Saskatchewan Air Zones Report

Meeting the Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone 2016-18

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1.0 Summary

This report describes Saskatchewan's achievement of the Canadian Ambient Air Quality Standards (CAAQS) for ground-level ozone and fine particulates ($PM_{2.5}$) for the 2016-18 reporting period, the associated management levels, and recent and future actions designed to improve air quality in Saskatchewan. The CAAQS are national air quality standards intended to protect human health and the environment. This report satisfies Saskatchewan's commitment to the Canadian Council of Ministers of the Environment's (CCME) Air Quality Management System (AQMS) for the monitoring and reporting to the public on air quality. Additional pollutants will be included in future reporting.

The CAAQS for fine particulates were achieved for all of Saskatchewan's six air zones after data influenced by transboundary flows and exceptional events were removed. During this reporting period, smoke from wildfires in Saskatchewan and surrounding jurisdictions significantly influenced ambient fine particulate concentrations in the province and would have resulted in three of the air zones exceeding the 24-hour CAAQS for fine particulates. The CAAQS for ozone were achieved in all six air zones without the need to consider transboundary flows or exceptional events.

The colour-coded management levels for ozone and $PM_{2.5}$ are presented for each air zone in Table 1. The assigned management levels for each air zone are based on the calculated metric values, which are determined through statistical analysis of all data collected from each representative air monitoring station after removal of transboundary flows or exceptional events. The colour code for each management level is associated with progressively more rigorous actions, such as air pollutant source management, as the air quality comes closer to exceeding the CAAQS. Air zone management levels and their threshold values are provided in Section 2.4.

TABLE 1 - 2016-2018 CAAQS AIR ZONE MANAGEMENT LEVELS

Air Zone	$PM_{2.5}$ Management Level	Ozone Management Level
Great Plains	Actions for Preventing Air Quality Deterioration	Actions for Preventing CAAQS Exceedances
Northeast	Actions for Preventing CAAQS Exceedances	Actions for Preventing Air Quality Deterioration
Southeast Saskatchewan	Actions for Preventing Air Quality Deterioration	Actions for Preventing CAAQS Exceedances
Grasslands	Actions for Preventing CAAQS Exceedances	Actions for Keeping Clean Air Clean
Boreal	Actions for Preventing Air Quality Deterioration	Actions for Preventing Air Quality Deterioration
Western Yellowhead	Actions for Preventing CAAQS Exceedances	Actions for Preventing Air Quality Deterioration

Legend:

Red	Actions for Achieving CAAQS	Orange	Actions for Preventing CAAQS Exceedances
Yellow	Actions for Preventing Air Quality Deterioration	Green	Actions for Keeping Clean Air Clean

The following are some of the important provincial actions that have been or will be taken to protect air quality and prevent CAAQS exceedances:

- In 2018 and 2019, the Government of Saskatchewan enacted legislation to reduce greenhouse gas emissions, including methane. This legislation will reduce methane emissions and emissions from electricity production. This should also result in a reduction in ground level ozone, as methane in the air can lead to ozone formation.

- The Government of Saskatchewan will review air quality trends to identify issues, with a specific focus on the orange management-level air zones.
- The Government of Saskatchewan will improve its collaborative efforts with air zone associations to identify and assess air quality issues.

Additional provincial and air zone-specific actions are provided in Table 6.

2.0 Background

2.1 The Air Quality Management System

The Air Quality Management System (AQMS) was established in October 2012 by the Canadian Council of Ministers of the Environment (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 the implementation of, and improve the AQMS. More information on the AQMS can be found on the CCME website: https://www.ccme.ca/en/resources/air/aqms.html. The driver for the AQMS is the Canadian Ambient Air Quality Standards (CAAQS). Figure 1 provides a visual representation of the AQMS elements. As part of its commitment to the AQMS, the province established Saskatchewan air zones and reports to the public on air quality.

FIGURE 1 – AQMS ELEMENTS

2.2 The Canadian Ambient Air Quality Standards

The Canadian Ambient Air Quality Standards (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 CCME. Table 2 shows the current and future CAAQS for fine particulates ($PM_{2.5}$) and ozone and their respective metrics. The 2015 CAAQS, which were used for assessment purposes, include standards for ozone and fine particulates. The 2020 CAAQS for sulphur dioxide (SO_2) and nitrogen dioxide (NO_2) will be implemented for the 2018-2020 reporting period in Saskatchewan. The standards include metric values for averaging periods to account for varying exposures that may result in acute (short-term) and chronic (long-term) effects.

TABLE 2 - 2015 AND 2020 CAAQS

Pollutant	Averaging Time	Standard		Metric
		2015	2020	
$PM_{2.5}$	24-hour	28 micrograms/cubic meter	27 micrograms/cubic meter	The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations
$PM_{2.5}$	Annual	10.0 micrograms/cubic meter	8.8 micrograms/cubic meter	The 3-year average of the annual average of the daily 24-hour average concentrations
Ozone	8-hour	63 parts per billion	62 parts per billion	The 3-year average of the annual 4th highest daily maximum 8-hour average concentrations
SO_2	1-hour	-	70 parts per billion	The 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average concentrations
SO_2	Annual	-	5.0 parts per billion	The average over a single calendar year of all 1-hour average SO_2 concentrations
NO_2	1-Hour	-	60 parts per billion	The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations
NO_2	Annual	-	17.0 parts per billion	The average over a single calendar year of all 1-hour average concentrations

*There are no standards for NO_2 and SO_2 in the 2015 CAAQS

2.3 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 taking action on air quality issues. There are six air zones identified in Saskatchewan, each of which has at least one CAAQS reporting station, as seen in Figure 2.

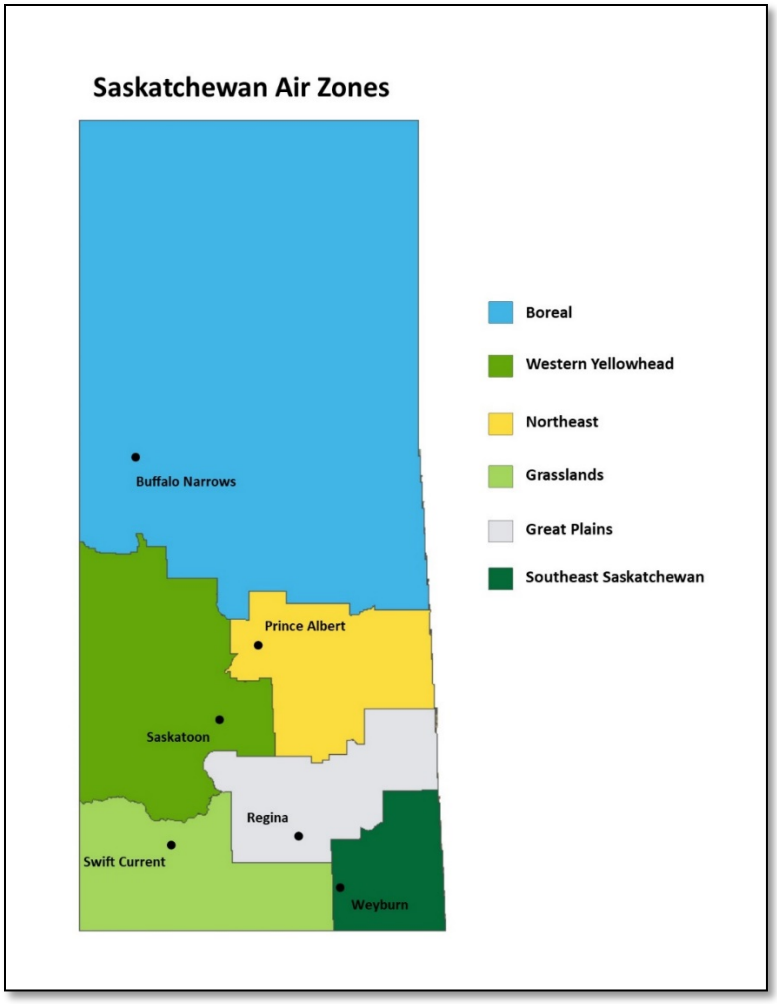

FIGURE 2 - SASKATCHEWAN AIR ZONES AND CAAQS REPORTING STATIONS FOR 2016-2018

2.4 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 Table 3.

TABLE 3: 2015 MANAGEMENT LEVELS

Management Level	**$PM_{2.5}$ 24-hour** micrograms/cubic meter	**$PM_{2.5}$ Annual** micrograms/cubic meter	**Ozone 8-hour** parts per billion
Red	Actions for Achieving CAAQS		
	>28	>10.0	>63
Orange	Actions for Preventing CAAQS Exceedances		
	20 to 28	6.5 to 10.0	57 to 63
Yellow	Actions for Preventing Air Quality Deterioration		
	11 to 19	4.1 to 6.4	51 to 56
Green	Actions for Keeping Clean Air Clean		
	≤10	≤4.0	≤50

Each management level has associated actions. The *Guidance Document on Air Zone Management (CCME, 2019)* suggests that 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:

- ensuring 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.

2.5 Transboundary Flows and Exceptional Events

The ambient pollutant concentrations measured at a monitoring station may be the total of $PM_{2.5}$ and ozone from local, human-made sources and from other origins. Two of these other origins are transboundary flows and exceptional events. Transboundary flows are air pollutants that originate in one province or country and are transported by air flows to another.

Exceptional events include:

- unintentional forest fires and other natural sources within or outside Canada;
- prescribed forest fires intentionally ignited for safety or management purposes and which are conducted according to best smoke management practices;
- events caused by human activities that are not reasonably controllable or preventable and are unlikely to reoccur or are infrequent over the three-year reporting period; and
- natural sources in which human activity plays little or no direct role.

Wildfires are considered exceptional events and Saskatchewan is susceptible to wildfire smoke impacts.

3.0 CAAQS Assessment Methodology

3.1 Saskatchewan CAAQS reporting stations for 2016-2018

Saskatchewan CAAQS achievement reporting is accomplished using monitoring data from the National Air Pollution Surveillance (NAPS), provincial and air zone association ambient air quality monitoring programs. The NAPS program is a collaborative air quality monitoring network jointly operated and maintained by the provinces, territories and Environment and Climate Change Canada. The NAPS ambient air monitoring program is operated by the provincial government in Saskatchewan and provides accurate, long-term air quality data. Air zone association monitoring provides additional data in areas not monitored by the NAPS and provincial monitoring programs. Based on data availability in the 2016-2018 reporting period, the following air quality stations were used to calculate the CAAQS metric values:

- **Boreal**– Provincial (2016-2017)/NAPS (2018) monitoring station, Buffalo Narrows
- **Western Yellowhead** – NAPS monitoring station, Saskatoon
- **Grasslands** – NAPS monitoring station, Swift Current
- **Southeast Saskatchewan** –Southeast Saskatchewan Airshed Association monitoring station, Weyburn
- **Great Plains** – NAPS monitoring station, Regina
- **Northeast** – NAPS monitoring station, Prince Albert

All ambient air monitoring equipment at these reporting stations met the instrumentation quality requirements for CAAQS reporting except for the fine particulate monitor at the Weyburn station. For future reports, the Estevan station will be used to represent Southeast Saskatchewan as this station was added to the NAPS network in 2017. All the ambient air monitoring equipment in Saskatchewan's NAPS network meets the instrumentation quality requirements for CAAQS reporting.

3.2 Achievement Assessment

Data from the six reporting stations is assessed for completeness and used to calculate the metric values as specified in the *Guidance Document on Air Zone Managem*ent (CCME, 2019). The CAAQS standards are provided in Table 2, in Section 2.2.

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 above the standard.

3.3 Management Levels Assignment

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 A. 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 that the province can influence.

4.0 Results

4.1 Fine Particulate 24-hour and Annual Metrics

Wildfire smoke was the largest contributor to fine particulates ($PM_{2.5}$) in the 2016-2018 reporting period.

Before the removal of TF/EE influenced data:

- all six air zones achieved the $PM_{2.5}$ annual standard of 10.0 micrograms/cubic meter
- three air zones achieved the $PM_{2.5}$ 24-hour standard of 28 micrograms per cubic meter - Great Plains, Northeast and Southeast Saskatchewan
- three air zones exceeded the $PM_{2.5}$ 24-hour standard of 28 micrograms/cubic meter – Grasslands, Boreal and Western Yellowhead

After the removal of data influenced by transboundary flows and exceptional events, the resulting adjusted metric values met the $PM_{2.5}$ 24-hour CAAQS in all six air zones.

Table 4 presents each air zone's 2016-2018 $PM_{2.5}$ actual metric values, their adjusted metric values and their associated $PM_{2.5}$ Management Level. Since there are two CAAQS averaging periods for $PM_{2.5}$ (24-hour and annual), the final management level is the most stringent of the two adjusted levels.

TABLE 4 – $PM_{2.5}$ CAAQS RESULTS

Air Zone	Station	# of Valid Years	PM 2.5 24-hour micrograms/cubic meter		PM 2.5 Annual micrograms/cubic meter		$PM_{2.5}$ Air Zone Management Level
			Actual	Adjusted	Actual	Adjusted	
Great Plains	Regina	3	24	15	7.1	6.1	Yellow
Northeast	Prince Albert	3	25	16	7.9	6.7	Orange
Southeast Saskatchewan	Weyburn	3	18	14	4.7	4.3	Yellow

Grasslands	Swift Current	2	36	15	8.9	6.7	Orange
Boreal	Buffalo Narrows	2	30	13	5.0	3.8	Yellow
Western Yellowhead	Saskatoon	3	33	17	8.8	7.4	Orange

4.2 Ozone Metric

All air zones achieved the ozone eight-hour standard of 63 parts per billion. Since all air zones achieved the CAAQS, transboundary flow and exceptional events were not evaluated to assign management levels.

Table 5 presents the 2016-2018 ozone metric values for each air zone and their associated management level.

TABLE 5 – OZONE CAAQS RESULTS

Air Zone	**Station**	**# of Valid Years**	**Ozone 8-hr Metric** parts per billion	**Ozone Air Zone Management Level**
Great Plains	Regina	3	58	Orange
Northeast	Prince Albert	3	51	Yellow
Southeast Saskatchewan	Weyburn	3	57	Orange
Grasslands	Swift Current	3	50	Green
Boreal	Buffalo Narrows	3	54	Yellow
Western Yellowhead	Saskatoon	3	56	Yellow

4.3 CAAQS Management Levels

Maps of the effective management levels in Saskatchewan during the 2016-2018 reporting period are provided in Figure 3.

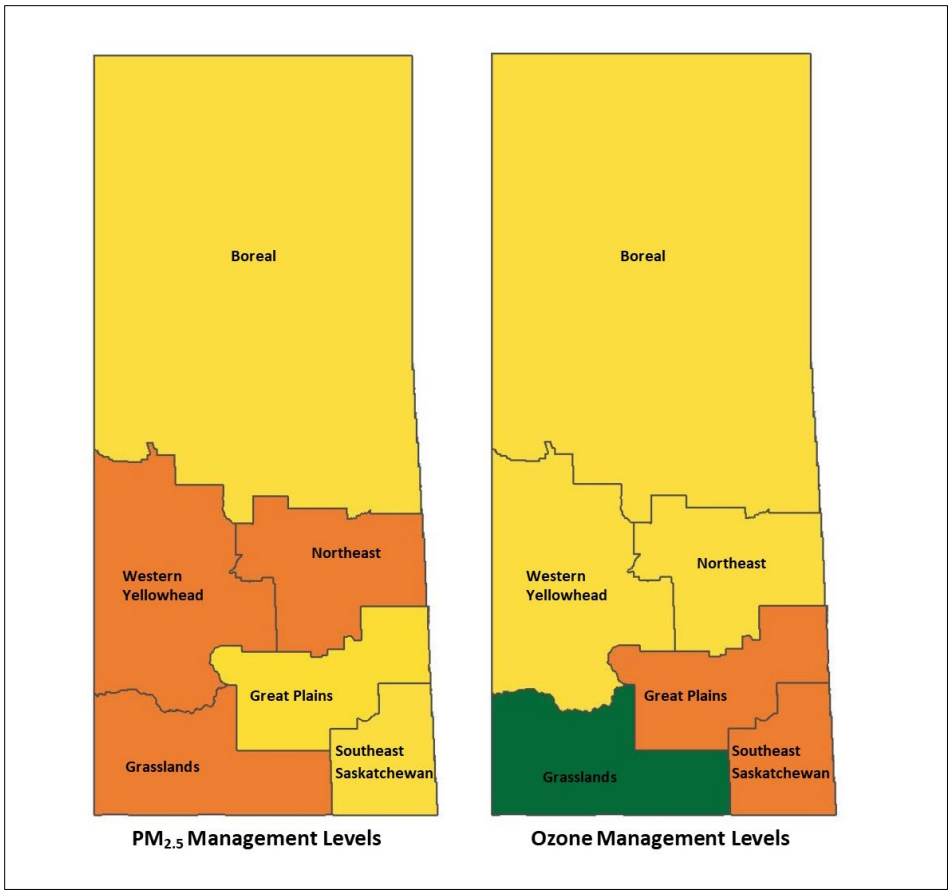

FIGURE 3 – AIR ZONE MANAGEMENT LEVELS

For fine particulates ($PM_{2.5}$), three air zones were assigned the orange management level and three air zones were assigned the yellow management level. The air zones that were in the orange management level for $PM_{2.5}$ had adjusted metric values that fell in the lower range of values captured by the orange management level.

For ozone, two of the air zones were assigned the orange management level, three of the air zones were assigned the yellow management level, and one was assigned the green management. The air zones that were in the orange management level for ozone had metric values that fell in the lower range of values captured by the orange management level.

5.0 Air Zone Management Plan

Saskatchewan's air zone management plan is provided in Table 6. 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.

TABLE 6 - PROVINCIAL AND AIR ZONE MANAGEMENT PLAN

	Current Reporting Period Management Levels (2016-2018)		Action	Action Category	Status
	$PM_{2.5}$	Ozone			
Saskatchewan	Yellow and Orange	Green, Yellow, and Orange	In January 2019, the Government of Saskatchewan adopted *The Oil and Gas Emissions Management Regulations.* This regulation will lead to an annual reduction of flared and vented methane emissions of 40 to 45 per cent by 2025. The reduction in methane emissions should result in a reduction in ground level ozone as methane can lead to the formation of ozone.	Actions to be undertaken by governments and stakeholders to reduce emissions with short, medium and long-term milestones and targets	Regulations adopted 2019
			In January 2018, the Government of Saskatchewan adopted *The Management and Reduction of Greenhouse Gases (General and Electricity Producer) Regulations.* This is anticipated to lead to 40 per cent emissions reduction of greenhouse gases from electricity generation by 2030. The reduction 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.	Actions to be undertaken by governments and stakeholders to reduce emissions with short, medium and long-term milestones and targets	Regulations adopted 2018
			The Government of Saskatchewan will review air quality trends to identify any air quality deterioration concerns, with a specific focus on the orange management level zones.	Monitor Air Quality	2020-2021
			The Government of Saskatchewan will improve its collaborative efforts with air zone associations.	Stakeholder Engagement	2020-2021
			The Government of Saskatchewan will evaluate the potential to use air zone association data in CAAQS reporting.	Characterizing Air Pollutant Concentrations in Air Zones	2020-2021
			The Government of Saskatchewan will evaluate if the transboundary flows and exceptional events removal methodology is effective in determining adjusted values.	Characterizing Air Pollutant Concentrations in Air Zones	Ongoing

Great Plains	Yellow	Orange	The Great Plains Air Zone Association has improved its ambient air monitoring data quality by constructing a new ambient air monitoring station, with updated instrumentation, in east Regina. It has also improved spatial representation of the air zone by the establishment of monitoring stations in Pense and Yorkton.	Characterizing Air Pollutant Concentrations in Air Zones	East Regina Operational May 2018 Pense and Yorkton Stations Operational 2017
			The Government of Saskatchewan will engage the air zone association to collaboratively identify air quality issues related to ozone with a focus on evaluating and assessing existing data.	Stakeholder Engagement	2020-2021
Northeast	Orange	Yellow	The Government of Saskatchewan will complete an ambient air monitoring gap analysis and identify a representative amount of locations to temporarily monitor for $PM_{2.5}$, ozone, NO_2 and SO_2, using its mobile air quality station(s).	Characterizing Air Pollutant Concentrations in Air Zones	2021-2022
			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	2020-2021
Southeast Saskatchewan	Yellow	Orange	An existing industry ambient air monitoring station in Estevan was added to the NAPS network. This will ensure that data quality for this air zone will meet AQMS requirements for reporting.	Characterizing Air Pollutant Concentrations in Air Zones	Fall 2017
			The Government of Saskatchewan will engage the air zone association to collaboratively identify air quality issues related to ozone with a focus on evaluating and assessing existing data.	Stakeholder Engagement	2020-2021
Grasslands	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	2020-2021
			The Government of Saskatchewan will complete an ambient air monitoring gap analysis and identify a representative amount of locations to temporarily monitor for $PM_{2.5}$, ozone, NO_2 and SO_2, using its mobile air quality station(s).	Characterizing Air Pollutant Concentrations in Air Zones	2020-2021
			The Government will assess if the operation of an air zone association in this air zone could help to prevent air quality deterioration.	Stakeholder Engagement	2020-2021

Boreal	Yellow	Yellow	The provincial monitoring station in Buffalo Narrows was added to the NAPS network. This will ensure that 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	Yellow	The Government of Saskatchewan will engage the air zone association to collaboratively identify air quality issues related to ozone and $PM_{2.5,}$ with a focus on evaluating and assessing existing data.	Stakeholder Engagement and Characterizing Air Pollutant Concentrations in Air Zones	2020-2021

The $PM_{2.5}$ data collected to represent Southeast Saskatchewan does not meet instrumentation quality requirements for CAAQS reporting, which means that widely impactful policy decisions should not necessarily be made based solely on this data. For the purposes of reporting the 2016-2018 results, the $PM_{2.5}$ data from Weyburn was used as an indicator to address air quality issues. The management actions that have been developed for the Southeast air zone are appropriate for the data source.

6.0 Conclusion

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

Saskatchewan's ambient air monitoring data is available to the public, so that residents have the information they need to make good decisions about their activities. 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

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;
- Satellite imagery of wildfire smoke from NASA Worldview; and
- Smoke forecasts provided by BlueSky Canada, a collaboration between British Columbia, Alberta and the federal government.

$PM_{2.5}$ 24-hour metric 2016-2018 TF/EE Assessment

TABLE A-1 SUMMARY OF NOTABLE WILDFIRES THAT INFLUENCED SASKATCHEWAN $PM_{2.5}$ CONCENTRATIONS

Date Discovered	Size (ha)	Geographic Location	Description
May 1, 2016	590, 000	Horse River, Alberta	First discovered 7km outside Fort McMurray. Deemed "under control" July 4, 2016
July 7, 2017	850,520	Various locations in British Columbia	Includes the Plateau, Hanceville, West Chilcotin and Central Cariboo complexes
August 29, 2017	~	Northeastern Saskatchewan	Includes Granite, Preston and Wilkin fires
May 13, 2018	~	Saskatchewan	Forest and grass fires
July 31, 2018	1,354,284	British Columbia	Large fires in all BC fire centres
October 24, 2018	~	Saskatchewan	Southern half of province

~ Means that the data was not provided in the sources used to compile this table

$PM_{2.5}$ 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 May 5, 2016, all valid monitoring stations reported $PM_{2.5}$ concentrations that were greater than the orange management threshold value of 19 micrograms/cubic meter.

TABLE A-2

Date	Buffalo Narrows ($PM_{2.5}$ 24-hr)	Prince Albert ($PM_{2.5}$ 24-hr)	Regina ($PM_{2.5}$ 24-hr)	Saskatoon ($PM_{2.5}$ 24-hr)	(Weyburn) ($PM_{2.5}$ 24-hr)	Swift Current ($PM_{2.5}$ 24-hr)
May 5, 2016	62.5	22.7	23.6	27.0	No data available	34.8

* Data listed is in micrograms/cubic meter

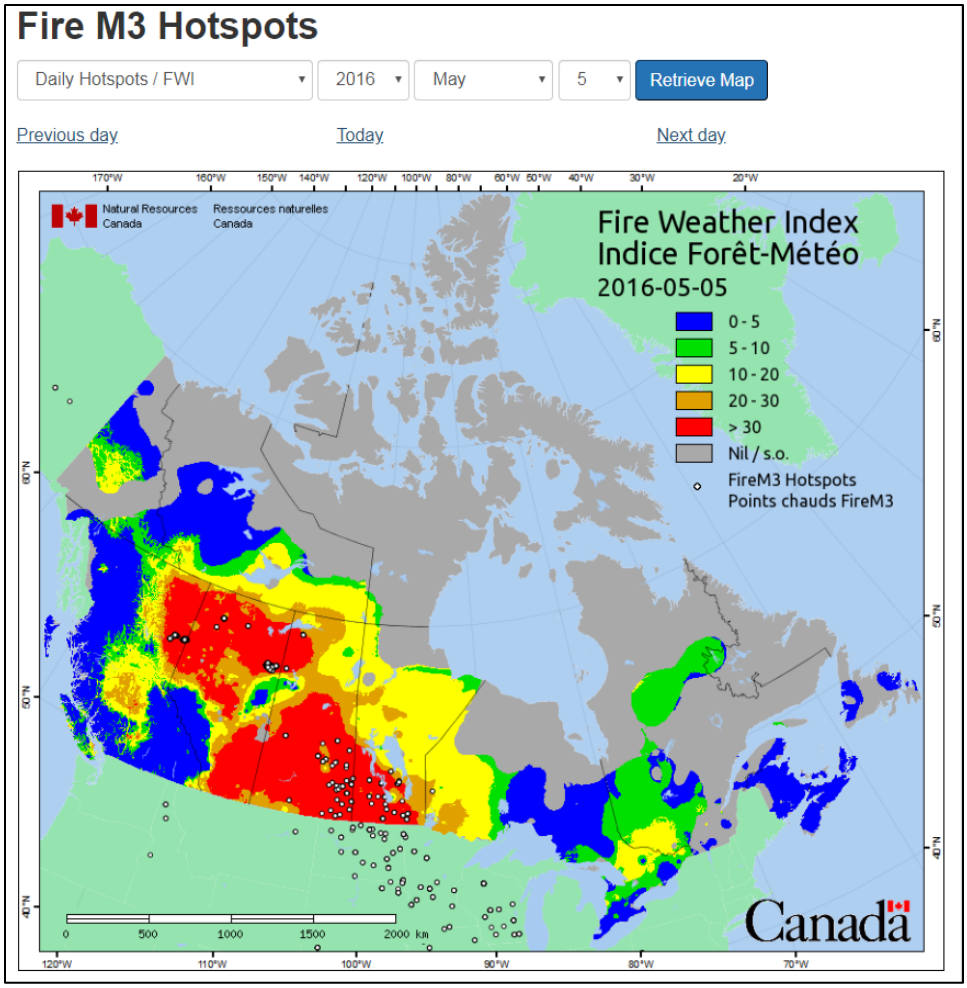

FIGURE A-1 MAP OF FIRE HOT SPOTS FOR MAY 5, 2016 FROM THE CWFIS.

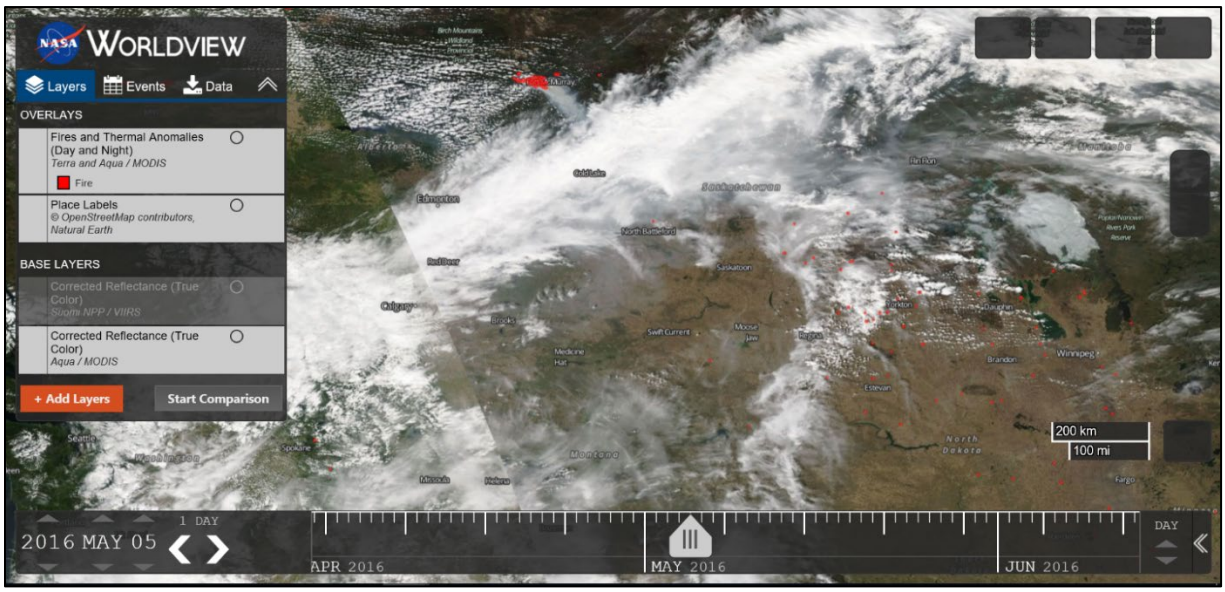

FIGURE A-2 SATELLITE IMAGES MAY 5, 2016 FROM NASA WORLDVIEW. It shows wildfire smoke (grey plumes) over Saskatchewan and fires/thermal anomalies (red dots)

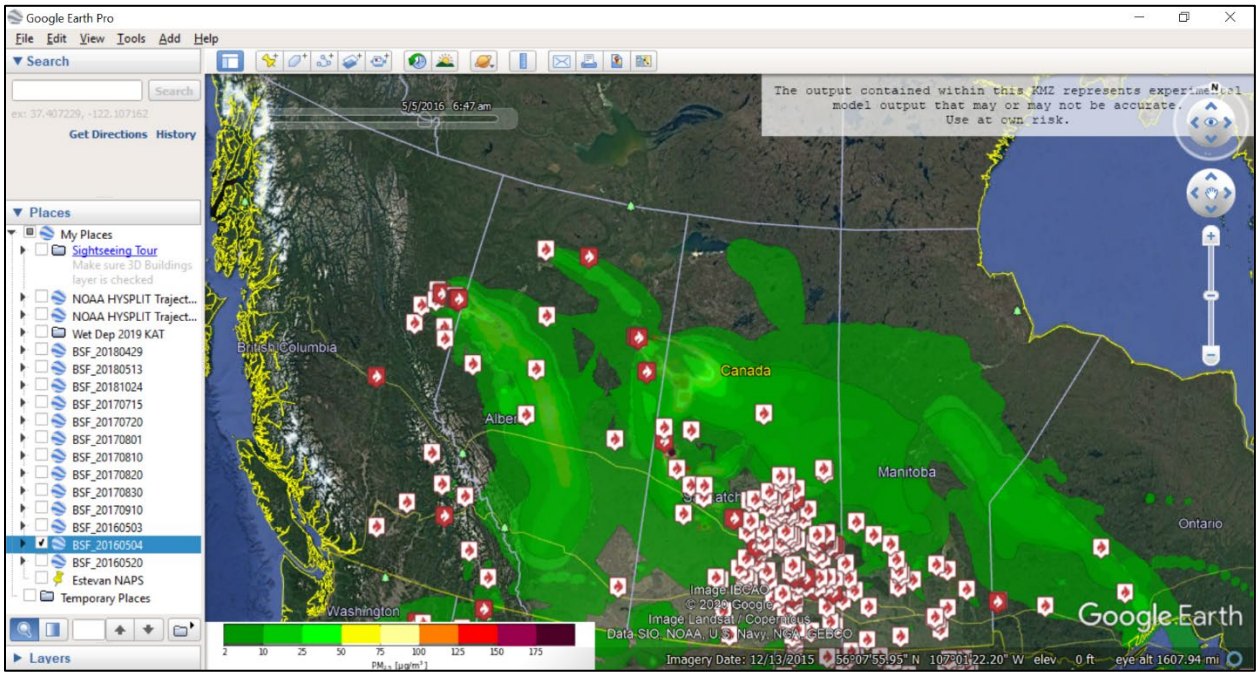

FIGURE A-3 SCREENSHOT OF SMOKE FORECASTS FOR MAY 5, 2016 FROM FIRESMOKE.CA

With this evidence, $PM_{2.5}$ 24-hour values for May 5, 2016 were removed to determine effective management levels.

Wildfire-Influenced $PM_{2.5}$ Data for 2016-2018 reporting period

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 meter)**
5/4/2016	23.2
5/5/2016	62.5
5/6/2016	60.1
5/7/2016	22.6
5/8/2016	38.2
5/9/2016	23.9
5/13/2016	57.2
5/14/2016	43.2
5/15/2016	42.3
5/16/2016	19.9
5/18/2016	41.2
8/30/2017	23.1
8/31/2017	20.9
9/8/2017	49.6
9/9/2017	32.2
9/19/2017	21.1
5/20/2018	21.9
5/23/2018	25.3
5/24/2018	33.4
8/7/2018	45.7
8/8/2018	65.4
8/9/2018	74.0
8/10/2018	122.5
8/11/2018	58.6
8/15/2018	38.6
8/17/2018	60.8
8/18/2018	78.7
8/21/2018	40.1
8/22/2018	54.8

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 meter)**
5/5/2016	22.7
5/6/2016	32.4
5/7/2016	24.8
5/8/2016	26.1
5/9/2016	25.3
7/15/2017	21.0
7/17/2017	25.1
8/30/2017	32.0
8/31/2017	24.5
9/7/2017	54.3
9/9/2017	25.5
9/10/2017	19.2
9/16/2017	22.8
9/17/2017	20.3
5/13/2018	24.3
5/14/2018	29.7
5/15/2018	20.9
5/22/2018	20.5
8/7/2018	41.8
8/8/2018	68.5
8/9/2018	61.1
8/10/2018	58.6
8/11/2018	158.7
8/15/2018	84.6
8/16/2018	39.2
8/17/2018	34.7
8/18/2018	108.0
8/19/2018	23.1
8/20/2018	20.9
8/21/2018	35.5
8/22/2018	29.2
8/26/2018	21.6
10/24/2018	21.7

TABLE A-5 WILDFIRE INFLUENCED PM2.5 DATA FOR GREAT PLAINS AIR ZONE

Regina NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic meter)**
5/4/2016	21.1
5/5/2016	23.6
5/6/2016	29.8
5/7/2016	35.9
5/8/2016	32.4
5/9/2016	22.9
5/10/2016	19.4
5/15/2016	35.0
5/16/2016	19.8
5/20/2016	27.0
8/22/2016	19.6
7/17/2017	36.4
8/30/2017	21.6
8/31/2017	21.9
9/7/2017	31.8
9/11/2017	31.6
9/12/2017	26.7
9/13/2017	20.2
9/14/2017	25.9
8/8/2018	35.4
8/9/2018	45.0
8/10/2018	44.8
8/11/2018	23.6
8/12/2018	19.7
8/15/2018	27.7
8/16/2018	46.9
8/17/2018	34.3
8/18/2018	44.5
8/19/2018	26.1
8/21/2018	21.0
8/24/2018	19.0
8/26/2018	22.3
8/27/2018	24.0

TABLE A-6 WILDFIRE INFLUENCED $PM_{2.5}$ DATA FOR WESTERN YELLOWHEAD AIR MANAGEMENT ZONE

Saskatoon NAPS Station	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic meter)**
5/3/2016	20.6
5/5/2016	27.0
5/6/2016	25.3
5/7/2016	21.4
5/8/2016	23.8
5/14/2016	25.8
5/15/2016	27.2
5/16/2016	26.7
7/20/2017	26.1
8/17/2017	19.2
8/30/2017	25.3
8/31/2017	25.3
9/7/2017	47.6
9/9/2017	31.0
9/10/2017	20.8
9/11/2017	20.3
4/29/2018	72.3
5/15/2018	20.0
5/22/2018	25.3
8/7/2018	21.9
8/8/2018	56.9
8/9/2018	62.8
8/10/2018	57.4
8/11/2018	120.7
8/15/2018	89.8
8/16/2018	76.8
8/17/2018	52.7
8/18/2018	92.3
8/19/2018	27.8
8/20/2018	36.6
8/21/2018	32.5
8/22/2018	24.9
8/23/2018	22.5
8/26/2018	27.4
8/27/2018	25.8
9/1/2018	20.7
10/25/2018	20.9
10/26/2018	20.8

TABLE A-7 WILDFIRE INFLUENCED $PM_{2.5}$ DATA FOR SOUTHEAST SASKATCHEWAN AIRSHED ASSOCIATION

Weyburn SESAA Site	
Date	**$PM_{2.5}$ 24-hour (micrograms/cubic meter)**
7/17/2017	25.0
9/12/2017	27.6
7/10/2018	22.0
8/8/2018	22.6
8/9/2018	40.1
8/10/2018	39.4
8/11/2018	26.4
8/12/2018	25.5
8/15/2018	22.2
8/16/2018	32.2
8/17/2018	26.3
8/18/2018	31.2
8/19/2018	26.6
8/23/2018	20.5

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 meter)**
5/5/2016	34.8
5/6/2016	26.1
5/7/2016	30.3
5/8/2016	26.0
5/14/2016	25.5
5/15/2016	26.4
5/16/2016	28.3
7/9/2017	19.4
7/10/2017	24.7
7/11/2017	22.4
7/14/2017	20.2
7/15/2017	19.9
7/16/2017	20.0
7/17/2017	57.8
7/19/2017	27.5
7/20/2017	27.1
7/21/2017	19.2
7/22/2017	22.5
7/27/2017	25.2

TABLE A-8 CONTINUED

7/28/2017	21.8
7/29/2017	21.0
7/30/2017	19.3
7/31/2017	31.5
8/1/2017	22.3
8/14/2017	24.5
8/15/2017	27.1
8/16/2017	35.0
8/17/2017	35.9
8/18/2017	35.3
8/24/2017	27.7
8/25/2017	20.7
8/26/2017	19.8
8/30/2017	23.7
8/31/2017	36.9
9/1/2017	24.0
9/2/2017	23.1
9/8/2017	20.9
9/9/2017	42.7
9/10/2017	29.8
9/11/2017	33.0
9/12/2017	62.3
9/16/2017	24.6
9/18/2017	22.4
8/8/2018	34.6
8/9/2018	40.3
8/10/2018	39.8
8/11/2018	36.5
8/12/2018	61.3
8/15/2018	33.6
8/16/2018	56.7
8/17/2018	68.1
8/18/2018	73.5
8/19/2018	31.6
8/20/2018	24.4
8/21/2018	28.3
8/23/2018	21.0
8/24/2018	28.5
8/26/2018	27.0
8/27/2018	26.3