



# 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 Graphic Arts and Printing Operations

Version 1.0

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### 1. Graphic Arts and Printing Operations Source Category Definition

A graphic arts and printing operation is any facility which uses offset lithographic, letterpress, rotogravure, and flexographic methods to apply ink and other coatings to paper, cardboard, metal, and other surfaces by means of a printing press. The proposed General Air Quality Permit for New or Modified True Minor Source Graphic Arts and Printing Operations<sup>1</sup> only covers graphic arts and printing operations that are located at true minor New Source Review (NSR) sources.

### 2. Source Category Characterization

The operations and equipment at a typical graphic arts and printing operation are described in AP 42, Chapters 4.9.1, General Graphic Printing, and 4.9.2, Publication Gravure Printing.<sup>2</sup> Graphic arts and printing operations are a segment of the larger surface coating industry. In graphic arts and printing operations, coatings are applied to a wide variety of substrates by means of a printing press. The substrates or surfaces can be newsprint, coated and uncoated paper, cardboard, metal, sheet plastics, fabrics, and other thin, flexible materials. The inks are composed of: pigments, which impart the color; binders, which are composed of resins, polymers, oils, or resins and which bind the pigment to the substrate; and solvents, which dissolve and disperse the pigments and binder to enable application. Depending on the type of process and inks, heat may be used to 'set' the inks. Incinerators may be used to destroy volatile organic compounds (VOC) evaporated from the inks during printing. Solvent compounds are used both during press operations to maintain print quality and during cleanup of the presses.

Lithography is characterized by a planographic image carrier, in which the image and nonimage areas are on the same plane. The image area is ink wettable and water repellent, and the nonimage area is chemically repellent to ink. In "offset" lithography, the image is applied to a rubber-covered "blanket" cylinder and then transferred onto the substrate. In "sheet-fed" printing, individual sheets of paper or substrate are sent through the press, and one color of ink is added during each pass. In "web" printing, a continuous roll of paper or substrate (the 'web') is fed through the press, and then cut after printing is finished. Web printing can be used to apply multiple inks and coatings to a substrate to produce a multi-color product in a single pass. Multicolor web offset printing employs "heatset" inks that dry very quickly. After receiving inks, the web passes through a dryer tunnel at about 400-500 degrees Fahrenheit, where the ink is dried. The web then passes over chiller rolls, prior to folding and cutting. Newspapers are produced using web offset printing methods, but a web newspaper printing line contains no dryer, because the ink contains very little solvent, and somewhat porous paper is generally used.

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<sup>1</sup> This document supports EPA's preferred approach of proposing a general permit for graphic arts and printing operations, as well as EPA's alternative proposal of a permit by rule for graphic arts and printing operations.

<sup>2</sup> AP 42, Chapters 4.9.1, General Graphic Printing and 4.9.2, Publication Gravure Printing, April 1981, <http://www.epa.gov/ttn/chief/ap42/ch04/index.html>.

In letterpress printing, the image area is raised, and the ink is transferred to the paper directly from the image surface. The image carrier may be made of metal or plastic. Letterpress printing can use either solvent-borne, or non-solvent-borne inks, depending upon the process. Some letterpress newspaper and sheet-fed printing processes use oxidative drying inks, which are not a source of VOC emissions. Publication letterpress printing uses a paper web that is printed on one side at a time and dried after each color is applied. The inks employed are heatset inks, usually of about 40 volume percent solvent.

In gravure printing, the image area is engraved, or "intaglio" relative to the surface of the image carrier, which is a copper-plated steel cylinder that is usually also chrome plated to enhance wear resistance. The gravure cylinder rotates in an ink trough or fountain. The ink is picked up in the engraved area, and ink is scraped off the nonimage area with a blade. The image is transferred directly to the web when it is pressed against the inked cylinder by a rubber covered impression roll, and the product is then dried. Rotary gravure (web fed) systems are known as "rotogravure" presses. Rotogravure can produce illustrations with excellent color control, and it may be used on coated or uncoated paper, film, foil, and almost every other type of substrate. The inks used in rotogravure publication printing contain from 55 to 95 volume percent low boiling solvent (average is 75 volume percent), and they must have low viscosities. Rotogravure is similar to letterpress printing in that the web is printed on one side at a time and must be dried after application of each color.

In flexographic printing, as in letterpress, the image area is above the surface of the plate. The distinction is that flexography uses a rubber image carrier and alcohol-based inks. The process is usually web fed and is employed for medium or long multicolor runs on a variety of substrates, including heavy paper, fiberboard, and metal and plastic foil. Flexography can use steam set inks, which are low-viscosity inks of a paste consistency that are gelled by water or steam and produce no significant emissions. Water-based inks, usually pigmented suspensions in water, are also available for some flexographic operations. Solvent-based inks are used primarily in publication printing. Flexography publication printing uses very fluid inks of about 75 volume percent organic solvent which are alcohol or alcohol-based.

Printing operations can give off significant emissions of VOCs. Such emissions vary with printing process, ink formulation and coverage, press size and speed, and operating time. Emission points from printing include: the ink fountains/inking mechanism, the dampening/roller cleaning system, the plate and blanket cylinders, the dryer (if any), the chill rolls, and the final printed product. Overall solvent emissions can be computed using material balance equations. Thermal incinerators and carbon adsorbers are used to control VOC emissions from printing operations. VOC emissions can also be reduced by using waterborne inks.

### **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 printing operations. 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 printing operations. The EPA examined permits-by-rule and general permit documents for printing operations in Connecticut, Florida, Indiana, Maryland, Missouri, Nebraska, New York, Ohio, Oklahoma, Pennsylvania, Texas, and Wisconsin in developing this general permit. The EPA chose general permits and permits by rule 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 printing facilities vary from the streamlined (Indiana, at two pages for a graphic arts operation) to the detailed (Nebraska and Texas at 22 pages, and Oklahoma at 26 pages). The state printing permits typically limit either pollutant emissions or materials usage.

Some of the state general permits (Connecticut, Florida, New York, Oklahoma, and Pennsylvania) specify de minimis levels below which no permit is needed. The upper levels of emissions for which general permits will be issued vary widely. Connecticut, Florida, Nebraska, New York, Oklahoma, Pennsylvania, and Wisconsin issue general permits for printing for true minor sources or sources with potentials to emit (PTEs) above major source levels (synthetic minor sources), but the permits limit emissions to less than major source levels. Missouri and Ohio issue general permits for printing operations whose PTE of VOC is less than 40 tons per year (tpy), while Indiana, Maryland, and Texas issue permits to sources whose PTE of VOC does not exceed 25 tpy. Indiana, New York, and Texas have special restrictions on VOC emissions for printing operations located in ozone nonattainment areas. Indiana's Source Specific Operating Agreements and Maryland's general permit for printing operations are perhaps the most stringent, limiting emissions of VOC to less than 5 tpy.

Some states that limit emissions (Florida and Ohio) also specify materials throughput limits for each specific type of printing operation (heatset offset lithographic, non-heatset offset lithographic, digital, screen, letterpress, water-based ink, ultraviolet cured inks, flexographic, and rotogravure). These material throughput limits vary by state. States that limit materials usage calculate the materials throughput limits based on assumptions about the VOC and hazardous air pollutant (HAP) content of typical materials. These vary slightly from state to state. The state permits account for emissions from other sources (heaters, etc.) located at the printing shop to varying degrees, mostly by limiting emissions from the printing operations to a margin (20% or greater) below major source levels.

There are three federal regulations that can apply to graphic arts and printing operations. These are the New Source Performance Standards (NSPS) Subpart QQ, NSPS Subpart FFF, and the National Emission Standard for Hazardous Air Pollutants (NESHAP) Subpart KK. None of the state permits incorporate the text of the NSPS or NESHAP into the text of the permit, but some states (Connecticut, Nebraska, Oklahoma, and Texas) incorporate the Subpart QQ, Subpart FFF, and Subpart KK requirements by reference, or simply require that sources comply with the requirements of the federal NSPS and NESHAP regulations.

Table 7 in Section 5.2.3 contains a summary of the printing 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 graphic arts and printing operations 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, capacity, materials throughput, 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, including requirements for sources located in nonattainment areas; and
- PTE Calculator Spreadsheet: Allows applicants to calculate their PTE, based on owner inputs of the specific equipment present at their source, assuming 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, type of fuel, 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 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 the Indian Country Minor NSR rule (40 CFR 49.153) are exempt from the minor NSR program. The exemption thresholds for particulate matter (PM) and criteria pollutants are listed in Table 1 below. Facilities applying for the proposed general permit will be required to calculate their PTE and may use the PTE calculator provided 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 <sub>10</sub>                   | 5 tpy           | 1 tpy              |
| PM <sub>2.5</sub>                  | 3 tpy           | 0.6 tpy            |
| Sulfur Dioxide (SO <sub>2</sub> )  | 10 tpy          | 5 tpy              |
| Nitrogen Oxides (NO <sub>x</sub> ) | 10 tpy          | 5 tpy              |
| 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 – Graphic Arts and Printing facilities – 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**

| <b>Pollutant</b>                                      | <b>Nonattainment Classification</b> | <b>NSR Major Source Threshold</b> |
|---|-------------------------------------|-----------------------------------|
| Ozone   | Marginal                            | 100 tpy of VOC or NO <sub>x</sub> |
|   | Moderate                            | 100 tpy of VOC or NO <sub>x</sub> |
|   | Serious                             | 50 tpy of VOC or NO <sub>x</sub>  |
|   | Severe                              | 25 tpy of VOC or NO <sub>x</sub>  |
|   | Extreme                             | 10 tpy of VOC or NO <sub>x</sub>  |
| PM <sub>10</sub>                                      | Moderate                            | 100 tpy                           |
|   | Serious                             | 70 tpy                            |
| CO  | Moderate                            | 100 tpy                           |
|   | Serious                             | 50 tpy                            |
| SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> | 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 graphic arts and printing operations permit contains questions designed to limit the availability of this general permit to true minor source graphic arts and printing operations. 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, and 4.5. Section 5 provides background on the emissions limitations provided in the proposed graphic arts and printing operations general permit.

Facilities with HAP emissions at or above the major source thresholds are not eligible for a general permit under the minor NSR program. The major source thresholds for HAPs are 10 tons per rolling 12-month period for a single HAP and 25 tons per 12-month rolling period for any combination of HAPs. If, after construction or modification, the facility's HAP emissions exceed the major source thresholds, then the facility will need to apply for a site-specific permit.

### **4.3 Specific Permit Requirements for General Permits**

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 is a description of 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, 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.

#### 40 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 graphic arts and printing operations, limits are placed on VOC emissions, as these are the primary pollutants emitted by these types of facilities. 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 consideration were used for setting the limits in the general permit for graphic arts and printing operations:

1. Local air quality conditions – To address this requirement, the general permit requires sources locating in ozone nonattainment areas to meet more stringent VOC emission limits. This will also ensure these sources are not major sources in those areas.
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 sources locating in nonattainment areas, the EPA looked at the control requirements specified by California’s Air Quality Management Districts<sup>3</sup>. For this proposed

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<sup>3</sup> South Coast Air Quality Management District, Rule 1130 – Graphic Arts, [http://www.aqmd.gov/rules/reg/reg11\\_tofc.html](http://www.aqmd.gov/rules/reg/reg11_tofc.html).

general permit, the EPA considered the following regulations and control technique guidelines that apply to equipment at graphic arts and printing facilities:

- a. 40 CFR 60 Subpart QQ: Standards of Performance for the Graphic Arts Industry: Publication Rotogravure Printing;
- b. 40 CFR 60 Subpart FFF: Standards of Performance for Flexible Vinyl and Urethane Coating and Printing;
- c. South Coast Air Quality Management District (SCAQMD), Rule 1130, "Graphic Arts";
- d. 40 CFR 60 Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines;
- e. 40 CFR 63 Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines;
- f. Control Techniques Guidelines for Flexible Package Printing, EPA 453/R-06-003, U.S. Environmental Protection Agency, September 2006; and
- g. Control Techniques Guidelines (CTGs) for Offset Lithographic Printing and Letterpress Printing, EPA-453/R-06-002, U.S. Environmental Protection Agency, September 2006.

These regulations cover emissions from the following equipment at graphic arts and printing operations:

- Publication rotogravure printing presses;
- Rotogravure printing lines used to print or coat flexible vinyl or urethane products;
- Product and packaging rotogravure presses;
- Flexographic printing presses;
- Lithographic printing presses;
- Letterpress printing; and
- Emergency generator engines.

The conditions in the Emission Limitations and Standards section of the general permit were developed from the NSR Rule, NSPS, NESHAP, CTGs, SCAQMD Rule 1130, and the state permit examples. The derivation of the emission limitations in the general permit are discussed 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 that:

- Source-wide VOC emissions from all printing lines to be limited to specific levels, depending upon the attainment status of the facility's location;
- Limit on VOC emissions from individual printing presses;
- Materials meet specific VOC content limits;
- Standards for cleaning operations;
- New stationary emergency engines meet the applicable NSPS standards;
- Existing stationary emergency engines meet applicable maintenance requirements of the NESHAP;
- All VOC-containing material (e.g., inks, adhesives, coatings, thinners, and clean-up solvents) be stored in closed containers with labels that clearly identify the contents of the containers;

- All waste materials containing VOC (e.g., soiled rags) be stored in sealed containers until properly disposed;
- Sources implement procedures to minimize spills of any VOC-containing material during handling and transfer to and from containers, enclosed systems, waste receptacles and other equipment;
- All engines that use liquid fuels use ultra low-sulfur diesel and biodiesel as fuels; and
- Sources located in serious, severe or extreme ozone nonattainment areas meet certain additional requirements.

VOC control devices are not required in the permit.

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 graphic arts and printing facilities across the country in both attainment and nonattainment areas, the EPA expects 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 graphic arts and printing facilities 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. The EPA intends 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 and Testing 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 weekly monitoring of usage of any VOC-containing materials. The permit also requires that emergency engines that are not certified by the manufacturer be tested to verify compliance with the 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 and VOC content of any inks, coatings, adhesives, fountain-solution alcohol and alcohol substitutes, thinners, cleaners, and any other VOC-containing materials used at each printing line at the facility.

The permittee must maintain monthly usage records in gallons or liters of graphic arts materials and cleaning solutions showing the type and amount used of each graphic-arts ink, coating, adhesive, fountain solution, blanket wash, and all other cleaning solutions or VOC-containing materials. The permittee must maintain monthly records of VOC emissions from (1) each printing press and the resulting 12-month rolling total of VOC emissions and (2) the combination of all graphic arts and printing operations and the resulting 12-month rolling total of VOC emissions.

For each emergency engine, the permittee must maintain records: (1) of all maintenance activities conducted; (2) of the hours of operation including the date, time, duration, and reason for use; and (3) of fuel supplier



certifications to demonstrate compliance with the fuel sulfur content limit. The results of performance tests must also be recorded.

#### 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**

The EPA has included additional requirements for graphic arts and printing operations locating in ozone nonattainment areas. The VOC emission limitations for the entire source vary, depending upon the severity of the location's ozone nonattainment classification. The permit also requires lower VOC content for inks, coatings, fountain solutions, and adhesives for sources located in serious, severe, or extreme ozone nonattainment areas.

### **4.5 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 graphic arts and printing operations general permit, the EPA provides guidance to assist sources in complying with these two statutes.

## **5. Emission Limitations<sup>4</sup>**

### **5.1 Developing the Emission Limitations**

The proposed general permit includes source-wide VOC emission limitations. The VOC limitations vary depending upon the ozone attainment status of the area where the source will locate. The emission limitations in Table 3 are for sources located in attainment and nonattainment areas and are approximately 50 – 70% of the corresponding NSR major source threshold in Table 2. To determine compliance with the limitations, the source is required to calculate their emissions on a monthly based on the quantity of VOC-containing materials they use per their type of printing operation. VOC emissions are calculated using the type of printing operation, the amount and VOC content of the materials, and assumptions about the percentage of VOC released from those materials. The VOC calculations are based on material balance, and can be calculated using the PTE Calculator provided by the EPA.

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<sup>4</sup> The definition of emission limitation used in this background document is the one provided in the Indian Country Minor NSR rule at 40 CFR 49.152 and includes requirements established by the reviewing authority that limit the quantity of air pollutants, and includes any requirement relating to the operation of a source.

These limits on PTE are well below the levels at which a source would become a major source and subject to Title V permitting. Limits on emissions of HAPs are not included in the permit. Since the promulgation of 40 CFR 63, Subpart KKK in May of 1996, the HAP content of commercially-available printing inks, coatings, adhesives, solvents, and other materials has decreased to the point where a violation of the HAP major source thresholds (10 tpy for a single HAP and 25 tpy for any combination of HAPs) is unlikely. The permit also contains material-specific VOC limitations that were derived from the NSPS regulations, the state permits, and the SCAQMD Rule 1130.

In this General Air Quality Permit for New or Modified True Minor Source Graphic Arts and Printing Operations, limits are placed on VOC emissions from the graphic arts and printing facilities, in order to limit emissions to below the NSR major source thresholds. The source-wide VOC emission limitation varies according to the ozone attainment status and nonattainment classification of the location in which the facility is located (See Table 3). For example, an owner wanting to construct a new printing operation in an attainment area would be limited to installing equipment with a PTE of VOC less than 75 tons per year. The general permit also requires that no one printing line could emit more than 25 tpy of VOC. Applicants can calculate the PTE of their proposed facility using the PTE calculator provided at <http://www.epa.gov/air/tribal/tribalnsr.html>.

**Table 3: Emission Limitations for Graphic Arts and Printing Operations**

| Pollutant of Concern | Attainment, Unclassifiable or Attainment/Unclassifiable Areas | Nonattainment Areas                        |
|----------------------|---|--|
| VOC                  | 75 tpy  | 50 tpy (marginal and moderate ozone areas) |
|                      |   | 25 tpy (serious ozone areas)               |
|                      |   | 15 tpy (severe ozone areas)                |
|                      |   | 7 tpy (extreme ozone areas)                |

## 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)<sup>5</sup> 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

There are no specific EPA regulation-based emissions limitations for graphic arts and printing operations. In general, facilities in attainment areas with a PTE of any criteria pollutant equal or greater than 250 tpy are NSR major sources. Facilities with a PTE of any criteria pollutant equal to or greater than 100 tpy or HAP emissions greater than 10 tpy for a single HAP and 25 tpy for total HAPs are subject to Title V operating permit program. However, most graphic arts and printing operations covered by this permit have actual emissions for criteria pollutants much less than 100 tpy (see the actual emission information provided in Table 6). While the NSR major source thresholds do not specifically limit the emissions from a particular source, they do prevent a source from being eligible for a general permit. Similarly, we have limited eligibility for the general permit to area sources of HAP emissions, so that we did not have to evaluate and determine the emission limitations that would assure compliance with the requirements in 40 CFR part 63 for major sources of HAP emissions.

### 5.2.2 Analysis of NEI Data

The EPA analyzed 2011 NEI data for existing graphic arts and printing facilities 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 printing operations 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

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

System (NAICS) codes listed in Table 4. For sources in these three NAICS codes, the EPA selected actual emissions<sup>6</sup> within the ranges listed in Table 5.

**Table 4: NAICS Codes Selected for Graphic Arts and Printing Facilities**

| NAICS Code | Description  |
|------------|--|
| 323111     | Printing: Flexographic, Rotogravure, Gravure, Letterpress, Lithographic, Digital |
| 323113     | Commercial Printing, Newspapers, Print Shops                                     |
| 323117     | Printing Books   |

**Table 5: Emission Ranges Selected for Graphic Arts and Printing Facilities**

| Area Designation     | VOC |
|----------------------|-----|
| Attainment Area      |     |
| Min. Emissions (tpy) | 10  |
| Max. Emissions (tpy) | 250 |
| Nonattainment Area   |     |
| Min. Emissions (tpy) | 5   |
| Max. Emissions (tpy) | 250 |

The EPA selected the facilities with emission levels similar to the facilities potentially subject to the minor NSR program. These are 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 4 and the emission ranges defined in Table 5, the EPA identified the graphic arts and printing operations located in attainment and nonattainment areas for VOC. In Table 6, 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 Graphic Arts and Printing Facilities Selected.**

| Criteria Pollutants                | Number of Facilities            |
|------------------------------------|---------------------------------|
| <b>Attainment Areas</b>            |                                 |
| <b>VOC</b>                         |                                 |
| Facilities >5 tpy and < 75 tpy     | 187 (58% of facilities covered) |
| Average Emissions (tpy)            | 21                              |
| Facilities > 75 tpy and < 250 tpy  | 35                              |
| Average Emissions (tpy)            | 132                             |
| <b>Nonattainment Areas</b>         |                                 |
| <b>VOC (marginal and moderate)</b> |                                 |
| Facilities >2 tpy and < 50 tpy     | 303 (63% of facilities covered) |
| Average Emissions (tpy)            | 10                              |

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

| Criteria Pollutants               | Number of Facilities           |
|-----------------------------------|--------------------------------|
| Facilities > 50 tpy and < 250 tpy | 10                             |
| Average Emissions (tpy)           | 95                             |
| <b>VOC (serious)</b>              |                                |
| Facilities >2 tpy and < 25 tpy    | 3 (16% of facilities covered)  |
| Average Emissions (tpy)           | 4                              |
| Facilities > 25 tpy and < 250 tpy | 0                              |
| Average Emissions (tpy)           | N/A                            |
| <b>VOC (severe)</b>               |                                |
| Facilities >2 tpy and < 15tpy     | 4 (19% of facilities covered)  |
| Average Emissions (tpy)           | 3                              |
| Facilities > 15 tpy and < 250 tpy | 0                              |
| Average Emissions (tpy)           | N/A                            |
| <b>VOC (extreme)</b>              |                                |
| Facilities >2 tpy and < 7 tpy     | 27 (30% of facilities covered) |
| Average Emissions (tpy)           | 4                              |
| Facilities > 7 tpy and < 250 tpy  | 14                             |
| Average Emissions (tpy)           | 17                             |

### 5.2.3 State Program Limits

The state permits either limit pollutant emissions or raw material throughput. Only the Florida, Ohio, and Wisconsin permits limit both pollutant emissions and raw material throughput. The state permit limits on actual VOC emissions vary widely. For sources in ozone attainment areas, state VOC permit limits are:

- Indiana limits actual VOC emissions of VOC to 2.74 tpy;
- Ohio limit is less than 10 or 25 tpy of VOC, depending upon the size of the source;
- Texas limit is 25 tpy of VOC;
- Missouri limit is 40 tpy of VOC;
- Florida limit is 80 tpy of VOC; and
- Other states limit actual VOC emissions in attainment areas at 100 tpy.

The limits also vary widely for sources in ozone nonattainment areas. For printing plants located in severe nonattainment areas, state VOC permit limits are:

- Indiana limits VOC emissions to less than 1.4 tpy;
- New York limits VOC emissions to less than 25 tpy; and
- Pennsylvania limits VOC emissions to less than 50 tpy.

Missouri and Oklahoma do not issue their permit by rule to sources in nonattainment areas.

Seven of the states (Connecticut, Florida, Maryland, New York, Oklahoma, Pennsylvania, and Texas) have de minimis exemptions, varying from less than 2.7 tpy of VOC to less than 15 tpy of VOC. Several of the state permits also include limits on usage of HAP, presumably intended to keep sources minor for HAPs.

Table 7 shows the pollutant emission limits and materials usage limits contained in graphic arts and printing permits issued by states.

**Table 7: State Permits: Eligibility Restrictions, Throughput Limits, and Emission Limitations**

| State       | Permitting Level(s) Allowed   | Eligibility Restrictions  | De Minimis Exemption?  | Materials Throughput Limits  | Criteria Pollutant Emission Limitations?   | Hazardous Air Pollutant Emission Limitations?          |
|-------------|---|---|--|--|--|--|
| Connecticut | General permit issued to synthetic minor sources.   | None specified.   | PTE for any criteria pollutant < 15 tpy and PTE for any HAP < 10 tpy.  | None specified.  | PTE > 100 tpy and limit < 100 tpy.   | PTE > 10/25 tpy and limit < 10/25 tpy.                 |
| Florida     | General permit issued to minor sources with actual emissions less than major source levels. | None specified.   | Facilities that use less than 667 gallons of materials containing HAP are exempt and print line-specific materials usage thresholds. | Use < 1,333 gallons/year of materials containing HAP and print line-specific materials usage thresholds.   | Actual emissions: < 80 tpy VOC, without use of controls.                                       | Actual emissions: < 8/20 tpy, without use of controls. |
| Indiana     | Source specific operating agreement issued for synthetic minor sources.                     | None specified.   | None specified.  | None specified.  | 15 pounds (lbs)/day of VOC in attainment areas and 7 lbs/day VOC in severe nonattainment area. | None specified.  |
| Maryland    | General permit issued to true minor sources.  | Issued only for non-heatset, sheetfed offset lithographic printing operations.  | Roller widths less than 18 inches.   | Less than 1,000 gallons/year of fountain solution and no materials containing: methylene chloride, dichloromethane, heavy aliphatic petroleum distillate, or dipropylene glycol butyl ether. | None specified.  | None specified.  |
| Missouri    | Permit by rule issued to true minor and synthetic minor sources.                            | Facilities shall not utilize heat set, thermo set, or oven-dried inks and facility shall not be located in an ozone nonattainment area. | None specified.  | Emissions shall be calculated based on mass-balance, assuming 100% evaporation of any VOC or HAP.  | Actual emissions: < 40 tpy VOC.  | Actual emissions: < 10 tpy of all HAPs.                |

| State    | Permitting Level(s) Allowed   | Eligibility Restrictions  | De Minimis Exemption?  | Materials Throughput Limits                               | Criteria Pollutant Emission Limitations?   | Hazardous Air Pollutant Emission Limitations?                                   |
|----------|---|---|--|---|--|---|
| Nebraska | Class II general permit issued to true minor sources and synthetic minor sources. | None specified.   | None specified.  | None specified.   | Actual emissions: < 100 tpy.   | Actual emissions: < 10/25 tpy.  |
| New York | General permit issued for true minor sources.                                     | Not issued to sources subject to a NESHAP.  | Facilities with de minimis emissions (< 3 tpy or 20 lbs/day VOC) are exempt. | None specified.   | Severe ozone nonattainment areas - actual emissions < 25 tpy VOC; moderate ozone nonattainment areas - actual emissions < 50 tpy VOC; and ozone attainment areas - actual emissions < 100 tpy VOC. | Actual emissions: < 10/25 tpy.  |
| Ohio     | Permit by rule issued for true minor sources.                                     | Only for small and mid-sized printing operations that do not utilize add-on emission control equipment. | None specified.  | There are print line-specific materials usage thresholds. | Small: actual emissions < 10 tpy VOC and mid-Size: actual emissions < 25 tpy VOC.  | Small: actual emissions < 5/10 tpy and mid-Size: actual emissions < 5/12.5 tpy. |



| State        | Permitting Level(s) Allowed                                       | Eligibility Restrictions  | De Minimis Exemption?   | Materials Throughput Limits                           | Criteria Pollutant Emission Limitations?   | Hazardous Air Pollutant Emission Limitations?   |
|--------------|---|---|---|---|--|---|
| Oklahoma     | Permit by rule and general permit issued for true minor sources.  | Permit by rule: PTE of VOC > 5 tpy and < 40 tpy and general permit: PTE of VOC > 40 tpy and < 100 tpy; facilities located in nonattainment areas.   | Facilities with de minimis emissions (less than 5 tpy VOC) are exempt.  | None specified.                                       | Actual emissions < 100 tpy.  | Actual emissions: < 10/25 tpy.  |
| Pennsylvania | General permit issued for true minor and synthetic minor sources. | General permits only for sheet-fed offset lithographic printing press operations and non-heatset web offset lithographic printing press operations. | Facilities with de minimis emissions (less than 2.7 tpy VOC, 1 tpy single HAP, 2.5 tpy total HAP) are exempt. | None specified.                                       | Actual emissions: < 100 tpy for PM, PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO; < 50 tpy for VOC; and < 25 tpy NO <sub>x</sub> in severe nonattainment areas. | Actual emissions: < 10/25 tpy.  |
| Texas        | Permit by rule issued for true minor and synthetic minor sources. | Vary based on location.   | Permit not required for source with de minimis emissions and the threshold varies by county.                  | None specified.                                       | PTE of SO <sub>2</sub> , PM <sub>10</sub> , VOC < 25 tpy and PTE of NO <sub>x</sub> , CO < 250 tpy.  | PTE < 10/25 tpy.  |
| Wisconsin    | General permit issued for true minor and synthetic minor sources. | None specified.   | None specified.   | Varies depending upon the type of printing operation. | Synthetic minor: PTE > 100 tpy and limit < 100 tpy.<br>True minor: PTE < 100 tpy limit < 100 tpy and, 10 tpy for digital printing.   | Synthetic minor: PTE > 10/25 tpy and Limit < 10/25 tpy.<br>True minor: PTE < 10/25 tpy and Limit < 10/25 tpy. |

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