



Yukon Air Zone Report 2015

For the years 2013-2015

Summary

This is the second air zone report for the Yukon Air Zone. Air zone reports are a commitment of the Government of Yukon under the national Air Quality Management System (AQMS) to annually report on the achievement of the Canadian Ambient Air Quality Standards (CAAQS) for ground-level ozone and fine particulate matter (PM_{2.5}). Meeting objectives under the Air Zone Management Framework of the AQMS will ensure that poor outdoor air quality improves and that good air quality is maintained. The Air Zone Management Framework defines four colour-coded Management Levels associated with a different intensity of management action and planning. Ambient air quality for PM_{2.5} and ozone is measured against the CAAQS to determine Management Levels for the air zone.

This report summarizes the CAAQS achievement status and management levels for the Yukon Air Zone for fine particulate matter and ground-level ozone concentrations under the Air Zone Management Framework for the year 2015. Yearly metrics are based on the preceding three years of air quality data; thus, this report uses data from 2013 to 2015 to calculate the metric.

Insufficient PM_{2.5} data for the years 2014 and 2015 resulted in the dataset not achieving the completeness criteria; therefore, no metric is reported for the year 2015 for both the annual and 24-hour standards. The ground-level ozone metric is 54.1 ppb, which yields a Management Level of Yellow; this is the same Management Level achieved in 2014.



Introduction: Air Quality Monitoring in Yukon

Environment Yukon monitors air quality in Yukon as part of the National Air Pollution Surveillance (NAPS) program and Canada's Air Quality Management System (AQMS). As part of this monitoring program, Environment Yukon operates one air quality station located in downtown Whitehorse that collects real-time data year-round to assess and track ambient air quality levels of various pollutants.

Canadian Ambient Air Quality Standards

In 2012, the Canadian Council of Ministers of the Environment (CCME) committed to implementing a new air management system, the Air Quality Management System; the AQMS provides a framework to protect and improve ambient air quality across Canada. The Canadian Ambient Air Quality Standards, the driver for air quality management under the AQMS, are numerical values (metrics) of ambient air pollutant concentrations. Each provincial/territorial jurisdiction is responsible for measuring, reporting and managing their air zones to ensure that they meet the CAAQS. The CAAQS are voluntary objectives under the *Canadian Environmental Protection Act* and replace the Canada-wide Standards previously used for ozone and PM_{2.5} by setting stricter targets and introducing an annual standard for PM_{2.5}. Fine particulates and ground-level ozone are outdoor pollutants of concern associated with short- and long-term effects to human and environmental health.

Air Zone Management, Threshold Values and Actions





Air zone management is a mechanism to help provincial/territorial jurisdictions achieve continuous improvement in air quality; prevent air quality deterioration; and ensure the CAAQS are not exceeded. The CAAQS are the drivers for four colour-coded Management Levels (Table 1). The Management Levels are separated by threshold values (a specific concentration of a pollutant) and require progressively more rigorous management and actions as air quality within an air zone approaches or exceeds the CAAQS.¹

An air zone metric for each pollutant is calculated to determine the achievement status of a given standard and the associated management level for the air zone. The calculated annual metric for each pollutant is averaged over a three-year period (i.e. the reported value is a three-year running mean). This report therefore reports on data collected from 2012 to 2014, though the reported metric is assigned to the year 2014. The metric is then associated with a Management Level for each pollutant.

¹ Guidance documents and information on the CAAQS, procedures for calculating metrics for each pollutant, and determining Management Levels are available on the CCME website: www.ccme.ca/en/resources/air/aqms.html.



Table 1. Air Management Threshold Values and Actions, based on 2015 CAAQS

Management Level	Management Actions	Air Management Threshold Values		
		Ozone (ppb)	PM _{2.5} 24-hour (µg/m ³)	PM _{2.5} Annual (µg/m ³)
Red 	Actions for achieving air zone CAAQS	63	28	10
Orange 	Actions for prevention CAAQS exceedances	56	19	6.4
Yellow 	Actions for preventing air quality deterioration	50	10	4
Green 	Actions for keeping clean areas clean	0	0	0

The Yukon Air Zone

Under the AQMS, air zones are the basis for monitoring, reporting and taking action on air quality. Air zones are areas that exhibit similar air quality characteristics, issues and trends. In Yukon, there is a single air zone (the “Yukon Air Zone”) for which air quality management and actions are determined under the AQMS.


Major anthropogenic air emissions sources in the Yukon Air Zone include emissions from fossil fuel burning (from transportation and power generation), wood burning, waste disposal (incineration and open burning), and fugitive dust from roads, quarrying and construction. Natural sources of particulate matter include forest fires, wind-blown dust, pollen and transboundary flows and exceptional events.

Results: Yukon Air Zone in 2015

In 2015, based on results from the ozone metric, the Yukon Air Zone achieved a Management Level of Yellow. However, air quality data for particulate matter for both years of 2014 and 2015 did not meet the completeness criteria to calculate an annual mean; therefore, there is no calculated metric for 2015.

The ozone metric, based on air quality data from 2013 – 2015, is 54.1 ppb; this is an increase compared to the 2014 ozone metric (of 51.4 ppb), however it still falls within the Yellow Management Level. There were no days throughout 2015 that exceeded the 63 ppb CAAQS for ozone.

Table 2. Yukon Air Zone Metric Values

	2015 Results ²	Management Level	Management Action
PM _{2.5} - 24-hour (µg/m ³)	N/A	N/A	Actions for preventing air quality deterioration (as per 2014 Air Zone Management Level)
PM _{2.5} – Annual (µg/m ³)	N/A	N/A	Actions for preventing air quality deterioration (as per 2014 Air Zone Management Level)
Ozone - 8-hour average (ppb)	54.1		Actions for preventing air quality deterioration

Influence of transboundary flows and exceptional events

Ambient air quality can be influenced by emission sources that are outside of Yukon; these influences are called transboundary flows and exceptional events (TF/EE). Transboundary flows are defined as the transport of air pollution across provincial/territorial boundaries, or between Canada and the United States. Exceptional events are events that contribute to air pollution in an air zone that are not reasonably controllable or preventable; are caused by human activities which are unlikely to recur; or are natural sources.

If the influence of a TF/EE has impacts or is suspected to have impacts on the achievement of a given Management Level, CCME guidance³ indicates that these influences should be considered when

² 2014 results for all three reporting metrics are based on two years of data instead of the recommended three years due to data loss.



implementing management actions. Although Yukon generally has a high standard of air quality, it is still susceptible to pollution from TF/EEs.

The influence of TF/EEs was considered for ozone with a preliminary weight of evidence analysis. As in 2014, the highest values for ozone were recorded for the month of May; while forest fire activity could influence air quality, there is no clear indication that a specific forest fire event in neighbouring jurisdictions (including Alaska) contributed to May levels of ground-level ozone. Alaska did have an overall significant level of forest fire activity in the summer of 2015, which may have inflated pollution levels in Yukon. However, the high level of Alaskan fire activity was throughout the summer and therefore it would be difficult to attribute the slightly higher ozone metric to any one event.

Air Zone Management

For the Yukon Air Zone in 2015, the achieved Management Level is Yellow based on limited results as there was insufficient data to report a metric for particulate matter. Environment Yukon continues to strive to ensure that monitoring devices are operational to collect data to sufficiently characterize air quality trends and influences.

Environment Yukon is striving to work with stakeholders to improve awareness in the public of air quality. Yukon government implemented the Air Quality Health Index in June 2016 which was accompanied by a public education campaign regarding the importance of air quality.

Environment Yukon has also partnered with the Department of Health and Social Services (Government of Yukon) and the City of Whitehorse to monitor fine particulate matter at various sites around Whitehorse to better characterize air quality and particulate matter pollution throughout the topographically diverse area. Data will be used to determine the levels of pollution in various neighbourhoods, and help decision-making on actions to be taken in high-pollutant neighbourhoods.

³ Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone (Available online at www.ccme.ca/files/Resourcess/air/aqms/pn_1483_gdad_eng.pdf).