

# **The Dallas-Fort Worth Area Minor Source Rule: An Air Quality Rule for Equipment at Your Business**

## **A Draft Document**

### **How do I calculate the emissions from my stationary engines?**

#### **How can this guide help me?**

This publication will help you determine the emissions of nitrogen oxides (NO<sub>x</sub>) from combustion devices, such as stationary engines. Determining NO<sub>x</sub> emissions is required by the Texas Commission on Environmental Quality's (TCEQ) air quality rules for minor-source combustion devices in the Dallas-Fort Worth (DFW) area. The DFW Minor Source Rule is designed to protect air quality and human health.

This publication will lead you through the calculation process necessary to determine compliance with Title 30, Texas Administrative Code (30 TAC), Sections 117.2100 through 2145. **Use this publication to determine the emissions associated with the applicable combustion devices.**

#### **Keep in mind that this guide does not contain the complete rules or all of the information you may need to be in compliance.**

See Note One for instructions on finding the text of this rule and other state environmental rules on the Secretary of State's Web site. You may keep up to date with efforts to improve air quality in the DFW area by signing up for the automated mailing list for Texas' State Implementation Plan (SIP), or subscribe to the TCEQ's e-mail update service at <[tceq.state.tx.us](http://tceq.state.tx.us)> and click on the "sign up for e-mail updates" icon. To join the mailing list, send a blank e-mail with no subject or message to <[join-sip@listserv.tceq.state.tx.us](mailto:join-sip@listserv.tceq.state.tx.us)>. You will be notified of stakeholder meetings, public hearings, and comment periods for draft rules and air quality plans.

See Note Two for instructions on how to locate information on available resources that can be used for record keeping and reporting.

See Note Three and Four for assistance with calculating your potential to emit, commonly referred to as PTE. This calculation must be done to determine whether your facility is a major or minor source of NO<sub>x</sub>.

Note Five will help you determine whether additional rules might apply to your facility.

## **Determine Your Emissions Specifications**

### **Step 1: Determine the maximum capacity of your engines.**

*Maximum rated capacity* is the maximum amount of work that your equipment can perform. This value can be found on the faceplate of your equipment or in the owner's manual.

<b>Determine your maximum capacity.</b>		
1	Enter the maximum rated capacity of your equipment on Dec. 31, 2000.	_____
2	Enter the maximum rated capacity after Dec. 31, 2000.	_____
3	Enter the greater of the two numbers on this line. This is your maximum rated capacity. Enter it here and on line 11 of the Equipment Profile Worksheet found online at <a href="http://www.tceq.state.tx.us/goto/nox">www.tceq.state.tx.us/goto/nox</a> .	_____
<b>Use this number in the Emission Specification Tables (EST)</b>		

**Step 2. Determine your applicable averaging time.**

<p>Does your equipment have a continuous emissions monitoring system (CEMS) or a predictive emissions monitoring system (PEMS)?</p> <p><b>YES...</b> Your averaging time is specified in Table 1.</p> <p><b>NO...</b> Your averaging time is a block one-hour average in units of the applicable emission standard</p>
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**Table 1: Averaging time for units with a CEMS or PEMS**

<b>Use any of the following Averaging Time Procedures:</b>	
1	30-day average period (in units of the applicable standard)
2	Block one-hour averaging period (in units of the applicable standard)

Enter the appropriate averaging time on line 8 of the Equipment Profile Worksheet, which you may use to assist with record keeping at your site, and can be downloaded at [www.tceq.state.tx.us/goto/nox](http://www.tceq.state.tx.us/goto/nox).

**Step 3. Review the Emission Specification Table that applies to your engines.**

Refer to the table below that matches the engine's category for fuel type that was in effect December 31, 2000. For example, if an engine is classified as a stationary gas-fired engine as of December 31, 2000, but is later authorized to operate as a dual fuel-engine, it must be classified as a stationary gas-fired engine for the purposes of this rule.

**EST 1: Gas-fired, Reciprocating Internal Combustion Engines**

	<b>Type of Unit</b>	<b>Emission Specification</b>
Rich Burn Engines	Fired on landfill gas	0.60 gram per horsepower-hour (g/hp-hr)
	Other	0.50 g/hp-hr
Lean Burn Engines	Placed into service before 6/1/07, that has not been modified, reconstructed, or	0.70 g/hp-hr

	relocated on or after 6/1/07	
	Placed into service, modified, reconstructed, or relocated on or after 6/1/07	Same as above rich burn engine specification

### EST 2: Dual-fuel, Reciprocating Internal Combustion Engines

Type of Unit	Emission Specification
All	5.83 g/hp-hr

### EST 3: Diesel, Reciprocating Internal Combustion Engines

Emission specifications depend on the **combination of horsepower and the date installed**, so be sure you have checked both.

Horsepower	Date Installed, Modified, Reconstructed, or Relocated	Emission Specification In gram per horsepower-hour (g/hp-hr)
Greater than or equal to 50	Before March 1, 2009, <b>and</b> not modified, reconstructed, or relocated on or after March 1, 2009	The lower of 11.0 g/hp-hr <b>or</b> the emission rate established by testing, monitoring, manufacturer's guarantee, or manufacturer's other data.
Greater than or equal to 50 and less than 100	On or after March 1, 2009	3.3 g/hp-hr
Greater than or equal to 100 and less than 750	On or after March 1, 2009	2.8 g/hp-hr
Greater than or equal to 750	On or after March 1, 2009	4.5 g/hp-hr

#### Step 4.

If the engine has an annual capacity factor of 0.0383 or less, see 30 TAC 117.2110(a)(4) under "Additional Emission Specifications" in Note Five.

The annual capacity factor is the total annual fuel consumed by a unit divided by the fuel that could be consumed by the unit if operated at its maximum rated capacity for 8,760 hours per year.

If you make changes after Dec. 31, 2000, to engines not subject to any emission specifications in these rules and the changes increase the engine's NO<sub>x</sub> emissions, see 30 TAC 117.2110(e) under "Additional Emission Specifications" in Note Five.

#### Step 5.

If your unit is subject to any of the emission specifications in the tables in Step 3, there are additional emission specifications for gases other than NO<sub>x</sub>. These standards are described in Table 2.

Enter any carbon monoxide (CO) emission standards on line 12 B of your Equipment Profile Worksheet.

Enter any emission standards for ammonia (NH<sub>3</sub>) on line 12 C of your Equipment Profile Worksheet.

**Table 2: Additional Emission Standards**

Applicable Compound	Equipment	Emission Standard	Averaging period	
			With CEMS or PEMS for the applicable compound	Without CEMS or PEMS
Carbon monoxide (CO)	Stationary internal combustion engines	400 ppmv at 3.0% O <sub>2</sub> (dry basis), or 3.0 g/hp-hr	On a rolling 24-hour averaging period	On a one-hour average
Ammonia (NH <sub>3</sub> ) (units that inject urea or ammonia into exhaust stream for NO <sub>x</sub> control)	Gas-fired, lean-burn engines	10 ppmv at 15.0% O <sub>2</sub> (dry basis)	On a rolling 24-hour averaging period	Block one-hour averaging period
	All other equipment	10 ppmv at 3.0% O <sub>2</sub> (dry basis)		

**NOTE:** If your equipment cannot meet the limits for carbon monoxide or ammonia in Table A3, a different emission specification may be approved by the TCEQ. See 30 TAC 117.2125 for details.

☞ To obtain assistance with these environmental requirements, please contact your local equipment technician, equipment operator, or stack-testing specialist.

☞ A stack-testing company will be able to perform an emissions test to determine whether your equipment meets the emissions limits.

**Important:** If your equipment **does not** meet the emissions limits, you **must** repair, retrofit, or replace it.

### Note One: How to Locate TCEQ and EPA Rules

This guide explains some sections of Texas' Minor Source Rule (30 TAC 117.2100 through 2145).

To find the text of this rule, follow these steps:

1. Go to <<http://www.sos.state.tx.us/tac/index.shtml>>.
2. Click <[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.viewtac](http://info.sos.state.tx.us/pls/pub/readtac$ext.viewtac)> at the bottom of the page.
3. Click *Title 30 Environmental Quality*.
4. Click *Part 1 Texas Commission on Environmental Quality*.
5. Click *Chapter 117 Control of Air Pollution from Nitrogen Compounds*.
6. Click *Subchapter D Combustion Control at Minor Sources in Ozone Nonattainment Areas*.

## 7. Click Division 2 *DFW Eight-Hour Ozone Nonattainment Area Minor Sources*

You can find the text of other state environmental rules by following steps 1 through 4 and then clicking on the appropriate chapter and subsequent links.

Federal environmental rules from the EPA are in Title 40 of the Code of Federal Regulations. The CFR can be found at <[www.gpoaccess.gov/cfr/index.html](http://www.gpoaccess.gov/cfr/index.html)>. There are multiple versions reflecting various amendments over the years. You should check the current version unless otherwise specified.

### **Note Two: How to locate compliance assistance information for the NO<sub>x</sub> Minor Source Rule**

For information that will assist with emission calculations and specifications, along with operating requirements, record keeping and reporting, visit <[www.tceq.state.tx.us/goto/nox](http://www.tceq.state.tx.us/goto/nox)>

If you are unable to visit the Web site, call TCEQ Publications at 512-239-0028 to request copies, or you can view or print publications online at <[www.tceq.state.tx.us/publications](http://www.tceq.state.tx.us/publications)>.

### **Note Three: Calculating Potential to Emit (PTE)**

The potential to emit is the total air contaminants emitted if the equipment were to operate 24 hours a day, 365 days per year. To determine if your site is a **major source**, you must review *all* the stationary equipment on your site that can emit NO<sub>x</sub>. Then use the calculations listed below to estimate your potential emissions. The calculations are **only estimates**, not the final and most accurate determination of your potential to emit.

*For the purpose of this rule*, your highest potential to emit on or since December 31, 2000 will determine if you are considered a major or a minor source. You must calculate your potential to emit based on the highest emissions at your site on or since December 31, 2000. (If you've removed equipment, changed operations or replaced equipment you must use the calculations that result in the highest PTE.)

#### **Major source rules**

A major source in the DFW ozone non-attainment area, for the purposes of Chapter 117, is any stationary source or group of sources within a contiguous area and under common control that emits or has the potential to emit at least 50 tpy of NO<sub>x</sub>

- If total tpy = 48 tons or more, **you may be a major source of NO<sub>x</sub>**. The calculation above is only an estimate. It is recommended that if your total is 48 tons or more, you contact the Air Quality Planning Section at 512-239-4900 to determine if any air authorizations are required.

The minor source rule does not apply to sites that are considered major sources of NO<sub>x</sub>.

### **Step 1: List each unit at your site that can emit NO<sub>x</sub>**

**Step 2: For each unit on the list, calculate the design capacity emission rate.**

**Calculation Note**

- The emission factor can be determined by stack testing or the vendor's guarantee. The emission factor is the amount of NO<sub>x</sub> emitted before any pollution controls are applied.
- Design capacity is from information supplied by the manufacturer. It may be on the name plate on the equipment.
- The number of operating hours in a year is 8,760 (for these calculations).
- The number of pounds in a ton is 2,000.
- The number of grams in a ton is 907,184.74.

**A. For engines, use the following formula:**

a = Emission factor in grams of NO<sub>x</sub>/horsepower/hour (g/hp-hr)

b = Design capacity in hp

$$(a \times b) \times \frac{8760 \text{ hrs}}{\text{yr}} \times \frac{\text{ton}}{907,184.74 \text{ grams}} = \text{tons NO}_x / \text{yr}$$

**B. For boilers, heaters, furnaces, duct burners, and turbines, use the following formula:**

a = Emission factor in lbs of NO<sub>x</sub>/MMBtu

b = Design capacity in MMBtu/hr

$$(a \times b) \times \frac{8760 \text{ hrs}}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \text{tons NO}_x / \text{yr}$$

**C. For oil-fired boilers, heaters, and furnaces, use the following formula:**

a = Emission factor in lbs of NO<sub>x</sub>/Mgal

b = Design capacity in Mgal/hr

$$(a \times b) \times \frac{8760 \text{ hrs}}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lbs}} = \text{tons NO}_x / \text{yr}$$

**Step 3: Add together the tons of NO<sub>x</sub> per year for each piece of equipment, which will equal your total tons per year (tpy) for the site. Any other equipment which emits NO<sub>x</sub> must also be included in the calculation.**

**Note Four: Is my site subject to other air quality rules?**

**General air quality rules**

30 TAC 116.110(a) requires that any facility which emits air contaminants have authorization. If you are not currently operating under an air authorization such as a permit by rule, standard permit or individual permit, contact 800-448-2827.

## **Note Five: Additional Rule Requirements**

### **Additional Emission Specifications**

These specifications apply only in specific situations. Please review them to determine if they apply to your site.

#### **1. For equipment changes that cause NO<sub>x</sub> emissions in other equipment to increase**

30 TAC 117.2110(e) Changes after Dec. 31, 2000, to a unit subject to an emission specification in subsection (a) of this section emission specification and attainment demonstration (ESAD) unit which result in increased NO<sub>x</sub> emissions from a unit not subject to an emission specification in subsection (a) of this section (non-ESAD unit), such as redirecting one or more fuel or waste streams containing chemical-bound nitrogen to an incinerator or a flare, is only allowed if:

- a. the increase in NO<sub>x</sub> emissions at the non-ESAD unit is determined using a CEMS or PEMS which meets the requirements of 30 TAC 117.2135(c), or through stack testing which meets the requirements of 30 TAC 117.2135(f); and
- b. emission credits equal to the increase in NO<sub>x</sub> emission at the non-ESAD unit are obtained and used in accordance with section 30 TAC 117.9800 (relating to Use of Emission Credits for Compliance).

#### **2. For equipment with an annual capacity factor of 0.0383 or less**

30 TAC 117.2110(a)(4) As an alternative to the emission specifications in 30 TAC 117.2110(a)(1) through (3) for units with an annual capacity factor of 0.0383 or less, 0.060 lb/MMBtu heat input. For units placed into service on or before Dec. 31, 2000, the annual capacity as of Dec. 31, 2000, must be used to determine eligibility for the alternative emission specification of this paragraph. For units placed into service after Dec. 31, 2000, a 12-month rolling average must be used to determine the annual capacity factor.