March 2018

PROCEDURE FOR PREPARING AN EMISSION SUMMARY AND DISPERSION MODELLING REPORT

[GUIDELINE A-10]

Version 4.1

Guidance for Emission Summary and Dispersion Modelling Reports under

Ontario Regulation 419/05
Air Pollution – Local Air Quality

made under the *Environmental Protection Act*

PIBs # 3614e04.1

Ontario

FOREWORD

The "Procedure for Preparing an Emission Summary and Dispersion Modelling Report, September 2016, version 4.0" (the Procedure Document) provides guidance on complying with the ESDM report content requirements of Ontario Regulation 419/05: Air Pollution - Local Air Quality.

The Procedure Document is intended to provide guidance to ensure the fair and consistent implementation of the Regulation. This document updates the previous Ontario Ministry of the Environment and Climate Change (ministry) document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" PIBs #3614e03 dated March 2009.

Starting October 31, 2011, the ministry's Environmental Approvals Branch has implemented new environmental approvals legislation that requires facilities that emit contaminants to the air to either obtain an Environmental Compliance Approval (ECA) (formerly Certificate of Approval (Air)) or register online in the Environmental Activity and Sector Registry (EASR) for activities under subsection 9 (1) of the Environmental Protection Act (EPA). Guidance on documenting these activities in an Emission Summary and Dispersion Modelling (ESDM) report for a facility is included in this Procedure Document.

The ministry may periodically publish a list of questions and answers to assist in the interpretation of this Procedure Document. The contents of this document may also be up-dated from time to time based upon public consultation consistent with the Ontario Environmental Bill of Rights legislation. All website addresses referred to in this document were current at the time of release.

While every effort has been made to ensure the accuracy of the information contained in this Procedure Document, it should not be construed as legal advice. In the event of conflict with requirements identified in Regulation, then the regulatory requirements shall determine the appropriate approach.

For any addenda or revisions to this guide please visit the ministry website or contact:

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1.0 INTRODUCTION

Ontario's local air quality regulation (O. Reg. 419/05: Air Pollution – Local Air Quality or the "Regulation") works within the province's air management framework by regulating air contaminants released into communities by various sources, including local industrial and commercial facilities[1]. The Ontario Ministry of the Environment and Climate Change (the ministry) regulates contaminants in air to protect communities who live close to these sources. The Regulation aims to limit substances released into air that can affect human health and the environment, and requires industry to operate responsibly under a set of rules that is publicly transparent.

The Regulation includes three compliance approaches for regulated facilities to demonstrate environmental performance, and make improvements when required. These compliance approaches include meeting air standards prescribed in the Regulation, requesting, receiving and meeting a site-specific standard or registering under and meeting the requirements of a technical standard (if available). All three compliance approaches are allowable under the Regulation.

Provincial air standards are used to assess a facility's individual contribution of contaminants to air. They are set based solely on science without taking into account technological or economic factors into account. As such some regulated facilities and industry sectors may not be able to meet some standards due to unique technical or economic limitations. In these cases, industries or sectors look to technology and best practices to improve their environmental performance and comply with the Regulation by either requesting a site-specific standard or registering under a technical standard (if available).

The Regulation places limits on the concentration of contaminants in the natural environment that are caused by emissions from a facility. The concentrations in the natural environment are calculated at a location referred to as a "point of impingement" which is defined in section 2 of the Regulation, as follows:

[1] This Regulation does not apply to discharges of contaminants from motor vehicles or to discharges of heat, sound or vibration (section 5 of the Regulation).

Points of Impingement

"2. (1) A reference in this regulation to a point of impingement with respect to the discharge of a contaminant does not include any point that is located on the same property as the source of contaminant.

(2) Despite subsection (1), a reference in this Regulation to a point of impingement with respect to the discharge of a contaminant includes a point that is located on the same property as the source of contaminant, if that point is located on,

(a) a child care facility; or

(b) a structure, if the primary purpose of the property on which the structure is located, and of the structure, is to serve as,

(i) a health care facility,

(ii) a senior citizens' residence or long-term care facility, or

(iii) an educational facility."

The Regulation requires that where a facility discharges a contaminant into the air from one or more sources, the concentration at any point of impingement (POI) resulting from that combined discharge must be less than the standard prescribed in the Regulation. The ministry also uses a broader list of point of impingement limits (ministry POI Limits)[2] and other screening tools[3,4] to assist in preventing adverse effects that may be caused by local sources of air pollution.

[2] The generic term "limits" in the context of this guideline means any numerical concentration limit set by the ministry including standards in the schedules to the Regulation, guidelines and recommended screening levels for chemicals with no standard or guideline. The ministry Air Contaminants Benchmarks List (ACB List) summarizes standards, guidelines and screening levels used for assessing point of impingement concentrations of air contaminants. See Footnote 6 under Chapter 2.3 "Update of an ESDM report" of this Procedure Document.

[3] In January, 2017 the ministry published the Air Contaminants Benchmarks List (ACB List). The ACB List includes the following benchmarks:

- Benchmark 1 (B1) Values: Standards and guideline values
- Benchmark 2 (B2) Values: Screening levels

This ACB list (as amended) replaces the following documents:

- Summary of Standards and Guidelines sorted by Chemical Abstracts Service (PIBS # 6569e01)
- Summary of Standards and Guidelines sorted by Chemical Name (PIBS # 6569e01)
- Jurisdictional Screening Level (JSL) List - A Screening Tool for Ontario Regulation 419 (PIBS # 6547e)

Demonstration of compliance with the air standards compliance approach under the Regulation begins with development of an Emission Summary and Dispersion Modelling (ESDM[5]) report that includes a summary of total property air emissions. These emissions are then converted to POI concentrations using mathematical air dispersion models. In addition, a facility may use an approved air dispersion model in combination with monitoring or measurement to determine compliance. This "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" (Procedure Document) provides guidance on complying with the requirements of the Regulation that govern the content of an ESDM report and should be used in conjunction with other ministry documents such as "Air Dispersion Modelling Guideline for Ontario" (ADMGO) (as amended from time to time) and associated technical bulletins. The guidance set out in this Procedure Document became applicable when the Regulation came into force on November 30, 2005. This guidance is primarily intended for facilities that are operating under the prescribed air standards compliance approach or are required to do an ESDM report because they are applying for an Environmental Compliance Approval (ECA) or requesting a site-specific standard.

The Regulation requires use of specified approved dispersion models, whereas earlier versions of the Regulation (previously known as Regulation 346: General Air Pollution) included a set of suggested dispersion models in its Appendix. In broad terms, the Regulation:

- Prescribes "approved dispersion models" which are required to be used when assessing compliance with the standards in Schedules 2 or 3. These models include: those in the Appendix to Regulation 346, SCREEN3, AERMOD and ASHRAE. The Regulation also stipulates how the models are to be used with the various inputs (as applicable), including:
    - operating conditions;
    - source of contaminant emission rates;
    - meteorological conditions;
    - area of modeling coverage; and
    - terrain data.

- Includes a phase-out (between 2010 and 2020) of the models in the Appendix to Regulation 346, according to a timetable that varies by industrial sector (the sectors are identified using the North American Industry Classification System). See Appendix A for a list of the industrial sectors that are to have the initial phase-out of the models in the Appendix to Regulation 346.

- Includes a phased introduction by sector (in Schedules 4 and 5) of a requirement to prepare an ESDM report. The Regulation also specifies the report content and

[4] For contaminants with standards that have an annual averaging period, please refer to Chapter 12.4 and the ministry technical bulletin "Methodology For Assessment Of Contaminants With Annual Average Standards under O. Reg. 419/05" (as amended).

[5] A facility which emits only noise as a contaminant is not required to prepare an ESDM report.

requires that the report is to be: kept on-site for at least five years; up-dated annually and made available to the ministry upon request.

- Allows consideration of requests for a site-specific air standard. Requests for site-specific standards are based upon: local public input; a comparison of technology requirements and methods that are available for use; and (optional) economic factors. For more information on the site-specific standards, see ministry documents, "Guideline for Implementation of Air Standards in Ontario" and the "Guide to Requesting a Site-Specific Air Standard" available on the ministry website (as amended from time to time).

- Allows facilities to register to a technical standard if one is available. A technical standard is a legally enforceable technology-based solution that may be requested when two or more facilities in a sector may not be able to meet an air standard due to technical or economic limitations. The technical standard can include technology, operational, monitoring and reporting requirements. Once established, any facility in the sector may request to register under the technical standard, regardless of whether that facility can meet the air standard prescribed in the Regulation. Once a facility registers under a technical standard, it is no longer required to model in an ESDM Report the registered contaminants addressed in the technical standard that are linked to the North American Industrial Classification System (NAICS). For more information on technical standards, see ministry documents, "Guide to Registering to a Technical Standard" (as amended from time to time) available on the website.

As set out above, the Regulation includes three compliance approaches for regulated facilities to demonstrate environmental performance, and make improvements when required (meet the air standards, request and meet a site-specific standard or apply for registration and meet a technical standard (if available)). Most facilities in Ontario are regulated by the air standards compliance approach. This approach requires ESDM reports be developed (see Chapter 2.1 Who is Required to Prepare an ESDM Report). Site-specific air standards also require the preparation of ESDM reports. Facilities registered to a Technical Standard do not typically need to prepare an ESDM report for the registered contaminants but one may be requested (see Chapter 2.1.2 Special Case: A Property that includes all or a portion of the facility registered on Technical Standard Registry and the Regulation for more details).

2.0 OVERVIEW OF ESDM REPORTS

2.1 Who is Required to Prepare an EDSM Report?

The Regulation requires the preparation of an ESDM report in the following circumstances:

- By a person who is applying for an ECA or amendment to an ECA under section 20.2 of Part II.1 of the EPA – see subsections 22 (1) and 22 (2) of the Regulation.

- By a person who operates a facility that has an ECA that includes the requirement to prepare and maintain a current ESDM report.

- By February 1, 2010, by a person responsible for a facility within a class or an industrial sector listed in Schedule 4 of the Regulation (see subsection 23 (1)) who is required to annually update their ESDM report (see also Appendix A of this Procedure Document for a list of sectors included in Schedule 4 of the Regulation).

- By February 1, 2013, by a person responsible for a facility within a class or industrial sector listed in Schedule 5 of the Regulation (see subsection 23 (2)) who is required to annually update their ESDM report (see also Appendix A of this Procedure Document for a list of sectors included in Schedule 5 of the Regulation).

- By a person who receives a written notice from a ministry Director for submission of an ESDM report – see subsection 24 (1) of the Regulation when, for example, the ministry would like the person to demonstrate compliance with the air standards or for assessment purposes.

- By a person who discharges a contaminant that may result in a POI concentration that is above an Upper Risk Threshold in Schedule 6 of the Regulation – see subsection 30 (4). This report must be submitted to a ministry Director within three months of the discharge.

- By a person requesting a site-specific standard – see sections 32 to 37.1 of the Regulation as well as the ministry documents, "Guideline for the Implementation of Air Standards in Ontario" and the "Guide to Requesting a Site-Specific Air Standard", as amended from time to time, for more information on Site-Specific Standards). For more information on these ESDM reports, see also Chapter 13.3 Site-Specific Standards Compliance Approach.

2.1.1 Special Case: A Property that Includes Production Facilities with Multiple NAICS Codes

As noted above, Schedule 4 and Schedule 5 of the Regulation identify the targeted sectors that must prepare and annually update an ESDM report. These sectors are identified using the NAICS maintained for Canada by Statistics Canada. There may be occasions where a property may include a variety of production processes that may be identified by different NAICS codes. This may include a NAICS code listed in Schedules 4 or 5 and a NAICS code not listed in these schedules ("unscheduled"). In such a situation, either of the following contaminant-based options may be used in completing an ESDM report and updating it annually:

Option 1

Calculate POI concentrations as if <u>all</u> discharges from the property were from a facility in a sector listed in Schedule 4 or 5. Then under this option, POI concentrations for all sources on property whether they are categorized part of a sector listed in Schedule 4 or 5 or an unscheduled sector shall be calculated using the more advanced air dispersion models.

Option 2

1. Determine which contaminants are discharged from facilities on the property that are in sectors listed in Schedules 4 or 5.

2. Calculate POI concentrations of the contaminants determined by item 1 as if all discharges from all sources of these contaminants from the property were from a facility in a sector listed in Schedules 4 or 5. These POI concentrations shall be calculated using the more advanced air dispersion models.

3. For all of the remaining contaminants, calculate POI concentrations as if discharges of those contaminants from the property were from a facility in an unscheduled sector. Note that on February 1, 2020 all sectors must use the more advanced air dispersion models.

2.1.2 Special Case: A Property that includes all or a portion of the facility registered on Technical Standard Registry

Under certain conditions, the Regulation allows a facility to register under a technical standard for certain contaminants. For details in respect of technical standards, please refer to the Technical Standards publication document "Technical Standards to Manage Air Pollution" dated March 9, 2016, as amended from time to time. Registering for and meeting the requirements of a technical standard is a compliance approach recognized in the Regulation. The Technical Standards publication is published under the authority of section 38 of the Regulation.

There are two types of technical standards:

Industry Standards regulate all sources of a specified contaminant(s) within an industry sector.

Equipment Standards address a source of contaminant, but may apply to one or multiple industry sectors.

A facility may be registered under an industry standard, an equipment standard or a combination of an industry and an equipment standard. A facility that meets its obligations under a technical standard is in compliance with the Regulation for the registered contaminants.

In general, a person is exempt from Part II of the Regulation for a contaminant if the person is registered with respect to a sufficient number of industry standards, equipment standards or a combination of industry standards and equipment standards to address all sources of that contaminant at their facility. In this case, registering for and meeting the requirements of a technical standard(s) is the compliance approach under the Regulation as opposed to the air standards compliance approach that is based on contaminant concentrations and associated ESDM requirements. In this case, no ESDM report is required to be prepared or submitted for the relevant contaminants (e.g. Technical Standard registration(s) covers all contaminants emitted from all sources at the facility).

If a person is registered to an industry standard(s), equipment standard(s) or combination of industry standard(s) and equipment standard(s) in respect of a facility and a contaminant, but all sources of the contaminant at the facility are not addressed by theses technical standard(s) (i.e. there are sources of contaminant at the facility that are part of other NAICS codes), the person may only exclude the sources of contaminant(s) that are associated with the NAICS code addressed in the technical standard(s). An ESDM report would be required for the remaining contaminants that were not registered and/or sources that emitted these contaminants that are associated with a different NAICS code. See also note in Chapter 2.1.3 Special Case: A Property that includes a portion of the facility registered on the Environmental Activity and Sector Registry.

For more information, please refer to the Regulation and the "Guide to Applying for Registration to the Technical Standards Registry - Air Pollution".

Note: Under the Regulation, the Director may still issue a notice under section 24 to request a facility registered to one or more technical standard(s) to submit an ESDM report for assessment purposes only.

2.1.3 Special Case: A Property that includes a portion of the facility registered on the Environmental Activity and Sector Registry

Sources that are exempt from requiring an ECA under an exempting regulation or an Environmental Activity and Sector Registry (EASR) are still required to be included in the ESDM report for that facility. The EASR sources should be listed in the ***Sources and Contaminants Identification Table:*** for further information, see Chapter 6 Initial Identification Of Sources And Contaminants of this Procedure Document and the Guide to Applying for an Environmental Compliance Approval as amended.

Note: In accordance with the Regulation, an applicant for an ECA is required to include a source of contaminant in the ESDM report, unless the source of contaminant is exempt from all or portions of Part II of the Regulation. The only sources exempt from the requirement to do modelling are those addressed under a technical standard compliance approach.

2.2 Contents of an ESDM report

All ESDM reports are required to be prepared in accordance with section 26 of the Regulation. Section 26 sets out the minimum requirements for assessing compliance with ministry POI Limits. Chapter 3 Minimum Requirements For An Emission Summary And Dispersion Modelling Report of this Procedure Document sets out the minimum requirements for the contents of an ESDM report, as set out in section 26 of the Regulation.

ESDM reports are typically prepared as site-wide ESDM reports and include all contaminants that are discharged from the property. However, there are a number of sections within the Regulation which allow only specific contaminant(s) to be addressed in an ESDM report. Table 2-1: Contaminants Included in ESDM reports summarizes the sections of the Regulation which address which contaminants discharged from the property are to be assessed in an ESDM report.

TABLE 2-1: CONTAMINANTS INCLUDED IN ESDM REPORTS

Sections of the Regulation Requiring Site-Wide ESDM reports (i.e. All Contaminants)	**Sections of the Regulation Where Only Specified Contaminant(s) Need to be Addressed in the ESDM report**
Subsections 23 (1) and 23 (2): Facilities part of a class identified by a NAICS code listed in Schedule 4 or 5 must prepare a site-wide ESDM report addressing all sources and all contaminants.	Subsection 22 (2) states that it is not necessary for an ESDM report prepared to support an application for ECA to include contaminants other than those relevant to the application.
Subsection 24 (1): Facilities that receive a notice from the Director to prepare an ESDM report must ensure that it addresses all sources and all contaminants (see also section 24 (1.1)).	Subsection 24 (1.1): A notice from Director to prepare an ESDM report may be for specified contaminant(s).
Subsection 33 (1): Facilities that submit a request for a site-specific standard must prepare and submit an ESDM report that addresses all sources and all contaminants, not just the one that is the subject of the request.	Subsection 30 (6.1): States that it is not necessary for an ESDM report prepared because of a potential exceedence of an Upper Risk Threshold (s.30(4)) to include contaminants other than those specified in the notification given to the Director under s. 30 (3).

Note: Subsection 26 (1) paragraph 2 requires a facility to include all sources of contaminants that are discharged from the facility. However, sub-subparagraphs 3 iii B and C of subsection 26 (1) says that facilities that have been registered to the ministry's Technical Standards Registry (see subsections 42 (1), (3) and (4)) need only prepare an ESDM report that includes those contaminants and sources that are not covered by the facility's registration to a technical standard.

2.3 Update of an ESDM report

Section 25 of the Regulation sets out the requirements that relate to the updating of ESDM reports.

Facilities in Sectors listed in Schedules 4 and 5

ESDM reports that are required to be prepared for facilities in sectors identified in Schedules 4 and 5 shall after 2010 and 2013, respectively, be accurate as of December 31st in the year in which the last update was required to be completed (i.e., the ESDM report for these facilities must be updated on an annual basis). The update must be completed no later than March 31st in the following year.

If nothing has changed at the facility, the existing ESDM report could simply be copied and re-dated to indicate that the required annual update was considered and that the ESDM report is up-to-date. Note that the report cannot simply replace last year's as it must be kept on site for five years. Alternatively, a letter could be appended to the previous year's report indicating that it is up-to-date.

Things to look for could include:
a clear indication that the update is for the applicable reporting year;
date of update must be before March 31st of the year following the reporting year in order for facility to be compliant with section 25 of the Regulation;
an indication that the production was not increased; and
an indication that emissions have not changed and the POI concentrations set out in referenced report reflect the emissions and concentrations resulting from the facility for the year in question.

Note that a facility which estimates emissions using maximum operating scenarios may reduce operations in future years but the resultant maximum emissions scenarios, modelling and POI concentrations would remain the same in their ESDM reports. In this context, the ESDM report may not require revision.

However, if operations at the facility have changed such that sources at a facility are no longer operating etc., these changes should be recorded and as such a revised ESDM report would be expected so that it is accurate for the preceding year.

Facilities Applying for an Environmental Compliance Approval (ECA)

Section 25 of the Regulation stipulates that certain ESDM reports that are required to be submitted to the ministry as part of an application for ECA be updated annually. This update is required if the following criteria are met:
the ECA application is for a facility within a sector identified in Schedules 4 or 5; and
construction of the facility began after November 30, 2005; and
no application was made on or before that day for an ECA in respect of the facility.

For clarity, the above criteria captures 'new facilities' and is not intended to capture a modification or expansion of a facility or an installation of a new process at an existing facility. Where the above listed criteria are met, the ESDM report that accompanied the ECA application must be accurate as of December 31st in the year the report was prepared and must be updated annually. This update shall be completed no later than March 31st in the following year. Note that the annual update requirement does not apply to ESDM reports that accompany ECA applications where the above criteria are not met.

Please note that there may be ECAs (e.g. ECAs with Limited Operational Flexibility) that require periodic updates to the ESDM report as a condition of the approval. This is not discussed in this Procedure Document. Conditions to update this information are in addition to the requirements of the Regulation. For example, all facilities listed in Schedules 4 or 5 must have their ESDM updated as of March 31 of each year.

Regulatory Requirements for Other ESDM reports (Notice, URT, Site-Specific Standards (SSS))

In addition to ESDM reports described above, the annual update requirements in section 25 of the Regulation also apply to ESDM reports that are required to be submitted to the ministry because of:

1. a written notice from a ministry Director (s.24 of the Regulation);
2. a predicted exceedence of an Upper Risk Threshold (URT) in Schedule 6 of the Regulation (s.30(4) of the Regulation); or
3. a request to the ministry for site-specific standards (s.33(1) of the Regulation).

The above ESDM reports must be accurate as of December 31st in the year the report was prepared and updated annually. This update shall be completed no later than March 31st in the following year. It should be noted that, pursuant to subsection 25 (6), the annual update requirement does not apply to ESDM reports submitted for the above reasons if a ministry Director is satisfied that an exceedence of a standard and an adverse effect are not likely to occur.

Summary

In general, the ESDM reports must be up-to-date as of December 31 of the relevant year. Accordingly, ESDM reports must be dated "December 31 of the relevant year". The actual updating of the report may occur at any point throughout the relevant year, as long as the information is checked to ensure that nothing has changed (i.e. that it is current) as of December 31 of the relevant year. Finally, the Regulation requires the update to be completed by March 31 of the year following the relevant year. The facility must ensure that the information contained in the updated ESDM report is accurate to December 31 of the relevant year. See also Facilities in Sectors listed in Schedules 4 and 5.

If the update demonstrates an exceedence of a ministry POI Limit[6], notification requirements under subsections 25 (9) and 28 (1) of the Regulation may be triggered - see Chapter 13.0 Other Considerations That Require Follow Up Actions of this Procedure Document. If, after March 31 of the relevant year, a facility is still in the process of refining their ESDM report, a notification under subsection 25 (9) of the Regulation must be made as soon as practicable. This is irregardless of the stage of refinement of the ESDM report (i.e., even if section 12 of the Regulation has not yet been complied with). The facility should communicate its intention to further refine the ESDM report when they notify the ministry of an exceedence under this section. The ministry expects that a facility date the results of modelling runs and that re-modelling using more accurate inputs be completed within approximately six months of a more conservative modelling run that indicates an exceedence. Where ambient monitoring or comprehensive source testing is required to refine the modelling, it is acknowledged that more than six months may be required. These measurements would be done in accordance with a plan accepted by the ministry. Where there is a more serious risk to human health or the re-modelling exercise is straightforward,

[6]Reference to statements such as "sections 19 and 20 do not apply to discharges of the contaminant and the use of the model indicates that discharges of the contaminant may cause an adverse effect", "the discharge may cause an adverse effect" and similar statements within the Regulation are meant to require assessment of contaminants with ministry POI guidelines and screening levels (as well as contaminants without any ministry POI Limit).

[7]For the purposes of the guidance information contained in this Procedure Document, the term 'insignificant' is synonymous with 'negligible' and 'significant' is synonymous with the term 'not negligible'.

it is expected that the refinement be completed in less than six months and as soon as possible.

Under section 25 of the Regulation – Update of ESDM report:

"(9) A person who is required under subsection (8) to complete the update of a report not later than March 31 in a year shall, as soon as practicable after that date, notify a provincial officer in writing if the person has started to use an approved dispersion model with respect to a contaminant for the purpose of completing the update but has not yet complied with section 12, and,

(a) the use of the model indicates that discharges of the contaminant may result in a contravention of section 19 or 20; or

(b) sections 19 and 20 do not apply to discharges of the contaminant and the use of the model indicates that discharges of the contaminant may cause an adverse effect."

2.4 Retention of ESDM report

Section 27 of the Regulation requires that the most up-to-date ESDM report be kept at the place to which the report relates. The section also requires the ESDM report be made available to a provincial officer upon request. The executive summary of the ESDM report is also required to be made available to the public (by posting it on the Internet or by making it available during regular business hours at the place to which the report relates).

Retention of ESDM report, etc.

27. (1) A person who prepares or updates a report that is required to be prepared or updated in accordance with section 26 shall keep a copy of the report at the place to which the report relates for at least five years.

(2) A person who prepares or updates a report that is required to be prepared or updated in accordance with section 26 shall, on request, immediately submit a copy of the report or any part of the report to the Director or to a provincial officer.

(3) A person who prepares or updates a report that is required to be prepared or updated in accordance with section 26 shall ensure that a copy of the most up-to-date executive summary referred to in

paragraph 15 of subsection 26 (1),

(a) is made available for examination by any person, without charge, by posting it on the Internet or by making it available during regular business hours at the place to which the report relates; and

(b) is given, without charge, to any person within 15 days after the person requests it.

2.5 Requirements for ESDM Reports when Applying for a Environmental Compliance Approval

All ESDM reports must include all of the requirements set out in section 26 of the Regulation with one exception. Subsection 22 (3) of the Regulation provides the Director appointed for the purposes of Part II.1 of the EPA with the authority to relieve a person from the obligation to comply with any of the requirements set out in section 26 of the Regulation. The Director may exercise this discretion only if he or she is of the opinion that compliance with the particular requirement is not necessary to understand the impact of discharges of one or more contaminants.

Requirement for ESDM report: Environmental Compliance Approval

22(3) The Director may relieve a person who is required by subsection (1) to prepare a report in accordance with section 26 from the obligation to comply with any provision of subsection 26 (1) that is specified by the Director, subject to such conditions as are specified by the Director, if the Director is of the opinion that compliance with the provision is not necessary to understand the impact of discharges of one or more contaminants.

As a result, there may be some differences in the requirements for preparing an ESDM report when it is used to support an application for an ECA or to demonstrate compliance with the requirements of an ECA with Limited Operational Flexibility. This Procedure Document is designed to assist the reader by highlighting the potential differences using the text boxes accompanied by the rectangular “ECA” icon.

A question and answer document that provides guidance on a variety of topics, including how ESDM Reports are used within the ECA process, may also be published from time to time.

Clause 22 (1.2) (c) of the Regulation includes an additional requirement facilities should be aware of. This states that any new requirements that would apply to a facility (i.e. standards or approved models) must be included in an ESDM report one year sooner than they would

ordinarily apply for the purposes of submitting an ECA application under section 20.2 of Part II.1 of the EPA.

Requirement for ESDM report: Environmental Compliance Approval

22. (1) A person who applies for an environmental compliance approval or amendment to an environmental compliance approval in respect of a facility that discharges or will discharge a contaminant into the air shall prepare a report in accordance with section 26 and submit it to the Director as part of the application.

(1.1) Section 19 shall be deemed to apply for the purpose of preparing the report referred to in subsection (1) if,

(a) the application is made after January 31, 2009 and before February 1, 2010; and

(b) section 20 will not apply to discharges of the contaminant on February 1, 2010.

(1.2) Section 20 shall be deemed to apply for the purpose of preparing the report referred to in subsection (1) if,

(a) the application is made after January 31, 2009 and before February 1, 2010 and, pursuant to subclause 20 (3) (a) (i), section 20 will first apply to discharges of the contaminant on February 1, 2010;

(b) the application is made after January 31, 2012 and before February 1, 2013 and, pursuant to subclause 20 (3) (b) (i), section 20 will first apply to discharges of the contaminant on February 1, 2013; or

(c) the application is made after January 31, 2019 and before February 1, 2020 and, pursuant to clause 20 (3) (e), section 20 will first apply to discharges of the contaminant on February 1, 2020.

…

(4) If a person is required by subsection (1) to submit a report to the Director as part of an application for an environmental compliance approval or amendment to an environmental compliance approval, section 19 applies to the preparation of the report, the report relates to a contaminant listed in Schedule 7 for which a standard is set out

in an amendment to Schedule 2 that has not yet come into force, and the person submits the application to the Director less than 12 months before the amendment to Schedule 2 comes into force, the standard set out in the amendment shall be deemed to apply for the purpose of preparing the report.

(5) If a person is required by subsection (1) to submit a report to the Director as part of an application for an environmental compliance approval or amendment to an environmental compliance approval, section 20 applies to the preparation of the report, the report relates to a contaminant listed in Schedule 7 for which a standard is set out in an amendment to Schedule 3 that has not yet come into force, and the person submits the application to the Director less than 12 months before the amendment to Schedule 3 comes into force, the standard set out in the amendment shall be deemed to apply for the purpose of preparing the report.

3.0 MINIUMUM REQUIREMENTS FOR AN EMISSION SUMMARY AND DISPERSION MODELLING REPORT

Table 3-1 Summary Of Minimum Requirements For ESDM Report on the following page summarizes the minimum requirements of an ESDM report, set out in section 26 of the Regulation. Chapters 4 through 13 of the Procedure Document provide further information and explanation of the requirements summarized in Table 3-1 Summary Of Minimum Requirements For ESDM Report.

See Appendix D for an example format for a Table of Contents for an ESDM report.

Where there is any conflict between the ESDM report requirements in this Procedure Document and the requirements in Ontario Regulation 419/05: Air Pollution – Local Air Quality, as amended, then the requirements in the Regulation take precedence.

ECA

Applying for an ECA

ESDM Reports submitted to the ministry as supporting information to an application for an ECA must include a completed copy of an Emission Summary and Dispersion Modelling Checklist and signed form that is part of the Checklist. This Checklist is included in Appendix D of this Procedure Document. **If any of the items listed in the checklist are not submitted then the ESDM report may not be accepted by the Environmental Approvals Branch (EAB) unless the Director has exercised his or her discretion under s 22(3).**

It is also recommended that the purpose and scope of the application for ECA be included in the introduction to the ESDM report.

Applications for ECAs that include only noise as a contaminant are not required to complete an ESDM report.

The individual responsible for preparing the ESDM report must be able to defend the accuracy of the information presented in the report and sign to attest to it.

Table 3-1: Summary of Minimum Requirements for ESDM report

ESDM report Chapter	Minimum Requirements	See…
Chapter 4 Executive Summary	Overview of the ESDM report and Emissions Summary Table.	Regulation para. 15 of s. 26(1)
Chapter 5 Facility Description	The Facility Description should be provided in adequate detail to select and justify appropriate facility operating conditions.	Regulation para. 1 of s. 26(1)
Chapter 6 Initial Identification of Sources and Contaminants	Initial listing of all air emission sources and contaminants emitted from the facility. If applicable, a statement indicating the Industry Standards and Equipment Standards that a facility is registered to and its registered contaminants.	Regulation para. 2 of s. 26(1) subpara. 3 i of s. 26(1) sub-subparas. 3 iii B and C of s. 26(1)
Chapter 7 Assessment Of The Significance Of Contaminants And Sources	Eliminate negligible sources and contaminants from further analysis. The ESDM report must provide an explanation of how it was determined that an amount of a contaminant discharged is negligible and/or that a source discharges a contaminant in a negligible amount. (Note: This assessment is not required for contaminants that have been registered on the Technical Standards Registry, if applicable.)	Regulation s. 8 subpara. 3 ii of s. 26(1) subpara. 3 iii of s. 26(1) paras. 4, 5 of s. 26(1)
Chapter 8 Operating Conditions,	For each contaminant, describe the facility operating condition(s) that results in the actual maximum POI concentration that occurred within the last year or that corresponds to the maximum POI concentration that the facility is capable of. Operating conditions must correspond to the averaging period for each applicable ministry POI Limit.	Regulation s. 10 s. 12 para. 6 of s. 26(1)
Chapter 9 Emission Rate Estimating And Data Quality	Estimate emission rates; describe the estimating methodology for each significant (or non-negligible) contaminant or group of similar contaminants; and classify how accurately each method is in estimating emissions.	Regulation s. 11 s. 12 para. 7 of s. 26(1)

Table 3-1 Summary of Minimum Requirements for ESDM report (Continued)

ESDM report Chapter	Minimum Requirements	See…
Chapter 10 Source Summary Table and Site Plan	Appropriate detail to support the use of the approved models for contaminants that are not negligible. Note: A Source Summary Table should contain sufficient information to correlate the sources with the contaminants.	Regulation paras. 8 and 9 of s. 26(1)
Chapter 11 Dispersion Modelling	This Chapter Dispersion Modelling includes: o a description of the local land use conditions if ministry approved regional meteorological data has been refined to reflect local land use; o identification of the approved dispersion model that was used and a description of the way in which the approved dispersion model was used that is sufficient to show compliance with sections 8 to 17 of the Regulation (guidance and a suggested summary table format is provided in Chapter 11 Dispersion Modelling of this Procedure Document); and o a description of the terrain data that was employed if according to section 16, terrain data is required.	Regulation s. 6 s. 7 s. 8 - 17 s. 17.1 paras.10, 11 and 13 of s. 26(1)
Chapter 12 Emission Summary and Interpretation Of Results	A summary of the significant (or non-negligible) contaminants; the aggregate facility-wide emission rate; the maximum POI concentrations; comparison to ministry POI Limits; and interpretation of results/conclusions. Note: If an ESDM report is required, the Emission Summary Table should include contaminants registered to a technical standard with an explanation of why emissions or sources were not modelled.	Regulation para. 14 of s. 26(1)
Chapter 13 Other Considerations That Require Follow Up Actions	This Chapter Other Considerations That Require Follow Up Actions includes when to providing notice to a Provincial Officer; submission of an abatement plan; assessing concentrations and frequency at specified POIs; site-specific standards compliance approach; and the Technical Standards compliance approach.	Regulation s. 25(9) s. 30 32 to 37.1 s. 28 s. 29 s. 38
Appendices	Explanation of the identification of negligible sources and contaminants; supporting calculations; and dispersion model input files; and an electronic copy of the input and output files.	Regulation para. 12 of s. 26(1)

4.0 EXECUTIVE SUMMARY

The purpose of the Executive Summary in an ESDM report is to provide an overview of the facility and to outline whether or not it is meeting the appropriate POI Limits. Paragraph 15 of subsection 26(1) of the Regulation requires that the ESDM report include:

Under Subsection 26(1) of the Regulation – Contents of ESDM report:

"15. An executive summary of the information referred to in paragraphs 1 to 14 that includes, in full, the table required by paragraph 14."

Therefore, the Executive Summary must summarize all of the information required by section 26 of the Regulation to be included in the ESDM report and, must specifically include, the Emissions Summary Table required by paragraph 14 of subsection 26 (1) of the Regulation. Under section 54 of the Regulation, electronic submission of an entire ESDM report or part thereof may be required by a Director or provincial officer. It is recommended that an electronic copy of the executive summary be kept on site by the facility so that it may be made available to the ministry. See Chapter 11 Dispersion Modelling of this Procedure Document for more information on the required information that must be contained in an Emissions Summary Table.

Also under section 27 of the Regulation, others may request a copy of the Emission Summary Table:

Under Subsection 27(1) of the Regulation – Contents of ESDM report:

"27. (1) A person who prepares or updates a report that is required to be prepared or updated in accordance with section 26 shall keep a copy of the report at the place to which the report relates for at least five years.

(2) A person who prepares or updates a report that is required to be prepared or updated in accordance with section 26 shall, on request, immediately submit a copy of the report or any part of the report to the Director or to a provincial officer.

(3) A person who prepares or updates a report that is required to be prepared or updated in accordance with section 26 shall ensure that a copy of the most up-to-date executive summary referred to in paragraph 15 of subsection 26 (1),

(a) is made available for examination by any person, without charge, by posting it on the Internet or by making it available during regular business hours at the place to which the report relates; and

(b) is given, without charge, to any person within 15 days after the person requests it. "

It is also recommended that the Executive Summary indicate the reason for the preparation of the ESDM report (e.g., the ESDM report is part of an application for ECA; is required to satisfy sections 23 or 24 of the Regulation; site-specific standard, section 24 notice, etc.)

5.0 FACILITY DESCRIPTION

The purpose of the Facility Description in an ESDM report is to provide a summary of the operations and activities at the facility that discharge contaminants.

Paragraph 1 of subsection 26(1) of the Regulation requires that the Facility Description include:

Under Subsection 26(1) of the Regulation – Contents of ESDM report:

"1. A description of the activities that are engaged in on the property from which contaminants are discharged, including, if anything is produced on the property,

i. a description of what is produced and a statement of the amount of product that is produced on each day that the production process operates in accordance with the operating conditions described in paragraph 6,

ii. a description of the steps involved in the production process, including a drawing of the process,

iii. a description of the materials used in the production process, and

iv. a statement of the number of weeks per year, the number of days per week and the number of hours per day that the production process is in operation."

The Facility Description is intended as an overview of facility operations and relevant data to support the selection of the appropriate operating conditions that will form the basis of air emission rate estimates and the assessment of maximum POI concentrations.

Information related to the four items required by paragraph 1 of subsection 26(1) of the Regulation must be provided in sufficient detail to support the identification of the operating conditions that correspond to the maximum POI concentrations. Although the above-mentioned items must always be included in an ESDM report, they may be included in a general manner in the Facility Description, if more specific information relevant to the development of estimates of air emissions and maximum POI concentrations is provided in the operating condition portion of the ESDM report. For example, if the description of the operating conditions provides specific information to support the development of estimates of air emissions and maximum POI concentration then, the ESDM report could refer the

reader to these portions of the Report and the Facility Description may be expressed in a general manner including:

- what is produced;
- a summary of the overall facility production rate (or rates if multiple products are manufactured);
- an explanation of how the production rate(s) relate to the operating conditions that are used to estimate emissions and predict the maximum POI concentration;
- a statement within a Facility Description might indicate that "a maximum of 'x widgets' per day are produced where the applicable standard has a 24-hour averaging period and operating conditions, air contaminant emission rate estimates and corresponding predictions of POI concentrations contained in this ESDM report are either directly or indirectly related to this production rate";
- the basic unit processes (including a simplified process flow diagram), that are relevant to the air contaminants emitted from the facility;
- the raw materials that are most relevant to estimating air emissions;
- the overall facility production periods that will assist in defining the appropriate averaging periods for the operating conditions. For example, to assess compliance with a standard that has a 24-hour averaging period, it would be relevant to include the daily production at the facility; and
- whether or not any contaminants are part of a site-specific standard or registered to a technical standard.

The location with zoning information and identification of sensitive receptors is also helpful to have. Please refer to Chapter 8 Operating Conditions of this Procedure Document for a more detailed discussion of information required to describe the relevant operating conditions.

Providing the NAICS Code or Codes for the Facility

All Facility Descriptions in an ESDM report must include the NAICS code or codes that are applicable to the facility. The NAICS codes are maintained for Canada by Statistics Canada and may be amended from time to time. A facility should review the NAICS code descriptions to determine which codes best fit its site operations. This information is also provided by facilities when reporting air emissions under provincial regulations such as Ontario Regulation 127/01 – Airborne Contaminant Discharge Monitoring and Reporting, the Toxics Reduction Act and Ontario Regulation 455/09, Ontario Regulation 452/09 – Greenhouse Gas Emissions Reporting Regulation. The NAICS codes identified under these programs should be the same. NAICS codes are also provided when reporting under federal programs such as the National Pollutant Release Inventory (NPRI) requirements. In addition the Industry Canada web-site also includes descriptions for the various NAICS code sectors and sub-sectors.

The NAICS Code of the facility determines whether Section 19 or 20 of the Regulation applies to the facility at the time the ESDM report was prepared or updated, and whether section 19 or 20 of the Regulation is used in the ESDM report to assess compliance with the requirements of the Regulation. The Facility Description must include the NAICS code for the facility and which of s. 19 or 20 applies to the facility or specific contaminant.

ECA

Applying for an ECA

Applicants for an ECA must include a description of the facility however applicants are only required to provide a description of the facility that contains sources that emit contaminants in common with the sources that are the subject of the application itself.

6.0 INITIAL IDENTIFICATION OF SOURCES AND CONTAMINANTS

The purpose of this portion of an ESDM report is to provide an initial listing of the contaminants and individual sources of contaminants at the facility according to paragraphs 2 through 5 of subsection 26(1) of the Regulation:

Under Subsection 26(1) of the Regulation – Contents of ESDM report:

"…

2. Subject to subsection (2), a list of all contaminants that are discharged from the property and, for each of those contaminants, a list of all the sources of contaminant that are located on the property.

3. For each source of contaminant listed for a contaminant under paragraph 2,

i. a description of the source of contaminant, including the location of the source of contaminant,

ii. an indication of whether the source of contaminant was considered when using an approved dispersion model in respect of the contaminant for the purpose of this section, and

iii. if the source of contaminant was not considered when using an approved dispersion model in respect of the contaminant for the purpose of this section and,

A. the non-consideration was authorized by section 8, an explanation of how it was determined that the source of contaminant discharges a negligible amount of the contaminant,

B. the non-consideration was authorized by subsection 42 (4), a statement identifying the industry standard in respect of which the person is registered on the Ministry's Technical Standards Registry – Air Pollution that makes subsection 42 (4) applicable, or

C. the non-consideration was authorized by subsection 43 (3), a statement identifying the equipment standard in respect of which the person is registered on the Ministry's Technical Standards Registry – Air Pollution that makes subsection 43 (3) applicable.

4. Subject to subsections (2), a list of all contaminants that are discharged from the property in an amount that is not negligible.

5. For each contaminant listed under paragraph 2 that is discharged from the property in an amount that is negligible, an explanation of how it was determined that the amount is negligible."

Please note that it is acceptable for a facility to account for every source and contaminant in an ESDM report. However, if the facility is assessing significance (or non-negligible), the steps described in Chapter 7, Assessment of the Significance of Contaminants and Sources, are intended to focus the initial contaminant list into an identification of the significant[7] sources and contaminants for a more detailed analysis of emissions and POI concentrations. As a result, the guidance provided in Chapters 6 Initial Identification Of Sources And Contaminants and 7 Assessment Of The Significance Of Contaminants And Sources of this Procedure Document can generally be used together to satisfy the requirements of paragraphs 2 through 5 of subsection 26(1). In particular, it is recommended that the requirements of paragraph 2; subparagraphs 3i, 3ii and 3iii and paragraph 4 of subsection 26 (1) of the Regulation be presented in a ***Sources and Contaminants Identification Table*** which includes, for each source and contaminant emitted from the facility:

- A list of all sources on the property, including a brief description of the source or a source title; a general location (i.e., building or description of portion of property where the source can be found); and a source identifier. The Sources and Contaminants Identification Table should include sources that are addressed under the Technical Standard Registry or have been registered in the Environmental Activity and Sector Registry (EASR) (if a facility is required to do an ESDM report).

- A list of all contaminants that may be discharged from the facility. In most cases, it is sufficient to identify the types of contaminants (e.g., "by-products of combustion"; "volatile organic compounds"; "suspended particulate matter"; etc.)[8]. However, if a

7 For the purposes of the guidance information contained in this Procedure Document, the term 'insignificant' is synonymous with 'negligible' and 'significant' is synonymous with the term 'not negligible'.

8 Since the Source Summary Table (see Chapter 10 of this Procedure Document) includes a listing of the significant contaminants for each significant source, it is acceptable within the above-noted "Sources and Contaminants Identification Table" to include either a listing of the contaminants or a more generalized listing of the types of contaminants.

contaminant is not considered in the dispersion modelling then a specific list of these contaminants (and not just the types of contaminants) must be included as part of the explanation, required by sub-subparagraphs 3 iii B and C and paragraph 5 of subsection 26 (1) of the Regulation. The explanation should address how the facility determined that these contaminants do not need to be considered or were emitted in an amount that is negligible.

- A reference to the method that was used to identify the expected contaminants (see Table 6-2, Reference Information to Assist in Identifying Contaminants). Please note that this is an optional component of the Sources and Contaminants Identification Table.

- An indication of whether a contaminant is discharged from the facility in a negligible amount.

- An indication of whether a source discharges a negligible amount of a contaminant and, consequently, whether the source has been considered in the use of the approved dispersion models.

As per Chapter 2.1.2 Special Case: A Property that includes all or a portion of the facility registered on Technical Standard Registry, only some facilities registered under the Technical Standards Registry would be required to have an ESDM report for sources or contaminants that are not addressed in one or a combination of more than one Industry or Equipment Standards or they are not registered for. These facilities should list their sources of contaminants in the ***Sources and Contaminants Identification Table.***

See Appendix D for an example format for a Sources and Contaminants Identification Table. Also source labels to identify the sources should match the modelling input files and site plans.

The rationale for excluding negligible sources and contaminants emitted in negligible amounts must be included in the ESDM report (e.g., in an appendix to the report).

ESDM reports that are required to be prepared as a result of an exceedence of an Upper Risk Threshold listed in Schedule 6 of the Regulation (see in subsection 30 (4) of the Regulation) are required to consider only those contaminants for which an Upper Risk Threshold is predicted to be exceeded (s. 30 (6.1) of the Regulation).

6.1 Identifying Sources

A reference to the term “source” in this guidance document includes an individual point of emission or a distinct process or area from which emissions may originate.

Where multiple stacks or vents arise from a common process, the process itself may be considered a source rather than the individual points of emission. Where several separate processes, each causing a distinct mixture of contaminants, are discharged to a common stack, each separate process should be considered a separate source. For the purpose of

this guidance document, a 'process' is a production step or series of production steps for which an emission rate is calculated based on assessing the process as a whole.

Sources shall be identified regardless of when a source was installed or whether or not approval under Part II.1 of the EPA was obtained for that source. Starting October 31, 2011, the ministry's Environmental Approvals Branch (EAB) has implemented a new environmental approvals system to require a facility to either obtain an ECA (formerly C of A) or register online in the Environmental Activity and Sector Registry (EASR) for certain activities. Activities eligible for registration are set out in O. Reg. 245/11: Registrations under Part II.2 of the Act - General. Activities registered under the EASR are not required to obtain an ECA. However, the sources that are included in the activities are still required to be identified in the ESDM report prepared for the facility. The ESDM report must state that these sources are registered in EASR and therefore an ECA for the sources is not required to be obtained.

Note that as a result of the 2011 amendments to the EPA, an ECA is required for the ongoing operation of all equipment engaging in s. 9 (1) activities that are not excepted/exempted from the approval requirement, regardless of whether they were put in place.

ECA

Applying for a ECA

Applicants for an Environmental Compliance Approval under Section 20.2 of Part II.1 of the EPA are required to document only those sources that emit contaminants in common with the sources that are the subject of the application itself.

6.1.1 Fugitive Sources

For the purposes of this guidance document, a fugitive source is a source associated with an area or activity rather than a distinct point of emission or a source whose emissions are not emitted through a confined process stream. In general, fugitive sources should be included in the list or in the Sources and Contaminants Identification Table. Some examples of fugitive sources are:

- leakage of gaseous contaminants from valves or pipes;
- leaks of contaminants around process operations;
- incomplete capture from ventilation of process operations (such as hooding);
- particulate emissions from roof vents on a process building;
- particulate emissions from storage piles or open material conveying; and
- particulate emissions from travel over on-site unpaved roadways, paved roadways, and on-site traffic (e.g. bull-dozers, grading, and parking lots) for the sectors identified in Table 6-1 Sectors that Should List Fugitive Sources of Air Emissions.

Where emissions from fugitive sources may originate from a relatively large number of individual sources, it may be reasonable to group them together for the purposes of identification, emission rate estimating and dispersion modelling.

It is anticipated that the fugitive particulate from roadways, storage piles and other fugitive sources emitted by facilities within the sectors listed in Table 7-2 Sectors Where Metal Content Within Fugitive Particulate Must Be Considered may contain significant quantities of contaminants with health-based ministry POI limits such as metals. See Chapter 7.4 Fugitive Dust Emissions for more information on some outdoor dust emissions from fugitive sources.

Table 6-1: Sectors that Should List Fugitive Sources of Air Emissions

NAICS Code	NAICS Code Description
2122	Metal Ore Mining
2123	Non-Metallic Mineral Mining and Quarrying
221112	Fossil-Fuel Electric Power Generation (coal-fired only)
321113	Sawmills
3212	Veneer, Plywood and Engineered Wood Product Manufacturing
324121	Asphalt Paving Mixture and Block Manufacturing
327310	Cement Manufacturing
327320	Ready Mix Concrete Manufacturing
327330	Concrete Pipe, Brick and Block Manufacturing
327390	Other Concrete Product Manufacturing
327410	Lime Manufacturing
327420	Gypsum Product Manufacturing
331	Primary Metal Manufacturing
332810	Coating, Engraving, Heat Treating and Allied Activities
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing
5622	Waste Treatment and Disposal (landfills only)

This Table 6-1 Sectors that Should List Fugitive Sources of Air Emissions contains two columns. The first column contains the North American Industrial Classification System (NAICS) Code and the second column contains the corresponding NAICS code description.

6.2 Description of the Contaminants that May be Discharged

Contaminants that may be discharged from the facility must be identified in it's ESDM report. Generally available information such as guidance on air emissions that is published by environmental regulatory agencies; peer-reviewed documents; or industry sponsored studies may be used in most cases for this purpose. An indication of whether or not the study was validated by a regulatory agency or an independent third party should be provided when referencing industry sponsored studies. See Table 6-2 Reference Information to Assist in Identifying Contaminants for specific examples of reference information that can be used to identify the expected contaminants.

All contaminants that may be discharged to the air from the facility must be included in an ESDM report, even if there is no ministry POI Limit. However, it should be noted that the facility is not required to assess emissions for the contaminants that have been registered

under the Technical Standards Registry (see Chapter 2.1.2 Special Case: A Property that includes all or a portion of the facility registered on Technical Standard Registry of this Procedure Document for further information) unless the source of that contaminant is from a NAICS code not considered in the technical standard(s) the facility is registered to.

For further information on assessing the significance of sources and contaminants please see Chapter 7 Assessment Of The Significance Of Contaminants And Sources of this Procedure Document.

Table 6-2: Reference Information to Assist in Identifying Contaminants

Material Balances: Material Safety Data Sheets for materials used in process

Emission Factor Documents and Reports.
The United States Environmental Protection Agency (US EPA) publishes a variety of emissions related information to assist facilities in assessing impacts. This information is often used to assess emission rates from various production processes. Although it is reasonable to use site or sector-specific studies as a means of identifying the expected contaminants emitted from various sources, the following references are also commonly used and widely available:

i) Emission Factors published in the US EPA Document Number AP-42, Compilation of Air Pollutant Emission Factors. This document includes process description and emission factors for a broad range of criteria contaminant emission sources. Supplements are published regularly.

ii) Factor Information Retrieval (FIRE) Data System. The FIRE Data System (from the US EPA) is a database that can be used in an initial effort to identify contaminants. Note: although the FIRE Data system can be used to identify contaminants from a variety of sources, the quality of the emission factors listed in this system varies.

iii) Locating and Estimating (L&E) documents for specific contaminants. The L&E report series, are for specific air toxic emissions from sources (source category or substance) and characterizes the source categories for which emissions of a toxic substance have been identified. These volumes include general descriptions of the emitting processes, identifying potential release points and emission factors. The L&E series presently contains emission reports for the following contaminants:
Acrylonitrile, Arsenic, Benzene, 1,3 Butadiene, Cadmium, Carbon Tetrachloride, Chlorobenzene, Chloroform, Chromium, Cyanide, Dioxins and Furans, Epichlorohydrin, Ethylene Dichloride, Ethylene Oxide, Formaldehyde, Lead, Mercury, Methyl Chloroform, Methyl Ethyl Ketone, Methylene Chloride, Nickel, Perchloroethylene, Phosgene, Polycyclic Organic Matter, Styrene, Toluene, Vinylidene Chloride and Xylene.

iv) U.S. state environmental agencies also publish information such as the State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Officials (ALAPCO).

v) Guidance and emission rate estimating information provided by the Ontario Ministry of the Environment for Regulation 127/01 - Airborne Contaminant Discharge Monitoring and Reporting and provided by Environment Canada for reporting to the National Pollutant Release Inventory.

vi) Contaminants identified from site-specific source testing and/or industry sponsored studies.

vii) In addition to the above, other information from regulatory agencies in a variety of jurisdictions is also available including Environment Canada; Australia; and the European Union; etc.

This Table 6-2 Reference Information to Assist in Identifying Contaminants contains just one column, and is intended to emphasize its contents.

6.3 General Location

The location of each source identified in the ESDM report prepared for the facility must be provided. The intent is to ensure that ministry staff are able to locate the source either on a site plan or in a site visit.

6.4 Overview of Identifying and Assessing Sources and Contaminants

The following summarizes, in broad terms, the approach to initially identify sources and contaminants emitted from the facility. The summary is intended to also provide an analysis that is focused on the significant sources and contaminants. The ESDM report should:

i. Identify the sources and contaminants emitted from the facility (for guidance, see reference material in Table 6-2 Reference Information to Assist in Identifying Contaminants of this Procedure Document). [Note: please ensure the source identifiers in all ESDM reports are consistent. If there is a change in the name, please identify the old and new name. The ESDM report should include a tabulated summary that co-relates short-form source identifications that are used in the modelling runs and/or Source Summary Table with brief descriptions of each source].

ii. Document the sources and contaminants in a Sources and Contaminants Identification Table or Tables. (Note: these Tables should include the sources and contaminants that have been registered on the EASR. If a facility has registered under the Technical Standards Registry, and is still required to prepare an ESDM report for other contaminants, then these sources should also be listed in the Sources and Contaminants Identification Table. If there is no requirement for an ESDM report, then this is not necessary).

iii. An optional assessment of the significance of sources and contaminants can be done. If an assessment of significance is made, it must be documented (see Chapter 7 Assessment Of The Significance Of Contaminants And Sources of this Procedure Document). (Note: It is acceptable to exclude assessment of the contaminants that have been registered under the Technical Standard Registry by referencing the appropriate section of the Regulation.)

iv. Include emission rates that have been developed for the significant contaminants and sources based upon a review of operating conditions (see Chapter 8 Operating Conditions of this Procedure Document).

v. Document the emission rates and source parameters for the significant contaminants and sources in a Source Summary Table (see Chapter 10 Source Summary Table And Site Plan). [Note: A Source Summary Table should contain sufficient information to correlate the contaminant and the source].

vi. Include complete dispersion modelling for the significant contaminants and sources (see Chapter 11 Dispersion Modelling).

vii. Include the results of the dispersion modelling in an Emission Summary Table (see Chapter 12 Emissions Summary Table and Interpretation Of Results). Note: It recommended that contaminants registered under the Technical Standard Registry should be included in the Emission Summary Table with an indication of the title of the technical standard the facility is registered under.

7.0 ASSESSMENT OF THE SIGNIFICANCE OF CONTAMINANTS AND SOURCES

Please note that it is acceptable for the facility to account for every source and every contaminant in its ESDM report. However, the facility may also choose to assess the significance of sources and contaminants and eliminate those that are determined to be negligible from further analysis. This approach may allow a facility to focus on a more detailed analysis of emissions and POI concentrations of the significant contaminants and sources.

Where the facility opts to focus on the significant sources and contaminants, the ESDM report must provide an explanation of how it was determined that a contaminant is discharged in a negligible amount. The results of this assessment may be summarized in a Sources and Contaminants Identification Table.

Note that although a facility may emit a contaminant in a significant amount, there may be some sources that emit this contaminant in a negligible amount. Section 8 of the Regulation sets out requirements for assessing negligible sources of contaminant(s).

Negligible Sources of Contaminant

"8. (1) It is not necessary, when using an approved dispersion model for the purposes of this Part, to consider a source of contaminant that discharges a negligible amount of the relevant contaminant, having regard to,

(a) the total amount of the contaminant that is discharged by all the sources of contaminant with which the approved dispersion model is used; and

(b) the nature of the contaminant.

(2) Despite subsection (1), the Director may give written notice to a person who discharges or causes or permits discharges of contaminants requiring the person to consider a source of contaminant specified in the notice in accordance with the notice when the person uses an approved dispersion model for the purposes of this Part, if,

(a) the Director has reasonable grounds to believe that, if the source of contaminant is considered, the person may contravene 19 or 20; or

(b) sections 19 and 20 do not apply to discharges of the relevant contaminant and the Director has reasonable grounds to believe that, if the source of contaminant is considered, a discharge of the relevant contaminant may cause an adverse effect.

(3) Before the Director gives a person a notice under subsection (2), the Director shall give the person a draft of the notice and an opportunity to make written submissions to the Director during the period that ends 30 days after the draft is given."

Section 26 of the Regulation sets out the requirements for documenting assessments of significant sources in an ESDM report. The ESDM report must include an indication of whether a source of contaminant was considered when using an approved dispersion model (see s. 26 (1) 3 ii, and s. 8).

In addition, paragraph 4 of subsection 26 (1), of the Regulation requires that the ESDM report must also include a list of contaminants that are emitted in significant (or non-negligible) amounts. For clarity, contaminants determined to be emitted in negligible amounts do not need to be included in this list (s. 8).

The ESDM report must include an explanation of how it was determined that contaminants and sources were considered negligible (s.26 (1) 3 iii A and 5). The ESDM report also must include information related to significant contaminants and sources to be included (e.g. in the description of operating conditions, the explanation and assessment of emissions, the Source Summary Table, the site plan, the identification of the approved dispersion model and the Emission Summary Table).

In summary, the combination of section 8 and paragraphs 3 through 9 and paragraph 11 of subsection 26 (1):

- allow for the exclusion of negligible contaminants and sources from both the use of the models and certain portions of the ESDM report (note however that paragraph 2 of subsection 26 (1), requires all sources and contaminants to be listed); and

- require an explanation of how it was determined that a contaminant is emitted in a negligible amount or a source of contaminant discharges a negligible amount of the contaminant.

- in an effort to ensure that ESDM reports are comprehensive enough to identify any exceedences of POI Limits, the ministry may, as a result of site-specific considerations and consistent with subsection 8 (2) of the Regulation, require the inclusion of sources that were originally considered negligible.

Chapter 6 Initial Identification Of Sources And Contaminants provides guidance on the initial listing of all sources and contaminants. The rationale for excluding insignificant sources and contaminants emitted in negligible amounts must be included in the ESDM report (e.g., in an appendix to the report). The following three options have been developed to provide guidance in assessing the significance of sources and contaminants and thereby eliminating negligible sources and contaminants from further analysis:

1. Screening-Out Contaminants that are Emitted in Negligible Amounts (refer to Chapter 7.1 Screening-Out Contaminants that are Emitted in Negligible Amounts)

2. Screening-Out Sources that Emit Contaminants in Negligible Amounts (refer to Chapter 7.2 Screening-Out Sources that Emit Contaminants in Negligible Amounts)

3. Generalized Guidance to Identifying Insignificant or Significant Sources and Contaminants (refer to Chapter 7.3 General Guidance to Identifying Insignificant or Significant Sources and Contaminants)

In addition, fugitive dust emissions from on-site road-ways and storage piles may be excluded from use with the approved dispersion models under the special circumstances set out in Chapter 7.4 Fugitive Dust Emissions.

ECA

Applying for an ECA

The identification of a source or contaminant as negligible for the purposes of an ESDM report does **not** provide an exemption from the requirement to obtain an ECA under Section 20.3 of Part II.1 of the EPA, unless the source is included in an activity under Part II.2 of the EPA.

7.1 Screening-Out Contaminants that are Emitted in Negligible Amounts

The significant contaminants for some types of sources can be readily defined. One method of identifying significant contaminants is to use emission thresholds (see Chapter 7.1.2 Identifying Significant Contaminants Using an Emission Threshold). Appendix B and Table B-1: Guidance for Screening-Out with Dispersion Factors provide guidance on using dispersion factors to screen-out contaminants. Another method of identifying significant contaminants is to use the ministry's list of de minimus concentrations for contaminants that do not have ministry POI Limits. Appendix B Supporting Information for the Assessment of the Significance of Contaminants and Sources provides guidance on how to apply the de minimus values in Table B-2B List of Contaminants Excluded from de minimus level.

7.1.1 Combustion of Natural Gas and Propane

The significant contaminant from the combustion of natural gas and propane is typically nitrogen oxides. Other contaminants, for this type of source, are generally emitted in negligible amounts.

7.1.2 Identifying Significant Contaminants Using an Emission Threshold

In most cases, contaminants that are emitted from a specific facility may be identified as negligible when they are below emission thresholds that are developed using the following formula:

$$\text{Emission Threshold (g/s)} = \frac{0.5 \times \text{Ministry POI Limit } (\mu g/m^3)}{\text{Dispersion Factor } (\mu g/m^3 \text{ per g/s emission})}$$

Aggregate facility-wide emissions of a contaminant that are less than the calculated site-specific Emission Threshold may be considered negligible.

Notes for Development of Emission Thresholds:

i) The averaging period for the Emission Threshold calculation must be consistent. The averaging period for the ministry POI Limit and the dispersion factor must be the same (see following example of developing site-specific emission thresholds).

ii) The appropriate ministry POI Limit can be obtained from the ministry "Air Contaminants Benchmarks List (ACB List): standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants" available from the ministry website[9].

iii) Where a contaminant has more than one ministry POI Limit, multiple emission thresholds must be calculated. The emission threshold(s) can be converted to the appropriate averaging period (e.g., mass per 24-hour period for a ministry POI Limit with a 24-hour averaging period and mass per 1 hour period for a ministry POI limit with a 1 hour averaging period, such as nitrogen oxides).

[9] For the purposes of identifying a contaminant/source as insignificant, the Screening Levels (SLs) (B2 values) may also be used. However, it is not appropriate to use the URTs or Assessment Values.

iv) See Appendix B, Table B-1 Guidance for Screening-Out with Dispersion Factors for factors that are dependent upon distance from the source to the closest POI (use the source that has a POI closest to it, for multiple sources of a contaminant) and have been developed, on a maximum 1-hour average basis, by the ministry using a conservative set of assumptions. These factors can be converted to other averaging periods (to remain consistent with the averaging period for the ministry POI Limit) using the formula set out in section 17 of the Regulation or the equivalent formula set out below in Table 7-1 Averaging Period Conversion Factor (F).

v) $\mu g/m^3$ means micrograms per cubic metre.

Table 7-1: Averaging Period Conversion Factor (F)

$$C_0 = C_1 \times F$$

where,

C_0 = the concentration at the averaging period t_0

C_1 = the concentration at the averaging period t_1

F = factor to convert from the averaging period t_1 to the averaging period t_0

$= (t_1/t_0)^n$

and where, the exponent n is 0.28, which is generally representative of average conditions across a range of atmospheric stabilities. Note that alternative values for the exponent n can be selected, if approved by the ministry.

This Table contains just one column, and is intended to emphasize its contents which are calculating conversion factors for averaging times.

In most cases, Emission Thresholds for contaminants without ministry POI Limits may be developed using ministry recommendations for de minimus POI concentrations (24-hour average basis) that are set out in Appendix B (see Table B-2A: De minimus Concentrations for Contaminants Not Listed in the ministry ACB List that Can Be Considered Insignificant in a Specific Situation and Table B-2B: List of Contaminants Excluded from de minimus level) of this Procedure Document. These de minimus concentrations are only applicable to contaminants that are not included in the ACB List (see Chapter 12.2 Contaminants without Ministry POI Limits). The appropriate use of other dispersion modelling screening tools, such as SCREEN3 in screening-mode, as described in the ministry document, “Air Dispersion Modelling Guideline for Ontario” (as amended from time to time) may also be used to assist in the development of Emission Thresholds.

Examples of Developing Site-Specific Emission Thresholds:

- Contaminant is Xylenes (CAS # 1330-20-7) and Shortest Distance from a Number of Sources to the Property-Line (in an area classified as urban) is 50 metres

  i) The standard in Schedule 3 of the Regulation for Xylenes is 730 µg/m^3 (24-hour average).

  ii) The 1-hour average Dispersion Factor from Appendix B for 50 metres (interpolated) = 5450 µg/m^3 per g/s.

  iii) Dispersion Factor Converted to 24-hour average is 5450 x $(1/24)^{0.28}$ = 2238 µg/m^3 per g/s.

  iv) Site-Specific Emission Threshold for Xylenes:
  = 0.5 x (730/2238) = 0.16 g/s or 14 kilograms per 24-hour period.

  Therefore, in this situation, if facility-wide emissions of Xylenes are less than 14 kilograms in a 24-hour period they can, in most cases, be considered negligible.

7.1.3 Sub-Speciation of Contaminants

There are some ministry POI Limits (e.g., mineral spirits[10]) that represent a group of contaminants. In these cases, sub-speciation into the individual components is generally not required unless the mixture contains contaminants with specific ministry POI limits.

In addition, there may be situations where air emissions may be comprised of a complex mixture of a relatively large number of contaminants. For example, volatile organic compound emissions are comprised of a multi-component spectrum of compounds that make up raw materials at a facility. In this or a similar type of situation, it is reasonable to focus on those substances that have already been identified through other air emission reporting processes such as the federal National Pollutant Release Inventory. These emission reports are submitted through Environment Canada's Single Window Reporting System.

For clarity, speciation of VOCs in a maximum ground level concentration [MGLC] acceptability request is necessary.

[10] As defined in the Regulation, "mineral spirits" are petroleum distillate mixtures of C_7 – C_{12} alkanes (paraffins) and cycloalkanes (naphthenes) ranging from 5 to 20 percent aromatics by weight and less than 0.1 percent benzene by weight with a boiling point ranging from 130 – 220 degrees Celsius and a flash point ranging from 21 – 60 degrees Celsius.

7.2 Screening-Out Sources that Emit Contaminants in Negligible Amounts

Although a facility may emit a contaminant in a significant amount, there may be some sources that emit this contaminant in a negligible amount. The following Chapters provide guidance to screen-out sources of contaminants emitted in negligible amounts.

7.2.1 Specific Examples of Sources that Emit Contaminants in Negligible Amounts

Appendix B, Tables B-3A and B-3B list examples of sources that may emit contaminants in negligible amounts. In general, sources in Table B-3A Specific Examples of Sources that Likely Emit Contaminants in Negligible Amounts may be considered to likely emit contaminants in negligible amounts, however an additional explanation may be required on a case by case basis to justify these sources as negligible. Sources in Table B-3B: Examples of Sources that may Emit Contaminants in Negligible Amounts are examples of sources that ***may*** emit contaminants in negligible amounts but an additional rationale is needed.

7.2.2 Sources that are Insignificant Relative to Total Emissions

It may not be necessary to consider a source of contaminant that discharges a negligible amount of the relevant contaminant, having regard to the total amount of the contaminant that is discharged by all the sources of contaminant and to the nature of the contaminant (s. 8).

Sources that, in combination, represent less than 5% of total property-wide emissions of a contaminant can, in many cases, be considered negligible sources.

There are some exceptions to this general concept and as such, the ministry may require, on a case-by-case basis, the inclusion of sources that would typically be considered insignificant relative to property-wide emissions of the contaminant. For example, a source would be required to be included in the modelling of an ESDM report where it emits a relatively small amount of a contaminant, but is the main contributor to the POI concentration due to the close proximity of the source to the POI or poor atmospheric dispersion. Similarly, an otherwise negligible source may be required to be included in the modelling of the ESDM report where there is concern about the nature of the contaminant.

7.3 General Guidance to Identifying Insignificant or Significant Sources and Contaminants

Facility-specific assessments, within ESDM reports, of the significance of sources and contaminants can be developed and proposed but they should be submitted to the ministry for review prior to their inclusion in the ESDM report. Any facility-specific assessment is required to be consistent with the Regulation (in particular, section 8 and paragraphs 2 through 5 of subsection 26 (1)). Site-specific assessments of significance can be based on either qualitative or quantitative arguments or a combination of both.

Decisions that are made by the ministry on facility-specific proposals may be communicated to others, after being generalized and removing proprietary information or other confidential information under *Freedom of Information and Protection of Privacy Act*.

In addition, the ministry may, in cooperation with representatives of various industry sectors, develop sector-specific guidance to assist in identifying the significant sources that need to be included in an ESDM report. Sources not identified as significant could then be considered negligible.

7.4 Fugitive Dust Emissions

The operations of some sectors lend themselves to dust emissions from fugitive sources such as on-site roadways, storage piles and other fugitive sources. Emissions from these sources can be significant or of concern if the dust includes contaminants with health-based ministry POI Limits or if the emissions are likely to be relatively high. However, in some situations, fugitive dust emissions from on-site roadways, storage piles and other fugitive sources are insignificant or negligible. In many cases, the most appropriate manner in which to manage POI concentrations from these types of sources is through an effective best management practices plan. As a result, generally, fugitive dust emissions from on-site roadways, storage piles, and other fugitive sources may be excluded from the dispersion modelling assessment of compliance with ministry POI Limits, where:

a. the nature of the fugitive dust emissions is such that they are not likely to pose a health risk to humans; and
b. the emissions are relatively small or have been minimized through effective implementation of a fugitive dust control plan, consistent with best management practices.

If the emissions from fugitive sources contain significant quantities of any contaminants with health-based ministry POI limits, these must be included in the modelling. If the fugitive dust emissions include contaminants with no ministry POI limits, the contaminants must be included in the modelling of the ESDM report unless they are considered negligible.

7.4.1 Special Case: Consideration of a Best Management Practices Plan for Fugitive Dust

Fugitive particulate emissions from on-site roadways[11], storage piles (that are susceptible to wind erosion), and other fugitive sources must be included in an ESDM report when the particulate contains significant quantities of contaminants that contribute to a ministry POI Limit that may cause a health effect (e.g., metals or other health-based ministry POI limits). As set out below, in certain circumstances particulate emissions from fugitive sources do not have to be included in the ESDM report if the facility has implemented a best management practices (BMP) plan for fugitive dust. For more information on BMPs, please refer to the ministry Technical Bulletin: Management Approaches For Industrial Fugitive

[11] Also see Appendix E: Guidance for Standards with Annual Averages Estimation of Particulate Emissions from Paved and Unpaved Roads

Dust Sources, dated September 2016, as amended (which replaced Review Of Approaches To Manage Industrial Fugitive Dust Sources, dated January 2004).

Note: Stationary sources such as loading/unloading areas, material handling processes such as conveyor systems and related drop-points should be included in the modelling.

1. Sectors where metals in fugitive dust must be considered

It is anticipated that the fugitive dust from roadways, storage piles, and other fugitive sources emitted by facilities within the sectors listed in Table 7-2 Sectors Where Metal Content within Fugitive Particulate must be Considered may contain significant quantities of metals or other contaminants with health-based ministry POI limits, or where no limit exists, may cause adverse health effects.

Table 7-2: Sectors Where Metal Content within Fugitive Particulate must be Considered

NAICS Code	NAICS Code Description
2122	Metal Ore Mining
331	Primary Metal Manufacturing
332810	Coating, Engraving, Heat Treating and Allied Activities
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing

Table 7-2 Sectors Where Metal Content within Fugitive Particulate must be Considered contains two columns. The first column contains the NAICS Code and the second column contains the corresponding description.

Accordingly, metals (or other contaminants with health-based POI Limits) in fugitive emissions from on-site roadways, storage piles and other fugitive sources from facilities within these sectors must be included in the assessment of compliance when using an approved dispersion model. In addition, it is recommended that facilities in these sectors develop and implement a BMP plan to manage fugitive dust emissions.

Sufficient information must be provided to estimate the amount of metal content in the particulate. For example, speciation of metal content in fugitive emissions through site-specific analyses of road dust, storage piles or other fugitive sources would be useful to support emission estimates. If data quality of the emission estimates is not sufficient, a notice under s. 11 of the Regulation may be considered. If any facility claims that roads or other fugitive dust sources are negligible, adequate sampling of the sources would be required to support this: a notice under section 8 of the Regulation may also be considered.

In addition to metals (or other contaminants with health-based POI Limits), fugitive particulate dust emissions from on-site roadways, storage piles and other fugitive sources from facilities within the sectors listed in Table 7-2 Sectors Where Metal Content within Fugitive Particulate must be Considered may also need to include an assessment SPM emissions unless the facility:

1. develops and implements a BMP plan and a copy of this plan is included as an Appendix to the ESDM report; and
2. retains a copy of the BMP plan and appropriate implementation records on-site for inspection by the ministry; and,

3. demonstrates that each contaminant that has a health-based ministry POI Limit (or that may cause health effects) has been adequately assessed in the ESDM report and any issues have been addressed.

BMPs should contain the best available controls for fugitive dust, and therefore best available control of all contaminants associated with the particulates from fugitive sources. For more information, please see the ministry Technical Bulletin: Approaches to Manage Industrial Fugitive Dust Sources (as amended). If an adequate BMP plan is implemented at a facility, fugitive dust emissions from roadways, storage piles or other fugitive sources may generally be considered to be a negligible source. Proponents may be asked to include sources of fugitive dust in the ESDM report if the BMP plan is not acceptable to the ministry or if sufficient information has not been provided on other contaminants of concern. The Director has the authority to require a person who discharges or causes or permits discharges of a contaminant to consider a source of contaminant as not being negligible (see subsection 8 (2) of the Regulation).

Note: BMP plans required by ECAs are reviewed by the district office and the Part II.1 Director. BMPs may also be part of an action plan as part of a site-specific standard request (part of SDB review).

2. Sectors where metals in fugitive dust is generally not anticipated

Fugitive dust emitted from facilities in the sectors listed in Table 7-3 Sectors where Metals in Fugitive Particulate is Generally Not Anticipated is generally not expected to contain significant quantities of metals or other contaminants with health-based POI limits in the dust. Nevertheless, fugitive particulate from on-site roadways, storage piles and other fugitive sources from facilities within the sectors listed in Table 7-3 Sectors where Metals in Fugitive Particulate is Generally Not Anticipated must be included in the assessment of compliance with ministry POI Limits including SPM unless the facility:

1. develops and implements a BMP plan and a copy of this plan is included as an Appendix to the ESDM report; and
2. retains a copy of the BMP plan and appropriate implementation records on-site for inspection by the ministry; and,
3. demonstrates that each contaminant that has a health-based ministry POI Limit (or that may cause health effects) has been adequately assessed in the ESDM report and any issues have been addressed.

The BMP should contain the best available controls for fugitive dust, and therefore best available control of all contaminants associated with the particulates from fugitive sources. For more information, please see the ministry Technical Bulletin: Approaches to Manage Industrial Fugitive Dust Sources (as amended). If an adequate BMP plan is implemented at a facility, fugitive dust emissions from roadways, storage piles or other fugitive sources may generally be considered to be a negligible source. It should be noted that proponents may be asked to include sources of fugitive dust in the ESDM report if the BMP plan is not acceptable to the ministry. The Director has the authority to require a person who discharges or causes or permits discharges of a contaminant to consider a source of contaminant as not being negligible (see subsection 8 (2) of the Regulation).

The ministry Technical Bulletin: Approaches to Manage Industrial Fugitive Dust Sources (as amended) includes a review of approaches to manage industrial fugitive dust sources. The suggested approaches in the Technical Bulletin can be modified and customized based upon site-specific considerations including the proximity of receptors and based upon input by ministry staff.

Table 7-3 Sectors where Metals in Fugitive Particulate is Generally Not Anticipated

NAICS Code	NAICS Code Description
2123	Non-Metallic Mineral Mining and Quarrying
221112	Fossil-Fuel Electric Power Generation (coal-fired only)
321113	Sawmills
3212	Veneer, Plywood and Engineered Wood Product Manufacturing
324121	Asphalt Paving Mixture and Block Manufacturing
327310	Cement Manufacturing
327320	Ready Mix Concrete Manufacturing
327330	Concrete Pipe, Brick and Block Manufacturing
327390	Other Concrete Product Manufacturing
327410	Lime Manufacturing
327420	Gypsum Product Manufacturing
5622	Waste Treatment and Disposal (landfills only)

This Table 7-3 Sectors where Metals in Fugitive Particulate is Generally Not Anticipated contains two columns. The first column contains the NAICS code and the second column contains the corresponding description.

7.4.2 When Fugitive Dust Emissions are Negligible

Fugitive dust emissions from roadways, storage piles, or other fugitive sources may generally be considered to be a negligible source for facilities in sectors that are not included in Tables 7-2 Sectors Where Metal Content Within Fugitive Particulate Must Be Considered and 7-3 Sectors where Metals in Fugitive Particulate is Generally Not Anticipated. However, if the emissions contain significant quantities of contaminants with health-based ministry POI limits, then these sources would not be considered negligible and should also be included in the modelling.

8.0 OPERATING CONDITIONS

Facility operating conditions affect contaminant emission rates and emission rates are key inputs to the use of the approved models and assessment of POI concentrations. The purpose of this portion of an ESDM report is to document both the facility operating conditions (that are relevant to estimating emission rates) and the development of emission rate estimates for the significant air contaminants discharged from the facility.

Section 10 of the Regulation relates to facility operating conditions. Section 11 sets out the requirements for emission rates. In general, section 12 sets out the requirements to "refine" emission rate estimates[12] when the combined effect of sections 10 and 11 result in predictions of exceedences of ministry POI Limits. In summary, sections 10, 11 and 12 of

[12] Also note that section 12 of the Regulation allows a person to abate as an alternative to refining.

the Regulation work together to ensure that the assessment of maximum POI concentration are as accurate as possible and do not under-estimate actual concentrations.

8.1 Operating Conditions

Operating conditions provide key information to the development of emission rate estimates. For example, operating conditions link to production information which are often the basis for emission factors used for emission rate estimates. Subsection 10 (1) of the Regulation states:

Operating Conditions

"10. (1) An approved dispersion model that is used for the purposes of this Part shall be used in accordance with one of the following scenarios for each averaging period applicable to the relevant contaminant under section 19 or 20, whichever is applicable:

1. ***A scenario that, for the relevant averaging period, assumes operating conditions for the facility that would result in the highest concentration of the contaminant at a point of impingement that the facility is capable of.***

2. ***A scenario that, for the relevant averaging period, uses actual operating data for the facility for the occasion when the highest concentration of the contaminant at a point of impingement resulted during,***

    i. ***the year preceding the year in which the model is being used; or***

    ii. ***the year in which the model is being used, if the facility did not operate at any time during the year referred to in subparagraph i."***

Subsection 10 (1) of the Regulation allows a choice between the scenarios described in paragraphs 1 and 2 of this subsection. In other words, when using an approved dispersion model, a person may choose to assume conservative operating conditions or to use actual operating conditions from the previous year. In situations, where the actual operating condition (e.g., from the previous year) is used to assess compliance with the ministry POI Limits, it will also be necessary to verify compliance according to the operating condition allowed by the most recent ECA issued and its approved production limit. A facility that uses actual operating conditions (e.g. from the previous year) in its ESDM report to assess compliance with the ministry POI Limits may have its operation restrained in its ECA to the actual operating condition used in its ESDM report.

Although subsection 10 (1) allows a choice of operating conditions, section 12 of the Regulation may require the use of the scenario described in paragraph 2 of subsection 10 (1) if an exceedence of a standard results from the use of a scenario based upon paragraph 1 of this section (see subsection 12 (2) of the Regulation for an exception to this requirement and see Chapter 9.3 Refinement of Emission Rates of this Procedure Document for more information).

For paragraph 1 of subsection 10 (1), the approved dispersion model must be used with operating conditions that result in the maximum POI concentration for each significant contaminant, according to the averaging period for the relevant ministry POI Limit corresponding to that contaminant. For example, a 24-hour average operating condition must be used when comparing to a ministry POI Limit that has a 24-hour averaging period. If a contaminant has more than one limit, then the operating conditions and averaging periods for all those limits must be assessed and included in the ESDM report.

The operating condition that corresponds to the maximum POI concentration may occur when the facility is at the maximum production level or running at a lower production level or the process is in transition (see Chapter 8.3 Transitional Operating Conditions for more information). Persons preparing an ESDM report must assess all operating scenarios to determine the scenario that results in the maximum POI concentration for that contaminant.

Determining the appropriate Operating Conditions should be based on the following:

- the averaging period for the ministry POI Limit(s) for the contaminant;
- information contained in the Facility Description of the ESDM report;
- simultaneous versus sequential operations and emission estimates that are based upon either design capacities or actual operating data; and
- technical and operational limitations on production.

Development of a Realistic Scenario that Results in the Highest Concentration

Many facilities have a combination of sources that emit the same contaminant. In some cases, the various sources emit the contaminant simultaneously while in other situations the contaminant is emitted at different times or sequentially from each source. Where there is a simultaneous emission of a contaminant, it may not be realistic, at some facilities, to assume that each individual source of contaminant is resulting in a maximum emission at the same time.

The following examples are intended to provide guidance in identifying a realistic assumption of the operating condition that results in the highest point of impingement concentration of a contaminant, as per paragraph 1 of subsection 11 (1). For more information on refinement of emissions, please refer to guidance for paragraphs 2 and 3 subsection 11 (1) in Chapter 9 Emission Rate Estimating And Data Quality.

Example Scenario 1: more than one source emitting the same contaminant at the same time. For this example, the operation of each source is linked to a common overall production rate and it is realistic to assume maximum emissions from each source of the contaminant occur simultaneously. To simplify the assessment, if a facility assumes that the sources are all emitting at the same time, and the assessment shows that the ministry POI limit is met, then no further assessment is necessary. If not, the operating scenario can be tailored to more closely simulate the operation of the facility.

Example Scenario 2: this is similar to Example 1 where there is more than one source emitting the same contaminant at the same time. However, for this example, the operation of each source of the same contaminant is not linked to the others and it is reasonable to assume that maximum emissions for each source are not occurring at the same time. In this situation, it would be realistic to assume the following scenario:

- maximum emission rate from the source of contaminant that has the largest contribution to the maximum POI concentration;
- maximum emission rate from the sources where it is reasonable to assume that these maximum emissions can occur simultaneously with the highest contributing source; and
- average emission rates for all other sources of contaminant that operate simultaneously.

Example Scenario 3: more than one source emitting the same contaminant but the emissions occur at different times. For this example, the scenario that results in the highest concentration would be based upon maximum emissions (for the relevant averaging period) from the source that has the largest contribution to the maximum POI concentration with an assumption of zero emissions for all other non-simultaneously operating sources. The use of the variable emission rate option in some dispersion modelling interfaces may also be a reasonable approach to address this type of situation; particularly when the averaging period for the relevant air standard is relatively long (e.g., annual-average).

To simplify the effort in selecting the operating condition that results in a maximum POI concentration for each significant contaminant, it may be possible to develop a common operating condition for similar contaminants. Operating conditions that are developed from an understanding of process interactions and operations may also simplify this task and result in common operating conditions for a variety of significant (non-negligible) contaminants. Paragraph 6 of subsection 26 (1) of the Regulation states the following regarding the documentation of operating conditions within an ESDM report:

Under Subsection 26 (1) of the Regulation – Contents of ESDM report:

"6. For each contaminant listed under paragraph 4, a description of the operating conditions that were used in accordance with section 10 when using an approved dispersion model in respect of the contaminant for the purpose of this section."

To summarize, in accordance with paragraph 6, the ESDM report shall include a description of the operating condition for each contaminant that is emitted in significant amounts. This description of the operating condition for each significant contaminant should:

i. identify each significant source (or group of sources) of the contaminant;

ii. describe the operating conditions of the significant sources that result in the maximum POI concentration for the contaminant, ensuring that the operating conditions correspond to the averaging period of the ministry POI Limit(s); and

iii. be based upon information contained in the Facility Description section of the ESDM report with consideration for simultaneous versus sequential operations and emissions; design capacities versus actual operating data; technical and operational limitations on production and the terms and conditions of ECAs issued to the facility.

Table 8-1 Assessing Emissions At Operating Conditions That Result In Maximum POI Concentrations For Different Averaging Periods – EXAMPLES provides a series of examples for identifying operating conditions and developing emission rate estimates for different averaging periods.

ECA

Applying for an ECA

Facilities applying for approval under section 20.2 of the EPA are required to document operating conditions for only those significant contaminants (and relevant significant sources of these contaminants) that are the subject of the application itself. Any ECA that may be issued will be based on the Operating Conditions provided in the ESDM report.

Holders of ECA with LOF may make modifications to the facility including updating the operating conditions as long as those modifications are in accordance with the conditions on the ECA and are within the Operating Envelope defined by the ECA. For more information, please see the relevant ministry guidance document prepared by EAB.

Table 8-1: Assessing Emissions at Operating Conditions that Result in Maximum POI Concentrations for Different Averaging Periods - Examples

Using the Models in the Appendix to Regulation 346 in comparison to 1/2-hour average ministry POI Limits: Emission rates based on an operating condition, averaged over a ½ hour period that results in the maximum POI concentration must be developed as an input to the models. Output from the dispersion models must be compared to the ½-hour average ministry POI Limits, including standards in Schedule 2.

Using SCREEN3 or AERMOD in comparison to 1/2-hour average ministry POI Limits: Emission rates based on an operating condition, averaged over a ½ hour period, that results in the maximum POI concentration must be developed as an input to the models. Output from these dispersion models must be converted to ½ hr averages using the formula in section 17 and compared to the ½ hour average ministry POI Limits, including standards in Schedule 2 of the Regulation.

Using SCREEN3, or AERMOD in comparison to 1-hour average ministry POI Limits: Emission rates based on an operating condition, averaged over a 1-hour period, that results in the maximum POI concentration must be developed as an input to the models. Output from the dispersion models must be compared to the 1-hour average ministry POI Limits, including standards in Schedule 3 of the Regulation.

Using SCREEN3, or AERMOD in comparison to 24-hour average ministry POI Limits: *Emission rates based on an operating condition, averaged over a 24-hr period, that results in the maximum POI concentration must be developed as an input to the models. Output from the dispersion models must be compared to the 24-hour average ministry POI Limits, including 24-hour average standards in Schedule 3 of the Regulation. This approach would also be used for 24-hour Upper Risk Thresholds in Schedule 6.

Note: The SCREEN3 dispersion model is only able to predict 1-hour average concentrations. These 1-hour results can be converted to a 24-hour average concentration by using the averaging period conversion factor set out in section 17 of the Regulation**. In this case, *emission rates would correspond to a maximum 24-hour average operating condition.

Using SCREEN3, or AERMOD in comparison to annual average ministry POI Limits: *Emission rates based on an operating condition, averaged over a year period, that results in the maximum POI concentration must be developed as an input to the models. Output from the dispersion models must be compared to the annual average ministry POI Limits, including annual average standards in Schedule 3 of the Regulation.

Note: The SCREEN3 dispersion model is only able to predict 1-hour average concentrations. These 1-hour results can be converted to an annual average concentration by using the averaging period conversion factor set out in section 17 of the Regulation**. In this case, *emission rates would correspond to a maximum annual average operating condition.

Note: Annual average emission rates must not be used as modelling inputs for ministry POI Limits with different averaging periods nor for URTs which are based on a 24 hour average emission rate.

Using SCREEN3 or AERMOD in comparison to "X" – hour average ministry POI Limits: *Emission rates based upon an operating condition, averaged over an X-hour period, that results in the maximum POI concentration must be developed as an input to the models. Output from the dispersion models must be compared to the "X"-hour average ministry POI Limits, including the standards in Schedule 3 of the Regulation. This example is intended to illustrate that when using the appropriate dispersion model, the averaging period of the operating condition that represents the maximum POI concentration must be consistent with the averaging period of the corresponding ministry POI Limits.

Using ASHRAE in comparison to "X" – hour average ministry POI Limits: *Emission rates based upon an operating condition, averaged over an X-hour period, that results in the maximum POI concentration must be developed as an input to ASHRAE. Output from ASHRAE must be converted to "X" hour averaging times using the formula in section 17** to compare to the appropriate ministry POI Limits, including standards in Schedule 3 of the Regulation.

*Annual average emission rates must not be used as modelling inputs for any ministry POI Limit with shorter averaging times.

** Or the equivalent method set out in Table 7-1 Averaging Period Conversion Factor (F) in Chapter 7.1.2 Identifying Significant Contaminants Using an Emission Threshold of this Procedure Document.

This Table contains just one column, and is intended to emphasize its contents.

Note

For the Ministry's recommended methodology for assessing contaminants with 10-minute average standards and guidelines, refer to the ministry Technical Bulletin "*Methodology for Modelling Assessments of Contaminants with 10-Minute Average Standards and Guidelines under O.Reg.419/05*", as amended.

8.2 Multiple Operating Conditions

The Regulation may also require, in some cases, that ESDM reports be submitted with operational scenarios from both paragraphs 1 and 2 of section 10(1) as shown below.

Subsection 30(5.2) of the Regulation – Upper risk thresholds:

(5.2) Despite subsection 10 (1), a person who prepares a report required by subsection 30(4) shall use an approved dispersion model in accordance with both of the scenarios described in subsection 10 (1), and the report shall set out separately the information relevant to each scenario.

Subsection 33 (7) of the Regulation – Site-Specific Standards:

(7) Despite subsections 10 (1) and (2), a person who prepares a report required by paragraph 1 of subsection 33 (1) shall, for the contaminant that is the subject of the request, use an approved dispersion model in accordance with both of the scenarios described in subsection 10 (1).

ESDM reports prepared for URT exceedences (s.30) and Site-Specific Standards (s.32) are required to assess both of the operating scenarios described in subsection 10 (1) of the Regulation describing Operating Conditions, namely:

i. The conservative maximum operating scenario as set out in subsection 10 (1) paragraph 1; and
ii. The scenario based on actual operating data from the previous year as set out in subsection 10 (1) paragraph 2.

Because both these ESDM reports under sections 30 and 33 of the Regulation involve assessments of POI concentrations above the standards, an assessment of frequency at specified human receptors is required. For more information on assessing frequency of exceedences see Chapter 13.2 Assessing Concentrations and Frequency at Specified POIs of this Procedure Document as well as Chapter 4.5 of the ministry document "Guideline for Implementation of air Standards in Ontario (GIASO)" (as amended) and Chapter 3.5 Assessing Concentrations and Frequency at Receptors of the "Guide to Requesting a Site-Specific Air Standard" (as amended).

8.3 Transitional Operating Conditions

This section is revoked, please refer to Section 10 of O.Reg.419/05 amended on March 20th, 2018.

8.4 Estimating Emissions for Different Averaging Periods

There is an interaction between s.10 (operating conditions), s.11 (emission rates) and s.13 (meteorological data) of the Regulation. The ministry already allows for some worst-case meteorological conditions to be discounted in the modelling by allowing the worst-case day per year or the highest 8 of the 1-hour values in a year to be discarded from the modelling results (see ADMGO)

There are often situations where contaminant emissions from sources are variable according to a time pattern and/or in accordance with specific conditions. Matching this variability with variable meteorological conditions can be particularly important for longer averaging periods. The dispersion modelling software such as AERMOD allow for the input of variable emissions, by hour, by week, by season and/or by wind speed. For more details on the use of this approach, please see the dispersion modelling documentation for the relevant approved model (e.g., AERMOD).

In addition, emission rate inputs depend on the averaging period that is relevant to the contaminant under review (e.g., use of the averaging period for the contaminant air standard). The following provides guidance on developing emission rate estimates for different averaging period scenarios[13].

8.4.1 Estimating Emissions for a Maximum 1-hour Averaging Period
(for contaminants with maximum 1-hour average standards)

Maximum 1-hour average emissions are generally developed either using maximum, 1-hour average measurement data or identifying the maximum 1-hour average for operating parameters that affect emissions of the contaminant (in conjunction with emission factors that are a function of these parameters).

Table 8.4.1: 1 Hour Averaging Period

Example 2.1a: Using Source Testing Data

- Stack testing campaigns were conducted for four different operating conditions for a source of emission. Source tests (each with three test runs), of at least one hour durations, were completed for each of the four operating conditions. The average emission rate, for each source test was 1 g/s, 1.5 g/s, 2.5 g/s and 3 g/s. In this example, the maximum 1-hour average emission rate for the tested source would be 3 g/s.

[13] Of course, the simplest situation is when emissions are constant over 1-hour, 24-hours; and 1-year (i.e., the emission rate input is the same for all three averaging periods).

Example 2.1b: Combination of a Varying Operational Parameter and Emission Factors

- A process operating at full capacity is observed to have production rates that varied as follows over a 1-hour period: 1 unit of production per hour for the first fifteen minutes; 1.2 units per hour for the next 30 minutes; and 1.5 units for the last fifteen minutes. Emissions from this process were estimated (by past source tests on a similar set of processes) to be the following function of production:

  Emission Factor Equation: [10 g/s per hourly unit of production] x [units of production per hour]

  Therefore, maximum 1-hour average emissions = (1x0.25 + 1.2x0.5 + 1.5x0.25) x 10 = 12.25 g/s

A third scenario involving estimating maximum 1-hour average emissions relates to emissions that occur over only a portion of an hour.

Example 2.1c: Part-Time Emissions

- Emissions from a process occur only for 20 minutes on an intermittent basis. Emissions are zero for the other 40 minutes in an hour. The maximum emissions, over a 20-minute period, were observed to be 1 g/s.

  Maximum 1-hour average emissions = (1 g/s) x (20/60) + (0 g/s) x (40/60) = 0.33 g/s

8.4.2 Estimating Emissions for a Maximum 24-hour Averaging Period (for contaminants with maximum 24-hour average standards)

The approach to estimating maximum 24-hour average emissions is similar to that used to estimate maximum 1-hour average emission estimates. However, situations where there is variation in emissions or where sources of contaminant are only operational for a fraction of the period are more common when estimating maximum 24-hour average emissions.

In addition, the dispersion models allow for the input of emission estimates on an hourly basis (also known as the “variable emissions input tool”). This allows for the matching of emissions with variations in meteorology over the 24-hour period.

Table 8.4.2: 24 Hour Averaging Period

Example 2.2a: REGULAR Variation in Emissions Over a 24-Hour Period; Five Days per Week

- Production and the emissions from a process are variable but regular and predictable and the same every day, five days per week. During the first 16 hours (of a 24-hour period), emissions are at a maximum of 1 g/s but only 0.5 g/s for the other 8 hours.

In this situation, an appropriate approach would be to use the variable emissions input tool and input 1 g/s for the first 16 hours of the 24-hour period and 0.5 g/s for the other 8 hours.

Example 2.2b: IRREGULAR Variation in Emissions Over a 24-Hour Period; Five Days per Week

- Production and the emissions from a process are variable and irregular over a 24-hour period but the pattern is the same for every day, five days per week. In this example, emissions of 1 g/s occur over any 16 hour period (not necessarily consecutive) and emissions are 0.5 g/s for the other 8 hours.

  One approach is to develop an overall average for the 24-hour period as a single input for the model run (and there is no need to use variable emissions input tool for this type of situation):

  Maximum 24-hour average emissions = (1 g/s) x (16/24) + (0.5 g/s) x (8/24) = 0.83 g/s
  (a single emission rate input for the modelling for each hour in the model run)

Example 2.2c: IRREGULAR Variation in Emissions Over a 24-Hour Period; Five Days per Week with Occasionally Higher Emissions

- Production is generally the same as in example 2.2b, above, but a few days per year, the emissions increase to 3 g/s for 16 hours and 1 g/s for 8 hours.

  One approach is to develop an overall average for the "worst-case" 24-hour period as a single input for the model run and input this for each hour in the model run:

  Maximum 24-hour average emissions = (3 g/s) x (16/24) + (1 g/s) x (8/24) = 2.33 g/s
  (a single emission rate input for the modelling for each hour in the model run)

8.4.3 Estimating Annual Average Emissions
(for contaminants with annual average standards)

Estimating emissions on an annual-average basis includes consideration of variation in emissions on a daily, weekly and monthly basis.

The following general scenarios are intended to represent some common type of situations that affect how annual average emission estimates are developed for input into atmospheric dispersion models:

a. Source with intermittent and regular (i.e., same time of day) emissions, every day of the year.

b. Source with intermittent and irregular (i.e., any time of day) emissions, every day of the year.

c. Source with intermittent and irregular emissions, but only two days per week.

d. Source with intermittent and regular emissions, but for only the same two months per year.

Table 8.4.3: Annual Averaging Period

Example 2.3a: Intermittent and Regular (i.e., **same** time of day) Emissions; Every Day of the Year

- Source with intermittent (i.e., not constant) and regular (i.e., occur at the same time of day) emissions that average 1 g/s for any three hours between 6am and noon, every day of the year.

  Note: In this example, emissions between noon and 6am on the following day are zero.

  In this situation, an appropriate approach would be to use the variable emissions tool and input 0.5 g/s for each of the six hours between 6am and noon and 0 g/s for the remaining hours. This pattern would be applicable to every day in the year.

  Where, emissions input for 6am-Noon = 1 g/s x (3 hours/6 hours) = 0.5 g/s

Example 2.3b: Intermittent and Irregular (i.e., **any** time of day) Emissions; Every Day of the Year

- Source with intermittent and irregular (i.e., occur **any** time of day) emissions that average 1 g/s for any three hours during the day, every day of the year.

  In this situation, the appropriate approach would be to input 0.125 g/s for each of the twenty-four hours in a day. This pattern would be applicable to every day in the year and there is no need to use variable emissions input tool for this type of situation.

  Where, emissions input for every hour = 1 g/s x (3 hours/24 hours) = 0.125 g/s

Example 2.3c: Intermittent and Irregular (ie., any time of day) Emissions; **Only Two Days per Week**

- Source with intermittent and irregular (ie., occur any time of day) emissions that average 1 g/s for any three hours during the day and **only two days per week**.

  In this situation, the appropriate approach would be to input 0.036 g/s for each of the twenty-four hours. This pattern would be applicable to every day in the year.

Where, emissions input for every hour = 1 g/s x (3 hours/24 hours) x (2 days/7 days) = 0.036 g/s

Example 2.3d: Intermittent and Regular (ie., same time of day) Emissions; **Only for the Same Two Months Every Year**

- Source with intermittent and regular emissions that average 1 g/s for any twenty-four hours per day **but only for the same two months per year (ie., zero emissions, other months).**

  In this situation, the appropriate approach would be to use the variable emissions tool and input 1 g/s for all 24-hours but only for the two months of emissions and 0 g/s for all other months in the year.

9.0 EMISSION RATE ESTIMATING AND DATA QUALITY

Section 11 of the Regulation sets out the requirements for estimating and refining emission rates. The ESDM report must document both the facility operating conditions (that are relevant to estimating emission rates based on the averaging time of the standard or ministry POI limit) and the development of emission rate estimates for the significant air contaminants discharged from the facility. In general, section 12 sets out the requirements to "refine" emission rate estimates when the combined effect of sections 10 and 11 result in predictions of exceedences of ministry POI Limits. Also note that section 12 of the Regulation allows a person to proceed directly to abatement as an alternative to refinement. Under section 28 of the Regulation, there are notification requirements for exceedences of Benchmark 1 (B1) values on the ACB List (i.e. standards and guidelines) once refinement has been completed. However, if a facility determines that refinement will still likely show an exceedence of a ministry B1 value, they may choose to focus their efforts on abatement (as opposed to refinement) - see subsection 12 (3) of the Regulation. Note that if this option is chosen the person must notify the ministry of an exceedence under section 28 and submit an abatement plan as per section 29. Please note that there are additional notification requirements under sections 25 and 30 of the Regulation that are also required before refinement is completed. For more information on notification requirements, see Chapter 2.3 Updates to ESDM Reports, Chapter 12.3 Upper Risk Thresholds, and Chapter 13.0 Other Considerations That Require Follow Up Actions.

Refinement of emission rates may include source testing across a range of operating conditions or the ability to assess emissions in accordance with a plan approved by the director under paragraph 3 of subsection 11 (1) of the Regulation. These plans are typically referred to as a Combined Assessment of Modelled and Monitored Results (CAMM). In summary, sections 10, 11 and 12 of the Regulation work together to ensure that the assessment of maximum POI concentration are as accurate as possible and do not under-estimate actual concentrations.

9.1 Emission Rate and Estimation Techniques

Subsection 11 (1) of the Regulation states:

Source of Contaminant Emission Rates

11. (1) An approved dispersion model that is used for the purposes of this Part shall be used with an emission rate that is determined in one of the following ways for each source of contaminant and for each averaging period applicable to the relevant contaminant under section 19 or 20, whichever is applicable:

1. ***The emission rate that, for the relevant averaging period, is at least as high as the maximum emission rate that the source of contaminant is reasonably capable of for the relevant contaminant.***

2. ***The emission rate that, for the relevant averaging period, is derived from site-specific testing of the source of contaminant that meets all of the following criteria:***

    i. ***The testing must be conducted comprehensively across a full range of operating conditions.***
    ii. ***The testing must be conducted according to a plan approved by the Director as likely to provide an accurate reflection of emissions.***
    iii. ***The Director must be given written notice at least 15 days before the testing and representatives of the Ministry must be given an opportunity to witness the testing.***
    iv. ***The Director must approve the results of the testing as an accurate reflection of emissions.***

3. ***The emission rate that, for the relevant averaging period, is derived from a combination of a method that complies with paragraph 1 or 2 and ambient monitoring, according to a plan approved by the Director as likely to provide an accurate reflection of emissions.***

Paragraph 1 of subsection11(1) of the Regulation states that an approved dispersion model must be used with an emission rate that is “at least as high as the maximum emission rate that the source of contaminant is reasonably capable of”. This section of the Regulation ensures that the emission rates estimates that are used by a facility in its initial assessment are conservative. If a facility can show it meets the air standards at the maximum POI using conservative emission rate estimates, then no further assessment is required for those contaminants.

If this initial assessment shows the standard (or ministry POI Limit) may be exceeded, the Regulation requires a facility either to “refine” its assessment or to take steps to come into compliance or meet the ministry POI Limit. Paragraphs 2 and 3 of subsection11 (1) of the Regulation describe ways to refine the assessment by using other less conservative but more accurate methods to assess emission rates including:

- An emission rate that, for the relevant averaging period, is derived from site-specific testing of the source of contaminant across a range of operating conditions (paragraph 2 of subsection 11 (1) of the Regulation); and/or

- An emission rate that, for the relevant averaging period, is derived from a combination of a method that complies with paragraph 1 or 2 of subsection 11 (1) and ambient monitoring, according to a plan approved by the Director as likely to provide an accurate reflection of emissions (paragraph 3 of subsection 11 (1) of the Regulation).

Paragraph 3 of subsection 11 (1) of the Regulation typically refers to the Combined Assessment of Modelled and Monitored Results (CAMM) as an emission rate refinement tool. For more information, please refer to the Technical Bulletin on CAMM as an Emission Rate Refinement Tool, as amended from time to time.

Emissions rates are directly linked to operating conditions at the facility. Subsection 10 (1) paragraph 1 of the Regulation states that a facility must use:

"A scenario that, for the relevant averaging period, assumes operating conditions for the facility that would result in the highest concentration of the contaminant at a point of impingement that the facility is capable of."

In summary, the emission rate estimating must be either:

- "conservative"[14], as represented by paragraph 1 of subsection 11 (1); or
- as accurate as possible, as represented by the methodologies set out in paragraphs 2 and 3 of subsection 11 (1).

The concepts of accuracy and conservatism in emission rate estimating work together. For example, the need for conservatism in the estimating technique should be inversely proportional to the degree of accuracy of the technique. The greater the accuracy, the less there is a need for conservatism in the emission rate estimating method.

In many cases, emission rate estimating is an iterative process where estimates start out conservative and are then refined to be more accurate and less conservative when earlier iterations result in an exceedence of a ministry POI Limit. Although the emission rate estimating methodologies described in paragraph 2 and 3 of subsection 11 (1) of the Regulation can be selected at any time, they also represent the end of the iterative or refinement process.

Paragraph 7 of subsection 26 (1) of the Regulation requires that an ESDM report contain the following information with respect to emission rates:

[14] For the purpose of this Procedure Document the term "conservative" refers to an estimated emission rate that is certain to be higher than the actual emission rate.

Under Subsection 26(1) of the Regulation – Contents of ESDM report:

"7. For each source of contaminant identified under subparagraph 3 ii as a source of contaminant that was considered, with respect to a contaminant listed under paragraph 4, when using an approved dispersion model for the purpose of this section,

i. an explanation, for each averaging period used with respect to that contaminant and source of contaminant, of the method used to estimate the emission rate for the contaminant and source of contaminant,

ii. a sample calculation illustrating each method explained under subparagraph i, and

iii. an assessment of how accurately each method explained under subparagraph i estimates the emission rate, including an assessment of whether the method is more likely to overestimate or underestimate the emission rate and an assessment of how significant the overestimate or underestimate may be."

Chapters 9.1 Emission Rate and Estimation Techniques of this Procedure Document provide information on four basic methods to estimate air emission rates and provides guidance on developing emission rates that are, in most cases, consistent with paragraph 1 of subsection 11 (1) of the Regulation.

See Chapter 9.2 Data Quality for guidance on the requirement to assess the accuracy of the emission rate estimating methodologies. Also see Chapter 9.3 Refinement of Emission Rates for additional guidance on the requirements.

9.1.1 Emission Factors

Emission factors are typically constants (usually expressed in mass emission per unit of production or mass of raw material input) which are applied to a process parameter or production rate to generate an emission rate. The most commonly used emission factors are those published by the United States Environmental Protection Agency (US EPA). The US EPA and other regulatory agencies use data from past source testing campaigns to develop emission factors for a variety of industrial processes. When well-documented emission factors (e.g., such as the factors presented in US EPA guidance) are applied to a source that they were meant for; and applied in a manner that will result in a conservative estimate of emission rates then the use of emission factors is, in most cases, consistent with paragraph 1 of subsection 11 (1) of the Regulation.

9.1.2 Mass Balance Calculations

A mass balance is an accounting of the material that enters and leaves from a process or reaction. Emissions resulting from many processes, such as painting or

surface-coating, are a direct result (i.e., no chemical transformation through the process) of the raw material inputs to the processes. In these cases, emission rates can be estimated from the through-put of raw materials (e.g., paint and solvent usage).

Typically, mass balance calculations that assume 100% of material used is emitted to the air are considered to be conservative. However, a follow-up "field verification" of material usage may be required by the ministry depending on:

i) the type of contaminants emitted;
ii) the magnitude of the POI concentrations relative to the relevant ministry POI Limit; and
iii) the presence of other evidence (e.g., odour complaints) of adverse effect.

In most cases, the use of a mass balance approach is consistent with paragraph 1 of subsection 11 (1) of the Regulation as long as the mass balance calculations are: (i) well documented (e.g., calculations are provided); (ii) used for emissions that are not chemically transformed through the process; and (iii) account for all discharges/flows of the contaminant used in the process.

9.1.3 Source Tests

Source tests may be conducted at the facility to measure contaminant emission rates, required to prepare the ESDM report. Source testing is to be conducted following the requirements outlined in the Ontario Source Testing Code. Emission rates may also be based on source tests conducted on another similar process provided that the similarity of the process can be established. Emission rate estimates that are based on validated source tests are another acceptable approach to estimating emission rates. In order for the ministry to accept source test results, without further analysis, source tests should be validated by the ministry. A ministry validated source test means:

- source testing methods were submitted to the ministry in a pre-test plan;
- the ministry accepted the pre-test plan;
- the ministry had an opportunity to witness the test; and
- the final report was submitted to the ministry. (Note: if a ministry review of the report indicates that the source test results may not be accurate, the data should not be used)

Source test results that have had similar over-sight from other regulatory agencies may also be considered validated. Proof of this validation must be documented in the ESDM report, and shall be comparable to the validation typically undertaken by the ministry.

Results from un-validated source testing may be used to estimate emission rates but the quality of the estimates may be considered to be classified as uncertain. The quality of un-validated source testing can be improved through a review and comparison to other validated sources of information. For example, an executive summary that includes a summary of the sampling and analytical methodology; the

name of the persons responsible for the testing; the process operating conditions that the tests were conducted under; the dates of testing; and a full test report that is available for review upon request. This may demonstrate that the un-validated data is in the range of expected emission rates for the facility. It is also possible to demonstrate this through partial post-testing validation. See Chapter 9.2 Data Quality for further information.

In summary, the use of source testing to estimate emission rates is, in most cases, acceptable under ***paragraph 1*** (not paragraph 2) of subsection 11(1) of the Regulation when:

- source tests are validated;
- the source testing represents one specific operating condition; or
- sources tests are not validated but the results are demonstrated to be comparable to other validated emission rate information and are well documented.

When estimating emission rates according to **paragraph 2** of subsection 11(1) of the Regulation, source testing is required to be conducted comprehensively across a full range of operating conditions. The range of operating conditions must be approved by the ministry before source testing is conducted. Testing must be conducted in accordance with a plan approved by the Director. The Director must also be given at least 15 days written notice of the source testing and an opportunity to witness the testing, and the results of the testing must be approved by the Director. For more information, see Chapter 9.2.1 “Highest Data Quality” Emission rate estimating Techniques.

9.1.4 Engineering Calculations

Emission rates can also be developed from fundamental scientific principles and measurements. In this case, an engineering estimate can be based on operating conditions, data from the literature, thermodynamic and physical properties. Included in this category of emission rate estimates are calculations based on direct source measurements that are neither considered validated source tests nor comparable to validated results, as noted above.

The use of derived formulae (sometimes in combination with accepted empirical data) is also an acceptable emission rate estimating method as long as the approach is demonstrated through documentation and references to be based upon sound scientific and engineering principles. When engineering calculations are based upon fundamental scientific principles or based upon a recognized empirical relationship (e.g., the ministry Evaporation Equation in Appendix C); are well documented (e.g., calculations are provided); then the use of engineering calculations is, in most cases, consistent with paragraph 1 of subsection 11 (1) of the Regulation.

See Appendix C for further guidance and reference material to assist with estimating emission rates.

9.2 Data Quality

Every emission rate estimate must include some quantification or qualification of the uncertainty of the estimation. For the purposes of this Procedure Document, the data qualification is referred to as Data Quality (i.e., the higher the quality of the data, the higher the accuracy and certainty of the emission rates and therefore assessment of POI concentrations).

This assessment of accuracy is required by subparagraph 7 iii of subsection 26 (1) of the Regulation and is intended to avoid any underestimations that may result in a false prediction of compliance.

A "Data Quality" classification system, that provides an indication of the accuracy of the emission rate estimating methods used in the ESDM report, is set out in Chapter 9.2 Data Quality of this Procedure Document. The basic concepts of the Data Quality classification system are: (i) the accuracy of the emission rate estimate is directly proportional to the level of Data Quality and (ii) the "conservatism" of the emission rate estimate generally decreases with increasing Data Quality.

This Data Quality classification system may generally be used to assess the accuracy and conservatism of the emission rate estimating method, consistent with paragraph 7 iii of subsection 26 (1) of the Regulation. However, on a case-by-case basis, the ministry may request a more comprehensive assessment of the accuracy and the likelihood of an underestimated emission rate. An assessment of the significance of the error in the estimate may also be required by the ministry. In addition, when there is sufficient data to quantify the range of expected emission rates (e.g., in the case of data from a continuous emission monitoring system) then it should be included in an ESDM report.

Example to Illustrate Concept of Data Quality
(for emission rate estimates that satisfy para. 1 of s. 11 (1) of the Regulation)

In one situation, there are two different emission rate estimates (one higher than the other) where both emission rate estimates have the same data quality. Only the higher of the two emission rate estimates in this example can satisfy the requirements of paragraph 1 of subsection 11(1) of the Regulation.

In another situation, there are two different emission rate estimates where the lower emission rate estimate has a higher data quality than the greater emission rate estimate. In this case, the lower emission rate estimate would satisfy paragraph 1 of subsection 11(1) of the Regulation since it has higher data quality.

9.2.1 "Highest Data Quality" Emission rate estimating Techniques

- Combined Assessment of Modelled and Monitored Results (CAMM): The highest quality data is provided by site-specific emission rate estimating and air dispersion modelling in combination with ambient monitoring of contaminants using an approach that has been validated by the ministry. This type of approach is typically used for fugitive emissions. The ministry Technical Bulletin: "Combined Assessment of Modelled and Monitored Results (CAMM) as an Emission Rate Refinement Tool"

provides further guidance with respect to an acceptable plan under paragraph 3 of subsection 11 (1) of the Regulation. The guidance provided in the Technical Bulletin functions to ensure that the emission rates used in an approved dispersion model are "as accurate as possible". A form is available on the ministry website to request approval of the modelling-monitoring plan (PIBs # 6323e) (as amended). (See also Chapter 9.3 on Refinement of Emission Rates).

- Comprehensive and Validated Source Testing Across a Full Range of Operating Conditions: The highest quality estimates of emission rates for point sources are derived from comprehensive equipment-specific testing that have been validated by the ministry or a regulatory agency acceptable to ministry. This approach involves source tests conducted to measure contaminant emission rates over a range of operating conditions where process data was available and recorded; and results in a statistically significant data set. The use of validated continuous emission monitoring systems also represents "Highest Data Quality". This category is consistent with subsection 11 (1) paragraph 2 of the Regulation. (See also Chapter 9.3 on Refinement of Emission Rates).

- Note: If a source testing plan and notification to witness a source test is being submitted under paragraph 2 of subsection 11(1), this must be clearly identified in the submission. Facilities that are using paragraph 2 of subsection 11(1) of the Regulation for refinement of emissions must contact the ministry prior to source testing in order to confirm the range of operating conditions to be source tested for the purposes of "refinement".

- Mass Balance: A mass balance technique may be considered to provide a Highest Data Quality estimate if:

    - 100% of the material balance is accounted for (e.g., 100% emitted to air);
    - it is reasonable to assume that the contaminants will not undergo a chemical transformation through the source/process;
    - the usage averaging period is similar to the averaging period for the air quality standard; and
    - the material usage information has been validated (e.g., through purchase records that are provided to the ministry upon request).

9.2.2 "Above-Average Data Quality" Emission rate estimating Techniques

- Validated Source Testing at One Specific Operating Condition: Emission rate estimates that are derived from validated source testing at one specific operating condition are anticipated to provide above-average quality of estimate of emission rates and POI concentrations.

- Mass Balance: A mass balance technique can be considered to provide emission rate estimates of above-average quality if:

    - 100% of the material balance is accounted for (e.g., 100% emitted to air);
    - it is reasonable to assume that the contaminants will not undergo a chemical transformation through the source/process; and

  - the usage averaging period is similar to the averaging period for the air quality standard.

- Emission Factors: Emission rate estimates that are developed from tests on a moderate to large number of sources where the source category population is sufficiently specific to minimize variability (e.g., US EPA, AP-42, emission factor quality rating of A or B) are anticipated to provide above-average quality of emission rate estimates.

- Engineering Calculations/Judgement: Emission rate estimates derived from fundamental scientific and engineering principles; and/or relevant empirical data can be considered above-average quality estimates if it is clear (e.g., the approach is recommended through ministry documentation) that the estimating technique will result in relatively conservative predictions.

9.2.3 "Average Data Quality" Emission Rate Estimating Techniques

- Emission Factors: Emission rate estimates that are developed from tests on a reasonable number of facilities where the source category population is sufficiently specific to minimize variability (e.g., US EPA, AP-42, emission factor quality rating of C) are anticipated to provide average quality emission rate estimates.

- Engineering Calculations/Judgement: Emission rate estimates derived from fundamental scientific and engineering principles; and/or relevant empirical data can be considered average data quality estimates.

- Partially Validated Source Testing at One Specific Operating Condition: emission rate estimates that are from source testing where the testing has only been partially validated (e.g., pre-test plan approval or post-testing assessment and documentation, by a regulatory agency, of the quality of the final source testing report) at a specific operating condition. These tests are anticipated to provide an average data quality estimate of emission rates.

9.2.4 "Marginal" or "Uncertain Data Quality" Emission Rate Estimating Techniques

- Un-Validated Source Testing at One Specific Operating Condition: emission rate estimates that are from un-validated source testing are considered to be of Uncertain Data Quality. The quality of un-validated source testing results may be up-graded to "Average Data Quality" through post-testing assessment (if enough information is available) by a regulatory agency or by comparison of the test results to alternative sources of validated information (e.g., validated source testing on similar equipment and/or comparison to emission factors of at least average data quality).

- Emission Factors: Emission rate estimates that are developed from tests on only a small number of facilities where there is evidence of variability within the source category population (e.g., US EPA, AP-42, emission factor quality rating of D or E)

and/or the emission factor rating is uncertain are considered to have uncertain data quality.

- Calculations/Judgement: Emission rate estimates derived from calculations where the scientific/technical integrity of the approach is uncertain are considered to have uncertain data quality.

In many cases, the use of emission rate estimating methodologies that are classified as Marginal or Uncertain Data Quality may be the only method available to the facility. Where the maximum POI concentration from the facility is less than 10% of the ministry POI Limit, emission rate estimates of Marginal or Uncertain Data Quality, may be adequate. In most cases, where POI concentrations are more significant, emission rate estimates based on Marginal or Uncertain Data Quality may also be considered acceptable ***provided these emission rate estimates have been altered to be sufficiently conservative***.

Depending on the nature of the contaminant and the magnitude of the POI concentrations, emission rate estimates that are identified as having Marginal or Uncertain Data Quality may warrant development of a range of estimated emission rates and POI concentrations and/or follow-up development of source-specific emission studies. In some cases, implementation of air pollution abatement may also be a reasonable requirement where Data Quality is Marginal or Uncertain and the likelihood and extent of exceedence of an air quality standard is high.

In the event that initial estimates of maximum POI concentration are above the ministry POI Limits then the above-noted Data Quality classification system also informs “refinement” to a higher level of accuracy in the predictions, as required by section 12 of the Regulation and as explained in Chapter 9.3 Refinement of Emission Rates.

9.3 Refinement of Emission Rates

Development of emission rates and resulting POI concentrations can, in many cases, be an iterative process. Section 12 of the Regulation will determine the need for further refinement of emission rates. This section is entitled “Combined effect of assumptions for operating conditions and emission rates” and states:

Combined Effect of Assumptions for Operating Conditions and Emission Rates

"12. (1) Despite subsections 10 (1) and 11 (1), an approved dispersion model that is used for the purposes of this Part shall be used in accordance with a scenario described in paragraph 2 of subsection 10 (1) and with an emission rate determined in accordance with paragraph 3 of subsection 11 (1).

(1.1) Despite subsection (1), an approved dispersion model that is used for the purposes of this Part may be used in accordance with a scenario described in paragraph 2 of subsection 10 (1) and with an emission rate determined in accordance with paragraph 2 of subsection 11 (1) if the Director is of the opinion that the emission rate will be accurately determined.

(2) Despite subsection (1), an approved dispersion model that is used for the purposes of this Part may be used in another manner that is in accordance with sections 10 and 11 if,

(a) the use of the model does not indicate that discharges of the relevant contaminant from the property may result in a contravention of section 19 or 20; or
(b) sections 19 and 20 do not apply to discharges of the relevant contaminant and the use of the model does not indicate that discharges of the contaminant may cause an adverse effect.

(3) This section does not apply to a contaminant if a written abatement plan for discharges of the contaminant from the property has been prepared and submitted to a provincial officer in accordance with section 29.

If the results of an approved dispersion model indicate that discharges of a contaminant may result in an exceedence of an air quality standard or an adverse effect[15] then the modelling exercise is not complete. In order to run an approved dispersion model in accordance with the Regulation, section 12 must be complied with. Section 12 generally states that where an exceedence or adverse effect is indicated, one of the following requirements must be automatically completed:

1. Refinement: the approved dispersion model shall be used in conjunction with actual operating data in accordance with a scenario described in paragraph 2 of subsection 10 (1) and emission rate estimating methods set out in paragraphs 3 in subsection 11(1) of the Regulation (i.e., highest data quality emission rate estimates) (unless the Director accepts a submission under paragraphs 2 in subsection 11(1) of the Regulation), or

[15] Where the Regulation uses language similar to "sections 19 and 20 do not apply to discharges of the relevant contaminant and the use of the model does not indicate that discharges of the contaminant may cause an adverse effect" and language similar to "the discharge may cause an adverse effect" the person shall compare the concentrations to those listed in Air Contaminants Benchmarks List (ACB List)-(as amended) to assess compliance. Assessment of contaminants without any ministry POI Limit must also be included. Please see the ministry website.

2. Abatement: submit an abatement plan (see s. 12 (3) and s. 29 of the Regulation) that sets out the steps for achieving compliance with the POI Limits to the ministry.

In summary, a conservative[16] emission rate estimating technique may be used if the ESDM report shows compliance with the ministry POI Limit. If, however, an ESDM report identifies an exceedence of a ministry POI Limit then the facility must either: (i) develop and implement an abatement plan that will achieve compliance with the Limit; and/or (ii) refine the ESDM report in accordance with section 12[17,18] of the Regulation. Note that the end-point for ESDM report refinement is the highest data quality obtained from a modelling-monitoring analysis. If refinement shows non-compliance, then abatement action will be required by the ministry.

The ministry expects that a facility date the results of modelling runs and that re-modelling using more accurate inputs be completed within approximately six months of a more conservative modelling run that indicates an exceedence. Where ambient monitoring or comprehensive source testing is required to refine the modelling, it is acknowledged that more than six months may be required. Where there is a more serious risk to human health or the re-modelling exercise is straightforward, it is expected that the refinement be completed in less than six months and as soon as possible.

Table 9-1: Overview of the section 26 ESDM report Requirements to Document Operating Conditions, Emission Rate Estimates and Data Quality

Emission Rates and Point of Impingement Concentrations at the Maximum Operating Condition

According to paragraph 6 of subsection 26 (1) of the Regulation, each significant contaminant must have a description of the operating conditions that result in the maximum POI concentration (either that the facility is capable of or based on the actual operating conditions for the time period described in paragraph 2 of section 10 (1) of the Regulation), according to the averaging period for the relevant ministry POI Limit. This description of the operating condition for each significant contaminant should:

- identify each significant source (or group of sources) of the contaminant (including the specific modelled source name);
- describe the operating conditions of the significant sources that result in the maximum POI concentration for the contaminant, according to the averaging period for the ministry POI Limit; and
- be based upon information contained in the Facility Description section of the ESDM report with consideration for simultaneous versus sequential operations and emissions; design capacities; technical and operational limitations on production and the terms and conditions of ECAs issued to the facility.

Explanation of the Emission Rate Estimating Methodology and Sample Calculation (see section 11 of the Regulation)

[16] For the purpose of this Procedure Document the term "conservative" refers to an estimated emission rate that is certain to be higher than the actual emission rate.

[17] Subsection 12 (1.1) allows the Director to accept source testing over a range of operating conditions (paragraph 2 of subsection 11 (1)) as the final stage in the refinement process for the emission rate estimates if the Director is of the opinion that the emission rate will be accurately determined.

[18] This statement refers to refined emission rate estimates which satisfy paragraph 3 of subsection 11 (1). See the ministry Technical Bulletin "Combined Assessment of Modelled and Monitored Results (CAMM) as an Emission Rate Refinement Tool" and GIASO for further information. Documents are available on the ministry website].

According to subparagraph 7 i of subsection 26 (1) of the Regulation, an explanation of the method used to estimate emission rates must be included for each significant contaminant. The description should include a brief section for each significant source or source category. Any appropriate references should also be provided (e.g., emission factor document title and relevant information to assist a reviewer in obtaining a copy). If source testing is used to develop emission rate estimates then copies of an executive summary from the source testing report should be provided with full copies of the report available upon request. As per subparagraph 7 ii of subsection 26 (1), a sample calculation that illustrates each emission rate estimating method used should also be provided.

Assessment of Accuracy/Data Quality

According to subparagraph 7 iii of subsection 26 (1) of the Regulation, an assessment must be provided for each significant contaminant, on the accuracy of each emission rate estimating method including an assessment of whether the method is more likely to overestimate or underestimate and an assessment of how significant this error might be. In most cases, the assessments required by subparagraph 7 iii of subsection 26 (1) of the Regulation can be satisfied by use of the Data Quality classification system described in Chapters 9.2.1 through 9.2.4 of this Procedure Document. This Data Quality classification system may generally be used to assess the accuracy and conservatism of the emission rate estimating method.

10.0 SOURCE SUMMARY TABLE AND SITE PLAN

A Source Summary Table is an efficient means to present information about the sources of air emissions from a facility and is a required component of an ESDM report. The information in a Source Summary Table is intended for use as inputs to the approved dispersion models as set out in Chapter 10 Source Summary Table And Site Plan of this Procedure Document. A scaled site plan is also required as part of an ESDM report and assists, among other things, in the locating of sources and property boundaries.

10.1 Source Summary Table

Paragraph 8 of subsection 26 (1) of the Regulation sets out the information that is required for a Source Summary Table:

Under Subsection 26 (1) of the Regulation – Contents of ESDM report:

"8. A table, labelled as the "Source Summary Table", that shows, for each source of contaminant identified under subparagraph 3 ii as a source of contaminant that was considered, with respect to a contaminant listed under paragraph 4, when using an approved dispersion model for the purpose of this section,

i. a label that identifies the source of contaminant,

ii. the averaging periods for which the approved dispersion model was used with respect to that contaminant and source of contaminant,

iii. for each averaging period referred to in subparagraph ii,

A. the emission rate for the contaminant and source of contaminant,

B. an indication of the method used to estimate the emission rate for the contaminant and source of contaminant,

C. an indication of how significantly the method used may overestimate or underestimate the emission rate for the contaminant and source of contaminant, and

D. the percentage that the emission rate for the contaminant and source of contaminant represents of the total emission rate for the contaminant and all sources of contaminant that were considered, with respect to the contaminant, when using an approved dispersion model for the purpose of this section,

iv. the volumetric flow rate for discharges from the source of contaminant,

v. the temperature of discharges from the source of contaminant,

vi. the height above ground level that discharges are released into the air from the source of contaminant,

vii. the difference between the height referred to in subparagraph vi and the height above ground level of the structure that is nearest to the source of contaminant and is on the same property, and an indication of whether discharges are released into the air from the source of contaminant at a height above or below the top of that structure, and

viii. the dimensions of the part of the source of contaminant from which discharges are released into the natural environment."

Appendix D includes two suggested formats for a Source Summary Table, however, the contaminant-based format is generally more appropriate and easier to use when identifying the most significant contributors to a POI concentration. Other formats for the table may be used as long as the format includes all of the information required by paragraph 8 of subsection 26 (1) of the Regulation. Note: A Source Summary Table should contain sufficient information to correlate the contaminant and the source.

ECA

Applying for an ECA

Applicants for an ECA are required to document only the Source Data for those sources of contaminants that emit contaminants in common with the sources of emissions that are the subject of the application itself.

For complex sites, it may be reasonable to sub-divide the information into a series of tables. In addition, for specific sources, data normally required within a Source Summary Table that is not required by the dispersion model does not have to be included in the Source Summary Table. For example, the exit temperature from unit heaters are generally not necessary, when using the models in the Appendix to Regulation 346, to assess compliance for nitrogen oxide emission if all sources are configured as a virtual source. In this case exit temperature is not required. However, all significant contaminants that are emitted from the facility must be included in a Source Summary Table even if there is no ministry POI Limit.

10.1.1 Additional Guidance for a Source Summary Table

Contaminant Information

It is recommended that the Source Summary Table include name and chemical abstract number (CAS #), where available, for the significant contaminants. The following web sites may provide a convenient way to obtain specific CAS numbers:

Chemfinder
NIST Chemistry WebBook - Scroll down to Search Options
TOXNET - Click on ChemIDplus

Units and Suggested Nomenclature

- Averaging period should match the averaging period of the standard which can be 10 minutes, hourly, 24 hour or an annual average.
- The volumetric flow-rate should be provided in cubic metres per second (actual or reference where the reference conditions, such as standard temperature and pressure, are specified).
- The temperature of the exhaust gases should be provided in degrees Celsius.
- The heights above grade and the roof and the stack diameter should be provided in metres.
- Emission rates should be provided in grams per second. The emission rate estimating method can be indicated using the following short-forms:
  - “EF” means Emission Factor
  - “MB” means Mass Balance
  - “V-ST” means Validated Source Test
  - “EC” means Engineering Calculation

- See Chapter 9.2 Data Quality of this Procedure Document for a classification system that may, in most cases, be used to provide an indication of how significantly the emission rate estimating method may overestimate or underestimate the actual emission rate. For example, emission rate estimates of Highest Data Quality would overestimate or underestimate the actual emission rate the least significantly, while estimates of Marginal or Uncertain Data Quality would overestimate or underestimate the most significantly. The following Data Quality classifications can be used in the Source Summary Table:
    - Highest Data Quality
    - Above-Average Data Quality
    - Average Data Quality
    - Marginal or Uncertain Data Quality

10.2 Site Plan

Paragraph 9 of subsection 26 (1) of the Regulation states the following regarding the information that must be placed on a site plan:

Under Subsection 26 (1) of the Regulation – Contents of ESDM report:

"9. A plan of the property from which contaminants are discharged, drawn to scale, that shows,

i. the property boundary,

ii. the co-ordinates for sufficient points on the property boundary to accurately describe the boundary,

iii. each source of contaminant identified under subparagraph 3 ii as a source of contaminant that was considered when using an approved dispersion model for the purpose of this section and, for each source of contaminant, the label referred to in subparagraph 8 i,

iv. the location, dimensions and elevation of every structure on the property, and

v. an indication of which structures referred to in subparagraph iv contain child care facilities."

In most cases, for a scaled site plan, it is reasonable to provide the location, dimensions and elevations of only those on-site structures that may affect the dispersion of emissions from significant sources, according to the use of the approved dispersion model. It may be reasonable to use multiple scaled site plans for some complex sites.

11.0 DISPERSION MODELLING

Dispersion models are used to predict how a contaminant concentration is diluted as it moves through the atmosphere. The concentration of a contaminant at a specific POI is a function of a variety of parameters including meteorological conditions in the vicinity of the source, POI, contaminant emission rate(s) and physical characteristics of the source and terrain in the vicinity of both the source and receptor. Atmospheric dispersion models use a combination of data inputs for these parameters in conjunction with mathematical algorithms that describe both the temporal and spatial variation of contaminants as they move away from the source.

Sections 6 through 17 of the Regulation contain the dispersion modelling requirements, including what models are to be used, required inputs into the models and the averaging periods that must be used for the models. References to an approved dispersion model means that sections 9 through 17 of the Regulation have been complied with. Section 17.1 of the Regulation states:

> ***17.1 A person who is required under this Regulation to prepare or update a report in accordance with section 26 and who uses an approved dispersion model for that purpose shall comply with sections 9 to 17.***

The ministry document "Air Dispersion Modelling Guideline for Ontario, (as amended) (ADMGO) provides details on the appropriate use of the approved dispersion models listed in the Regulation. This Chapter 11 Dispersion Modelling provides guidance on the inclusion, in an ESDM report, of dispersion modelling inputs and outputs. As per subparagraph 14 ii of subsection 26 (1) of the regulation, the Emission Summary Table should include the models used in the assessment including the version code for the model used.

11.1 Inclusion of Dispersion Modelling Input Data and Output Results in an ESDM report

Paragraphs 10 through 13 of subsection 26(1) of the Regulation describe the requirements for the inclusion of dispersion modelling results in an ESDM report as follows:

> ***Under Subsection 26 (1) of the Regulation – Contents of ESDM report:***
>
> ***"10. A description of the local land use conditions, if meteorological data described in paragraph 2 of subsection 13 (1) was used when using an approved dispersion model for the purpose of this section.***
>
> ***11. For each contaminant listed under paragraph 4, a statement identifying the approved dispersion model that was used for the purpose of this***

section and a description of the way in which the approved dispersion model was used that is sufficient to show compliance with sections 8 to 17.

12. For each contaminant listed under paragraph 4, an electronic copy of the input files that were used with, and the output files that were produced by, the approved dispersion model that was used for the purpose of this section.

13. A description of the terrain data that was employed when using an approved dispersion model for the purpose of this section, if section 16 required terrain data to be employed."

In addition, paragraph 14 of subsection 26 (1) of the Regulation requires submission of an Emission Summary Table and this requirement is discussed in Chapter 12 Emissions Summary Table And Interpretation Of Results of this Procedure Document.

11.1.1 Localized Land Use Conditions

Paragraph 10 of subsection 26 (1) of the Regulation requires inclusion of a description of the local land use conditions that were used if, according to paragraph 2 of subsection 13 (1) of the Regulation, the meteorological data used in the AERMOD dispersion model has been refined to reflect local land use. Nevertheless, a description of the local land use conditions should be provided to support the choice of the regional meteorological data used in the AERMOD modelling.

ECA

Applying for an ECA

Applicants for an ECA are required to submit a Land Use Designation Plan as part of the supporting documentation for the noise assessment.

For more information see the ministry document, "Guide to Applying for an Environmental Compliance Approval", as amended.

11.1.2 Guidance for Describing the Dispersion Modelling

See Appendix D for a suggested tabulated format for providing the description, required under paragraph 11 of subsection 26 (1) of the Regulation, of the way in which the approved dispersion model was used that is sufficient to show compliance with sections 9 to 17 of the Regulation. Documenting compliance with sections 10, 11, and 12 was discussed in Chapter 8 Operating Conditions and 9 Emission Rate Estimating And Data Quality of this Procedure Document. The necessary descriptions for some of these sections may already have been included elsewhere in the ESDM report and can be simply referenced in a summary table. However, it is anticipated that it will be necessary to include, within the tabulation or a separate section of the ESDM report, descriptions of the

way in which the approved dispersion model was used that is sufficient to show compliance with the following sections:

- section 9 of the Regulation – Same Structure Contamination
- section 13 of the Regulation – Meteorological Conditions
- section 14 of the Regulation – Area of Modelling Coverage
- section 15 of the Regulation – Stack Height for Certain New Sources of Contaminant
- section 16 of the Regulation – Terrain Data
- section 17 of the Regulation – Averaging Periods

The ADMGO provides further guidance on the above-noted sections of the Regulation. Also, see Table 11-1 Dispersion Modelling Input Summary Table: Guidance On Providing A Description Of The Way In Which The Approved Dispersion Model Was Used for additional guidance on satisfying the requirements of paragraph 11 of subsection 26 (1) of the Regulation.

Table 11-1: Dispersion Modelling Input Summary Table: Guidance on Providing a Description of the Way in Which the Approved Dispersion Model was Used

Relevant section of the Regulation	Section Title	Guidance to Providing a Tabulated Summary of How the Approved Dispersion Model was Used
section 6	Approved dispersion models	Include model version numbers for all models including: AERMOD and ASHRAE.
section 8	Negligible Sources of Contaminant	If a source(s) was not considered in the application of the dispersion models, then it is sufficient to reference the portion of the ESDM report that relates to Chapter 7 Assessment Of The Significance Of Contaminants And Sources of this Procedure Document; which provides an explanation of how it was determined that the source(s) discharge a negligible amount of contaminant.
section 9	Same Structure Contamination	If same structure contamination is applicable, then provide a description of how the methods described in the ASHRAE Handbook – HVAC Applications were combined with the dispersion modelling. See the ADMGO for more detailed guidance on the ASHRAE Handbook.
section 10	Operating Conditions	Reference the portion of the ESDM report that relates to Chapter 8 Operating Conditions of this Procedure Document and describes the operating condition that results, for each significant contaminant, in the POI concentration for that contaminant.
section 11	Source of Contaminant Emission Rates	Reference the portion of the ESDM report that relates to Chapters 9.0 Emission Rate Estimating And Data Quality of this Procedure Document (i.e., provides an explanation of the methods used to estimate contaminant emission rates and an assessment of how accurately the methods estimate the emission rate).
section 12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	If, based upon emission rate estimating methodologies that are consistent with *paragraph 1* of subsection 11 (1) and operating conditions consistent with subsection 10 (1) of the Regulation, predictions of POI concentration exceed ministry POI Limits then describe either: (i) the refinement of emission rate estimates according to section 12 of the Regulation (also see Chapter 8 Operating Conditions and 9 Emission Rate Estimating And Data Quality of this Procedure Document) or (ii) the abatement plan, which is an option under section 12, and its submission to a provincial officer.
section 13	Meteorological Conditions	If using ministry regional meteorological data sets or regional meteorological data with local land use conditions, then simply indicate the description of the local land use conditions; or if using site-specific meteorological data, then indicate the means in which the ministry Director has approved the use of this data and the AERMET model version used. See the ADMGO for more detailed guidance on the application of meteorological data.

Table 11-1 Dispersion Modelling Input Summary Table: Guidance on Providing a Description of the Way in Which the Approved Dispersion Model was Used (Continued)

Relevant section of the Regulation	Section Title	Guidance to Providing a Tabulated Summary of How the Approved Dispersion Model was Used
section 14	Area of Modelling Coverage (receptor locations)	If the area of the modeling coverage is applicable to the use of the approved dispersion models then it is sufficient to provide a statement or brief description of how the receptor grid pattern that was used in the modelling includes a spacing that is no greater than the largest grid interval allowed by section 14 of the Regulation and how the bounds of the grid are large enough to capture the maximum POI as required by section 14 of the Regulation. If using different modelling grid, then indicate the means in which the ministry Director has approved the use of this approach. See the ADMGO for more detailed guidance on receptor locations.
section 15	Stack Height for Certain New Sources of Contaminant	If this section is applicable (i.e., to sources constructed after November 30, 2005), then it is sufficient to provide a summary of the actual stack heights of the relevant sources and the calculated or stipulated maximum height that can be used with the approved dispersion model. See the ADMGO for more information on Stack Height for Certain New Sources of Contaminant.
section 16	Terrain Data	If terrain data is applicable to the use of the approved dispersion models, then it is sufficient to: • indicate whether there were any points of impingement that had an elevation higher than the lowest point from which a relevant contaminant is discharged from; and if so • provide a brief description of how terrain data was considered or employed and provide a copy of the terrain data that was used (if applicable).[19] See the ADMGO for more detailed guidance on the application of terrain data.
section 17	Averaging Periods	Provide an indication of how the averaging periods for the dispersion model outputs were consistent with the requirements of this section and/or how any averaging period conversions were consistent with the requirements of this section. See Table 7-1 Averaging Period Conversion Factor (F) of this Procedure Document for an equivalent method, to section 17 of the Regulation, in converting POI concentrations to different averaging periods. Also, see the ADMGO for more additional guidance on the application of averaging periods.

[19] The terrain data for Ontario has been provided by the Ontario Ministry of Natural Resources in a format that can be used to run the US EPA models. Terrain data is available from the ministry's web-site and the ministry's Public Information Centre (on compact disc).

11.1.3 Guidance for Providing Input and Output Files

Paragraph 12 of subsection 26 (1) of the Regulation requires submission of an electronic copy of the input files that were used with the approved dispersion model and the output files that were produced by the use of the models. Please see the ADMGO for additional guidance on the topic of providing input and output files related to use of the approved dispersion models.

Self-contamination assessed using ASHRAE calculations should include a site drawing (including a side and top view). This should include Plan and/or Elevation views of the building showing the building height, length and width, in addition to source and receptor (intake) locations and distances. Source details and parameters such as the stack height, flow rate and diameter should also be provided. Full calculations (including the wind speed ranges searched) must be provided in an Appendix, or electronically via an Excel spreadsheet.

11.1.4 Guidance for Providing Terrain Data

If terrain data was used during modelling, the data must be submitted as a part of the ESDM report. (s. 16 (1) and s. 26 (1) 3). Please see ADMGO document for more detailed guidance on the use of terrain data with the approved dispersion models.

11.1.5 Dispersion Modelling for Standards with Annual Averages

When modelling for standards with annual averaging periods, using models such as AERMOD, the emission rate inputs to the model must reflect the maximum annual operating scenario (i.e. worst case year). The maximum annual POI concentration would be compared to the annual standard to assess compliance.

The model run would be conducted either with the appropriate five-year regional meteorological data set or a site-specific meteorological data set approved by the ministry under s.13 of the Regulation, if applicable. Because the hourly POI concentrations are converted to annual averages by AERMOD, It is not necessary to remove any meteorological data from the model run.

Earlier versions of the AERMOD dispersion model will average all the meteorological conditions over five years for each grid point to produce one maximum POI concentration based on the annual emission rate. Later versions of AERMOD (2015) do output the maximum POI for each meteorological year. If a proponent is using an earlier version of AERMOD, the ministry would prefer that proponents evaluate the maximum POI for each year. The maximum annual POI from those 5 years is then compared to the annual standard. This can be done by running each model year individually and evaluating the outputs to determine the maximum annual POI. For post 2015 versions of AERMOD, the maximum POI from the five years should be used to assess against the annual standard.

For the earlier versions of AERMOD, in order to avoid complex post-processing steps, it may also be acceptable to do one model run, using the appropriate five-year regional meteorological data set or a site-specific meteorological data set approved for that site

under s.13 of the Regulation, if applicable. The maximum annual POI could then be multiplied by 140% and this number would be compared to the annual standard. This is intended to act as a conservative screening check against the annual standard. If 140% of the five year averaged POI model results is more than that of the annual standard, then individual model runs must be conducted for each of the five years of meteorological data or the site-specific meteorological data. The maximum POI from each of those individual years is then assessed against the annual standard.

[Note: if the above approach involving an assessment of 140% of the modelled value is used, this must be highlighted in the Emission Summary Table with a note.]

11.2 Roadways, Railways and Bodies of Water

POI concentrations must be below the relevant ministry POI Limit at all off-site locations (as per the definition of point of impingement in section 2 of the Regulation). However, there may be site-specific situations where an off-site location would not need to be considered in the ESDM report as a POI, such as:

i) Most public roadways between two separate parcels of a facility property.

ii) Most railway lines or railway right-of-ways.

iii) Bodies of water that are inside the boundaries of Ontario, except situations where an adverse effect may occur (e.g., in the vicinity of a marina).

12.0 EMISSIONS SUMMARY TABLE AND INTERPRETATION OF RESULTS

Each ESDM report must include an Emission Summary Table. Paragraph 14 of subsection 26 (1) of the Regulation sets out the requirements for an Emissions Summary Table as follows:

Under Subsection 26 (1) of the Regulation – Contents of ESDM report:

"14. A table, labelled as the "Emissions Summary Table", that shows, for each contaminant listed under paragraph 4,

i. the Chemical Abstracts Service Registry Number for the contaminant,

ii. the approved dispersion model that was used in respect of the contaminant for the purpose of this section,

iii. the averaging periods for which the approved dispersion model was used in respect of the contaminant and, for each averaging period, the sum of the emission rates for the contaminant for all sources of contaminant identified under subparagraph 3 ii as a source of

contaminant that was considered when using an approved dispersion model for the purpose of this section,

iv. the standard set out for the contaminant in,

A. Revoked: O. Reg. 507/09, s. 25 (4).

B. Schedule 2, if section 19 applies to the contaminant, or

C. Schedule 3, if section 20 applies to the contaminant,

v. the concentration predicted by the approved dispersion model for the point of impingement with the highest concentration,

vi. a comparison of the concentration referred to in subparagraph v and the standard referred to in subparagraph iv, expressed as a percentage of the standard, if section 19 or 20 applies to the contaminant,

vii. the location of the point of impingement referred to in subparagraph v, if section 19 or 20 applies to the contaminant and the concentration referred to in subparagraph v exceeds the standard referred to in subparagraph iv, and

viii. an indication of the likelihood, nature and location of any adverse effect, if sections 19 and 20 do not apply to discharges of the contaminant."

See Appendix D for an example format for an Emissions Summary Table. The following is additional guidance regarding paragraph 14 of subsection 26 (1) (i.e., the Emissions Summary Table) in an ESDM report:

- The averaging period reference should be expressed in hours or an annual average.
- The emission rates should be expressed in grams per second.
- The models used, included their version codes.
- The POI concentration should be expressed in the same units (e.g., typically, micrograms per cubic metre) as the ministry POI Limit for the respective contaminant.
- The location of the maximum POI required by subparagraph vii, may be expressed as a map which depicts the location and concentration of each maximum POI.
- To satisfy subparagraph viii, it is generally sufficient to provide:

  - A comparison to ministry POI Limits for the relevant contaminant and
  - The basis of the ministry POI Limit[20].

- The Emissions Summary Table should also include sources that have been excluded from the modelling because they are part of a technical standard.

If the maximum POI concentration is less than the standard (or guideline) (B1 values), the facility is in compliance (conformance) with the standard (or guideline). If the maximum POI concentration exceeds the standard (or guideline), the facility may (i) refine their assessment in accordance with s.12 of the Regulation; or (ii) take abatement action to bring the facility into compliance with the standard or conformance with the guideline; or (iii) take other actions to comply with the Regulation which may include requesting a site-specific standard or registering for a technical standard (if available).

For more information on what information to include in the Emission Summary Table for facilities registered to a Technical Standard, please see Chapter 2 Overview or ESDM Reports and Chapter 12.4 Contaminants Registered to Technical Standards of this Procedure Document.

ECA

Applying for an ECA

It is recommended that applicants for an ECA provide a Scaled Map or Area Location Plans showing the location of the maximum point of impingement concentration for each contaminant.

Facilities that are permitted to use the models in the Appendix to Regulation 346 and that are modelling a virtual source are not required to provide detailed information on the surrounding land use beyond what is required as part of the noise assessment of the application.

Applicants must be prepared to verify the accuracy of the submission.

12.1 Contaminants with Ministry POI Limits

The “Air Contaminants Benchmarks (ACB) List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants” (as amended) contains a summary of Ministry POI Limits for contaminants that may be used or produced by industry in Ontario. This Procedure Document is the primary reference to be used to assess POI concentrations from ESDM reports.

Note: A contaminant that has a POI concentration below its respective Benchmark 2 (B2) Value (screening level) on the ACB List does not require further assessment but must be documented in the Emission Summary Table of the ESDM Report. If the B2 value is exceeded, further assessment must be done.

[20] The basis of the ministry POI Limit can be identified from the ministry’s ACB List (as amended). If there is no ministry POI Limit, see Chapter 12.2

Note: For more information on Upper Risk Thresholds (URT) listed in Schedule 6 of the Regulation, see Chapter 12.3 Upper Risk Thresholds of this Procedure Document.

12.2 Contaminants without Ministry POI Limits

There are many more compounds that meet the definition of a contaminant under the Ontario EPA than there are contaminants with ministry POI Limits. Persons preparing an ESDM report are accountable for the assessment of all contaminants that are discharged from the facility regardless of whether or not a ministry POI Limit is available.

The ESDM report must provide an indication of the likelihood and nature of any adverse effect that may be caused by a contaminant with no ministry POI Limit. This may be addressed as follows:

i. If a facility emits a contaminant that does not have an ministry POI Limit, further assessment must be done.

ii. If the ESDM Report is submitted as part of the ECA process, this further assessment will occur with input from ministry scientists as part of the ministry's review and acceptance of a Maximum Ground Level Concentration. This acceptance then appears in the Emission Summary Table upon completion of the review process. The location with zoning information and identification of sensitive receptors is also helpful to have during the GLC review process.

iii. If the ESDM Report is being prepared under:

1. sections 23 and 25 of the Regulation - facility is part of sector on Schedules 4 or 5 where the ESDM report is kept on-site and is up-dated annually; or
2. section 24 of the Regulation - a facility is required to submit an ESDM report based upon a Notice from a ministry Director; or
3. section 32 of the Regulation (request for a Site-Specific Standard).

and there is no value on the ACB List or the B2 value is exceeded, then this can be dealt with at the next available opportunity for ministry review. The next review could occur as part of an application for an ECA, or if ministry requests a copy of the ESDM report prepared under sections 23 or 25 of the Regulation.

iv. If the ESDM Report is being prepared under section 11(1) of Ontario Regulation 1/17: Registrations Under Part II.2 of the Act – Activities Requiring Assessment of Air Emissions (Air Emissions EASR Regulation) and there is no value on the ACB List or the B2 value is exceeded, an assessment to determine the likelihood of adverse effect would be required.

Note: The de minimus or threshold concentrations were also developed to screen out contaminants that are emitted in negligible amounts. Details on this screening tool are outlined in Appendix B of this guideline.

ECA

Applying for an ECA

Applicants for approval under Section 20.2 of Part II.1 of the EPA must submit a completed copy of the ministry document "Supporting Information for a Maximum Ground Level Concentration Acceptability Request Supplement to Application for Approval, EPA S.9" (PIBS 4872) for each significant contaminant with no ministry POI Limit.

12.3 Upper Risk Thresholds

Upper Risk Thresholds (URTs) represent a concentration of a contaminant in air above its air standard. If a URT is exceeded anywhere off property, timely actions are required. Subsections 30 (1) through 30 (7) of the Regulation state:

Upper Risk Thresholds

"30. (1) A person who discharges or causes or permits the discharge of a contaminant listed in Schedule 6 into the air shall comply with subsections (3) and (4) if there is reason to believe, based on any relevant information, that discharges of the contaminant may result in,

(a) the concentration of the contaminant exceeding the half hour upper risk threshold set out for that contaminant in Schedule 6 at a point of impingement, if section 19 applies to the person in respect of the contaminant; or

(b) the other time period upper risk threshold set out for that contaminant in Schedule 6 at a point of impingement, if section 20 applies to the person in respect of the contaminant.

(1.1) The two items in Schedule 6 that set out upper risk thresholds for total reduced sulphur (TRS) compounds specify the facilities to which they apply.

(2) Without limiting the generality of subsection (1), the reference in that subsection to relevant information includes relevant information from predictions of a dispersion model, including,

(a) an approved dispersion model or other dispersion model; or

(b) a dispersion model that is not used in accordance with this Regulation.

(3) If subsection (1) applies to a discharge, the person who discharged or caused or permitted the discharge of the contaminant shall immediately notify the Director in writing.

(4) If subsection (1) applies to a discharge, the person who discharged or

caused or permitted the discharge of the contaminant shall, within three months after the discharge, prepare a report in accordance with section 26 and submit the report to the Director.

(5) If a person is required to prepare a report under subsection (4) and section 20 does not apply to the person in respect of the contaminant, section 20 shall be deemed to apply for the purpose of preparing the report and for the purpose of subsections (7) and (8).

(5.1) A person who prepares a report required by subsection (4) shall prepare the report using,

(a) the AERMOD dispersion model described in paragraph 1 of subsection 6 (1);

(b) Revoked: O. Reg. 507/09, s. 30 (2)

(c) a dispersion model or combination of dispersion models that,

(i) pursuant to subsection 7 (3), is deemed to be included in references in this Part to approved dispersion models, and

(ii) is capable of providing the information referred to in subsection (7).

...

(6) Paragraphs 1, 1.1, 2 and 2.1 of subsection 13 (1) do not apply to a person who prepares a report required by subsection (4) unless meteorological data described in paragraph 3 and 4 of subsection 13 (1) is not available and cannot reasonably be available in time to prepare the report within the three-month period referred to in subsection (4).

(6.1) If a report is required by subsection (4) to be prepared in accordance with section 26, it is not necessary for the lists of contaminants required by paragraphs 2 and 4 of subsection 26 (1) to include any contaminant other than the contaminant in respect of which the Director must be notified under sub section (3).

(6.2) A person who is required to prepare a report under subsection (4) shall ensure that the table required by paragraph 14 of subsection 26 (1) contains the following additional information:

1. The other time period upper risk threshold set out for the contaminant in Schedule 6.

2. A comparison of the concentration referred to in subparagraph 14 v of subsection 26 (1) and the other time period upper risk threshold set out for the contaminant in Schedule 6, expressed as a percentage of

the threshold.

(7) If, according to an approved dispersion model that is used for the purpose of preparing a report under subsection (4), discharges of a contaminant may result in a contravention of section 20 because of the concentration of the contaminant at a point of impingement located on a place referred to in subsection (8), the person who prepares the report shall include the following in the report:

1. ***A statement or map identifying the place that the point of impingement is located on.***

2. ***A statement specifying the highest concentration of the contaminant that the approved dispersion model predicts for the point of impingement.***

3. ***A statement specifying the number of averaging periods for which the approved dispersion model predicts that discharges of a contaminant may result in a contravention of section 20 because of the concentration of the contaminant at the point of impingement, expressed as a percentage of the number of averaging periods in,***

    i. ***a period of five years, if the approved dispersion model was used in accordance with meteorological data described in paragraph 1, 1.1, 2 or 2.1 of subsection 13 (1),***

    ii. ***a period equal to the length of the period over which the meteorological data was collected, if the approved dispersion model was used in accordance with local or site-specific meteorological data described in paragraph 3 of subsection 13 (1), or***

    iii. ***a period equal to the length of the period that was used for the purposes of the computational method, if the approved dispersion model was used in accordance with meteorological data obtained from a computational method in accordance with paragraph 4 of subsection 13 (1).***

The Director must be notified at the earliest stage where there is reason to believe, based on any relevant information, that discharges of a contaminant may result in an exceedence of an URT listed in Schedule 6 of the Regulation.

ESDM reports that are required as a result of an exceedence of an URT are only required to consider those contaminants for which an URT is predicted to be exceeded (see s. 30 (6.1) of the Regulation). It is also important to note that:

30 (5.2) Despite subsections 10 (1) and (2), a person who prepares a report required by subsection (4) shall use an approved dispersion model in accordance with both of the scenarios described in subsection 10 (1).

URTs can be used to manage risks both during and after the phase-in period of an air standard and is also used during the evaluation of requests for site-specific standards. URTs are NOT standards. See Chapter 3 of the ministry document, "Guideline for the Implementation of Air Standards in Ontario" (as amended) for guidance on determining appropriate action in relation to upper risk thresholds.

URTs listed in Schedule 6 of the Regulation are not standards. URTs have separate and distinct regulatory and notification requirements. These requirements are set out in section 30 of the Regulation. During the phase-in period of a new air standard, emitters must ensure, as a minimum, that they do not exceed the concentration set out in Schedule 6 of the Regulation. If the existing standard or guideline was less stringent than a URT, then the old standard or guideline would be removed from the ACB List. During the phase-in of the new standards, applications under section 20.2 of the Environmental Protection Act for an ECA and ESDM reports prepared in accordance with the Regulation, will be assessed against the URTs rather than the less stringent old standards or guidelines.

12.4 Assessment Values for Contaminants with Annual Standards

"Assessment values" are being introduced for exclusive use with annual standards. Annual average standards are based on an annual operating scenario and a typical annual emission rate, which averages out peak exposures over the year. However, POI concentrations can be influenced on a day-to-day basis by variations in emissions as well as weather conditions. These variations may cause elevations in exposure and therefore may be of concern depending on the length of time and concentration of the contaminant. The ministry has introduced "assessment values" in order to assess possible and occasional periods of elevated exposure that may occur during the year.

Assessment values would only be used if a facility is assessing against the annual standard in Schedule 3 (i.e. would not be used by a facility assessing against a standard in Schedule 2). Assessment values are values that do not appear in the Regulation, but if exceeded, may lead to a further assessment to determine if any further action is necessary or not.

Assessment values are available for use with modelling as well as monitoring results.

For further information on assessment values, please refer to the technical bulletin "Methodology For Assessment of Contaminants with Annual Average Standards under O. Reg. 419/05" (as amended) and available on the ministry website.

12.5 Contaminants Registered to Technical Standards

A facility may be registered for an industry standard, an equipment standard or a combination of industry standard and equipment standard. If a person is registered for a technical standard(s) in respect of a facility and contaminant(s), but all sources of the contaminant at the facility are not addressed by theses technical standard(s) (i.e. there are sources of contaminant at the facility that are part of other NAICS codes), the person may only exclude the sources of contaminant(s) that are associated with the NAICS code addressed in the technical standard(s). An ESDM report would be required for the remaining sources.

If the person is registered with respect to a sufficient number of industry standards, equipment standards or a combination of industry standard and equipment standards to address all sources of that contaminant at their facility, then this person is exempt from Part II of the Regulation for a contaminant. Registering for and complying with technical standard(s) is an alternative to complying with the air standards and associated ESDM requirements. In this case, no ESDM report is required to be submitted for the relevant contaminants. The Emission Summary Table of this ESDM report should clearly state if the contaminant (either whole or in part) is registered to a Technical Standard.

Note: An assertion or information on compliance with other relevant regulations or guidelines (such as guideline A9 and A5 etc.) needs to be included in the ECA application package. Currently all such compliance assessments are provided within the body of the ESDM Report.

13.0 Other Considerations that Require Follow Up Actions

This Chapter 13 Other Considerations that Require Follow Up Actions of this Procedure Document describes what action is or may be required when a ministry POI limit is exceeded. For example, there are different notification requirements under the Regulation under subsection 25 (9) [Update of ESDM report], section 28 [Notice to provincial officer as a result of modelling or measurements], and section 30[Upper risk thresholds].

Under section 28 of the Regulation, there are notification requirements for exceedences of ministry B1 values on the ACB List (standards and guidelines) once refinement has been completed. However, if a facility determines that refinement will still likely show an exceedence, they may choose to focus their efforts on abatement (as opposed to refinement). Subsection 12 (3) of the Regulation says a person can choose to proceed directly to abatement activities. Note that if this option is chosen, the person must notify the ministry of an exceedence under section 28 of the Regulation and submit an abatement plan as per section 29.

For facilities required to update their ESDM report annually (generally facilities in Schedules 4 and 5), after March 31 of the relevant year, if the facility is in the process of refining the ESDM report, notification under subsection 25(9) of the Regulation must be made as soon as practicable. This notification should communicate a facility's intent to further refine the ESDM report or to proceed to abatement. Upper Risk Thresholds (URTs) (Schedule 6) also have separate and distinct notification requirements under section 30 of the Regulation (see also Chapter 2.3 Update of an ESDM report). The Director must be notified at the earliest stage where there is any reason to believe, based on any relevant information, that discharges of a contaminant may result in an exceedence of an URT listed

in Schedule 6 of the Regulation. For more information on notification requirements, see Chapter 2.3 Updates to ESDM Reports, Chapter 12.3 Upper Risk Thresholds, and Chapter 13.1 Notification to a Provincial Officer for more information.

13.1 Providing Notice to a Provincial Officer

Section 28 of the Regulation states:

Notice to Provincial Officer as a result of Modelling or Measurements

"28. (1) A person who discharges or causes or permits the discharge of a contaminant shall, as soon as practicable, notify a provincial officer in writing if,

(a) the person uses an approved dispersion model to predict concentrations of the contaminant that result from the discharges and,

(i) the use of the model indicates that discharges of the contaminant may result in a contravention of section 19 or 20, or

(ii) sections 19 and 20 do not apply to discharges of the contaminant and the use of the model indicates that discharges of the contaminant may cause an adverse effect;

(b) measurements of air samples indicate that discharges of the contaminant may result in a contravention of section 19 or 20; or

(c) sections 19 and 20 do not apply to discharges of the contaminant and measurements of air samples indicate that discharges of the contaminant may cause an adverse effect.

(1.1) The Director may give written notice to a person who discharges or causes or permits the discharge of a contaminant requiring the person to notify a provincial officer in writing, at regular intervals specified by the Director, of any circumstances described in clause (1) (a), (b) or (c).

(1.1.1) Before the Director gives a person a notice under subsection (1.1), the Director shall give the person a draft of the notice and an opportunity to make written submissions to the Director during the period that ends 15 days after the draft is given.

(1.2) Subsection (1) does not apply to a person who complies with a notice given by the Director under subsection (1.1). …

See Chapter 4 of the ministry document, "Guideline for the Implementation of Air Standards in Ontario" (PIBs # 5166e) for guidance on factors to consider when standards are exceeded.

13.1.1 Submission of a Written Abatement Plan

Section 29 of the Regulation states:

Abatement plan

"29. (1) A person who gives a notice to a provincial officer under subsection 28 (1) or (1.1) in respect of a contaminant shall, not later than 30 days after giving the notice, prepare and submit to a provincial officer a written abatement plan for the contaminant that recommends steps that should be taken to prevent discharges of the contaminant from resulting in a contravention of section 19 or 20 or an adverse effect.

(2) Subsection (1) does not apply if,

(a) an abatement plan for the contaminant is already required to be submitted to a provincial officer within the 30-day period referred to in subsection (1);

(a.1) an abatement plan for the contaminant has previously been submitted to a provincial officer under subsection (1) and the Director is satisfied that another plan is not necessary; or

(b) a plan for the contaminant was submitted to the Ministry before November 30, 2005 and the Director is satisfied that it is not necessary to prepare and submit an abatement plan under subsection (1)."

At a minimum, the submission of a pollution abatement plan should be of sufficient detail to initiate a substantive discussion, with representatives of the ministry, on the options to fully address the contravention or adverse effect. The final abatement plan must demonstrate that the proposed mitigation is certain to result in compliance with the ministry POI Limits. If compliance is not certain, a facility may be able to consider a request for a site-specific standard under section 32 of the Regulation. Alternatively, where available, the facility may choose to register to a Technical Standard under the Regulation.

For more information on site-specific or Technical Standard, please visit the ministry website (under Industrial Air emissions).

13.2 Assessing Concentrations and Frequency at Specified POIs

There are two types of ESDM reports that automatically require this information to be included in the ESDM report; namely, ESDM reports required under section 30 (upper risk thresholds) and section 33 (request for a site-specific standard). The Regulation (see

subsection 30 (8)) requires the frequency of exceedences to be determined for the following places:

1. A health care facility.
2. A senior citizens' residence or long-term care facility.
3. A child care facility.
4. An educational facility.
5. A dwelling.
6. A place specified by the Director in a notice under subsection 30 (9) as a place where discharges of a contaminant may cause a risk to human health.

In making a decision regarding a request for a site-specific standard, information regarding these specific POIs and frequency of exceedences is required to enable the Director to make a decision as per subclause 35(1) (b) (iii) as well as subsection 35 (2) of the Regulation.

The Regulation requires that the frequency of exceedences at specified POIs may also be required in some ESDM reports. A Director may require this information by issuing various notices under sections 24, 25, and 28 of the Regulation. This would be information submitted in addition to the maximum POI concentration.

Assessment of the frequency of exceedences based on any monitoring data must also be included in the ESDM report in addition to the modelled frequency results. The ministry may request more information on frequency and magnitude.

If a facility is required to notify the ministry of an exceedence of an air standard (or ministry POI Limit) under section 28 of the Regulation, then it may also be useful for ESDM reports to include an assessment of emission rates and POI concentrations for different operating conditions (in addition to the assessment at operating conditions that result in the maximum POI concentration). It would also be useful to include a discussion of the frequency and duration of maximum POI concentration at the various operating conditions assessed. This additional information will be particularly useful in assessing the significance of any exceedences of a ministry POI Limit or Assessment Values (linked to annual standards).

Any information on the frequency and magnitude of exceedences should be in a separate appendix that can be provided to ministry toxicologists for their review.

For more information on how to assess the frequency and magnitude of an exceedence, see also see Chapters 2.2.1 and 4 of GIASO and Chapter 3.5 of "Guide to Requesting a Site-Specific Standard" (PIBs # 6322e) dated September 2016 (as amended) (formerly called the Guide to Requesting an Alternative Air Standard).

13.3 Site-Specific Standards Compliance Approach

Section 32 of the Regulation allows for site-specific standards to be requested during specific periods of time. A facility is eligible to request a site-specific standard as a result of the phase-in of new or updated air standards; the phase-in of the SCREEN3, AERMOD

and ASHRAE; the use of specific models as required by a ministry Director; or as part of an abatement order issued by ministry.

See sections 32 to 37.1 of the Regulation for more detail. The ministry document, "Guideline for the Implementation of Air Standards in Ontario" (PIBs # 5166e) (as amended) also provides guidance on these requests. Further information is also available in the "Guide to Requesting a Site-Specific Standard" (PIBs # 6322e), dated July 2016 (as amended).

13.4 Technical Standards Compliance Approach

Section 38 of the Regulation allows for a person to register for a technical standard for certain contaminants, as identified in the Technical Standards publication document "Technical Standards to Manage Air Pollution" dated March 5, 2015, as amended from time to time. Registering for and complying with a technical standard is a compliance approach recognized in the Regulation.

For more information, please refer to sections 38 to 44 of the Regulation and the "Guide to Applying for Registration to the Technical Standards Registry - Air Pollution" dated July 2016 (as amended) (PIBs # 7804e).

Note: Under the Regulation, the Director may still issue a notice under section 24 to request a facility registered to one or more technical standard(s) to submit an ESDM report for assessment purposes only.

Appendix A: List of Sectors Targeted within Ontario Regulation 419/05

SCHEDULE 4
TARGET SECTORS FOR 2010

(for Phase-Out of Models in the Appendix to Regulation 346 and
Phase-In of On-Site ESDM report Requirements on February 1, 2010)

Item	NAICS Code	North American Industry Classification System Description
1.	2122	Metal Ore Mining
2.	221112	Fossil-Fuel Electric Power Generation
3.	324110	Petroleum Refineries
4.	3251	Basic Chemical Manufacturing
5.	3252	Resin, Synthetic Rubber, and Artificial and Synthetic Fibres and Filaments Manufacturing
6.	3311	Iron and Steel Mills and Ferro-Alloy Manufacturing
7.	331410	Non-Ferrous Metal (except Aluminum) Smelting and Refining

Note: A fossil-fuel electric power generation facility with a maximum electrical power output capacity of less than 25 megawatts shall be deemed not to be part of the class identified by NAICS code 221112 (Fossil-Fuel Electric Power Generation).

SCHEDULE 5
TARGET SECTORS FOR 2013

(for Phase-Out of Models in the Appendix to Regulation 346 and
Phase-In of On-Site ESDM report Requirements on February 1, 2013)

Item	NAICS Code	North American Industry Classification System Description
1.	3221	Pulp, Paper and Paperboard Mills
2.	324190	Other Petroleum and Coal Products Manufacturing
3.	325	Chemical Manufacturing
4.	326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing
5.	3279	Other Non-Metallic Mineral Product Manufacturing
6.	331	Primary Metal Manufacturing
7.	332810	Coating, Engraving, Heat Treating and Allied Activities
7.1	332999	All Other Miscellaneous Fabricated Metal Product Manufacturing
8.	336	Transportation Equipment Manufacturing
9.	5622	Waste Treatment and Disposal

Notes:

i) A mobile PCB destruction facility within the meaning of Regulation 352 of the Revised Regulations of Ontario, 1990 (Mobile PCB Destruction Facilities) made under the Act shall be deemed not to be part of the class identified by NAICS code 5622 (Waste Treatment and Disposal); and

ii) A facility shall be deemed not to be part of the class identified by NAICS code 5622 (Waste Treatment and Disposal) unless the facility,
- is a solid waste combustor or incinerator, or
- is used for hazardous waste treatment or disposal.

Appendix B: Supporting Information for the Assessment of the Significance of Contaminants and Sources

Table B-1: Guidance for Screening-Out with Dispersion Factors

Table B-2A: De minimus Concentrations for Contaminants Not Listed in the ministry ACB List that Can Be Considered Insignificant in a Specific Situation

Table B-2B: List of Contaminants Excluded from de minimus level

Table B-3A: Specific Examples of Sources that Likely Emit Contaminants in Negligible Amounts

Table B-3B: Examples of Sources that may Emit Contaminants in Negligible Amounts (suggested rationales)

B.1Screening–Out Contaminants that are Emitted in Negligible Amounts

The product of a conservative dispersion modelling factor (in micrograms per cubic metre per gram per second emission) and the aggregate facility-wide emission rate of a contaminant (using the appropriate averaging period) can be compared to the corresponding ministry POI Limit as a means to conservatively but simply assess POI concentrations as appropriate. A series of appropriate conservative dispersion modelling factors have been developed for a short stack on a 6 metre tall building in combination with distances from the stack, as set out below.

Table B-1 Guidance for Screening-Out with Dispersion Factors (Table values based on 1 hour average)

Distance from Source (m)	Urban Dispersion Factor ($\mu g/m^3$ per g/s emission)	Rural Dispersion Factor ($\mu g/m^3$ per g/s emission)
Up to 20	8700	10000
40	6300	8100
60	4600	5900
80	3400	5100
100	2600	4500
150	1400	3500
200	900	2800
250	600	2300
300	450	1900
350	350	1700
400	300	1500
450	250	1300
500	200	1150
600	150	950
700	120	800
800	90	650
900	80	575
1000	70	500

This Table contains three columns. The first column contains the distance from the source, and the remaining two columns contain the corresponding Dispersion Factor. The second column contains values that are to be used if modelling in urban areas, while the third column is to be used if modelling in rural areas. Refer to the ministry guidance document titled *Air Dispersion Modelling Guideline for Ontario, 2005* for urban and rural definitions.

If the aggregate facility-wide emission rate of a contaminant multiplied by the appropriate dispersion factor from Table B-1 Guidance for Screening-Out with Dispersion Factors (Table values based on 1 hour average) is less than the ministry POI Limit (or converted to a 24-hour average concentration in the case of 24-hour average ministry POI Limit) then the assessment for that contaminant is complete.

For cases where a facility has some significant emission sources of a contaminant and other sources with small emission rates, the following approach may be used:

- sum the emissions from the less significant sources and multiply the sum by the appropriate dispersion factor;
- Add resulting concentration to the SCREEN3 or tier 2 or 3 model results for the more significant sources of that contaminant to assess against the ministry POI Limit.

However, if the maximum concentration for the less significant sources is less than 5% of the ministry POI Limit (consistent with the conditions identified in Chapter 6.2 Description of the Contaminants that May be Discharged of this Procedure Document) those sources can be dropped from further assessments for that contaminant. Alternatively the maximum concentration for the less significant sources could be added to SCREEN3 or tier 2 or 3 modelling results for the more significant sources of that contaminant to assess against the ministry POI Limit. The rationale for assessing contaminants and sources as insignificant must be documented in the ESDM report.

Contaminants without ministry POI Limits that Can Be Considered Insignificant in Specific Situations

If the substance is listed in the ministry document,"Air Contaminants Benchmarks (ACB) List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", then the following de minimus or threshold concentrations are NOT applicable. The following table presents de minimus concentrations, by contaminant type/group, for contaminants that are not listed in the above-noted document.

Table B-2A: De minimus Concentrations for Contaminants Not Listed in the ministry ACB List that Can Be Considered Insignificant in a Specific Situation

Assessment Steps		Threshold Concentration (below which impacts can be considered insignificant)
STEP 1:	If substance **ON** ACB List:	**Threshold Concentration Consideration Not Applicable** (Assessment to be based on ministry ACB List of standards, guidelines and screening levels
STEP 2:	If substance **NOT** on ACB List **AND NOT** on Table B-2B List of Contaminants Excluded from de minimus level:	If < 0.1 µg/m³ (24-hour average) or < 0.3 µg/m³ (1/2-hr average), then impacts can be considered insignificant
STEP 3:	If substance NOT on ACB List AND ON Table B-2B List of Contaminants Excluded from de minimus level	If < 0.01 µg/m³ (24-hour average) or < 0.03 µg/m³ (1/2-hr average), then impacts can be considered insignificant

Note:

ACB List = ministry document "Air Contaminants Benchmarks (ACB) List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants" as amended or updated"

Table B-2B List of Contaminants Excluded from de minimus level (see Table B-2A)

Sorted By CAS Number		Sorted By Chemical Name	
CAS Number	**Chemical**	**CAS Number**	**Chemical**
52-24-4	Tris(1-aziridinyl) phosphine sulphide	24304-00-5	Aluminum nitride
56-53-1	Diethylstilbesterol	134-29-2	o-Anisidine hydrochloride
57-41-0	Phenytoin	108171-26-2	Chlorinated paraffins (C12, 60% chlorine)
95-69-2	p-Chloro-o-toluidine	563-47-3	3-Chloro-2-methylpropene
117-08-8	Tetrachlorophthalic anhydride	95-69-2	p-Chloro-o-toluidine
134-29-2	o-Anisidine hydrochloride	94097-88-8	(4-Chlorophenyl) cyclopropylmethanone, O-[(4-nitrophenyl)methyl] oxime
135-20-6	Cupferron	135-20-6	Cupferron
338-98-7	Isoflupredone acetate	56-53-1	Diethylstilbesterol
552-30-7	Trimellitic anhydride	765-34-4	Glycidaldehyde
563-47-3	3-Chloro-2-methylpropene	338-98-7	Isoflupredone acetate
563-68-8	Thallium acetate	68891-01-0	Melamine, formaldehyde, toluenesulfonamide polymer, butylated
630-93-3	Phenytoin sodium	2385-85-5	Mirex
637-03-6	Oxophenylarsine	637-03-6	Oxophenylarsine
765-34-4	Glycidaldehyde	57-41-0	Phenytoin
2385-85-5	Mirex	630-93-3	Phenytoin sodium
6533-73-9	Thallium carbonate	12185-10-3	Phosphorus (yellow)
7446-18-6	Thallium sulfate	n/a	Polybrominated Biphenyls (PBBs)
7791-12-0	Thallium chloride	61788-33-8	Polychlorinated terphenyls (PCTs)
10102-45-1	Thallium nitrate	117-08-8	Tetrachlorophthalic anhydride
12185-10-3	Phosphorus (yellow)	563-68-8	Thallium acetate
24304-00-5	Aluminum nitride	6533-73-9	Thallium carbonate
61788-33-8	Polychlorinated terphenyls (PCTs)	7791-12-0	Thallium chloride
68891-01-0	Melamine, formaldehyde, toluenesulfonamide polymer, butylated	10102-45-1	Thallium nitrate
94097-88-8	(4-Chlorophenyl) cyclopropylmethanone, O-[(4-nitrophenyl)methyl] oxime	7446-18-6	Thallium sulphate
108171-26-2	Chlorinated paraffins (C12, 60% chlorine)	552-30-7	Trimellitic anhydride
n/a	Polybrominated Biphenyls (PBBs)	52-24-4	Tris(1-aziridinyl) phosphine sulphide

B.2 Screening-Out Sources that May Emit Contaminants in Negligible Amounts

An explanation of how it was determined that a contaminant is discharged in a negligible amount must be provided. The results of this assessment may be summarized in a Sources and Contaminants Identification Table. A facility may emit a contaminant in a significant amount but there may be some sources that emit this contaminant in a negligible amount.

Table B-3A lists examples of sources that ***likely*** emit contaminants in negligible amounts. Regardless of the guidance provided in these tables, when a source listed in Table B-3A is screened out as negligible, a ministry reviewer may at any time request an additional explanation on a case by case basis to justify the assertion that the source emits a negligible amount of contaminant. Table B-3B lists examples of sources that ***may*** emit contaminants in negligible amounts but an additional rationale is needed.

Section 8 of the Regulation sets out requirements for assessing negligible sources of contaminant(s). The Director has the authority to require a person who discharges or causes or permits discharges of a contaminant to consider a source of contaminant as not being negligible (see subsection 8 (2) of the Regulation). For more information on negligible sources, please refer to Chapters 6 Initial Identification Of Sources And Contaminants and 7 Assessment Of The Significance Of Contaminants And Sources of this Procedure Document.

Table B-3A: Specific Examples of Sources that Likely Emit Contaminants in Negligible Amounts

- Minor surface coating operations within larger operations such as a touch up paint booth at an automotive manufacturing facility.
- Chemical storage room ventilation.
- Fume hoods for laboratories that are used for quality control and quality assurance purposes at industrial facilities.
- Parts washers for maintenance shops.
- On-site storage tanks and facilities that are used for fueling on-site vehicles.
- Battery chargers.
- Storage and emission of nitrogen and oxygen.
- Small maintenance and janitorial activities.

• Exhaust of inert gases. One standby power generator unit rated less than 700 kilowatts (for more information see Table B-3B Examples of Sources that may Emit Contaminants in Negligible Amounts).

Table B-3B: Examples of Sources that may Emit Contaminants in Negligible Amounts

Potential Negligible Source	Rationale to be provided
Sources that are Exempt from Obtaining an ECA [O. Reg. 524/98: Environmental Compliance Approvals — Exemptions From Section 9 Of The Act]	Section 1(7) of O. Reg. 524/98 states: "(7) An exemption under this Regulation from section 9 of the Act does not relieve a person of any other legal duty or obligation, including a duty or obligation arising under an existing environmental compliance approval." Sources that are exempt from an ECA are not exempt from O. Reg. 419/05. Hence, although many of these sources are likely to be negligible, in some cases, they are not negligible and must be assessed.
Maintenance welding stations.	The following information must be provided in order to assess whether or not this is a negligible source or whether the source should be assessed in the ESDM report: • whether emissions are controlled by an air pollution control device; • number of welding rods used and type (e.g. stainless steel, etc.); • list of contaminants from welding rod MSDS; • the quantity or frequency of welding operations. • location of the stack; • distance to the property line; • discharge type (Horizontal/Vertical). In general, if any of the following conditions exist, the source should be assessed in the ESDM report: • stainless steel welding • no controls

Potential Negligible Source	Rationale to be provided
	• manganese in welding rod • the exhaust stack is part of a multi-tenant building; • the stack has a horizontal discharge (as opposed to vertical discharge)
Standby power generators firing liquid or gaseous fuels that are used for standby power only with periodic testing as per s. 20.4 of the Regulation.	The following information must be provided in order to assess whether or not this is a negligible source or whether the source should be assessed in the ESDM report: • distance to property line; • distance to nearest air intake, if applicable; • number of units, the size of the units and the locations; • location of nearby human receptors including: 1. A health care facility; 2. A senior citizens' residence or long-term care facility; 3. A child care facility; 4. An educational facility; 5. A dwelling; 6. A place specified by the Director as a place where discharges of a contaminant may cause a risk to human health. In general, if any of the following conditions exist, the source should be assessed in the ESDM report: • any unit >700 kW; • multiple units; • any unit near an air intake/property line; • any unit close to a human receptor (see above).
Natural gas fired water heaters, space-heaters and make-up air units when the total facility-wide heat input usage for this equipment is less than 20 million kilojoules per hour.	The following information must be provided in order to assess whether this is a negligible source: • the number of units; • the size or power rating of each unit; Note: must provide information on any units that existed or were modified before 1989.

Potential Negligible Source	Rationale to be provided
	In general, if any of the following conditions exist, the source should be assessed in the ESDM report: • any unit is >10 Megajoules/hr; • units addressed by Guideline A-9: NOx Emissions from Boilers and Heaters
Low temperature handling of compounds with a vapour pressure less than 1 kiloPascal.	The following information must be provided in order to assess whether this is a negligible source or whether the source should be assessed in the ESDM report: • a description of the contaminants being handled; • a description of each process that proposes to use this 1 kPa factor including the nature of the operation [e.g. loading areas; filling operations; railcars; waste processing; lubricating oils or greases; fuel storage; wash chemicals, etc.] • the volume, size of the container(s); • the filling rate or flowrate of the process or container; • the temperature of the process or container; • the number of units; • a calculation to demonstrate the vapour pressure for each process or operation. • the location of each source on the property**;** • distance to property line. In general, if any of the following conditions exist, the source should be assessed in the ESDM report: • tanks; • loading or filling operations including truck and railcar areas; • unloading operations such as marine terminals, etc.

Appendix C: Reference Material for Emission rate estimating

Table C-1: Emission rate estimating Reference Material

Table C-2: Summary of Some Useful Equations and General Guidance

The following Table C-1: Emission Rate Estimating Reference Material is a summary list of websites (which may change with time but are accurate according to the date of this Addendum) that may assist in obtaining emissions information for specific sources. This list is not exhaustive and only intended as additional guidance.

Table C-1: Emission rate estimating Reference Material

Reference Material	Description	
United States Environmental Protection Agency (USEPA)		
Clearinghouse for Inventories & Emissions Factors (CHIEF)	Primary web-site for emission factors and development of emission inventories.	
Emissions Factors & AP 42	AP-42 series documents emission factors for a variety of processes.	
Emission Inventory Improvement Program (EIIP)	EIIP was established in 1993 to promote the development and use of standard procedures for collecting, calculating, storing, reporting, and sharing air emissions data. Includes up-to-date, comprehensive emissions information for a variety of processes and sources.	
Locating & Estimating (L&E) Documents	L&E documents characterizes the source categories for which emissions of a toxic substance have been identified. These volumes include general descriptions of the emitting processes, identifying potential release points and emission factors.	
Air Toxics Web Site (ATW)	ATW includes links to information on the list of the 188 Hazardous Air Pollutants (HAPs) regulated by the USEPA and corresponding development of Maximum Achievable Control Technology (MACT) standard for the 175 source categories identified as critical sources of HAPs. Over the past 10 years, EPA has issued 45 air toxics MACT standards.	
Toxics Release Inventory (TRI) Program	The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases reported annually by certain covered industry groups as well as federal facilities.	
Emissions Factors Software and Tools	Emission rate estimating software such as web*FIRE* (air toxics Database for a variety of processes); and TANKS (assists with estimates of VOC emissions from storage tanks)	
Control Technologies for Hazardous Air Pollutants June 1991	This handbook provides detailed descriptions, design information, performance and costing data for a variety of air pollution control equipment. It is not available on-line but a hard copy can be ordered from the USEPA.	
Environment Canada		
National Pollutant Release Inventory (NPRI)	A search engine to review annual emissions of a wide range of contaminants from facilities across Canada	

Reference Material	Description	
NPRI Toolbox	The "NPRI Toolbox" was created to assist those involved in preparing NPRI reports by placing all available information on estimation in one location. The Toolbox contains various methods of estimating releases, references (including guidance documents and software), case studies and examples, various spreadsheets for estimating emissions for various processes and questions and answers pertaining to release estimation.	
Strategic Options Process (SOP)	The SOP is a multi-stakeholder effort that has resulted in the development of technical background information documents and proposals for the reduction of designated toxic pollutants.	
Ontario Ministry of the Environment and Climate Change		
OnAir Historic Repository	Effective February 15, 2006, the Ministry of the Environment has amended Ontario Regulation 127/01 - Airborne Contaminant Discharge Monitoring and Reporting. The amended regulation harmonized the province's air emission reporting system with that of the federal government's National Pollutant Release Inventory (NPRI) program. As a result, Ontario's OnAIR web site has been discontinued. Beginning for reporting year 2005, all Ontario airborne emissions data, including those reported under the authority of O.Reg. 127/01, will be available to the public through the NPRI program. For data prior to 2005, please contact the ministry at 855-779-2788 or by email at onair.facility@ontario.ca.	
Evaporation Equation	This equation (provided by staff of the ministry, Environmental Monitoring and Reporting Branch) may be used to approximate evaporation rates from spills, open tanks, drums or pools	
Approximating Vapour Pressure Within a Mixture of Compounds	The following approach can be used to estimate the vapour pressure of a specific compound within a liquid mixture (contained in a drum, tank, etc) when only the vapour pressure of the mixture at standard temperature and pressure is known.	
Ontario Ministry of the Environment and Climate Change (Continued)		
Approximating the Specific Volume of a Gas	This equation (based on Ideal Gas Law) may be used to approximate the specific volume of a gas.	
Approximating Particulate Emissions from Baghouse	See Table C-2: Summary of Some Useful Equations and General Guidance.	
Guidance for Welding Operations	Where there are emission factors for specific welding operations available in AP 42 or other reliable published information, this information should be used in the assessment of welding emissions. Where this is no other information available, proponents may assume 1% but additional rationale may be requested. A ministry approvals guidance document, from the late 1980's suggests that it is reasonable to assume that 1% of the consumable electrode in electric-arc welding will be emitted as fume from the welding operation.	

Reference Material	Description	
Technical Bulletin: Emission Factors For 1,6-Hexamethylene Diisocyanate (Hdi) Emissions From Spray Booth Operations	In cooperation with the suppliers and users of isocyanates, the Ontario Ministry of the Environment (ministry) conducted a study of 1,6-Hexamethylene Diisocanate (HDI) emissions with a focus on spray booth operations in the automotive industry. Emissions factors were developed for three (3) operating conditions : • Autobody Sector using Best Management Practices; • Autobody Sector using Historical Practices; and • Original Equipment Manufacturer Sector.	
Other		
AWMA Air Pollution Engineering Manual	This text includes comprehensive descriptions and emission factors for a variety of industrial processes (based on information from the USEPA and industry associations) and provides information on the fundamentals of air pollution control. This text can be ordered on-line from the Air & Waste Management Association (AWMA).	

This Table C-1: Emission Rate Estimating Reference Material contains two columns. The first column contains the name of the reference material, the second column contains a description of reference material.

Table C-2: Summary of Some Useful Equations and General Guidance

Evaporation Equation

This equation (provided by staff of the ministry, Environmental Monitoring and Reporting Branch), may be used to approximate evaporation rates from spills, open tanks, drums or pools:

$Q = (8.5 \times 10^{-10}) \times A_p \times P^* \times M \times (u)^{0.78}$ (kg/s at 293 K or 20 degrees Celsius)

Where; Q = evaporation rate (vapour release rate), kg/s at 293 K or 20°C
A_p = pool area, in square metres
P* = partial vapour pressure (this can be estimated from the liquid mole-fraction), Pascal's
M = molecular weight, (summation of individual element molecular weights)
u= wind speed, metres per second

For evaporation rates at temperatures other than 293K or 20°C, use
$Q_t = Q \times (P_t/P_{293K}) \times (293/T_t)$; kg/s at T_t degrees Kelvin

Notes:

i) The wind speed can be estimated from site-specific data; or an assumption of typical wind-speed (i.e., 5 m/s for outdoor and 1 m/s for indoors).
ii) Molecular weight can be calculated from the chemical formula for the compound and use of the periodic table.
iii) Partial vapour pressures for mixtures of compounds can be approximated from the equation/pro-ratio procedure set out below.
iv) The above equations will be conservative for situations where the liquid level is well-below the tank/drum top. See the TANKS program (US EPA, US EPA TTN web-site) for guidance on how to account for this situation.

Approximating the Vapour Pressure within a Mixture of Compounds

In many cases it is necessary to estimate the vapour pressure of a specific compound within a liquid mixture (contained in a drum, tank, etc.) where the Material Safety Data Sheet for the mixture includes only a vapour pressure for the mixture at standard temperature and pressure. The following approach can be used to estimate emissions of constituent 'i' in the liquid mixture. However, this procedure is only a "rough" approximation using Raoult's Law.

For an ideal solution, the equilibrium partial pressure, P^*_i, of constituent 'i', in a mixture at a fixed temperature equals the product of it's vapour pressure, P_i, when pure at this temperature and its mole fraction in the liquid, $M_{f\text{-}l}$ ...

$P^*_i = P_i \times M_{f\text{-}l}$

where $M_{f\text{-}l}$ = [(mass fraction in liquid of i)/(molecular weight of i)]
Summation of (mass fraction/molecular weight) for all constituents

Notes:

The vapour pressure, P_i (in Pascal where 1 atmosphere= 101.3 kilopascals or 14.7 psi or 760 mm mercury), of constituent 'i' can be identified from reference texts such as Perry's.

This Table C-2: Summary Of Some Useful Equations And General Guidance Continued contains just one column, and is intended to emphasize its contents.

Table C-2: Summary of Some Useful Equations and General Guidance continued

1. Approximating the Specific Volume of a Gas (from Ideal Gas Law)

$V = (T + 460)/(1.369 \times M_w)$, ft^3/lb

where; V = specific volume, cubic feet per pound of gas;
T = temperature, degrees Fahrenheit
M_w = molecular weight, (summation of individual element molecular weights)

Conversion to cubic metres per kilogram: multiply the above by (2.2046/35.315) or (0.0624).

2. Approximating Particulate Emissions from Baghouses

An emission factor of 0.01 grains/ft^3 or ~20 milligrams per cubic metre (mg/m^3) of gas can be assumed at the outlet of a fabric filter dust collector. In cases of sites with multiple baghouse (also known as fabric filter dust collectors) discharging simultaneously, an emission factor of 20 mg/m^3 can be assumed for the most significant dust collector and 10 mg/m^3 for the remaining units.

A review of ministry compiled source testing data (n=96) for fabric filter dust collectors between 1994-2007 showed that 90% of the measured particulate outlet concentrations were below 20 mg/m^3 and the mean of the test results were approximately 9 mg/m^3. These tests were conducted on a wide range of dust collector types at numerous industrial and waste management facilities and are considered to have a data quality of "Average" to "Above-Average" as all of the tests were conducted under approved pre-test plans and the results were validated by the ministry. The results of this analysis support a reasonable level of "conservatism" in using the above emission factors where no other emission estimation information is available for the fabric filtration devices.

The review of this source test data also indicated that a segment of the test results measured concentrations below 10 mg/m^3. Proponents proposing to use emission factor(s) of less than 20 mg/m^3 or 10 mg/m^3 (as applicable to emission estimation scenario under consideration) will need to demonstrate that the fabric filter dust collector has been selected/designed appropriately for the source of emissions and is maintained and monitored to ensure that filtration is occurring under optimal conditions. If the proponent can demonstrate the above, which are indicators of a system that is capable of consistently operating at a lower outlet loading, then at the discretion of the review engineer, emission factors less than 20 mg/m^3 or 10mg/m^3 (as applicable to emission estimation scenario under consideration) may be accepted. These claims can be substantiated by providing information such as: validated source tests, design information (i.e. air to cloth ratios, bag materials...) documentation of proper operation and maintenance practices and the presence of bag leak detection devices (where warranted).

In summary, the following scenarios can guide the development of particulate emission estimating for baghouses:

1. Facilities with a single baghouse: 20 mg/m^3.
2. Facilities with multiple simultaneously operating units: 20 mg/m^3 for the most significant baghouse and 10 mg/m^3 for other units.
3. Facilities that use a baghouse to control particulate emissions (other than the metals listed in item 4, below) and have a dust collector maintenance program: can use a lower particulate outlet loading than identified in items 1 and 2, above provided this is supported with appropriate information such as: validated source tests, design

information (i.e. air to cloth ratios, bag materials, etc.) and documentation of proper operation and maintenance practices.

4. Facilities that use a baghouse to control particulate emissions (that include priority metals such as arsenic, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel and vanadium) and have a bag leak detection/alarm system: can use a lower particulate outlet loading than identified in items 1 and 2, above provided this is supported with appropriate information such as: validated source tests, design information (i.e. air to cloth ratios, bag materials, etc.) and documentation of proper operation and maintenance practices.

References: United States Environmental Protection Agency, "Handbook – Control Technology for Hazardous Air Pollutants, June 1991, EPA/625/6-91/014"; section 3.3.1 Control Techniques for Particulate from Point Sources, Page 3-14 and section 4.9.4 Determination of Baghouse Operating Parameters, Page 4-70 and 4-71. Ministry source testing data from 1994-2007.

3. Approximating Isocyanate Emissions

Many spray-painting operations include the use of an isocyanate-based catalyst/activator. Recent information has caused the ministry to consider re-evaluating the acceptable emission rate estimating calculations from painting operations for a number of hexamethylene diisocyanate compounds (HDI). In 2004 (tests conducted between June and August of 2004), ministry worked with representatives of industrial users and suppliers of HDI and coatings containing these compounds, to implement a study to develop air emission factors. HDI emission factors were developed for the following situations:

- Down-draft type spray booth with high volume low pressure (HVLP) spray guns using a high solids content coating;
- Down-draft spray booth with conventional spray guns using a low solids content coating; and
- Water-wash type spray booth with electrostatic conventional gun and a high solids content coating (i.e., typically, assembly-line type applications).

This information is available in a technical bulletin "Emission Factors For 1,6-Hexamethylene Diisocyanate (HDI) Emissions From Spray Booth Operations", dated April 2006 is available on the ministry website.

This Table C-2: Summary Of Some Useful Equations And General Guidance Continued contains contains just one column, and is intended to emphasize its contents.

Appendix D: ESDM report Check-List and Suggested Format for an ESDM report – Table of Contents

Table D-1: Sources and Contaminants Identification Table

Table D-2: Source Summary Table

Table D-3: Dispersion Modelling Input Summary Table

Table D-4: Emission Summary Table

2016
EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

Company Name:

_____

Company Address:

_____

_____

Location of Facility:

_____

_____

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with the guidance in the ministry document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July 2016 and "Air Dispersion Modelling Guideline for Ontario" dated July 2016 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact: _____

Name: _____

Title: _____

Phone Number: _____

Signature: _____

Date: _____

Technical Contact: _____

Name: _____

Representing: _____

Phone Number: _____

Signature: _____

Date: _____

2016
EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

	Required Information			
			Submitted	Explanation/Reference
	Executive Summary and Emission Summary Table			
	1.1	Overview of ESDM report	□ Yes	
	1.2	Emission Summary Table	□ Yes	
1.0	**Introduction and Facility Description**			
	1.1	Purpose and Scope of ESDM report (when report only represents a portion of facility)	□ Yes	
	1.2	Description of Processes and NAICS code(s)	□ Yes	
	1.3	Description of Products and Raw Materials	□ Yes	
	1.4	Process Flow Diagram	□ Yes	
	1.5	Operating Schedule	□ Yes	
2.0	**Initial Identification of Sources and Contaminants**			
	2.1	Sources and Contaminants Identification Table	□ Yes	
3.0	**Assessment of the Significance of Contaminants and Sources**		□ Yes	
	3.1	Identification of Negligible Contaminants and Sources	□ Yes	
	3.2	Rationale for Assessment	□ Yes	
4.0	**Operating Conditions, Emission rate estimating and Data Quality**			
	4.1	Description of operating conditions, for each significant contaminant that results in the maximum POI concentration for that contaminant	□ Yes	
	4.2	Explanation of Method used to calculate the emission rate for each contaminant	□ Yes	
	4.3	Sample calculation for each method	□ Yes	
	4.4	Assessment of Data Quality for each emission rate	□ Yes	
5.0	**Source Summary Table and Property Plan**			
	5.1	Source Summary Table* – sorted by sources	□ Yes	
	5.2	Source Summary Table* – sorted by contaminant	□ Yes	
	5.3	Site Plan (scalable)	□ Yes	
	5.4	A scalable roof layout indicating discharge locations and air intakes	□ Yes	
	Note: A Source Summary Table should contain sufficient information to correlate the contaminants and the sources			
6.0	**Dispersion Modelling**			
	6.1	Dispersion Modelling Input Summary Table	□ Yes	
	6.2	Land Use Zoning Designation Plan	□ Yes	

	Required Information			
			Submitted	Explanation/Reference
	6.3	Dispersion Modelling Input and Output Files	□ Yes	
7.0	**Emission Summary Table and Conclusions**			
	7.1	Emission Summary Table	□ Yes	
	7.2	Assessment of Contaminants with no ministry POI Limits	□ Yes	
	7.3	Assessment Values (if contaminants with Annual Standards are emitted – see Technical Bulletin - Methodology For Using "Assessment Values" For Contaminants With Annual Air Standards under O. Reg. 419/05)	□ Yes	
	7.4	Conclusions	□ Yes	
	Appendices (Provide supporting information or details such as…)			
	Assessment of Frequency of Exceedences (if applicable) (see section 30 requirements for URTs and section 33 requirements for site-specific standards)		□ Yes	
	Assessment of Frequency of Exceedences (if applicable) (see Technical Bulletin - Methodology For Using "Assessment Values" For Contaminants With Annual Air Standards under O. Reg. 419/05		□ Yes	
			□ Yes	
			□ Yes	
			□ Yes	
			□ Yes	
			□ Yes	
			□ Yes	
			□ Yes	
			□ Yes	

SUGGESTED TABLE OF CONTENTS FOR AN ESDM REPORT

Notes: .....

(1) It is recommended that an ESDM report prepared in support of an application for ECA should include a completed **Emission Summary and Dispersion Modelling Report Checklist**

(2) Alternate formats for an ESDM report are acceptable if they comply with the ESDM report requirements of the Regulation.

Table D-1: Suggested Format for a Sources and Contaminants Identification Table

Source Information			Expected Contaminants	Included in Modelling?
Source ID (optional)	Source Description or Title	General Location	Contaminants	Significant (Yes or No?)

Notes for Table D-1: Suggested Format for a Sources and Contaminants Identification Table: It is optional to identify the reference information that was used to identify the Expected Contaminants from the facility. But if it is used, please ensure it is correct and matches the model input files.

Table D-2a: Suggested Format for a Source Summary Table

FORMAT 1 – Sorted by Contaminant

Contaminant	CAS #	Source Data								Emission Data					
		Source ID	Source Description	Stack Volumetric Flow Rate (Am^3/s)	Stack Exit Gas Temperature (^oC)	Stack Inner Diameter (m)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates (x,y) (m)	Maximum Emission Rate (g/s)	Averaging Period (hours)	Emission rate estimating Technique	Sample Calculation Identifier	Emissions Data Quality	% of Overall Emissions (%)

This Table D-2a: Suggested Format for a Source Summary Table contains fourteen columns and one row header. It contains no data, and serves to present the format suggested. The first column contains the name of the contaminant that is to be modelled, and the second column contains the corresponding CAS number of the contaminant. The third column contains the identification code of the source, and the fourth column contains the source's description. The fifth to tenth columns contain the volumetric flow rate, exit gas temperature, diameter, height above grade, height above roof, and coordinates respectively, of the corresponding source being modelled. The eleventh to fourteenth columns contain emissions information for the source being modelled, and include the maximum emission rate, the averaging time period, the technique used to estimate the emissions, and the level of data quality used in estimating the emissions.

Notes for Table D-2a: Suggested Format for a Source Summary Table:

i) Source ID: should provide information on the modelling source type (e.g., Point, Area or Volume Source); the process source or sources within the modelling source (e.g., Process Line #1); and the stack or stacks within each process source . Please ensure the Source IDs match the model input files. If the Source ID terminology is modified in subsequent ESDM reports, a note to highlight the changes in terminology for each Source ID are to be included for clarity and comparisons.

ii) Emission rate estimating Technique Short-Forms:
"V-ST" means Validated Source Test; "ST" means Source Test; "EF" means Emission Factor; "MB" means mass balance; "EC" means engineering calculation
Data Quality Categories: Highest; Above-Average; Average; and Marginal.

iii) Alternate Table Formats: are acceptable if they provide the information required, under paragraph 8 of subsection 26 (1), of the Regulation, for a source summary table. In addition, multiple source summary tables can be used. The Source Summary Table should contain sufficient information to correlate the sources with the contaminants. For site-specific standard requests, the table must be sorted by contaminant.

iv) Sample Calculation Identifier: Sample calculation for each different source, contaminant or estimation method should be numbered and presented in the Appendix. It is not necessary to repeat the sample calculation if same approach is used to for multiple source and/or contaminant.

Table D-2b: Suggested Format for a Source Summary Table

FORMAT 2: Sorted by Source

Source Identifier	Source Description	Source Data						Emission Data							
		Stack Volumetric Flow Rate (m^3/s)	Stack Exit Gas Temperature (^oC)	Stack Inner Diameter (m)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates (x,y) (m)	Contaminant	CAS #	Maximum Emission Rate (g/s)	Averaging Period (hours)	Emission rate estimating Technique	Sample Calculation Identifier	Emissions Data Quality	% of Overall Emissions (%)

This Table D-2b: Suggested Format for a Source Summary Table contains fourteen columns and one row header. It contains no data, and serves to present the format suggested. The first column contains the name of the contaminant that is to be modelled, and the second column contains the corresponding CAS number of the contaminant. The third column contains the identification code of the source, and the fourth column contains the source's description. The fifth to tenth columns contain the volumetric flow rate, exit gas temperature, diameter, height above grade, height above roof, and coordinates respectively, of the corresponding source being modelled. The eleventh to fourteenth columns contain emissions information for the source being modelled, and include the maximum emission rate, the averaging time period, the technique used to estimate the emissions, and the level of data quality used in estimating the emissions.

Notes for Table D-2b: Suggested Format for a Source Summary Table:

i) Source ID: should provide information on the modelling source type (e.g., Point, Area or Volume Source); the process source or sources within the modelling source (e.g., Process Line #1); and the stack or stacks within each process source. Please ensure the Source IDs match the model input files. If the Source ID terminology is modified in subsequent ESDM reports, a note to highlight the changes in terminology for each Source ID are to be included for clarity and comparisons.

ii) Emission rate estimating Technique Short-Forms:
"V-ST" means Validated Source Test; "ST" means Source Test; "EF" means Emission Factor; "MB" means mass balance; "EC" means engineering calculation.

iii) Data Quality Categories: Highest; Above-Average; Average; and Marginal.

iv) Alternate Table Formats: are acceptable if they provide the information required, under paragraph 8 of subsection 26 (1) of the Regulation, for a source summary table. In addition, multiple source summary tables can be used.

v) Sample Calculation Identifier: Sample calculation for each different source, contaminant or estimation method should be numbered and presented in the Appendix. It is not necessary to repeat the sample calculation if same approach is used to for multiple sources and/or contaminant.

Table D-3: Suggested Format for a Dispersion Modelling Input Summary Table

Relevant Section of the Regulation	Section Title	Description of How the Approved Dispersion Model was Used
Section 6	Approved Air Dispersion (include Model Versions)	
Section 8	Negligible Sources	
Section 9	Same Structure Contamination	
Section 10	Operating Conditions	
Section 11	Source of Contaminant Emission Rates	
Section 12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	
Section 13	Meteorological Conditions (include AERMET version)	
Section 14	Area of Modelling Coverage	
Section 15	Stack Height for Certain New Sources of Contaminant	
Section 16	Terrain Data	
Section 17	Averaging Periods	

Table D-3: Suggested Format for a Dispersion Modelling Input Summary Table has three columns. The first is Relevant Section of the Regulation, the second is Section Title, the third is the Description of How the Approved Dispersion Model was Used.

Table D-4: Suggested Format for an Emission Summary Table

Contaminant Name	Contaminant CAS #	Total Facility Emission Rate (g/s)	Air Dispersion Model Used (include version code)	Maximum POI Concentration ($\mu g/m^3$)	Averaging Period (hours)	Ministry POI Limit ($\mu g/m^3$)	Limiting Effect	Regulation Schedule #	Percentage of Ministry POI Limit (%)

This Table D-4: Suggest Format for an Emission Summary Table contains ten columns and one row header. It contains no data, and serves to present the format suggested. The first column contains the name of the contaminant that is to be modelled, and the second column contains the corresponding CAS number of the contaminant. The third column contains the total property-wide emissions of the contaminant. The fourth column contains the name of the air dispersion model used to model, and the fifth and sixth column contains the corresponding maximum Point of Impingement (POI) concentration predicted by the model and the model averaging period respectively. The seventh, eighth and ninth column contain Ontario's air quality limit, the corresponding limiting effect, and the Regulation Schedule Number from which the limit was obtained. The tenth column contains the ratio of the modelled maximum POI as a percentage of the ministry POI limit.

The term "Ministry POI Limit" identified in Table D-4 refers to the following information (there may be more than one relevant ministry POI Limit for each contaminant):

(1) air standards in Schedules 2 and 3 of the Regulation; and

(2) the guidelines for contaminants set out the ministry publication, Air Contaminants Benchmarks (ACB) List (B1 values) (as amended) and can be found on the ministry's web site.

(3) an acceptable concentration for contaminants with no standards or guidelines. This may include reference to the in the Air Contaminants Benchmarks (ACB) List (as amended) (B2 values (screening levels)).

(4) Note: if a facility is subject to section 20 and a contaminant has a standard (or guideline) with more than one averaging period, then the Emission Summary Table must include an assessment against each standard and its appropriate averaging period.

(5) For contaminants with an annual standard, where applicable, the Emission Summary Table should a review against the standard with the annual averaging period as well as a review against the daily and annual "Assessment Vales". For more information on Assessment Values, please refer to the technical bulletin: "Methodology For Assessment of Contaminants with Annual Average Standards under O. Reg. 419/05" (as amended) and available on the ministry website.

Appendix E: Guidance for Standards with Annual Averages

ESTIMATION OF PARTICULATE EMISSIONS FROM PAVED AND UNPAVED ROADS

For vehicles travelling on roads at industrial sites, particulate emissions are estimated based on the US EPA, AP-42 Emission Factors Guide, Section 13.2.1 for paved roads, and Section 13.2.2 for unpaved roads. For Ontario, this guidance is only applicable for standards with annual averaging times. For compliance with shorter term (24-hour) standards, the use of precipitation corrections must NOT be used. AP-42 states "*Equation 1 may be extrapolated to average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual (or other long-term) average emissions are inversely proportional to the frequency of measurable (> 0.254 mm [0.01 inch]) precipitation by application of a precipitation correction term."*

In addition, AP 42 the guidance notes that these assumptions have not been validated in any way, and thus the data quality must be downgraded by one level if they're used. Data quality is also downgraded if default silt loadings are used – this could result in uncertain data quality "D".

Methodology

The methodology assumed that annual (or other long-term) average emissions are inversely proportional to the frequency of measurable (> 0.254 mm [0.01 inch]) precipitation by application of a precipitation correction term. For assessment of annual averaging periods, the daily precipitation correction term is recommended. This correction factor would be applied equally to all hours in the modelling period, to provide an average reduction due to natural mitigation.

Paved Roads - Daily Basis:

For the daily basis, emissions from vehicles travelling on paved roads are estimated based on Equation 1 (see Section 13.2.1 of AP-42 Guide for details).

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02} \,]\,(1 - P/4N) \qquad (1)$$

where:

- E_{ext} = annual or other long-term average emission factor,
- k = particle size multiplier for particle size range,
- sL = road surface silt loading,
- W = average weight of the vehicles travelling the road,
- P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
- N = number of days in the averaging period (e.g., 365 for annual).

Table G-1 Percentage (Number) Of Days And Hours Above 0.254 mm Of Precipitation In Ontario presents the value of day percent for the term "P/N" in the above equation, which is the percentage of days above 0.254 mm of precipitation, produced by ministry based on a 5-year average Ontario-specific data.

Information on the "sL" silt loading term can be developed on a site-specific basis from Appendix C.1 of AP-42 Guide.

Table E-1: Percentage (Number) of days and hours above 0.254 mm of Precipitation in Ontario

	Daily Basis	
Regions	Day Percent (>0.254 mm precipitation)	Number of Days in a year (>0.254 mm precipitation)
Windsor	37	135
London	42	153
Toronto	35.6	130
Ottawa	40	146
Sudbury	40.8	149
Peterborough	51.9	189
Thunder Bay	35.5	130

AP 42 also references a correction factor based on hourly data. This approach is generally not recommended as it would be applicable only in specific modelling approaches. If any proponent has questions about using the hourly correction, they should contact EMRB for additional guidance.

Unpaved Roads - Daily Basis:

For the daily basis, emissions from vehicles traveling on unpaved surfaces are estimated from Equation 3 (see Section 13.2.2 of AP-42 Guide for details):

$E_{ext} = E\ [(365 - P)]/365]$ (3)

where:

- E_{ext} = annual size-specific emission factor extrapolated for natural mitigation,
- E = size-specific emission factor,
- P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation.

Table G-1 Percentage (Number) Of Days And Hours Above 0.254 Mm Of Precipitation In Ontario gives the value of P, which is the number of days in a year above 0.254 mm precipitation.