

**OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

MEMORANDUM

April 1, 2024

TO: Kendal Stegmann, Division Director

THROUGH: Phillip Fielder, P.E., Chief Engineer

THROUGH: Travis Couch, Environmental Attorney, Legal Counsel

THROUGH: Rick Groshong, Environmental Manager, Enforcement and Compliance

THROUGH: Lee Warden, P.E., Manager of Permits and Engineering Group
Richard Kienlen, P.E., Engineering Manager, New Source Permits Section
Eric L. Milligan, P.E., Engineering Manager, Engineering Section

FROM: Iftekhar Hossain, P.E., New Source Permits Section

SUBJECT: General Permit to Construct/Operate
Minor Source Hot Mix Asphalt Facilities (2024 HMAF-GP)

April 1, 2024

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SECTION I. INTRODUCTION

The Hot Mix Asphalt Facilities (HMAF) General Permit (GP), issued originally on December 12, 2002, was developed to authorize construction and/or operation of facilities whose primary air pollutant emissions (particulate matter) are from the handling and production of Hot Mix Asphalt (HMA). All of these facilities are typically categorized under a Standard Industrial Classification (SIC) code of 2951 - Asphalt Paving Mixtures and Blocks. The minor facility GP as originally issued has an indefinite term - it is effective until modified or cancelled. Because of significant changes in rules and regulations since its issuance, this GP is updated and modified to provide a revised comprehensive discussion of applicable rules for the affected industries.

This GP has been developed to authorize facilities with emissions less than major source thresholds (i.e., 100 TPY of any regulated air pollutant and/or 10 TPY of any single hazardous air pollutant (HAP) or 25 TPY of any combination of HAPs). In addition, this permit will distinguish synthetic minor facilities with actual emissions below 80 TPY (Class I) and those facilities with actual emissions equal to or above 80 TPY but below 100 TPY (Class II). The applicant can request limits of less than 80 TPY for NO_x, CO, PM₁₀, PM_{2.5}, VOC, and SO₂.

Upon issuance of this GP, the terms and conditions of the 2024 HMAF-GP supersede all previous versions. All facilities constructed or operating under the previous GP will be subject to and must comply with the 2024 HMAF-GP after 24-months of the issuance date. During the 24-month transition period coverage can be obtained as described in the 2024 HMAF-GP under Part 3, Section XI.C.

Applicants with the same or substantially similar operations, emissions, activities, and facilities which emit the same types of regulated air pollutants, which are subject to the same or similar standards, limitations, operating requirements, and monitoring requirements, can be covered under this permit. Permits issued to these facilities must address all air emissions from all sources at these facilities. Thus, the permit is designed to include those sources typically expected to be present at these facilities, including: HMA rotary drum dryers (dryer), heaters, screens, crushers, elevators, conveyors, storage silo loading systems, asphalt/fuel storage tanks, internal combustion (IC) engines, other miscellaneous equipment, and fugitives from roads, stockpiles, and loading and unloading operations. Other facilities which perform similar activities, such as batch processing cement plants or manufacturers of “earthen” materials (glassware, gypsum board, pottery, etc.) will not be eligible for coverage under this General Permit since they typically include additional significant emission sources, e.g., kilns, furnaces, thermal dryer, and other combustion equipment.

SECTION II. ELIGIBILITY

In order to provide the broadest coverage to applicants under this permit and to ensure compliance with all applicable requirements, eligibility must be restricted to those minor facilities whose emission units are addressed in this permit. The permit has been developed for a facility designed and operated for the primary purpose of manufacturing HMA by heating and drying aggregates and mixing with asphalt cements.

Emission units identified as typically present at such a facility, and addressed in the permit, include the dryer, hot oil heater, heaters, screens, crushers, elevators, conveyors, storage silo loading systems, asphalt/fuel storage tanks, internal combustion (IC) engines (diesel or gasoline), other miscellaneous equipment, and fugitives from roads, stockpiles, piping, and loading and unloading operations. In addition, those emission units identified as a de minimis facility, as defined in OAC 252:100 Appendix H, are also recognized as typically present at such a facility and are addressed in the permit. Any other emission units subject to an applicable requirement not included in this permit makes that facility ineligible for coverage under this permit.

Facilities with emission units subject to New Source Performance Standards (NSPS) requirements under 40 CFR Part 60 and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements under 40 CFR Part 63 are eligible for this permit. Any facility that becomes subject to a subpart that becomes effective subsequent to the issuance of this permit can get coverage under this permit, as long as they can comply with that subpart.

In general, the following facilities are not eligible for coverage under this permit.

1. Facilities for which material facts were misrepresented or omitted from the application and the applicant knew or should have known of such misrepresentation or omission.
2. Facilities with emissions units that are subject to:
 - a. OAC 252:100-8 (Permits for Part 70 Sources).
 - b. OAC 252:100-17 (Incinerators).
 - c. OAC 252:100-23 (Cotton Gins).
 - d. OAC 252:100-24 (Grain, Feed, or Seed Operations).
 - e. OAC 252:100-35 (Control of Emissions of Carbon Monoxide).

The following facilities are not eligible to obtain an Authorization to Construct under this permit, but may be eligible for coverage under an Authorization to Operate if they obtain an individual construction permit and all relevant requirements and limitations in that permit are incorporated into the Authorization to Operate.

1. Facilities with a design process rate greater than 1,000 tons HMA/hour.
2. Facilities with a design process rate greater than 500 tons HMA/hour and using a venturi or wet scrubber.
3. Facilities with fuel-burning equipment fired with fuels other than: natural gas, liquid petroleum gas (LPG), diesel with a maximum sulfur content of 15 ppmw, or for the dryer #2 through #6 fuel oil with a maximum sulfur content of 0.7% by weight.
4. Facilities that store VOCs with a vapor pressure greater than 1.5 psia in storage tanks built after December 28, 1974, with a capacity greater than 151 m³ (40,000 gallons), or with a capacity greater than 400 gallons that are not equipped with a submerged fill.

5. Facilities located in Tulsa County which store gasoline or other VOCs (with vapor pressure greater than 1.5 psia) in storage tanks with a capacity greater than 2,000 gallons.
6. Facilities that use combustion devices (such as flares, incinerators, or thermal oxidizers) to control emissions of VOCs. This does not include flares subject to the control requirements of 40 CFR Part 60, Subpart A.
7. Facilities located in an area that is federally designated as non-attainment.
8. Facilities that request an Alternative Emissions Reduction Authorization under OAC 252:100-11.
9. Facilities requesting control efficiencies above the levels allowed in Section VIII.C-Control Devices.
10. Facilities requesting unit specific limits not allowed or required under the general permit.

The DEQ may not issue a permit authorization sought by an applicant that has not paid all monies owed to the DEQ or is not in substantial compliance with the Environmental Quality Code, rules of the Board and the terms of any existing DEQ permits and orders. The DEQ may impose specific conditions on the applicant to ensure compliance and/or a separate schedule that the DEQ considers necessary to achieve required compliance.

Facilities that are not in compliance with all applicable State and Federal air requirements may become eligible for coverage under this permit through submission of a compliance plan meeting the requirements of Part 3 of this Permit.

In addition, the DEQ may refuse issuance of an authorization to an applicant even though the facility meets the above eligibility criteria. In such a case, DEQ will provide in writing to the facility an explanation providing the reason(s) for the decision. This is necessary to handle certain situations where a particular emissions unit is not expected to be present at such facilities, but gives the agency the discretion to make the final decision as to whether coverage is appropriate.

SECTION III. PERMIT STRUCTURE

This general permit is designed for minor facilities (i.e., with actual emissions less than 100 TPY of a non-HAP regulated pollutant in an attainment area, less than 10 TPY of any single HAP, and less than 25 TPY of total HAPs). The general permit can authorize both construction and operation, and can be used both for new sources and for modifications at existing sources. Major sources must obtain coverage under a major source construction permit and Part 70 permit.

The general permit is structured so that eligible facilities can obtain an Authorization to Construct and Authorization to Operate under the general permit, or can obtain an individual minor source construction permit and then an Authorization to Operate under the general permit, or can obtain an Authorization to Construct under the general permit and then an individual minor source operating permit and pay all applicable fees. This should allow applicants the greatest flexibility for obtaining coverage under the general permit. No site-specific determinations can be made in

issuance of an Authorization to Construct under a general permit. However, once these site-specific determinations have been completed and drafted into an individual minor source construction permit as emissions limitations and/or specific conditions, they can then be incorporated into the Authorization to Operate under a general permit.

In addition, certain other options usually available by regulation had to be disallowed so that no site-specific determinations were made in issuance of an Authorization to Construct under the general permit. Alternate emissions reduction authorizations are not allowed under an Authorization to Construct under this permit, as these site-specific limitations require Air Quality Council approval. Similarly, several regulations allow exceptions from specific requirements “if approved by the Executive Director.” These approvals also require a site-specific determination that cannot be reasonably made in issuance of an Authorization to Construct under this permit.

All conditions in the general permit have been derived directly from applicable requirements given in OAC 252:100, Air Pollution Control, as promulgated to implement the Oklahoma Clean Air Act. The general permit is formatted so that the first section establishes emissions limitations. Then specific conditions are given for each emissions unit allowed under the general permit, i.e., dryer, hot oil heater, nonmetallic mineral processing equipment, storage tanks, and engines, as well as facility-wide requirements. In order to streamline the permit, specific conditions to ensure compliance with fugitive emissions requirements were incorporated in the facility-wide section rather than being addressed in a separate stand-alone section.

Each section may contain a list of emissions limitations, operational conditions, and monitoring and recordkeeping conditions developed to ensure compliance with applicable requirements. Conditions to ensure compliance with those state regulations that implement federal requirements, e.g., NSPS Subpart I (HMA Facilities), NSPS Subpart OOO (Nonmetallic Mineral Processing), and NESHAP Subpart ZZZZ (Reciprocating Internal Combustion Engines (RICE)), are also incorporated as a specific condition for the general permit. These emission unit-specific conditions, as required by Oklahoma regulations, are generally established in the Authorization to Construct under this general permit or by a minor source individual construction permit, then incorporated into a subsequently issued Authorization to Operate for the facility. Additionally, a section of standard conditions contains those requirements applicable to all minor facilities.

Specific numeric emissions limitations are usually required for sources that have the potential to exceed a threshold value or violate an applicable requirement. However, this general permit establishes those limitations as a facility-wide cap on emissions from the facility, rather than establishing limitations on individual emission units, except where emissions limits are required for compliance methods to avoid an otherwise applicable limit. The permit initially establishes a facility-wide emissions cap, which may include pre-approved changes foreseeable at the time of permit application. Certain modifications, e.g., adding, modifying, replacing equipment, changing fuels, or increasing operating hours of equipment, or adding or removing a unit specific TPY limit, are pre-approved so long as the facility remains in compliance with its facility-wide emissions cap and all other applicable notifications and recordkeeping.

This approach should greatly reduce the burden on both the permittee and AQD by eliminating the need for construction permits, permit modifications, or new Authorizations when making certain

changes to the facility. Notification to DEQ within 15 days following the start of operation is required for certain specified changes that do not result in an exceedance of the facility-wide emissions cap.

A relocation permit issued by the DEQ shall be required for the relocation of any portable source from one site to another. A relocation permit does not take the place of an operating permit. Any purported or attempted relocation of such a source without such permit shall automatically void the operating permit or the grandfather exemption for that source. The relocation of portable sources shall be limited to previously permitted or existing sources within attainment regions of this state and shall be valid for only two years. Failure of the source to change its locale within the two-year time period will be considered prima facie evidence that the source is a stationary source and subject it, at that time, to permit analysis requirements as stated in 252:100-7-15(c) to determine whether a modification of the operating permit is necessary. Relocation permits are for relocation of an entire facility covered under an authorization and not individual pieces of equipment.

SECTION IV. FACILITY DESCRIPTION

A significant portion of the industry background information in this section was excerpted or developed from AP-42 Section 11.1 (4/04) “Hot Mix Asphalt Plants.” Thus, a specific reference is not provided for each excerption.

Activities typically associated with the production of HMA are screening and crushing (if necessary) of aggregates, loading bins with different sized aggregates using a front-end loader, and conveying aggregates into the dryer. Hot oil heaters are used to keep the asphalt cement in a liquid state. The hot asphalt cement is mixed with the dried aggregate to make a hot asphalt mix (product). The newly formed product is pulled to the top of a storage silo by a conveyor. The product is then discharged from the storage silo through a slide gate into dump trucks for transport to the final destination. Most fuel-burning equipment is fueled with gasoline, diesel, or #2 through #6 fuel oil. Thus, other activities include fueling of front-end loaders, dump trucks, and engines. Gasoline, diesel, fuel oil, and asphalt cement storage tanks at these facilities are typically aboveground horizontal tanks with capacities less than 40,000 gallons.

HMA is a mixture of graded, high-quality aggregate (which can include reclaimed asphalt pavement [RAP]), and liquid asphalt cement. Aggregates are the mixtures of different sizes of crushed stones, gravel, sand and/or other nonmetallic minerals. The asphalt cement 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.

HMA paving materials can be manufactured by: (1) batch mix plants; (2) continuous mix (mix outside 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. 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.

A. Batch Mix Plants

In the batch mix HMA production process, raw aggregate normally is stockpiled near the plant. 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 conveyor belt and is transported into a dryer (typically gas- or oil-fired). Dryers are equipped with flights designed to shower the aggregate inside the drum to promote the 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 then is dropped into individual “hot” bins according to size. 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. RAP may also be added at this point. 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.

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. The total mixing time is usually 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.

B. Parallel Flow Drum Mix Plants

The parallel flow drum mix 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. The exhaust gases also exit the end of the drum and pass 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 processes.

C. Counterflow Drum Mix Plants

In a counterflow drum mix type plant, the material flow in the drum is opposite or counterflows 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 PM 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. A counterflow drum mix plant can normally process RAP at ratios up to 50 percent with little or no observed effect upon emissions. Today's counterflow drum mix plants are designed for improved thermal efficiencies.

D. Recycle Processes

In recent years, the use of RAP has been initiated in the HMA industry. RAP 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 a high-quality grade of HMA.

SECTION V. EMISSION LIMITATIONS AND CALCULATION METHODS FOR COMPLIANCE WITH THE CAP

A. Facility-Wide Emissions Cap

This GP establishes facility-wide emissions caps of less than major source thresholds (i.e., 100 TPY of any regulated pollutant and/or 10 TPY of any single hazardous air pollutant (HAP) or 25 TPY of any combination of HAPs). In addition, this permit allows the applicant to distinguish their facilities as either synthetic minor facilities with actual emissions below 80 TPY (Class I) or synthetic minor facilities with actual emissions equal to or above 80 TPY but below 100 TPY (Class II).

Emissions limitations specified in the general permit are established from applicable federal and state requirements, or from a limitation that the source assumes to avoid an applicable requirement, or from limitations established in previously issued state or federal permits for the facility. Provided, however, that source assumed limitations and/or limitations from previously issued permits must be equivalent to or more stringent than the federal and state applicable requirements.

The permit requires the calculation of actual facility-wide emissions, as a monthly, 12-month rolling total, to determine compliance with each facility-wide emissions cap. The facility-wide annual emissions must include emissions from each source located at the facility, including

emissions related to maintenance, start-ups, and shutdowns. A direct comparison of the calculated emissions can then be compared to the permitted levels to determine compliance with the specific condition in the general permit. In those cases where a numerical limitation is not specifically developed to demonstrate compliance, other methods (e.g., work practices, parametric monitoring, operational limits, etc.) are required by the general permit to ensure compliance.

General EPA policy and preference is to not have emission compliance periods longer than one month, i.e., a 12-month rolling total is preferred for compliance with annual emissions limitations. Also, to demonstrate compliance with the facility-wide emissions caps, the permit requires the use of conservatively high, short-term emission rates for some emission units, which can be significantly higher than actual emissions.

Note that facilities covered by a general permit are not required to obtain an Authorization to Construct when adding a piece of equipment subject to NSPS or NESHAP. An Authorization to Construct, and a new Authorization to Operate, is not needed for most other changes at the facility, so long as facility emissions after the change do not exceed the facility-wide cap. For certain modifications at the facility, the permittee must send in a Notice of Modification (NOM) to AQD documenting that such changes do not cause emissions to exceed the facility-wide cap.

This approach should greatly reduce the burden on both the permittee and AQD by eliminating the need for construction permits, permit modifications, or new Authorizations when making certain changes to the facility. Notification of DEQ within 15 days following the start of operation is required for certain specified changes that do not result in an exceedance of the facility-wide emissions cap previously established in an Authorization to Operate. To ensure continuing compliance with these limits, the permittee must estimate emissions periodically-especially after a change at the facility, and maintain a current equipment inventory to document that such changes do not cause emissions to exceed the facility-wide emissions cap.

B. Dryer

The most significant point source of emissions from HMA plants is the dryer. Emissions from the dryer consist of PM₁₀, and PM_{2.5} from drying of the aggregate; NO_x, CO, SO₂, PM₁₀, PM_{2.5}, VOC, and HAP from the combustion and incomplete combustion of natural gas and liquid fuels; and PM₁₀, PM_{2.5}, VOC, and HAP from heating and application of asphalt cement to the aggregate after drying.

Emissions estimates from HMA facilities can be calculated using data available from the latest AP-42, Section 11.1 and product throughput. Emission factors for both batch mix and drum mix asphalt plants are available in AP-42, Section 11.1 including fugitives from product handling. These factors were based on actual emissions tests at several facilities. However, in some cases limited data was available to calculate specific factors. Thus, some factors are not rated as reliable as others. Incorporation of a reasonable safety factor may be appropriate in developing final estimates.

C. Heaters and Boilers

Heaters and boilers emit NO_x, CO, SO₂, VOC, PM₁₀, and PM_{2.5} from the combustion and incomplete combustion of natural gas and liquid fuels. Emissions estimates from heaters and boilers can be calculated using data available from the latest AP-42, Sections 1.3 and 1.4 and continuous hours of operation.

D. Storage Tanks

Storage tanks emit VOC, PM₁₀, and PM_{2.5} (PM as POM) from the storage of organic liquids. Storage tank emissions at these facilities are related to the number of turnovers. Emissions estimates from storage tanks can be calculated using data available from the latest AP-42, Section 7.1 and throughput. HAP emissions from tanks can be estimated by speciation of the HAP content of the liquids stored and using standardized default contents. The permittee will be required to maintain records of all storage tanks at the facility with a capacity of 400 gallons or more.

E. Internal Combustion Engines

In Oklahoma, most HMAF power their (stationary) machinery with engines fueled with gasoline, diesel, or fuel oils. Thus, emissions can be estimated by recording only the hours the equipment is operated, based on the fuel type. However, compliance with the cap for engines using a control device (i.e., non-selective catalytic reduction (NSCR) catalyst, oxidation catalyst, or selective catalytic reduction (SCR) catalyst) is not a straightforward determination. Catalysts are fairly efficient (90-95% pollutant reduction). Thus, if they fail, they most likely would cause that engine to become a major source, if operated for any length of time after failure.

Engines emit NO_x, CO, SO₂, VOC, PM₁₀, and PM_{2.5} from the combustion and incomplete combustion of natural gas and liquid fuels.

The permittee will be required to calculate emissions of NO_x, CO, PM₁₀, PM_{2.5}, and HAPs from engines. NO_x, CO, and PM₁₀ short-term emission limits shall be estimated from emissions factors based on stack test data, manufacturer's data, NSPS Subparts IIII or JJJJ, ICE Tier standards, or AP-42, Chapter 3. Annual emissions must be based upon the short-term limit and annual hours of operation.

The general permit requires initial and semi-annual testing for engines to demonstrate compliance with the short-term emission limits. To reduce the regulatory burden on the permittee and AQD, the general permit does not require testing for Emergency Use Engines or engines rated less than or equal to 250-hp.

Compliance with NO_x and CO hourly emissions limits for engines using a control device (e.g., NSCR, oxidation, or SCR catalyst) is more critical. Catalysts typically have pollutant conversion efficiencies as high as 90%. Thus, if the catalyst fails or is bypassed substantially through channeling, or, for NSCR or SCR, if the engine controllers are not operating correctly, a single engine could become a major source if operated for even a short period of time. A specific condition requiring

semi-annual testing of NO_x and CO emissions from each non-emergency controlled engine greater than 250-hp is included in the general permit.

Engines, emit HAPs. Estimates of potential HAP emissions may be made using manufacturer's data, stack tests, or emission factors from AP-42, Chapter 3.

F. Non-Metallic Mineral Processing Equipment

Emissions from other equipment at the facility, including screens, crushers, elevators, conveyors, bagging operations, storage silo loading systems, other miscellaneous equipment, and fugitives from roads, stockpiles, and loading and unloading operations are dependent upon production. Thus, compliance with the cap is easily demonstrated by calculation of their associated emissions using factors from AP-42.

Fugitive emissions are included in estimates of potential to emit, if the facility is included in a stationary source category that as of August 7, 1980, is regulated by NSPS pursuant to Section 111 of the Act. Since NSPS Subpart I (Asphalt Concrete Plants) was promulgated on June 11, 1973, fugitive emissions are counted in the potential to emit calculations. There are fugitive PM and VOC emissions from the aggregate material feed, transport and handling of the HMA from the drum mixer to the storage silo, from the load-out operations to the delivery trucks, from batch/continuous drop operations of front-end loaders to piles and/or to the feeder/conveyor, vehicle traffic on unpaved haul roads, and wind erosion from stockpiles.

G. Maintenance, Startup And Shutdown (MSS)

The general permit requires the permittee to estimate VOC emissions from any MSS activity and include those emissions in calculating compliance with the facility-wide emissions cap for VOC.

Some MSS emissions, such as blowdowns, can be estimated using mass balance equations, volume of gas vented, the number of events, and percent VOC.

H. HAPs

In Oklahoma, these facilities have not historically reported emissions other than criteria pollutants. HAPs (e.g., metals, phosphorus, formaldehyde, and crystalline silica) have the potential to be emitted during the process of manufacturing asphalt or as fugitive emissions (road dust or wind erosion of stockpiles). In addition, organic HAPs may be emitted from storage tanks holding fossil fuels, typically diesel or gasoline, and associated equipment, or from the incomplete combustion of fossil fuels.

Emissions estimates for HAPs for most of the various emissions units can be made using data available from AP-42 and manufacturer's data. The AP-42 factors were based on actual emissions tests at several facilities. However, in some cases limited data was available to calculate specific factors. Thus, some factors are not rated as reliable as others. Incorporation of a reasonable safety factor may be appropriate in developing final estimates.

SECTION VII. APPLICABLE RULES AND REGULATIONS

Applicable rules and regulations are given below for each emission unit and also for fugitive emissions authorized in this permit including facility-wide requirements, dryer, hot oil heaters, nonmetallic mineral processing equipment, storage tanks, and engines. For brevity, only those applicable requirements that are specific to the particular emissions unit, and not addressed in the Facility-wide requirements, are covered in each section.

A. Oklahoma Air Pollution Control Rules

OAC 252:100-1 (General Provisions)

[Applicable]

Subchapter 1 includes definitions but there are no regulatory requirements.

OAC 252:100-2 (Incorporation by Reference)

[Applicable]

This Subchapter incorporates by reference applicable provisions of Title 40 of the Code of Federal Regulations listed in OAC 252:100, Appendix Q. These requirements are addressed in the “Federal Regulations” section.

OAC 252:100-3 (Air Quality Standards and Increments)

[Applicable]

Subchapter 3 enumerates the primary and secondary ambient air quality standards and the significant deterioration increments. At this time, all of Oklahoma is in attainment of these standards.

OAC 252:100-5 (Registration, Emissions Inventory, & Operating Fees)

[Applicable]

Subchapter 5 requires sources of air contaminants to register with Air Quality, file emission inventories annually, and pay annual operating fees based upon total annual emissions of regulated pollutants.

This permit ensures compliance with this regulation using the following approach:

A standard condition in the permit requires the permittee to file an annual emissions inventory and pay annual fees in accordance with OAC 252:100-5(2)(e).

OAC 252:100-7 (Permits for Minor Facilities)

[Applicable]

Part 1 includes definitions and subjects all permitting to the tiered Uniformed Permitting Act. Permits are required to meet public review requirements consistent with the Tier System given in the Uniform Permitting Act.

Part 2 establishes fees for construction and operating permits, Authorizations issued under General Permits, and applicability determinations.

Part 3 establishes construction permit categories and requirements. A construction permit is required for new facilities and modification of existing facilities. A general permit may be issued for an industry if there are a sufficient number of facilities that have the same or substantially similar operations, emissions, and activities that are subject to the same standards, limitations, and operating and monitoring requirements. For general permits that provide for application through the filing of a notice of intent (NOI) to construct, authorization under the general permit is effective upon receipt of the NOI. Construction permits shall require compliance with all applicable air pollution rules, prohibit the exceedance of ambient air quality standards contained in OAC

252:100-3, and may establish permit conditions and limitations as necessary to ensure compliance with all rules.

Part 4 establishes operating permit requirements. Emission limitations established and made a part of the construction permit are incorporated into and become enforceable limitations of the subsequently issued operating permit. Permit limitations in adjustment of, or in addition to, the facility's construction permit limitations may be made a condition of the facility's operating permit issuance. Relocation permits may be issued to portable sources determined to be operating in compliance with any permit or all applicable air quality control rule(s).

This permit ensures compliance with this regulation using the following approach:

For Part 1, the general permit has gone through Tier II review; therefore, only Tier I review will be provided for any Authorizations issued hereunder.

For Part 2, the general permit requires remittance of the applicable fees.

For Part 3, the general permit is designed to allow minor facilities to fulfill the requirement to obtain an Authorization to Construct before starting construction of an eligible facility or for modifications to existing eligible facilities. Limitations are established as part of the facility-wide emissions cap of this general permit, not to equal or exceed the levels for Class I or Class II facilities. AQD has determined that a sufficient number of oil and gas facilities with the same or substantially similar operations and activities exist within the state of Oklahoma that require permitting, which creates the need to develop this general permit.

An NOI to Construct is required prior to commencing construction of a new facility or modification of an existing facility not covered under this general permit. Coverage under the general permit is effective upon DEQ's receipt of the NOI to Construct application when accompanied by applicable fees, a receipt, or other confirmation of payment by the AQD. The earliest of (1) a legible dated U.S. Postal Service postmark (private metered postmarks are not acceptable); (2) a dated receipt from a commercial carrier or the U.S. Postal Service; (3) a DEQ date stamped application, or (4) a date of receipt of a digital copy of an application is acceptable documentation of receipt of the NOI to Construct.

In lieu of an Authorization to Construct, an applicant may obtain an individual minor source construction permit. Certain facility modifications, as defined by the general permit, may be constructed without an individual minor source construction permit, an Authorization to Construct, or a new Authorization to Operate. For these modifications, the permittee must submit a Notice of Modification (NOM) form to AQD within 15 days of the start of operation of the modification.

This general permit requires compliance with all state and federal regulations which are evaluated in this Section of the memorandum.

For Part 4, after construction is complete, an application for an Authorization to Operate must be submitted within 180 days of start-up. Permit conditions have been included in the permit that provide that conditions from a minor source construction permit can be incorporated into the Authorization to Operate as long as the conditions are equivalent to or more stringent than the corresponding conditions in the General Permit. Operational conditions have been included in the

permit to require a source to construct and operate all emission units and associated control equipment within a practical range of operating conditions so as to achieve, on a continuous basis, a level of emissions that complies with applicable requirements. Operating and compliance requirements, as well as monitoring and recordkeeping requirements for control devices, are specifically addressed in the permit. The Authorization to Operate does not make use of an NOI process, therefore, coverage under the general permit is not effective until the issuance of the Authorization to Operate. An applicant proposing to obtain coverage under this permit for an existing, previously permitted facility, need only submit an application for an Authorization to Operate. Any of the relevant requirements and limitations in the existing operating permit, and any new requirements may be incorporated.

OAC 252:100-9 (Excess Emission Reporting Requirements) [Applicable]

Subchapter 9 requires an owner or operator of a regulated facility to report all excess emissions from an air pollution source caused by malfunction, shutdown, start-up, or regularly scheduled maintenance that are in violation of the applicable air pollution control rule, permit, or order of the DEQ. No specific emission limitation, standard, or criterion is specified in this subchapter.

The permit ensures compliance with this regulation using the following approach:
Conditions are included in the standard conditions of the general permit that require compliance with this subchapter should excess emissions occur.

OAC 252:100-13 (Open Burning) [Applicable]

This subchapter prohibits open burning of refuse and other combustible material except in compliance with OAC 252:100-13-7 and 9. No specific emission limitation or criterion is specified in this subchapter. However, work practice conditions and standards are specified.

The permit ensures compliance with this regulation using the following approach:
Subchapter 13 applies to all facilities. Therefore, the general permit includes a condition that requires compliance with this subchapter. However, open burning is not expected to take place at facilities covered under this permit. Therefore, no initial compliance demonstration or continuing monitoring, recordkeeping, or reporting requirements associated with this subchapter are included in the general permit.

OAC 252:100-19 (Control of Emissions of PM)[Appendix G Applicable]

Subchapter 19 controls the emission of particulate matter from both fuel-burning equipment and industrial processes. Allowable particulate matter emissions rates are established for both new and existing directly fired fuel-burning units and industrial processes. Emissions limits are specified in OAC 252:100, Appendix C for any new or existing indirectly fired fuel-burning unit, and Appendix G for any new or existing directly-fired fuel-burning unit or from any emission point in an industrial process.

The permit ensures compliance with this regulation using the following approach:

Direct Fired Fuel-burning Equipment and Industrial Processes

For Dryers

Eligibility for an Authorization to Construct under the permit is restricted to those facilities with a design process rate of 1,000 tons HMA/hour or less using a fabric filter and an overall efficiency for PM of at least 99.8% to ensure compliance with the requirements of this subchapter; Or to those facilities with a design process rate of 500 tons HMA/hour or less using a venturi or wet scrubber and an overall efficiency for PM of at least 99.56% to ensure compliance with the requirements of this subchapter. A complete justification that demonstrates compliance with this rule is included as Appendices A of this memorandum. A permit condition is included which requires the permittee to monitor and keep records of the equipment ID, daily production rate, cumulative annual throughput, type of control device used if any, efficiency of the control device, and the daily hours of operation.

For Non-Metallic Mineral Processing Equipment

A permit condition is included which requires the permittee to monitor and keep records of the equipment ID, maximum design hourly process weight rate, type of control device used if any, and efficiency of the control device. In addition, hourly limitations are established in the authorization for those emission points that have the potential to exceed allowable rates.

Indirect Fired Fuel-burning Equipment

Eligibility for an Authorization to Construct under the permit is restricted to those facilities using pipeline natural gas, liquid petroleum gas, diesel, or #2 through #6 fuel oil to ensure compliance with the requirements of this subchapter.

For Heaters

AP-42 (7/98) Table 1.4-2 lists natural gas total PM emissions to be 7.6 lb/MMSCF or about 0.0076 lb/MMBTU, which is in compliance. AP-42 (7/98) Section 1.3 lists worst case fuel oil total PM emissions to be 11.5 lb/10³ gallons or about 0.076 lb/MMBTU, which is in compliance. Usage of these fuels and AP-42 PM emissions factors will ensure compliance with this subchapter.

For Internal Combustion Engines

AP-42, Table 3.2-2 (10/96) lists natural gas PM₁₀ emissions to be 0.048 lb/MMBTU for 2-cycle lean-burn engines and 0.019 lb/MMBTU for 4-cycle engines, which is in compliance for all heat input ranges. For gasoline fuel, AP-42, Table 3.3-1 (10/96) lists PM₁₀ emissions to be 0.10 lb/MMBTU which is also in compliance for all heat input ranges. For diesel fuel, AP-42, Table 3.3-1 (10/96) lists PM₁₀ emissions to be 0.31 lb/MMBTU, for engines smaller than 10 MMBTUH and is in compliance with this subchapter. which corresponds to an engine(s) of 160 MMBTUH. For engines with a heat input greater than 10 MMBTUH fired with diesel fuel, AP-42, Table 3.4-1 (10/96) lists PM₁₀ emissions to be about 0.1 lb/MMBTU which is also in compliance for all heat input ranges. Usage of these fuels and AP-42 PM emissions factors will ensure compliance with this subchapter.

OAC 252:100-25 (Smoke, Visible Emissions and Particulates)

[Applicable]

This subchapter states no person shall allow or permit the discharge of any fumes, aerosol, mist, gas, smoke, vapor, particulate matter, or any combination thereof, exhibiting greater than 20 percent equivalent opacity except for short-term occurrences. At no time may the opacity exceed 20 percent for one six-minute period in any consecutive 60 minutes nor more than three such

periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity.

The permit ensures compliance with this regulation using the following approach:

Subchapter 25 compliance demonstrations require an opacity reading by a Certified Visible Emission Evaluator using Method 9 (40 CFR Part 60, Appendix A). The DEQ will, however, accept use of an alternative test method under limited circumstances. The permittee can demonstrate the presence or absence of visible emissions using Method 22 (40 CFR Part 60, Appendix A). The term “Fugitive emissions” as used in Method 22 shall be deemed to include all units subject to Subchapter 25 requirements. If visible emissions are present, Method 9 must be used to determine their level. Method 22 does not require a certified visible emissions observer, thus giving the facility some flexibility in meeting this requirement. Any source subject to an NSPS opacity limit is exempt from OAC 252:100-25-3 requirements.

OAC 252:100-29 (Control of Fugitive Dust)

[Applicable]

This subchapter prohibits any person from causing or allowing any fugitive dust source to be operated, or any substances to be handled, transported, or stored, or any structure constructed, altered, or demolished to the extent that such operation or activity may enable fugitive dust to become airborne and result in air pollution, without taking reasonable precautions to minimize or prevent pollution. Subchapter 29 further prohibits discharge of visible fugitive dust beyond the property line on which the emissions originated in such a manner as to damage or interfere with the use of adjacent properties, or cause air quality standards to be exceeded, or to interfere with the maintenance of air quality standards. A list of reasonable precautions is specified in this subchapter.

OAC 252:100-31 (Control of Emission of Sulfur Compounds)

[Applicable]

Part 2 limits the ambient air impacts of H₂S emissions from any facility to 0.2 ppm at standard conditions, 24-hour average (equivalent to 283 µg/m³). The standard shall not apply to ambient air concentrations occurring on the property from which such emission occurs, providing such property, from the emission point to the point of any such concentration, is controlled by the person responsible for such emission.

Part 5 limits SO₂ emissions from any new gas-fired fuel-burning equipment to 0.2 lb/MMBTU heat input and new liquid-fired fuel-burning equipment to 0.8 lb/MMBTU heat input, three-hour average.

The permit ensures compliance with this regulation using the following approach:

Eligibility for an Authorization to Construct under the permit is restricted to those facilities using pipeline natural gas (0.5 grains/100 scf total sulfur), liquid petroleum gas, gasoline meeting EPA Tier 3 standards (10 ppm sulfur), or diesel and fuel oil #2 through #6 with a maximum of sulfur content of 15 ppmw for all fuel burning equipment except for the dryers and 0.7 % for the dryers to ensure compliance with the new fuel-burning equipment requirements of this subchapter. A complete justification that demonstrates compliance with the SO₂ emission limits is included as Appendix B of this memorandum. The fuels combusted at these facilities do not contain significant amount of H₂S and the asphalt storage tanks do not emit significant amounts of H₂S at normal storage temperature.

OAC 252:100-33 (Control of Emission of Nitrogen Oxides) [Applicable]

Subchapter 33 prohibits discharge into the atmosphere of NO_x in excess of 0.2 lb/MMBTU, 3-hour average of heat input from gas-fired, fuel-burning equipment and 0.3 lb/MMBTU, 3-hour average of heat input from liquid-fired, fuel-burning equipment, for any new equipment as defined in Section 33-1.1 of Subchapter 33, and with a rated heat input of 50 MMBTUH or more. The only fuel-burning equipment expected to exceed 50 MMBTUH is the HMA dryer burner.

The permit ensures compliance with this regulation using the following approach:

AP-42 (7/98) Table 1.4-1 lists the NO_x emissions from natural gas-fired equipment, greater than 100 MMBTUH, as 0.186 to 0.274 lb/MMBTU. AP-42 (5/10) Table 1.3-1 lists the NO_x emissions from fuel oil-fired equipment, greater than 100 MMBTUH, as 0.185 to 0.313 lb/MMBTU.

Table 11.1-5 list the emissions from oil-fired HMA dryer as 0.12 lb/ton and natural gas-fired HMA dryer as 0.025 lb/ton.

The permittee is required to keep a record of the manufacturer's specifications on the dryer burner documenting initial compliance with this requirement for each type of fuel burned. This record shall be updated any time the dryer burner is replaced or modified. To ensure continuing compliance with this requirement, the permittee is required to perform a biennial combustion optimization (tune-up) using methods specified in Appendix B of the permit, unless the dryer is equipped with a continuous automated combustion management and control technology system. The purpose of the tune-up is to optimize combustion while minimizing NO_x emissions. Consistent with the Subchapter 37 requirement to minimize VOC emissions, the permittee must tune the dryer burner to minimize VOC emissions while maintaining compliance with the NO_x standard. In addition, the permittee is required to maintain records of all tune-ups, maintenance, and adjustments made to the dryer burner, including all documents and calculations used to determine reduced NO_x emission settings.

OAC 252:100-37 (Control of Emissions of Volatile Organic Compounds) [Applicable]

Subchapter 37 limits the emission of VOC from stationary sources. Emission limitations, design criteria, and work practice standards are specified in the regulation for various sources located at HMA facilities, including storage tanks and fuel-burning equipment.

Part 3 requires storage tanks (except pressure tanks) built after December 28, 1974, and with a capacity of 400 gallons or more storing a VOC with a vapor pressure of 1.5 psia or greater under actual conditions to be equipped with a submerged fill pipe or a vapor-recovery system as required under OAC 252:100-37-15(a)(2).

Part 3 requires storage tanks (except pressure tanks) built after December 28, 1974, with a capacity greater than 40,000 gallons to be a pressure vessel or equipped with an external floating roof, a fixed roof with an internal floating roof or a vapor-recovery system capable of collecting 85% or more of the uncontrolled VOCs.

Part 7 requires fuel-burning equipment to be operated and maintained so as to minimize emissions. Temperature and available air must be sufficient to provide essentially complete combustion.

The permit ensures compliance with this regulation using the following approach:

For Storage Tanks

Tanks constructed after December 28, 1974, storing a VOC with a vapor pressure greater than 1.5

psia, with a capacity greater than 400 gallons must be equipped with a submerged fill pipe. Compliance with this rule requires that the permittee maintain records of the types of volatile petroleum liquids stored, the true vapor pressure of the liquid as stored, and the dimension and capacity of the tank. An Authorization to Construct is not allowed for a facility using a vapor-recovery/vapor disposal system as required by OAC 252:100-37-15(a)(2). Such facilities must obtain a minor source construction permit for these vapor-recovery/vapor disposal systems and operational requirements developed in that construction permit must be incorporated into an Authorization to Operate. Thus, requirements do not need to be included in the general permit for vapor recovery/vapor disposal systems and their associated control devices. No conditions are included in the permit for storage tanks with a capacity greater than 40,000 gallons since they are ineligible for coverage under this permit.

For Dryers

The permittee is required to perform a biennial tune-up using methods specified in Appendix B of the permit, unless the dryer is equipped with a continuous automated combustion management and control technology system. In addition, the permittee is required to maintain records of all tune-ups, maintenance, and adjustments made to the dryer burner, including all documents and calculations used to determine reduced emissions settings.

For Heaters and Engines

Specific conditions are included in the permit that require that the permittee properly operate and maintain heaters and engines and associated control systems in a manner that will minimize VOC emissions. Operational and maintenance records are required to be kept to document compliance with this requirement.

OAC 252:100-39 (VOCs in Non-Attainment & Former Non-attainment Areas)[Applicable]

Part 5 sets control requirements for petroleum liquid storage vessels equipped with external floating roofs, having capacities greater than 40,000 gallons and located in Tulsa and Oklahoma counties.

Part 7 defines “Cutback asphalt” to mean a basic asphalt or asphalt concrete containing a petroleum distillate. Part 7 requires that no owner, operator and/or contractor shall prepare or apply cutback asphalt without the prior written consent of the Division Director. Such consent may be granted during Oklahoma's non-oxidant season, i.e., December 1 through the last day of February.

Part 7 requires that each VOC vessel with a capacity greater than 40,000-gal shall be a pressure vessel or shall be equipped with a floating roof or a vapor-recovery system that consists of a vapor-gathering system capable of collecting 90 percent by weight or more of the uncontrolled VOCs.

Part 7 requires that each VOC storage vessel with a nominal capacity greater than 400-gal and less than 40,000-gal shall be equipped with a submerged fill pipe or be bottom filled. The displaced vapors from each storage vessel with an average daily throughput of 30,000-gal or greater which stores VOCs shall be processed by a system that has a total collection efficiency no less than 90 percent by weight of total VOCs in the vapors.

Part 7 requires that each VOC storage vessel (located in Tulsa County only) with a nominal capacity greater than 2,000-gal and less than 40,000-gal, in addition to being equipped with a submerged fill pipe or being bottom loading, shall be equipped with a vapor control system.

The permit ensures compliance with this regulation using the following approach:

For Storage Tanks

Eligibility is restricted to those gasoline or other VOCs (with vapor pressure greater than 1.5 psia) tanks constructed in Tulsa County with a capacity less than 2,000 gallons. Thus, the only requirement that applies is the installation and operation of a permanent submerged fill pipe for any tank with capacity greater than 400 gallons. An Authorization to Construct is not allowed for a facility using a vapor-recovery/vapor disposal system as required by OAC 252:100-39-41(b)(2). Such facilities must obtain a minor source construction permit for these vapor-recovery/vapor disposal systems and operational requirements developed in that construction permit must be incorporated into an Authorization to Operate. Thus, requirements do not need to be included in the general permit for vapor recovery/vapor disposal systems and their associated control devices.

For Preparation or Use of Cutback Asphalt

Eligibility is limited for facilities that prepare or apply cutback asphalt in Tulsa and Oklahoma counties. An Authorization to Construct is not allowed for a facility using cutback asphalt in Tulsa and Oklahoma counties. Such facilities must obtain a minor source construction permit and Division Director's approval, prior to receiving an authorization to operate.

OAC 252:100-43 (Specific Sampling and Testing Methods)**[Part 1 Applicable]**

This subchapter provides general requirements for testing, monitoring and recordkeeping and applies to any testing, monitoring or recordkeeping activity conducted at any stationary source. To determine compliance with emissions limitations or standards, the Air Quality Director may require the owner or operator of any source in the state of Oklahoma to install, maintain and operate monitoring equipment or to conduct tests, including stack tests, of the air contaminant source. All required testing must be conducted by methods approved by the Air Quality Director and under the direction of qualified personnel. A notice-of-intent to test and a testing protocol shall be submitted to Air Quality at least 30 days prior to any EPA Reference Method stack tests. Emissions and other data required to demonstrate compliance with any federal or state emission limit or standard, or any requirement set forth in a valid permit shall be recorded, maintained, and submitted as required by this subchapter, an applicable rule, or permit requirement. Data from any required testing or monitoring not conducted in accordance with the provisions of this subchapter shall be considered invalid. Nothing shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

The permit ensures compliance with this regulation using the following approach:

A standard condition is included which states that all required tests shall be made and the results calculated in accordance with test procedures described or referenced in the permit and approved by Air Quality. Permit specific conditions establish minimum monitoring requirements for control devices associated with emission units addressed in this permit. In addition, testing must be performed as specified in 40 CFR Parts 51, 60, 61, 63, and 75, as applicable, unless otherwise specified in an Authorization under this permit.

Non-applicable Oklahoma Rules

The following table lists the Oklahoma Air Pollution Control Rules that are not applicable to HMA plants on a facility-wide basis. Rules applicable to a specific emission unit are listed separately.

Non-applicable Oklahoma Air Pollution Control Rules

OAC 252:100-8	Permits for Major Sources	Ineligible
OAC 252:100-11	Alternative Emissions Reduction	Ineligible
OAC 252:100-17	Incinerators	not a covered source
OAC 252:100-19-10	PM from Indirectly Fired Wood Fuel-burning Units	not a covered source
OAC 252:100-19-11	PM from Combined Wood Fuel and Fossil Fuel Fired Steam Generating Units	not a covered source
OAC 252:100-23	Cotton Gins	not a covered source
OAC 252:100-24	Grain, Feed or Seed Operations	not a covered source
OAC 252:100-35	Carbon Monoxide	not a covered source
OAC 252:100-37, Part 5	Control of VOC Coating Operations	not a covered source
OAC 252:100-37, Part 7	Control of Specific Processes	not a covered source
OAC 252:100-39, Part 7 Sections 40, 42-47, & 49	Emissions of VOCs in Nonattainment Areas and Former Non-Attainment Areas	Ineligible *
OAC 252:100-43, Part 3	Specific Testing Methods	not a covered source

* Ineligible for Authorization to Construct. May be eligible if addressed in an individual permit and carried over into Authorization to Operate.

B. Federal Regulations

Certain state regulations require compliance with federally promulgated regulations. OAC 252:100-7-15(d) requires that construction permits include all applicable requirements, including NSPS and NESHAP.

NSPS, 40 CFR Part 60

[Applicable]

NSPS means a standard of emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which, taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements, the Administrator of EPA determines has been adequately demonstrated. NSPS apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication of the standard applicable to that facility. Certain notification, recordkeeping, emissions limitations, performance tests, and monitoring requirements are specified in these regulations.

Applicable NSPS Regulations

Subpart	Description	Applicable Equipment
A	General Provisions	
I	Hot Mix Asphalt (HMA) Facilities	Affected Processing Equipment
K	Storage Vessels for Petroleum Liquids	Storage Tanks
Ka	Storage Vessels for Petroleum Liquids	Storage Tanks
Kb	VOL Storage Vessels (Including Petroleum Liquid Storage Vessels)	Storage Tanks
OOO	Nonmetallic Mineral Processing Plants	Affected Processing Equipment
IIII	Stationary Compression Ignition Internal Combustion Engines	Engines
JJJJ	Stationary Spark Ignition Internal Combustion Engines	Engines

The permit ensures compliance with this regulation using the following approach:

Conditions are included to address the NSPS general notification, recordkeeping, emissions limitations, performance test, and monitoring requirements. Language in the general permit emphasizes that NSPS notification and performance test requirements are separate, stand-alone, and independent federal requirements that must be met in addition to any other general permit requirements, e.g., equipment addition or change notifications. However, a timely submitted NOM shall suffice as a notice of the actual date of initial start-up, and as a notice of a physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies as required by an NSPS (40 CFR §60.7(a)). Conditions specific to a particular NSPS are included for each emissions unit that may be determined to be an affected unit.

NESHAP, 40 CFR Part 63**[Applicable]**

NESHAP contain standards that regulate specific categories of stationary sources that emit one or more hazardous air pollutants. These standards require all owners or operators of major and area sources in certain source categories that are constructed or reconstructed to install generally achievable control technology (GACT) unless specifically exempted. Certain notification, recordkeeping, emissions limitations, performance tests, and monitoring requirements are specified in these NESHAP regulations.

Applicable NESHAP Regulations

Subpart	Description	Applicable Equipment
A	General Provisions	
ZZZZ	Stationary Reciprocating Internal Combustion Engines	Engines
CCCCC	Gasoline Distribution Facilities	Gasoline Storage Tanks

The permit ensures compliance with this regulation using the following approach:

Conditions are included to address NESHAP general notification, recordkeeping, emissions limitations, performance test, and monitoring requirements. Language in the general permit emphasizes that NESHAP notification and performance test requirements are separate, stand-

alone, and independent federal requirements that must be met in addition to any other general permit requirements, e.g., equipment addition or change notifications. However, a timely submitted NOM shall suffice as a notice of the actual date of initial start-up.

SECTION VIII. CONTROL DEVICES

Control devices typically expected at these facilities include baghouses and scrubbers to capture particulate matter from the dryer, and catalytic reduction systems on the engines (primarily NSCR for 4SRB, an oxidation catalyst for 4SLB, and SCR catalyst for diesel). Wet suppression may also be used at the facility to control fugitive dust from aggregate stockpiles and haul roads. Note that these requirements may be superseded by more stringent monitoring if an individual construction permit is needed to develop other site-specific conditions to ensure compliance with a particular rule, e.g., compliance with the tank control requirements of OAC 252:100-39 for tanks with a capacity greater than 2,000 gallons in Tulsa County.

Fabric Filters

The primary operational parameter for fabric filters or baghouse systems is the pressure drop across the filters. The permittee is required to determine the normal range of differential pressure across the filters that will ensure the system is meeting the emissions limitations at all times, e.g., based on manufacturer's specifications or determined during testing. Monitoring and recording of the pressure drop is required daily. At least once per month, the permittee is required to inspect the baghouse cleaning system, dust removal system, and fan, and perform maintenance as needed. At least annually, or during each outage period that is longer in duration than 1 week, the permittee is required to conduct a thorough baghouse inspection, including the filter bags, baghouse structure, expansion joints, turning vanes, and dampers, and conduct a review of all inspection and maintenance logs. Maintenance is required to be performed as needed. The permittee is required to maintain logs of all visible emissions observations, baghouse inspections, pressure drop measured, and maintenance performed.

Wet Scrubbers

The primary operational parameters for wet scrubbers are the pressure drop across the scrubber and the flow rate of the scrubbing solution. The permittee is required to determine the normal range of differential pressure across the scrubber and flow rate of the scrubbing solution that will ensure that the system is meeting emissions limitations at all times, i.e., when periodic testing is not required, or between tests. Monitoring and recording of the pressure drop and flow rate is required daily.

Cyclones

The primary operational parameter for a cyclone is the pressure drop across the cyclone. The permittee is required to determine the normal range of differential pressure across the cyclone that will ensure the system is always meeting emissions limitations, e.g., when periodic testing is not required, or between once-per-day pressure drop monitoring. When both the scrubber and the cyclone are operating together, the permittee shall measure the pressure drop across a wet scrubber and/or a cyclone, as per manufacturer's specifications, to determine that both the scrubber and cyclone are operating properly. Monitoring and recording of the pressure drop are required daily.

NSCR

The primary operational parameters for NSCR systems include the outlet oxygen concentration. Thus, NSCR systems may be constructed with an Air-to-Fuel Ratio Controller with an exhaust oxygen sensor. Oxidation catalysts do not require air-to-fuel ratio controller.

Specific conditions are included in the permit that require that the permittee properly operate and maintain engines and associated control systems in a manner that will minimize emissions. Operational and maintenance records are required to be kept to document compliance with this requirement.

Wet Suppression

The primary operational parameters for water/chemical spray dust suppression systems is the amount and frequency of water/chemical applied. However, the amount needed is dependent upon the amount of moisture present in the processed material, which may vary from load to load. The permittee is required to operate water/chemical spray dust suppression systems on nonmetallic mineral processing equipment and transfer points on either a continuous or intermittent basis, depending on whether processed materials contain sufficient moisture such that operation of the plant does not cause a violation of applicable limitations. Water/chemical spray dust suppression systems necessary to comply with emissions limitations are required to be maintained in good operating condition at all times regardless of whether the system is in use at the time. At a minimum, the water pump, pipe system, spray nozzles, and any gauges (e.g., water pressure) are required to be inspected weekly. The permittee must maintain records of the description and the date of repairs on the water spray system.

The primary operational parameter for water/chemical spray dust suppression systems for fugitive dust control on roads is the amount of water/chemical applied. However, the amount needed is dependent upon the amount of moisture present, which may vary throughout the day. The permittee is required to operate water/chemical spray dust suppression systems on roads at the facility as needed such that operation of the plant does not cause a violation of applicable limitations.

SECTION IX. DEFINITIONS

The following definitions apply to this memorandum and general permit. All defined terms are written with initial capital letters in the memorandum and permit.

“Affected Facility” as defined in 40 CFR §60.2 of the General Provisions to mean, with reference to a stationary source, any apparatus to which a standard is applicable. Typically, each NSPS standard defines the applicability of the affected facility within the first few regulatory sections of the final rule.

“Affected Source” as defined in 40 CFR §63.2 of the General Provisions as the stationary source, the group of stationary sources, or the portion of a stationary source that is regulated by a relevant standard or other requirement established pursuant to Section 112 of the Clean Air Act. Typically, each MACT standard defines the applicability of the affected source within the first few regulatory sections of the final rule.

“Certified Engine” means any engine that has been certified by the EPA to meet emissions standards for the purposes of meeting an NSPS or NESHAP.

“Class I” means a facility that has an enforceable limit less than 80% of major source levels for each regulated air pollutant.

“Class II” means a facility that has an enforceable limit of less than 100% of major source levels for each regulated air pollutant and is not a Class I facility.

“Controlled Engine” means an engine, with or without an Air to Fuel Ratio Controller, that uses catalytic or oxidation catalyst control.

“De minimis Activities” Certain equipment or activities on the De Minimis Facilities list under OAC 252:100 Appendix H warrant inclusion in the facility’s emissions calculations if located at a permitted facility. AQD evaluated the De Minimis Facilities list and determined the equipment or activities that need to be included for oil and natural gas facilities (HMA-GP, Part 2, Section I.E).

“Engine” means any reciprocating internal combustion engine or any gas-fired turbine.

“Emergency Use Engine” means any engine that drives an emergency power generator, peaking power generator, firewater pump, or other emergency use equipment, and operates no more than 500 hours per year.

“Maintenance, Startup, and Shutdown (MSS)” refers to maintenance, startup, or shutdown; it does not include periods of malfunction.

“Maintenance” means the planned routine repair and upkeep of equipment.

“Malfunction” means a sudden and unavoidable breakdown of process or control equipment.

“Maximum Rated Horsepower” means an engine’s maximum horsepower at ISO or manufacturer’s standard conditions and maximum RPM, or an engine’s maximum horsepower at engine site conditions and maximum RPM.

“Notice of Modification (NOM)” means a written notice informing AQD of: (1) any modification or change of operations at the facility that would construct a piece of equipment or a process that is subject to NSPS or NESHAP, or that would modify or reconstruct a piece of equipment or a process such that it becomes subject to NSPS or NESHAP; (2) that would change its facility classification (either from a Class I Facility to a Class II facility or a Class II Facility to a Class I facility); (3) any modification to add or replace a hot mix asphalt dryer, heater, storage tank with a capacity of 400 gallons or more storing VOC, any internal combustion engine, or any nonmetallic mineral/aggregate processing/handling equipment; or (4) any modification to change emissions factors relied on in an application or a previous NOM. Such notice shall contain all information required in the NOM form. Any emissions limits requested in an NOM become an enforceable upon submittal.

“Pipeline Natural Gas” as defined in Part 72 having 0.5 grains total sulfur per 100 scf.

“Portable Source” means a source with design and intended use to allow disassembly or relocation.

“Relocation” means to move a source from one geographical location to another. The term does not include minimal moves within the facility boundaries.

“Relocation Permit” means a permit that may be issued to portable sources determined to be operating in compliance with any permit or all applicable air quality control rule(s). A relocation permit transfers all authorization to operate from one location to another and may not be used to split an authorization between two or more geographical locations.

“Shutdown” means, generally, the cessation of operation of a source for any reason.

“Startup” means, generally, the setting in operation of a source for any reason.

“Synthetic Minor Facility” means a facility that has the potential to emit over major source levels of any regulated air pollutant but with controlled actual emissions below major source levels.

“Uncontrolled Engine” means an engine, with or without an Air to Fuel Ratio Controller, that has no catalytic or oxidation catalyst control.

SECTION X. TIER CLASSIFICATION AND PUBLIC REVIEW

Processing of a General Permit modification/renewal has been classified as Tier II based on OAC 252:4-7-33(c)(1). A request for an Authorization under this General Permit will typically be classified as Tier I, unless a compliance schedule required by OAC 252:100-8-5(e)(8)(A)(iii) is included, in which case it will be classified as Tier II.

After completion of the peer review of this draft permit, DEQ published the "Notice of Tier II Draft Permit" in the *Daily Oklahoman* and the *Tulsa World* on September 1, 2023. The notice stated that the draft permit was available for public review at the Air Quality Division Office located at 707 North Robinson, Suite 400, Oklahoma City, Oklahoma, 73101. The notice also stated that the draft permit was available for public review on the Air Quality section of the DEQ web page at www.deq.ok.gov.

Comments were received during the 30-day comment period. A summary of the comments, and DEQ responses, are included below (SECTION XI) and also have been incorporated in the final permit. No significant changes were made as a result of the comments received and no additional public review is necessary.

SECTION XI. RESPONSE TO COMMENTS

The Oklahoma Department of Environmental Quality (DEQ) published a notice indicating a draft HMA Facility General Permit was available for public review and comment. A summary of the comments and staff's responses are listed in this section.

Comment #1.

Water truck on location for fugitive dust is a problem. Some locations have issues with water. Could a water truck from the construction site come to the plant site at different times of the day to water? We also don't need to wet our stockpiles since the whole idea is to dry the aggregates. This would end up using more fuel to dry.

Response:

AQ agrees that trucks can come from the construction site to the plant site as often as required to keep the facility in compliance with fugitive dust requirements and the permit was revised to include the following language in Part II, Section VII.D.

The permittee shall have reasonably available an operable water-spray vehicle or other equipment capable of wetting roads to reduce fugitive dust emissions. The permittee shall maintain a record showing the dates and times of application of water to the roadway.

AQ agrees that watering the stockpiles is of limited benefit. However, sources are subject to OAC 252:100-29 and must continue to take reasonable precautions to minimize fugitive dust.

Comment #2.

Records - Do records need hard copies at the plant or can they be kept electronically?

Response:

AQ confirms that records may be maintained electronically and must be provided within 5 working days upon request per Part 3, Section IV.A.

Comment #3.

Clarification on Class I and Class II facility.

Response:

“**Class I**” means a facility that has an enforceable limit less than 80% of major source levels for each regulated air pollutant.

“**Class II**” means a facility that has an enforceable limit of less than 100% of major source levels for each regulated air pollutant and is not a Class I facility.

Comment #4.

Record Keeping – Why the change from 2-hour average to 3-hour average?

Response:

OAC 252:100-33-2 requires three-hour averages.

Comment #5.

Needs clarification on Facility-Wide Emission Cap.

Response:

This is a synthetic minor permit where, absent any requested or required specific emission limits, the emission limits of each regulated pollutant are restricted to less than major source thresholds.

Comment #6.

Refinery Fuel Oil (RFO) or Waste Oil is used by several portable units. With the sulphur change in the maritime industry, suppliers of RFO/Waste Oil have higher sulphur contents that could be more than the 0.7% maximum by weight.

Response:

Facilities wanting to use RFO/Waste Oil with a sulfur content greater than 0.7% by weight are not eligible for this GP unless they get an individual minor facility construction permit and then incorporate all relevant requirements and limitations from the construction permit into an Authorization to Operate. (Part 1, Section III.D.3)

Comment #7.

Clarification on equipment inventory on plant location.

Response:

Part 2, Section VII.G. describes the requirement for an inventory to be included in the permit application and for changes to the facility to be updated through FORM 100-341. The inventory can be kept on-site, at a nearby manned facility, or at the nearest field office.

Comment #8.

Is the 24-month transition period a hard date?

Response:

Yes. Please refer to Part 3, Section XI.C.

Comment #9.

Part 2, Section I – Emission Calculations

(a) Permittees would benefit from ODEQ adding specificity regarding what types of combustion equipment and storage tanks should be included in combustion calculations. Do office heaters, shop heaters, shop used oil heaters, etc. need to be included?

(b) Would ODEQ consider allowing the use of ICE tiered system emission factors in place of manufacturer's data in emission calculations when manufacturer's data is not available?

Response:

In answer to (a), yes. All combustion sources that are part of the facility operations are required to be included in the emissions calculations. Please refer to Part 2, Section I.E.

In answer to (b), yes. Federal standards may be used to estimate emissions for engines and the permit was modified to represent this accordingly. Please refer to Part 2, Section V.A.

Comment #10.

Part 2, Section II.E & Appendix A.A – Manufacturer's Specifications

Some equipment does not have Manufacturer's Specifications available due to its age, it being built in-house, or other reasons. How will ODEQ handle this situation?

Response:

Section II.E: If manufacturer specifications are not available, the rated heat input of the burner can be based on the specifications of the burner, the fuel feed (e.g., nozzle diameter and pressure), and the expected heat content of the fuel.

Appendix A.A: If manufacture's specification for the control device are not available, then this would have to be addressed on a case-by-case basis depending on the type of control device. Maintaining the control device in accordance with manufacture specifications is considered an inherent requirement of control devices being able to meet the control efficiencies indicated.

There are general industry standards in terms of maintaining specific types of controls that could be used to support the general control efficiencies of a specific control device.

Comment #11.

Part 3, Section IV.A – Electronic Recordkeeping

Does the final sentence of this paragraph apply to the entire permit? It states that, “Records may be maintained in paper, electronic, or computerized form.” If not, ODEQ should consider allowing for electronic recordkeeping of all required items including inspection and maintenance logs and manufacturers’ specifications.

Response:

Yes, refer to Response to Comment #2.

Comment #12.

Appendix A, Section C

We believe there is an incorrect reference in the following section. Appendix A, Section C: “Fugitive road dust shall be controlled as needed to maintain compliance with Part II – Section VII.G. standards by applying water and/or chemical spray to the road.” We believe Section V is incorrectly referenced and Section VII should be referenced instead.

Response:

Yes, the reference should have been Part 2, Section VII.D. The permit has been updated to reflect this.

Comment #13.

General Comments

We agree that this permit should allow some non-metallic mineral processing, i.e., processing recycled asphalt pavement, conveying aggregates within the HMA facility, etc., however, we believe that the practice of including quarrying activities in this General Permit is inconsistent with the definition of “Facility” found in OAC 252:100. This permit should not be used to combine the emissions of collocated quarry facility and HMA production facility that have different SIC codes.

Response:

A determination if separate but co-located facilities are a part of the same facility is dependent on multiple requirements which cannot be addressed for every possible situation.

There is a possibility that two facilities that are co-located could be considered a single facility but that is a case-by-case determination.

SECTION XII. SUMMARY

Applicants must demonstrate eligibility for coverage under this General Permit and that they are able to comply with applicable air quality rules and regulations. Ambient air quality standards are not threatened at any of the sites eligible for coverage under this General Permit. Issuance of the permit is recommended.

SECTION XIII. REFERENCES

1. AP-42 Section 11.1 (4/2004) “Hot Mix Asphalt Plants.”
2. “Tuning the burner should be a top plant maintenance priority,” *Asphalt Contractor*, September 2000, pp. 34-36.
3. USEPA, 40 CFR, Pt. 72, Subpart A, §72.2, Definitions, March 26, 1999.
4. AP-42 (1/1995) “Compilation of Air Pollution Emission Factors,” Appendix A.

Appendix A - Compliance with OAC 252:100-19 For Drum and Batch Mix Dryers

Subchapter 19 controls the emission of particulate matter from both fuel-burning equipment and industrial processes. Allowable particulate matter emissions rates are established for both new and existing directly fired fuel-burning units and industrial processes. Such emissions, as pertains to the dryer, shall not exceed the limits specified in OAC 252:100, Appendix G.

$$E_{STD} = 4.10P^{0.67} \quad \text{P up to 30 tons/hour}$$

$$E_{STD} = 55.0P^{0.11} - 40 \quad \text{P greater than 30 tons/hour}$$

where: E_{STD} = rate of emission in lb/hour
 P = process weight rate in tons/hour

Emissions of particulate matter from these facilities are high. AP-42, Table 11.1-1 (4/04) lists the uncontrolled PM emissions factor for a batch mix asphalt plant as 32 lb PM/ton HMA and 28 lb PM/ton HMA for a drum mix asphalt plant. Thus, drum and batch mix dryers are typically controlled at these facilities using either a scrubber or baghouse in order to meet these limitations. Typical control and capture efficiencies for these devices are high, i.e., 99% and above.

In order to demonstrate compliance with the allowable rates, the required control efficiency for a particular process rate can be calculated as follows.

$$E_{STD} = 4.10P^{0.67} = E_F P \times (1 - E_C)$$

$$\text{thus } E_C = 1 - 4.1 \frac{P^{-0.33}}{E_F} \quad \text{P up to 30 tons/hour}$$

$$E_{STD} = 55.0P^{0.11} - 40 = 32P \times (1 - E_C)$$

$$\text{thus } E_C = 1 - \frac{55.0P^{0.11} - 40}{E_F P} \quad \text{P greater than 30 tons/hour}$$

where: E_C = overall (control plus capture) efficiency, %
 P = process weight rate in tons/hour
 E_F = emissions factor,
 32 lb/ton HMA for batch mix, 28 lb/ton HMA for drum mix

The following table summarizes the required control efficiency necessary for each type of plant to ensure that particulate matter emissions do not exceed the allowable rates.

**Required Control Efficiency to Ensure Compliance
With OAC 252:100-19, Appendix G Allowable Emissions Rate
For HMA Dryer**

Process Weight Rate P (Tons HMA/hour)	Overall Efficiency	
	E_C (%)	E_C (%)
	Batch Mix	Drum Mix
5	92.47	91.39
10	94.01	93.15
30	95.83	95.23
60	97.59	97.24
100	98.40	98.17
250	99.24	99.13
500	99.57	99.51
600	99.63	99.58
700	99.67	99.63
800	99.71	99.67
900	99.74	99.70
1,000	99.76	99.72

Note that at process rates exceeding about 100 tons HMA/hour the facility has the potential to exceed major source thresholds for PM and other criteria pollutants, depending upon the type of plant, hours of operation, control devices used, etc. For example, operating a 250 TPH drum mix plant continuously (8,760 hrs/year) with a control device with an efficiency of 99.13% would result in emissions of PM of 267 TPY. However, plants (or combinations of plants at the same facility) may operate at higher capacities so long as hours of operation are curtailed (or additional controls are utilized). In order to provide the applicant the greatest flexibility, yet simplify the permitting process, an eligibility restriction will be established in the permit to ensure compliance with OAC 252:100-19.

Thus, eligibility for an Authorization to Construct under the permit is restricted to those facilities with a design process rate of 1,000 tons HMA/hour or less using a fabric filter and an overall control device efficiency of at least 99.8%, or with a design process rate of 500 tons HMA/hour or less using a venturi or wet scrubber and an overall control device efficiency of at least 99.56%¹. A permittee not meeting this eligibility requirement may be eligible for coverage under an Authorization to Operate if they obtain an individual construction permit and all relevant requirements and limitations in that permit are incorporated into the Authorization to Operate.

¹ Control efficiency based on AP-42 (3/04), Section 11.1, Table 11.1-1 for venturi or wet scrubber control technology for total PM.

Appendix B - Compliance with OAC 252:100-31 for Fuel-burning equipment

PART 5. NEW EQUIPMENT STANDARDS

252:100-31-25 Requirements for new fuel-burning equipment.

(1) Emission limits.

(A) **Gaseous fuel.** Emissions of SO₂ from combustion of natural gas or other gaseous fuel in fuel-burning equipment shall not exceed 0.2 lb/MMBTU heat input (86 ng/J), 3-hour average.

(B) **Liquid fuel.** Emissions of SO₂ from combustion of liquid fuel in fuel-burning equipment shall not exceed 0.8 lb/MMBTU heat input (340 ng/J), 3-hour average.

Justification: New Equipment Standard

The amount of SO₂ produced by burning natural gas is dependent upon the conversion of sulfur compounds in the gas, measured as TRS (Total Reduced Sulfur), to SO₂. If sulfur levels in natural gas used to fuel these facilities are not expected to exceed 0.5 grains/100 scf, then, the conversion of all sulfur compounds, on a basis of one mole TRS to one mole SO₂, the amount of SO₂ generated can be calculated as below:

$$\frac{20 \text{ grain } S}{100 \text{ scf}} \times \frac{1 \text{ pound}}{7000 \text{ grains}} \times \frac{1 \text{ mole}}{32 \text{ lb } S} \times \frac{64 \text{ lb } SO_2}{1 \text{ mole}} = 5.714 \times 10^{-5} \frac{\text{lb } SO_2}{\text{scf}}$$

$$5.714 \times 10^{-5} \frac{\text{lb } SO_2}{\text{scf}} \times \frac{1 \text{ scf}}{1050 \text{ BTU}} \times \frac{10^6 \text{ BTU}}{\text{MMBTU}} = 0.05 \frac{\text{lb } SO_2}{\text{MMBTU}}$$

The result of 0.05 lb of SO₂/MMBTU heat input is less than 0.2 lb/MMBTU in 252:100-31-25(a)(1) heat input limit. Thus, setting up an eligibility restriction at 0.5 grains/100 scf (pipeline natural gas) ensures compliance with the new equipment standard of 0.2 lb/MMBTU heat input.

Likewise, the amount of SO₂ produced by burning liquid fuels can be calculated in a similar manner. The following table shows the characteristics of the various fuels expected to be used at an asphalt plant. Note that liquid petroleum gas (LPG), typically made by fractionating natural gas into its various components, has a sulfur content similar to pipeline natural gas.

Fuel Characteristics¹

Fuel Type	Density (lb/gallon)	Heating Value (BTU/gallon)	Wt. % Sulfur
Residual Oil	7.88	150,000	0.5-4.0
Distillate Oil	7.05	140,000	0.2-1.0
Diesel Fuel	7.0	137,000	0.4
Liquid Petroleum Gas	NA	94,000	negligible

¹ – Values based on AP-42 (9/85) Appendix A

The maximum allowable sulfur content of the fuel oil at 0.8 lb/MMBTU heat input in 252:100-31-25(a)(2) limit can be calculated using a worst case of a liquid fuel with 135,000 BTU/gallon and density of 7.0 lb/gallon, as follows.

$$\frac{0.8 \text{ lb } SO_2}{\text{MMBTU}} \times \frac{135,000 \text{ BTU}}{\text{gallon}} \times \frac{1 \text{ gallon}}{7 \text{ pounds}} \times \frac{\text{MMBTU}}{10^6 \text{ BTU}} \times \frac{1 \text{ mole}}{64 \text{ lb } SO_2} \times \frac{32 \text{ lb } S}{1 \text{ mole}} = 0.0077 \frac{\text{lb } S}{\text{lb fuel}}$$

$$0.0077 \frac{\text{lb } S}{\text{lb fuel}} \times 100 = 0.8 \text{ wt} \%$$

Thus, setting up an eligibility restriction for fuel-burning equipment of diesel fuel with a maximum sulfur content of 15 ppmw and for dryers #2 through #6 fuel oil with a maximum sulfur content of 0.7% by weight ensures compliance with the new equipment standard of 0.8 lb/MMBTU heat input.