

Smog and the Environment

Ozone not only affects human health, it can have harmful effects on the environment. Smog can damage vegetation and decrease the productivity of some crops, injure flowers and shrubs and contribute to forest decline in some parts of Canada.

Ozone can also damage synthetic materials, cause cracks in rubber, accelerate fading of dyes, and speed deterioration of some paints and coatings. As well, it damages cotton, acetate, nylon, polyester and other textiles.

Are you at risk?

Smog affects everyone's health. Some people are more vulnerable to the effects of air pollution than others. Those most sensitive to smog include:

- Young children
- Pregnant women
- The elderly
- Asthmatics
- People with heart problems
- Smokers
- People who work or exercise outdoors

Warning signs that smog may be affecting your health:

- Mild breathing difficulties
- Chest tightness and coughing
- Headache
- Eye, nose and throat irritation
- Low energy or feeling unusually tired; a chore that usually seems easy could prove more strenuous
- Aggravation of respiratory diseases (such as asthma)

What is a smog alert?

When widespread and persistent smog levels are forecast due to elevated ground-level ozone and/or fine particulate matter, the ministry informs the public by issuing two types of alerts:

- A **Smog Watch** is issued when there is at least a 50 per cent probability that smog conditions will occur within the next three days.
- A **Smog Advisory** is issued when there is a high probability of elevated smog levels occurring within the next 24 hours or if smog conditions happened without warning.

When the weather changes, resulting in cleaner air, the ministry issues an advisory termination notice.



Where does smog come from?

Smog-causing pollutants are created by combustion, in particular from the burning of fuels such as oil, gas and coal. A large amount of air pollution comes from cars and trucks. Industries such as coal-fired electric stations in Ontario and midwestern United States are also a large source of air pollutants. More than half of our smog problem comes from the United States.



Smog: a year-round issue

In southern Ontario, particularly in and around the urban areas, periods of smog occur most often from May to September. **However, smog levels can be high during all months of the year.** Here's why:

The key components of smog are ground-level ozone and fine particulate matter. Since ground-level ozone forms when pollutants (nitrogen oxides and volatile organic compounds) react in heat and sunlight, high ozone levels generally occur on hot sunny days between noon and early evening. Fine particulate matter is formed from pollutants released from factories, power plants and vehicles. Therefore, unlike ozone, fine particulate matter levels can remain high day and night, throughout the entire year.

For more information:

The Ministry of the Environment's website www.airqualityontario.com provides current AQI readings and air quality forecasts, as well as information on what to do when a smog alert is issued.

The Ministry of Health and Long-Term Care's website www.health.gov.on.ca provides information on the health impacts of poor air quality and what you can do to protect yourself.

Subscribe to the ministry's *Smog Alert Network* and receive a free automatic email whenever a smog watch or smog advisory is issued and terminated.

You can get AQI readings from recorded telephone messages by dialing **1-800-387-7768** toll-free or **416-246-0411** in Toronto. To obtain AQI readings in French, dial **1-800-221-8852**.

Your local radio and television stations add smog watches and smog advisories to their weather forecasts.

PIBS 5099e ISBN: 0-7794-8167-4 ©2005 Queen's Printer for Ontario



Smog and Your Health

What is smog?

The term “smog” was defined more than three decades ago to describe a mixture of smoke and fog in the air. Today, smog is a general term used to describe a mixture of air pollutants that is often seen as a brownish haze hanging over our community on warm, sunny days.



Smog is a mixture of air pollutants. The two main ingredients in smog that have the most impact on our health and the environment are ground-level ozone (O₃) and fine particulate matter (PM_{2.5}).

Ground-level ozone (O₃) forms when certain pollutants (nitrogen oxides and volatile organic compounds) combine in the presence of sunlight and heat – which is why smog is primarily a summer phenomenon, occurring mostly in southern Ontario. Ground-level ozone is a harmful pollutant, and should not be confused with the protective ozone in the upper atmosphere which shields the earth from the sun’s ultraviolet rays.

Fine particulate matter (PM_{2.5}) is a mixture of microscopic particles of soot, ash, dirt, dust and metals in the air measuring less than 2.5 micrometers in size (about 1/30th the diameter of a human hair). It comes from industrial and vehicle emissions, brake-lining, tire wear, road dust, agriculture, construction and wood-burning. PM_{2.5} is primarily formed from chemical reactions in the atmosphere and through fuel combustion. PM_{2.5} poses a health concern because it can pass through the nose and throat and get deep into the lungs.

What is the Air Quality Index (AQI)?

The Ministry of the Environment samples and analyzes air across Ontario continuously and reports air quality readings to the public using the Air Quality Index, or AQI.



The Ontario government’s automatic air monitoring stations constantly analyze the quality of our air by measuring concentrations of smog pollutants (ground-level ozone and fine particulate matter) as well as other key urban air pollutants: carbon monoxide, nitrogen dioxide, sulphur dioxide, and total reduced sulphur. The results are translated into an AQI value that helps Ontarians understand the level of air pollution. The AQI value is based on whichever pollutant peaks at a given hour.

AQI values are posted on the ministry’s air quality website at www.airqualityontario.com, and are often reported by Ontario media outlets. AQI values are also available by calling the ministry’s information line at 1-800-387-7768, or in Toronto, 416-246-0411 (English) or 1-800-221-8852 (French).

What do the readings mean?

Air Quality Index: Smog Pollutants and Their Impacts*

Index	Category	Ground-level Ozone (O ₃)	Fine Particulate Matter (PM _{2.5})
0–15	Very good	No health effects are expected in healthy people	Sensitive populations may want to exercise caution
16–31	Good	No health effects are expected in healthy people	Sensitive populations may want to exercise caution
32–49	Moderate	Respiratory irritation in sensitive people during vigorous exercise; people with heart/lung disorders at some risk; damages very sensitive plants	People with respiratory disease at some risk
50–99	Poor	Sensitive people may experience irritation when breathing and possible lung damage when physically active; people with heart/lung disorders at greater risk; damages some plants	People with respiratory disease should limit prolonged exertion; general population at some risk
100 and over	Very poor	Serious respiratory effects, even during light physical activity; people with heart/lung disorders at high risk; more vegetation damage	Serious respiratory effects even during light physical activity; people with heart disease, the elderly and children at high risk; increased risk for general population

* Please note that the information in this table will be reviewed and may change.

Protect your health

When air quality is poor:

- Avoid or reduce time spent outdoors doing vigorous activities.
- Stay indoors if you can – a cool, well-ventilated place is best.

- Avoid being outside around high traffic areas and during peak rush hour times to minimize your exposure to smog.
- If you experience any breathing difficulties or respiratory complications, contact your physician or go to the nearest hospital.

What you can do to reduce smog

Here are some actions you can take to help protect the environment and your own health:

At home:

- Conserve energy: Ontario’s energy comes from a mix of sources including gas, oil and coal-fire generators that emit pollutants. Save electricity at home year-round by adjusting the heat or air conditioner and turning off lights you are not using.
- Avoid letting your car, or any other engine, idle for long periods.
- Reduce your use of gasoline-powered equipment.
- Avoid mowing the lawn when air quality is poor.
- Don’t use oil-based products such as paints, solvents or cleaners if you can avoid them; they contain volatile organic compounds (VOCs), which contribute to smog.
- Get engine tune-ups and car maintenance checks as advised by the manufacturer.

At work:

- Whenever possible, take public transit or walk to work.
- If you use a car, don’t travel alone; encourage and facilitate carpooling.
- Avoid traffic congestion.
- Consider teleconferencing, instead of travelling to meetings.

As always, consult your doctor for specific medical advice on how to cope with poor air quality.