Proposal for Amendments to O. Reg. 419/05
Presentation to Air Practitioners

Ministry of Environment and Climate Change

November 21, 2017

Purpose & Outline

Purpose

- To provide a summary of the Ministry's proposal to amend O. Reg. 419/05:
  - Updated sulphur dioxide (SO_2) air standards
  - Clarify requirements for transitional operating conditions
  - Seek input on consequential amendments to the LIMA regulation

Ontario

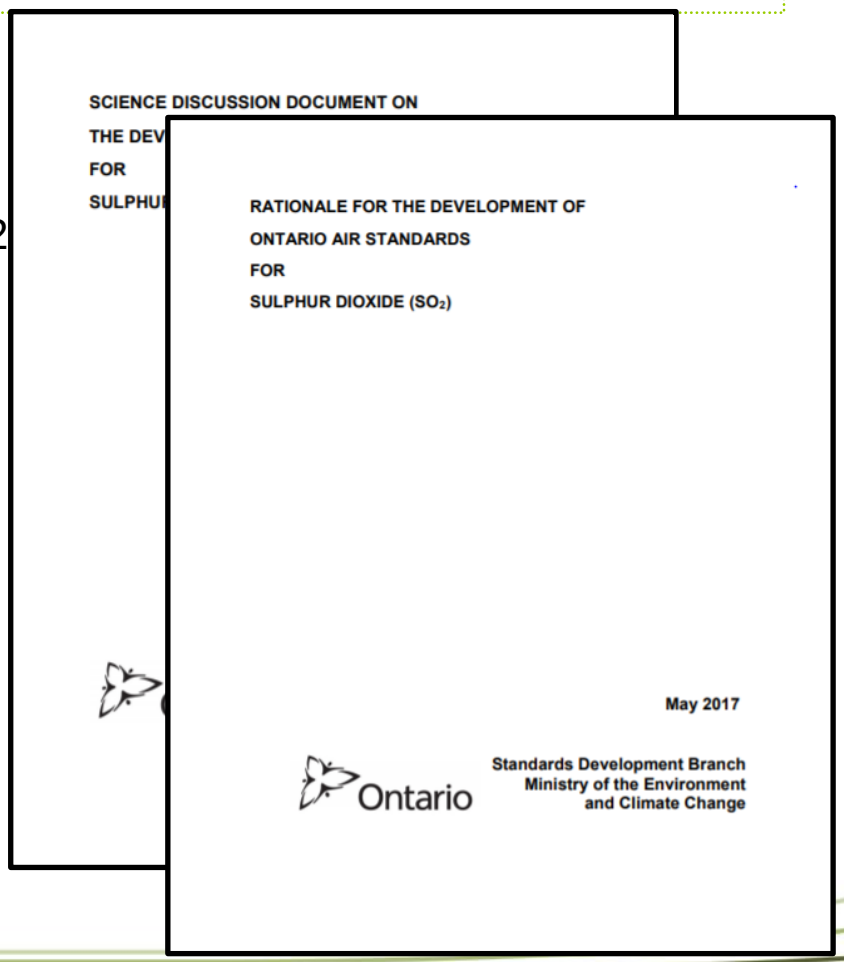
Sulphur Dioxide Air Standards

Ontario Air Standards Development – a 3-step process

1) **Review the science** – prepare Science Discussion Document and post information notice on the Environmental Bill of Rights (EBR) Environmental Registry (EBR 012-7192 March 2016); meet with First Nations and stakeholders (May/July 2016).

2) **Propose standard and regulatory amendments** (45 day consultation period) - Rationale Document posted on the EBR Environmental Registry (EBR 013-0903; October 27, 2017);

3) **Post final decision** – decision posted on the EBR Environmental Registry; regulation is amended.


SCIENCE DISCUSSION DOCUMENT ON
THE DEV
FOR
SULPHU

RATIONALE FOR THE DEVELOPMENT OF
ONTARIO AIR STANDARDS
FOR
SULPHUR DIOXIDE (SO_2)

May 2017

Ontario

Standards Development Branch
Ministry of the Environment
and Climate Change

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Air Standards Development

- The ministry sets standards based on health and environmental impacts without consideration of technology or economic issues.

- Toxicological information from peer-reviewed studies (animal, occupational, epidemiological) about a contaminant is reviewed to understand the contaminant's potential effects and to identify:
  - the critical effect (e.g., cancer, irritation, odour)
  - the most sensitive receptor (human, plant, animal)

- Air standards are set at concentrations well below the levels where adverse effects are observed.

- Most air standards are based on human health effects (i.e., most effects data is related to human health). For some contaminants, we have more than one standard, based on more than one effect of interest: *Two standards are proposed in the current update; an acute health-based standard, and a chronic ecological-based standard*

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AAQCs and Air Standards

- The outcome of the science review is the development of ambient air quality criteria (AAQCs), which are non-regulatory targets for air quality. AAQCs are used to establish air standards under the regulation.
  - **AAQCs are used to assess ambient air quality** (i.e., resulting from *all sources of a contaminant to air*).
  - **Air standards are used to assess a regulated facility** and, if exceeded, drive abatement actions or requests to comply with the regulation through technology-based approaches.

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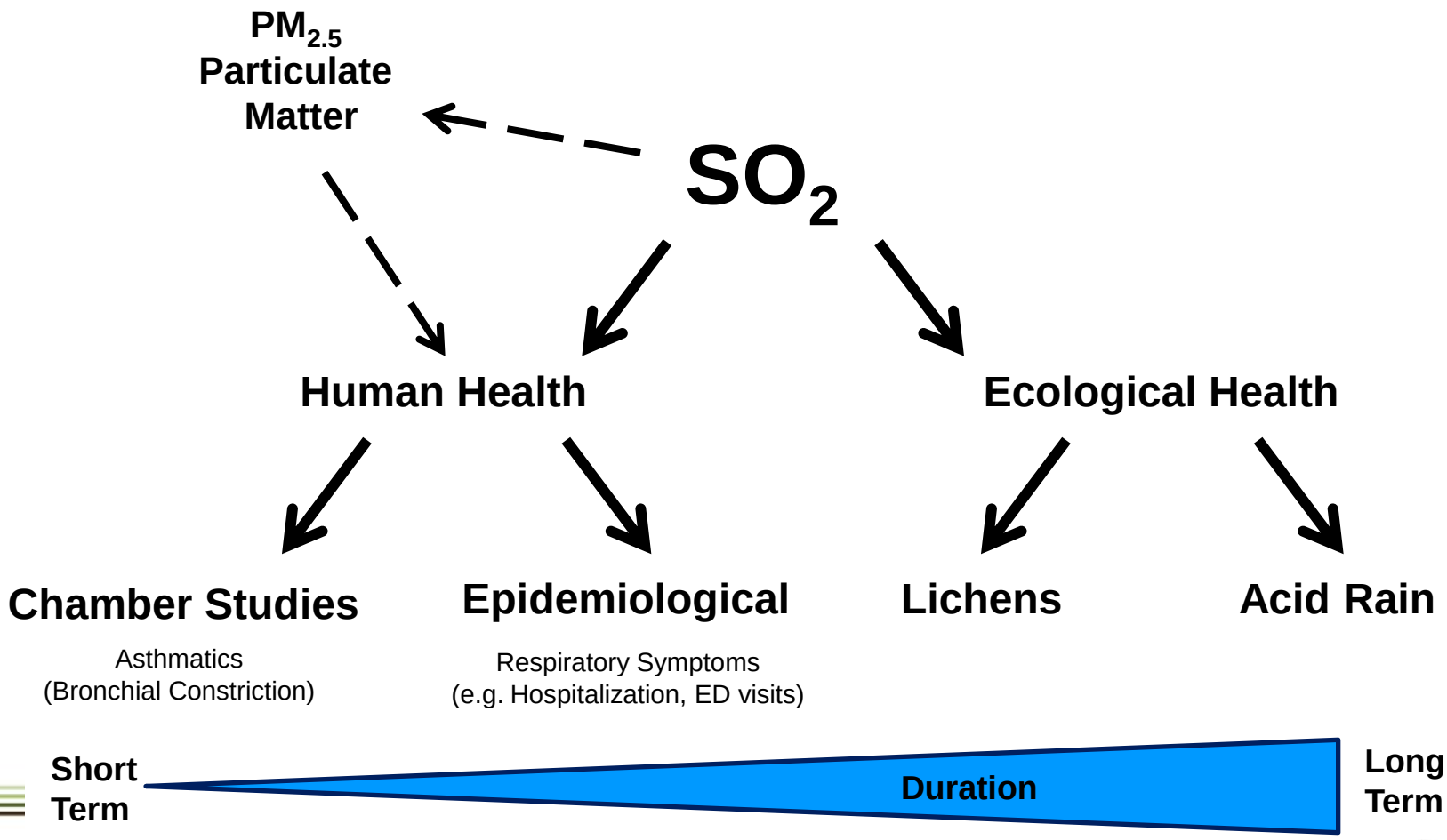
Why Are We Concerned About Sulphur Dioxide?

- Short-term exposure to sulphur dioxide causes **acute health effects** in the form of lung irritation (e.g., coughing, asthma attacks, cardiovascular impacts).

- Long-term exposure to sulphur dioxide causes **chronic health effects** by contributing to smog (e.g., breathing problems, hospital admissions, cardiovascular impacts).

- Long-term acidic deposition of sulphur dioxide causes **ecological effects**, such as vegetative damage and acidification of lakes.

SO_2 Effects


PM2.5 Particulate Matter
SO2
Human Health
Ecological Health
Chamber Studies
Asthmatics
(Bronchial Constriction)
Epidemiological
Respiratory Symptoms
(e.g. Hospitalization, ED visits)
Lichens
Acid Rain
Short Term
Duration
Long Term

Summary: Air Standards and AAQCs for SO_2

Existing (1974):

Standards:

- 830 μg/m³ (½ hour)
- 690 μg/m³ (1-hour)
- 275 μg/m³ (24-hour)

AAQCs:

- 690 μg/m³ (1-hour)
- 275 μg/m³ (24-hour)
- 55 μg/m³ (annual)

Proposed (2017):

Standards:

- **100 μg/m³ (1-hour)** (human health effects)
- **10 μg/m³ (annual)** (ecological effects)

AAQCs:

- **180 μg/m³ (10-min)** (human health effects)
- **100 μg/m³ (1-hour)** (human health effects)
- **10 μg/m³ (annual)** (ecological effects)

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Proposed 1-hour Air Standard: 100 µg/m^3 (human health effects)

- The proposed 1 hour standard is designed to protect against critical human health impacts of SO_2.
- The science used to inform the proposed standard, includes the Health Canada reference concentration of **180 µg/m^3 (10-minute)**
- Based on the meteorological conversion factors used in O. Reg. 419/05, a reference concentration of 180 µg/m^3 (10-minute) converts to **100 µg/m^3 (1 hour)**
  - This conversion factor minimizes the number of 10-minute periods within the hour that the reference concentration (180 µg/m^3) is exceeded under real-world wind and weather conditions.
- Consistent with the standard-setting approach under the regulation, the selected value is considered to be **protective of both the general population and sensitive individuals** against the critical effects of acute exposure to sulphur dioxide.

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Proposed Annual Air Standard: 10 µg/m^3 (ecological effects)

In addition to a 1-hour standard set to address critical effects to human health, an SO_2 **annual standard of 10 µg/m^3** is also proposed.

- Protects against sulphur dioxide contributions to acid deposition (“acid rain”) and damaging effects on plants, including sensitive species such as lichens.
- Developed through consideration of World Health Organization (WHO) limits, studies from the Sudbury area, protection of crops, and the values assessed during the federal CAAQS process for sulphur dioxide.
  - The annual CAAQS for sulphur dioxide is 12 µg/m^3 in 2020, and 10 µg/m^3 in 2025.
  - The 10 µg/m^3 target also aligns with the WHO value.

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EBR Registry Number 013-0903

Title: Regulatory amendments to air emissions of sulphur dioxide and other items

a) Updated air standards for sulphur dioxide

Ministry specifically is seeking input on whether to apply the updated standards to Southern Ontario and have the current standards apply to Northern Ontario or part thereof.

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Lambton Industrial Meteorological Alerts

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Consequential Amendment - Lambton Industrial Meteorological Alerts (LIMA) Regulation 350

- Regulation 350: Lambton Industry Meteorological Alerts (LIMA) was introduced in 1981 (see Appendix A). Currently, alerts are triggered if the running daily (24-hr) average sulphur dioxide concentration reaches 0.07 parts per million (68% of the current 24-hour standard) at any of the monitoring stations in the LIMA network.

- With the introduction of an updated air standard for sulphur dioxide, the ministry will consider the consequential amendments to this regulation.

- As part of the consultation on an updated sulphur dioxide standard, **the ministry is seeking input on potential amendments to Regulation 350.**

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Consequential Amendment – LIMA Regulation 350 [Reference to the Air Dispersion Model]

The LIMA regulation currently requires the concentration of sulphur dioxide at a point of impingement to be calculated in accordance with the air dispersion models in the Appendix to Regulation 346. Under O. Reg. 419/05, the air dispersion models in the Appendix to Regulation 346 will be phased out by February 1, 2020.

If there is a role for the LIMA regulation, then this reference to the models in the Appendix to Regulation 346 would be updated to refer to the U.S. EPA AERMOD dispersion model as referenced in subsection 6(1) paragraph 1 of O. Reg. 419/05.

Consequential Amendment – LIMA Regulation 350 [Updating SO_2 Values]

Subsection 2(1) of the LIMA regulation states that “The Director shall declare an Alert when the 24-hour running average sulphur dioxide concentration at any monitoring station in the Lambton Industry Meteorological Alert System reaches 0.07 parts per million (ppm) parts of air”. The current levels in the LIMA regulation are based on the existing 1974 sulphur dioxide air standards:

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LIMA: Questions for Consultation

- What role is there for an alert going forward?
- If there is a role for the LIMA regulation, should the values in the LIMA regulation also be updated? If so, what should these values be updated to?
- If the proposed monitoring levels are updated, what if any additional actions can industry consider to reduce the monitoring levels in the community? What actions will continue to be considered?

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Environmental Protection Act

R.R.O. 1990, REGULATION 350 - LAMBTON INDUSTRY METEOROLOGICAL ALERT

1. (1) In this Regulation,

"Alert" means an alert declared by the Director under section 2;

"Lambton Industry Meteorological Alert System" means an air monitoring system utilizing meteorological facilities and data from air monitoring stations located in the part of the County of Lambton described in subsection (2);

"**source of contaminant**" means a source of contaminant capable of emitting 500 kilograms of sulphur dioxide into the air in a twenty-four hour period.

(2) The application of this Regulation is limited to that part of the County of Lambton bounded by Lake Huron, the St. Clair River, Lambton County Road 80 (Courtright Line), Lambton County Road 31 (Kimball Road) and its continuation through that part of the King's Highway known as No. 40 and Lambton County Road 27 (Modeland Road). O. Reg. 590/99, s.1 (2).

2. (1) The Director shall declare an Alert when the 24-hour running average sulphur dioxide concentration at any monitoring station in the Lambton Industry Meteorological Alert System reaches 0.07 parts per million parts of air. O. Reg. 590/99, s. 2 (1).

(2) The Director may declare the termination of an Alert, when weather conditions conducive to the elevated sulphur dioxide concentrations referred to in subsection (1) end, and are forecast not to return within the next six hours.

(3) The Director shall not declare another Alert within six hours of declaring an Alert terminated, unless weather conditions conducive to elevated sulphur dioxide concentrations return.

3. (1) During an Alert, no person shall cause or permit the emission of sulphur dioxide from a source of contaminant so that its concentration at a point of impingement exceeds 415 micrograms of sulphur dioxide per cubic metre of air, half hour average.

(2) The concentration of sulphur dioxide at a point of impingement shall be calculated in accordance with the Appendix to Regulation 346 of the Revised Regulations of Ontario, 1990 (General — Air Pollution) made under the Act, as that regulation read immediately before it was revoked on November 30, 2005.

Transitional Operating Conditions

Background - Regulation 419/05

- O. Reg. 419/05 contains over 130 air standards for a variety of contaminants.

- Facilities applying for an Environmental Compliance Approval (ECA) or governed by O. Reg. 1/17 – the Air Emissions Environmental Activity and Sector Registry (EASR) regulation - must demonstrate compliance with the standards at a point of impingement (POI) using approved dispersion models and document results in an Emission Summary Dispersion Modelling (ESDM) Report.

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Background: Current TOC Requirements Regulation and Guidance

- Paragraph 1 of subsection 10 (1) of O. Reg. 419/05 requires a facility to use an approved dispersion model with a scenario that assumes operating conditions that result in the highest contaminant concentration off-site of the facility property. In order to determine which scenario results in the highest, a facility must assess a number of scenarios assuming multiple operating conditions.

- The ESDM Procedure indicates the following operating conditions be considered when determining the highest contaminant concentration:
  - Conditions which are typical or routine
  - Transitional operating conditions which result in the emission of contaminants with acute health effects.

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Proposed Regulatory Amendments

Operating conditions to be assessed under paragraph 1 of subsection 10 (1) to now include:

- Requirement to consider the following types of scenarios when determining, for all contaminants, which scenario results in the highest POI concentration:
  - Scenarios that assume operating conditions that reflect the maximum design capacity of the facility;
  - Scenarios that assume start-up operating conditions of a facility or part of a facility;
  - Scenarios that assume shut-down operating conditions of a facility of part of a facility; and
  - Any other scenario that occurs when the facility is operating normally.
- The scenario that results in the maximum concentration of a contaminant at a POI must be included in the ESDM report for compliance assessment.

Ontario

Proposed Regulatory Amendments

Petroleum Refineries Provision:

- In addition to the scenarios required to be assessed under paragraph 1 of subsection 10 (1) of O. Reg. 419/05, petroleum facilities (NAICS 324110 and 324190) would also be required to model the scenario that, for a one-hour averaging period, assumes operating conditions for the facility that would result in the highest concentration of SO_2 at a POI that the facility is capable of when acid gas is flared at the facility.

- In order to determine the acid gas flaring scenario that would result in the highest POI concentration of SO_2, there is a requirement to consider the following types of scenarios:
  - The scenario that assumes operating conditions at the facility when the flare system is operating at design capacity;
  - Any other scenarios occurring when acid gas is flared.

Ontario

Proposed regulatory amendments

Director's Notices:

- First new notice provision would allow the Director, on a case-by-case basis, to require that a specific scenario (to be specified by the Director) be assessed to determine if that scenario results in the highest POI concentration for the purposes of paragraph 1 of subsection 10 (1).

- Second new notice provision would allow the Director, on a case-by-case basis, to require that a specific scenario (designed for but <u>not otherwise required to be considered under paragraph 1 of subsection 10 (1))</u>, be assessed to determine if it results in the highest POI concentration, if either:
  - A contaminant with acute effect is discharged during the operating conditions assumed in the scenario; or
  - The operating conditions assumed in the scenario occur frequently and discharge of any contaminant may result in a contravention or may cause an adverse effect.

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Proposed regulatory amendments

Incident Modelling provision:

- New provision would allow the Director to order the preparation and submission of an ESDM report following a specific discharge to air (incident). The incident discharge would be modelled using actual operating data, emission rates, meteorological and local land use data for the time period of the discharge event.

- In addition to preparing an ESDM report, the Director would be able to require the submission of an assessment of all circumstances surrounding the discharge including the most likely cause of the discharge.

- To issue the incident modelling order, the Director would need to have reasonable grounds to believe the facility may exceed an air standard or the discharge of contaminants into the air may cause an adverse effect.

Ontario

Questions or Comments

EBR Registry Number 013-0903

Date: December 11, 2017 (Public Record)

Contact:

All comments on this proposal must be directed to:

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To submit a comment online, click the submit button below:

Submit Comment (opens in new window)

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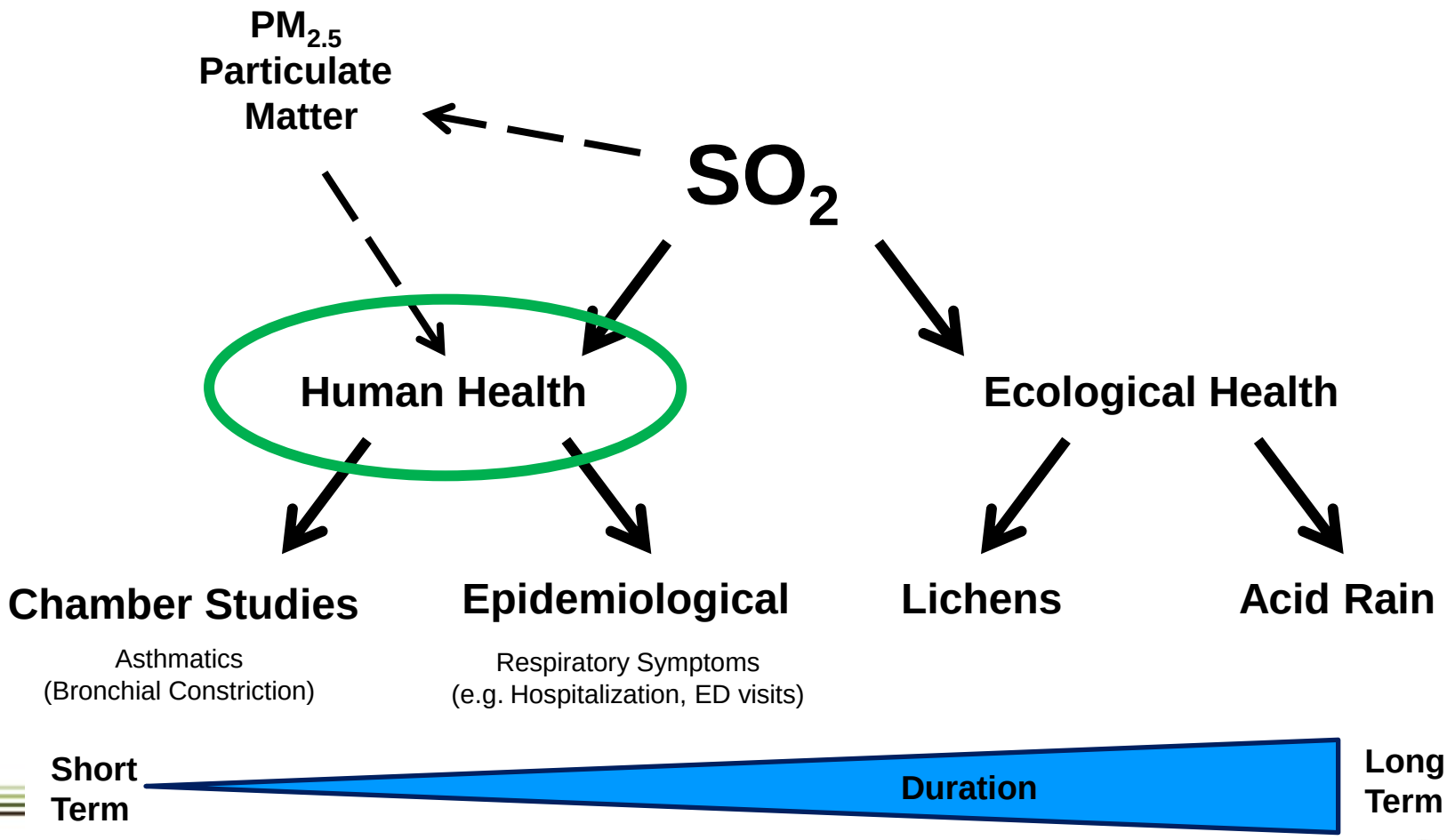
Appendix

SO_2 Effects


PM2.5 Particulate Matter
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Human Health
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Chamber Studies
Asthmatics
(Bronchial Constriction)
Epidemiological
Respiratory Symptoms
(e.g. Hospitalization, ED visits)
Lichens
Acid Rain
Short Term
Duration
Long Term

Rationale for a Short-Term AAQC & Air Standard

Human Health Endpoint

Ontario

Mode Of Action

SO_2 inhalation

↓

Bronchial chemosensitive receptors
in the tracheobronchial tree are stimulated

↓

Vagal nerve stimulation
(afferents to CNS)

↓

Smooth muscle contraction
(reflexive)

↓

Bronchoconstriction

cough,
apnea followed by rapid shallow breathing,
mucus secretion,
mucosal vasodilation, and
cardiovascular system
(bradycardia) hypotension or hypertension

MINISTRY RATIONALE: The Ministry will consider respiratory effects as the critical adverse health endpoint for short-term SO_2 exposure.

Ontario

Susceptible Population

- Asthma is characterized by inflammation and airway hyper-responsiveness, which presents as excessive bronchoconstriction to irritants and other stimuli
- 3 million Canadians, representing about 9% of the population
- Epidemiologic (population) studies at relevant SO_2 concentrations show an increase in asthma-related hospital admissions in studies of all age groups (e.g., children, older adults)
- Clinical data show that respiratory effects experienced by asthmatics following SO_2 exposure appear to be more severe than among non-asthmatics

MINISTRY RATIONALE: Asthmatics are considered a susceptible population in studying the effects of SO_2 associated with bronchoconstriction.

Ontario

Studies of Exercising Asthmatics

- Studies of exercising asthmatics allow for specific lung function measurements to be taken at specific concentrations of SO_2.
- The body's response to inhaled SO_2 is immediate.
- Despite a strong causal relationship between breathing difficulties and short-term exposure in population studies, studies of exercising asthmatics provide a more reliable method of quantitation than the semi-quantitative information gleaned from population studies

Rationale for Key Study

MINISTRY RATIONALE: The development of an acute AAQC for SO_2 is better served by the quantitative evaluation of lung function as observed in exercising asthmatics under controlled conditions (i.e., chamber studies), supported by semi-quantitative information from relevant epidemiological studies.

Thus, similar to Health Canada, the Ministry will utilize the U.S. EPA meta-analyses of multiple chamber studies of exercising asthmatics, in place of the selection of a single 'key study'.

Approach #1 to develop an Acute AAQC: Health Canada (RfC) (2016)

Critical effect	Respiratory effects (bronchoconstriction)
Key study	Meta-analysis of clinical studies under controlled conditions (i.e., chamber studies) of exercising asthmatics (U.S. EPA, 2008, WHO 2005 and Johns and Linn, 2011)
Point of Departure	400 ppb (as a LOAEC) •400 - 600 ppb for 5-10 minutes •20-60% exercising asthmatics experience decrease in lung function •sRaw ≥ 200% increase and/or FEV1 ≥ 20% decrease •asthmatics may - symptoms (e.g., wheezing, chest tightness)
Uncertainty Factor(s)	6
Approach #1 Acute AAQC	**67 ppb (10 minutes)**

Ontario

Approach #2 to develop an Acute AAQC: Ontario-modified Health Canada RfC (2016)

Critical effect	Respiratory effects (bronchoconstriction)
Key study	Meta-analysis of clinical studies under controlled conditions (i.e., chamber studies) of exercising asthmatics (U.S. EPA, 2008, WHO 2005 and Johns and Linn, 2011)
Point of Departure	200 ppb (akin to BMD) •200 - 300 ppb (≈525 – 800 µg/m3) for 5-10 minutes •5-30% exercising asthmatics experience decreases in lung function •sRaw ≥ 100% increase and/or FEV1 ≥ 15% decrease •some asthmatic individuals - asymptomatic
Uncertainty Factor(s)	3 (for intra-species sensitivity)
Approach #2 Acute AAQC	**67 ppb (10 minutes)**

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Proposed AAQC Derivation

Regardless of the approach taken in deriving a health-based AAQC, both approaches to derivation (i.e., #1, Health Canada RfC; #2, Ontario-modified Health Canada RfC) are supportable, and both result in an AAQC of 67 ppb (180 µg/m^3) associated with a 10-minute exposure.

MINISTRY RATIONALE: Based on the U.S. EPA and Health Canada meta-analyses of chamber studies of exercising asthmatics, the Ministry considers 67 ppb (180 µg/m^3) an appropriate health-based value for an acute AAQC derivation, in order to protect the general population and sensitive individuals against the health effects associated with a 10-minute exposure to SO_2.

Ontario

Rationale for Averaging Time

- Science shows that 5-10 minute exposures are the most health-relevant.
- An AAQC could be considered over 10 minutes, but a 1-hour value IS more practical for the air standard.
- When setting the air standard, consideration must be made of meteorological variation within an hour period that can result in peaks of 10-minutes

MINISTRY RATIONALE: A 10-minute averaging time would be the most health-relevant for the proposed acute AAQC of 67 ppb (180 µg/m^3). Additionally, a 1-hour AAQC and 1-hour air standard of 40 ppb (100 µg/m^3) are proposed to support evaluation of ambient air monitoring and O. Reg. 419/05, respectively.

Ontario

Recommended Acute AAQC and Air Standard for SO_2

- Based on a quantitative analysis of human clinical studies under controlled conditions of exercising asthmatics experiencing respiratory morbidity, the Ministry proposes the following health-based acute AAQC for SO_2:

  • 10-minute AAQC of 180 µg/m^3 for SO_2 (67 ppb), based on respiratory morbidity in exposed sensitive populations

- Using the preceding health-based 10-minute AAQC as a foundation, the following converted AAQC and air standard are proposed:

  • 1-hour AAQC of 100 µg/m^3 for SO_2 (40 ppb), based on respiratory morbidity in exposed sensitive populations

- For Ontario Regulation 419: Air Pollution – Local Air Quality compliance purposes, the Ministry proposes the following air standard for SO_2:

  • 1-hour air standard of 100 µg/m^3 for SO_2 (40 ppb), based on respiratory morbidity in exposed sensitive populations

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Summary of proposed AAQCs and Air Standards for SO_2

Averaging Time	AAQC ($\mu g/m^3$)	Air Standard ($\mu g/m^3$)	Basis
10 min	180	–	Health (respiratory morbidity)
1-hr	100	100	Health (respiratory morbidity)
Annual	10	10	Vegetation (damage)

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Rationale for a Long-Term AAQC & Air Standard

Ecological Endpoint

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Ecological Effects

- In humid air and under fog conditions, SO_2 dissolves in water molecules leading to the formation of a sulphuric acid mist, increasing potential of adverse effects on plants (i.e., acid deposition)

MINISTRY RATIONALE: The Ministry considers the direct effect of SO_2 on vegetation, including foliar injury, decreased photosynthesis, and decreased growth, as the critical adverse endpoint for long-term SO_2 exposure.

- Lichens are among the first species affected by acidifying deposition in land ecosystems, and are known early-warning indicators of air pollution.

MINISTRY RATIONALE: The Ministry considers lichens as the susceptible species in studying the chronic effects of SO_2 on the environment.

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Rationale for a Long-Term AAQC

- The Ministry considered World Health Organization (WHO) limit for the protection of lichens, and considered studies on vegetation in the Sudbury area, the protection of crops, and the values considered during the Federal CAAQS process.

MINISTRY RATIONALE: The Ministry considers the lower bound of the CCME range 4 ppb (10 µg/m^3) as appropriate proposed value for a chronic AAQC for SO_2, in order to protect against ecological impacts.

- The Ministry considered toxicological and implementation issues in assigning an averaging time.

MINISTRY RATIONALE: An annual averaging time would be the most toxicologically-relevant for the chronic ecologically-based AAQC and air standard.

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Recommended Chronic AAQC and Air Standard for SO_2

- Considering the observable effects on lichen abundance and biodiversity with environmental chronic exposures to SO_2, the Ministry proposes the following ecologically-based chronic AAQC for SO_2:

  • Annual AAQC of 10 µg/m^3 for SO_2 (4 ppb), based on vegetation damage in exposed sensitive species

- Additionally, for Ontario Regulation 419: Air Pollution – Local Air Quality compliance purposes, the Ministry proposes the following air standard for SO_2:

  • Annual air standard of 10 µg/m^3 for SO_2 (4 ppb), based on vegetation damage in exposed sensitive species

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Phase-In Considerations

- Consistent with updates to most previous standards, a 5-year phase-in is proposed.
  - Note that O. Reg. 419/05 sets out timing related to making requests for site-specific standards (e.g. in certain circumstances, request are to be submitted to the Director 15 months prior to the effective date of the new standard). See s.32 of O. Reg. 419/05.

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Upper Risk Threshold (URT)

- URT's: are set at a concentration of a contaminant in air above the general air standard as part of the framework for managing risk.

- The framework for establishing, implementing and assessing URTs was established through consultation with stakeholders including public health associations and industry and is described in the Guideline for Implementation of Air Standards in Ontario (GIASO).

- For substances

  non-carcinogenic effects = 10-fold higher than the standard.

  carcinogenic effects = 100-fold higher than the standard.

- URT may also include consideration of other effects that may be of concern at higher exposure levels and/or acknowledgment of current Ontario air standards for the compound, and this information may be used to adjust from the default levels.

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Proposed URT for SO_2

- For SO_2 the current air standard represents a concentration which is protective against adverse health effects on the general population but not sensitive populations, the URT is proposed to be set at the level of the current SO_2 air standards, namely:

  1-hour URT of 690 µg/m^3 for Sulphur Dioxide (Section 20 facilities)

  ½ hour URT of 830 µg/m^3 for Sulphur Dioxide (Section 19 facilities)

- Generally, URTs under O. Reg. 419/05 are not phased-in. Hence, there is no phase-in period proposed for the proposed sulphur dioxide URTs.

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Canadian Ambient Air Quality Criteria

- Canadian Ambient Air Quality Standards (CAAQS) are targets for regional air quality across Canada.
- The recent CAAQS process for sulphur dioxide considered a range of SO_2 concentrations (40 ppb to 70 ppb) to inform the CAAQS management levels
- Health Canada's interpretation of the range:
  - *At 40 ppb,* ***all members of the population, including sensitive subgroups such as individuals with asthma, would be expected to be protected if 40 ppb were not exceeded****.*
  - *At 70 ppb, the general population would be expected to be protected but there would be times when sensitive subgroups such as individuals with asthma may not be protected.*
- In October 2016, CAAQS targets of 70 ppb in 2020, and 65 ppb in 2025, were set.

Averaging time	Numerical Value in parts per billion (ppb)		Statistical form of the standards (metric)
	Effective 2020	Effective 2025	
1-hour	70	65	The 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average concentrations.
1-calendar year (annual)	5.0	4.0	The arithmetic average over a single calendar year of all 1-hour average SO_2 concentrations.

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CAAQS Management Levels

Management level and action	Management levels for the 1-hour CAAQS for SO_2 (ppb)		Management levels for the annual CAAQS for SO_2 (ppb)	
	Effective 2020	Effective 2025	Effective 2020	Effective 2025
Red To ensure that CAAQS are not exceeded through advanced air management actions	> 70 ppb (CAAQS)	> 65 ppb (CAAQS)	> 5.0 ppb (CAAQS)	> 4.0 ppb (CAAQS)
Orange To improve air quality through active air management and prevent exceedance of the CAAQS	>50 to ≤70 ppb	> 50 to ≤ 65 ppb	>3.0 to ≤ 5.0 ppb	> 3.0 to ≤ 4.0 ppb
Yellow To improve air quality using early and ongoing actions for continuous improvement	> 30 to ≤ 50 ppb		> 2.0 to ≤ 3.0 ppb	
Green To maintain good air quality through proactive air management measures to keep clean areas clean	≤ 30 ppb		≤ 2.0 ppb	

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