



FORT AIR PARTNERSHIP

We Monitor the Air You Breathe

Network Monitoring Plan

Executive Summary

January, 2014

BACKGROUND

Historically, Fort Air Partnership's (FAP) primary monitoring objective was to ensure compliance with regulatory monitoring requirements of Alberta's Environmental Protection and Enhancement Act's (EPEA) operating approvals. Monitoring data was also compared to Alberta's Ambient Air Quality Objectives (AAAQO) and Canada-Wide Standards (CWS). However, in recent years, the airshed monitoring concept adopted in Alberta has shifted the focus from fence line monitoring to operating networks that gain a better understanding of regional air quality.

A major benefit of regional monitoring is that it measures the cumulative impact of all sources – in addition to regulated industrial emissions. Non-regulated emission sources would include such things as oil and gas drilling, vehicles, and agricultural and urban activities. Regional monitoring also allows for a more accurate comparison to ambient air quality standards such as AAAQOs and CWSs. In the future, ambient air quality monitoring will play a role in triggering air quality management activities and assessing the efficacy of those activities. At the same time, stakeholders in FAP are interested in tracking the impact of emerging local issues, such as new facilities and regional development.

The FAP Board recognized that its current monitoring network, with many fence line monitoring locations historically placed there because of industrial operating requirements, was not adequate to meet these evolving needs. In 2011, FAP contracted Sonoma Technology Inc. (STI) to do an independent network assessment.

STUDY RESULTS

STI's 2012 *Evaluation of Fort Air Partnership Ambient Air Quality Monitoring Network* report assessed all of FAP's continuous and passive monitors. The report found that the current monitoring network is well suited for meeting some of its monitoring objectives but needs to change to meet other regional monitoring objectives.

FAP Monitoring Objectives

- Understand spatial distribution of pollutants in the region.
- Identify regional air quality trends.
- Provide flexibility to characterize emerging issues, sources, and locations.
- Provide appropriate information for evaluating population exposure to ambient air quality.
- Provide information required to understand air quality impacts on the health of the environment.
- Improve the ability to identify and apportion pollutant sources for purposes of air quality management.
- Provide suitable input and validation information for air quality models.

STI's recommendations were prioritized based on:

1. Better meeting multiple FAP monitoring objectives.
2. Reducing unnecessary measurements.
3. Improving a single monitoring objective or emerging issue.

The recommendations made by STI are the impetus for FAP's new Monitoring Plan.

IMPLEMENTATION AND TIMING

Funding must be secured before this plan can be implemented. It is FAP's intent to seek funding from a number of sources to enable the implementation of this plan. However, it is projected that it will take several years before all changes in this plan are in place. FAP plans to address emerging issues through an annual review of the monitoring plan. After review it will be updated as deemed necessary with new timelines as appropriate. Other factors, influences and provincial governance of monitoring may also impact the implementation of this plan.

PLANNED CHANGES

A. New Permanent Station at Gibbons

- This station will provide information on the influence of trans-boundary emissions from the Edmonton area coming into the FAP airshed.
- This station will monitor ambient air quality where people live, which is one of FAP's top priority monitoring objectives.
- The addition of this station will also provide better north-south coverage of monitoring in the airshed.
- The station would monitor the following parameters: SO₂, H₂S, PM_{2.5}, Ozone, NO, NO₂, NO_x, wind speed and direction, temperature and relative humidity.

B. Portable Monitoring Station

- This station would add monitoring to parts of the airshed underserved by air monitoring.
- A portable monitoring station rotating at several months per site through several locations will address spatial gaps.
- It would enable the characterization of air quality where people live, by placing the portable in various communities.
- FAP would be able to respond to issues or concerns brought up throughout the airshed region.
- Data generated from a portable monitoring station could:
 - Improve spatial characterization, characterize emissions/transport, and provide suitable input for air quality models.
 - Help characterize sources and locations using triangulation.
 - Identify upwind concentrations coming into the airshed by setting up a site upwind of most major emissions sources.

Hydrocarbon sampling would be part of a portable station as air emissions from oil and gas development have historically caused concern for some residents in the airshed. It is an important consideration for FAP because air quality around local oil and gas development has historically not been well characterized.

C. Relocation of the Redwater Industrial Monitoring Station

This station was placed in its current location many years ago to comply with regulatory approvals for industry to operate in the region under EPEA. Termed a compliance station, this station and others like it were meant to monitor ambient (outdoor) air quality in the immediate vicinity of industrial facilities. As such, this station strictly monitors for local effects on air quality, also known as fence line monitoring.

Fence line monitoring data from this location (which is located in the middle of an industrial area) cannot be extrapolated to portray an accurate picture of regional impacts on air quality. The station must be re-located in order to gain a better understanding of regional air quality. Relocating this station closer to the Town of Redwater will allow FAP to monitor for ambient air quality where people live, one of its primary monitoring objectives.

D. Relocation of the Scotford 2 Monitoring Station

FAP's Scotford 2 station is situated in a pipeline corridor right-of-way and must be relocated to allow construction of an Enbridge pipeline. It is estimated that Scotford 2 will need to be relocated in the spring of 2014.

A plan for relocating the station has been developed, including a review of monitoring objectives and modeling and emissions inventory data to determine the optimum location for the new Scotford station. The new location, as recommended by consultants who evaluated all possible sites, has been secured. It will increase FAP's understanding of the air quality in the region, and still meet the same monitoring objectives currently set for the existing Scotford station.

E. Discontinue Redundant Monitors

The network assessment identified several analyzers as possible candidates for removal and/or relocation as they are located in close proximity to each other and are providing redundant data. Discontinuing the use of redundant monitors will help FAP use monitoring resources most efficiently.

A justification document will be developed and submitted to the Government of Alberta's Environment and Sustainable Resource Development (ESRD) department for approval for the removal of any analyzers from the network.

F. Stop Sampling PM₁₀

When the Lamont County station began operating in 2001, the measurement of PM₁₀ was an established technology. PM_{2.5} was still relatively new with little historical data in Alberta. Both PM₁₀ and PM_{2.5} were required as the industrial facility operating approval linked to this station. In the 12 years since the station was first installed, PM_{2.5} data has become more valuable as a health effects indicator and PM₁₀ has diminished in value such that it is measured very little across Alberta or Canada. It is no longer used for comparison purposes or any other regional reporting. There is no longer a regulatory requirement to measure PM₁₀, nor are there ESRD ambient objectives or guidelines for PM₁₀. FAP discontinued monitoring PM₁₀ after receiving approval in September, 2013 from ERSD to stop monitoring the substance.

G. Upgrade PM_{2.5} Technology

FAP is striving towards the use of consistent PM_{2.5} monitoring technology at all of its eight continuous monitoring stations. Environment Canada and the Alberta Government are working toward requiring all PM_{2.5} monitors that report against guidelines or standards to be Federal Equivalent Method (FEM) technology. By early 2014, all FAP stations that report the Air Quality Health Index will be using the same FEM technology PM_{2.5} analyzers.

H. Organic Hydrocarbons Sampling

One of FAP's monitoring objectives is to characterize emerging issues and sources contributing to air quality in the FAP region. A specific issue that has arisen in the past few years is concerns from the Town of Bruderheim regarding oil and gas emissions from wells surrounding the Town.

Oil and gas well sources are not well characterized in the FAP region due to the fact that historically, monitoring has only been required for large scale development related to oil and gas and chemical manufacturing. It is now recognized, by both FAP and ESRD, that a better understanding of the cumulative impact of all emission sources on regional air quality is required, including smaller sources such as oil and gas wells.

There are two separate sub projects under this umbrella project:

1. Intermittent volatile organic compound (VOC) sampling. This will be added at the Bruderheim station to monitor the most important additional compounds with AAAQOs.
2. VOC sampling to better characterize emissions from oil and gas wells. Data from this project will be used to provide an evaluation of the impacts of upstream oil and gas development.

I. Passive Monitoring for Nitrogen Dioxide and Ozone

Passive monitoring for NO₂ and O₃ is no longer done but FAP has in place an ongoing plan to assess and ensure NO₂ and O₃ measured at its continuous monitoring stations provides representative coverage within the airshed. An analysis of what monitoring data is required to evaluate whether the continuous monitoring stations provide representative coverage within the airshed will be done every three years.