



Protecting Air Quality in the Heartland



Managing Regional Environmental Impacts

Like all Albertans, the members of the Northeast Capital Industrial Association (NCIA) are working to minimize our impact on the environment. We live, work and play in this community. So that air you breathe is the air we breathe and the air our families breathe too.

Alberta's Industrial Heartland is experiencing economic growth and questions about air quality are being raised. This fact sheet provides information about how air quality in the region is monitored, the results of that monitoring, and how we compare to other regions in the province. There is also information on innovative new ways industry, government and the public are collaborating to protect air quality and human health while achieving the economic opportunities available to our region.

Regulatory Requirements

Alberta's regulatory framework ensures that industry protects air quality through the application of:

- source emission limits;
- pollution control equipment/technologies;
- operational procedures required to minimize emissions; and
- environmental monitoring and reporting requirements.

In Alberta, companies seeking approvals for new facilities are required to control industrial emissions by using best available demonstrated technology that is economically achievable (BATEA) for new facilities. Existing companies are required to use best available retrofit technology (BART) to upgrade their facilities and control emissions.

Air Monitoring

The specific monitoring requirements for each industrial operation are tailored to that facility based on the types and quantities of emissions. In general, the larger the emission source or the greater the potential for environmental impact, the more frequent and detailed the compulsory monitoring requirements will be.

While specific monitoring requirements vary, approvals stipulate that industrial operators must monitor stack emissions and the resulting ambient air around their facilities to demonstrate compliance with emission limits and ambient air quality objectives. In-stack emissions monitoring occurs in two ways:

- *manual stack surveys* - conducted by trained personnel who collect samples from the stack; or
- *continuous emissions monitoring* - conducted with equipment installed on the stack.

Industry is required to submit regular monitoring reports to Alberta Environment. The reports summarize the source monitoring data and outline problems which may have arisen and corrective actions taken. Any measured exceedence of a performance limit must be reported immediately including the source, type and cause of the exceedence.

An example of how technology helps monitor emissions

Infrared camera – One NCIA member is now using a FLIR GasfindIR Camera (Infra-Red Camera) as a visual leak detector to identify volatile organic compound (VOC) emission sources of high leak volume rates and high VOC concentrations. The IR Camera can scan an area and identify any high leaks more quickly than previous technology. The use of the camera is also incorporated in maintenance programs (shut-down/start-ups) and process safety events (identification of leaks).

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Alberta Environment has developed Ambient Air Quality Objectives (AAAQO) to protect Alberta's air quality. These objectives are generally established for one-hour, 24-hour, and annual averaging periods. The AAAQO's are used to define desired environmental quality and are based on an evaluation of scientific, social, technical, and economic factors. All industrial facilities must be designed and operated such that the ambient air quality remains below AAAQO's.

More information on AAAQO's is available online at: <http://environment.gov.ab.ca/info/library/5726.pdf>.

Fort Air Partnership

In Alberta's Industrial Heartland, ambient monitoring is conducted by the Fort Air Partnership (FAP), which has the mandate "to generate and provide comprehensive air quality information to the public, industries and government." Governed by a multi-stakeholder board comprised of government, industry and the public, FAP has been an objective source of quality air monitoring data since 2003. Both NCIA and Alberta Environment contribute to FAP's operations; industry support is required as part of the regulated approval process.

FAP's network includes eight continuous air monitoring stations and 57 passive air sampling sites. These monitoring sites produce data on a continuous basis, assisting governments, industry, local residents and other interested groups insight into the *community's overall air quality, over time*. It also gives industry an opportunity to analyze the data and identify ways to improve the management of substances on site.

FAP's monitors capture information on air emissions from all sources, not only industry. Other emission sources are transportation vehicles, homes and businesses, and agricultural production. At present, FAP monitors the following substances:

What is monitored in the ambient air?

Parameters measured on a continuous basis include:

- Sulphur dioxide (SO₂)
- Hydrogen sulphide (H₂S)
- Nitrogen oxides (NO, NO_x, and NO₂)
- Reactive oxidized nitrogen (NO_y)
- Total Hydrocarbons (THC)
- Non-methane hydrocarbons (NmHC)
- Methane (CH₄)
- Ammonia (NH₃)
- Carbon Monoxide (CO)
- Ethylene (C₂ H₄)
- Ground level ozone (O₃)
- Respirable Particulates (PM_{2.5})
- Inhalable Particulates (PM₁₀)
- Benzene, toluene, ethyl-benzene, o-xylene and styrene
- Barometric Pressure
- Precipitation
- Relative Humidity
- Air Temperature
- Wind Speed and Direction (WS and WD)

Parameters measured on a monthly basis with passive monitors distributed widely throughout the airshed are:

- Sulphur dioxide (SO₂)
- Hydrogen sulphide (H₂S)
- Nitrogen dioxide (NO₂)
- Ozone(O₃)

For more information on these specific parameters visit: <http://environment.alberta.ca/620.html>

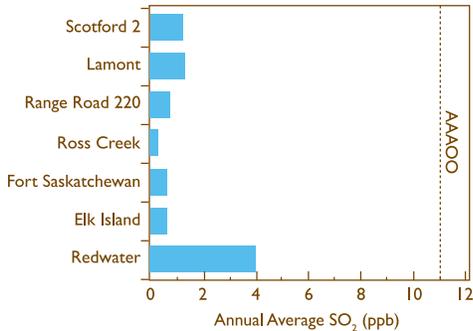
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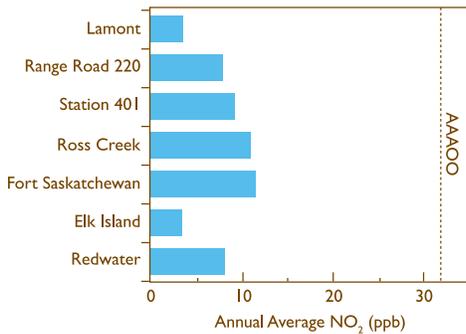
What does the monitoring tell us?

2007 Continuous Ambient Air Monitoring Data provided by the Fort Air Partnership. For more information on the Fort Air Partnership or the full 2007 Report to the Community visit: <http://www.fortair.org>

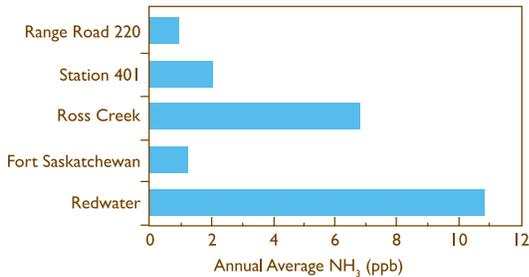
Annual Average Sulphur Dioxide (SO₂)



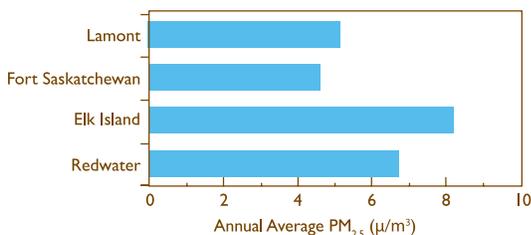
Annual Average Nitrogen Dioxide (NO₂)



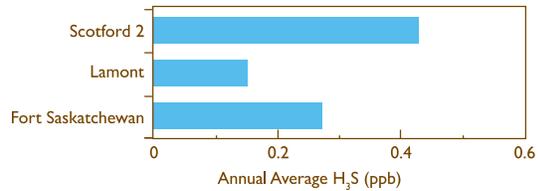
Annual Average Ammonia (NH₃)



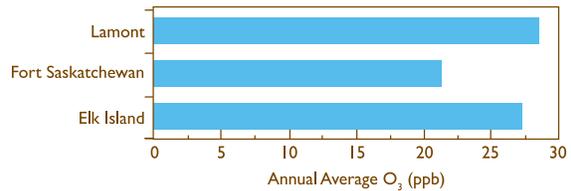
Annual Average Particulate Matter (PM_{2.5})



Annual Average Hydrogen Sulphide (H₂S)



Annual Average Ozone (O₃)



2007 Ambient Exceedances

Exceedances of AAAQOs are reported by FAP as soon as they are known to Alberta Environment's Environmental Service Response Centre, and the industrial operation involved is required to provide further follow-up information and corrective action within 7 days. As noted in the chart below, FAP reported more exceedances of H₂S in 2007 than in 2006. FAP's Technical Working Group is conducting a review of the H₂S exceedances.

Compound	2007	2006	2005	2004
Hydrogen Sulphide (H ₂ S)	13	0	1	3
Sulphur dioxide (SO ₂)	14	1	18	24
Fine Particulate Matter (PM _{2.5}) ¹	2	n/a	n/a	n/a
Ozone (O ₃)	0	7	0	1
Nitrogen dioxide (NO ₂)	0	0	0	0
Ammonia (NH ₃)	0	0	0	0
Benzene (C ₆ H ₆) ²	1	n/a	n/a	n/a
Toluene (C ₇ H ₈) ²	0	n/a	n/a	n/a
Ethylbenzene (C ₈ H ₁₀) ²	0	n/a	n/a	n/a
o-Xylene (C ₂₄ H ₃₀) ²	0	n/a	n/a	n/a
Styrene (C ₈ H ₈) ²	0	n/a	n/a	n/a
Ethylene (C ₂ H ₄)	0	0	0	0
Ammonia (NH ₃)	0	0	0	0
Carbon Monoxide (CO)	0	0	0	0

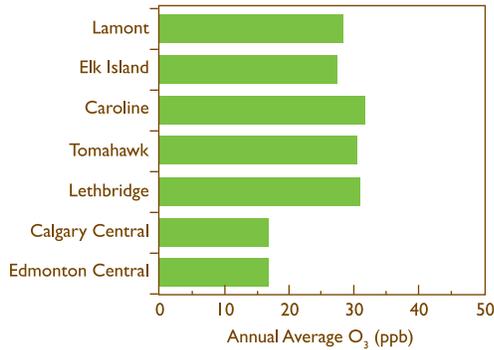
AAAQO Exceedances in FAP Airshed
¹Alberta Environment implemented a 24-hr AAAQO objective for PM_{2.5} during the Fall of 2007.
²BTEX/S monitoring began in January 2007. Results prior to this are not available.

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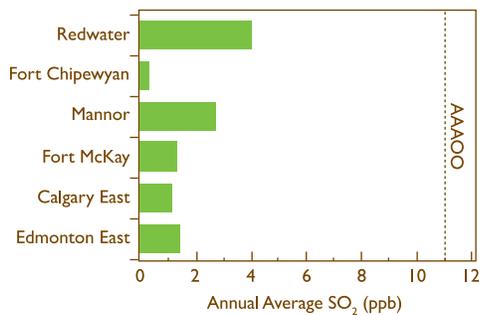


How does Alberta's Industrial Heartland air quality compare to other regions?

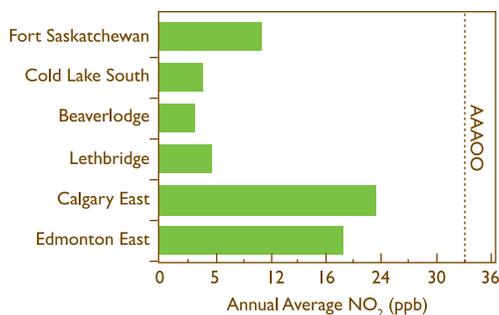
Ozone (O₃)



Sulphur Dioxide (SO₂)



Nitrogen Dioxide (NO₂)

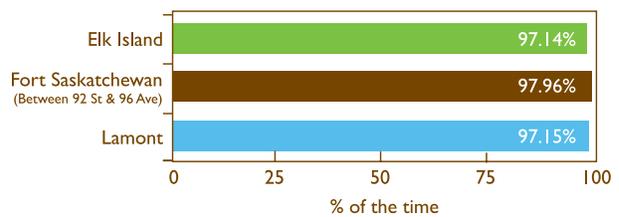


What is the air quality in the Industrial Heartland?

Alberta uses an air quality index (AQI) to provide the public with a meaningful measure of outdoor air quality. From the AQI, air quality is rated as **Good**, **Fair**, **Poor** or **Very Poor**. The AQI converts concentrations of five major air pollutants to a single numerical value and matching description. For example, a rating of 0-25 indicates **Good** air quality, 26-50 is **Fair**, 51-100 is **Poor**, and more than 100 is **Very Poor**.

The AQI is based on outdoor concentrations of carbon monoxide, fine particulate matter (PM_{2.5}), nitrogen dioxide, ozone and sulphur dioxide. Based on the data collected by FAP, our air quality in the region was **Good** over 97 percent of the time.

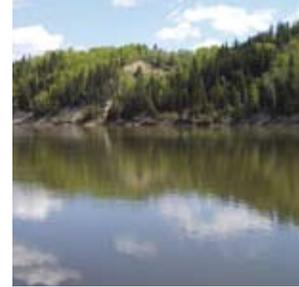
2007 AQI for the Industrial Heartland



Did you know....

A study conducted in 2003 by the provincial government about air quality and health issues show that the levels of all airborne contaminants measured in Fort Saskatchewan and area was favourable. Levels were well within recommended federal and provincial guidelines. The outdoor air quality was shown to be similar to other communities in the province with no significant differences found in the rates of illness and death from diseases such as asthma, bronchitis, and chronic obstructive pulmonary disease. (<http://www.health.alberta.ca/resources/publications/FtACE.pdf>)

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Recent Actions in the Region

Cumulative Effects

Management Framework

In 2007 the provincial government announced that Alberta's Industrial Heartland would be the first region to implement a new approach to environmental management called Cumulative Effects Management Framework. Under the framework, a series of comprehensive, science-based targets, outcomes and actions for the region will be set to protect the air, land and water. Outcomes are being developed for Nitrogen Oxides and Sulphur Dioxide. The framework allows various stakeholders within the region to work together and agree on targets, outcomes and actions with full consideration of the social, economic and environmental implications. Strategies for meeting those standards will be shared fairly among all residents, including municipalities and industry.

Ozone Management Plan

Ozone levels across the entire Capital Region are close to the Canada Wide Standard and resulting in the development of management plan as required under the Alberta Particulate Matter and Ozone Management Framework. As a result, FAP is working in partnership with two other airsheds in the capital region to develop a management plan that will keep ozone levels below Canada Wide Standards. FAP is including industry, municipalities, and transportation sectors in the development of plan which is expected at the end of 2008.

Odour Protocol

Whenever there are several large industrial facilities operating in close proximity to one another, there is always a potential for odours. When odour incidents do occur it is often difficult to pinpoint the extent, nature and reasons for the odour. That's why industry and regulators have established an Odour Complaint Protocol. The protocol allows industry and government to provide a timely, more efficient approach for resolution of any public complaints. A database is also maintained for tracking all odour complaint calls received by the ERCB, the local authority and industry along with the resulting follow-up.

Reducing greenhouse gas emissions

Alberta was the first province to introduce specific climate change legislation in 2002 and the first to require large industrial facilities to report their greenhouse gas emissions. As of July 2007, Alberta facilities that emit more than 100,000 tonnes of greenhouse gases a year are now required to reduce emissions intensity by 12 per cent.

Alberta's Industrial Heartland is also home to one of Canada's most innovative greenhouse reduction projects called the Heartland Area Redwater Project (HARP). HARP is a long-term carbon dioxide capture and storage (CCS) project which seeks to capture and store greenhouse gas emissions in an underground formation. This formation is directly underneath Alberta's Industrial Heartland and could accommodate more than 20 years worth of CO₂ emissions from the large emitting facilities existing and planned for the Industrial Heartland Area.

For more information on NCIA and how industry is managing regional environmental impacts visit www.ncia.ab.ca