

Title:	Alberta Ambient Air Quality Objectives and Guidelines Summary
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Program Name:	Air Policy Branch
Effective Date:	Differential effective dates for each objective or guideline
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Disclaimer:	

Alberta’s ambient air quality objectives and guidelines are developed under the Alberta *Environmental Protection and Enhancement Act* (EPEA). Objectives are developed to protect Alberta’s air quality.

Alberta has developed or adopted objectives from other jurisdictions where there are no national objectives or Canadian Ambient Air Quality Standards.

Air quality objectives are generally established for one-hour, 24-hour, and annual averaging periods. Occasionally, the underlying information or ambient monitoring method requires that other averaging periods be used. For example, a three-day objective was set for ethylene as experimental evidence indicated that this was a more appropriate averaging period than 24-hours.

Objectives and guidelines are based on an evaluation of scientific, social, technical, and economic factors.

Consultation

Alberta Environment and Parks works with a variety of stakeholders, including other government departments, the scientific community, environmental organizations, industry and the general public to prioritize substances and to develop and review objectives and guidelines.

Reporting Air Quality

The Ambient Air Quality Objectives are compared to actual air quality measurements to report on:

- the state of Alberta’s environment;
- special ambient air quality surveys; and
- current air quality through the Air Quality Health Index.

Industrial Facilities

All industrial facilities must be designed and operated such that the ambient air quality remains below Ambient Air Quality Objectives.

Use of Objectives (Table 1)

Objectives are used:

- to determine adequacy of facility design
- to establish required stack heights and other release conditions
- to assess compliance and evaluate facility performance

Use of Guidelines (Table 2)

Guidelines may be used:

- for airshed planning and management
- as a general performance indicator
- to assess local concerns

Table 1 Alberta Ambient Air Quality Objectives

Substance/ CAS	Averaging Period	$\mu\text{g m}^{-3}$ †	ppbv *	Basis	Effective Date**	Last Review**
Acetaldehyde 75-07-0	1-hour	<u>90</u>	<u>50</u>	Adopted from Texas	1999	
Acetic acid 64-19-7	1-hour	<u>250</u>	<u>102</u>	Adopted from Texas	1999	
Acetone 67-64-1	1-hour	<u>5,200</u>	<u>2,400</u>	Adopted from Texas	1999	2005
Acrolein 107-02-8	1-hour	<u>4.5</u>	<u>1.9</u>	Adopted from Ontario (development of irritation)	Oct 1, 2013	
	24-hour	<u>0.40</u>	<u>0.17</u>	Adopted from Ontario (development of lesions in upper airways)		
Acrylic acid 79-10-7	1-hour	<u>60</u>	<u>20</u>	Adopted from Texas	Jan 1, 2004	
	Annual	<u>1.0</u>	<u>0.34</u>	Adopted from California		
Acrylonitrile 107-13-1	1-hour	<u>43</u>	<u>19</u>	Adopted from Texas	Jan 1, 2004	
	Annual	<u>2</u>	<u>0.9</u>	Adopted from California		
Ammonia 7664-41-7	1-hour	<u>1,400</u>	<u>2,000</u>	Odour perception	1976	2005
Arsenic 7440-38-2	1-hour	<u>0.1</u>	-	Respiratory effects	May 1, 2005	2013
	Annual	<u>0.01</u>	-	Carcinogenic effects		

Substance/ CAS	Averaging Period	$\mu\text{g m}^{-3}$ †	ppbv *	Basis	Effective Date**	Last Review**
Benzene						
71-43-2	1-hour	<u>30</u>	<u>9.0</u>	Haematological effects	1999	2012
	Annual	<u>3</u>	<u>0.9</u>	Carcinogenic effects		
Benzo[a]pyrene						
50-32-8	Annual	<u>0.30</u> ng m^{-3}	<u>2.9</u> $\times 10^{-5}$	Chronic and carcinogenic human health effects	June 1, 2009	
Carbon disulphide						
75-15-0	1-hour	<u>30</u>	<u>10</u>	Odour threshold	1999	2006
Carbon monoxide						
630-08-0	1-hour	<u>15,000</u>	<u>13,000</u>	Oxygen carrying capacity of blood	1975	
	8-hour	<u>6,000</u>	<u>5,000</u>	--		
Chlorine						
7782-50-5	1-hour	<u>15</u>	<u>5.0</u>	Adopted from Texas	1999	
Chlorine dioxide						
10049-04-4	1-hour	<u>2.8</u>	<u>1.0</u>	Adopted from Texas	1999	
Chromium						
7440-47-3	1-hour	<u>1</u>	-	Adopted from Texas	1999	
Cumene						
98-82-8	1-hour	<u>500</u>	<u>100</u>	Adopted from Texas	May 1, 2005	
Dimethyl ether						
115-10-6	1-hour	<u>19,100</u>	<u>10,100</u>	Adopted from Texas	1999	
2-Ethylhexanol						
104-76-7	1-hour	<u>600</u>	<u>110</u>	Adopted from Ontario	May 1, 2005	
Ethylbenzene						
100-41-4	1-hour	<u>2000</u>	<u>460</u>	Adopted from Texas	May 1, 2005	
Ethyl chloroformate						
541-41-3	1-hour	<u>0.57</u>	<u>0.13</u>	Stack emission limits	1999	
Ethylene						
74-85-1	1-hour	<u>1,200</u>	<u>1,050</u>	Crop yield	Jan 1, 2004	
	3-day	<u>45</u>	<u>40</u>	Crop yield		
	Annual mean	<u>30</u>	<u>26</u>	Conifers and perennials		
Ethylene oxide						
75-21-8	1-hour	<u>15</u>	<u>8.0</u>	Adopted from Ontario	1999	
Formaldehyde						
50-00-0	1-hour	<u>65</u>	<u>53</u>	Adopted from Texas	1999	2007
n-Hexane						
110-54.3	1-hour	<u>21,000</u>	<u>5,960</u>	Derived from 24-hr California objective	Aug 1, 2008	
	24-hour	<u>7,000</u>	<u>1,990</u>	Adopted from California		
Hydrogen chloride						
7647-01-0	1-hour	<u>75</u>	<u>50</u>	Adopted from Texas	1999	
Hydrogen fluoride						
7664-39-3	1-hour	<u>4.9</u>	<u>6.0</u>	Adopted from Texas	1999	2009

Substance/ CAS	Averaging Period	$\mu\text{g m}^{-3}\dagger$	ppbv *	Basis	Effective Date**	Last Review**
Fluoride content in forage – dry wt basis						
	30-day avg.	<u>35</u> $\mu\text{g g}^{-1}$		Adopted from Ontario April 1 to October 31	2009	
	Avg. for any single 30-day period	<u>80</u> $\mu\text{g g}^{-1}$		April 1 to October 31		
	Avg. for 2 consecutive months	<u>60</u> $\mu\text{g g}^{-1}$		April 1 to October 31		
Hydrogen sulphide						
7783-06-4	1-hour	<u>14</u>	<u>10</u>	Odour perception	1975	
	24-hour	<u>4</u>	<u>3</u>	Health effects		
Isopropanol						
67-63-0	1-hour	<u>7,850</u>	<u>3,190</u>	Adopted from Texas	Aug 1, 2005	
Lead						
7439-92-1	1-hour	<u>1.5</u>	-	Adopted from Texas	1999	
Manganese						
7439-96-5	1-hour	<u>2</u>	-	Adopted from Texas	May 1, 2005	
	Annual	<u>0.2</u>	-	Adopted from Texas and California		
Methanol						
67-56-1	1-hour	<u>2,600</u>	<u>2,000</u>	Adopted from Texas	1999	
Methylene bisphenyl diisocyanate						
101-68-8	1-hour	<u>0.51</u>	<u>0.050</u>	Adopted from Texas	1999	
Monoethylamine						
75-04-7	1-hour	<u>1.19</u>	<u>0.645</u>	Stack emission limits	1999	
Naphthalene						
91-20-3	Annual	<u>3</u>	-	Health effects	Sept 1, 2016	
Nickel						
7440-02-0	1-hour	<u>6</u>	-	Adopted from California	May 1, 2005	
	Annual	<u>0.05</u>	-	Adopted from California		
Nitrogen dioxide						
10102-44-0	1-hour	<u>300</u>	<u>159</u>	Respiratory effects	1975	2009
	Annual	<u>45</u>	<u>24</u>	Vegetation		
Ozone (ground level)						
10028-15-6	1-hour daily maximum	<u>160</u>	<u>82</u>	Pulmonary function	1975	2007
Particulate Matter						
Fine - 2.5 microns or less	24-hour	<u>30</u>	-	Canada Wide Standard	2007	

Substance/ CAS	Averaging Period	$\mu\text{g m}^{-3}$ †	ppbv *	Basis	Effective Date**	Last Review**
Total suspended particulate matter	24-hour	<u>100</u>	-	Pulmonary effects	1975	
	Annual geometric mean	<u>60</u>	-			
Pentachlorophenol						
87-86-5	1-hour	<u>5.0</u>	<u>0.44</u>	Adopted from Texas	Nov 1, 2004	
	Annual	<u>0.5</u>	<u>0.04</u>	Adopted from Texas		
Phenol						
108-95-2	1-hour	<u>100</u>	<u>26.0</u>	Adopted from Ontario	1999	
Phosgene						
75-44-5	1-hour	<u>4</u>	<u>1</u>	Adopted from Texas	1999	
Propylene oxide						
75-56-9	1-hour	<u>480</u>	<u>200</u>	Adopted from Oklahoma	Jan 1, 2004	
	Annual	<u>30</u>	<u>13</u>	Adopted from California		
Styrene						
100-42-5	1-hour	<u>215</u>	<u>52.0</u>	Adopted from Texas	1999	
Sulphur dioxide						
7446-09-5	1-hour	<u>450</u>	<u>172</u>	Pulmonary function	1975	2008
	24-hour	<u>125</u>	<u>48.0</u>	Adopted from European Union – human health		
	30-day	<u>30</u>	<u>11</u>			
	Annual	<u>20</u>	<u>8.0</u>	Adopted from European Union - ecosystems		
Sulphuric acid						
7664-93-9	1-hour	<u>10</u>	<u>2.5</u>	Adopted from Texas	1999	
Toluene						
108-88-3	1-hour	<u>1,880</u>	<u>499</u>	Adopted from Texas	May 1, 2005	
	24-hour	<u>400</u>	<u>106</u>	Adopted from Michigan and Washington		
Vinyl Chloride						
75-01-4	1-hour	<u>130</u>	<u>51</u>	Adopted from Texas	1999	
Xylenes						
1330-20-7	1-hour	<u>2,300</u>	<u>530</u>	Adopted from Ontario	May 1, 2005	
	24-hour	<u>700</u>	<u>161</u>	Adopted from California		

† $\mu\text{g m}^{-3}$ is the weight, in micrograms, of the substance in one cubic meter of air.

* Standard conditions of 25°C and 101.325 kPa are used as the basis for conversion from $\mu\text{g m}^{-3}$ to ppbv (parts per billion by volume) or from mg m^{-3} to ppmv (parts per million by volume).

** The Effective Date column indicates when the objective was initially effective in Alberta. A date in the Last Review column indicates the last date the objective was reviewed.

Note: Underscore indicates this digit is the last significant figure in the number e.g. 100 has two significant figures.

Note: The least significant figure is underlined to indicate calculation accuracy when converting from one unit to the other (e.g. $\mu\text{g m}^{-3}$ to ppbv). These numbers **do not** indicate reporting accuracy or precision. Refer to the Air Monitoring Directive for the Reporting Policy on significant figures for comparison to the ambient air quality objective.

Table 2 Alberta Ambient Air Quality Guidelines

Parameter	Guideline	Effective
Dustfall		
30 days	53 mg 100 cm ⁻²	In residential and recreation areas
30 days	158 mg 100 cm ⁻²	In commercial and industrial areas
Particulate Matter Fine - 2.5 microns or less		
1-hour	80 µg m ⁻³	Derived from the Canada Wide Standard
Static fluorides		
30 days	40 µg 100 cm ⁻²	Water soluble fluorides
Use of the following two shall cease July 30, 2017 as per the Air Monitoring Directive		
Static total sulphation		
	0.50 mg 100 cm ⁻²	SO ₃ equivalent per day as a 1-month accumulated loading
Static hydrogen sulphide		
	0.10 mg 100 cm ⁻²	SO ₃ equivalent per day as a 1-month accumulated loading

For More Information

For more information on Alberta's Ambient Air Quality Objectives, contact:

Alberta Environment and Parks
Air Policy
Phone: (780) 427-4979

Original signed by: _____
 Hamid Namsechi
 Air Policy Branch
 Environment and Parks

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Further information is available online at
aep.alberta.ca/