



THE HOUSTON-GALVESTON-BRAZORIA AREA

# Minor Source Rule

*An Air Quality Rule for Equipment at Your Business*

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**Is My Boiler, Process Heater,  
Stationary Engine, or Turbine  
Regulated under the  
Minor Source NO<sub>x</sub> Rule?**



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*This document is not a replacement for Chapter 117 rules. Other compliance requirements may apply (monitoring, testing, record keeping, reporting, notification, etc.). Under Texas law, all new or modified air-pollutant-emitting facilities statewide have to obtain permit authorization, under either Chapter 106 or 116. Separately and additionally, Chapter 117 requires NO<sub>x</sub> reductions in specific areas in order to meet federal ambient ozone standards. Separate permitting and/or federal requirements may apply. Download rules from the TCEQ Web site: <[www.tceq.state.tx.us/goto/rules](http://www.tceq.state.tx.us/goto/rules)>.*

# Minor Source Rule

*An Air Quality Rule for Equipment at Your Business*

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## Is my boiler, process heater, stationary engine, or turbine regulated under the Minor Source NO<sub>x</sub> Rule?

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### How can this guide help me?

This publication summarizes the Texas Commission on Environmental Quality’s air quality rules for controlling emissions of nitrogen oxides (NO<sub>x</sub>) from certain combustion sources—equipment such as boilers, process heaters, stationary engines, and turbines. This rule, designed to protect air quality and human health in the Houston-Galveston-Brazoria area, applies only to businesses that qualify as minor sources.

This publication will lead you through the actions you need to take in order to operate your equipment in accordance with the rules found in Title 30, Texas Administrative Code (30 TAC), sections 117.2000–2045. Use this guide to determine whether, and how, the rule may apply to your business.

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

See Note One on page 7 for instructions on finding the text of this rule and other state environmental rules at the Secretary of State’s Web site. You may keep up to date with efforts to improve air quality in the Houston-Galveston-Brazoria 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 <www.tceq.state.tx.us> by clicking on the icon labeled “Get e-mail updates on your choice of topics.” To join the mailing list, send a blank e-mail with no subject or message to <join-sip@listserv.tceq.state.tx.us>. By doing so, 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 this rule. See Note Three for additional instructions on how to calculate potential to emit.

### Glossary

To assist in answering the questions in this document, you should refer to the following definitions, which paraphrase the specific definitions found in the TCEQ rules. Most of those definitions are found in 30 TAC 117.10.

**Annual Capacity Factor.** 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.

**Boiler.** Any combustion equipment fired with solid, liquid, and/or gaseous fuel used to produce steam or to heat water. [30 TAC 117.10(6)]

**CEMS.** Abbreviation for ‘continuous emissions monitoring system.’

**CO.** Chemical symbol for carbon monoxide.

**Diesel engine.** A two- or four-stroke engine in which liquid fuel injected into the combustion chamber ignites when the air charge has been compressed to a temperature sufficiently high for auto-ignition.

**ESAD.** Abbreviation for ‘emission specification and attainment demonstration.’

**Heat Input.** The chemical heat released due to fuel combustion in a unit, using the higher heating value of the fuel. This does not include the sensible heat of the incoming combustion air. In the case of carbon monoxide boilers, the heat input includes the enthalpy of all regenerator off-gases and the heat of combustion of the incoming CO and of the auxiliary fuel. The enthalpy change of the fluid catalytic cracking unit regenerator

off-gases refers to the total heat content of the gas at the temperature it enters the CO boiler, referring to the heat content at 60 degrees Fahrenheit, as being zero. [30 TAC 117.10(17)]

**Maximum rated capacity.** The maximum design heat input, usually expressed in MMBtu/hr. [30 TAC 117.10(30)]

**NH<sub>3</sub>.** Chemical symbol for ammonia.

**Nonattainment area.** A defined region within the state that is designated by the U.S. Environmental Protection Agency (EPA) as failing to meet the national ambient air quality standard for a pollutant for which a standard exists [30 TAC 101.1(70)]. The Houston-Galveston-Brazoria (HGB) ozone nonattainment area consists of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties.

**NO<sub>x</sub>.** Chemical symbol for nitrogen oxides, products of combustion that are air pollutants, which contribute to the production of smog.

**O<sub>2</sub>.** Chemical symbol for oxygen.

**PEMS.** Abbreviation for 'predictive emissions monitoring system.'

**Process heater.** Any combustion equipment fired with liquid or gaseous fuel (or both) and used to transfer heat from combustion gases to a process fluid, superheated steam, or water to heat the process fluid or cause a chemical reaction. [30 TAC 117.10(40)]

**Site.** The total of all stationary sources located on one or more contiguous or adjacent properties, which are under common control of the same person (or persons under common control). Your business location is frequently the same as your site.

**Source.** A point of origin of air contaminants, whether privately or publicly owned or operated. [30 TAC 101.1(96)]

**Stationary gas turbine.** Any gas turbine system that is gas and/or liquid fuel fired with or without power augmentation and operated at a specific minor or major source for more than 90 days in any 12-month period. The equipment may be attached to a foundation or may be portable. Two or more gas turbines powering one shaft are treated as one unit. [30 TAC 117.10(45)]

**Stationary internal combustion engine.** A reciprocating engine that remains or will remain at a single site at a building, structure, facility, or installation for more than 12 consecutive months. This includes any engine that is part of any piece of portable equipment while the equipment is on-site. Portable engines or equipment are designed to be capable of being moved from one location to another. Indicators of portability include, but are not limited to, wheels, skids, carrying handles, a dolly, a trailer, or a platform. If an engine is replaced, the 12 consecutive months do not start over; the period begins from the date the initial engine was put in place. An engine is considered stationary if it is removed, then returned to the same location in an attempt to circumvent the 12-month requirement. Non-road engines, as defined in Title 40, Code of Federal Regulations (40 CFR), section 89.2, are not considered stationary for the purposes of these rules. [30 TAC 117.10(46)]

## Eligibility:

To find out if you have equipment that must comply with these NO<sub>x</sub> rules, start by answering the questions below.

### Question 1

Is your equipment located in any of the counties listed below? *Check all that apply.*

- |                                   |                                    |                                  |                                     |
|-----------------------------------|------------------------------------|----------------------------------|-------------------------------------|
| <input type="checkbox"/> Brazoria | <input type="checkbox"/> Fort Bend | <input type="checkbox"/> Harris  | <input type="checkbox"/> Montgomery |
| <input type="checkbox"/> Chambers | <input type="checkbox"/> Galveston | <input type="checkbox"/> Liberty | <input type="checkbox"/> Waller     |

**YES** ---- Go to Question 2.

**NO**----- This rule does not apply to you.

### Question 2

Do you have any of the following at your site? *Check all that apply.*

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Boiler  | <input type="checkbox"/> Process Heater | <input type="checkbox"/> Stationary, Reciprocating Internal Combustion Engine |
| <input type="checkbox"/> Stationary Gas Turbine (including duct burners) |   |   |

**YES** ---- Go to Question 3.

**NO**----- This rule does not apply to you.

### Question 3

Is your site a *major source* of air contaminants?

**YES** ---- You are a *major source*. This rule does not apply to you. However, there are other TCEQ air quality requirements that apply to your site. Contact the Air Permits program at 512-239-1250 for further information.

**NO**----- Go to Question 4.

#### Don't know if you're a *major source*?

For help in making this determination, see Note Three for instructions on calculating your potential to emit.

### Question 4

**YOU ARE A MINOR COMBUSTION SOURCE SUBJECT TO THIS COMBUSTION SOURCE RULE.**

Please answer the following question and follow the directions below:

**Are you subject to the TCEQ Mass Emissions Cap and Trade program (Cap and Trade)?**

**YES** ---- If your equipment **is** subject to Cap and Trade, check YES on line 13 of the Equipment-Profile Worksheet that follows and then complete the rest of the worksheet.

**NO**----- If your equipment **is not** subject to Cap and Trade, check NO on line 13 of the Equipment-Profile Worksheet that follows and then complete the rest of the worksheet.

**Don't know if you're subject to the TCEQ Mass Emissions Cap and Trade program?** For help in making this determination, and to obtain emission-calculation tables for the applicable combustion devices, review publication RG-440B, *What Are the Operating, Monitoring, Testing, and Emission-Calculation Requirements of the Minor Source NO<sub>x</sub> Rule?* If you need further assistance, contact the Chief Engineer's Office at 512-239-4900.

# Equipment-Profile Worksheet

Please answer the following questions in order to profile each piece of equipment and to determine which standards apply to it. Copy the worksheet below and complete it for each piece of equipment on your site. Keep it with other information about each piece of equipment.

<b>Unit ID:</b>	<b>Date:</b>
-----------------	--------------

1. Type of equipment as of Dec. 31, 2000<sup>a</sup> (*check the one that applies*)
  - Boiler/process heater
  - Gas-fired stationary reciprocating internal combustion engine
  - Diesel stationary reciprocating internal combustion engine
  - Dual-fuel stationary reciprocating internal combustion engine
  - Gas turbine (including duct burners)
  
2. County where equipment is located as of the date this worksheet is initially completed \_\_\_\_\_
  
3. Date installed \_\_\_\_\_
  
4. Date of initial start of operation<sup>b</sup> \_\_\_\_\_
  
5. Date(s) of any modifications, reconstructions, or relocations<sup>c</sup> \_\_\_\_\_
  
6. Manufacturer \_\_\_\_\_
  
7. Unit classification for this equipment<sup>d</sup> \_\_\_\_\_
  
8. Averaging time applicable to this equipment<sup>d</sup> \_\_\_\_\_
  
9. Permit number for this equipment<sup>d</sup> \_\_\_\_\_
  
10. Date of the permit \_\_\_\_\_
  
11. Maximum rated capacity of this equipment<sup>d</sup> \_\_\_\_\_
  
12. Emission specification for this equipment<sup>d</sup>
  - A. NO<sub>x</sub> \_\_\_\_\_
  - B. CO \_\_\_\_\_
  - C. NH<sub>3</sub> \_\_\_\_\_
  
13. Is this equipment subject to the TCEQ Mass Emissions Cap and Trade program?<sup>d</sup>       YES       NO
  
14. Does this equipment have a CEMS or PEMS for ...?<sup>e</sup> (*check all that apply*)
  - nitrogen oxides (NO<sub>x</sub>)       carbon monoxide (CO)       ammonia (NH<sub>3</sub>)

<sup>a</sup> Equipment classification can be changed. Please indicate the classification as it was on or before Dec. 31, 2000.  
<sup>b</sup> The date your facility assumed control of the equipment.  
<sup>c</sup> For any relocation, record the address of each location and the length of time the equipment was at each location.  
<sup>d</sup> For assistance with making this determination, review publication RG-440B, *What Are the Operating, Monitoring, Testing, and Emission-Calculation Requirements of the Minor Source NO<sub>x</sub> Rule?*  
<sup>e</sup> CEMS = continuous emissions monitoring system; PEMS = predictive emissions monitoring system.

# Determine if any exemptions apply to your equipment.

A variety of equipment may be entirely or partially exempt from the *minor source* requirements. To determine if your equipment qualifies for any exemptions, consult Table 1.

**Table 1: What part of the rule applies to my equipment?**

Type of Equipment	Review the following
Boilers, process heaters	Is my boiler exempt? (Table 2)
Stationary, reciprocating internal combustion engines (gas, diesel, or dual-fuel engines)	Is my engine exempt? (Table 3)
Stationary gas turbines including duct burners	Is my turbine exempt? (Table 4)

## Is your equipment partially exempt or non-exempt?

### Partially Exempt Equipment:

If your equipment meets one of the descriptions in Tables 2, 3, or 4, you are *partially exempt* and must comply with only the indicated requirements.

### Non-Exempt Equipment:

If your equipment is not described in Tables 2, 3, or 4, you must comply with **all** requirements of the Minor Source Rule.

**Table 2: Partial Exemptions for Boilers and Process Heaters\***

Boiler/Process Heater Description (Find your equipment in this column)	Requirements
Equipment has a maximum rated capacity of <b>2.0 MMBtu/hour or less.</b>	Your equipment is exempt from all compliance requirements. If this is the only equipment you have, you are finished with this guidance document. If not, proceed to determine the requirements for your other equipment.
Equipment has a maximum rated capacity <b>greater than 2.0 MMBtu/hour and less than 5.0 MMBtu/hour</b> and meets <b>all</b> of the following: <ul style="list-style-type: none"> <li>■ Is stationary</li> <li>■ Has an annual heat input less than or equal to <math>1.8 \times 10^9</math> Btu per calendar year. (For help determining Btu per calendar year from monthly gas bills, visit &lt;<a href="http://www.tceq.state.tx.us/goto/nox-hgb">www.tceq.state.tx.us/goto/nox-hgb</a>&gt; and use the Calculation Spreadsheet for Natural Gas-Fired Boilers.)</li> </ul> OR <p>Has a maximum rated capacity equal to or greater than <b>5.0 MMBtu/hour</b> and meets <b>ALL</b> of the following:</p> <ul style="list-style-type: none"> <li>■ Is stationary</li> <li>■ Has an annual heat input less than or equal to <math>9.0 \times 10^9</math> Btu per calendar year. (For help determining Btu per calendar year from monthly gas bills, visit &lt;<a href="http://www.tceq.state.tx.us/goto/nox-hgb">www.tceq.state.tx.us/goto/nox-hgb</a>&gt; and use the Calculation Spreadsheet for Natural Gas-Fired Boilers.)</li> </ul>	<ul style="list-style-type: none"> <li>■ Install and maintain a totalizing fuel flow meter with <math>\pm 5\%</math> measurement accuracy for fuel usage. (A computer to collect, sum, and store data from continuous fuel flow meters is an acceptable alternative.) Totalizing flow meters were to have been installed by March 31, 2005.</li> <li>■ Totalizing flow meters installed before March 31, 2005, that do not meet the accuracy requirements were to have been replaced by March 31, 2007.</li> <li>■ Alternatives are available. [See 30 TAC 117.2035(a)(2).]</li> <li>■ For equipment located at their properties, independent school districts may keep specific records instead of having a totalizing fuel flow meter. For help with record-keeping requirements, visit &lt;<a href="http://www.tceq.state.tx.us/goto/nox-hgb">www.tceq.state.tx.us/goto/nox-hgb</a>&gt;.</li> <li>■ Maintain written or electronic records of annual fuel usage. Keep records available upon request for five years.</li> </ul>

## Instructions for Table 3:

1. Review engine descriptions in column 1 to determine if your engine fits one of the descriptions. If so, go to column 2. If not, your engine is not exempt—visit [www.tceq.state.tx.us/goto/nox-hgb](http://www.tceq.state.tx.us/goto/nox-hgb) for help with meeting compliance requirements for non-exempt equipment.
2. If your engine is
  - diesel, columns 2–6 apply.
  - gas fired, columns 3 and 6 apply.
  - dual fuel, columns 2, 3, 5, and 6 apply.

**Table 3: Partial Exemptions for Gas, Diesel, or Dual-Fuel Engines**

✓ = Required

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Engine Description (Find Your Equipment in This Column)	Operating, Monitoring, Record-Keeping, and Reporting Requirements				
	Diesel or dual-fuel engines may not be started for testing or maintenance between 6 a.m. and noon except to: <ul style="list-style-type: none"> <li>■ conduct manufacturer-recommended testing requiring an 18-hour running time.</li> <li>■ verify reliability of emergency equipment after unforeseen repairs (not following routine maintenance such as oil changes).</li> <li>■ test firewater pumps used for emergency-response training from April through October.</li> </ul>	All engines maintain written records of: <ul style="list-style-type: none"> <li>■ hours of engine operation per day.</li> <li>■ purpose of operation.</li> </ul>	Diesel engines must use an elapsed-run-time meter to record hours of operation. (Meters installed after Oct. 1, 2001, cannot be resettable.)	Diesel or dual-fuel engines operated for testing and maintenance must maintain written records identifying the engine and recording: <ul style="list-style-type: none"> <li>■ dates of operations.</li> <li>■ operation start and end times.</li> <li>■ monthly total hours of operation for the most recent 12 consecutive months.</li> </ul>	All engines must maintain written records of: <ul style="list-style-type: none"> <li>■ type of emergency (if any).</li> <li>■ start and end times of operation.</li> <li>■ dates of any emergencies.</li> </ul>
	Records must be kept for five years and be available upon request.				
The engine has a rating of < 50 hp.	✓			✓	
The engine is used in research and testing only.	✓			✓	
The engine is used for performance verification and testing only.	✓			✓	
The engine is used solely to power other engines or gas turbines during startups.	✓			✓	
The engine is used during response to any officially declared disaster or state of emergency.	✓			✓	
The engine is used exclusively by agricultural operations for growing crops or raising fowl or other animals.	✓			✓	
The engine is operated <b>only</b> in emergency situations <b>and</b> : <ol style="list-style-type: none"> <li>1. testing or maintenance operation is ≤52 hr/yr, based on a rolling 12-month average.</li> <li>2. if a <b>diesel</b> emergency engine placed into service before Oct. 1, 2001, <b>has not</b> been modified<sup>a</sup> after Oct. 1, 2001.</li> </ol>	✓	✓	✓	✓	✓
<b>Diesel</b> engine meets <b>all</b> of the following conditions: <ol style="list-style-type: none"> <li>1. Placed into service before Oct. 1, 2001.</li> <li>2. Operates &lt;100 hr/yr (based on a rolling 12-month average).</li> <li>3. Has not been modified, reconstructed, or relocated<sup>a</sup> on or after Oct. 1, 2001.</li> </ol>	✓	✓	✓	✓	
<b>Diesel</b> engine meets <b>all</b> of the following conditions: <ol style="list-style-type: none"> <li>1. Placed into service on or after Oct. 1, 2001.</li> <li>2. New, modified, reconstructed, or relocated<sup>a</sup> stationary engine.</li> <li>3. Operates &lt;100 hr/yr in non-emergency situations, based on a rolling 12-month average.</li> <li>4. Meets emission standards for non-road engines<sup>b</sup> in effect at the time of installation, modification, reconstruction, or relocation.</li> </ol>	✓	✓	✓	✓	

<sup>a</sup> "Modification" and "reconstruction" have the meanings defined in 30 TAC 116.10 and 40 CFR 60.15 (December 16, 1975), respectively, and "relocated" means to newly install, at an account, as defined in 30 TAC 101.1, a used engine from anywhere outside the account.

<sup>b</sup> Applicable emission standards are listed in 40 CFR §89.112(a), Table 1 (Oct. 23, 1998). (See Note One for directions on how to find 40 CFR on the Web.)

**Table 4: Partial Exemptions for Gas Turbines (including Duct Burners)**

Turbine Description	Rule Requirements
<ul style="list-style-type: none"><li>■ Rated at less than 1.0 megawatt <b>and</b></li><li>■ Initial start of operation date was on or before Oct. 1, 2001.</li></ul>	<b>This turbine is exempt from this rule. Stop here.</b>

**Note One:**

## How to Locate TCEQ and EPA Rules

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This regulatory guide explains some sections of Texas' Minor Source Rule (30 TAC 117.2000–2045).

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

1. Go to <[www.sos.state.tx.us/tac/index.shtml](http://www.sos.state.tx.us/tac/index.shtml)>.
2. Click <[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 1 Houston-Galveston-Brazoria Ozone Nonattainment Area Minor Sources*.

You can find the text of other state environmental rules by following steps 1–4 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)>.

**Note Two:**

## How to locate compliance assistance information for the Minor Source NO<sub>x</sub> rule

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Companion TCEQ publications in this series: *What Are the Operating, Monitoring, Testing, and Emission-Calculation Requirements of the Minor Source NO<sub>x</sub> Rule?* (RG-440B) and *What Are the Record-Keeping and Reporting Requirements of the Minor Source NO<sub>x</sub> Rule?* (RG-440C). The series contains information to assist you in complying with the rules in 30 TAC 117. Call TCEQ Publications at 512-239-0028 to request copies, or view and print publications at <[www.tceq.state.tx.us/goto/nox-hgb](http://www.tceq.state.tx.us/goto/nox-hgb)>.

**Note Three:**

## Calculating Potential to Emit (PTE)

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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 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.)

## Step N3.1. List each unit at your site that can emit NO<sub>x</sub>.

## Step N3.2. For each unit on the list, calculate the design capacity emission rate.

### Calculation notes:

- The emission factor can be determined by stack testing or from 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 equipment's nameplate.
- 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

$$(a \times b) \times \frac{8,760 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{907,184.74 \text{ g}} = \text{tons NO}_x \text{ per year}$$

### 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

$$(a \times b) \times \frac{8,760 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{2,000 \text{ lb}} = \text{tons NO}_x \text{ per year}$$

### 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

$$(a \times b) \times \frac{8,760 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{2,000 \text{ lb}} = \text{tons NO}_x \text{ per year}$$

## Step N3.3. 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.

### Major Source Rules

A major source in the HGB ozone nonattainment 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 25 tpy of NO<sub>x</sub>.

- If total tpy = 23 or more, you may be a major source of NO<sub>x</sub>. The major source threshold is 25 tpy or more. The calculation above is only an estimate. It is recommended that, if your total is 23 tpy or more, you contact the Air Quality Planning section at 512-239-4900 to determine major source requirements.

The minor source rule does not apply to sites that are considered to be major sources of NO<sub>x</sub>. Major sources of NO<sub>x</sub> should review 30 TAC 117.300–356.