

The Addition of Small Sensor Monitoring to HAMP's Network

One of [Heartland Air Monitoring Partnership's](#) (HAMP) primary monitoring objectives is to monitor air quality where people live. Over the past several years HAMP's transition to a regional monitoring network has enabled the addition of continuous air monitoring stations in Bruderheim, Gibbons and Redwater. A portable station that began operating in 2018 has completed monitoring projects in Bon Accord, Chipman and Sturgeon County, Lamont and Newbrook.

However, there are smaller populated areas in HAMP's Airshed that do not have continuous air monitoring stations. To work towards filling this gap, HAMP has installed small sensors manufactured by PurpleAir, to monitor for fine particulate matter (PM_{2.5}) (the main component in wildfire smoke), in the communities of Waskatenau, Bon Accord, Josephburg, Thorhild, Newbrook and Elk Island National Park. HAMP is also planning to expand this network to include schools throughout the HAMP region. The PurpleAir sensors, donated to HAMP by Environment and Climate Change Canada (ECCC), are installed and maintained by HAMP.

The recorded information is validated and available in real time on an [AQMap](#) operated by the University of Northern British Columbia (UNBC) in partnership with ECCC.

What is a PurpleAir Sensor?

PurpleAir sensors are small (only 3.5" in diameter), inexpensive, easy to install and operate requiring only a power source and Wi-Fi connection. A PurpleAir sensor uses a fan to draw a sample of air past a laser beam. The beam reflects light from any fine particulate matter particles that exist in the air sample, like dust shimmering in a sunbeam, onto a detection plate. Using this process, the size and amount of particulate matter can be determined.



In comparison, while a continuous air monitoring station is more accurate in determining fine particulate matter concentrations, they are significantly more expensive to build and operate. Although less accurate, PurpleAir sensors can provide a valuable assessment of levels of fine particulate matter. Fine particulate matter is an important component in calculating the [Air Quality Health Index](#) at HAMP continuous air monitoring stations.



Limitations of PurpleAir Sensors

Data from PurpleAir sensors does not meet Government of Alberta regulatory standards and will not be used to make regulatory decisions, or to issue air quality advisories.

Why monitor PM_{2.5}?

PM_{2.5} is an air pollutant that can be harmful to human health. PM_{2.5} is generally the largest contributor to poor air quality during episodes of wildfire smoke. PM_{2.5} is made up of very small particles, with a size of 2.5 micrometres or smaller. PM_{2.5} can be inhaled into the lungs and may cause symptoms such as coughing or may worsen existing heart and lung conditions.

How can I interpret PM_{2.5} data?

The AQMap shows PM_{2.5} concentrations from PurpleAir sensors and associated health messaging. One-hour averaged PM_{2.5} concentrations can be compared to the [Alberta Ambient Air Quality Guideline \(AAAQG\)](#) of 80 µg/m³. 24-hour averaged PM_{2.5} concentrations can be compared to the [Alberta Ambient Air Quality Objective \(AAAQO\)](#) of 29 µg/m³. The PM_{2.5} AAAQO and AAAQG are based on health effects.

The AQMap health messaging can serve as broad guidance since individuals can react differently to air pollution. It is recommended that you monitor your symptoms and adjust your activities to reduce your exposure levels as needed. The AQMap health messaging was developed by the British Columbia Centre for Disease Control and may differ slightly from Alberta's health messaging.

About Heartland Air Monitoring Partnership

HAMP is a not-for-profit organization that monitors the air people breathe within a 4,500 square kilometre area north and east of Edmonton that encompasses [Alberta's Industrial Heartland](#). Our 10 continuous air monitoring stations monitor and report on 18 different substances and several weather conditions. The collected data is used to compare to government standards, including AAAQOs and [Canadian Ambient Air Quality Standards](#). It is also used by the Government of Alberta to calculate an Air Quality Health Index, which is a general measure of air quality as it pertains to human health.

HAMP's work is open and transparent, governed by a multi-stakeholder Board of Directors, guided by a scientific Technical Working Group and driven by national and provincial standards. Continuous data is collected 24 hours a day, seven days a week and made available to anyone via [HAMP's live data site](#).