



An Introduction to Air Quality Advisories

Prabjit Barn and Tom Kosatsky

What are Air Quality Advisories?

Air quality advisories are a mechanism by which provincial and regional governments actively provide the public with information on hourly or daily periods of poor outdoor air quality. Advisories are issued for specific geographical locations when one or more pollutants approach or exceed (or are forecasted to approach/exceed) a relevant air quality trigger. Advisories inform the public about mandatory and voluntary actions to reduce or prevent further emissions during the advisory period. Advisories also inform the public about the potential health impacts of poor air quality, as well as recommend protective measures that can be taken to minimize health risks while the advisory is in effect. Both long-term and short-term exposures to air pollution have impacts on health; the focus of air quality advisories is on short-term exposure to the public.

Although the information and advice conveyed in advisories differs slightly between jurisdictions that issue them, most advisories include some or all of the following information:

- The trigger for the advisory and for how long elevated concentrations are expected.
- A description of the major source(s).
- A description of weather conditions related to the advisory.
- Mandatory and voluntary actions that should be taken by the public during the advisory, to prevent further deterioration of air quality.
- Health impacts that can be expected and for whom (i.e., a description of vulnerable populations).
- Actions that can be taken by individuals to reduce their personal exposures and health impacts, while the advisory is in effect.
- Resources for further information.

Example Advisories from Across Canada

Provinces may issue air quality advisories for different pollutants and trigger concentrations. Examples of advisories in British Columbia, Ontario, and Quebec are summarized in Table 1.

Note: *The NCCEH solicits examples of air quality advisories from across Canada, which will be posted to offer as examples.*

Table 1: A summary of air quality advisories in British Columbia, Ontario, and Quebec

Province	Who is involved	Advisories	Basis for Advisory	Mechanism for Issuing Advisory	Examples
British Columbia	BC Ministry of Environment (MoE), BC Centre for Disease Control (BCCDC); Regional Health Authorities (RHAs), Metro Vancouver Regional Government	PM _{2.5} Ozone Dust (PM ₁₀) Wildfire smoke	Issued when levels exceed trigger values. PM_{2.5} : 25 µg/m ³ over 24-hr Ozone : 82 ppb over 1-hr Dust : 50 µg/m ³ over 24-hr Wildfire smoke : no trigger value, instead a combination of information is used including PM _{2.5} levels, presence of smoke plumes, and meteorological conditions to issue an advisory.	Advisories issued through media alerts; may also be posted on RHA and Metro Vancouver websites.	See figure 1 for a PM _{2.5} air quality template developed by MoE, BCCDC, and RHAs (not available on-line). Metro Vancouver smog advisory issued in August 2010. ¹
Ontario	Environment Canada, Ontario Ministry of the Environment	Smog*	Issued when Air Quality Index (AQI) readings are above (or forecasted to be above) 50 for a region. In Ontario, AQI readings are typically driven by PM _{2.5} and ozone; levels above 45 µg/m ³ over 3-hr (PM_{2.5}) and/or 80 ppb over 1-hr (ozone) will result in an AQI > 50.	Notification issued through a Smog Alert Network as well as through media alerts; also posted on the Ministry of Environment webpage.	Smog Advisory issued in August 2009. ²
Quebec	Environment Canada; Quebec Ministry of Health (Ministère de la Santé et des Services Sociaux); Quebec Ministry of Environment (Le Ministère du Développement Durable de l'Environnement et des Parcs); Montreal Health Board (Direction de Santé Publique de l'Agence de la Santé des Services Sociaux de Montreal); City of Montreal	Smog*	Issued when levels exceed or are expected to exceed trigger values. PM_{2.5} : 35 µg/m ³ over 3-hr Ozone : 80 ppb over 1-hr	Advisories are issued through the Info Smog program . Like Ontario, Quebec also maintains an AQI but these readings do not serve as a trigger for issuing advisories.	See figure 2 (not available on-line).

*Advisories may also be issued due to elevated levels of other pollutants emitted from local sources. These pollutants include: PM₁₀, nitrogen dioxide (NO₂), carbon monoxide (CO), sulphur dioxide (SO₂), and total reduced sulphur (TRS).

Figure 1: A fine particulates air quality advisory template developed by the BC Ministry of Environment, BC ministry of Healthy Living and Sport, and the Regional Health Authorities

A i r Q u a l i t y A d v i s o r y B a s e d o n F i n e P a r t i c u l a t e s

AIR QUALITY ADVISORY IN EFFECT FOR [CITY]

(Jan 11, 2010 – [City]) The Ministry of Environment has issued an Air Quality Advisory for [City] because of high concentrations of fine particulates which are expected to persist until [weekday].

Exposure may be of special concern for people with diabetes, lung or heart conditions, and the elderly.

In the short term, exposure can be reduced by avoiding strenuous outdoor activities and by staying indoors with windows and doors closed. To avoid exposure to heat, stay in spaces that are air conditioned. *(Delete if not applicable)*

If you are experiencing symptoms such as chest discomfort, shortness of breath, cough, or wheeze follow the advice of your health care provider.

Outdoor burning under the Open Burning Smoke Control Regulation is prohibited until further notice. *(Delete if not applicable)* The use of wood burning stoves is prohibited unless this is your only source of heat. *(Delete if not applicable)*

Additional Information

Tips to avoid exposure during the advisory

- Avoid roads with heavy vehicle traffic and areas with wood smoke.
- Avoid strenuous outdoor activities; take regular breaks from active outdoor work or sports.
- Stay inside (when windows and doors are kept closed, less of the outdoor fine particulates can get indoors):
 - Staying inside buildings, which have large indoor volumes and limited entry of outdoor air, can help reduce peak exposures to fine outdoor particulates.
 - If it is hot outdoors, stay in spaces that are air conditioned *(delete if not applicable)*.
 - Avoid indoor sources of pollution such as smoking, vacuuming, and use of woodstoves.
 - Run an air cleaner; some room air cleaners, such as HEPA filters, can help reduce fine particles indoors, provided they are the right size for your home and filters are kept clean.

Tips to reduce health effects during the advisory

Maintaining good overall health is key to preventing health effects resulting from short-term exposure to air pollution.

- Continue to control medical conditions such as diabetes, heart failure, and chronic respiratory disease.
- Use symptom management medications, such as inhalers, if you need them.
- Drink lots of water to help with the heat *(delete if not applicable)*.

- If symptoms continue to be bothersome, seek medical attention.

Mandatory Emission Reduction Actions (*revise as needed*)

- **Open burning is banned** by order of the Ministry Director under the Open Burning Smoke Control Regulation for all category 2 and 3 burns within a 20 kilometre radius from [location] until further notice [*update as needed*].
- The **addition of materials to existing fires is prohibited** for the duration of the ban and contravention of this prohibition may be subject to a fine under the Regulation.
- **[City]'s Clean Air Bylaw prohibits the use of wood-burning appliances**, except for sole wood burning heat users, when an Air Quality Advisory is in effect.

Voluntary Emission Reduction Actions (*revise as needed*)

- Avoid the use of wood-burning stoves and fireplace inserts, unless used as the sole source of residential heat.
- Where wood stoves or fireplaces are the sole source of residential heat, use only CSA/EPA emissions approved wood-burning appliances and well-cured wood and ensure an adequate supply of combustion air.
- Follow local backyard burning bylaws and avoid backyard burning where a bylaw prohibiting this practice does not already exist.
- Reduce the use and idling of vehicles.

Additional Information (*revise as needed*)

- Fine particulate (PM_{2.5}) concentrations are currently [xxx] and are expected to exceed the provincial air quality objective of 25 micrograms per cubic metre (µg/m³), averaged over 24 hours.
- This episode is expected to continue until there is a change in the current weather system.
- Sources of PM_{2.5} contributing to this air quality episode include wood smoke (wood stoves and open burning), as well as emissions from industry and transportation sources, such as automobiles, trucks, and rail traffic.
- Real-time air quality information from [city] and other B.C. communities can be found at: www.bcairquality.ca .

Contacts

- Air Quality Meteorologist, Ministry of Environment

Figure 2: A smog air quality advisory example issued through Info Smog in Quebec.

Smog warning
Updated at 02:51 PM EDT Tuesday 31 August 2010.

Smog warning issued for the following regions:
Eastern Townships
Metro Montréal - Laval
Vaudreuil - Soulanges - Huntingdon
Richelieu Valley - Saint-Hyacinthe
Lachute - Saint-Jérôme
Lanaudière
Laurentians
Mauricie
Drummondville - Bois-Francs
Québec
Beauce
Montmagny - L'Islet.

Until Thursday morning

Atmospheric conditions could trigger deterioration in air quality today.

We can all help improve air quality by doing simple things, such as using public transit, reducing our driving speed, and not letting our car engines idle unnecessarily.

Smog especially affects asthmatic children and people with respiratory ailments or heart disease. It is therefore recommended that these individuals avoid intense physical activity outdoors, until the smog warning is lifted.

Additional information:
This warning is issued jointly by Environment Canada, the Ministère du Développement durable, de l'Environnement et des Parcs, the Ministère de la Santé et des Services sociaux, the direction de sante publique de l'agence de la sante et des services sociaux de Montréal and the city of Montréal.

For the smog warning, visit Environment Canada's website at www.qc.ec.gc.ca/atmos/smog

To find the air quality index for the city of Montréal, visit the city's website at www.rsqa.qc.ca

To find out the air quality index for other Québec regions, visit the web site of the Ministère du Développement durable, de l'Environnement et des Parcs at www.mddep.gouv.qc.ca/air/iqa.

For more information on the health effects of smog, visit the direction de sante publique de l'agence de la sante et des services sociaux de Montréal web site at <http://www.santepub-mtl.qc.ca/Environnement/smog/> or the web site of the Ministère de la Santé et des Services sociaux at <http://www.msss.gouv.qc.ca/environnement>.

Acknowledgements: We would like to thank Natalie Suzuki, Eric Taylor, David Yap, and Audrey Smargiassi for their review of this document.

References:

1. Metro Vancouver. Air quality advisory. Burnaby, BC: Metro Vancouver; 2010. Available from:
<http://www.metrovancouver.org/about/media/Media%20Releases/2010-08-04-AirQualityAdvisory.pdf>.
2. Ontario Ministry of the Environment. Notice of smog advisory. Toronto, ON: Government of Ontario; 2010; Available from:
http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@business/@air/documents/nativedocs/stdprod_082695.pdf

Production of this document was made possible through a financial contribution from the Public Health Agency of Canada.