

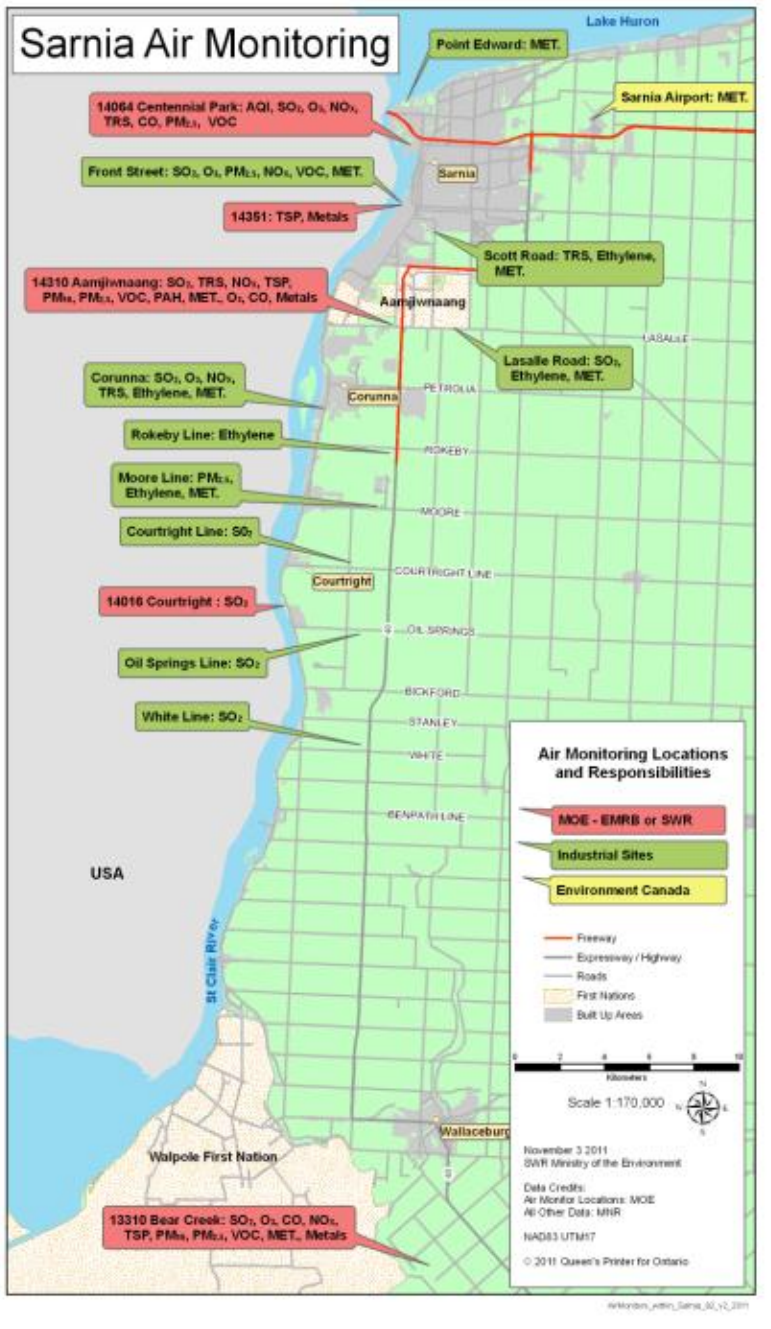


Sarnia Area Air Monitoring

September 27, 2012

Ministry of the Environment

Sarnia Air Monitoring



Sarnia Air Monitoring Network

Currently 16 monitoring locations operating in the Sarnia area

- 5 by Ministry of the Environment
 - 1 by Environmental Monitoring and Reporting Branch
 - 4 by Southwestern Region
- 10 by industry
- 1 by Environment Canada

Ministry of the Environment Stations

- Aamjiwnaang First Nation (ambient air quality)
- Bear Creek Station (background air quality)
- Courtright (monitor Ontario Power Generation's Lambton Generating Station for SO₂)
- Front Street in Sarnia (industrial emissions)
- Centennial Park (Air Quality Index)

Aamjiwnaang Monitoring Station

Real-time on-site measurement:

- **Sulphur Dioxide (SO₂)**
- **Nitrogen Oxides (NO/NO₂/NO_x)**
- **Ground-level Ozone (O₃)**
- **Total Reduced Sulphur (TRS)**
- **Carbon Monoxide (CO)**
- **Respirable Particulate Matter (PM_{2.5})**
- **Volatile Organic Compounds (VOC)**
- **Wind speed and direction**

Off-site laboratory analysis:

- **Total Suspended Particulate (TSP)**
- **Polycyclic Aromatic Hydrocarbons (PAH)**
- **Volatile Organic Compounds (VOC)**
- **Metals**



Regional Air Monitoring Van

Monitoring Equipment:

- Nitrogen oxides (Teco 42i)
- Sulphur dioxide (Teco 43i)
- Total reduced sulphur (Rotek Thermal Oxidizer)
- Particulate: $PM_{2.5}$, PM_{10} , & PM_{25} (GRIMM 180)
- Volatile organic compounds
 - Hound Spectrometer
 - Inficon Hapsite Portable GC/MS
- Wind Speed and Direction





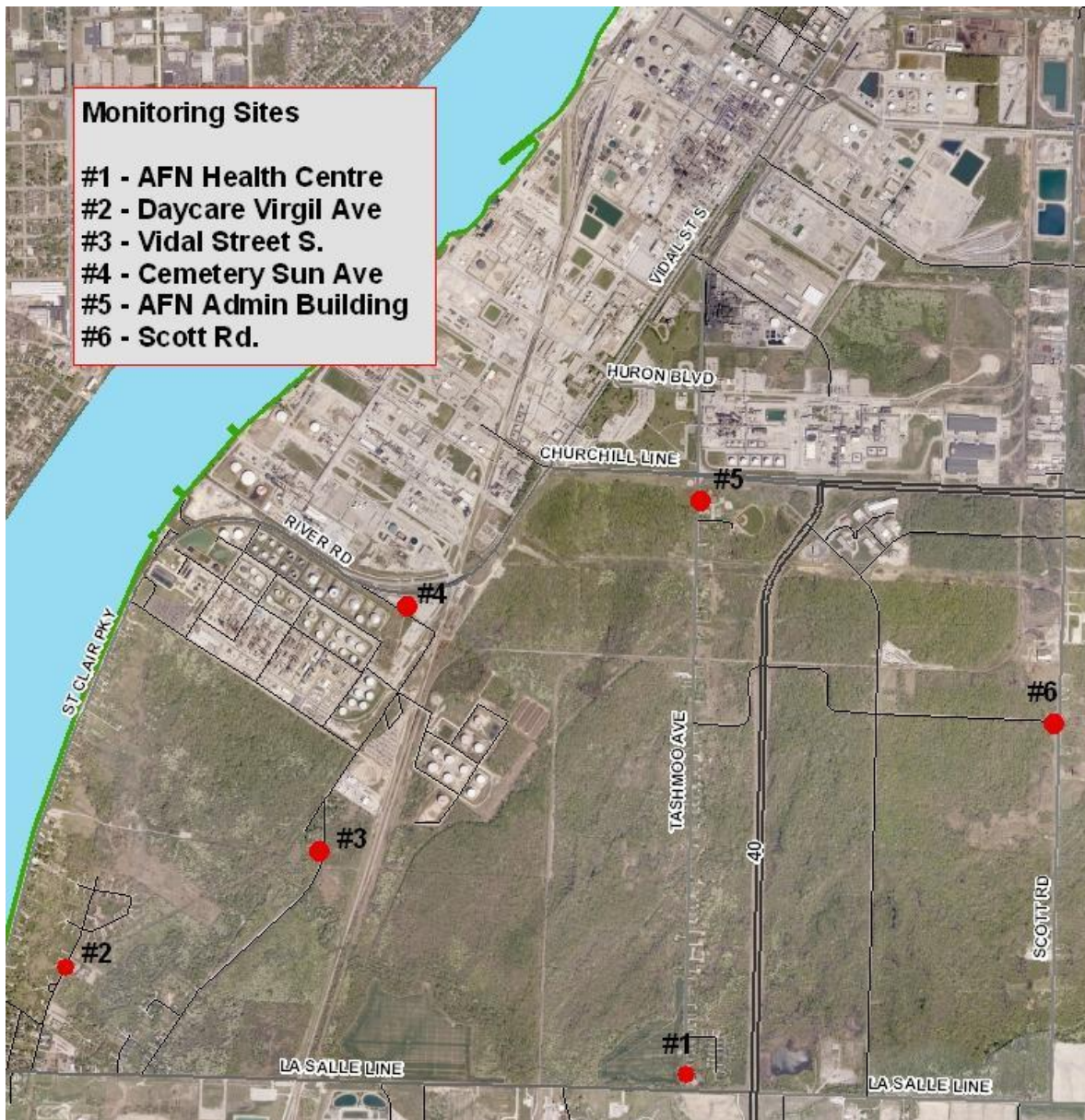
Mobile Air Monitoring 2011 Results

September 27, 2012

Ministry of the Environment

Summary

- During 2011, the ministry's Mobile Air Monitoring Van sampled for Volatile Organic Compounds (VOC) at six sites around Aamjiwnaang First Nation on nine separate days between June and December.
- Half-hour samples were taken at the same six sites in the same order on each of the sampling days.
- The ministry sampled for sixteen VOC.



Sites

Volatile Organic Compound Species

Propylene

1,3-Butadiene

Carbon disulfide

Chloroform

Carbon Tetrachloride

Toluene

m- & p-Xylene

o-Xylene

Chloromethane

Acrylonitrile

Hexane

Benzene

Cyclohexane

Ethyl benzene

Styrene

Naphthalene

**Not detected*

Summary of Results

2011 Mobile Monitoring

Averages (ppb)

Compound Name	Health Centre	Virgil Ave Daycare	Vidal St S	Cemetery	AFN Admin Building	Scott Rd
Propylene	7.9	4.1	10.9	4.8	4.9	0.2
Hexane	2.0	1.2	0.7	1.6	6.7	1.0
Chloroform	2.4	0.7	1.4	0.6	1.3	0.2
Benzene	2.1	1.4	2.0	1.0	3.9	1.4
Carbon Tetrachloride	0.1	0.0	0.1	0.0	0.0	0.0
Cyclohexane	0.0	1.0	2.8	1.0	6.4	0.0
Toluene	8.0	3.5	7.0	4.4	3.0	4.6
Ethyl benzene	1.5	0.9	1.8	0.7	2.0	1.8
m- & p-Xylene	2.1	1.2	1.9	0.4	0.9	0.7
Styrene	0.7	0.5	0.3	0.4	1.3	0.3
o-Xylene	0.9	0.5	0.7	0.3	0.5	0.5
Naphthalene	0.8	0.6	1.0	0.6	0.9	0.4

Evaluation

- The mobile air monitoring van collected half-hour samples at several sites, over a number of days.
- These short term exploratory samples are meant to look for the levels of compounds that may indicate the need for a closer look.
- To decide if levels of any compounds warrant a closer look we calculate a half hour comparison number using the 24 hour Ambient Air Quality Criteria (AAQC).
- All compounds were well below the comparison value except benzene and chloroform, which were slightly higher on some occasions.
- Benzene values are in the range or those seen at the station.
- These values will be evaluated against longer-term data from stations in the Sarnia area monitoring network.

Comparison to Converted AAQC

Location	Benzene				Chloroform			
	Detected	Avg (ppb)	Max (ppb)	Over	Detected	Avg (ppb)	Max (ppb)	Over
Health Centre	7	2.1	5.6	3	2	2.4	18.9	2
Community Centre	6	1.4	4.4	2	2	0.7	3.3	2
Vidal St. South	6	2.0	5.8	5	4	1.4	7.6	4
Cemetery	5	1.0	4.0	1	2	0.6	3.2	2
AFN Admin Building	7	3.9	7.0	7	2	1.3	8.5	2
Scott Road	4	1.4	4.2	3	2	0.2	1.0	2

2011 Mobile TAGA Survey

- The Ministry of the Environment's Trace Atmospheric Gas Analyzer (TAGA) conducted a mobile air monitoring survey of the AFN from May 16-20 and May 24-27 in 2011. Monitoring sites for the survey were selected, in consultation with AFN officials and ministry staff in Sarnia.
- A similar survey was conducted in September & October 2007.
- A comparison is made of the same ten chemicals. Measured levels, in general, were lower in 2011 than in 2007. Ambient air temperatures during the survey were lower than in 2007, which could have contributed to lower evaporation rates and potentially lower levels of chemicals when compared to 2007 results.
- Concentrations of all chemicals measured were below applicable Ontario Regulation 419/05 contaminant concentration standards and guidelines.

Next Steps – Follow Up to Open House

- Over the coming reporting year, the values for benzene and preliminary values for chloroform will be evaluated against longer-term data and further work will be undertaken.
- The ministry developed the Sarnia Regulation 419 Initiative to verify that major sources of air pollution in the vicinity of the Aamjiwnaang First Nation comply with air emissions regulation.
- The ministry ensures that facilities meet legislative requirements by conducting periodic air monitoring, proactive inspections, spill and incident response, and ensuring compliance through the use of tough enforcement measures.

Next Steps – Follow Up to Open House

- The ministry's Sarnia Regulation 419 Initiative is an on-going multi-year effort which includes:
 - Working cooperatively with the Aamjiwnaang First Nation and the Sarnia Lambton Environmental Association (SLEA) to identify the facilities in the Sarnia airshed where Emission Summary and Dispersion Modelling (ESDM) and/or technology benchmarking reports and compliance assessments will need to be completed and submitted to the ministry;
 - Requiring additional air monitoring in the immediate vicinity of on site sources to improve the understanding of fugitive emissions from the facilities through combined air monitoring/modelling (CAMM) programs;
 - Pollution abatement activities in the event of non-compliance;
 - Regular community updates; and,
 - Coordination with other ongoing air quality related projects in the Sarnia area (e.g. community ambient monitoring, community health study, etc.)