



**Lower Athabasca Region Air Zone  
Canadian Ambient Air Quality Standards Response  
Government of Alberta Action Plan**

---

September 2017

Any comments or questions regarding the content of this document may be directed to:

Operations Division  
Alberta Environment and Parks  
Provincial Building/Jubilee Centre  
9915 Franklin Avenue  
Fort McMurray, Alberta, Canada T9H 2K4  
Website: [AEP.alberta.ca](http://AEP.alberta.ca)

Date of Publication: September 2017

ISBN 978-1-4601-3592-1 (PDF)

Copyright in this publication, regardless of format, belongs to Her Majesty the Queen in right of the Province of Alberta. Reproduction of this publication, in whole or in part, regardless of purpose, requires the prior written permission of Alberta Environment and Parks.

© Her Majesty the Queen in right of the Province of Alberta, 2017

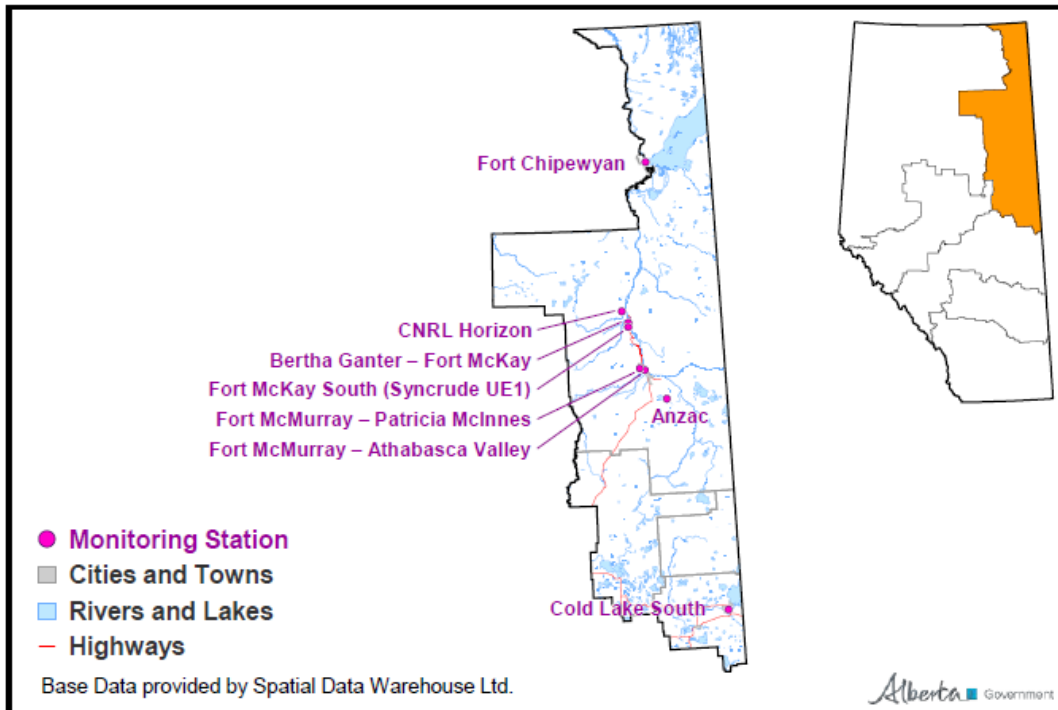
## Air Quality Management System

The Air Quality Management System (AQMS) provides a comprehensive, cross-Canada framework for collaborative action to further protect human health and the environment through continuous improvement of air quality. The Air Zone Management Framework, a component of the AQMS, provides a system for the management, monitoring and reporting actions to be implemented at an air zone level. The first Canadian Ambient Air Quality Standards (CAAQS) assessment results for Alberta were published in September 2015 for the 2011 to 2013 monitoring period - *Alberta: Air Zones Report 2011-2013*.

Alberta is committed to implementing the national Air Quality Management System, including taking action to reduce emissions, as required, in each air zone to meet the CAAQS requirements. Alberta Environment and Parks developed and published the *Alberta Implementation of the Air Zone Management Framework for Fine Particulate Matter and Ozone* in September 2015. In addition to providing information on air zone boundaries and monitoring stations used for CAAQS reporting, the policy sets management planning requirements and timelines. Air zones in the orange and red management levels are required to develop a management plan to achieve CAAQS and/or further improve ambient air quality within two years of CAAQS reporting.

## Current Assessment

The annual Air Zones Report summarizes the CAAQS achievement status and management levels for Alberta's Air Zones for fine particulate matter (PM<sub>2.5</sub>) and ozone (O<sub>3</sub>) monitoring results. Eight stations in the Lower Athabasca Region (LAR) air zone were used in the 2011 to 2013 assessment. These stations are located within communities or in areas accessed by members of the public. The boundaries of the LAR air zone and the locations of the ambient air quality monitoring stations are shown in Figure 1.



**Figure 1 – Lower Athabasca Region Air Zone Boundaries and Monitoring Stations used for AQMS Reporting.**

A summary of the 2011 to 2013 reporting period assessment results for the LAR air zone is provided in Table 1. The PM<sub>2.5</sub> metric value for data collected at CNRL Horizon station had exceeded the CAAQS Threshold of orange management level, Actions for Preventing CAAQS Exceedance. As such, the zone was assigned to the orange management level for PM<sub>2.5</sub>. This management level indicates that PM<sub>2.5</sub> concentrations are approaching CAAQS Threshold and proactive action is needed to prevent exceedance.

The LAR air zone is assigned to the yellow management level for O<sub>3</sub>, Actions for Preventing Air Quality Deterioration. This management level calls for improvement to air quality using early and ongoing actions for continuous improvement.

**Table 1: Air Quality Results for the Lower Athabasca Region Air Zone**

Air Zone	Station	PM <sub>2.5</sub> 24-hour	PM <sub>2.5</sub> Annual	Ozone 8-Hour
Lower Athabasca	Anzac	Green	Green	Yellow
	Bertha Ganter –Fort McKay	Yellow	Yellow	Green
	CNRL Horizon	Orange	Orange	_ <sup>a</sup>
	Cold Lake South	Yellow	Yellow	Green
	Fort Chipewyan	Green	Green	Green
	Fort McKay South(Syncrude UE 1)	Yellow	Yellow	Green
	Fort McMurray-Athabasca Valley	Yellow	Yellow	Green
	Fort McMurray –Patricia McInnes	Green	Green	Green

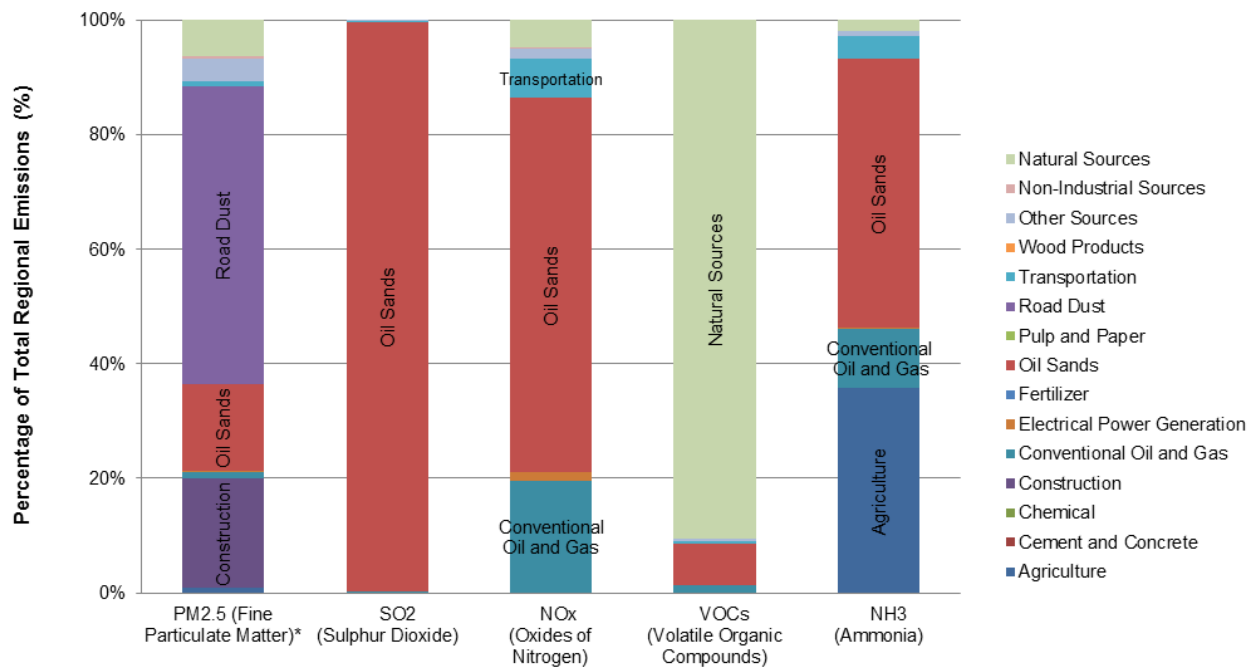
<sup>a</sup>: No assessment is possible as this substance is not monitored at this station.

## Emissions

Figure 2 shows the percent of total emissions by sector for the LAR air zone for selected compounds. This is based on the Alberta Air Emissions Inventory. While these data are a few years old, they represent the most consistent and detailed emissions inventory dataset available for all air zones, including non-industrial non-point<sup>1</sup> sources, and small sources.

Road dust, construction and oil sands sectors contribute the greatest amounts to the primary PM<sub>2.5</sub> emissions. The oil sands sector dominates sulphur dioxide (SO<sub>2</sub>) emissions. Oil sands, conventional oil and gas, and transportation contribute the largest amount of nitrogen oxides (NO<sub>x</sub>), whereas volatile organic compounds (VOCs) emissions are dominated by natural sources such as forests, grasslands and swamps. Contributions to VOCs from natural sources are estimated to be almost six times greater than from human sources. Ammonia (NH<sub>3</sub>) emissions contributions in the LAR Air Zone originate from the oil sands sector, agriculture, and conventional oil and gas.

<sup>1</sup> Non-point source pollution is subtle and gradual, caused by the release of pollutants from many different and diffuse sources (aggregated sources of emissions). This aggregation is done because the emission sources are either too small and numerous, too geographically dispersed, or too geographically large to be estimated or represented by a single point.



\*Primary particulate matter emissions

\*\*Conventional oil and gas includes both upstream and downstream oil and gas

**Figure 2: Percent of Total Emissions by Sector for the Lower Athabasca Region Air Zone**

## Government of Alberta Commitment to Improve Air Quality in Lower Athabasca Region Air Zone

As the LAR air zone has been assigned to the orange management level for PM<sub>2.5</sub>, a management plan is required. Alberta Environment and Parks is committed to management actions and working with stakeholders to effectively meet the CAAQS in the LAR air zone. Several of the policies and management actions listed can apply provincially to improve protection of air quality.

Alberta Environment and Parks will undertake action in the following areas to reduce air emissions:

### Regional Planning Actions:

The Government is committed to an Integrated Resource Management System (IRMS). Regional planning and related initiatives under the Land-use Framework are components of this system. IRMS is based on the principles of cumulative effects management - the management of the combined effects of past, present, and foreseeable future activities on the environment, economy, and society over time and in a particular place. The IRMS will support responsible resource management in the province, in part through the implementation of environmental management frameworks. CAAQS and their associated air zone management thresholds are being incorporated into air quality management frameworks and provide context for development and related planning and decision-making processes in each land use region. Each regional plan is at a different stage of development. Alberta Environment and Parks will continue to advance air quality management frameworks developed within each region.

Action	Description and Timeframe
Implement a regional land-use plan and associated air quality management framework.	The Lower Athabasca Regional Plan (LARP) and the Lower Athabasca Region Air Quality Management Framework were approved in

	<p>September 2012 and are currently being implemented.</p> <p>CAAQS will be added to the framework and plan as part of the 5-year review and amendments.</p>
--	--

**Policy Actions:**

In addition to the Alberta Implementation of the Air Zone Management Framework for Fine Particulate Matter and Ozone policy defining requirements to ensure the CAAQS are achieved, Alberta is assessing additional policies that can be applied in air zones at orange and red CAAQS management levels. While some of these actions may not be directly applicable to LAR air zone, pollution can be transported long distances, so actions taken in one air zone may lead to air quality improvements in other air zones. Technology and equipment standards and policy for point sources such as large industry and non-point sources such as transportation will be assessed.

Action	Description
<p>Establish provincial air emission policy, including defining standards / tools to apply to reduce emissions in air zones at orange and red CAAQS management levels.</p>	<p>Jurisdictional review has been completed and published online.</p> <p>Based on the jurisdictional review of international policy approaches and regulatory tools applied in areas requiring air quality management, the Government of Alberta will subsequently identify policy gaps and develop tools for air zones at orange and red CAAQS management levels.</p>
<p>Establish and update source standards for both industrial sectors and equipment to reduce emissions</p>	<p>Coal fired power plants are some of the major polluters in Alberta, and their emissions can impact air quality across the province. Requiring the electricity generating sector (existing coal-fired units) to meet the Alberta emission management framework standards for sulphur dioxide and nitrogen dioxide to significantly lower fine particulate matter precursor gases. Alberta's Climate Leadership Plan will phase out coal-fired electricity sources by 2030.</p> <p>Provincial roll out of more stringent equipment standards for new boilers and heaters.</p>
<p>Reduce methane emissions in Alberta under the Climate Leadership Plan.</p>	<p>Methane is known to be a major source of ozone throughout the troposphere and the sources of which is mainly fossil fuel production and intensive livestock farming. Reductions in methane emissions would help to decrease greenhouse warming by decreasing both methane and ozone in the atmosphere and would help to reduce surface air pollution. In Alberta, the government's current initiative to reduce methane emission by 45% from oil and gas industry by 2025 may have a co-benefit of reducing VOCs, precursors to particulate matter and ozone, from these sources.</p>
<p>Action on non-point sources such as transportation.</p>	<p>The Government is collaborating with industry, non-government organizations, and airsheds cross-provincially through the Clean Air Strategic</p>

	<p>Alliance (CASA) to provide recommendations for potential management actions on non-point source emissions such as transportation and wood burning.</p> <p>The Government continues to support the development of green transit alternatives and continues to collaborate with federal/provincial/territorial jurisdictions through the Canadian Council of Ministers of the Environment (CCME) Mobile Sources Working Group to help inform further transportation management actions in Alberta.</p>
Provide support and guidance to assist municipalities when making decisions on land-use planning for improved environmental outcomes.	Emissions from municipalities include sources such as vehicles, home-heating furnaces, backyard fire pits, and small engines such as lawn mowers. Provide technical support to municipalities for their planning, by-law development and public education efforts to reduce air emissions.
Better understand contributions from small businesses and manufacturing that do not require an Environmental Protection and Enhancement Act approval to the fine particulate matter issue.	Assess contributions from small businesses and manufacturing to better inform what impacts these have on air quality and help identify partners and promote collaboration.
Update Alberta Ambient Air Quality Objectives	Updates to Objectives for fine particulate matter, ozone, nitrogen dioxide, sulphur dioxide, and hydrogen sulphide and potential new Objective for total reduced sulphur compounds are planned over the next few years.

### Regulatory Process Actions:

Industrial facilities in Alberta regulated by the *Environmental Protection and Enhancement Act* operate under the terms and conditions stipulated in their respective approval documents, which include emission control standards. These standards are updated when the facility approval are renewed on a 10-year cycle. Efforts are ongoing to ensure principles of continuous improvement are incorporated into the approval process to support environmental outcomes. The Government of Alberta is committed to taking actions to reduce emissions from existing sources and requiring control technologies on par with leading jurisdictions for major new sources.

Action	Description
Action on industrial emissions.	Industrial approvals in Alberta are normally issued for a ten-year period. The Alberta Energy Regulator and Environment and Parks are requesting more stringent emissions standards be applied to all the industrial sources in renewal applications that are in air zones at orange and red CAAQS management levels. Data and information on current operations, management practices and technologies will be collected.

**Knowledge Improvement:**

Currently, Alberta has the largest network of air monitoring stations in Canada. All population centres of over 50,000 people, as well as some smaller centres have at least one continuous air monitoring station, and this network is being expanded. Alberta Environment and Parks will work with local airshed organizations and other partners to advance knowledge in priority areas and inform management approaches.

<b>Action</b>	<b>Description</b>
Ambient data analysis	Analyze available monitoring data to investigate possible cause or influences on elevated concentrations. Look at links to meteorology (wind/wind direction), topography and covariance between pollutants. Identify any temporal and spatial long term trends.
Network Assessment	Assess the adequacy of existing ambient air quality monitoring in the area.

**Engagement Actions:**

Air quality management requires the participation of numerous affected people, industries, and agencies. There are two aspects to engagement actions. The first is in recognizing work with stakeholders to achieve a better understanding of regional priorities to align management initiatives with regional needs. The second is focused on outreach and education to inform the public and stakeholders on the state of air quality, how it impacts them, and what they can do to help manage air quality.

<b>Action</b>	<b>Description</b>
Develop a provincial air literacy program.	Update and develop, as required, suitable air quality literature for the public.
Continue stakeholder consultations with existing airshed advisory committees	Ongoing quarterly meeting with existing airshed multi-stakeholder committees to implement the Lower Athabasca Air Quality Management Framework.



## Additional Information

Information on the national Air Quality Management System, of which the CAAQS are a part, can be found on the Canadian Council of Ministers of the Environment website at:

- <http://www.ccme.ca/en/resources/air/aqms.html>

Information on Alberta's Implementation of the Air Zone Management Framework for Fine Particulate Matter and Ozone can be found at:

- <http://aep.alberta.ca/air/management-frameworks/canadian-ambient-air-quality-standards/default.aspx>

The 2011-2013 ambient air quality report for air zones, fact sheets on the results for the Red Deer and other zones can be found at:

- <http://aep.alberta.ca/air/management-frameworks/canadian-ambient-air-quality-standards/default.aspx>

Historical information on the management of PM<sub>2.5</sub> and ozone in Alberta before the CAAQS, which was based on the Canada-wide Standards, including the results of the assessments for the 2010-2012 and earlier periods, can be found at:

- <http://aep.alberta.ca/air/management-frameworks/canadian-ambient-air-quality-standards/default.aspx>