

# Permit Boilerplate Procedures For HOT MIX ASPHALT PLANTS

**\*\*Note: If you are unfamiliar with asphalt plants, please read AP-42 Section 11.1, Hot Mix Asphalt Plants located at: <http://www.epa.gov/ttn/chief/ap42/ch11/index.html>**

## **Purpose:**

The purpose of this document is to specify the requirements for permit applicability and approval for hot mix asphalt plants. These procedures are meant to provide guidelines for the minimum requirements of the Department of Environmental Quality (DEQ) when developing a minor new source review (NSR) permit using the hot mixed asphalt conditions document ("boilerplate"). More stringent requirements may be imposed if necessary to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) or other special requirements.

These procedures do not apply to asphalt plants subject to Prevention of Significant Deterioration (PSD), Nonattainment or state major permit reviews as these types of permits require additional analyses and extensive public participation. These procedures do not cover all emission units that may be found at asphalt plants (e.g. stationary internal combustion engines, storage silos, fuel storage tanks, boilers etc.). Any such units should be evaluated on a case-by-case basis using other boilerplates or guidance as appropriate.

## **Definitions:**

The following definitions are for use in this permit boilerplate and procedure and do not necessarily have the same meaning in other portions of the regulations.

*Batch Mix Plant* - An asphalt plant that heats the aggregate, screens out the oversize aggregates, and stores the hot aggregate prior to blending the hot liquid asphalt and the aggregates in a mixer. A batch plant may include hot mix asphalt storage bins and mineral filler (lime) storage silos.

*Burner* - A device that combusts fuel by external combustion to heat either the liquid asphalt or the aggregate dryer.

*Cold Feed Bins* - A divided aggregate feed hopper fed by a front-end loader or similar device. The aggregates are metered out via volumetric feeders onto a belt conveyor, and moved to the aggregate dryer. Cold feed bins are not subject to NSPS Subpart I, but may be subject to NSPS Subpart OOO if the facility includes an affected reclaimed asphalt pavement (RAP) crusher that uses the same material handling systems.

*Drum Mix Plant* - An asphalt plant that heats the aggregate and mixes the hot liquid asphalt in the dryer in a continuous process. The drum mix plant may include mineral filler silos and hot mix storage silos.

*Distillate Oil* - Fuel oil (including diesel oil) that complies with the specifications for fuel numbers 1 or 2 as defined by the American Society for Testing and Materials (ASTM). This definition does not include number 4 oil nor does it include used or waste oil. Although diesel oil has its own ASTM specification, numbers 1 and 2 diesel oil also meet the specifications for numbers 1 and 2 fuel oil and should be considered as such.

*Lime Silo* - An enclosed storage bin used to store finely ground lime or mineral fillers used in certain asphalt mixes. The storage silo is usually equipped with a bin vent filter to control particulate emissions during filling. The discharge particulate emissions are usually controlled by complete enclosure.

*Liquefied Petroleum Gas (LPG)* - Petroleum gas, including butane and propane, as defined by the American Society for Testing and Materials in ASTM D1835.

*Natural Gas* - A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth's surface that has been made commercially available through a pipeline distribution system. The definition of natural gas presented here does not include synthetic gases or byproducts of chemical or refinery processes.

*On-Specification Used Oil* – Used oil that meets the specifications outlined in 40 CFR 279.11. See section on used oil for more detailed information.

*Reclaimed Asphalt Pavement (RAP)* - Asphalt which has been reclaimed from roads, parking lots, or from other sources, which is then reprocessed either by itself or with virgin feed.

*RAP Crusher* - A crusher (usually a form of an impact crusher) used to break up lumps in RAP for ease of handling and reprocessing. The RAP crusher may be subject to NSPS Subpart OOO if constructed (manufactured), modified, or reconstructed after 8/31/83 and meets the criteria of 40 CFR 60.670(a)(1), a device that reduces the size of the embedded nonmetallic mineral within the asphalt. If the RAP crusher is a NSPS Subpart OOO affected facility, then the feed hopper, belt conveyor, and cold feed screen are also considered as affected facilities and subject to the all provisions of this subpart.

*Rotary Dryer* - A rotating cylindrical device which utilizes an external heat source to dry and heat aggregates. In drum mixed plants, a rotary dryer mixes the liquid asphalt with the hot aggregate as well. The rotary dryer, including the burner is the major source of air pollutant emissions for the asphalt plant. The standard aggregate dryer does not separate the flame from the aggregates, and the dryer is not subject to the provisions of NSPS Subpart Dc or Db.

*Used Oil* - Spent lubricating and other industrial oils that are recovered for reuse as fuels, road oils and processed oils. The principal type of used oil is used vehicle crankcase oil recovered by automobile service stations and used oil collection depots. Other types of used oil include metal working lubricants, heavy hydrocarbon fuels, animal and vegetable oils and fats, transmission fluids, brake fluids, hydraulic oils, compressor oils, and industrial oils, including those used as transformer and other heat transfer fluids. Used oil does not include oily wastes, cleaning solvents, degreaser oils or similar products, nor are such products allowed to be mixed with used oil. Common contaminants in used oils include metals, halogens, various Volatile Organic Compounds and solvents, and sulfur. Halogens are introduced from the use of organic halides from additives, or through commingling of used oils and cleaning solvents.

### **Permit Application:**

A permit application specifically for asphalt plants has been developed to assist the source and DEQ staff in the permitting process.

### **Applicability:**

This boilerplate applies to the construction or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes) of hot mix asphalt plants as stated in Section I of these procedures.

**Existing Source Rule 4-10 Emission Standards for Asphalt Plants** – The limits on the asphalt plant cannot be less stringent than Rule 4-10.

**MACT and State Toxics** – EPA formally delisted both the major source and area source categories for asphalt hot-mix production from list for standards under Section 112(c)(6) and 112(k) of the Clean Air Act. As a result there are no MACTs for hot mix asphalt plants and they are exempt from routine review under state toxics in accordance with 9 VAC 5-60-300 C.5. However, if there are case-specific situations where this exemption does not adequately protect human health, the state toxics rule can be applied as provided for in 9 VAC 5-60-300 F.

**NSPS, Subpart I – [Standards of Performance for Hot Mix Asphalt Facilities](#)**

NSPS Subpart I is applicable to any asphalt plant for which construction, reconstruction, or modification commenced after June 11, 1973. NSPS Subpart I only regulates particulate emissions from the asphalt plant. Subpart I affected facilities include dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler, systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems. There is no de minimis level based on hourly asphalt production capacity or fuel consumption.

**NSPS, Subpart OOO - [Standards of Performance for Nonmetallic Mineral Processing Plants](#)**

Some asphalt plants may include equipment subject to NSPS Subpart OOO. NSPS Subpart OOO affected facilities may include the cold aggregate handling equipment and RAP crushing system, to be NSPS Subpart OOO applicable, the RAP crusher must be capable of breaking the non-metallic minerals embedded in the asphalt. Once the RAP crusher is determined to be an NSPS OOO affected facility, then all cold aggregate handling equipment must be evaluated for compliance with NSPS Subpart OOO. Note that the hourly capacity of the affected facilities should be clearly stated in Permit Condition #1. See the stone processing procedures document for details.

**On-Specification Used Oil**

Under 40 CFR Part 241 (Solid Wastes Used as Fuels or Ingredients in Combustion Units) definition section (241.2), used oil can be considered a traditional fuel if it meets the specifications outlined in 40 CFR 279.11. Used oil that meets these specifications is termed “on-specification” used oil. Facilities that burn “off-specification” used oil may be subject to the Commercial and Industrial Solid Waste Incinerator (CISWI) regulations or the Hazardous Waste Incineration (40 CFR 63, Subpart EEE) regulations.

The following table from 40 CFR 279.11 includes specifications for “on-specification” used oil.

**Table 1— Used Oil Not Exceeding Any Allowable Level Shown Below Is Not Subject To This Part When Burned For Energy Recovery<sup>1</sup>**

Constituent/Property	Allowable Level
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Flash Point	100 °F minimum
Total Halogens (see additional information below)	4,000 ppm maximum <sup>2</sup>
<b>**Note:</b> Applicable standards for the burning of used oil containing PCBs are imposed by 40 CFR 761.20(e).	

<sup>1</sup>The allowable levels do not apply to mixtures of used oil and hazardous waste that continue to be regulated as hazardous waste (see §279.10(b)).

<sup>2</sup>Used oil containing more than 1,000 ppm total halogens is presumed to be a hazardous waste under the rebuttable presumption provided under §279.10(b)(1). Such used oil is subject to subpart H of part 266 of this chapter rather than this part when burned for energy recovery unless the presumption of mixing can be successfully rebutted.

Although the allowable level for total halogens in Table 1 above is a maximum of 4,000 ppm, footnote 2 states that used oil containing more than 1,000 ppm total halogens is presumed to be a hazardous waste except as provided in 40 CFR 279.10(b)(1). To avoid the potential of burning used oil that could be considered a hazardous waste, the allowable level for total halogens for "on-specification" used oil will be a maximum of 1,000 ppm.

The combustion of used oil containing detectable levels of PCBs is regulated by the Toxic Substance Control Act under 40 CFR Part 761. Based on DEQ staff review of the regulation, asphalt plants are not a listed combustion device approved to burn used oil with detectable amounts of PCBs (>2ppm).

The asphalt boilerplate contains the allowable contaminant levels to meet the on-specification used oil and TSCA requirements. Documentation that the used oil meets the allowable levels for on-specification used oil should be obtained by performing analyses or obtaining copies of analyses or other information documenting that the used oil fuel meets the specifications.

### **Emission Controls and BACT under Article 6:**

Listed below are the conditions/emission limits that are considered BACT for a hot mix asphalt plant.

- a. Particulate emissions from the drum mix plant or the batch mix plant (rotary dryer, hot elevator, hot screen, and hot storage bins) shall be controlled by a fabric filter to meet the allowable grain loading standard of 0.04 grains/dscf from NSPS, Subpart I.
- b. Particulate emissions from the lime storage silo shall be controlled by a fabric filter.
- c. Proper operation and maintenance of the rotary dryer meets BACT for NO<sub>x</sub> and/or VOC emissions.
- d. Fugitive emissions from material handling, RAP screening, RAP and cold aggregate belt conveyor transfers, load-outs and other dust sources shall be controlled by wet suppression or equivalent as approved by DEQ.
- e. Fugitive emissions from RAP crushing shall be controlled by the use of wet suppression and/or reducing the free fall distance of materials at transfer points and/or enclosing the conveyor drop points with venting of particulate emissions to a fabric filter.
- f. Stockpiles must be kept adequately moist to control dust during storage and handling or covered at all times to minimize emissions.
- g. Sulfur dioxide emissions are controlled by the percentage of sulfur in the fuel. Maximum sulfur content of distillate and residual oil (not on-specification used oil) is 0.05%. Maximum sulfur content for on-specification used oil is 0.5%.

### **Monitoring:**

**Fabric filters:** A requirement to monitor the pressure drop across induced or forced draft fabric filters should be included in the permit. Meeting a manufacturer's recommendation for differential

pressure is not considered a surrogate for meeting an opacity limitation. Both measures are required for adequate periodic monitoring.

The permit should require the source to keep a log of the differential pressure readings on a regular basis. The log shall include the name of the observer, the date and time of the observation, and the differential pressure reading.

Bin vent filters: Due to the absence of an induced or forced draft fan (i.e. bin vent filter), the requirement for a differential pressure measurement is not appropriate.

### **Emission Limits/Calculations:**

The most significant source of emissions from hot mix asphalt plants is the rotary drum dryer. Unless source specific emission factors are provided, emission limits are calculated using EPA AP-42 emission factors. The section on hot mix asphalt plants contains emission factors for all aspects of the operation. If a RAP crusher and conveying equipment is included, emissions should be calculated based on the emission factors from the Crushed Stone Processing Operations section. Links to the sections are provided below:

- [AP-42 Section 11.1 for Hot Mix Asphalt Plants](#)
- [AP-42 Section 11.19.2 for Crushed Stone Processing Operations](#)

The Hot Mix Asphalt Plant Excel Spreadsheet provided on DEQNet may be used to calculate the emissions from the hot mix asphalt plant. The spreadsheet contains a GHG calculation page to document that the potential to emit CO<sub>2</sub>e is below the major source threshold level.

- a. Asphalt Plant Particulate Emission Limit: The asphalt plant's primary baghouse (controlling rotary drum dryer) has a 0.04 gr/dscf particulate grain loading limit on the exhaust stack. The hourly particulate emissions limit (lb/hr) for the asphalt plant should be omitted and only the grain loading (0.04 gr/dscf) limit should be included as an emissions limit. However, the annual particulate emissions limit is reported in tons/yr.
- b. Asphalt Plant Non-Particulate Emission Limits: The fuel burning criteria pollutant emissions in excess of 0.5 tons/yr should be specified in the condition limiting the asphalt plant emissions. The asphalt heater, RAP crusher, and other fugitive pollutant emissions (stockpiles, etc) should be limited in separate permit conditions using current permit procedures.
- c. Multiple Fuel Emissions Limits: For units capable of burning multiple fuels, the lbs/hr limits are based on the higher emission rate of the fuels combusted. Separate emission rates are not necessary for each fuel. Annual emissions limits in tons/yr are based on the permitted combination of fuel that produces the highest emission rate. Emission limits in lbs/10<sup>6</sup> Btu are not necessary for non-NSPS fuel burning units.
- d. Throughput Limits: There is no need to limit annual throughput for the individual emission units that comprise the asphalt plant since these units cannot operate independently of the plant. However, the RAP crusher and lime silos operating schedule can be substantially different from the asphalt plants operating schedule, and the permit should address this operational difference.

### **Visible Emissions:**

Visible emissions from the asphalt plants affected facility (NSPS Subpart I), hot mix asphalt load-out, transfer station, and asphalt storage silos fabric filter exhaust shall not exceed 5% opacity. If

the product being produced contains at least 10% recycled asphaltic material, then the visible emission limit is 20% opacity.

Visible emissions from the asphalt heater, aggregate handling equipment, and fugitive emission sources shall not exceed 10% opacity.

Visible emissions from RAP crushing shall not exceed 15% opacity (for units built after 1983 but before 2008) or 12% opacity (for units built after 2008).

Visible emissions from the lime storage silo fabric filter (bin vent) shall not exceed 5% opacity.

### **Recordkeeping:**

All permitted facilities must maintain the following records on site. Throughput and fuel consumption records should be calculated monthly as the sum of each consecutive twelve month period:

- a. **[O]** Annual hours of operation of {process}.
- b. Annual production of asphalt.
- c. **[O]** Annual production of RAP through the RAP crushing plant
- d. Annual throughput of (fuel type) in the rotary dryer and asphalt heater
- e. **[O]** Annual throughput of lime
- f. All fuel supplier certifications.
- g. Operation and control device monitoring records for the {process, **or** air pollution control device}
- h. Results of all visible emission evaluations and stack testing.
- i. Scheduled and unscheduled maintenance, and operator training
- j. **[O]** A record of each visible emissions observation shall be maintained and shall include, at a minimum, the date, time, name of the emission unit, the applicable visible emissions requirement, the results of the observation, and the name of the observer.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

### **Notification for Relocation of Portable Facilities**

Asphalt plants may be permitted as portable facilities. The portable plant relocation conditions and form letters have not been included in this boilerplate but should be included in the permit if the applicant requests that the facility be permitted as a portable plant. Copies of the portable plant permit conditions and form letters for notification of relocation can be found in the Minor NSR Boilerplate Directory on DEQNET.

### **Testing Requirements:**

A Method 5 (particulate stack test) and Method 9 (Visual Emissions Evaluation (VEE)) are required for all new NSPS Subpart I affected facilities. A non-NSPS asphalt plant being constructed in Virginia or a plant where the emissions control equipment has been modified may require both a Method 5 and Method 9 performance test. The test is usually performed by an independent testing consultant within 60 days after achieving maximum production but no later than 180 days after initial start-up.

Initial VEEs for RAP crushers, belt conveyor transfers, cold storage bins, and cold screening affected facilities are required per NSPS Subpart OOO.

Emissions testing for pollutants other than total particulates are not usually required.