FORT AIR PARTNERSHIP
We Monitor the Air You Breathe

NEWS RELEASE

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Fort Air Partnership Fine Particulate Matter Speciation Study Released

A three-year research study that examined sources of fine particulate matter in the Fort Saskatchewan area provides valuable information on sources contributing to $PM_{2.5}$ generation in the Fort Air Partnership (FAP) region. The study was conducted in response to a recommendation from a network assessment completed in 2012 to better understand sources contributing to $PM_{2.5}$ in the FAP region.

Alberta Environment and Parks (AEP) contributed significant technical expertise and support to this project. The data collected during this project will also be used by AEP in particulate matter speciation work they are conducting in the Red Deer- North Saskatchewan Region, as well as evaluating the performance of photochemical modelling in support of the Designated Industrial Zone Pilot Project.

Explaining $PM_{2.5}$

$PM_{2.5}$ refers to "fine particulate matter", particles that are 2.5 microns or smaller in size. For reference, the average cross-section of a human hair is 50 microns. Particulate matter is categorized by size because different sized particles can have different health effects. PM_{10} particles (particles less than 10 microns in size) raise the possibility of irritating your nose and eyes. $PM_{2.5}$ pollutants, 75% smaller than PM_{10} pollutants, raise the possibility of moving deeper into the lungs. They can be made up of numerous types of chemicals and particles, both liquid and solid. This is why $PM_{2.5}$ is also an important component of the Air Quality Health Index (AQHI), a general measure of air quality as it pertains to human health.

The results

$PM_{2.5}$ mass concentrations at the Ross Creek station located in Fort Saskatchewan had the largest contributions from secondary particulate matter components consisting of organic carbon and metals, ammonium nitrate, and ammonium sulphate. The substances that react to form these secondary particulate matter components observed during the study are emitted by urban and industrial activities both within and outside of Fort Air Partnership's boundaries and the broader Edmonton Metropolitan Area.

On the days when higher concentrations of $PM_{2.5}$ were measured, meteorological conditions were more conducive to pollution buildup, especially in the case of wintertime temperature inversions in the winter months and wildfire smoke episodes during the summer months.

Although a major contributing factor to elevated $PM_{2.5}$ levels in the FAP region is wildfire smoke that cannot be directly managed by entities in FAP or the Edmonton Metropolitan Area, there is still a significant contribution from other sources generating secondary particulate matter, including both urban and industrial. This contribution from other sources highlights the need for collective regional air quality stewardship.

Air monitoring in FAP

FAP monitors $PM_{2.5}$ continuously at seven air quality monitoring stations and uses microsensors called *Purple Airs* in communities that do not currently have continuous $PM_{2.5}$ monitoring.

An assessment of the last five years of Air Quality Health Index (AQHI) results indicates that 93.79% of the time, the FAP region experienced low risk AQHI ratings, moderate risk AQHI ratings occurred 5.66% of the time, and high/very high risk AQHI ratings occurred 0.55% of the time.

An assessment of the last five years of $PM_{2.5}$ exceedances of Alberta Ambient Air Quality Objectives (AAAQOs) in the FAP region shows that:

- 82% were due to wildfires,
- 16% were due to local influences or unknown causes, and
- 2% due to wintertime temperature inversions.

FAP also participates in many collaborative regional efforts related to $PM_{2.5,}$ including the Capital Region Oversight Advisory Committee, the ongoing implementation of a Fine Particulate Matter Response Plan for the Edmonton Metropolitan Area, and participation in the Designated Industrial Zone Pilot Project. This last project will create a unique regulatory framework that provides environmental standards that are efficient and constant for an approval process.

The Fort Air Partnership Fine Particulate Matter Speciation Study report is available on FAP's website, along with a summary.

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