

## Smog Facts

Smog is a pollution mixture of gases and particles that can appear in the air as a visibility reducing haze. Smog can have negative effects on human health, vegetation and air quality, and is an issue in Alberta, across Canada and around the world.

### What Makes up Smog?

Typically, smog in Alberta contains two primary components:

#### Ozone (O<sub>3</sub>)

Ozone in the upper atmosphere protects life on earth by filtering the sun's harmful ultraviolet rays; however, when formed by chemical reactions near the ground in the presence of sunlight it can be a major component of smog during the summer.

During hot weather, emissions of chemicals from automobiles, industry and other non-natural sources can produce high ozone levels. Ozone can also be produced during warm weather conditions due to chemical reactions involving organic compounds emitted by vegetation.

#### Fine Particulate Matter (PM<sub>2.5</sub>)

These are tiny airborne particles that are less than 2.5 micrometres in diameter. In comparison, a human hair is about 70 micrometres in diameter. These particles can be inhaled deep into the lungs and are a health concern.

PM<sub>2.5</sub> may form in the atmosphere as a by-product of the chemical reactions of other pollutants, or be emitted by any combustion source including automobiles, industry, and wood burning. Smoke from forest fires and other types of biomass burning can also be a major source of PM<sub>2.5</sub>.

### Formation of Smog

While smog can occur year round, in Alberta it usually appears in the summer and winter.

In the summer when it is sunny and hot, higher levels of ozone contribute to the formation of photochemical smog, which has a light brown colour and can reduce visibility.

In the winter, smog is primarily driven by fine particulate matter contributions rather than ozone, especially when the winds are calm and a temperature inversion is present. A temperature inversion takes place when cold, stagnant air close to the ground is trapped by a layer of warm air above. Under such conditions, air pollutants build up close to the ground. Higher levels of fine particulate matter can result from increased vehicle usage in the winter months and residential heating or wood burning.

### Who is Affected by Smog and How?

Healthy people may experience temporary symptoms (e.g., runny nose, irritated eyes, or coughing) due to smog. However, there are certain groups of people that need to pay particular attention to smog:

- Adults engaged in outdoor physical activities requiring deeper and faster breathing as they end up breathing in more of the pollutants
- Children breathe more frequently than adults which can increase their intake of pollutants

- People who spend a significant amount of time outdoors may increase their exposure to smog
- People with heart diseases, lung diseases, or diabetes because exposure is linked to exacerbation of pre-existing heart and lung diseases

## How does Smog Affect the Environment?

Ozone near the ground can also damage vegetation and ecosystems. It lessens the growth of vegetation, crop yield and defence against diseases, pests and natural stressors (like harsh weather). Fine particulate matter can impair visibility and travel long distances in the air.

## Managing Air Quality and Exposure

Every year, the Government of Alberta posts a report on particulate matter and ozone levels across the province. The data from these annual reports is used by the province to better plan for managing air quality. For more information, see Canadian Ambient Air Quality Standards at:

- [AEP.alberta.ca](http://AEP.alberta.ca)

The Air Quality Health Index (AQHI) helps Albertans understand what the air quality in their community means to their health. It is a useful tool to help Albertans reduce their exposure to air pollution. It also includes special messaging about visibility. Air quality advisories are issued by Alberta Health Services when smog and poor air quality may affect communities.

- [Air Quality Health Index](#)
- [Alberta Health Services – Air Quality Advisories](#)

## Smog Prevention and Reduction

- Avoid idling; unless you are in traffic, if you are going to be stopped for 10 seconds or more turn your engine off
- Consider fuel efficiency when buying a vehicle
- Consider using alternative energy resources
- Do not burn leaves, branches or other yard wastes; instead, compost them  
Drive within the speed limit and keep all vehicles well maintained
- Rather than driving your car, opt for public transportation or carpooling; if smog levels do not pose a serious health risk, you can also walk or cycle
- Reduce the use of fossil fuels