

2016 Aamjiwnaang First Nation Air Monitoring Station Review



Pollutants Measured in 2016

- Sulphur dioxide (SO₂)
- Nitrogen dioxide (NO₂)
- Total reduced sulphur (TRS)
- Particulate matter less than 2.5 µm in diameter (PM_{2.5})
- Total suspended particulate (TSP)
- 9 metals
- 107 volatile organic compounds (VOCs)
- 8 polycyclic aromatic hydrocarbons (PAHs)

Pollutants were compared to Ontario's Ambient Air Quality Criteria (AAQC) or similar benchmark values. AAQC are desirable concentrations of contaminants based on protection against adverse effects on health and the environment.

KEY RESULTS

Levels of contaminants measured at Aamjiwnaang in 2016 generally met Ontario's AAQC or similar benchmark values.

Only benzene and benzo(a)pyrene were measured above Ontario's AAQC (24-hour and annual). SO₂ was below its previous 1-hour AAQC but above the updated 1-hour AAQC which was not in effect in 2016.

Since the Aamjiwnaang station was established in 2008, benzene and benzo(a)pyrene levels have been mostly stable. Annual average SO₂, NO₂, PM_{2.5}, and TRS concentrations have been decreasing.

2009-2016 Trends

Benzene	Stable*
Benzo(a)Pyrene	

PM _{2.5}	↓ 26%
SO ₂	↓ 38%
NO ₂	↓ 41%
TRS	↓ 73%

2009-2016 trends in TSP could not be assessed because of a change in the type of monitor being used (see section on TSP below).

*There was no trend in the data so a valid percent change could not be reported. However, the average benzene concentrations in 2014 to 2016 were higher than in 2009-2013 (see more information on benzene below).

2015 to 2016

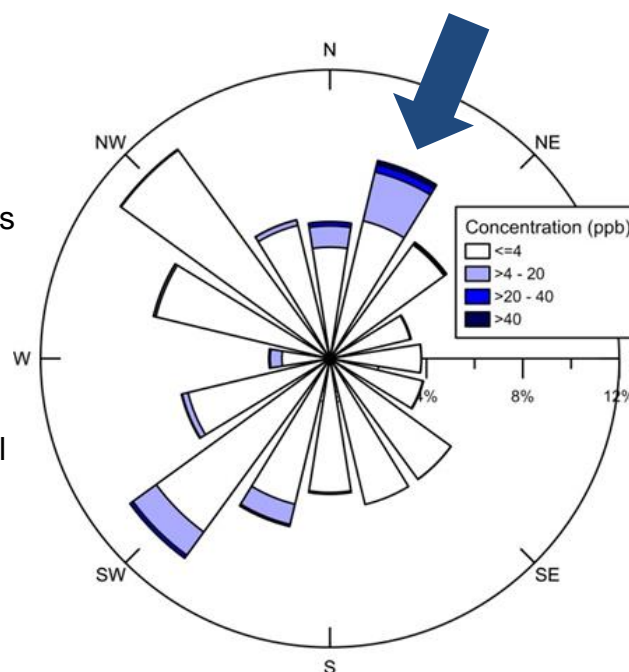
Benzene	↑ 2%
TRS	0%

TSP	↓ 13%
PM _{2.5}	↓ 19%
SO ₂	↓ 23%
NO ₂	↓ 24%
Benzo(a)Pyrene	↓ 37%

SULPHUR DIOXIDE

There were no exceedances of the previous 1-hour AAQC of 250 parts per billion (ppb). The updated 1-hour AAQC of 40 ppb was exceeded 0.3% of the time.

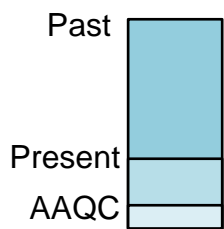
The annual average concentration was 1.6 ppb, which is below the updated annual AAQC of 4 ppb.



1-hr SO₂ Concentrations by Wind Direction

The most elevated concentrations were associated with winds from the north-northeast.

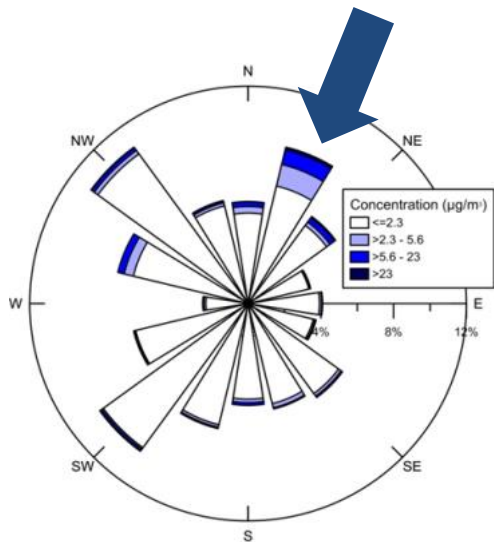
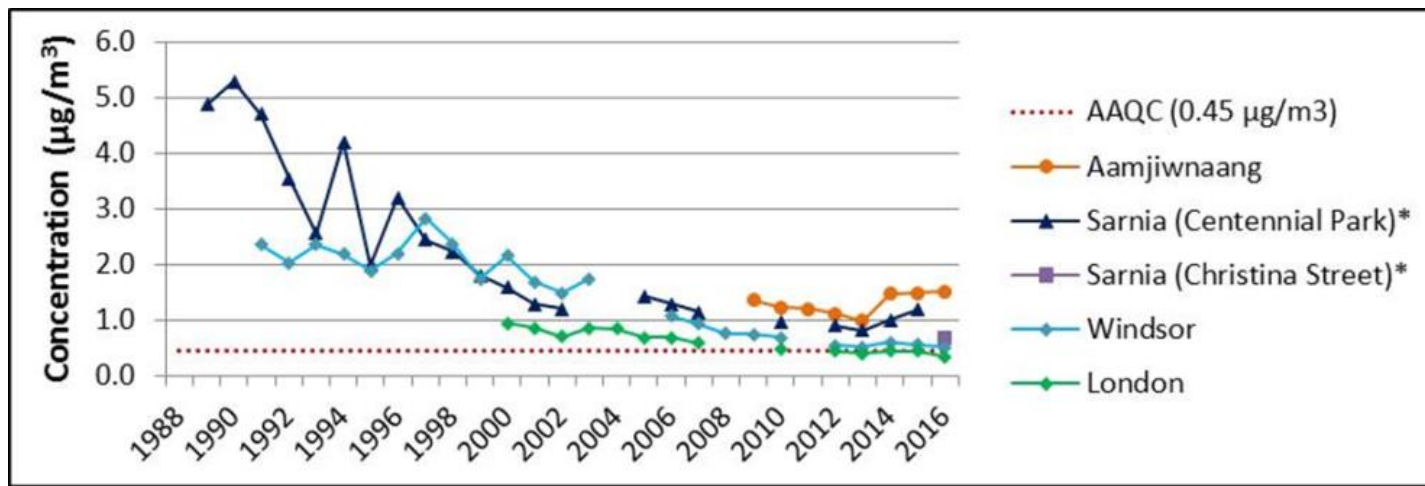
BENZENE



Benzene concentrations in the Sarnia air shed have decreased to about one third of the levels measured 25 years ago.

The annual average concentration was approximately three times the AAQC but is still within the range of negligible risk.

Historic Annual Benzene Concentrations at Aamjiwnaang and Other Nearby Communities



1-hr Benzene Concentrations by Wind Direction

The most elevated concentrations were associated with winds from the north-northeast.

*In 2016 the Sarnia station was relocated about 1 km to the northeast, which is further from the industrial sources. Sampling at the new location began at the end of April so the average concentration may not be representative of the full 2016 year.

82% of samples were below the 24-hour AAQC.

The maximum 24-hour concentration was nearly four times the AAQC and was found to be related to an incident that occurred at a nearby facility.

BENZO(A)PYRENE

The annual average and 24-hour maximum concentrations were each approximately five times their AAQC.

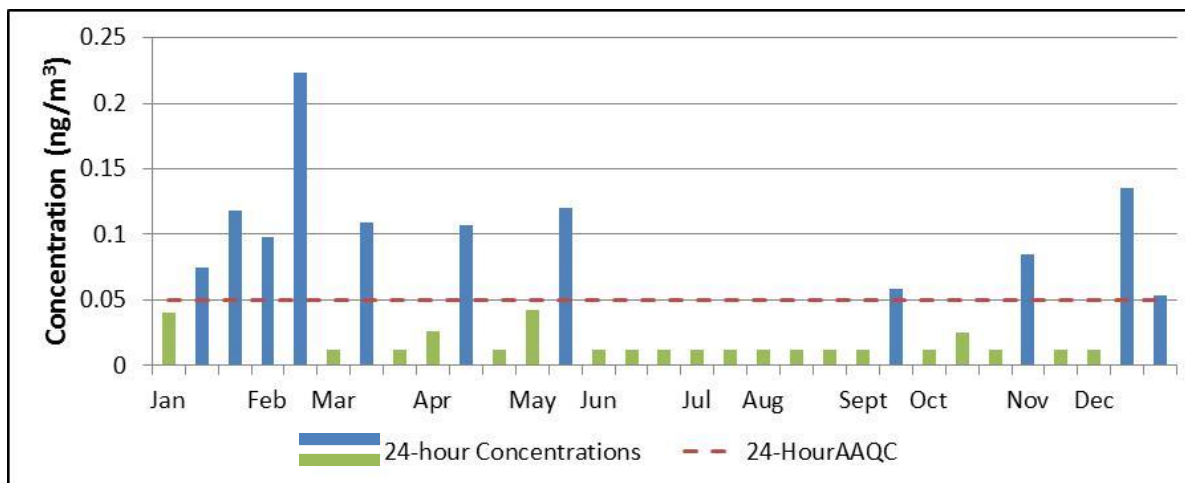
The annual average concentration at the Aamjiwnaang Station is lower than Windsor (urban) but higher than Wallaceburg (rural).

There was not a strong association between elevated concentrations and wind direction.

Lowest concentrations were observed during the summer.

65% of samples were below the 24-hour AAQC.

24-hr Benzo(a)pyrene Concentrations Measured in 2016



TOTAL SUSPENDED PARTICULATE

TSP concentrations remained below the 24-hour and annual AAQC.

Between 2014 and 2015 there was an increase in the annual average TSP concentration due to a change to a more efficient monitor. The data from 2016 does not indicate any continuing trend of increasing TSP concentrations.

The annual average concentration in 2016 was still higher than it was in 2009 through 2014 when a less efficient monitor was used, but was 13% lower than in 2015 using the same monitor.

Data represents concentrations only at the location of the air monitoring station in 2016 and may not represent actual exposures of individuals moving about the community.

2016 data from the Aamjiwnaang monitoring station are available at: <http://www.aamjiwnaang.ca/air-monitoring/>

Current data from the Aamjiwnaang monitoring station, and other area air monitoring stations, are available at: <https://www.cleanairsarniaandarea.com/>