



United States Environmental Protection Agency General Permit for New or Modified Minor Sources of Air Pollution in Indian Country

<http://www.epa.gov/air/tribal/tribalnsr.html>

Background Document: General Air Quality Permit for New or Modified True Minor Source Concrete Batch Plants

Version 1.0

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1. Concrete Batch Plant Source Category Definition

A concrete batch plant is an operation that combines various ingredients to form concrete. Some of these inputs include sand, water, aggregate (rocks, gravel, etc.), fly ash, potash, and cement. There are two types of concrete batch plants: ready mix plants and central mix plants. A concrete batch plant can have a variety of parts and equipment, including, but not limited to: mixers (either tilt-up or horizontal or in some cases both), cement batchers, aggregate batchers, conveyors, radial stackers, aggregate bins, cement bins, heaters, chillers, cement silos, batch plant controls, and dust collectors. The proposed General Air Quality Permit for New or Modified True Minor Source Concrete Batch Plants only covers concrete batch operations that are located at true minor New Source Review (NSR) sources.

2. Source Category Characterization

The operations and equipment at a typical concrete batch plant facility are described in AP 42, Chapter 11.12, Concrete Batching.¹ Concrete is composed essentially of water, cement, sand (fine aggregate) and coarse aggregate. Coarse aggregate may consist of gravel, crushed stone or iron blast furnace slag. Some specialty aggregate products could be either heavyweight aggregate (of barite, magnetite, limonite, ilmenite, iron or steel) or lightweight aggregate (with sintered clay, shale, slate, diatomaceous shale, perlite, vermiculite, slag pumice, cinders, or sintered fly ash). Supplementary cementitious materials, also called mineral admixtures or pozzolan minerals, may be added to make the concrete mixtures more economical, reduce permeability, increase strength, or influence other concrete properties. Typical examples are natural pozzolans, fly ash, ground granulated blast-furnace slag, and silica fume, which can be used individually with portland or blended cement or in different combinations. Chemical admixtures are usually liquid ingredients that are added to concrete to entrain air, reduce the water required to reach a required slump, retard or accelerate the setting rate, to make the concrete more flowable, or other more specialized functions.

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

¹ AP-42, Chapter 11.12, Concrete Batching, <http://www.epa.gov/ttn/chief/ap42/ch11/index.html>.

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

Particulate matter (PM), consisting primarily of cement and pozzolan dust, but including some aggregate and sand dust emissions, is the primary pollutant of concern. In addition, there are emissions of metals that are associated with this PM. Point source emissions include the transfer of cement and pozzolan material to silos that are usually vented to a fabric filter. Fugitive sources include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. The amount of fugitive emissions generated during the transfer of sand and aggregate depends primarily on the surface moisture content of these materials.

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

3. State Minor Source Permit Programs

The U.S. Environmental Protection Agency (EPA) researched state air quality permitting websites for examples of permits by rule and general permits for concrete batch plants. The EPA examined these documents for their applicability in developing a general permit for Indian country. The EPA incorporated elements from these permits in developing the documents and regulations in the general permit for concrete batch facilities. The EPA examined permits by rule and general permit documents for concrete batch operations in Arizona, Florida, Idaho, Illinois, Indiana, Iowa, Maine, Maryland, Mississippi, New Mexico, Ohio, Oregon, South Carolina, and Texas in developing this general permit. The EPA chose general permits from these states because of characteristics they possess:

- Readily available;
- Clear throughput limits; and
- Organization of the regulations followed the typical form for federal NSR permits:
 - Limitations and standards, and
 - Monitoring, testing, recordkeeping, and reporting requirements.

The state general permits and permits by rule for concrete batch plants vary from the streamlined (Indiana at two pages) to the extremely detailed and complex (Arizona at 108 pages).

The state concrete batch plant permits limit emissions with either concrete production limits or pollutant emission limits. Only a few of the state concrete batch plant permits (Florida, Maryland, Maine) restrict issuance to true minor sources whose potential to emit (PTE) of criteria pollutants is less than 100 tons per year (tpy). The other states issue their concrete batch plant permits to sources to control emissions to minor source levels. These production limits, and boiler/heater size, and engine displacement limits, are intended to keep emissions below the major source thresholds, making the source a synthetic minor. The state permits that limit production and engine displacement (Idaho, Illinois, Indiana, Iowa, Ohio, and Texas) use these limits as a surrogate for limiting emissions through individual numerical limits on individual pollutants.

Only the Arizona, Idaho, Iowa, Maine, New Mexico, South Carolina, and Texas state permits regulate emissions from engines. The regulations limit combustion emissions by limiting either fuel sulfur content, engine displacement, or both.

All of the state concrete batch plant permits require control of particulate emissions, and the requirements are fairly standardized. Emissions from silos, weigh hoppers and mixers are required to be controlled with fabric filters or baghouses, fugitive emissions from materials handling and loading are required to be controlled with shrouds, suction, wetting, or best management practices (BMPs), and fugitives from storage piles and roadways are required to be controlled with wetting, dust suppressants, or sweeping. In general, all of the state concrete batch plant permits require BMPs for control of fugitives, and have monitoring and recordkeeping requirements adequate to enforce these measures. Visible emissions and opacity requirements are present in all of the state permits, but vary from state to state. Setbacks are present in most of the state permits, but they also vary state by state.

Only the Arizona² state permit incorporates the requirements of New Source Performance Standards (NSPS) Subpart IIII and Subpart JJJJ, and National Emissions Standards for Hazardous Air Pollutants (NESHAP) Subpart ZZZZ for engines into the text of the permit. Several other states (Florida, Idaho, Iowa, Maine, South Carolina, and Texas) mention that sources must comply with these requirements, or incorporate the NSPS and NESHAP requirements by reference. The other state permits do not mention the federal requirements.

Table 7 in Section 5.2.3 contains a summary of the concrete batch plant permit requirements by state.

4. Requirements for General Permit

4.1 Documents for General Permit

The EPA developed a standardized set of permit documents in support of a general permit for concrete batch plants located in Indian country. These consist of the following documents:

- Questionnaire: Assists the facility owner or operator in determining whether they are eligible for a General Air Quality Permit;
- Request for Coverage under the General Air Quality Permit: States the criteria for qualification, gathers information on the source, facility location, and source contact, and requests technical information on facility equipment, concrete production, and attainment status;
- Instructions: Guides the applicant in filling out the Request for Coverage under the General Air Quality Permit;
- General Air Quality Permit, Terms and Conditions: Contains the requirements and regulations with which the source must comply. The emission limitations, monitoring, recordkeeping and reporting requirements are in the permit; and
- PTE Calculator Spreadsheet: Allows applicants to calculate their PTE, based on owner inputs of either the specific equipment and throughput capacity or the plant's maximum production capacity, assuming

² Arizona Department of Environmental Quality, General Permits, General Concrete Batch Plant Permit, <http://www.azdeg.gov/environ/air/permits/download/gncbppermit.pdf>.

continuous operation throughout the year. The PTE Calculator spreadsheet generates potential emissions, based on these inputs. The spreadsheet illustrates the correlation between equipment, raw material throughput, concrete production and emissions.

4.2 Exemption and Qualification for General Permits

Facilities applying for the proposed general permit must meet the following criteria:

- Must be a true minor NSR source;
- Must be minor source for hazardous air pollutants (HAPs); and
- Be below the emission limitations established for the general permit.

New facilities with a PTE or modifications to existing facilities with an emissions increase lower than the minor NSR thresholds specified in Table 1 of Indian Country Minor NSR rule (40 CFR 49.153) are exempt from the minor NSR program. The exemption thresholds for PM and criteria pollutants are listed in Table 1 below. Facilities applying for the proposed general permit may calculate their PTE using the PTE calculator to determine if they are exempt from the minor NSR program.

Table 1: Minor NSR Thresholds in 40 CFR 49.153

Pollutant	Attainment Area	Nonattainment Area
Carbon Monoxide (CO)	10 tpy	5 tpy
PM	10 tpy	5 tpy
PM ₁₀	5 tpy	1 tpy
PM _{2.5}	3 tpy	0.6 tpy
Sulfur Dioxide (SO ₂)	10 tpy	5 tpy
Nitrogen Oxides (NO _x)	10 tpy	5 tpy
Volatile Organic Compounds (VOC)	5 tpy	2 tpy

Under current EPA policy, only true NSR minor sources qualify for the proposed general permit. Therefore, facilities will be required to compare their PTE to the NSR major source thresholds to determine if they qualify for the proposed general permit. For this source category – concrete batch plants – the NSR major source threshold for attainment areas is 250 tpy of any criteria pollutant. The NSR major source thresholds for nonattainment areas are summarized in Table 2 below:

Table 2: NSR Major Source Thresholds for Nonattainment Areas

Pollutant	Nonattainment Classification	NSR Major Source Threshold
Ozone	Marginal	100 tpy of VOC or NO _x
	Moderate	100 tpy of VOC or NO _x
	Serious	50 tpy of VOC or NO _x
	Severe	25 tpy of VOC or NO _x
	Extreme	10 tpy of VOC or NO _x
PM ₁₀	Moderate	100 tpy
	Serious	70 tpy

Pollutant	Nonattainment Classification	NSR Major Source Threshold
CO	Moderate	100 tpy
	Serious	50 tpy
SO ₂ , NO _x , PM _{2.5}	No nonattainment classification	100 tpy

If the facility's PTE is above the NSR major source threshold of 250 tpy, or above the applicable nonattainment area thresholds listed in Table 2 (for any pollutant that is designated nonattainment in the area the source will locate), then the facility does not qualify for the proposed general permit. The following documents are available to assist sources in the screening and application process:

- Questionnaire; and
- Request for Coverage under the General Air Quality Permit.

The questionnaire and the application for the concrete batch plants permit contain questions designed to limit the availability of this general permit to true minor source concrete batch plants. For facilities not exempt from the minor NSR program and having a PTE below the NSR major source thresholds, the facilities will further evaluate if they can meet the emission limitations established in this general permit. The specific requirements for the proposed general permit are discussed in Sections 4.3, 4.4, 4.5, and 4.6. Section 5 provides background on the surrogate emissions limitations provided in the proposed concrete batch plants general permit.

4.3 Specific Permit Requirements for General Permits and Permits by Rule

The terms and conditions of the general permit were established according to the required permit content and analyses in the Indian Country Minor NSR rule. The required permit content is listed in 40 CFR 49.155(a) – *What information must my permit include?* Below we describe the basis for the permit conditions.

40 CFR 49.155(a)(1) – General Requirements

The rule establishes general requirements that each permit must identify: the effective date of the permit; the date by which the owner/operator must commence construction in order for the permit to remain valid; the emission units subject to the permit and their associated emission limitations; and monitoring, recordkeeping, and reporting requirements to assure compliance with the emission limitations.

The proposed general permit contains all of this required information, except for the emission units subject to the permit. Because of the nature of general permits we believe it is more appropriate to identify the emission units covered by the general permit in the Approval of the Request for Coverage. The general permit incorporates the Approval of the Request for Coverage into the general permit. Each permit contains a separate section that specifically identifies the emission limitations and standards, monitoring and testing, recordkeeping, and reporting and notification requirements.

CFR 49.155(a)(2) – Emission Limitations

The permit must contain the emission limitations determined by the reviewing authority under 40 CFR 49.154(c) for each affected emissions unit. In this General Permit for concrete batch plants, limits on the annual concrete production of the concrete batch plant is used to limit emissions of all criteria pollutants to below the NSR major source thresholds. 40 CFR 49.154(c) – *How will the reviewing authority determine the emission limitations that will be required in my permit?* – identifies the case-by-case control technology review that must be used by the reviewing authority to determine the appropriate level of control. In carrying out the case-by-case control technology review, the reviewing authority must consider the following factors:

1. Local air quality conditions;
2. Typical control technology or other emission reduction measures used by similar sources in surrounding areas;
3. Anticipated economic growth in the area; and
4. Cost-effective emission reduction alternatives.

In addition, the reviewing authority must require a numerical limit on the quantity, rate or concentration of emissions for each regulated NSR pollutant emitted by each affected emissions unit, for which such a limit is technically feasible. The emission limitation required may also be included as pollution prevention techniques, design standards, equipment standards, work practices, operational standards or any combination thereof. However, the emission limitations must assure that each affected emission unit will comply with all requirements of 40 CFR parts 60, 61, and 63, as well as any federal or tribal implementation plans that apply to the unit. Finally, the emission limitations required may not rely on a stack height that exceeds good engineering practice or any other dispersion technique, except as allowed by 40 CFR 51.118(b).

To address the requirements for establishing emission limitations the following considerations were used for setting the limits in the general permit for concrete batch plants:

1. Local air quality conditions – To address this requirement, the general permit requires all sources to utilize fabric or cartridge filters to control PM emissions from point sources such as silos, weigh hoppers, and storage bins. The general permit also requires that all sources utilize work practice standards (sometimes referred to as BMPs) to minimize fugitive emissions from materials handling, loading, storage piles, and roadways. The permit contains a requirement to take corrective action if fugitive dust is visible beyond the property line. This will aid in reducing local PM air quality impacts.
2. Typical control technology or other emission reduction measures used by similar sources in surrounding areas – For sources locating in attainment areas the EPA looked at the control requirements required by 40 CFR parts 60, 61 and 63. These regulations establish minimum technology and emission limitations that must be met nationally and also meet the requirements of 40 CFR 49.154(c)(4) to ensure compliance with parts 60, 61, and 63. For this general permit the EPA considered regulations that apply to the equipment at concrete batch plants:
 - a. 40 CFR 60 Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Facilities;
 - b. 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines;
 - c. 40 CFR 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines; and
 - d. 40 CFR 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutions for Stationary Reciprocating Internal Combustion Engines.

These regulations cover emissions from the following equipment at concrete batch plants:

- Mixers;
- Silos, weigh hoppers, and storage bins;
- Material handling equipment; and
- Emergency engines.

The derivation of the surrogate emissions limitations in the general permit are discussed fully in Section 5. The minor NSR thresholds are based on provisions of the *Review of New Sources and Modifications in Indian Country* rule at 40 CFR 49.153 and are provided in Table 1.

Review of the regulations and other existing general permits resulted in permit conditions requiring emissions from all mixers, silos, weigh hoppers, and storage bins be controlled by fabric or cartridge filters, while fugitive emissions from materials handling, drop points, loading, storage piles, roadways, and other possible release points to be controlled by shrouds, wet suppression, and work practices standards. The permit also requires fugitive emissions to be controlled by a fugitive dust control plan. Non-emergency and emergency engines are required to meet the applicable NSPS or NESHAP emission requirements. In addition, liquid fuels in the engines are limited to using ultra low sulfur fuels with no more than 0.0015 percent sulfur by weight. These conditions represent the standard fuels used for this equipment and the standard sulfur content these fuels must attain. Although we reviewed the NSPS requirements for tanks, we did not include any limits in the permit as the fuel storage tanks used by concrete batch plants are not expected to need to meet the control requirements of the NSPS.

3. Anticipated economic growth in the area – The Reviewing Authority may consider anticipated economic growth when determining whether coverage under the proposed general permit is justifiable. Considering, however, that the proposed general permit sets emission standards that are consistent with what is required by concrete batch plants across the country in both attainment and nonattainment areas, we expect that this will rarely be a factor.
4. Cost-effective emission reduction alternatives – The proposed general permit sets emission standards that are consistent with what is required by concrete batch plants across the country, based on the particular attainment status where the source is locating. As such, the chosen technologies are considered widely available and consideration of more cost-effective alternatives is not necessary at this time. We intend to periodically review technology costs in the future to determine when more stringent, cost-effective technologies become widely available.

40 CFR 49.155(a)(3) – Monitoring Requirements

The proposed general permit must include monitoring that is sufficient to assure compliance with the emission limitations that apply to the source. The proposed general permit requires monitoring that assures that the particulate control systems are operating properly, that a visible emissions survey is conducted on a weekly basis, and that fugitive emissions surveys are conducted weekly. Also, certain emergency engines are required to conduct performance testing to demonstrate compliance with the applicable emission limitations.

40 CFR 49.155(a)(4) – Recordkeeping Requirements

The proposed general permit must include recordkeeping that is sufficient to assure compliance with the emission limitations and monitoring requirements, including certain statements listed in 40 CFR 49.155(a)(4)(i) and (ii). In addition to the recordkeeping requirements in 40 CFR 49.155(a)(4)(i), the proposed general permit also requires records of the amount of concrete produced each day, control equipment inspections, visible emission surveys, fugitive emission surveys, corrective actions taken, results of corrective actions taken, maintenance activities of stationary engines, and fuel supplier certifications. For emergency engines, the permittee must maintain a log of the hours of operation, including the date, time, duration, and reason(s) for use.

40 CFR 49.155(a)(5) – Reporting Requirements

The proposed general permit includes the reporting requirements listed in 40 CFR 49.1559(a)(5)(i) and (ii) related to annual reports and reporting of deviations.

40 CFR 49.155(a)(6) – Severability Clause

The proposed general permit includes a severability clause to ensure the continued validity of the other portions of the permit in the event of a challenge to a portion of the permit. This condition is found in the General Provisions of the proposed general permit.

40 CFR 49.155(a)(7) – Additional Provisions

The proposed general permit contains the additional provision required for each permit. These conditions are found in the General Provisions, Changes to this General Permit, and Obtaining Coverage under this General Permit sections of the proposed general permit.

4.4 Requirements for Sources Located in Nonattainment Areas

We did not include any additional requirements for sources locating in air quality nonattainment areas. We are not aware of any more stringent state/local control requirements for concrete batch plants in nonattainment areas. The limits on concrete production and the equipment control requirements will ensure that the general permit only applies to true minor sources locating or expanding in these nonattainment areas.

4.5 Additional Permit Requirements

The EPA added a 150 foot setback requirement from the nearest property boundary and a 1,000 foot setback requirement between the concrete batch plant and the nearest residence. Permits from Arizona, Idaho, Iowa, Mississippi, New Mexico, and Texas include setback requirements, and, along with Maryland, also require that no visible emissions cross the property boundary.

4.6 Requirements of the Endangered Species Act and National Historic Preservation Act

Prior to seeking coverage under this general permit, sources must satisfactorily address the permitting requirements related to the Endangered Species Act and National Historic Preservation Act. Attached to the request for coverage document for the concrete batch plant general permit, the EPA provides guidance to assist sources in complying with these two statutes.

5. Emission Limitations³ and Surrogate Throughput Limits

5.1 Developing the Surrogate Limits and Limitations

In order to limit emissions to below the NSR major source thresholds, the EPA has chosen to limit the yearly concrete production of the concrete batch plant. The draft general permit includes the annual concrete production limit that applies to all sources in both attainment and nonattainment areas (see Table 4). The concrete production limit for attainment and nonattainment areas is set at the same level because the EPA has selected the same emissions limitations for attainment and nonattainment areas. The production limit serves as

³ The definition of emission limitation used in this background document is the one provided in the Indian Country Minor NSR rule (described in Section 4.3) and includes requirements established by the reviewing authority that relate to the operation of a source, which allows for the use of production throughput limits.

a surrogate emissions limitation. (The general permit also includes requirements to control emissions from storage silos, mixers, and weigh hoppers.) The production limit and control requirements were established as surrogate emissions limitations in order to limit emissions below the thresholds for the Title V and major NSR permitting programs. In addition, PM/PM₁₀/PM_{2.5} are the pollutants of concern emitted by concrete batch plants. However, the general permit also includes a limit on the quantity of total annual cold cleaning solvent makeup not to exceed 500 gallons per year based on a 12-month rolling total. Degreasing operations can be found at concrete batch plants that clean engine parts in trucks used to transport concrete to job sites.

The tpy emission rates provided in Table 3 used to determine eligibility for the general permit for sources located in attainment and nonattainment areas correspond to the source-wide annual concrete production limit intended to prevent a plant from becoming a major source and subject to Title V permitting (referred to hereafter as “the Title V major source threshold”). In attainment areas, the Title V major source threshold is 100 tpy for any criteria pollutant. The emissions thresholds for facilities located in nonattainment areas are set at the thresholds in Table 2 for each pollutant and nonattainment status, which serve as the thresholds for both the major NSR and Title V permitting programs. The threshold is 50 tpy for PM₁₀ in moderate PM₁₀ nonattainment areas.

The EPA evaluated the emission rates at which a new or modified source would become a major source under Title V. The EPA developed a PTE Calculator spreadsheet that allows applicants to calculate pollutant emissions for the emission units at a concrete batching plant using AP 42 emission factors. Using the PTE calculator, the EPA back-calculated the throughput of materials (production of concrete) that yielded the emissions rate in Table 3 by using an equipment configuration based on the description of a typical concrete batch plant, 8,760 hours of production, and emission factors from AP 42, Chapter 11.12.⁴ Equipment configurations and any controls present have a significant impact on the level of pollutants emitted.

As an example, an owner wanting to construct a new concrete batch plant utilizing controls on point source and fugitive PM emissions would be limited to producing 2,000,000 cubic yards of concrete per year. By using the PTE calculator provided by the EPA at <http://www.epa.gov/air/tribal/tribalnsr.html>, an applicant can determine whether emissions from their concrete batch plant would exceed the major source thresholds.

Table 3: Emission Rates Used to Determine Emission Limitations for Concrete Batch Plants

Pollutant of Concern	Attainment, Unclassifiable or Attainment/Unclassifiable Areas	Nonattainment Areas
PM ₁₀	20 tpy	20 tpy (moderate and serious areas)
PM _{2.5}	5 tpy	5 tpy

⁴ AP-42, Chapter 11.12, Concrete Batching, <http://www.epa.gov/ttn/chief/ap42/ch11/index.html>.

Table 4: Surrogate Concrete Production Limits

Attainment Status	Upper Concrete Production Limit (cubic yards/year)
PM ₁₀ Attainment, Unclassifiable or Attainment/Unclassifiable Areas and Nonattainment Areas	2,000,000
PM ₁₀ Attainment, Unclassifiable or Attainment/Unclassifiable Areas and Moderate and Serious Nonattainment Areas	2,000,000

5.2 Emission Limitations

Three considerations form the basis for the upper eligibility emission limitations for general permits and permits by rule:

1. Are there any EPA regulation-based emission limitations?
2. What do actual emissions data from the 2011 National Emissions Inventory (NEI)⁵ indicate about the size profile of the source category?
3. Where do state programs establish eligibility limits?

5.2.1 EPA Regulation-Based Emissions Limitations

The surrogate emissions limitation on concrete production was established to keep permitted sources emissions below the thresholds for the major NSR and Title V permitting programs. For PM₁₀, the production limit was set to correspond to emission rates at below 20 tpy for PM_{2.5} and below 5 tpy (see Table 3).

5.2.2 Analysis of NEI Data

The EPA analyzed 2011 NEI data for existing concrete batch plants across the U.S. to evaluate the emission limitations established in the general permit. Although the NEI does not include potential emissions information for sources in Indian country, it reflects the actual emissions from concrete batch plants in 50 states. In order to analyze facilities whose emissions are similar to those for sources potentially subject to the Indian Country Minor NSR rule, the EPA selected facilities for analysis with the North American Industry Classification System (NAICS) codes listed in Table 5. For sources in these four NAICS codes, the EPA selected actual emissions⁶ within the ranges listed in Table 6.

Table 5: NAICS Codes Selected for Concrete Manufacturing Facilities

NAICS Code	Description
327320	Central Mixed Concrete Manufacturing
327320	Concrete Batch Plants (including temporary)
327320	Ready Mix Concrete Manufacturing and Distributing

⁵ For more information, go to: <http://www.epa.gov/ttnchie1/net/2011inventory.html>.

⁶ Only point source NEI data were used for this analysis. The point source inventory does not include emissions from nonroad engines.

NAICS Code	Description
327320	Transit Mixed Concrete Manufacturing
327320	Truck Mixed Concrete Manufacturing
327331	Concrete Manufacturing: All Types of Blocks and Bricks
327332	Concrete Manufacturing: All Types of Pipe and Conduit
327390	Concrete Manufacturing: All Structural Forms

Table 6: Emission Ranges Selected for Concrete Manufacturing Facilities

Criteria Pollutants	PM ₁₀	PM _{2.5}
Attainment Area		
Min. Emissions (tpy)	5	3
Max. Emissions (tpy)	250	250
Nonattainment Area		
Min. Emissions (tpy)	1	0.6
Max. Emissions (tpy)	250	250

The 2008 NEI data does not include emissions information for total PM. The EPA analyzed the emissions rates listed in Table 3 that were used to establish the surrogate throughput emissions limitations and selected the facilities with emission levels similar to the facilities potentially subject to the minor NSR program, i.e., the facilities with emissions greater than the minor NSR applicability thresholds in Table 1 of 40 CFR 49.153 (Indian Country Minor NSR Rule) and less than the PSD major source threshold of 250 tpy. For purposes of this analysis, facilities located in nonattainment areas are defined as facilities located in counties that are designated nonattainment for the pollutant being analyzed.

With the NAICS codes listed in Table 5 and the emission ranges defined in Table 6, the EPA identified the concrete manufacturing facilities located in attainment and nonattainment areas for PM₁₀ and PM_{2.5}. The EPA is providing the number of facilities (and average emissions) under the proposed emissions limitations and above the minor source thresholds.

Table 6: Number of Facilities and Average Emissions for Concrete Manufacturing Facilities Selected

Criteria Pollutants	Number of Facilities
Attainment Areas	
PM_{2.5}	
Facilities >3 tpy and < 5 tpy	16 (2% of facilities covered)
Average Emissions (tpy)	4
Facilities > 3 tpy and < 250 tpy	24
Average Emissions (tpy)	13
PM₁₀	
Facilities >5 tpy and < 20 tpy	81 (8% of facilities covered)
Average Emissions (tpy)	9
Facilities > 5 tpy and < 250 tpy	12
Average Emissions (tpy)	52
Nonattainment Areas	
PM_{2.5}	

Criteria Pollutants	Number of Facilities
Facilities >0.6 tpy and < 5 tpy	60 (24% of facilities covered)
Average Emissions (tpy)	2
Facilities >0.6 tpy and < 250 tpy	5
Average Emissions (tpy)	26
PM₁₀ (moderate and serious)	
Facilities >1 tpy and < 20 tpy	69 (34 % of facilities covered)
Average Emissions (tpy)	4
Facilities > 20 tpy and < 250 tpy	2
Average Emissions (tpy)	35

5.2.3 State Program Limits

Table 7 presents the limits in general permits and permits by rule for concrete batch plants issued by states. These state permits limit emissions by limiting: concrete production, fuel usage, fuel sulfur content, total pollutant emissions, pollutant emission rates, boiler capacity, engine capacity, co-location, or by requiring controls for particulate and fugitive emissions. Most state permits utilize combinations of the above limits to control the various pollutants. The Indiana permit is the simplest in that it limits annual concrete production to 300,000 cubic yards per year. The Iowa permit is perhaps the most complex. It limits everything mentioned above except for individual pollutant emission rates. A comparison of requirements for attainment and nonattainment areas is not possible due to lack of a distinction made in most state programs, except for Arizona. The Arizona permit is an example of a concrete batch plant permit designed for an area designated as nonattainment for PM₁₀. The Arizona general permit⁷ places limits on concrete production based on the attainment/nonattainment status of the concrete batch plant's location. This distinction is necessary, as nearly half of the counties in Arizona have been designated nonattainment for PM₁₀.

⁷ Arizona Department of Environmental Quality, General Permits, General Concrete Batch Plant Permit, <http://www.azdeg.gov/environ/air/permits/download/gncbppermit.pdf>.

Table 7: State Program Limits

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
Arizona	Attainment areas: 1,280 yards/day if using generator power, 1310 yards/day if using line power and nonattainment areas: 930 yards/day if using generator power, 960 yards/day if using line power.	Each engine must limit hours of operation to the limits in the individual Authorizations to Operates.	Limit CO, NO _x , SO ₂ emissions from concrete batch plant to < 90 tpy; engine PM ₁₀ emissions: < 1.02 Q ^{0.769} lb/hour, where Q=million British thermal units (MMBtu) of engine; and engine SO ₂ emissions: < 1 lb/MMBtu.	Boilers limited to 10 MMBtu total and engine fuel sulfur: < 0.9%.	Cannot collocate with hot mix asphalt or rock crushing facility; and storage piles must be > 25 feet from boundary.	Water sprays required for mobile sources and fugitives must be controlled by water spray and other reasonable precautions.	Yes; emissions from silos must be controlled by baghouses.	Yes; no visible emissions (VE) beyond property line
Florida	None specified.	Annual Use < 250,000 gal diesel fuel; < 23,000 gal gasoline; and < 44 million standard cubic feet natural gas.	General permit issued to sources w/ PTE < major source levels (< 100 tpy).	Total boiler capacity < 250 MMBtu.	A concrete batch plant can be collocated with a nonmetallic mineral processing plant.	Water sprays required for mobile sources and fugitives must be controlled by water spray, dust suppressant.	Yes; emissions from enclosed operations must be controlled by baghouses to keep opacity less than 5%.	Yes; 5% opacity for emissions from enclosed equipment.

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
Idaho	150,000 cubic yards/year.	There are limits for water heaters, but these are not specified.	PM from fuel burning equipment must be < than 0.050 grains per standard cubic foot (gr/dscf) for diesel and < 0.015 gr/dscf for natural gas and there are no explicit limits in general permit, but this is a synthetic minor permit (actual emissions < 100 tpy).	Fuel for heaters and engines must be < 0.0015% sulfur and Any engine fuel must be No.1 or 2 distillate oil.	Yes; varies depending upon engine size and concrete production rate.	Fugitives must be controlled by water spray, dust suppressant, or paving; 95% control of storage piles, use 3-sided enclosures; and 75% control Best Management Practices (BMPs) must be used.	Emissions from enclosed operations must be controlled by baghouses with 99% control; transfer operations must be controlled with water spray; and load out controlled 95-99%.	Yes; no VE beyond property line.
Illinois	167,000 – 2,200,000 cubic yards/year, depending upon equipment and controls used.	None specified.	24 – 79.6 tpy PM, depending upon equipment and controls used.	None specified.	Cannot collocate with hot mix asphalt or rock crushing facility.	Yes.	Yes.	Unknown.

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
Indiana	300,000 cubic yards/year.	None specified.	Actual emissions limited to < 100 tpy.	None specified.	No fugitive emissions beyond property boundary.	Apply water to storage piles and roads as needed to control visible emissions to less than 20%.	All cement transfer operations must be enclosed and controlled by baghouse with visible emissions < 20%.	Yes; less than 20%.
Iowa	Limit on production rate varies; there are five levels from: 648 cubic yards/day for dry mix without load out control to 5,790 cubic yards/day for wet mix with load out controls.	Less than 35 gal/hour for generators ≤ 600 hp and less than 50 gal/hour for generators > 600 hp; and generators may operate no more than 4,850 hours/year.	Permit issued to sources with PTE > major source levels but actual emissions < 50% of major source levels and actual emissions: < 50 tpy criteria poll. < 5/12.5 tpy HAPs.	Engines must use No. 1 or 2 diesel fuel with 0.5% or less sulfur; maximum boiler heat input may not exceed 10 MMBtu/hour; and boiler shall fire only natural gas or propane.	1,000 feet from another concrete batch plant, any aggregate processing plant, or any hot mix asphalt facility.	Utilize BMPs to minimize fugitives, watering roads and storage piles, enclose conveyors, drop points, and storage piles.	Emissions from silos, mixer, and truck load out must be controlled with a baghouse.	Less than 25% from equipment and no VE beyond property boundary.

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
Maine	None specified.	Less than 65,000 gallons/year of diesel, #2, #4, or #6 fuel, or equivalent of natural gas or propane.	Less than 100 tpy and engine PM emissions shall not exceed 0.12 lb/MMBtu.	Engine size/ heat input shall not exceed 5 MMBtu/hour or 700 hp Engine fuel sulfur content must not exceed 15 parts per million	None specified	Yes; BMPs required for concrete batch plant equipment	Concrete batch plant and all material handling equipment must be controlled w/ baghouses	Engine VE and concrete batch plant VE may not exceed 20%; VE from transfer points shall not exceed 7%
Maryland	None specified.	None specified.	General permit issued to true minor sources; PM emissions must be < 0.03 gr/dscf or < 0.05 gr/dscf, depending upon location.	None specified.	None specified.	Reasonable precautions must be taken to prevent fugitive dust from becoming airborne.	Emissions must meet standard, so a baghouse would be required.	No VE beyond property boundary and VE may not exceed 0% or 20%, depending upon location.
Mississippi	None specified.	None specified.	Emissions limited to synthetic minor levels (< 100 tpy).	None specified.	150 ft from nearest residence.	Fugitives must be kept to minimum and roads must be wetted.	Mixer and silo must be equipped with baghouse.	Yes; opacity limited to less than 40%.

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
New Mexico	Less than 2,400 cubic yards/day.	None specified.	NO _x , CO, VOC, & TSP: < 95 tpy; SO ₂ : < 50 tpy; single HAP: < 8 tpy; and total HAP: < 23 tpy.	Heaters must have heat input rate less than 25 MMBtu/hour and fuel sulfur content for engines and heaters must be less than 0.05%.	Any emission unit must be located a minimum of 42 feet from boundary and located a minimum of 3 miles from Class 1 area.	Control storage piles and haul roads with watering, use enclosure during loading, use controls during truck loading.	Emissions from silos must be filtered to at least 95%.	No VE beyond property boundary and no VE from silo exhausts.
Ohio – Truck Mix Ready Mix	Less than 200 cu yards/hour and less than 250,000 cubic yards/year.	None specified.	TSP emissions < 0.03 gr/dscf and each piece of equipment has separate emission limits and total allowed emissions after controls is about 12 tpy of total suspended particulate (TSP).	Boilers and heaters each have max heat input rating < 10 MMBtu/hour and fuel sulfur content < 0.5%.	N/A	Truck loading must be enclosed and vented to filters.	Silos and mixers and hoppers must be vented to filters.	No VE from filters and VE of fugitives shall not exceed 10%.

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
Ohio – Central Mix Ready Mix	Less than 300 cubic yards/hour and Less than 300,000 cubic yards/year.	None specified.	TSP emissions < 0.03 gr/dscf; each piece of equipment has separate emission limits; and total allowed emissions after controls is about 5.3 tpy of TSP	Boilers and heaters must each have maximum heat input rating < 10 MMBtu/hour and fuel sulfur content < 0.5%.	None specified.	Must use BMPs, minimize drop heights, add moisture to aggregates, and enclose mixing equipment and vent to filter.	Silos and mixers and hoppers must be vented to filters and Best Available Control Technology must be used for materials transfer.	Yes. No VE from filters; VE of fugitives shall not exceed 10%.
Oregon	None specified.	None specified.	PM: 24 tpy; PM ₁₀ : 14 tpy; SO ₂ : 39 tpy; NO _x : 39 tpy; CO: 99 tpy; VOC: 39 tpy; and PM ₁₀ in Medford-Ashland AQMA: 4.5 tpy	Fuel oil sulfur content specs: No. 1 oil: < 0.3%; No. 2 oil: < 0.5%; Residual oil: < 1.75%; and Used oil: < 0.5%.	None specified.	Must control vehicle speeds, control fugitive dust from all processes, treat storage piles, and clean roads.	Silo emissions must be filtered and truck loading must use water sprays.	VE must not exceed 20% and no deposition of PM on nearby property.

State	Concrete Throughput Limits	Fuel Usage Limits?	Criteria Pollutant Emission Limitations?	Boiler or Engine Fuel or Size Limitation?	Setback Required?	Fugitive Dust Controls Required?	PM Emissions Controls Required?	Visible Emissions Limitation?
South Carolina	None specified.	None specified.	PM emissions from fuel burning must be less than 0.6 lbs/MMBtu and NO _x emissions from fuel burning must be less than 0.036 lb/MMBtu for natural gas and less than 0.15 lb/MMBtu for distillate oil.	Engines and heaters must have maximum heat input less than 30 MMBtu/hour and burn fuel w/ sulfur content less than 0.5% and there are HAP metal limits for fuel.	None specified.	Must not violate NAAQS at property boundary and must maintain dust control on storage piles and roadways with watering, sweeping.	Silos must be controlled with filter.	Opacity must be less than 20%.
Texas	Less than 300 cubic yards/hour and Less than 6,000 cubic yards/day.	None specified.	PM emissions < 0.01 gr/dscf.	Engines limited to total of 1,000 hp and sulfur content of fuel shall be less than 0.0015%.	Storage piles and equipment at least 50 feet from property boundary and baghouse exhaust at least 100 feet from boundary and 440 yards from the nearest residence.	Storage piles, roadways, must be controlled; must construct dust-suppressing fencing around site to height of 12 feet; and 3-sided enclosures around piles.	Must use suction shroud for truck loading and silos and hoppers must be controlled with a filter at 99.5% control.	No visible emissions beyond property boundary.

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Attachment A:
Emissions Calculations for Concrete Batch Production Limits

Assume that plant production capacity is 2,000,000 cubic yards of concrete per year.
Assume that plant emissions are controlled with control devices and work practice standards.

For PM₁₀ emissions:

Railcar/Barge/Truck Sand Unloading:

$$2,000,000 \text{ yards/year} \times 0.0007 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.7 \text{ tpy PM}_{10}/\text{year}$$

Railcar/Barge/Truck Aggregate Unloading:

$$2,000,000 \text{ yards/year} \times 0.0031 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 3.1 \text{ tpy PM}_{10}/\text{year}$$

Cement - Unloading to Elevated Storage:

$$2,000,000 \text{ yards/year} \times 0.0001 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.1 \text{ tpy PM}_{10}/\text{year}$$

Cement Supplement - Unloading to Elevated Storage:

$$2,000,000 \text{ yards/year} \times 0.0002 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.2 \text{ tpy PM}_{10}/\text{year}$$

Sand - Transfer to Conveyor:

$$2,000,000 \text{ yards/year} \times 0.0007 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.7 \text{ tpy PM}_{10}/\text{year}$$

Aggregate - Transfer to Conveyor:

$$2,000,000 \text{ yards/year} \times 0.0031 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 3.1 \text{ tpy PM}_{10}/\text{year}$$

Sand - Transfer to Elevated Storage:

$$2,000,000 \text{ yards/year} \times 0.00007 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.07 \text{ tpy PM}_{10}/\text{year}$$

Aggregate - Transfer to Elevated Storage:

$$2,000,000 \text{ yards/year} \times 0.00031 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.31 \text{ tpy PM}_{10}/\text{year}$$

Weigh Hopper Loading:

$$2,000,000 \text{ yards/year} \times 0.00038 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 0.38 \text{ tpy PM}_{10}/\text{year}$$

Mixer Loading:

$$2,000,000 \text{ yards/year} \times 0.001551 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 1.551 \text{ tpy PM}_{10}/\text{year}$$

Truck Loading:

$$2,000,000 \text{ yards/year} \times 0.0074166 \text{ (lbs/yard)} \times 1 \text{ ton}/2,000 \text{ yards} = 7.4166 \text{ tpy PM}_{10}/\text{year}$$

Total PM₁₀ emissions = 17.6 tpy