each active trackout point from an active construction site, to the paved road mileage of the specified category within the county. In calculating $PM_{2.5}$ emissions, it is recommended that three additional miles of road be added for each trackout point from an active construction site.

It is suggested the number of trackout points for activities other than road and building construction areas be related to land use. For example, in rural farming areas, each mile of paved road would have a specified number of trackout points at intersections with unpaved roads. This value could be estimated from the unpaved road density (mi/sq. mi.).

The use of a default value from Table 13.2.1-2 should be expected to yield only an order-of-magnitude estimate of the emission factor. Public paved road silt loadings are dependent

13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23, 26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

- E = size-specific emission factor (lb/VMT)
- s = surface material silt content (%)
- W = mean vehicle weight (tons)
- M = surface material moisture content (%)
- S = mean vehicle speed (mph)
- C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" – not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$$E_{ext} - E\ [(365 - P)/365] \qquad (2)$$

where:

E_{ext} – annual size-specific emission factor extrapolated for natural mitigation, lb/VMT

E = emission factor from Equation 1a or 1b

P – number of days in a year with at least 0.254 mm (0.01 in) of precipitation (see below)

Figure 13.2.2-1 gives the geographical distribution for the mean annual number of "wet" days for the United States.

Equation 2 provides an estimate that accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface. In the event that a finer temporal and spatial resolution is desired for inventories of public unpaved roads, estimates can be based on a more complex set of assumptions. These assumptions include:

1. The moisture content of the road surface material is increased in proportion to the quantity of water added;
2. The moisture content of the road surface material is reduced in proportion to the Class A pan evaporation rate;
3. The moisture content of the road surface material is reduced in proportion to the traffic volume; and
4. The moisture content of the road surface material varies between the extremes observed in the area. The CHIEF Web site (http://www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html) has a file which contains a spreadsheet program for calculating emission factors which are temporally and spatially resolved. Information required for use of the spreadsheet program includes monthly Class A pan evaporation values, hourly meteorological data for precipitation, humidity and snow cover, vehicle traffic information, and road surface material information.

It is emphasized that <u>the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution</u> have not been verified in any rigorous manner. For this reason, the quality ratings for either approach should be downgraded one letter from the rating that would be applied to Equation 1.

13.2.2.3 Controls[18-22]

A wide variety of options exist to control emissions from unpaved roads. Options fall into the following three groupings:

1. <u>Vehicle restrictions</u> that limit the speed, weight or number of vehicles on the road;

13.2.4 Aggregate Handling And Storage Piles

13.2.4.1 General

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, such as material loading onto the pile, disturbances by strong wind currents, and loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

13.2.4.2 Emissions And Correction Parameters

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Emissions also depend on 3 parameters of the condition of a particular storage pile: age of the pile, moisture content, and proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, the potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents, either from aggregate transfer itself or from high winds. As the aggregate pile weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and then the drying process is very slow.

Silt (particles equal to or less than 75 micrometers [μm] in diameter) content is determined by measuring the portion of dry aggregate material that passes through a 200-mesh screen, using ASTM-C-136 method.[1] Table 13.2.4-1 summarizes measured silt and moisture values for industrial aggregate materials.

Table 13.2.4-1. TYPICAL SILT AND MOISTURE CONTENTS OF MATERIALS AT VARIOUS INDUSTRIES[a]

Industry	No. Of Facilities	Material	Silt Content (%)			Moisture Content (%)		
			No. Of Samples	Range	Mean	No. Of Samples	Range	Mean
Iron and steel production	9	Pellet ore	13	1.3 - 13	4.3	11	0.64 - 4.0	2.2
		Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.0	5.4
		Coal	12	2.0 - 7.7	4.6	11	2.8 - 11	4.8
		Slag	3	3.0 - 7.3	5.3	3	0.25 - 2.0	0.92
		Flue dust	3	2.7 - 23	13	1	—	7
		Coke breeze	2	4.4 - 5.4	4.9	2	6.4 - 9.2	7.8
		Blended ore	1	—	15	1	—	6.6
		Sinter	1	—	0.7	0	—	—
		Limestone	3	0.4 - 2.3	1.0	2	ND	0.2
Stone quarrying and processing	2	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
		Various limestone products	8	0.8 - 14	3.9	8	0.46 - 5.0	2.1
Taconite mining and processing	1	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.0	0.9
		Tailings	2	ND	11	1	—	0.4
Western surface coal mining	4	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
		Overburden	15	3.8 - 15	7.5	0	—	
		Exposed ground	3	5.1 - 21	15	3	0.8 - 6.4	3.4
Coal-fired power plant	1	Coal (as received)	60	0.6 - 4.8	2.2	59	2.7 - 7.4	4.5
Municipal solid waste landfills	4	Sand	1	—	2.6	1	—	7.4
		Slag	2	3.0 - 4.7	3.8	2	2.3 - 4.9	3.6
		Cover	5	5.0 - 16	9.0	5	8.9 - 16	12
		Clay/dirt mix	1		9.2	1	—	14
		Clay	2	4.5 - 7.4	6.0	2	8.9 - 11	10
		Fly ash	4	78 - 81	80	4	26 - 29	27
		Misc. fill materials	1		12	1	—	11

[a] References 1-10. ND = no data.

13.2.4.3 Predictive Emission Factor Equations

Total dust emissions from aggregate storage piles result from several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continuous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

Either adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate emissions generated by either type of drop operation, per kilogram (kg) (ton) of material transferred, may be estimated, with a rating of A, using the following empirical expression:[1]

$$E = k(0.0016)\ \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\ \text{(kg/megagram [Mg])}$$

(1)

$$E = k(0.0032)\ \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\ \text{(pound [lb]/ton)}$$

where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 µm	< 15 µm	< 10 µm	< 5 µm	< 2.5 µm
0.74	0.48	0.35	0.20	0.053[a]

[a] Multiplier for < 2.5 µm taken from Reference 14.

The equation retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as follows. Note that silt content is included, even though silt content does not appear as a correction parameter in the equation. While it is reasonable to expect that silt content and emission factors are interrelated, no significant correlation between the 2 was found during the derivation of the equation, probably because most tests with high silt contents were conducted under lower winds, and vice versa. It is recommended that estimates from the equation be reduced 1 quality rating level if the silt content used in a particular application falls outside the range given:

Ranges Of Source Conditions For Equation 1			
Silt Content (%)	Moisture Content (%)	Wind Speed	
		m/s	mph
0.44 - 19	0.25 - 4.8	0.6 - 6.7	1.3 - 15

To retain the quality rating of the equation when it is applied to a specific facility, reliable correction parameters must be determined for specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site-specific values for correction parameters cannot be obtained, the appropriate mean from Table 13.2.4-1 may be used, but the quality rating of the equation is reduced by 1 letter.

For emissions from equipment traffic (trucks, front-end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 13.2.2). For vehicle travel between storage piles, the silt value(s) for the areas among the piles (which may differ from the silt values for the stored materials) should be used.

Worst-case emissions from storage pile areas occur under dry, windy conditions. Worst-case emissions from materials-handling operations may be calculated by substituting into the equation appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 hours. The treatment of dry conditions for Section 13.2.2, vehicle traffic, "Unpaved Roads", follows the methodology described in that section centering on parameter p. A separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity also may be justified for the worst-case averaging period.

13.2.4.4 Controls[12-13]

Watering and the use of chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions. A much more effective technique is to apply chemical agents (such as surfactants) that permit more extensive wetting. Continuous chemical treating of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[12]

References For Section 13.2.4

1. C. Cowherd, Jr., *et al.*, *Development Of Emission Factors For Fugitive Dust Sources*, EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. Bohn, *et al.*, *Fugitive Emissions From Integrated Iron And Steel Plants*, EPA-600/2-78-050, U. S. Environmental Protection Agency, Cincinnati, OH, March 1978.

3. C. Cowherd, Jr., *et al.*, *Iron And Steel Plant Open Dust Source Fugitive Emission Evaluation*, EPA-600/2-79-103, U. S. Environmental Protection Agency, Cincinnati, OH, May 1979.

4. *Evaluation Of Open Dust Sources In The Vicinity Of Buffalo, New York*, EPA Contract No. 68-02-2545, Midwest Research Institute, Kansas City, MO, March 1979.

5. C. Cowherd, Jr., and T. Cuscino, Jr., *Fugitive Emissions Evaluation*, MRI-4343-L, Midwest Research Institute, Kansas City, MO, February 1977.

6. T. Cuscino, Jr., *et al.*, *Taconite Mining Fugitive Emissions Study*, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

7. *Improved Emission Factors For Fugitive Dust From Western Surface Coal Mining Sources*, 2 Volumes, EPA Contract No. 68-03-2924, PEDCo Environmental, Kansas City, MO, and Midwest Research Institute, Kansas City, MO, July 1981.

8. *Determination Of Fugitive Coal Dust Emissions From Rotary Railcar Dumping*, TRC, Hartford, CT, May 1984.

9. *PM-10 Emission Inventory Of Landfills In the Lake Calumet Area*, EPA Contract No. 68-02-3891, Midwest Research Institute, Kansas City, MO, September 1987.

10. *Chicago Area Particulate Matter Emission Inventory — Sampling And Analysis*, EPA Contract No. 68-02-4395, Midwest Research Institute, Kansas City, MO, May 1988.

11. *Update Of Fugitive Dust Emission Factors In AP-42 Section 11.2*, EPA Contract No. 68-02-3891, Midwest Research Institute, Kansas City, MO, July 1987.

12. G. A. Jutze, *et al., Investigation Of Fugitive Dust Sources Emissions And Control*, EPA-450/3-74-036a, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

13. C. Cowherd, Jr., *et al., Control Of Open Fugitive Dust Sources*, EPA-450/3-88-008, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1988.

14. C. Cowherd, *Background Document for Revisions to Fine Fraction Ratios &sed for AP-42 Fugitive Dust Emission Factors*. Prepared by Midwest Research Institute for Western Governors Association, Western Regional Air Partnership, Denver, CO, February 1, 2006.

VOLUME II: CHAPTER 3

PREFERRED AND ALTERNATIVE METHODS FOR ESTIMATING AIR EMISSIONS FROM HOT-MIX ASPHALT PLANTS

Final Report

July 1996

Prepared by:
Eastern Research Group, Inc.
Post Office Box 2010
Morrisville, North Carolina 27560

Prepared for:
Point Sources Committee
Emission Inventory Improvement Program

In the counterflow drum mixing process, the aggregate is proportioned through a cold feed system prior to introduction to the drying process. As opposed to the parallel flow drum mixing process though, the aggregate moves opposite to the flow of the exhaust gases. After drying and heating take place, the aggregate is transferred to a part of the drum that is not exposed to the exhaust gas and coated with asphalt cement. This process prevents stripping of the asphalt cement by the hot exhaust gas. If RAP is used, it is usually introduced into the coating chamber.

2.2 EMISSION SOURCES

Emissions from HMA plants derive from both controlled (i.e., ducted) and uncontrolled sources. Section 7 lists the source classification codes (SCCs) for these emission points.

2.2.1 MATERIAL HANDLING (FUGITIVE EMISSIONS)

Material handling includes the receipt, movement, and processing of fuel and materials used at the HMA facility. Fugitive particulate matter (PM) emissions from aggregate storage piles are typically caused by front-end loader operations that transport the aggregate to the cold feed unit hoppers. The amount of fugitive PM emissions from aggregate piles will be greater in strong winds (Gunkel, 1992). Piles of RAP, because RAP is coated with asphalt cement, are not likely to cause significant fugitive dust problems. Other pre-dryer fugitive emission sources include the transfer of aggregate from the cold feed unit hoppers to the dryer feed conveyor and, subsequently, to the dryer entrance. Aggregate moisture content prior to entry into the dryer is typically 3 percent to 7 percent. This moisture content, along with aggregate size classification, tend to minimize emissions from these sources, which contribute little to total facility PM emissions. PM less than or equal to 10 μm in diameter (PM_{10}) emissions from these sources are reported to account for about 19 percent of their total PM emissions (NAPA, 1995).

If crushing, breaking, or grinding operations occur at the plant, these may result in fugitive PM emissions (TNRCC, 1994). Also, fine particulate collected from the baghouses can be a source of fugitive emissions as the overflow PM is transported by truck (enclosed or tarped) for on-site disposal. At all HMA plants there may be PM and slight process fugitive volatile organic compound (VOC) emissions from the transport and handling of the hot-mix from the mixer to the storage silo and also from the load-out operations to the delivery trucks (EPA, 1994a). Small amounts of VOC emissions can also result from the transfer of liquid and gaseous fuels, although natural gas is normally transported in a pipeline (Gunkel, 1992, Wiese, 1995).

TABLE 3.2-1

TYPICAL HOT-MIX ASPHALT PLANT EMISSION CONTROL TECHNIQUES

Emission Source	Pollutant	Control Technique	Typical Efficiency (%)
Process	PM and PM_{10}	Cyclones	50 - 75[a,b]
		Multiple cyclones	90[c]
		Settling chamber	<50[b]
		Baghouse	99 - 99.97[a,d]
		Venturi scrubber	90 - 99.5[d,e]
	VOC	Dryer and combustion process modifications	37 - 86[f,g]
	SO_x	Limestone	50[b,e]
		Low sulfur fuel	80[c]
Fugitive dust	PM and PM_{10}	Paving and maintenance	60 - 99[g]
		Wetting and crusting agents	70[b] - 80[c]
		Crushed RAP material, asphalt shingles	70[h]

[a] Control efficiency dependent on particle size ratio and size of equipment.
[b] Source: Patterson, 1995c.
[c] Source: EIIP, 1995.
[d] Typical efficiencies at a hot-mix asphalt plant.
[e] Source: TNRCC, 1995.
[f] Source: Gunkel, 1992.
[g] Source: TNRCC, 1994.
[h] Source: Patterson, 1995a.

NEW MEXICO

AVERAGE WIND SPEED - MPH

STATION	ID	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
ALAMOGORDO AIRPORT ASOS	KALM	1996-2006	5.1	6.3	7.1	7.9	7.1	6.9	6.1	5.3	5.2	5.2	5.0	5.0	6.0
ALAMOGORDO-HOLLOMAN AFB	KHMN	1996-2006	8.5	9.7	10.6	11.8	10.8	10.6	9.8	9.1	8.8	8.5	8.1	8.3	9.6
ALBUQUERQUE AP ASOS	KABQ	1996-2006	7.0	8.2	9.3	11.1	10.0	10.0	8.7	8.3	8.0	7.9	7.2	6.9	8.5
ALBUQUERQUE-DBLE EAGLE	KAEG	1999-2006	7.1	7.9	9.0	10.6	9.5	8.6	7.0	6.2	7.0	6.5	6.5	6.1	7.7
ARTESIA AIRPORT ASOS	KATS	1997-2006	7.8	9.1	10.1	10.9	10.2	9.9	7.8	6.9	7.6	7.8	7.6	7.4	8.5
CARLSBAD AIRPORT ASOS	KCNM	1996-2006	9.2	9.8	10.9	11.4	10.4	9.9	8.5	7.7	8.2	8.5	8.4	8.8	9.3
CLAYTON MUNI AP ASOS	KCAO	1996-2006	11.9	12.7	13.4	14.6	13.4	13.0	11.7	10.8	11.8	12.1	12.1	12.0	12.4
CLINES CORNERS	KCQC	1998-2006	16.2	16.1	15.7	16.9	14.6	13.5	10.6	10.1	11.8	13.3	15.0	16.0	14.1
CLOVIS AIRPORT AWOS	KCVN	1996-2006	12.3	12.3	13.4	13.8	12.4	11.9	9.7	8.9	9.7	10.9	11.6	12.2	11.6
CLOVIS-CANNON AFB	KCVS	1996-2006	12.5	12.6	13.6	13.8	12.2	12.5	10.7	10.0	10.2	11.3	11.7	12.4	12.0
DEMING AIRPORT ASOS	KDMN	1996-2006	8.7	9.7	10.9	12.0	10.6	10.1	8.9	8.1	8.4	8.2	8.5	8.1	9.3
FARMINGTON AIRPORT ASOS	KFMN	1996-2006	7.3	8.3	9.0	9.8	9.4	9.4	8.7	8.2	8.0	7.8	7.6	7.3	8.4
GALLUP AIRPORT ASOS	KGUP	1996-2006	5.7	6.9	7.8	10.0	9.0	8.8	6.9	6.0	6.5	6.1	5.6	5.3	7.0
GRANTS-MILAN AP ASOS	KGNT	1997-2006	7.8	8.8	9.6	10.9	10.0	9.8	8.1	7.2	7.9	8.4	8.0	7.6	8.7
HOBBS AIRPORT AWOS	KHOB	1996-2006	11.3	11.9	12.6	13.4	12.5	12.3	11.0	10.0	10.2	10.6	10.7	11.1	11.4
LAS CRUCES AIRPORT AWOS	KLRU	2000-2006	6.4	7.5	8.8	10.1	8.7	8.2	6.8	6.0	6.2	6.1	6.4	6.0	7.3
LAS VEGAS AIRPORT ASOS	KLVS	1996-2006	10.9	12.2	12.5	14.3	12.4	11.8	10.0	9.2	10.9	10.8	11.0	10.9	11.4
LOS ALAMOS AP AWOS	KLAM	2005-2006	3.9	5.7	7.5	8.1	7.1	7.3	5.3	4.8	5.7	5.1	4.4	3.2	5.4
RATON AIRPORT ASOS	KRTN	1998-2006	8.9	9.4	10.4	12.2	10.8	10.2	8.4	8.1	8.6	9.0	8.6	8.5	9.4
ROSWELL AIRPORT ASOS	KROW	1996-2006	7.4	8.9	9.9	11.1	10.3	10.2	8.8	7.9	8.3	8.0	7.5	7.3	8.8
RUIDOSO AIRPORT AWOS	KSRR	1996-2006	8.8	9.6	10.0	11.6	10.0	8.4	5.9	5.3	6.4	7.4	7.9	8.7	8.3
SANTA FE AIRPORT ASOS	KSAF	1996-2006	8.9	9.5	9.9	11.2	10.6	10.5	9.2	8.8	8.8	9.1	8.7	8.5	9.5
SILVER CITY AP AWOS	KSVC	1999-2006	8.1	8.7	9.9	10.8	10.2	9.9	8.5	7.2	6.9	7.6	7.9	7.7	8.5
TAOS AIRPORT AWOS	KSKX	1996-2006	5.8	6.5	7.7	9.1	8.6	8.5	7.1	6.6	6.7	6.6	6.0	5.7	7.0
TRUTH OR CONSEQ AP ASOS	KTCS	1996-2006	7.4	8.7	9.9	11.1	10.4	9.8	8.1	7.4	7.7	8.0	7.7	7.3	8.6
TUCUMCARI AIRPORT ASOS	KTCC	1999-2006	10.0	11.2	11.9	13.6	11.9	11.6	9.9	9.3	10.0	10.0	10.4	10.2	10.8

TANKS 4.0.9d

Emissions Report - Detail Format

Tank Identification and Physical Characteristics

Identification		
User Identification:	NM Terminal HMA Plant	
City:	Albuquerque	
State:	New Mexico	
Company:	NM Terminal Services	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	Tanks 1 and 2	
Tank Dimensions		
Shell Height (ft):		40.00
Diameter (ft):		12.00
Liquid Height (ft) :		37.00
Avg. Liquid Height (ft):		20.00
Volume (gallons):		30,000.00
Turnovers:		173.54
Net Throughput(gal/yr):		5,206,074.00
Is Tank Heated (y/n):	Y	
Paint Characteristics		
Shell Color/Shade:	Aluminum/Specular	
Shell Condition	Good	
Roof Color/Shade:	Aluminum/Specular	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		40.00
Radius (ft) (Dome Roof)		12.00
Breather Vent Settings		
Vacuum Settings (psig):		0.00
Pressure Settings (psig)		0.00

Meteorological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

NM Terminal HMA Plant - Vertical Fixed Roof Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg	Min	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min	Max.	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Asphalt Cement	All	350.00	350.00	350.00	350.00	0.0347	0.0347	0 0347	105 0000			1 000 00	Option 3: A=75350 06 B=9 00346

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

NM Terminal HMA Plant - Vertical Fixed Roof Tank
Albuquerque, New Mexico

Annual Emission Calcaulations

Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	38,034.2150
Vapor Density (lb/cu ft):	0.0004
Vapor Space Expansion Factor	0.0000
Vented Vapor Saturation Factor	0.6177
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	38,034.2150
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft)	336.2963
Tank Shell Height (ft):	40.0000
Average Liquid Height (ft)	20.0000
Roof Outage (ft):	316.2963
Roof Outage (Dome Roof)	
Roof Outage (ft):	316.2963
Dome Radius (ft):	12.0000
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0004
Vapor Molecular Weight (lb/lb-mole):	105.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Daily Avg. Liquid Surface Temp. (deg. R):	809.6700
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	809.6700
Tank Paint Solar Absorptance (Shell)	0.3900
Tank Paint Solar Absorptance (Roof)	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	785.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000
Daily Vapor Pressure Range (psia)	0.0000
Breather Vent Press. Setting Range(psia)	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.0347
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0347
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0347
Daily Avg. Liquid Surface Temp. (deg R):	809.6700
Daily Min. Liquid Surface Temp. (deg R):	809.6700
Daily Max. Liquid Surface Temp. (deg R):	809.6700
Daily Ambient Temp. Range (deg. R)	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor	0.6177
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Vapor Space Outage (ft):	336.2963
Working Losses (lb)	153.4596
Vapor Molecular Weight (lb/lb-mole)	105.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.0347
Annual Net Throughput (gal/yr):	5,206,074.0000
Annual Turnovers:	173.5358
Turnover Factor,	0.3395
Maximum Liquid Volume (gal):	30,000.0000
Maximum Liquid Height (ft):	37.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor	1.0000
Total Losses (lb)	153.4596

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

NM Terminal HMA Plant - Vertical Fixed Roof Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Asphalt Cement	153.46	0.00	153 46

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Calculations
400 TPH

Mix Ratios

Rail Unloading		133.333	tons/hr	1168000	tons/yr
Aggregate	57.50%	230	tons/hr	460000	tons/yr
RAP	35.00%	140	tons/hr	280000	tons/yr
Mineral Filler	1.50%	6	tons/hr	12000	tons/yr
Asphalt Cement	6.00%	24	tons/hr	48000	tons/yr
Aggregate Total		376	tons/hr	752000	tons/yr
	Total	400	tons/hr	800000	tons/yr

Plant Hourly Average	400.0 tons/hr	
	2000.0 hrs/yr	Based on Annual Production and Hourly Production. Not a requested Permit Condition
Uncontrolled hrs/yr of operation	8760.0 hrs/yr	
Annual tons per year	800000 tpy	

Aggregate Railcar Unloading

AP-42 13.2.4 (11/06)	E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton			
Max tph	133.3 tph		3200 tons/day	1168000 tons/yr
k(tsp)	0.74			
k(pm10)	0.35			
k(pm2.5)	0.053			
U	1.3 MPH	Low-end of Equation 13.2.4-1 Range. Below Ground Hopper		
M	2 %	NMED Default Moisture Content		

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.055	0.240
E(pm10) Uncontrolled	0.026	0.114
E(pm2.5) Uncontrolled	0.004	0.017

Rail Transfer Point 1

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8 2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.0001	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8 2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput	133.3 tph			[illegible]	[illegible]

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.40000	1.752
E(pm10) Uncontrolled	0.14667	0.642
E(pm2.5) Uncontrolled	0.02267	0.099
E(tsp) Controlled	0.01867	0.082
E(pm10) Controlled	0.00613	0.027
E(pm2.5) Controlled	0.00173	0.008

Rail Transfer Point 2

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8 2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8 2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput	133.3 tph			[illegible]	[illegible]

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.40000	1.752
E(pm10) Uncontrolled	0.14667	0.642
E(pm2.5) Uncontrolled	0.02267	0.099
E(tsp) Controlled	0.0186	0.082
E(pm10) Controlled	0.00613	0.027
E(pm2.5) Controlled	0.00173	0.008

Aggregate Handling Storage Piles

AP-42 Section 13.2.4 "Aggregate Handling"	E(TSP)	0.00472 lbs/ton	AP-42 13.2.4 (11/06)	E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton	
Ver 11 2006	E(PM10)	0.00223 lbs/ton	Max tph	133.3 tph	
	E(PM2.5)	0.00034 lbs/ton	k(tsp)	0.74	
			k(pm10)	0.35	
	E(TSP)	0.00472 lbs/ton	k(pm2.5)	0.053	
	E(PM10)	0.00223 lbs/ton	U Maximum	8.5 MPH	1996-2006 Albuquerque Ave MPH
	E(PM2.5)	0.00034 lbs/ton	U Annual	8.5 MPH	1996-2006 Albuquerque Ave MPH
			M	2 %	NMED Default
		133.3 tph	1168000 ton/yr		

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.62937	2.76
E(pm10) Uncontrolled	0.2976	1.30
E(pm2.5) Uncontrolled	0.04508	0.20

Aggregate Truck Loading

AP-42 Section 13.2.4 "Aggregate Handling"	E(TSP)	0.00472 lbs/ton	AP-42 13.2.4 (11/06)	E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton	
Ver 11 2006	E(PM10)	0.00223 lbs/ton	Max tph	100.0 tph	
	E(PM2.5)	0.00034 lbs/ton	k(tsp)	0.74	
			k(pm10)	0.35	
	E(TSP)	0.00472 lbs/ton	k(pm2.5)	0.053	
	E(PM10)	0.00223 lbs/ton	U Maximum	8.5 MPH	1996-2006 Albuquerque Ave MPH
	E(PM2.5)	0.00034 lbs/ton	U Annual	8.5 MPH	1996-2006 Albuquerque Ave MPH
			M	2 %	NMED Default
		100.0 tph	708000 ton/yr		

	lb/hr	tons/yr
E(tsp) Uncontrolled	[illegible]	1.67
E(pm10) Uncontrolled	[illegible]	0.79
E(pm2.5) Uncontrolled	[illegible]	0.12

RAP Handling Storage Piles

AP-42 Section 13.2.4 "Aggregate Handling"	E(TSP)	0.00142 lbs/ton	AP-42 13.2.4 (11/06)	E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton	
Ver 11 2006	E(PM10)	0.00067 lbs/ton	Max tph	140.0 tph	
	E(PM2.5)	0.00010 lbs/ton	k(tsp)	0.74	
			k(pm10)	0.35	
	E(TSP)	0.00142 lbs/ton	k(pm2.5)	0.053	
	E(PM10)	0.00067 lbs/ton	U Maximum	8.5 MPH	1996-2006 Albuquerque Ave MPH
	E(PM2.5)	0.00010 lbs/ton	U Annual	8.5 MPH	1996-2006 Albuquerque Ave MPH
		140.0 tph	M	2 %	NMED Default
			Inherent Material Property Control	70 %	

	lb/hr	tons/yr	
E(tsp) Uncontrolled	0.19825	0.87	
E(pm10) Uncontrolled	0.09377	0.41	
E(pm2.5) Uncontrolled	0.01420	0.06	
E(tsp) Controlled	0.19825	0.20	Annual Emissions are Controlled by Limiting Annual Production
E(pm10) Controlled	0.09377	0.09	Annual Emissions are Controlled by Limiting Annual Production
E(pm2.5) Controlled	0.01420	0.01	Annual Emissions are Controlled by Limiting Annual Production

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Calculations
400 TPH

Aggregate Feed Bin Loading (Cold)

AP-42 Section 13.2.4 "Aggregate Handling"	E(TSP)	0.00472 lbs/ton	AP-42 13.2.4 (11/06)	E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton		
Ver 11/2006	E(PM10)	0.00223 lbs/ton	Max tph	230.0 tph		
	E(PM2.5)	0.00034 lbs/ton	k(tsp)	0.74		
			k(pm10)	0.35		
	E(TSP)	0.00472 lbs/ton	k(pm2.5)	0.053		
	E(PM10)	0.00223 lbs/ton	U Maximum	8.5 MPH	1996-2006 Albuquerque Ave MPH	
	E(PM2.5)	0.00034 lbs/ton	U Annual	8.5 MPH	1996-2006 Albuquerque Ave MPH	
		230.0 tph	M	2 %	NMED Default	

	lb/hr	tons/yr	
E(tsp) Uncontrolled	1.08566	4.76	
E(pm10) Uncontrolled	0.51349	2.25	
E(pm2.5) Uncontrolled	0.0777	0.34	
E(tsp) Controlled	1.08566	1.09	Annual Emissions are Controlled by Limiting Annual Production
E(pm10) Controlled	0.51349	0.51	Annual Emissions are Controlled by Limiting Annual Production
E(pm2.5) Controlled	0.0777	0.078	Annual Emissions are Controlled by Limiting Annual Production

Aggregate Feed Bin Unloading

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		230.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.69000	3.022
E(pm10) Uncontrolled	0.25300	1.108
E(pm2.5) Uncontrolled	0.03910	.171
E(tsp) Controlled	0.03220	0.032
E(pm10) Controlled	0.01058	0.011
E(pm2.5) Controlled	0.00299	0.003

Scalping Screen

AP-42 Table 11.19.2-2 "Screening Uncontrolled"	E(TSP)	0.02500	lbs/ton		
Ver 8/2004	E(PM10)	0.00870	lbs/ton		
	E(PM2.5)	0.00132	lbs/ton		
				91.20 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Screening Controlled"	E(TSP)	0.00220	lbs/hr		
Ver 8/2004	E(PM10)	0.00074	lbs/ton		
	E(PM2.5)	0.00005	lbs/ton		
Throughput		230.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	5.75000	25.185
E(pm10) Uncontrolled	2.00100	8.764
E(pm2.5) Uncontrolled	0.30360	1.330
E(tsp) Controlled	0.50600	0.506
E(pm10) Controlled	0.17020	0.170
E(pm2.5) Controlled	0.01150	0.012

Scalping Screen Unloading

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		230.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.69000	3.022
E(pm10) Uncontrolled	0.25300	1.108
E(pm2.5) Uncontrolled	0.03910	0.171
E(tsp) Controlled	0.03220	0.032
E(pm10) Controlled	0.01058	0.011
E(pm2.5) Controlled	0.00299	0.003

Pug Mill

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		236.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.70800	3.101
E(pm10) Uncontrolled	0.25960	1.137
E(pm2.5) Uncontrolled	0.04012	0.176
E(tsp) Controlled	0.03304	0.033
E(pm10) Controlled	0.01086	0.011
E(pm2.5) Controlled	0.00304	0.003

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Calculations
400 TPH

Pug Mill Unloading to Scale Conveyor

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		236.0	tph		

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.70800	3.101
E(pm10) Uncontrolled	0.25960	1.137
E(pm2.5) Uncontrolled	0.04012	0.176
E(tsp) Controlled	0.03304	0.033
E(pm10) Controlled	0.01086	0.011
E(pm2.5) Controlled	0.0030	0.003

Scale Conveyor Transfer to Slinger Conveyor

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		236	tph		

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.70800	3.101
E(pm10) Uncontrolled	0.25960	1.137
E(pm2.5) Uncontrolled	0.04012	0.176
E(tsp) Controlled	0.03304	0.033
E(pm10) Controlled	0.01086	0.011
E(pm2.5) Controlled	0.00307	0.003

RAP Feed Bin Loading

AP-42 Section 13.2.4 "Aggregate Handling	E(TSP)	0.00142 lbs/ton	AP-42 13.2.4 (11/06)	E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton	
Ver 11/2006	E(PM10)	0.00067 lbs/ton	Max tph	140.0 tph	
	E(PM2.5)	0.00010 lbs/ton	k(tsp)	0.74	
			k(pm10)	0.35	
	E(TSP)	0.00142 lbs/ton	k(pm2.5)	0.053	
	E(PM10)	0.00067 lbs/ton	U Maximum	8.5 MPH	1996-2006 Albuquerque Ave MPH
	E(PM2.5)	0.00010 lbs/ton	U Annual	8.5 MPH	1996-2006 Albuquerque Ave MPH
		140.0 tph	M	2 %	NMED Default
RAP Inherent Material Properties	EIIP - Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final			70 % Reduction	

	lb/hr	tons/yr	
E(tsp) Uncontrolled	0.19825	0.87	
E(pm10) Uncontrolled	0.09377	0.41	
E(pm2.5) Uncontrolled	0.01420	0.06	
E(tsp) Controlled	0.19825	0.20	Annual Emissions are Controlled by Limiting Annual Production
E(pm10) Controlled	0.09377	0.09	Annual Emissions are Controlled by Limiting Annual Production
E(pm2.5) Controlled	0.01420	0.01	Annual Emissions are Controlled by Limiting Annual Production

RAP Crusher

AP-42 Table 11.19.2-2 "Crusher Uncontrolled"	E(TSP)	0.00540	lbs/ton		
Ver 8/2004	E(PM10)	0.00240	lbs/ton		
	E(PM2.5)	0.00036	lbs/ton		
				[illegible] % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Crusher Controlled"	E(TSP)	0.00120	lbs/hr		
Ver 8/2004	E(PM10)	0.00054	lbs/ton		
	E(PM2.5)	0.00010	lbs/ton		
Throughput		140.0	tph		

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.75600	3.311
E(pm10) Uncontrolled	0.33600	1.472
E(pm2.5) Uncontrolled	0.05040	0.221
E(tsp) Controlled	0.16800	0.168
E(pm10) Controlled	0.07560	0.076
E(pm2.5) Controlled	0.01400	0.0140

RAP Crusher Unloading

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		140.0	tph		

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.42000	1.840
E(pm10) Uncontrolled	0.15400	0.675
E(pm2.5) Uncontrolled	0.02380	0.104
E(tsp) Controlled	0.01960	0.020
E(pm10) Controlled	0.00644	0.006
E(pm2.5) Controlled	0.00182	0.002

RAP Screen

AP-42 Table 11.19.2-2 "Screening Uncontrolled"	E(TSP)	0.02500	lbs/ton		
Ver 8/2004	E(PM10)	0.00870	lbs/ton		
	E(PM2.5)	0.00132	lbs/ton		
				91.20 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Screening Controlled"	E(TSP)	0.00220	lbs/hr		
Ver 8/2004	E(PM10)	0.00074	lbs/ton		
	E(PM2.5)	0.00005	lbs/ton		
Throughput		140.0	tph		

	lb/hr	tons/yr
E(tsp) Uncontrolled	3.50000	15.330
E(pm10) Uncontrolled	1.21800	5.335
E(pm2.5) Uncontrolled	0.18480	0.809
E(tsp) Controlled	0.30800	0.308
E(pm10) Controlled	0.10360	0.104
E(pm2.5) Controlled	0.00700	0.007

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Calculations
400 TPH

RAP Screen Unloading

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		140.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.42000	1.840
E(pm10) Uncontrolled	0.15400	0.675
E(pm2.5) Uncontrolled	0.02380	0.104
E(tsp) Controlled	0.01960	0.020
E(pm10) Controlled	0.00644	0.006
E(pm2.5) Controlled	0.00182	0.002

RAP Transfer Conveyor to Conveyor

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.0011	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		140.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.42000	1.840
E(pm10) Uncontrolled	0.15400	0.675
E(pm2.5) Uncontrolled	0.02380	0.104
E(tsp) Controlled	0.01960	0.020
E(pm10) Controlled	0.00644	0.006
E(pm2.5) Controlled	0.00182	0.002

RAP Transfer Conveyor to Drum

AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"	E(TSP)	0.00300	lbs/ton		
Ver 8/2004	E(PM10)	0.00110	lbs/ton		
	E(PM2.5)	0.00017	lbs/ton		
				95.33 % Control Efficiency	AP-42 Table 11.19.2-2
AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"	E(TSP)	0.00014	lbs/hr		
Ver 8/2004	E(PM10)	0.000046	lbs/ton		
	E(PM2.5)	0.000013	lbs/ton		
Throughput		140.0 tph			

	lb/hr	tons/yr
E(tsp) Uncontrolled	0.42000	1.840
E(pm10) Uncontrolled	0.15400	0.675
E(pm2.5) Uncontrolled	0.02380	0.104
E(tsp) Controlled	0.01960	0.020
E(pm10) Controlled	0.00644	0.006
E(pm2.5) Controlled	0.00182	0.002

Mineral Filler Silo

Uncontrolled emissions based on AP-42 Section 11.12 "Concrete Batching" Table 11.12-2 "Cement Unloading to Elevated Storage Silo"

E(TSP)	0.72 lbs/ton	Uncontrolled Cement Silo Loading TSP
E(PM10)	0.46 lbs/ton	Uncontrolled Cement Silo Loading PM10
E(PM2.5)	0.036 lbs/ton	Uncontrolled Cement Silo Loading PM2.5 (TSP * 0.05025 Table 11.12-3 Uncontrolled)

Max tph Mineral Filler	25 tph Max	6 tph Ave	52560.00 tons/yr uncontrolled 12000.00 tons/yr controlled
	lb/hr	lb/hr Ave	tons/yr
E(tsp) uncontrolled cement	18.00000	4.32000	18.922
E(pm10) uncontrolled cement	11.50000	2.76000	12.089
E(pm2.5) uncontrolled cement	0.90000	0.21600	0.946

Baghouse Control Efficiency 99.0 % Engineering Judgement based on lower end of Baghouse Controls

Uncontrolled emissions based on AP-42 Section 11.12 "Concrete Batching" Table 11.12-2 "Cement Unloading to Elevated Storage Silo" and %CE

E(TSP)	[illegible] lbs/ton	Controlled Cement Silo Loading TSP
E(PM10)	[illegible] lbs/ton	Controlled Cement Silo Loading PM10
E(PM2.5)	[illegible] lbs/ton	Controlled Cement Silo Loading PM2.5 (TSP * 0.06, Table 11.12-3 Controlled E factors)

	lb/hr	lb/hr Ave	tons/yr
E(tsp) controlled	0.18000	[illegible]	0.043
E(pm10) controlled	0.11500	[illegible]	0.028
E(pm2.5) controlled	0.00900	[illegible]0216	0.002

Asphalt Cement Storage Tanks
TANKS 4.0.9d

Tank capacity	30000 gallons		Tank capacity	30000 gallons	
Tons Per Hour	24 tons		Tons Per Hour	24 tons	
Tons Per Year	24000 tons		Tons Per Year	24000 tons	
Density	9.22 lbs/gallon		Density	9.22 lbs/gallon	
Gallons Per Hour	5206.1 gal/hr		Gallons Per Hour	5206.1 gal/hr	
Gallons Per Year	5206073.8 gal/yr		Gallons Per Year	5206073.8 gal/yr	
Tank Temperature	325 degrees F		Tank Temperature	325 degrees F	
Turnovers	173.5357918 per year		Turnovers	173.5357918 per year	
Working Loss TOC	153.46 lbs/yr		Working Loss TOC	153.6 lbs/yr	
Breathing Loss TOC	0 lbs/yr		Breathing Loss TOC	0 lbs/yr	
Total TOC	153.46 lbs/yr		Total TOC	153.6 lbs/yr	
Total TOC	0.018 lbs/hr		Total TOC	0.018 lbs/hr	
Total TOC	0.077 tpy		Total TOC	0.077 tpy	
Total Asphalt Fumes	0.00023 lbs/hr	1.3% of VOC	Total Asphalt Fumes	0.00023 lbs/hr	[illegible]
Total Asphalt Fumes	0.00100 tpy	1.3% of VOC	Total Asphalt Fumes	0.00100 tpy	[illegible]

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Calculations
400 TPH

Drum Mixer Emissions

Uncontrolled emissions based on AP-42 Section 11.1 "Hot Mix Asphalt Plants" Table 11.1-3, -4, -7, -8, -14

E(TSP)	28.000 lbs/ton	Uncontrolled Drum Mixer	
E(PM10)	6.500 lbs/ton	Uncontrolled Drum Mixer	
E(PM2.5)	1.565 lbs/ton	Uncontrolled Drum Mixer	Table 11.1-4 plus condensable
E(NOx)	0.055 lbs/ton	Uncontrolled Drum Mixer	
E(CO)	0.130 lbs/ton	Uncontrolled Drum Mixer	
E(SO2)	0.058 lbs/ton	Uncontrolled Drum Mixer	
E(VOC)	0.032 lbs/ton	Uncontrolled Drum Mixer	
E(Asphalt Fumes)	0.012 lbs/ton	Uncontrolled Drum Mixer	Table 11.1-3 Organic Condensable
E(CO) Silo Filling	0.001179981 lbs/ton	Uncontrolled Drum Unloading CO	
E(TOC) Silo Filling	0.012186685 lbs/ton	Uncontrolled Drum Unloading TOC	
E(Asphalt Fumes) Silo Filling	0.000188603 lbs/ton	Uncontrolled Drum Unloading PM	
E(TSP) Silo Filling	0.000585889 lbs/ton	Uncontrolled Drum Unloading PM	
E(PM10) Silo Filling	0.000585889 lbs/ton	Uncontrolled Drum Unloading PM	
E(PM2.5) Silo Filling	0.000585889 lbs/ton	Uncontrolled Drum Unloading PM	
E(CO) Plant Unloading	0.001349240 lbs/ton	Uncontrolled Silo Loading CO	
E(TOC) Plant Unloading	0.004158948 lbs/ton	Uncontrolled Silo Loading TOC	
E(Asphalt Fumes) Plant Unloading	0.000087048 lbs/ton	Uncontrolled Silo Loading PM Organic	
E(TSP) Plant Unloading	0.000521937 lbs/ton	Uncontrolled Silo Loading PM	
E(PM10) Plant Unloading	0.000521937 lbs/ton	Uncontrolled Silo Loading PM	
E(PM2.5) Plant Unloading	0.000521937 lbs/ton	Uncontrolled Silo Loading PM	
E(CO) Yard	0.000352000 lbs/ton	Uncontrolled Yard CO	
E(TOC) Yard	0.001100000 lbs/ton	Uncontrolled Yard TOC	

TSP	11200.00 lbs/hr	49056.00 tons/yr	
PM10	2600.00 lbs/hr	11388.00 tons/yr	
PM2.5	626.00 lbs/hr	2741.88 tons/yr	
NOx	22.00 lbs/hr	96.36 tons/yr	
CO	52.00 lbs/hr	227.76 tons/yr	
SO2	23.20 lbs/hr	101.62 tons/yr	
VOC	12.80 lbs/hr	56.06 tons/yr	
Asphalt Fumes	4.80 lbs/hr	21.02 tons/yr	
CO Silo Filling	0.47 lbs/hr	2.07 tons/yr	
TOC Silo Filling	4.87 lbs/hr	21.35 tons/yr	
Asphalt Fumes Silo Filling	0.075 lbs/hr	0.33 tons/yr	
TSP Silo Filling	0.23 lbs/hr	1.03 tons/yr	
PM10 Silo Filling	0.23 lbs/hr	1.03 tons/yr	
PM2.5 Silo Filling	0.23 lbs/hr	1.03 tons/yr	
CO Plant Unloading	0.54 lbs/hr	2.36 tons/yr	
TOC Plant Unloading	1.66 lbs/hr	7.29 tons/yr	
Asphalt Fumes Plant Unloading	0.035 lbs/hr	0.15 tons/yr	
TSP Plant Unloading	0.21 lbs/hr	0.91 tons/yr	
PM10 Plant Unloading	0.21 lbs/hr	0.91 tons/yr	
PM2.5 Plant Unloading	0.21 lbs/hr	0.91 tons/yr	
CO Yard	0.14 lbs/hr	0.62 tons/yr	
TOC Yard	0.44 lbs/hr	1.93 tons/yr	
Asphalt Fumes Yard	0.01 lbs/hr	0.03 tons/yr	1.5% of TOC

Controlled emissions based on AP-42 Section 11.1 "Hot Mix Asphalt Plants" Table 11.1-3, -7, -8, -14

E(TSP)	0.033 lbs/ton	Controlled Drum Mixer	99.88 % Control Efficiency	AP-42 Section 11.1
E(PM10)	0.023 lbs/ton	Controlled Drum Mixer		
E(PM2.5)	0.023 lbs/ton	Controlled Drum Mixer		
E(NOx)	0.055 lbs/ton	Controlled Drum Mixer		
E(CO)	0.130 lbs/ton	Controlled Drum Mixer		
E(SO2)	0.058 lbs/ton	Controlled Drum Mixer		
E(VOC)	0.032 lbs/ton	Controlled Drum Mixer		
E(Asphalt Fumes)	0.012 lbs/ton	Controlled Drum Mixer	Table 11.1-3 Organic Condensable	
E(CO) Silo Filling	0.001179981 lbs/ton	Controlled Drum Unloading CO		
E(TOC) Silo Filling	0.012186685 lbs/ton	Controlled Drum Unloading TOC		
E(Asphalt Fumes) Silo Filling	0.000188603 lbs/ton	Controlled Drum Unloading TOC		
E(TSP) Silo Filling	0.000585889 lbs/ton	Controlled Drum Unloading PM		
E(PM10) Silo Filling	0.000585889 lbs/ton	Controlled Drum Unloading PM		
E(PM2.5) Silo Filling	0.000585889 lbs/ton	Controlled Drum Unloading PM		
E(CO) Plant Unloading	0.001349240 lbs/ton	Controlled Silo Loading CO		
E(TOC) Plant Unloading	0.004158948 lbs/ton	Controlled Silo Loading TOC		
E(Asphalt Fumes) Plant Unloading	0.000087048 lbs/ton	Controlled Silo Loading PM Organic		
E(TSP) Plant Unloading	0.000521937 lbs/ton	Controlled Silo Unloading PM		
E(PM10) Plant Unloading	0.000521937 lbs/ton	Controlled Silo Unloading PM		
E(PM2.5) Plant Unloading	0.000521937 lbs/ton	Controlled Silo Unloading PM		
E(CO) Yard	0.000352000 lbs/ton	Controlled Yard CO		
E(TOC) Yard	0.001100000 lbs/ton	Controlled Yard TOC		

TSP	13.20 lbs/hr	13.20 tons/yr	AP-42 11.1
PM10	9.20 lbs/hr	9.20 tons/yr	
PM2.5	9.20 lbs/hr	9.20 tons/yr	
NOx	22.00 lbs/hr	22.00 tons/yr	
CO	52.00 lbs/hr	52.00 tons/yr	
SO2	23.20 lbs/hr	23.20 tons/yr	
VOC	12.80 lbs/hr	12.80 tons/yr	
Asphalt Fumes	4.80 lbs/hr	4.80 tons/yr	
CO Silo Filling	0.47 lbs/hr	0.47 tons/yr	
TOC Silo Filling	4.87 lbs/hr	4.87 tons/yr	
Asphalt Fumes Silo Filling	0.075 lbs/hr	0.08 tons/yr	
TSP Silo Filling	0.23 lbs/hr	0.23 tons/yr	
PM10 Silo Filling	0.23 lbs/hr	0.23 tons/yr	
PM2.5 Silo Filling	0.23 lbs/hr	0.23 tons/yr	
CO Plant Unloading	0.54 lbs/hr	0.54 tons/yr	
TOC Plant Unloading	1.66 lbs/hr	1.66 tons/yr	
Asphalt Fumes Plant Unloading	0.035 lbs/hr	0.03 tons/yr	
TSP Plant Unloading	0.21 lbs/hr	0.21 tons/yr	
PM10 Plant Unloading	0.21 lbs/hr	0.21 tons/yr	
PM2.5 Plant Unloading	0.21 lbs/hr	0.21 tons/yr	
CO Yard	0.14 lbs/hr	0.14 tons/yr	
TOC Yard	0.44 lbs/hr	0.44 tons/yr	
Asphalt Fumes Yard	0.0066 lbs/hr	0.007 tons/yr	1.5% of TOC

New Mexico Terminal Services NSR Railyard HMA Plant Emission Calculations
400 TPH

<u>HMA Haul Road Traffic</u>

AP-42 13.2 Unpaved Roads (11/06)

Equation

$E = k(s/12)^a (W/3)^b [(365-p)/365]$ *Annual emissions only include p factor*

k TSP	4.9	
k PM10	1.5	
k PM25	0.15	
a TSP	0.7	
a PM10	0.9	
a PM25	0.9	
b TSP	0.45	
b PM10	0.45	
b PM2.5	0.45	
% Silt Content s	4.8 %	Sand and Gravel (AP-42 13.2.2-1)
p days with precipitation over 0.01 inches	60	

Vehicle control	90.0 %	Surfactants, millings and water

Mineral Filler Truck VMT Unpaved	422.3 meter rt vehicle	25 tons load	6 tons hr	0.26246 miles vehicle
Asphalt Cement Truck VMT Unpaved	422.3 meter rt vehicle	25 tons load	24 tons hr	0.26246 miles vehicle
Asphalt Truck VMT Unpaved	422.3 meter rt vehicle	25 tons load	400 tons hr	0.26246 miles vehicle
Aggregate Truck VMT Unpaved	143.2 meter one way vehicle	25 tons load	300 tons hr	0.17804 miles vehicle
RAP Truck VMT Unpaved	268.2 meter one way vehicle	25 tons load	140 tons hr	0.33335 miles vehicle

Max. Mineral Filler Truck hr	0.2 truck hr	480 truck yr	12000 tons yr
Max. Asphalt Cement Truck hr	1.0 truck hr	1920 truck yr	48000 tons yr
Max. Asphalt Truck hr	16.0 truck hr	32000 truck yr	800000 tons yr
Max. Aggregate Truck hr	4.0 truck hr	28320 truck yr	708000 tons yr
Max. RAP Truck hr	5.6 truck hr	11200 truck yr	280000 tons yr
Max. Total Truck into Site	26.8 truck hr	73920 truck yr	

Mineral Filler Truck VMT Unpaved	0.06299 miles hr	551.8021865	125.9822344
Asphalt Cement Truck VMT Unpaved	0.25196 miles hr	2207.208746	503.9289374
Asphalt Truck VMT Unpaved	4.19931 miles hr	36786.81243	8398.815624
Aggregate Truck VMT Unpaved	0.71216 miles hr	6238.525491	5042.095945
RAP Truck VMT Unpaved	1.86676 miles hr	16352.7932	3733.51443
	5.227 miles hr	45784.349	14070.823

Mineral Filler Truck weight	27.5 tons
Asphalt Cement Truck weight	27.5 tons
Asphalt Truck weight	27.5 tons
Aggregate Truck weight	27.5 tons
RAP Truck weight	27.5 tons

		TSP Uncontrolled		TSP Control	
Max. Mineral Filler Truck Emissions Unpaved		0.44 lbs hr	1.61 tons yr	0.044 lbs hr	0.037 tons yr
Max. Asphalt Cement Truck Emissions Unpaved		1.76 lbs hr	6.45 tons yr	0.176 lbs hr	0.15 tons yr
Max. Asphalt Truck Emissions Unpaved		29.36 lbs hr	107.47 tons yr	2.936 lbs hr	2.45 tons yr
Max. Aggregate Truck Emissions Unpaved		4.98 lbs hr	18.23 tons yr	0.498 lbs hr	1.47 tons yr
Max. RAP Truck Emissions Unpaved		13.05 lbs hr	47.78 tons yr	1.305 lbs hr	1.09 tons yr
	HMA total traffic	49.60 lbs hr	181.54 tons yr	4.96 lbs hr	5.20 tons yr
		PM10 Uncontrolled		PM10 Control	
Max. Mineral Filler Truck Emissions Unpaved		0.11 lbs hr	0.41 tons yr	0.011 lbs hr	0.0094 tons yr
Max. Asphalt Cement Truck Emissions Unpaved		0.45 lbs hr	1.64 tons yr	0.045 lbs hr	0.038 tons yr
Max. Asphalt Truck Emissions Unpaved		7.48 lbs hr	27.39 tons yr	0.748 lbs hr	0.63 tons yr
Max. Aggregate Truck Emissions Unpaved		1.27 lbs hr	4.65 tons yr	0.127 lbs hr	0.38 tons yr
Max. RAP Truck Emissions Unpaved		3.33 lbs hr	12.18 tons yr	0.333 lbs hr	0.28 tons yr
	HMA total traffic	12.64 lbs hr	46.27 tons yr	1.26 lbs hr	1.33 tons yr
		PM2.5 Uncontrolled		PM2.5 Control	
Max. Mineral Filler Truck Emissions Unpaved		0.011 lbs hr	0.041 tons yr	0.0011 lbs hr	0.00094 tons yr
Max. Asphalt Cement Truck Emissions Unpaved		0.045 lbs hr	0.16 tons yr	0.0045 lbs hr	0.0038 tons yr
Max. Asphalt Truck Emissions Unpaved		0.75 lbs hr	2.74 tons yr	0.075 lbs hr	0.063 tons yr
Max. Aggregate Truck Emissions Unpaved		0.13 lbs hr	0.46 tons yr	0.013 lbs hr	0.038 tons yr
Max. RAP Truck Emissions Unpaved		0.33 lbs hr	1.22 tons yr	0.033 lbs hr	0.028 tons yr
	HMA total traffic	1.26 lbs hr	4.63 tons yr	0.13 lbs hr	0.13 tons yr

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Calculations
400 TPH

AP-42 13.1 Paved Road (01/11)
Equation
E = k(sL) 0.91*(W) 1.02*[1-P/4N] *annual emissions only include p factor*

k TSP	0.011	
k PM10	0.0022	
k PM25	0.00054	
sL	0.6	road surface silt loading (g/m2)
P days with precipitation over 0.01 inches	60	
N number of days in averaging period	365	

Truck weight	27.5 tons	
Haul Truck VMT Paved In	533.1 meter round trip/vehicle	0.66266 miles/vehicle
Max. Mineral Filler Truck/hr	0.2 truck/hr	480 truck/yr
Max. Asphalt Cement Truck/hr	1 truck/hr	1920 truck/yr
Max. Asphalt Truck/hr	16 truck/hr	32000 truck/yr
Max Aggregate Truck/hr	4 truck/hr	28320 truck/yr
Max RAP Truck/hr	5.6 truck/hr	11200 truck/yr
Max. Total Truck into Site	26.8 truck/hr	73920 truck/yr

	Hourly Max		Annual VMT
HMA Haul Truck VMT Paved In	15.11 miles/hr		30217
Agg Haul Truck VMT Paved In	2.65 miles/hr		18766
		TSP Uncontrolled	
Max. HMA Truck Emissions Paved Road In	3.0680 lbs/hr		2.94[illegible]9 tons/yr
		PM10 Uncontrolled	
	[illegible].6136 lbs/hr		[illegible].5884 tons/yr
		PM2.5 Uncontrolled	
	0.15061 lbs/hr		0.1444 tons/yr
		TSP Uncontrolled	
Max. Aggregate Truck Emissions Paved Road In	0.5382 lbs/hr		1.827[illegible] tons/yr
		PM10 Uncontrolled	
	0.107[illegible] lbs/hr		0.3654 tons/yr
		PM2.5 Uncontrolled	
	0.02642 lbs/hr		0.0897 tons/yr
		TSP Uncontrolled	
Max. Total Truck Emissions Paved Road In	3.6062 lbs/hr		4.7690 tons/yr
		PM10 Uncontrolled	
	0.7212 lbs/hr		0.9538 tons/yr
		PM2.5 Uncontrolled	
	0.1[illegible] lbs/hr		0.2341 tons/yr

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Summary
Hot Oil Heater Emissions

Asphalt Heater
AP-42 1.3 (5/10)

Heater Size — Diesel

2500000 BTU/hr		Heat Rate	128000 BTU/gal
19.5 gal/hr		%sulfur	0.05

Uncontrolled Hours	8760
Controlled Hours	8760

Emission Factors

NOx	20.00	lbs/1000 gal	
CO	5.00	lbs/1000 gal	
VOC	0.34	lbs/1000 gal	
SO2	142S	lbs/1000 gal	S = % sulfur
PM	2.00	lbs/1000 gal	

Calculated Uncontrolled Emissions

NOx	0.391 lbs/hr	1.711 tpy
CO	0.098 lbs/hr	0.428 tpy
VOC	0.0066 lbs/hr	0.029 tpy
SOx	0.139 lbs/hr	0.607 tpy
PM	0.039 lbs/hr	0.171 tpy

Calculated Controlled Emissions

NOx	0.39 lbs/hr	1.7 tpy
CO	0.098 lbs/hr	0.43 tpy
VOC	0.0066 lbs/hr	0.029 tpy
SOx	0.14 lbs/hr	0.61 tpy
PM	0.039 lbs/hr	0.17 tpy

AP-42 1.5 (7/08)

Natural Gas or Propane

2500000 BTU/hr	Heat Rate	91500 BTU/gal
27.3 gal/hr		

Uncontrolled Hours	8760
Controlled Hours	8760

Emission Factors

NOx	13	lbs/1000 gal
CO	7.5	lbs/1000 gal
VOC	1	lbs/1000 gal
SO2	0.018	lbs/1000 gal
PM	0.7	lbs/1000 gal

Calculated Uncontrolled Emissions

NOx	0.36 lbs/hr	1.6 tpy
CO	0.20 lbs/hr	0.90 tpy
VOC	0.027 lbs/hr	0.12 tpy
SOx	0.00049 lbs/hr	0.0022 tpy
PM	0.019 lbs/hr	0.084 tpy

Calculated Controlled Emissions

NOx	0.36 lbs/hr	1.56 tpy
CO	0.20 lbs/hr	0.90 tpy
VOC	0.027 lbs/hr	0.12 tpy
SOx	0.00049 lbs/hr	0.0022 tpy
PM	0.019 lbs/hr	0.084 tpy

New Mexico Terminal Services - NSR Railyard HMA Plant Emission Summary
400 TPH

Uncontrolled Emission Totals

		NOx		CO		SO2		VOC		TSP		PM10		PM2.5		Asphalt Fumes	
		lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
1	Railcar Unload to Hopper									0.055	0.24	0.026	0.11	0.0039	0.017		
2	Rail Hopper Conveyor									0.40	1.75	0.15	0.64	0.023	0.099		
3	Rail Telescoping Conveyor									0.40	1.75	0.15	0.64	0.023	0.099		
4	Aggregate Storage Pile									0.63	2.76	0.094	0.41	0.014	0.062		
5	Aggregate Truck Loading									0.47	1.67	0.22	0.79	0.034	0.12		
6	RAP Storage Piles									0.20	0.87	0.094	0.41	0.014	0.062		
7	Aggregate Feed Bin Loading									1.09	4.76	0.51	2.25	0.078	0.34		
8	Aggregate Feed Bin Unloading									0.69	3.02	0.25	1.11	0.039	0.17		
9	Scalping Screen									5.75	25.19	2.00	8.76	0.30	1.33		
10	Scalping Screen Unloading									0.69	3.02	0.25	1.11	0.039	0.17		
11	Pug Mill Load									0.71	3.10	0.26	1.14	0.040	0.18		
12	Pug Mill Unload									0.71	3.10	0.26	1.14	0.040	0.18		
13	Scale Conveyor to Slinger Conveyor									0.71	3.10	0.26	1.14	0.040	0.18		
14	RAP Bin Loading									0.20	0.87	0.094	0.41	0.014	0.062		
15	RAP Crusher									0.76	3.31	0.34	1.47	0.050	0.22		
16	RAP Crusher Unloading									0.42	1.84	0.15	0.67	0.024	0.10		
17	RAP Screen									3.50	15.33	1.22	5.33	0.18	0.81		
18	RAP Screen Unloading									0.42	1.84	0.15	0.67	0.024	0.10		
19	RAP Transfer Conveyor									0.42	1.84	0.15	0.67	0.024	0.10		
20	RAP Transfer Conveyor									0.42	1.84	0.15	0.67	0.024	0.10		
21	Mineral Filler Silo Loading									18.00	18.92	11.50	12.09	0.90	0.95		
22	Drum Dryer	22.0	96.4	52.0	227.8	23.2	101.6	12.8	56.1	11200	49056	2600	11388	626	2742	4.80	21.0
23	Drum Mixer Unloading			0.47	2.07			4.87	21.35	0.23	1.03	0.23	1.0	0.23	1.0	0.075	0.33
24	Asphalt Silo Unloading			0.54	2.36			1.66	7.29	0.21	0.91	0.21	0.91	0.21	0.91	0.035	0.15
25	Asphalt Heater	0.39	1.71	0.20	0.90	0.14	0.61	0.027	0.12	0.039	0.17	0.039	0.17	0.039	0.17		
26	Asphalt Cement Storage Tank			***	***			0.035	0.15							0.00046	0.0020
27	Haul Road Traffic									53.21	186.30	13.36	47.22	1.44	4.86		
28	Yard			0.14	0.62			0.44	1.93							0.0066	0.029
	Total	**22.39**	**98.07**	**53.36**	**233.71**	**23.34**	**102.22**	**19.84**	**86.90**	**11289**	**49341**	**2632**	**11478**	**630**	**2754**	**4.92**	**21.54**

Controlled Emission Totals

		NOx		CO		SO2		VOC		TSP		PM10		PM2.5		Asphalt Fumes	
		lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
1	Railcar Unload to Hopper									0.055	0.24	0.026	0.11	0.0039	0.017		
2	Rail Hopper Conveyor									0.019	0.082	0.0061	0.027	0.0017	0.0076		
3	Rail Telescoping Conveyor									0.019	0.082	0.0061	0.027	0.0017	0.0076		
4	Aggregate Storage Pile									0.63	2.76	0.30	1.30	0.045	0.20		
5	Aggregate Truck Loading									0.47	1.67	0.22	0.79	0.034	0.12		
6	RAP Storage Piles									0.20	0.20	0.094	0.094	0.014	0.014		
7	Aggregate Feed Bin Loading									1.09	1.09	0.51	0.51	0.078	0.078		
8	Aggregate Feed Bin Unloading									0.032	0.032	0.011	0.011	0.0030	0.0030		
9	Scalping Screen									0.51	0.51	0.17	0.17	0.012	0.012		
10	Scalping Screen Unloading									0.032	0.032	0.011	0.011	0.0030	0.0030		
11	Pug Mill Load									0.033	0.033	0.011	0.011	0.0031	0.0031		
12	Pug Mill Unload									0.033	0.033	0.011	0.011	0.0031	0.0031		
13	Scale Conveyor to Slinger Conveyor									0.033	0.033	0.011	0.011	0.0031	0.0031		
14	RAP Bin Loading									0.20	0.20	0.094	0.094	0.014	0.014		
15	RAP Crusher									0.17	0.17	0.076	0.076	0.014	0.014		
16	RAP Crusher Unloading									0.020	0.020	0.0064	0.0064	0.0018	0.0018		
17	RAP Screen									0.31	0.31	0.10	0.10	0.0070	0.0070		
18	RAP Screen Unloading									0.020	0.020	0.0064	0.0064	0.0018	0.0018		
19	RAP Transfer Conveyor									0.020	0.020	0.0064	0.0064	0.0018	0.0018		
20	RAP Transfer Conveyor									0.020	0.020	0.0064	0.0064	0.0018	0.0018		
21	Mineral Filler Silo Loading									0.18	0.043	0.12	0.028	0.0090	0.0022		
22	Drum Dryer	22.00	22.00	52.00	52.00	23.20	23.20	12.80	12.80	13.20	13.20	9.20	9.20	9.20	9.20	4.80	4.80
23	Drum Mixer Unloading			0.47	0.47			4.87	4.87	0.23	0.23	0.23	0.23	0.23	0.23	0.075	0.075
24	Asphalt Silo Unloading			0.54	0.54			1.66	1.66	0.21	0.21	0.21	0.21	0.21	0.21	0.035	0.035
25	Asphalt Heater	0.39	1.71	0.20	0.90	0.14	0.61	0.027	0.12	0.039	0.17	0.039	0.17	0.039	0.17		
26	Asphalt Cement Storage Tank			***	***			0.035	0.15							0.00046	0.0020
27	Haul Road Traffic									8.57	9.97	1.99	2.28	0.30	0.37		
28	Yard			0.14	0.14			0.44	0.44							0.0066	0.0066
	Total	**22.39**	**23.71**	**53.36**	**54.05**	**23.34**	**23.81**	**19.84**	**20.05**	**26.33**	**31.37**	**13.47**	**15.51**	**10.24**	**10.69**	**4.92**	**4.92**

Insignificant "***"

2" 530.8

Attachment D
USGS Topographic Maps

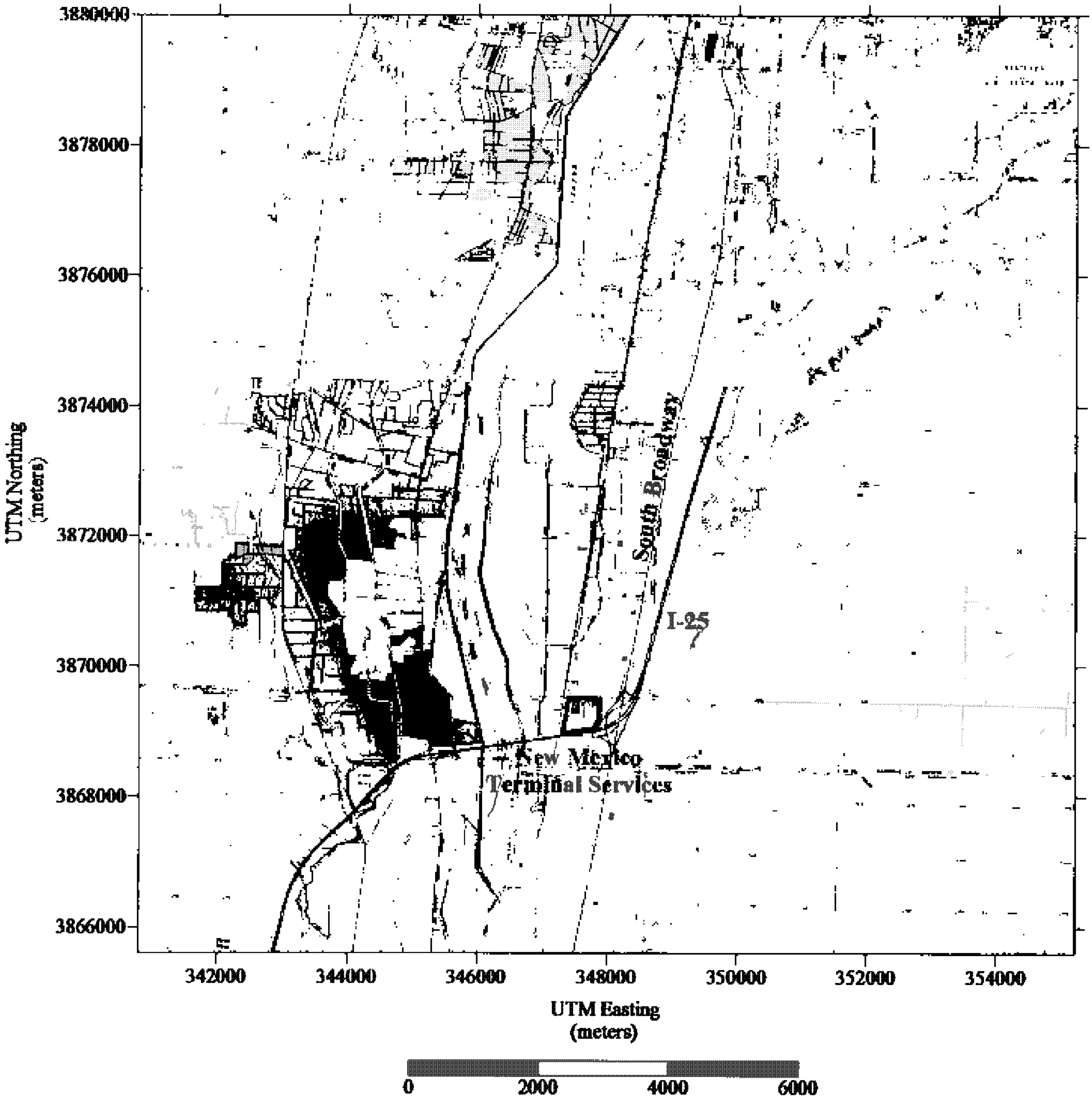

Figure D-1: 7 ½ Minute Topo Map Showing Site Location
Albuquerque West 7 ½ Minute Quadrant
NAD 83

Attachment E
Facility Process Description

Facility Process Description

Aggregate material will be delivered to the site by railcar and unloaded into a below ground railcar hopper (Unit 1). From the railcar hopper, aggregate will be transferred by conveyors (Units 2, 3) to the aggregate storage piles (Unit 4). Aggregate from the storage pile can then be used in the HMA plant or transported off-site by haul trucks.

The NM Terminal's Railyard HMA Plant produces hot mix asphalt concrete. The operation is typical of a continuous drum mix HMA operation. Aggregate in loaded into the Cold Aggregate Feed Bins (Unit 7), where it is metered onto the Feed Bin Conveyor (Unit 8). From the Feed Bin Conveyor the aggregate is sent to the Scalping Screen and Scalping Screen Conveyor (Units 9, 10) and Pug Mill (Unit 11). The Mineral Filler Silo and Augur (Unit 21) meters mineral filler into the Pug Mill. The Pug Mill mixes the aggregate and mineral filler together and empties onto the Pug Mill Conveyor (Unit 12). The Pug Mill Conveyor transfers the material onto the Slinger Conveyor (Unit 13) and sends the aggregate/mineral filler to the Drum Dryer/Mixer (Unit 22). RAP material is delivered to the site by haul truck and unloaded to the RAP storage piles (Unit 6). RAP is loaded into the RAP Bins (Unit 14) and to the RAP Crusher (Unit 15). From the RAP Crusher, RAP is metered onto the RAP Bin Conveyor (Unit 16) and then transferred to the RAP Screen (Unit 17). The RAP Transfer Conveyors (Units 18, 19, 20) transports RAP to the Drum Dryer/Mixer. There the material is dried and asphalt cement is added to make asphalt concrete. From the Drum Dryer/Mixer the asphalt concrete is sent by the Asphalt Incline Conveyor (Unit 23) to the Asphalt Silos (Unit 24).

Control Units include a Drum Dryer/Mixer Dust Collector that captures particulates generated at the Drum Dryer/Mixer and Mineral Filler Silo Dust Collector that captures particulates generated during loading of the Mineral Filler Silo. Controlled particulates exhaust the Drum Dryer/Mixer Dust Collector Stack (Stack 1) and Mineral Filler Silo Dust Collector Stack (Stack 2).

Fugitive dust is controlled when material exits the Cold Aggregate or RAP Feed Bins to the Cold Aggregate or RAP Feed Bin Collection Conveyors with enclosures and/or water sprays, as needed, to reduce the chance that wind will blow any generated fugitive dust away at the exit of the feed bins.

Fugitive dust is controlled when material enters and exits the Scalping Screen (Unit 9), Pug Mill (Unit 11), RAP Crusher (Unit 15), and RAP Screen (Unit 17) with the addition of water on the material at the Scalping Screen, Pug Mill, RAP Crusher, and RAP Screen.

Baghouse fines that are captured in the Drum Dryer/Mixer Dust Collector are recycled back to the Drum Dryer using an enclosed loop.

Baghouse fines that are captured in the Mineral Filler Silo Dust Collector are recycled back to the Mineral Filler Silo.

There are no pollution controls for the Aggregate Railcar Hopper (Unit 1), Aggregate Truck Loading (Unit 5), Aggregate or RAP Storage Piles (Units 4, 6), Aggregate or RAP Feed Bins (Units 7, 14), Incline Belt (Unit 23), Asphalt Silos (Units 24), Asphalt Heater (Unit 25), or Hot Oil Asphalt Storage Tanks (Unit 26).

All truck traffic travels to the HMA Plant on the main access road. The road in and out of the site is paved to limit fugitive emissions from truck traffic. Paved roads will be periodically cleaned to reduce the buildup of silt on the road surface. Around the HMA plant, roads will be unpaved and controlled with surfactants/millings or equivalent plus routine watering to limit fugitive emissions from truck traffic. Aggregate material is delivered by railcars and stored in on-site stockpiles with a portion of it being used in production of asphalt concrete or transported off-site by haul trucks. RAP material is delivered by haul trucks and stored in on-site stockpiles.

Annual emissions are controlled by permit limits on annual production for processing equipment. Commercial line power will provide electricity to power the HMA plant.

To mitigate source emissions during malfunction, startup, or shutdown, all control equipment and methods will be in operation prior to and until the end of asphalt production.

Process flow diagrams are presented in Attachment A.

Attachment F

Dispersion Modeling Summary

DISPERSION MODEL REPORT FOR NEW MEXICO TERMINAL SERVICES, LLC. PROPOSED HOT MIX ASPHALT PLANT

Albuquerque, New Mexico

PREPARED FOR
NEW MEXICO TERMINAL SERVICES, LLC.

February 16, 2018

Prepared by

Montrose Air Quality Services, LLC

MONTROSE
AIR QUALITY SERVICES

CONTENTS

TABLE OF CONTENTS **PAGE**

TABLES **PAGE**

FIGURES **PAGE**

1.0 INTRODUCTION

This dispersion modeling analysis was conducted by Montrose Air Quality Services, LLC (Montrose) on behalf of New Mexico Terminal Services, LLC (New Mexico Terminal), to evaluate ambient air quality impacts from the proposed hot mix asphalt plant. The project includes a new hot mix asphalt plant. Aggregate used in the asphalt mix will be delivered by railcar and offloaded using a railcar bottom dump hopper, transfer conveyors, and radial telescoping stacker. Aggregate material not used in the hot mix asphalt process may be transported off-site by haul truck. Recycled asphalt pavement (RAP) and mineral filler used in the hot asphalt mix will be delivered by haul truck. Hot mix asphalt product will be transported off-site by haul truck. The location of the hot mix asphalt plant is near the northwest corner of the intersection of South Broadway and I-25 at 9615 Broadway Blvd SE. The objective of this evaluation is to determine whether ambient air concentrations from the maximum operation of the proposed project for nitrogen dioxide, (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter; total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$); are below Class II federal and state ambient air quality standards (NAAQS and NMAAQS) found in 40 CFR part 50 and the City of Albuquerque/Bernalillo County (COABC) air quality regulation 20.11.8 NMAC.

The dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 16216r. This model is recommended by EPA for determining Class II impacts within 50 km of the source being assessed. Additionally, AERMOD was developed to handle complex terrain. In this analysis, AERMOD was used to estimate pollutant ambient air concentrations of NO_2, CO, SO_2, TSP, PM_{10}, and $PM_{2.5}$ from the New Mexico Terminal Railyard HMA Plant emission sources. Montrose employs the general modeling procedures outlined in "Permit Modeling Guidelines, Albuquerque Environmental Health Department", revised 02/03/2016, "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised 08/08/2017, and the most up to date EPA's *Guideline on Air Quality Models.*

Aggregate material handling equipment, stockpiles, and haul roads were input into the model as volume sources. Model input parameters for feeders and transfer points will follow the NMED model guidelines Table 23. Model input parameters for haul roads will follow the NMED model guidelines Tables 24 and 25.

Figure 1 below shows the location of the site overview. Figure 2 shows the railcar unloading and HMA equipment process flow. This could change during the final modeling analysis.

Co-located on this same site will be a proposed aggregate processing facility that presently is in the process of obtaining an air quality permit. This source was included in all dispersion model analysis. Information on model inputs was obtained from the COABC AQP modeling section.

Additional neighboring sources identified by the COABC AQP Program that were included in the dispersion model analysis is Western Organics located directly north of this site. Information on model inputs was obtained from the COABC AQP modeling section.

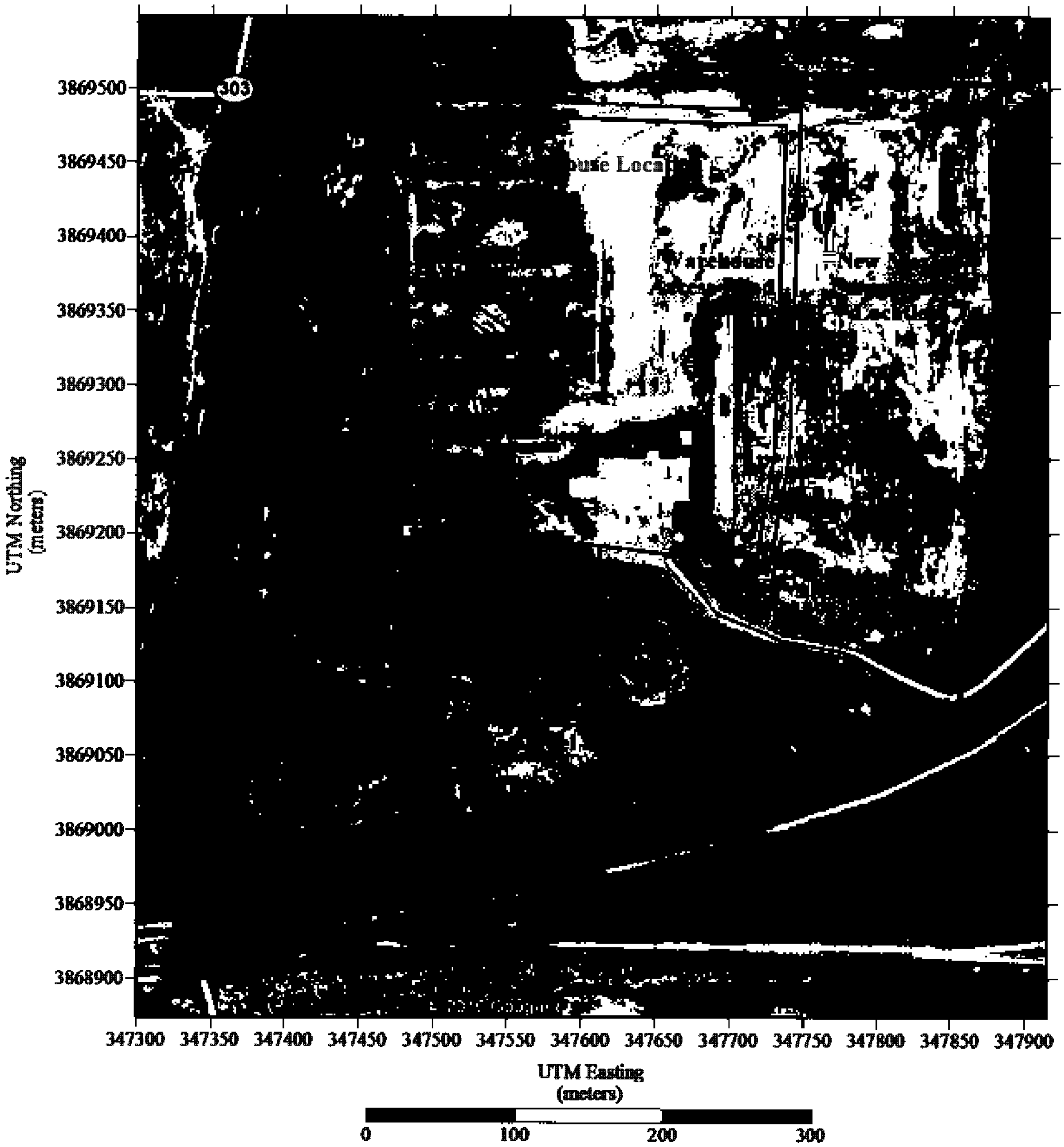

FIGURE 1: New Mexico Terminal Services, LLC's Site Layout Plan

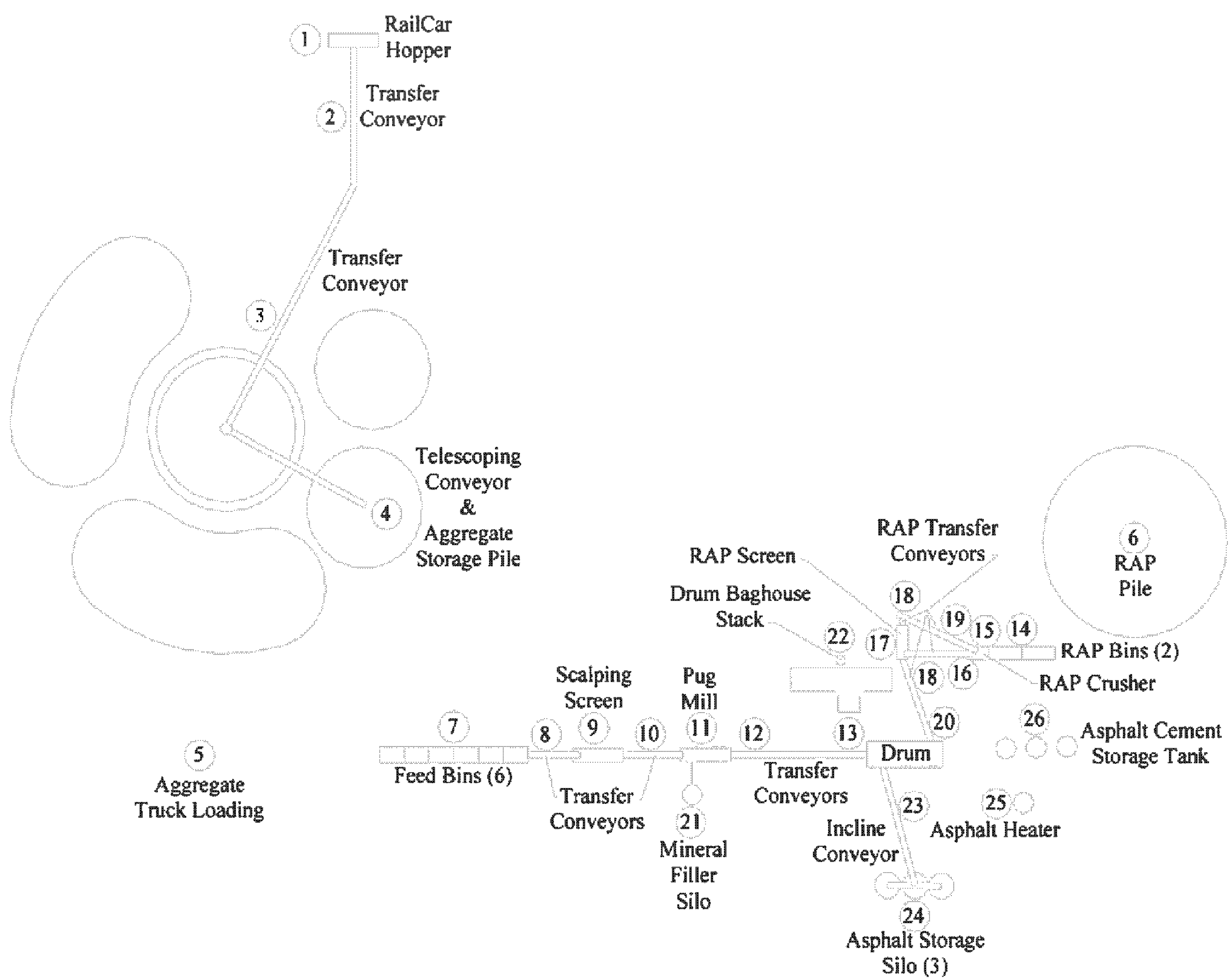

FIGURE 2: New Mexico Terminal Services, LLC's Aggregate Railcar Unloading and Railyard HMA Plant Process Flow

2.0 DISPERSION MODELING PROTOCOL

This section identifies the technical approach and dispersion model inputs that will be used for the Class II federal and State ambient air quality standards for this source. COABC Air Quality Program (AQP) requires that all applicable criteria pollutant emissions be modeled using the most recent versions of US EPA's approved models and be compared with National Ambient Air Quality Standards (NAAQS), and New Mexico Ambient Air Quality Standards (NMAAQS). Table 1 shows the NAAQS and NMAAQS that the source's ambient impacts must meet in order to demonstrate compliance. Table 1 also lists the Class II Significant Impact Levels (SILs) which are used to assess whether a source has a significant impact at downwind receptors.

The dispersion modeling analysis will be performed to estimate concentrations resulting from the operation of the New Mexico Terminal Railyard HMA sources using the maximum emission rates while all emission sources are operating. The modeling will determine the maximum off site concentrations for nitrogen dioxide, (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter; total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), for comparison with modeling significance levels, national/New Mexico ambient air quality standards (AAQS). The modeling will follow the guidance and protocols outlined in the "Permit Modeling Guidelines, Albuquerque Environmental Health Department", revised 02/03/2016, "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised 08/08/2017, and the most up to date EPA's *Guideline on Air Quality Models.*

Initial modeling will be performed with New Mexico Terminal sources only to determine pollutant and averaging periods that exceeds pollutant SILs. If initial modeling for any pollutant and averaging period exceeds SILs, than cumulative modeling was performed for those pollutants and averaging periods for all receptors that exceeds the SILs which included significant neighboring sources along with background ambient concentrations.

TABLE 1: Air Quality Standard Summary

Pollutant	Avg. Period	Sig. Lev. (µg/m³)	Class I Sig. Lev. (µg/m³)	NAAQS	NMAAQS	PSD Increment Class I	PSD Increment Class II
CO	8-hour	500		9,000 ppb(1)	8,700 ppb(2)		
	1-hour	2,000		35,000 ppb(1)	13,100 ppb(2)		
NO_2	annual	1.0	0.1	53 ppb(3)	50 ppb(2)	2.5 µg/m³	25 µg/m³
	24-hour	5.0			100 ppb(2)		
	1-hour	7.54		100 ppb(4)			
$PM_{2.5}$	annual	0.3	0.06	12 µg/m³(5)		1 µg/m³	4 µg/m³
	24-hour	1.2	0.07	35 µg/m³(6)		2 µg/m³	9 µg/m³
PM_{10}	annual	1.0	0.2			4 µg/m³	17 µg/m³
	24-hour	5.0	0.3	150 µg/m³(7)		8 µg/m³	30 µg/m³
TSP	7-day				110 µg/m³		
	30-day				90 µg/m³		
	annual	1.0			60µg/m³		
	24-hour	5.0			150µg/m³		
SO_2	annual	1.0	0.1		20 ppb(2)	2 µg/m³	20 µg/m³
	24-hour	5.0	0.2		100 ppb(2)	5 µg/m³	91 µg/m³
	3-hour	25.0	1.0	500 ppb(1)		25 µg/m³	512 µg/m³
	1-hour	7.8		75 ppb(8)			

Standards converted from ppb to µg/m³ use a reference temperature of 25° C and a reference pressure of 760 millimeters of mercury.

(1) Not to be exceeded more than once each year.
(2) Not to be exceeded.
(3) Annual mean.
(4) 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
(5) annual mean, averaged over 3 years.
(6) 98th percentile, averaged over 3 years.
(7) Not to be exceeded more than once per year on average over 3 years.
(8) 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

TABLE 2: Standards for Which Modeling Is Not Required.

Standard not Modeled	Surrogate that Demonstrates Compliance
TSP 7-day NMAAQS	TSP 24-hour NMAAQS
SO_2 3-hour NAAQS	SO_2 1-hour NAAQS

2.1 DISPERSION MODEL SELECTION

The dispersion modeling will be conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 16216r. This model is recommended by EPA for determining Class II impacts within 50 km of the source being assessed. Additionally, AERMOD was developed to handle complex terrain. In this analysis, AERMOD will be used to estimate pollutant ambient air concentrations of NO_X, CO, SO_2, TSP, PM_{10}, and $PM_{2.5}$ from New Mexico Terminal Services emission sources.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD modeling system has three components: AERMAP, AERMET, and AERMOD. AERMAP is the terrain preprocessor program. AERMET is the meteorological data preprocessor. AERMOD includes the dispersion modeling algorithms and was developed to handle simple and complex terrain issues using improved algorithms. AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

AERMOD was run using all the regulatory default options including use of:

- Gradual Plume Rise
- Stack-tip Downwash
- Buoyancy-induced Dispersion
- Calms and Missing Data Processing Routine
- Upper-bound downwash concentrations for super-squat buildings
- Default wind speed profile exponents
- Calculate Vertical Potential Temperature Gradient
- No use of gradual plume rise
- Rural Dispersion

2.2 BUILDING WAKE EFFECTS

New Mexico Terminal Services structures will be included in the model as a building and analyzed as a building downwash source using the BPIP-Prime program. The results of the BPIP-Prime output will be inputted into the AERMOD model.

2.3 METEOROLOGICAL DATA

Dispersion model meteorological input file to be used in this modeling analysis are years 2001 - 2005 Albuquerque met data (AERMET version 16216 dated 01/30/2017) available from the COABC AQP. For TSP modeling only, one year, 2003, was used for the modeling analysis.

2.4 RECEPTORS AND TOPOGRAPHY

Modeling will be completed using as many receptor locations to ensure that the maximum estimated impacts are identified. Initial radius of impact modeling will be performed with receptors within 3 kilometer of the model boundary. Because of the nature of the emissions from the site, it is expected the maximum concentrations will be on or near the site fenceline.

The refined receptor grid will include receptors located at 50 meters apart out to 500 meters from the property line, 100 meters apart from 500 meters out to 1000 meters, 250 meters apart from 1000 meters out to 3000 meters, and 500 meters apart from 3000 meters to 5000 meters. Fenceline receptor spacing will be 25 meters.

All refined model receptors will be preprocessed using the AERMAP software associated with AERMOD. The AERMAP software establishes a base elevation and a height scale for each receptor location. The height scale is a measure of the receptor's location and base elevation and its relation to the terrain feature that has the greatest influence in dispersion for that receptor. AERMAP will be run using U.S. Geological Survey (USGS) national elevation data (NED) data. Output from AERMAP will be used as input to the AERMOD runstream file for each model run.

2.5 MODELED EMISSION SOURCES INPUTS

The proposed operating time for the Railyard HMA Plant will be 17 hours per day (4 AM to 9 PM) for the months of December through February, 24 hours per day for the months of March through November, 7 days per week, and 8130 hours per year. For the Railyard HMA Plant, New Mexico Terminal will take site-specific conditions on daily HMA operating throughput. For the months of December through February the daily throughput will be limited to 3200 tons (8 hours maximum at 400 tph). For the months of March through May the daily throughput will be limited to 4000 tons (10 hours maximum at 400 tph). For the months of June through November the daily throughput will be limited to 4400 tons (12 hours maximum at 400 tph). For modeling, the hourly blocks vary starting from midnight then shifting on 2 hour intervals for the 24 hour period or 12 separate model runs as summarized on Table 3.

For annual averaging period TSP and $PM_{2.5}$ dispersion modeling, the Railyard HMA Plant hourly emission factor included in the model is based on the annual throughput limit. New Mexico Terminal will limit the Railyard HMA Plant to 400 tons per hour and 800,000 tons per year. If the Railyard HMA Plant were run 365 days per year at the daily limits discussed above, that would be equivalent to 1,534,400 tons per year. For HMA annual model, the hourly emission factor reduces the hourly emission factor to 0.521 (800,000/1,534,400) for all throughput based emission rate sources.

TABLE 3: HMA Model Scenario Time Segments

Model Scenario	Time Segments 8-Hour Blocks December - February	Time Segments 10-Hour Blocks March - May	Time Segments 12-Hour Blocks June - November
1	4 AM to 12 PM	12 AM to 10 AM	12 AM to 12 PM
2	6 AM to 2 PM	2 AM to 12 PM	2 AM to 2 PM
3	8 AM to 4 PM	4 AM to 2 PM	4 AM to 4 PM
4	10 AM to 6 PM	6 AM to 4 PM	6 AM to 6 PM
5	12 PM to 8 PM	8 AM to 6 PM	8 AM to 8 PM
6	1 PM to 9 PM	10 AM to 8 PM	10 AM to 10 PM
7	1 PM to 9 PM	12 PM to 10 PM	12 PM to 12 AM
8	1 PM to 9 PM	2 PM to 12 AM	2 PM to 2 AM
9	1 PM to 9 PM	4 PM to 2 AM	4 PM to 4 AM
10	1 PM to 9 PM	6 PM to 4 AM	6 PM to 6 AM
11	1 PM to 9 PM	8 PM to 6 AM	8 PM to 8 AM
12	4 AM to 12 PM	10 PM to 8 AM	10 PM to 10 AM

For railcar unloading of aggregate materials, New Mexico Terminal will take site-specific conditions on daily operating throughput. Each railcar is 100 tons and takes 45 minutes to unload, then for one hour this is 133.3 tons per hour. For one day at this rate 32 railcars could be unloaded. Annually, the railcar maximum unloading rate will be 1,168,000 tons per year. Of this, a range of 380,000 to 752,000 tons will be used in the Railyard HMA Plant. All others will be available to off-site sources by haul truck transport. Hourly throughput for off-site transport of aggregate will be 100 tons per hour or four (4) haul truck loads.

2.5.1 New Mexico Terminal Services Railyard HMA Plant Road Vehicle Traffic Model Inputs

The access road fugitive dust for truck traffic will be modeled as a line of volume sources. The NMED AQB's approved procedure for Modeling Haul Roads will be followed to develop modeling input parameters for haul roads. Volume source characterization followed the steps described in the NMED Air Quality Bureau's Guidelines.

2.5.2 New Mexico Terminal Services Railyard HMA Plant Material Handling Volume Source Model Inputs

Particulate emissions from material handling and process from aggregate transloading will be modeled as volume sources. Model input parameters for feeders, screens, crushers, transfer points, and truck loading follow the NMED Air Quality Bureau's model guidelines Table 23.

2.5.3 New Mexico Terminal Services Railyard HMA Plant Point Source Model Inputs

Emissions from exhaust stacks from the asphalt mixer baghouse, asphalt cement heater, and mineral filler silo baghouse will be modeled as point sources. Model input parameters are based on lowest release height, release diameter, release velocity or flow rate, and release temperature. For the asphalt drum mixer and asphalt cement heater, emission rates will be calculated for dual fuels with the highest emission rate for each pollutant used as model input. For horizontal or raincap releases, the AERMOD version for horizontal and raincap releases will be used with actual release parameters.

Tables 4, 5, and 6 summarize the model input for the proposed New Mexico Terminal Services Railyard HMA Plant.

TABLE 4: Summary of Model Inputs for Point Sources at the New Mexico Terminal Services Railyard HMA Plant - Combustion

Source Description	Model ID	Stack Height (m)	Stack Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)	NOx Emission Rate (lb/hr)	CO Emission Rate (lb/hr)	SO2 Emission Rate (lb/hr)
HMA Baghouse Stack - Unit 22	HMASTK	7.620	408.150	19.810	1.370	22.00000	52.00000	23.20000
HMA Asphalt Cement Heater - Unit 25	HMAHEAT	2.670	588.710	1.260	0.090	0.39063	0.20492	0.13867

TABLE 5: Summary of Model Inputs for Point Sources at the New Mexico Terminal Services Railyard HMA Plant - Particulate

Source Description	Model ID	Stack Height (m)	Stack Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)
HMA Baghouse Stack - Unit 22	HMASTK	7.620	408.150	19.812	1.372	13.20000	9.20000	9.20000
HMA Asphalt Cement Heater - Unit 25	HMAHEAT	2.667	588.710	1.261	0.090	0.03906	0.03906	0.03906
HMA Mineral Filler Silo Loading - Unit 21	HMAFILL	19.050	0.000	11.887	0.240	0.18000	0.11500	0.00900

TABLE 6: Summary of Model Inputs for Volume Sources at the New Mexico Terminal Services Railyard HMA Plant

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)
HMA Asphalt Silo Loading - Unit 23	DRUMUNL	2.00	0.47	0.93	0.23436	0.23436	0.23436
					CO Emission Rate (lbs/hr)		0.47199
HMA Asphalt Silo Unloading - Unit 24	HMASILO	4.00	0.47	0.93	0.20877	0.20877	0.20877
					CO Emission Rate (lbs/hr)		0.53970
Aggregate Storage Pile 1 - Unit 4	HMA4A	4.00	0.47	0.93	0.15734	0.07442	0.01127
Aggregate Storage Pile 2 - Unit 4	HMA4B	4.00	0.47	0.93	0.15734	0.07442	0.01127
Aggregate Storage Pile 3 - Unit 4	HMA4C	4.00	0.47	0.93	0.15734	0.07442	0.01127
Aggregate Storage Pile 4 - Unit 4	HMA4D	4.00	0.47	0.93	0.15734	0.07442	0.01127
Aggregate Truck Loading - Unit 5	HMATL	5.00	1.16	2.33	0.47203	0.22326	0.03381
RAP Storage Pile - Unit 6	HMARP	2.44	7.16	2.27	0.19825	0.09377	0.01420
Cold Feed Bin 1 - Unit 7	HMA7A	5.00	1.16	2.33	0.18094	0.08558	0.01296
Cold Feed Bin 2 - Unit 7	HMA7B	5.00	1.16	2.33	0.18094	0.08558	0.01296
Cold Feed Bin 3 - Unit 7	HMA7C	5.00	1.16	2.33	0.18094	0.08558	0.01296
Cold Feed Bin 4 - Unit 7	HMA7D	5.00	1.16	2.33	0.18094	0.08558	0.01296
Cold Feed Bin 5 - Unit 7	HMA7E	5.00	1.16	2.33	0.18094	0.08558	0.01296
Cold Feed Bin 6 - Unit 7	HMA7F	5.00	1.16	2.33	0.18094	0.08558	0.01296
HMA Bin Unloading - Unit 8	HMATP1	2.00	0.47	0.93	0.03220	0.01058	0.00299
HMA Scalping Screen - Unit 9	HMASCR	4.00	1.16	2.33	0.50600	0.17020	0.01150
HMA Scalping Screen Unloading - Unit 10	HMATP2	2.00	0.47	0.93	0.03220	0.01058	0.00299
HMA Pug Mill - Unit 11	HMAPUG	4.00	1.16	2.33	0.03304	0.01086	0.00307
HMA Pug Mill Unloading - Unit 12	HMATP3	2.00	0.47	0.93	0.03304	0.01086	0.00307
HMA Conveyor Transfer to Drum Conveyor - Unit 13	HMATP4	2.00	0.47	0.93	0.03304	0.01086	0.00307

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)
HMA RAP Bin Loading - Unit 14	RAPBIN	5.00	1.16	2.33	0.19825	0.09377	0.01420
HMA RAP Crusher - Unit 15	RAPCRH	5.00	1.16	2.33	0.16800	0.07560	0.01400
HMA RAP Bin Unloading - Unit 16	RAPTP1	2.00	0.47	0.93	0.01960	0.00644	0.00182
HMA RAP Screen - Unit 17	RAPSCR	5.00	1.16	2.33	0.30800	0.10360	0.00700
HMA RAP Screen Unloading - Unit 18	RAPTP2	2.00	0.47	0.93	0.01960	0.00644	0.00182
HMA RAP Transfer Point - Unit 19	RAPTP3	2.00	0.47	0.93	0.01960	0.00644	0.00182
HMA RAP Transfer Point - Unit 20	RAPTP4	2.00	0.47	0.93	0.01960	0.00644	0.00182
Rail Car Unload to Underground Hopper - Unit 1	RAILHOP2	0.00	1.16	2.33	0.05480	0.02592	0.00392
Rail Conveyor Transfer Point 1 - Unit 2	RAILTP1	4.00	0.47	0.93	0.01867	0.00613	0.00173
Rail Transfer Point 2 - Unit 3	RAILTP2	4.00	0.47	0.93	0.01867	0.00613	0.00173
HMA Haul Road Paved In Volume 1-19	HMAP 0001-19	3.40	6.05	3.16	3.06799	0.61360	0.15061
					CO Emission Rate (lbs/hr) (1-19)		0.07040
HMA Haul Road Unpaved Asphalt Volume 1-33	ASP_0001-33	3.40	6.05	3.16	3.15667	0.80452	0.08045
					CO Emission Rate (lbs/hr) (15-19)		0.07040
HMA Haul Road Unpaved RAP Volume 1-22	RAP_0001-22	3.40	6.05	3.16	1.30533	0.33268	0.03327
Aggregate Haul Road Paved In Volume 1-19	PAGG 0001-19	3.40	6.05	3.16	0.53824	0.10765	0.02642
Aggregate Haul Road Unpaved Volume 1-12	UPA_0001-12	3.40	6.05	3.16	0.49798	0.12692	0.01269

Tables 7, 8, and 9 summarize the model input for New Mexico Terminal Services Truck Terminal operating under Permit 3311.

TABLE 7: Summary of Short-Term Model Inputs for Volume Sources at the New Mexico Terminal Services – Truck Terminal

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)
Rail Car Unload to Underground Hopper	RAILHOP	0.00	1.16	2.33	0.05480	0.02592	0.00392
Rail Conveyor Drop Pile 1	PILE1	3.66	0.47	0.93	0.62937	0.29767	0.04508
Loader Drop Pile 2	PILE2	2.00	0.47	0.93	0.31468	0.14884	0.02254
Loader Drop Pile 3	PILE3	2.00	0.47	0.93	0.31468	0.14884	0.02254
Truck Loading by Loader 1	TRUCK1	4.00	1.16	2.33	0.20979	0.09922	0.01503
Truck Loading by Loader 2	TRUCK2	4.00	1.16	2.33	0.20979	0.09922	0.01503
Truck Loading by Loader 3	TRUCK3	4.00	1.16	2.33	0.20979	0.09922	0.01503
Paved Entrance Haul Road Volume 1-19	PAV_0001-19	3.40	6.05	3.16	0.79211	0.15842	0.03889
Unpaved Haul Road 1 Volume 1-36	UP1_0001-36	3.40	6.05	3.16	1.97736	0.50396	0.05040
Unpaved Haul Road 2 Volume 1-46	UP2_0001-46	3.40	6.05	3.16	1.00104	0.25513	0.02551

For annual modeling of New Mexico Terminal's Truck Terminal, annual emission rates will be used in the modeling, per their permit application. Table 8 lists the hourly emission rates in tons per year.

TABLE 8: Summary of Annual Model Inputs for Volume Sources at the New Mexico Terminal Services – Truck Terminal

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (tpy)	PM10 Emission Rate (tpy)	PM2.5 Emission Rate (tpy)
Rail Car Unload to Underground Hopper	RAILHOP	0.00	1.16	2.33	0.24003	0.11353	0.01719
Rail Conveyor Drop Pile 1	PILE1	3.66	0.47	0.93	2.75663	1.30381	0.19743
Loader Drop Pile 2	PILE2	2.00	0.47	0.93	1.37831	0.65191	0.09872
Loader Drop Pile 3	PILE3	2.00	0.47	0.93	1.37831	0.65191	0.09872
Truck Loading by Loader 1	TRUCK1	4.00	1.16	2.33	0.91888	0.43460	0.06581
Truck Loading by Loader 2	TRUCK2	4.00	1.16	2.33	0.91888	0.43460	0.06581
Truck Loading by Loader 3	TRUCK3	4.00	1.16	2.33	0.91888	0.43460	0.06581
Paved Entrance Haul Road Volume 1-19	PAV_0001-19	3.40	6.05	3.16	3.32687	0.66537	0.16332
Unpaved Haul Road 1 Volume 1-36	UP1_0001-36	3.40	6.05	3.16	7.23715	1.84448	0.18445
Unpaved Haul Road 2 Volume 1-50	UP2_0001-50	3.40	6.05	3.16	3.66379	0.93377	0.09338

TABLE 9: Summary of Point Source Model Inputs at the New Mexico Terminal Services – Truck Terminal

Source Description	Model ID	Stack Height (meter)	Temperature (K)	Exit Velocity (m/s)	Stack Dia. (meter)	Pollutant	Emission Rate (lbs/hr)
Fuel Transloading Engine	ENGINE	1.8288	699.82	59.3945	0.1006	NO_X	3.87500
						CO	0.87000
						SO_2	0.07388
						PM	0.27500

Tables 10, 11, 12, and 13 summarize the model input for co-located source NM Aggregate, and neighboring source Western Organics. For Western Organics, NO_X, CO, SO_2, and only particulate emission rates greater than 10 microns (TSP lbs/hr minus PM_{10} lbs/hr) are included in the dispersion modeling analysis.

TABLE 10: Summary of Model Inputs for Volume Sources for New Mexico Aggregate

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)
Raw Stockpile	1	2.286	14.176	14.176	0.24500	0.11600	0.01800
Raw Stockpile	2	2.286	14.176	14.176	0.24500	0.11600	0.01800
Feed Hopper (at Crusher)	3	1.676	2.128	1.561	0.49000	0.23300	0.03500
Portable Crusher	4	1.676	2.128	1.561	0.13500	0.06000	0.02000
Conveyor from Crusher	5	1.524	2.978	0.710	0.07500	0.02800	0.01000
Feed Hopper (at screen)	6	3.063	4.310	2.850	0.49000	0.23300	0.03500
Portable Screen	7	3.063	4.310	2.850	0.62500	0.21800	0.07500
Finished Pile formation	8	2.438	2.128	1.134	0.12300	0.05800	0.00900
Finished Pile formation	9	2.438	2.128	1.134	0.12300	0.05800	0.00900
Finished Pile formation	10	2.438	2.128	1.134	0.12300	0.05800	0.00900
Finished Pile formation	11	2.743	2.978	1.277	0.12300	0.05800	0.00900
Feed Hopper (at Crusher)	12	1.829	3.658	1.701	0.49000	0.23300	0.03500
Portable Crusher	13	1.829	3.658	1.701	0.13500	0.06000	0.02000
Conveyor from Crusher	14	1.570	0.497	0.732	0.07500	0.02800	0.01000
Feed Hopper (at screen)	15	3.082	4.148	2.868	0.49000	0.23300	0.03500

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	PM2.5 Emission Rate (lb/hr)
Portable Screen	16	3.082	4.148	2.868	0.62500	0.21800	0.07500
Finished Pile formation	17	2.103	0.814	0.978	0.16300	0.07700	0.01200
Finished Pile formation	18	2.103	2.588	0.978	0.16300	0.07700	0.01200
Finished Pile formation	19	2.103	2.259	0.978	0.16300	0.07700	0.01200
Conveyor from Screen	20	3.200	5.669	1.487	0.07500	0.02800	0.01000
Finished Pile formation	21	3.200	5.669	1.487	0.49000	0.23300	0.03500
Finish Pile	22	2.286	7.090	14.176	0.12300	0.05800	0.00900
Finish Pile	23	2.286	7.090	14.176	0.12300	0.05800	0.00900
Finish Pile	24	2.286	7.090	14.176	0.12300	0.05800	0.00900
Finish Pile	25	2.286	7.090	14.176	0.12300	0.05800	0.00900
Haul Road 1	HR1_0002-0022	3.383	6.050	3.170	1.28700	0.31950	0.03330
Haul Road 2	HR2_0002-0022	3.383	6.050	3.170	3.00300	0.74550	0.07770
Haul Road 3	HR3_0002-0008	3.383	6.050	3.170	1.00100	0.24850	0.02590
Haul Road 4	HR4_0002-0024	3.383	6.050	3.170	3.28900	0.81650	0.08510
Haul Road 5	HR5 0002-0008	3.383	6.050	3.170	1.00100	0.24850	0.02590

TABLE 11: Summary of Point Source Model Inputs for New Mexico Aggregate

Source Description	Model ID	Stack Height (meter)	Temperature (K)	Exit Velocity (m/s)	Stack Dia. (meter)	Pollutant	Emission Rate (lbs/hr)
455 hp diesel engine	ENGINE1	3.962	765.928	64.474	0.165	NO_X	13.64000
						CO	7.50000
						SO_2	0.93000
						PM	0.97000
440 hp diesel engine	ENGINE2	3.048	755.370	99.458	0.127	NO_X	6.08000
						CO	2.94000
						SO_2	0.90000
						PM	0.35000
400 hp diesel engine	ENGINE3	3.658	657.040	105.560	0.102	NO_X	4.65000
						CO	2.61000
						SO_2	0.82000
						PM	0.33000
250 hp diesel engine	ENGINE4	3.658	744.260	98.224	0.102	NO_X	3.01000
						CO	1.43000
						SO_2	0.51000
						PM	0.11000
150hp diesel engine	ENGINE5	3.658	727.590	64.005	0.089	NO_X	1.57000
						CO	1.21000
						SO_2	0.31000
						PM	0.08000

TABLE 12: Summary of Model Inputs for Volume Sources for Western Organics

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	TSP Emission Rate (lb/hr)	PM10 Emission Rate (lb/hr)	TSP-PM10 Emission Rate (lb/hr)
Medium and Small Bark Bagger Unit 6	SBARKBAG	2.134	0.425	1.985	0.03853	0.01835	0.02018
Topsoil Bagger Unit 7	TOPBAGGR	2.134	0.425	1.985	0.16119	0.07676	0.08443
Potting Soil Bagger Unit 8	POTSLBAG	2.134	0.425	1.985	0.01171	0.00558	0.00613
Potting Soil Mixer Unit 9	POTSLMIX	1.219	0.567	1.134	0.09227	0.04394	0.04833
Warehouse	WAREHSE	2.134	4.252	1.985	0.01052	0.00501	0.00551
Pumice Rock Building Unit	PUMCEBLD	2.591	2.835	2.411	0.01606	0.00765	0.00841

TABLE 13: Summary of Point Source Model Inputs for Western Organics

Source Description	Model ID	Stack Height (meter)	Temperature (K)	Exit Velocity (m/s)	Stack Dia. (meter)	Pollutant	Emission Rate (lbs/hr)
Hog Unit 1	HOG	4.000	295.000	0.150	1.000	TSP	0.70049
						PM_{10}	0.33357
						$TSP-PM_{10}$	0.36693
Bark Screen Unit 2	BARKSCRN	4.000	295.000	0.150	1.000	TSP	0.86862
						PM_{10}	0.41363
						$TSP-PM_{10}$	0.45500
Powerscreen Unit 3	POWRSCRN	4.000	295.000	0.150	1.000	TSP	0.91289
						PM_{10}	0.43471
						$TSP-PM_{10}$	0.47818
Topsoil Screen Unit 4	TOPSCRN	4.000	295.000	0.150	1.000	TSP	0.96988
						PM_{10}	0.46185
						$TSP-PM_{10}$	0.50803
Large Bark Bagger Unit 5	LBARKBAG	4.000	295.000	0.150	1.000	TSP	0.12610
						PM_{10}	0.06005
						$TSP-PM_{10}$	0.06605
Pumice Dye and Bagger Unit 10	PUMICE	4.000	295.000	0.150	1.000	TSP	0.59319
						PM_{10}	0.28247
						$TSP-PM_{10}$	0.31072
Powerscreen Diesel Engine Unit 11	PSENGINE	0.914	699.817	24.384	0.152	NO_X	0.27000
						CO	0.06000
						SO_2	0.02000
						$TSP-PM_{10}$	0.00000

2.6 PARTICLE SIZE DISTRIBUTION

TSP emissions are modeled using plume depletion. Plume deposition simulates the effect of gravity as particles '"fall-out" from the plume to the ground as the plume travels downwind. Therefore, the farther the plume travels from the emission point to the receptor, the greater the effect of plume deposition and the greater the decrease in modeled impacts or concentrations. Particle size distribution, particle mass fraction, and particle density are required inputs to the model to perform this function.

The particle size distribution data used in the modeling for aggregate handling is based upon data obtained from the City of Albuquerque AQB's "Air Dispersion Modeling Guidelines for Air Quality Permitting", revised 02/03/2016, Table 1. Particle size distribution for fugitive road dust was obtained from the particle size *k* factors found in the AP-42 13.2.2 emission equations for unpaved roads (ver. 11/06).

The mass-mean particle diameter was calculated using the formula:

$$d - ((d^3_1 + d^2_1 d_2 + d_1 d^2_2 + d^3_2) / 4)^{1/3}$$

Where: d – mass-mean particle diameter
d_1 = low end of particle size category range
d_2 = high end of particle size category range

Representative average particle densities for particle types emitted in the modeling analysis were obtained from NMED accepted values. The list below summarizes these values.

Material	Density (g/cm^3)	Reference
Road Dust – NMT and Neighbor	2.5	NMED Value
Lime – NMT and Neighbor	3.3	NMED Value
HMA Asphalt – NMT and Neighbor	1.5	NMED Value
Combustion NMT and Neighbor	1.5	NMED Value
Fugitive Dust NMT and Neighbor	2.5	NMED Value

The densities and size distribution for TSP emission sources are presented in Tables 14 - 18.

TABLE 14: Road Vehicle Fugitive Dust Depletion Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm³)
TSP			
0-2.5	1.57	5.0	2.5
2.5-10	6.91	15.0	2.5
10-15	12.63	5.0	2.5
15-30	23.23	75.0	2.5

Based on NMED Particle Size Distribution Spreadsheet April 25, 2007

TABLE 15: Lime Baghouse Source Depletion Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm³)
TSP			
0-2.5	1.57	17.4	3.3
2.5-10	6.91	52.1	3.3
10-30	21.54	30.5	3.3

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007

TABLE 16: Combustion Source Depletion Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm³)
TSP			
0 - 2.5	1.57	100	1.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007

TABLE 17: Asphalt Baghouse and Stack Source Depletion Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
TSP			
0-1.0	0.63	15.0	1.5
1.0-2.5	1.85	6.0	1.5
2.5-10	6.92	9.0	1.5
10.0-15.0	12.66	5.0	1.5
15.0-30.0	23.3	65.0	1.5

Based on NMED Particle Size Distribution Spreadsheet · April 25, 2007

TABLE 18: Fugitive Dust Source Depletion Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
TSP			
2.5 5	3.88	6.0	2.5
5 – 10	7.77	20.5	2.5
10 – 15	12.66	16.0	2.5
15 – 20	17.62	17.5	2.5
20 – 30	25.33	22.5	2.5
30 45	38.00	17.5	2.5

Parameters based on values from the Albuquerque Air Quality Division Modeling Guidelines.

2.7 $PM_{2.5}$ SECONDARY EMISSIONS MODELING

The form of the $PM_{2.5}$ 24 hour design value is based on the 98th percentile or the highest 8th high result. Calculated $PM_{2.5}$ combustion emission rates included into the model consist of both filterable and condensable components. Secondary $PM_{2.5}$ emissions from combustion sources are created by the conversion to nitrates and sulfates as the exhaust plume travels away from the source and mixes with ambient air. Fugitive dust emission sources do not consist of a condensable component and will not create secondary emissions of $PM_{2.5}$.

$PM_{2.5}$ secondary emission concentration analysis will follow EPA guidelines. Based on requested permit emission rates, the Case 2 analysis in the May 20 2014 "Guidance for PM2.5 Permit Modeling"[1] the direct $PM_{2.5}$ emissions are greater than 10 tpy, and NOx and SO_2 emissions each are less than 40 tpy. For this case, no "secondary impact" approach is required for NAAQS assessment.

[1] "Guidance for $PM_{2.5}$ Permit Modeling", EPA, Memo from Steven Page, May 20, 2014.

For this modeling analysis, the comparison with the $PM_{2.5}$ 24 hour NAAQS was based on the 98th percentile or highest 8th high.

2.8 NO_2 DISPERSION MODELING ANALYSIS

The AERMOD model predicts ground-level concentrations of any generic pollutant without chemical transformations. Thus, the modeled NO_X emission rate will give ground-level modeled concentrations of NO_X. NAAQS and NMAAQS values are presented as NO_2.

EPA has a three-tier approach to modeling NO_2 concentrations.

- Tier I – total conversion, or all NOx = NO_2
- Tier II –Ambient Ratio Method 2 (ARM2) modeling.
- Tier III – case-by-case detailed screening methods, such as OLM (Ozone Limiting Method) and Plume Volume Molar Ratio Method (PVMRM)

Initial significance modeling was performed using the ARM2 methodology for both the 1 hour and annual averaging periods.

For NO_2 CIA modeling, including identified neighboring sources, the Tier III PVMRM method will be used for the 1 hour averaging period and the Tier II ARM2 method will be used for the annual averaging period.

Tier III NO_2 modeling approach, OLM or PVMRM, consider the basic chemical assumptions, the titration of NO by ozone to form NO_2. Both use the NO_2/NO_X in-stack ratio (ISR) and information about the ambient ozone in the determination of the amount of titration that will occur in the plume. The primary difference between the two methods is the way in which the amount of ozone available for conversion of NO to NO_2 is determined. OLM assumes that all the ambient ozone is available for NO titration (i.e., instantaneous complete mixing with background air), regardless of the source or plume characteristics. In contrast, PVMRM determines the amount of ozone within the plume volume (computed from the source to the receptor) and limits the conversion of NO to NO_2 based on the ozone entrained in the plume. The calculation of the plume volume is done for an individual source or group of sources and on an hourly basis for each source/receptor combination, taking into account the plume dispersion for that hour. For this modeling analysis, if the Tier III methodology is required, PVMRM is selected.

For PVMRM, three inputs can be selected in the model, the ISR, the NO_2/NO_X equilibrium ratio for the ambient air, and the ambient ozone concentration. The ISR will be determined for each source or group of sources. The NO_2/NO_X equilibrium ratio will be the EPA default of 0.90. Ozone input will be from monitored ozone data collected from the South Valley monitoring station as representative for simultaneous hourly model meteorological data years 2001 – 2005.

In-Stack Ratio (ISR)

It is evident that at distances close to a modeled source, the modeled NO_2/NO_X ratio (and, thus, the NO_2 concentration) is highly dependent upon the assumed ISR. No data could be found for a hot mix asphalt drum, so to be conservative, the EPA default ISR of 0.50 will be used. For the asphalt heater, natural gas or diesel combustion, to be conservative, the EPA default ISR of 0.50 will be used. References are available for similar equipment categories (diesel-fired RICE) with actual in-stack data from EPA's ISR database summarized in Table 19. Table 20 summarizes the ISR selected for each NO_X source in the NO_2 1 hour modeling.

TABLE 19: EPA's ISR Database - Diesel-fired RICE[2]

Equipment class	Equipment manufacturer & model	Equipment capacity	Control Equipment	Load (% of capacity)	Avg. NO2	Avg. NOx	Ratio
Reciprocating IC Engine	Caterpillar 3512	810 kW	Uncontrolled	99	146.5	1842	0.0795
Reciprocating IC Engine	Caterpillar 3512	810 kW	Uncontrolled	84	155	1875	0.0827
Reciprocating IC Engine	Caterpillar 3512	810 kW	Uncontrolled	69	163.9	1857	0.0882
Reciprocating IC Engine	Caterpillar 3512	810 kW	Uncontrolled	49	171.5	1789	0.0959
Reciprocating IC Engine	Caterpillar 3516	1,100 kW	Uncontrolled	47	164.2	1665	0.0986
Reciprocating IC Engine	Caterpillar 3516	1,100 kW	Uncontrolled	65	165.2	1860	0.0888
Reciprocating IC Engine	Caterpillar 3516	1,100 kW	Uncontrolled	78	154.7	1882	0.0822
Reciprocating IC Engine	Caterpillar 3516	1,100 kW	Uncontrolled	96	138.1	1833	0.0753
Reciprocating IC Engine	Caterpillar 3606	1,500 kW	Uncontrolled	100	147	1861	0.0790
Reciprocating IC Engine	Caterpillar 3606	1,500 kW	Uncontrolled	80	146.8	1869	0.0785
Reciprocating IC Engine	Caterpillar 3606	1,500 kW	Uncontrolled	66	141.1	1799	0.0784
Reciprocating IC Engine	Caterpillar 3606	1,500 kW	Uncontrolled	47	129.8	1674	0.0775
Reciprocating IC Engine	Caterpillar 3512C	1,050 kW	Uncontrolled	30	15	415	0.0361
Reciprocating IC Engine	Caterpillar 3512C	1,050 kW	Uncontrolled	60	12.3	559	0.0220
Reciprocating IC Engine	Caterpillar 3512C	1,050 kW	Uncontrolled	90	19.4	726	0.0267
Reciprocating IC Engine	Caterpillar 3516	1,135 kW	Uncontrolled	40	128.4	1534	0.0837
Reciprocating IC Engine	Caterpillar 3516	1,135 kW	Uncontrolled	60	148.2	1986	0.0746
Reciprocating IC Engine	Caterpillar 3516	1,135 kW	Uncontrolled	90	123.4	1963	0.0629
Reciprocating IC Engine	Caterpillar 3516	440 kW	Uncontrolled	30	79.9	1186	0.0674
Reciprocating IC Engine	Caterpillar 3516	440 kW	Uncontrolled	70	133.3	1914	0.0696
Reciprocating IC Engine	Caterpillar 3516	440 kW	Uncontrolled	100	167	2241	0.0745
Reciprocating IC Engine	Caterpillar 3516B	1,285 kW	Uncontrolled	30	54.7	901	0.0607
Reciprocating IC Engine	Caterpillar 3516B	1,285 kW	Uncontrolled	50	78.7	1183	0.0665
Reciprocating IC Engine	Caterpillar 3516B	1,285 kW	Uncontrolled	80	76.2	1128	0.0676

[2] EPA's NO2/NOx ISR Database http://www3.epa.gov/ttn/scram/no2 isr database htm

Ave	0.072
Max	0.099
Min	0.022

Based on EPA's ISR databases, a proposed conservative NO_2/NOx ISR ratio for Diesel-fired RICE is 0.15. Table 20 summarizes the ISR selected for each NO_X source in the NO_2 1 hour modeling.

TABLE 20: Summary of Selected ISR

Source Description	Selected ISR
New Mexico Terminal HMA Drum Mixer - Default	0.50
New Mexico Terminal HMA Asphalt Heater - Default	0.50
New Mexico Terminal Services Engine - diesel-fired RICE	0.15
New Mexico Aggregate Engine 1 - diesel-fired RICE	0.15
New Mexico Aggregate Engine 2 - diesel-fired RICE	0.15
New Mexico Aggregate Engine 3 - diesel-fired RICE	0.15
New Mexico Aggregate Engine 4 - diesel-fired RICE	0.15
New Mexico Aggregate Engine 5 - diesel-fired RICE	0.15
Western Organics Powerscreen Engine - diesel-fired RICE	0.15

Model Ozone Data

For PVMRM, modeling of the project-generated 1-hour NO_2 concentrations requires use of ambient monitored O_3 concentrations. Background ambient O_3 concentrations for the project area during the 2001-2005 meteorological data years have been obtained from the Del Norte (Years 2001 - 2002)[3] monitoring station and South Valley (Years 2003 – 2005) monitoring station, which is the monitoring site nearest to the project.

Concerning data substitution for missing hourly O_3 ambient monitoring data, the hourly O_3 data are used within the AERMOD air dispersion model when operated using the PVMRM option that simulates the atmospheric chemistry of O_3 reacting with initially emitted nitric oxide (NO) to form NO_2. If there is only a limited amount of O_3 in the plume, then the reaction is limited, forming less NO_2 than occurs with the simplifying assumption of complete conversion. The model disperses the initial NO_X emissions, which are mostly NO, during each of the 8,760 hours in a 365-day year. If the hourly ambient O_3 data from the nearest monitoring station have missing data, the missing O_3

[3] Ozone monitoring did not begin at the South Valley monitoring station until July 2002 Del Norte monitoring station data is substituted for years 2001 - 2002 into the background ozone data input into the dispersion model

hours are given substituted concentrations with the following procedure to better simulate the resulting NO_2 concentrations:

- If two or fewer consecutive hours of O_3 ambient concentrations are missing, the missing concentrations will be based on the highest previous or subsequent hour concentrations.
- If three or more consecutive hours of O_3 ambient concentrations are missing, then substitution for each missing concentration will be based on the highest 1 hour for same hour in the day over that month. Example: for data missing in January for the first hour of the day will be substituted for the highest value for all first hour of the day in January, etc.

2.9 AMBIENT MODELING BACKGROUND

Ambient background concentrations will be added to the dispersion modeling results and compared to the NAAQS and NMAAQS. Background concentrations were obtained from the COABC AQP Modeling Section with the exception of the 1-hour NO_2 background methodology discussed below.

CO 1-hr:	2864 micrograms per cubic meter
CO 8-hr:	1260 micrograms per cubic meter
SO_2 1-hr:	13.1 micrograms per cubic meter
SO_2 24-hr:	0 micrograms per cubic meter
SO_2 Annual:	0 micrograms per cubic meter
NO_2 Annual:	30 micrograms per cubic meter
TSP Annual, 24-hr:	31 micrograms per cubic meter
PM_{10} 24-hr:	31 micrograms per cubic meter
$PM_{2.5}$ 24-hr:	18 micrograms per cubic meter
$PM_{2.5}$ annual:	7.5 micrograms per cubic meter

NO_2 1-hour Background data

NO_2 1-hour background data will be based on the Tier 2 procedure found in EPA guidance documents[4] for determining background concentrations.

> *"Based on this guidance, we believe that an appropriate methodology for incorporating background concentrations in the cumulative impact assessment for the 1-hour NO_2 standard would be to use multiyear averages of the 98th-percentile of the available background concentrations by season and hour-of-day, excluding periods when the source in question is expected to impact the monitored concentration (which is only relevant for modified sources). For situations involving a significant mobile source component to the background monitored concentrations, inclusion of a day-of-week component to the temporal variability*

[4] Memo: "Additional Clarification Regarding Application of Appendix W Modeling Guidance for 1-hour NO2 National Ambient Air Quality Standard" Tyler Fox, Leader, Air Quality Modeling Group, C439-01, dated March 1, 2011.

may also be appropriate. The rank associated with the 98th-percentile of daily maximum 1-hour values should be generally consistent with the number of "samples" within that distribution for each combination based on the temporal resolution but also account for the number of samples "ignored" in specifying the 98th-percentile based on the annual distribution. For example, Table 1 in Section 5 of Appendix S specifies the rank associated with the 98th-percentile value based on the annual number of days with valid data. Since the number of days per season will range from 90 to 92, Table 1 would indicate that the 2nd-highest value from the seasonal distribution should be used to represent the 98th-percentile. On the other hand use of the 2nd-highest value for each season would effectively "ignore" only 4 values for the year rather than the 7 values "ignored" from the annual distribution. Balancing these considerations we recommend that background values by season and hour-of-day used in this context should be based on the 3rd-highest value for each season and hour-of-day combination, whereas the 8th-highest value should be used if values vary by hour-of-day only. For more detailed temporal pairing, such as season by hour-of- day and day-of-week or month by hour-of-day, the 1st-highest values from the distribution for each temporal combination should be used."

The NO_2 monitoring data will be from the Del Norte Station for the most recent complete 3-years of data, 2012 2014. This monitoring station provides the most conservative NO_2 data for the Albuquerque area since it include one of the highest traffic areas in the city. For each season; winter (December – February), spring (March – May), summer (June – August), and fall (September – November), the multi-year average of the 3-highest value for each hour of the day was determined. This was input into the model and the background value will be added to the model concentration results for each corresponding hour of the day and season.

Background concentrations specified in units of PPB are converted to $\mu g/m^3$ based on reference temperature (25° C) and pressure (1013.25 millibars). This further provides a conservative result based on standard pressure and temperature instead of actual pressure and temperature which would result in a lower $\mu g/m^3$ based on the monitored background concentration in PPB at the Del Norte Station elevation.

TABLE 21: Del Norte Monitored Seasonal NO_2 Background – 3rd Highest Hourly PPB

Hour	Winter	Spring	Summer	Fall
1	37.0	28.4	19.5	32.8
2	37.1	26.0	16.1	33.1
3	36.1	25.7	16.4	30.3
4	36.1	28.5	16.0	31.7
5	37.0	32.0	20.0	31.8
6	37.6	36.2	25.0	33.6
7	39.2	39.7	30.4	35.9
8	43.0	41.1	27.8	38.5
9	42.5	35.4	24.1	36.6
10	42.2	32.1	16.2	32.9
11	36.5	21.9	12.2	27.2
12	27.4	15.7	9.4	19.7
13	21.6	11.2	8.5	17.6
14	20.6	9.8	7.9	15.2
15	20.9	9.7	8.4	13.4
16	23.9	10.8	9.6	14.5
17	27.5	10.5	11.2	20.1
18	38.8	11.2	10.5	36.7
19	41.8	19.5	14.1	42.1
20	41.9	27.1	20.8	39.9
21	40.3	28.8	23.2	39.1
22	40.1	33.8	21.1	38.0
23	38.9	33.9	20.9	35.5
24	38.1	31.9	23.0	34.9

3.0 MODEL SUMMARY

This section summarizes the model results, following the technical approach approved in Section 2 of this report for Class II federal ambient air quality standards for this facility. Model results show for each criteria pollutant and applicable averaging periods for nitrogen dioxide, (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter; total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), the proposed New Mexico Terminal Services' Railyard HMA Plant does not contribute to an exceedance of the national/New Mexico ambient air quality standards (AAQS). The modeling followed the general modeling procedures outlined in "Permit Modeling Guidelines, Albuquerque Environmental Health Department", revised 02/03/2016, "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised 08/08/2017, and the most up to date EPA's *Guideline on Air Quality Models.*

The operating hours for the proposed New Mexico Terminal Services' Railyard HMA Plant will be 17 hours per day (4 AM to 9 PM) for the months of December through February, 24 hours per day for the months of March through November, 7 days per week, and 8130 hours per year. For the Railyard HMA Plant, New Mexico Terminal will take site-specific conditions on daily HMA operating throughput. For the months of December through February the daily throughput will be limited to 3200 tons (8 hours maximum at 400 tph). For the months of March through May the daily throughput will be limited to 4000 tons (10 hours maximum at 400 tph). For the months of June through November the daily throughput will be limited to 4400 tons (12 hours maximum at 400 tph).

New Mexico Terminal Services' Railyard HMA Plant, the permitted operating hours are 24 hours per day, 8760 hours per year. For the co-located New Mexico Aggregate Plant, the proposed operating hours are from 7 AM to 4 PM or 9 hours per day.

3.1 SIGNIFICANT IMPACT LEVEL (SILs) MODELING ANALYSIS

Significant impact level AERMOD dispersion modeling was completed for nitrogen dioxide, (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter; total suspended particles (TSP), and both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$). All significant impact models were run in terrain mode with building downwash for New Mexico Terminal emission sources only. Results for all significant impact level dispersion modeling below the applicable SILs are summarized in Table 22.

TABLE 22: Summary of SIL Modeling Results – New Mexico Terminal Railyard HMA and Co-located New Mexico Terminal Truck Terminal and New Mexico Aggregate Sources Only

Parameter	Maximum Modeled Concentration (μg/m³)	Significant Impact Level (μg/m³)	% of Significant Impact Level
CO 1 Hour	374.4	2000	18.7
CO 8 Hour	306.8	500	61.4

For CO 1 and 8 hour averaging periods no additional modeling was performed.

3.2 CUMULATIVE IMPACT ANALYSIS (CIA) MODEL RESULTS

The model results using the maximum operation at New Mexico Terminal's Railyard HMA Plant, co-located New Mexico Terminal's Truck Terminal and New Mexico Aggregate Plant, significant neighboring sources, and approved ambient background are summarized below in Table 23. Dispersion modeling analysis followed the modeling protocol outline in Section 2 of this report.

TABLE 23: Summary of CIA Modeling Results Including New Mexico Terminal's Truck Terminal, New Mexico Aggregate, and all Significant Neighboring Sources and Background

Parameter	Maximum Modeled Concentration (μg/m³)	Significant Impact Level (μg/m³)	Maximum Modeled Concentration With Background (μg/m³)	Lowest Applicable Standard (μg/m³)	% of Standard
NO_2 1 Hr. 8th High Max Daily	71.7	7.52	131.2	188.0	69.8
NO_2 Annual	12.9	1	42.9	94.0	45.6
SO_2 1 Hr. 4th High Max Daily	154.8	7.8	167.9	196.4	85.5
SO_2 24 Hr.	58.9	5	58.9	261.9	22.5
SO_2 Annual	3.9	1	3.9	52.4	7.4
$PM_{2.5}$ 24 Hr. High 8th High	13.5	1.2	31.5	35	90.0
$PM_{2.5}$ Annual	3.0	0.3	10.5	12	87.5
PM_{10} 24 Hr. High 2nd High	73.1	5	104.1	150	69.4
TSP 24 Hr. Highest High	118.5	5	149.5	150	99.7
TSP Annual	27.6	1	58.6	60	97.7

Note: Background concentrations are found in Section 2.9 of the modeling protocol. Dispersion modeling inputs and settings are presented in Section 2.

3.2.1 NO_2 Cumulative Impact Analysis Modeling Results

NO_2 CIA modeling was performed with terrain elevations and building downwash for New Mexico Terminal Site. NO_X emission rates represented the maximum hourly rate for New Mexico Terminal point sources, and co-located and significant neighboring sources.

Table 24 shows the NO_2 1 Hour 8th highest 1 hour daily maximum and annual model results and locations.

TABLE 24: NO_2 CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	Modeled Concentration With Background ($\mu g/m^3$)	Location UTMs E/N	
NO_2 1 Hr. 8th highest 1 hour daily maximum	71.7	131.2	347372.2	3869319.3
NO_2 Annual	12.9	42.9	347875.2	3869284.4

For NO_2 1-hour modeling, the Tier III PVMRM approach found in Section 2.8 of this report was used for the analysis. For PVMRM, background ambient O_3 concentrations for the project area during the 2001-2005 meteorological data years was obtained from the Del Norte (Years 2001 - 2002) monitoring station and South Valley (Years 2003 – 2005) monitoring station.

Dispersion modeling meteorology for this analysis included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, was obtained from the COABC AQP.

Albuquerque Del Norte Monitor, years 2012 – 2014, 1-hour and annual NO_2 background concentrations found in Section 2.9 of this report were added to the modeled results and compared to the lowest applicable ambient standard.

Model results show the highest annual concentrations occurred along the eastern New Mexico Terminal restricted boundary. Maximum 1 hour concentrations occurred along the western New Mexico Terminal restricted boundary.

Figure 3 shows a contour map of the NO_2 8th highest 1 hour daily maximum concentration and the location of the maximum concentration including background where New Mexico Terminal sources contribute above the 1 hour NO_2 SIL.

Figure 4 shows a contour map of the NO_2 highest annual concentration and the location of the maximum concentration including background where New Mexico Terminal sources contribute above the annual NO_2 SIL.

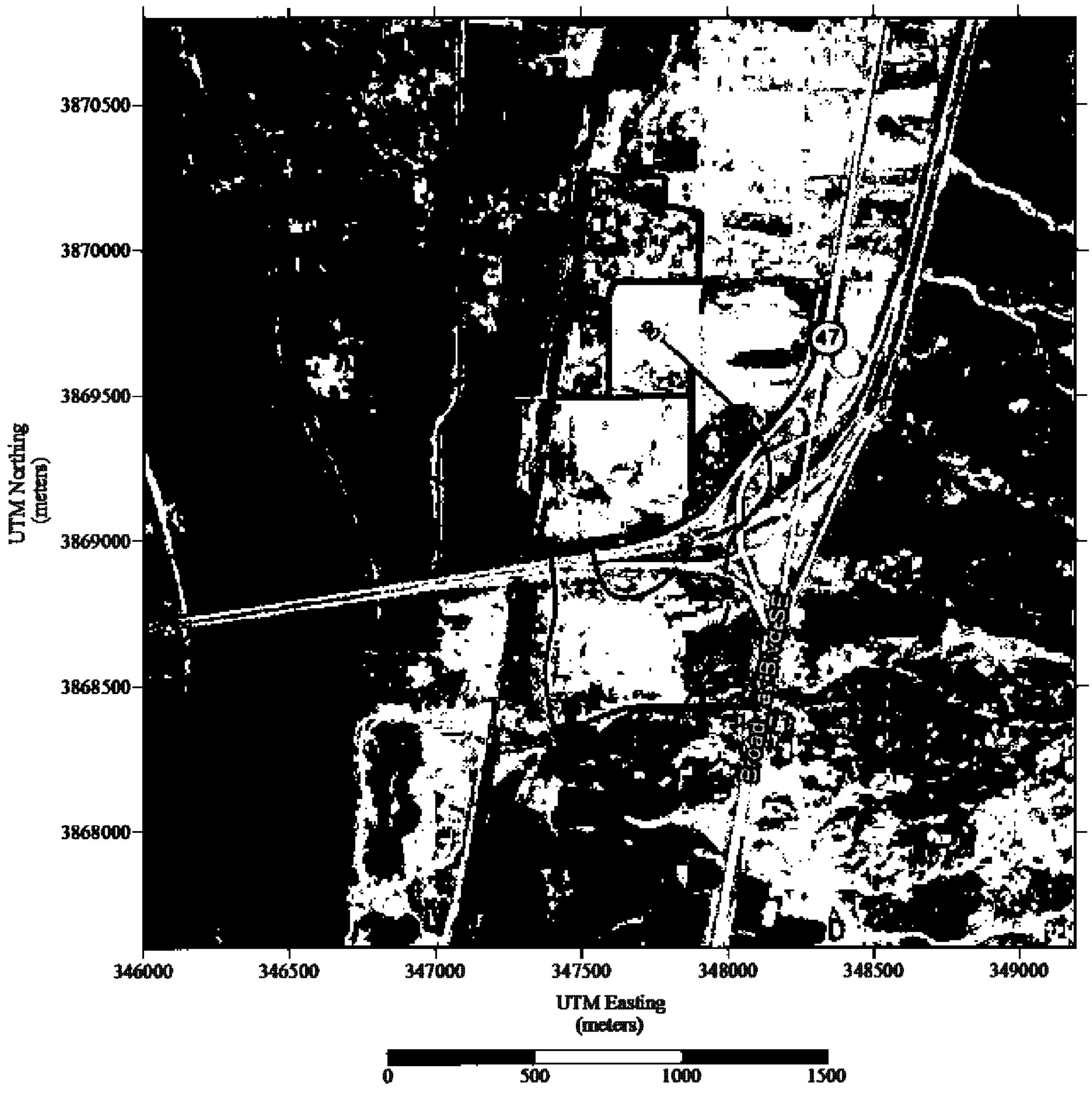

Figure 3: Contour Map for NO_2 with location of 8th Highest Daily High 1 Hour Concentration Model Result ($\mu g/m^3$)

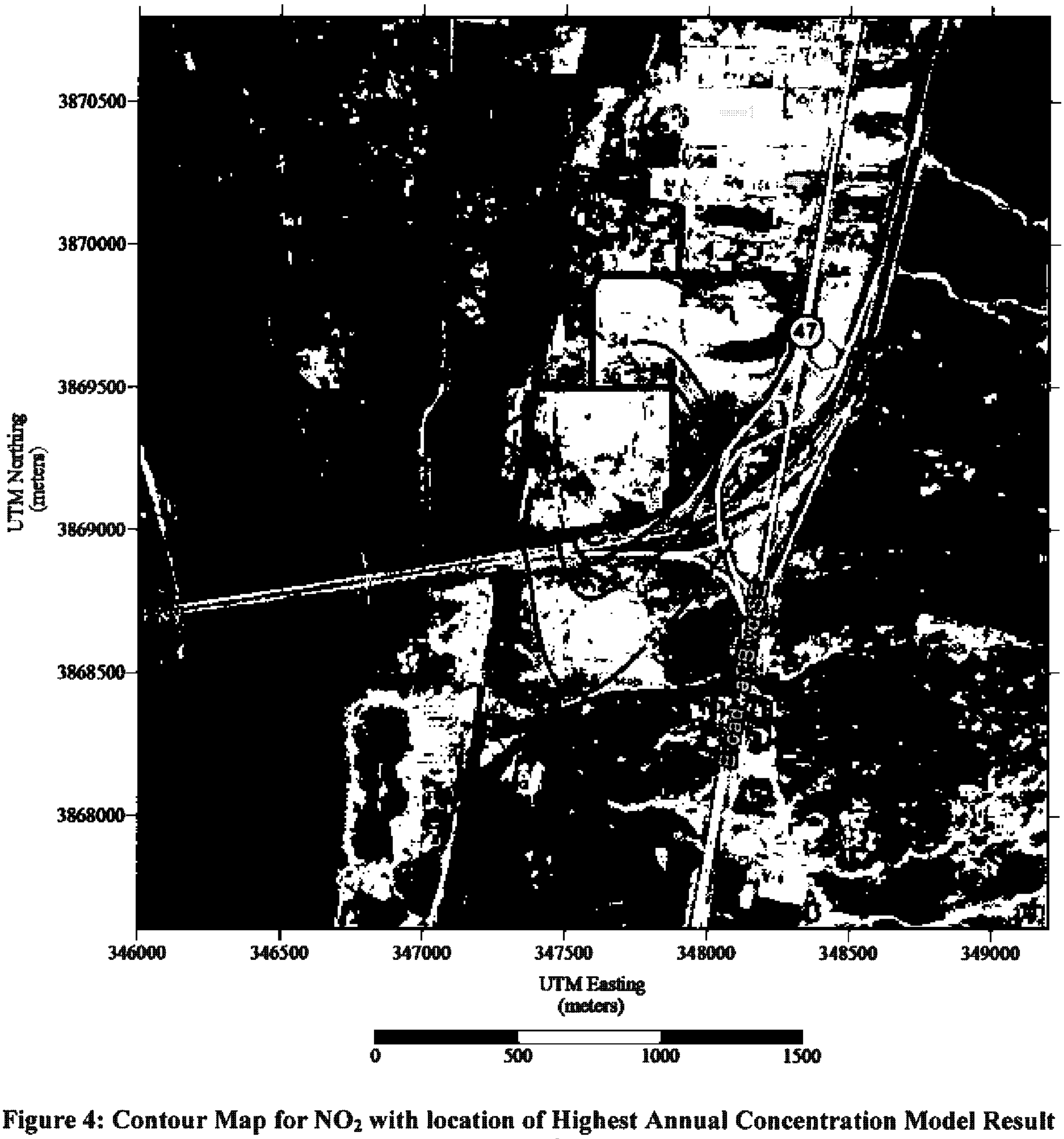

Figure 4: Contour Map for NO_2 with location of Highest Annual Concentration Model Result ($\mu g/m^3$)

3.2.2 SO_2 Cumulative Impact Analysis Modeling Results

SO_2 CIA modeling was performed with terrain elevations and building downwash for New Mexico Terminal Site. SO_2 emission rates represented the maximum hourly rate for New Mexico Terminal point sources and significant neighboring sources.

Table 25 shows the SO_2 1 Hour 4th highest 1 hour daily maximum, 24 hour maximum, and annual average model results and locations.

TABLE 25: SO_2 CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	Modeled Concentration With Background ($\mu g/m^3$)	Location UTMs E/N	
SO_2 1 Hr. 4th highest 1 hour daily maximum	154.8	167.9	347372.2	3869319.3
SO_2 24 Hr.	58.9	58.9	347300.0	3869350.0
SO_2 Annual	3.9	3.9	347372.2	3869319.3

CIA SO_2 modeling was performed with terrain and meteorology which included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, obtained from the COABC AQP. Albuquerque/Bernalillo County representative 1-hour SO_2 background concentrations was added to the 1-hour modeled results and compared to the lowest applicable ambient standard. The 1-hour background concentrations that were used for SO_2 1-hour period is found in Section 2.9 of this report.

Model results show the highest concentrations occur for the 1 hour and annual concentrations occurred along the western New Mexico Terminal restricted boundary. Model results show the highest concentrations occur for the 24 hour concentration occurred 80 meters from the western New Mexico Terminal restricted boundary.

Figure 5 shows the receptor location of the SO_2 4th highest 1 hour daily maximum concentration, including background, where New Mexico Terminal sources contribute above the 1 hour SO_2 SIL.

Figure 6 shows the receptor location of the SO_2 highest 24 hour concentration where New Mexico Terminal sources contribute above the 24 hour SO_2 SIL.

Figure 7 shows the receptor location of the SO_2 highest annual average concentration where New Mexico Terminal sources contribute above the annual SO_2 SIL.

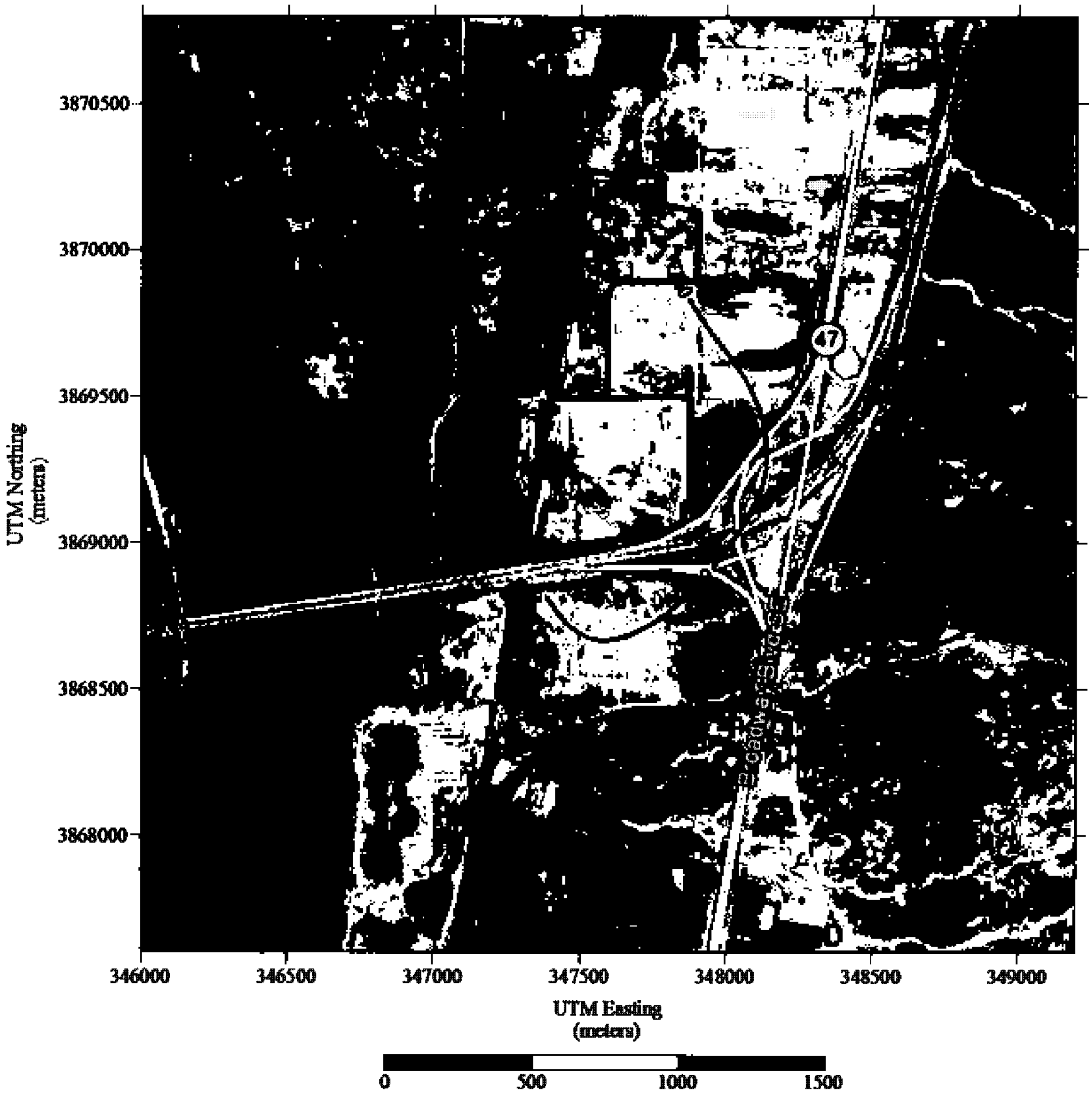

Figure 5: Contour Map for SO_2 with location of 4th Highest Daily High 1 Hour Concentration Model Result ($\mu g/m^3$)

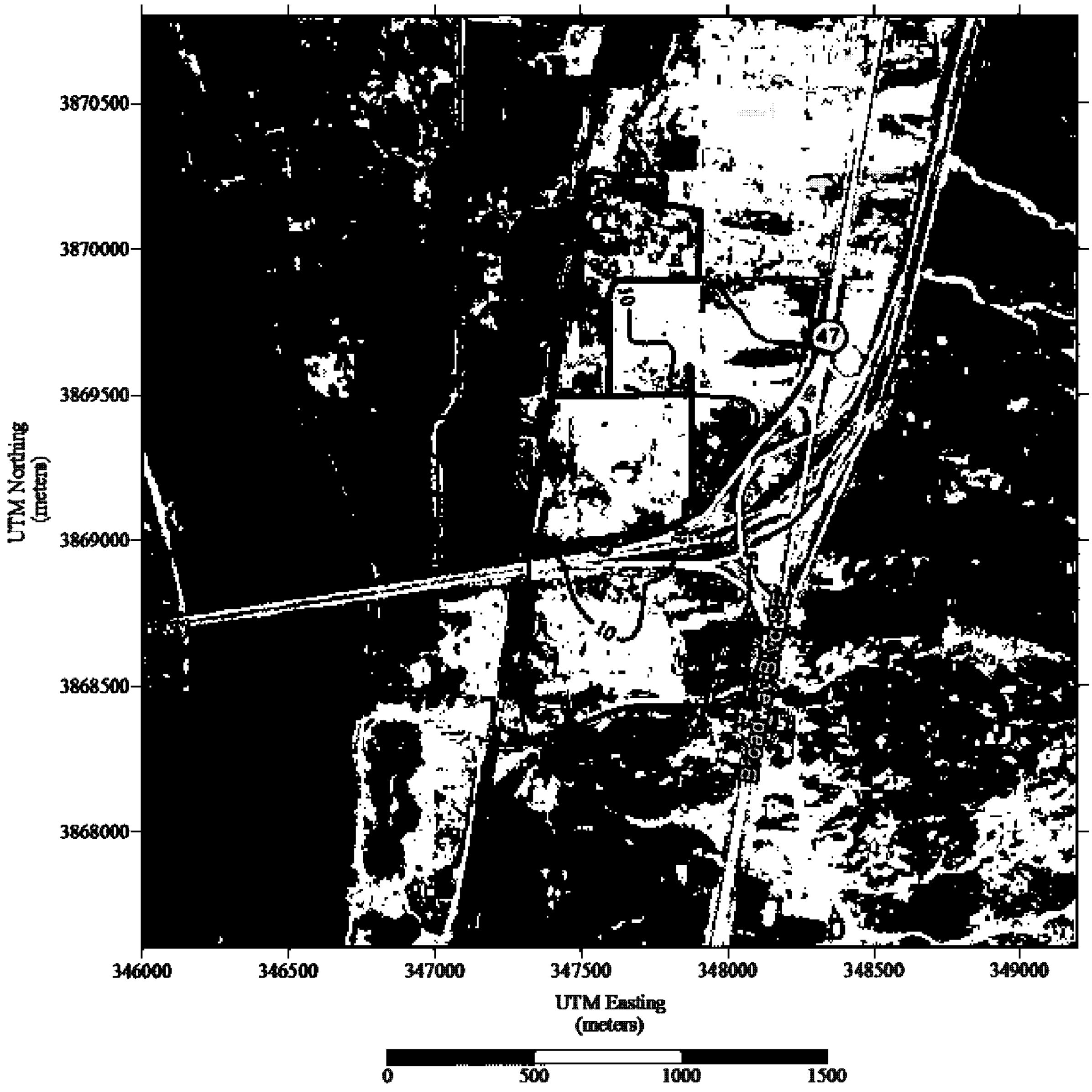

Figure 6: Contour Map for SO_2 with location of Highest 24 Hour Concentration Model Result ($\mu g/m^3$)

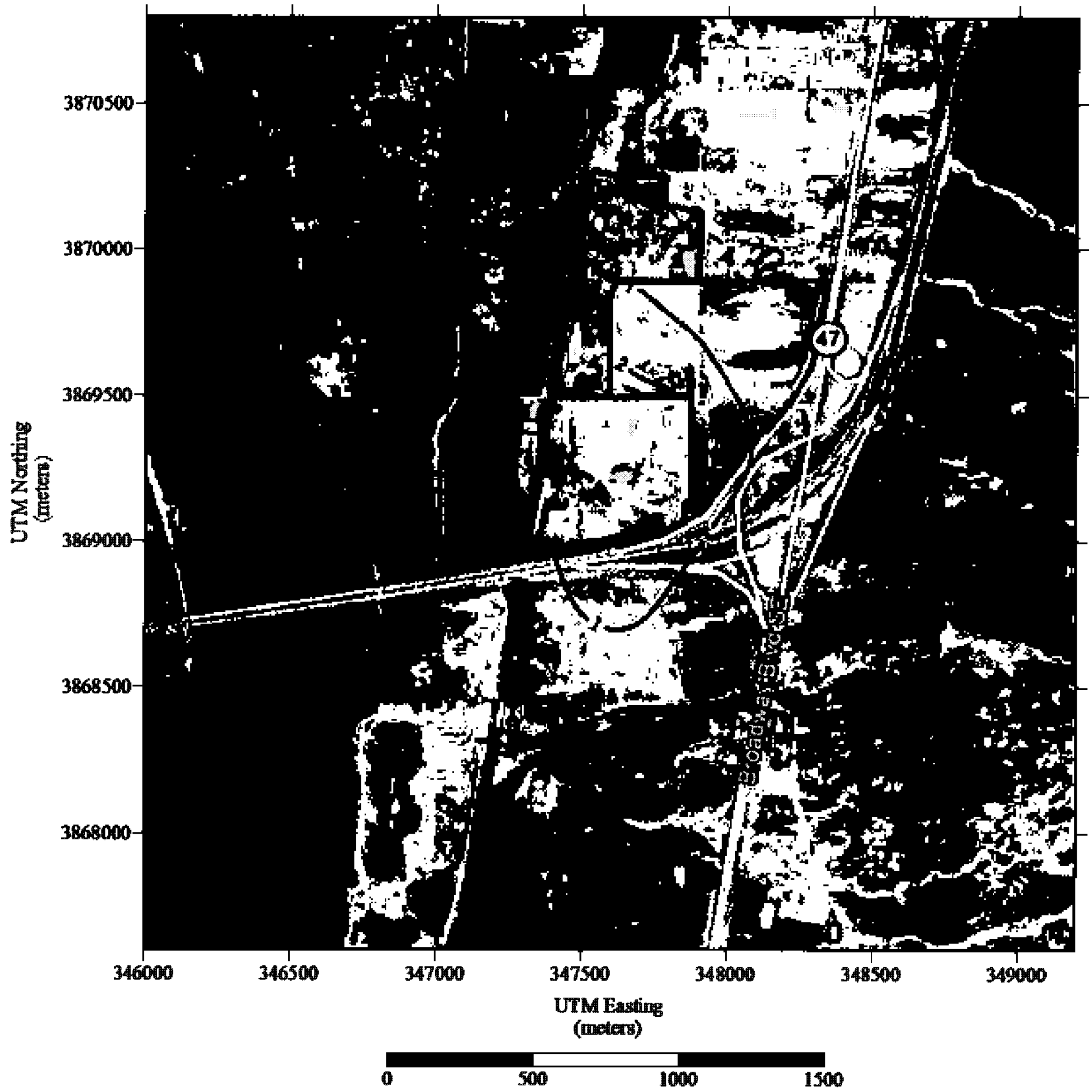

Figure 7: Contour Map for SO_2 with location of Highest Annual Average Concentration Model Result ($\mu g/m^3$)

3.2.3 $PM_{2.5}$ Direct Cumulative Impact Analysis Modeling Results

Particulate matter includes both "primary" PM, which is directly emitted into the air, and "secondary" PM, which forms indirectly from fuel combustion and other sources. Primary PM consists of carbon (soot)—emitted from cars, trucks, heavy equipment, forest fires, and burning waste—and crustal material from unpaved roads, stone crushing, construction sites, and metallurgical operations. Secondary PM forms in the atmosphere from gases. Since direct $PM_{2.5}$ emissions are greater than 10 tpy, and NOx and SO_2 emissions are less than 40 tpy, the comparison with the $PM_{2.5}$ 24 hour NAAQS with model results was based on the 98th percentile or highest 8th high.

CIA direct "primary" $PM_{2.5}$ modeling was performed with terrain and meteorology which included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, obtained from the COABC AQP. Modeling was performed for both 24 hour and annual averaging periods. $PM_{2.5}$ emission rates represented the maximum hourly rate for all emission sources. South Valley representative 24-hour and annual $PM_{2.5}$ background concentrations was added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour and annual background concentrations that were used for $PM_{2.5}$ averaging periods are found in Section 2.9 of this report.

Annual $PM_{2.5}$ model results show the highest 5 year annual average occurred during modeling scenario 11.

TABLE 26: Results $PM_{2.5}$ Annual Model Scenario Time Segments

Model Scenario	$PM_{2.5}$ 5-Year Annual Average High ($\mu g/m^3$)
1	10.38
2	10.33
3	10.27
4	10.23
5	10.21
6	10.21
7	10.23
8	10.26
9	10.34
10	10.47
11	**10.51**
12	10.46

$PM_{2.5}$ 5-Year 24 Hr. High 8th High model results show the highest 5 year 24 hour average occurred during modeling scenario 10.

TABLE 27: Results $PM_{2.5}$ 24 Hour Model Scenario Time Segments

Model Scenario	$PM_{2.5}$ 5-Year 24 Hr. High 8th High ($\mu g/m^3$)
1	30.22
2	28.08
3	26.25
4	26.13
5	26.29
6	27.04
7	28.19
8	29.74
9	30.41
10	**31.49**
11	31.06
12	30.31

Maximum 24 hour and annual concentrations occurred along the western New Mexico Terminal restricted boundary. Table 28 shows the $PM_{2.5}$ 24 hour 8th highest 1 hour daily maximum, and annual average model results and locations.

TABLE 28: $PM_{2.5}$ CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	Modeled Concentration With Background ($\mu g/m^3$)	Location UTMs E/N	
24 Hour Average Highest 8th High	13.5	31.5	347372.2	3869319.3
Annual Average	3.0	10.5	347363.7	3869270.1

Figures 8 and 9 summarize the results of the modeling analysis.

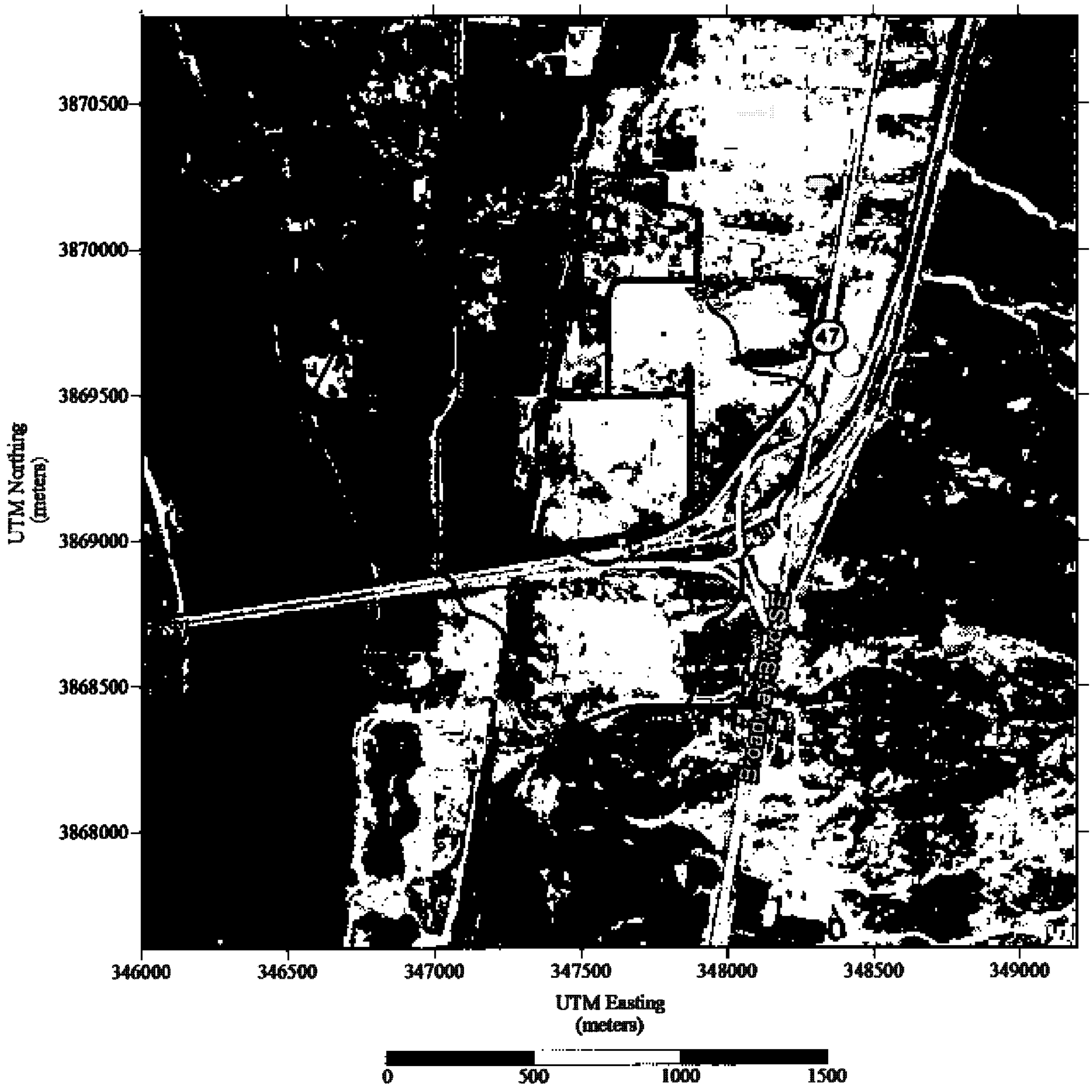

Figure 8: Contour Map for $PM_{2.5}$ with location of Highest 8th High 24 Hour Concentration Model Result ($\mu g/m^3$)

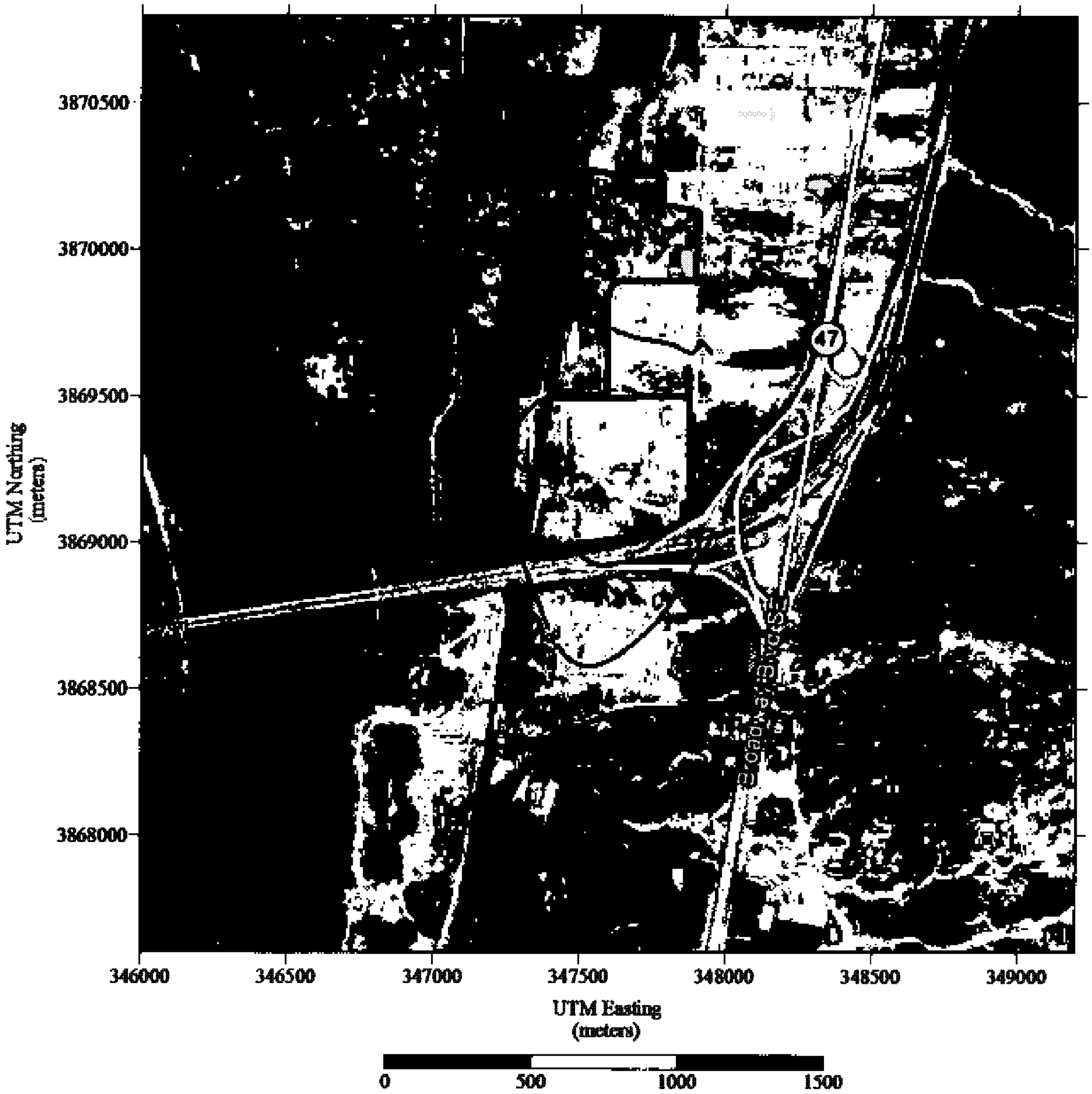

Figure 9: Contour Map for $PM_{2.5}$ with location of Highest Annual Concentration Model Result ($\mu g/m^3$)

3.2.4 PM_{10} Cumulative Impact Analysis Modeling Results

CIA PM_{10} modeling was performed with terrain and meteorology, which included 5 years of data, 2001 2005 Albuquerque Meteorological data obtained from the COABC AQP. Modeling was performed for the 24 hour averaging period. PM_{10} modeled emissions rates represented the maximum hourly rate for all emission sources. South Valley representative 24-hour PM_{10} background concentrations was added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour background concentrations that were used for PM_{10} 24 hour averaging period is found in Section 2.9 of this report.

PM_{10} 5-Year 24 Hr. Highest 2nd High model results show the highest 5 year 24 hour average occurred during modeling scenario 10.

TABLE 29: Results PM_{10} 24 Hour Model Scenario Time Segments

Model Scenario	PM_{10} 5-Year 24 Hr. Highest 2nd High ($\mu g/m^3$)
1	96.71
2	94.57
3	88.05
4	92.48
5	93.11
6	93.55
7	94.12
8	96.99
9	101.10
10	**104.07**
11	100.57
12	100.25

Maximum 24 hour highest 2nd high concentration occurred along the western New Mexico Terminal restricted boundary. Table 30 shows the PM_{10} 24 hour highest 2nd high model result and location.

TABLE 30: PM_{10} CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	Modeled Concentration With Background ($\mu g/m^3$)	Location UTMs E/N	
24 Hour Average Highest 2nd High	73.1	104.1	347363.7	3869270.1

Figure 10 summarize the results of the modeling analysis.

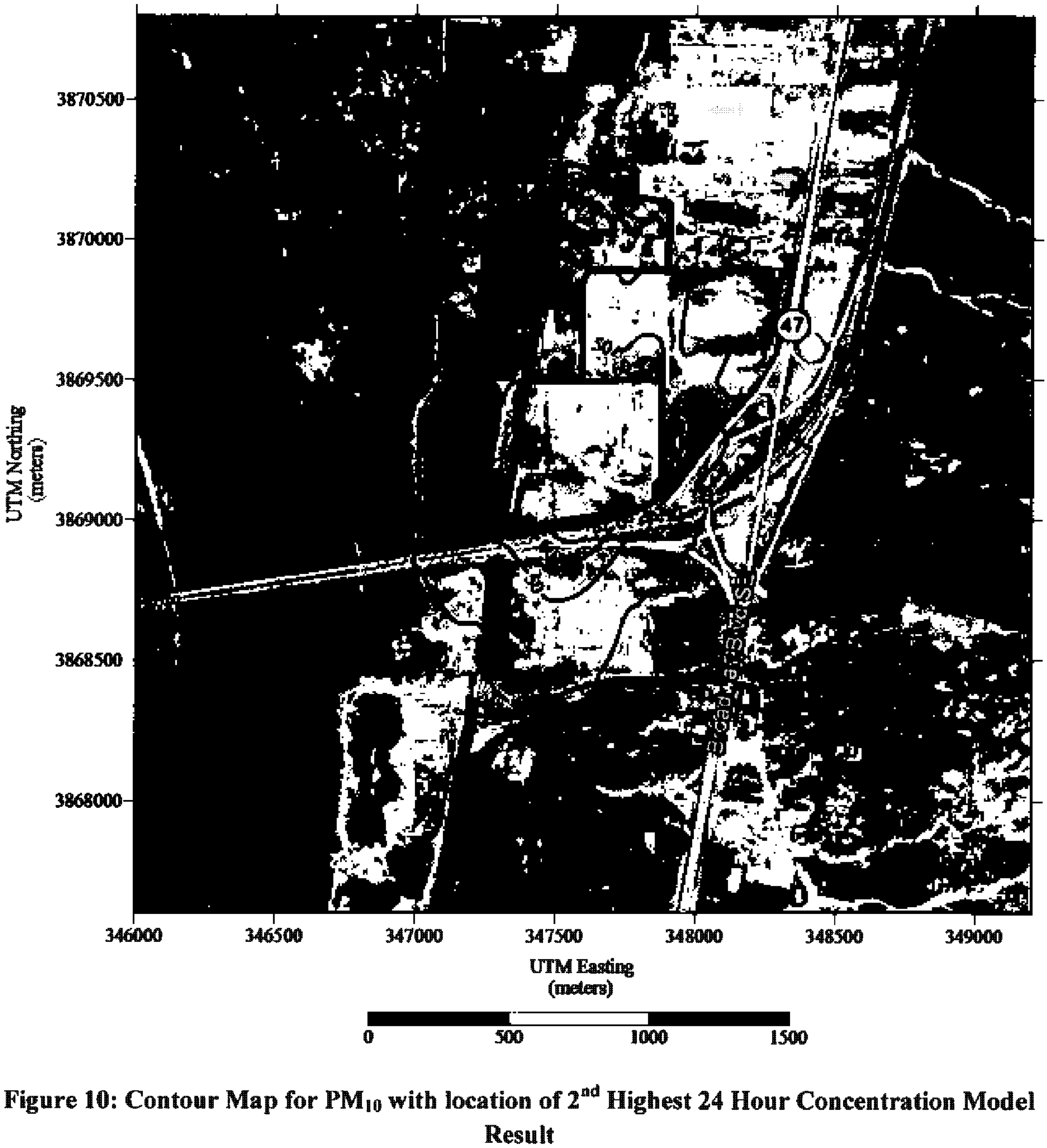

Figure 10: Contour Map for PM_{10} with location of 2nd Highest 24 Hour Concentration Model Result ($\mu g/m^3$)

3.2.5 TSP Cumulative Impact Analysis Modeling Results

CIA TSP modeling was performed with terrain and meteorology which included 1 year of data, 2003 Albuquerque Meteorological data, obtained from the COABC AQP. Modeling was performed for both 24 hour and annual averaging periods. TSP emission rates represented the maximum hourly rate for all emission sources. South Valley representative 24-hour and annual TSP background concentrations were added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour and annual background concentrations that were used for TSP averaging periods are found in Section 2.9 of this report.

TSP emissions are modeled using plume depletion. Plume deposition simulates the effect of gravity as particles '"fall-out" from the plume to the ground as the plume travels downwind. Therefore, the farther the plume travels from the emission point to the receptor, the greater the effect of plume deposition and the greater the decrease in modeled impacts or concentrations. Particle size distribution, particle mass fraction, and particle density are required inputs to the model to perform this function (see Section 2.6).

Dispersion model results showed the highest concentrations were within Western Organics restricted boundary. When Western Organics particulate sources were excluded from the results, these receptors within Western Organics restricted boundary were no longer the highest.

Annual TSP model results show the highest annual average occurred during modeling scenario 10

TABLE 31: Results TSP Annual Model Scenario Time Segments

Model Scenario	TSP Annual Average High ($\mu g/m^3$)
1	56.83
2	56.09
3	55.35
4	54.75
5	54.68
6	54.97
7	55.65
8	56.61
9	57.58
10	**58.61**
11	58.60
12	57.66

TSP 24 hour highest high model results show the highest concentration occurred during modeling scenario 1.

TABLE 32: Results TSP 24 Hour Model Scenario Time Segments

Model Scenario	TSP 24 Hr. Highest High ($\mu g/m^3$)
1	**149.46**
2	134.62
3	131.39
4	122.81
5	122.49
6	128.87
7	148.00
8	147.69
9	147.61
10	141.36
11	147.65
12	148.85

Model results show the highest 24 hour and annual average concentrations occurred along the western New Mexico Terminal restricted boundary.

Table 33 summarizes the TSP 24 hour highest and annual average model results and locations.

TABLE 33: TSP CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	Modeled Concentration With Background ($\mu g/m^3$)	Location UTMs E/N	
24 Hour Average Highest High	118.5	149.5	347363.7	3869270.1
Annual Average	27.6	58.6	347363.7	3869270.1

Figures 11 and 12 summarize the results of the modeling analysis.

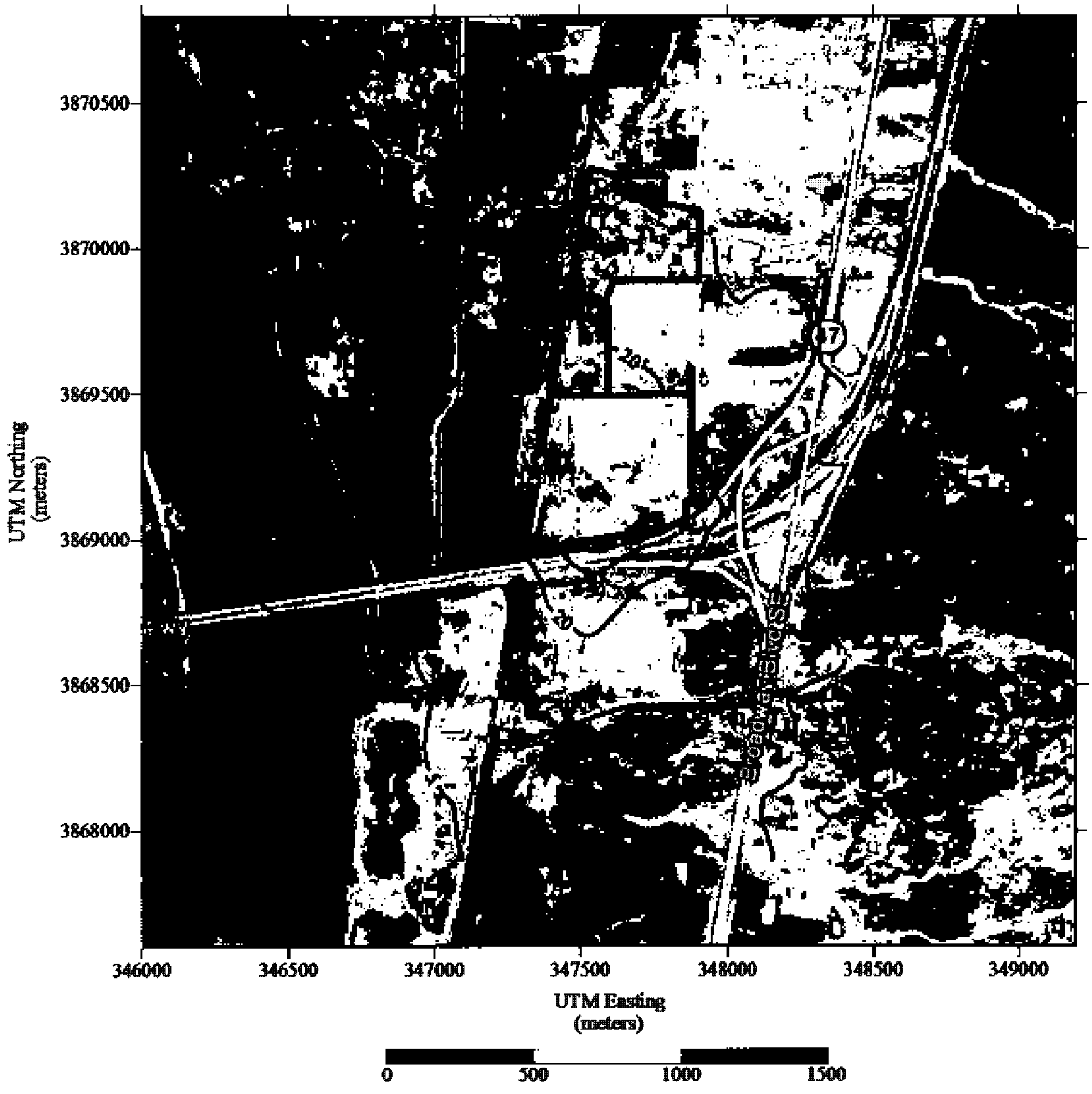

Figure 11: Contour Map for TSP with location of Highest 24 Hour Concentration Model Result
(μg/m³)

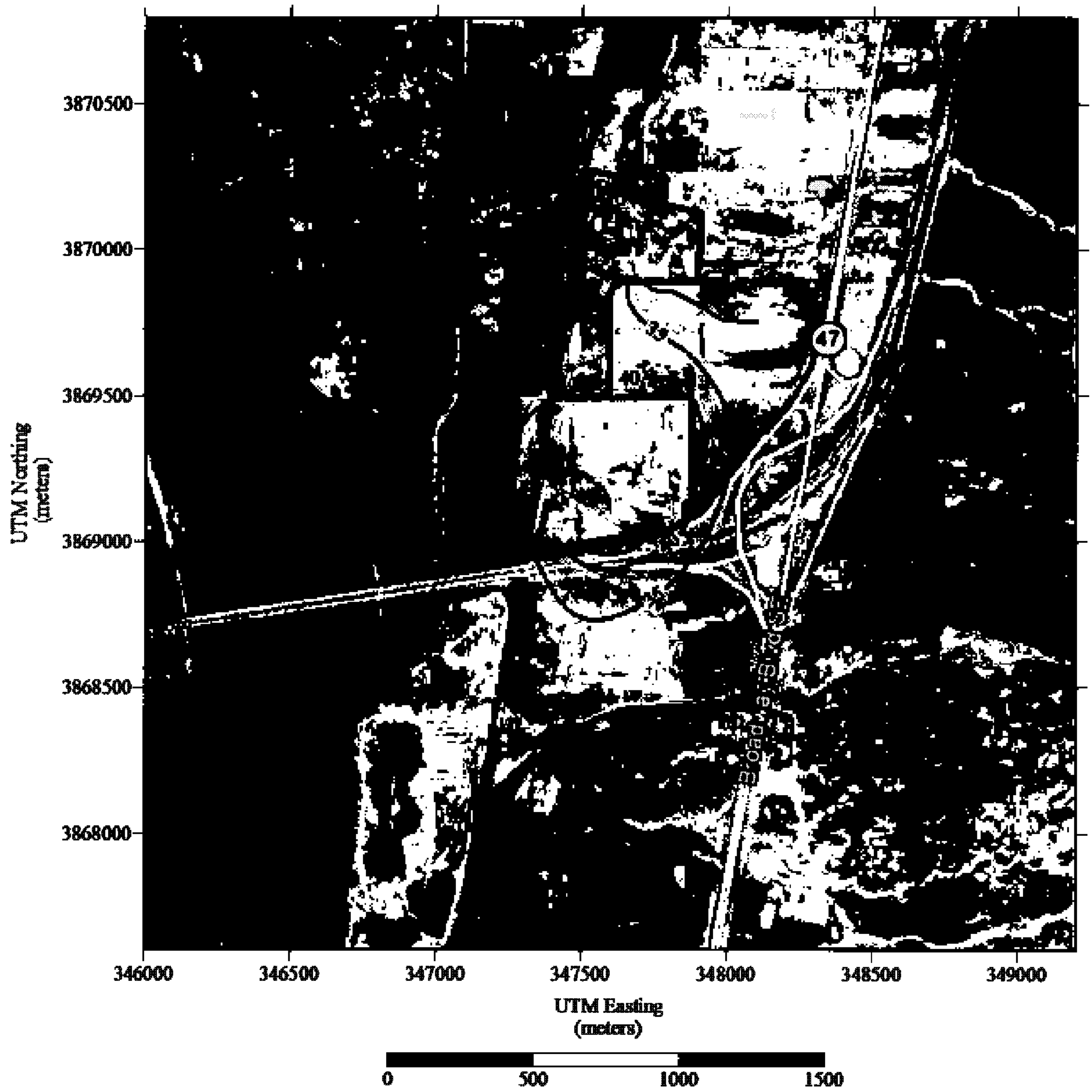

Figure 12: Contour Map for TSP with location of Highest Annual Concentration Model Result ($\mu g/m^3$)

Modeling File List

Model File Name	Description
NMTerminal HMA CombustROI	NO2, CO, SO2 Significance Modeling -- New Mexico Terminal and New Mexico Aggregate Sources Only
NMTerminal PM 24hrROI	PM2.5 and PM10 24 Hour Significance Modeling – New Mexico Terminal and New Mexico Aggregate Sources Only
NMTerminal PM25 AnnualROI	PM2.5 Annual Average Significance Modeling New Mexico Terminal and New Mexico Aggregate Sources Only
NMTerminal TSP 24hrROI	TSP 24 Hour Significance Modeling – New Mexico Terminal and New Mexico Aggregate Sources Only
NMTerminal TSP AnnualROI	TSP Annual Average Significance Modeling – New Mexico Terminal and New Mexico Aggregate Sources Only
NMTerminal HMA CO	Significance CO Modeling 1and 8 Hour – New Mexico Terminal and New Mexico Aggregate Sources Only
NMTerminal HMA NO2 1hr PVMRM	Cumulative NO2 1 Hour PVMRM Modeling
NMTerminal HMA NO2 Annual	Cumulative NO2 ARM2 Annual Modeling
NMTerminal HMA SO2 1hr	Cumulative SO2 1 Hour Modeling
NMTerminal HMA SO2	Cumulative SO2 24 Hour and Annual Average Modeling
NMTerminal HMA PM 24hr S1-12	Cumulative $PM_{2.5}$ Modeling 24 Hour Averaging Period Scenarios 1 through 12
NMTerminal HMA PM25 Annual S1-12	Cumulative $PM_{2.5}$ Modeling – Annual Averaging Period Scenarios 1 through 12
NMTerminal HMA PM 24hr S1-12	Cumulative PM_{10} Modeling – 24 Hour Averaging Period -- Scenarios 1 through 12
NMTerminal TSP 24hrS1-12	Cumulative TSP Modeling -- 24 Hour Averaging Period – Scenarios 1 through 12
NMTerminal TSP Annual S1-12	Cumulative TSP Modeling -- Annual Averaging Period – Scenarios 1 through 12

MONTROSE Paul Wade <pwade@montrose-env.com>

New Mexico Terminal Services Proposed HMA Plant Model Protocol

5 messages

Paul Wade <pwade@montrose-env.com> Thu Feb 8, 2018 at 12:33 PM
To: "Stonesifer, Jeff W." <JStonesifer@cabq.gov>
Cc: "Karl Pergola (karl.pergola@rockhousekp.com)" <Karl.Pergola@rockhousekp.com>, "Tavarez, Isreal L." <ITavarez@cabq.gov>

Jeff
Attached is a modeling protocol for a proposed HMA plant to be located at New Mexico Terminal Services site at 9615 Broadway Blvd SE The proposed HMA plant wi : operate in conjunction with an aggregate railcar unloading system along with all permits that are presently allowed to operate at the site

Please let me know if you have any questions or comments on the modeling protocol

Thank you

–

MEG Logo_Signature

Paul Wade

Sr. Engineer

Montrose Air Quality Services LLC

3500 G Comanche Rd NE, Albuquerque, NM 87107

T 505 830 9680 x6 F 505.830 9678

PWade@montrose-env.com

www.montrose-env.com

New Mexico Terminal Services HMA Model Protocol 020818.pdf
1233K

Stonesifer, Jeff W. <JStonesifer@cabq gov> Wed, Feb 14, 2018 at 2:26 PM
To: Paul Wade <pwade@montrose-env com>
Cc: "Karl Pergola (karl.pergola@rockhousekp.com)" <Karl Pergola@rockhousekp com>, "Tavarez Isreal L." <ITavarez@cabq gov>, "Eyerman. Regan V." <reyerman@cabq.gov>

Paul,

Our questions and concerns regarding the proposed NMTS HMA plant:

1) Referring to Table 3 on page 8, scenario #12 should include the worst case hours (i.e. 4 AM to Noon) for Dec Feb in the annual particulate models.

2) The first paragraph of Page 8 states "a range of 380,000 to 752,000 tons will be used in the HMA plant." How will this range be handled in the model? Will you use the maximum figure (750,000) for the HMA and reduce the truck terminal emissions using the 380,000? Will there then be a revision to permit #3311-M1? Or will emissions for the truck terminal remain the same?

3) Comparing the TSP emissions for the truck terminal in Table 7 to what was modeled for permit #3311-M1, it appears there will be increases in emissions for the truck terminal. Is this correct, and if so, will there be a modification to permit #3311? Why would there be increases to the truck terminal emissions when it appears that RAILHOP2, RAILTP1, and RAILTP2 are part of the HMA?

4) The protocol argues that because NO_X and SO_2 emissions are each less than 40 TPY, a Case2 analysis is required. However, the EPA guidance quoted can also be interpreted as considering the sum of NO_X and SO_2 emissions. Does you know of additional EPA guidance that clarifies the May2014 memo? If not, the Case 2 analysis may not suffice.

Regards,

Jeff Stonesifer

City of Albuquerque

Environmental Health Dept

(505)767-5624

From: Paul Wade [mailto:pwade@montrose-env.com]
Sent: Thursday, February 8, 2018 12:34 PM
To: Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Cc: Karl Pergola (karl.pergola@rockhousekp.com) <Karl.Pergola@rockhousekp.com>; Tavarez, Isreal L. <ITavarez@cabq.gov>
Subject: New Mexico Terminal Services Proposed HMA Plant Model Protoco

Jeff

Attached is a modeling protocol for a proposed HMA plant to be located at New Mexico Terminal Services site at 9615 Broadway Blvd SE. The proposed HMA plant will operate in conjunction with an aggregate railcar unloading system along with all permits that are presently allowed to operate at the site.

Please let me know if you have any questions or comments on the modeling protocol

Thank you

--

Paul Wade

Sr. Engineer

Montrose Air Quality Services, LLC

3500 G Comanche Rd. NE, Albuquerque NM 87107

T: 505.830 9680 x6 | F: 505.830.9678

PWade@montrose-env com

www montrose-env.com

Paul Wade <pwade@montrose-env.com> Thu, Feb 15, 2018 at 10.23 AM
To: "Stonesifer, Jeff W." <JStonesifer@cabq.gov>
Cc: "Karl Pergola (karl.pergola@rockhousekp.com)" <Karl.Pergola@rockhousekp.com>, "Tavarez, Isreal L " <ITavarez@cabq.gov>, "Eyerman, Regan V" <reyerman@cabq.gov>

Jeff
Below are my responses to your questions on the Modeling Protocol for New Mexico Terminal's Railyard HMA plant.

1) Referring to Table 3 on page 8, scenario #12 shou d include the worst case hours (i.e. 4 AM to Noon) for Dec-Feb in the annual particulate models.

wil change the hourly scenario to reflect this comment for the annual particulate modeling analysis, Scenario #12.

2) The first paragraph of Page 8 states "a range of 380,000 to 752,000 tons will be used in the HMA plant." How will this range be handled in the model? Will you use the maximum figure (750,000) for the HMA and reduce the truck termina emissions using the 380,000? Will there then be a revision to permit #3311-M1? Or will emissions for the truck terminal remain the same?

The highest emissions from the facility occurs when the HMA plant is operating at maximum capacity or producing 800,000 tons per year of asphalt. This includes an aggregate/RAP throughput of 752,000 tons per year. These throughputs are what will be the basis of emission rates input into the modeling ana ysis for the HMA plant.

3) Comparing the TSP emissions for the truck terminal in Table 7 to what was modeled for permit #3311-M1, it appears there wil be increases in emissions for the truck terminal. Is this correct, and if so, will there be a modification to permit #3311? Why would there be increases to the truck terminal emissions when it appears that RA LHOP2, RAILTP1, and RAILTP2 are part of the HMA?

Tables 7 and 8 have been corrected to reflect what was modeled for Permit 3311-M1. Yes, RAILHOP2, RAILTP1, and RAILTP2 are separate sources connected to the HMA plant and not the Truck Terminal.

4) The protoco argues that because NO_X and SO_2 emissions are each less than 40 TPY, a Case2 analysis is required. However, the EPA guidance quoted can also be interpreted as considering the sum of NO_X and SO_2 emissions. Does you know of additional EPA guidance that clarifies the May2014 memo? If not, the Case 2 analysis may not suffice.

The emission limits used in the EPA guidance document for determining if secondary PM2.5 emissions need to be included in a modeling analysis are based on PSD Significant Emission Rates (see 20.11.61.27 Table 2). In the table it discusses the 40 tons per year emission rates for precursors (individually NOx and SO2) used to determine if secondary emissions of PM2.5 need to be included in the modeling analysis.

If you have any additional questions or comments please send them to me.

Thank you
[Quoted text hidden]
--

MEG Logo_Signature

Paul Wade

Sr. Engineer

Montrose Air Quality Services, LLC

3500 G Comanche Rd. NE, Albuquerque. NM 87107

T: 505 830.9680 x6 | F 505.830 9678

PWade@montrose-env.com

www montrose-env.com

New Mexico Terminal Services HMA Model Protocol 021518.pdf
1234K

Stonesifer, Jeff W. <JStonesifer@cabq gov> Thu Feb 15. 2018 at 11 16 AM
To. Paul Wade <pwade@montrose-env com>
Cc: "Karl Pergola (karl.pergola@rockhousekp.com)" <Karl.Pergola@rockhousekp.com>, "Tavarez Isreal L " <ITavarez@cabq gov>, "Eyerman, Regan V." <reyerman@cabq.gov>

Paul,

Sounds good. The revised protocol is approved. Please go ahead and submit the application and modeling when you are ready.

Regards,

Jeff Stonesifer

City of Albuquerque

Environmental Health Dept

(505)767-5624

From: Paul Wade [mailto:pwade@montrose-env.com]
Sent: Thursday, February 15, 2018 10:24 AM
To: Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Cc: Karl Pergola (karl.pergola@rockhousekp com) <Karl.Pergola@rockhousekp.com>; Tavarez, Isreal L. <ITavarez@cabq gov>; Eyerman, Regan V. <reyerman@cabq.gov>
Subject: Re: New Mexico Terminal Services Proposed HMA Plant Model Protocol

[Quoted text hidden]

Paul Wade <pwade@montrose-env.com> Thu Feb 15 2018 at 11:23 AM
To: "Stonesifer, Jeff W." <JStonesifer@cabq.gov>

Thank you Jeff
[Quoted text hidden]
--

MEG Logo_Signature

Paul Wade

Sr. Engineer

Montrose Air Quality Services, LLC

3500 G Comanche Rd. NE, Albuquerque, NM 87107

T: 505 830.9680 x6 | F: 505.830 9678

PWade@montrose-env com

www montrose-env.com

Attachment G
Public Notice Documents

Timothy M. Keller, Mayor

Environmental Health Department
Air Quality Program
Interoffice Memorandum

Danny Nevarez, Acting Director

TO: PAUL WADE, SENIOR ENGINEER, MONTROSE AIR QUALITY SERVICES

FROM: MELISSA PADILLA, ADMINISTRATIVE ASSISTANT

SUBJECT: DETERMINATION OF NEIGHBORHOOD ASSOCATIONS AND COALITIONS WITHIN 0.5 MILES OF 9615 BROADWAY BLVD SE, ALBUQUERQUE, NM 87105

DATE: FEBRUARY 13, 2018

DETERMINATION:

On 02/13/2018, I used the City of Albuquerque Zoning Advanced Map Viewer (http://sharepoint.cabq.gov/gis) to review which City of Albuquerque (COA) Neighborhood Associations (NAs) and Neighborhood Coalitions (NCs) and which Bernalillo County (BC) NAs and NCs are located within 0.5 miles of 9615 Broadway Blvd SE, Albuquerque in Bernalillo County, NM.

I then used the City of Albuquerque Office of Neighborhood Coordination's Monthly Master NA List dated February 2018 and the Bernalillo County Monthly Neighborhood Association February 2018 Excel file to determine the contact information for each NA and NC located within 0.5 miles of 9615 Broadway Blvd SE, Albuquerque in Bernalillo County, NM.
(X:\ENVIRONMENTAL HEALTH\SHARE\EH-Staff\Permitting Section\Neighborhood Association Lists\2018\February)

Duplicates have been deleted.

District 6 Coalition of NAs	Eileen Jessen	eileentjessen@gmail.com
District 6 Coalition of NAs	Gina Dennis	GinaForNM@gmail.com
Mountain View Community Action	Marla Painter	marladesk@gmail.com
Mountain View Community Action	Maria Globus	mlglobus@gmail.com
Mountain View NA	Nora Garcia	ngarcia49@yahoo.com
Mountain View NA	Julian Vargas	javargasconst@gmail.com
South Valley Coalition of NAs	Rod Mahoney	rmahoney01@comcast.net
South Valley Coalition of NAs	Marcia Fernandez	mbfernandez1@gmail.com
South Valley Alliance	Sara Newton Juarez	snjart@yahoo.com
South Valley Alliance	Zoe Economou	zoecon@unm.edu

MONTROSE Paul Wade <pwade@montrose-env.com>

New Mexico Terminal Services LLC's Railyard HMA Plant Public Notice Documents

1 message

Paul Wade <pwade@montrose-env.com> Thu, Feb 15, 2018 at 2:59 PM
To: eileentjessen@gmail.com, GinaForNM@gmail.com, Marla Painter <marladesk@gmail.com>, Maria Globus <mlglobus@gmail.com>, ngarcia49@yahoo.com, javargasconst@gmail.com, rmahoney01@comcast.net, Marcia Fernandez <mbfernandez1@gmail.com>, Sara Newton Juarez <snjart@yahoo.com>, zoe Economou <zoecon@unm.edu>
Cc: "Tavarez, Isreal L." <ITavarez@cabq.gov>, "Karl Pergola (karl.pergola@rockhousekp.com)" <Karl.Pergola@rockhousekp.com>, "Eyerman, Regan V." <reyerman@cabq.gov>

Under 20.11.41 13B NMAC, the owner/operator is required to provide public notice by certified mail or electronic mail to the designated representative(s) of the recognized neighborhood associations and recognized coalitions that are within one-half mile of the exterior boundaries of the property on which the source is or is proposed to be located if they propose to construct or establish a new facility or make modifications to an existing facility that is subject to 20.11 41 NMAC – Construction Permits

Any questions, comments, or concerns can be addressed to the contacts listed on the Notice of Intent. Attached is a notice of intent for submittal of a new permit application for New Mexico Terminal Services LLC - Ra lyard HMA Plant.

Respectfully,

--

MEG Logo_Signature

Paul Wade

Sr. Engineer

Montrose Air Quality Services, LLC

3500 G Comanche Rd. NE. Albuquerque, NM 87107

T 505.830.9680 x6 | F: 505.830.9678

PWade@montrose-env.com

www.montrose-env.com

2 attachments

NM Terminal HMA NOI Cover Letter.pdf

25K

NM Terminal HMA NOI Public Notice.pdf
110K

SUBJECT: Public Notice of Proposed Air Quality Construction Permit Application

Dear Neighborhood Association/Coalition Representative(s),

Why did I receive this public notice?

You are receiving this notice in accordance with New Mexico Administrative Code (NMAC) 20.11.41.13.B(1) which requires any applicant seeking an Air Quality Construction Permit pursuant to 20.11.41 NMAC to provide public notice by certified mail or electronic mail to the designated representative(s) of the recognized neighborhood associations and recognized coalitions that are within one-half mile of the exterior boundaries of the property on which the source is or is proposed to be located.

What is the Air Quality Permit application review process?

The City of Albuquerque, Environmental Health Department, Air Quality Program (Program) is responsible for the review and issuance of Air Quality Permits for any stationary source of air contaminants within Bernalillo County. Once the application is received, the Program reviews each application and rules it either complete or incomplete. Complete applications will then go through a 30-day public comment period. Within 90 days after the Program has ruled the application complete, the Program shall issue the permit, issue the permit subject to conditions, or deny the requested permit or permit modification. The Program shall hold a Public Information Hearing pursuant to 20.11.41.15 NMAC if the Director determines there is significant public interest and a significant air quality issue is involved.

What do I need to know about this proposed application?

Applicant Name	New Mexico Terminal Services, LLC
Site or Facility Name	Rail Yard HMA
Site or Facility Address	9615 Broadway Blvd SE, Albuquerque, NM 87105
New or Existing Source	New Source
Anticipated Date of Application Submittal	February 23, 2018
Summary of Proposed Source to Be Permitted	The project will include a new railcar terminal for the delivery of aggregate products and a 400 ton per hour hot mix asphalt plant. Aggregate used in the asphalt mix will be delivered by railcar and offloaded using a railcar bottom dump hopper, transfer conveyors, and radial telescoping stacker to storage piles. All other materials, raw and product, will be transported to or from the HMA plant by haul trucks. The HMA plant will consist of a feed bin, scalping screen, pug mill, mineral filler silo with auger, drum dryer/mixer, RAP bin, RAP crusher, RAP screen, asphalt cement oil heater, and multiple transfer conveyors. The HMA plant drum dryer will be permitted to burn either fuel oil or natural gas. The HMA plant will be powered by commercial line power, so no generators/engines powering the HMA plant will be permit.

What emission limits and operating schedule are being requested?

See attached Notice of Intent to Construct form for this information.

How do I get additional information regarding this proposed application?

For inquiries regarding the proposed source, contact:

- Karl Pergola
- karl.pergola@rockhousekp.com
- (505) 459-7776

For inquiries regarding the air quality permitting process, contact:

- City of Albuquerque Environmental Health Department Air Quality Program
- aqd@cabq.gov
- (505) 768-1972

Notice of Intent to Construct

Under 20.11.41.13B NMAC, the owner/operator is required to *provide public notice by certified mail or electronic mail to the designated representative(s) of the recognized neighborhood associations and recognized coalitions that are with-in one-half mile of the exterior boundaries of the property on which the source is or is proposed to be located* if they propose to construct or establish a new facility or make modifications to an existing facility that is subject to 20.11.41 NMAC – Construction Permits. **A copy of this form must be included with the application.**

Applicant's Name and Address:
New Mexico Terminal Services, LLC, 9615 Broadway Blvd SE, Albuquerque, NM 87105

Owner / Operator's Name and Address:
New Mexico Terminal Services, LLC, 9615 Broadway Blvd SE, Albuquerque, NM 87105

Actual or Estimated Date the Application will be submitted to the Department:
February 23, 2018

Exact Location of the Source or Proposed Source:
9615 Broadway Blvd SE, Albuquerque, NM 87105

Description of the Source:
The project includes a 400 ton per hour hot mix asphalt (HMA) plant. Aggregate will be delivered by railcars and transloaded to storage piles to be used in the asphalt mix or transported by delivery trucks to off-site customers. Additional materials, recycled asphalt, asphalt cement, and mineral filler used in the asphalt mix will be delivered by haul truck. Asphalt concrete material produced is transported off-site by haul truck. The HMA plant will be permitted to burn either fuel oil or natural gas. The HMA plant will be powered by commercial line power, so no generators/engines powering the HMA plant will be permit.

Nature of the Business:
The business will produce hot mix asphalt concrete for use in highway road work.

Process or Change for which the permit is requested: N/A

Preliminary Estimate of the Maximum Quantities of each regulated air contaminant the source will emit:

Initial Construction Permit

	Pounds Per Hour (lbs/hr)	Tons Per Year (tpy)
CO	53.4	54.1
NOx	22.4	23.7
NOx + NMHC	***	***
VOC	19.8	20.1
SO_2	23.3	23.8
TSP	26.3	31.4
PM10	13.5	15.5
PM2.5	10.2	10.7
VHAP	4.2	4.2

Net Changes In Emissions

(Only for permit Modifications or Technical Revisions)

	lbs/hr	tpy	Estimated Total TPY
CO	+/-	+/-	
NOx	+/-	+/-	
NOx + NMHC	+/-	+/-	
VOC	+/-	+/-	
SO_2	+/-	+/-	
TSP	+/-	+/-	
PM10	+/-	+/-	
PM2.5	+/-	+/-	
VHAP	+/-	+/-	

City of Albuquerque- Environmental Health Department
Air Quality Program- Permitting Section
Phone: (505) 768-1972 Email: aqd@cabq.gov

Maximum Operating Schedule: 24 hours per day, 365 days per year

Normal Operating Schedule: 10 hours per day, 365 days per year

Current Contact Information for Comments and Inquires:

Name: Karl Pergola
Address: 9615 Broadway Blvd SE, Albuquerque, NM 87105
Phone Number: (505) 459-7776
E-Mail Address: karl.pergola@rockhousekp.com

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

Environmental Health Manager
Stationary Source Permitting
Albuquerque Environmental Health Department
Air Quality Program
PO Box 1293
Albuquerque, New Mexico 87103
(505) 768-1972

Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, if required, the Department's notice will be published in the legal section of the Albuquerque Journal and mailed to neighborhood associations and neighborhood coalitions near the facility location or near the facility proposed location.

City of Albuquerque

Environmental Health Department
Air Quality Program

Public Notice Sign Guidelines

Any person seeking a permit under 20.11.41 NMAC, Authority-to-Construct Permits, shall do so by filing a written application with the Department. *Prior to submitting an application, the applicant shall post and maintain a weather-proof sign provided by the department. The applicant shall keep the sign posted until the department takes final action on the permit application; if an applicant can establish to the department's satisfaction that the applicant is prohibited by law from posting, at either location required, the department may waive the posting requirement and may impose different notification requirements.* **A copy of this form must be submitted with your application.**

Applications that are ruled incomplete because of missing information will delay any determination or the issuance of the permit. The Department reserves the right to request additional relevant information prior to ruling the application complete in accordance with 20.11.41 NMAC.

Name: Railyard HMA Plant
Contact: Karl Pergola
Company/Business: New Mexico Terminal Services LLC

X The sign must be posted at the more visible of either the proposed or existing facility entrance (or, if approved in advance and in writing by the department, at another location on the property that is accessible to the public)

X The sign shall be installed and maintained in a condition such that members of the public can easily view, access, and read the sign at all times.

X The lower edge of the sign board should be mounted a minimum of 2' above the existing ground surface to facilitate ease of viewing

X Attach a picture of the completed, properly posted sign to this document

☐ **Check here if the department has waived the sign posting requirement.**
Alternative public notice details:

Ver. 11/13