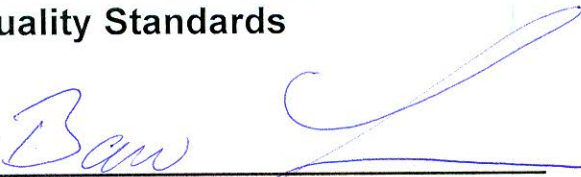


Guidance Document

Title: **Determination of Compliance with the Ambient Air
Quality Standards**

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Issue Date: **February 08, 2001**


1st Revision: **July 22, 2004**

2nd Revision: **September 20, 2005**

3rd Revision: **August 1, 2006**

4th Revision: **December 11, 2012**

Approved By:


Derrick Maddocks, Director

**Compliance Determination
GD-PPD-009.4**

SUBJECT

The determination of a facility's compliance with the ambient air quality standards.

OBJECTIVE

To set out and define the procedures that the Department of Environment and Conservation will follow in determining whether a facility is in compliance with section 3 of the *Air Pollution Control Regulations*. More specifically, this guidance document will outline the conditions under which a facility will have to perform dispersion modelling, compliance ambient air monitoring, and / or stack emission testing, as well as define how compliance will be determined.

BACKGROUND

Under the *Air Pollution Control Regulations*, the ambient air quality standards are defined for a series of contaminants. These standards define levels that the minister deems to be acceptable for the protection of the environment, including human life, wildlife and vegetation.

By their very nature, the ambient air quality standards are based on the emissions from all potential sources within an air zone. For some pollutants, such as sulphur dioxide, the number of potential sources contributing to the concentrations in ambient air would be limited due to the chemistry involved in the formation of sulphur dioxide. For other pollutants, such as particulate matter, the number of potential sources in an air zone can be quite large, and difficult to assign to any particular source.

To determine the ambient levels of a particular pollutant, typically a series of monitors are located within the air zone. If the level of a pollutant exceeds the corresponding ambient air quality standard, then by section 3 of the *Air Pollution Control Regulations*, the minister can specify conditions in an approval or develop an air quality management plan. However, it is often the case in an air zone which includes major industrial operations that the series of monitors do not record an ambient concentration in excess of the associated standard, yet an exceedance of the ambient air standard was likely to have occurred in an area where a monitor was not located.

So the question becomes: how is compliance with the ambient air quality standards determined in those areas with the presence of an industrial facility?

In those air zones without any major industrial influences which could skew the normal levels, a series of monitors is likely representative of the air quality. However, in air zones with major industrial influences, compliance must be determined factoring into account the emissions from these industrial areas.

This guidance document addresses how the Department of Environment and Conservation will determine compliance with the ambient air quality standards when there is a major influence in an air zone. As environmental standards are ever evolving and new developments evolve, this guidance document will be subject to regular updates and refinements.

For this 4th revision, a number of threshold limits for indicating compliance from facilities, as well as the interpretation of modelling outcomes have been modified. Previous revisions (3rd) were made as a direct result in the reduction of sulphur in diesel fuel which came into effect on June 1, 2006 under the *Federal Sulphur in Diesel Fuel Regulations*, and a consequence of fuel switching by industrial operations (2nd).

LEGISLATIVE AUTHORITY

Air Pollution Control Regulations 2004, sections 3 and 21 under the *Environmental Protection Act*:

Ambient air quality standards

3. (1) The ambient air quality standards prescribed in Schedule A shall be used to maintain air quality in the province.
- (2) The concentration of air contaminants due to all sources shall not exceed the standards prescribed in Schedule A.
- (3) For the purpose of ensuring that the standards prescribed in Schedule A are met, the minister may:
 - (a) specify a condition in an approval issued under Part XI of the Act; or
 - (b) develop an air quality management plan specifying the provisions to reduce the level of air contaminants emitted by each facility identified in the plan, and the owner or operator of each facility shall
 - (i) provide the minister with any information he or she may require regarding the development of an air quality management plan, including a company specific air quality management plan, and
 - (ii) comply with the provisions of the plan within the time specified by the minister.

Manner of measurements, recording and analyses

21. All measurements, recordings and analyses conducted under these regulations shall be
 - (a) performed at locations and by devices and methods acceptable to the Department; and
 - (b) made readily accessible to the Department in a time and manner acceptable to the Department.

DEFINITIONS

- a) “administrative boundary” means the boundary, as defined in a Certificate of Approval, for the administration of the Air Pollution Control Regulations, 2004;
- b) “air contaminant” means any discharge, release, or other propagation into the air and includes, but is not limited to, dust, fumes, mist, smoke, particulate matter, vapours, gases, odours, odorous substances, acids, soot, grime or any combination of them;
- c) “ambient air” means the portion of the atmosphere which is external to buildings, structures or underground spaces;
- d) “Department” means the Department of Environment and Conservation and its successors;
- e) “dispersion model” means a mathematical model used to predict point of impingement concentrations;
- f) “distillate fuel oil” means fuel oil grades 1 and 2, including light fuel oil and diesel;
- g) “emission source” means any combustion process equipment, installation, machinery, appliance, equipment or tanks from which air contaminants may be released or discharged;
- h) “existing” means an age of more than 2 years;
- i) “facility” means any stationary property, real or personal, taken as a whole, which has an emission source;
- j) “GD-PPD-016.1” means Department guidance document GD-PPD-016.1 entitled *Procedural Guide for Source Emission Testing* or its successors;
- k) “GD-PPD-019.2” means Department guidance document GD-PPD-019.2 entitled *Departmental Requirements for Dispersion modelling* or its successors;
- l) “GD-PPD-065” means Department guidance document GD-PPD-065 entitled *Guidelines for Ambient Air Monitoring* or its successors;
- m) “modified” means any addition or alteration to emission sources which may cause:
- an increase in the release of an air contaminant, or
 - an emission of an air contaminant that was not previously emitted;

- n) “new” means an age up to and including the first 2 years;
- o) “registered” means submitted to and approved by the Department in accordance with departmental policy and guidelines;
- p) “residual fuel oil” means fuel oil grades 5, 6 and heavier which includes Bunker C, and for the purposes of this guidance document, includes used oil;
- q) “stack emission test” means the sampling of pollutant emissions in accordance with Department guidance document GD-PPD-016.1.

GENERAL

1. These guidelines will apply to all facilities which have emission sources that:

Type I emission source

- (a) require a minimum annual residual fuel oil consumption of 2,000,000 litres; or
- (b) require a minimum annual distillate fuel oil consumption of 15,000,000 litres; or
- (c) emit a minimum of 20 tonnes of total particulate matter from a stack or a series of stacks annually; or
- (d) require a minimum of 25 MW of electrical power on a continuous basis for use in an industrial process where the process has a resulting emission of an air contaminant to the atmosphere;

Type II emission source

- (a) require less than 2,000,000 litres of residual fuel oil consumption annually;

Type III emission source

- (a) have a minimum total particulate matter emission of 20 tonnes annually, where the emission is not from a stack or a series of stacks;

Type IV emission source

- (a) diesel generating facilities with a total installed capacity of 100 KW of power and operating for at least 500 hours annually.

Type V emission source

- (a) have an emission from a source that is not categorized as either a Type I, Type II, Type III or Type IV emission source, but which may have an emission that poses an environmental concern.

2. Where an emission source can be categorized into more than one Type category, the category with the more stringent requirements, as defined in Section 5 of this guidance document, will prevail.
3. For all facilities covered by this guideline, compliance with the ambient air quality standards will primarily be determined through a registered dispersion model conducted in accordance with GD-PPD-019.2 and secondarily, when applicable, through ambient air monitoring conducted in accordance with GD-PPD-065.
4. Unless otherwise specified under a Certificate of Approval issued by the Department, the minimum number of pollutants to be modelled is listed in Table 1.

Table 1

Pollutant	Combustion Sources	Non-Combustion Sources
sulphur dioxide (SO ₂)	✓	✗
total suspended particulate (TSP)	✓	✓
particulate matter less than 10 microns (PM ₁₀)	✓	✓
particulate matter less than 2.5 microns (PM _{2.5})	✓	✓
nitrogen dioxide (NO ₂)	✓	✗
carbon monoxide (CO)	✓	✗

Where other pollutants are deemed by the Department to have the potential to exceed the limits established in the *Air Pollution Control Regulations, 2004* or otherwise have an adverse effect on the environment, the Department reserves the right to require the modelling of these other pollutants.

5. Compliance for a facility will be determined based on the predicted levels from a registered dispersion model for all locations at or beyond the administrative boundary as defined in the associated Certificate of Approval. Owing to potential adverse meteorological conditions and the general limitation of on-site meteorological data, it is recognized that model over-prediction may occur. Consequently compliance for modelled impacts for any given year will be based on the:

- 9th highest level at any given receptor for 1-hour averaging period;
- 6th highest level at any given receptor for 3-hour averaging period;
- 3th highest level at any given receptor for 8-hour averaging period; and
- 2nd highest level at any given receptor for 24-hour averaging period.

6. All facilities covered under this guidance are required to show compliance with the ambient air quality standards on a continuous basis as follows, subject to the terms and conditions of the associated Certificate of Approval:

Type I emission source

New Facility

- (a) Register a stack emission test and a dispersion model within the first 6 months of operation, and register a second stack emission test and dispersion model within the last 6 months of the first 2 years of operation. After the first 2 years of operation, a new facility becomes an existing facility.

Modified Facility

- (a) Register a stack emission test and dispersion model for the modified emission source within the first 6 months of operation after the modifications have been completed. Upon registration, a modified facility will again be considered an existing facility.

Existing Facility

- (a) Register a stack emission test and dispersion model once every 4 years if it has been shown, through a registered dispersion model, that the facility is compliant with the ambient air quality standards for all pollutants.
- (b) If a registered dispersion model indicates non-compliance with the ambient air quality standards for any pollutant, then the facility will normally complete and register a stack emission test and dispersion model, once every 2 years.
- (c) Under special circumstances, the Department reserves the right to require an existing facility to register a stack emission test, and a dispersion model at more frequent intervals.

Type II emission source

New Facility

- (a) Register a stack emission test and a dispersion model within the first 6 months of operation. After the first 2 years of operation, a new facility becomes an existing facility.

Modified Facility

- (a) Register a stack emission test and dispersion model for the modified emission source within the first 6 months of operation after the modifications have been completed. Upon registration, a modified facility will again be considered an existing facility.

Existing Facility

- (a) Register a stack emission test and a dispersion model once every 5 years.
- (b) Under special circumstances, the Department reserves the right to require an existing facility to register a stack emission test, and a dispersion model at more frequent intervals.

Type III emission source

New Facility

- (a) Register a dispersion model within the first 6 months of operation. After the first 2 years of operation, a new facility becomes an existing facility.

Modified Facility

- (a) Register a dispersion model for the facility, within the first 6 months of operation after the modifications have been completed. Upon registration, a modified facility will again be considered an existing facility.

Existing Facility

- (a) Register a dispersion model once every 5 years.
- (b) Under special circumstances, the Department reserves the right to require an existing facility to complete and register a dispersion model at more frequent intervals.

Type IV emission source

New Facility

- (a) Register a dispersion model prior to operation. After the first 2 years of operation, a new facility becomes an existing facility.

Modified Facility

- (a) No modifications are permissible under this Type category.

Existing Facility

- (c) Register a dispersion model once every 5 years.

Type V emission source

- (a) All new, modified and existing facilities will conduct a stack emission tests and register a dispersion model per the provisions outlined in the associated Certificate of Approval.

7. When determining compliance, all sources which account for at least 1% of the facility's total emission, shall be included in the dispersion modelling analysis. Potential sources include, but are not limited to, stacks, vents, stockpiles, open pits, tailings, tanks, loadouts, lagoons and on-site vehicular movement. Emission determination from stacks and vents will be in accordance with GD-PPD-016.1 or through in-stack continuous emission monitoring when available. Emissions from tanks will be determined through the U.S. EPA Tanks program, adjusted for the meteorological conditions at the industrial facility. Emissions from all other potential sources may be determined through on-site measurements or through approved emissions factors. Emissions estimates from blasting operations are not required.
8. For the purposes of this guidance document:
 - (a) New facilities include facilities which began operation on or after December 1, 2012,
 - (b) Existing facilities include facilities which were in operation on or before November 30, 2012,
 - (c) Modified facilities include facilities which completed modifications on or after

December 1, 2012.

- (d) Modifications do not include:
- (i) routine maintenance, repair and parts replacement;
 - (ii) normal increases in production rates unless otherwise prohibited;
 - (iii) increases in hours of operation unless otherwise prohibited; or
 - (iv) use of an alternative cleaner fuel or raw material.
9. Where a facility can demonstrate to the Department that an emission source, which would have otherwise been subject to the provisions of this guidance document, is not a major contributor to the local ambient air zone, then upon application, the frequency of stack emission testing, as outlined in this guidance document, may be reduced.
10. Compliance determination, irrespective of the two-year or four-year cycle, will be based on the modelling of the actual emissions profile and meteorological conditions for the previous four years. In the case of the two-year cycle this means that the model outcomes for the last two years of a prior cycle will be considered in compliance determination. Compliance determination for a five-year cycle will be based on the modelling of the actual emissions profile and meteorological conditions for the previous five years.
- For example, a Type I facility determined to be non-compliant in 2010 would have to determine compliance again in 2012 based on the actual emission profiles and meteorological conditions for 2008, 2009, 2010 and 2011. The non-compliance determined in 2010 would have been based on the actual emission profiles and meteorological conditions from 2006, 2007, 2008 and 2009. Since modelling in both 2010 and 2012 would have included 2008 and 2009, it would only be necessary to model 2010 and 2011 emissions in 2012, though compliance would be based on the results for the years 2008, 2009, 2010 and 2011.
11. For each pollutant modelled, when the predicted ground-level concentration is below the associated ambient air quality standard for the given timeframe, as defined under section 4 of this guidance document, the facility will be deemed to be compliant for that particular pollutant. The facility on whole will be deemed compliant when the modelling for all pollutants of concern indicates compliance. Compliance will be valid until registration of the next scheduled dispersion model.

12. If non-compliance is determined, a facility may elect to enter into a compliance agreement with the Department for the purposes of:
 - (a) attaining compliance within a reasonable timeframe; or
 - (b) establishing a compliance ambient monitoring network at locations of maximum predicted non-compliance. If the network indicates compliance at all locations for all timeframes after 4 years of monitoring, then the facility will be deemed compliant. If the network indicates non-compliance at any locations for any timeframe within 4 years of monitoring, then the facility may enter into an additional compliance agreement for the purposes of attaining compliance within a reasonable timeframe. Measurements from a compliance ambient monitoring network are to be compliant 100% of the time for all averaging periods.

13. Where a facility elects to establish and operate a compliance ambient monitoring network, it will be established subject to the provisions of the facility's Certificate of Approval and in accordance with GD-PPD-065.

14. Where it is not practical to establish a compliance ambient monitoring network at locations of maximum predicted non-compliance, upon application to the Department, the facility may establish a compliance ambient monitoring network at alternate locations in close proximity to the location of maximum predicted non-compliance. In such situations, compliance will be based on prorating the monitored levels to the locations of maximum predicted non-compliance based on the registered dispersion model.

15. The establishment of a compliance ambient monitoring network in no way supersedes any requirements placed on a facility to operate a community ambient monitoring network as defined in the associated Certificate of Approval.

16. All records from both a community ambient monitoring network and a compliance ambient monitoring network will be public record and used for public awareness.