Saskatchewan Air Quality Report

Meeting the Canadian Ambient Air Quality Standards 2021-23

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Saskatchewan

Contents

1.0 Summary

This report summarizes the state of ambient air quality in Saskatchewan in relation to achievement of the Canadian Ambient Air Quality Standards (CAAQS) for 2021-2023, the associated management levels and recent and future actions designed to improve air quality in Saskatchewan. It also examines the long-term trends of the same four air pollutants that make up the CAAQS in the province:

- sulfur dioxide (SO_2);
- nitrogen dioxide (NO_2);
- ground-level ozone (O_3); and
- fine particulate matter ($PM_{2.5}$).

Overall, concentrations of SO_2, O_3, and NO_2 generally meet the Saskatchewan and Canadian ambient air quality standards in Saskatchewan and the health risk to humans from ambient air quality is generally low. The observed increase in $PM_{2.5}$ peak ambient concentrations due to wildfire activity continues to be a concern across the province, especially in the Boreal, Northeast and Western Yellowhead air zones, as this leads to an increased health risk.

Over the last 19 years:

- Provincial annual averages show a general decrease in SO_2 and NO_2 concentrations compared to 2005 values, with concentrations leveling off since 2018. These decreases in concentration can be attributed to lower emissions from industry and mobile or transportation sources.
- The province has been experiencing an increase in $PM_{2.5}$ concentrations, primarily due to wildfire smoke.
- Provincial O_3 concentrations have increased by 63.5 per cent since 2005. The increase in O_3 concentrations may be related to changes in nitrogen oxide concentrations over time and to impacts from wildfire smoke.

Changes in pollutant concentrations since the last report:

- Provincially, there was a slight increase in O_3 with a 4.5 per cent increase and no significant change in SO_2 concentrations.
- The annual concentration of $PM_{2.5}$ was on average 114.5 per cent greater in the province compared to 2022, with a notable 305.6 per cent difference in Buffalo Narrows and 139.7 per cent difference in Prince Albert. This is attributed to significant wildfire activity in 2023.

Some provincial actions that have been or will be taken to protect air quality and prevent CAAQS exceedances include:

- Continuing to use the provincial mobile monitoring program to better characterize air pollutant concentrations in air zones.
- Assessing existing monitoring networks and developing a provincial monitoring system to improve data collection and reporting.
- Working with federal and provincial partners to better monitor and report air quality information during high-risk events such as wildfires.
- Work with federal and provincial partners to understand long term trends of O_3 and $PM_{2.5}$.

Additional provincial and air zone-specific actions are provided in Table 10.

This report satisfies Saskatchewan's commitment to the Canadian Council of Ministers of the Environment's (CCME) Air Quality Management System (AQMS) for monitoring and reporting to the public on air quality.

2.0 Background

2.1 Long-term Ambient Air Quality Monitoring

The Ministry of Environment, in cooperation with the National Air Pollution Surveillance (NAPS) program, operates a network of ambient air quality monitoring stations in Saskatchewan. The NAPS program is administered by Environment and Climate Change Canada (ECCC) and is managed through an agreement between the federal government and the provincial and territorial governments. The NAPS program was established to ensure quality, reliable data and to produce a standard method of obtaining measurements of ambient air quality across Canada.

Continuous ambient air quality monitoring in Saskatchewan began in the early 1970s. The number of stations and locations have varied over the years and as of 2023, there are six NAPS stations. The ambient air monitoring stations are located in Buffalo Narrows, Estevan, Prince Albert, Regina, Saskatoon and Swift Current. Figure 2 in Section 2.4 shows the locations of the NAPS stations.

The long-term trend analysis presented in this report focuses on the four CAAQS pollutants: SO_2, O_3, NO_2 and $PM_{2.5}$. As per NAPS reporting standards, only annual averages that meet 50 per cent data completeness criteria are presented.

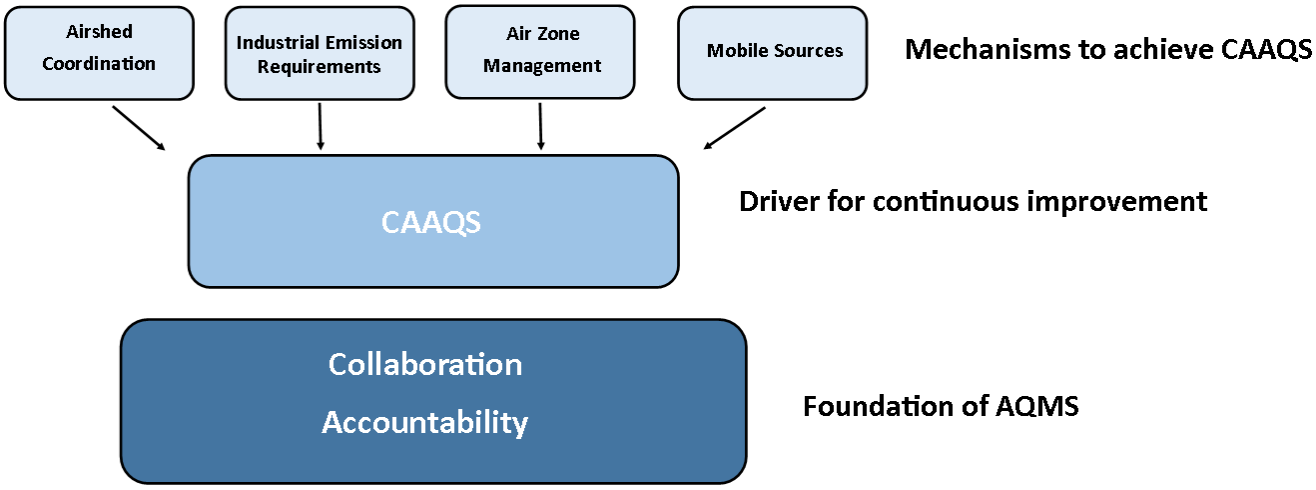
These pollutants can cause a range of negative human health effects and impacts on the environment. For instance, all four pollutants can cause irritation of the lungs, eyes, nose, throat and respiratory tract. Chronic exposure can result in decreased lung function. Sulfur dioxide and nitrogen dioxide can react with moisture in the atmosphere to produce acid rain, which in turn can damage ecosystems. Nitrogen oxides also react with hydrocarbons in the air to form O_3, which is a component of smog.

Ambient air quality data at NAPS stations is measured with analyzers that meet the United States Environmental Protection Agency Federal Equivalent Methodology (USEPA FEM) requirements for ambient air quality monitoring. To ensure ambient air quality data is scientifically defensible and comparable in all jurisdictions across Canada, the Ministry of Environment carries out all the requirements of the NAPS *Ambient Air Monitoring and Quality Assurance/Quality Control (QA/QC) Guidelines* (2019). Annual averages of each parameter were calculated for each NAPS station, and both station and network-wide trends are presented and discussed in Section 4.1.

2.2 The Air Quality Management System

The AQMS was established in October 2012 by the CCME and is the national approach to managing air quality in Canada. The AQMS is built on a foundation of collaboration, accountability and transparency. Industry, non-governmental and Indigenous organizations worked with governments to develop the AQMS. The CCME continues to develop, monitor and improve the implementation of the AQMS. More information on the AQMS can be found on the CCME website: ccme.ca/en/air-quality-report. The driver for continuous air quality improvement is the CAAQS. Figure 1 provides a visual representation of the AQMS elements. As part of its commitment to the AQMS, the Government of Saskatchewan established Saskatchewan air zones and reports to the public on air quality.

Figure 1 - Air Quality Management System Elements



2.3 The Canadian Ambient Air Quality Standards

The CAAQS are national air quality standards intended to protect human health and the environment. The CAAQS were developed collaboratively with the federal, provincial and territorial governments and stakeholders under the direction of CCME. Table 1 shows the current 2020 CAAQS for $PM_{2.5}$, O_3, SO_2, NO_2 and their respective averaging times and statistical metrics. The 2020 CAAQS are used in this report to assess achievement for the 2021-2023 reporting period. The standards are the concentration numerical values in Table 1 and are based on associated time-averaging periods and statistical forms, which account for varying exposures that may result in acute (short-term) and chronic (long-term) effects. More information on the CAAQS can be found on the CCME website: ccme.ca/en/air-quality-report.

Table 1 - 2020 CAAQS

Pollutant	Averaging Time	Standard	Metric
		2020	
$PM_{2.5}$	24-hour	27 micrograms/cubic meter	The three-year average of the annual 98 percentile of the daily 24-hour average concentrations.
$PM_{2.5}$	Annual	8.8 micrograms/cubic meter	The three-year average of the annual average of the daily 24-hour average concentrations.
O_3	Eight-hour	62 parts per billion	The three-year average of the annual fourth highest daily maximum eight-hour average concentrations.
SO_2	One-hour	70 parts per billion	The three-year average of the annual 99 percentile of the SO_2 daily maximum one-hour average concentrations.
SO_2	Annual	5.0 parts per billion	The average over a single calendar year of all one-hour average SO_2 concentrations.
NO_2	One-hour	60 parts per billion	The three-year average of the annual 98 percentile of the daily maximum one-hour average concentrations.
NO_2	Annual	17.0 parts per billion	The average over a single calendar year of all one-hour average concentrations.

2.4 Air Zones

Air zones are established by provincial and territorial governments to define areas that exhibit similar air quality characteristics, issues and trends. These air zones form the basis for monitoring, reporting and acting on air quality issues. Saskatchewan has six air zones, each of which has at least one CAAQS reporting station, as seen in Figure 2.

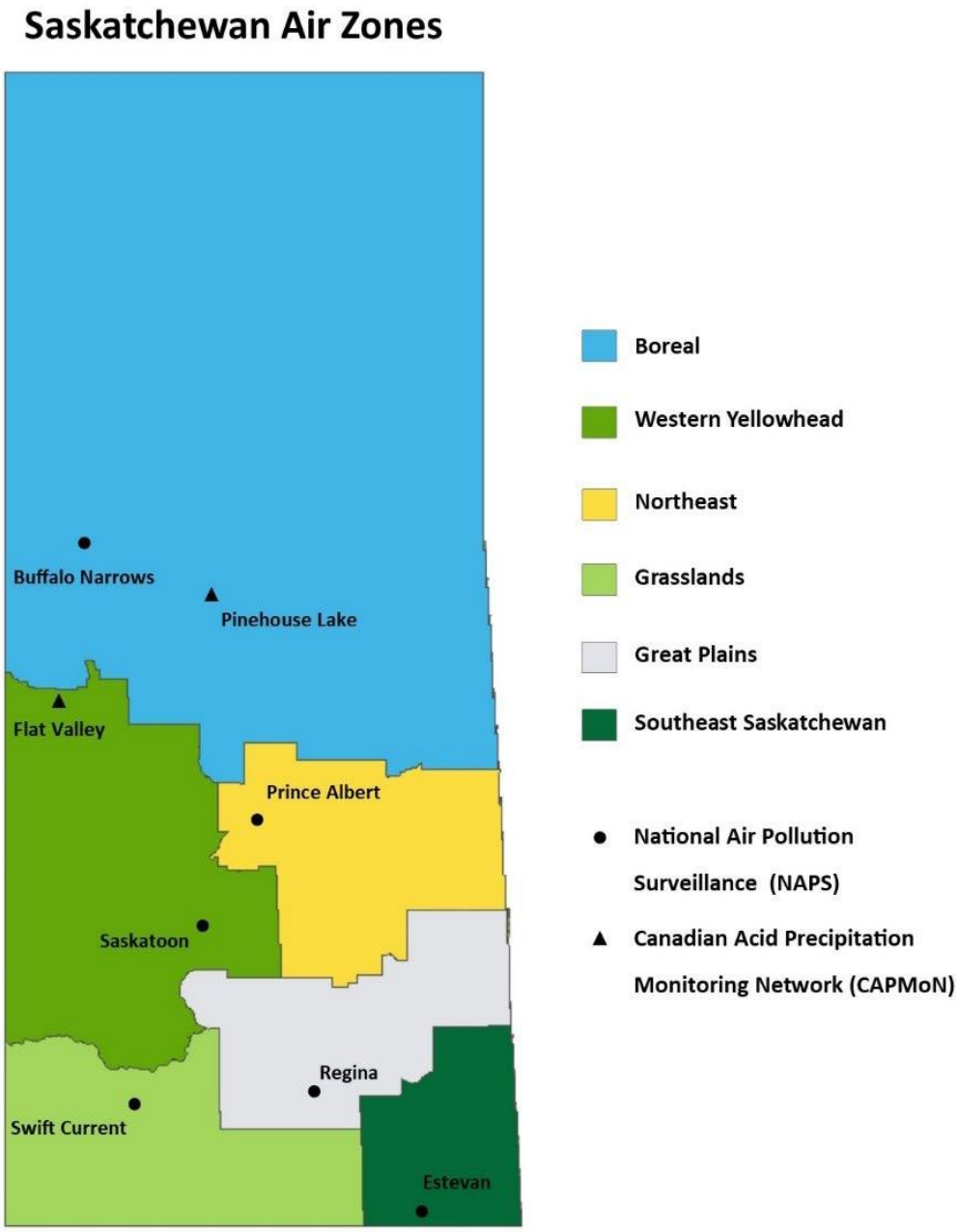


Figure 2 - Saskatchewan Air Zones and CAAQS Reporting Stations

2.5 Air Zone Management Levels

Under the AQMS, progressively more rigorous actions are expected as air quality approaches or exceeds the CAAQS. The level of action is guided by the Air Zone Management Framework outlined in Tables 2 through 5 and Figure 3.

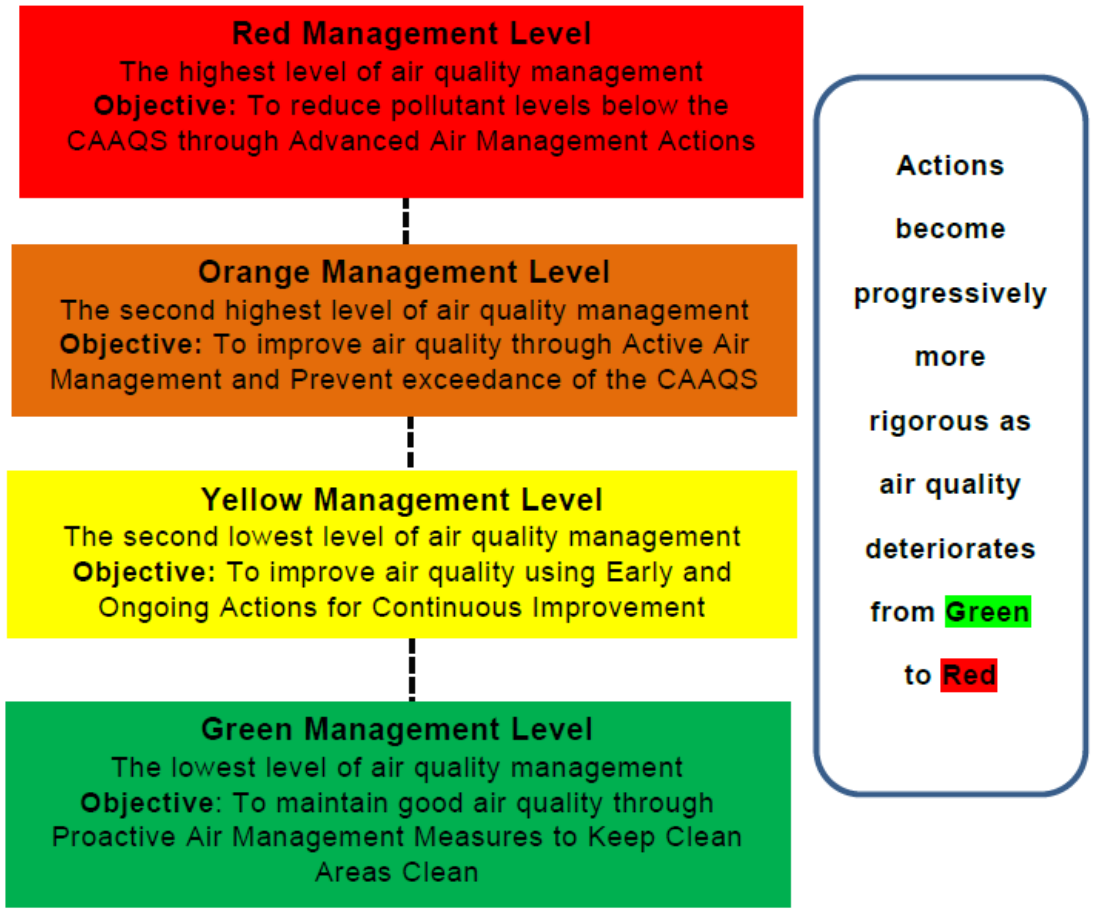


Figure 3 – The Air Zone Management Framework

Table 2 - Management levels for O_3 (8-hour average)

Management level	2020
Red	> 62 ppb
Orange	57 to 62 ppb
Yellow	51 to 56 ppb
Green	≤ 50 ppb

Table 3 - Management levels for $PM_{2.5}$

Management level	$PM_{2.5}$ 24-hour	$PM_{2.5}$ annual
	2020	2020
Red	> 27 µg/m^3	> 8.8 µg/m^3
Orange	20 to 27 µg/m^3	6.5 to 8.8 µg/m^3
Yellow	11 to 19 µg/m^3	4.1 to 6.4 µg/m^3
Green	≤ 10 µg/m^3	≤ 4.0 µg/m^3

Table 4 - Management levels for SO_2

Management level		SO_2 1-hour	SO_2 annual
		2020	2020
Red		> 70 ppb	> 5.0 ppb
Orange		51 to 70 ppb	3.1 to 5.0 ppb
Yellow		31 to 50 ppb	2.1 to 3.0 ppb
Green		≤ 30 ppb	≤ 2.0 ppb

Table 5 - Management levels for NO_2

Management level	NO_2 1-hour	NO_2 annual
	2020	2020
Red	> 60 ppb	> 17.0 ppb
Orange	32 to 60 ppb	7.1 to 17.0 ppb
Yellow	21 to 31 ppb	2.1 to 7.0 ppb
Green	≤ 20 ppb	≤ 2.0 ppb

Each management level has associated actions. The *Guidance Document on Air Zone Management (CCME, 2019)* suggests air zones in all management levels should:

- Prepare and publish annual reports on current ambient air quality levels and trends, air zone management levels and management actions to reduce air pollutant levels; and
- Educate the public on local air quality.

Air zones assigned management levels other than green have additional emphasis on active management to improve air quality, both to prevent deterioration in air quality and to achieve the CAAQS. Yellow and orange levels initiate actions such as:

- Ensure air pollutant monitoring is adequate to capture variability in concentrations over time and in different locations;
- Compile, as required, emissions inventories for air zones to evaluate main sources of air pollutants;
- Engage local stakeholders as appropriate; and
- Develop, implement and release air zone management plans to prevent air quality deterioration, taking into consideration all important sources of air pollutants and provincial and territorial policies and assess progress.

2.6 Transboundary Flows and Exceptional Events

Measured concentrations of air pollutants may reflect human activity, transboundary flows (TFs) and exceptional events (EEs). The achievement status and management levels of the CAAQS must be reported regardless of the pollutant source. However, adjusted metric values and management levels may be reported when considering TF or EE, when supported by evidence, in addition to the CAAQS values of all measured concentrations.

TFs refer to emissions of air pollutants related to human activity released in one jurisdiction and transported or moved by winds and weather systems into another. EEs typically refer to smoke from forest fires or other non-controllable or accidental causes. For more information on TFs or EEs, please refer to the Guidance Document on Transboundary Flows and Exception Events (CCME 2019), which provides guidance on the procedures to use for considering the influences of TF-EE on CAAQS exceedances and management levels.

3.0 CAAQS Assessment Methodology

3.1 Saskatchewan CAAQS reporting stations for 2021-2023.

Saskatchewan CAAQS achievement reporting for the 2021-2023 reporting period was accomplished using data from the NAPS program and the Canadian Acid Precipitation Monitoring Network (CAPMoN). The NAPS ambient air monitoring program is operated by the Government of Saskatchewan and provides accurate, long-term air quality data. The CAPMoN program is operated by the federal government and collects continuous O_3 data, in addition to monitoring for wet deposition.

Based on data availability in the 2021-2023 reporting period, the following air quality stations were used to calculate the CAAQS metric values:

- **Boreal** – NAPS monitoring station, Buffalo Narrows; CAPMoN site, Pinehouse Lake.
- **Western Yellowhead** – NAPS monitoring station, Saskatoon; CAPMoN site, Flat Valley.
- **Grasslands** – NAPS monitoring station, Swift Current.
- **Southeast Saskatchewan** –NAPS monitoring station, Estevan.
- **Great Plains** – NAPS monitoring station, Regina.
- **Northeast** – NAPS monitoring station, Prince Albert.

3.2 Achievement Assessment

Data from the NAPS and CAPMoN reporting stations is assessed for completeness and used to calculate the metric values as specified in the appropriate *Guidance Document on Achievement Determination for Canadian Ambient*

Air Quality Standards for $PM_{2.5}$, O_3, NO_2 and SO_2. These calculated values are then compared against the CAAQS standards, which are provided in Table 1, Section 2.3.

An air zone achieves the standard if the calculated metric value is equal to or less than the standard. An air zone does not achieve the standard if the metric value is greater than the standard.

3.3 Management Levels Assignment

For this report, fine particulate matter values that were equal to or greater than the orange management level threshold values and that were identified as being influenced by transboundary flows and exceptional events, were removed from the dataset as described in Appendix B. The metric values were recalculated without the influenced data to assign management levels and are referred to as the adjusted metric values. Since the management level dictates the types of actions the province should take, long-term management strategies should be developed based on factors the province can influence. Fine particulate matter was the only parameter that this process applied to as being influenced by transboundary flows and exceptional events.

4.0 Results

4.1 Long-term Ambient Air Quality Trends

Long-term trends were evaluated for SO_2, O_3, NO_2, and $PM_{2.5}$ for the period of 2005 to 2023, and are presented in Figures 4 to 7 for each station and for each pollutant. Network wide annual average concentrations and change in concentrations since 2005 are presented in Appendix A and graphically in Figure 8. Overall, concentrations of these pollutants are generally low in Saskatchewan, and the health risk to humans from ambient air quality is generally low. There have been some notable changes in measured concentrations over the last 19 years.

Annual SO_2 and NO_2 concentrations have generally decreased since 2005 due to decreasing emissions from industry and mobile sources, with a -25 per cent decrease for SO_2 and -40 per cent decrease for NO_2. Concentration trends have plateaued in the last 5 years due to the levelling off of these emissions in recent years.

Fine particulate matter concentrations have been increasing in the province, primarily due to an increase in wildfire activity in Canada and western USA and resultant smoke. There was a significant spike in annual $PM_{2.5}$ concentrations in 2023 compared to 2022, which saw a 114.5 per cent increase provincially due to a significant wildfire season and 305.6 per cent annual increase at Buffalo Narrows, the most northerly NAPS station in Saskatchewan located in the Boreal air zone.

Ground level ozone concentrations have also been increasing, but at a more gradual pace, with an overall provincial increase of 63.5 per cent since 2005. A combination of factors is likely contributing to increasing trends in O_3 concentrations. The increase in O_3 concentrations may be related to changes to nitrogen oxide concentrations and variation in metrological conditions. Nitrogen oxides can both increase and decrease O_3 concentration, depending on the level of air pollution and meteorology. There is also evidence that O_3 concentrations spike during moderate wildfire smoke events and more research is being conducted to better understand this relationship. The Regina and Prince Albert NAPS stations have reported the greatest increase, with 66.5 per cent and 65.6 per cent increase respectively.

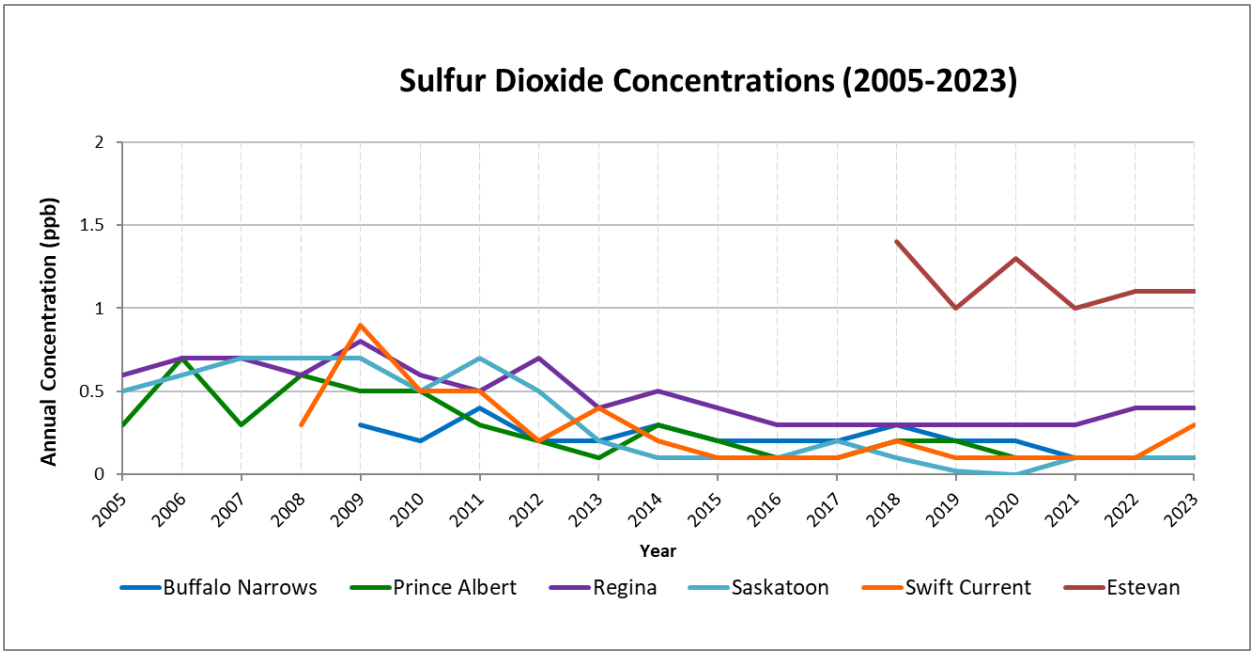


Figure 4 - Annual Average Concentrations of SO_2 Since 2005

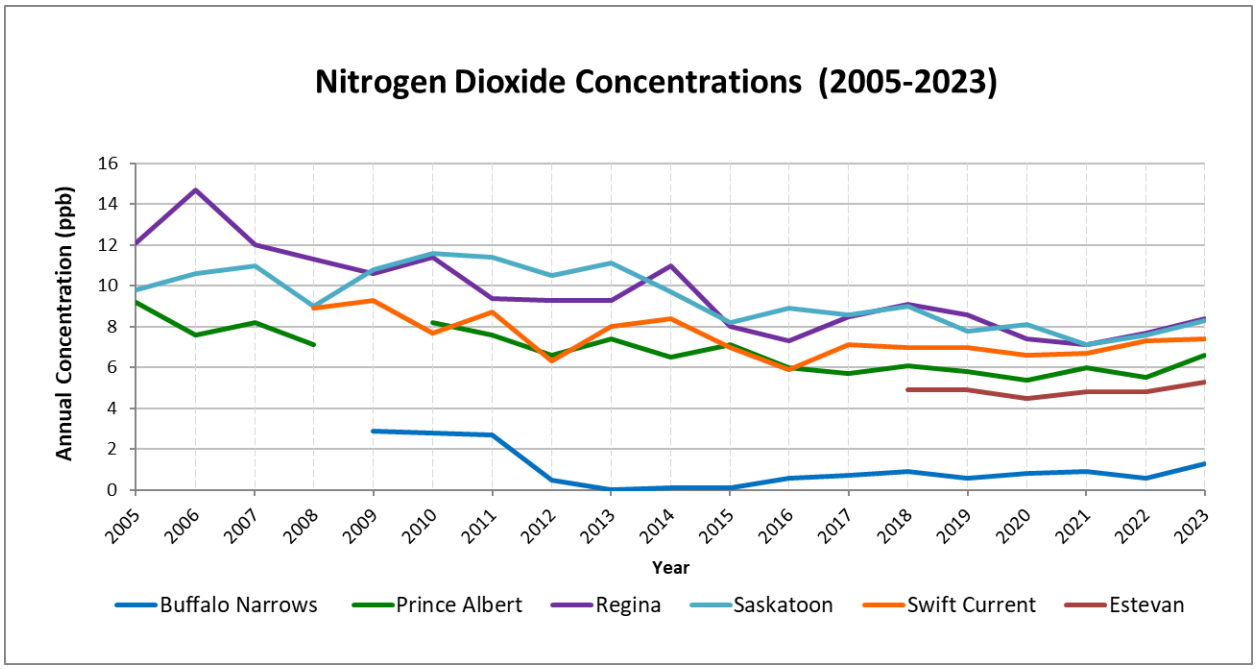


Figure 5 - Annual Average Concentrations of NO_2 Since 2005

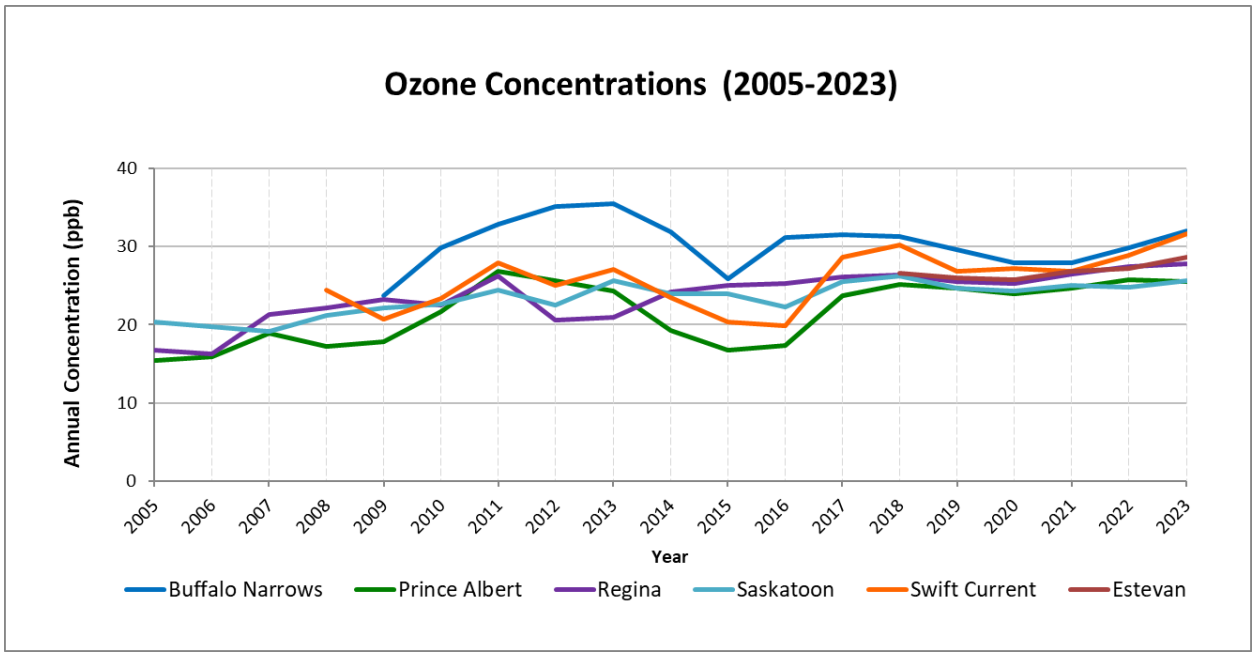


Figure 6 - Annual Average Concentrations of O_3 Since 2005

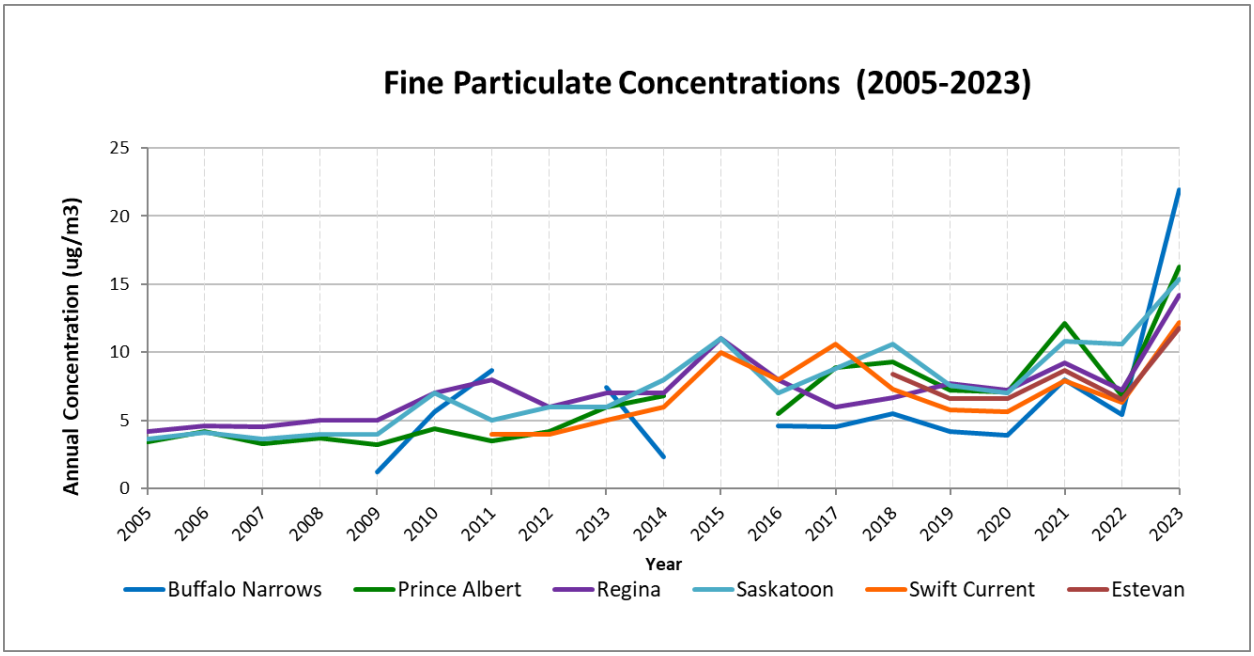


Figure 7 - Annual Average Concentrations of $PM_{2.5}$ Since 2005

Note: As federal equivalence measurement technology improves for fine particulates, it is likely that the results have varied between changing methodologies, potentially influencing the long-term trend.

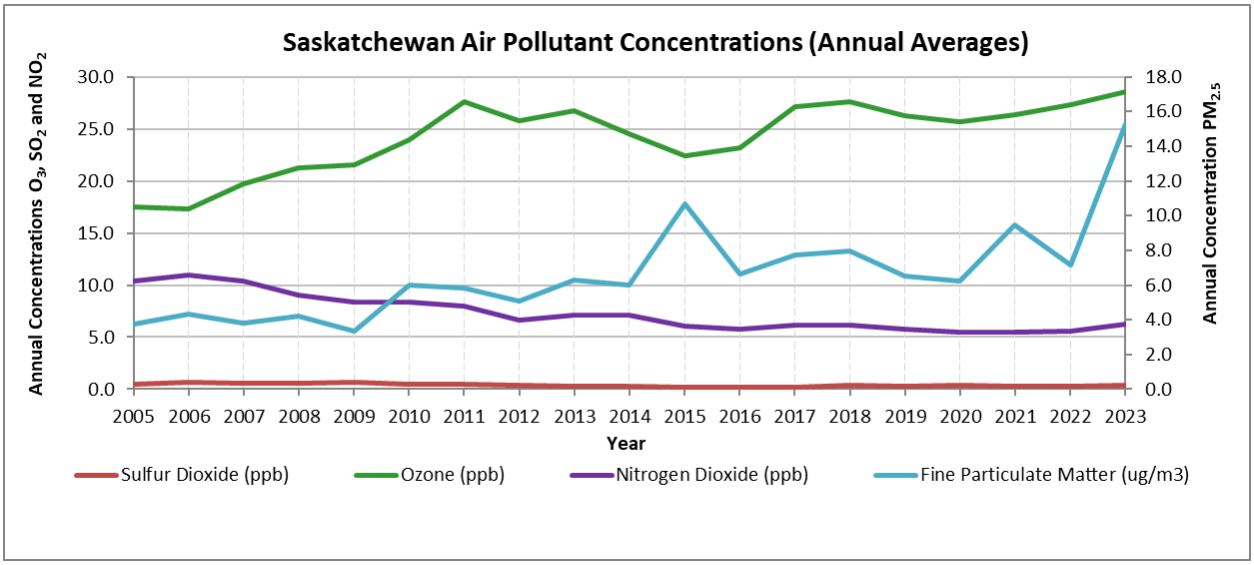


Figure 8 - Network-wide annual average concentrations of O_3, SO_2, NO_2 and $PM_{2.5}$ Since 2005

4.2 CAAQS Achievements and Management Levels

Maps of the effective station management levels in Saskatchewan for the 2021-2023 reporting period are provided in **Figure 9, 10, 11 and 12.**

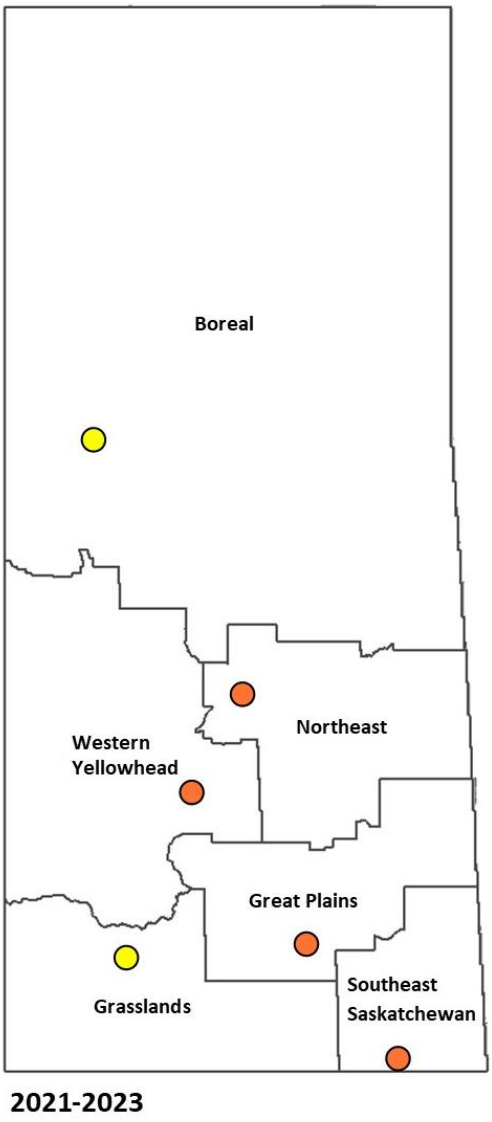


Figure 9 – CAAQS Reporting Station Management Levels of $PM_{2.5}$

After adjusting for wildfire influence, four CAAQS reporting stations were assigned the $PM_{2.5}$ orange management level and two stations were assigned the yellow management level for the 2021-2023 reporting period. The Buffalo Narrows station has adjusted $PM_{2.5}$ metric values in the low range of values captured by the yellow management level.

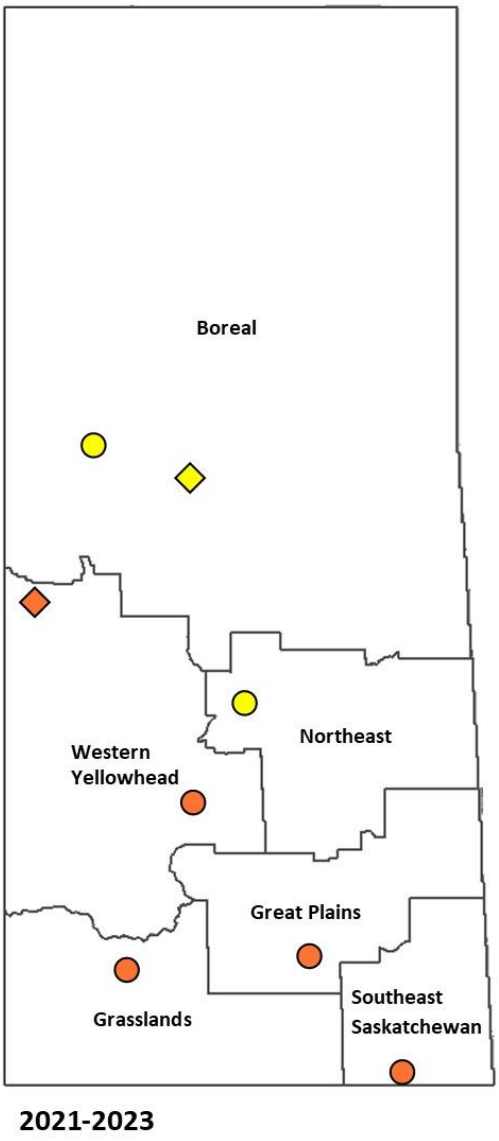


Figure 10 CAAQS Reporting Station Management Levels of O_3

For O_3 CAAQS metric calculations, data from CAPMoN stations (represented by diamond symbols) were also used in addition to the NAPS stations (represented by circular symbols). For 2021-2023, four of the CAAQS reporting stations were assigned the orange management level and three of the stations were assigned the yellow management level.

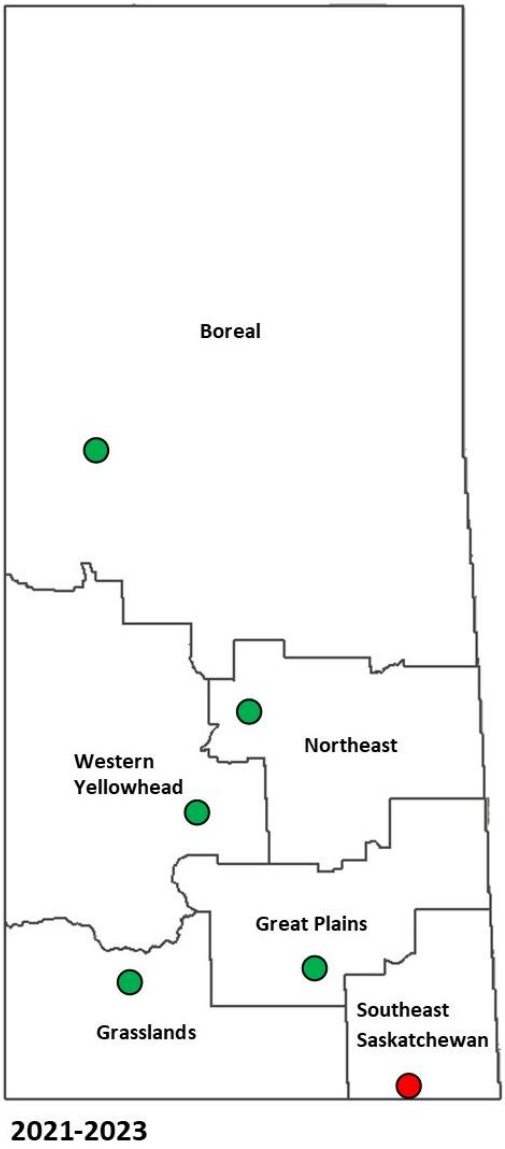


Figure 11 – CAAQS Reporting Station Management Levels of SO_2

For SO_2, there was no change in management levels for the province compared to past reports. All CAAQS reporting stations were assigned the green management level with the exception of the Estevan station, which is assigned the red management level for SO_2 due to its exceedance of the 1-hour CAAQS.

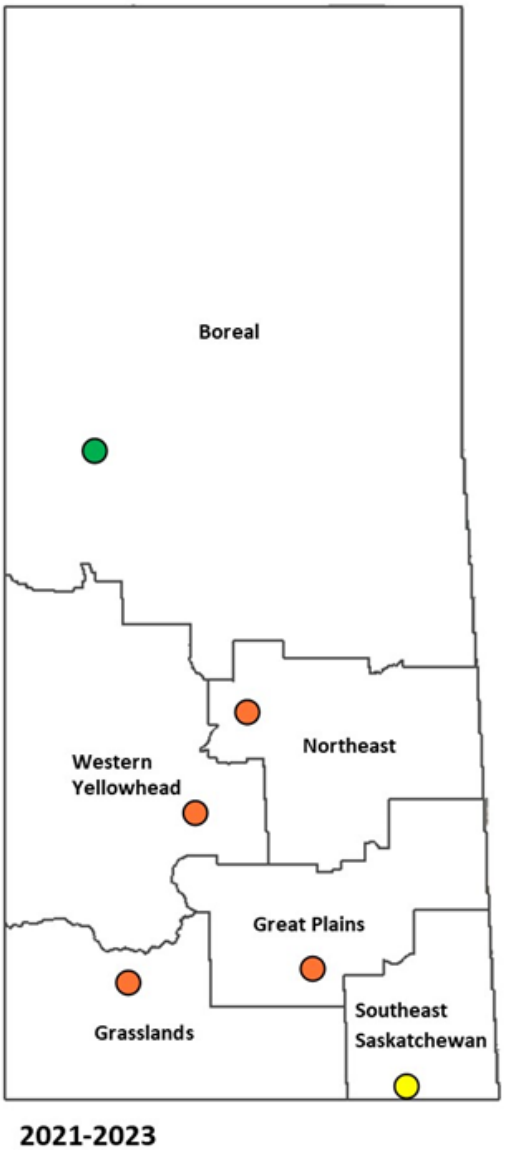


Figure 12 – CAAQS Reporting Station Management Levels of NO_2

Four of the CAAQS reporting stations were assigned to the orange management level for NO_2, the Boreal station was assigned to the green management level, and the Southeast station was assigned to the yellow management level.

4.2.1 $PM_{2.5}$ Achievement and Air Zone Management Levels

Wildfire smoke was the largest contributor to $PM_{2.5}$ in the 2021-2023 reporting period and the only pollutant for which the guidelines for removing exceptional events were triggered and an adjusted metric value calculated.

For the 2021-2023 reporting period, before the removal of wildfire influenced data:

- Only one air zone achieved the $PM_{2.5}$ annual standard of 8.8 micrograms per cubic meter: Swift Current
- All six air zones exceeded the $PM_{2.5}$ 24-hour standard of 27 micrograms per cubic meter.

After the removal of data influenced by wildfires, the resulting adjusted metric values achieved the $PM_{2.5}$ 24-hour CAAQS and annual CAAQS in all six air zones.

Table 6 presents each air zone's 2021-2023 actual $PM_{2.5}$ metric values, their adjusted metric values and their associated $PM_{2.5}$ air zone management level. Since there are two CAAQS averaging periods for $PM_{2.5}$ (24-hour and annual), the management level is determined as the most stringent of the two adjusted levels.

Table 6 - $PM_{2.5}$ CAAQS RESULTS 2021-2023

Air Zone	Station	Type of Station	# of Valid Years	PM 2.5 24-hour micrograms/cubic meter		PM 2.5 Annual micrograms/cubic meter		Air Zone Management Level
				Actual	Adjusted	Actual	Adjusted	
Great Plains	Regina	NAPS	3	43	18	10.2	7.1	Orange
Northeast	Prince Albert	NAPS	3	59	19	11.7	7.1	Orange
Southeast Saskatchewan	Estevan	NAPS	3	38	17	9.0	6.6	Orange
Grasslands	Swift Current	NAPS	3	43	16	8.8	5.7	Yellow
Boreal	Buffalo Narrows	NAPS	3	98	16	11.8	4.5	Yellow
Western Yellowhead	Saskatoon	NAPS	3	58	19	12.3	7.8	Orange

4.2.2 O_3 Achievement and Air Zone Management Levels

All air zones achieved the O_3 eight-hour standard of 62 parts per billion. Table 7 presents the 2021-2023 O_3 metric values for each air zone and their associated air zone management level.

Table 7 - O_3 CAAQS RESULTS 2021-2023

Air Zone	Station	Type of Station	# of Valid Years	O_3 8-hr Metric parts per billion	Air Zone Management Level
Great Plains	Regina	NAPS	3	61	Orange
Northeast	Prince Albert	NAPS	3	53	Yellow
Southeast Saskatchewan	Estevan	NAPS	3	60	Orange
Grasslands	Swift Current	NAPS	3	57	Orange
Boreal	Buffalo Narrows	NAPS	3	54	Yellow
	Pinehouse	CAPMoN	3	56	
Western Yellowhead	Flat Valley	CAPMoN	3	58	Orange
	Saskatoon	NAPS	3	55	

4.2.3 SO_2 CAAQS Achievement and Air Zone Management Levels

The achievement of the SO_2 CAAQS is summarized below.

- All six air zones achieved the SO_2 annual standard of 5.0 parts per billion.
- Five air zones achieved the SO_2 one-hour standard of 70 parts per billion: Great Plains, Northeast, Grasslands, Boreal, and Western Yellowhead.
- One air zone exceeded the SO_2 one-hour standard of 70 parts per billion: Southeast Saskatchewan.

The 1-hour CAAQS metric for the Southeast air zone has been decreasing since reporting started in 2018, decreasing from 101 ppb in 2018-2020 to 96 ppb in 2020-2022 to 79 ppb in 2023. If this trend continues, this indicates that conditions at the Estevan reporting station are improving. Table 8 presents the 2021-2023 SO_2 metric values for each air zone and their associated air zone management level.

Table 8 – SO_2 CAAQS RESULTS 2021-2023

Air Zone	Station	Type of Station	# of Valid Years	SO_2 1-hr Metric parts per billion	SO_2 Annual Metric parts per billion	Air Zone Management Level
Great Plains	Regina	NAPS	3	18	0.4	Green
Northeast	Prince Albert	NAPS	3	1	0.1	Green
Southeast Saskatchewan	Estevan	NAPS	3	79	1.1	Red
Grasslands	Swift Current	NAPS	3	3	0.3	Green
Boreal	Buffalo Narrows	NAPS	3	3	0.1	Green
Western Yellowhead	Saskatoon	NAPS	3	1	0.1	Green

4.2.4 NO_2 CAAQS Achievements and Air Zone Management Levels

All six air zones achieved the NO_2 one-hour standard of 60 parts per billion. Table 9 presents the 2021-2023 and NO_2 metric values for each air zone and their associated air zone management level.

Table 9 - NO_2 CAAQS RESULTS 2021-2023

Air Zone	Station	Type of Station	# of Valid Years	NO_2 1-hr Metric parts per billion	NO_2 Annual Metric parts per billion	Air Zone Management Level
Great Plains	Regina	NAPS	3	44	8.4	Orange
Northeast	Prince Albert	NAPS	3	37	6.6	Orange
Southeast Saskatchewan	Estevan	NAPS	3	32	5.3	Yellow
Grasslands	Swift Current	NAPS	3	36	7.4	Orange
Boreal	Buffalo Narrows	NAPS	3	9	1.3	Green
Western Yellowhead	Saskatoon	NAPS	3	42	8.3	Orange

5.0 Air Zone Management Plan

Saskatchewan's air zone management plan is provided in Table 10. The management plan is a compilation of targeted actions that will improve air quality and will help to identify air quality issues that may require further assessment. Actions include Saskatchewan and federal regulations to reduce emissions, past, current and planned ambient air quality monitoring special studies to capture spatial and temporal variability in concentrations, and stakeholder engagement.

Table 13 - PROVINCIAL AND AIR ZONE MANAGEMENT PLAN

	Current Reporting Period Management Levels (2021-2023)				Action	Action Category	Status
	$PM_{2.5}$	**O_3**	**NO_2**	**SO_2**			
Saskatchewan	Yellow and Orange	Yellow and Orange	Green, Yellow and Orange	Green and Red	The federal government has adopted the *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)*. These regulations detail requirements for the upstream oil and gas industry with respect to the reduction of targeted methane and other VOC emissions. This targeted reduction should help to improve ambient air quality.	Actions to be undertaken by governments and stakeholders to reduce emissions with short, medium and long-term milestones and targets.	First set of requirements were implemented in 2020. The second set of requirements were implemented in 2023. Amendments to the regulations were proposed in December 2023 to build on existing regulations and introduce a new performance-based compliance option designed to focus on emissions outcomes, rather than prescribing a specific pathway to compliance. Coming into effect in 2025, there is an equivalency agreement in place so that these regulations do not apply in Saskatchewan.
					The federal government has published Canada's 2030 Emissions Reduction Plan (ERP), that provides a roadmap to reach its climate commitments, such as reducing national GHG emissions by 40 to 45 per cent below 2005	Actions to be undertaken by governments and stakeholders to reduce	Plan published 2022

					levels by 2030 and achieving net-zero emissions by 2050. This commitment is anticipated to further reduce the emissions of greenhouse gases may lead to the reduction in methane, which should result in a reduction in ground level ozone as methane can lead to the formation of ozone.	emissions with short, medium and long-term milestones and targets.	
					The Government of Saskatchewan will review air quality trends and work with federal and provincial partners to understand air quality deterioration concerns, with a specific focus on the orange management level zones for O_3, NO_2 and $PM_{2.5}$	Characterizing Air Pollutant Concentrations in Air Zones	2025-2027
					The Government of Saskatchewan will improve its collaborative efforts with air zone associations.	Stakeholder Engagement	2022-2026
					The Ministry of Environment has completed a review of Saskatchewan's air zone association model. Recommendations and actions from the review are intended to improve air quality monitoring, stakeholder engagement and air quality management in the province.	Characterizing Air Pollutant Concentrations in Air Zones Stakeholder Engagement	2021-2025
					The Ministry of Environment will develop a provincial monitoring system comprised of provincial, air zone association and other partner networks to improve air quality monitoring coverage and reporting in Saskatchewan	Characterizing Air Pollutant Concentrations in Air Zones Stakeholder Engagement	2024-2027
					The Ministry of Environment procured a new mobile monitoring station that will allow for year-round special air monitoring studies.	Characterizing Air Pollutant Concentrations in Air Zones	2024-2025

Great Plains	Orange	Orange	Orange	Green	The Government of Saskatchewan will engage the air zone association to collaboratively identify air quality issues related to NO_2 with a focus on understanding the risk of exceeding the CAAQS. Saskatchewan will also work to identify air quality issues related to O_3 and $PM_{2.5}$ with a focus on evaluating and assessing existing data.	Stakeholder Engagement	2025-2026
Southeast Saskatchewan	Orange	Orange	Yellow	Red	The Government of Saskatchewan will engage the air zone association to collaboratively identify air quality issues related to SO_2 with a focus on evaluating and assessing existing data.	Stakeholder Engagement	2025-2026
Grasslands	Yellow	Yellow	Orange	Green	The Government of Saskatchewan will evaluate the physical placement of the NAPS Station in Swift Current to ensure it provides representative data.	Characterizing Air Pollutant Concentrations in Air Zones	2025-2026
					The Government of Saskatchewan will continue to temporarily monitor $PM_{2.5}$, O_3, NO_2 and SO_2 using its mobile air quality station at targeted locations.	Characterizing Air Pollutant Concentrations in Air Zones	2025-2030
					The Government of Saskatchewan will assess if the operation of an air zone association in this air zone could help to prevent air quality deterioration.	Stakeholder Engagement	2026-2027
Boreal	Yellow	Yellow	Green	Green	The provincial monitoring station in Buffalo Narrows will continue to monitor under the NAPS network. This will ensure the data quality for this air zone will meet AQMS requirements for reporting.	Characterizing Air Pollutant Concentrations in Air Zones	Added to NAPS Network in 2018
Western Yellowhead	Orange	Orange	Orange	Green	The Government of Saskatchewan will engage the air zone association to collaboratively identify air quality issues related to O_3 and $PM_{2.5}$ with a focus on evaluating and assessing existing data.	Stakeholder Engagement and Characterizing Air Pollutant Concentrations in Air Zones	2025-2026

					The Government of Saskatchewan/Western Yellowhead Air Management Zone (WYAMZ) will evaluate the physical placement of the NAPS station in Saskatoon to ensure it provides representative data. A mobile air quality station was deployed to Saskatoon to evaluate the placement of the NAPS station.	Characterizing Air Pollutant Concentrations in Air Zones	Completed Spring 2024. Recorded concentrations were not significantly different from data collected at the NAPS site.
					WYAMZ will review air quality trends to identify any air quality deterioration concerns with a specific focus on the orange management level zones.	Characterizing Air Pollutant Concentrations in Air Zones	2025-2026
					The Government of Saskatchewan will work with the Government of Alberta to examine the feasibility of establishing a co-located air monitoring station in Lloydminster, SK.	Characterizing Air Pollutant Concentrations in Air Zones	2023-2025

6.0 Conclusion

The Government of Saskatchewan is committed to the AQMS and will continue to collaborate with stakeholders to ensure Saskatchewan has a healthy, resilient environment.

Long-term trends in annual concentrations of O_3 and $PM_{2.5}$ suggest the province might be challenged to meet future CAAQS as the standards become increasingly more stringent in the future. While exceptional events such as wildfires are removed from the dataset when determining air zone management levels, wildfire smoke continues to negatively impact Saskatchewan's air quality. The province will continue to work internally, with stakeholders, and with other jurisdictions to ensure high quality $PM_{2.5}$ data is available to inform decision-making and protect the health of Saskatchewan citizens.

The NO_2 long-term trend suggests NO_2 concentrations are decreasing as best management practices and pollution abatement technology improves. However, except for the Boreal air zone, the province is in the orange and yellow management levels for NO_2, suggesting additional long-term management strategies may need to be developed. The Government of Saskatchewan will work with the air zone associations and other stakeholders to understand the sources of NO_2 in large urban communities in Saskatchewan and develop management strategies to improve air quality.

Saskatchewan air zones achieved the green management level for SO_2 for the 2021-2023 reporting periods except for the Southeast Saskatchewan air zone. The Southeast Saskatchewan air zone exceeded the SO_2 CAAQS one-hour standard of 70 ppb, remaining at the red management level from the previous reporting periods. It should be noted that Southeast Saskatchewan achieved the annual CAAQS standard of 5 ppb with a metric value of 1.1 ppb. This suggests only a small number of isolated incidents of one-hour SO_2 concentrations greater than 70 ppb in the Southeast Saskatchewan air zone, specifically in Estevan, caused the one-hour CAAQS metric value to be exceeded. There is also evidence that conditions are generally improving in Estevan – the CAAQS metric reported for the Estevan NAPS station has been decreasing since 2018. This could be the result of improved emission mitigation actions by SaskPower and other industrial sources in the area. The Government of Saskatchewan will continue to work with SESAA and stakeholders to understand SO_2 sources in the air zone, specifically their impact on air quality in the Estevan area.

Saskatchewan's ambient air monitoring data is available to the public so residents have the information they need to make informed decisions about their activities: Saskatchewan Air Quality Map. Residents concerned about air quality, especially during wildfire events, should check the Air Quality Health Index for their community and follow Health Canada's recommendations on how to reduce their exposure.

For more information on this report, please contact the Ministry of Environment Inquiry Centre at centre.inquiry@gov.sk.ca or 1-800-567-4224.

Appendix A

Network-wide annual average concentrations of O_3, SO_2, NO_2 and $PM_{2.5}$ concentrations since 2005.

Province Wide Averages	SO_2 (ppb)	O_3 (ppb)	NO_2 (ppb)	$PM_{2.5}$ (µg/m^3)
2005	0.5	17.5	10.4	3.7
2006	0.7	17.3	11.0	4.3
2007	0.6	19.8	10.4	3.8
2008	0.6	21.3	9.1	4.3
2009	0.6	21.5	7.3	3.8
2010	0.5	24.0	7.5	7.0
2011	0.5	27.7	7.2	6.7
2012	0.4	25.8	6.1	5.7
2013	0.3	26.7	6.9	6.6
2014	0.3	24.6	7.2	6.0
2015	0.2	22.4	6.7	9.8
2016	0.2	23.2	5.5	6.7
2017	0.2	27.1	6.1	7.8
2018	0.4	27.7	6.2	8.0
2019	0.3	26.2	5.8	6.5
2020	0.3	25.7	5.5	6.3
2021	0.3	26.3	5.5	9.5
2022	0.3	27.3	5.6	7.1
2023	0.4	28.6	6.2	15.3

Station and Network-wide change (percentage) in O_3, SO_2, NO_2 and $PM_{2.5}$ concentrations since 2005

Percentage change since 2005	SO_2	O_3	NO_2	$PM_{2.5}$
Buffalo Narrows*	-66.7%	35.0%	-55.2%	1725.0%
Prince Albert	-66.7%	65.6%	-28.3%	379.4%
Saskatoon	-80.0%	26.6%	-15.3%	327.8%
Regina	-33.3%	66.5%	-30.6%	238.1%
Swift Current*	0.0%	29.9%	-16.9%	205.0%
Estevan **	-21.4%	7.5%	8.2%	40.5%
Network-wide	**-25.0%**	**63.5%**	**-40.0%**	**309.8%**

* (monitoring began 2008 and 2009)

**(monitoring began 2018)

Appendix B

A weight of evidence approach to assessing transboundary flow and exceptional events (TF/EE) is outlined in the *Guidance Document on Transboundary Flows and Exceptional Events for Air Zone Management (2019).* This section describes TF/EE influences that were removed to determine fine particulate ($PM_{2.5}$) management levels.

Wildfire smoke, both from forest and grass fires, was the largest contributor to $PM_{2.5}$ TF/EE events in Saskatchewan during this reporting period. Many of the wildfires occurred in jurisdictions outside of Saskatchewan, including Alberta, British Columbia and the United States. TF/EE influences were identified using:

- Maps of fire hot spots from the Canadian Wildland Fire Information System, Natural Resources Canada (CWFIS);
- Annual reports from the Canadian Interagency Forest Fire Centre and provincial ministries;
- Environmental and Climate Change Canada Special Air Quality Alerts; and
- Smoke forecasts provided by FireSmoke Canada.

$PM_{2.5}$ 24-hour metric 2021-2023 TF/EE Assessment

$PM_{2.5}$ 24-hour data that was identified as influenced by wildfire and had values greater than 19 micrograms per cubic meter (the orange management level threshold) was removed. The $PM_{2.5}$ 24-hour and $PM_{2.5}$ annual metrics were then re-calculated and the adjusted metrics used to determine $PM_{2.5}$ management levels.

Example of TF/EE assessment

On July 12, 2021, two monitoring stations reported $PM_{2.5}$ concentrations that were greater than the orange management threshold value of 19 micrograms/cubic meter. Information to identify these days being impacted by wildfires included review of the day's Fire M3 hotspots (Figure A-1) and the Firesmoke modelled smoke forecast (Figure A-2).

TABLE A-2

Air Zone	Station	July 12, 2021 PM2.5 Concentration ($PM_{2.5}$ 24-hour)
Great Plains	Regina	17.2
Northeast	Prince Albert	39.8
Southeast Saskatchewan	Estevan	12.6
Grasslands	Swift Current	9.9
Boreal	Buffalo Narrows	55.1
Western Yellowhead	Saskatoon	17.2

* Data listed is in micrograms/cubic meter

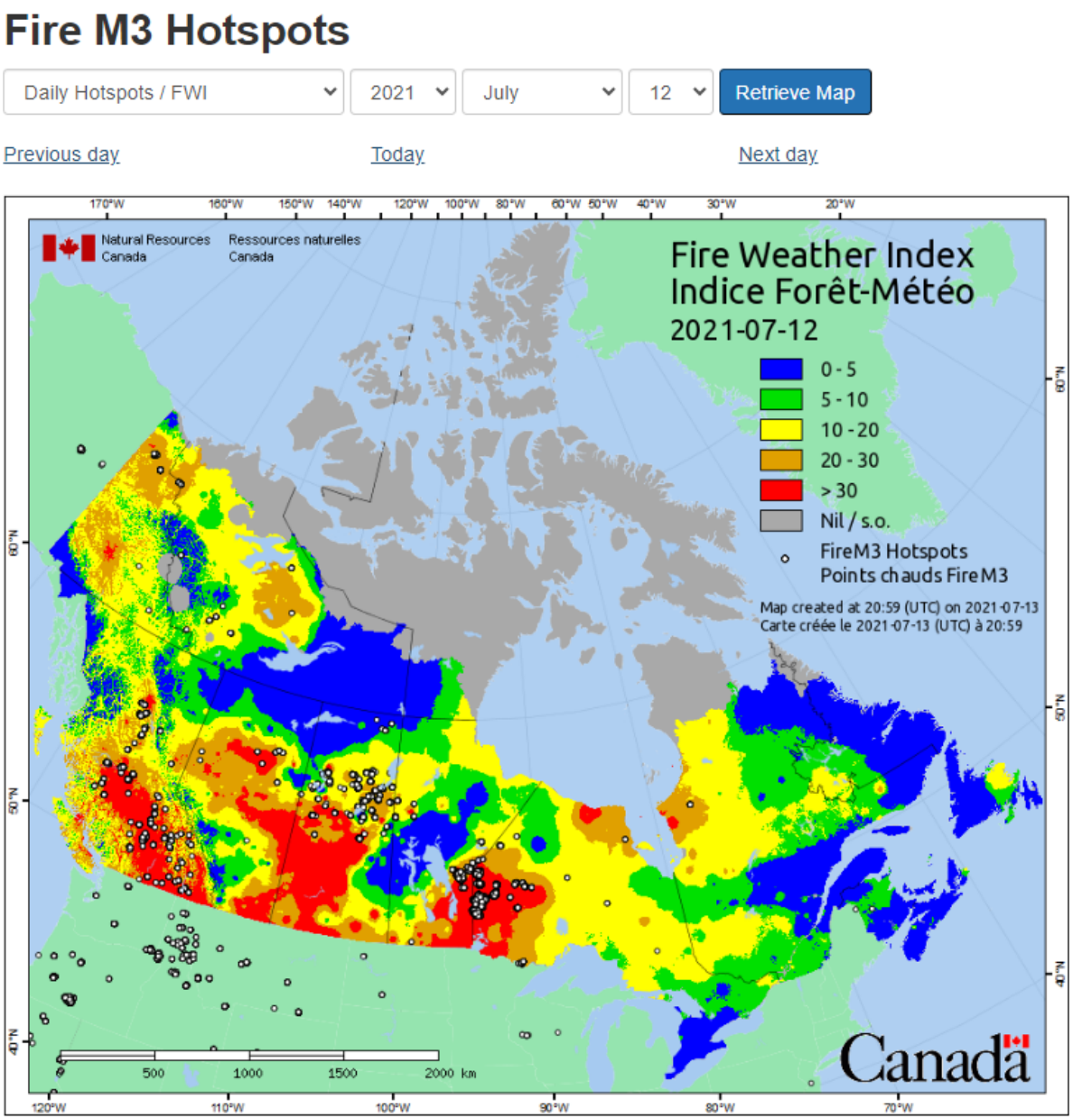


Figure A-1 – Screen shot of fire hot spot map for July 12, 2021, from the CWFIS.

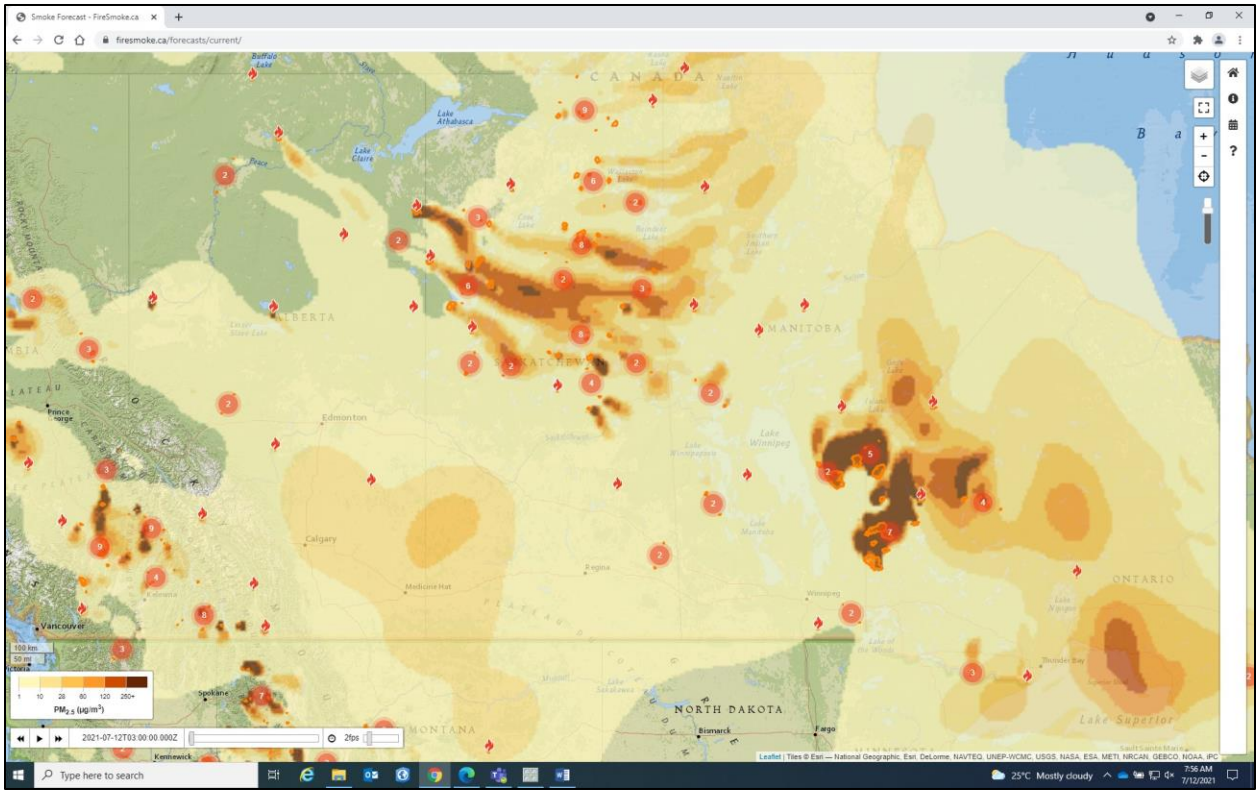


Figure A-2 - Screenshot of Smoke Forecasts for July 12, 2021, from Firesmoke.ca

With this evidence, $PM_{2.5}$ 24-hour values for July 12, 2021 reported by Buffalo Narrows and Prince Albert were removed to determine effective management levels.

Wildfire-Influenced $PM_{2.5}$ Data for 2021-2023 reporting periods

Table A-3 Wildfire influenced $PM_{2.5}$ data for Boreal Air Zone	
Buffalo Narrows NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2021/07/10	46.7
2021/07/11	96.7
2021/07/12	55.1
2021/07/14	43.6
2021/07/15	89.4
2021/07/16	103.4
2021/07/17	152.9
2021/07/18	146.5
2021/07/19	46.0
2021/07/20	32.6
2021/07/21	56.0
2021/07/22	41.0
2021/08/01	35.2
2021/08/02	62.2
2021/08/03	34.5
2021/08/04	63.1
2021/08/05	45.1
2021/08/06	28.4
2022/07/29	29.9
2022/08/21	111.2
2022/08/22	27.3
2022/08/23	30.2
2022/08/24	30.8
2022/08/25	21.2
2022/09/05	28.0
2022/09/10	19.3
2022/10/19	31.6
2023/05/10	40.7
2023/05/11	27.3
2023/05/13	85.4
2023/05/18	315.3
2023/05/19	211.3
2023/05/20	398.7
2023/05/21	327.8
2023/05/22	504.2
2023/05/23	155.6

Table A-3 Wildfire influenced $PM_{2.5}$ data for Boreal Air Zone	
Buffalo Narrows NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/05/25	21.8
2023/05/26	42.3
2023/05/27	114.0
2023/05/28	43.9
2023/05/29	106.6
2023/05/30	108.3
2023/05/31	267.1
2023/06/01	56.5
2023/06/03	19.5
2023/06/08	33.6
2023/06/09	46.2
2023/06/10	31.6
2023/06/11	50.4
2023/06/12	167.5
2023/06/13	193.9
2023/06/14	39.3
2023/06/16	26.8
2023/06/18	27.6
2023/06/26	23.7
2023/06/28	19.2
2023/07/01	37.0
2023/07/02	54.2
2023/07/08	58.5
2023/07/09	21.6
2023/07/21	42.4
2023/07/22	90.7
2023/07/23	88.3
2023/07/24	38.1
2023/07/25	49.7
2023/08/01	25.8
2023/08/02	53.0
2023/08/03	58.2
2023/08/04	23.5
2023/08/05	31.8
2023/08/06	57.0
2023/08/14	78.4

Table A-3 Wildfire influenced $PM_{2.5}$ data for Boreal Air Zone	
Buffalo Narrows NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/08/16	55.3
2023/08/18	44.8
2023/08/23	25.3
2023/08/25	20.6
2023/08/27	153.1
2023/08/28	108.7
2023/08/29	55.9
2023/08/30	44.3
2023/08/31	38.8
2023/09/01	107.5
2023/09/02	226.5
2023/09/03	260.8
2023/09/04	45.9
2023/09/07	39.2
2023/09/09	19.3
2023/09/13	55.2
2023/09/14	71.3
2023/09/15	52.4
2023/09/16	44.6
2023/09/17	28.3
2023/09/18	110.9
2023/09/21	76.9
2023/09/22	24.8
2023/09/27	19.2
2023/09/28	21.5
2023/09/29	34.0

Table A-4 Wildfire influenced $PM_{2.5}$ data for Northeast Air Zone	
Prince Albert NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2021/05/18	26.4
2021/07/10	23.8
2021/07/11	23.4
2021/07/12	39.8
2021/07/13	46.1
2021/07/14	59.2
2021/07/15	21.5
2021/07/16	117.4
2021/07/17	146.6
2021/07/18	59.6
2021/07/20	31.4
2021/07/2	55.5
2021/07/22	31.2
2021/08/02	30.9
2021/08/03	84.2
2021/08/04	37.9
2021/08/05	34.2
2021/08/06	27.8
2021/08/07	32.1
2021/10/05	94.4
2021/10/06	149.0
2021/10/08	33.3
2021/10/09	35.9
2021/10/13	45.5
2022/07/30	20.8
2022/08/23	22.5
2022/08/24	24.6
2022/08/25	27.5
2022/08/26	20.5
2022/09/05	19.4
2022/10/20	30.4
2021/05/18	25.4
2021/07/10	24.6
2021/07/11	19.8
2023/05/13	20.5
2023/05/14	29.3
2023/05/16	227.0
2023/05/17	133.7
2023/05/19	20.3

Table A-4 Wildfire influenced $PM_{2.5}$ data for Northeast Air Zone	
Prince Albert NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/05/20	101.1
2023/05/22	38.2
2023/05/23	29.0
2023/05/26	30.9
2023/05/29	21.5
2023/05/30	79.2
2023/05/31	35.5
2023/06/08	38.5
2023/06/09	31.8
2023/06/10	20.5
2023/06/12	106.3
2023/06/13	151.2
2023/06/14	25.1
2023/06/16	19.8
2023/06/17	19.3
2023/06/25	34.7
2023/06/26	19.7
2023/06/29	23.1
2023/06/30	23.0
2023/07/03	19.8
2023/07/09	21.9
2023/07/13	23.9
2023/07/17	20.0
2023/07/18	23.8
2023/07/19	21.3
2023/07/20	25.6
2023/07/21	28.1
2023/07/22	48.2
2023/07/25	36.8
2023/08/02	25.6
2023/08/03	55.6
2023/08/04	26.4
2023/08/05	33.5
2023/08/06	54.8
2023/08/07	41.4
2023/08/14	28.2
2023/08/15	110.6
2023/08/16	21.1
2023/08/19	27.7

Table A-4 Wildfire influenced $PM_{2.5}$ data for Northeast Air Zone	
Prince Albert NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/08/21	22.1
2023/08/22	21.2
2023/08/25	19.3
2023/08/27	45.2
2023/08/28	64.8
2023/08/29	88.3
2023/08/30	52.7
2023/08/31	20.2
2023/09/01	98.1
2023/09/02	93.8
2023/09/03	353.6
2023/09/04	171.4
2023/09/06	26.8
2023/09/07	32.3
2023/09/08	23.0
2023/09/13	50.1
2023/09/14	26.0
2023/09/15	65.9
2023/09/16	38.4
2023/09/17	24.5
2023/09/18	59.1
2023/09/19	28.2
2023/09/20	21.2
2023/09/21	23.8
2023/09/22	26.1

Table A-5 Wildfire Influenced $PM_{2.5}$ Data for Great Plains Air Zone	
Regina NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2021/07/13	27.3
2021/07/14	32.2
2021/07/15	21.7
2021/07/16	20.1
2021/07/18	24.8
2021/07/19	39.0
2021/07/20	39.1
2021/07/21	36.8
2021/07/22	25.0
2021/07/23	28.7
2021/07/27	22.7
2021/08/01	22.4
2021/08/02	23.5
2021/08/03	59.6
2021/08/04	38.3
2021/08/05	57.1
2021/08/06	42.9
2021/08/07	39.9
2021/08/15	21.1
2021/08/16	50.7
2022/08/24	53.5
2022/08/25	51.9
2022/09/05	20.3
2022/09/05	23.4
2022/10/19	23.1
2022/10/20	20.8
2021/07/13	22.3
2021/07/14	29.5
2021/07/15	25.6
2023/05/17	215.6
2023/05/20	29.4
2023/05/22	27.2
2023/06/09	38.4
2023/06/14	29.3
2023/06/16	22.7
2023/06/17	21.7

Table A-5 Wildfire Influenced $PM_{2.5}$ Data for Great Plains Air Zone	
Regina NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/06/30	35.7
2023/07/03	32.7
2023/07/09	37.7
2023/07/13	33.9
2023/07/14	75.5
2023/07/15	31.9
2023/07/20	22.6
2023/07/21	26.6
2023/07/22	36.0
2023/07/23	32.8
2023/07/24	27.6
2023/08/04	22.4
2023/08/06	56.8
2023/08/07	60.3
2023/08/08	24.0
2023/08/15	34.7
2023/08/18	28.3
2023/08/19	21.0
2023/08/20	22.6
2023/08/21	21.6
2023/08/22	19.0
2023/08/24	19.4
2023/08/27	31.8
2023/08/28	74.1
2023/08/29	68.8
2023/08/30	60.0
2023/09/01	59.9
2023/09/02	81.8
2023/09/03	107.8
2023/09/04	176.0
2023/09/05	38.2
2023/09/06	58.0
2023/09/07	40.7
2023/09/08	20.2
2023/09/10	21.7
2023/09/14	35.8

Table A-5 Wildfire Influenced $PM_{2.5}$ Data for Great Plains Air Zone	
Regina NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/09/15	72.0
2023/09/16	69.4
2023/09/17	26.6
2023/09/18	49.0
2023/09/19	66.7
2023/09/20	24.5
2023/09/21	27.7
2023/09/22	31.9
2023/09/25	22.0

Table A-6 Wildfire influenced $PM_{2.5}$ data for Western Yellowhead Air Zone	
Saskatoon NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2021/07/13	40.0
2021/07/14	31.0
2021/07/15	24.9
2021/07/16	129.1
2021/07/17	124.5
2021/07/18	74.1
2021/07/20	26.8
2021/07/21	36.0
2021/07/22	26.9
2021/07/23	24.2
2021/07/30	23.6
2021/08/01	21.7
2021/08/02	31.8
2021/08/03	37.7
2021/08/04	38.9
2021/08/05	42.1
2021/08/06	34.1
2021/08/07	31.6
2021/10/05	99.7
2021/10/06	55.9
2021/10/07	23.9
2021/10/08	23.6
2021/10/14	34.9
2022/07/30	37.9
2022/07/31	23.3
2022/08/19	21.5
2022/08/22	36.1
2022/08/23	29.9
2022/08/24	43.1
2022/08/25	43.5
2022/08/26	19.0
2022/09/04	36.2
2022/09/05	42.3
2022/09/06	23.4
2022/09/07	28.9
2022/09/11	27.3
2022/09/12	25.6
2022/10/03	21.1

Table A-6 Wildfire influenced $PM_{2.5}$ data for Western Yellowhead Air Zone	
Saskatoon NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2022/10/04	28.8
2022/10/08	23.0
2022/10/09	33.2
2022/10/10	23.8
2022/10/19	44.9
2022/10/20	32.3
2023/05/13	21.5
2023/05/16	97.9
2023/05/17	137.8
2023/05/20	104.6
2023/05/21	23.3
2023/05/22	38.4
2023/05/23	33.4
2023/05/26	24.6
2023/05/30	42.8
2023/06/02	19.7
2023/06/08	32.1
2023/06/09	60.3
2023/06/10	21.1
2023/06/12	55.4
2023/06/13	130.7
2023/06/14	31.0
2023/06/16	37.5
2023/06/17	21.8
2023/06/26	22.2
2023/06/30	27.1
2023/07/03	22.8
2023/07/06	25.2
2023/07/09	40.5
2023/07/13	56.1
2023/07/14	62.5
2023/07/15	44.7
2023/07/16	19.5
2023/07/19	23.1
2023/07/20	30.0
2023/07/21	29.8
2023/07/22	33.2
2023/07/23	48.4

Table A-6 Wildfire influenced $PM_{2.5}$ data for Western Yellowhead Air Zone	
Saskatoon NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/07/24	37.2
2023/07/25	29.9
2023/08/03	22.3
2023/08/04	27.0
2023/08/05	21.1
2023/08/06	39.0
2023/08/07	30.9
2023/08/08	22.2
2023/08/15	90.1
2023/08/21	24.0
2023/08/27	33.1
2023/08/28	48.0
2023/08/29	48.9
2023/08/30	55.8
2023/09/01	112.9
2023/09/02	105.2
2023/09/03	270.0
2023/09/04	175.1
2023/09/06	32.6
2023/09/07	22.8
2023/09/13	36.9
2023/09/14	28.2
2023/09/15	39.8
2023/09/16	46.6
2023/09/18	75.0
2023/09/19	31.5
2023/09/21	23.8
2023/09/22	20.6

Table A-7 Wildfire influenced $PM_{2.5}$ data for Southeast Saskatchewan Air Zone	
Estevan NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2021/05/20	35.1
2021/05/21	24.4
2021/07/14	28.4
2021/07/19	45.4
2021/07/20	25.8
2021/07/23	22.1
2021/07/24	24.9
2021/07/25	25.2
2021/08/15	30.2
2021/08/16	81.7
2021/08/17	30.9
2021/10/02	62.8
2021/10/03	34.8
2021/10/05	23.2
2021/10/06	21.0
2021/10/07	55.9
2021/10/08	58.2
2022/08/24	21.2
2022/08/25	19.8
2022/09/07	21.3
2022/10/19	20.7
2022/10/20	22.4
2023/05/17	186.2
2023/05/18	20.2
2023/05/20	25.0
2023/05/22	23.5
2023/05/23	27.1
2023/06/17	20.5
2023/06/29	28.9
2023/06/30	40.5
2023/07/03	27.7
2023/07/09	27.1
2023/07/14	101.3
2023/07/15	46.0
2023/07/16	22.3
2023/07/21	26.5
2023/07/22	33.0
2023/07/23	26.2
2023/07/24	23.3
2023/08/06	48.6
2023/08/07	75.4

Table A-7 Wildfire influenced $PM_{2.5}$ data for Southeast Saskatchewan Air Zone	
Estevan NAPS Station	
Date	**PM2.5 24-hour (micrograms/cubic metre)**
2023/08/08	39.5
2023/08/18	25.4
2023/08/27	20.8
2023/08/28	58.1
2023/08/29	76.6
2023/08/30	59.7
2023/09/01	41.5
2023/09/02	23.6
2023/09/03	88.4
2023/09/04	83.9
2023/09/05	62.5
2023/09/06	34.8
2023/09/07	58.4
2023/09/08	20.3
2023/09/09	21.1
2023/09/15	76.2
2023/09/16	43.6
2023/09/17	20.9
2023/09/18	23.5
2023/09/19	51.9
2023/09/20	20.6
2023/09/21	25.0
2023/09/22	25.6

Table A-8 Wildfire influenced $PM_{2.5}$ data for Grasslands Air Zone	
Swift Current NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre**
2021/07/15	26.2
2021/07/16	100.7
2021/07/17	46.3
2021/07/18	42.3
2021/07/19	24.5
2021/07/20	29.6
2021/07/21	24.8
2021/07/22	23.2
2021/07/23	36.6
2021/07/24	34.4
2021/07/25	26.9
2021/07/27	25.7
2021/07/30	25.3
2021/07/31	20.0
2021/08/01	27.3
2021/08/02	27.5
2021/08/03	34.5
2021/08/04	32.9
2021/08/05	29.8
2021/08/06	30.7
2021/08/07	35.7
2021/08/15	51.7
2021/08/16	63.0
2021/10/06	24.5
2021/10/07	33.8
2022/08/24	20.2
2022/09/04	54.1
2022/09/05	28.1
2002/09/07	19.5
2022/09/12	31.4
2022/10/19	24.5
2022/10/20	21.8
2023/05/16	24.8
2023/05/17	150.6
2023/05/18	27.0
2023/05/19	19.3
2023/05/20	154.3
2023/05/21	82.0
2023/05/22	40.1
2023/05/24	20.8

Table A-8 Wildfire influenced $PM_{2.5}$ data for Grasslands Air Zone	
Swift Current NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic metre)**
2023/06/02	27.1
2023/06/09	40.7
2023/06/10	25.8
2023/06/16	36.9
2023/06/17	20.0
2023/07/03	33.8
2023/07/07	29.5
2023/07/08	24.8
2023/07/09	30.5
2023/07/10	26.7
2023/07/13	39.0
2023/07/14	147.1
2023/07/15	157.2
2023/07/16	65.2
2023/07/17	24.3
2023/07/20	19.9
2023/07/21	21.6
2023/07/22	26.3
2023/07/23	23.3
2023/08/04	24.4
2023/08/06	92.7
2023/08/07	67.8
2023/08/08	22.2
2023/08/17	24.0
2023/08/18	38.7
2023/08/21	20.0
2023/08/27	25.5
2023/08/28	52.2
2023/08/29	49.2
2023/08/30	21.0
2023/09/01	46.8
2023/09/02	75.0
2023/09/03	68.3
2023/09/04	204.7
2023/09/05	47.3
2023/09/06	58.0
2023/09/07	21.6
2023/09/14	22.2
2023/09/18	26.3