20.2.72 NMAC
AIR QUALITY
PERMIT # 1347-M2
MODIFICATION APPLICATION

For

OLDCASTLE SW GROUP, INC. dba
FOUR CORNERS MATERIALS

300 TPH DRUM MIXED ASPHALT PLANT

Aztec, NM

PREPARED BY
MONTROSE ENVIRONMENTAL SOLUTIONS, INC.
ALBUQUERQUE, NM
NOVEMBER 2024

Mail Application To:		For Department use only:
New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 www.env.nm.gov/aqb		

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well.

This application is submitted as (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☒ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ NOI 20.2.73 NMAC ☒ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☐ TV significant mod. ☐ TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☐ Minor Modification to a PSD source ☐ a PSD major modification

Acknowledgements:

☒ I acknowledge that a pre-application meeting is available to me upon request. ☐ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.

☒ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

☒ Check No.: 2226250 in the amount of $500

☒ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☒ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.

☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.200.B NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

Section 1 – Facility Information

Section 1-A: Company Information

		AI # if known: 24760	Updating Permit/NOI #: 1347-M2
1	Facility Name: 300 TPH Drum Mixed Asphalt Plant (Aztec, NM)	Plant primary SIC Code (4 digits): 2951	
		Plant NAIC code (6 digits): 324121	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): 1106 Hwy 516, Aztec, NM 87410		
2	Plant Operator Company Name: Oldcastle SW Group, Inc. dba Four Corners Materials	Phone/Fax: (970) 247-2172/	

a	Plant Operator Address: 9755 CR 213, Durango, CO 81303	
b	Plant Operator's New Mexico Corporate ID or Tax ID: PRC2293934	
3	Plant Owner(s) name(s): Same as Operator	Phone/Fax: (970) 247-2172
a	Plant Owner(s) Mailing Address(s): 1106 Hwy 516, Aztec, NM 87410	
4	Bill To (Company): Oldcastle SW Group, Inc. dba Four Corners Materials	Phone/Fax: (970) 247-2172
a	Mailing Address: 1106 Hwy 516, Aztec, NM 87410	E-mail: franchesca.mallonee@fourcornersmaterials.com
5	☐ Preparer: ☒ Consultant: Paul Wade, Montrose Environmental Solutions, Inc.	Phone/Fax: 505-830-9680 x6/505-830-9678
a	Mailing Address: 9100 2nd St NW, Suite 200, Albuquerque, NM 87114-1664	E-mail: pwade@montrose-env.com
6	Plant Operator Contact: Franchesca Mallonee	Phone/Fax: (970) 247-2172
a	Address: Same as Operator	E-mail: franchesca.mallonee@fourcornersmaterials.com
7	Air Permit Contact: Franchesca Mallonee	Title: Resource & Environmental Manager
a	E-mail: franchesca.mallonee@fourcornersmaterials.com	Phone/Fax: (970) 247-2172
b	Mailing Address: 9755 CR 213, Durango, CO 81303	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☒ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☒ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☒ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☒ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☒ No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☒ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐ Yes ☐ No ☒ N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is: P-
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☒ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☒ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☒ Yes ☐ No	If yes, the permit No. is: 1347-M2
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☒ No	If yes, the register No. is:

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 300 TPH	Daily: 3,900 TPD	Annually: 1,006,200 TPY
b	Proposed	Hourly: 300 TPH	Daily: 3,900 TPD	Annually: 1,006,200 TPY
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 300 TPH	Daily: 3,900 TPD	Annually: 1,006,200 TPY
b	Proposed	Hourly: 300 TPH	Daily: 3,900 TPD	Annually: 1,006,200 TPY

Section 1-D: Facility Location Information

1	Latitude (decimal degrees): 36.82917	Longitude (decimal degrees): -108.048272	County: San Juan	Elevation (ft): 5,840
2	UTM Zone: ☒ 12 or ☐ 13	Datum: ☒ NAD 83 ☐ WGS 84		
a	UTM E (in meters, to nearest 10 meters): 763,750	UTM N (in meters, to nearest 10 meters): 4,080,020		
3	Name and zip code of nearest New Mexico town: Aztec 87410			
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): West edge of Aztec city limits North side of SR 516. Entrance address: 1106 Hwy 516, Aztec, NM 87410			
5	The facility is 0.5 miles west of Aztec, NM.			
6	Land Status of facility (check one): ☒ Private ☐ Indian/Pueblo ☐ Government ☐ BLM ☐ Forest Service ☐ Military			
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: San Juan County, Aztec, Farmington, Bloomfield			
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/air-quality/modeling-publications/)? ☒ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: Colorado/NM border - 18.6 km			
9	Name nearest Class I area: Mesa Verde National Park (Colorado)			
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 50.3 km			
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: 425 meters			
12	Method(s) used to delineate the Restricted Area: Area is restricted by perimeter fencing and steep rugged topography "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.			
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☒ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.			
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☐ No ☒ Yes If yes, what is the name and permit number (if known) of the other facility? CSP#1 GCP-2-4220			

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{hours}{day}$): 24	($\frac{days}{week}$): 7	($\frac{weeks}{year}$): 52	($\frac{hours}{year}$): 3354	
2	Facility's maximum daily operating schedule (if less than 24 $\frac{hours}{day}$)? Start:	☐AM ☐PM	End:	☐AM ☐PM	
3	Month and year of anticipated start of construction: Presently Operating				
4	Month and year of anticipated construction completion: Presently Operating				
5	Month and year of anticipated startup of new or modified facility: Will operate under nighttime scenario after permit issuance				
6	Will this facility operate at this site for more than one year? ☒ Yes ☐ No				

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☒ Yes ☐ No If yes, specify:

a	If yes, NOV date or description of issue: Enforcement Discretion Application for Night work for NMDOT		NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☒ No If Yes, provide the 1c & 1d info below:		
c	Document Title: Enforcement Discretion Application	Date: 08/20/2020	Requirement # (or page # and paragraph #): Pg 3, B. #5 (Conditions of Approval)
d	Provide the required text to be inserted in this permit: Allowed to operate as necessary for required night time public works operations		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? ☒ Yes ☐ No		
3	Does this facility require an “Air Toxics” permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☒ No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☒ Yes ☐ No		
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☒ **Minor** (☒ <10 tpy of any single HAP **AND** ☒ <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☒ No		
a	If yes, include the name of company providing commercial electric power to the facility: ___________________________ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application (This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, “Addendum for Streamline Applications.”	☒ N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC):	Phone:
a	R.O. Title:	R.O. e-mail:
b	R. O. Address:	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):	Phone:
a	A. R.O. Title:	A. R.O. e-mail:
b	A. R. O. Address:	
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship):	
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.):	
a	Address of Parent Company:	
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.):	
6	Telephone numbers & names of the owners’ agents and site contacts familiar with plant operations:	
7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers:	

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package printed double sided 'head-to-toe' 2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.
2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.
3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB's secure file transfer service.

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

☒ Secure electronic transfer. Air Permit Contact Name Paul Wade, Email pwade@montrose-env.com Phone number (505) 830-9680 x6.

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.
5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.
6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

Table of Contents

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] Date of Construction/ Reconstruction[2]	Controlled by Unit # Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
46.801.01	Cold Feed Bins Virgin Aggregates	Gencor	300 Ton	4BCF-12914-93-NA	300 TPH	300 TPH	1993 2005	NA NA	30500216	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.10	Cold Feed Bin Recycled Asphalt	Gencor	300 Ton	1BRCF-12914-93-NA	300 TPH	300 TPH	1993 2005	NA NA	30500216	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.02	Shaker Sceen and Conveyor	Gencor	300 Ton	V510SD-12914-93-NA	300 TPH	300 TPH	1993 2005	C1, C2 NA	30500204	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.11	RAP Shaker Sceen	Gencor	300 Ton	R48SD-12914-93-NA	300 TPH	300 TPH	1993 2005	C2 NA	30500204	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.03	Int Scale Conveyor	Gencor	300 Ton	3040IBC-12914-93-NA	300 TPH	300 TPH	1993 2005	C1 NA	30500217	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.06	Scale Conveyor	Gencor	300 Ton	V3060SC-12914-93-NA	300 TPH	300 TPH	1993 2005	C1 NA	30500217	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.12	RAP Scale Conveyor	Gencor	300 Ton	R2470SC-12914-93-NA	300 TPH	300 TPH	1993 2005	C1 NA	30500217	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.05	Pug Mill	Gencor	300 Ton	PM300-12914-93-NA	300 TPH	300 TPH	1993 2005	C1 NA	30500204	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.16	Mineral Filler Silo	Gencor	300 Ton	Unk	500 BBL	Load 25 tph; Unload 4.5 tph	1993 2005	46.801.16B 46.801.16s	30500213	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.07	Drum Mixer (Dryer)	Hunter Grant	300 Ton	16293	300 TPH	300 TPH	2009 2011	48.801.09 NA	30500201	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.09	Dust Removal System	Gencor	300 Ton	14x18SC-12914-93-NA	300 TPH	300 TPH	1993 2005	NA 48.801.09s	30500201	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.13	Slat Conveyor	Gencor	300 Ton	300TPHSC-81-1125-93-NA	300 TPH	300 TPH	1993 2005	NA NA	30500221	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.14 a,b	Hot Mix Asphalt Storage Silos (2)	Gencor	300 Ton	100TD-150-1221 (&1222)-93-NA	300 TPH	300 TPH	1993 2005	NA NA	30500213	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
46.801.15	RAP Transfer Conveyor	Gencor	300 Ton	300TPHTC-16-1126-93-NA	300 TPH	300 TPH	1993 2005	C1 NA	30500217	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] / Date of Construction/ Reconstruction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
46.801. 17&18	Asphalt Cement Storage Tanks (2)	Gencor	Unk	Ukn	30,000 gallons each	30,000 gallons each	1993	NA	30500212	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
							2005	NA				
46.801. 19	Asphalt Heater	Gencor	Unk	Ukn	1 MMBtu	1 MMBtu	1993	46.801. 19s	30500208	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
							2005	NA				
AGGPILE	Cold Aggregate/RAP Storage Pile	NA	NA	NA	300 TPH	300 TPH	NA	NA	30500203	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
							NA	NA				
TRCK	Haul Road Traffic	NA	NA	NA	64528 truck/yr	64528 truck/yr	NA	TRCKC	30602011	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
							NA	NA				
YARD	HMA Yard	NA	NA	NA	300 TPH	300 TPH	NA	NA	30502014	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	NA	NA
							NA	NA				

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.
[2] Specify dates required to determine regulatory applicability.
[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.
[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at https://www.env.nm.gov/wp-content/uploads/sites/2/2017/10/InsignificantListTitleV.pdf. TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
None	Evotherm Tank	TBD	TBD	TBD		TBD	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			TBD	TBD	IA.1.a and IA.1.b	TBD	
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
48.801.09	Drum Mixer (Dryer) Baghouse	2011	Particulate	46.801.07	99.88%	AP-42 11.1
48.801.16B	Mineral Filler Silo Baghouse	2011	Particulate	46.801.16	99.0%	Engineering Judgement based on lower end of Baghouse Controls - AP-42
TRCKC	Haul Road Control - Paved and Sweep	NA	Particulate	TRCK	95.0%	NMED Default
C1	Conveyor Transfer Points - Wet Dust Suppression System or Enclosures	2011	Particulate	46.801.03, 46.801.02b, 46.801.05, 46.801.06a, 46.801.06b, 46.801.15, 46.801.12a, 46.801.12b	PM - 95.33%	AP-42 11.19.2 Emission Factors
C2	Screen - Wet Dust Suppression System	2011	Particulate	46.801.02a, 46.801.11	PM - 91.20%	AP-42 11.19.2 Emission Factors

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
AGGPILE									1.83	6.54	0.87	3.09	0.13	0.47				
46.801.01									1.04	3.71	0.49	1.76	0.07	0.27				
46.801.03									0.47	2.07	0.17	0.76	0.03	0.12				
46.801.02a									3.94	17.25	1.37	6.00	0.21	0.91				
46.801.02b									0.47	2.07	0.17	0.76	0.03	0.12				
46.801.05									0.49	2.13	0.18	0.78	0.03	0.12				
46.801.06a									0.49	2.13	0.18	0.78	0.03	0.12				
46.801.06b									0.49	2.13	0.18	0.78	0.03	0.12				
46.801.10									0.79	2.83	0.37	1.34	0.06	0.20				
46.801.15									0.36	1.58	0.13	0.58	0.02	0.09				
46.801.11									3.00	13.14	1.04	4.57	0.16	0.69				
46.801.12a									0.36	1.58	0.13	0.58	0.02	0.09				
46.801.12b									0.36	1.58	0.13	0.58	0.02	0.09				
46.801.16									18.25	14.39	11.75	9.26	2.33	1.83				
46.801.07	16.50	72.27	39.00	170.82	9.60	42.05	17.40	76.21	8400.00	36792.00	1950.00	8541.00	469.50	2056.41	0.016	0.068	0.0045	0.0075
46.801.13			0.66	2.90	6.85	29.99			0.24	1.06	0.24	1.06	0.24	1.06	0.00044	0.0019		
46.801.14a,b			0.76	3.32	2.34	10.24			0.25	1.08	0.25	1.08	0.25	1.08	0.00044	0.0019		
46.801.19	0.11	0.46	0.09	0.39	0.01	0.05	0.00	0.01	0.01	0.04	0.01	0.04	0.01	0.04			0.000000	2E-06
46.801.17&18					0.03	0.13												
TRCK									145.78	516.05	37.15	131.52	3.72	13.15				
YARD			0.11	0.46	0.33	1.45												
Totals	**16.61**	**72.73**	**40.62**	**177.9**	**19.16**	**83.90**	**17.40**	**76.22**	**8579**	**37383**	**2005**	**8706**	**477**	**2077**	**0.016**	**0.072**	**0.0045**	**0.0075**

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but PM is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E^{-4}).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
AGGPILE									1.83	2.50	0.87	1.18	0.13	0.18				
46.801.01									1.04	1.42	0.49	0.67	0.074	0.10				
46.801.03									0.022	0.037	0.0072	0.012	0.0020	0.0034				
46.801.02a									0.35	0.58	0.12	0.20	0.0079	0.013				
46.801.02b									0.022	0.037	0.0072	0.012	0.0020	0.0034				
46.801.05									0.023	0.038	0.0075	0.012	0.0021	0.0035				
46.801.06a									0.023	0.038	0.0075	0.012	0.0021	0.0035				
46.801.06b									0.023	0.038	0.0075	0.012	0.0021	0.0035				
46.801.10									0.79	1.08	0.37	0.51	0.057	0.078				
46.801.15									0.017	0.028	0.0055	0.0093	0.0016	0.0026				
46.801.11									0.26	0.44	0.089	0.15	0.0060	0.010				
46.801.12a									0.017	0.028	0.0055	0.0093	0.0016	0.0026				
46.801.12b									0.017	0.028	0.0055	0.0093	0.0016	0.0026				
46.801.16									0.18	0.055	0.12	0.035	0.023	0.0070				
46.801.07	16.50	27.67	39.00	65.40	9.60	16.10	17.40	29.18	9.90	16.60	6.90	11.57	6.90	11.57	0.016	0.026	0.0045	0.0075
46.801.13			0.66	1.11	6.85	11.48			0.24	0.41	0.24	0.41	0.24	0.41	0.00044	0.00073		
46.801.14a,b			0.76	1.27	2.34	3.92			0.25	0.41	0.25	0.41	0.25	0.41	0.00044	0.00073		
46.801.19	0.11	0.46	0.089	0.39	0.012	0.051	0.0023	0.010	0.0080	0.035	0.0080	0.035	0.0080	0.035			0.0E+00	2.0E-06
46.801.17&18					0.030	0.13												
TRCK									7.29	9.88	1.86	2.52	0.19	0.25				
YARD			0.11	0.18	0.33	0.55												
Totals	**16.61**	**28.13**	**40.62**	**68.35**	**19.16**	**32.23**	**17.40**	**29.19**	**22.30**	**33.69**	**11.36**	**17.78**	**7.90**	**13.09**	**0.016**	**0.028**	**0.0045**	**0.0075**

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

X This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals																		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

☑ I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		PM		PM10		PM2.5		☐ H_2S or ☐ Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here:

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
48.801.09	46.801.07	V	No	43.0	190	733.33			84.0	3.33
46.801. 19s	46.801. 19	V	Yes	12.5	600	23.56			30.0	1.00
46.801.16Bs	46.801.16	H	No	45.0	Ambient	8.33			10.6	1.00

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A “-” symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Asphalt Fumes ☐ HAP or ☑ TAP		Toluene ☑ HAP or ☐ TAP		Formaldehyde ☑ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
48.801.09s	46.801.07	3.14	5.27	3.60	6.04	0.87	1.45	0.93	1.56										
46.801.19s	46.801.19	0.0019	0.0081																
	46.801.13			0.11	0.18														
	46.801.14a,b			0.049	0.08202														
	46.801.17&18			0.00038	0.00168														
	YARD			0.0050	0.0083														
Totals:		**3.14**	**5.27**	**3.76**	**6.31**	**0.87**	**1.45**	**0.93**	**1.56**										

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, …)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
48.801.09	On-Spec Burner Fuel Oil	purchased commercial	140,353	450.0 gallons	1,500,000 gallons	0.5	0
	Natural Gas	purchased commercial	1,000 Btu/cubic feet	63,160 scf	211.8 million cubic feet	0.75 grains/100 scf	0
	Propane	purchased commercial	91,500 Btu/Gallon	8,022.4 gallons	20,056,000 gallons	0.2 grains/100scf	0
46.801. 19	Natural Gas	purchased commercial	1,000 Btu/cubic feet	1058.2 scf	9.3 million cubic feet	0.75 grains/100 scf	0

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
46.801.17	3-05-002-12	Hot Oil Asphalt Cement	Hot Oil Asphalt Cement	9.22	105	350	0.0347	350	0.0347
46.801.18	3-05-002-12	Hot Oil Asphalt Cement	Hot Oil Asphalt Cement	9.22	105	350	0.0347	350	0.0347

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			
46.801.17	2005	Hot Oil Asphalt Cement	NA	FX	714.29	113.56	3.66	2.42	OT (Yellow)	OT (Yellow)	Good	6,547,940	218.26
46.801.18	2005	Hot Oil Asphalt Cement	NA	FX	714.29	113.56	3.66	2.42	OT (Yellow)	OT (Yellow)	Good	6,547,940	218.26

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
FX: Fixed Roof	**Mechanical Shoe Seal**	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**	**WH**: White	Good
IF: Internal Floating Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**LG**: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Aggregate	Aggregate	Solid	157.5 TPH	Asphalt	Aggregate, RAP, Asphalt Cement, Mineral Filler or Evotherm	Solid	300 TPH
RAP	Recycled Asphalt Products	Solid	120 TPH				
Mineral Filler	Rock dust, Slag dust, Hydrated lime, Cement, Versabind, and/or Loess	Solid	4.5 TPH				
Asphalt Cement	Asphalt Cement	Heated Liquid	18 TPH				
Evotherm	Evotherm	Liquid	1.5 TPH				

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
None									

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
None								

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box.

☑ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**22,800**	**footnote 3**										
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
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	mass GHG															
	CO_2e															
	mass GHG															
	CO2e															
Total	mass GHG															
	CO_2e															

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

Section 3

Application Summary

The **<u>Application</u> <u>Summary</u>** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **<u>Process</u> <u>Summary</u>** shall include a brief description of the facility and its processes.

<u>Startup,</u> <u>Shutdown,</u> <u>and</u> <u>Maintenance</u> <u>(SSM)</u> routine or predictable emissions: Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

This document and the accompanying material are an application for a significant revision of Air Quality Permit 1347-M2 submitted under i.e. 20.2.72.200.B NMAC for an asphalt plant owned and operated by Four Corners Materials. The facility is a 300 ton per hour hot mix asphalt (HMA) plant, SIC Code 2341, located near Aztec in San Juan County, New Mexico. This application seeks to change the following from the existing permit:

1. Proposed operating schedule to includes; Nighttime Production for the Hot Mix Asphalt,
2. Inclusion in the permit of the existing asphalt heater,
3. Inclusion in the permit truck traffic, aggregate/RAP storage piles, and yard emissions.

Except for the change in operational hours and analysis and inclusion of the asphalt heater, truck traffic, aggregate/ Recycled Asphalt Pavement (RAP) storage piles, yard emissions, no other changes are proposed. Only this change is addressed in this permit application. The facility will remain a minor source for Title V and PSD purposes. Montrose Environmental Solutions, Inc (Montrose) has been retained to help prepare the permit application.

Process Summary

Aztec Hot Mix Asphalt (HMA) is a 300-tph drum mix plant. The facility is permitted to be co-located with a crusher (CSP#1 GCP-2-4220). The HMA plant has two process lines: one for virgin aggregates and one for RAP. Both aggregates and RAP have been crushed, screened, and stockpiled by an on-site crusher prior to their introduction to the HMA process. A front-end loader transports material from each stockpile, placing it in the appropriate feed bin. Aggregates are moved by conveyor from the feed bins, across a vibrating screen (which removes any over-size material), and into a pug mill. The enclosed pug mill mixes the aggregates with any mineral fillers that is added. The mixture then travels to the dryer drum. RAP is conveyed from its own feed bin, across a screen, and directly into the dryer drum.

The dryer drum heats the aggregates, then adds RAP and liquid asphalt cement. Emissions from the dryer drum are controlled by a cyclone and baghouse. A metered auger facilitates the incorporation of trapped particulate matter from the baghouse back into HMA mixture with an enclosed loop.

HMA is conveyed via a slat conveyor from the dryer drum to enclosed silos for storage and dispensing. The mixture is loaded from the silos into trucks for delivery offsite.

FCM's 300 TPH Drum Mixed Asphalt Plant will includes; aggregate/RAP storage piles, a 5-bin cold aggregate feeder, scalping screen, pug mill, mineral filler silo with baghouse, drum dryer/mixer with baghouse, incline slat conveyor, two (2) asphalt silos, natural gas-fired asphalt heater, six (6) transfer conveyors, Evotherm storage tank, and two (2) asphalt cement storage tanks. The plant is powered by line power. Processed asphalt will be transported from the HMA plant to off-site sales. The HMA plant will limit processing rates to the present permit conditions of 300 tph and 1,006,200 tpy.

For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours lists the maximum hours of operation during daylight hours.

TABLE 3-1: HMA Production Daylight Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	1	1	1	1	1	0.5	0	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	0.5	0	0	0
7:00 PM	0	0	0	0	0	0.5	0.5	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	10.5	11.5	12	14	14	14.5	14.5	14	13	12	10.5	10

For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours lists the maximum hours of operation during night time hours. Only the months of April through October will be permitted for night time hours of operation. For the months of April through August the modeling will be based on a production level of 2700 tons per day (9 hours running at maximum) and for the months of September and October the modeling will be based on a production level of 2100 tons per day (7 hours running at maximum). During the 24 hour period (12 AM to 12 PM) of night time operations these production limits are the requested permit limits for asphalt production.

TABLE 3-2: HMA Production Nighttime Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
1:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
2:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
3:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
4:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
5:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
7:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
8:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
9:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
10:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
11:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
Total	10.5	11.5	12	24	24	24	24	24	24	24	10.5	10

Since there are two production scenarios, days with only daylight hour production or days with nighttime production, daily record logs will be keep identifying which operating scenario occurred that day. For nighttime production scenario the daily production value will be included to show compliance with nighttime production limits.

Nighttime operations for the HMA plant will follow the guidelines issued by the department "Air Quality Permitting Guidelines for Night Operations of Crushing and Screening Plants, Hot Mix Asphalt Plants, and Concrete Batch Plants" (Ver.08/14/06). Nighttime conditions acceptable to Four Corners Materials include:

Construction and Operation

The permittee shall install data logger(s) capable of continuously recording differential pressure measured by magnahelic gauges or equivalent differential pressure gauges installed on the Drum Dryer/Mixer (Unit 46.801.07) Baghouse (Control Unit 46.801.09).

Monitoring

The permittee shall, during nighttime loading of the Mineral Filler Silo (Unit 46.801.16, Control Unit 48.801.16B), monitor the differential pressure across the Mineral Filler Silo Baghouse by the use of a differential pressure gauge to ensure it is within the manufacturers or facility determined specified operating range. One reading shall be taken during the silo loading operation.

The permittee shall, during nighttime operation of the plant continuously monitor and record the differential pressure across the Drum Dryer/Mixer Baghouse (Unit 46.801.07, Control Unit 46.801.09) by the use of a differential pressure gauge with a data recording system to ensure it is within the manufacturers or facility determined specified operating range.

The permittee shall, during nighttime operating hours, ensure fugitive dust control systems are functioning correctly per {CONDITION X}.

Recordkeeping

During night operation the permittee shall record, by the use of a data logger, a continuous record of the differential pressure across Drum Dryer/Mixer Baghouse (Unit 46.801.07, Control Unit 46.801.09).

During silo loading of the Mineral Filler Silo (Unit 46.801.16, Control Unit 48.801.16B), the differential pressure shall be recorded once.

Routine or predictable emissions during Startup, Shutdown, and Maintenance (SSM)

No SSM emissions are predicted for this permit application. All control systems will be operational prior to the start or until shutdown of asphalt production or aggregate processing. Maintenance will be performed during period with no production.

Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

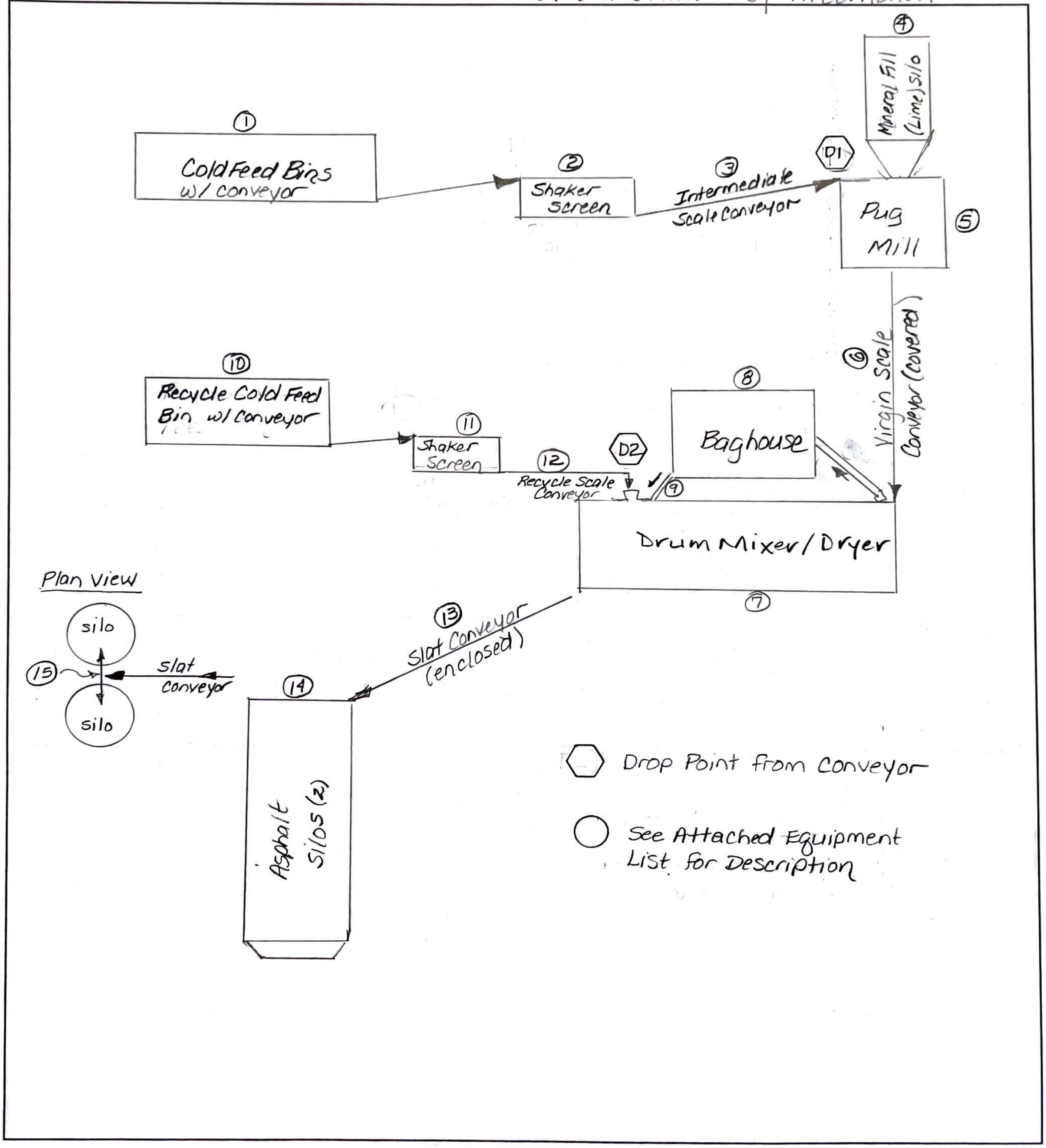
FOUR CORNERS
MATERIALS

Job No. 1347 Project NMED Permit Mod'n

Date 03JAN05 By M Tohitie Page 1 of 1

Subject Process Flow Sheet

Revised 09APR12 by M Carnahan



Section 5

Plot Plan Drawn to Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

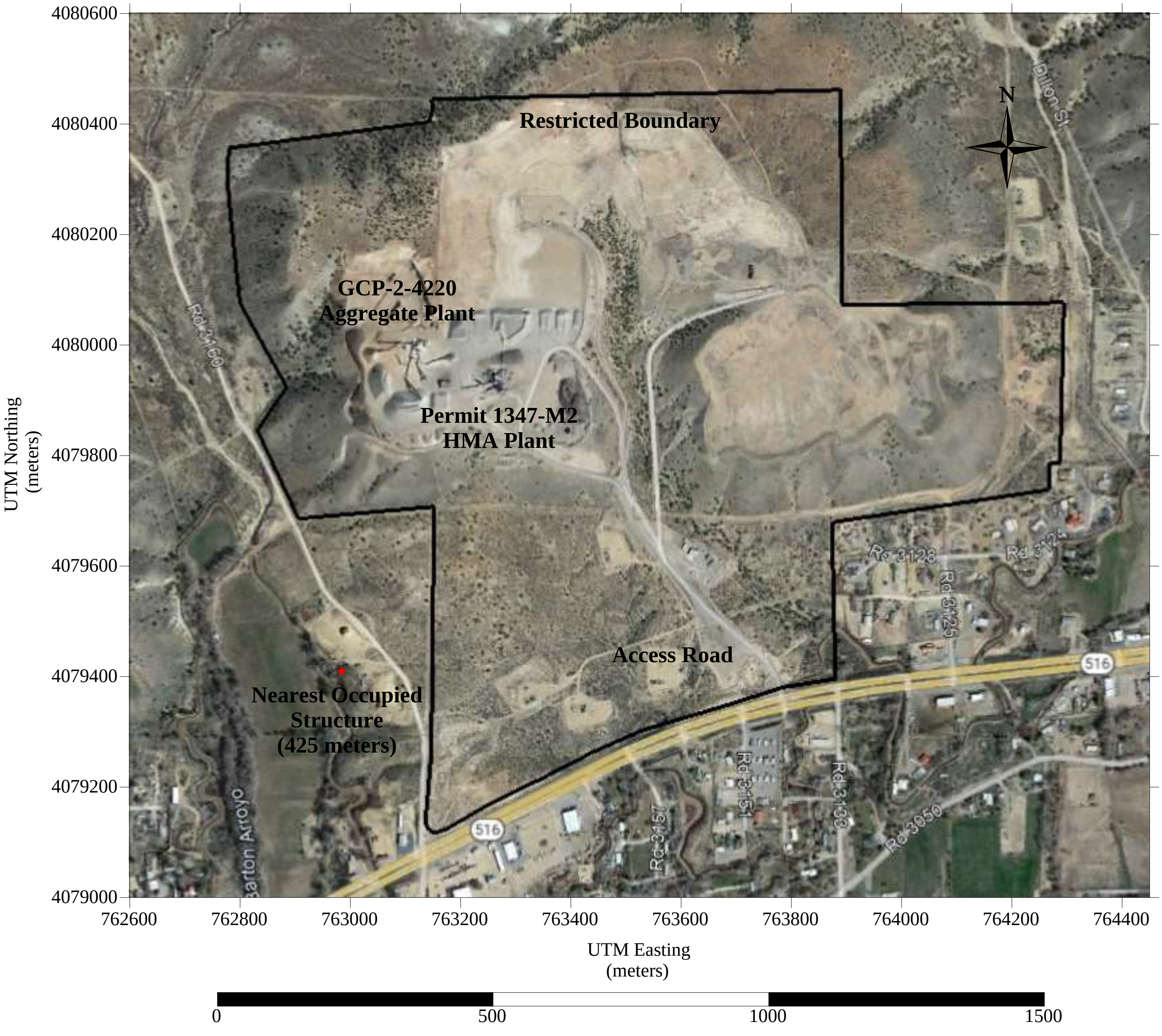


Figure 5-1: Plot Plan of Permit 1317-M2 FCM 300 TPH Drum Mixed Asphalt Plant

Section 6

All Calculations

Show all calculations used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:

A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
B. At least 5 significant figures shall be retained in all intermediate calculations.
C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

(1) If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
(2) If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
(3) If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.

(4) The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Hot Mix Asphalt Plant

Pre-Control Particulate Emission Rates

Material Handling ($PM_{2.5}$, PM_{10}, and PM)

To estimate material handling pre-control particulate emissions rates for screening, pugmill, 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 particulate emission rates for aggregate handling operations (aggregate and RAP piles/ loading cold and RAP 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 (PM = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly emission rate is the NMED default of 11 MPH and for determining the annual emission rate is based on the average wind speed for Aztec found on the internet of 9.4 mph, and the NMED default moisture content of 2 percent.

The asphalt may will contain 1.5% mineral filler, if Evotherm is not used. 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 1.92/0.38 from $PM_{10}/PM_{2.5}$ uncontrolled k factors found in AP-42 Section 11.12 (06/06), Table 11.12-4 "Central Mix Operation" was used.

Maximum hourly asphalt production is 300 tons per hours. Virgin aggregate/RAP/Mineral filler/Asphalt cement ratios used in estimating material handling particulate emission rates is equal to 52.5/40.0/1.5/6.0. These ratios are estimates and ratios may change with mix requirements, these are not requested permit conditions.

Aggregate/RAP Storage Piles and Cold/RAP 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_{PM} (lbs/ton) = $0.74 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

E_{PM10} (lbs/ton) = $0.35 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = $0.053 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00660 lbs/ton;

E_{PM10} (lbs/ton) = 0.00312 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00047 lbs/ton

Aggregate/RAP Storage Piles and Cold/RAP Feed Bin Loading Emission Equation:

Annual Emission Factor

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

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(9.4/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(9.4/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(9.4/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00538 lbs/ton;

E_{PM10} (lbs/ton) = 0.00254 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00039 lbs/ton

AP-42 Emission Factors:

All Bin Unloading and Conveyor Transfers = Uncontrolled Conveyor Transfer Point Emission Factor

Screening = Uncontrolled Screening Emission Factor

Pugmill Loading and Unloading = Uncontrolled Conveyor Transfer Point Emission Factor

Material Handling Emission Factors:

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Uncontrolled Screening	0.02500	0.00870	0.00132
Uncontrolled Screen Unloading, Pug Mill Loading and Unloading, Feed Bin Unloading, and Conveyor Transfers	0.00300	0.00110	0.00017
Uncontrolled Aggregate Storage Piles, Cold Aggregate Feeder Loading Max Hourly	0.00660	0.00312	0.00047
Uncontrolled Aggregate Storage Piles, Cold Aggregate Feeder Loading Annual	0.00538	0.00254	0.00039

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

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Mineral Filler Silo Loading	0.73	0.47	0.093

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:

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

Table 6-1 Pre-Controlled Regulated Process Equipment Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	PM Emission Rate (lbs/hr)	PM 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)
AGGPILE	Cold Aggregate/RAP Storage Pile	277.5	1.83	6.54	0.87	3.09	0.13	0.47
46.801.01	Cold Aggregate Feed Bin Loading	157.5	1.04	3.71	0.49	1.76	0.074	0.27
46.801.03	Cold Aggregate Feed Bin Unloading (Conveyor)	157.5	0.47	2.07	0.17	0.76	0.027	0.12
46.801.02a	Scalping Screen	157.5	3.94	17.2	1.37	6.00	0.21	0.91
46.801.02b	Scalping Screen Unloading (Conveyor)	157.5	0.47	2.07	0.17	0.76	0.027	0.12
46.801.05	Pug Mill Load	162.0	0.49	2.13	0.18	0.78	0.028	0.12
46.801.06a	Pug Mill Unload (Conveyor)	162.0	0.49	2.13	0.18	0.78	0.028	0.12
46.801.06b	Conveyor Transfer to Slinger Conveyor	162.0	0.49	2.13	0.18	0.78	0.028	0.12
46.801.10	RAP Feed Bin Loading	120.0	0.79	2.83	0.37	1.34	0.057	0.20
46.801.15	RAP Feed Bin Unloading (Conveyor)	120.0	0.36	1.58	0.13	0.58	0.020	0.089
46.801.11	RAP Screen	120.0	3.00	13.1	1.04	4.57	0.16	0.69
46.801.12a	RAP Screen Unloading (Conveyor)	120.0	0.36	1.58	0.13	0.58	0.020	0.089
46.801.12b	RAP Transfer Conveyor	120.0	0.36	1.58	0.13	0.58	0.020	0.089
46.801.16	Mineral Filler Silo	25 tph, 15093 tpy	18.25	14.39	11.75	9.26	2.33	1.83
		TOTALS	**32.33**	**73.11**	**17.17**	**31.62**	**3.15**	**5.24**

HMA Plant Haul Truck Travel

Haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) “Unpaved Roads” emission equation. The haul road to the plant will be unpaved. Table 6-14 summarizes the emission rate for each haul truck category.

Unpaved Roads Plant HMA
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
PM = 4.9
s = % silt content (Table 13.2.2-1, “Sand and Gravel” 4.8%)
W = mean vehicle weight (26.5 tons – 15 tons truck, 23 tons load)
p = number of days with at least 0.01 in of precip. (70 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
PM = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
PM = 0.45
Vehicle Dust Control 0%

Trucks per Hour
Mineral Fill Trucks = 0.2 truck per hour average
Asphalt Cement Trucks = 0.8 truck per hour average
Asphalt Trucks = 13.0 truck per hour average
RAP Trucks = 5.2 truck per hour average

Trucks per Year (Uncontrolled)
Mineral Fill Trucks = 1,714 truck per year
Asphalt Cement Trucks = 6,856 truck per year
Asphalt Trucks = 114,261 truck per year
RAP Trucks = 45,704 truck per year

VMT =Vehicle Miles Traveled
Mineral Fill Trucks Unpaved – 1.12219 miles per vehicle
Asphalt Cement Trucks Unpaved – 1.12219 miles per vehicle
Asphalt Trucks Unpaved – 1.12219 miles per vehicle
RAP Trucks Unpaved – 1.04704 miles per vehicle

Miles Traveled
HMA Plant Unpaved – 21.19795 miles per hour; 185,694 miles per year

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 – 0% Control
PM = 6.87692 lbs/VMT
PM10 = 1.75267 lbs/VMT
PM2.5 = 0.17527 lbs/VMT

Annual Emission Rate Factor – 0% Control
PM = 5.55806 lbs/VMT
PM10 = 1.41655 lbs/VMT
PM2.5 = 0.14165 lbs/VMT

Table 6-2: Pre-Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	PM Emission Rate (lbs/hr)	PM 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)
Mineral Filler Truck Emissions	0.21956 miles/hr; 1,923 miles/yr	1.51	5.35	0.38	1.36	0.038	0.14
Asphalt Cement Truck Emissions	0.87824 miles/hr; 7,693 miles/yr	6.04	21.38	1.54	5.45	0.15	0.54
Asphalt Truck Emissions Paved	14.63732 miles/hr; 128,223 miles/yr	100.66	356.34	25.65	90.82	2.57	9.08
RAP Truck Emissions	5.46283 miles/hr; 47,854 miles/yr	37.57	132.99	9.57	33.89	0.96	3.39
	Total	**145.78**	**516.05**	**37.15**	**131.52**	**3.72**	**13.15**

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 will be permitted to combust on-spec recycled oil. 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 (V) and a tank temperature setting of 350˚ F for HMA mix temperature (T).

<u>Silo Filling</u>

Total PM	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

<u>Plant Loadout</u>

Total PM	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$

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.

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.

<u>**AP-42 Section 11.1 Table 11.1-3, -4, -7, -8, and -14 Uncontrolled Emission Factors:**</u>

Process Unit	Pollutant	Emission Factor (lbs/ton)
Drum Mixer	NO_X	0.055
	CO	0.13
	SO_2	0.058
	VOC	0.032
	TOC	0.044
	PM	28.0
	PM_{10}	6.5
	$PM_{2.5}$	1.565
	CO_2	33.0
Silo Filling	CO	0.002210012
	TOC	0.022824716
	PM	0.000807515
	PM_{10}	0.000807515
	$PM_{2.5}$	0.000807515
Plant Loadout	CO	0.002527022
	TOC	0.007789387
	PM	0.000819549
	PM_{10}	0.000819549
	$PM_{2.5}$	0.000819549
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:

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

Table 6-3: 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)
46.801.07	Asphalt Drum Dryer/Mixer	NO_X	300	16.50	72.27
		CO	300	39.00	170.82
		SO_2	300	17.40	76.21
		VOC	300	9.60	42.05
		PM	300	8400	36792
		PM_{10}	300	1950	8541
		$PM_{2.5}$	300	469.5	2056.4
		CO_2	300	9900	43362
46.801.13	Silo Filling (Drum Mixer Unloading)	CO	300	0.66	2.90
		TOC	300	6.85	29.99
		PM	300	0.24	1.06
		PM_{10}	300	0.24	1.06
		$PM_{2.5}$	300	0.24	1.06
46.801.14a,b	Plant Loadout (Asphalt Silo Unloading)	CO	300	0.76	3.32
		TOC	300	2.34	10.24
		PM	300	0.25	1.08
		PM_{10}	300	0.25	1.08
		$PM_{2.5}$	300	0.25	1.08
46.801.17&18	Asphalt Cement Storage Tanks (2)	TOC	30,000 gallons each	0.030	0.13
YARD	HMA YARD	TOC	300	0.33	1.45
		CO	300	0.11	0.46

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 (46.801.07), unloading the drum mixer (46.801.13), asphalt silo (46.801.14a,b), and asphalt heater (46.801.19) with the exception of limiting annual production rates for production equipment.

Controlled Material Handling ($PM_{2.5}$, PM_{10}, and PM)

No fugitive dust controls or emission reductions are proposed for the aggregate storage piles (AGGPILE), loading of the cold aggregate feed bins (46.801.01), or loading of the RAP feed bins (46.801.10) with the exception of limiting annual production rates.

Fugitive dust control for unloading the cold aggregate feed bins onto the cold aggregate feed bin conveyor (46.801.03) and RAP feed bin conveyor (46.801.15) will be controlled, as needed, with enclosures and/or water sprays at the exit of the feed bins. 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 scalping screens (46.801.02a and 46.801.11) 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.

Fugitive dust control for unloading the scalping screens (46.801.02b and 46.801.12a), loading and unloading the pug mill (46.801.05 and 46.801.06a), transfer from the scale conveyor to the drum (46.801.06b), and RAP transfer conveyor (46.801.12b) will be controlled, as needed, with enclosures and/or water sprays. 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.

Particulate emissions from loading the mineral filler silo (46.801.16) will be controlled with a baghouse dust collector on the exhaust vent (46.801.16B). 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 dumped 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 (46.801.07) will be controlled with a baghouse dust collector (46.801.09) 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 sent to a dust box. Additional emission reductions include limiting annual production rates.

No fugitive controls or emission reductions are proposed for unloading the drum dryer/mixer or asphalt silo (46.801.13, 46.801.14a,b) with the exception of limiting annual production rates. No fugitive controls are proposed for yard emissions (YARD) or asphalt storage tanks (46.801.17&18).

To estimate material handling control particulate emissions rates for 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 particulate emission rates for aggregate handling operations (aggregate storage piles and cold aggregate 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 (PM = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly emission rate is the NMED default of 11 MPH and for determining the annual emission rate is based on the average wind speed for Aztec found on the internet of 9.4 mph, and the NMED default moisture content of 2 percent.

The asphalt may will contain 1.5% mineral filler, if Evotherm is not used. 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 uncontrolled "Cement Unloading to Elevated Storage Silo" and a control efficiency of 99% for the baghouse.

Maximum hourly asphalt production is 300 tons per hours. Virgin aggregate/RAP/Mineral filler/Asphalt cement ratios used in estimating material handling particulate emission rates is equal to 52.5/40.0/1.5/6.0. These ratios are estimates and ratios may change with mix requirements, these are not requested permit conditions. Annual emissions in tons per year (tpy) were calculated assuming an annual production throughput of 1,006,200 tons of asphalt per year.

Aggregate/RAP Storage Piles and Cold/RAP Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

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

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00660 lbs/ton;

E_{PM10} (lbs/ton) = 0.00312 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00047 lbs/ton

Aggregate/RAP Storage Piles and Cold/RAP Feed Bin Loading Emission Equation:

Annual Emission Factor

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

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(9.4/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(9.4/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(9.4/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00538 lbs/ton;

E_{PM10} (lbs/ton) = 0.00254 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00039 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	PM 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 Screening	0.00220	0.00074	0.00005
Transfer Conveyor	0.00014	0.00005	0.000013
Controlled Pug Mill Loading and Unloading	0.00014	0.00005	0.000013
Uncontrolled Aggregate Storage Piles, Cold Aggregate Bin Loading Max Hourly	0.00660	0.00312	0.00047
Uncontrolled Aggregate Storage Piles, Cold Aggregate Bin Loading Annual	0.00538	0.00254	0.00039

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

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Mineral Filler Silo Loading	0.0073	0.0047	0.00093

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:

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

Table 6-4 Controlled Regulated Process Equipment Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	PM Emission Rate (lbs/hr)	PM 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)
AGGPILE	Cold Aggregate/RAP Storage Pile	277.5	1.83	2.50	0.87	1.18	0.13	0.18
46.801.01	Cold Aggregate Feed Bin Loading	157.5	1.04	1.42	0.49	0.67	0.074	0.10
46.801.03	Cold Aggregate Feed Bin Unloading (Conveyor)	157.5	0.022	0.037	0.0072	0.012	0.0020	0.0034
46.801.02a	Scalping Screen	157.5	0.35	0.58	0.12	0.20	0.0079	0.013
46.801.02b	Scalping Screen Unloading (Conveyor)	157.5	0.022	0.037	0.0072	0.012	0.0020	0.0034
46.801.05	Pug Mill Load	162.0	0.023	0.038	0.0075	0.012	0.0021	0.0035
46.801.06a	Pug Mill Unload (Conveyor)	162.0	0.023	0.038	0.0075	0.012	0.0021	0.0035
46.801.06b	Conveyor Transfer to Slinger Conveyor	162.0	0.023	0.038	0.0075	0.012	0.0021	0.0035
46.801.10	RAP Feed Bin Loading	120.0	0.79	1.08	0.37	0.51	0.057	0.078
46.801.15	RAP Feed Bin Unloading (Conveyor)	120.0	0.017	0.028	0.0055	0.0093	0.0016	0.0026
46.801.11	RAP Screen	120.0	0.26	0.44	0.089	0.15	0.0060	0.010
46.801.12a	RAP Screen Unloading (Conveyor)	120.0	0.017	0.028	0.0055	0.0093	0.0016	0.0026
46.801.12b	RAP Transfer Conveyor	120.0	0.017	0.028	0.0055	0.0093	0.0016	0.0026
46.801.16	Mineral Filler Silo	25 tph, 15093 tpy	0.18	0.055	0.12	0.035	0.023	0.0070
		TOTALS	**4.62**	**6.36**	**2.11**	**2.84**	**0.31**	**0.41**

Controlled Haul Truck Travel

Haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) “Unpaved Roads” emission equation. All other haul roads throughout the plant are paved that will be controlled with water and sweeping. Haul road traffic emission rates controlled by paving and sweeping have applied a control efficiency of 95%. Table 6-17 summarizes the emission rate for each haul truck category.

Unpaved Roads Plant HMA

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
PM = 4.9
s = % silt content (Table 13.2.2-1, “Sand and Gravel” 4.8%)
W = mean vehicle weight (26.5 tons – 15 tons truck, 23 tons load)
p = number of days with at least 0.01 in of precip. (70 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
PM = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
PM = 0.45
Vehicle Dust Control 95%

Trucks per Hour
Mineral Fill Trucks = 0.2 truck per hour average
Asphalt Cement Trucks = 0.8 truck per hour average
Asphalt Trucks = 13.0 truck per hour average
RAP Trucks = 5.2 truck per hour average

Trucks per Year (Controlled)
Mineral Fill Trucks = 656 truck per year
Asphalt Cement Trucks = 2,625 truck per year
Asphalt Trucks = 43,748 truck per year
RAP Trucks = 17,499 truck per year

VMT =Vehicle Miles Traveled

Mineral Fill Trucks	Unpaved – 1.12219 miles per vehicle
Asphalt Cement Trucks	Unpaved – 1.12219 miles per vehicle
Asphalt Trucks	Unpaved – 1.12219 miles per vehicle
RAP Trucks	Unpaved – 1.04704 miles per vehicle

Miles Traveled
HMA Plant Unpaved – 21.19795 miles per hour; 71,098 miles per year

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 – 95% Control**</u>

PM = 0.34385 lbs/VMT
PM10 = 0.08763 lbs/VMT
PM2.5 = 0.00876 lbs/VMT

Annual Emission Rate Factor – 95% Control
PM = 0.27790 lbs/VMT
PM10 = 0.07083 lbs/VMT
PM2.5 = 0.00708 lbs/VMT

Table 6-5: Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	PM Emission Rate (lbs/hr)	PM 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)
Mineral Filler Truck Emissions	0.21956 miles/hr; 736 miles/yr	0.075	0.10	0.019	0.026	0.0019	0.0026
Asphalt Cement Truck Emissions	0.87824 miles/hr; 2,946 miles/yr	0.30	0.41	0.077	0.10	0.0077	0.010
Asphalt Truck Emissions Paved	14.63732 miles/hr; 49,094 miles/yr	5.03	6.82	1.28	1.74	0.13	0.17
RAP Truck Emissions	5.46283 miles/hr; 18,322 miles/yr	1.88	2.55	0.48	0.65	0.048	0.065
	Total	**7.29**	**9.88**	**1.86**	**2.52**	**0.19**	**0.25**

Drum Mix Hot Mix Asphalt Plant

Particulate emissions from the drum dryer/mixer (46.801.07) will be controlled with a baghouse dust collector (46.801.09) 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 silo (46.801.13, 46.801.14a,b) 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 will be permitted to combust on-spec recycled oil. Hourly emission rates are based on maximum hourly asphalt production (300 tph) and maximum annual asphalt production rates of 1,006,200 tons. 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 (V) and a tank temperature setting of 350˚ F for HMA mix temperature (T).

<u>Silo Filling</u>

Total PM	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

<u>Plant Loadout</u>

Total PM	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$

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.

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, -4, -7, -8, and -14 Controlled Emission Factors:

Process Unit	Pollutant	Emission Factor (lbs/ton)
Drum Mixer	NO_X	0.055
	CO	0.13
	SO_2	0.058
	VOC	0.032
	TOC	0.044
	PM	0.033
	PM_{10}	0.023
	$PM_{2.5}$	0.023
	CO_2	33.0
Silo Filling	CO	0.002210012
	TOC	0.022824716
	PM	0.000807515
	PM_{10}	0.000807515
	$PM_{2.5}$	0.000807515
Plant Loadout	CO	0.002527022
	TOC	0.007789387
	PM	0.000819549
	PM_{10}	0.000819549
	$PM_{2.5}$	0.000819549
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:

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

Table 6-6: 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)
46.801.07	Asphalt Drum Dryer/Mixer	NO_X	300	16.50	27.67
		CO	300	39.00	65.40
		SO_2	300	17.40	29.18
		VOC	300	9.60	16.10
		PM	300	9.90	16.60
		PM_{10}	300	6.90	11.57
		$PM_{2.5}$	300	6.90	11.57
		CO_2	300	9900	16602
46.801.13	Silo Filling (Drum Mixer Unloading)	CO	300	0.66	1.11
		TOC	300	6.85	11.48
		PM	300	0.24	0.41
		PM_{10}	300	0.24	0.41
		$PM_{2.5}$	300	0.24	0.41
46.801.14a,b	Plant Loadout (Asphalt Silo Unloading)	CO	300	0.76	1.27
		TOC	300	2.34	3.92
		PM	300	0.25	0.41
		PM_{10}	300	0.25	0.41
		$PM_{2.5}$	300	0.25	0.41
46.801.17&18	Asphalt Cement Storage Tanks (2)	TOC	30,000 gallons each	0.030	0.13
YARD	HMA YARD	TOC	300	0.33	0.55
		CO	300	0.11	0.18

Natural Gas Fired Asphalt Heater

One natural gas asphalt heater (46.801.19) heats the asphalt oil before it is mixed with the aggregate in the drum dryer/mixer. The unit is rated at 1,000,000 Btu/hr. The estimated hourly natural gas combusted is 1058.2 scf/hr. Emissions of nitrogen oxides (NO_X), carbon monoxides (CO), hydrocarbons (VOC) and particulate (PM) are estimated using AP-42 Section 1.4 (7/98). Sulfur content of diesel will not exceed 0.75 grains per 100 scf. 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.

AP-42 Emission Factors: Section 1.4

Natural Gas Emission Factors

Pollutant	Emission Factor
Nitrogen Oxides	100 lbs/10^6 scf
Carbon Monoxides	84 lbs/10^6 scf
Particulate	7.6 lbs/10^6 scf
Hydrocarbons	11 lbs/10^6 scf
Sulfur Oxides	0.75 grains/100 scf
Carbon Dioxide	120000 lbs/10^6 scf

The following equation was used to calculate the hourly emission rate for asphalt heater pollutant (NO_X, CO, VOC, PM):

Emission Rate (lbs/hr) = EF (lbs/10^6 scf) * fuel usage (1058.2 scf/hr) / 1,000,000

The following equation was used to calculate the hourly emission rate for asphalt heater pollutant (SO_2):

Emission Rate (lbs/hr) = Sulfur Content (0.75 grains/100 scf) * fuel usage (1058.2 scf/hr) / 100 scf/hr * 7000 grains/lb * 2

The following equation was used to calculate the hourly emission rate for asphalt heater pollutant (CO_2):

Emission Rate (lbs/hr) = EF (120000 lbs/10^6 scf) * fuel usage (1058.2 scf/hr) / 1,000,000

The following equation was used to calculate the annual emission rate for asphalt heater pollutant (NO_X, CO, VOC, PM, SO_2, CO_2):

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

Table 6-7: Pre-Controlled Combustion Emission Rates for Asphalt Heater

Process Unit Number	Pollutant	Fuel Usage (scf/hr)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
46.801.19	NO_X	1058.2	0.11	0.46
	CO	1058.2	0.089	0.39
	VOC	1058.2	0.012	0.051
	SO_2	1058.2	0.0023	0.010
	PM	1058.2	0.0080	0.035
	CO_2	1058.2	127.0	556.2

Table 6-8: Controlled Combustion Emission Rates for Asphalt Heater

Process Unit Number	Pollutant	Fuel Usage (scf/hr)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
46.801.19	NO_X	1058.2	0.11	0.46
	CO	1058.2	0.089	0.39
	VOC	1058.2	0.012	0.051
	SO_2	1058.2	0.0023	0.010
	PM	1058.2	0.0080	0.035
	CO_2	1058.2	127.0	556.2

Table 6-9 Summary of Uncontrolled NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
		NOx		CO		SO_2		VOC		PM		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
AGGPILE	Cold Aggregate/RAP Storage Pile	-	-	-	-	-	-	-	-	1.83	6.54	0.87	3.09	0.13	0.47
46.801.01	Cold Aggregate Feed Bin Loading	-	-	-	-	-	-	-	-	1.04	3.71	0.49	1.76	0.074	0.27
46.801.03	Cold Aggregate Feed Bin Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.47	2.07	0.17	0.76	0.027	0.12
46.801.02a	Scalping Screen	-	-	-	-	-	-	-	-	3.94	17.2	1.37	6.00	0.21	0.91
46.801.02b	Scalping Screen Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.47	2.07	0.17	0.76	0.027	0.12
46.801.05	Pug Mill Load	-	-	-	-	-	-	-	-	0.49	2.13	0.18	0.78	0.028	0.12
46.801.06a	Pug Mill Unload (Conveyor)	-	-	-	-	-	-	-	-	0.49	2.13	0.18	0.78	0.028	0.12
46.801.06b	Conveyor Transfer to Drum Loading	-	-	-	-	-	-	-	-	0.49	2.13	0.18	0.78	0.028	0.12
46.801.10	RAP Feed Bin Loading	-	-	-	-	-	-	-	-	0.79	2.83	0.37	1.34	0.057	0.20
46.801.15	RAP Feed Bin Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.36	1.58	0.13	0.58	0.020	0.089
46.801.11	RAP Screen	-	-	-	-	-	-	-	-	3.00	13.1	1.04	4.57	0.16	0.69
46.801.12a	RAP Screen Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.36	1.58	0.13	0.58	0.020	0.089
46.801.12b	RAP Conveyor Transfer to Drum Loading	-	-	-	-	-	-	-	-	0.36	1.58	0.13	0.58	0.020	0.089
46.801.16	Mineral Filler Silo Loading	-	-	-	-	-	-	-	-	18.25	14.39	11.75	9.26	2.33	1.83
46.801.07	Drum Dryer/Mixer	16.5	27.7	39.0	65.4	17.4	29.2	9.6	42.0	8400	36792	1950	8541	470	2056
46.801.13	Drum Mixer Unloading (Incline Conveyor)	-	-	0.66	1.11	-	-	6.85	30.0	0.24	1.06	0.24	1.06	0.24	1.06
46.801.14a,b	Asphalt Silo Unloading (Asphalt Silos)(2)	-	-	0.76	1.27	-	-	2.34	10.2	0.25	1.08	0.25	1.08	0.25	1.08

Table 6-9 Summary of Uncontrolled NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
		NOx		CO		SO_2		VOC		PM		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
46.801.19	Asphalt Heater	0.11	0.46	0.089	0.39	0.0023	0.010	0.012	0.051	0.0080	0.035	0.0080	0.035	0.0080	0.035
46.801.17&18	Asphalt Cement Storage Tanks (2)	-	-	-	-	-	-	0.030	0.13	-	-	-	-	-	-
TRCK	Haul Road Traffic	-	-	-	-	-	-	-	-	145.8	516.0	37.2	131.5	3.72	13.15
YARD	HMA Yard	-	-	0.11	0.46	-	-	0.33	1.45	-	-	-	-	-	-
Total		**16.6**	**72.7**	**40.6**	**177.9**	**17.4**	**76.2**	**19.2**	**83.9**	**8579**	**37383**	**2005**	**8706**	**477**	**2077**

Table 6-10 Summary of Allowable NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
		NOx		CO		SO_2		VOC		PM		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
AGGPILE	Cold Aggregate/RAP Storage Pile	-	-	-	-	-	-	-	-	1.83	2.50	0.87	1.18	0.13	0.18
46.801.01	Cold Aggregate Feed Bin Loading	-	-	-	-	-	-	-	-	1.04	1.42	0.49	0.67	0.074	0.10
46.801.03	Cold Aggregate Feed Bin Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.022	0.037	0.0072	0.012	0.0020	0.0034
46.801.02a	Scalping Screen	-	-	-	-	-	-	-	-	0.35	0.58	0.12	0.20	0.0079	0.013
46.801.02b	Scalping Screen Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.022	0.037	0.0072	0.012	0.0020	0.0034
46.801.05	Pug Mill Load	-	-	-	-	-	-	-	-	0.023	0.038	0.0075	0.012	0.0021	0.0035
46.801.06a	Pug Mill Unload (Conveyor)	-	-	-	-	-	-	-	-	0.023	0.038	0.0075	0.012	0.0021	0.0035
46.801.06b	Conveyor Transfer to Drum Loading	-	-	-	-	-	-	-	-	0.023	0.038	0.0075	0.012	0.0021	0.0035
46.801.10	RAP Feed Bin Loading	-	-	-	-	-	-	-	-	0.79	1.08	0.37	0.51	0.057	0.078
46.801.15	RAP Feed Bin Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.017	0.028	0.0055	0.0093	0.0016	0.0026
46.801.11	RAP Screen	-	-	-	-	-	-	-	-	0.26	0.44	0.089	0.15	0.0060	0.010
46.801.12a	RAP Screen Unloading (Conveyor)	-	-	-	-	-	-	-	-	0.017	0.028	0.0055	0.0093	0.0016	0.0026
46.801.12b	RAP Conveyor Transfer to Drum Loading	-	-	-	-	-	-	-	-	0.017	0.028	0.0055	0.0093	0.0016	0.0026
46.801.16	Mineral Filler Silo Loading	-	-	-	-	-	-	-	-	0.18	0.055	0.12	0.035	0.023	0.0070
46.801.07	Drum Dryer/Mixer	16.50	27.67	39.00	65.40	17.40	29.18	9.60	16.10	9.90	16.60	6.90	11.57	6.90	11.57
46.801.13	Drum Mixer Unloading (Incline Conveyor)	-	-	0.66	1.11	-	-	6.85	11.48	0.24	0.41	0.24	0.41	0.24	0.41
46.801.14a,b	Asphalt Silo Unloading (Asphalt Silos)(2)	-	-	0.76	1.27	-	-	2.34	3.92	0.25	0.41	0.25	0.41	0.25	0.41

Table 6-10 Summary of Allowable NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
		NOx		CO		SO_2		VOC		PM		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
46.801.19	Asphalt Heater	0.11	0.46	0.089	0.39	0.0023	0.010	0.012	0.051	0.0080	0.035	0.0080	0.035	0.0080	0.035
46.801.17&18	Asphalt Cement Storage Tanks (2)	-	-	-	-	-	-	0.030	0.13	-	-	-	-	-	-
TRCK	Haul Road Traffic	-	-	-	-	-	-	-	-	7.29	9.88	1.86	2.52	0.19	0.25
YARD	HMA Yard	-	-	0.11	0.18	-	-	0.33	0.55	-	-	-	-	-	-
Total		**16.61**	**28.13**	**40.62**	**68.35**	**17.40**	**29.19**	**19.16**	**32.23**	**22.30**	**33.69**	**11.36**	**17.78**	**7.90**	**13.09**

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 (0.012 pounds per ton x 300 tons/hr) from the drum dryer/mixer baghouse stack or 3.60 pounds per hour/6.04 tons per year.

Emissions of asphalt fumes from the asphalt silo loading (46.801.13), asphalt plant unloading (46.801.14a,b), yard (asphalt transported in asphalt trucks-YARD), and hot oil asphalt storage tanks (46.801.17&18) assumed that the emissions of concern from the silo filling, plant loadout, 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, plant loadout, 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 plant loadout emission factors were calculated using the default value of –0.5 for asphalt volatility (V) and a tank temperature setting of 350˚ F for HMA mix temperature (T). Inputting these values in to the equations gives you a pound per ton value of 0.0003532 lbs/ton and 0.0001630 lbs/ton or asphalt fumes emission rates of 0.11 pounds/hour/0.18 tons/yr and 0.049 pounds per hour/0.082 tons/yr (300 tph of asphalt production).

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 0.0050 pounds per hour and 0.0083 tons/yr (300 tph of asphalt production).

Emissions of asphalt fumes from the asphalt cement storage (2) tanks (46.801.17&18) 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 tank were estimated at 258.42 pounds per year or 0.030 pounds per hour. Based on 1.3 percent of the VOC emissions (0.030 pounds per hour total from both tanks), the asphalt fumes emission rate is 0.00038 pounds per hour and 0.0017 tons/yr.

Total asphalt fumes from the HMA plant is 3.76 pounds per hour and 6.31 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 is 0.18 pounds per hour.

Estimates for Hydrogen Sulfide Pollutants

The Hot Mix Asphalt Plant (HMA) drum dryer/mixer, asphalt silo loading, and asphalt silo unloading are sources of hydrogen sulfide (H_2S) listed as a state regulated ambient air quality standard. Emission factors of H_2S from the drum dryer/mixer, asphalt silo loading, and asphalt silo unloading are based on a 2001 study performed by the North Carolina Division of Air Quality and the city of Salisbury, NC. From the study the H_2S emission factors from these sources are:

Process Unit Number	Process Unit Description	H_2S Emission Factor
46.801.07	Drum Dryer/Mixer and Baghouse	0.0000518 lbs/ton
46.801.13	Drum Mixer Unloading	0.000001460 lbs/ton
46.801.14a,b	Asphalt Silo Unloading	0.000001460 lbs/ton

Table 6-11: 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)
46.801.07	Drum Dryer/Mixer and Baghouse	H_2S	300	0.016	0.026
46.801.13	Drum Mixer Unloading	H_2S	300	0.00044	0.00073
46.801.14a,b	Asphalt Silo Unloading	H_2S	300	0.00044	0.00073
			Total H_2S	**0.016**	**0.028**

Estimates for Federal HAPs Air Pollutants

The Hot Mix Asphalt Plant (HMA) drum dryer (46.801.07) and asphalt heater (46.801.19) 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 heater using AP-42 Section 1.4.

The following tables summarize the HAPs emission rates from the drum mixer and asphalt heater. Total combined HAPs emissions from Aztec HMA Plant is 4.27 pounds per hour and 5.25 tons per year.

Table 6-12: HAPs Emission Rates from the Drum Dryer/Mixer (46.801.07)
EPA HAPS Emissions Drum Mixer Hot Mix Asphalt Plant with Fabric Filter

Average Hourly Production Rate:	300	tons per hour
Yearly Production Rate:	1006200	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)
Acetaldehyde	75-07-0		1.3E-03	0.390000	0.654030
Acrolein	107-02-8		2.6E-05	0.007800	0.013081
Benzene	71-43-2		3.9E-04	0.117000	0.196209
Ethylbenzene	100-41-4		2.4E-04	0.072000	0.120744
Formaldehyde	50-00-0		3.1E-03	0.930000	1.559610
Hexane	110-54-3		9.2E-04	0.276000	0.462852
Isooctane	540-84-1		4.0E-05	0.012000	0.020124
Methyl Ethyl Ketone	78-93-3		2.0E-05	0.006000	0.010062
Propionaldehyde	123-38-6		1.3E-04	0.039000	0.065403
Quinone	106-51-4		1.6E-04	0.048000	0.080496
Methyl chorlform	71-55-6		4.8E-05	0.014400	0.024149
Toluene	108-88-3		2.9E-03	0.870000	1.458990
Xylene	1330-20-7		2.0E-04	0.060000	0.100620
		Total Non-PAH HAPS	9.5E-03	2.842200	4.766369

PAH HAPS	CAS#		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
2-Methylnaphthalene	91-57-6		1.7E-04	0.051000	0.085527
Acenaphthene	83-32-9		1.4E-06	0.000420	0.000704
Acenaphthylene	208-96-8		2.2E-05	0.006600	0.011068
Anthracene	120-12-7		3.1E-06	0.000930	0.001560
Benzo(a)anthracene	56-55-3		2.1E-07	0.000063	0.000106
Benzo(a)pyrene	50-32-8		9.8E-09	0.000003	0.000005
Benzo(b)fluoranthene	205-99-2		1.0E-07	0.000030	0.000050
Benzo(b)pyrene	192-97-2		1.1E-07	0.000033	0.000055
Benzo(g,h,l)perylene	191-24-2		4.0E-08	0.000012	0.000020
Benzo(k)fluoranthene	207-08-9		4.1E-08	0.000012	0.000021
Chrysene	218-01-9		1.8E-07	0.000054	0.000091
Fluoranthene	206-44-0		6.1E-07	0.000183	0.000307
Fluorene	86-73-7		1.1E-05	0.003300	0.005534
Indeno(1,2,3-cd)pyrene	193-39-5		7.0E-09	0.000002	0.000004
Naphthalene	91-20-3		6.5E-04	0.195000	0.327015
Perylene	198-55-0		8.8E-09	0.000003	0.000004
Phenanthrene	85-01-8		2.3E-05	0.006900	0.011571
Pyrene	129-00-0		3.0E-06	0.000900	0.001509
		Total PAH HAPS	8.8E-04	0.265445	0.445151

HAPS Metals		**Emission Factor (lbs/ton)**	**Emission Rate (lbs/hr)**	**Emission Rate (ton/yr)**
Arsenic		5.6E-07	0.000168	0.000282
Beryllium		0.0E+00	0.000000	0.000000
Cadmium		4.1E-07	0.000123	0.000206
Chromium		5.5E-06	0.001650	0.002767
Cobalt		2.6E-08	0.000008	0.000013
Hexavalent Chromium		4.5E-07	0.000135	0.000226
Lead		1.5E-05	0.004500	0.007547
Manganese		7.7E-06	0.002310	0.003874
Mercury		2.6E-06	0.000780	0.001308
Nickel		6.3E-05	0.018900	0.031695
Phosphorus		2.8E-05	0.008400	0.014087
Selenium		3.5E-07	0.000105	0.000176
	Total Metals HAPS	1.2E-04	0.037079	0.062181
	Total HAPS		**3.14472**	**5.27370**

Table 6-13: HAPs Emission Rates from the Asphalt Heater (46.801.19)

Btu Rating	1	mmBtu/hr	
Fuel Usage:	980.4	scf/hr	(based on 1020 Btu/scf)
MMscf/hr:	0.000980392	MMscf/hr	
Yearly Operating Hours:	8760	hours per year	

Type of Fuel:	Natural Gas
Emission Factors	AP-42 Section 1.4

Organic Compounds	CAS#		Emission Factor (lbs/MM scf)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Benzene	71-43-2		2.10E-03	0.000002	0.000009
Formaldehyde	50-00-0		7.50E-02	0.000074	0.000322
Hexane	110-54-3		1.80E+00	0.001765	0.007729
Naphthalene	91-20-3		6.10E-04	0.000001	0.000003
Toluene	108-88-3		3.40E-03	0.000003	0.000015
		Total Organic Compounds	1.88E+00	0.001844	0.008078

HAPS Metals		Emission Factor (lbs/MM scf)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Arsenic		2.00E-04	0.000000	0.000001
Beryllium		1.20E-05	0.000000	0.000000
Cadmium		1.10E-03	0.000001	0.000005
Chromium		1.40E-03	0.000001	0.000006
Cobalt		8.40E-05	0.000000	0.000000
Lead		5.00E-04	0.000000	0.000002
Manganese		3.80E-04	0.000000	0.000002
Mercury		2.60E-04	0.000000	0.000001
Nickel		2.10E-03	0.000002	0.000009
Selenium		2.40E-05	0.000000	0.000000
	Total Metals HAPS	6.06E-03	0.000006	0.000026
	Total HAPS		**0.001850**	**0.008104**

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following **X** By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

Section 7

Information Used to Determine Emissions

<u>Information Used to Determine Emissions</u> shall include the following:

- ☐ If manufacturer data are used, include specifications for emissions units <u>and</u> control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ☒ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ☐ If an EPA document or other material is referenced, include a complete copy.
- ☐ Fuel specifications sheet.
- ☐ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

A-1347-7-AP42S1-3	Asphalt Heater Combustion and HAPs Emission Factors
A-1347-7-AP42S11-1	HMA Plant and HAPs Emission Factors
A-1347-7-AP42S11-12	Mineral Filler Silo Emission Factors
A-1347-7-AP42S11-19-2	Screen, Pugmill, and Transfer Point Emission Factors
A-1347-7-AP42S13-2-2	Unpaved Road Emission Factors
A-1347-7-AP42S13-2-4	Material Handling Emission Factors
A-1347-7-HMAEI.xls	Aztec HMA Plant Emissions Spreadsheet (Electronic File)

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 1.3-9. 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.

Table 1.3-11. EMISSION FACTORS FOR METALS FROM UNCONTROLLED NO. 6 FUEL OIL COMBUSTION[a]

Metal	Average Emission Factor[b, d] (lb/10^3 Gal)	EMISSION FACTOR RATING
Antimony	5.25E-03[c]	E
Arsenic	1.32E-03	C
Barium	2.57E-03	D
Beryllium	2.78E-05	C
Cadmium	3.98E-04	C
Chloride	3.47E-01	D
Chromium	8.45E-04	C
Chromium VI	2.48E-04	C
Cobalt	6.02E-03	D
Copper	1.76E-03	C
Fluoride	3.73E-02	D
Lead	1.51E-03	C
Manganese	3.00E-03	C
Mercury	1.13E-04	C
Molybdenum	7.87E-04	D
Nickel	8.45E-02	C
Phosphorous	9.46E-03	D
Selenium	6.83E-04	C
Vanadium	3.18E-02	D
Zinc	2.91E-02	D

[a] Data are for residual oil fired boilers, Source Classification Codes (SCCs) 1-01-004-01/04.
[b] References 64-72. 18 of 19 sources were uncontrolled and 1 source was controlled with low efficiency ESP. To convert from lb/10^3 gal to kg/10^3 L, multiply by 0.12.
[c] References 29-32,40-44.
[d] For oil/water mixture, reduce factors in proportion to water content of the fuel (due to dilution). To adjust the listed values for water content, multiply the listed value by 1-decimal fraction of water (ex: For fuel with 9 percent water by volume, multiply by 1-0.9=.91).

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 (≤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 batch 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.

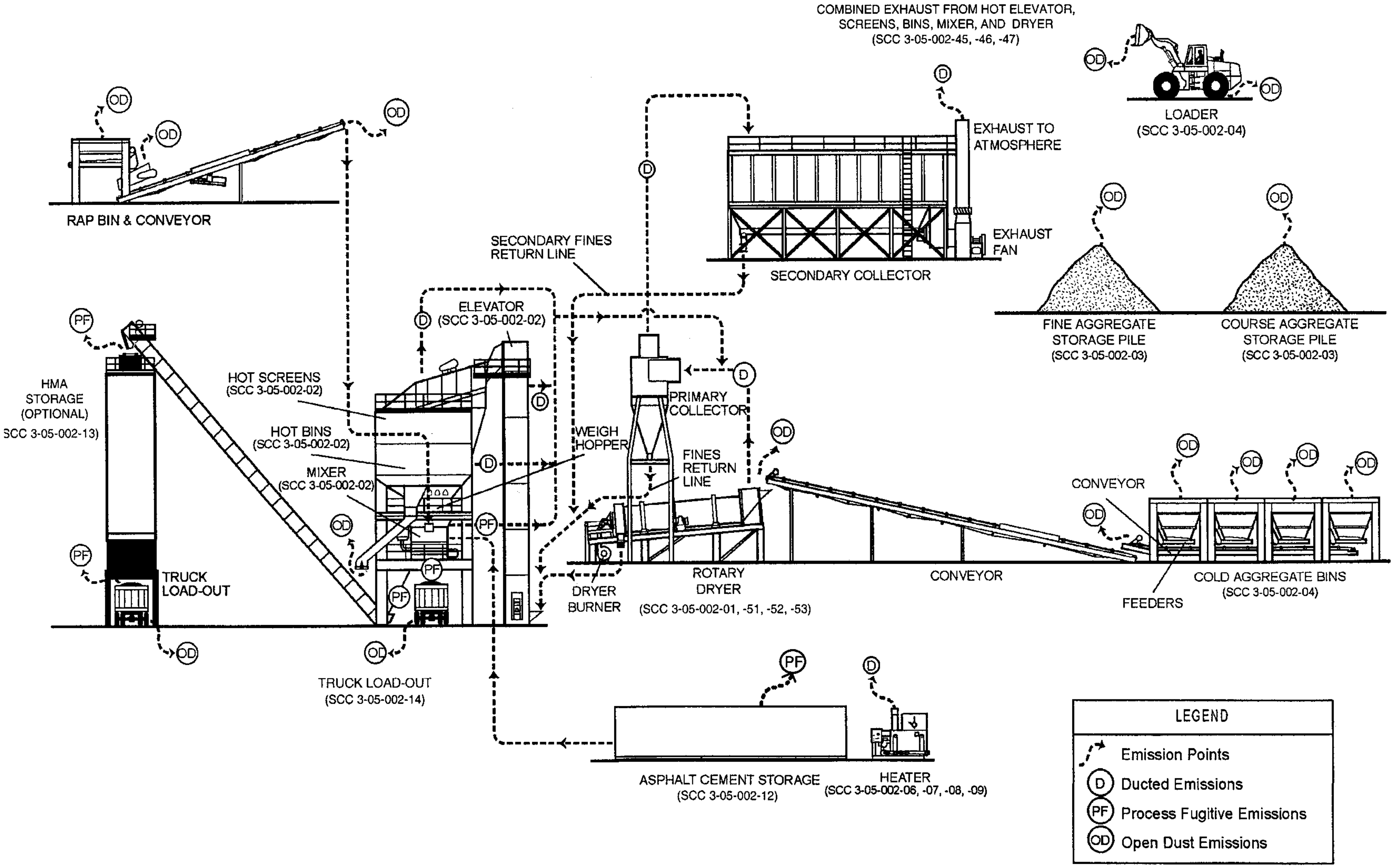


Figure 11.1-1. General process flow diagram for batch mix asphalt plants (source classification codes in parentheses).[3]

The aggregate from the weigh hopper is dropped into the mixer (pug mill) and dry-mixed for 6 to 10 seconds. The liquid asphalt is then dropped into the pug mill where it is mixed for an additional period of time. At older plants, RAP typically is conveyed directly to the pug mill from storage hoppers and combined with the hot aggregate. Total mixing time usually is less than 60 seconds. Then the hot mix is conveyed to a hot storage silo or is dropped directly into a truck and hauled to the job site.

11.1.1.2 Parallel Flow Drum Mix Plants –

Figure 11.1-2 shows the parallel flow drum mix process. This process is a continuous mixing type process, using proportioning cold feed controls for the process materials. The major difference between this process and the batch process is that the dryer is used not only to dry the material but also to mix the heated and dried aggregates with the liquid asphalt cement. Aggregate, which has been proportioned by size gradations, is introduced to the drum at the burner end. As the drum rotates, the aggregates, as well as the combustion products, move toward the other end of the drum in parallel. Liquid asphalt cement flow is controlled by a variable flow pump electronically linked to the new (virgin) aggregate and RAP weigh scales. The asphalt cement is introduced in the mixing zone midway down the drum in a lower temperature zone, along with any RAP and particulate matter (PM) from collectors.

The mixture is discharged at the end of the drum and is conveyed to either a surge bin or HMA storage silos, where it is loaded into transport trucks. The exhaust gases also exit the end of the drum and pass on to the collection system.

Parallel flow drum mixers have an advantage, in that mixing in the discharge end of the drum captures a substantial portion of the aggregate dust, therefore lowering the load on the downstream PM collection equipment. For this reason, most parallel flow drum mixers are followed only by primary collection equipment (usually a baghouse or venturi scrubber). However, because the mixing of aggregate and liquid asphalt cement occurs in the hot combustion product flow, organic emissions (gaseous and liquid aerosol) may be greater than in other asphalt mixing processes. Because data are not available to distinguish significant emissions differences between the two process designs, this effect on emissions cannot be verified.

11.1.1.3 Counterflow Drum Mix Plants –

Figure 11.1-3 shows a counterflow drum mix plant. In this type of plant, the material flow in the drum is opposite or counterflow to the direction of exhaust gases. In addition, the liquid asphalt cement mixing zone is located behind the burner flame zone so as to remove the materials from direct contact with hot exhaust gases.

Liquid asphalt cement flow is controlled by a variable flow pump which is electronically linked to the virgin aggregate and RAP weigh scales. It is injected into the mixing zone along with any RAP and particulate matter from primary and secondary collectors.

Because the liquid asphalt cement, virgin aggregate, and RAP are mixed in a zone removed from the exhaust gas stream, counterflow drum mix plants will likely have organic emissions (gaseous and liquid aerosol) that are lower than parallel flow drum mix plants. However, the available data are insufficient to discern any differences in emissions that result from differences in the two processes. A counterflow drum mix plant can normally process RAP at ratios up to 50 percent with little or no observed effect upon emissions.

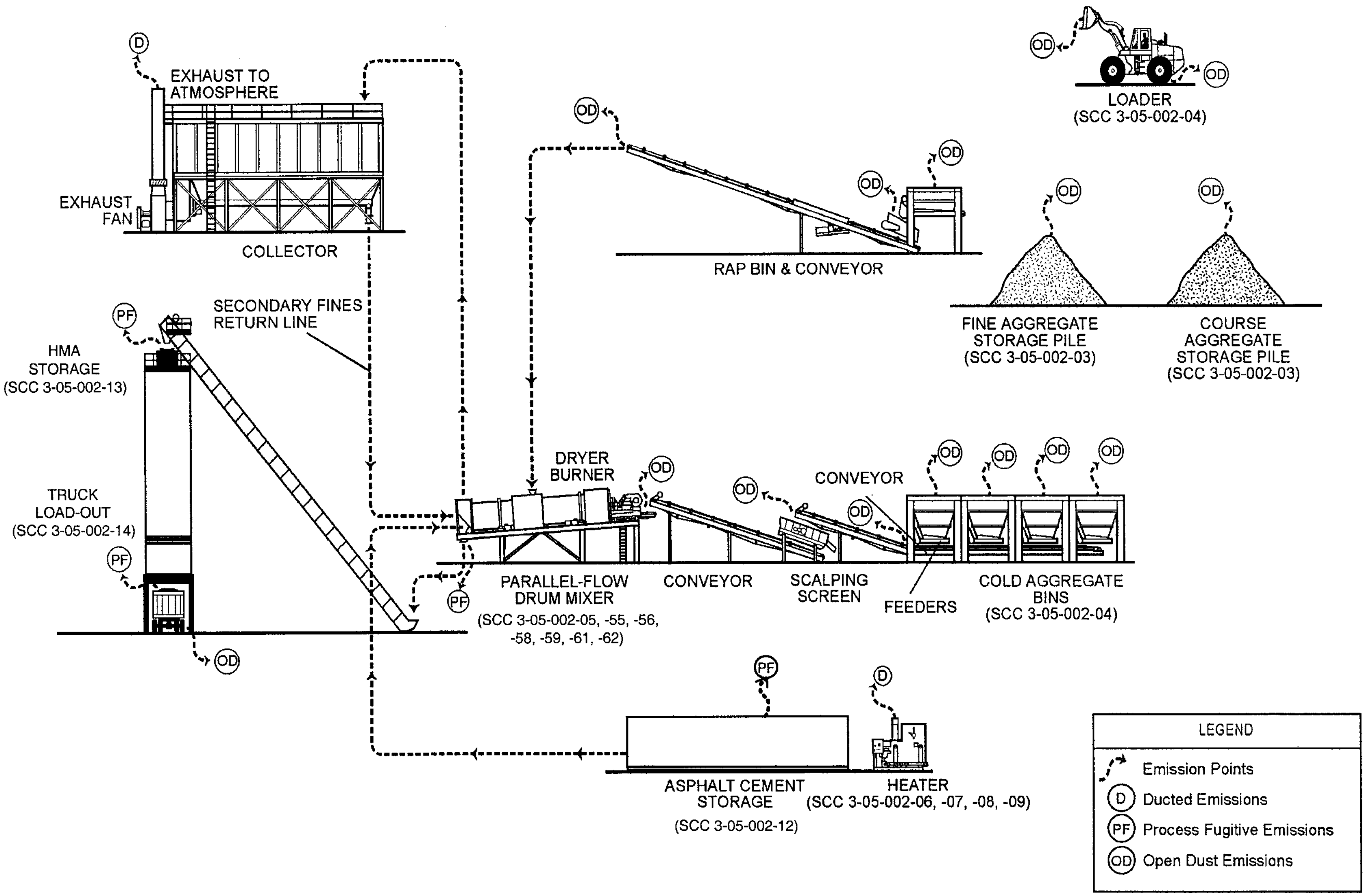


Figure 11.1-2. General process flow diagram for parallel-flow drum mix asphalt plants (source classification codes in parentheses).[3]

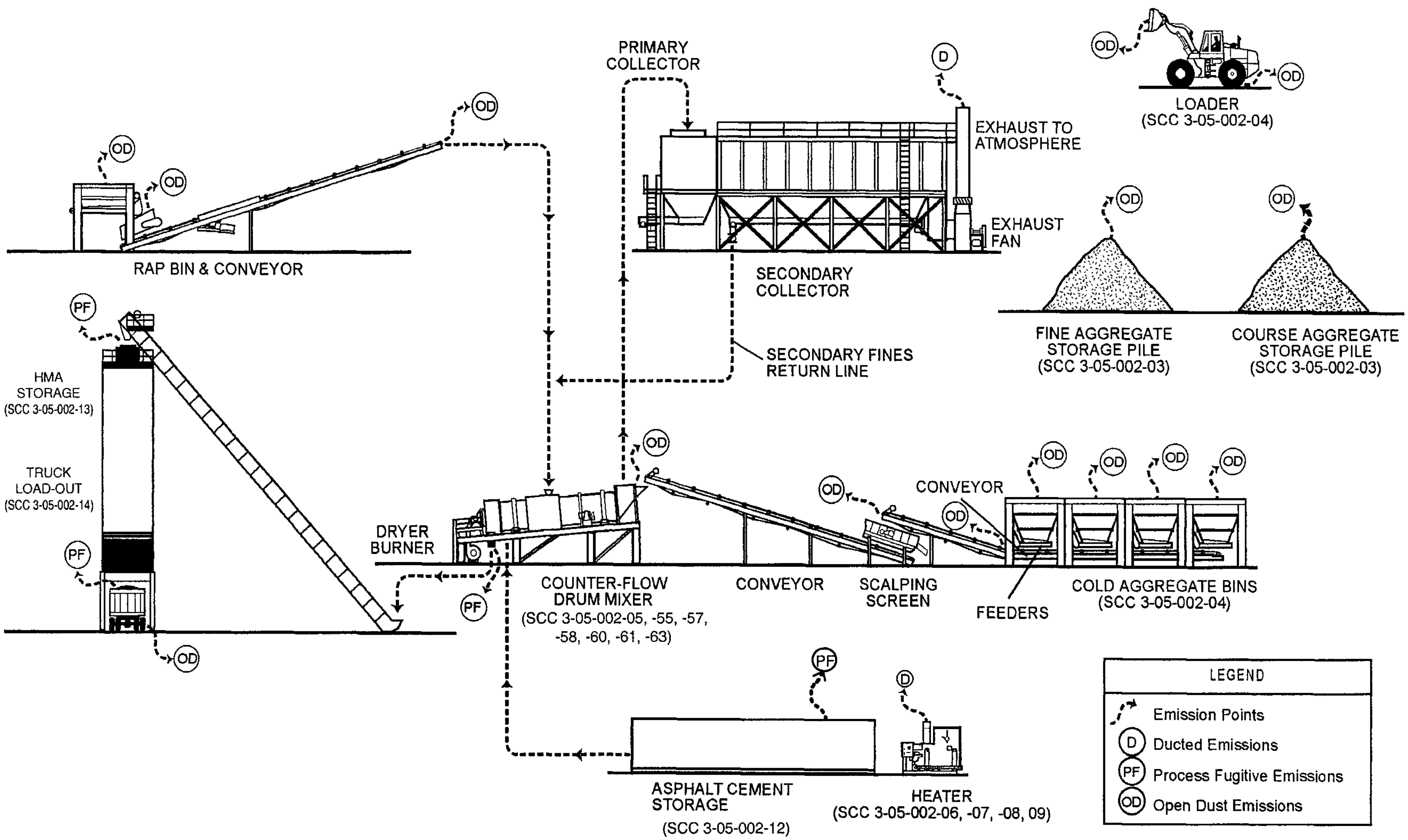


Figure 11.1-3. General process flow diagram for counter-flow drum mix asphalt plants (source classification codes in parentheses).[3]

11.1.1.4 Recycle Processes[393] –

In recent years, the use of RAP has been initiated in the HMA industry. Reclaimed asphalt pavement significantly reduces the amount of virgin rock and asphalt cement needed to produce HMA.

In the reclamation process, old asphalt pavement is removed from the road base. This material is then transported to the plant, and is crushed and screened to the appropriate size for further processing. The paving material is then heated and mixed with new aggregate (if applicable), and the proper amount of new asphalt cement is added to produce HMA that meets the required quality specifications.

11.1.2 Emissions And Controls[2-3,23]

Emissions from HMA plants may be divided into ducted production emissions, pre-production fugitive dust emissions, and other production-related fugitive emissions. Pre-production fugitive dust sources associated with HMA plants include vehicular traffic generating fugitive dust on paved and unpaved roads, aggregate material handling, and other aggregate processing operations. Fugitive dust may range from 0.1 µm to more than 300 µm in aerodynamic diameter. On average, 5 percent of cold aggregate feed is less than 74 µm (minus 200 mesh). Fugitive dust that may escape collection before primary control generally consists of PM with 50 to 70 percent of the total mass less than 74 µm. Uncontrolled PM emission factors for various types of fugitive sources in HMA plants are addressed in Sections 11.19.2, "Crushed Stone Processing", 13.2.1, "Paved Roads", 13.2.2, "Unpaved Roads", 13.2.3, "Heavy Construction Operations", and 13.2.4, "Aggregate Handling and Storage Piles." Production-related fugitive emissions and emissions from ducted production operations are discussed below. Emission points discussed below refer to Figure 11.1-1 for batch mix asphalt plants and to Figures 11.1-2 and 11.1-3 for drum mix plants.

11.1.2.1 Batch Mix Plants –

As with most facilities in the mineral products industry, batch mix HMA plants have two major categories of emissions: ducted sources (those vented to the atmosphere through some type of stack, vent, or pipe), and fugitive sources (those not confined to ducts and vents but emitted directly from the source to the ambient air). Ducted emissions are usually collected and transported by an industrial ventilation system having one or more fans or air movers, eventually to be emitted to the atmosphere through some type of stack. Fugitive emissions result from process and open sources and consist of a combination of gaseous pollutants and PM.

The most significant ducted source of emissions of most pollutants from batch mix HMA plants is the rotary drum dryer. The dryer emissions consist of water (as steam evaporated from the aggregate); PM; products of combustion (carbon dioxide [CO_2], nitrogen oxides [NO_x], and sulfur oxides [SO_x]); carbon monoxide (CO); and small amounts of organic compounds of various species (including volatile organic compounds [VOC], methane [CH_4], and hazardous air pollutants [HAP]). The CO and organic compound emissions result from incomplete combustion of the fuel. It is estimated that between 70 and 90 percent of the energy used at HMA plants is from the combustion of natural gas.

Other potential process sources include the hot-side conveying, classifying, and mixing equipment, which are vented either to the primary dust collector (along with the dryer gas) or to a separate dust collection system. The vents and enclosures that collect emissions from these sources are commonly called "fugitive air" or "scavenger" systems. The scavenger system may or may not have its own separate air mover device, depending on the particular facility. The emissions captured and transported by the scavenger system are mostly aggregate dust, but they may also contain gaseous organic compounds and a fine aerosol of condensed organic particles. This organic aerosol is created by the condensation of vapor into particles during cooling of organic vapors volatilized from the asphalt cement in the mixer (pug mill). The amount of organic aerosol produced depends to a large extent on the temperature of the asphalt cement and aggregate entering the pug mill. Organic vapor and its associated aerosol also are emitted directly to the atmosphere as process fugitives during truck load-out, from the bed of the truck itself during transport to the job site, and from the asphalt storage tank. Both the low molecular weight organic compounds and the higher weight organic aerosol contain small amounts of HAP. The ducted emissions from the heated asphalt storage tanks include gaseous and aerosol organic compounds and combustion products from the tank heater.

The choice of applicable emission controls for PM emissions from the dryer and vent line includes dry mechanical collectors, scrubbers, and fabric filters. Attempts to apply electrostatic precipitators have met with little success. Practically all plants use primary dust collection equipment such as large diameter cyclones, skimmers, or settling chambers. These chambers often are used as classifiers to return collected material to the hot elevator and to combine it with the drier aggregate. To capture remaining PM, the primary collector effluent is ducted to a secondary collection device. Most plants use either a fabric filter or a venturi scrubber for secondary emissions control. As with any combustion process, the design, operation, and maintenance of the burner provides opportunities to minimize emissions of NO_x, CO, and organic compounds.

11.1.2.2 Parallel Flow Drum Mix Plants –

The most significant ducted source of emissions from parallel-flow drum mix plants is the rotary drum dryer. Emissions from the drum consist of water (as steam evaporated from the aggregate); PM; products of combustion; CO; and small amounts of organic compounds of various species (including VOC, CH_4, and HAP). The organic compound and CO emissions result from incomplete combustion of the fuel and from heating and mixing of the liquid asphalt cement inside the drum. Although it has been suggested that the processing of RAP materials at these type plants may increase organic compound emissions because of an increase in mixing zone temperature during processing, the data supporting this hypothesis are very weak. Specifically, although the data show a relationship only between RAP content and condensible organic particulate emissions, 89 percent of the variations in the data were the result of other unknown process variables.

Once the organic compounds cool after discharge from the process stack, some condense to form a fine organic aerosol or “blue smoke” plume. A number of process modifications or restrictions have been introduced to reduce blue smoke, including installation of flame shields, rearrangement of flights inside the drum, adjustments of the asphalt injection point, and other design changes.

11.1.2.3 Counterflow Drum Mix Plants –

The most significant ducted source of emissions from counterflow drum mix plants is the rotary drum dryer. Emissions from the drum consist of water (as steam evaporated from the aggregate); PM; products of combustion; CO; and small amounts of organic compounds of various species (including VOC, CH_4, and HAP). The CO and organic compound emissions result primarily from incomplete combustion of the fuel, and can also be released from the heated asphalt. Liquid asphalt cement, aggregate, and sometimes RAP, are mixed in a zone not in contact with the hot exhaust gas stream. As a result, kiln stack emissions of organic compounds from counterflow drum mix plants may be lower than parallel flow drum mix plants. However, variations in the emissions due to other unknown process variables are more significant. As a result, the emission factors for parallel flow and counterflow drum mix plants are the same.

11.1.2.4 Parallel and Counterflow Drum Mix Plants –

Process fugitive emissions associated with batch plant hot screens, elevators, and the mixer (pug mill) are not present in the drum mix processes. However, there are fugitive PM and VOC emissions from transport and handling of the HMA from the drum mixer to the storage silo and also from the load-out operations to the delivery trucks. Since the drum process is continuous, these plants have surge 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:

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

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.

March 2004

- The emission factor for formaldehyde for oil fired hot oil heaters was revised. An emission factor for formaldehyde for gas fired hot oil heaters and emission factors for CO and CO_2 for gas and oil fired hot oil heaters were developed. (Table 11.1-13)

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 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)	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)	4.0×10^{-5}	E	339-340
	71-55-6	Methyl chloroform[f]	4.8×10^{-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]	7.4×10^{-5}	D	44,45,48
	83-32-9	Acenaphthene[g]	1.4×10^{-6}	E	48
	208-96-8	Acenaphthylene[g]	8.6×10^{-6}	D	35,45,48
	120-12-7	Anthracene[g]	2.2×10^{-7}	E	35,48
	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
	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]	3.8×10^{-6}	D	35,45,48,163
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	7.0×10^{-9}	E	48
	91-20-3	Naphthalene[g]	9.0×10^{-5}	D	35,44,45,48,163
	198-55-0	Perylene[g]	8.8×10^{-9}	E	48
	85-01-8	Phenanthrene[g]	7.6×10^{-6}	D	35,44,45,48,163
	129-00-0	Pyrene[g]	5.4×10^{-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)	4.0×10^{-5}	E	339-340
	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	0.0078		
	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

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		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
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		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
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	$2.6x10^{-5}$	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)	$4.0x10^{-5}$	E	339-340
	78-93-3	Methyl Ethyl Ketone	$2.0x10^{-5}$	E	25
	123-38-6	Propionaldehyde	0.00013	E	25
	106-51-4	Quinone	0.00016	E	25
	71-55-6	Methyl chloroform[f]	$4.8x10^{-5}$	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	0.0095		
	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
	191-24-2	Benzo(g,h,i)perylene[g]	$4.0x10^{-8}$	E	48

Table 11.1-10 (cont.)

Process	Pollutant		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
Waste oil-fired dryer with fabric filter (SCC 3-05-002-61, -62,-63) (cont.)	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]	$1.1x10^{-5}$	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	$7.0x10^{-9}$	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[g]	$8.8x10^{-9}$	E	48
	85-01-8	Phenanthrene[g]	$2.3x10^{-5}$	D	50,162,164
	129-00-0	Pyrene[g]	$3.0x10^{-6}$	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	$8.6x10^{-5}$	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	$3.2x10^{-5}$	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	$6.7x10^{-5}$	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 11.1-13. EMISSION FACTORS FOR HOT MIX ASPHALT HOT OIL SYSTEMS[a]

Process	Pollutant CASRN	Pollutant Name	Emission factor	Emission factor units	EMISSION FACTOR RATING	Reference
Hot oil system fired with natural gas (SCC 3-05-002-06)	630-08-0	Carbon monoxide	8.9×10^{-6}	lb/ft^3	C	395
	124-38-9	Carbon dioxide	0.20	lb/ft^3	C	395
	50-00-0	Formaldehyde	2.6×10^{-8}	lb/ft^3	C	395
Hot oil system fired with No. 2 fuel oil (SCC 3-05-002-08)	630-08-0	Carbon monoxide	0.0012	lb/gal	C	395
	124-38-9	Carbon dioxide	28	lb/gal	C	395
	50-00-0	Formaldehyde	3.5×10^{-6}	lb/gal	C	395
	83-32-9	Acenaphthene[b]	5.3×10^{-7}	lb/gal	E	35
	208-96-8	Acenaphthylene[b]	2.0×10^{-7}	lb/gal	E	35
	120-12-7	Anthracene[b]	1.8×10^{-7}	lb/gal	E	35
	205-99-2	Benzo(b)fluoranthene[b]	1.0×10^{-7}	lb/gal	E	35
	206-44-0	Fluoranthene[b]	4.4×10^{-8}	lb/gal	E	35
	86-73-7	Fluorene[b]	3.2×10^{-8}	lb/gal	E	35
	91-20-3	Naphthalene[b]	1.7×10^{-5}	lb/gal	E	35
	85-01-8	Phenanthrene[b]	4.9×10^{-6}	lb/gal	E	35
	129-00-0	Pyrene[b]	3.2×10^{-8}	lb/gal	E	35
	Dioxins					
	19408-74-3	1,2,3,7,8,9-HxCDD[b]	7.6×10^{-13}	lb/gal	E	35
	39227-28-6	1,2,3,4,7,8-HxCDD[b]	6.9×10^{-13}	lb/gal	E	35
		HxCDD[b]	6.2×10^{-12}	lb/gal	E	35
	35822-46-9	1,2,3,4,6,7,8-HpCDD[b]	1.5×10^{-11}	lb/gal	E	35
		HpCDD[b]	2.0×10^{-11}	lb/gal	E	35
	3268-87-9	OCDD[b]	1.6×10^{-10}	lb/gal	E	35
		Total PCDD	2.0×10^{-10}	lb/gal	E	35
	Furans					
		TCDF[b]	3.3×10^{-12}	lb/gal	E	35
		PeCDF[b]	4.8×10^{-13}	lb/gal	E	35
		HxCDF[b]	2.0×10^{-12}	lb/gal	E	35
		HpCDF[b]	9.7×10^{-12}	lb/gal	E	35
	67562-39-4	1,2,3,4,6,7,8-HpCDF[b]	3.5×10^{-12}	lb/gal	E	35
	39001-02-0	OCDF[b]	1.2×10^{-11}	lb/gal	E	35
		Total PCDF	3.1×10^{-11}	lb/gal	E	35
		Total PCDD/PCDF	2.3×10^{-10}	lb/gal	E	35

[a] Emission factor units are lb/gal of fuel consumed. To convert from pounds per standard cubic foot ($lb/ft^{3)}$ to kilograms per standard cubic meter ($kg/m^{3)}$, multiply by 16. To convert from lb/gal to kilograms per liter (kg/l), multiply by 0.12. CASRN = Chemical Abstracts Service Registry Number. SCC = Source Classification Code.

[b] Compound is classified as polycyclic organic matter, as defined in the 1990 Clean Air Act Amendments (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 11.1-14. 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 11.1-15. SPECIATION PROFILES FOR LOAD-OUT, SILO FILLING, AND ASPHALT STORAGE EMISSIONS–ORGANIC PARTICULATE-BASED COMPOUNDS

EMISSION FACTOR RATING: C

Pollutant	CASRN[a]	Speciation Profile for Load-out and Yard Emissions[b]	Speciation Profile for Silo Filling and Asphalt Storage Tank Emissions
		Compound/Organic PM[c]	Compound/Organic PM[c]
PAH HAPs			
Acenaphthene	83-32-9	0.26%	0.47%
Acenaphthylene	208-96-8	0.028%	0.014%
Anthracene	120-1207	0.070%	0.13%
Benzo(a)anthracene	56-55-3	0.019%	0.056%
Benzo(b)fluoranthene	205-99-2	0.0076%	ND[d]
Benzo(k)fluoranthene	207-08-9	0.0022%	ND[d]
Benzo(g,h,i)perylene	191-24-2	0.0019%	ND[d]
Benzo(a)pyrene	50-32-8	0.0023%	ND[d]
Benzo(e)pyrene	192-97-2	0.0078%	0.0095%
Chrysene	218-01-9	0.103%	0.21%
Dibenz(a,h)anthracene	53-70-3	0.00037%	ND[d]
Fluoranthene	206-44-0	0.050%	0.15%
Fluorene	86-73-7	0.77%	1.01%
Indeno(1,2,3-cd)pyrene	193-39-5	0.00047%	ND[d]
2-Methylnaphthalene	91-57-6	2.38%	5.27%
Naphthalene	91-20-3	1.25%	1.82%
Perylene	198-55-0	0.022%	0.030%
Phenanthrene	85-01-8	0.81%	1.80%
Pyrene	129-00-0	0.15%	0.44%
Total PAH HAPs		5.93%	11.40%
Other semi-volatile HAPs			
Phenol		1.18%	ND[d]

[a] Chemical Abstract Service Registry Number.
[b] Emissions from loaded trucks during the period between load-out and the time the truck departs the plant.
[c] Emission factor for compound is determined by multiplying the percentage presented for the compound by the emission factor for extractable organic particulate (organic PM) as determined from Table 11.1-14.
[d] ND = Measured data below detection limits.

Table 11.1-16. SPECIATION PROFILES FOR LOAD-OUT, SILO FILLING, AND ASPHALT STORAGE EMISSIONS–ORGANIC VOLATILE-BASED COMPOUNDS

EMISSION FACTOR RATING: C

Pollutant	CASRN	Speciation Profile for Load-Out and Yard Emissions Compound/TOC[a]	Speciation Profile for Silo Filling and Asphalt Storage Tank Emissions Compound/TOC (%)[a]
VOC[b]		94%[b]	100%
Non-VOC/non-HAPs			
Methane	74-82-8	6.5%	0.26%
Acetone	67-64-1	0.046%	0.055%
Ethylene	74-85-1	0.71%	1.1%
Total non-VOC/non-HAPS		7.3%	1.4%
Volatile organic HAPS			
Benzene	71-43-2	0.052%	0.032%
Bromomethane	74-83-9	0.0096%	0.0049%
2-Butanone	78-93-3	0.049%	0.039%
Carbon Disulfide	75-15-0	0.013%	0.016%
Chloroethane	75-00-3	0.00021%	0.0040%
Chloromethane	74-87-3	0.015%	0.023%
Cumene	92-82-8	0.11%	ND[c]
Ethylbenzene	100-41-4	0.28%	0.038%
Formaldehyde	50-00-0	0.088%	0.69%
n-Hexane	100-54-3	0.15%	0.10%
Isooctane	540-84-1	0.0018%	0.00031%
Methylene Chloride	75-09-2	0.0%[d]	0.00027%
MTBE	596899	0.0%[d]	ND[c]
Styrene	100-42-5	0.0073%	0.0054%
Tetrachloroethene	127-18-4	0.0077%	ND[c]
Toluene	100-88-3	0.21%	0.062%
1,1,1-Trichloroethane	71-55-6	0.0%[d]	ND[c]
Trichloroethene	79-01-6	0.0%[d]	ND[c]
Trichlorofluoromethane	75-69-4	0.0013%	ND[c]
m-/p-Xylene	1330-20-7	0.41%	0.2%
o-Xylene	95-47-6	0.08%	0.057%
Total volatile organic HAPs		1.5%	1.3%

Table 11.1-16 (cont.)

[a] Emission factor for compound is determined by multiplying the percentage presented for the compound by the emission factor for total organic compounds (TOC) as determined from Table 11.1-14.

[b] The VOC percentages are equal to 100 percent of TOC minus the methane, acetone, methylene chloride, and 1,1,1-trichloroethane percentages.

[c] ND = Measured data below detection limits. Additional compounds that were not detected are: acrylonitrile, allyl chloride, bromodichloromethane, bromoform, 1,3-butadiene, carbon tetrachloride, chlorobenzene, chloroform, dibromochloromethane, 1,2-dibromoethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,2-dichloropropane, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,2-epoxybutane, ethyl acrylate, 2-hexanone, iodomethane, methyl methacrylate, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, vinyl acetate, vinyl bromide, and vinyl chloride

[d] Values presented as 0.0% had background concentrations higher than the capture efficiency-corrected measured concentration.

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.

Types of controls used may include water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central duct collection systems, and the like. A major source of potential emissions, the movement of heavy trucks over unpaved or dusty surfaces in and around the plant, can be controlled by good maintenance and wetting of the road surface.

Predictive equations that allow for emission factor adjustment based on plant specific conditions are given in the Background Document for Chapter 11.12 and Chapter 13. Whenever plant specific data are available, they should be used with these predictive equations (e.g. Equations 11.12-1 through 11.12-3) in lieu of the general fugitive emission factors presented in Table 11.12-1 through11.12-5 in order to adjust to site specific conditions, such as moisture levels and localized wind speeds.

11.12-3 Updates since the 5th Edition.

October 2001 – This major revision of the section replaced emissions factors based upon engineering judgment and poorly documented and performed source test reports with emissions tests conducted at modern operating truck mix and central mix facilities. Emissions factors for both total PM and total PM_{10} were developed from this test data.

June 2006 – This revision of the section supplemented the two source tests with several additional source tests of central mix and truck mix facilities. The measurement of the capture efficiency, local wind speed and fines material moisture level was improved over the previous two source tests. In addition to quantifying total PM and PM_{10}, $PM_{2.5}$ emissions were quantified at all of the facilities. Single value emissions factors for truck mix and central mix operations were revised using all of the data. Additionally, parameterized emissions factor equations using local wind speed and fines material moisture content were developed from the newer data.

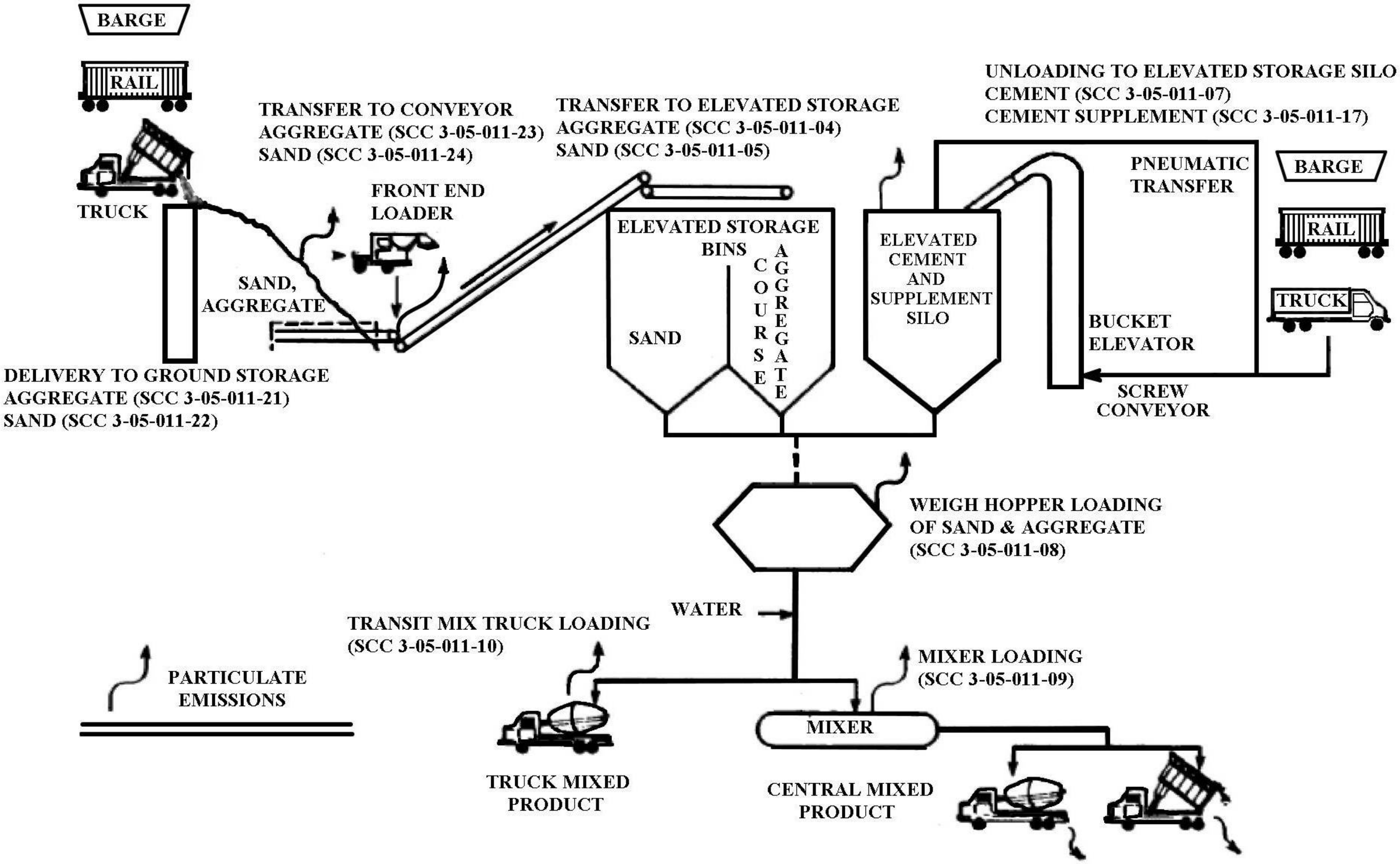


Figure 11.12-1. Typical Concrete Batching Process.

TABLE 11.12-1 (METRIC 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)	0.0035	D	0.0017	D	ND		ND	
Sand transfer [b] (3-05-011-05,22,24)	0.0011	D	0.00051	D	ND		ND	
Cement unloading to elevated storage silo (pneumatic)[c] (3-05-011-07)	0.36	E	0.23	E	0.00050	D	0.00017	D
Cement supplement unloading to elevated storage silo (pneumatic)[d] (3-05-011-17)	1.57	E	0.65	E	0.0045	D	0.0024	E
Weigh hopper loading [e] (3-05-011-08)	0.0026	D	0.0013	D	ND		ND	
Mixer loading (central mix)[f] (3-05-011-09)	0.272 or Eqn. 11.12-1	B	0.067 or Eqn. 11.12-1	B	0.0087 or Eqn. 11.12-1	B	0.0024 or Eqn. 11.12-1	B
Truck loading (truck mix)[g] (3-05-011-10)	0.498	B	0.139	B	0.0280 or Eqn. 11.12-1	B	0.0080 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 kg of pollutant per Mg 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 846 kg course aggregate, 648 kg sand, 223 kg cement and 33kg cement supplement. Approximately 75 liters of water was added to this solid material to produce 1826 kg of concrete.

[b] Reference 9 and 10. Emission factors are based upon an equation from AP-42, Section 13.2.2, with k_{PM-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 kg of pollutant per Mg of aggregate and sand.

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

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-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 emissions of PM, PM-10, PM-10-2.5, and PM-2.5 are calculated by multiplying the emission factor calculated using Equation 11.12-2 by a factor of 0.140 to convert from emissions per ton of cement and cement supplement to emissions per yard of concrete. This equation is based on a typical concrete formulation of 564 pounds of cement and cement supplement in a total of 4,024 pounds of material (including aggregate, sand, and water). This calculation is summarized in Equation 11.12-2.

$$\text{PM, PM10, PM10-2.5, PM2.5 emissions}\left(\frac{\text{pounds}}{\text{yd}^3\text{ of concrete}}\right) = 0.140\,(\text{Equation 11.12}-1\text{ factor or Table 11.12-2 Factor})$$

Equation 11.12-2

Metals emission factors for concrete batching are given in Tables 11.12-6 and 11.12-7. Alternatively, the metals emissions from ready mix plants can be calculated based on (1) the weighted average concentration of the metal in the cement and the cement supplement (i.e. flyash) and (2) on the total particulate matter emission factors calculated in accordance with Equation 11.12-3. Emission factors calculated using Equation 11.12-3 are rated D.

$$\text{Metal}_{\text{EF}} = \text{PM}_{\text{EF}}\left(\frac{aC + bS}{C + S}\right)$$

Equation 11.12-3

Where:

Metal_{EF}	=	Metal Emissions, Lbs. As per Ton of Cement and Cement Supplement
PM_{EF}	=	Controlled Particulate Matter Emission Factor (PM, PM10, or PM2.5) Lbs. per Ton of Cement and Cement Supplement
a	=	ppm of Metal in Cement
C	=	Quantity of Cement Used, Lbs. per hour
b	=	ppm of Metal in Cement Supplement
S	=	Quantity of Cement Supplement Used, Lbs. per hour

This equation is based on the assumption that 100% of the particulate matter emissions are material entrained from the cement and cement supplement streams. Equation 11.12-3 over-estimates total metal emissions to the extent that sand and fines from aggregate contribute to the total particulate matter emissions.

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.

Oversized material is processed in a cone crusher or a hammermill (fines crusher) adjusted to produce small diameter material. The output is returned to the fines screen for resizing.

In certain cases, stone washing is required to meet particulate end product specifications or demands.

Pulverized Mineral Processing

Pulverized minerals are produced at specialized processing plants. These plants supply mineral products ranging from sizes of approximately 1 micrometer to more than 75 micrometers aerodynamic diameter. Pharmaceutical, paint, plastics, pigment, rubber, and chemical industries use these products. Due to the specialized characteristics of the mineral products and the markets for these products, pulverized mineral processing plants have production rates that are less than 5% of the production capacities of conventional crushed stone plants. Two alternative processing systems for pulverized minerals are summarized in Figure 11-19.2-2.

In dry processing systems, the mineral aggregate material from conventional crushing and screening operations is subject to coarse and fine grinding primarily in roller mills and/or ball mills to reduce the material to the necessary product size range. A classifier is used to size the ground material and return oversized material that can be pulverized using either wet or dry processes. The classifier can either be associated with the grinding operation, or it can be a stand-alone process unit. Fabric filters control particulate matter emissions from the grinding operation and the classifier. The products are stored in silos and are shipped by truck or in bags.

In wet processing systems, the mineral aggregate material is processed in wet mode coarse and fine grinding operations. Beneficiation processes use flotation to separate mineral impurities. Finely ground material is concentrated and flash dried. Fabric filters are used to control particulate matter emissions from the flash dryer. The product is then stored in silos, bagged, and shipped.

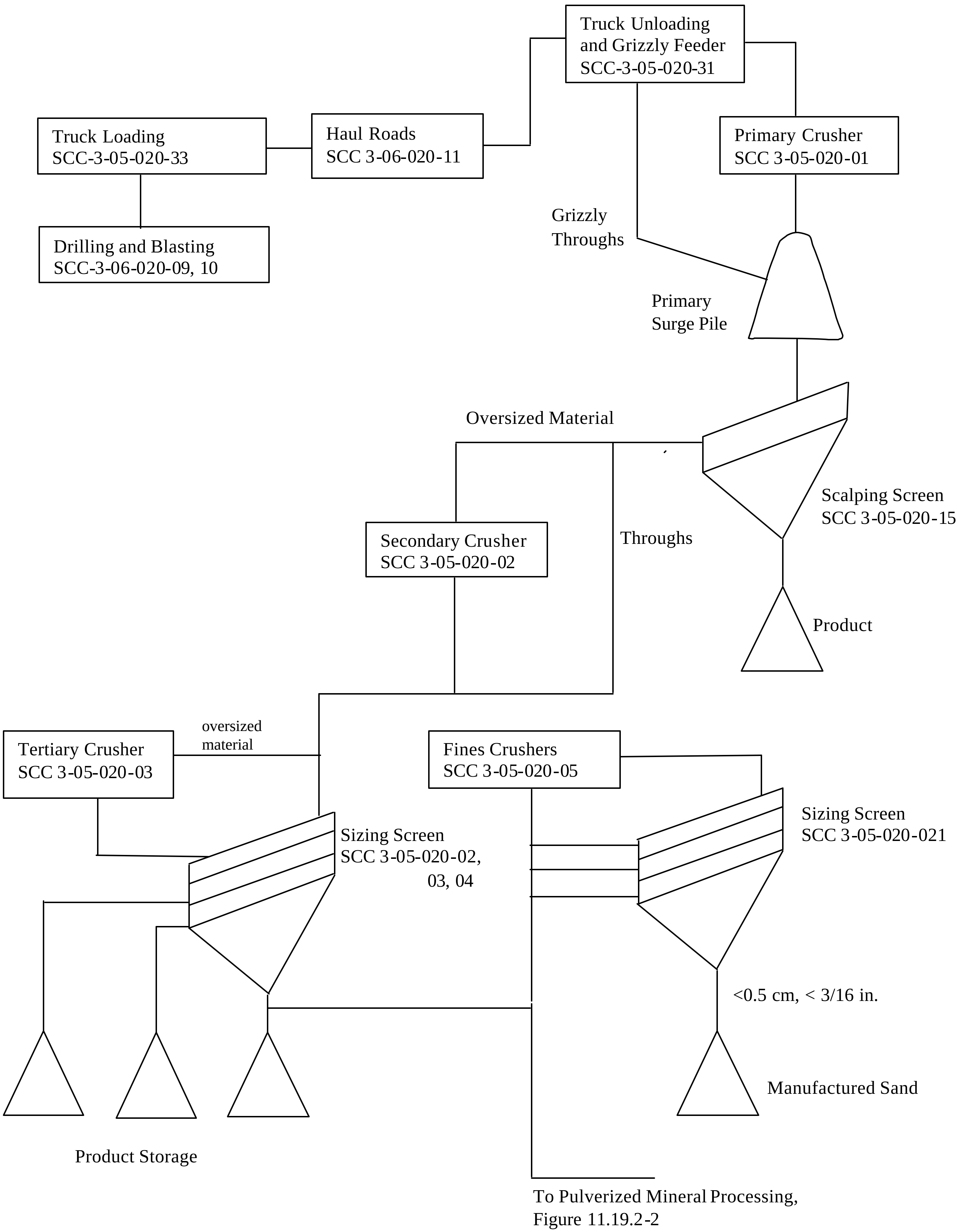


Figure 11.19.2-1. Typical stone processing plant

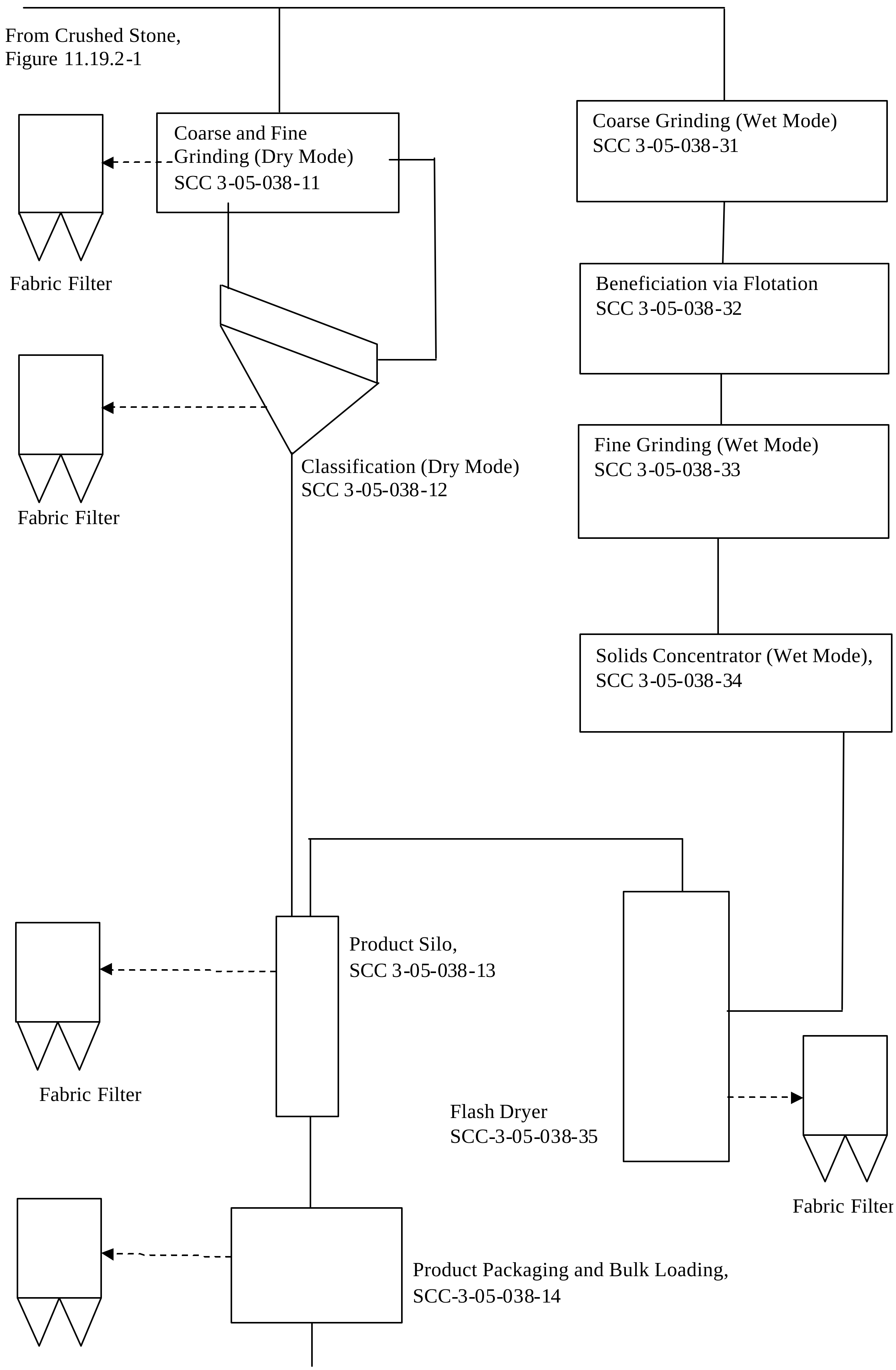


Figure 11.19.2-2 Flowchart for Pulverized Mineral Processing

11.19.2.2 Emissions and Controls [10, 11, 12, 13, 14, and 26]

Crushed Stone Processing

Emissions of PM, PM-10, and PM-2.5 occur from a number of operations in stone quarrying and processing. A substantial portion of these emissions consists of heavy particles that may settle out within the plant. As in other operations, crushed stone emission sources may be categorized as either process sources or fugitive dust sources. Process sources include those for which emissions are amenable to capture and subsequent control. Fugitive dust sources generally involve the reentrainment of settled dust by wind or machine movement. Emissions from process sources should be considered fugitive unless the sources are vented to a baghouse or are contained in an enclosure with a forced-air vent or stack. Factors affecting emissions from either source category include the stone size distribution and the surface moisture content of the stone processed, the process throughput rate, the type of equipment and operating practices used, and topographical and climatic factors.

Of graphical and seasonal factors, the primary variables affecting uncontrolled PM emissions are wind and material moisture content. Wind parameters vary with geographical location, season, and weather. It can be expected that the level of emissions from unenclosed sources (principally fugitive dust sources) will be greater during periods of high winds. The material moisture content also varies with geographical location, season, and weather. Therefore, the levels of uncontrolled emissions from both process emission sources and fugitive dust sources generally will be greater in arid regions of the country than in temperate ones and greater during the summer months because of a higher evaporation rate.

The moisture content of the material processed can have a substantial effect on emissions. This effect is evident throughout the processing operations. Surface wetness causes fine particles to agglomerate on or to adhere to the faces of larger stones, with a resulting dust suppression effect. However, as new fine particles are created by crushing and attrition and as the moisture content is reduced by evaporation, this suppressive effect diminishes and may disappear. Plants that use wet suppression systems (spray nozzles) to maintain relatively high material moisture contents can effectively control PM emissions throughout the process. Depending on the geographical and climatic conditions, the moisture content of mined rock can range from nearly zero to several percent. Because moisture content is usually expressed on a basis of overall weight percent, the actual moisture amount per unit area will vary with the size of the rock being handled. On a constant mass-fraction basis, the per-unit area moisture content varies inversely with the diameter of the rock. The suppressive effect of the moisture depends on both the absolute mass water content and the size of the rock product. Typically, wet material contains >1.5 percent water.

A variety of material, equipment, and operating factors can influence emissions from crushing. These factors include (1) stone type, (2) feed size and distribution, (3) moisture content, (4) throughput rate, (5) crusher type, (6) size reduction ratio, and (7) fines content. Insufficient data are available to present a matrix of rock crushing emission factors detailing the above classifications and variables. Available data indicate that PM-10 and PM-2.5 emissions from limestone and granite processing operations are similar. Therefore, the emission factors developed from the emissions data gathered at limestone and granite processing facilities are considered to be representative of typical crushed stone processing operations. Emission factors for filterable PM, PM-10, and PM-2.5 emissions from crushed stone processing operations are presented in Tables 11.19.2-1 (Metric units) and 11.19.2-2 (English units.)

Table 11.19.2-1 (Metric Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (kg/Mg)[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)	0.0027[d]	E	0.0012[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0006[d]	E	0.00027[p]	C	0.00005[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0195[e]	E	0.0075[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0015[f]	E	0.0006[f]	E	0.000035[q]	E
Screening (SCC 3-05-020-02, 03)	0.0125[c]	E	0.0043[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0011[d]	E	0.00037[m]	C	0.000025[q]	E
Fines Screening (SCC 3-05-020-21	0.15[g]	E	0.036[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0018[g]	E	0.0011[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0015[h]	E	0.00055[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00007[i]	E	2.3×10^{-5}[i]	D	6.5×10^{-6}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		4.0×10^{-5}[j]	E	ND	
Truck Unloading - Fragmented Stone (SCC 3-05-020-31)	ND		8.0×10^{-6}[j]	E	ND	
Truck Unloading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		5.0×10^{-5}[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in kg/Mg of material 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 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.

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 x 10^{-5}[i]	D	1.3 x 10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0 x 10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6 x 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.

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Emission factor estimates for stone quarry blasting operations are not presented because of the sparsity and unreliability of available tests. While a procedure for estimating blasting emissions is presented in Section 11.9, Western Surface Coal Mining, that procedure should not be applied to stone quarries because of dissimilarities in blasting techniques, material blasted, and size of blast areas. Emission factors for fugitive dust sources, including paved and unpaved roads, materials handling and transfer, and wind erosion of storage piles, can be determined using the predictive emission factor equations presented in AP-42 Section 13.2.

The data used in the preparation of the controlled PM calculations was derived from the individual A-rated tests for PM-2.5 and PM-10 summarized in the Background Support Document. For conveyor transfer points, the controlled PM value was derived from A-rated PM-2.5, PM-10, and PM data summarized in the Background Support Document.

The extrapolation line was drawn through the PM-2.5 value and the mean of the PM-10 values. PM emission factors were calculated for PM-30, PM-50, and PM-100. Each of these particle size limits is used by one or more regulatory agencies as the definition of total particulate matter. The graphical extrapolations used in calculating the emission factors are presented in Figures 11.19.2-3, -4, -5, and -6.

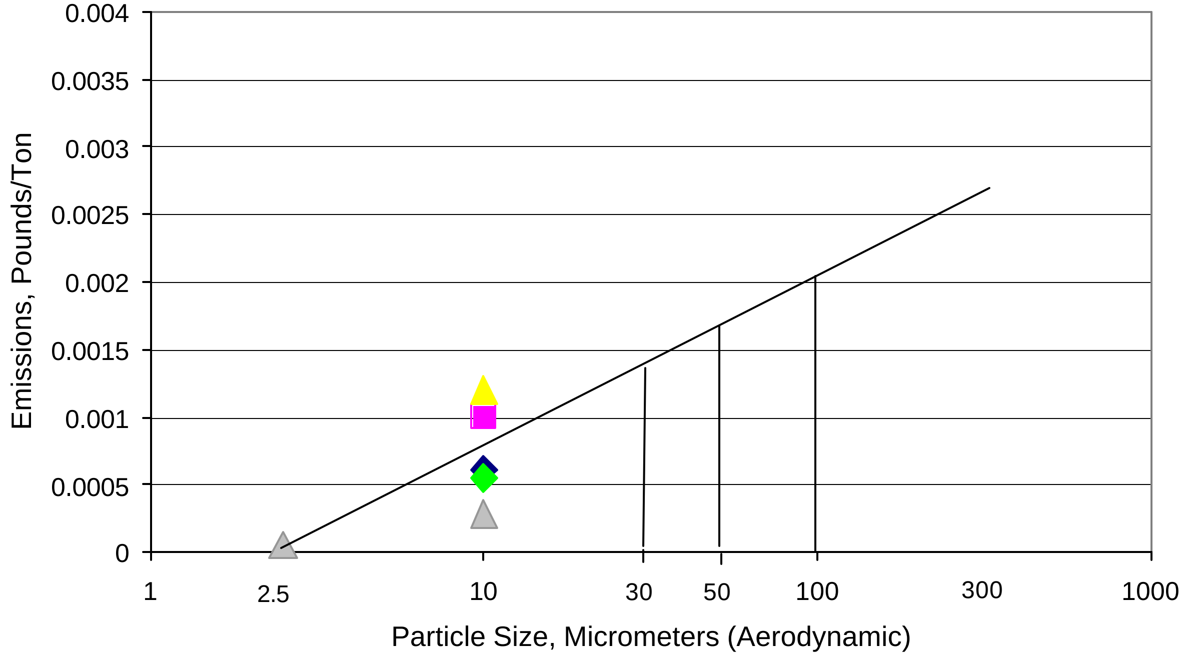

Figure 11-19-3. PM Emission Factor Calculation, Screening (Controlled)

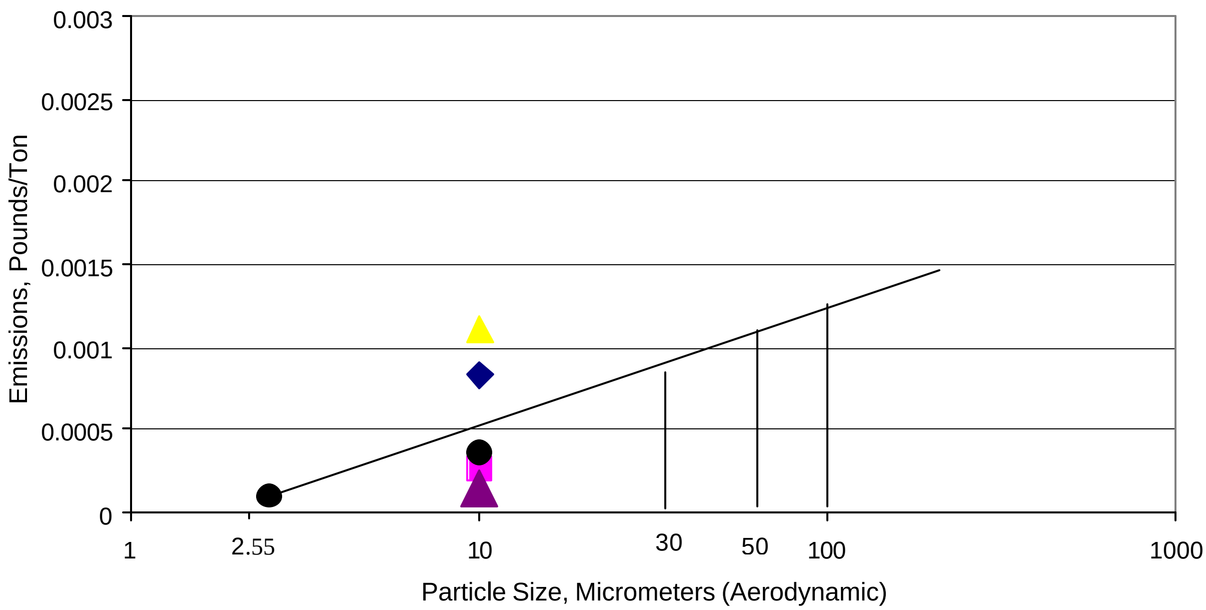

Figure 11.19-4. PM Emission Factor Calculation, Tertiary Crushing (Controlled)

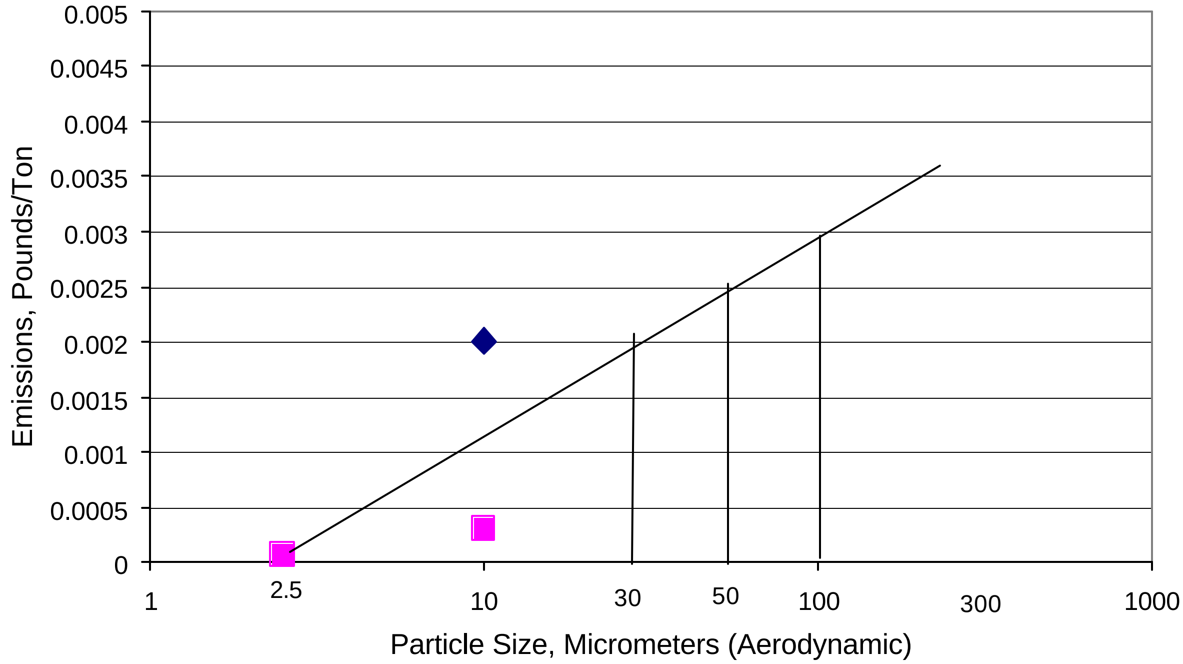

Figure 11-19.5. PM Emission Factor Calculation, Fines Crushing (Controlled)

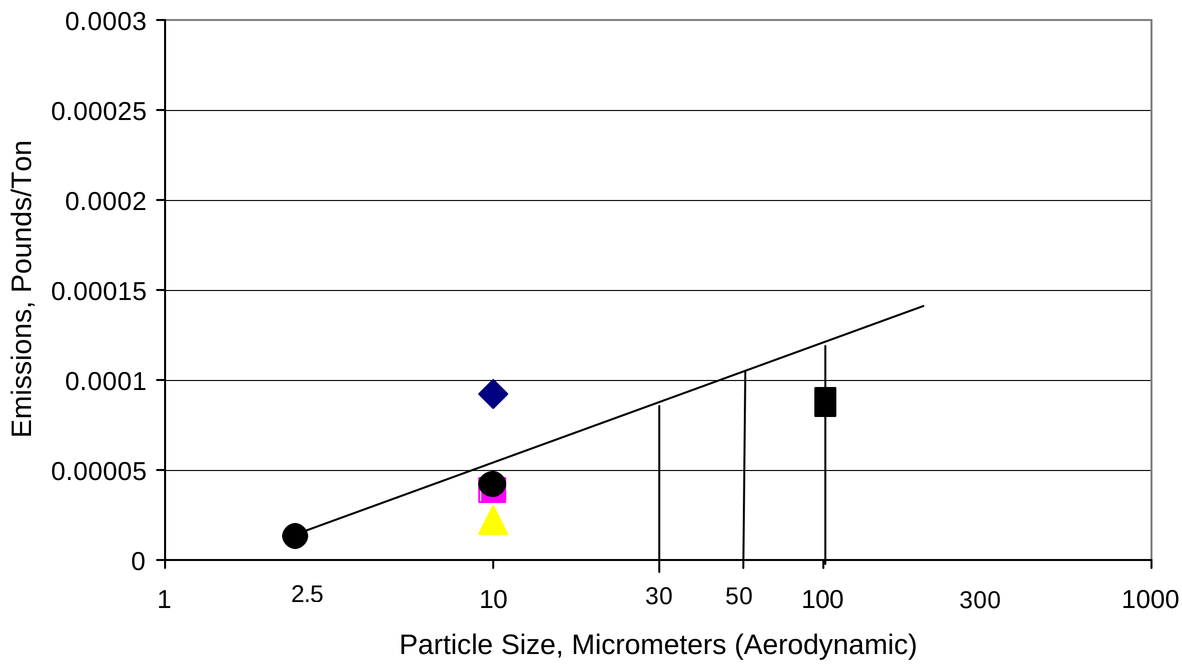

Figure 11.19-6. PM Emission Factor Calculation, Conveyor Transfer Points (Controlled)

The uncontrolled PM emission factors have been calculated from the controlled PM emission factors calculated in accordance with Figures 11.19.2-3 through 11.19.2-6. The PM-10 control efficiencies have been applied to the PM controlled emission factor data to calculate the uncontrolled PM emission rates.

Screening PM-10

Controlled = 0.00073 Lbs./Ton.

Uncontrolled = 0.00865 Lbs./Ton.

Efficiency = 91.6%

Tertiary Crushing PM-10

Controlled = 0.00054

Uncontrolled = 0.00243

Efficiency = 77.7%

Fines Crushing PM-10:

Controlled = 0.0012

Uncontrolled = 0.015

Efficiency = 92.0%

Conveyor Transfer Points PM-10

Controlled = 0.000045

Uncontrolled = 0.0011

Efficiency = 95.9%

The uncontrolled total particulate matter emission factor was calculated from the controlled total particulate matter using Equation 1:

$$\text{Uncontrolled emission factor} = \frac{\text{Controlled total particulate emission factor}}{(100\% - \text{PM-10 Efficiency }\%)/100\%} \qquad \text{Equation 1}$$

The Total PM emission factors calculated using Figures 11.19.2-3 through 11.19.2-6 were developed because (1) there are more A-rated test data supporting the calculated values and (2) the extrapolated values provide the flexibility for agencies and source operators to select the most appropriate definition for Total PM. All of the Total PM emission factors have been rated as E due to the limited test data and the need to estimate emission factors using extrapolations of the PM-2.5 and PM-10 data.

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.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

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 as shown in Table 13.2.2-4

Table 13.2.2-4. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	*C*, Emission Factor for Exhaust, Brake Wear and Tire Wear[b] lb/VMT
$PM_{2.5}$	0.00036
PM_{10}	0.00047
PM_{30}[c]	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

It is important to note that the vehicle-related source conditions refer to the average weight, speed, and number of wheels for all vehicles traveling the road. For example, if 98 percent of traffic on the road are 2-ton cars and trucks while the remaining 2 percent consists of 20-ton trucks, then the mean weight is 2.4 tons. More specifically, Equations 1a and 1b are *not* intended to be used to calculate a separate emission factor for each vehicle class within a mix of traffic on a given unpaved road. That is, in the example, one should *not* determine one factor for the 2-ton vehicles and a second factor for the 20-ton trucks. Instead, only one emission factor should be calculated that represents the "fleet" average of 2.4 tons for all vehicles traveling the road.

Moreover, to retain the quality ratings when addressing a group of unpaved roads, it is necessary that reliable correction parameter values be determined for the road in question. The field and laboratory procedures for determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. Vehicle-related parameters should be developed by recording visual observations of traffic. In some cases, vehicle parameters for industrial unpaved roads can be determined by reviewing maintenance records or other information sources at the facility.

In the event that site-specific values for correction parameters cannot be obtained, then default values may be used.In the absence of site-specific silt content information, an appropriate mean value from Table 13.2.2-1 may be used as a default value, but the quality rating of the equation is reduced by two letters. Because of significant differences found between different types of road surfaces and between different areas of the country, use of the default moisture content value of 0.5 percent in Equation 1b is discouraged. The quality rating should be downgraded two letters when the default moisture content value is used. (It is assumed that readers addressing industrial roads have access to the information needed to develop average vehicle information in Equation 1a for their facility.)

The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, “Controls”. However, all roads are subject to some natural mitigation because of rainfall and other precipitation. The Equation 1a and 1b emission factors can be extrapolated to annual 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:

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

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;

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and

3. Surface treatment, such as watering or treatment with chemical dust suppressants.

Available control options span broad ranges in terms of cost, efficiency, and applicability. For example, traffic controls provide moderate emission reductions (often at little cost) but are difficult to enforce. Although paving is highly effective, its high initial cost is often prohibitive. Furthermore, paving is not feasible for industrial roads subject to very heavy vehicles and/or spillage of material in transport. Watering and chemical suppressants, on the other hand, are potentially applicable to most industrial roads at moderate to low costs. However, these require frequent reapplication to maintain an acceptable level of control. Chemical suppressants are generally more cost-effective than water but not in cases of temporary roads (which are common at mines, landfills, and construction sites). In summary, then, one needs to consider not only the type and volume of traffic on the road but also how long the road will be in service when developing control plans.

Vehicle restrictions. These measures seek to limit the amount and type of traffic present on the road or to lower the mean vehicle speed. For example, many industrial plants have restricted employees from driving on plant property and have instead instituted bussing programs. This eliminates emissions due to employees traveling to/from their worksites. Although the heavier average vehicle weight of the busses increases the base emission factor, the decrease in vehicle-miles-traveled results in a lower overall emission rate.

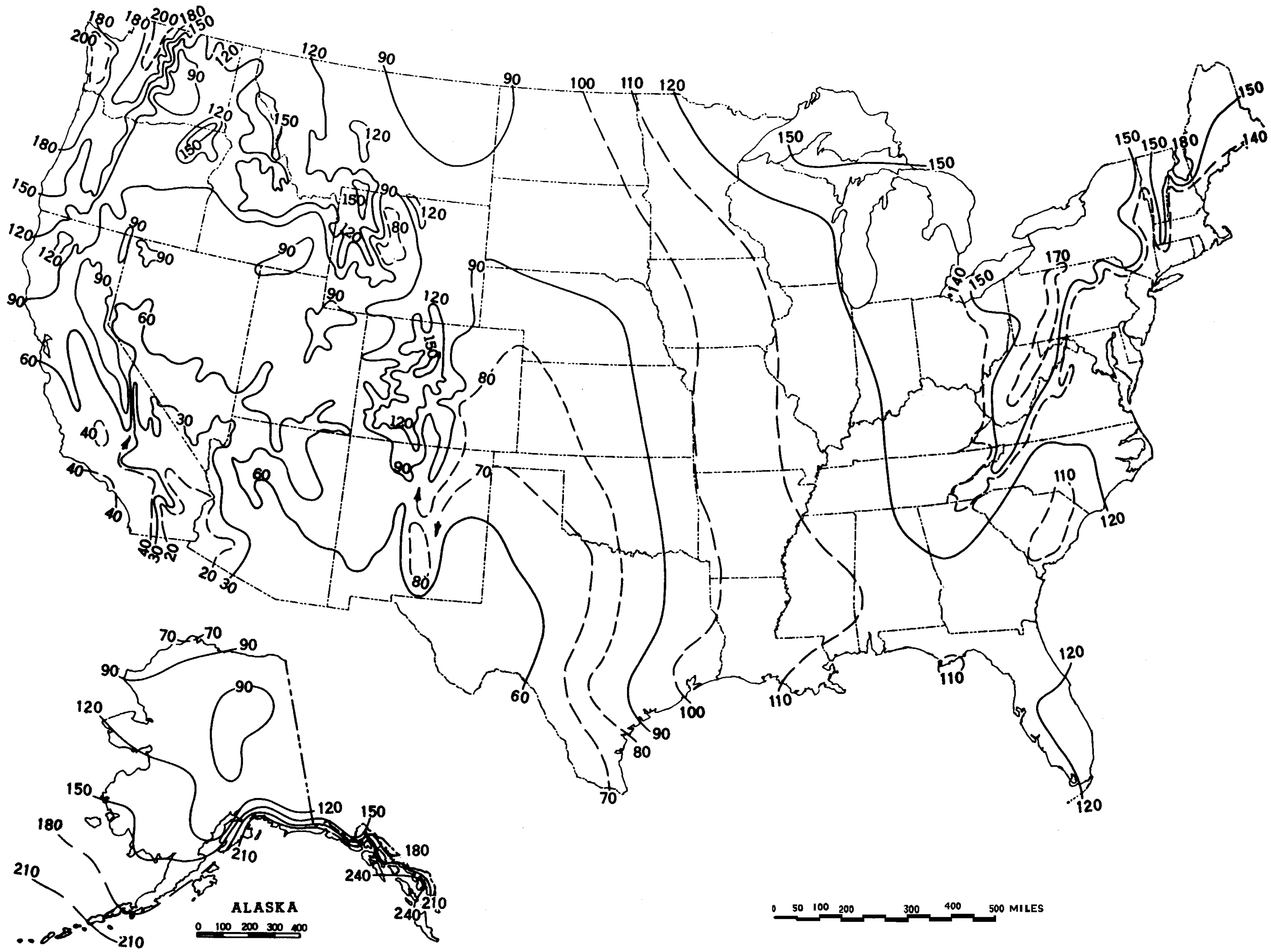

Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

Surface improvements. Control options in this category alter the road surface. As opposed to the "surface treatments" discussed below, improvements are relatively "permanent" and do not require periodic retreatment.

The most obvious surface improvement is paving an unpaved road. This option is quite expensive and is probably most applicable to relatively short stretches of unpaved road with at least several hundred vehicle passes per day. Furthermore, if the newly paved road is located near unpaved areas or is used to transport material, it is essential that the control plan address routine cleaning of the newly paved road surface.

The control efficiencies achievable by paving can be estimated by comparing emission factors for unpaved and paved road conditions. The predictive emission factor equation for paved roads, given in Section 13.2.1, requires estimation of the silt loading on the traveled portion of the paved surface, which in turn depends on whether the pavement is periodically cleaned. Unless curbing is to be installed, the effects of vehicle excursion onto unpaved shoulders (berms) also must be taken into account in estimating the control efficiency of paving.

Other improvement methods cover the road surface with another material that has a lower silt content. Examples include placing gravel or slag on a dirt road. Control efficiency can be estimated by comparing the emission factors obtained using the silt contents before and after improvement. The silt content of the road surface should be determined after 3 to 6 months rather than immediately following placement. Control plans should address regular maintenance practices, such as grading, to retain larger aggregate on the traveled portion of the road.

Surface treatments refer to control options which require periodic reapplication. Treatments fall into the two main categories of (a) "wet suppression" (i. e., watering, possibly with surfactants or other additives), which keeps the road surface wet to control emissions and (b) "chemical stabilization/ treatment", which attempts to change the physical characteristics of the surface. The necessary reapplication frequency varies from several minutes for plain water under summertime conditions to several weeks or months for chemical dust suppressants.

Watering increases the moisture content, which conglomerates particles and reduces their likelihood to become suspended when vehicles pass over the surface. The control efficiency depends on how fast the road dries after water is added. This in turn depends on (a) the amount (per unit road surface area) of water added during each application; (b) the period of time between applications; (c) the weight, speed and number of vehicles traveling over the watered road during the period between applications; and (d) meteorological conditions (temperature, wind speed, cloud cover, etc.) that affect evaporation during the period.

Figure 13.2.2-2 presents a simple bilinear relationship between the instantaneous control efficiency due to watering and the resulting increase in surface moisture. The moisture ratio "M" (i.e., the x-axis in Figure 13.2.2-2) is found by dividing the surface moisture content of the watered road by the surface moisture content of the uncontrolled road. As the watered road surface dries, both the ratio M and the predicted instantaneous control efficiency (i.e., the y-axis in the figure) decrease. The figure shows that between the uncontrolled moisture content and a value twice as large, a small increase in moisture content results in a large increase in control efficiency. Beyond that, control efficiency grows slowly with increased moisture content.

Given the complicated nature of how the road dries, characterization of emissions from watered roadways is best done by collecting road surface material samples at various times between water truck passes. (Appendices C.1 and C.2 present the sampling and analysis procedures.) The moisture content measured can then be associated with a control efficiency by use of Figure 13.2.2-2. Samples that reflect average conditions during the watering cycle can take the form of either a series of samples between water applications or a single sample at the midpoint. It is essential that samples be collected during periods with active traffic on the road. Finally, because of different evaporation rates, it is recommended that samples be collected at various times during the year. If only one set of samples is to be collected, these must be collected during hot, summertime conditions.

When developing watering control plans for roads that do not yet exist, it is strongly recommended that the moisture cycle be established by sampling similar roads in the same geographic area. If the moisture cycle cannot be established by similar roads using established watering control plans, the more complex methodology used to estimate the mitigation of rainfall and other precipitation can be used to estimate the control provided by routine watering. An estimate of the maximum daytime Class A pan evaporation (based upon daily evaporation data published in the monthly Climatological Data for the state by the National Climatic Data Center) should be used to insure that adequate watering capability is available during periods of highest evaporation. The hourly precipitation values in the spreadsheet should be replaced with the equivalent inches of precipitation (where the equivalent of 1 inch of precipitation is provided by an application of 5.6 gallons of water per square yard of road). Information on the long term average annual evaporation and on the percentage that occurs between May and October was published in the Climatic Atlas (Reference 16). Figure 13.2.2-3 presents the geographical distribution for "Class A pan evaporation" throughout the United States. Figure 13.2.2-4 presents the geographical distribution of the percentage of this evaporation that occurs between May and October. The U. S. Weather Bureau Class A evaporation pan is a cylindrical metal container with a depth of 10 inches and a diameter of 48 inches. Periodic measurements are made of the changes of the water level.

The above methodology should be used <u>only for prospective analyses</u> and for designing watering programs for existing roadways. The quality rating of an emission factor for a watered road that is based on this methodology should be downgraded two letters. Periodic road surface samples should be collected and analyzed to verify the efficiency of the watering program.

As opposed to watering, chemical dust suppressants have much less frequent reapplication requirements. These materials suppress emissions by changing the physical characteristics of the existing road surface material. Many chemical unpaved road dust suppressants form a hardened surface that binds particles together. After several applications, a treated road often resembles a paved road except that the surface is not uniformly flat. Because the improved surface results in more grinding of small particles, the silt content of loose material on a highly controlled surface may be substantially higher than when the surface was uncontrolled. For this reason, the models presented as Equations 1a and 1b cannot be used to estimate emissions from chemically stabilized roads. Should the road be allowed to return to an uncontrolled state with no visible signs of large-scale cementing of material, the Equation 1a and 1b emission factors could then be used to obtain conservatively high emission estimates.

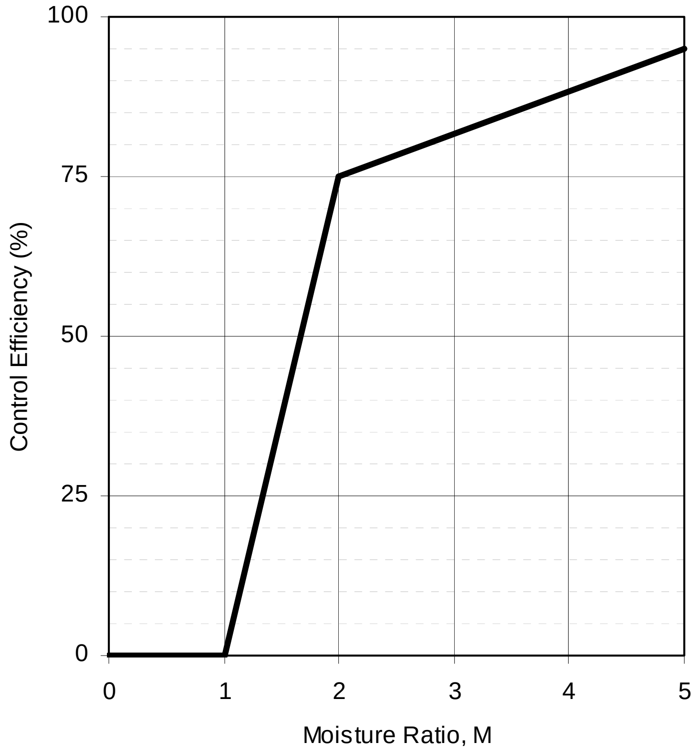

Figure 13.2.2-2. Watering control effectiveness for unpaved travel surfaces

The control effectiveness of chemical dust suppressants appears to depend on (a) the dilution rate used in the mixture; (b) the application rate (volume of solution per unit road surface area); (c) the time between applications; (d) the size, speed and amount of traffic during the period between applications; and (e) meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period. Other factors that affect the performance of dust suppressants include other traffic characteristics (e. g., cornering, track-on from unpaved areas) and road characteristics (e. g., bearing strength, grade). The variabilities in the above factors and differences between individual dust control products make the control efficiencies of chemical dust suppressants difficult to estimate. Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

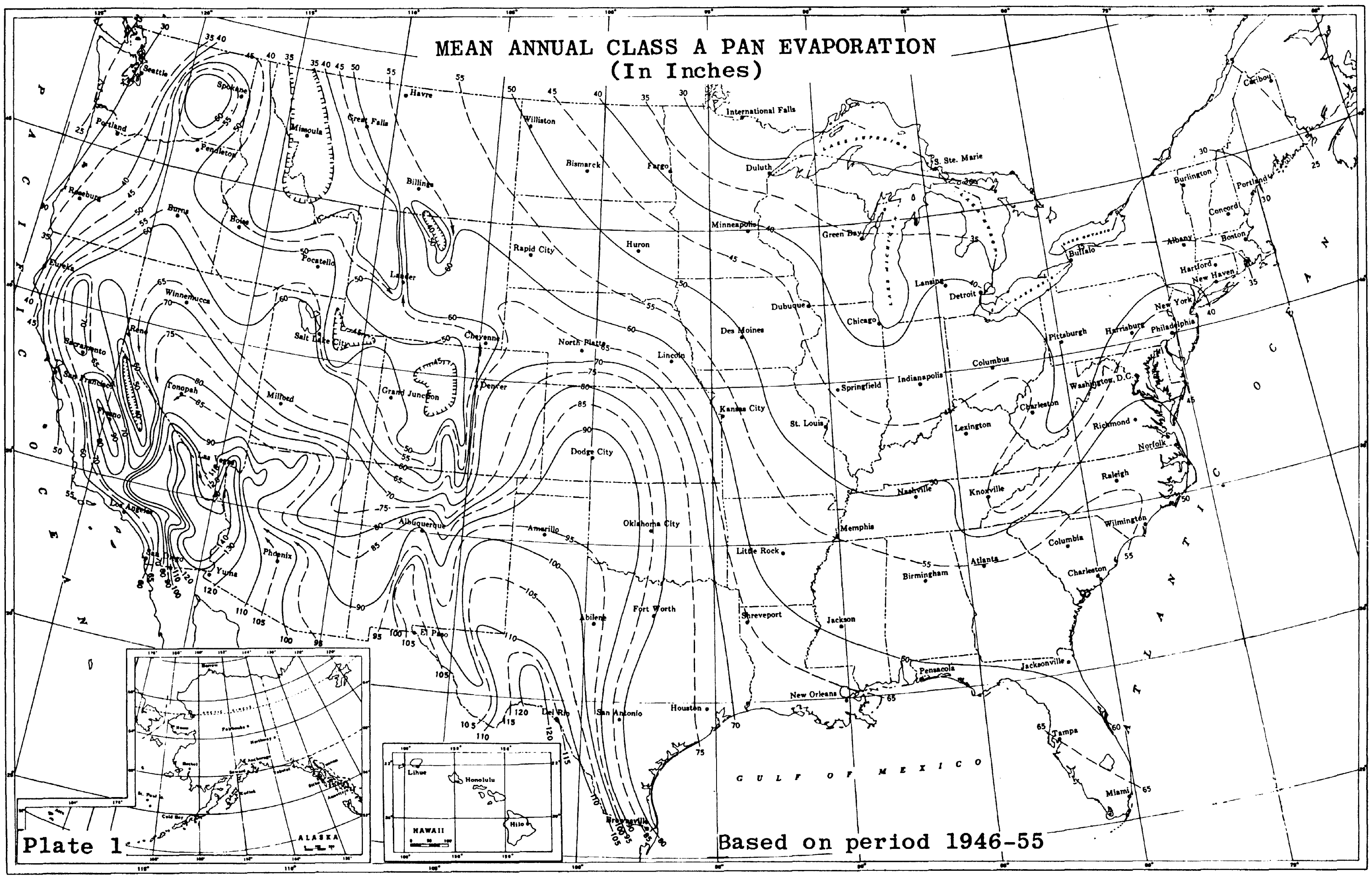

Figure 13.2.2-3. Annual evaporation data.

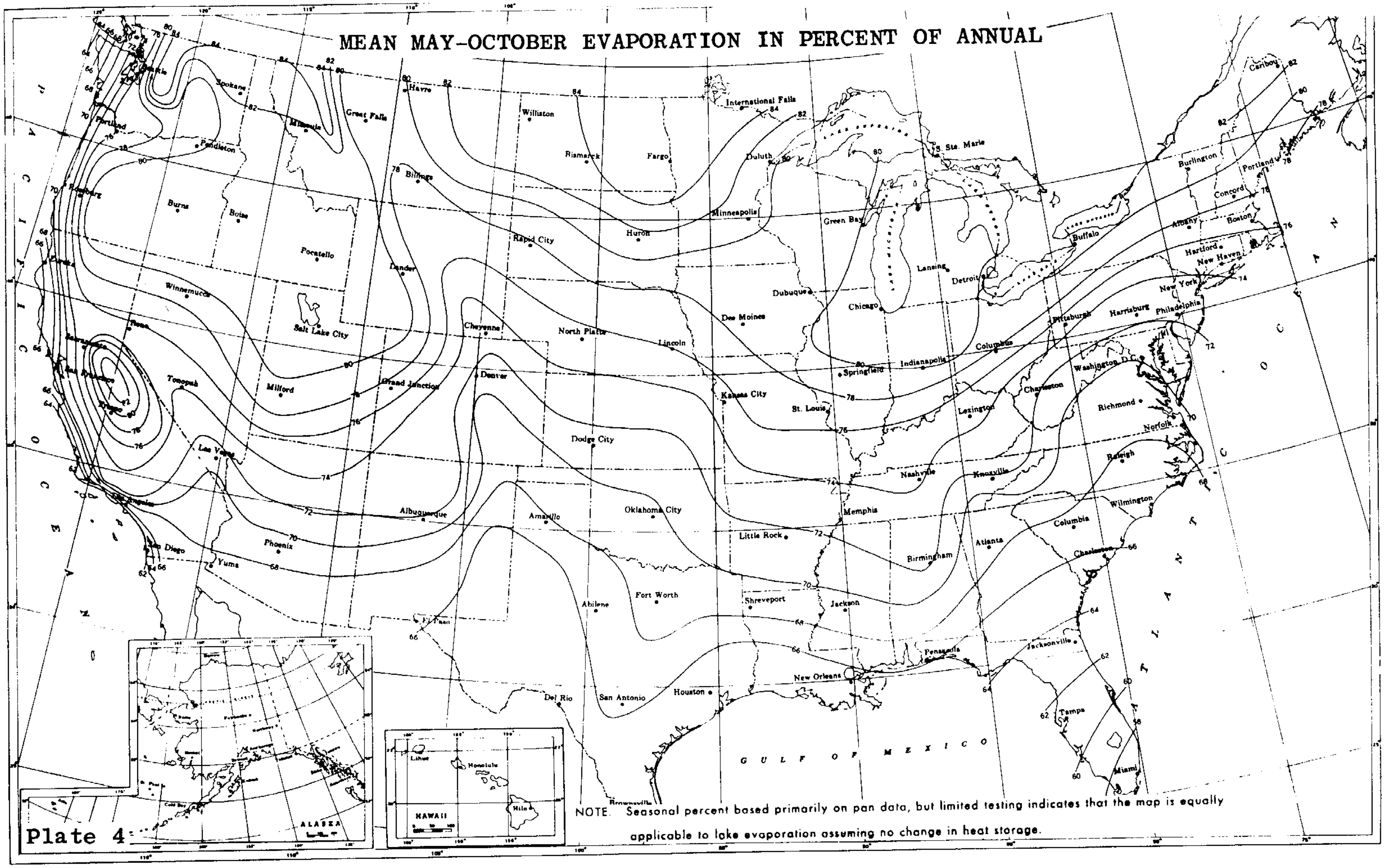

Figure 13.2.2-4. Geographical distribution of the percentage of evaporation occurring between May and October.

Petroleum resin products historically have been the dust suppressants (besides water) most widely used on industrial unpaved roads. Figure 13.2.2-5 presents a method to estimate average control efficiencies associated with petroleum resins applied to unpaved roads.[20] Several items should be noted:

1. The term "ground inventory" represents the total volume (per unit area) of petroleum resin concentrate (*not solution*) applied since the start of the dust control season.

2. Because petroleum resin products must be periodically reapplied to unpaved roads, the use of a time-averaged control efficiency value is appropriate. Figure 13.2.2-5 presents control efficiency values averaged over two common application intervals, 2 weeks and 1 month. Other application intervals will require interpolation.

3. Note that zero efficiency is assigned until the ground inventory reaches 0.05 gallon per square yard (gal/yd^2). Requiring a minimum ground inventory ensures that one must apply a reasonable amount of chemical dust suppressant to a road before claiming credit for emission control. Recall that the ground inventory refers to the amount of petroleum resin concentrate rather than the total solution.

As an example of the application of Figure 13.2.2-5, suppose that Equation 1a was used to estimate an emission factor of 7.1 lb/VMT for PM-10 from a particular road. Also, suppose that, starting on May 1, the road is treated with 0.221 gal/yd^2 of a solution (1 part petroleum resin to 5 parts water) on the first of each month through September. Then, the average controlled emission factors, shown in Table 13.2.2-5, are found.

Table 13.2-2-5. EXAMPLE OF AVERAGE CONTROLLED EMISSION FACTORS FOR SPECIFIC CONDITIONS

Period	Ground Inventory, gal/yd^2	Average Control Efficiency, %[a]	Average Controlled Emission Factor, lb/VMT
May	0.037	0	7.1
June	0.073	62	2.7
July	0.11	68	2.3
August	0.15	74	1.8
September	0.18	80	1.4

[a] From Figure 13.2.2-5, ≤10 μm. Zero efficiency assigned if ground inventory is less than 0.05 gal/yd^2. 1 lb/VMT = 281.9 g/VKT. 1 gal/yd^2 = 4.531 L/m^2.

Besides petroleum resins, other newer dust suppressants have also been successful in controlling emissions from unpaved roads. Specific test results for those chemicals, as well as for petroleum resins and watering, are provided in References 18 through 21.

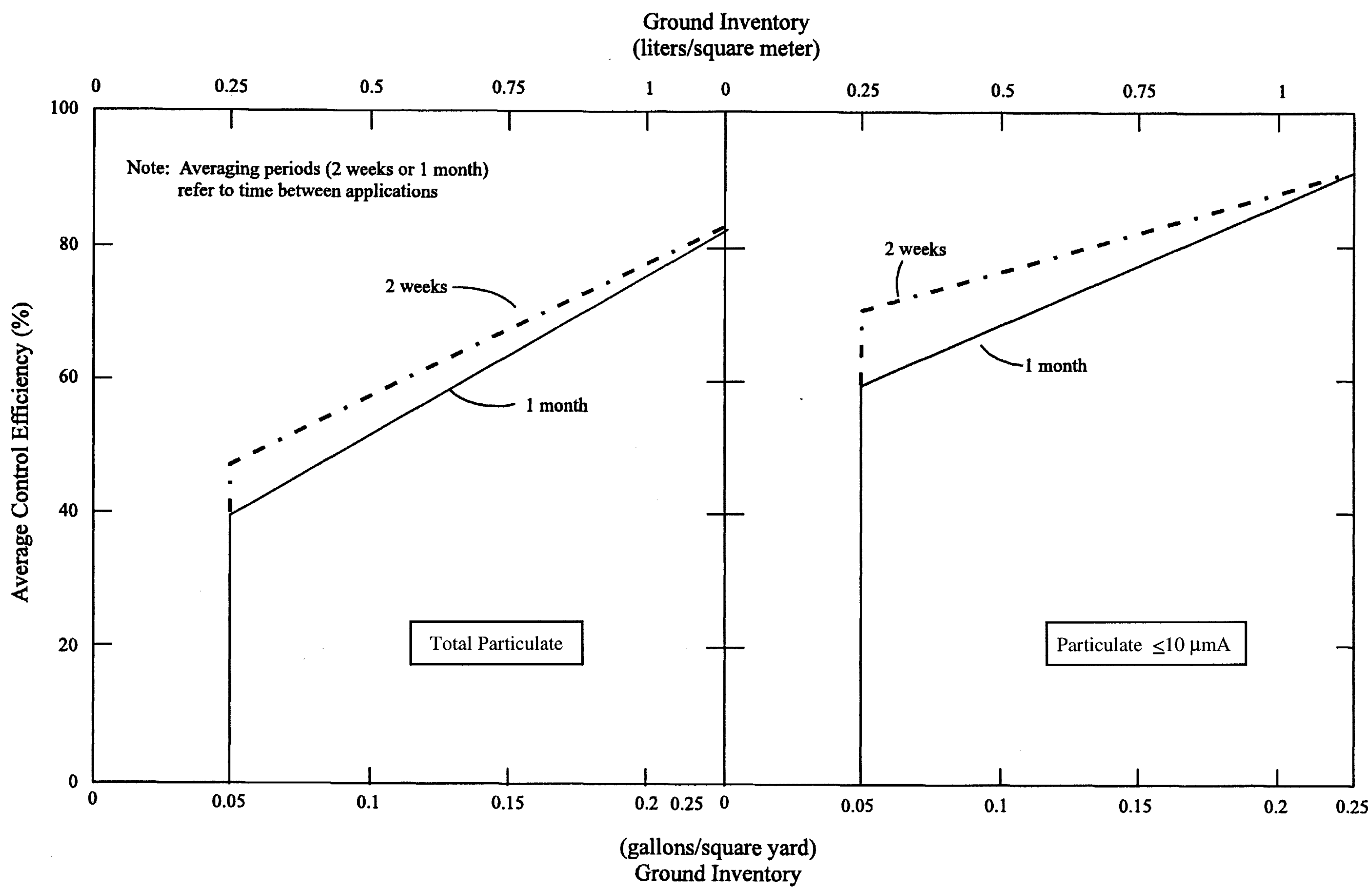

Figure 13.2.2-5. Average control efficiencies over common application intervals.

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:[11]

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

(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.

Section 8

Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

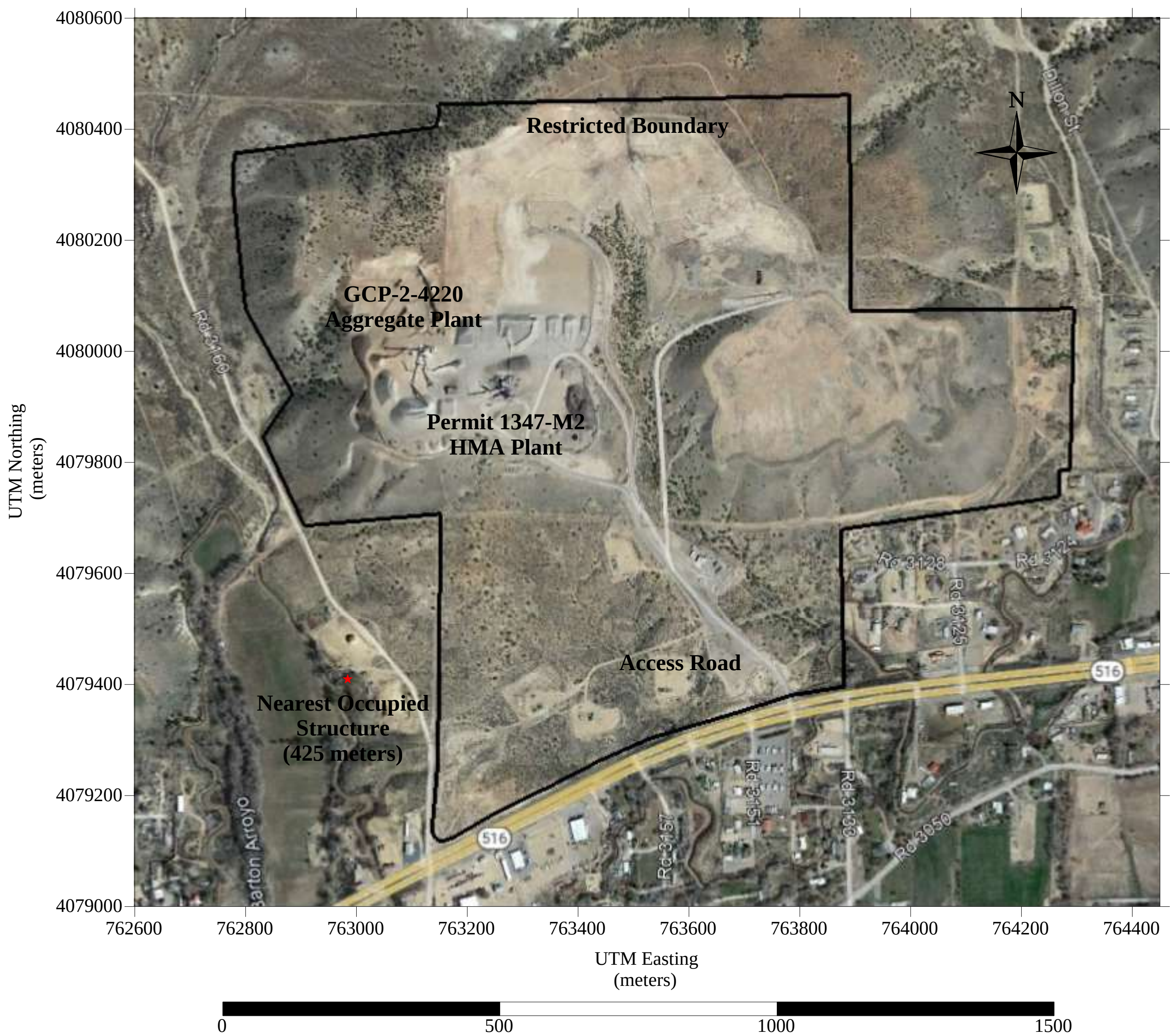

Figure 8-1: Location of Four Corners Materials Aztec HMA Plant

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)

(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☐ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**

This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. **X** A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. **X** A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. **X** A copy of the property tax record (20.2.72.203.B NMAC).
4. **X** A sample of the letters sent to the owners of record.
5. **X** A sample of the letters sent to counties, municipalities, and Indian tribes.
6. **X** A sample of the public notice posted and a verification of the local postings.
7. **X** A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. **X** A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. **X** A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. **X** A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. **X** A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

FOUR_CORNERS_MATERIALS

ACCOUNTNO	NAME1	NAME2	ADDRESS	CITYSTATEZIP	LocationAddress	LocationCity	LocationZip
R0011491	BACA REIDA KAY AND RONNIE J	<null>	PO BOX 245	AZTEC, NM 87410	1059 NM 516	AZTEC	<null>
R0012623	TIDWELL ROBERT J AND JUDITH L ETAL	<null>	631 D ST NW APT 232	WASHINGTON, DC 20004	1120 NM 516 #A	AZTEC	<null>
R0012758	WITT FRANCES R ESTATE	SHORTER RONNIE AND MARILYN	21 ROAD 3160	FLORA VISTA , NM 87415	21 ROAD 3160	AZTEC	<null>
R0012988	GARCIA HERNANDO AND ALEJANDRINA	<null>	2 ROAD 3128	AZTEC, NM 87410-9534	8 ROAD 3128	AZTEC	<null>
R0012994	SMITH TERRI	<null>	PO BOX 283	FLORA VISTA, NM 87415	11 ROAD 3128	AZTEC	<null>
R0012998	MORGAN JAMES S	<null>	9 ROAD 3126	AZTEC, NM 87410	9 ROAD 3126	AZTEC	<null>
R0013930	BENDER JAMES AND CANDACE LIVING TRUST	<null>	31 ROAD 5467	FARMINGTON, NM 87401	1060 NM 516	AZTEC	<null>
R6002346	WRIGHT DON AND BETTY TRUST ET AL	<null>	16133 N BROKEN TOP	NAMPA, ID 836518716	ROAD 3160	AZTEC	<null>
R6002347	MCWILLIAMS DAVID AND PEGGY ET AL	<null>	PO BOX 427	FLORA VISTA, NM 87415	NM 516	AZTEC	<null>
R6002348	WRIGHT DON AND BETTY TRUST ET AL	<null>	16133 N BROKEN TOP	NAMPA, ID 836518716	ROAD 3160	AZTEC	<null>

FOUR CORNERS MATERIALS
A CRH COMPANY

Four Corners Materials
9755 CR 213
Durango, CO 81303

T +1 (970) 247-2172
F +1 (970) 259-3631

www.fourcornersmaterials.com

Notice to Neighbors, Indian Tribes, Counties, and/or Municipalities
(20.2.72.203.C NMAC)

23 January 2024

CERTIFIED MAIL 9589071052700836202002
Return Receipt Requested

Ronnie J and Reida Kay Baca
PO Box 245
Aztec, NM 87410

Parcel Address: 1059 NM 516, Aztec

Re: **Four Corners Materials Air Quality Permit Modifications- Aztec Facility**

Dear **Sir or Madam,**

Oldcastle Materials SW Group Inc. dba Four Corners Materials announces its application submittal to the New Mexico Environment Department for an air quality permit **modification** of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is **February 1, 2024.**

The exact location for the proposed facility known as, **Aztec HMA Plant**, is at **1106 NM HWY 516.** The approximate location of this facility is **2.7 miles west of the HWY 550/516 Intersection** in **San Juan County, NM**

The proposed **modification** consists of: **nighttime production of asphalt.**

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and may change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM_{10}	11.36 lb/hr	17.78 tpy
$PM_{2.5}$	7.90 lb/hr	13.09 tpy
Sulfur Dioxide (SO_2)	17.70 lb/hr	29.19 tpy
Nitrogen Oxides (NO_x)	16.61 lb/hr	28.13 tpy
Carbon Monoxide (CO)	40.62 lb/hr	68.35 tpy
Volatile Organic Compounds (VOC)	19.16 lb/hr	32.23 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	3.20 lb/hr	5.30 tpy
Toxic Air Pollutant (TAP)	4.00 lb/hr	6.50 tpy
Green House Gas Emissions as Total CO_2e	n/a	17,160 tpy

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Durango, CO 81303

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F +1 (970) 259-3631

www.fourcornersmaterials.com

The standard operating schedule of the facility will be from a.m. to 7 a.m. to 7 p.m 7days a week and a maximum of 52 weeks per year. The maximum night operating schedule will be from 6 p.m to 6 a.m 7 days a week and a maximum of 52 weeks per year.

Owners and operators of the facility include:
Kyle High General Manager
1370 Bisti HWY
Farmington, NM 87401

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención

Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

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Yours sincerely,

Franchesca Mallonee

Franchesca Mallonee
Environmental Specialist
T + 1 (970) 317-8787
E Franchesca.Mallonee@fourcornersmaterials.com

FOUR CORNERS MATERIALS

A CRH COMPANY

9755 CR 213 • Durango, CO 81303

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Ronnie J and Reida Kay Baca

PO Box 245

Aztec, NM

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- ☐ Certified Mail Restricted Delivery $ $0.00
- ☐ Adult Signature Required $ $0.00
- ☐ Adult Signature Restricted Delivery $ $0.00

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01/23/2024

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Postage $0.68
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Adult Signature Required $0.00
Adult Signature Restricted Delivery $0.00
Postage $0.68
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DURANGO COLORADO JAN 23 2024 81301-USPS
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Street and Apt. No., or PO Box No. 2 Road 3178
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PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions
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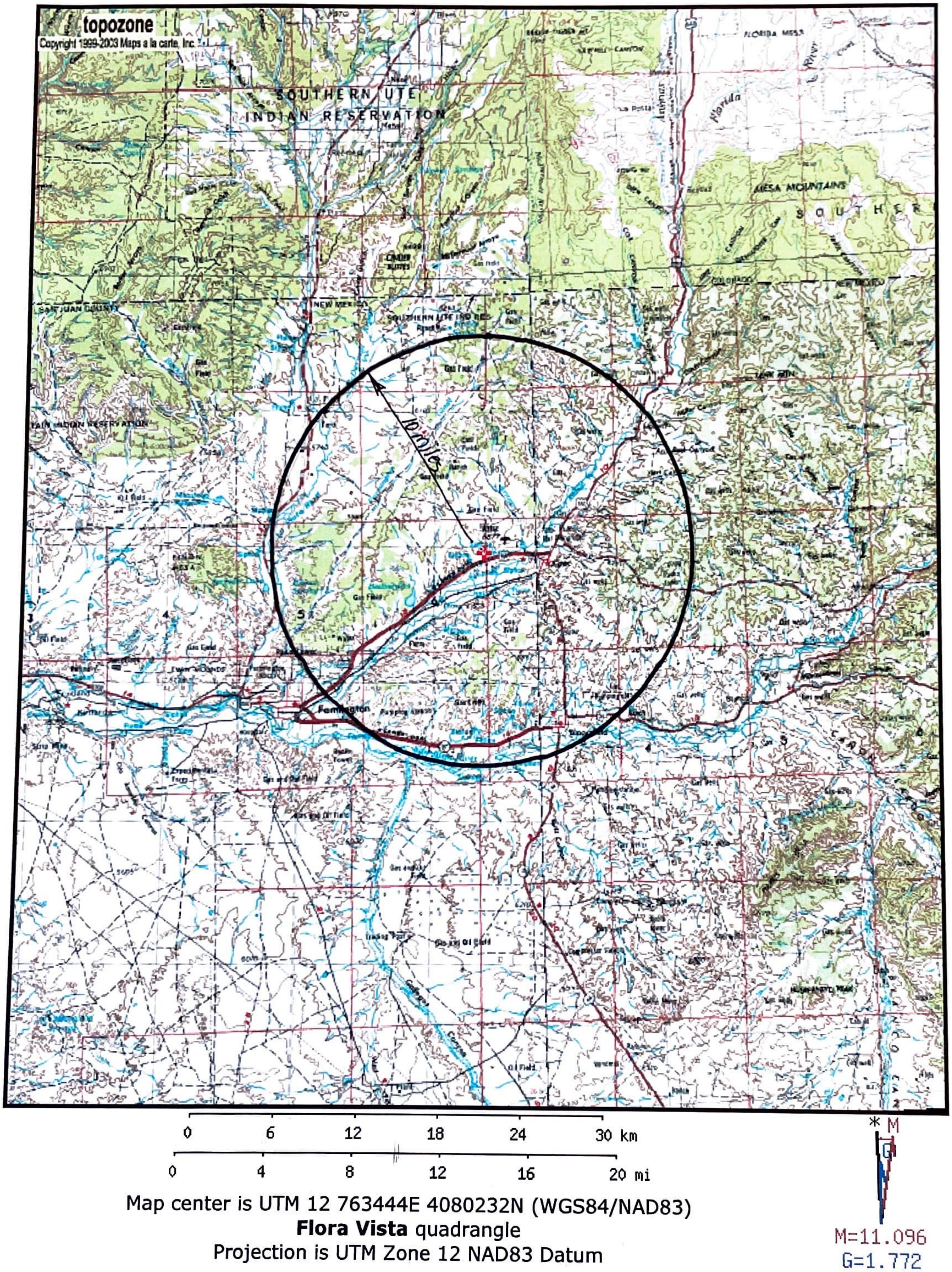

Map center is UTM 12 763444E 4080232N (WGS84/NAD83)

Flora Vista quadrangle

Projection is UTM Zone 12 NAD83 Datum

Map center is UTM 12 763444E 4080232N (WGS84/NAD83)

Flora Vista quadrangle

Projection is UTM Zone 12 NAD83 Datum

Four Corners Materials
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www.fourcornersmaterials.com

Notice to Neighbors, Indian Tribes, Counties, and/or Municipalities

(20.2.72.203.C NMAC)

23 January 2024

CERTIFIED MAIL 70201290000124936583
Return Receipt Requested

City of Aztec
201 West Chaco
Aztec, NM 87410

Re: **Four Corners Materials Air Quality Permit Modifications- Aztec Facility**

Dear **Sir or Madam,**

Oldcastle Materials SW Group Inc. dba Four Corners Materials announces its application submittal to the New Mexico Environment Department for an air quality permit **modification** of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is **February 1, 2024.**

The exact location for the proposed facility known as, **Aztec HMA Plant**, is at **1106 NM HWY 516.** The approximate location of this facility is **2.7 miles west of the HWY 550/516 Intersection** in **San Juan County, NM**

The proposed **modification** consists of: **nighttime production of asphalt.**

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Pollutant:	Pounds per hour	Tons per year
PM_{10}	11.36 lb/hr	17.78 tpy
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Carbon Monoxide (CO)	40.62 lb/hr	68.35 tpy
Volatile Organic Compounds (VOC)	19.16 lb/hr	32.23 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	3.20 lb/hr	5.30 tpy
Toxic Air Pollutant (TAP)	4.00 lb/hr	6.50 tpy
Green House Gas Emissions as Total CO_2e	n/a	17,160 tpy

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The standard operating schedule of the facility will be from a.m. to 7 a.m. to 7 p.m 7days a week and a maximum of 52 weeks per year. The maximum night operating schedule will be from 6 p.m to 6 a.m 7 days a week and a maximum of 52 weeks per year.

Owners and operators of the facility include:

Kyle High General Manager
1370 Bisti HWY
Farmington, NM 87401

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención

Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

Yours sincerely,

Franchesca Mallonee
Environmental Specialist
T + 1 (970) 317-8787
E Franchesca.Mallonee@fourcornersmaterials.com

FOUR CORNERS MATERIALS
A CRH COMPANY

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Notice to Neighbors, Indian Tribes, Counties, and/or Municipalities

(20.2.72.203.C NMAC)

23 January 2024

CERTIFIED MAIL 70201290000124936590
Return Receipt Requested

City of Bloomfield
915 N. 1st Street
Bloomfield, NM 87413

Re: **Four Corners Materials Air Quality Permit Modifications- Aztec Facility**

Dear **Sir or Madam,**

Oldcastle Materials SW Group Inc. dba Four Corners Materials announces its application submittal to the New Mexico Environment Department for an air quality permit **modification** of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is **February 1, 2024.**

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Carbon Monoxide (CO)	40.62 lb/hr	68.35 tpy
Volatile Organic Compounds (VOC)	19.16 lb/hr	32.23 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	3.20 lb/hr	5.30 tpy
Toxic Air Pollutant (TAP)	4.00 lb/hr	6.50 tpy
Green House Gas Emissions as Total CO_2e	n/a	17,160 tpy

The standard operating schedule of the facility will be from a.m. to 7 a.m. to 7 p.m 7days a week and a

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Durango, CO 81303

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maximum of 52 weeks per year. The maximum night operating schedule will be from 6 p.m to 6 a.m 7 days a week and a maximum of 52 weeks per year.

Owners and operators of the facility include:

Kyle High General Manager
1370 Bisti HWY
Farmington, NM 87401

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Yours sincerely,

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E Franchesca.Mallonee@fourcornersmaterials.com

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/

Notice to Neighbors, Indian Tribes, Counties, and/or Municipalities

(20.2.72.203.C NMAC)

23 January 2024

CERTIFIED MAIL 9589071052700836202033
Return Receipt Requested

City of Farmington
800 Municipal Drive
Farmington, NM 87401

Re: **Four Corners Materials Air Quality Permit Modifications- Aztec Facility**

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US identifies soldiers killed in strike

All 3 were assigned to unit based in Georgia

Thao Nguyen
USA TODAY

The three soldiers were identified as, from left, Spc. Kennedy Sanders, Sgt. William Rivers and Spc. Breonna Moffett, according to the U.S. Army Reserve.
SHAWN SANDERS AND U.S. ARMY VIA AP

The Department of Defense on Monday identified the three U.S. Army Reserve soldiers who were killed over the weekend at a base in Jordan near the Syrian border in what officials said was a drone attack by Iran-backed militants.

The three soldiers were identified as Sgt. William Rivers, 46, of Willingboro, New Jersey; Spc. Kennedy Sanders, 24, of Waycross, Georgia.; and Spc. Breonna Moffett, 23, of Savannah, Georgia., according to the Army Reserve. They died Sunday after a one-way, unmanned attack drone struck their housing units.

The soldiers are the first U.S. troops killed by enemy fire in the Middle East since the start of the Israel-Hamas war on Oct. 7. On Monday, the number of troops wounded in the attack rose to 40 and Deputy Pentagon press secretary Sabrina Singh noted that number may increase as troops continue to report symptoms.

Central Command said about 350 Army and Air Force personnel were deployed to the base that was attacked Sunday. The incident is under investigation.

Rivers, Sanders, and Moffett were all assigned to the 718th Engineer Company, 926th Engineer Battalion, and 926th Engineer Brigade, based at Fort Moore, Georgia. In Jordan, the three were supporting Operation Inherent Resolve — targeted operations to defeat the Islamic State terror group, according to the Defense Department.

The soldiers' deaths have "left an indelible mark on the United States Army Reserve," Lt. Gen. Jody Daniels, chief of the Army Reserve, said in a statement.

"These Citizen-Soldiers died in service to their country on Jan. 28, 2024, in Jordan," Daniels added. "On behalf of the Army Reserve, I share in the sorrow felt by their friends, family, and loved ones. Their service and sacrifice will not be forgotten, and we are committed to supporting those left behind in the wake of this tragedy."

Sgt. William Rivers, 46

Rivers, who was also a resident of Carrollton, Georgia, enlisted in the Army Reserve in 2011 and was first assigned to the 990th Engineer Company at Fort McGuire-Dix, N.J., the Army Reserve said. In support of Operation Inherent Resolve, Rivers completed a nine-month rotation to Iraq in 2018.

His awards and decorations include the Army Achievement Medal, National Defense Service Medal, and Global War on Terrorism Service Medal, among several other honors.

New Jersey Gov. Phil Murphy said he will sign an executive order later this week lowering flags to half-staff in Rivers' honor. He expressed sympathy for the soldiers' families and gratitude for the military members' "bravery and sacrifice."

Spc. Kennedy Sanders, 24

Sanders enlisted in the Army Reserve in 2019 and was first assigned to the 381st Engineer Company in Tifton, Georgia. In 2021, Sanders completed an eight-month rotation to Djibouti in support of Operation Enduring Freedom.

She was honored with the National Defense Service Medal, Global War on Terrorism Expeditionary Medal and Global War on Terrorism Service Medal, among other awards.

Flags were lowered to half-staff on Monday in Sanders' hometown of Waycross, the Associated Press reported. Her parents told the news agency that her unit was deployed to Kuwait before she was based in Jordan.

Her mother, Oneida Oliver-Sanders, said the reservist would practice jiu-jitsu and run to keep in shape during her spare time. Sanders was also relaxed by knitting and called home almost daily.

The two last spoke the day before Sanders was killed, according to Oliver-Sanders. Sanders told her mother that she was thinking about buying a motorcycle and also spoke recently about buying a home.

"All of these different things that she had plans for, you know, were just cut short in the blink of an eye," Oliver-Sanders said.

Spc. Breonna Moffett, 23

Moffett enlisted in the Army Reserve in 2019 soon after graduating high school and was first assigned to the 381st Engineer Company in Tifton, Georgia. Her awards include the National Defense Service Medal and the Army Service Ribbon.

Community reactions and condolences poured in shortly after Moffett was identified Monday. Savannah Mayor Van Johnson said in a statement on Facebook that the soldiers were heroes.

"The City of #Savannah joins me in mourning the heartbreaking loss of three U.S. Army Reserve soldiers from Georgia who were killed when an unmanned aerial drone impacted their container housing units in Jordan," Johnson said. "One of these soldiers was our very own, Breonna Alexsondria Moffett of Savannah, a Windsor Forest High School graduate."

The Windsor Forest Mighty Marching Knights also posted on Facebook honoring Moffett, who was a drum major for the band.

In addition to her military service, Moffett worked for a home care provider cooking, cleaning, and running errands for people with disabilities, her parents told the AP. Moffett's parents said their daughter celebrated her 23rd birthday just nine days before she was killed. She was the oldest of four siblings.

"I just hope and pray no other family has to go through this," Francine Moffett, her mother, said. "It takes your heart and your soul."

Contributing: John Bacon and Jorge L. Ortiz, USA TODAY; Evan Lasseter, Savannah Morning News; Jim Walsh, Cherry Hill Courier-Post; The Associated Press

NOTICE OF AIR QUALITY PERMIT APPLICATION

Oldcastle SW Group Inc., dba Fout Corners Materials announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **hot mix asphalt** facility. The expected date of application submittal to the Air Quality Bureau is **February, 2024.**

The exact location of the facility known as, **Aztec HMA Plant**, is at **1106 NM Hwy 516, Aztec, NM 87410.** The approximate location of this facility is 2.7 miles west of the HWY 550/516 Intersection in San Juan County, New Mexico.

The proposed **modification** consists of **nighttime production of asphalt.**

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Particulate Matter (PM)	11.36 lb/hr	17.78 tpy
PM_{10}	7.90 lb/hr	13.09 tpy
$PM_{2.5}$	17.70 lb/hr	29.19 tpy
Sulfur Dioxide (SO_2)	16.61 lb/hr	28.13 tpy
Nitrogen Oxides (NO_x)	40.62 lb/hr	68.35 tpy
Carbon Monoxide (CO)	19.16lb/hr	32.23 tpy
Volatile Organic Compounds (VOC)	3.20 lb/hr	5.30 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	4.00 lb/hr	6.50 tpy
Toxic Air Pollutant (TAP)	4.00 lb/hr	6.50 tpy
Green House Gas Emissions as Total CO_2e	n/a	17,160 tpy

The standard operating schedule of the facility will be from 7a.m. to 7 p.m. 7 days a week and a maximum of 52 weeks per year. The nighttime maximum operating schedule will be from 6 p.m. to 6 a.m. 7 days a week and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is:

Kyle High, General Manager
1370 Bisti HWY
Farmington, NM 87401

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

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Notice of Non-Discrimination

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

TX-GC11

Legal Notices

PLANNING & ZONING COMMISSION
NOTICE OF PUBLIC HEARING

Notice is hereby given that the following agenda items will be presented to the Planning & Zoning Commission of the City of Farmington, New Mexico.

Petition SUP 24-01 – A request for a Special Use Permit to allow for keeping of one horse on a residential property. Located at 300 Dekalb Rd.

Pursuant to the provisions of Section 3-21-6, New Mexico Statutes Annotated, 1978 Compilation, notice is hereby given that items listed above will be considered at the regularly scheduled public hearing of the Planning & Zoning Commission of the City of Farmington on **Thursday, February 15, 2024** at 3:00 p.m. in the City Council Chambers, City Hall, 800 Municipal Drive, Farmington, New Mexico. All persons of interest are invited to attend and shall have an opportunity to be heard.

Tami Spencer
Administrative Assistant
505-599-1301
#5877745, Daily Times, 1/31/24

PUBLIC NOTICE IS HEREBY GIVEN that the San Juan College Board of Trustees has changed the time of the monthly meeting scheduled for February 6, 2024. The Work Session will take place at 5:45 p.m. in Work Session Room #306 and the Board Meeting will take place at 7:00 p.m. in Board Room #308 on the 3rd Floor of the 30th Street Education Center located at 3401 East 30th Street in Farmington, NM.

Agendas for these meetings will be available in the President's Office at San Juan College not less than 72 hours prior to the session and will also be posted on the college website http://www.sanjuancollege.edu/presdients-office/presidents-office/board-of-trustees/meeting-agendas-and-minutes/.

Individuals with a disability or who are in need of special services for a public hearing or meeting, should contact the President's Office at (505) 566-3209 at least three (3) days prior to the meeting or as soon as possible.
#5877750, Daily Times, 1/31/24

Legal Notices

LEGAL NOTICE
Shiprock – Navajo Nation, San Juan County New Mexico

SHIPROCK DINE YOUTH REQUEST FOR PROPOSALS
New Heavy Duty Full-size 15 Passenger Van Purchase for Shiprock Dine Youth
BID NO. # 24-01-3226LE

Shiprock Dine Youth is seeking proposals from qualified vendors to provide bids for the purchase of One (1) New Heavy Duty 15-Passenger Van. Detailed instructions and minimum requirements for the bids may be obtained from Shiprock Dine Youth located at Shiprock Youth Complex, South of Shiprock BIA Complex, US Hwy 491, Shiprock, NM or by calling 505-368-1125 or via email to Jonathan Tso, Program Supervisor III at jonathantso@nndode.org

To obtain bid packet, go to https://www.nnooc.org/request-for-proposals/

All bids must be received by Friday, February 16, 2024, at 4:00pm (MST). No faxed or emailed proposals will be accepted. This invitation is unrestricted; however, the Navajo Nation Business Opportunity Act will be applied.
#5875317, Daily Times, January 31, February 4, 7,11, 14, 2024

PUBLIC NOTICE OF DRAFT MS4 ANNUAL REPORT

The San Juan County announces the availability of the Draft MS4 Annual Report for the San Juan County's Stormwater Management Program, which is required by the U.S. EPA National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4) under Permit No. NMR040000. The report is available for public review and comment at the San Juan County's website: https://www.sjcounty.net/government/public-works. Please provide any comments before February 29, 2024 to Lisa Hale-BlueEyes, San Juan County, 305 S. Oliver Street, Aztec, NM at 505-334-7864 or lisa.blueeyes@sjcounty.net.
#5876679, Daily Times, 1/28, 1/31/24

ADVERTISEMENT FOR BIDS
No. 23-24-19

San Juan County will accept sealed bids for a **Price Agreement for the Purchase of Surface Treatment Aggregate until 2:00 p.m. (Local Time), February 27, 2024,** at the Central Purchasing Office, 213 S. Oliver, Aztec, NM 87410.

Bid documents may be obtained at www.sjcounty.net or (505) 334-4548.

NIGP Code: 750.35
#5877687, Daily Times, 1/31/24

Legal Notices

INVITATION TO BID

Submission of sealed bids are invited for Bidders for the Lower Animas Ditch Company, Toby's Seep Ditch Repair Improvements Flora Vista New Mexico, 87415.
The nature of the work is the ditch repair improvements involving approximately 706 feet of 60" diameter HDPE pipe and miscellaneous items of work.
Sealed bids to complete this work will be received by Cheney-Walters-Echols, Inc. at their office, 909 W. Apache St., Farmington, NM 87401, until 2:00 p.m. (local time), February 19, 2024 at which time and place all quotes will be publicly opened and tabulated. Bids received after 2:00 p.m. shall not be accepted.
Bid Documents for this construction project may be purchased by interested parties at the office of Cheney-Walters-Echols, Inc., 909 W. Apache St., Farmington, NM, 87401 (505) 327-3303 for a fee of $100.00 per full paper set. The documents may also be obtained via drop box at no cost. NO PARTIAL SETS WILL BE ISSUED.
A Pre-Bid Conference will be held at 2:00 p.m., (local time) Wednesday, February 6, 2024 at the office of Cheney-Walters-Echols, Inc. A tour of the project site will follow.
Bid Security in the amount of 5% of the total bid shall accompany each bid in accordance with Instructions to Bidders. All bidders shall hold their bids for 60 days after actual date of bid opening.
A wage rate decision for this project has been issued (SJ-24-0009-A).
The Owner reserves the right to reject any or all Bids and to waive informalities or irregularities in the Bidding.
NOTICE OF REGISTRATION REQUIREMENT. Bidders are reminded that in order to be considered for bid award, all contractors (including their subcontractors if at a specific cost threshold) must be registered under the LaborEnforcement Fund with the New Mexico Department of Workforce Solutions on the date bids are unconditionally accepted for consideration for bid award and must remain actively registered in order to perform work under this solicitation. The Contractor selected for award of a contract shall provide documentation to verify compliance with this paragraph prior to execution of a contract.
No. 5877158, The Daily Times, Jan. 29, 31, 2024

STATE OF NEW MEXICO
COUNTY OF SAN JUAN
11th JUDICIAL DISTRICT COURT
No. D-1116-PB-2023-112-V
IN THE MATTER OF THE ESTATE OF
ARTIE MERLYN REYNOLDS, Deceased.
NOTICE TO CREDITORS
NOTICE IS HEREBY GIVEN that Celsey Kerr, has been appointed Personal Representative of this Estate. All persons having claims against this estate are required to present their claims within four (4) months after the date of the first publication of this Notice or the claims will be forever barred. Claims must be presented either to Brandt Thrower Law Firm, P. C., Attorney for Personal Representative, 412 W. Arrington St., Farmington, NM, 87401, or filed with the 11th Judicial District Court, 103 S. Oliver Dr., Aztec, NM, 87410.
/s/ BRANDT THROWER
Attorney For Personal Representative
412 W. Arrington St.
Farmington, NM 87401
(505) 325-4575
#5877600, Daily Times, Jan. 31, Feb. 7, 14, 2024

STATE OF NEW MEXICO
COUNTY OF SAN JUAN
11th JUDICIAL DISTRICT COURT
No. D-1116-PB-2023-111-V
IN THE MATTER OF THE ESTATE OF
LOUIS E. EBERHARTER, Deceased.
NOTICE TO CREDITORS
NOTICE IS HEREBY GIVEN that Louis Scott Eberharter, has been appointed Personal Representative of this Estate. All persons having claims against this estate are required to present their claims within four (4) months after the date of the first publication of this Notice or the claims will be forever barred. Claims must be presented either to Brandt Thrower Law Firm, P. C., Attorney for Personal Representative, 412 W. Arrington St., Farmington, NM, 87401, or filed with the 11th Judicial District Court, 103 S. Oliver Dr., Aztec, NM, 87410.
/s/ BRANDT THROWER
Attorney For Personal Representative
412 W. Arrington St.
Farmington, NM 87401
(505) 325-4575
#5877598, Daily Times, Jan. 31, Feb. 7, 14, 2024

Legal Notices

STATE OF NEW MEXICO
COUNTY OF SAN JUAN
11th JUDICIAL DISTRICT COURT
No. D-1116-PB-2023-113-V
IN THE MATTER OF THE ESTATE OF
LAWRENCE M. "BRONC"
WILLIAMS, Deceased.
NOTICE TO CREDITORS
NOTICE IS HEREBY GIVEN that Donald J. Jones., has been appointed Personal Representative of this Estate. All persons having claims against this estate are required to present their claims within four (4) months after the date of the first publication of this Notice or the claims will be forever barred. Claims must be presented either to Brandt Thrower Law Firm, P. C., Attorney for Personal Representative, 412 W. Arrington St., Farmington, NM, 87401, or filed with the 11th Judicial District Court, 103 S. Oliver Dr., Aztec, NM, 87410.
/s/ BRANDT THROWER
Attorney For Personal Representative
412 W. Arrington St.
Farmington, NM 87401
(505) 325-4575
#5877599, Daily Times, Jan. 31, Feb. 7, 14, 2024

STATE OF NEW MEXICO
COUNTY OF SAN JUAN
11th JUDICIAL DISTRICT COURT
No. D-1116-PB-2023-109-V
IN THE MATTER OF THE ESTATE OF
RONALD GENE DeSHERLIA, Deceased.
NOTICE TO CREDITORS
NOTICE IS HEREBY GIVEN that Jimmy D. DeSherlia, has been appointed Personal Representative of this Estate. All persons having claims against this estate are required to present their claims within four (4) months after the date of the first publication of this Notice or the claims will be forever barred. Claims must be presented either to Brandt Thrower Law Firm, P. C., Attorney for Personal Representative, 412 W. Arrington St., Farmington, NM, 87401, or filed with the 11th Judicial District Court, 103 S. Oliver Dr., Aztec, NM, 87410.
/s/ BRANDT THROWER
Attorney For Personal Representative
412 W. Arrington St.
Farmington, NM 87401
(505) 325-4575
#5877601, Daily Times, Jan. 31, Feb. 7, 14, 2024

STATE OF NEW MEXICO
COUNTY OF SAN JUAN
ELEVENTH JUDICIAL DISTRICT COURT
No. D-1116-CV-2022-00883

NUSENDA FEDERAL CREDIT UNION,
Plaintiff,
v.
PRESTON JAYCE ALLISON,
Defendant.
NOTICE OF PENDENCY OF SUIT
To Defendant Preston Jayce Allison.
You are hereby notified that the above-named Plaintiff has filed a civil action against you in the above-entitled Court and cause, the general object thereof being to recover money due.
That unless you respond to the Complaint within 30 days of completion of publication of this Notice, judgment by default will be entered against you.
Name, address, and phone number of Plaintiff's attorney: Wainwright and Associates, P.A., 800 Lomas Blvd NW, Suite 100, Albuquerque, NM 87102, 505-842-1313.
WITNESS the Honorable Sarah V Weaver, District Judge of the Eleventh Judicial District Court of the State of New Mexico and the Seal of the District Court of San Juan County, on January 12, 2024.
/s/Jodie Schwebel
CLERK OF THE DISTRICT COURT
#5875609, Daily Times, Jan. 28, 31, Feb. 7, 2024

Legal Notices

NOTICE OF AIR QUALITY PERMIT APPLICATION

Oldcastle SW Group Inc., dba Fout Corners Materials announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **hot mix asphalt** facility. The expected date of application submittal to the Air Quality Bureau is **February, 2024.**

The exact location of the facility known as, **Aztec HMA Plant**, is at **1106 NM Hwy 516, Aztec, NM 87410.** The approximate location of this facility is 2.7 miles west of the HWY 550/516 Intersection in San Juan County, New Mexico.

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Green House Gas Emissions as Total CO_2e	n/a	17,160 tpy

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The owner and/or operator of the Facility is:

Kyle High, General Manager
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Farmington, NM 87401

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Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

General information about air quality and the permitting process, and links to the regulations can be found at the Air Quality Bureau's website: www.env.nm.gov/air-quality/permitting-section-home-page/. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC.

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Legal Notices

LEGAL NOTICE
Window Rock-Apache County Arizona

The Navajo Nation Department of Retirement Services (NDRS) is seeking Requests for Statements of Qualification (RSQ) from firms interested in providing recordkeeping and plan administration services for the Navajo Nation 401(k) Savings Plan and non-qualified Deferred Compensation Plan. The Navajo Nation has engaged WTW to assist with the solicitation. To obtain the RFQ and for more detailed information, email inquiries to Navajo.Nation.DRS-VS@wtwco.com Interested firms must submit a Notice of Intent to Respond by email by February 1, 2024. Responses must be received by WTW by February 5, 2024.
Legal #24-01-3225SB published in Publication January 29 & 30 & 31 & February 1 & 2, 2024.

Legal Notices

STATE OF NEW MEXICO
COUNTY OF SAN JUAN
ELEVENTH JUDICIAL DISTRICT COURT
No. D-1116-CV-2017-01458
SUN WEST MORTGAGE COMPANY, INC.,
Plaintiff,
vs.
CHARLES W. ROUFBERG, IF LIVING, IF DECEASED, WILLIAM CADY AS THE PERSONAL REPRESENTATIVE OF THE ESTATE OF BARBARA S. ROUFBERG, DECEASED, AND CONSECO FINANCE SERVICING CORP.
Defendants.
NOTICE OF SALE
NOTICE IS HEREBY GIVEN that on March 6, 2024, at the hour of 12:30 PM, the undersigned Special Master, or his designee, will, at the front entrance of the San Juan County Courthouse, at 851 Andrea Dr., Farmington, NM 87401, sell all of the rights, title, and interests of the above-named Defendant(s), in and to the hereinafter described real property to the highest bidder for cash. The property to be sold is located at 22 Road 2893, Aztec, New Mexico 87410, and is more particularly described as follows:
A tract of land in the Southeast Quarter of the Northeast Quarter (SE/4NE/4) of Section Thirty-Four (34), in Township Thirty-One (31) North of Range Eleven (11) West, N.M.P.M., San Juan County, New Mexico, also being known as a portion of Tract One (1) of the WILDWOOD SUBDIVISION, San Juan County, New Mexico, as shown on the Plat of said Subdivision filed for record August 10, 1979, being more particularly described as follows:
BEGINNING at a point that is the East Quarter corner of said Section 34, also being a point on the Southerly line of said Tract 1; THENCE North 89°23'24" West 570.05 feet along said Southerly line;
THENCE North 01°00'07" West 348.65 feet to the Southwest corner of that tract of land granted to Elizabeth I. Lloyd, et vir, by warranty deed recorded in Book 1337, page 719 of the Records of said County;
THENCE South 89°23'24" East 285.02 feet along the Southerly line of said Lloyd tract to the Southwest corner of a second tract of land granted to Elizabeth I. Lloyd, et vir, by warranty deed recorded in Book 1337, page 720 of the Records of said County;
THENCE South 89°23'24" East 285.02 feet along the Southerly line of said second Lloyd tract to its Southeast corner;
THENCE South 01°00'00" East 348.65 feet, more or less, to the point of beginning,
including a 2003 Solitaire, Vehicle Identification No. DMH-1081NFB, (hereinafter the "Property"). If there is a conflict between the legal description and the street address, the legal description shall control.
The foregoing sale will be made to satisfy a foreclosure judgment rendered by this Court in the above-entitled and numbered cause on December 27, 2023, being an action to foreclose a mortgage on the Property. Plaintiff's judgment is in the amount of $242,033.50, and the same bears interest at the rate of 4.5% per annum, accruing at the rate of $29.84 per diem. The Court reserves entry of final judgment against Defendant(s), Sarah K. Roufberg-Cady, for the amount due after foreclosure sale, including interest, costs, and fees as may be assessed by the Court. Plaintiff has the right to bid at the foregoing sale in an amount equal to its judgment, and to submit its bid either verbally or in writing. Plaintiff may apply all or any part of its judgment to the purchase price in lieu of cash.
In accordance with the Court's decree, the proceeds of sale are to be applied first to the costs of sale, including the Special Master's fees, and then to satisfy the above-described judgment, including interest, with any remaining balance to be paid unto the registry of the Court in order to satisfy any future adjudication of priority lienholders.
NOTICE IS FURTHER GIVEN that in the event that the subject Note and Mortgage is not sooner paid off or reinstated, the undersigned Special Master will, as set forth above, offer for sale and sell the Property to the highest bidder for cash or equivalent, for the purpose of satisfying, in the adjudged order of priorities, the judgment and decree of foreclosure described herein, together with any additional costs and attorney's fees, including the costs of advertisement and publication for the foregoing sale, and, reasonable receiver and Special Master's fees in an amount to be fixed by the Court. The amount of the judgment due is $242,033.50, plus interest to and including date of sale in the amount of $47,863.36 for a total judgment of $289,896.86.
The foregoing sale may be postponed and rescheduled at the discretion of the Special Master, and is subject to all taxes, utility liens and other restrictions and easements of record, and subject to a one (1) month right of redemption held by the Defendant(s) upon entry of an order approving sale, and subject to the entry of an order of the Court approving the terms and conditions of sale.
Witness my hand this 5th day of January, 2023.
/s/ David Washburn
DAVID WASHBURN, Special Master
8100 Wyoming Blvd NE
Suite M-4, Box 272
Albuquerque, NM 87113
Telephone: (505) 318-0300
E-mail: sales@nsi.legal
#5872131, Daily Times, Jan. 10, 17, 24, 31, 2024

Last Run Date
1/31/2024

Ad Number
GCI1133125

Publication
Farmington Daily Times

Market
El Paso

Delivery Method
Both

Number of Affidavits Needed
1

Customer Email
franchesca.mallonee@fourcornersmaterials.com

Customer Name
FOUR CORNERS MATERIALS INC.

Customer Address
franchesca.mallonee@fourcornersmaterials.com

Account Number (If Known)
12327

Name
FOUR CORNERS MATERIALS INC.

Street
PO BOX 1969

City
BAYFIELD

State
CO

ZIP Code
81122

Your Name
Alex Helmbrecht

Email Address
ahelmbrech@gannett.com

THE DAILY TIMES

AFFIDAVIT OF PUBLICATION
Ad No.
GCI1133125

FOUR CORNERS MATERIALS INC
PO BOX 1969
BAYFIELD, CO 81122
ATTN FRANCHESCA MALLONEE

I, being duly sworn say: **THE DAILY TIMES**, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said **DAILY TIMES**, a daily newspaper duly qualified for the purpose within the State of New Mexico for publication and appeared in the internet at The Daily Times web site on the following days(s):

1/31/204

Legal Clerk
Subscribed and sworn before me this
31st of January, 2024

State of WI, County of Brown
NOTARY PUBLIC

1-7-25

My Commission Expires

KATHLEEN ALLEN
Notary Public
State of Wisconsin

Ad#: GCI1133125-01
Ad Cost: $360.90
PO: PUBLIC NOTICE
# of Affidavits: 1

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Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

TX-GCI1133125-01

General Posting of Notices – Certification

I, Franchesca Mallonee, the undersigned, certify that on **1/29/24,** posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in **Aztec** and **Flora Vista** in **San Juan** County, State of New Mexico on the following dates:

1. Facility entrance 1-26-24
2. San Juan County Administration Building 1-26-24
3. Aztec Post Office 1-26-24
4. Flora Vista Post Office 1-26-24

Signed this 29 day of January, 2024

FMallonee
Signature

1-29-24
Date

Franchesca Mallonee
Printed Name

Environmental Specialist
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Notary for the State of Colorado

Ryan Lee

Ryan Lee

RYAN LEE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20224022113
MY COMMISSION EXPIRES 06/03/2026

NOTICE

Oldcastle SW Group, Inc. dba Four Corners Materials announces its application to the New Mexico Environment Department for an air quality permit for the **modification** of its **hot mix asphalt** facility. The expected date of application submittal to the Air Quality Bureau is **February 2024.**

The exact location for the proposed facility known as, Aztec HMA Plant, is at **1106 NM HWY 516 Aztec, New Mexico 87410.** The approximate location of this facility is **2.7** miles west of the **HWY 550/516 Intersection** in San Juan County.

The proposed **modification** consists of: **nighttime production of asphalt**.

The estimated maximum quantities of any regulated air contaminants will be as follows in pound per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Particulate Matter (PM)	11.36 lb/hr	17.78 tpy
PM_{10}	7.90 lb/hr	13.09 tpy
$PM_{2.5}$	17.70 lb/hr	29.19 tpy
Sulfur Dioxide (SO_2)	16.61 lb/hr	28.13 tpy
Nitrogen Oxides (NO_x)	40.62 lb/hr	68.35 tpy
Carbon Monoxide (CO)	19.16 lb/hr	32.23 tpy
Volatile Organic Compounds (VOC)	3.20 lb/hr	5.30 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	4.00 lb/hr	6.50 tpy
Toxic Air Pollutant (TAP)	4.00 lb/hr	6.50 tpy
Green House Gas Emissions as Total CO_2e	n/a	17,160 tpy

The standard operating schedule of the facility will be from 7 a.m. to 7 p.m. 7 days a week and a maximum of 52 weeks per year. The maximum night operating schedule will be from 6 p.m. to 6 a.m. 7 days a week and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is:

Kyle High, General Manager
1370 Bisti HWY
Farmington, NM 87401

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

With your comments, please refer to the company name and facility name, or send a copy of this notice along with your comments. This information is necessary since the Department may have not yet received the permit application. Please include a legible return mailing address. Once the

Department has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location. This information is also posted at the following locations:
Aztec Post Office
Flora Vista Post Office
San Juan County Administration Office
Four Corners Aztec Facility

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

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Submittal of Public Service Announcement – Certification

I, Franchesca Mallonee, the undersigned, certify that on 1-26-24, submitted a public service announcement to KENN Radio that serves the City of Aztec, San Juan County, New Mexico, in which the source is or is proposed to be located and that KENN Radio did respond that it would air the announcement.

Signed this 29 day of January, 2024

F. Mallonee
Signature

1-29-24
Date

Franchesca Mallonee
Printed Name

Environmental Specialist
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Notary for the Stat Of Colorado

Ryan Lee

Ryan Lee

RYAN LEE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20224022113
MY COMMISSION EXPIRES 06/03/2026

Section 10

Written Description of the Routine Operations of the Facility

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<u>A written description of the routine operations of the facility</u>. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

The FCM Aztec HMA produces hot mix asphalt concrete. The operation is typical to a continuous drum mix HMA operation. Aggregate (Unit AGGPILE) is loaded into the Cold Aggregate Feed Bins (Unit 46.801.01), where it is metered onto the Aggregate Feed Bin Collection Conveyor (Unit 46.801.03). From the Aggregate Feed Bin Collection Conveyor the aggregate is sent to the Scalping Screen and Scalping Screen Conveyor (Units 46.801.02a and 46.801.02b) and Pug Mill (Unit 46.801.05). The Mineral Filler Silo (Unit 46.801.16) 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 46.801.06a). The Pug Mill Conveyor transfers the material onto the Transfer Conveyor (Unit 46.801.6b) and sends the aggregate/mineral filler to the Drum Dryer (Unit 46.801.07). RAP is loaded into the RAP Feed Bin (Unit 46.801.10), where it is metered onto the RAP Feed Bin Conveyor (Unit 46.801.15) and then transferred to the RAP Screen (Unit 46.801.11). The RAP Scale Transfer Conveyor (Unit 46.801.12a and 46.801.12b) 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 Incline Slat Conveyor (Unit 46.801.13) to one of two Asphalt Silos (Unit 46.801.14a and 46.801.14b).

Control Units include a Drum Dryer/Mixer Dust Collector (Unit 46.801.09) that captures particulates generated at the Drum Dryer/Mixer and Mineral Filler Silo Dust Collector (Unit 46.801.16B) that captures particulates generated during loading of the Mineral Filler Silo. Controlled particulates exhaust the Drum Dryer/Mixer Dust Collector Stack (Stack 46.801.09s) and Mineral Filler Silo Dust Collector Stack (Stack 46.801.16Bs).

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 to reduce the chance that wind will blow any generated fugitive dust away and/or water sprays, as needed, at the exit of the feed bins.

Fugitive dust is controlled when material enters and exits the Scalping Screen (Units 46.801.02a and 46.801.02b), Pug Mill (Unit 46.801.05), and RAP Scalping Screen (Unit 46.801.11) with the addition of water, as needed, on the material at the Scalping Screen, Pug Mill, and RAP Scalping Screen.

All baghouse fines that are captured in the Drum Dryer/Mixer Dust Collector (Unit 46.801.09) are recycled back to the Drum Dryer using an enclosed loop with no visible emissions. The system is a closed loop. All baghouse fines are emptied before maintenance or relocation.

Baghouse fines that are captured in the Mineral Filler Silo Dust Collector (Unit 46.801.16B) are recycled back to the Mineral Filler Silo.

There are no pollution controls for the Aggregate/RAP Storage Piles (Unit AGGPILE), Aggregate or RAP Feed Bins (Units 46.801.01, 46.801.10), Incline Slat Belt (Unit 46.801.13), Asphalt Silos (Units 46.801.14a,46.801.14b). Asphalt Heaters (Unit 46.801.19), or Hot Oil Asphalt Storage Tanks (2 total) (Units 46.801.14a, 46.801.14b).

All truck traffic travels (Unit TRCK) to the HMA Plant on the Main Entrance road. The road is controlled with paving and sweeping to the HMA Plant. All truck traffic leaves the same way. Aggregate materials come from the aggregate plant onsite or on-site stockpiles.

Annual emissions are controlled by permit limits on annual production for processing equipment and hours of operation for the asphalt heater.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

X Yes ☐ No

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

X Yes ☐ No

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

X Yes ☐ No

C. Make a determination:

X The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Section 12

Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. **This facility is:**

- X **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories:**

a. **NOx: 28.1 TPY**
b. **CO: 68.4 TPY**
c. **VOC: 32.2 TPY**
d. **SOx: 29.2 TPY**
e. **PM: 33.7 TPY**
f. **PM10: 17.8 TPY**
g. **PM2.5: 13.1 TPY**
h. **Fluorides: <0.01 TPY**
i. **Lead: 0.0075 TPY**
j. **Sulfur compounds (listed in Table 2): NA**
k. **GHG: 17,159 TPY**

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:
For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

To save paper and to standardize the application format, delete this sentence, and begin your submittal for this attachment on this page.

Table for STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	20.2.3 NMAC is a SIP approved regulation that limits the maximum allowable concentration of Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This facility is subject to 20.2.7 NMAC.
20.2.11 NMAC	Asphalt Process Equipment	Yes	46.801.07, 46.801.16	These sources are subject to 20.2.11.108 NMAC and 20.2.11.109 NMAC.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	46.801.19	Engines and heaters are Stationary Combustion Equipment. Specify units subject to this regulation. The facility stationary combustion equipment are subject to a 20 percent opacity limit.
20.2.70 NMAC	Operating Permits	No	Facility	This facility is not a Title V Operating Permit source. The facility consists of aggregate processing plants and HMA plants. Aggregate processing falls under 2-digit SIC Code Group 14 and HMA plants falls under 2-digit SIC Code Group 29. While aggregate material from aggregate processing plants is used in the HMA plant, since they are operating under different SIC Codes they are separate facilities for major source determination.
20.2.71 NMAC	Operating Permit Fees	No	Facility	This facility is not a Title V Operating Permit source.
20.2.72 NMAC	Construction Permits	Yes	Facility	Potential emission rate (PER) for the facility is greater than 10 pph or greater than 25 tpy for any pollutant subject to a state or federal ambient air quality standard.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	**NOI:** 20.2.73.200 NMAC applies (requiring a NOI application) **Emissions Inventory Reporting:** 20.2.73.300 NMAC applies.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	Facility	This facility is not a PSD major source.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This facility is subject to 20.2.72 NMAC and is in turn subject to 20.2.75 NMAC.
20.2.77 NMAC	New Source Performance	Yes	Units subject to 40 CFR 60	This is a stationary source, which is subject to the requirements of 40 CFR Part 60.
20.2.78 NMAC	Emission Standards for HAPS	No	Units Subject to 40 CFR 61	This facility doesn't emit hazardous air pollutants which are subject to the requirements of 40 CFR Part 61.

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	This facility is located in an Attainment Area.
20.2.80 NMAC	Stack Heights	Yes	46.801.07, 46.801.16, 46.801.19	The objective of this Part is to establish requirements for the evaluation of stack heights and other dispersion techniques in permitting decisions. The Department shall give no credit for reductions in emissions due to the length of a source's stack height that exceeds good engineering practice or due to any other dispersion technique. The facility will meet all requirements of good engineering practices.
20.2.82 NMAC	MACT Standards for source categories of HAPS	No	Facility	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63.

Table for Applicable FEDERAL REGULATIONS:

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	This is a 20.2.72 NMAC permit application.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	Units subject to 40 CFR 60	Subpart I in 40 CFR 60 applies.
NSPS 40 CFR60.40, Subpart I	Subpart I, Performance Standards for **Hot Mix Asphalt Facilities**	Yes	46.801.07, 46.801.16	The affected facility, that commences construction or modification after June 11, 1973, to which the provisions of this subpart apply is each hot mix asphalt facility. For the purpose of this subpart, a hot mix asphalt facility is comprised only of any combination of the following: dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler, systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984	No		This facility does not have storage vessels with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR Part 60 Subpart OOO	Standards of Performance for **Nonmetallic Mineral Processing Plants**	No		NSPS standards for non-metallic minerals apply to applicable crushers, screens, and conveyors. No crushers operating at the facility.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No		The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE). No stationary CI ICE engine operating at the facility.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	No		See 40 CFR 60.4230 and EPA Region 1's Reciprocating Internal Combustion Guidance website.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	Units Subject to 40 CFR 61	Applies if any other Subpart in 40 CFR 61 applies.
MACT 40 CFR 63, Subpart A	General Provisions	No	Units Subject to 40 CFR 63	Applies if any other Subpart in 40 CFR 63 applies.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	No		Facilities are subject to this subpart if they own or operate a stationary RICE, except if the stationary RICE is being tested at a stationary RICE test cell/stand. Applicable if the units are located at the same location for a period of 12 months. No stationary CI ICE engine operating at the facility.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

Operational Plan to Mitigate Emissions and **Plan of Work Practices**

Startup

Prior to the production of asphalt, the drum mixer dust collector will be operational and functioning correctly per 20.2.11.108.A, 20.2.11.109, and applicable permit conditions.

Prior to loading of mineral filler, the mineral filler silo dust collector will be operational and functioning correctly per 20.2.11.108.A, 20.2.11.109, and applicable permit conditions.

Prior to the production of asphalt, feeder bin exit enclosures or other control measures will be functioning correctly to control fugitive emissions to an opacity limit of 20 percent per EPA Reference Method 9.

Prior to the production of asphalt, water sprays, or other control measures, for the scalping screen and pug mill will be functioning correctly and used as needed, to control fugitive emissions to an opacity limit of 20 percent per EPA Reference Method 9.

Upon visual inspection, all unpaved haul roads will be controlled with surfactants or other equivalent control methods, to minimize fugitive dust as required under applicable permit conditions.

Shutdown

All required control equipment will operate until all asphalt production ceases.

Maintenance

The feeder bin exit enclosures, asphalt drum mixer, drum mixer dust collector, equipment water sprays, and mineral filler silo dust collector will be maintained to prevent excess emissions during startup or shutdown. This facility will not have excess emissions during any maintenance procedures.

Malfunction

Upon malfunction where excess particulate emissions are observed from the feeder bin exit enclosures, asphalt drum mixer, drum mixer dust collector, scalping screen and pug mill water sprays, mineral filler silo dust collector, and baghouse loadout enclosure and watering, all asphalt production will cease until repairs to control equipment are made.

Upon malfunction where excess particulate emissions are observed from the feeder bin exit enclosures, and equipment water sprays, all aggregate processing will cease until repairs to control equipment are made.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

Construction Scenarios: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title “Construction Scenarios”, specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

Aztec HMA plant will have two operating scenarios; operating daylight hours only, and operating both daylight and nighttime hours. The operating scenario will be noted in the daily logs as to which operating scenario occurred that day.

Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	**X**
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.
☐ See attached, approved modeling **waiver for some** pollutants from the facility.
☒ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.
☐ No modeling is required.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the “Air Dispersion Modeling Report”, only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification		
1	Name of facility:	Four Corners Materials A CRH Company
2	Name of company:	300 TPH Drum Mixed Asphalt Plant
3	Current Permit number:	1347-M2
4	Name of applicant’s modeler:	Paul Wade
5	Phone number of modeler:	(505) 830-9680 x6
6	E-mail of modeler:	pwade@montrose-env.com

16-B: Brief			
1	Was a modeling protocol submitted and approved? May 30, 2023	Yes☒	No☐
2	Why is the modeling being done?	Other (describe below)	
3	Describe the permit changes relevant to the modeling.		
	Allow the facility to operate night time hours for the months of April through October		
4	What geodetic datum was used in the modeling?	NAD83	
5	How long will the facility be at this location?	Relocation Ability	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒
7	Identify the Air Quality Control Region (AQCR) in which the facility is located	014	

8	List the PSD baseline dates for this region (minor or major, as appropriate).	
	NO2	6/6/1989
	SO2	8/7/1978
	PM10	8/7/1978
	PM2.5	Not Established
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).	
	None	
10	Is the facility located in a non-attainment area? If so describe below	Yes☐ No☒
11	Describe any special modeling requirements, such as streamline permit requirements.	
	None	

16-C: Modeling History of Facility

1 Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO			Unknown
NO_2			Unknown
SO_2			Unknown
H_2S			Unknown
PM2.5			Unknown
PM10			Unknown
Lead			Unknown
Ozone (PSD only)			Unknown
NM Toxic Air Pollutants (20.2.72.402 NMAC)			Unknown

16-D: Modeling performed for this application

1 For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
CO	☒	☐	☐	☐	☐
NO_2	☒	☒	☐	☐	☐
SO_2	☒	☒	☐	☐	☐

	H_2S	☒	☐	☐	☐	☐
	PM2.5	☒	☒	☐	☐	☐
	PM10	☒	☒	☐	☐	☐
	Lead	☒	☐	☐	☐	☐
	Ozone	☐	☐	☐	☐	☐
	State air toxic(s) (20.2.72.402 NMAC)	☒	☐	☐	☐	☐

16-E: New Mexico toxic air pollutants modeling

1	List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.
2	List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor
Asphalt Fumes	3.76	0.333	13.1	5	0.752
Calcium Hydroxide	0.18	0.333	13.7	5	0.036

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☐	No☒
	Latest version of AERMOD was used. All volumes sources were modeled in flat terrain mode.		

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	04/12/2023
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.	
	PM10 and PM2.5 GCP emission sources were set to 71.25 tpy and 17.875 tpy, respectively. GCP2 and GCP3 hours of operation were limited to daylight hours only.	

AQB Source ID	Description of Corrections

16-H: Building and structure downwash

1	How many buildings are present at the facility?	3

2	How many above ground storage tanks are present at the facility?	4	
3	Was building downwash modeled for all buildings and tanks? If not explain why below.	Yes☒	No☐
4	Building comments		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.
	Fencing, Gates and Signs

2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?	Yes☒	No☐

4 Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.

Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
Very Fine	Cartesian	50 meters	Border	500 Meters	
Very Fine	Cartesian	100 meters	500 Meters	1 Kilometers	
Fine	Cartesian	250 meters	1 Kilometers	3 Kilometers	
Course	Cartesian	500 meters	3 Kilometers	10 Kilometers	
Course	Cartesian	1000 meters	10 Kilometers	40 Kilometers	

5	Describe receptor spacing along the fence line.
	25 Meters
6	Describe the PSD Class I area receptors.
	NA

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice.	Yes☐	No☒
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes☐	No☒

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).		
	For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours list the maximum hours of operation. Only the months of April through October will be permitted for operation anytime within a 24 hour period. For the months of April through August the modeling will be based on a production level of 2700 tons per day (9 hours running at maximum) and for the months of September and October the modeling will be based on a production level of 2100 tons per day (7 hours running at maximum). During the months of November through February, the hours of operation will be daylight hours only. CO, NO2, and SO2 modeling was run for all hours of operation.		
2	Which scenario produces the highest concentrations? Why?		
	PM10 24 hour – Scenario 11, operating nighttime hours with low winds and low boundary layer PM2.5 24 hour – Scenario 11, operating nighttime hours with low winds and low boundary layer PM2.5 annual – Scenario 12, operating nighttime hours with low winds and low boundary layer		
3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☒	No☐
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources:		
5	For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours lists the maximum hours of operation during daylight hours.		

HMA Production Daylight Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	1	1	1	1	1	0.5	0	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1

9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	0.5	0	0	0
7:00 PM	0	0	0	0	0	0.5	0.5	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	10.5	11.5	12	14	14	14.5	14.5	14	13	12	10.5	10

For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours lists the maximum hours of operation during night time hours. Only the months of April through October will be permitted for night time hours of operation. For the months of April through August the modeling will be based on a production level of 2700 tons per day (9 hours running at maximum) and for the months of September and October the modeling will be based on a production level of 2100 tons per day (7 hours running at maximum). During the 24 hour period (12 AM to 12 PM) of night time operations these production limits are the requested permit limits for asphalt production.

HMA Production Nighttime Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
1:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
2:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
3:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
4:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
5:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1

4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
7:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
8:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
9:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
10:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
11:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
Total	10.5	11.5	12	24	24	24	24	24	24	24	10.5	10

Since the HMA plant daily hours of operation running at maximum hourly production rate is less than the total hours of operation, twelve (12) PM modeling scenarios will be performed for each averaging period. For each scenario the hours of operation are shifted by two hours.

HMA Nighttime Model Scenario Time Segments

Model Scenario	Time Segments 9-Hour Blocks April, May, June, July, August	Time Segments 7-Hour Blocks September, October
1	12 AM to 9 AM	12 AM to 7 AM
2	2 AM to 11 AM	2 AM to 9 AM
3	4 AM to 1 PM	4 AM to 11 AM
4	6 AM to 3 PM	6 AM to 1 PM
5	8 AM to 5 PM	8 AM to 3 PM
6	10 AM to 7 PM	10 AM to 5 PM
7	12 PM to 9 PM	12 PM to 7 PM
8	2 PM to 11 PM	2 PM to 9 PM
9	4 PM to 1 AM	4 PM to 11 PM
10	6 PM to 3 AM	6 PM to 1 AM
11	8 PM to 5 AM	8 PM to 3 AM
12	10 PM to 7 AM	10 PM to 5 AM

6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☒	No☐

16-L: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.	
	☒	ARM2 - Annual
	☐	100% NO_X to NO_2 conversion
	☒	PVMRM – 1 Hour
	☐	OLM
	☐	Other:
2	Describe the NO_2 modeling.	
	NO2 modeling was performed with PVMRM and includes neighboring sources and background concentrations.	
3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☒ No☐
4	Describe the design value used for each averaging period modeled.	
	1-hour: 98th percentile as calculated by AERMOD Annual: Highest Annual Average of Three Years	

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	☐	PM2.5
	☒	PM10
	☐	None
2	Describe the particle size distributions used. Include the source of information.	

PM_{10} emissions may be modeled using plume deposition. 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.

Particle size distribution for material handling of aggregate; fugitive road dust on unpaved roads; mineral filler silo baghouse exhaust; HMA asphalt particulate emissions; and combustion will use the particle size distribution found in the NMED Modeling Section approved values.

The mass-mean particle diameters were 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 were obtained from NMED accepted values.

Material	Density (g/cm^3)	Reference
Road Dust	2.5	NMED Value
Lime	3.3	NMED Value
HMA Asphalt	1.5	NMED Value
Combustion	1.5	NMED Value
Fugitive Dust	2.5	NMED Value

The size distribution for PM_{10} emission sources are presented below.

Road Vehicle Fugitive Dust Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	2.5
2.5 – 10	6.91	75.0	2.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Vehicle Fugitive)

Lime Baghouse Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0-2.5	1.57	25	3.3
2.5-10	6.91	75	3.3

Parameters based on baghouse exhaust capture percentages. (Lime Silo)

Combustion Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 - 2.5	1.57	100	1.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Combustion)

Asphalt Baghouse and Stack Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0-1.0	0.63	50.0	1.5
1.0-2.5	1.85	19.0	1.5
2.5-10	6.92	31.0	1.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Asphalt Baghouse Stack)

TABLE 10: Fugitive Dust Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 - 2.5	1.57	7.8	2.5
2.5 – 5	3.88	27.0	2.5
5 – 10	7.77	65.2	2.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Coal Handling)**.**

3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☐	No☒
4	Was secondary PM modeled for PM2.5?	Yes☒	No☐

5

If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.

NO_X (ton/yr)	SO_2 (ton/yr)	$[PM2.5]_{annual}$	$[PM2.5]_{24\text{-hour}}$
28.1	29.2	0.00025 $\mu g/m^3$	0.00041 $\mu g/m^3$

The $PM_{2.5}$ secondary emission concentration analysis will follow EPA and NMED AQB guidelines. Following recent EPA guidelines for conversion of NO_X and SO_2 emission rates to secondary $PM_{2.5}$ emissions, FCM emissions are compared to appropriate western MERPs values (NO_X 24-Hr – 33634 tpy; NO_X Annual – 43833 tpy; SO_2 24-Hr – 11410 tpy; SO_2 Annual – 48057 tpy). The following equation, found in NMED AQB modeling guidance document on MERPs, will be added to determine if secondary emission would cause violation with $PM_{2.5}$ NAAQS.

$PM_{2.5}$ annual = ((NO_X emission rate (tpy)/43833 + (SO_2 emission rate (tpy)/48057)) x 0.2 $\mu g/m^3$

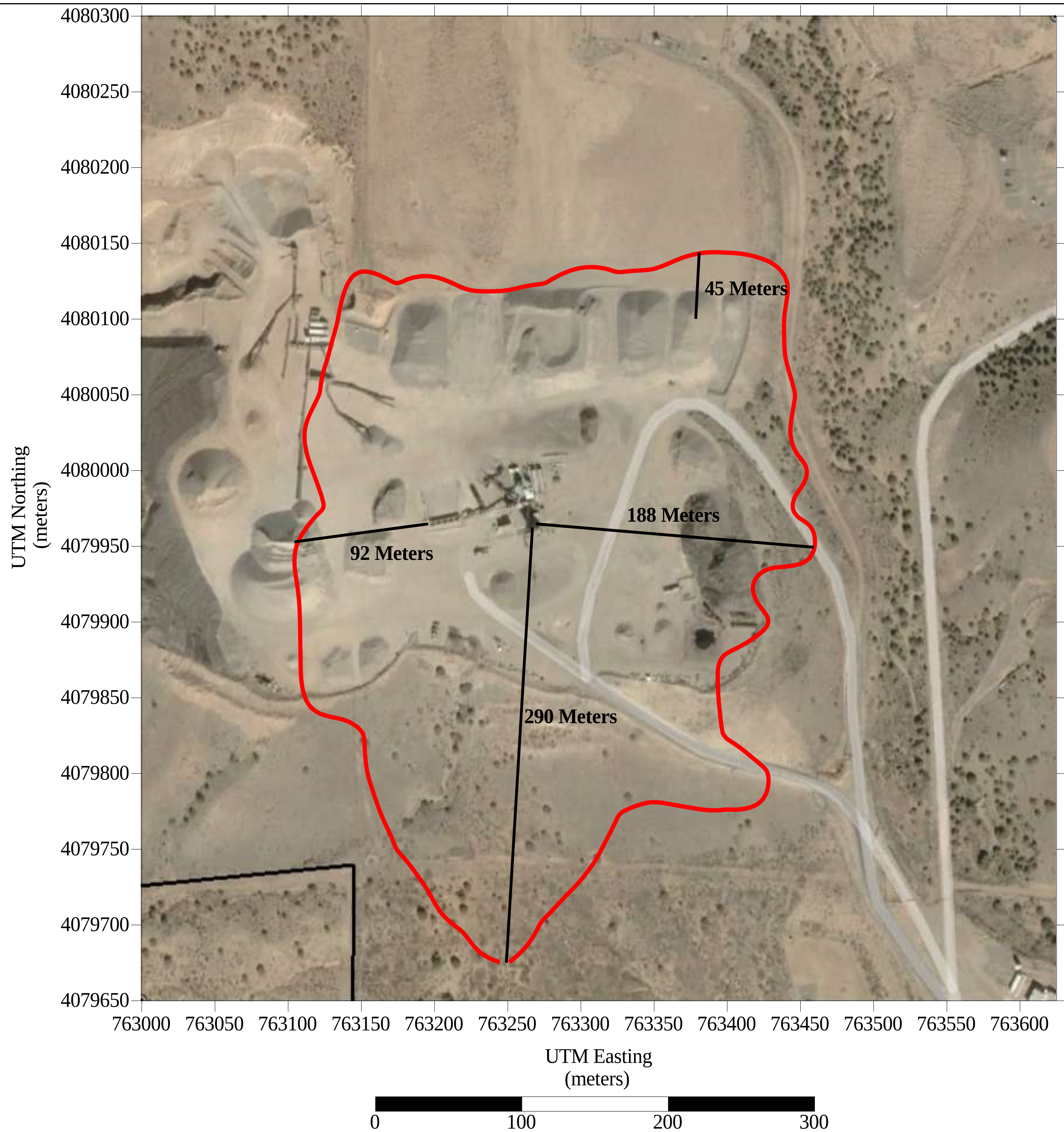
$PM_{2.5}$ 24 hour = ((NO_X emission rate (tpy)/33634 + (SO_2 emission rate (tpy)/11410)) x 1.2 $\mu g/m^3$

<u>$PM_{2.5}$ Annual</u>
0.00025 $\mu g/m^3$ = (28.1/43833 + 29.2/48057) x 0.2 $\mu g/m^3$
<u>$PM_{2.5}$ 24 Hour</u>
0.00041 $\mu g/m^3$ = (28.1/33634 + 29.2/11410) x 1.2 $\mu g/m^3$

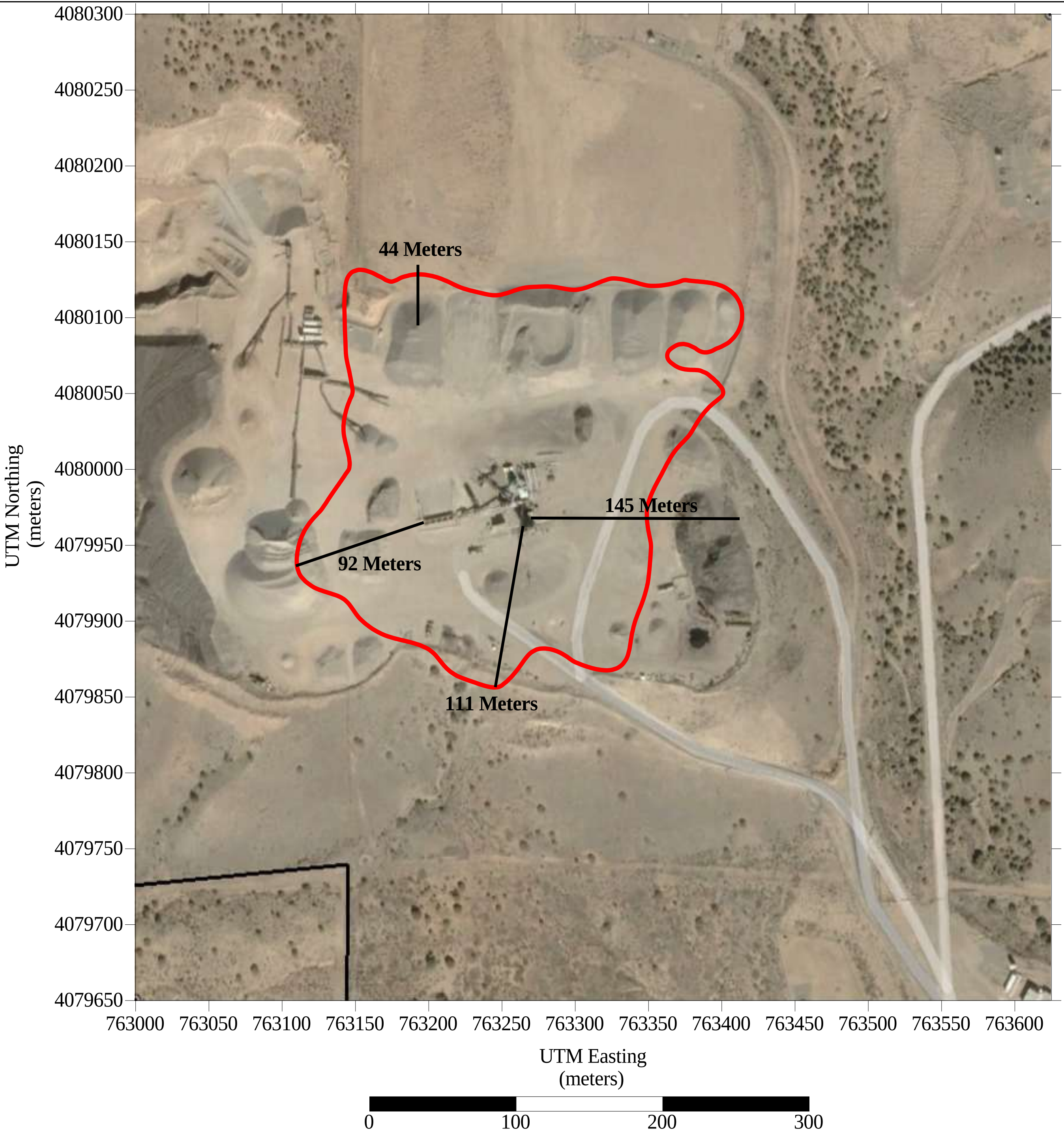
16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	No combustion emission setback modeling was above the NAAQS, so all setbacks are based on PM10 and PM2.5 modeling setback analysis. For PM10, there is six analysis; PM10 Increment Nighttime Hours, PM10 Increment Daylight Hours, PM10 NAAQS Nighttime Hours, PM10 NAAQS Daylight Hours, PM2.5 NAAQS Nighttime 24-Hours, and PM2.5 NAAQS Nighttime Annual. The PM10 and PM2.5 nighttime setback distances are based on site operating scenarios that produced the highest scenario modeled concentrations in the setback modeling, Scenario 11. For the initial site, PM10 Nighttime Increment 24 hour produced the largest setbacks.

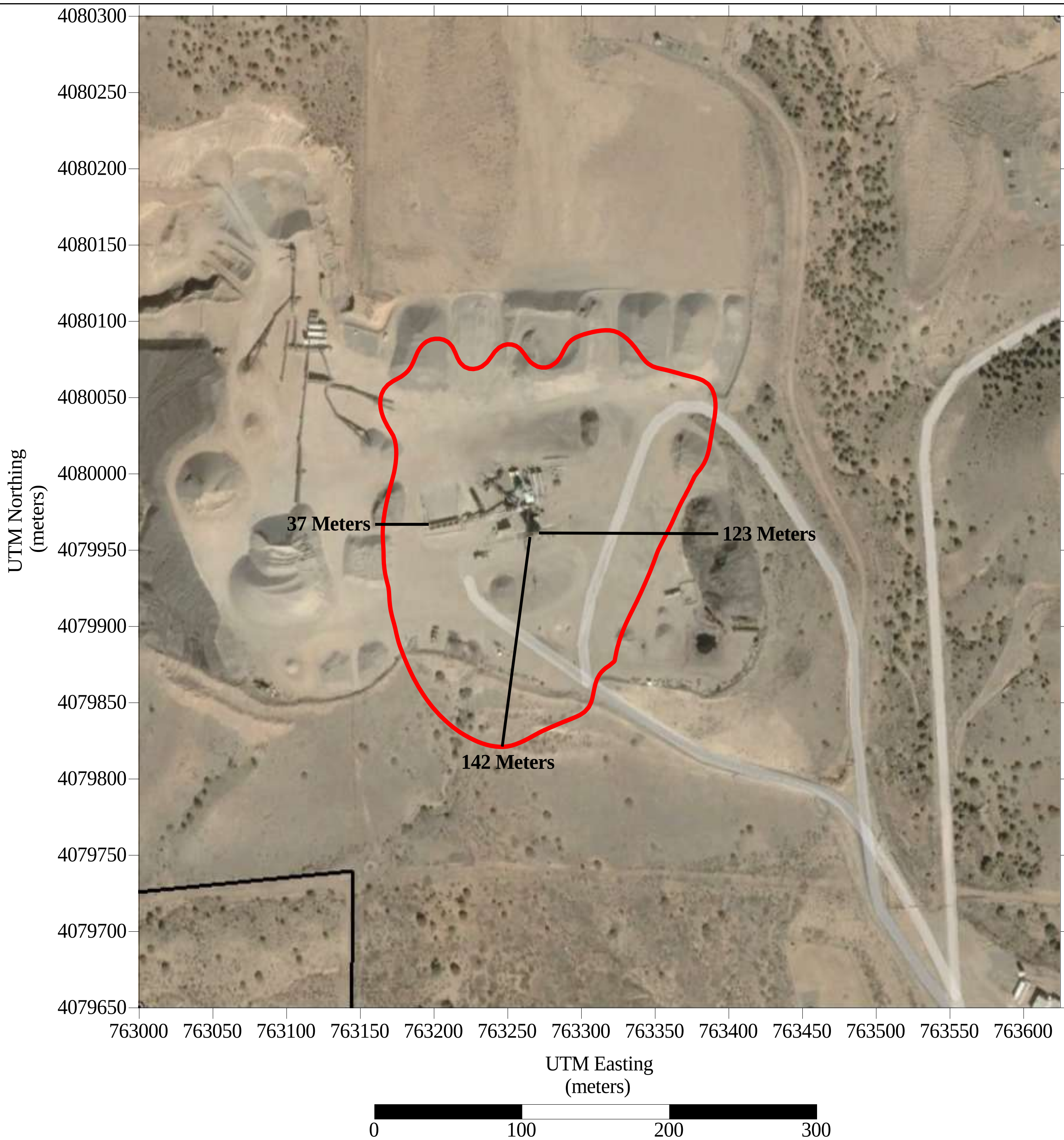
Direction at Site	Meters	Max Pollutant
West	92	PM10 Nighttime Increment 24-Hour
South	290	PM10 Nighttime Increment 24-Hour
East	188	PM10 Nighttime Increment 24-Hour
North	45	PM10 Nighttime Increment 24-Hour



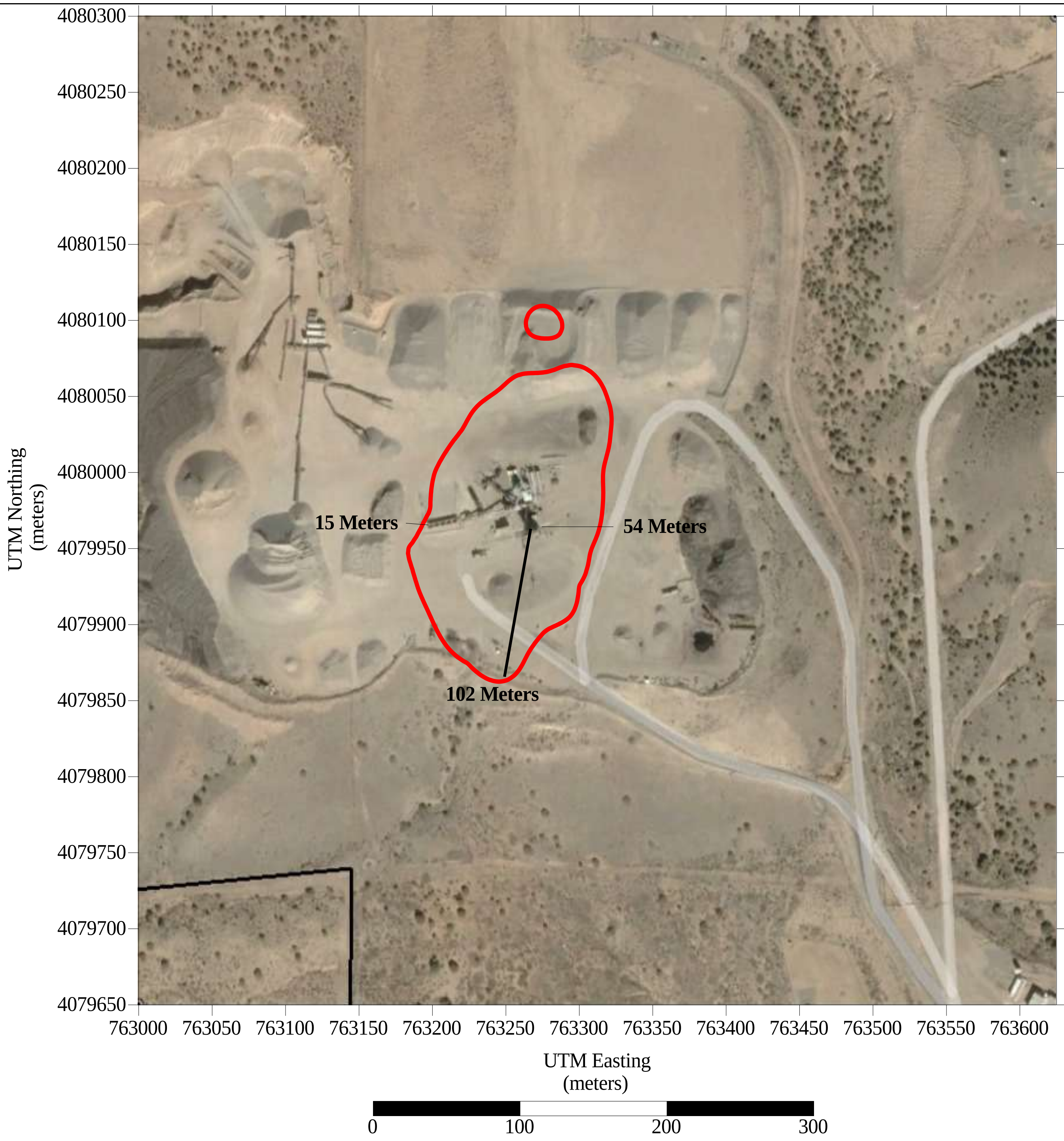
PM10 Nighttime 24-hour Increment Site Setback Modeling



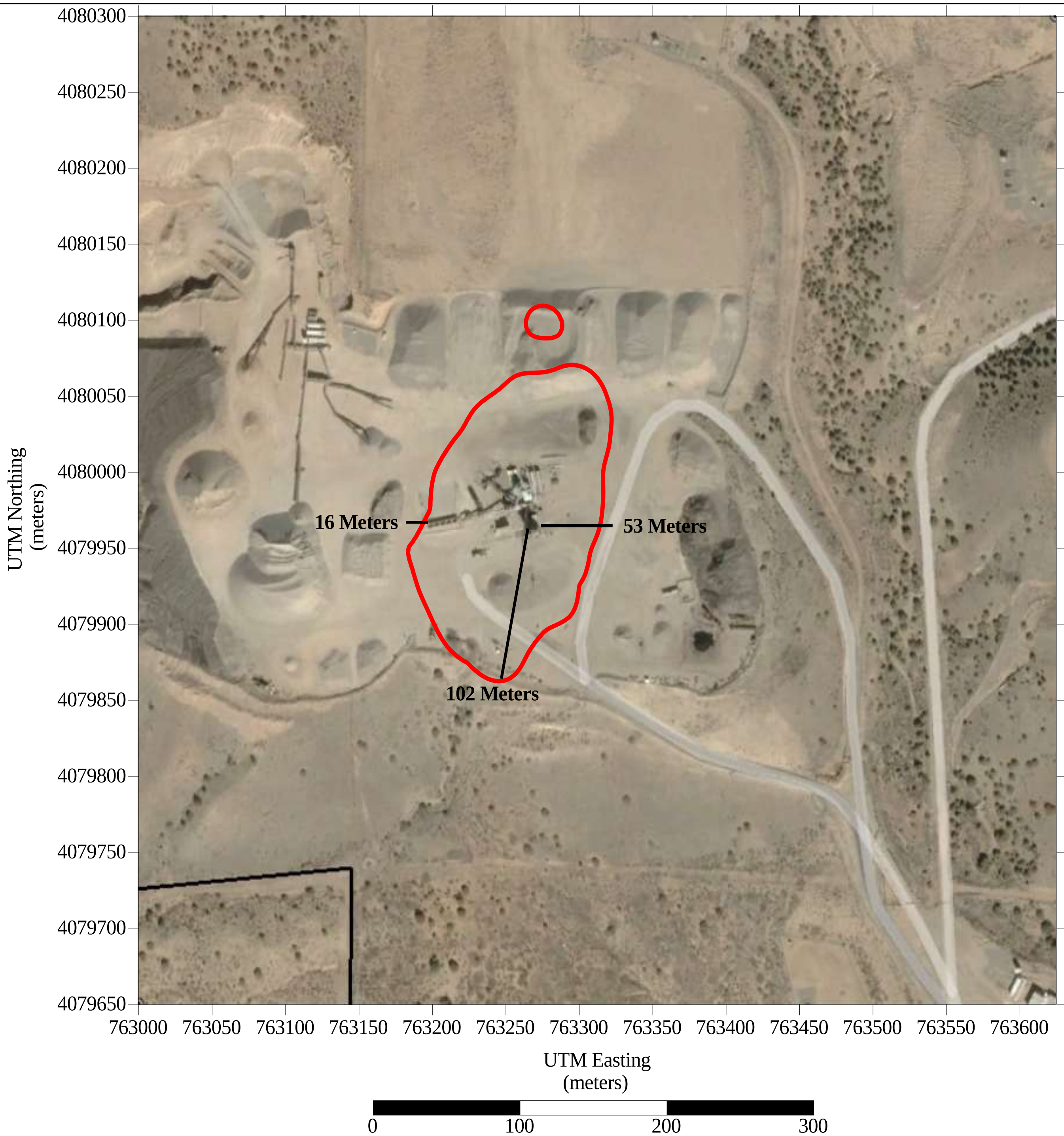
PM10 Daylight 24-hour Increment Site Setback Modeling



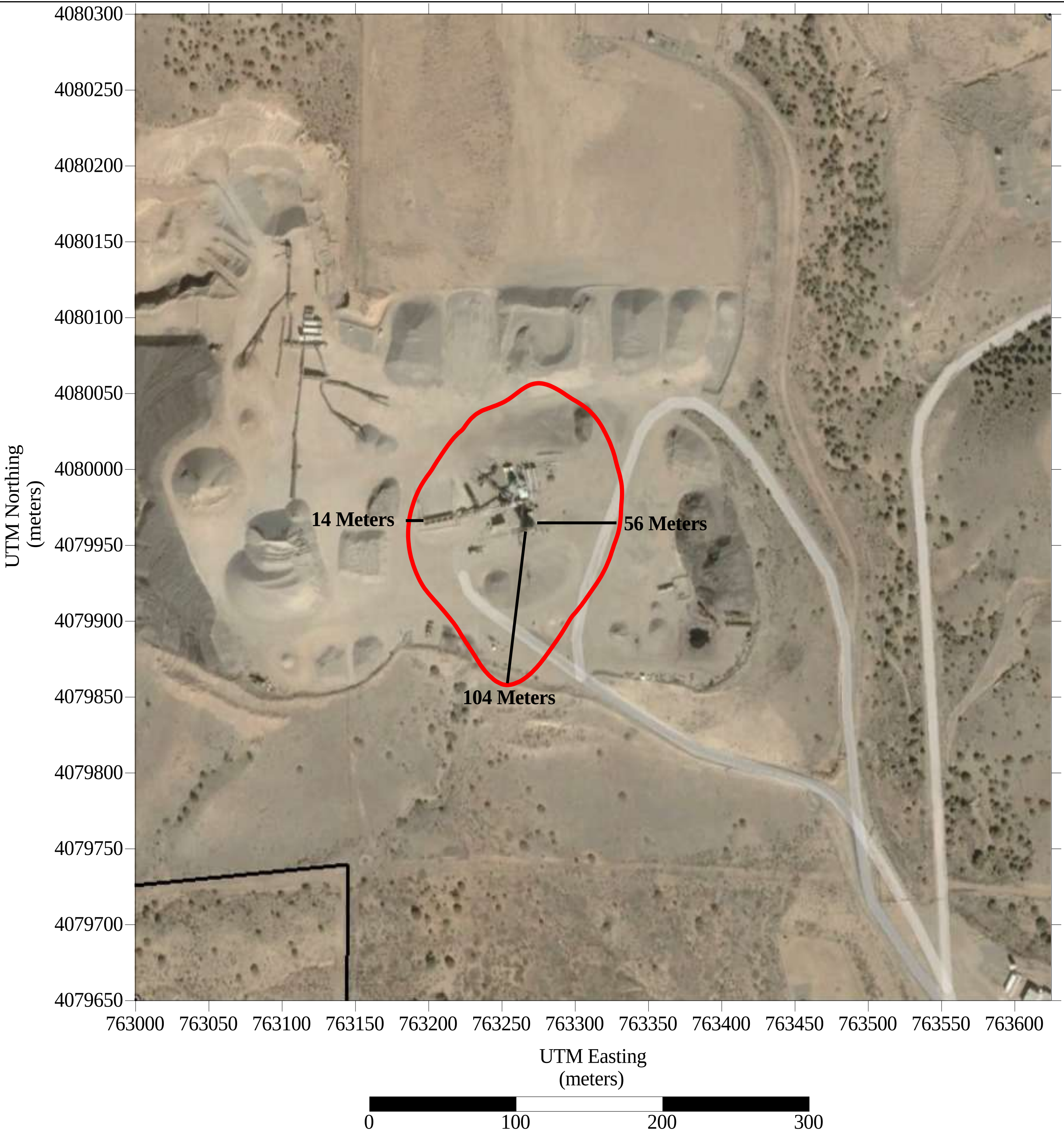
PM10 Nighttime Annual Increment Site Setback Modeling



PM10 Nighttime 24-Hour NAAQS Site Setback Modeling



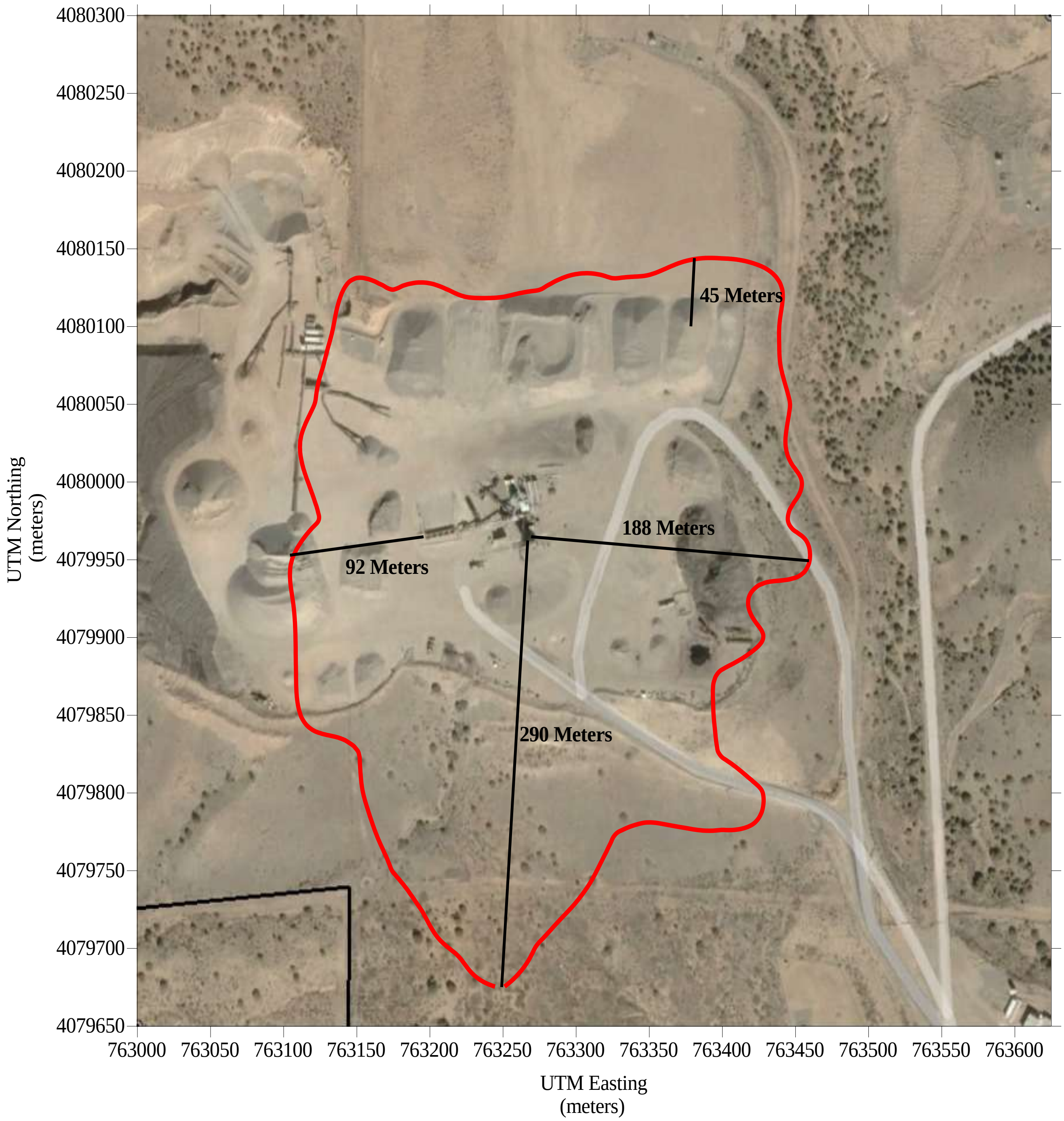
PM2.5 Nighttime 24-Hour NAAQS Site Setback Modeling



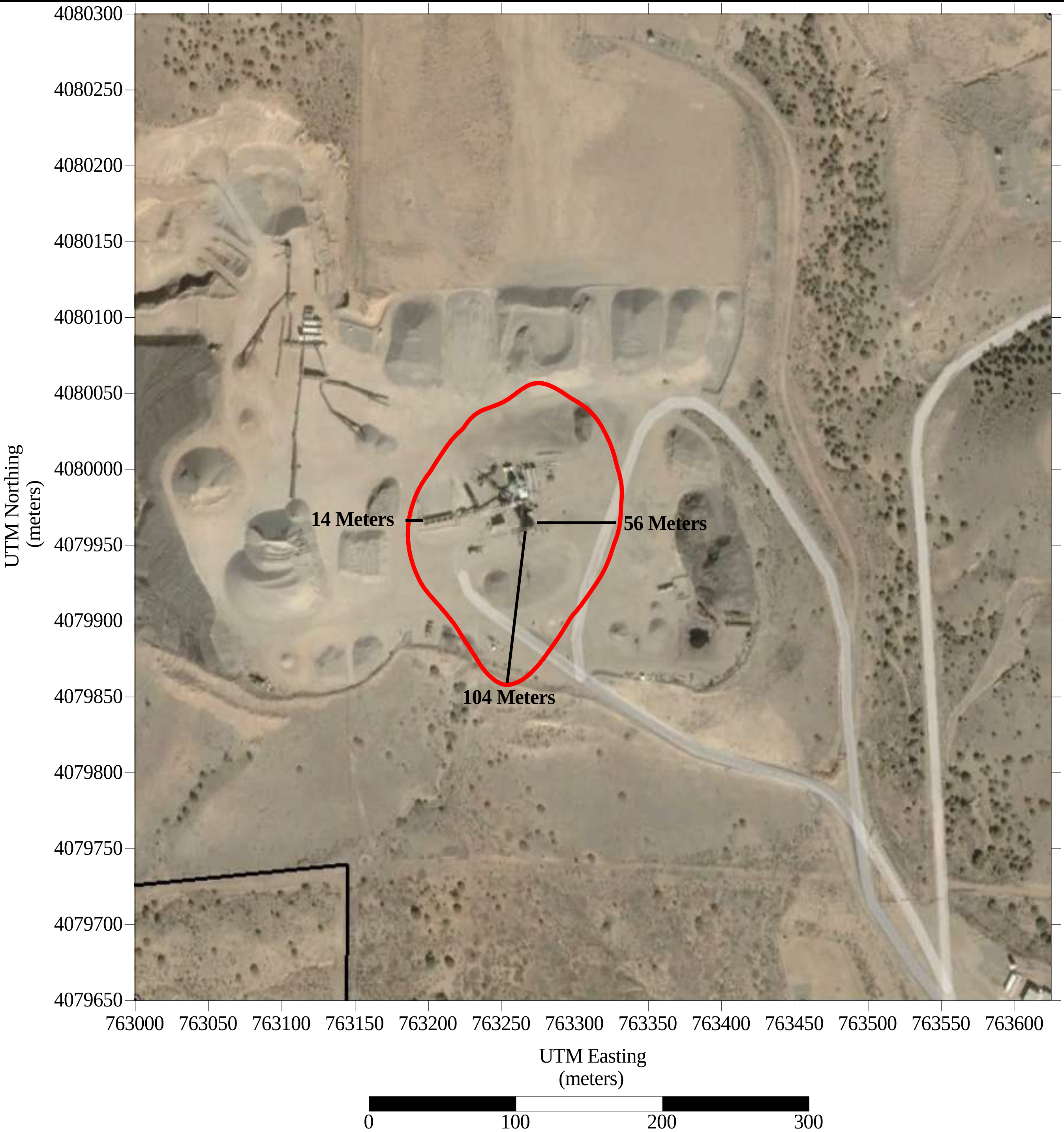
PM2.5 Nighttime Annual NAAQS Site Setback Modeling

	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.	
2	No combustion emission setback modeling was above the NAAQS, so all setbacks are based on PM10 and PM2.5 modeling setback analysis; PM10 Increment Nighttime Hours and PM2.5 NAAQS Nighttime Hours. The PM10 and PM2.5 nighttime setback distances are based on site operating scenarios that produced the highest scenario modeled concentrations in the setback modeling, Scenario 11. For the relocation sites where the PM10 minor source baseline date has been triggered, the	

setback distance is 290 meters. For the relocation sites where no particulate baseline date has been triggered, the setback distance is 104 meters



PM10 Nighttime 24-hour Increment Relocation Setback Modeling



PM2.5 Nighttime Annual NAAQS Relocation Site Setback Modeling

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☐	No☒

Unit Number in UA-2 | Unit Number in Modeling Files

Permit ID	Model ID	Source Description
AGGPILE	HMAPILE1 - 6	Cold Aggregate/RAP Storage Pile
46.801.01	HMABIN	Cold Aggregate Feed Bin Loading
46.801.03	HMATP1	Cold Aggregate Feed Bin Unloading (Conveyor)
46.801.02a	HMASCR	Scalping Screen
46.801.02b	HMATP2	Scalping Screen Unloading (Conveyor)
46.801.05	HMAPUG	Pug Mill Load
46.801.06a	HMATP3	Pug Mill Unload (Conveyor)
46.801.06b	HMATP4	Conveyor Transfer to Drum Loading
46.801.10	RAPBIN	RAP Feed Bin Loading
46.801.15	RAPTP1	RAP Feed Bin Unloading (Conveyor)
46.801.11	HMARAPSCR	RAP Screen
46.801.12a	RAPTP2	RAP Screen Unloading (Conveyor)
46.801.12b	RAPTP3	RAP Conveyor Transfer to Drum Loading
46.801.16	HMAFILL	Mineral Filler Silo Loading
46.801.07	HMASTK	Drum Dryer/Mixer
46.801.13	DRUMUNL	Drum Mixer Unloading (Incline Conveyor)
46.801.14a,b	HMASILO	Asphalt Silo Unloading (Asphalt Silos)(2)
46.801.19	HMAHEAT	Asphalt Heater
46.801.17&18	ASPHTANK	Asphalt Cement Storage Tanks (2)
TRCK	ASH_0001-0132;RAP_0001-0123	Haul Road Traffic
YARD	ASH_0063-0132	HMA Yard

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☐	No☒

Hourly model emission rates for material handling sources (Emissions calculated using AP-42 Section 13.2.4) are calculated using annual average windspeed for Moriarty.

Permit ID	Model ID	Source Description	Permit Emission Rate		Modeled Emission Rate	
			PM10 Lb/Hr	PM2.5 Lb/Hr	PM10 Lb/Hr	PM2.5 Lb/Hr
AGGPILE	HMAPILE1-6	Cold Aggregate/RAP Storage Pile	1.15497	0.17489	0.94151	0.14257
46.801.01	HMABIN	Cold Aggregate Feed Bin Loading	0.65552	0.09926	0.53437	0.08092
46.801.10	RAPBIN	HMA RAP Bin Loading	0.37458	0.05672	0.30535	0.04624

3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☒	No☐
4	Which units consume increment for which pollutants?		

Permit ID	Model ID	Description	NO2	SO2	PM10
46.801.07	HMASTK	HMA Baghouse Stack	X	X	X

46.801.19	HMAHEAT	HMA Asphalt Cement Heater	X	X	X
46.801.16	HMAFILL	HMA Mineral Filler Silo Loading			X
46.801.13	DRUMUNL	HMA Asphalt Silo Loading			X
46.801.14a,b	HMASILO	HMA Asphalt Silo Unloading			X
AGGPILE	HMAPILE1-6	HMA Storage Pile Handling 1-6			X
46.801.01	HMABIN	HMA Bin Loading			X
46.801.03	HMATP1	HMA Bin Unloading			X
46.801.02a	HMASCR	HMA Scalping Screen			X
46.801.02b	HMATP2	HMA Scalping Screen Unloading			X
46.801.05	HMAPUG	HMA Pug Mill			X
46.801.06a	HMATP3	HMA Pug Mill Unloading			X
46.801.06b	HMATP4	HMA Conveyor Transfer to Drum Loading			X
46.801.10	RAPBIN	HMA RAP Bin Loading			X
46.801.15	RAPTP1	HMA RAP Bin Unloading			X
46.801.11	HMARAPSCR	HMA RAP Screen			X
46.801.12a	RAPTP2	HMA RAP Screen Unloading			X
46.801.12b	RAPTP3	HMA RAP Conveyor Transfer to Drum Loading			X
TRCK	ASH_1-132	Asphalt/Asphalt Cement/Mineral Filler Haul Road			X
TRCK	RAP_1-123	RAP Haul Road			X

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	baseline unit expanded emissions after baseline date

6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	NA			

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.
	For storage piles the model inputs were based on the size of the pile (100 feet)/4.3 (sigma-Y) and a release height of 8 feet or a sigma-Z of 8ft*2/2.15. All others followed standard dimensions from Air Quality Bureau (AQB) Modeling Guidelines.
3	Describe how the volume sources are related to unit numbers. Or say they are the same.

Permit ID	Model ID	Source Description
AGGPILE	HMAPILE1-6	HMA Aggregate/RAP Storage Pile Handling 1-6
46.801.01	HMABIN	HMA Bin Loading
46.801.03	HMATP1	HMA Bin Unloading
46.801.02a	HMASCR	HMA Scalping Screen
46.801.02b	HMATP2	HMA Scalping Screen Unloading
46.801.05	HMAPUG	HMA Pug Mill
46.801.06a	HMATP3	HMA Pug Mill Unloading
46.801.06b	HMATP4	HMA Conveyor Transfer to Drum Conveyor
46.801.10	RAPBIN	HMA RAP Bin Loading
46.801.15	RAPTP1	HMA RAP Bin Unloading
46.801.11	HMARAPSCR	HMA RAP Screen
46.801.12a	RAPTP2	HMA RAP Screen Unloading
46.801.12b	RAPTP3	HMA RAP Transfer Point
46.801.17&18	ASPHTANK	Asphalt Cement Storage Tank
TRCK	ASH_0001-0132; RAP_0001-0123	Asphalt Haul Road Volume 1-132; RAP Haul Road Volume 1-123
YARD	ASH_0063-0132	Asphalt Haul Road Volume 63-132

4	Describe any open pits.
	NA
5	Describe emission units included in each open pit.
	NA

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☐
	CO: Del Norte High School (350010023)		
	NO_2: Bloomfield (350450009)		
	PM2.5: N/A		
	PM10: N/A		
	SO_2: Bloomfield(350450009)		
	Other:		
	Comments:	For PM_{10}, FCM is proposing using backgrounds from the Shiprock Substation (Monitor ID 350451005). For $PM_{2.5}$, FCM is proposing using backgrounds from the Farmington Environment Department Office (Monitor ID 350450019).	

2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☐	No☒

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used.	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	Bloomfield 2015 - 2019		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
	Yes, for point sources only. For volume sources, model was run in source selected flat terrain mode. For setback modeling all sources are run in flat terrain mode.		
2	What was the source of the terrain data?		
	USGS National Elevation Data (NED)		

16-U: Modeling Files

1	Describe the modeling files: Daylight hour only modeling and Nighttime hours of operation modeling as described in Section 16-K.		
	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	FCM Combustion SIL	NO2, CO, SO2	ROI/SIA
	FCM PM SIL Daylight	PM10, PM2.5 Daylight Hours	ROI/SIA
	FCM PM SIL S1 – S12	PM10, PM2.5 Nighttime Hour Scenarios	ROI/SIA
	FCM NO2 1hr CIA	NO2 1 hour	Cumulative
	FCM SO2 1hr CIA	SO2 1 hour	Cumulative
	FCM SO2 Incre	SO2 3hr, 24hr, & Annual	PSD Class II Increment Analysis
	FCM PM10 CIA Daylight	PM10 24hr Daylight Hours	Cumulative
	FCM PM10 Incre Daylight	PM10 24hr & Annual Daylight Hours	PSD Class II Increment Analysis
	FCM PM10 CIA S1, S9 – S12	PM10 24hr Nighttime Hour Scenarios	Cumulative
	FCM PM10 Incre S1, S9 – S12	PM10 24hr & Annual Nighttime Hour Scenarios	PSD Class II Increment Analysis
	FCM PM25 CIA Daylight	PM2.5 24hr & Annual Daylight Hours	Cumulative
	FCM PM25 CIA S1, S9 – S12	PM2.5 24hr & Annual Nighttime Hour Scenarios	Cumulative
	FCM AF	Asphalt Fumes 8hr	TAPs Model
	FCM H2S	H2S 1hr	ROI/SIA

	FCM Combustion Incre Setback	NO2, SO2 PSD Class II Increment	Site and Relocation Setback
	FCM Combustion Setback	NO2, CO, SO2 NAAQS	Site and Relocation Setback
	FCM PM10 Setback Daylight	PM10 NAAQS Daylight Hours	Site and Relocation Setback
	FCM PM10 Setback Incre Daylight	PM10 PSD Class II Increment Daylight Hours	Site and Relocation Setback
	FCM PM10 Setback S11	PM10 NAAQS Nighttime	Site and Relocation Setback
	FCM PM10 Setback Incre S11	PM10 PSD Class II Increment Nighttime	Site and Relocation Setback
	FCM PM25 Setback S11	PM2.5 Annual & 24 hour NAAQS Nighttime	Site and Relocation Setback
	FCM PM25 Setback Daylight	PM2.5 Annual & 24 hour NAAQS Daylight Hours	Site and Relocation Setback

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☒
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☒
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
	Not a PSD Source		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
	Not a PSD Source		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☒	No☐
	Secondary PM2.5 were calculated using Modeling Guideline MERPs		

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary. For PM10 24 hour, the maximum scenario was Scenario11. For PM2.5 24 hour, the maximum scenario was Scenario11. For PM2.5 Annual, the maximum scenario was Scenario11. All highest applicable concentrations were on the FCM site boundary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (m)
Asphalt Fumes – 8 Hr	4.1	NA	NA	NA	NA	50	8.2	763146.6	4079740.5	1739.22
H_2S – 1 Hr	0.11	NA	NA	NA	NA	SIL – 1.0	11.0	763146.6	4079740.5	1739.22
NOx - Annual	0.73	NA	NA	NA	NA	SIL – 1.0	73.0	762864.7	4079954.7	1730.69
NOx – 1 Hr	53.8	53.8	NA	61.4	115.2	188.0	61.3	763896.4	4080140.1	1784.64
CO – 1 hr	104	NA	NA	NA	NA	SIL – 2000	17.9	760500.0	4083500.0	1837.13
CO – 8 Hr	34	NA	NA	NA	NA	SIL – 500	33.0	763115.6	4080455.9	1763.28
SO_2 – 1 Hr	30.9	30.9	NA	3.5	34.4	196.4	17.5	760500.0	4083500.0	1837.13
SO_2 – Annual Incre	0.82	NA	NA	NA	NA	SIL – 1.0	82.0	762864.7	4079954.7	1730.69
SO_2 – 3 Hr Incre	28.2	28.2	NA	NA	28.2	512	5.5	762864.7	4079954.7	1730.69
SO_2 – 24 Hr Incre	9.8	9.8	NA	NA	9.8	91	10.8	763325.9	4079221.1	1731.48
$PM_{2.5}$ - Annual	1.3	1.7	0.00025	4.19	5.9	12	49.2	763146.6	4079740.5	1739.22
$PM_{2.5}$ – 24 Hr	4.4	4.9	0.00041	11.77	16.7	35	47.7	763146.6	4079740.5	1739.22
PM_{10} – 24 Hr	77.5	78.7	NA	66.0	101.4	150	67.6	763146.6	4079740.5	1739.22
PM_{10} – Annual Incre	5.9	6.0	NA	NA	6.0	17	35.3	763800.6	4079421.2	1726.48
PM_{10} – 24 Hr Incre	26.9	27.2	NA	NA	27.2	30	90.7	763146.6	4079740.5	1739.22

16-X: Summary/conclusions

	A statement that modeling requirements have been satisfied and that the permit can be issued.
1	Dispersion modeling was performed for the new HMA permit application. All facility pollutants with ambient air quality standards were modeled to show compliance with those standards. All results of this modeling showed the facility in compliance with applicable ambient air quality standards.

DISPERSION MODEL PROTOCOL
FOUR CORNERS MATERIALS, A CSH COMPANY
PERMIT #1347-M2 MODIFICATION APPLICATION

Aztec, New Mexico

PREPARED FOR

April 28, 2023

Prepared by

Montrose Environmental Solutions, Inc.

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1.0 INTRODUCTION

This dispersion modeling analysis will be conducted by Montrose Environmental Solutions, Inc. (Montrose) on behalf of Four Corners Materials (FCM), to evaluate ambient air quality impacts for a 300 ton per hour (tph) hot mix asphalt (HMA) plant located north-northeast of Spencerville, NM near Aztec, NM. FCM is applying for revision for 20.2.72 NMAC Permit #1347-M2 to allow nigh time operations. The permit consists of an existing HMA plant located at 1106 NM Highway 516, Aztec NM. The plant is identified as "300 TPH Drum Mixed Asphalt Plant". The UTM coordinates of the HMA plant are; 763,250 meters E, 4,079,990 meters N, Zone 13, NAD 83.

The dispersion modeling will be conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 21112. 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. The objective of this evaluation is to determine whether ambient air concentrations from the maximum operation of the facility for nitrogen dioxide, (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter; 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 state of New Mexico's air quality regulation 20.2.3 NMAC from FCM emission sources. Since the location of the site is within AQCR 014, where the minor source baseline date has been triggered for NO_2, SO_2, and PM_{10}, a modeling analysis will be performed for PSD increment consumption analysis for all FCM sources that consume increment. The nearest Class I area in Mesa Verde National Park at 50.3 kilometers. Since FCM is greater than 50 kilometers from the nearest Class I area, no Class I PSD increment modeling analysis will be completed.

HMA plant material handling equipment, stockpiles, and haul roads will be input into the model as volume sources. Exhaust stack sources; drum baghouse, mineral filler baghouse, and asphalt heater, will be input into the model as point sources. Model input parameters for feeders, screens, and transfer points will follow the New Mexico Environment Department (NMED) Air Quality Bureau (AQB) model guidelines Table 27. Model input parameters for haul roads will follow the NMED AQB model guidelines Tables 28 and 29. Model input parameters for storage piles will be based on site conditions and AERMOD volume source methodologies.

The following limits when the plant is operating at night will be requested for this permit revision application and will be included in the dispersion modeling analysis:

The HMA plant will limit daily throughput to the following during days of night time operations;

Month	HMA Tons Per Day
April	2700
May	2700
June	2700
July	2700
August	2700
September	2100
October	2100

During days where no night time asphalt production occurs the hours of asphalt production will be daylight hours only.

1.1 FACILITY DESCRIPTION

FCM's 300 TPH Drum Mixed Asphalt Plant will includes; aggregate/RAP storage piles, a 5-bin cold aggregate feeder, scalping screen, pug mill, mineral filler silo with baghouse, drum dryer/mixer with baghouse, incline conveyor, asphalt silo, natural gas-fired asphalt heater, six (6) transfer conveyors, Evotherm storage tank, and two (2) asphalt cement storage tanks. The plant is powered by line power. Processed asphalt will be transported from the HMA plant to off-site sales. The HMA plant will limit processing rates to the present permit conditions of 300 tph and 1,006,200 tpy.

For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours lists the maximum hours of operation during daylight hours.

TABLE 1: HMA Production Daylight Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	1	1	1	1	1	0.5	0	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	0.5	0	0	0
7:00 PM	0	0	0	0	0	0.5	0.5	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	10.5	11.5	12	14	14	14.5	14.5	14	13	12	10.5	10

For the FCM's 300 TPH Drum Mixed Asphalt Plant, the following hours lists the maximum hours of operation during night time hours. Only the months of April through October will be permitted for night time hours of operation. For the months of April through August the modeling will be based on a production level of 2700 tons per day (9 hours running at maximum) and for the months of September and October the modeling will be based on a production level of 2100 tons per day (7 hours running at maximum). During the 24 hour period (12 AM to 12 PM) of night time operations these production limits are the requested permit limits for asphalt production.

TABLE 2: HMA Production Nighttime Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
1:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
2:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
3:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
4:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
5:00 AM	0	0	0	1	1	1	1	1	1	1	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
7:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
8:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
9:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
10:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
11:00 PM	0	0	0	1	1	1	1	1	1	1	0	0
Total	10.5	11.5	12	24	24	24	24	24	24	24	10.5	10

Since the HMA plant daily hours of operation running at maximum hourly production rate is less than the total hours of operation, twelve (12) PM modeling scenarios will be performed for each averaging period. For each scenario the hours of operation are shifted by two hours.

TABLE 3: HMA Nighttime Model Scenario Time Segments

Model Scenario	Time Segments 9-Hour Blocks April, May, June, July, August	Time Segments 7-Hour Blocks September, October
1	12 AM to 9 AM	12 AM to 7 AM
2	2 AM to 11 AM	2 AM to 9 AM
3	4 AM to 1 PM	4 AM to 11 AM
4	6 AM to 3 PM	6 AM to 1 PM
5	8 AM to 5 PM	8 AM to 3 PM
6	10 AM to 7 PM	10 AM to 5 PM
7	12 PM to 9 PM	12 PM to 7 PM
8	2 PM to 11 PM	2 PM to 9 PM
9	4 PM to 1 AM	4 PM to 11 PM
10	6 PM to 3 AM	6 PM to 1 AM
11	8 PM to 5 AM	8 PM to 3 AM
12	10 PM to 7 AM	10 PM to 5 AM

1.2 FACILITY IDENTIFICATION AND LOCATION

FCM's 300 TPH Drum Mixed Asphalt Plant is located at 1106 NM Highway 516, Aztec NM. The UTM coordinates of the HMA plant is; 763,250 meters E, 4,079,990 meters N, Zone 13, with NAD83 datum at an elevation of approximately 5,810 feet above mean sea level.

Figure 1 below presents a layout of the site showing the area where the HMA plant is located.

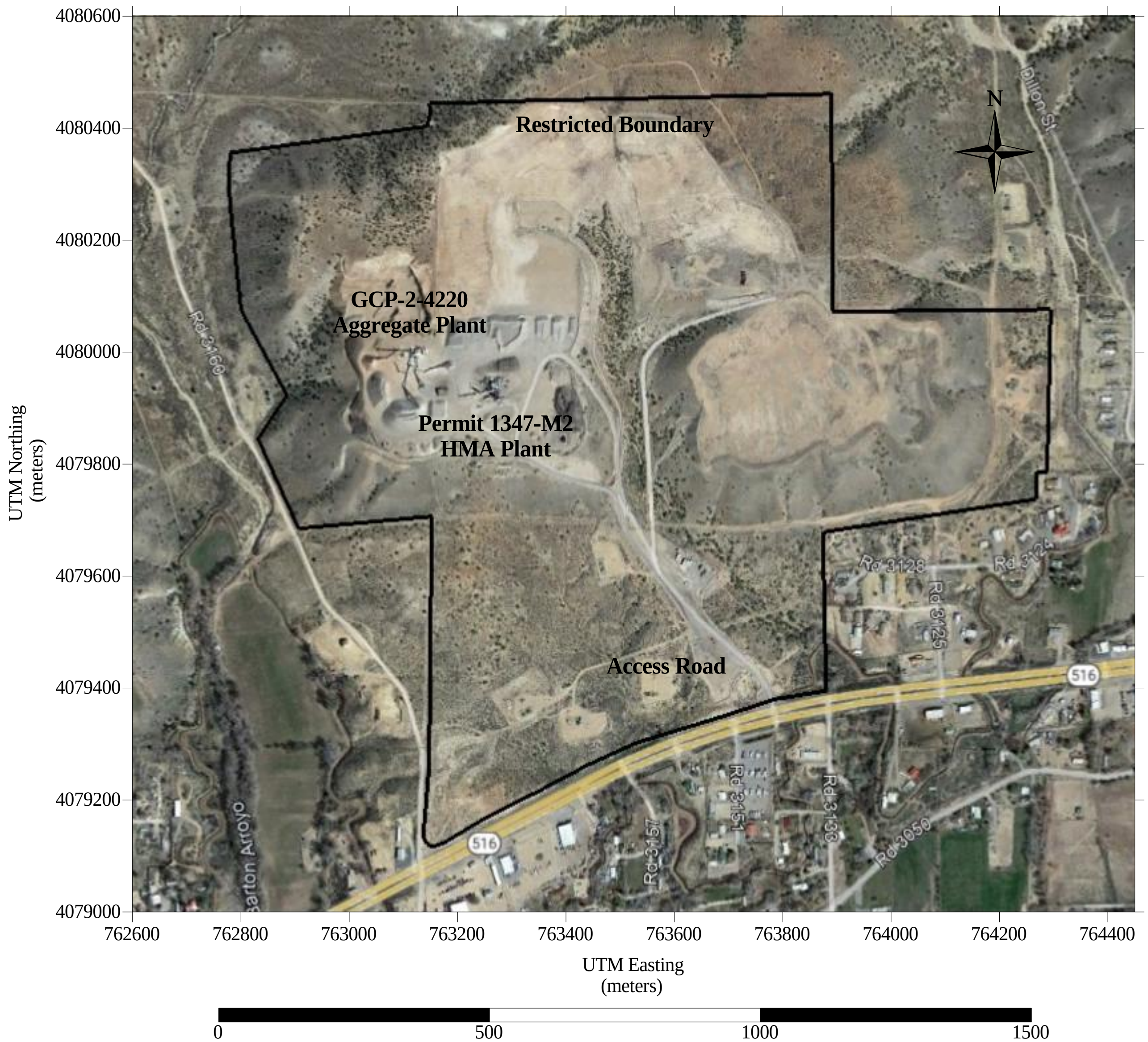

FIGURE 1: FCM's 300 TPH Drum Mixed Asphalt Plant Aerial View

2.0 SIGNIFICANT MONITORING AIR QUALITY IMPACT ANALYSIS

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. NMED AQB 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 4 shows the NAAQS and NMAAQS (without footnotes) that the source's ambient impacts must meet in order to demonstrate compliance. Table 6 also lists the Class II Significant Impact Levels (SILs) which are used to assess whether a source has a significant impact at downwind receptors. Table 5 lists all standards for which modeling is not required by NMED AQB.

The dispersion modeling analysis will be performed to estimate concentrations resulting from the operation of the FCM's 300 TPH Drum Mixed Asphalt Plant using the maximum hourly emission rates while all allowed emission sources are operating. The modeling will determine maximum off-site concentrations for nitrogen dioxide, (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with aerodynamic diameter less than 10 micrometers (PM_{10}) and particulate matter with aerodynamic diameter less than 2.5 micrometers ($PM_{2.5}$), for comparison with model significance levels, and national/New Mexico ambient air quality standards (AAQS). Since the location of the site is within AQCR 014, where the minor source baseline date has been triggered for NO_2, SO_2, and PM_{10}, a modeling analysis will be performed for PSD Class II increment consumption analysis for all FCM sources that consume increment. The modeling will follow the guidance and protocols outlined in the New Mexico Air Quality Bureau "Air Dispersion Modeling Guidelines" (Revised July 2022) and the most up to date EPA's *Guideline on Air Quality Models*.

The nearest Class I area in Mesa Verde National Park at 50.3 kilometers. Since FCM is greater than 50 kilometers from the nearest Class I area, no PSD Class I increment modeling analysis will be completed.

Initial modeling will be performed with FCM's 300 TPH Drum Mixed Asphalt Plant sources only to determine pollutant and averaging periods that exceeds pollutant SILs. If initial modeling for any pollutant and averaging period exceeds the SILs, then cumulative impact analysis (CIA) modeling will be performed for those pollutants, receptors with concentrations over the SIL, and averaging periods and will include significant neighboring sources along with background ambient concentrations as defined in the NMED AQB's modeling guidelines.

TABLE 4: National and New Mexico Ambient Air Quality Standard Summary

Pollutant	Avg. Period	Sig. Lev. (μg/m^3)	Class I Sig. Lev. (μg/m^3)	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/m^3	25 μg/m^3
	24-hour	5.0			100 ppb$^{(2)}$		
	1-hour	7.52		100 ppb$^{(4)}$			
$PM_{2.5}$	annual	0.2	0.05	12 μg/m$^{3(5)}$		1 μg/m^3	4 μg/m^3
	24-hour	1.2	0.27	35 μg/m$^{3(6)}$		2 μg/m^3	9 μg/m^3
PM_{10}	annual	1.0	0.2			4 μg/m^3	17 μg/m^3
	24-hour	5.0	0.3	150 μg/m$^{3(7)}$		8 μg/m^3	30 μg/m^3
SO_2	annual	1.0	0.1		20 ppb$^{(2)}$	2 μg/m^3	20 μg/m^3
	24-hour	5.0	0.2		100 ppb$^{(2)}$	5 μg/m^3	91 μg/m^3
	3-hour	25.0	1.0	500 ppb$^{(1)}$		25 μg/m^3	512 μg/m^3
	1-hour	7.8		75 ppb$^{(8)}$			

Standards converted from ppb to μg/m^3 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 5: Standards for Which Modeling Is Not Required by NMED AQB.

Standard not Modeled	Surrogate that Demonstrates Compliance
CO 8-hour NAAQS	CO 8-hour NMAAQS
CO 1-hour NAAQS	CO 1-hour NMAAQS
NO_2 annual NAAQS	NO_2 annual NMAAQS
NO_2 24-hour NMAAQS	NO_2 1-hour NAAQS
O_3 8-hour	Regional modeling
SO_2 annual NMAAQS	SO_2 1-hour NAAQS
SO_2 24-hour NMAAQS	SO_2 1-hour NAAQS
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 21112. 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_2, CO, SO_2, PM_{10} and $PM_{2.5}$ from FCM's 300 TPH Drum Mixed Asphalt Plant emission sources. Since the location of the site is located within AQCR 014, where the minor source baseline date has been triggered for NO_2, SO_2, and PM_{10}, a modeling analysis will be performed a PSD increment consumption analysis for all FCM sources that consume increment.

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 will be run using all the regulatory default options including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, no use of gradual plume rise, and horizontal release stacks. Alpha options include the use of flat terrain mode for fugitive ground release sources. The model incorporated local terrain into the calculations for point sources and neighboring sources only.

2.2 BUILDING WAKE EVALUATION

AERMOD can account for building downwash and cavity zone effects. Evaluation of building downwash on adjacent stack sources is deemed necessary, since most (if not all) of the stack source heights may be below Good Engineering Practice (GEP) heights. The formula for GEP height estimation is:

$H_s = H_b + 1.50L_b$

where: H_s = GEP stack height

H_b = building height

L_b = the lesser building dimension of the height, length, or width

The effects of aerodynamic downwash due to buildings and other structures will be accounted for by using wind direction-specific building parameters calculated by the USEPA-approved Building

Parameter Input Program Prime (BPIP-Prime (*Version 04274*)) and the algorithms included in the AERMOD air dispersion model. Buildings within 5L if any point sources located at the site will be analyzed with BPIP-Prime.

2.3 METEOROLOGICAL DATA

Dispersion model meteorological input file to be used in this modeling analysis is year 2015 - 19 Bloomfield met data available from the NMED AQB.

2.4 RECEPTORS AND TOPOGRAPHY

For each pollutant, the radius of significant impact around the facility is established using a Cartesian grid. A 25-meter grid spacing is used for the facility boundary receptors. A 50-meter spacing and 100-meter spacing are extended to 500-meters and 1-km beyond the facility boundary, respectively from the facility boundary in each direction for a very fine grid resolution. Receptors for a fine grid resolution are placed with 250-meter spacing to a distance of 3-km from the facility boundary. Receptors for a course grid resolution are placed with 500-meter, 1000-meter, and 2500-meter spacing to a distance of 10-km, 20-km, and 40-km, respectively from the facility boundary.

All model receptors will be preprocessed using the AERMAP software (*Version 18081*) 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 processed using U.S. Geological Survey (USGS) national elevation data (NED). Output from AERMAP will be used as input to the AERMOD runstream file for each model run. The AERMAP domain will be large enough to encompass the 10 percent slope factor required for calculating the controlling hill height.

2.5 MODELED EMISSION SOURCES INPUTS

FCM's 300 TPH Drum Mixed Asphalt Plant will operate a maximum of 7 days per week, 52 weeks per year with the HMA plant daily hours of operation summarized in Table 1.

2.5.1 FCM's 300 TPH HMA Plant Road Vehicle Traffic Model Inputs

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

2.5.2 FCM's 300 TPH HMA Plant Material Handling Volume Source Model Inputs

Material handling and processing will follow the procedure found in AQB's Modeling Guidelines for Fugitive Equipment Sources (Section 5.3.2).

2.5.3 FCM's 300 TPH HMA Plant Material Handling Point Source Model Inputs

For baghouse exhaust and the exhaust from asphalt heater, the release height will be the height from the ground to the exhaust exit height. For baghouse exhaust, the model input for the temperature will be 0 kelvin or ambient temperature will be used.

2.6 PARTICLE SIZE DISTRIBUTION

PM_{10} emissions may be modeled using plume deposition. 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 material handling of aggregate will be 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 material handling of aggregate; fugitive road dust on unpaved roads; mineral filler silo baghouse exhaust; HMA asphalt particulate emissions; and combustion will use the particle size distribution found in the NMED Modeling Section approved values.

The mass-mean particle diameters were 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 were obtained from NMED accepted values.

Material	Density (g/cm^3)	Reference
Road Dust	2.5	NMED Value
Lime	3.3	NMED Value
HMA Asphalt	1.5	NMED Value
Combustion	1.5	NMED Value
Fugitive Dust	2.5	NMED Value

The size distribution for PM_{10} emission sources are presented in Tables 6 - 10.

TABLE 6: Road Vehicle Fugitive Dust Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	2.5
2.5 – 10	6.91	75.0	2.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Vehicle Fugitive)

TABLE 7: Lime Baghouse Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0-2.5	1.57	25	3.3
2.5-10	6.91	75	3.3

Parameters based on baghouse exhaust capture percentages. (Lime Silo)

TABLE 8: Combustion Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 - 2.5	1.57	100	1.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Combustion)

TABLE 9: Asphalt Baghouse and Stack Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0-1.0	0.63	50.0	1.5
1.0-2.5	1.85	19.0	1.5
2.5-10	6.92	31.0	1.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Asphalt Baghouse Stack)

TABLE 10: Fugitive Dust Source Deposition Parameters

Particle Size Category (µm)	Mass Mean Particle Diameter (µm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 - 2.5	1.57	7.8	2.5
2.5 – 5	3.88	27.0	2.5
5 – 10	7.77	65.2	2.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Coal Handling).

2.7 PM2.5 SECONDARY EMISSIONS MODELING

Particulate matter includes both "primary" PM, which is directly emitted into the air, and "secondary" PM, which forms in the atmosphere from chemical reactions involving primary gaseous emissions of precursor air contaminants. 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. Some of these reactions require sunlight and/or water vapor. Secondary PM includes:

- Sulfates formed from SO_2 emissions from power plants and industrial facilities;
- Nitrates formed from NO_X emissions from cars, trucks, industrial facilities, and power plants; and
- Carbon formed from reactive organic gas (ROG or VOC) emissions from cars, trucks, industrial facilities, forest fires, and biogenic sources such as trees.

AERMOD does not account for secondary formation of $PM_{2.5}$ for near-field modeling. Any secondary contribution of the FCM source emissions is not explicitly accounted for in the model results. While representative background monitoring data for $PM_{2.5}$ should adequately account for secondary contribution from existing background sources, the FCM assessment of their potential contribution to cumulative impacts as secondary $PM_{2.5}$ was performed based on guidance from the NMED Modeling Section and using prescribed equations. The permit application for FCM's 300 TPH Drum Mixed Asphalt Plant emissions of precursors include:

- NO_X – 28.1 tons per year (above SER)
- SO_2 – 29.2 tons per year (below SER)
- Volatile Organic Compounds (VOC) – 32.2 tons per year (below SER)
- Particulate Matter with an aerodynamic diameter of 2.5 micron or less ($PM_{2.5}$) – 13.1 tons per year (above SER).

The $PM_{2.5}$ secondary emission concentration analysis will follow EPA and NMED AQB guidelines. Following recent EPA guidelines for conversion of NO_X and SO_2 emission rates to secondary $PM_{2.5}$ emissions, FCM emissions are compared to appropriate western MERPs values (NO_X 24-Hr – 33634 tpy; NO_X Annual – 43833 tpy; SO_2 24-Hr – 11410 tpy; SO_2 Annual – 48057 tpy). The following equation, found in NMED AQB modeling guidance document on MERPs, will be added to determine if secondary emission would cause violation with $PM_{2.5}$ NAAQS.

$PM_{2.5}$ annual = ((NO_X emission rate (tpy)/43833 + (SO_2 emission rate (tpy)/48057)) x 0.2 $\mu g/m^3$

$PM_{2.5}$ annual = ((28.1/43833) + (29.2/48057)) x 0.2 $\mu g/m^3$ = **0.00025 $\mu g/m^3$**

$PM_{2.5}$ 24 hour = ((NO_X emission rate (tpy)/33634 + (SO_2 emission rate (tpy)/11410)) x 1.2 $\mu g/m^3$

$PM_{2.5}$ 24 hour = ((28.1/33634) + (29.2/11410)) x 1.2 $\mu g/m^3$ = **0.00041 $\mu g/m^3$**

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 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)
- Tier III – case-by-case detailed screening methods, such as OLM and Plume Volume Molar Ratio Method (PVMRM) and NO_2/NO_X in-stack ratio

Initial modeling will be performed using both Tier I and Tier II methodologies. If these modeling iterations demonstrate that less conservative methods for determining 1-hour and annual NO_2

compliance would be needed for this project, then ambient impact of 1-hour and annual NO_X predicted by the model will use Tier III – OLM or PVMRM.

For OLM or 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 an approved monitoring station.

Based on EPA's ISR databases, a proposed conservative NO_2/NO_X ISR ratio for the co-located Diesel-fired RICE is 0.15. 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 natural gas-fired combustion asphalt heater, the EPA ISR databases, a proposed conservative NO_2/NO_X ISR ratio for natural gas combustion is less than 0.20. For neighboring sources, since the ISR has a diminishing impact on ambient NO_2/NO_X ratios as a plume is transported farther downwind due to mixing and reaction towards background ambient NO_2/NO_X ratios, a default ISR of 0.30 based on the NMED Modeling Guidelines will be used. Table 11 summarizes the ISR selected for each NO_X source in the NO_2 1-hour modeling.

TABLE 11: Summary of Selected ISR

Source Description	Selected ISR
HMA Baghouse Stack	0.50
HMA Natural Gas-Fired Asphalt Cement Heater	0.20
Plant Generator/Engine (RICE) Co-located	0.15
Neighboring Sources	0.30

Model Ozone Data

For OLM or PVMRM, modeling of the project-generated 1-hour NO_2 concentrations requires use of ambient monitored ozone concentrations. The ozone concentration will represent Bloomfield at Monitor 350450009. The highest 1-hour background concentration is 147.7 micrograms per cubic meters.

2.9 SIGNIFICANT NEIGHBORING BACKGROUND SOURCES

For all Cumulative Impact Analysis (CIA) combustion emissions dispersion modeling (NO_X, CO, SO_2), will include all significant neighboring sources within 50 kilometers of the FCM's 300 TPH Drum Mixed Asphalt Plant. PM CIA particulate dispersion modeling will include all significant neighboring sources within 10 kilometers of the FCM's 300 TPH Drum Mixed Asphalt Plant and regional monitored background. These sources will be obtained from the Air Quality Bureau's database.

2.10 REGIONAL BACKGROUND CONCENTRATIONS

Ambient background concentrations represent the contribution of pollutant sources that are not included in the modeling analysis, including naturally occurring sources. If the modeled concentration of a criteria pollutant is above the modeling significance level, the background concentration for each criteria pollutant will be added to the maximum modeled concentration to calculate the total estimated pollutant concentration for comparison with the AAQS.

The ambient background concentrations are listed in the Air Quality Bureau Guidelines for NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. For CO and SO_2, FCM is proposing using backgrounds for the generic "Rest of New Mexico". For PM_{10}, FCM is proposing using backgrounds from the Shiprock Substation (Monitor ID 350451005). For $PM_{2.5}$, FCM is proposing using backgrounds from the Farmington Environment Department Office (Monitor ID 350450019). For NO_2, FCM is proposing using backgrounds from Bloomfield (Monitor ID 350450009).

	$PM_{2.5}$ (μg/m³)	**PM_{10} (μg/m³)**	**NO_2 (μg/m³)**	**CO (μg/m³)**	**SO_2 (μg/m³)**
1 Hour			61.4	2148	3.5
8 Hour				1265	
24 Hour	11.77	66.0			
Annual	4.19		18.5		

MONTROSE ENVIRONMENTAL

Paul Wade <pwade@montrose-env.com>

Modeling Protocol Four Corners Materials

4 messages

Paul Wade <pwade@montrose-env.com> Fri, Apr 28, 2023 at 4:23 PM
To: "Peters, Eric, ENV" <eric.peters@env.nm.gov>, "Mustafa, Sufi A., ENV" <sufi.mustafa@env.nm.gov>, Franchesca Mallonee <franchesca.mallonee@fourcornersmaterials.com>

Eric
Attached is the model protocol for the permit revision of Permit 1347-M2, Four Corners Materials 300 TPH HMA plant located near Aztec NM.

Please let me know if you have any questions or concerns.

Thank you

--

MEG Logo_Signature

Paul Wade

Senior Associate Engineer

Montrose Environmental Solutions, Inc.

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FCMHMAModelProtocol.pdf
630K

Peters, Eric, ENV <eric.peters@env.nm.gov> Tue, May 30, 2023 at 5:03 PM
To: Paul Wade <pwade@montrose-env.com>, Franchesca Mallonee <franchesca.mallonee@fourcornersmaterials.com>
Cc: "Mustafa, Sufi A., ENV" <sufi.mustafa@env.nm.gov>

Paul,

I have reviewed the modeling protocol for Four Corners Materials 300 TPH HMA plant located near Aztec, NM. I have the following comments.

> Page 1 and page 9 of the protocol says “Version 21112” will be used. The current version of AERMOD is 22112.
>
> Page 10 of the protocol says that 2500-meter receptor spacing will be used from 20-km to 40-km. NM Modeling Guidelines suggests the use of 1000 meter spacing to define the extents of the modeling domain. It is unclear if the larger spacing proposed will adequately define the modeling domain.
>
> Page 11 of the protocol says, “The particle size distribution data used in the modeling for material handling of aggregate will be 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.” It does not appear that these specific values are identified in the protocol. These factors may come from a previous protocol template that is no longer used.

I approve the remainder of the protocol.

Eric

Eric Peters, Air Dispersion Modeler

New Mexico Environment Department / Air Quality Bureau

525 Camino de Los Marquez - Suite 1 / Santa Fe, NM, 87505

Phone: 505-629-5299

E-mail: eric.peters@env.nm.gov

www.env.nm.gov

From: Paul Wade <pwade@montrose-env.com>
Sent: Friday, April 28, 2023 4:24 PM
To: Peters, Eric, ENV <eric.peters@env.nm.gov>; Mustafa, Sufi A., ENV <sufi.mustafa@env.nm.gov>; Franchesca Mallonee <franchesca.mallonee@fourcornersmaterials.com>
Subject: [EXTERNAL] Modeling Protocol Four Corners Materials

Eric

Attached is the model protocol for the permit revision of Permit 1347-M2, Four Corners Materials 300 TPH HMA plant located near Aztec NM.

Please let me know if you have any questions or concerns.

Thank you

--

Paul Wade

Senior Associate Engineer

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PWade@montrose-env.com

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[Quoted text hidden]

Paul Wade <pwade@montrose-env.com> Wed, May 31, 2023 at 9:04 AM
To: "Peters, Eric, ENV" <eric.peters@env.nm.gov>
Cc: Franchesca Mallonee <franchesca.mallonee@fourcornersmaterials.com>, "Mustafa, Sufi A., ENV" <sufi.mustafa@env.nm.gov>

Eric
The correct version will be 22112. The 21112 in the protocol was a typo.

The ROI for any pollutant was less than 20 km so from 10 km to 20 km will be a receptor distance of 1000 meters.

The particle size distribution for fugitive emissions will follow the NMED guidance and not the city guidance. The discussion with the city guidance was a cut and paste error.

Thanks
[Quoted text hidden]
--

MEG Logo_Signature

[Quoted text hidden]

Peters, Eric, ENV <eric.peters@env.nm.gov> Wed, May 31, 2023 at 12:24 PM
To: Paul Wade <pwade@montrose-env.com>
Cc: Franchesca Mallonee <franchesca.mallonee@fourcornersmaterials.com>, "Mustafa, Sufi A., ENV" <sufi.mustafa@env.nm.gov>

Thanks for the clarifications.

[Quoted text hidden]

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

Compliance Test History Table

Unit No.	Test Description	Test Date
46.801	Tested in accordance with EPA test methods for NOx and CO	10/19/2007

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

No other relevant information.

Section 22: Certification

Company Name: Oldcastle SW Group Inc., dba Four Corners Materials

I, Franchesca Mallonee, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 2nd day of February, 2024, upon my oath or affirmation, before a notary of the State of

Colorado.

Franchesca Mallonee
*Signature

2-2-24
Date

Franchesca Mallonee
Printed Name

Environmental Specialist
Title

Scribed and sworn before me on this 2nd day of February, 2024.

My authorization as a notary of the State of Colorado expires on the

3rd day of June, 2026.

Ryan Lee
Notary's Signature

2-2-24
Date

Ryan Lee
Notary's Printed Name

RYAN LEE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20224022113
MY COMMISSION EXPIRES 06/03/2026

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.