

INTER-OFFICE COMMUNICATION

PS Memo 99-004

TO: CP and OP Permit Engineers

FROM: Dennis M. Myers/ Jim Geier

DATE: August 6, 1999

RE: Fugitive Emissions and Major Source Status

The purpose of this memo is to provide more detailed guidance on fugitive emissions and major source status. Included in this memo are a memo from EPA regarding Hot Mix Asphalt plants, a technical support document prepared by EPA regarding Hot Mix Asphalt plants, an excerpt from the EPA PSD Workshop Manual concerning fugitive emissions, and a list of other reference documents concerning fugitive emissions.

HISTORY

The issue of fugitive emissions affecting major source status emerged from the revised EPA regulations addressing Prevention of Significant Deterioration(PSD) in 1978. Under that version of the PSD rules all emissions were to be evaluated to determine if the major source threshold was exceeded. These rules did provide an exemption for 'fugitive dust' if the applicant could show that: "this dust was composed of particles of native soil which is uncontaminated by pollutants resulting from industrial activity. Fugitive dust may come from haul roads or exposed surfaces through the action of man or the wind or both." Even with the exemption many mining activities still triggered PSD major source levels and received PSD permits from EPA for fugitive emissions.

The 1978 PSD rules were challenged by industry in the 'Alabama Power' court case. The Court decisions were implemented in the revised PSD rules which were published in the August 7, 1980 Federal Register. These are basically the same PSD rules which are in effect today and are contained in Part B of Regulation 3. The court ruling required that fugitive emissions, for all pollutants, are only to be considered for applicability purposes if they are emitted by the sources listed in the regulation (listed source categories are in the major stationary source definition in Part A of Colorado Regulation 3) or any source subject to a NSPS or NESHAPS standard promulgated before August 7, 1980. Excerpts from the PSD Workbook are included in this memo to further identify those source categories where fugitives are counted.

Following the issuance of the revised PSD regulations EPA rescinded many permits which had been issued to mining operations. It should be noted that even if fugitive emissions are not counted for major source applicability, that they still must be quantified and modeled to show compliance with ambient air quality standards or increments.

Fugitive Emissions and Major Source Status

With the creation of the operating permit program the issue of fugitive emissions became important to many more sources because it could affect whether they were major or not. Many of these sources didn't have to consider the issue before, since they may have been grandfathered or minor sources, not subject to PSD. Title 5 generated new questions regarding fugitive emissions since sources now wanted to avoid having to obtain an operating permit, if possible. A question to Region 8 requested clarification as to whether fugitive emissions from coal dumping at a coal preparation plant, subject to NSPS Subpart Y, should be counted toward major source status. This question was posed by the Wyoming DEQ, since it would affect the major source status of some of their large surface mines and coal dumping was not specifically listed as an affected activity in the NSPS standard. EPA concluded that the fugitive emissions associated with dumping coal directly into the receiving hopper of processing equipment should be counted toward applicability, but if the coal was dumped into a storage pile that it was not to be considered. EPA also concluded that the dumping of coal into processing equipment was also subject to NSPS even though it was not listed as an affected activity (note: Region 8 originally determined that this activity was not subject to NSPS, however, EPA headquarters overturned that decision and said that NSPS did apply).

One last issue regarding fugitive emissions involves annual emission fees. Currently Colorado does not bill for emissions of fugitive dust. This means that haul road, wind erosion and other land development emission producing activities are not subject to annual fees.

CURRENT REQUIREMENTS

Fugitive emissions should be counted toward major source status in the following situations:

1. The source category is one of the 28 categories listed in the definition of major source (see Regulation No. 3, Definition No. 59) or see Table A-1 from the EPA's NSR Workshop manual on page 8.
2. The source is subject to a NSPS or NESHAP that was promulgated by EPA prior to August 7, 1980. The EPA's NSR Workshop manual contains a listing of the NSPS and NESHAPS promulgated before August 7, 1980 (see Table A-2 starting on page 9).

Some source categories that have a NSPS prior to August 7, 1980 that may be found in Colorado (which are not also on the list of 28 categories) include hot mix asphalt facilities, sewage treatment plants, coal preparation plants, glass manufacturing plants, stationary gas turbines, and lead acid battery manufacturing plants.

Examples of fugitive emissions that should be counted toward major source status would include (but not be limited to):

- coal piles

Fugitive Emissions and Major Source Status

- road dust
- quarries/mines (which are collocated with the listed facility)
- leaking valves and flanges at refineries and organic chemical processing equipment
- truck unloading

In regard to HAP sources, all fugitive HAP emissions should be counted toward determining major source status for Title V. Fugitive emissions should also be included in any air quality impact analysis for determining compliance with the NAAQS, regardless of whether they are counted toward major source status. An example of how this could affect permitting of a source could be as follows:

For a hot mix asphalt plant:

Fugitive particulate emissions from haul roads, and from material stockpiling and handling should be counted when determining major source status since the source category is listed. See the attached Section 8 from EPA's Technical Support Document For Potential To Emit Guidance Memo, Documentation OF Emission Calculations for Hot Mix Asphalt Plants, starting on page 14. In addition, these fugitive emissions should be included when modeling to determine if the facility will comply with the NAAQS. The fugitive emissions should also be included in the permit as a separate permit condition, and a fugitive particulate emissions control plan should also be included.

In regard to NSPS, Subpart Y for coal preparation plants, EPA has determined that fugitive emissions associated with coal unloading that involves conveying to plant machinery is an affected facility that is subject to Subpart Y. EPA has further determined though, that fugitive emissions associated with coal unloading of all types (whether into a stockpile or onto conveying equipment, etc.) should be counted toward determining major source status for the source category of coal preparation plants.

REFERENCES (See Jim Geier for copies of these references)

1. Federal Register August 7, 1980 pp.52690-52693. Describes how fugitives emissions are to be considered for the current PSD program and the rationale.
2. Federal Register June 19, 1978 p. 26395. Discusses 'fugitive dust' exclusion for old PSD rules. Provides some background information on the term 'fugitive dust' which was later defined in the AQCC regulations.
3. EPA New Source Review Workshop Manual, October 1990 Draft. pp. A.9 - A.16. Copies of these pages included in this memo.
4. Federal Register November 28, 1989 pp. 48870-48886. Addresses EPA determination that surface coal mines will not be a listed source category for counting fugitive emissions. Also discusses how sources should be classified

Fugitive Emissions and Major Source Status

according to their primary activity when determining the source category.

5. EPA Memo dated March 8, 1994 from Lydia Wegman titled 'Consideration of Fugitive Emissions in Major Source Determinations'. This memo describes how fugitive emissions should be considered for Title 5 purposes. Clarifies that fugitive emissions are only counted for NSPS standards passed before 8/7/80 and that they are counted for all hazardous pollutants.
6. Letter from EPA to Rep. Barbara Cubin dated October 3, 1997 and supporting analysis addressing Coal Preparation plants. Concludes that coal unloading activities at a coal prep plant are subject to NSPS even though it is not listed as an affected activity in the regulation and that fugitive emissions from those activities should be counted toward major source status. This issue was of greater importance to states like Wyoming with large surface coal mines, since it would affect whether the mines were subject to Title 5.
7. EPA Memo dated February 10, 1999 from Thomas Curran to Judith Katz titled 'Interpretation of the Definition of Fugitive Emissions in Parts 70 and 71'. Discusses whether fugitive emissions should be counted for some source categories where the determination is not straight forward. The memo concludes that if fugitive emissions are required to be collected and controlled for some source categories due to a federal or state/local regulation that those emissions will not be considered fugitive. Based on this rationale emissions from printing/publishing, paint manufacturing and landfills were determined to not be fugitive.

Fugitive Emissions and Major Source Status

THE TEXT YOU ARE VIEWING IS A COMPUTER-GENERATED OR RETYPED VERSION OF A PAPER PHOTOCOPY OF THE ORIGINAL. ALTHOUGH CONSIDERABLE EFFORT HAS BEEN EXPENDED TO QUALITY ASSURE THE CONVERSION, IT MAY CONTAIN TYPOGRAPHICAL ERRORS. TO OBTAIN A LEGAL COPY OF THE ORIGINAL DOCUMENT, AS IT CURRENTLY EXISTS, THE READER SHOULD CONTACT THE OFFICE THAT ORIGINATED THE CORRESPONDENCE OR PROVIDED THE RESPONSE.

5.7

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MEMORANDUM:

DATE: June 9, 1980

SUBJECT: PSD Applicability: Asphalt Concrete Plants

FROM: Director

Division of Stationary Source Enforcement

TO: F. W. Giaccone, Chief

Air Facilities Branch, Region II

This is in response to your memo of May 8, 1980, regarding the inclusion of fugitive emissions in PSD applicability determinations under the 1978 regulations as stayed. Specifically, you asked if fugitive emissions are to be included, for purposes of the stay, in cases where the NSPS and NESHAPs regulations for a particular source category do not regulate fugitive emissions.

The September 5, 1979 proposed PSD regulations provide for the accounting of fugitive emissions in determining a source's potential to emit if the source is regulated under section 111 or 112 of the Clean Air Act or is among the source categories listed in the definition of "major stationary source". Fugitive emissions are to be counted, for all these sources, regardless of whether the appropriate NSPS or NESHAP specifically regulates fugitive emissions.

The discussion in the preamble of the September 5 proposal concerning fugitive emissions states that:

"EPA believes that there is no reason why a source of a particular pollutant regulated under the Act should escape review because the emissions of the pollutant are fugitive, when a source of the same pollutant has to get a permit if the emissions are not fugitive. In both cases the emissions would deteriorate air quality regardless of how they emanate. Thus, it serves the purposes of NSR to scrutinize the one as well as the other."

Under the proposed PSD regulations source is defined as any "structure, building, facility, or installation which emits or may emit any air pollutant regulated under the Act". Note that this definition has a much broader scope than the definition of affected facility under NSPS and is intended to encompass all the pollutant emitting facilities located at one site and under common control.

Since the source mentioned in your memo is an asphalt plant, subject to NSPS under 40 CFR 60.90, fugitive emissions, from all activities at the site, should be included in determining PSD applicability under the 1978 regulations as stayed. This would include fugitive emissions from

Fugitive Emissions and Major Source Status

cold aggregate storage piles.

If you have any further questions regarding this determination, please contact Janet Littlejohn of my staff at 755-2564.

Edward E. Reich

cc: Peter Wyckoff (OGC)
Jim Weigold (OAQPS)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region II Office

DATE: May 8, 1980
SUBJECT: Interpretation of Proposed PSD Regulations
FROM: F. W. Giaccone, Chief

Air Facilities Branch
TO: Edward E. Reich, Director

Division of Stationary Source Enforcement

The proposed PSD regulations provide that fugitive emissions should not be included in an applicability determination except in the case of 26 specific industrial categories, and any other stationary "source category...regulated under Section 111 or Section 112 of the Act."

My question is: In the case of an asphalt plant subject to NSPS Subpart I, can fugitive emissions from aggregate stockpiles be included in an applicability determination even though Subpart I does not regulate these emissions, i.e. can fugitive emissions be included in cases where the NSPS or NESHAPS regulations for a particular source category does not regulate such emissions. It should be noted that cold aggregate storage piles are not included in the designation of affected Facility at Section 60.90(a), although common practice generally dictates the stockpiling of cold aggregate at the plant site, and that stockpiles are not considered part of an affected facility in the proposed NSPS For the non-metallic mining industry.

This branch is in the process of reviewing a potential PSD candidate asphalt plant, and an expedited response would be greatly appreciated.

cc: R. Ogg
K. Eng
P. Kahn
R. Stein

Notebook Entries: 2.11

II. B. 3. FUGITIVE EMISSIONS

As defined in the federal PSD regulations, fugitive emissions are those "...which could not reasonably pass through a stack, chimney, vent, or other

Fugitive Emissions and Major Source Status

functionally equivalent opening." To the extent they are quantifiable, fugitive emissions are included in the potential to emit (and increases in same due to modification), if they occur at one of the following stationary sources:

- ! Any belonging to one of the 28 named PSD source categories listed in Table A-1, which were explicitly identified in Section 169 of the Act as being subject to a 100-tpy emissions threshold for classification of major sources;
- ! Any belonging to a stationary source category that as of August 7, 1980, is regulated (effective date of proposal) by New Source Performance Standards (NSPS) pursuant to Section 111 of the Act (listed in Table A-2); and
- ! Any belonging to a stationary source category that as of August 7, 1980, is regulated (effective date of promulgation) by National Emissions Standards for Hazardous Air Pollutants (NESHAP) pursuant to Section 112 of the Act (listed in Table A-2).

Note also that, if a source has been determined to be major, fugitive emissions, to the extent they are quantifiable, are considered in any subsequent analyses (e.g., air quality impact).

Fugitive emissions may vary widely from source to source. Examples of common sources of fugitive emission include:

- ! coal piles - particulate matter (PM);
- ! road dust - PM;
- ! quarries - PM; and
- ! leaking valves and flanges at refineries and organic chemical processing equipment - volatile organic compounds (VOC).

Fugitive Emissions and Major Source Status

28. Charcoal production plants

TABLE A-2. NEW SOURCE PERFORMANCE STANDARDS PROPOSED AND NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS PROMULGATED PRIOR TO August 7, 1980

New Source Performance Standards 40 CFR 60
))
))))Q
 Source Subpart Affected Facility Proposed Date
))
)))

Fossil-fuel fired 08/17/71 steam generators for which construction is commenced after 08/17/71 and before 09/19/78 D Utility and industrial (coal, oil, gas, wood, lignite)

Elect. utility steam 09/19/78 generating units for which construction is commenced after 09/18/78 Da Utility boilers (solid, liquid, and gaseous fuels)

Municipal incinerators (>50 tons/day) E Incinerators 08/17/71

Portland cement plants F Kiln, clinker cooler 08/17/71

Nitric acid plants 08/17/71 G Process equipment

Sulfuric acid plants 08/17/71 H Process equipment

Asphalt concrete 06/11/73 plants I Process equipment

Petroleum refineries 06/11/73 J Fuel gas combustion devices Claus sulfur recovery

Storage vessels for K Gasoline, crude oil, and 06/11/73

Fugitive Emissions and Major Source Status

petroleum liquids
construction after
06/11/73 and prior
to 05/19/78

distillate storage tanks
≥40,000 gallons capacity

Storage vessels for
petroleum liquids
construction after
05/18/78

Ka

Gasoline, crude oil, and 05/18/78
distillate storage tanks
≥40,000 gallons capacity,
vapor pressure ≥1.5

Secondary lead
06/11/73
smelters and
refineries

L

Blast and reverberatory
furnaces, pot furnaces

Fugitive Emissions and Major Source Status

TABLE A-2. NEW SOURCE PERFORMANCE STANDARDS PROPOSED AND NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS PROMULGATED PRIOR TO August 7, 1980

New Source Performance Standards 40 CFR 60

))
))))Q

Source Proposed Date	Subpart	Affected Facility
))))))		

Secondary brass 06/11/73 and bronze ingot production plants	M	Reverberatory and electric furnaces and blast furnaces
--	---	---

Iron and steel mills 06/11/73	N	Basic oxygen process furnaces (BOPF) Primary emission sources
----------------------------------	---	---

Sewage treatment 06/11/73 plants	0	Sludge incinerators
--	---	---------------------

Primary copper smelters	P	Roaster, smelting furnace converter dryers 10/16/74
----------------------------	---	--

Primary zinc smelters	Q	Roaster sintering machine 10/16/74
--------------------------	---	------------------------------------

Primary lead 10/16/74 smelters	R	Sintering machine, electric smelting furnace, converter Blast or reverberatory furnace, sintering machine discharge end
--------------------------------------	---	--

Primary aluminum 10/23/74 reduction plants	S	Pot lines and anode bake plants
--	---	------------------------------------

Primary aluminum 04/11/79 reduction plants 111(d)		Pot lines and anode bake plants
--	--	------------------------------------

Phosphate fertilizer 10/22/74 industry	T	Wet process phosphoric acid
	U	Superphosphoric acid
	V	Di ammonium phosphate
	W	Triple superphosphate products

Fugitive Emissions and Major Source Status

	X	Granular triple superphosphate products
Coal preparation 10/24/74 plants	Y	Air tables and thermal dryers
Ferroalloy 10/21/74 production facilities	Z	Specific furnaces

Fugitive Emissions and Major Source Status

TABLE A-2. NEW SOURCE PERFORMANCE STANDARDS PROPOSED AND NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS PROMULGATED PRIOR TO August 7, 1980

New Source Performance Standards 40 CFR 60

))
))))Q

Source	Subpart	Affected Facility	Proposed Date
))))))			

Steel plants:	AA	Electric arc furnaces	
10/21/74			
electric arc furnaces			

Kraft pulp mills 09/24/76	BB	Digesters, lime kiln recovery furnace, washer, evaporator, strippers, smelt and BLO tanks Recovery furnace, lime, kiln, smelt tank	
------------------------------	----	---	--

Glass manufacturing plants	CC	Glass melting furnace	06/15/79
----------------------------	----	-----------------------	----------

Grain elevators 01/13/77	DD	Truck loading and unloading stations, barge or ship loading and unloading stations railcar loading and unloading stations, and grain handling operations	
-----------------------------	----	---	--

Stationary gas turbines 10/03/77	GG	Each gas turbine	
-------------------------------------	----	------------------	--

Lime manufacturing plants 05/03/77	HH	Rotary kiln, hydrator	
---------------------------------------	----	-----------------------	--

Degreasers (organic solvent cleaners)	JJ	Cold cleaner, vapor degreaser, conveyORIZED	06/11/80
---------------------------------------	----	---	----------

Fugitive Emissions and Major Source Status

degreaser

Lead acid battery
01/14/80
manufacturing plants

KK

Lead oxide production grid
casting, paste mixing, three-
process operation and lead reclamation

Automobile and
10/05/79
light-duty truck
surface coating
operations

MM

Prime, guide coat, and
top coat operations at
assembly plants

Fugitive Emissions and Major Source Status

surfacing (asbestos tailings);
demolition; spraying, fabri-
cation, waste disposal and
insulating

06/19/78

Manufacture of shotgun

shells, renovation,
fabrication, asphalt concrete,
products containing asbestos

Fugitive Emissions and Major Source Status

Due to the variability even among similar sources, fugitive emissions should be quantified through a source-specific engineering analysis. Suggested (but by no means all of the useful) references for fugitive emissions data and associated analytic techniques are listed in Table A-3.

Remember, if emissions can be "reasonably" captured and vented through a stack they are not considered "fugitive" under EPA regulations. In such cases, these emissions, to the extent they are quantifiable, would count toward the potential to emit regardless of source or facility type.

For example, the emissions from a rock crushing operation that could reasonably be equipped with a capture hood are not considered fugitive and would be included in the source's potential to emit.

As another example, VOC emissions, even if in relatively small quantities, coming from leaking valves inside a large furniture finishing plant, are typically captured and exhausted through the building ventilation system. They are, therefore, measurable and should be included in the potential to emit.

As a counter example, however, it may be unreasonable to expect that relatively small quantities of VOC emissions, caused by leaking valves at outside storage tanks of the large furniture finishing operation, could be captured and vented to a stack.

Attachment**Technical Support Document for Potential to Emit
Guidance Memo. Documentation of Emission Calculations.**

Tim Smith, USEPA/OAQPS. April 1998

Section 8. Hot-Mix Asphalt Plants8.1 Pertinent Data and Calculations

Hot-mix asphalt plants are described well in AP-42, section 11.1, and in a document prepared by the National Asphalt Paving Association entitled Dealing with Title V Operating Permits--the Synthetic Minor Alternative. There are about 3600 active asphalt plants in the United States, of which 2,300 are batch plants, 1,000 are parallel flow drum mix plants, and 300 are counterflow drum mix plants.

For purposes of major source applicability, the pollutants of greatest interest are PM-10, CO, and SO₂. Emission factors for other criteria pollutants, such as NO_x and VOC, are much less than those for these three pollutants. Hazardous air pollutants (metals, PAHs, benzene, ethylbenzene, toluene xylene, and formaldehyde) are emitted in relatively small quantities relative to criteria pollutants.

8.1.A. PM10 Emission Calculations

In addressing particulate emissions, both stack and fugitive emissions must be addressed. The New Source Performance Standard (NSPS) for hot mix asphalt plants, codified in subpart I of 40 CFR part 60, was promulgated during the 1970s. For major source identification purposes, fugitive emissions must be addressed for any “... stationary source category which, as of August 7, 1980, is being regulated under section 111 or 112 of the Act...” It should be noted that for such stationary source categories, fugitive emissions must be calculated for any source in the category, and not just those subject to the NSPS.

The State of Minnesota calculated fugitive emissions from material handling and stockpiles, using the equation in section 13.2.4 of AP-42:

$$E = k (0.0032)[(U/5)**1.3]/[(M/2)**1.4]$$

where: E = emission factor (lb/ton of material transferred)

k = particle size multiplier (0.35 for PM10)

U = mean wind speed (10 miles/hr was used for Minnesota)

M = material moisture content (1.5% assumed as worst case)

Using this equation a PM-10 factor of 0.00413 lb/ton of aggregate transferred was derived. This factor was multiplied by two, based upon a conservative assumption that each ton of aggregate is transferred twice, to yield an emission factor for material handling of 0.00816

 Fugitive Emissions and Major Source Status

lb/ton of hot mix asphalt produced.

Minnesota also calculated PM-10 emission from roads, using a conservative assumption that there would be ½ mile of unpaved roads at the site. The unpaved road calculations, used the following equation in AP-42, section 13.2.2:

$$\text{Emission factor (lb PM-10 per vehicle mile traveled)} =$$

$$k (5.9) X (s/12) X (S/30) X (W/3)^{0.7} X (w/4)^{0.5} X (365-p)/365$$

where: k = 0.36 for PM-10

s = silt content (%). (Minnesota calculations assumed 4.8%)

S = mean vehicle speed (miles per hour). (Minnesota calculations assumed 20 mph)

W = mean vehicle weight (tons). (Minnesota assumed 15 tons)

w = number of wheels. (Minnesota assumed 10 wheels)

p = number of days with \geq 0.1" rain (Minnesota used 111)

As a result of these calculations, Minnesota derived an emission factor of 1.92 pounds of PM10 per vehicle mile travel. Note that this emission factor is an uncontrolled factor which does not take credit for measures such as road watering. This was then converted to units of pounds PM10 per ton of hot mix asphalt, assuming 15 tons of asphalt per vehicle, and assuming each ton of asphalt travels twice on all unpaved roads at the site, and assuming ½ mile of unpaved road, as follows:

$$1.92 \text{ lb PM10/vehicle mile} X 1 \text{ vehicle/} 15 \text{ tons} X 2 X \frac{1}{2} =$$

$$0.128 \text{ lb PM10/(ton asphalt produced)}$$

In addition to the fugitive emissions there are also stack emissions from hot mix asphalt production, generally from a particulate control device controlling emissions from the dryer and other emission points. Uncontrolled PM10 emission from batch mix plants, as indicated in table 11.1-2 of AP-42, are 4.5 lbs PM10 per ton of hot mix asphalt produced, while controlled emissions are less than 0.1 lb PM10 per ton.

For PM10 emissions from sources subject to the NSPS (that is, those for which construction or modification commenced after June 11, 1973), the EPA believes that the NSPS will assure that allowable PM10 emissions will be consistent with the "controlled emission" values listed in AP-42. For sources not subject to the NSPS, the required PM10 emission rate will vary from State to State. For example, in Minnesota, a process rate equation yields a required lb/ton for PM (total PM, not PM10) for a non-NSPS plant operating at 200 tons per hour of 40 pounds per hour, or 0.2 pounds PM per ton. In Mississippi, the process weight calculation for a similarly-sized facility of 200 tons/hour would be as follows:

$$\text{Allowable emissions} = 4.1 X [(200 \text{ tons/hr})^{0.67}] = 142 \text{ pounds/hour}$$

Expressed as a lb ton figure, this value would be 142/200, or about 0.7 lb/ton.

Fugitive Emissions and Major Source Status

In Georgia, the process rate equation is as follows:

$$E = 10 \times P^{0.4}$$

For a process rate, P of 200 tons per hour, the Georgia allowable emission rate would be about 83 pounds per hour. Expressed as a lb/ton figure, this would equate to 83/200, or about 0.4 lb/ton.

8.1.B Sulfur Dioxide Calculations

Sulfur dioxide becomes an important pollutant to consider for hot mix asphalt plants with fuel oil-fired dryers, particularly those with residual fuel capability. The sulfur dioxide emission factor in AP-42, table 11.1-8, is 0.24 pounds per ton of asphalt produced, based upon a test for which firing was with #6 fuel oil. Footnote (e) to table 11.1-7 states that dryers fired with other fuel oils will have different emission factors.

The Minnesota calculations for sulfur dioxide assumed that a batch plant burning #6 residual oil with a sulfur content of 1.8% sulfur. Based upon source test results in the State, a further assumption was made that there would be a 20 percent reduction in sulfur dioxide emissions due to adsorption by the aggregate in the dryer. The result of these assumptions was an emission factor of 226.8 pounds SO₂ per 1000 gallons of fuel burned. Finally, the calculations assumed that 1.5 gallons of fuel oil must be burned for every ton of asphalt produced. For purposes of comparison with AP-42, the EPA converted this emission factor to a lb/ton basis and obtained an emission factor of (226.8/1000) X 1.5, or 0.34 lbs SO₂ per ton asphalt produced.

Calculations provided to the EPA by the State of Mississippi were also reviewed. For the Mississippi calculations, the SO₂ emissions were calculated based upon the fuel capacity of several example sized units. Example 1 in the calculations was a small batch plant with production capacity of 60 tons/hour and fuel capacity of 50 MMBTU/hr. Example 2 was a larger batch plant with production capacity of 190 tons per hour and fuel capacity of 86.3 MMBTU/hour. The Mississippi calculations are more conservative than for Minnesota, in that a much higher % sulfur is assumed (4.8 lb/MMBTU, or roughly 4.8% sulfur). The end result of the Minnesota calculations is 1814 tons sulfur dioxide per year for a plan with a capacity of 190 tons per hour. The effective emission factor of these calculations, is, therefore

$$\begin{aligned} 1814 \text{ tons/yr} \times 2000 \text{ lb/ton} \times 1 \text{ year}/8760 \text{ hours} &= 414 \text{ lb/hour} \\ 414 \text{ lb/hour} / 190 \text{ tons/hour} &= 2.1 \text{ lb SO}_2 \text{ per ton} \end{aligned}$$

8.1.C. Carbon Monoxide Calculations

Carbon monoxide emission factors are listed in table 11.1-7 and 11.1-8 of AP-42. The listed emission factors are larger for natural gas-fired dryers than for oil-fired dryers. The emission factor listed for natural gas-fired dryers at batch plants is 0.34 lb CO per ton of hot mix asphalt produced. For drum mix plants, the natural gas emission factor for CO is 0.056 lb/ton. A

Fugitive Emissions and Major Source Status

draft revision to AP-42 is currently under review that would raise the value for batch mix plants to 0.50 pounds per ton. Although CO emission factors are less for drum mix, the EPA for purposes of this guidance used the 0.50 value as a conservative case, rather than to develop guidance that differentiate between the various types of plants.

8.2 Recommended Approach for Screening Cutoffs

The EPA believes that 250,000 tons per 12-month rolling period is a possible demarcation between hot mix asphalt plants that would achieve synthetic minor status by general permit or prohibitory rule, while it may be reasonable to require those above 250,000 tons to seek synthetic minor status by case-by-case permit. A high percentage of asphalt plants operate at less than this level. (Ref: Personnel communication with Gary Fore, National Asphalt Paving Association). The calculations below suggest this to be a reasonable cutoff for prohibitory rules, with a few possible exceptions.

Based upon the above assumptions, CO is generally the limiting case for purposes of prohibitory rule or general permit limitations. Even with the draft CO emission factor of 0.5 lbs/ton, CO emission would be 250,000 tons X 0.5 lbs/ton X 1 ton/2000 lb, or 62.5 tons per year. This amount is considerably less than the major source threshold of 100 tons per year. For drum mix plants, CO emissions would be an even lesser fraction of the major source threshold.

For PM-10, a production rate of 250,000 tons per year would yield:

-- (based upon the Minnesota emission factors above), there would be fugitive emissions of 0.00826 lb/ton for material handling and 0.128 lb/ton for unpaved roads. Hence, fugitive emissions are $(0.00826 + 0.128)$ lb/ton X 250,000 tons/year X 1 ton/2000 lb, or about 17 tons per year.

-- for NSPS sources, potential stack emissions of PM10 would be less than 0.1 lb/ton, and hence annual emissions would be less than $250,000 \times 0.1/2000$, or less than 12.5 tons per year.

-- for non-NSPS sources, allowable emissions are more difficult to assess, because it is beyond the scope of this effort to explore any possible process weight table or other SIP limit that may exist. It appears, however, that in most cases a limit of 250,000 tons per year would like ensure nonmajor amounts even for non-NSPS sources. For example, the Mississippi SIP limit which equates to roughly 0.7 pounds per ton of PM, would equate to $250,000 \times 0.7/2000$, or about 82.5 tons per year of PM. Because some fraction of the total particulate emissions from an asphalt plant dryer is likely to contain particles greater than 10 microns, 82.5 tons per year of PM is likely to equate to a value of PM that is sufficient to be protective of the major source threshold, even if fugitive emissions on the order of 17 tons per year are considered. The EPA emphasizes, however, that before using the 250,000 tons per year value, the control agency must conduct an assessment of the allowable PM10 emissions for pre-NSPS sources before concluding that a 250,000 ton/year limit is adequate for a prohibitory rule. A comprehensive statement on this issue is beyond the scope of EPA's guidance effort.

For SO₂, 250,000 tons of hot mix asphalt production would yield annual emissions, using the 0.24 lb/ton figure in AP-42, of 30 tons per year. Using Minnesota's emission factor (as noted

Fugitive Emissions and Major Source Status

above, the 226.8 lb/1000 gallon emission factor is equivalent to 0.34 lb/ton), 250,000 tons of hot mix asphalt production would equate to 43 tons per year. These calculations suggest that even with residual oil firing capability, this level of production would be very unlikely to exceed 100 tons per year at this level of production.

8.3 Observation about Minor NSR

Asphalt plants provide an excellent example as to why guidance for cutoffs for synthetic minor limitations should NOT be construed as guidance for sources that do not need minor NSR permits. Conversations with State and local agency personnel indicate that at nonmajor emission levels, asphalt plants can be of concern for ambient concentrations of criteria pollutants such as sulfur dioxide. For example, Minnesota requires demonstration of compliance with sulfur dioxide ambient air quality standards through the use of EPA's SCREEN3 model if fuel exceeding 0.70 percent sulfur is burned by the asphalt dryer burner. If compliance is not demonstrated with SCREEN3, the source has two options: (1) to limit the sulfur content to 0.7% or (2) obtain a permit reflecting refined dispersion calculations.

In addition, the fact that control equipment is required by SIP regulations makes these plants a source for which any new plant would logically be reviewed by a permit engineer before a plant is constructed.