SESAA 2019 ANNUAL REPORT

Prepared for:
SOUTHEAST SASKATCHEWAN AIRSHED ASSOCIATION INC.

Prepared by:
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Prepared for Southeast Saskatchewan Airshed Association Inc., May 2020

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MESSAGE FROM THE EXECUTIVE DIRECTOR

2019 was an excellent year for the Southeast Saskatchewan Airshed Association (SESAA) and for air quality monitoring in the south eastern region of Saskatchewan. SESAA is very pleased to inform our members that eight (8) continuous air monitoring sites are now operating in the region and providing real-time data on the airshed's website. SESAA will continue to explore every opportunity to collaborate with other agencies in bringing additional air quality monitoring into the region. In summary, SESAA now manages a continuous air monitoring network which consists of eight monitoring sites, including the new NAPS Station, operated by the Ministry of Environment, in the City of Estevan.

This monitoring initiative is multi-purpose it: a) collects real time air quality data throughout the SESAA region, b) demonstrates companies are operating in a safe, environmentally sound manner that is enabling sustainable growth, and c) provides companies considering to invest in operations in Saskatchewan with data that shows it is a safe place to invest being that the air quality is well understood and not an impediment to growth. The credibility and strength of the continuous monitoring network is scientifically and financially sound. The continuous data is available live on the internet; it includes hourly concentrations of SO_2, H_2S, $NO/NO_2/NO_x$, $PM_{2.5}$ and O_3 as well as meteorological data at about two metres above the ground. The data is available on the SESAA website: http://www.sesaa.ca.

Our goal is to collect credible and defensible air quality data and provide excellent service to our members. The credibility and strength of the continuous monitoring network is scientifically and financially sound. We have and are continuing to communicate the work we do in many ways. When we do a presentation or place an article or a story in a newspaper, we highlight our members wherever possible. We list our members on our website and do as much as we can to inform the public the names of our member companies. This communication work is very important to SESAA and to its members.

In the past three years our communication initiatives included:

- News articles in the Regina Leader Post; the Saskatoon Star Phoenix; the Weyburn Review; the Estevan Mercury; CTV Regina News Interviews; Saskatchewan Oil and Gas Show, Weyburn
- Saskatchewan Association of Rural Municipalities (SARM) the Councillor Newsletter Article
- Quarterly SESAA E-bulletins to all members to keep them informed of any new developments, meeting dates and any other pertinent air quality information.
- Quarterly meetings of Board of Directors meetings at which anyone is welcome to attend.
- We are reviewing our website and improving our communication abilities.
- SESAA had a booth at Saskatchewan Oil Show in June 2017 which was very well attended. We gave away printed material with information about our Association as well as pens, Frisbees and balloons; all with the SESAA website address. We are booked for the Oil Show in 2021.
- SESAA has reviewed its communication plan and has decided to redesign our website. It has all of the data for each site by month since July of 2015. There is a feature that allows our members and the public to search for raw data for the past 120 days. The new website was launched the week of Clean Air Day June 4 to 8, 2018.
- The SESAA Board is working with the Science Fairs in our area. We will be providing the winner of the science Fair with the SESAA Environmental Award to the best science fair entry with an environmental theme. We did present the award in 2019 to Anna Tronson and will present the Award in 2020 and every year after.

All of these showcase the work we do and our members' involvement. It is important that the public is comfortable and welcoming of well-run industry in their municipalities as public acceptance plays a large

role in helping to foster a business-friendly environment that promotes future industrial growth. Future plans include determining the need for additional air monitoring stations and the development of more communication materials.

SESAA is pleased with the excellent response we received from our members. We have had a very good year financially and with our data monitoring capabilities. This is excellent news for the people of the south east area of Saskatchewan and for all of our valued members. We now have data to help inform our decision-making process. The Science Committee will review all of this data and bring recommendations to the Board as to how we should proceed with managing our monitoring capabilities. The data will direct our decisions as to how to improve our monitoring network.

2019 was another successful year for the SESAA. The Association continues to maintain a high level of membership support in the region, allowing us to collect and report good air quality information to the citizens of southeast Saskatchewan. The SESAA plans to continue building on its success in 2020. Future plans include reviewing and maintaining our network monitoring needs and continuing the development and delivery of a strong communications program that reaches out to organizations such as municipalities, Chambers of Commerce, high school classes, and School Community Council meetings. SESAA thanks all of our members for their committed participation.

EXECUTIVE SUMMARY

The Southeast Saskatchewan Airshed Association (SESAA), established in October 2005, was Saskatchewan's first airshed association with a mandate to monitor ambient air quality in the southeast region of the Province. SESAA is a collaborative group of industry, government, nongovernment organizations and private citizens. The airshed covers an area of 36,800 square kilometres and includes 45 municipalities. Major economic activities in the region include agriculture, oil and gas, mining, power generation and transportation.

SESAA manages a continuous air monitoring network. The continuous air monitoring network currently consists of seven air monitoring stations, each equipped with an airpointer®. Monitoring stations are located in Weyburn, Esterhazy, Glen Ewen, Oxbow, Stoughton, Wauchope, and Torquay. The seven continuous monitoring stations measure real-time data for one or more of the following parameters: sulphur dioxide (SO_2), hydrogen sulphide (H_2S), nitrogen oxides (NO, NO_2, NO_x), ozone (O_3), fine particulate matter ($PM_{2.5}$), ambient temperature, relative humidity (RH), barometric pressure (BP), precipitation, wind speed (WS) and wind direction (WD). Continuous monitoring results are available in real-time on the SESAA website, www.sesaa.ca. An eighth monitoring station located in Estevan is operated by the Ministry of Environment and is a National Air Pollution Surveillance (NAPS) Station. The Estevan station collects the same parameters as SESAA with the addition of course particulate matter (PM_{10}) and black carbon (BC).

A total of four calibrations and extensive maintenance was performed throughout 2019, in accordance to practices outlined in the *Air Monitoring Guidelines for Saskatchewan* (2012). Stations were plagued with power surges resulting in equipment failure in the summer of 2019 with addition of several equipment is no longer serviced due to age and acquiring parts has been a challenge throughout due to aging equipment issues

The installation and operation of continuous monitors throughout the region is helping SESAA reach its mission: to collect credible, scientifically defensible air quality data for the southeast Saskatchewan region. The data can be provided to current and future stakeholders and will mark SESAA as a region that is good to invest in.

The measured air quality was generally within the Saskatchewan Ambient Air Quality Standards (SAAQS), with the exception of H_2S, $PM_{2.5}$, and PM_{10}. There was a total of 35 exceedance events for 1-hour average H_2S, 6 exceedance events for 24-hour average H_2S, 2 exceedance events for 24-hour average $PM_{2.5}$, and 5 exceedance events for 24-hour average PM_{10}.

For the 2019 annual monitoring period, three stations were used to calculate the AQHI, which includes Estevan, Esterhazy, and Weyburn. All stations showed a low risk of over 95% for the entire year with rest of the year showing a moderate risk. The following table summarizes the annual averages of air quality parameters monitored in 2019.

Pollutant	Units	Annual Average Concentrations							
		Estevan	Esterhazy	Glen Ewen	Oxbow	Stoughton	Wauchope	Torquay	Weyburn
SO_2	**ppb**	1.1	[a]	1.1	0.7	0.5	0.6	0.3	1.4
H_2S	**ppb**	[a]	[a]	0.3	0.3	0.1	0.4	0.2	0.3
NO	**ppb**	1.8	0.4	0.4	0.3	0.4	[a]	[a]	0.6
NO_2	**ppb**	5.1	1.8	2.3	1.2	2.4	[a]	[a]	2.0
NO_x	**ppb**	6.9	2.2	2.5	1.6	2.8	[a]	[a]	2.5
O_3	**ppb**	26.1	30.0	26.2	[a]	[a]	[a]	[a]	26.4
$PM_{2.5}$	**µg/m³**	6.6	4.3	[a]	5.8	4.9	6.7	6.9	7.7
PM_{10}	**µg/m³**	20.1	[a]	[a]	[a]	[a]	[a]	[a]	[a]
Black Carbon	**ng/m³**	287	[a]	[a]	[a]	[a]	[a]	[a]	[a]

[a] Parameter was not measured

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1 INTRODUCTION

1.1 History

The Southeast Saskatchewan Airshed Association (SESAA) is a collaborative group of industry, non-government organizations, government, and private citizens. SESAA was established in 2005 with a mandate to collect credible, scientifically defensible air quality data and to make this data available to the public. SESAA also provides a forum for open communication of air quality concerns among all sectors of society. Membership in the airshed association is currently voluntary, with members sharing funding responsibilities for monitoring programs and studies. SESAA covers an area of 36,800 square kilometres, including 45 municipalities. The airshed boundaries were established based on common history, meteorology, and funding considerations. Major economic activities in the region include agriculture, oil and gas, mining, power generation, and transportation.

SESAA began monitoring in March of 2010 with the installation of the Weyburn airpointer®. The second station was installed at Glen Ewen in May 2012. The Stoughton, Esterhazy, Wawota, and Wauchope stations began operation in 2013 following a grant provided to SESAA by the Western Economic Diversification Canada (WEDC) office in Saskatoon. The monitoring station at Estevan was donated to SESAA by SaskPower in 2014, and SESAA took over management of the station in summer of 2014. In 2017 the Ministry of Environment commenced operation of the Estevan station as a NAPS station. The Oxbow station began operation in December 2014 through a grant provided by the Saskatchewan Ministry of the Economy (now Energy and Resources). The Wawota station was moved in October of 2018 and is currently located near Torquay.

The current SESAA membership includes members of the agriculture, oil and gas, mining and power generation sectors. The Government of Saskatchewan Ministries of Environment, Energy and Resources, and Health, as well as representatives of the City of Estevan and Rural Municipality of Tecumseh No. 65, also participate as members of the Board of Directors. SESAA's operating budget consists of membership fees, environmental footprint, and emissions-based fees assessed to facilities operating within the airshed (SESAA, 2017).

1.2 SESAA Mission

The SESAA mission is to collect credible, scientifically defensible air quality data for the southeast Saskatchewan region, and to make this data freely available to all stakeholders. Our objective is to bring together stakeholders from all backgrounds to identify regional air quality issues and to develop innovative solutions for managing these issues (SESAA, 2017).

1.3 SESAA Air Monitoring Network

Air quality data collected by SESAA is used to investigate the trends in air quality resulting from emissions of anthropogenic sources (industry, motor vehicles, etc.) and natural processes (such as forest fires, decomposition of organic matter, etc.) (SESAA, 2017).

The SESAA air monitoring network includes seven continuous monitoring airpointer® stations: near Weyburn, Esterhazy, Glen Ewen, Oxbow, Stoughton, Wauchope and Torquay. The Estevan site is the Ministry of Environment NAPS station. See Figure 1 for a map of the SESAA air monitoring stations.

The SESAA continuous air monitoring network measures SO_2, H_2S, NO and NO_2 (collectively NO_x), O_3, $PM_{2.5}$, ambient temperature, relative humidity, barometric pressure, precipitation, wind speed and wind direction. Table 1 shows the parameters measured at each station. Real-time air monitoring data is available on the SESAA website at www.sesaa.ca. Four (quarterly) calibrations and substantial maintenance was performed in 2019, in best ability, in accordance to practices outlined in the Air Monitoring Guidelines for Saskatchewan (2012).

Please note, the sonic meteorological monitors at the SESAA stations have not been calibrated.

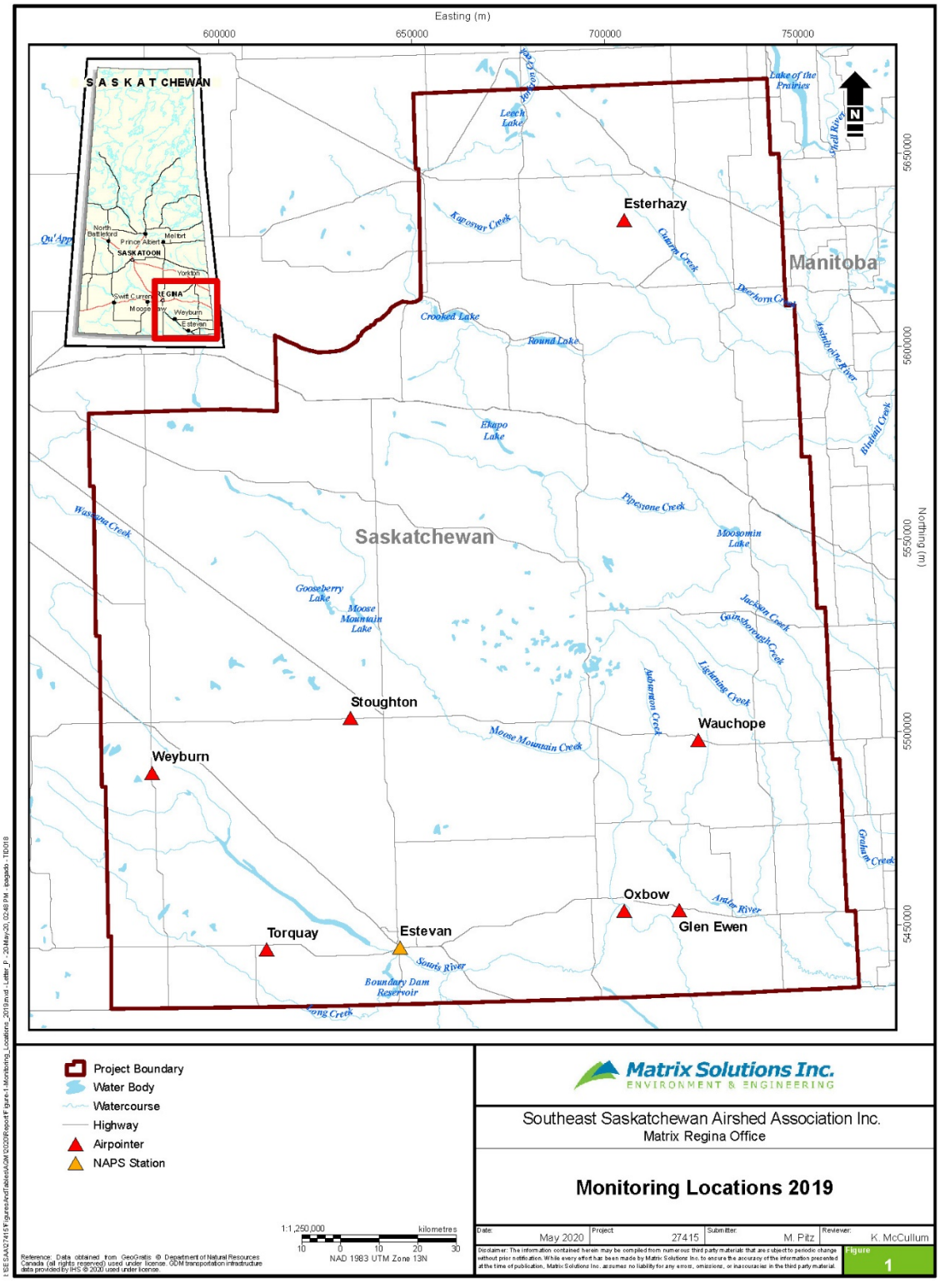

Figure 1 SESAA Monitoring Locations

Table 1 SESAA Air Quality Monitoring Parameters

Parameter	Estevan	Esterhazy	Glen Ewen	Oxbow	Stoughton	Wauchope	Torquay	Weyburn
SO_2	✓		✓	✓	✓	✓	✓	✓
H_2S			✓	✓	✓	✓	✓	✓
NO	✓	✓	✓	✓	✓			✓
NO_2	✓	✓	✓	✓	✓			✓
NO_x	✓	✓	✓	✓	✓			✓
O_3	✓	✓	✓					✓
$PM_{2.5}$	✓	✓		✓	✓	✓		✓
PM_{10}	✓							
Black Carbon	✓							
Ambient Temperature	✓	✓	✓	✓	✓	✓	✓	✓
Relative Humidity	✓	✓	✓	✓	✓	✓	✓	✓
Barometric Pressure	✓	✓	✓	✓	✓	✓	✓	✓
Precipitation	✓	✓	✓	✓	✓	✓	✓	✓
Wind Speed	✓	✓	✓	✓	✓	✓	✓	✓
Wind Direction	✓	✓	✓	✓	✓	✓	✓	✓

2 AIR QUALITY MONITORING

2.1 Exceedances Above the Saskatchewan Ambient Air Quality Standards

The SESAA air monitoring network measures air pollutant concentrations to indicate the quality of air found within the airshed's boundaries. Collected data is compared to the Saskatchewan Ambient Air Quality Standards (SAAQS) (Sask MoE 2010). Air pollutant concentrations that exceed or are near to their relevant standards are investigated and reported to government and members of SESAA. These exceedances are referred to as reportable events. Table 2 summarizes the SAAQS and the number of exceedances recorded in 2019.

Table 2 Summary of Exceedances in 2019

Parameter	Conc. Units	No. of Stations Showing Exceedances	Average Type	SAAQS	No. of Exceedances
SO_2	ppb	0	1-Hour	172	0
		0	24-Hour	48	0
		0	Annual	8	0
H_2S	ppb	5	1-Hour	11	35
		2	24-Hour	3.6	6
NO_2	ppb	0	1-Hour	159	0
		0	24-hr	106	0
		0	Annual	24	0
O_3	ppb	0	1-Hour	82	0
	ppb	0	8-Hour	63	0
$PM_{2.5}$	µg/m³	1	24-Hour	28	2
		0	Annual	10	0
PM_{10}	µg/m³	1	24-Hour	50	5

2.2 Wind Speed and Direction

Wind speed and direction are two important factors in relation to regional air quality. Wind speed, direction and the related air turbulence, dictate the dispersion and diffusion pathways that an air pollutant follows. As seen in Figure 2 the predominate patterns of wind flow differ according to the location sampled and the terrain in which the sampling occurs.

Figure 2 outlines the wind roses for seven of the SESAA stations and the Estevan NAPS station. The wind patterns of the stations show variation between each monitoring location. Generally, the prevailing wind direction is from the west to west northwest. Esterhazy, Estevan and Wauchope exhibited a greater portion of winds from the west, whereas Weyburn and Torquay exhibited a greater portion of wind from the northwest, Glen Ewen and Oxbow exhibited a greater portion of winds from the west northwest and Stoughton exhibited a greater portion of winds from the east southeast. The majority of the wind speeds were in the light breeze (<3.1 m/s) classification with low frequency occurrences of winds rising above moderate breeze (<7.8 m/s) and strong breeze (<10.8 m/s).

Appendix B through J provides additional detailed summaries and annual trend graphs.

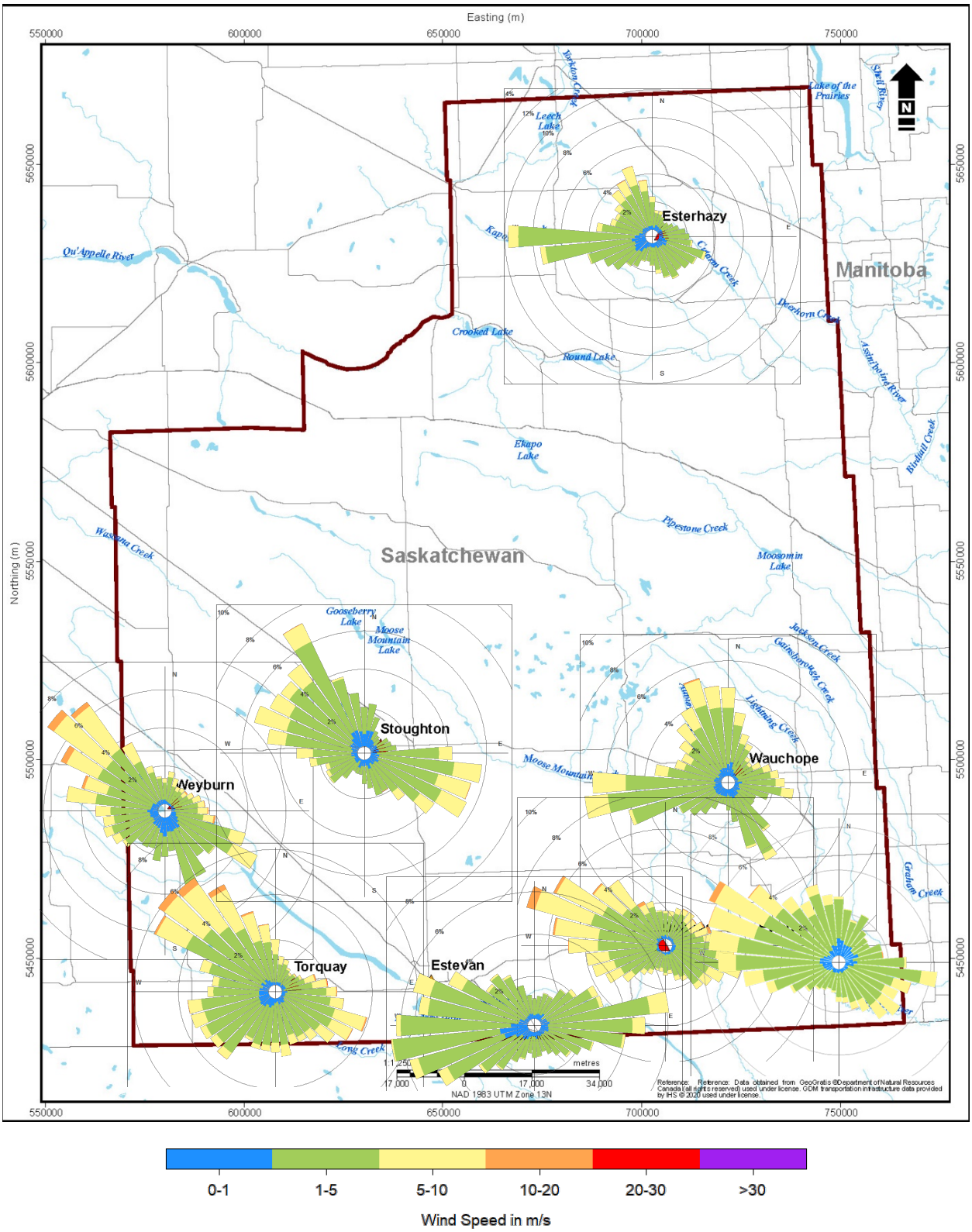

Figure 2 SESAA Wind Roses

2.3 Continuous Air Quality Data

2.3.1 Sulphur Dioxide

Sulphur dioxide (SO_2) is a pungent, colourless gas (Australian Gov. 2005). Sulphur dioxide is known to irritate the eyes, and other mucous membranes. At high concentrations, sulphur dioxide can cause irritation and inflammation within the lungs and respiratory tract. Pre-existing conditions such as asthma, bronchitis, and heart disease can be exasperated by elevated concentrations (NPS 2018a).

Sulphur dioxide contributes to a phenomenon known as acid rain. When SO_2 in the atmosphere reacts with water, acidic compounds such as sulfuric acid can be formed. These acidic compounds are then deposited through precipitation events (US EPA 2019a). Ecological impacts are most commonly found in aquatic environment. Acid rain can influence the pH of water bodies, therefore limiting its suitability for aquatic life. Additionally, acid rain can physically damage plant foliage and remove minerals and nutrients from the soil (US EPA 2017).

Sulphur dioxide is primarily produced through anthropogenic sources such as the burning of fossils fuels for transportation and industrial purposes (US EPA 2019b). Fossil fuels containing high concentrations of sulphur, gasoline and natural gas, are of particular concern.

In 2019, SESAA continuously monitored ambient SO_2 concentrations at seven locations. Instrument uptimes were greater than 85%, with the exceptions of Oxbow, Stoughton and Torquay. The overall annual average for SO_2 concentrations ranged between 0.3 ppb and 1.4 ppb. The maximum 1-hour and the 24-hour concentration occurred at Estevan, with values of 145.7 and 20.6 ppb, respectively. A summary of the annual SO_2 data can be found in Table 3.

Table 4 summarizes the 1-hour, 24-hour and annual SO_2 exceedances, for the duration of 2019, there were no SO_2 exceedances.

Figure 3 presents the pollutant roses for 1-hour average concentrations for SO_2. Generally, the concentrations measured at all stations were low, with the greater portion of values falling under 5 ppb. Estevan, Glen Ewen, and Weyburn detected higher concentration events (> 5 ppb) compared with the other stations. The high concentration events in Estevan were associated with winds from the south quadrant, in Glen Ewen with winds from the west quadrant and in Weyburn with winds from the southwest and southeast quadrants.

Appendix B through J provides additional summaries and annual trends.

Table 3 Summary of SO_2 Concentrations

Monitoring Station	Annual Average (ppb)	Operational Time (%)	Maximum Values (ppb)			
			24-hr	Date	1-hr	Date
Esterhazy	[a]	[a]	[a]	[a]	[a]	[a]
Glen Ewen	1.1	97.4	9.3	Mar 02	57.4	Feb 26 12:00
Oxbow	0.7	78.0[b]	3.7	Feb 10	21.2	Dec 01 13:00
Stoughton	0.5	75.0[b]	5.4	Dec 14	15.0	Dec 14 13:00
Wauchope	0.6	99.6	4.3	Mar 11	18.6	Feb 26 19:00
Torquay	0.3	81.6[b]	3.5	Dec 11	18.0	Apr 09 15:00
Weyburn	1.4	89.6	16.9	Feb 20	63.4	Feb 20 15:00
Estevan	1.1	99.5	20.6	Dec 20	145.7	Oct 25 21:00

[a] Parameter was not measured

[b] Unexpected instrument operation issues resulting in reduced operation time percentages

Table 4 Number of SO_2 Exceedance Events

Monitoring Station	Number of Exceedance Events for Saskatchewan SO_2 Ambient Air Quality Guidelines		
	1-Hr (172 ppb)	24-hr (48 ppb)	Annual (8 ppb)
Esterhazy	[a]	[a]	[a]
Glen Ewen	0	0	0
Oxbow	0	0	0
Stoughton	0	0	0
Wauchope	0	0	0
Torquay	0	0	0
Weyburn	0	0	0
Estevan	0	0	0

[a] Parameter was not measured

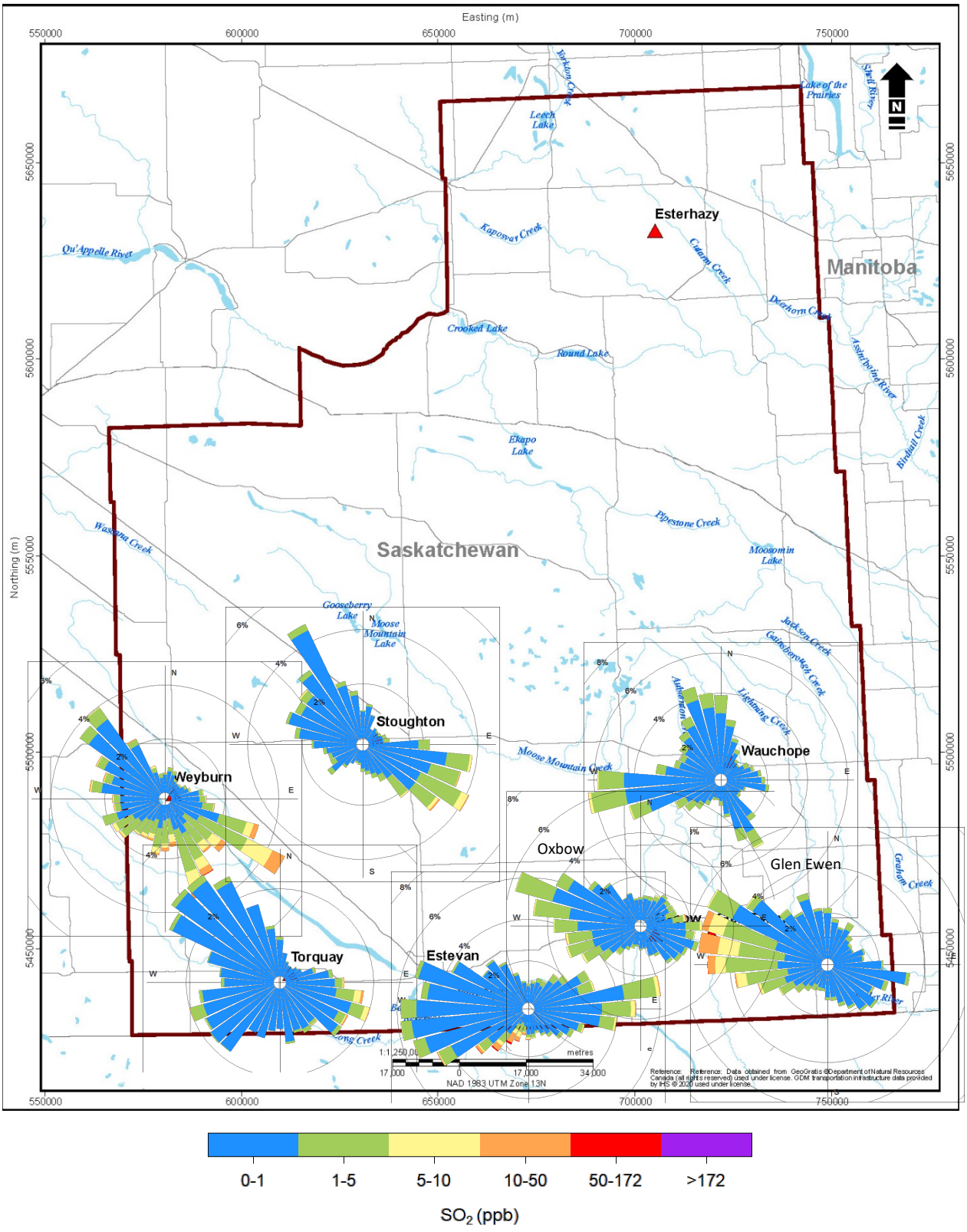

Figure 3 SESAA SO_2 Pollutant Roses

2.3.2 Hydrogen Sulfide

Hydrogen sulfide (H_2S) is a flammable, colourless gas. At low concentrations (0.0005 to 0.3 ppm), it can be described as having an odour similar to rotten eggs, at high concentrations one's sense of smell is often deadened. At low concentrations, H_2S can cause irritation to the eyes, nose, or throat. For those with pre-existing respiratory conditions such as asthma, difficulty breathing may also result (US EPA 2016a). At high concentrations, greater than 20 ppm, symptoms can include fatigue, headaches, and difficulty breathing. At concentrations greater than 100 ppm, exposure can be considered immediately dangerous to life and health (US DL 2016).

Hydrogen sulfide can be found naturally in crude petroleum, natural gas, decomposing organic matter, ponds, sloughs and natural hot springs. Anthropogenic sources include industrial processes, such as oil extraction, petroleum refining and tanneries (US EPA 2016a).

In 2019, SESAA continuously monitored ambient H_2S concentrations at six locations. Annual instrument uptimes were greater than 85%, with the exceptions of Stoughton and Oxbow. The annual average for H_2S concentrations ranged between 0.1 ppb and 0.4 ppb. The maximum 1-hour and 24-hour concentration occurred at Glen Ewen, with values of 42.2 ppb and 6.3 ppb respectively. A summary of the annual H_2S data can be found in Table 5.

Table 6 summarizes the 1-hour and 24-hour H_2S exceedances. For the duration of 2019, there were a total of 35 1-hour exceedances, and six 24-hour exceedances.

Figure 4 presents the pollutant roses for 1-hour average concentrations for H_2S of those stations that had uptimes >75%. Generally, the concentrations measured at all stations were low, with the greater portion of values falling under 1 ppb. Wauchope and Glen Ewen detected higher concentration events (< 11 ppb and greater) compared with the other stations. The high concentration events in Wauchope and Glen Ewen were associated with winds from the north and west quadrants.

Appendix B through J provides additional summaries and annual trends.

Table 5 Summary of H_2S Concentrations

Monitoring Station	Annual Average (ppb)	Operational Time (%)	Maximum Values (ppb)			
			24-hr	Date	1-hr	Date
Esterhazy	[a]	[a]	[a]	[a]	[a]	[a]
Glen Ewen	0.3	97.8	6.3	Jun 05	42.2	Jun 04 23:00
Oxbow	0.3	78.0[b]	0.9	Apr 21	6.0	Apr 28 23:00
Stoughton	0.1	75.0[b]	1.5	Oct 23	16.9	Oct 23 15:00
Wauchope	0.4	99.8	5.5	Jul 23	27.5	Jul 23 05:00
Torquay	0.2	94.0	2.4	Jun 13	37.2	Apr 23 21:00
Weyburn	0.3	89.6	1.9	Feb 21	12.1	Jun 06 02:00
Estevan	[a]	[a]	[a]	[a]	[a]	[a]

[a] Parameter not measured

[b] Unexpected instrument operation issues resulting in reduced operation time percentages

Table 6 Number of H_2S Exceedances

Monitoring Station	Number of Exceedance Events for Saskatchewan H_2S Ambient Air Quality Guidelines	
	1-Hr (11 ppb)	24-hr (3.6 ppb)
Esterhazy	[a]	[a]
Glen Ewen	8	2
Oxbow	0	0
Stoughton	1	0
Wauchope	23	4
Torquay	1	0
Weyburn	2	0
Estevan	[a]	[a]

[a] Parameter not measured

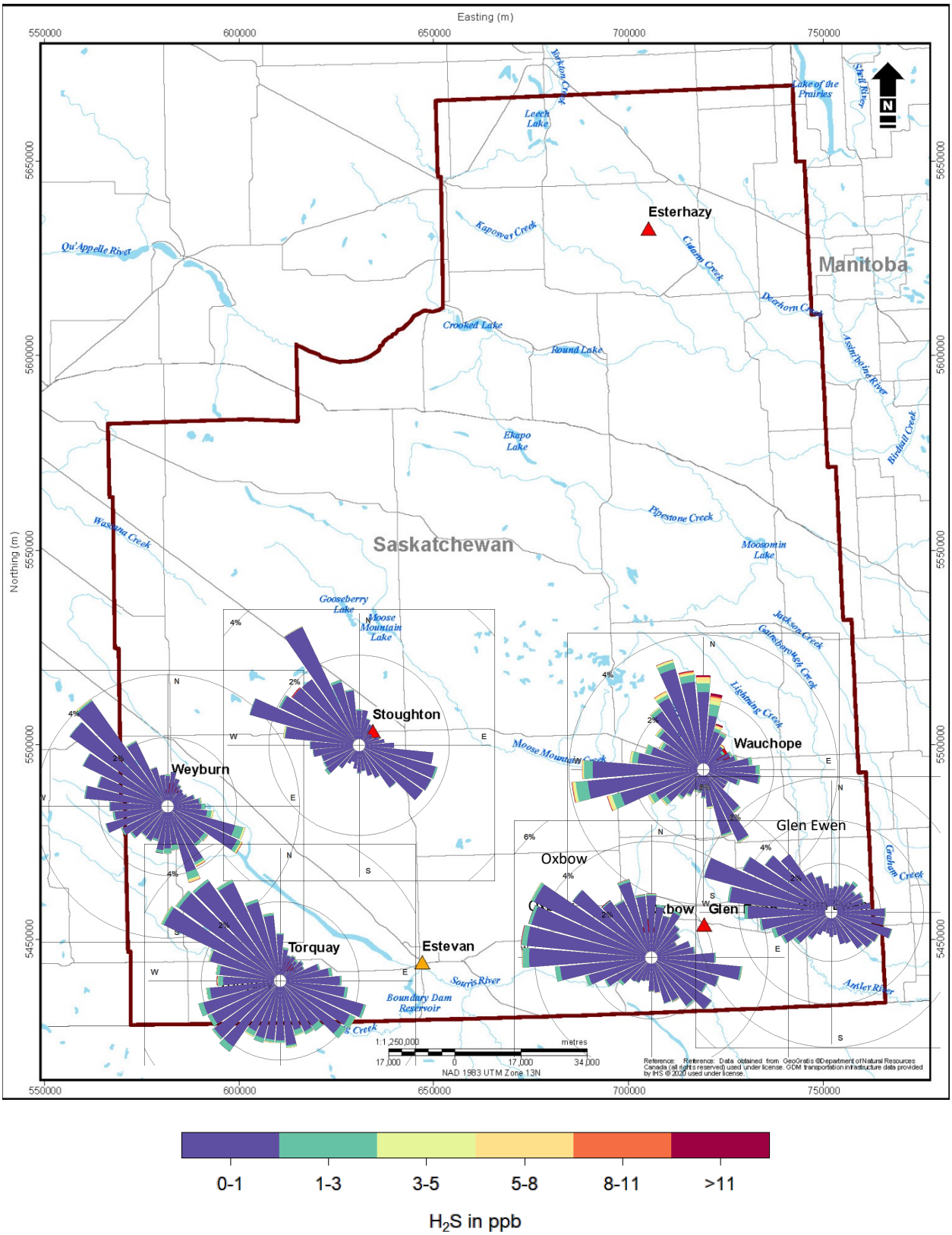

Figure 4 SESAA H_2S Pollutant Roses

2.3.3 Nitrogen Dioxide

Nitrogen dioxide (NO_2) is member of a group of highly reactive gases known as nitrogen oxides (NO_x) (US EPA 2016b). NO_2 is a reddish-brown gas with a pungent odour. Nitrogen dioxide can irritate the lungs and respiratory tract, symptoms could include coughing and wheezing. For those with supressed lung function, exposure can increase the risk of lung infection (Gov. of Ontario 2019).

Similar to sulphur dioxide, nitrogen dioxide contributes to the formation of acid rain. Within the atmosphere, NO_2 will react with water to produce nitric acid and nitrates. Additionally, NO_2 is a component to photochemical smog. NO_2 has a role in the photochemical production of ground-level ozone, and associated nitrate particulates contribute to smog's hazy appearance.

Oxides of nitrogen is primarily introduced to the environment through anthropogenic sources. The dominant source includes activities that involve the combustion of fossil fuels such as transportation (US EPA 2016b). NO_2 can be formed naturally through an atmospheric reaction between nitrogen and oxygen, enabled through the rapid heating produced from lightning.

In 2019, SESAA continuously monitored ambient NO_2 concentrations at seven locations, including the Estevan NAPS station. Instrument uptimes were lower than 85%, with excepts for Esterhazy and Estevan. The annual average for NO_2 concentrations ranged between 1.3 ppb and 5.1 ppb. The maximum 1-hour and 24-hour concentrations occurred at Estevan with values of 53.2 ppb and 24.4 ppb respectively. A summary of the annual NO_2 data can be found in Table 7.

Table 8 summarizes the 1-hour, 24-hour and annual NO_2 exceedances, for the duration of 2019, there were no exceedances.

Figure 5 presents the pollutant roses for 1-hour average concentrations for NO_2. Generally, the concentrations measured at all stations were low, with the greater portion of values falling under 5 ppb. Every station had periods of higher concentrations (<15 ppb), but Estevan, Stoughton and Weyburn also had periods of >30 ppb. The high concentration events in Estevan were associated with winds from the southwest and east quadrant, Stoughton's were associated with winds from the north west and west quadrant and Weyburn's were associated with winds from the southwest and south east quadrants.

Appendix B through J provides additional summaries and annual trends.

Table 7 Summary of NO_2 Concentrations

Monitoring Station	Annual Average (ppb)	Operational Time (%)	Maximum Values (ppb)			
			24-hr	Date	1-hr	Date
Esterhazy	1.8	98.1	7.7	May 29	26.9	May 29 22:00
Glen Ewen	2.3	69.2[b]	9.3	Feb 08	24.0	Feb 08 22:00
Oxbow	1.3	65.3[b]	5.4	Jun 01	14.1	Jun 01 06:00
Stoughton	2.4	75.0[b]	11.5	Feb 27	39.4	Feb 17 15:00

Wauchope	[a]	[a]	[a]	[a]	[a]	[a]
Torquay	[a]	[a]	[a]	[a]	[a]	[a]
Weyburn	2.0	84.5[b]	10.3	May 29	49.7	Mar 02 16:00
Estevan	5.1	99.4	24.4	Feb 20	53.2	Feb 23 07:00

[a] Pollutant not measured

[b] Unexpected instrument operation issues resulting in reduced operation time percentages

Table 8 Number of NO_2 Exceedances

Monitoring Station	Number of Exceedance Events for Saskatchewan NO_2 Ambient Air Quality Guidelines		
	1-Hr (159 ppb)	24-hr (48 ppb)	Annual (20 ppb)
Esterhazy	[a]	[a]	[a]
Glen Ewen	0	0	0
Oxbow	0	0	0
Stoughton	0	0	0
Wauchope	[a]	[a]	[a]
Torquay	[a]	[a]	[a]
Weyburn	0	0	0
Estevan	0	0	0

[a] Pollutant not measured

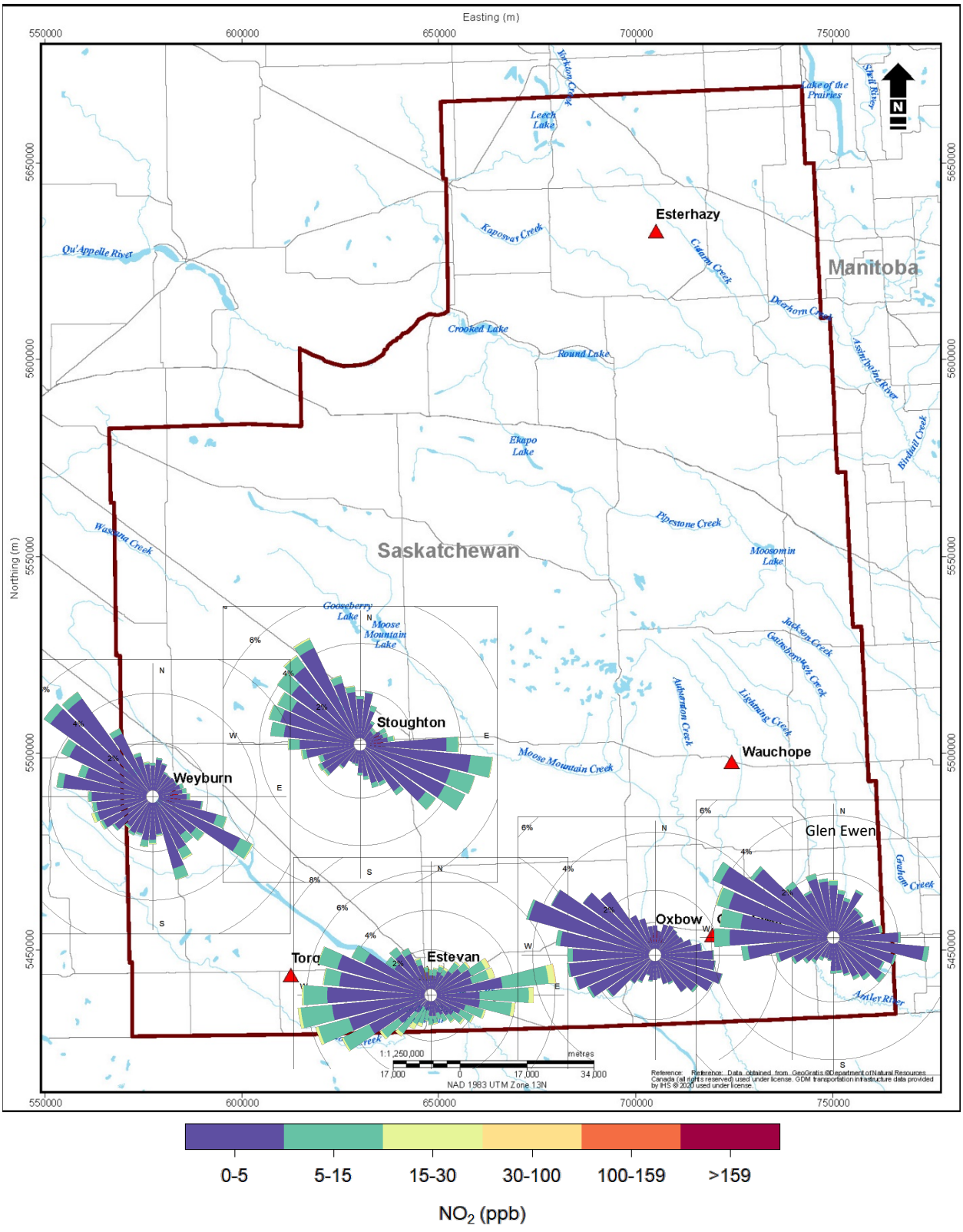

Figure 5 SESAA NO_2 Pollutant Roses

2.3.4 Ozone

Ozone (O_3), otherwise known as ground-level ozone, is considered a secondary pollutant. Ozone is produced through a photochemical reaction between NO_x and volatile organic compounds (VOCs) and can be transported from the upper atmosphere to the surface. Ozone can trigger symptoms such as coughing, chest pain, and airway irritation. Those with limited lung function or pre-existing respiratory conditions such as asthma or bronchitis are at a greater risk.

Ground-level ozone is a primary component to smog (NH DES 2015) and is also shown to negatively impact sensitive vegetation and agricultural crops, particularly during growing seasons (US EPA 2018a). Additionally, O_3 can accelerate the deterioration of rubber materials such as tires.

In 2019, SESAA continuously monitored ambient O_3 concentrations at four locations, including the government NAPS station. Instrument uptimes were greater than 85%. The annual average for O_3 concentrations ranged between 26.1 ppb and 30.0 ppb. The maximum 1-hour and 24-hour concentration occurred at Esterhazy with a value of 76.1 ppb and 52.9 ppb, respectively. A summary of the annual O_3 data can be found in Table 9.

Table 10 summarizes the 4th Highest Daily Maximum 8-hour O_3 Concentrations and Table 11 summarizes the 1-hour and 8-hour O_3 exceedances, of which for the duration of 2019, there were no exceedances.

Figure 6 presents the pollutant roses for 1-hour average concentrations for O_3. Generally, the concentrations measured at all stations were less than 60 ppb, with the greater portion of values falling above 20 ppb. Typically, higher concentrations presented themselves in the northwest and east quadrants.

Appendix B through J provides additional summaries and annual trends.

Table 9 Summary of O_3 Concentrations

Monitoring Station	Annual Average (ppb)	Operational Time (%)	Maximum Values (ppb)					
			24-hr	Date	8-hr	Date	1-hr	Date
Esterhazy	30.0	98.0	52.9	Mar 11	67.2	Jun 03	76.1	Jun 03 17:00
Glen Ewen	26.2	97.7	46.1	Mar 12	59.5	Jun 06	68. 1	Jun 06 17:00
Oxbow	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
Stoughton	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
Wauchope	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
Torquay	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
Weyburn	26.4	89.6	45.9	Mar 10	59.5	May 28	62.0	May 28 17:00
Estevan	26.1	99.5	46.5	Jun 06	60.5	Jun 06	62.6	Jun 06 16:00

[a] Pollutant not measured

Table 10 4th Highest Daily Maximum 8-hour O_3 Concentrations

Monitoring Station	SAAQS 3-year average of the annual 4th-highest daily maximum 8-hour average concentration = 63 ppb			
	2017	2018	2019	3-yr Average
Esterhazy	59.7	65.1	57.3	60.7
Glen Ewen	49.6	57.5	58.3	55.1
Weyburn	57.2	67.9	53.2	59.4

Table 11 Number of O_3 Exceedances

Monitoring Station	Number of Exceedance Events for Saskatchewan O_3 Ambient Air Quality Guidelines	
	1-Hr (82 ppb)	8-hr (63 ppb)
Esterhazy	0	0
Glen Ewen	0	0
Oxbow	[a]	[a]
Stoughton	[a]	[a]
Wauchope	[a]	[a]
Torquay	[a]	[a]
Weyburn	0	0
Estevan	0	0

[a] Pollutant not measured

Stoughton

Wauchope

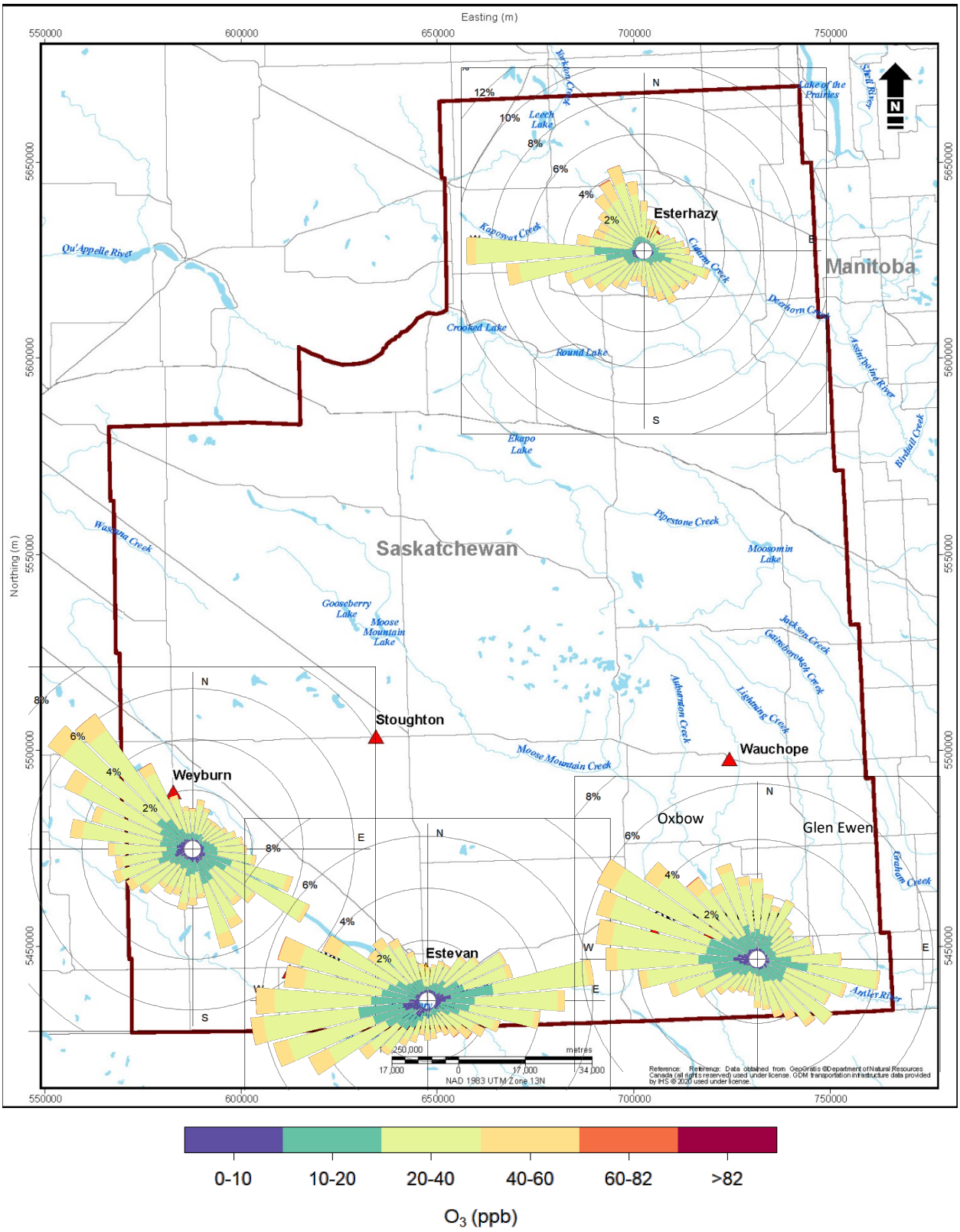

Figure 6 SESAA O_3 Pollutant Roses

2.3.5 Particulate Matter

Particulate matter is used to describes a wide variety of solid and liquid particulates often in two main size fractions PM_{10} and $PM_{2.5}$. $PM_{2.5}$ are often more identified with heath as they are considered fine inhalable particulates, which can travel far within the respiratory tract (US EPA 2018b). Health effects of $PM_{2.5}$ often include coughing, wheezing, and nose and throat irritation. Those who have asthma are at a greater risk. There is also risk to vegetation and visibility from high levels of particulate matter.

Most particulates are produced through complex atmospheric reactions involving pollutants such as NO_x and SO_2. $PM_{2.5}$ can also be directly emitted from a source such as fires, fossil fuel combustion, and dust.

In 2019, SESAA continuously monitored ambient $PM_{2.5}$ concentrations at seven locations, including the government NAPS station. Instrument uptimes were less than 85%, with the exceptions of Estevan and Wauchope. The annual average for $PM_{2.5}$ concentrations ranged between 4.3 µg/m³ and 7.7 µg/m³. The maximum 1-hour concentration occurred at Estevan with a value of 97.3 µg/m³. The maximum 24-hour concentration also occurred in Oxbow, with a value of 28.3 µg/m³. The NAPS station, Estevan also collected PM_{10}, with a maximum 1-hour concentration of 252.0 µg/m³ and a 24-hour maximum concentration at 66.0 µg/m³. A summary of the annual $PM_{2.5}$ data can be found in Table 12, and PM_{10} data can be found in Table 13.

The Estevan NAPS station also collects Black Carbon (BC), which is the sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuel. BC is considered a global environmental issue that has negative implications for both human health and environment. Inhalation of BC is associated with health problems including respiratory and cardiovascular disease, cancer, and even birth defects. BC also has emerged as a major contributor to climate change (US EPA, 2019c). Collection of BC at Estevan resulted in a maximum 1-hour concentration of 11,995 ng/m³ (12.00 µg/m³) and a 24-hour maximum concentration at 1,235 ng/m³ (1.24 µg/m³). A summary of the annual BC data can be found in Table 13.

Table 14 summarizes the 24-hour and annual exceedances for particulate matter ($PM_{2.5}$ and PM_{10}). For the duration of 2019, 2, 24-hour exceedances occurred with no exceedance of the annual standard. As the sources of $PM_{2.5}$ vary widely, the cause of the exceedance can be related to a number of factors (i.e. dry year, fires, etc.). Results for the PM_{10} showed 7, 24-hour exceedances.

Figure 7 presents the pollutant roses for 1-hour average concentrations for $PM_{2.5}$. Due to the variability in source, pollutant direction and concentration varies greatly. In Esterhazy and Stoughton, values appear to be more prominent in the northwest and southeast quadrants. In Oxbow values appear to be more prominent in the west and east quadrants. In Torquay values appear to be more prominent in the northwest and east quadrants. Concentrations typically are below 10 µg/m³.

Figure 8 present the pollutant rose for 1-hour average concentration of PM_{10} and BC at the Estevan station.

Appendix B through J provides additional summaries and annual trends.

Table 12 Summary of $PM_{2.5}$ Concentrations

Monitoring Station	Annual Average (µg/m³)	Operational Time (%)	Maximum Values (µg/m³)			
			24-hr	Date	1-hr	Date
Esterhazy	4.3	73.1	14.3	Feb 24	33.6	Oct 21 19:00
Glen Ewen	[a]	[a]	[a]	[a]	[a]	[a]
Oxbow	5.8	78.4[c]	28.3	Sep 17	78.9	Sep 17 20:00
Stoughton	4.9	74.3[c]	21.6	May 29	52.3	Jun 05 23:00
Wauchope	6.7	86.1	26.2	May 29	73.8	Aug 30 21:00
Torquay	6.9	47.9[b]	19.2	Aug 30	67.7	Sep 06 13:00
Weyburn	7.7	76.1[c]	21.3	Jul 08	34.1	Feb 22 12:00
Estevan	6.6	99.7	24.9	May 29	97.3	Nov 27 14:00

[a] Pollutant not measured
[b] Torquay started monitoring in May 2019
[c] Unexpected instrument operation issues resulting in reduced operation time percentages

Table 13 Summary of PM_{10} and BC Concentrations

Monitoring Station	Annual Average	Operational Time (%)	Maximum Values			
			24-hr	Date	1-hr	Date
Estevan, PM_{10} µg/m³	20.1	99.7	66.0	May 29	252.0	Oct 13 23:00
Estevan, BC ng/m³	287	99.6	1,235	Feb 20	11,995	Apr 19 19:00

Table 14 Number of $PM_{2.5}$ and PM_{10} Exceedances

Monitoring Station	Number of Exceedance Events for Saskatchewan $PM_{2.5}$ Air Quality Guidelines		Number of Exceedance Events for Saskatchewan PM_{10} Air Quality Guidelines
	24-Hr (28 µg/m³)	Annual (10 µg/m³)	24-Hr (50 µg/m³)
Esterhazy	0	0	[a]
Glen Ewen	[a]	[a]	[a]
Oxbow	2	0	[a]
Stoughton	0	0	[a]
Wauchope	0	0	[a]
Torquay	0	0	[a]
Weyburn	0	0	[a]
Estevan	0	0	7

a Pollutant not measured

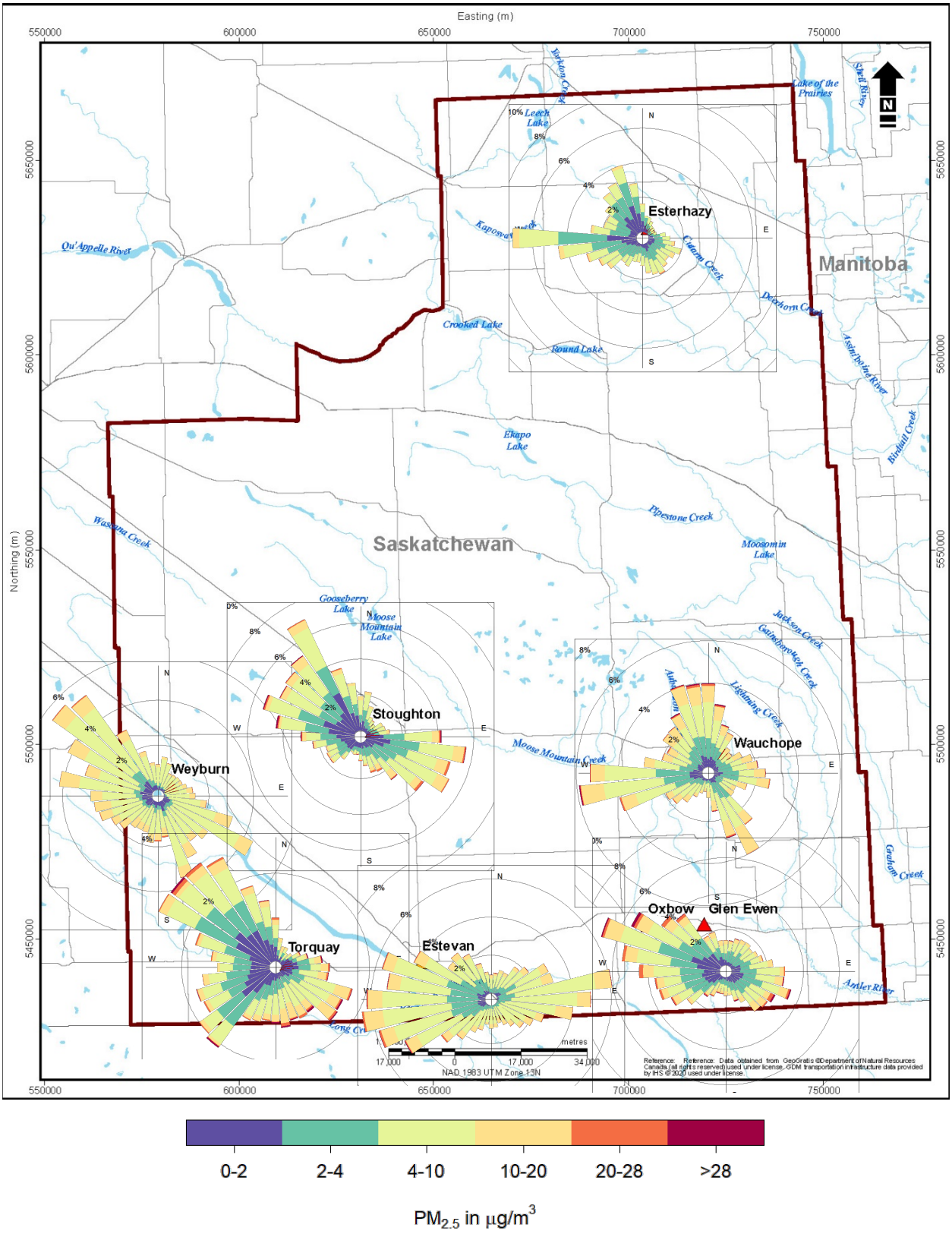

Figure 7 SESAA $PM_{2.5}$ Pollutant Roses

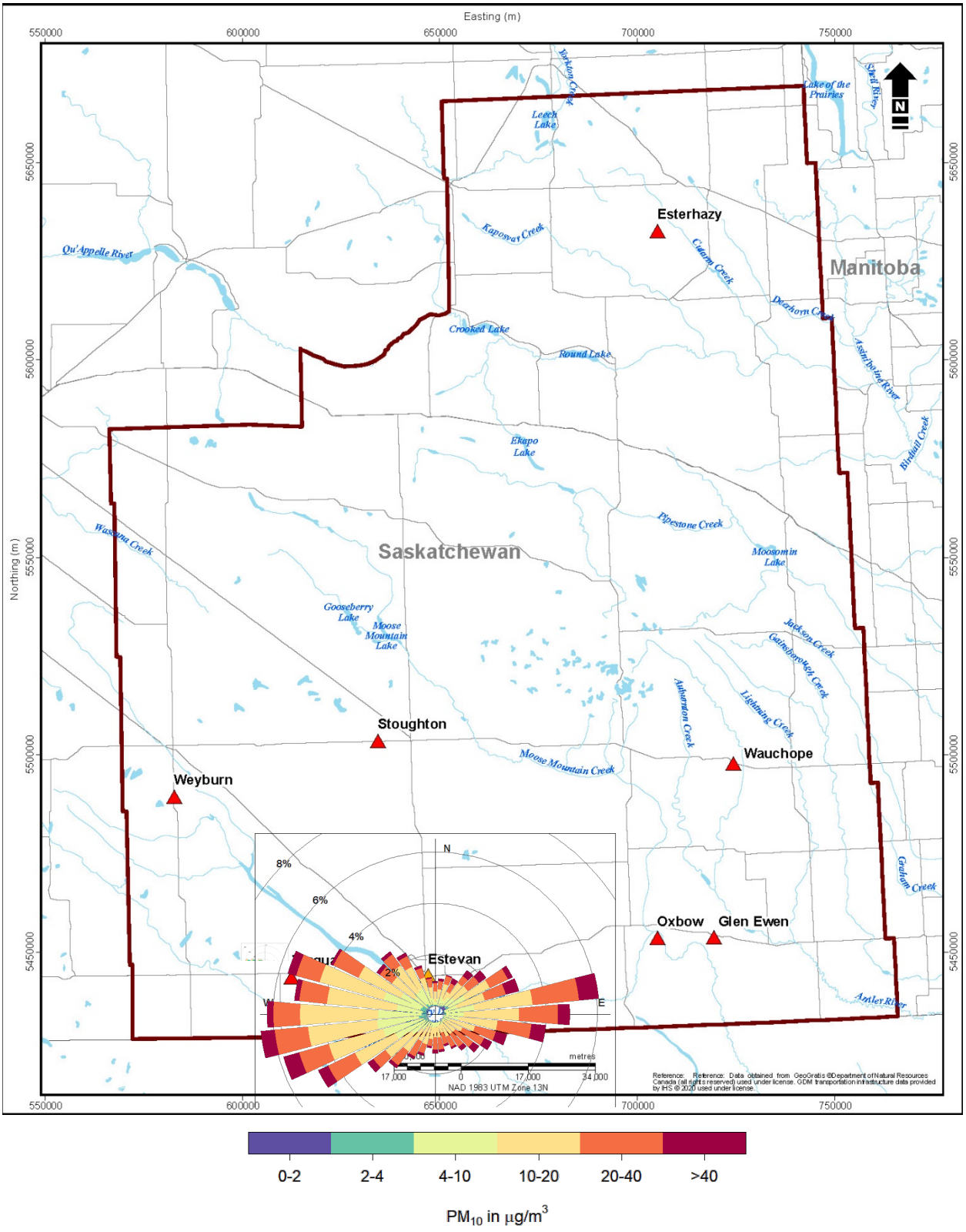

Figure 8 Estevan PM_{10} Pollutant Rose

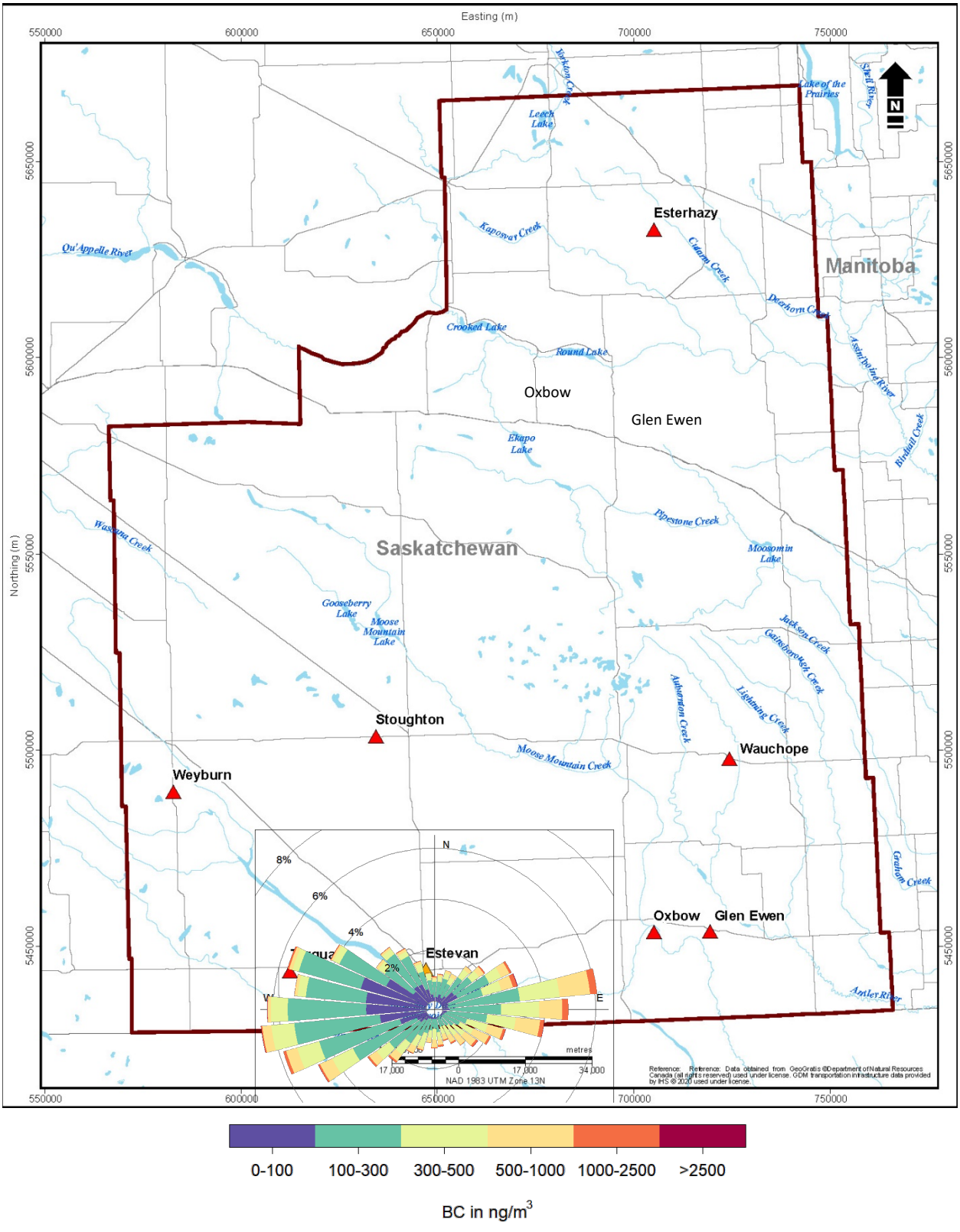

Figure 9 Estevan Black Carbon Pollutant Rose

2.4 Air Quality Health Index

The Air Quality Health Index (AQHI) is a scale designed to help the public make decisions to protect their health by limiting short-term exposure to air pollution. The AQHI uses a rolling three-hour average concentration of $PM_{2.5}$, NO_2, and O_3 to calculate a single numerical value to evaluate the health risk associated with air quality. The numerical value is then compared to a scale (Figure 35) that determines whether the air quality is low, moderate, high or a very high risk to one's health (GoC 2019).

Health Risk	Air Quality Health Index	Health Messages	
		At Risk Population	General Population
Low Risk	1 – 3	**Enjoy** your usual outdoor activities.	**Ideal** air quality for outdoor activities.
Moderate Risk	4 – 6	**Consider** reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	**No need to modify** your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High Risk	7 – 10	**Reduce or reschedule** strenuous activities outdoors. Children and the elderly should also take it easy.	**Consider** reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High Risk	Above 10	**Avoid** strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	**Reduce or reschedule** strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

Figure 10 Health Risk Classification for Air Quality Health Index (AQHI, 2019)

As can be seen in Figure 35 the AQHI is designed to give the public information about air quality along with suggestions on how to adjust outdoor activities depending on the individual health risk. The AQHI is calculated based on the relative risks of a combination of the air pollutants $PM_{2.5}$, NO_2, and O_3 that is known to harm human health. All three pollutants are required to calculate the AQHI according to the following equation (Stieb, et al, 2012):

$$AQHI = \left(\frac{1000}{10.4}\right) \times [(e^{0.000537 \times O_3} - 1) + (e^{0.000871 \times NO_2} - 1) + (e^{0.000487 \times PM_{2.5}} - 1)]$$

Within the SESAA monitoring network, three stations meet the requirements to calculate AQHI; Esterhazy, Weyburn, and the government NAPS station Estevan. For the 2019 annual monitoring period, the three stations calculated an AQHI rating is summarized in Table 15.

Table 15 Station AQHI Summary

Monitoring Station	Occurrence	Hours and Frequency by AQHI Risk Rating			
		Low Risk (1-3)	Moderate Risk (4-6)	High Risk (7-10)	Very High Risk (>10)
Esterhazy	Hours	5709	21	0	0
	Frequency	99.6%	0.4%	0%	0%
Estevan	Hours	8503	206	0	0
	Frequency	97.6%	2.4%	0%	0%
Weyburn	Hours	6998	14	0	0
	Frequency	99.8%	0.2%	0%	0%

[a] Data from Jan to Oct

From the summary we note that the majority (>95%) of the AQHI was rated a low risk and that there are no occurrences of high risk or very high risk in 2019.

3 AUDITED FINANCIAL STATEMENT

The 2019 audited financial summary for SESAA is presented in the following table. The complete audited report is presented in Appendix K.

Table 16 SESAA Audited Financial Statement

Southeast Saskatchewan Airshed Association Inc.
Statement of Financial Position
As at December 31, 2019

	2019	2018
Assets		
Current		
Cash	**162,457**	151,491
Marketable securities *(Note 3)*	**102,374**	101,814
Prepaid expenses and deposits	**4,778**	4,603
Government remittances receivable	**-**	4,812
	269,609	262,720
Capital assets *(Note 4)*	**261,832**	327,289
	531,441	590,009
Liabilities		
Current		
Accounts payable and accruals	**31,704**	30,984
Government remittances payable	**1,299**	-
Current portion deferred contributions *(Note 5)*	**11,913**	27,363
	44,916	58,347
Deferred contributions *(Note 5)*	**29,783**	41,696
	74,699	100,043
Net Assets		
Unrestricted net assets	**456,742**	489,966
	531,441	590,009

Approved on behalf of the Board of Directors

Director **Director**

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APPENDIX A
Saskatchewan Ambient Air Quality Standards

APPENDIX A SASKATCHEWAN AMBIENT AIR QUALITY STANDARDS (SAAQS)

TABLE 20: SASKATCHEWAN AMBIENT AIR QUALITY STANDARDS ($\mu g/m^3$)				
Air Pollutant	**1 Hour**	**8 Hours**	**24 Hours**	**Annual**
Particulate Matter ($PM_{2.5}$)			28[a]	10
Particulate Matter (PM_{10})			50	
Total Suspended Particulates (TSP)			100	60[b]
Nitrogen Dioxide (NO_2)	300 (159 ppb)		200 (106 ppb)	45[c] (24 ppb)
Sulphur Dioxide (SO_2)	450 (172 ppb)		125 (48 ppb)	20[c] (8 ppb)
Hydrogen Sulphide (H_2S)	15 (11 ppb)		5 (3.6 ppb)	
Ozone (O_3)	160 (82 ppb)	124[d] (63 ppb)		
Carbon Monoxide (CO)	15,000 (13,000 ppb)	6,000 (5,000 ppb)		

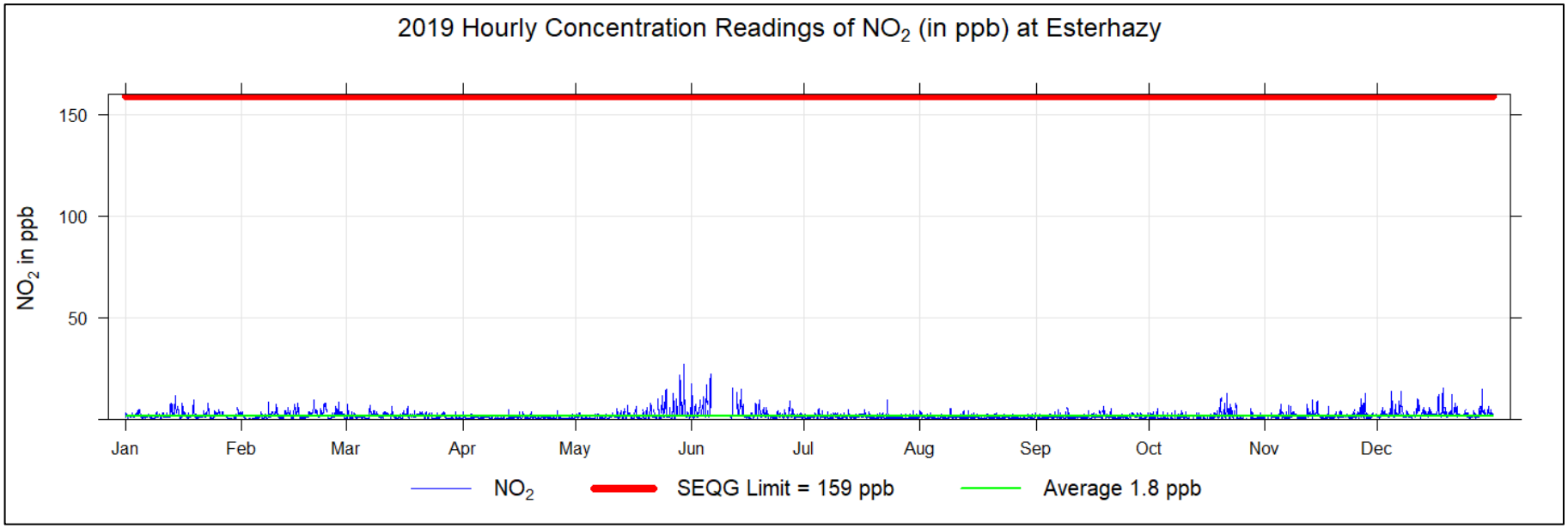
Footnotes

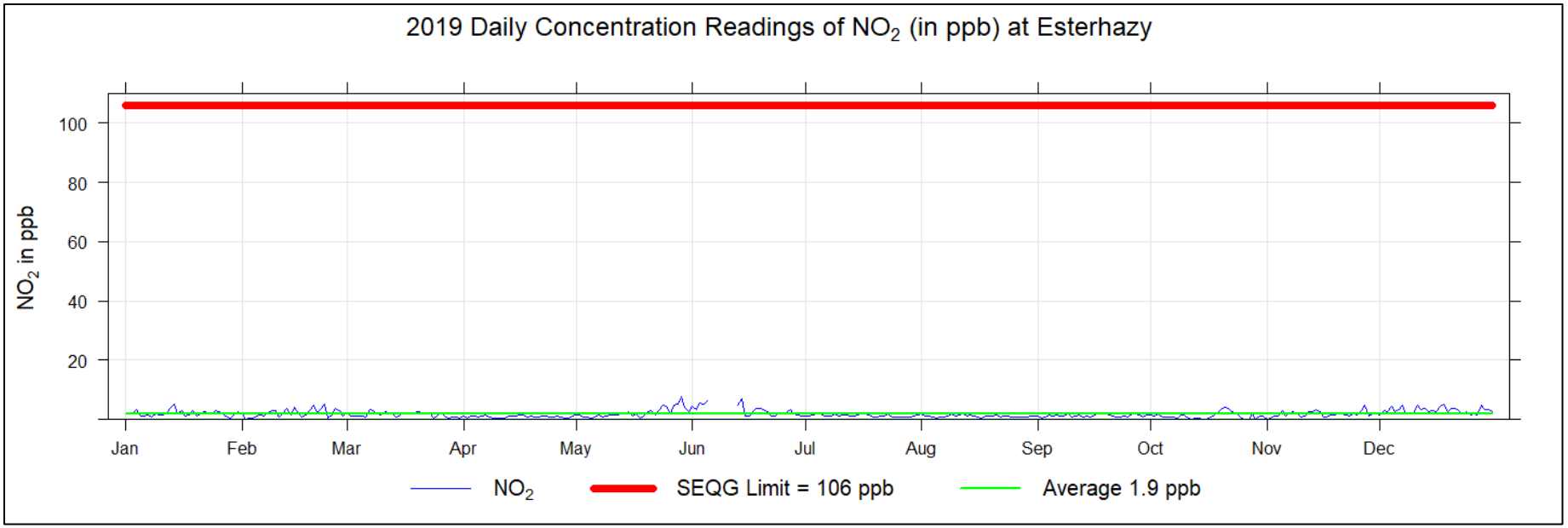
(a) The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
(b) Geometric means
(c) Arithmetic means
(d) The 3-year average of the annual 4th-highest daily maximum 8-hour average concentrations.

APPENDIX B
Esterhazy Station: Continuous Monitoring Data

Nitrogen Dioxide (NO_2) Frequency Distribution of 1-hr Averages - Esterhazy

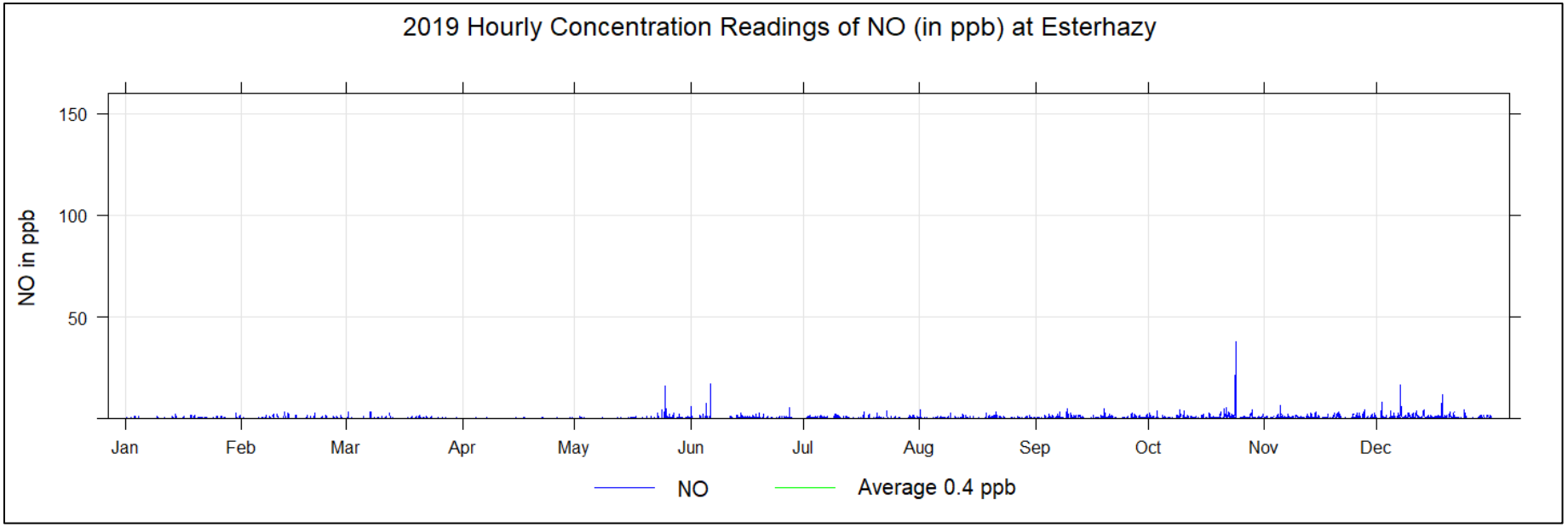
Month	Operational Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	2.1	11.5	Jan 14 09:00	5.3	Jan 14	100.0%	95.6%	4.4%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	2.1	9.9	Feb 20 05:00	5.1	Feb 23	100.0%	93.3%	6.7%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	743	1.7	7.5	Mar 01 07:00	3.4	Mar 07	99.9%	98.7%	1.2%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	720	0.9	5.0	Apr 13 04:00	1.6	Apr 17	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	744	2.3	26.9	May 29 22:00	7.7	May 29	100.0%	89.7%	9.4%	0.9%	0.0%	0.0%	0.0%	0	0
June 2019	566	3.3	22.4	Jun 06 05:00	7.0	Jun 14	78.6%	63.1%	14.7%	0.8%	0.0%	0.0%	0.0%	0	0
July 2019	741	1.3	9.7	Jul 23 07:00	2.0	Jul 09	99.6%	99.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	738	1.1	5.3	Aug 08 22:00	2.0	Aug 09	99.2%	98.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	720	1.3	6.2	Sep 18 21:00	2.0	Sep 19	100.0%	99.2%	0.8%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	741	1.2	12.7	Oct 21 19:00	4.0	Oct 21	99.6%	95.6%	4.0%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	720	1.8	12.6	Nov 27 20:00	4.9	Nov 27	100.0%	95.1%	4.9%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	3.0	15.7	Dec 18 11:00	5.1	Dec 18	100.0%	89.5%	10.3%	0.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8593**	**1.8**	**26.9**	**May 29**	**7.7**	**May 29**	**98.1%**	**93.2%**	**4.8%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of NO2 (in ppb) at Esterhazy
NO2 in ppb
100
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
NO2
SEQG Limit = 106 ppb
Average 1.9 ppb

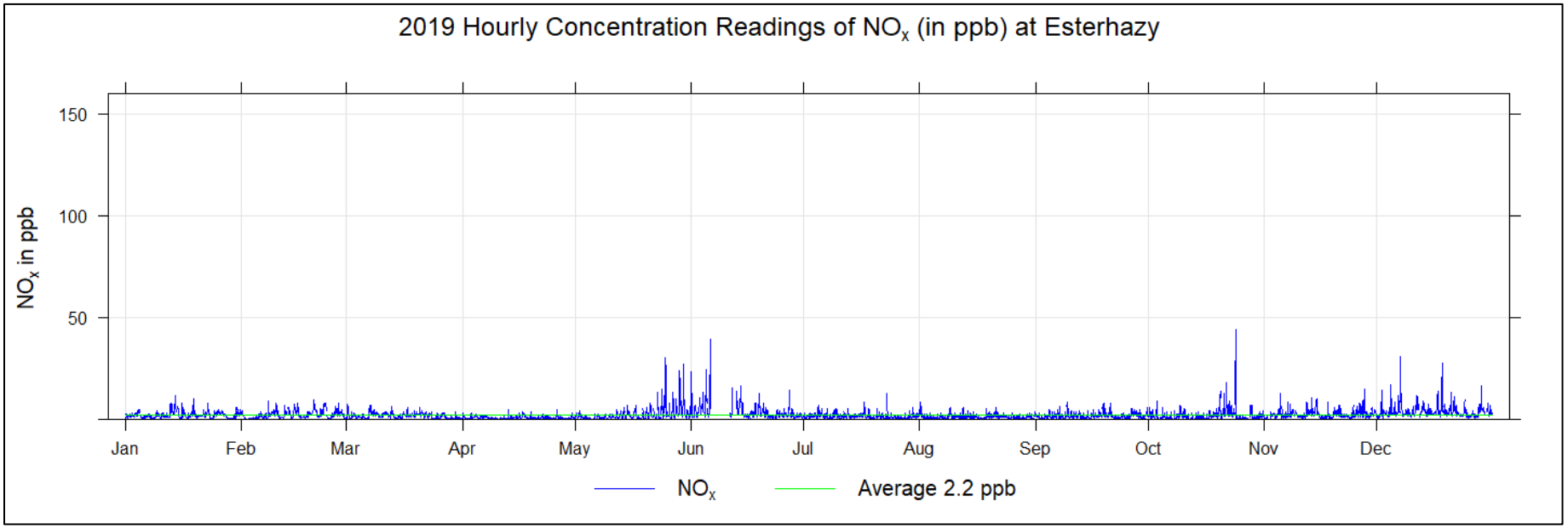
Nitric Oxide (NO) Frequency Distribution of 1-hr Averages - Esterhazy

Month	Operational Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	0.2	3.1	Jan 30 13:00	0.6	Jan 30	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	0.3	3.2	Feb 12 11:00	0.8	Feb 12	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	743	0.2	3.6	Mar 07 11:00	0.8	Mar 07	99.9%	99.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	720	0.1	0.8	Apr 04 14:00	0.3	Apr 17	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	744	0.3	16.1	May 25 04:00	1.8	May 25	100.0%	99.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0	0
June 2019	566	0.5	17.0	Jun 06 05:00	1.0	Jun 14	78.6%	78.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0	0
July 2019	741	0.4	3.9	Jul 23 08:00	0.9	Jul 09	99.6%	99.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	738	0.3	4.5	Aug 01 07:00	0.9	Aug 21	99.2%	99.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	720	0.5	4.7	Sep 09 08:00	1.0	Sep 26	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	741	0.7	37.9	Oct 24 08:00	2.5	Oct 24	99.6%	99.2%	0.3%	0.0%	0.1%	0.0%	0.0%	0	0
November 2019	720	0.7	6.7	Nov 05 07:00	1.5	Nov 20	100.0%	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	0.8	16.9	Dec 07 10:00	2.7	Dec 07	100.0%	99.2%	0.7%	0.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8593**	**0.4**	**37.9**	**Oct 24**	**2.7**	**Dec 07**	**98.1%**	**97.9%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



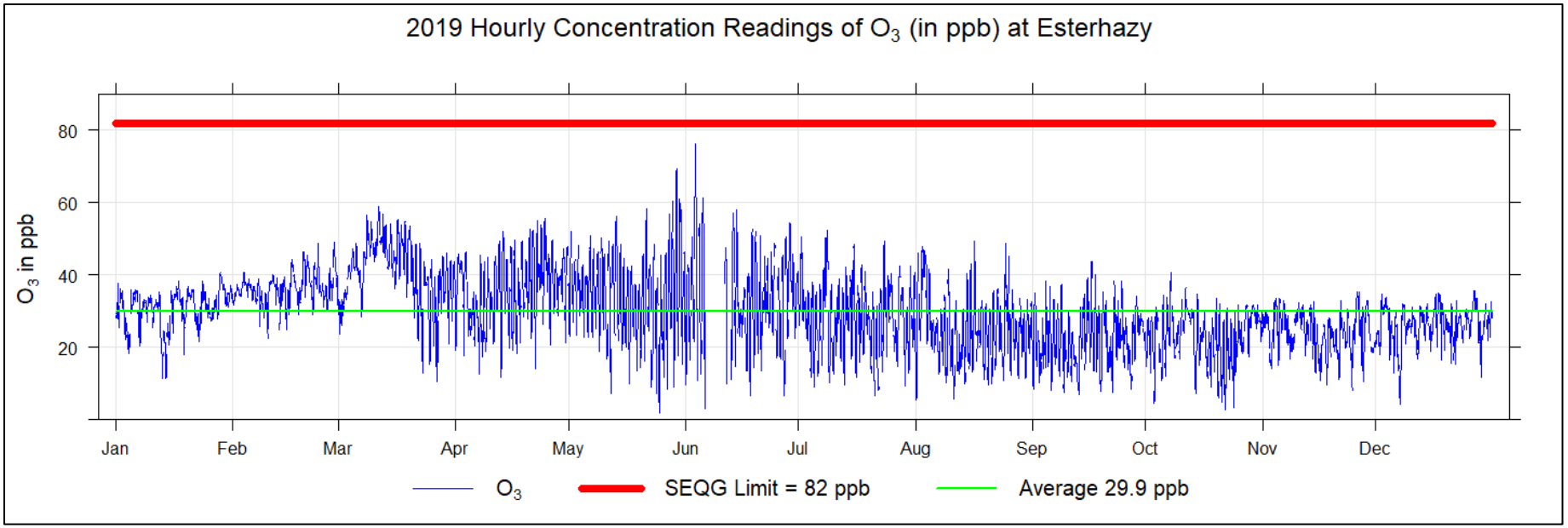
Oxides of Nitrogen (NO_X) Frequency Distribution of 1-hr Averages - Esterhazy

Month	Operational Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	2.2	11.9	Jan 14 09:00	5.7	Jan 14	100.0%	95.4%	4.6%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	2.4	9.9	Feb 20 05:00	5.6	Feb 20	100.0%	89.9%	10.1%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	743	1.8	7.5	Mar 01 07:00	4.2	Mar 07	99.9%	97.6%	2.3%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	720	0.9	4.9	Apr 13 04:00	1.9	Apr 17	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	744	2.5	30.3	May 25 04:00	7.7	May 29	100.0%	88.4%	10.2%	1.2%	0.1%	0.0%	0.0%	0	0
June 2019	566	3.7	39.4	Jun 06 05:00	8.0	Jun 14	78.6%	61.1%	16.1%	1.3%	0.1%	0.0%	0.0%	0	0
July 2019	741	1.6	13.0	Jul 23 07:00	2.8	Jul 09	99.6%	97.7%	1.9%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	738	1.4	8.5	Aug 01 07:00	2.4	Aug 21	99.2%	97.6%	1.6%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	720	1.8	8.3	Sep 09 08:00	2.9	Sep 26	100.0%	96.9%	3.1%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	741	1.9	44.2	Oct 24 08:00	5.5	Oct 21	99.6%	92.5%	6.9%	0.1%	0.1%	0.0%	0.0%	0	0
November 2019	720	2.5	14.8	Nov 27 18:00	6.0	Nov 27	100.0%	91.9%	8.1%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	3.8	31.0	Dec 07 10:00	7.6	Dec 07	100.0%	80.6%	18.4%	0.8%	0.1%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8593**	**2.2**	**44.2**	**Oct 24**	**8.0**	**Jun 14**	**98.1%**	**90.9%**	**6.9%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



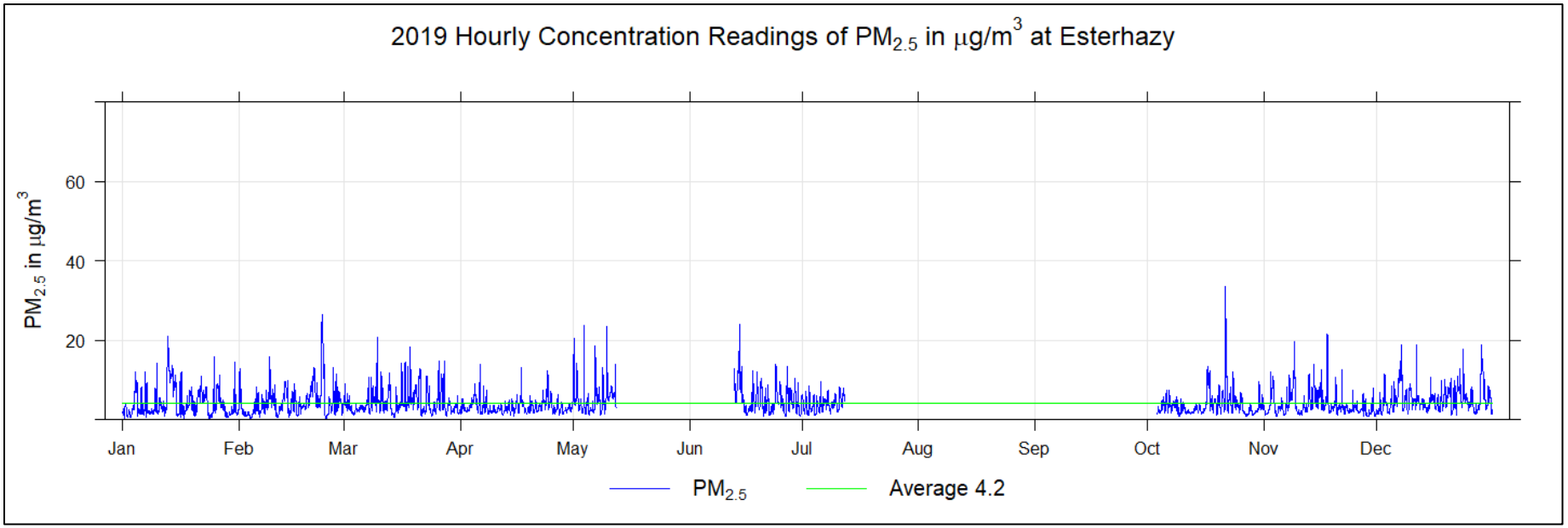
Ozone (O_3) Frequency Distribution of 1-hr Averages - Esterhazy

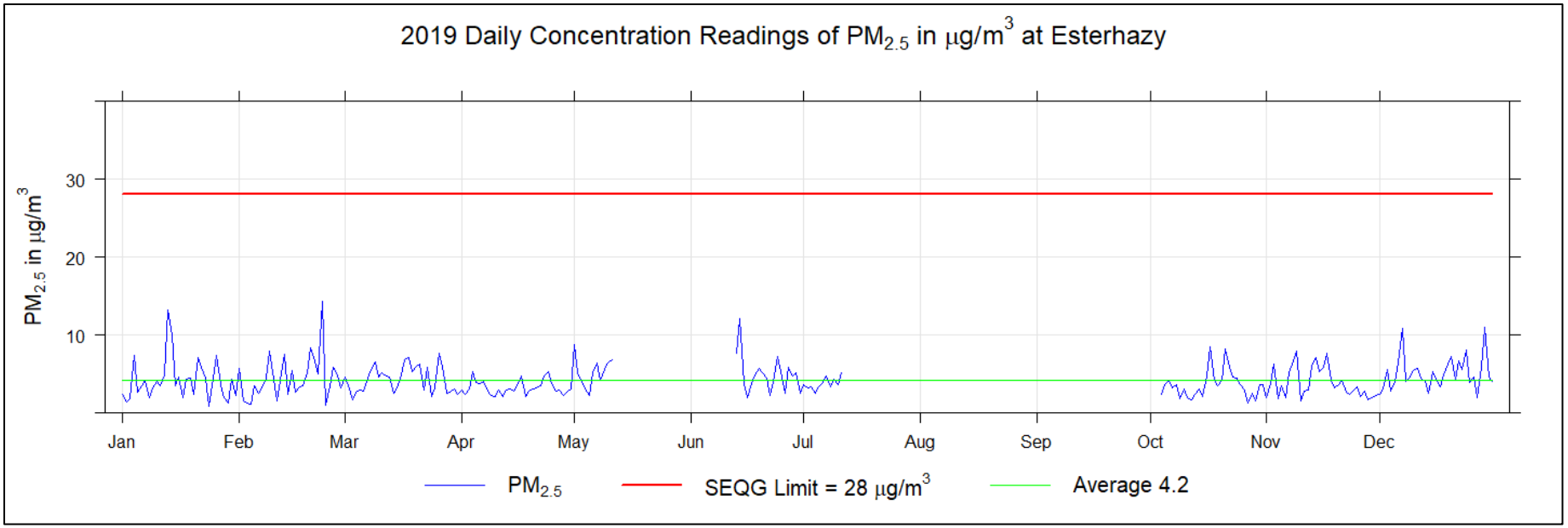
Month	Operational Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 10 (ppb)	10 to 20 (ppb)	20 to 40 (ppb)	40 to 60 (ppb)	60 to 82 (ppb)	> 82 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	30.6	40.8	Jan 28 19:00	37.0	Jan 29	100.0%	0.0%	3.8%	91.1%	0.7%	0.0%	0.0%	0	0
February 2019	672	36.2	49.0	Feb 27 20:00	41.0	Feb 20	100.0%	0.0%	0.0%	82.4%	13.2%	0.0%	0.0%	0	0
March 2019	739	40.8	58.8	Mar 11 18:00	52.9	Mar 11	99.3%	0.0%	2.2%	36.3%	56.7%	0.0%	0.0%	0	0
April 2019	720	36.0	55.7	Apr 24 18:00	45.2	Apr 24	100.0%	0.0%	3.3%	56.3%	36.0%	0.0%	0.0%	0	0
May 2019	744	34.2	69.4	May 29 16:00	42.8	May 13	100.0%	1.9%	9.8%	52.3%	30.6%	1.1%	0.0%	0	0
June 2019	568	33.5	76.1	Jun 03 17:00	44.9	Jun 03	78.9%	1.4%	9.7%	41.8%	21.5%	1.3%	0.0%	0	0
July 2019	742	28.2	52.3	Jul 08 12:00	42.4	Jul 08	99.7%	1.7%	19.4%	64.8%	9.7%	0.0%	0.0%	0	0
August 2019	737	24.8	49.4	Aug 16 15:00	41.4	Aug 03	99.1%	1.7%	30.2%	57.0%	6.5%	0.0%	0.0%	0	0
September 2019	719	22.2	43.7	Sep 16 16:00	28.9	Sep 15	99.9%	4.2%	35.6%	55.4%	0.6%	0.0%	0.0%	0	0
October 2019	739	22.9	40.7	Oct 07 17:00	30.5	Oct 29	99.3%	4.7%	24.6%	65.2%	0.1%	0.0%	0.0%	0	0
November 2019	720	24.2	35.3	Nov 26 14:00	31.6	Nov 26	100.0%	0.4%	21.1%	74.3%	0.0%	0.0%	0.0%	0	0
December 2019	744	26.1	35.7	Dec 27 02:00	32.8	Dec 27	100.0%	0.4%	9.3%	85.6%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8588**	**30.0**	**76.1**	**Jun 03**	**52.9**	**Mar 11**	**98.0%**	**1.4%**	**14.2%**	**63.5%**	**14.6%**	**0.2%**	**0.0%**	**0**	**0**



Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Esterhazy

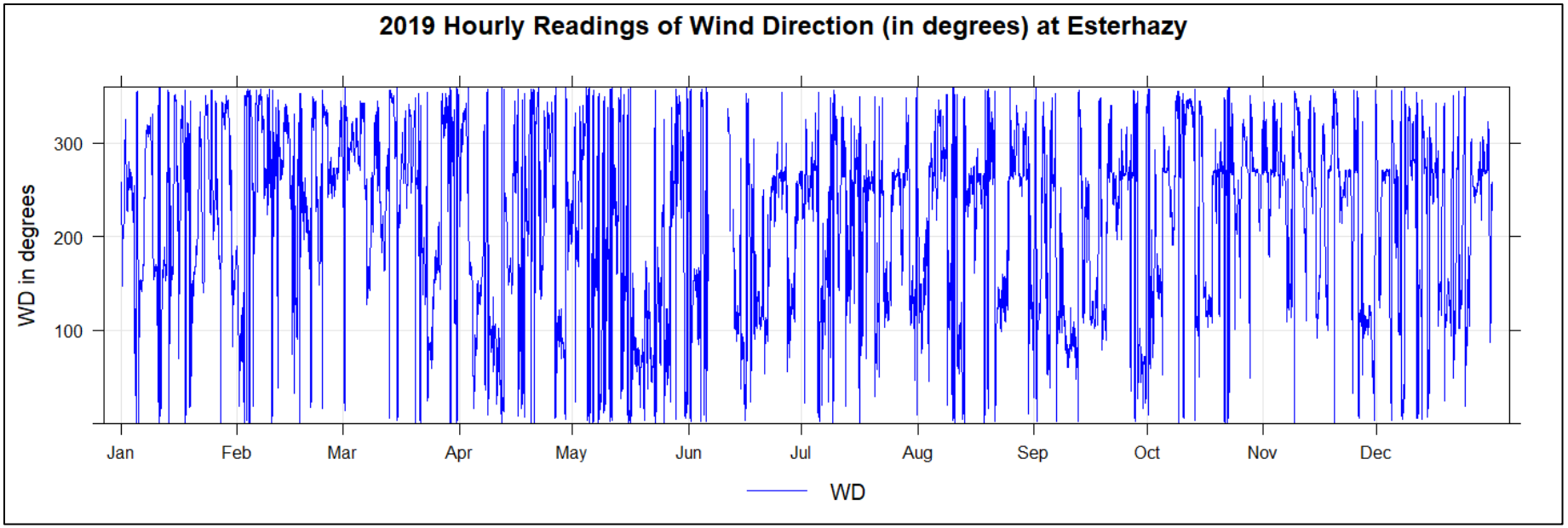
Month	Operational Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	744	4.1	21.1	Jan 12 23:00	13.1	Jan 14	100.0%	34.5%	29.2%	28.6%	7.4%	0.3%	0.0%	0	0
February 2019	672	4.4	26.5	Feb 23 03:00	14.3	Feb 24	100.0%	27.4%	29.3%	37.1%	5.1%	1.2%	0.0%	0	0
March 2019	744	4.3	20.6	Mar 09 19:00	7.7	Mar 26	100.0%	18.7%	42.2%	33.1%	5.9%	0.1%	0.0%	0	0
April 2019	720	3.2	14.0	Apr 06 04:00	5.3	Apr 04	100.0%	22.2%	54.2%	22.9%	0.7%	0.0%	0.0%	0	0
May 2019	274	5.3	23.8	May 03 20:00	8.7	May 01	36.8%	4.6%	12.2%	17.1%	2.7%	0.4%	0.0%	0	0
June 2019	566	4.9	23.9	Jun 14 09:00	12.1	Jun 14	78.6%	11.3%	18.8%	24.7%	4.7%	0.3%	0.0%	0	0
July 2019	540	3.8	9.5	Jul 06 00:00	5.1	Jul 11	72.6%	6.2%	16.3%	14.1%	0.0%	0.0%	0.0%	0	0
August 2019															
September 2019															
October 2019	679	3.5	33.6	Oct 21 19:00	8.5	Oct 17	91.3%	28.2%	37.1%	22.8%	2.8%	0.3%	0.1%	0	0
November 2019	720	3.8	21.4	Nov 17 18:00	7.9	Nov 09	100.0%	25.7%	46.5%	22.6%	4.6%	0.6%	0.0%	0	0
December 2019	744	5.1	18.9	Dec 07 18:00	11.0	Dec 29	100.0%	11.3%	34.3%	47.0%	7.4%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6403**	**4.3**	**33.6**	**Oct 21**	**14.3**	**Feb 24**	**73.1%**	**15.8%**	**26.6%**	**22.4%**	**3.4%**	**0.3%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of PM2.5 in µg/m3 at Esterhazy
PM2.5 in µg/m3
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
PM2.5
SEQG Limit = 28 µg/m3
Average 4.2

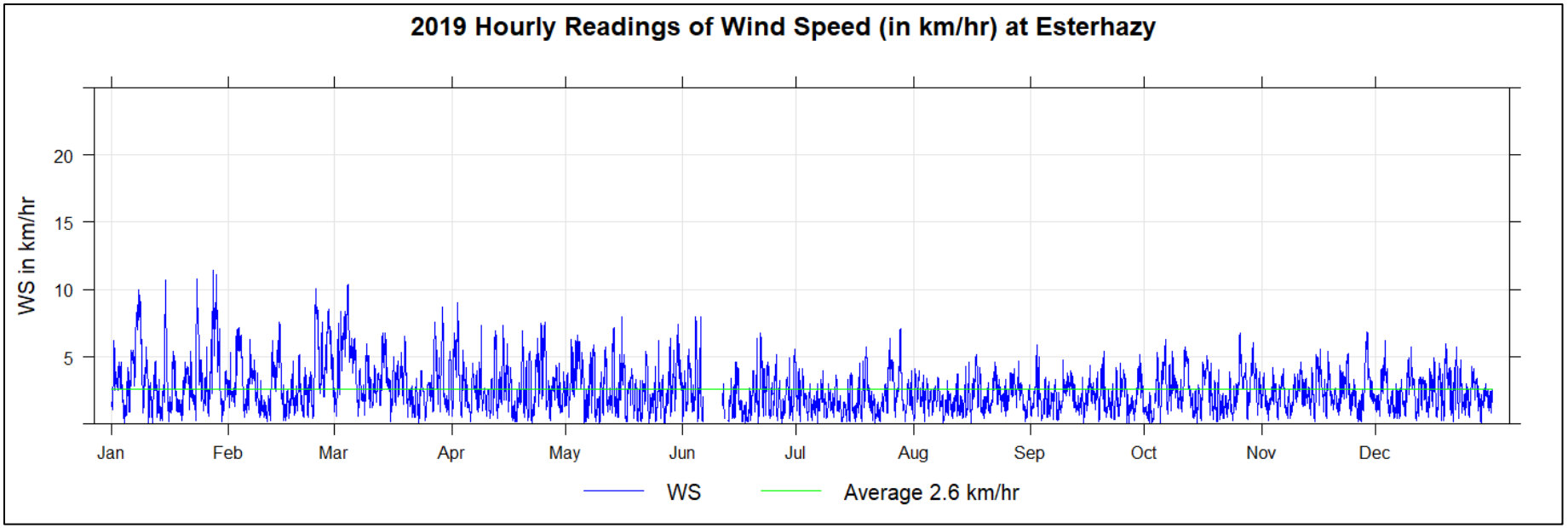
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Esterhazy

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 2 (m/s)	2 to 4 (m/s)	4 to 10 (m/s)	10 to 20 (m/s)	20 to 28 (m/s)	> 28 (m/s)	
N	462	3.1%	1.6%	0.6%	0.0%	0.0%	0.0%	5.4%
NNE	246	2.2%	0.5%	0.1%	0.0%	0.0%	0.0%	2.9%
NE	173	1.8%	0.2%	0.0%	0.0%	0.0%	0.0%	2.0%
ENE	268	2.4%	0.7%	0.0%	0.0%	0.0%	0.0%	3.1%
E	404	3.8%	0.9%	0.0%	0.0%	0.0%	0.0%	4.7%
ESE	631	5.7%	1.5%	0.1%	0.0%	0.0%	0.0%	7.3%
SE	519	4.3%	1.7%	0.0%	0.0%	0.0%	0.0%	6.0%
SSE	524	4.1%	2.0%	0.0%	0.0%	0.0%	0.0%	6.1%
S	323	2.8%	0.9%	0.1%	0.0%	0.0%	0.0%	3.8%
SSW	298	2.8%	0.6%	0.0%	0.0%	0.0%	0.0%	3.5%
SW	495	5.1%	0.7%	0.0%	0.0%	0.0%	0.0%	5.7%
WSW	820	7.6%	1.8%	0.1%	0.0%	0.0%	0.0%	9.5%
W	1490	10.8%	5.9%	0.6%	0.0%	0.0%	0.0%	17.3%
WNW	499	3.5%	1.9%	0.4%	0.0%	0.0%	0.0%	5.8%
NW	620	4.0%	2.2%	1.0%	0.0%	0.0%	0.0%	7.2%
NNW	838	4.6%	3.6%	1.5%	0.0%	0.0%	0.0%	9.7%
Total	**8,610**	**68.6%**	**26.8%**	**4.7%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Esterhazy
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

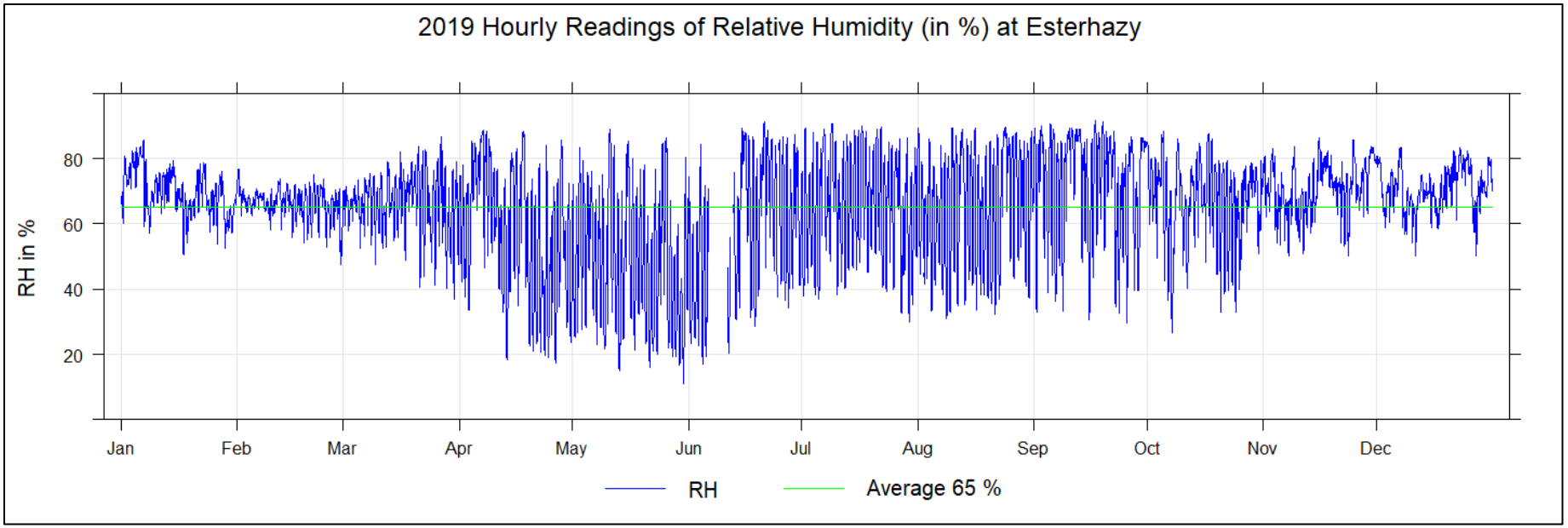
Wind Speed Frequency Distribution of 1-hr Averages - Esterhazy

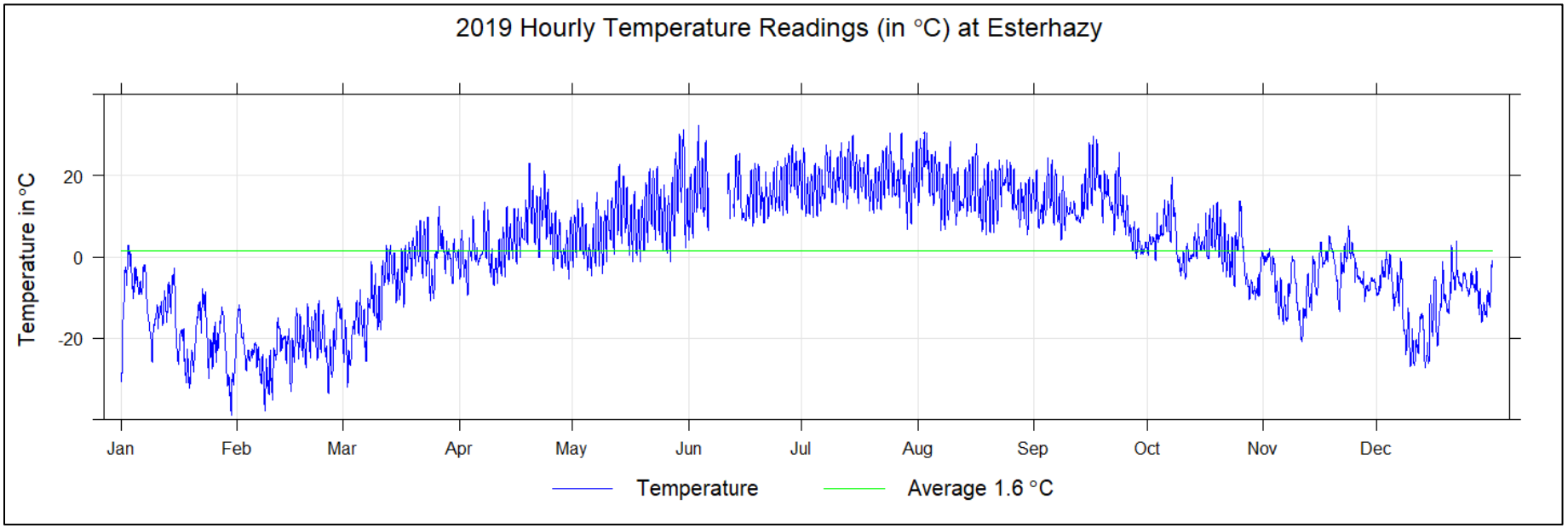
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	744	3.4	11.4	Jan 27 20:00	8.3	Jan 28	100.0%	54.2%	32.1%	13.7%	0.0%	0.0%	0.0%	0	0
February 2019	672	3.2	10.1	Feb 23 23:00	7.4	Feb 24	100.0%	57.6%	30.7%	11.8%	0.0%	0.0%	0.0%	0	0
March 2019	744	3.4	10.4	Mar 04 12:00	7.8	Mar 04	100.0%	51.2%	36.7%	12.1%	0.0%	0.0%	0.0%	0	0
April 2019	720	2.8	9.0	Apr 02 10:00	6.0	Apr 02	100.0%	62.6%	29.4%	7.9%	0.0%	0.0%	0.0%	0	0
May 2019	744	2.7	8.0	May 15 20:00	5.1	May 04	100.0%	64.7%	31.5%	3.9%	0.0%	0.0%	0.0%	0	0
June 2019	575	2.3	8.0	Jun 04 11:00	4.3	Jun 04	79.9%	57.2%	20.4%	2.2%	0.0%	0.0%	0.0%	0	0
July 2019	744	1.9	7.1	Jul 28 12:00	4.5	Jul 28	100.0%	83.2%	15.7%	1.1%	0.0%	0.0%	0.0%	0	0
August 2019	742	2.0	5.2	Aug 17 14:00	3.7	Aug 17	99.7%	84.9%	14.8%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	720	2.0	5.9	Sep 02 13:00	3.5	Sep 29	100.0%	81.9%	18.1%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	742	2.5	6.8	Oct 26 05:00	4.7	Oct 26	99.7%	66.3%	32.3%	1.2%	0.0%	0.0%	0.0%	0	0
November 2019	720	2.4	6.8	Nov 28 20:00	5.1	Nov 28	100.0%	72.2%	26.4%	1.4%	0.0%	0.0%	0.0%	0	0
December 2019	744	2.3	6.2	Dec 03 15:00	4.2	Dec 03	100.0%	71.8%	28.1%	0.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8611**	**2.6**	**11.4**	**Jan 27**	**8.3**	**Jan 28**	**98.3%**	**67.4%**	**26.3%**	**4.6%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Esterhazy

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	70	100.0%	953	100.0%	-16.4	100.0%
February 2019	66	100.0%	958	100.0%	-21.9	100.0%
March 2019	66	100.0%	956	100.0%	-6.1	100.0%
April 2019	57	100.0%	951	100.0%	4.2	100.0%
May 2019	48	100.0%	953	100.0%	9.6	100.0%
June 2019	60	79.9%	950	79.9%	16.7	79.9%
July 2019	66	100.0%	953	100.0%	19.0	100.0%
August 2019	65	99.7%	953	99.7%	16.6	99.7%
September 2019	72	100.0%	953	100.0%	12.4	100.0%
October 2019	67	99.7%	952	99.7%	2.2	99.7%
November 2019	71	100.0%	955	100.0%	-5.2	100.0%
December 2019	71	100.0%	952	100.0%	-10.9	100.0%
Average	65	98.3%	953	98.3%	1.7	98.3%

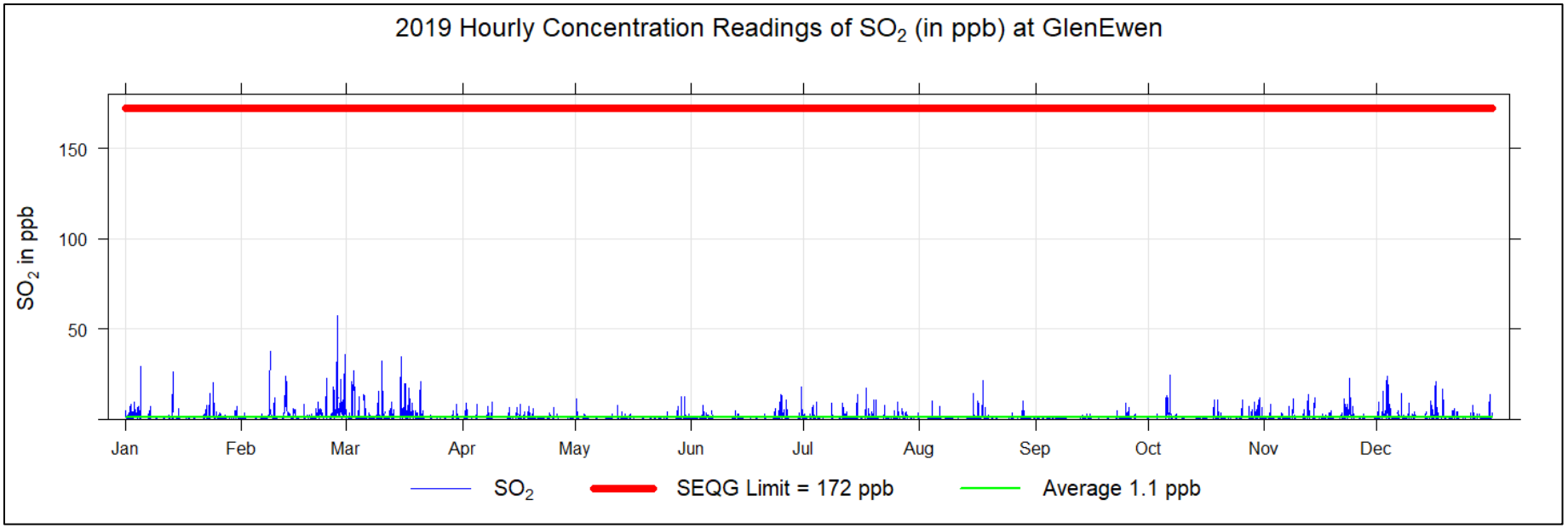

2019 Hourly Readings of Relative Humidity (in %) at Esterhazy
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 65 %

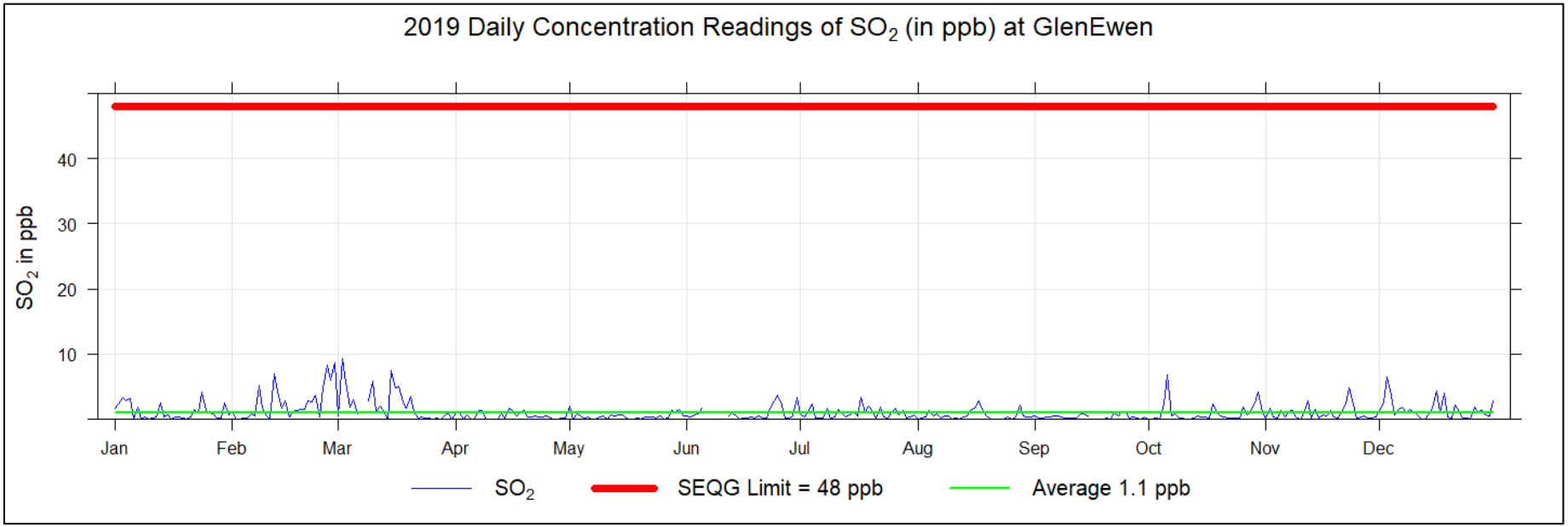

2019 Hourly Temperature Readings (in °C) at Esterhazy
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 1.6 °C

APPENDIX C
Glen Ewen Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Glen Ewen

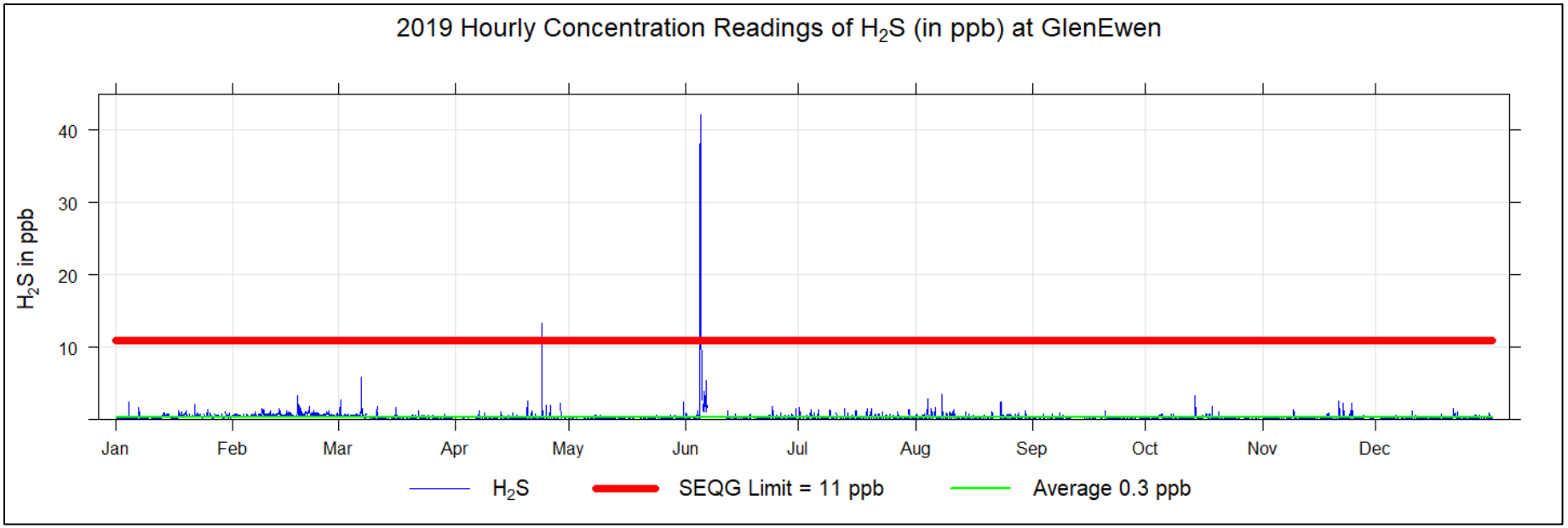
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	741	1.1	29.4	Jan 05 01:00	4.1	Jan 24	99.6%	75.8%	20.6%	1.9%	1.3%	0.0%	0.0%	0	0
February 2019	672	2.5	57.4	Feb 26 12:00	8.7	Feb 28	100.0%	52.5%	35.6%	7.7%	4.0%	0.1%	0.0%	0	0
March 2019	743	2.1	34.8	Mar 15 14:00	9.3	Mar 02	99.9%	69.6%	19.5%	4.6%	6.2%	0.0%	0.0%	0	0
April 2019	716	0.5	9.9	Apr 08 19:00	1.6	Apr 15	99.4%	87.8%	9.4%	2.2%	0.0%	0.0%	0.0%	0	0
May 2019	738	0.5	12.9	May 29 08:00	2.0	May 01	99.2%	90.5%	8.1%	0.3%	0.4%	0.0%	0.0%	0	0
June 2019	624	0.9	18.2	Jun 30 09:00	3.8	Jun 25	86.7%	68.9%	14.9%	2.1%	0.8%	0.0%	0.0%	0	0
July 2019	744	0.9	17.5	Jul 17 19:00	3.3	Jul 17	100.0%	81.5%	15.1%	2.7%	0.8%	0.0%	0.0%	0	0
August 2019	701	0.6	21.6	Aug 17 20:00	2.8	Aug 17	94.2%	83.3%	8.7%	1.3%	0.8%	0.0%	0.0%	0	0
September 2019	686	0.4	9.3	Sep 24 22:00	1.2	Sep 25	95.3%	88.8%	6.1%	0.4%	0.0%	0.0%	0.0%	0	0
October 2019	743	1.0	24.8	Oct 06 20:00	6.8	Oct 06	99.9%	84.8%	9.7%	3.5%	1.9%	0.0%	0.0%	0	0
November 2019	717	0.9	22.7	Nov 23 21:00	4.9	Nov 23	99.6%	79.3%	16.0%	3.5%	0.8%	0.0%	0.0%	0	0
December 2019	744	1.5	23.9	Dec 03 19:00	6.4	Dec 03	100.0%	65.7%	28.0%	4.2%	2.2%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8569**	**1.1**	**57.4**	**Feb 26**	**9.3**	**Mar 02**	**97.8%**	**77.5%**	**15.8%**	**2.8%**	**1.6%**	**0.0%**	**0.0%**	**0**	**0**

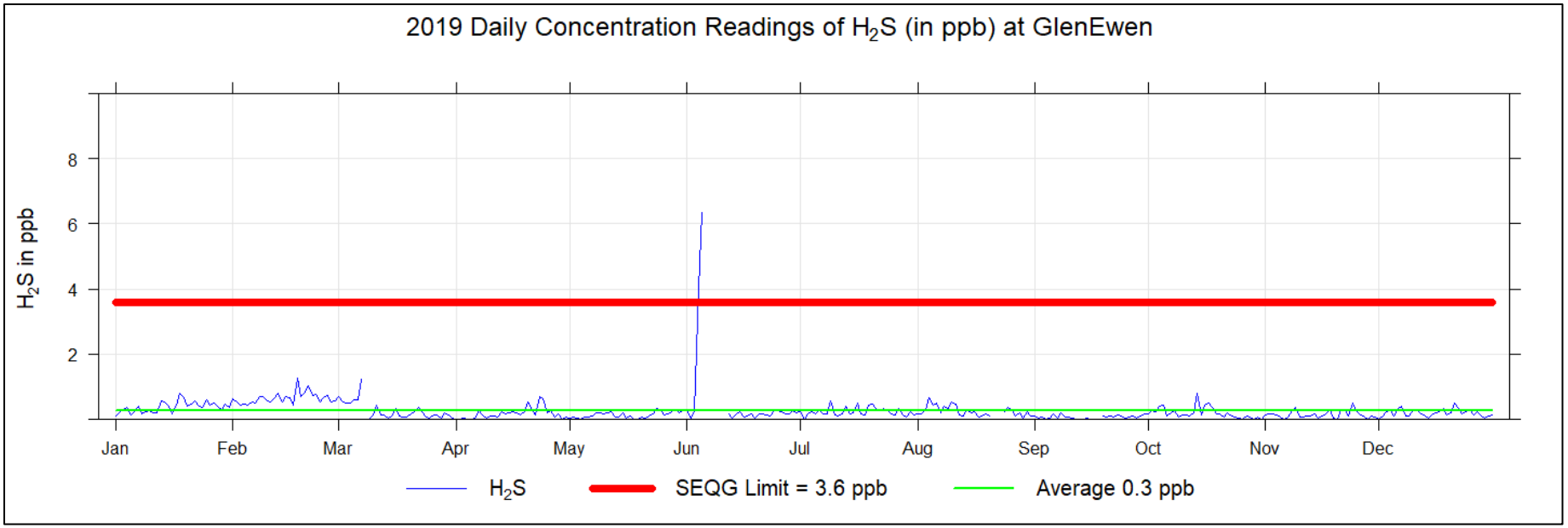



2019 Daily Concentration Readings of SO2 (in ppb) at GlenEwen
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 1.1 ppb

Hydrogen Sulphide (H_2S) Frequency Distribution of 1-hr Averages - Glen Ewen

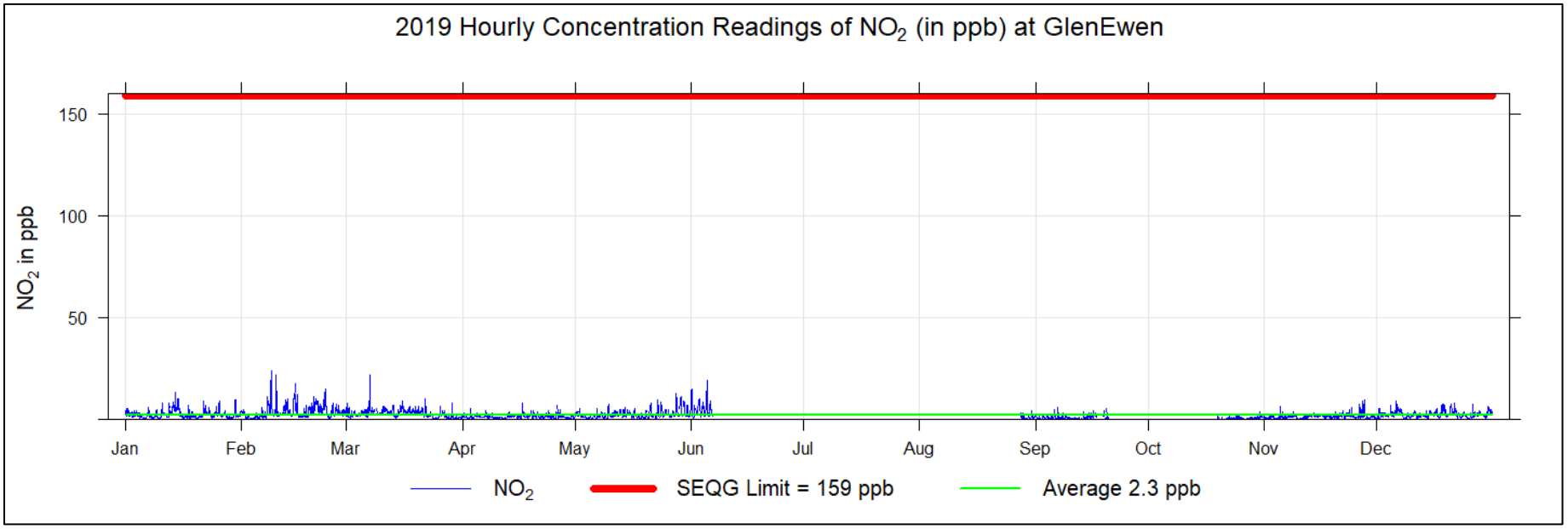
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 3 (ppb)	3 to 5 (ppb)	5 to 8 (ppb)	8 to 11 (ppb)	> 11 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	741	0.4	5.7	Jan 18 12:00	0.8	Jan 19	99.6%	98.3%	1.2%	0.0%	0.1%	0.0%	0.0%	0	0
February 2019	672	0.7	3.3	Feb 18 04:00	1.3	Feb 19	100.0%	92.7%	7.1%	0.1%	0.0%	0.0%	0.0%	0	0
March 2019	739	0.3	5.9	Mar 07 00:00	1.2	Mar 07	99.3%	96.9%	2.0%	0.3%	0.1%	0.0%	0.0%	0	0
April 2019	716	0.2	13.3	Apr 23 23:00	0.7	Apr 23	99.4%	97.6%	1.5%	0.0%	0.0%	0.1%	0.1%	0	1
May 2019	739	0.1	2.4	May 31 11:00	0.4	May 24	99.3%	99.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	625	0.6	42.2	Jun 04 23:00	6.3	Jun 05	86.8%	79.9%	4.3%	0.8%	0.6%	0.3%	1.0%	2	7
July 2019	744	0.2	1.7	Jul 01 07:00	0.6	Jul 09	100.0%	96.5%	3.5%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	701	0.3	3.5	Aug 08 01:00	0.7	Aug 04	94.2%	90.5%	3.6%	0.1%	0.0%	0.0%	0.0%	0	0
September 2019	687	0.1	1.2	Sep 20 06:00	0.2	Sep 08	95.4%	95.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	744	0.2	3.4	Oct 14 04:00	0.8	Oct 14	100.0%	98.9%	0.9%	0.1%	0.0%	0.0%	0.0%	0	0
November 2019	717	0.1	2.6	Nov 21 07:00	0.5	Nov 24	99.6%	98.6%	1.0%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	0.2	1.5	Dec 21 15:00	0.5	Dec 21	100.0%	99.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8569**	**0.3**	**42.2**	**Jun 04**	**6.3**	**Jun 05**	**97.8%**	**95.4%**	**2.1%**	**0.1%**	**0.1%**	**0.0%**	**0.1%**	**2**	**8**

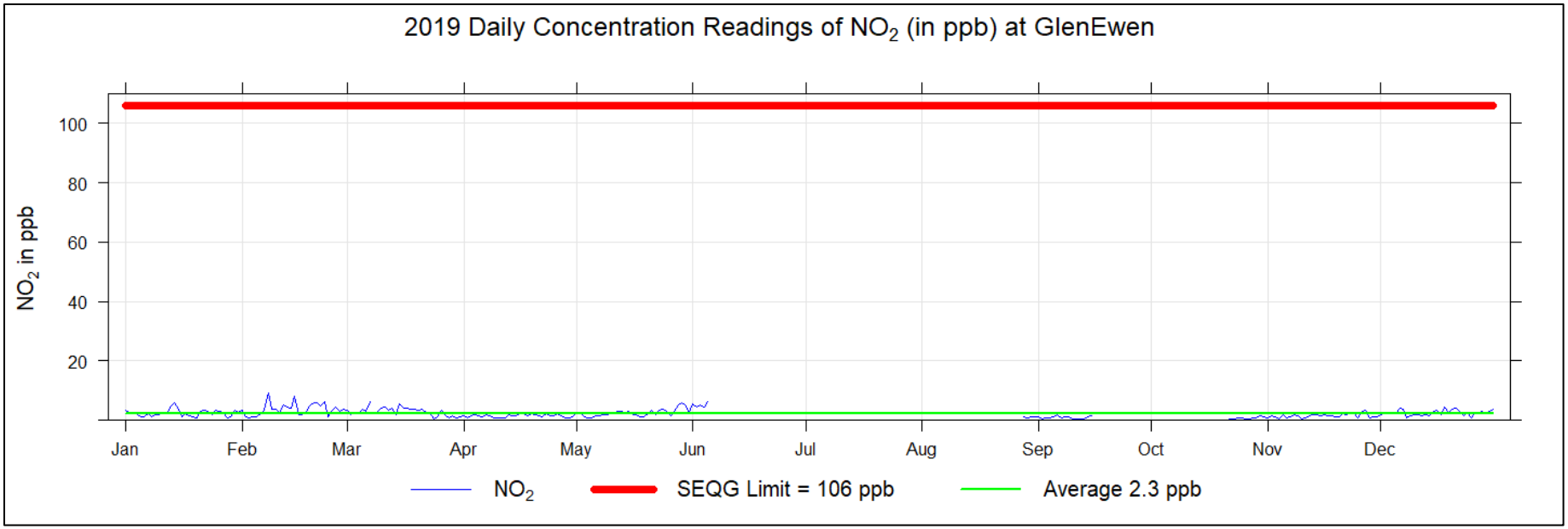



2019 Daily Concentration Readings of H2S (in ppb) at GlenEwen
H2S in ppb
8
6
4
2
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
H2S
SEQG Limit = 3.6 ppb
Average 0.3 ppb

Nitrogen Dioxide (NO_2) Frequency Distribution of 1-hr Averages - Glen Ewen

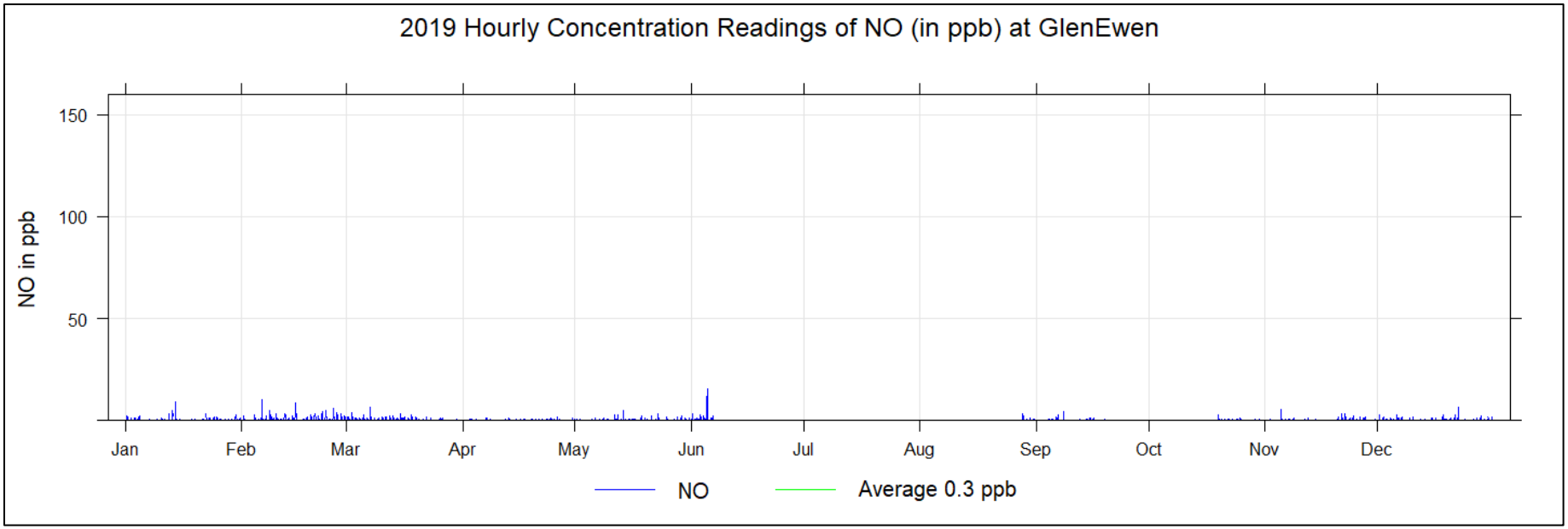
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	741	2.4	13.2	Jan 14 10:00	6.0	Jan 14	99.6%	91.7%	7.9%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	3.7	24.0	Feb 08 22:00	9.3	Feb 08	100.0%	79.0%	19.8%	1.2%	0.0%	0.0%	0.0%	0	0
March 2019	743	3.0	21.7	Mar 07 08:00	6.4	Mar 07	99.9%	89.5%	10.1%	0.3%	0.0%	0.0%	0.0%	0	0
April 2019	716	1.5	8.0	Apr 16 22:00	2.3	Apr 16	99.4%	98.9%	0.6%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	736	2.5	13.1	May 28 02:00	5.7	May 29	98.9%	89.7%	9.3%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	145	5.2	18.9	Jun 05 06:00	6.4	Jun 05	20.1%	11.4%	8.6%	0.1%	0.0%	0.0%	0.0%	0	0
July 2019															
August 2019	100	1.0	4.4	Aug 30 21:00	1.3	Aug 28	13.4%	13.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	426	1.0	6.2	Sep 06 22:00	1.9	Sep 06	59.2%	58.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	318	0.5	3.6	Oct 30 19:00	1.4	Oct 30	42.7%	42.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	1.5	9.4	Nov 27 19:00	3.3	Nov 27	99.6%	97.9%	1.7%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	2.5	9.1	Dec 06 07:00	4.6	Dec 18	100.0%	94.4%	5.6%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6058**	**2.3**	**24.0**	**Feb 08**	**9.3**	**Feb 08**	**69.2%**	**63.8%**	**5.2%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of NO2 (in ppb) at GlenEwen
NO2 in ppb
100
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
NO2
SEQG Limit = 106 ppb
Average 2.3 ppb

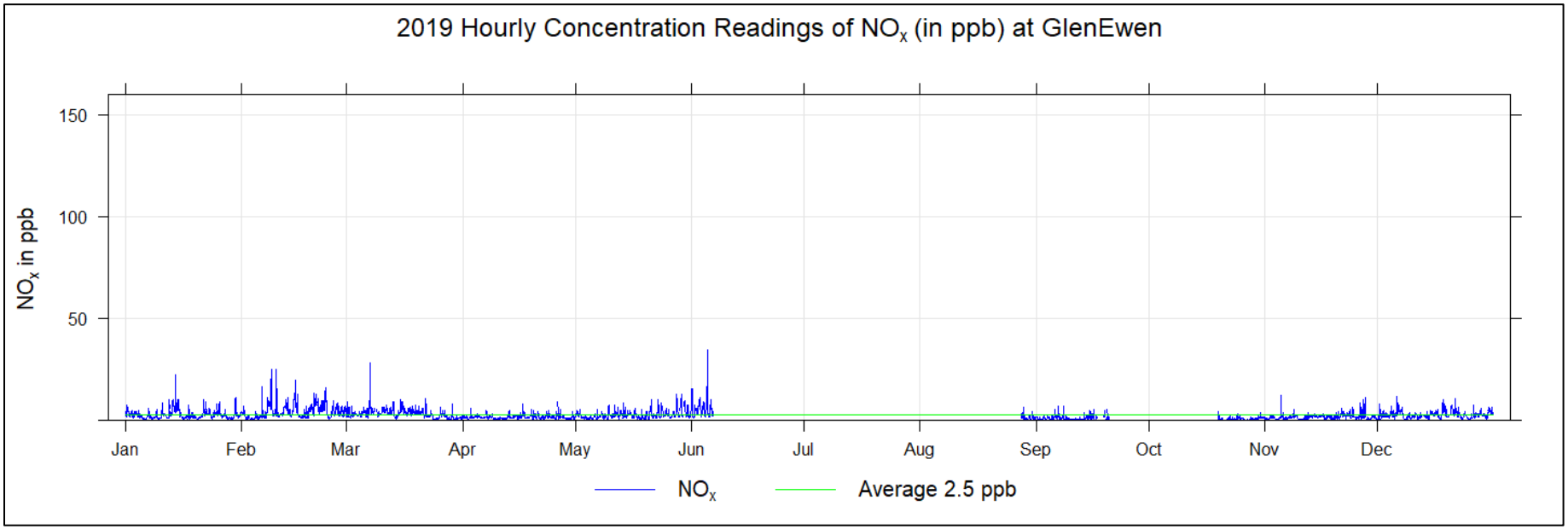
Nitric Oxide (NO) Frequency Distribution of 1-hr Averages - Glen Ewen

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	741	0.3	1.3	Jan 13 00:00	1.3	Jan 14	99.6%	99.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	0.7	1.7	Feb 08 00:00	1.7	Feb 09	100.0%	99.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	743	0.4	0.9	Mar 07 00:00	0.9	Mar 07	99.9%	99.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	716	0.2	0.4	Apr 19 00:00	0.4	Apr 19	99.4%	99.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	736	0.2	0.5	May 25 00:00	0.5	May 25	98.9%	98.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	145	0.7	1.4	Jun 05 00:00	1.4	Jun 05	20.1%	19.9%	0.1%	0.1%	0.0%	0.0%	0.0%	0	0
July 2019							0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	100	0.3	0.7	Aug 28 00:00	0.7	Aug 28	13.4%	13.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	426	0.2	0.5	Sep 06 00:00	0.5	Sep 06	59.2%	59.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	318	0.2	0.4	Oct 19 00:00	0.4	Oct 19	42.7%	42.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	0.2	0.6	Nov 21 00:00	0.6	Nov 21	99.6%	99.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	0.2	0.5	Dec 22 00:00	0.5	Dec 22	100.0%	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6058**	**0.3**	**1.7**	**Feb 08**	**1.7**	**Feb 09**	**69.2%**	**69.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



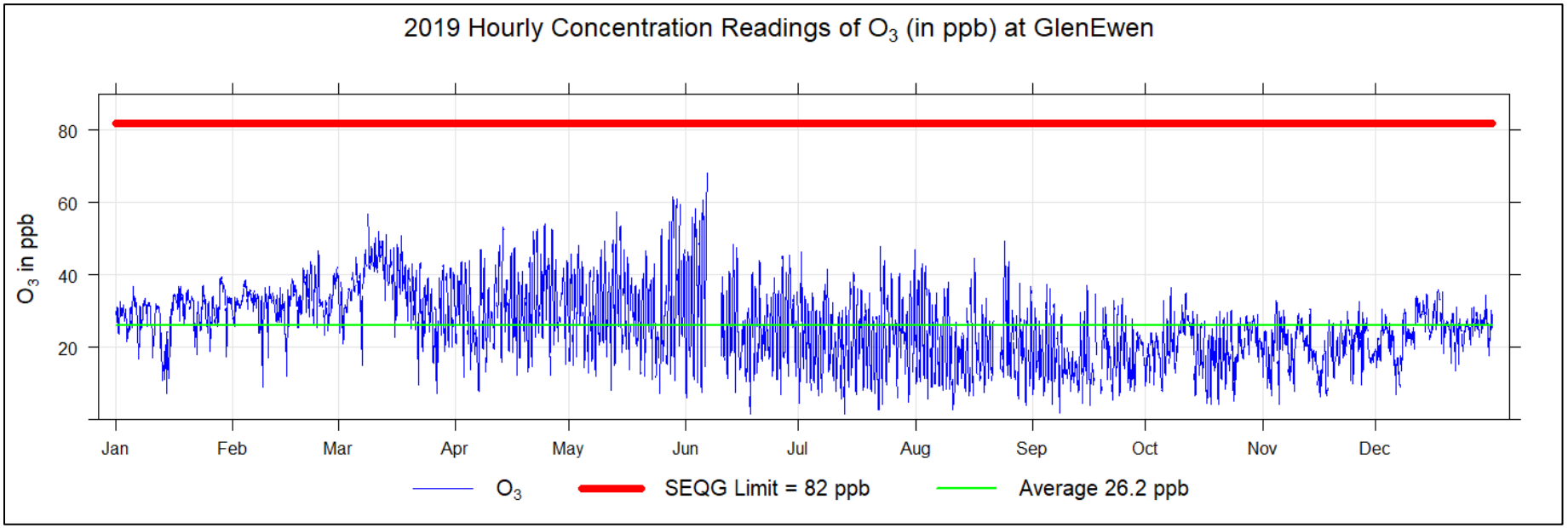
Oxides of Nitrogen (NO_X) Frequency Distribution of 1-hr Averages - Glen Ewen

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	741	2.7	22.2	Jan 14 10:00	7.0	Jan 14	99.6%	88.7%	10.6%	0.3%	0.0%	0.0%	0.0%	0	0
February 2019	672	4.3	25.1	Feb 10 07:00	11.0	Feb 08	100.0%	70.2%	28.1%	1.6%	0.0%	0.0%	0.0%	0	0
March 2019	743	3.3	28.2	Mar 07 08:00	7.3	Mar 07	99.9%	84.7%	14.9%	0.3%	0.0%	0.0%	0.0%	0	0
April 2019	716	1.6	9.1	Apr 26 08:00	2.6	Apr 16	99.4%	98.5%	1.0%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	736	2.7	13.0	May 28 02:00	6.1	May 29	98.9%	87.4%	11.6%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	145	5.9	34.7	Jun 05 06:00	7.8	Jun 05	20.1%	10.6%	9.0%	0.4%	0.1%	0.0%	0.0%	0	0
July 2019							0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	100	1.3	6.3	Aug 28 11:00	2.0	Aug 28	13.4%	13.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	426	1.1	7.1	Sep 06 22:00	2.5	Sep 06	59.2%	58.3%	0.8%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	318	0.7	4.3	Oct 19 14:00	1.6	Oct 30	42.7%	42.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	1.7	12.3	Nov 05 09:00	3.6	Nov 27	99.6%	97.1%	2.5%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	744	2.7	11.9	Dec 06 07:00	5.0	Dec 18	100.0%	91.8%	8.2%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6058**	**2.5**	**34.7**	**Jun 05**	**11.0**	**Feb 08**	**69.2%**	**61.8%**	**7.1%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



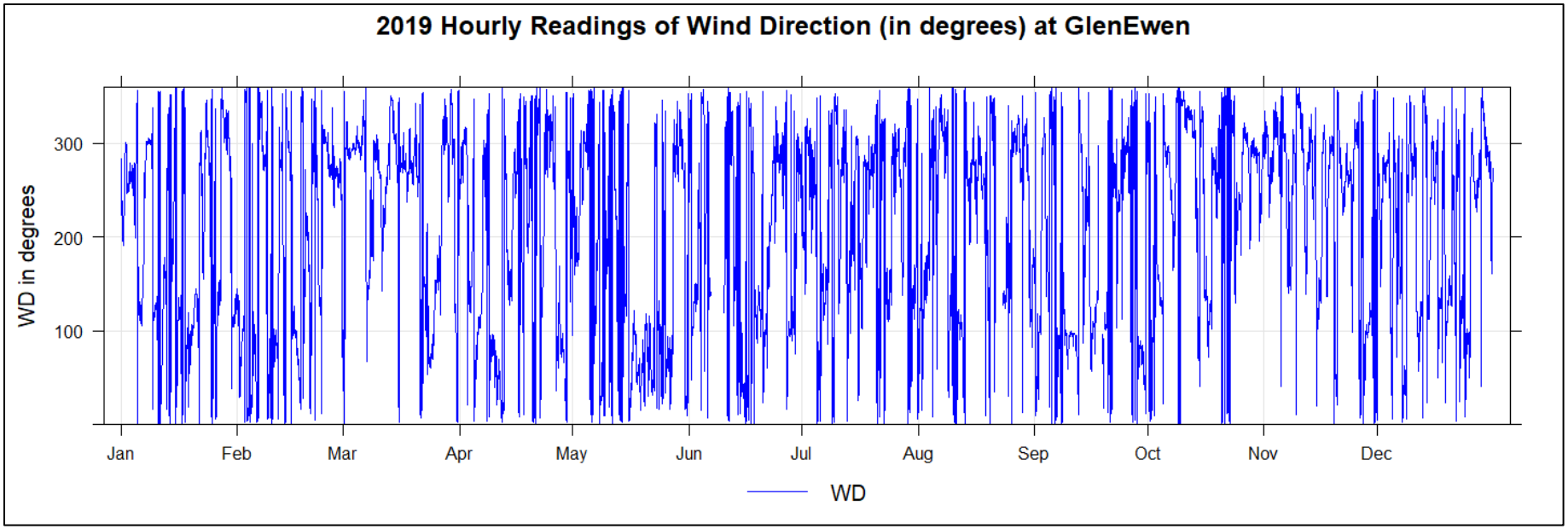
Ozone (O_3) Frequency Distribution of 1-hr Averages - Glen Ewen

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 10 (ppb)	10 to 20 (ppb)	20 to 40 (ppb)	40 to 60 (ppb)	60 to 82 (ppb)	> 82 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	739	28.9	39.4	Jan 28 23:00	36.7	Jan 29	99.3%	0.1%	7.5%	87.6%	0.0%	0.0%	0.0%	0	0
February 2019	672	32.9	46.6	Feb 23 15:00	38.9	Feb 28	100.0%	0.1%	1.9%	88.2%	5.4%	0.0%	0.0%	0	0
March 2019	741	35.4	56.7	Mar 08 21:00	46.1	Mar 12	99.6%	0.5%	4.2%	59.3%	30.4%	0.0%	0.0%	0	0
April 2019	716	31.6	54.0	Apr 24 16:00	40.9	Apr 24	99.4%	0.4%	11.8%	60.8%	22.1%	0.0%	0.0%	0	0
May 2019	736	31.4	61.7	May 28 18:00	39.6	May 28	98.9%	0.5%	14.2%	59.3%	20.3%	0.4%	0.0%	0	0
June 2019	622	27.7	68.1	Jun 06 17:00	39.6	Jun 05	86.4%	2.2%	23.8%	44.3%	11.9%	0.7%	0.0%	0	0
July 2019	744	22.6	47.7	Jul 22 16:00	30.3	Jul 08	100.0%	9.5%	28.4%	54.4%	3.4%	0.0%	0.0%	0	0
August 2019	700	21.1	49.4	Aug 24 16:00	29.7	Aug 03	94.1%	10.5%	34.7%	40.6%	3.8%	0.0%	0.0%	0	0
September 2019	685	17.4	37.3	Sep 04 18:00	22.6	Sep 15	95.1%	11.4%	48.5%	29.2%	0.0%	0.0%	0.0%	0	0
October 2019	742	20.1	36.3	Oct 07 17:00	29.5	Oct 11	99.7%	6.5%	38.7%	50.5%	0.0%	0.0%	0.0%	0	0
November 2019	716	20.0	33.0	Nov 04 15:00	26.3	Nov 10	99.4%	5.3%	39.4%	50.7%	0.0%	0.0%	0.0%	0	0
December 2019	744	24.9	35.9	Dec 17 13:00	33.3	Dec 17	100.0%	0.5%	13.6%	80.5%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8557**	**26.2**	**68.1**	**Jun 06**	**46.1**	**Mar 12**	**97.7%**	**4.0%**	**22.3%**	**58.7%**	**8.1%**	**0.1%**	**0.0%**	**0**	**0**



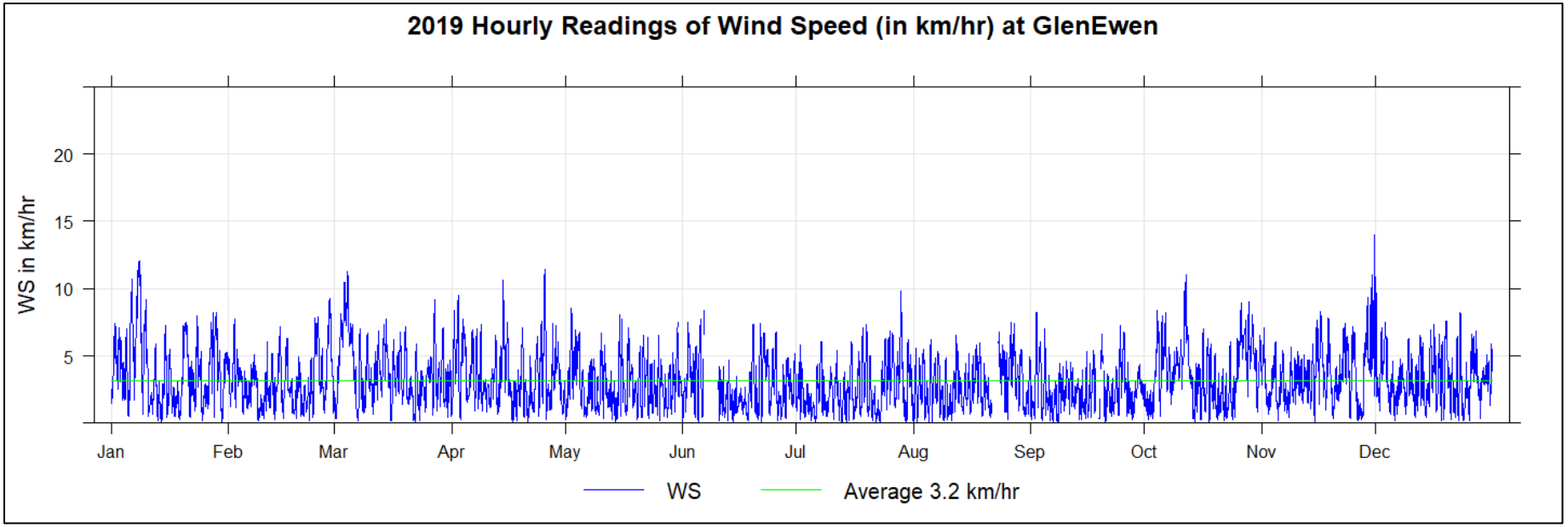
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Glen Ewen

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	486	4.1%	1.4%	0.1%	0.0%	0.0%	0.0%	5.7%
NNE	384	3.5%	0.9%	0.1%	0.0%	0.0%	0.0%	4.5%
NE	280	2.8%	0.5%	0.0%	0.0%	0.0%	0.0%	3.3%
ENE	305	2.9%	0.6%	0.0%	0.0%	0.0%	0.0%	3.6%
E	605	4.8%	1.9%	0.3%	0.0%	0.0%	0.0%	7.1%
ESE	591	2.9%	3.0%	1.0%	0.0%	0.0%	0.0%	6.9%
SE	582	2.3%	3.3%	1.1%	0.0%	0.0%	0.0%	6.8%
SSE	394	2.1%	2.1%	0.4%	0.0%	0.0%	0.0%	4.6%
S	278	1.8%	1.3%	0.2%	0.0%	0.0%	0.0%	3.2%
SSW	198	1.6%	0.7%	0.0%	0.0%	0.0%	0.0%	2.3%
SW	273	2.4%	0.8%	0.1%	0.0%	0.0%	0.0%	3.2%
WSW	564	4.0%	2.2%	0.4%	0.0%	0.0%	0.0%	6.6%
W	1023	6.0%	4.8%	1.1%	0.0%	0.0%	0.0%	11.9%
WNW	1165	4.4%	5.9%	3.2%	0.0%	0.0%	0.0%	13.6%
NW	815	3.7%	4.4%	1.4%	0.0%	0.0%	0.0%	9.5%
NNW	628	3.9%	2.7%	0.8%	0.0%	0.0%	0.0%	7.3%
Total	**8571**	**53.5%**	**36.3%**	**10.1%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at GlenEwen
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

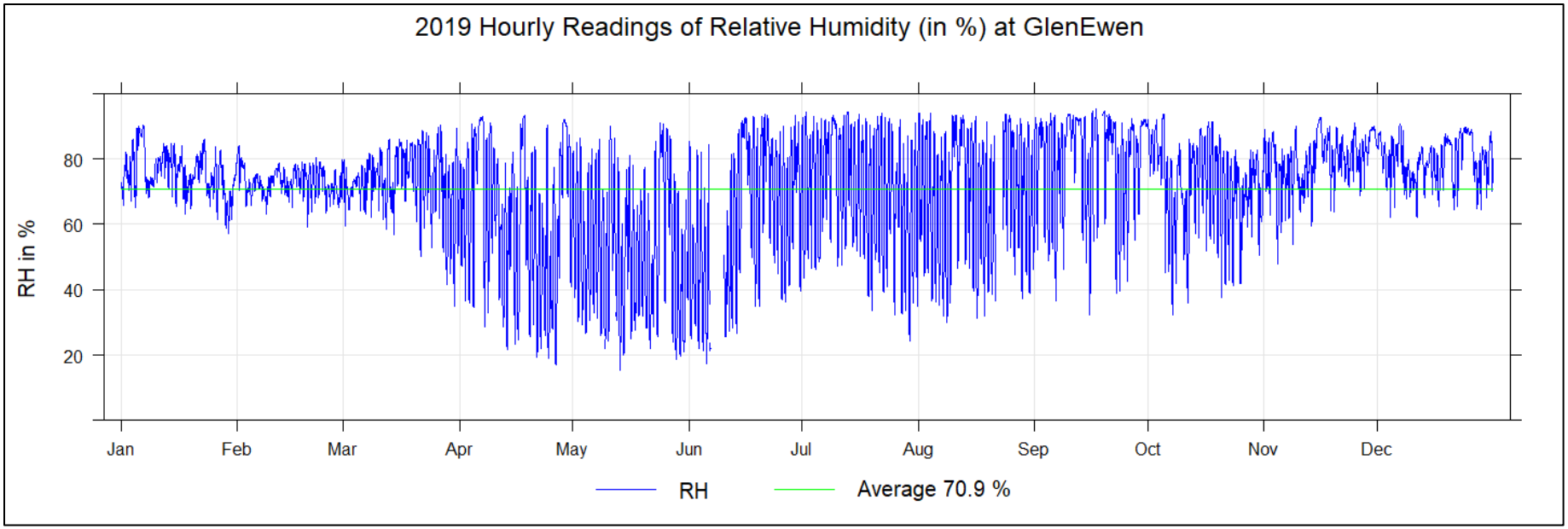
Wind Speed Frequency Distribution of 1-hr Averages - Glen Ewen

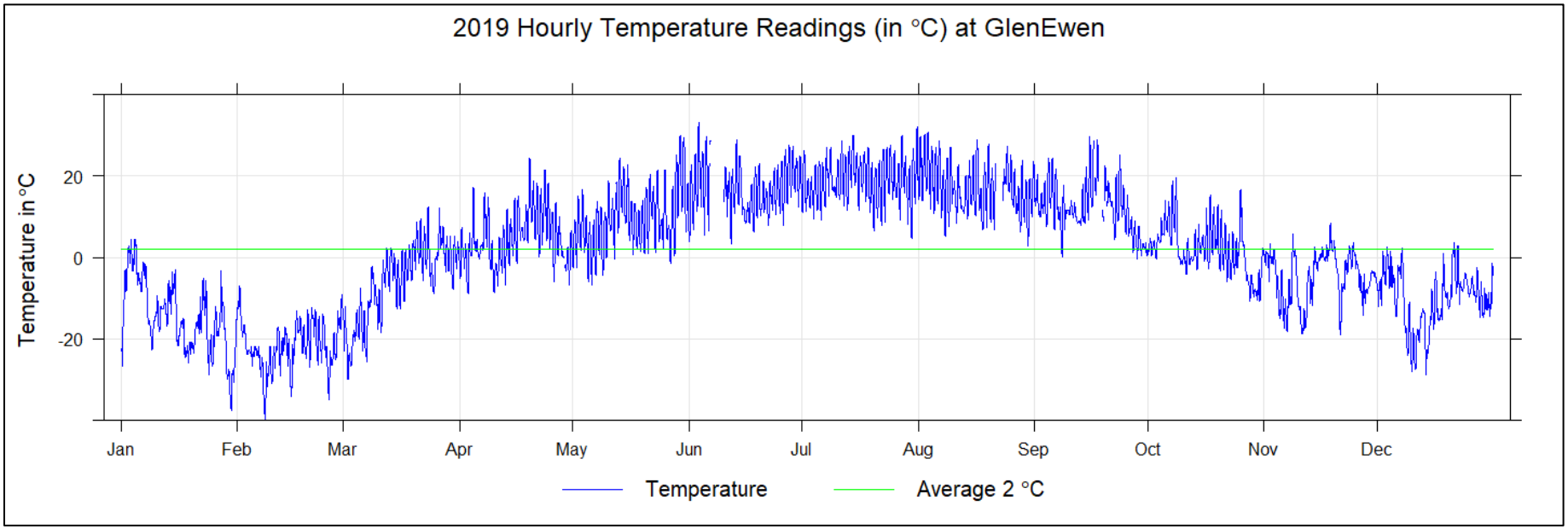
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	743	3.9	12.1	Jan 08 11:00	10.0	Jan 09	99.9%	44.9%	33.6%	21.1%	0.3%	0.0%	0.0%	0	0
February 2019	672	3.0	9.3	Feb 27 19:00	7.4	Feb 28	100.0%	57.6%	33.0%	9.4%	0.0%	0.0%	0.0%	0	0
March 2019	744	3.8	11.2	Mar 04 11:00	8.6	Mar 04	100.0%	42.6%	41.5%	15.9%	0.0%	0.0%	0.0%	0	0
April 2019	716	3.4	11.4	Apr 25 13:00	6.4	Apr 14	99.4%	53.9%	30.7%	14.9%	0.0%	0.0%	0.0%	0	0
May 2019	738	2.9	8.5	May 02 12:00	5.1	May 15	99.2%	56.5%	37.2%	5.5%	0.0%	0.0%	0.0%	0	0
June 2019	632	2.8	8.3	Jun 06 18:00	5.0	Jun 02	87.8%	54.4%	27.1%	6.3%	0.0%	0.0%	0.0%	0	0
July 2019	744	2.6	9.8	Jul 28 16:00	5.5	Jul 28	100.0%	63.8%	30.2%	5.9%	0.0%	0.0%	0.0%	0	0
August 2019	701	2.8	7.5	Aug 26 17:00	5.2	Aug 27	94.2%	54.2%	37.4%	2.7%	0.0%	0.0%	0.0%	0	0
September 2019	687	2.5	8.2	Sep 02 14:00	4.7	Sep 25	95.4%	65.6%	26.9%	2.9%	0.0%	0.0%	0.0%	0	0
October 2019	744	3.7	11.0	Oct 11 22:00	7.0	Oct 11	100.0%	41.4%	42.9%	15.7%	0.0%	0.0%	0.0%	0	0
November 2019	720	3.6	14.0	Nov 30 18:00	7.2	Nov 30	100.0%	43.1%	45.0%	11.8%	0.1%	0.0%	0.0%	0	0
December 2019	744	3.3	9.6	Dec 01 05:00	5.3	Dec 03	100.0%	49.2%	42.1%	8.7%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8585**	**3.2**	**14.0**	**Nov 30**	**10.0**	**Jan 09**	**98.0%**	**52.2%**	**35.7%**	**10.1%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Glen Ewen

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	76	99.9%	951.0	99.9%	-14.6	99.9%
February 2019	73	100.0%	954.7	100.0%	-21.7	100.0%
March 2019	73	100.0%	953.9	100.0%	-5.8	100.0%
April 2019	61	99.4%	948.8	99.4%	5.0	99.4%
May 2019	53	99.2%	949.9	99.2%	9.8	99.2%
June 2019	63	87.8%	947.2	87.8%	16.9	87.8%
July 2019	71	100.0%	949.5	100.0%	19.0	100.0%
August 2019	69	94.2%	948.2	94.2%	17.2	94.2%
September 2019	80	95.4%	948.5	95.4%	12.1	95.4%
October 2019	72	100.0%	948.3	100.0%	2.1	100.0%
November 2019	79	100.0%	951.0	100.0%	-4.7	100.0%
December 2019	80	100.0%	948.1	100.0%	-10.1	100.0%
Average	71	98.0%	950	98.0%	2.1	98.0%

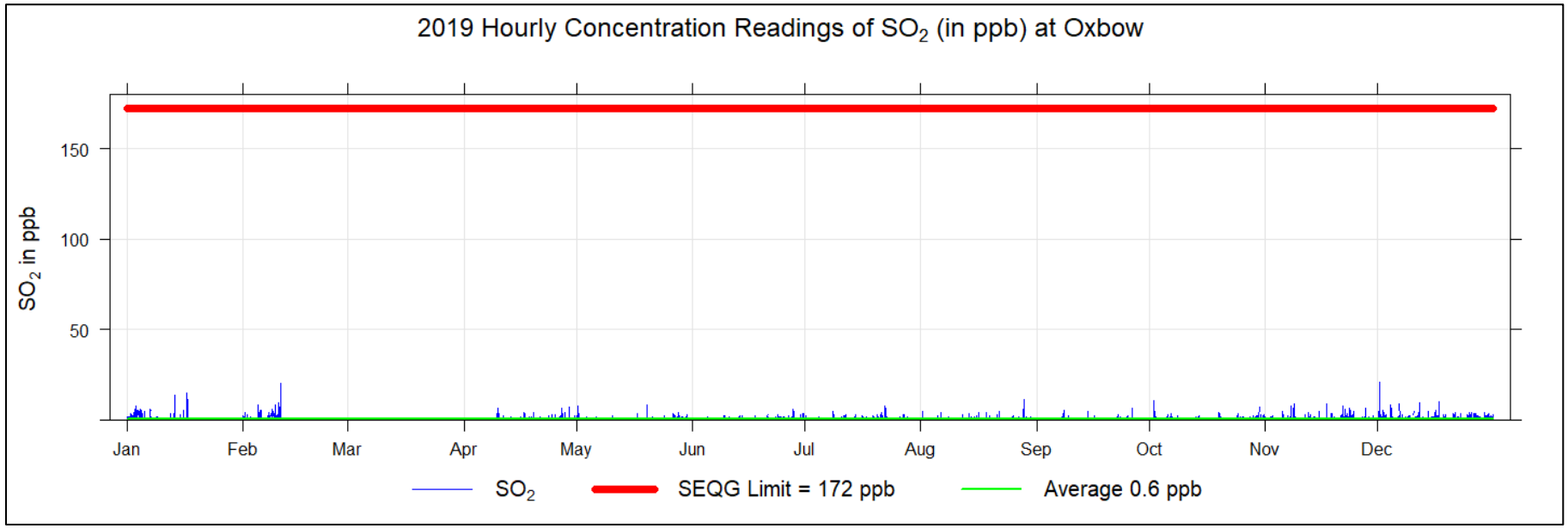

2019 Hourly Readings of Relative Humidity (in %) at GlenEwen
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 70.9 %

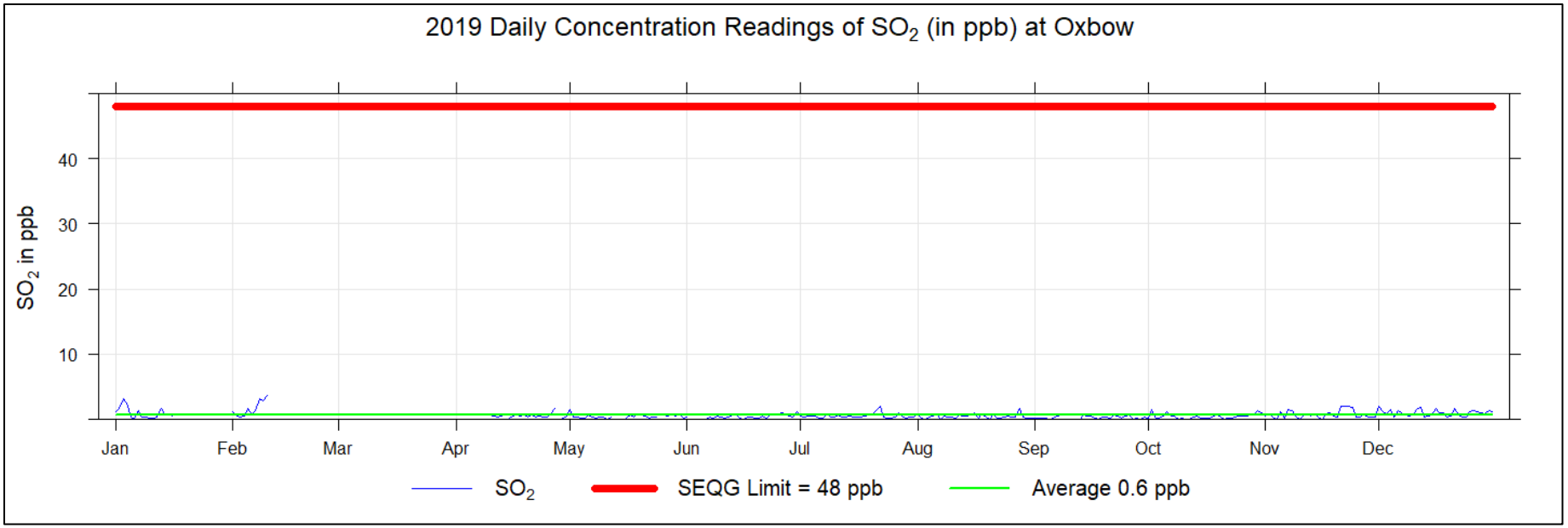

2019 Hourly Temperature Readings (in °C) at GlenEwen
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 2 °C

APPENDIX D
Oxbow Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Oxbow

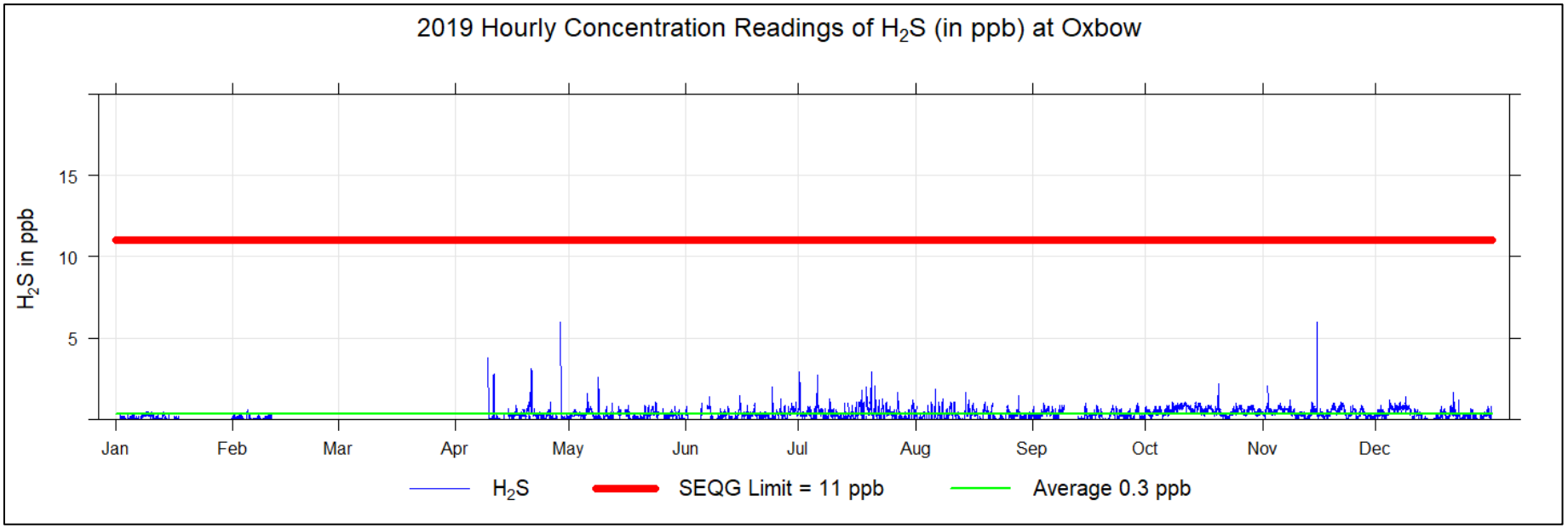
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	403	1.1	15.1	Jan 17 01:00	3.1	Jan 03	54.2%	37.6%	14.5%	1.7%	0.3%	0.0%	0.0%	0	0
February 2019	249	1.6	20.6	Feb 10 23:00	3.7	Feb 10	37.1%	22.2%	12.6%	1.8%	0.4%	0.0%	0.0%	0	0
March 2019															
April 2019	480	0.6	7.4	Apr 28 23:00	1.7	Apr 27	66.7%	58.5%	7.8%	0.4%	0.0%	0.0%	0.0%	0	0
May 2019	670	0.5	8.4	May 19 22:00	1.6	May 01	90.1%	81.5%	8.3%	0.3%	0.0%	0.0%	0.0%	0	0
June 2019	640	0.5	5.8	Jun 27 23:00	1.2	Jun 30	88.9%	77.6%	11.1%	0.1%	0.0%	0.0%	0.0%	0	0
July 2019	743	0.5	7.8	Jul 22 12:00	1.9	Jul 22	99.9%	88.4%	11.0%	0.4%	0.0%	0.0%	0.0%	0	0
August 2019	744	0.5	11.6	Aug 28 11:00	1.7	Aug 28	100.0%	90.2%	9.3%	0.3%	0.3%	0.0%	0.0%	0	0
September 2019	700	0.3	6.8	Sep 26 11:00	0.7	Sep 26	97.2%	92.1%	4.9%	0.3%	0.0%	0.0%	0.0%	0	0
October 2019	744	0.5	10.7	Oct 02 08:00	1.5	Oct 02	100.0%	89.5%	9.9%	0.4%	0.1%	0.0%	0.0%	0	0
November 2019	719	0.8	9.2	Nov 17 10:00	2.1	Nov 22	99.9%	77.9%	20.4%	1.5%	0.0%	0.0%	0.0%	0	0
December 2019	744	1.0	21.2	Dec 01 13:00	2.0	Dec 01	100.0%	69.5%	29.0%	1.3%	0.1%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6836**	**0.7**	**21.2**	**Dec 01**	**3.7**	**Feb 10**	**78.0%**	**65.7%**	**11.6%**	**0.7%**	**0.1%**	**0.0%**	**0.0%**	**0**	**0**

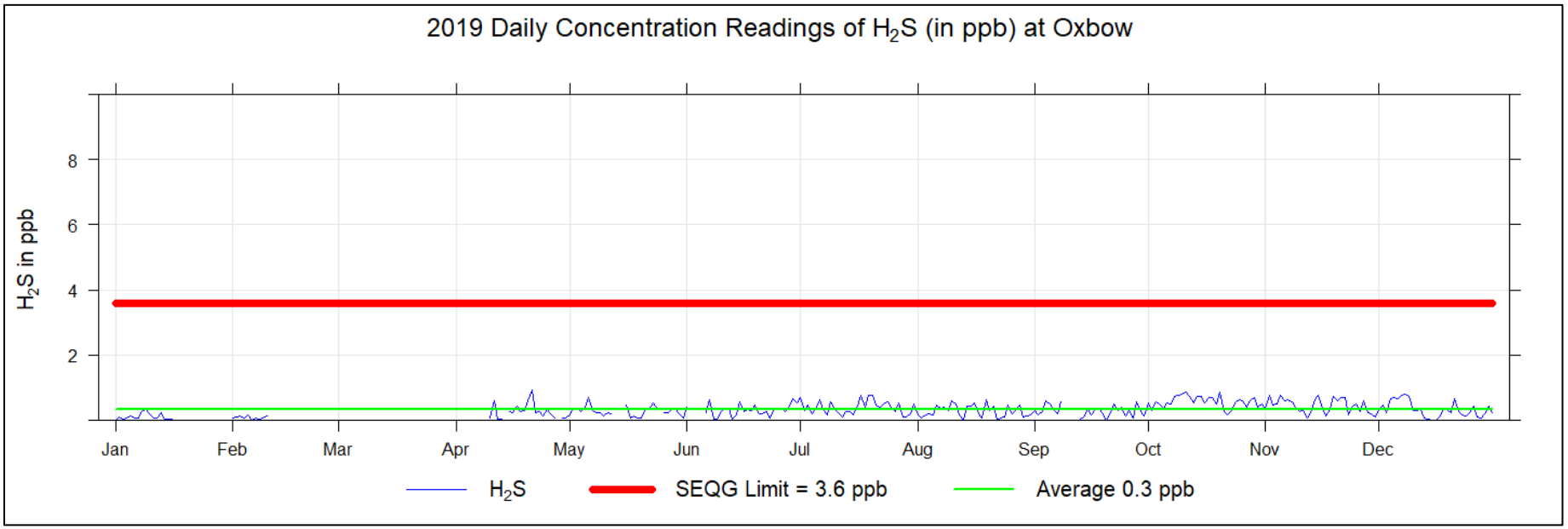



2019 Daily Concentration Readings of SO2 (in ppb) at Oxbow
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 0.6 ppb

Hydrogen Sulphide (H_2S) Frequency Distribution of 1-hr Averages - Oxbow

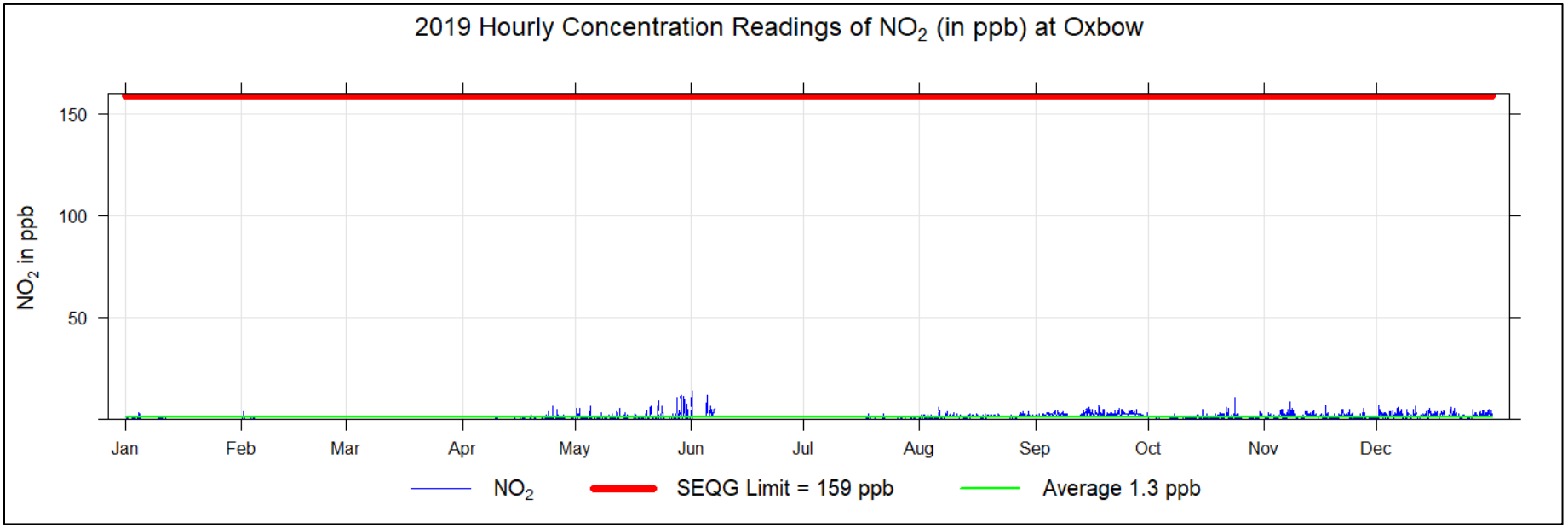
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 3 (ppb)	3 to 5 (ppb)	5 to 8 (ppb)	8 to 11 (ppb)	> 11 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	403	0.1	0.5	Jan 09 04:00	0.3	Jan 16	54.2%	54.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	249	0.1	0.6	Feb 04 23:00	0.2	Feb 10	37.1%	37.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019															
April 2019	476	0.3	6.0	Apr 28 23:00	0.9	Apr 21	66.1%	63.9%	1.8%	0.3%	0.1%	0.0%	0.0%	0	0
May 2019	670	0.3	2.6	May 08 22:00	0.7	May 06	90.1%	89.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	639	0.3	2.0	Jun 24 02:00	0.7	Jun 29	88.8%	87.6%	1.1%	0.0%	0.0%	0.0%	0.0%	0	0
July 2019	742	0.4	2.9	Jul 01 07:00	0.8	Jul 19	99.7%	94.6%	5.1%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	743	0.3	1.9	Aug 06 07:00	0.6	Aug 19	99.9%	97.0%	2.8%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	700	0.3	1.0	Sep 04 01:00	0.7	Sep 09	97.2%	97.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	744	0.6	2.2	Oct 20 08:00	0.9	Oct 11	100.0%	98.3%	1.7%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	719	0.4	6.0	Nov 15 10:00	0.8	Nov 15	99.9%	98.8%	0.8%	0.1%	0.1%	0.0%	0.0%	0	0
December 2019	744	0.3	1.7	Dec 21 14:00	0.8	Dec 08	100.0%	98.9%	1.1%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6829**	**0.3**	**6.0**	**Apr 28**	**0.9**	**Apr 21**	**78.0%**	**76.6%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**

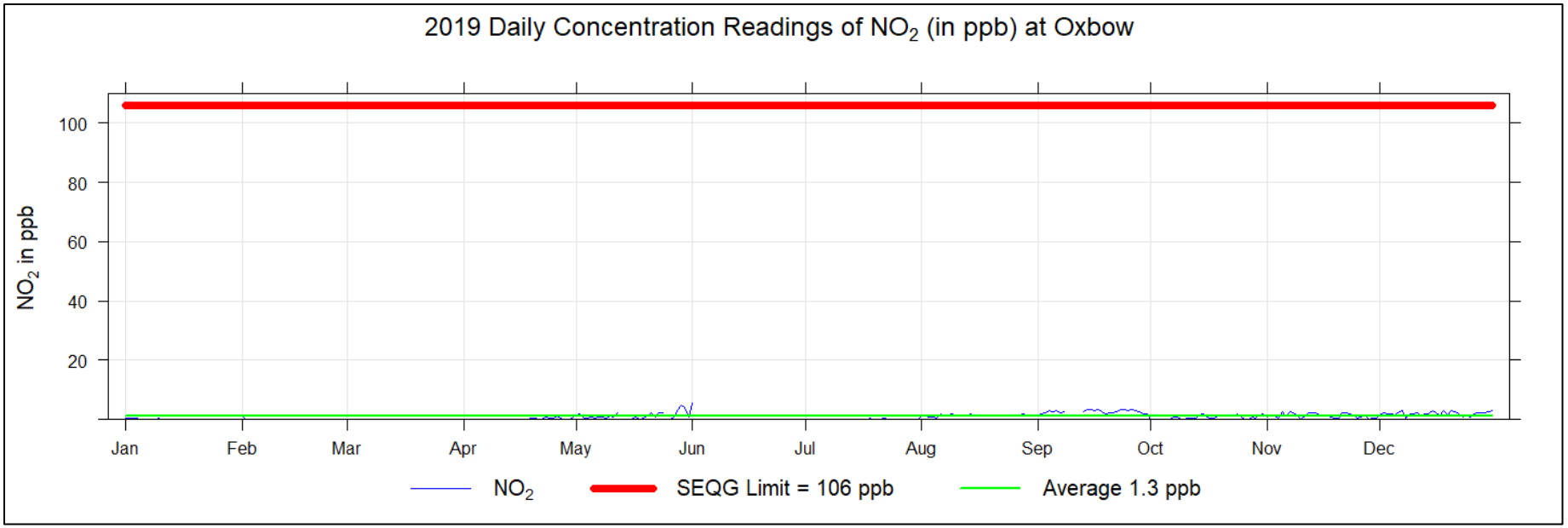



2019 Daily Concentration Readings of H2S (in ppb) at Oxbow
H2S in ppb
8
6
4
2
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
H2S
SEQG Limit = 3.6 ppb
Average 0.3 ppb

Nitrogen Dioxide (NO_2) Frequency Distribution of 1-hr Averages - Oxbow

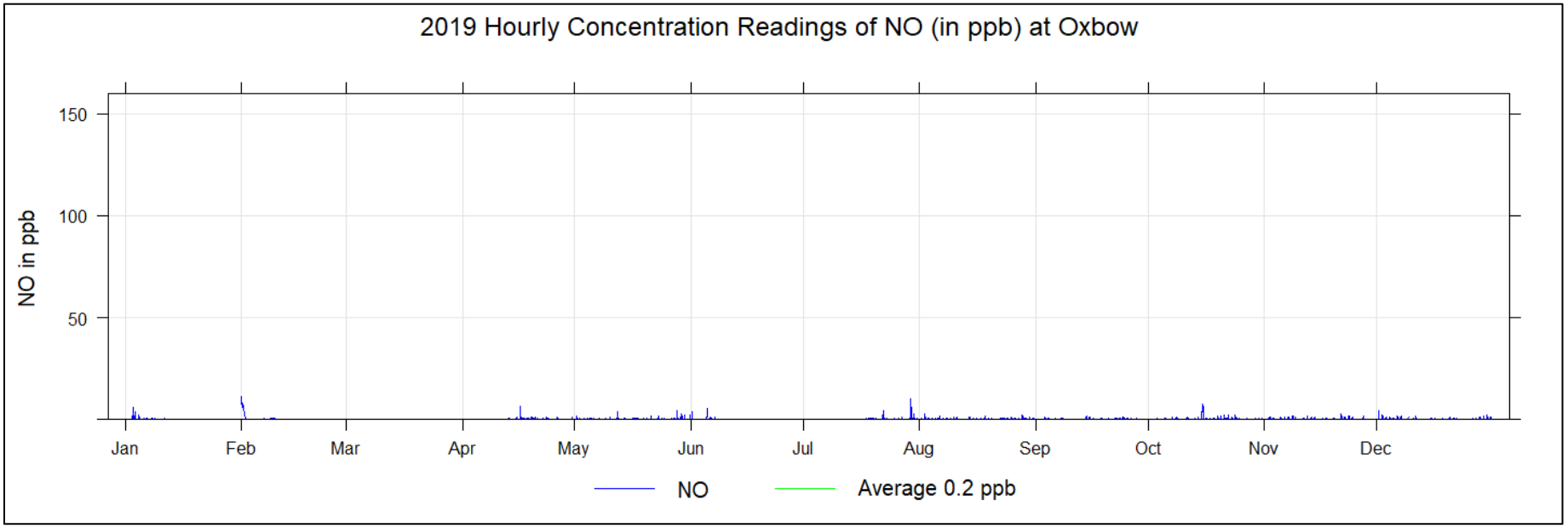
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	263	0.2	3.5	Jan 04 15:00	0.6	Jan 04	35.3%	35.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	249	0.2	3.8	Feb 01 10:00	1.1	Feb 01	37.1%	37.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019															
April 2019	476	0.3	6.6	Apr 25 02:00	1.1	Apr 26	66.1%	66.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	669	1.3	11.9	May 29 06:00	4.7	May 29	89.9%	84.5%	5.4%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	72	4.4	14.1	Jun 01 06:00	5.4	Jun 01	10.0%	7.1%	2.9%	0.0%	0.0%	0.0%	0.0%	0	0
July 2019	346	0.1	2.6	Jul 18 05:00	0.4	Jul 22	46.5%	46.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	742	1.4	5.8	Aug 06 05:00	2.0	Aug 06	99.7%	99.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	699	2.6	7.0	Sep 17 20:00	3.5	Sep 26	97.1%	95.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	744	0.7	10.9	Oct 24 06:00	1.9	Oct 24	100.0%	99.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	719	1.4	8.6	Nov 07 20:00	2.7	Nov 07	99.9%	99.2%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	2.0	6.8	Dec 01 13:00	3.0	Dec 18	99.9%	98.7%	1.2%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**5722**	**1.3**	**14.1**	**Jun 01**	**5.4**	**Jun 01**	**65.3%**	**64.3%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of NO2 (in ppb) at Oxbow
NO2 in ppb
100
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
NO2
SEQG Limit = 106 ppb
Average 1.3 ppb

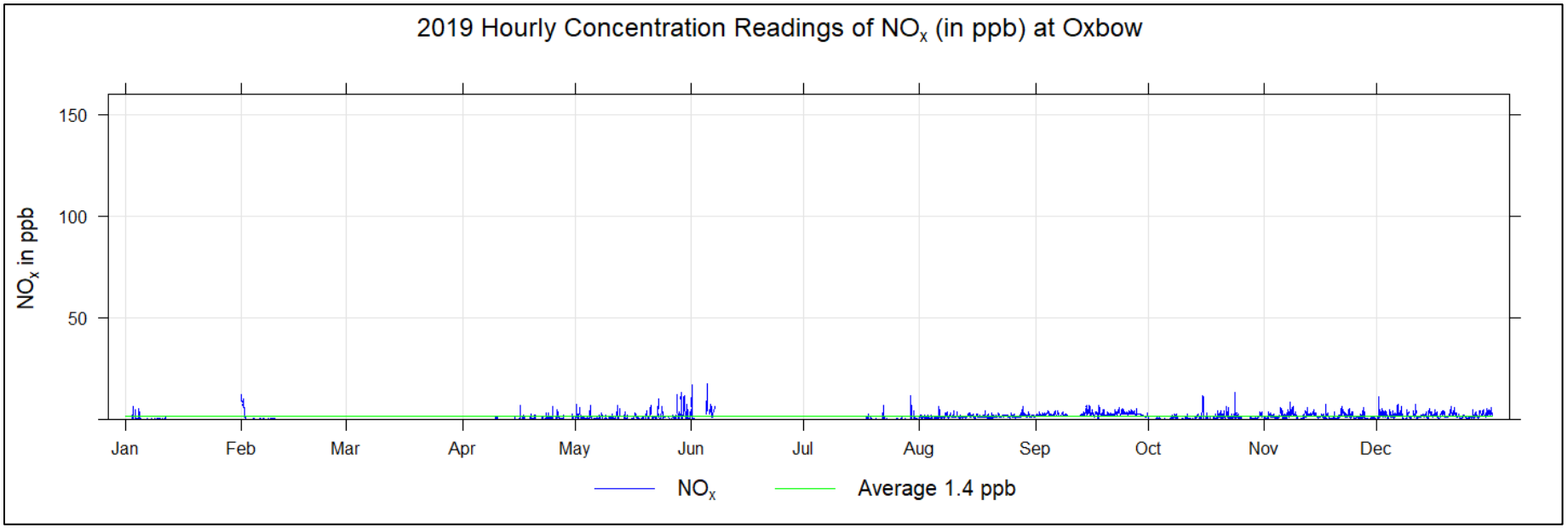
Nitric Oxide (NO) Frequency Distribution of 1-hr Averages - Oxbow

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	263	0.3	11.1	Jan 31 21:00	0.5	Jan 03	35.3%	34.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	249	0.7	7.9	Feb 01 01:00	5.4	Feb 01	37.1%	35.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019															
April 2019	476	0.2	6.7	Apr 16 10:00	0.7	Apr 16	66.1%	66.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	669	0.2	4.3	May 28 08:00	0.5	May 29	89.9%	89.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	72	0.6	5.4	Jun 05 07:00	0.6	Jun 01	10.0%	9.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
July 2019	346	0.3	10.1	Jul 29 17:00	0.8	Jul 29	46.5%	46.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	742	0.2	2.9	Aug 02 12:00	0.8	Aug 28	99.7%	99.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	699	0.2	1.6	Sep 14 12:00	0.4	Sep 14	97.1%	97.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	744	0.2	7.6	Oct 15 13:00	2.0	Oct 15	100.0%	99.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	719	0.2	2.9	Nov 21 12:00	0.7	Nov 21	99.9%	99.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	0.2	4.5	Dec 01 13:00	0.5	Dec 31	99.9%	99.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**5722**	**0.3**	**11.1**	**Jan 31**	**5.4**	**Feb 01**	**65.3%**	**65.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



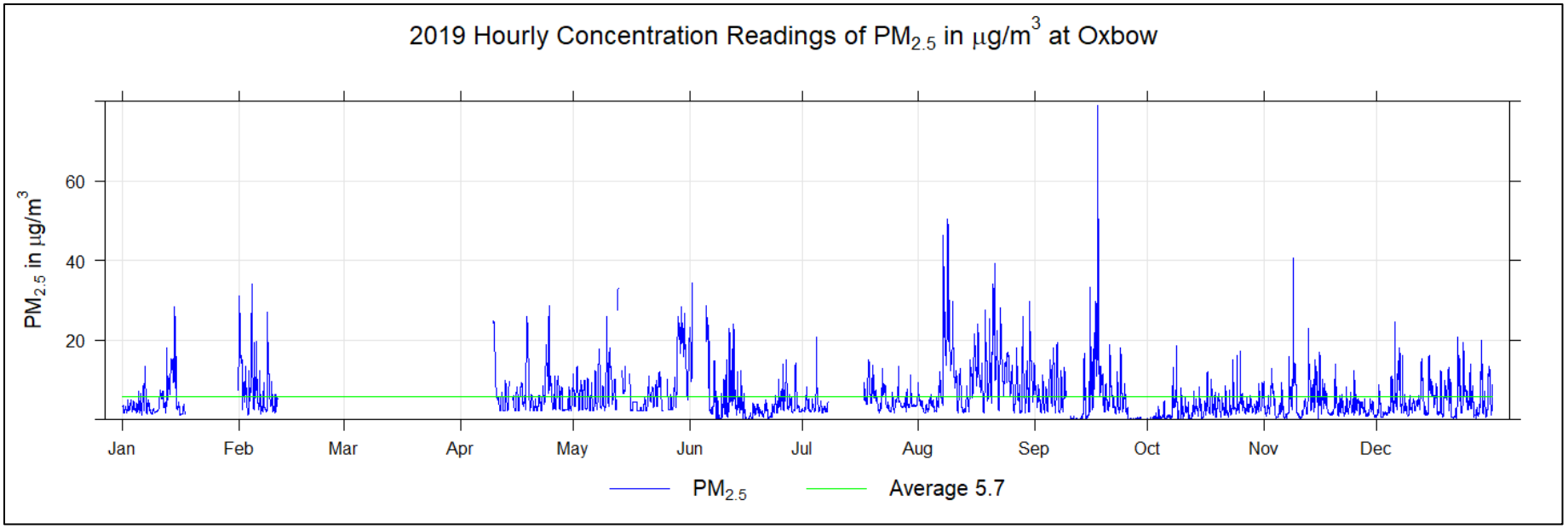
Oxides of Nitrogen (NO_X) Frequency Distribution of 1-hr Averages - Oxbow

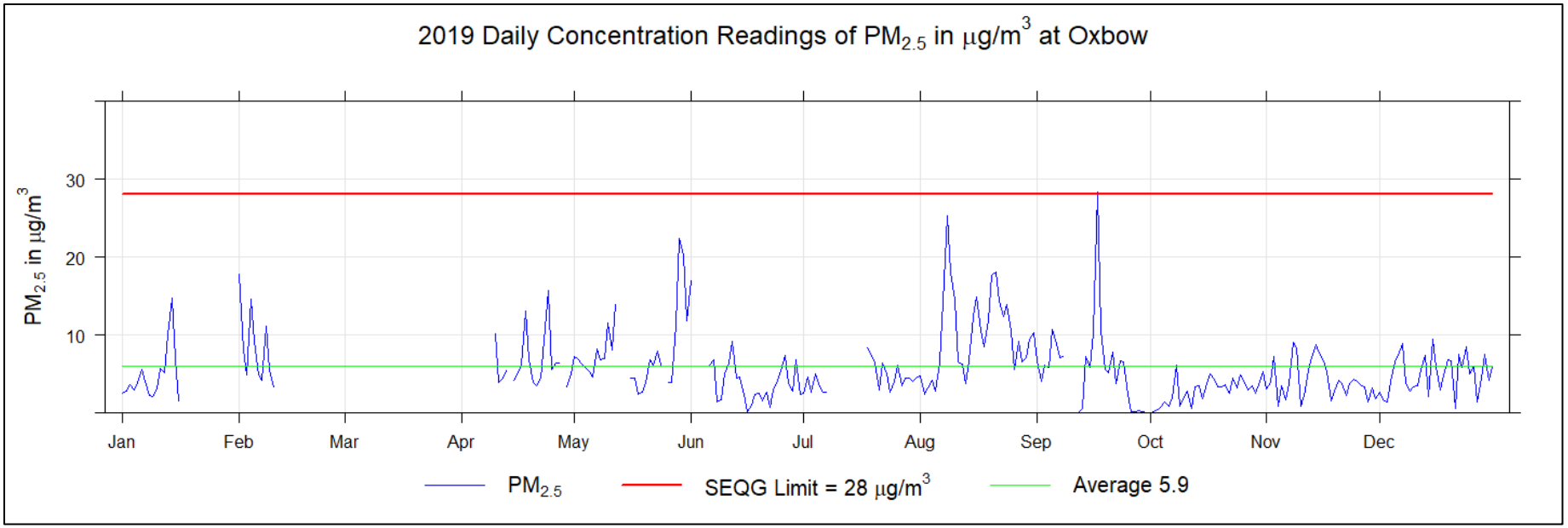
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	263	0.4	12.5	Jan 31 21:00	0.8	Jan 04	35.3%	34.7%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	249	0.8	10.4	Feb 01 10:00	6.2	Feb 01	37.1%	34.7%	2.4%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019															
April 2019	476	0.3	7.1	Apr 16 10:00	1.2	Apr 26	66.1%	65.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	669	1.5	13.2	May 29 07:00	4.8	May 29	89.9%	83.9%	6.0%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	72	5.0	17.4	Jun 05 07:00	5.9	Jun 01	10.0%	6.7%	2.9%	0.4%	0.0%	0.0%	0.0%	0	0
July 2019	346	0.2	11.6	Jul 29 17:00	1.0	Jul 22	46.5%	46.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	742	1.5	6.4	Aug 06 05:00	2.7	Aug 28	99.7%	99.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	699	2.8	7.2	Sep 15 08:00	3.8	Sep 14	97.1%	94.7%	2.4%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	744	0.9	13.1	Oct 24 06:00	3.7	Oct 15	100.0%	98.4%	1.6%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	719	1.6	8.8	Nov 07 20:00	3.0	Nov 07	99.9%	97.4%	2.5%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	2.1	11.3	Dec 01 13:00	3.3	Dec 31	99.9%	97.3%	2.6%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**5722**	**1.6**	**17.4**	**Jun 05**	**6.2**	**Feb 01**	**65.3%**	**63.5%**	**1.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Oxbow

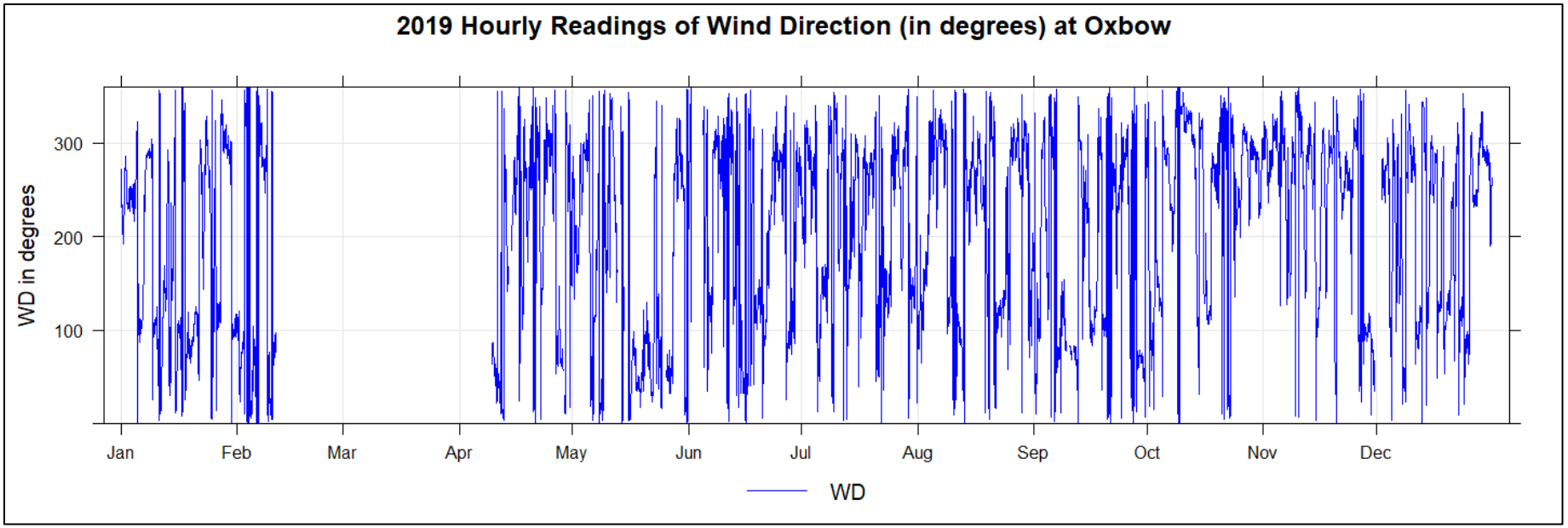
Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	407	4.8	31.1	Jan 31 23:00	14.8	Jan 16	54.7%	11.8%	22.4%	14.2%	5.5%	0.4%	0.3%	0	0
February 2019	249	8.2	34.0	Feb 04 13:00	17.8	Feb 10	37.1%	3.0%	9.1%	15.6%	6.5%	1.6%	1.2%	0	0
March 2019							0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	496	6.6	28.7	Apr 24 18:00	15.7	Apr 30	68.9%	2.2%	25.1%	32.9%	5.3%	3.2%	0.1%	0	0
May 2019	670	7.8	33.1	May 13 00:00	22.4	May 31	90.1%	0.0%	28.9%	39.7%	15.6%	4.8%	1.1%	1	0
June 2019	664	4.6	34.3	Jun 01 18:00	17.0	Jun 30	92.2%	35.0%	28.3%	18.2%	7.1%	3.3%	0.3%	0	0
July 2019	744	4.5	20.7	Jul 04 19:00	8.4	Jul 18	100.0%	36.4%	33.2%	27.7%	2.6%	0.1%	0.0%	0	0
August 2019	744	10.1	50.5	Aug 08 20:00	25.3	Aug 08	100.0%	7.0%	18.7%	30.9%	33.7%	6.6%	3.1%	0	0
September 2019	685	5.6	78.9	Sep 17 20:00	28.3	Sep 17	95.1%	37.2%	12.8%	27.9%	14.9%	0.8%	1.5%	1	0
October 2019	744	2.8	18.5	Oct 08 17:00	6.2	Oct 08	100.0%	43.0%	35.5%	19.5%	2.0%	0.0%	0.0%	0	0
November 2019	719	4.1	40.7	Nov 08 20:00	9.1	Nov 08	99.9%	36.8%	25.7%	29.3%	7.6%	0.1%	0.3%	0	0
December 2019	744	5.0	24.5	Dec 05 23:00	9.4	Dec 15	100.0%	30.1%	23.3%	33.1%	13.2%	0.4%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6866**	**5.8**	**78.9**	**Sep 17**	**28.3**	**Sep 17**	**78.4%**	**20.3%**	**22.0%**	**24.1%**	**9.5%**	**1.8%**	**0.7%**	**2**	**0**




2019 Daily Concentration Readings of PM2.5 in µg/m3 at Oxbow
PM2.5 in µg/m3
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
PM2.5
SEQG Limit = 28 µg/m3
Average 5.9

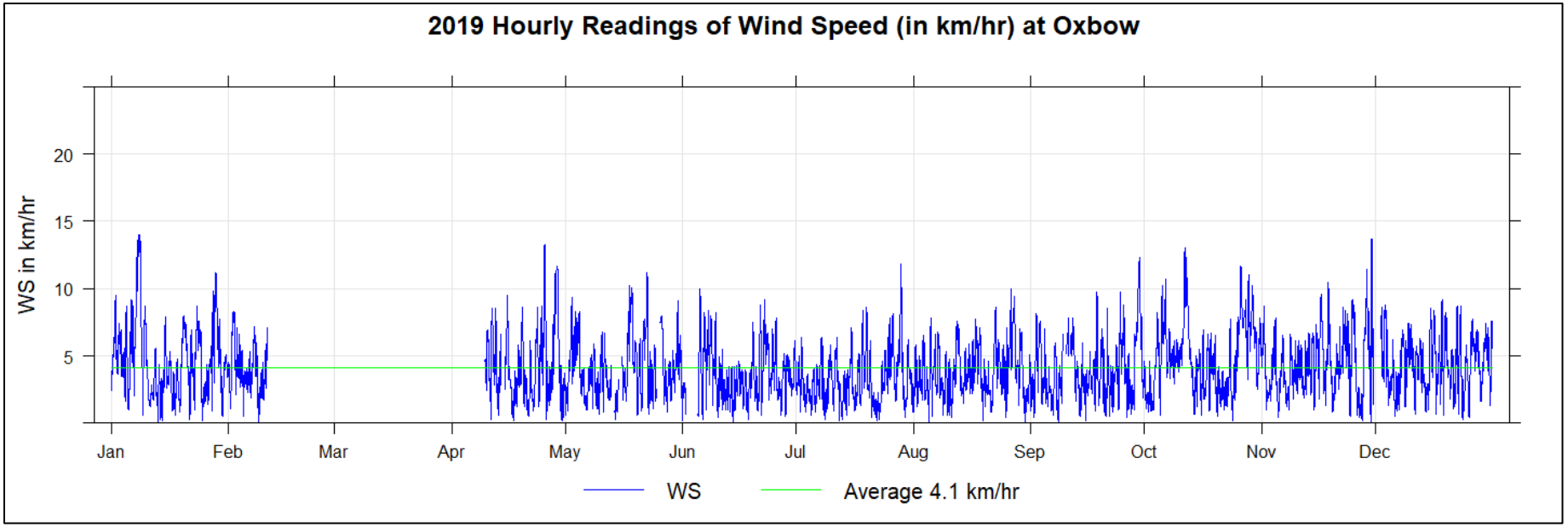
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Oxbow

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	236	2.0%	1.2%	0.1%	0.0%	0.0%	0.0%	3.3%
NNE	296	2.1%	1.7%	0.4%	0.0%	0.0%	0.0%	4.2%
NE	285	1.7%	1.3%	0.9%	0.0%	0.0%	0.0%	4.0%
ENE	365	1.8%	1.7%	1.6%	0.0%	0.0%	0.0%	5.1%
E	508	2.4%	3.2%	1.6%	0.0%	0.0%	0.0%	7.2%
ESE	559	3.0%	3.7%	1.1%	0.0%	0.0%	0.0%	7.9%
SE	429	2.9%	2.6%	0.6%	0.0%	0.0%	0.0%	6.0%
SSE	255	2.0%	1.3%	0.2%	0.0%	0.0%	0.0%	3.6%
S	181	1.2%	1.2%	0.2%	0.0%	0.0%	0.0%	2.6%
SSW	194	1.3%	1.3%	0.2%	0.0%	0.0%	0.0%	2.7%
SW	326	1.5%	2.6%	0.5%	0.0%	0.0%	0.0%	4.6%
WSW	570	2.7%	4.0%	1.3%	0.0%	0.0%	0.0%	8.0%
W	755	3.5%	4.8%	2.4%	0.0%	0.0%	0.0%	10.6%
WNW	1120	3.9%	6.6%	4.9%	0.3%	0.0%	0.0%	15.8%
NW	689	2.7%	3.7%	3.2%	0.0%	0.0%	0.0%	9.7%
NNW	328	2.1%	2.0%	0.4%	0.0%	0.0%	0.0%	4.6%
Total	**7,096**	**36.6%**	**43.5%**	**19.4%**	**0.4%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Oxbow
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

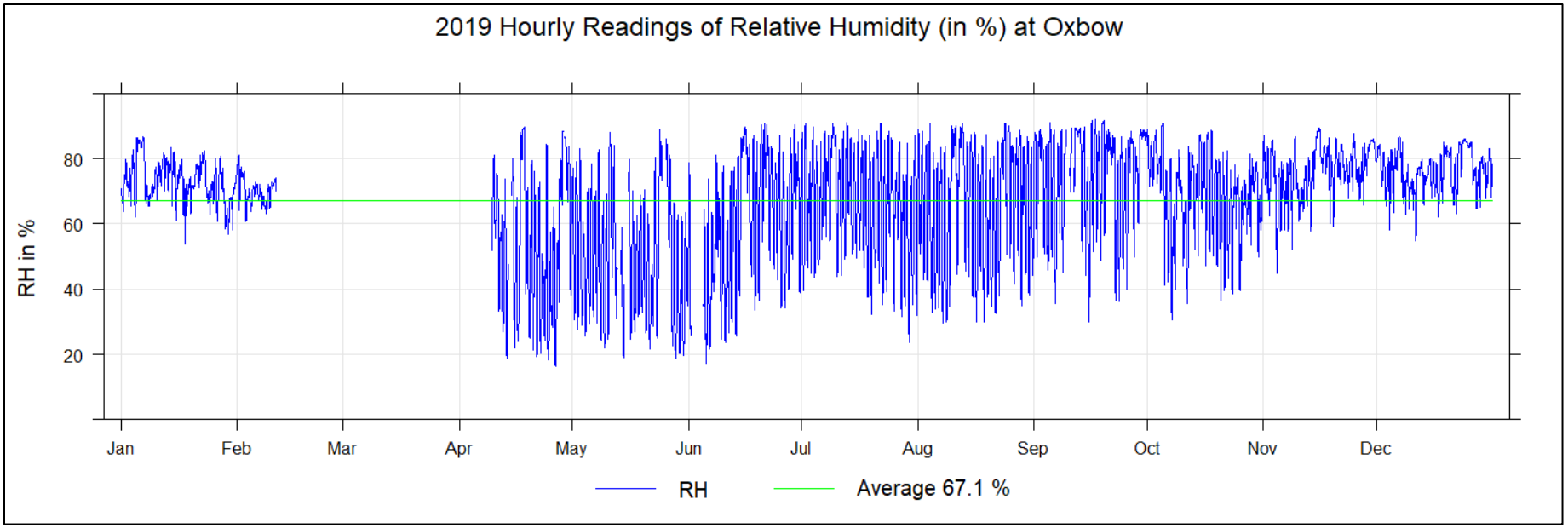
Wind Speed Frequency Distribution of 1-hr Averages - Oxbow

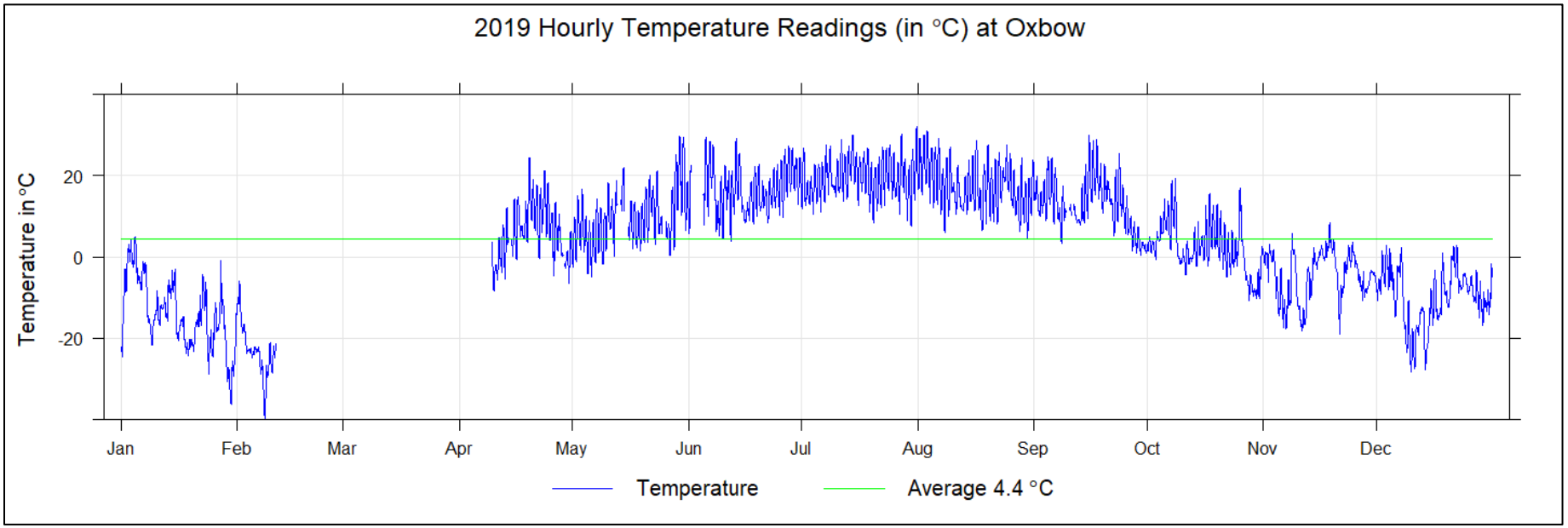
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	744	4.7	14.0	Jan 08 05:00	12.0	Jan 08	100.0%	31.9%	41.0%	24.6%	2.6%	0.0%	0.0%	0	0
February 2019	249	4.1	8.3	Feb 02 07:00	6.6	Feb 02	37.1%	10.9%	20.5%	5.7%	0.0%	0.0%	0.0%	0	0
March 2019															
April 2019	480	4.2	13.3	Apr 25 12:00	7.4	Apr 25	66.7%	27.5%	23.6%	15.1%	0.4%	0.0%	0.0%	0	0
May 2019	670	4.1	11.2	May 22 14:00	8.2	May 18	90.1%	32.9%	39.5%	17.6%	0.0%	0.0%	0.0%	0	0
June 2019	643	3.6	10.0	Jun 05 14:00	5.6	Jun 22	89.3%	42.8%	34.4%	12.1%	0.0%	0.0%	0.0%	0	0
July 2019	744	3.3	11.8	Jul 28 16:00	7.1	Jul 28	100.0%	53.2%	38.2%	8.6%	0.0%	0.0%	0.0%	0	0
August 2019	744	3.8	10.0	Aug 26 17:00	7.1	Aug 27	100.0%	41.3%	44.6%	14.1%	0.0%	0.0%	0.0%	0	0
September 2019	687	3.9	12.3	Sep 29 17:00	9.8	Sep 29	95.4%	41.9%	37.2%	16.0%	0.3%	0.0%	0.0%	0	0
October 2019	744	4.8	13.0	Oct 11 15:00	9.1	Oct 11	100.0%	27.8%	43.3%	28.1%	0.8%	0.0%	0.0%	0	0
November 2019	703	4.4	13.7	Nov 30 01:00	7.9	Nov 28	97.6%	30.4%	43.6%	23.2%	0.4%	0.0%	0.0%	0	0
December 2019	709	4.5	9.2	Dec 18 15:00	6.0	Dec 03	95.3%	25.5%	48.8%	21.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7117**	**4.1**	**14.0**	**Jan 08**	**12.0**	**Jan 08**	**81.2%**	**30.6%**	**34.7%**	**15.6%**	**0.4%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Oxbow

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	73	99.5%	948.4	100.0%	-14.0	99.5%
February 2019	70	37.1%	953.4	37.1%	-23.2	37.1%
March 2019						
April 2019	53	66.7%	946.9	66.7%	6.3	66.7%
May 2019	49	90.1%	948.0	90.1%	9.7	90.1%
June 2019	60	88.9%	945.1	88.2%	16.7	92.2%
July 2019	66	100.0%	947.4	100.0%	19.5	100.0%
August 2019	65	100.0%	947.1	100.0%	17.5	100.0%
September 2019	75	95.1%	946.0	95.4%	12.8	95.1%
October 2019	69	100.0%	945.9	100.0%	2.3	100.0%
November 2019	76	99.9%	948.6	100.0%	-4.5	99.9%
December 2019	76	100.0%	945.7	100.0%	-9.8	100.0%
Average	67	88.8%	948	88.9%	3.0	89.1%

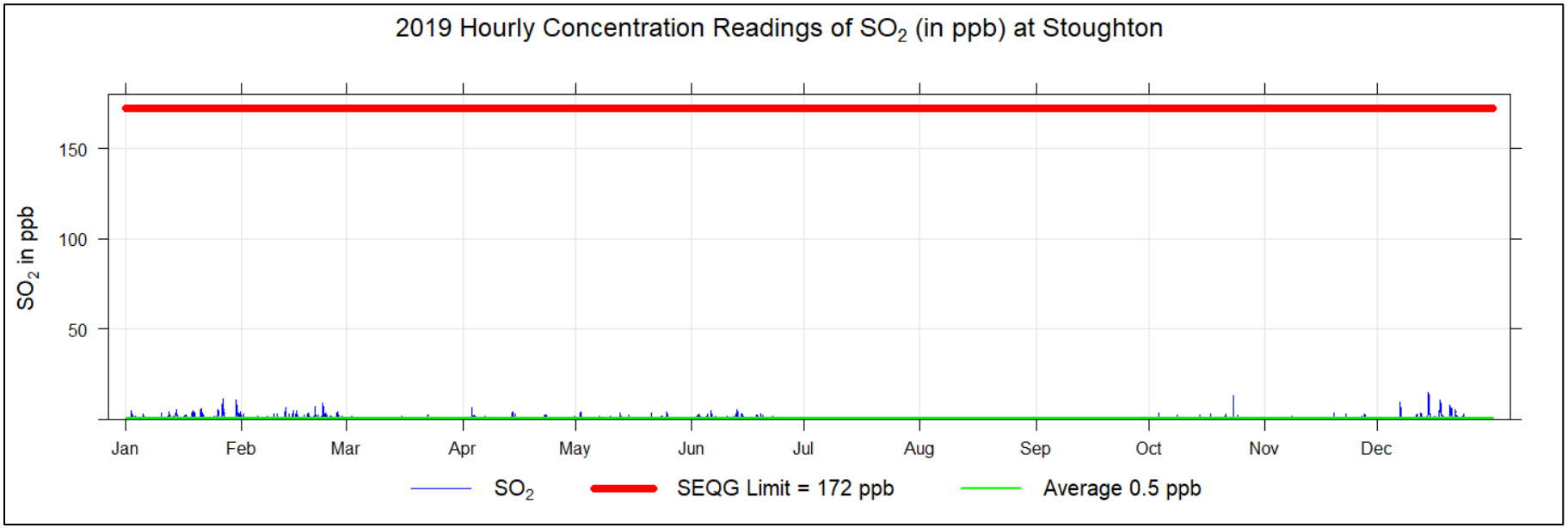

2019 Hourly Readings of Relative Humidity (in %) at Oxbow
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 67.1 %

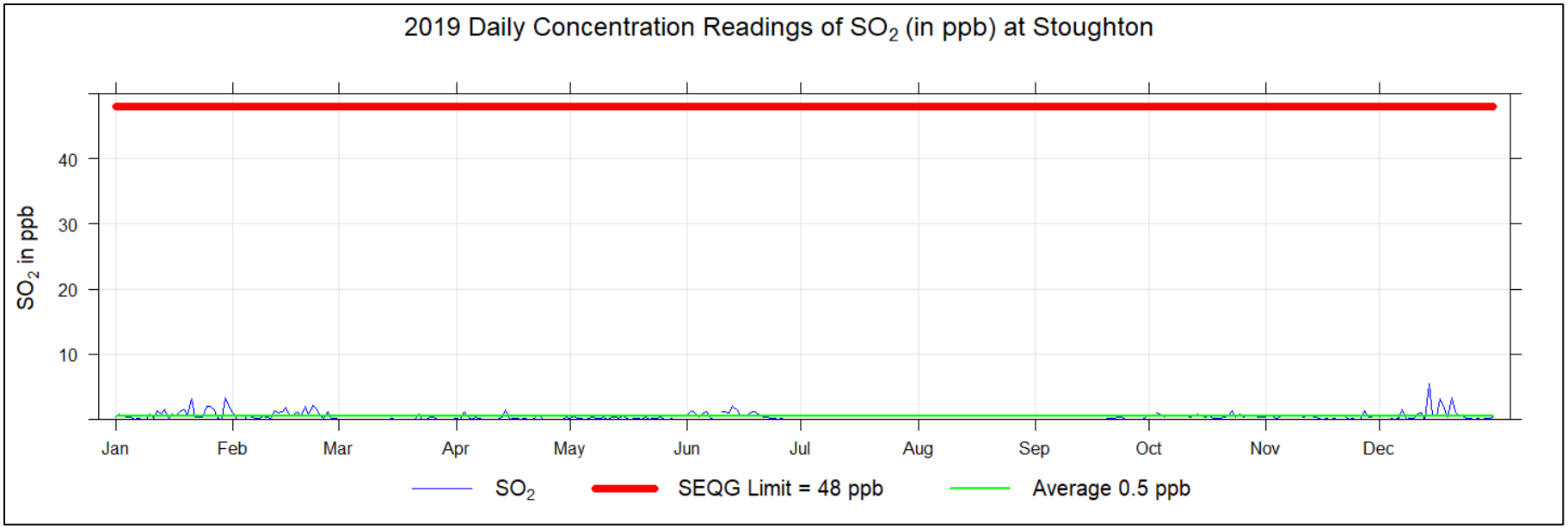

2019 Hourly Temperature Readings (in °C) at Oxbow
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 4.4 °C

APPENDIX E
Stoughton Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Stoughton

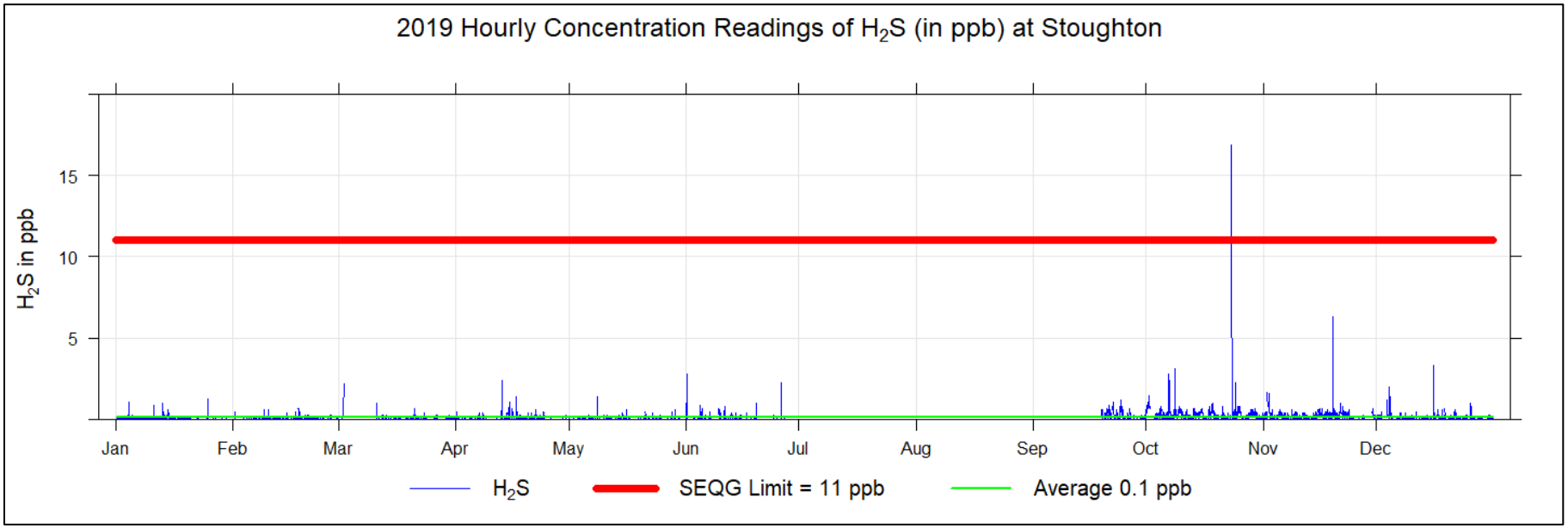
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	738	0.9	11.2	Jan 26 22:00	3.4	Jan 30	99.2%	75.8%	21.0%	1.9%	0.5%	0.0%	0.0%	0	0
February 2019	672	0.7	8.9	Feb 22 17:00	2.2	Feb 22	100.0%	78.7%	20.2%	1.0%	0.0%	0.0%	0.0%	0	0
March 2019	536	0.1	2.7	Mar 22 17:00	0.9	Mar 22	72.0%	70.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	720	0.2	6.5	Apr 03 12:00	1.5	Apr 14	100.0%	94.9%	4.9%	0.3%	0.0%	0.0%	0.0%	0	0
May 2019	738	0.2	4.4	May 02 10:00	0.6	May 15	99.2%	96.4%	2.8%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	630	0.8	5.6	Jun 13 01:00	2.1	Jun 13	87.5%	68.1%	19.3%	0.1%	0.0%	0.0%	0.0%	0	0
July 2019															
August 2019															
September 2019	394	0.1	0.7	Sep 24 08:00	0.4	Sep 24	54.7%	54.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	713	0.5	13.3	Oct 23 15:00	1.4	Oct 23	95.8%	91.5%	4.0%	0.1%	0.1%	0.0%	0.0%	0	0
November 2019	686	0.4	3.6	Nov 19 10:00	1.3	Nov 27	95.3%	90.7%	4.6%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	740	0.8	15.0	Dec 14 13:00	5.4	Dec 14	99.5%	83.9%	12.4%	2.3%	0.9%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6567**	**0.5**	**15.0**	**Dec 14**	**5.4**	**Dec 14**	**75.0%**	**66.8%**	**7.5%**	**0.5%**	**0.1%**	**0.0%**	**0.0%**	**0**	**0**

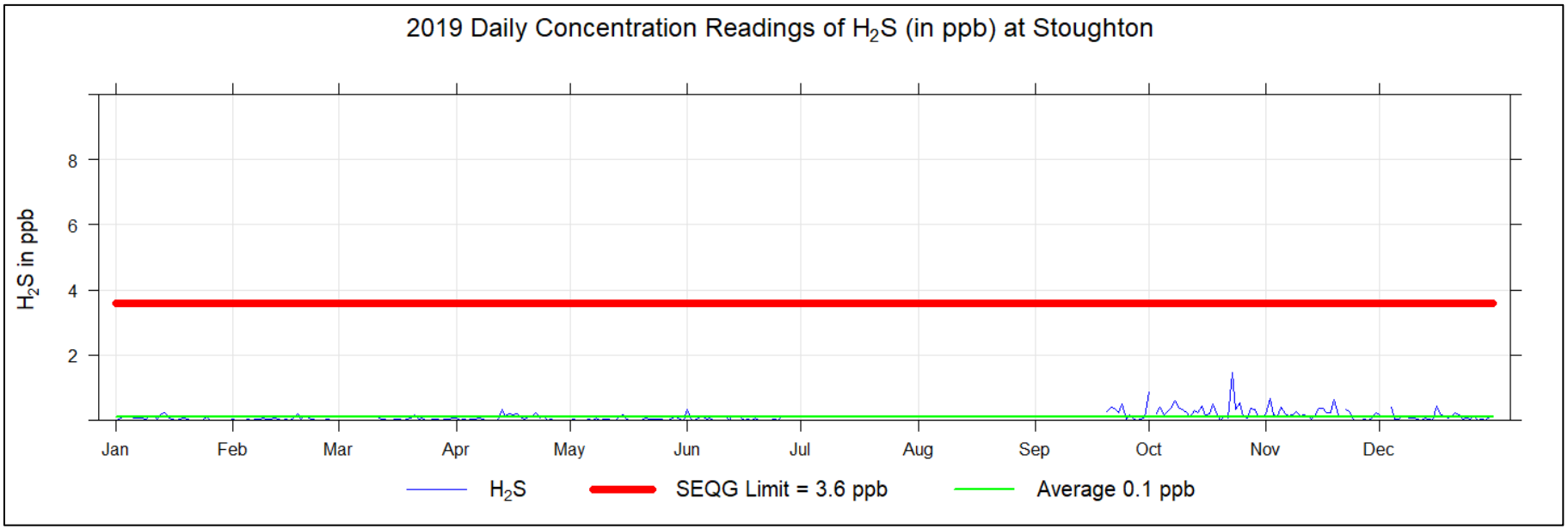



2019 Daily Concentration Readings of SO2 (in ppb) at Stoughton
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 0.5 ppb

Hydrogen Sulphide (H_2S) Frequency Distribution of 1-hr Averages - Stoughton

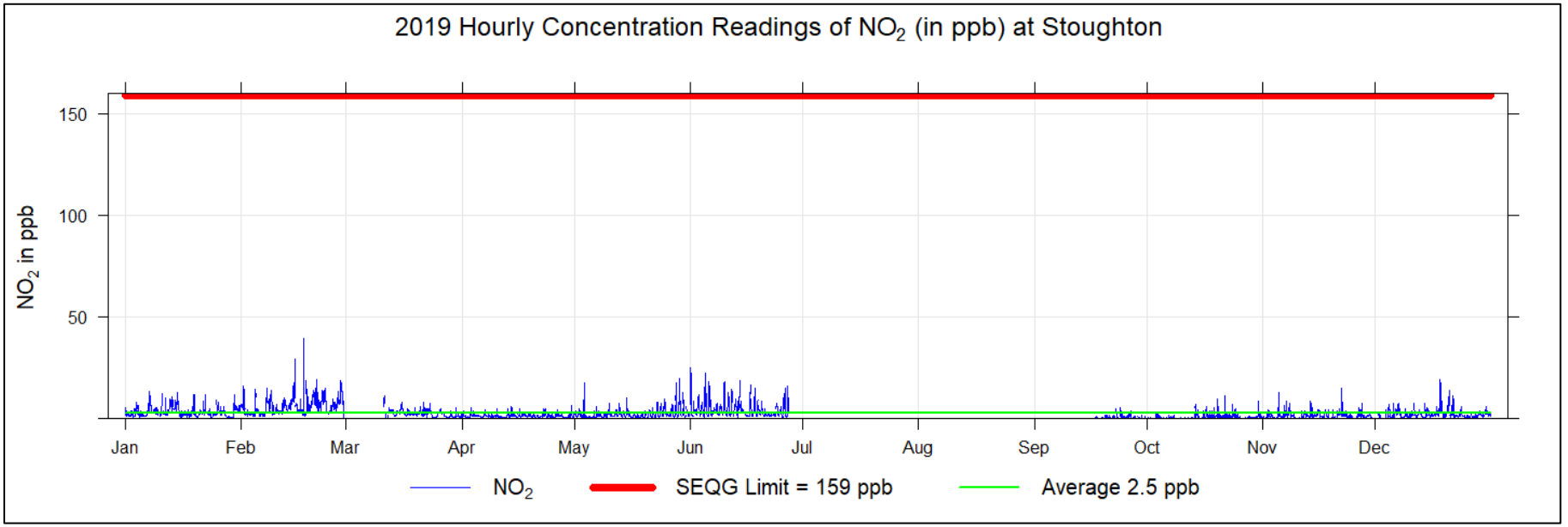
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 3 (ppb)	3 to 5 (ppb)	5 to 8 (ppb)	8 to 11 (ppb)	> 11 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	738	0.1	1.3	Jan 25 09:00	0.2	Jan 15	99.2%	98.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	0.0	0.7	Feb 18 07:00	0.2	Feb 19	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	536	0.1	2.2	Mar 02 11:00	0.8	Mar 02	72.0%	71.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	720	0.1	2.4	Apr 13 07:00	0.3	Apr 13	100.0%	99.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	738	0.0	1.4	May 08 11:00	0.2	May 15	99.2%	99.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	630	0.1	2.8	Jun 01 07:00	0.3	Jun 01	87.5%	87.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
July 2019														0	0
August 2019														0	0
September 2019	394	0.2	1.2	Sep 24 07:00	0.5	Sep 24	54.7%	54.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	713	0.3	16.9	Oct 23 15:00	1.5	Oct 23	95.8%	94.1%	1.3%	0.1%	0.0%	0.1%	0.1%	0	1
November 2019	686	0.2	6.3	Nov 19 10:00	0.7	Nov 02	95.3%	94.4%	0.7%	0.0%	0.1%	0.0%	0.0%	0	0
December 2019	740	0.1	3.3	Dec 16 02:00	0.5	Dec 03	99.5%	98.9%	0.4%	0.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6567**	**0.1**	**16.9**	**Oct 23**	**1.5**	**Oct 23**	**75.0%**	**74.5%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0**	**1**

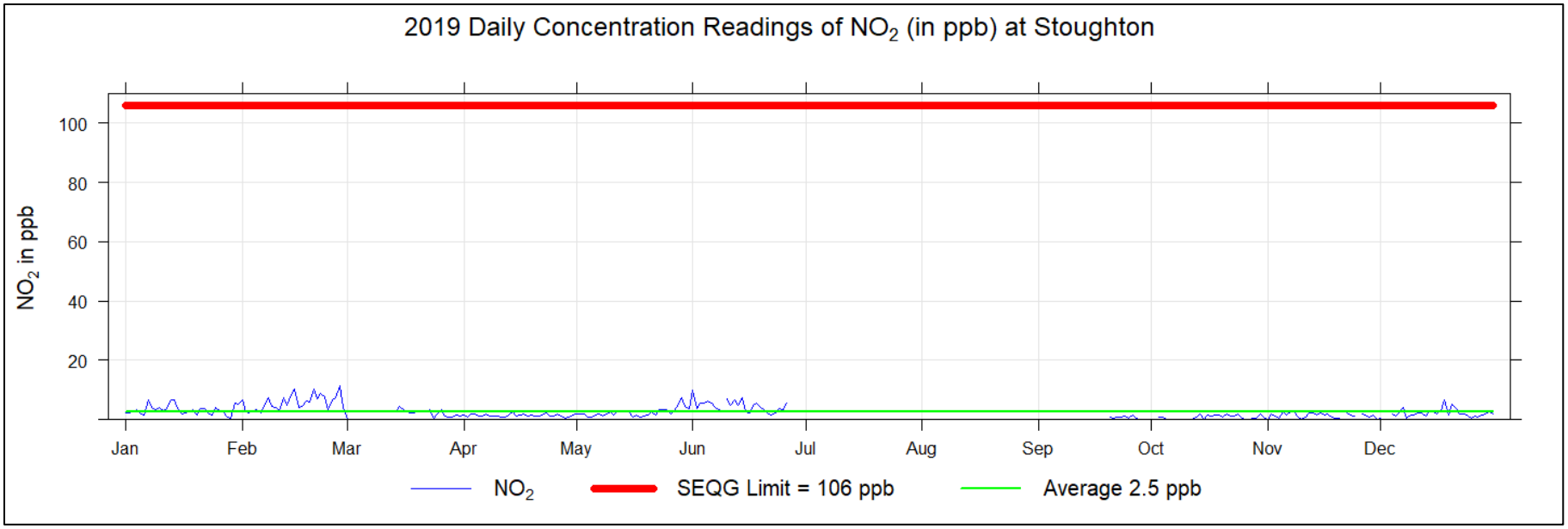



2019 Daily Concentration Readings of H2S (in ppb) at Stoughton
H2S in ppb
8
6
4
2
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
H2S
SEQG Limit = 3.6 ppb
Average 0.1 ppb

Nitrogen Dioxide (NO_2) Frequency Distribution of 1-hr Averages - Stoughton

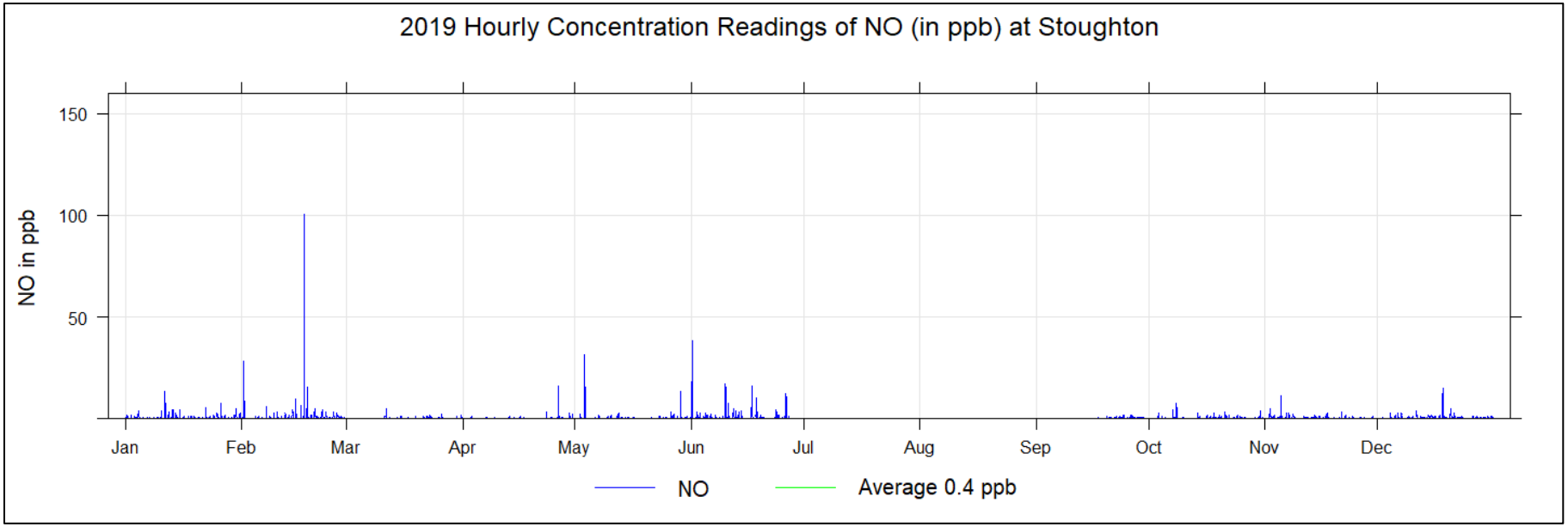
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	739	3.2	13.1	Jan 07 12:00	6.5	Jan 07	99.3%	82.3%	17.1%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	5.8	39.4	Feb 17 15:00	11.5	Feb 27	100.0%	53.9%	43.5%	2.5%	0.1%	0.0%	0.0%	0	0
March 2019	536	2.2	11.0	Mar 11 07:00	4.4	Mar 15	72.0%	69.1%	3.0%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	719	1.4	6.7	Apr 30 07:00	2.7	Apr 14	99.9%	99.2%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	735	2.3	19.9	May 29 02:00	7.4	May 28	98.8%	89.7%	8.3%	0.8%	0.0%	0.0%	0.0%	0	0
June 2019	630	4.7	25.2	Jun 01 02:00	9.8	Jun 01	87.5%	59.9%	25.0%	2.6%	0.0%	0.0%	0.0%	0	0
July 2019															
August 2019															
September 2019	404	0.5	5.2	Sep 23 23:00	1.4	Sep 26	56.1%	56.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	713	0.7	11.2	Oct 21 23:00	2.0	Oct 21	95.8%	94.1%	1.7%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	684	1.4	14.9	Nov 22 04:00	2.8	Nov 05	95.0%	92.5%	2.5%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	739	2.1	19.1	Dec 18 10:00	6.7	Dec 18	99.3%	91.8%	7.1%	0.4%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6571**	**2.4**	**39.4**	**Feb 17**	**11.5**	**Feb 27**	**75.0%**	**65.7%**	**8.8%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of NO2 (in ppb) at Stoughton
NO2 in ppb
100
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
NO2
SEQG Limit = 106 ppb
Average 2.5 ppb

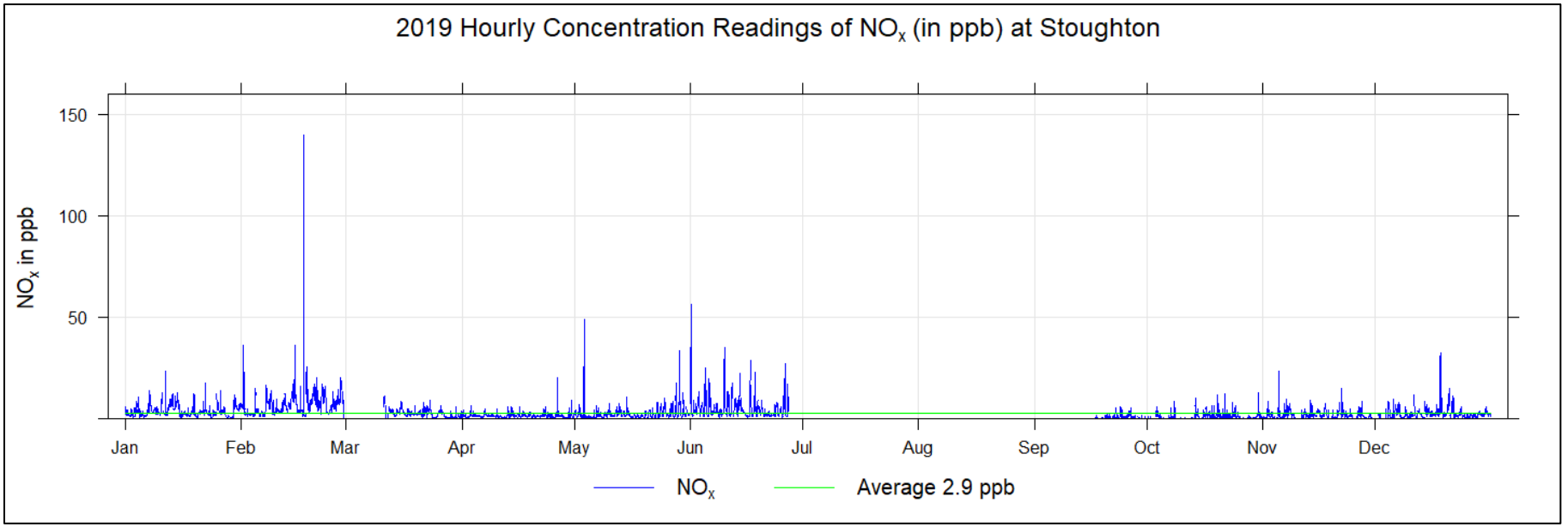
Nitric Oxide (NO) Frequency Distribution of 1-hr Averages - Stoughton

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	739	0.5	13.2	Jan 11 15:00	1.3	Jan 13	99.3%	98.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	0.9	100.3	Feb 17 15:00	4.6	Feb 17	100.0%	97.8%	1.6%	0.4%	0.0%	0.1%	0.0%	0	0
March 2019	536	0.2	5.2	Mar 11 14:00	0.4	Mar 22	72.0%	71.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	719	0.2	16.0	Apr 26 13:00	0.9	Apr 26	99.9%	99.7%	0.0%	0.1%	0.0%	0.0%	0.0%	0	0
May 2019	735	0.3	31.3	May 03 14:00	1.6	May 03	98.8%	98.5%	0.1%	0.0%	0.1%	0.0%	0.0%	0	0
June 2019	630	0.9	38.4	Jun 01 07:00	6.0	Jun 01	87.5%	84.4%	1.9%	0.8%	0.3%	0.0%	0.0%	0	0
July 2019															
August 2019															
September 2019	404	0.3	1.8	Sep 26 07:00	0.8	Sep 26	56.1%	56.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	713	0.3	7.4	Oct 08 09:00	0.8	Oct 08	95.8%	95.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	684	0.4	11.3	Nov 05 09:00	1.3	Nov 05	95.0%	94.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	739	0.5	14.8	Dec 18 11:00	1.8	Dec 18	99.3%	99.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6571**	**0.4**	**100.3**	**Feb 17**	**6.0**	**Jun 01**	**75.0%**	**74.4%**	**0.4%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



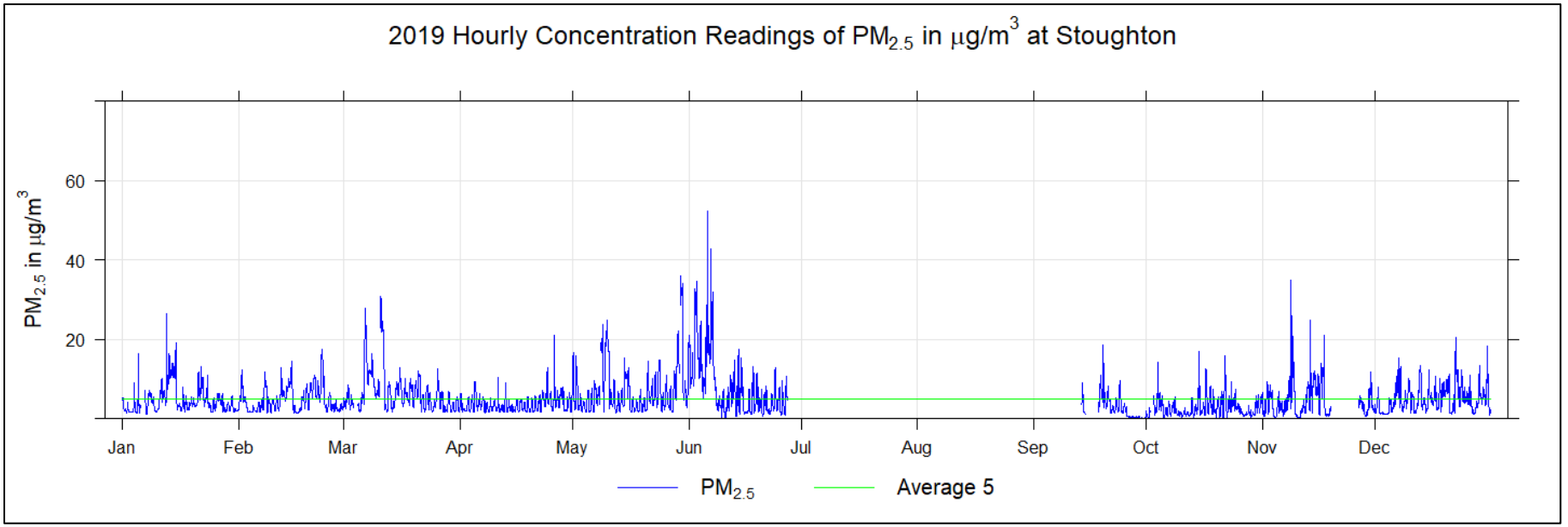
Oxides of Nitrogen (NO_X) Frequency Distribution of 1-hr Averages - Stoughton

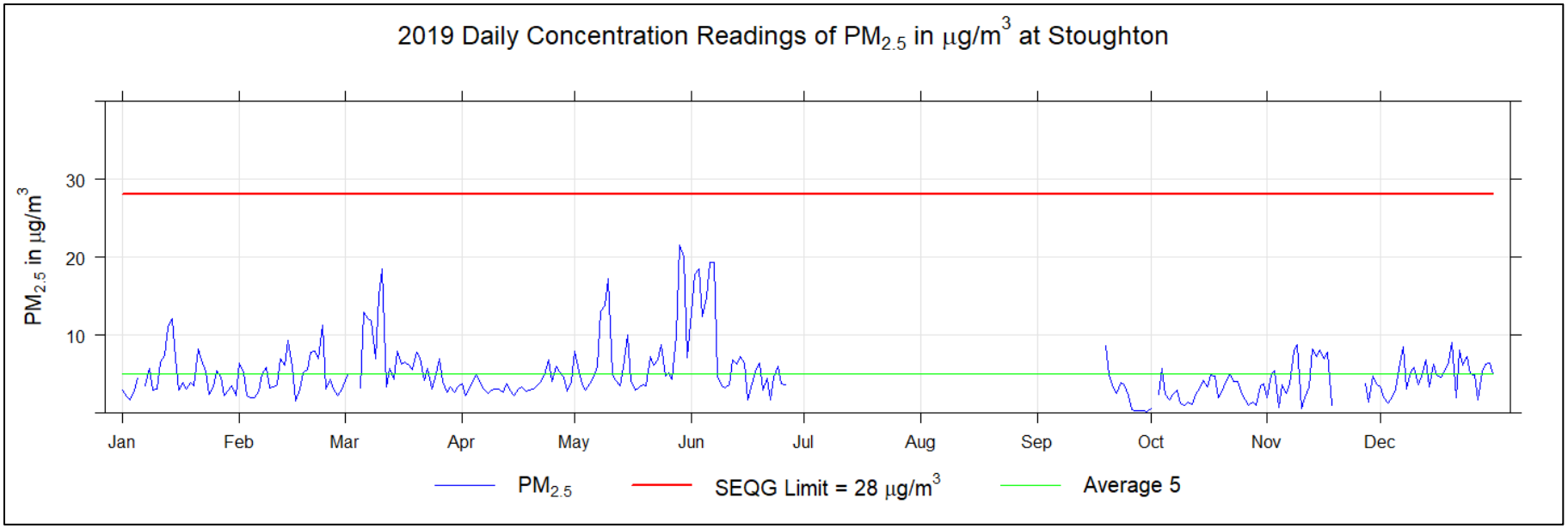
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	739	3.7	23.6	Jan 11 15:00	7.8	Jan 13	99.3%	76.9%	22.2%	0.3%	0.0%	0.0%	0.0%	0	0
February 2019	672	6.7	139.6	Feb 17 15:00	12.1	Feb 27	100.0%	51.2%	43.5%	4.6%	0.6%	0.1%	0.0%	0	0
March 2019	536	2.3	11.2	Mar 11 07:00	4.7	Mar 15	72.0%	67.6%	4.4%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	719	1.5	20.4	Apr 26 13:00	2.7	Apr 14	99.9%	98.5%	1.3%	0.1%	0.0%	0.0%	0.0%	0	0
May 2019	735	2.6	48.7	May 03 14:00	5.2	May 28	98.8%	88.0%	9.9%	0.5%	0.3%	0.0%	0.0%	0	0
June 2019	630	5.6	56.2	Jun 01 07:00	16.0	Jun 01	87.5%	56.9%	25.4%	4.0%	1.1%	0.0%	0.0%	0	0
July 2019															
August 2019															
September 2019	404	0.7	5.8	Sep 23 23:00	2.0	Sep 26	56.1%	55.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	713	1.0	12.8	Oct 30 19:00	2.5	Oct 21	95.8%	92.7%	3.1%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	684	1.7	23.7	Nov 05 09:00	3.9	Nov 05	95.0%	90.4%	4.4%	0.1%	0.0%	0.0%	0.0%	0	0
December 2019	739	2.6	32.3	Dec 18 11:00	8.6	Dec 18	99.3%	88.2%	10.8%	0.3%	0.1%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6571**	**2.8**	**139.6**	**Feb 17**	**16.0**	**Jun 01**	**75.0%**	**63.8%**	**10.2%**	**0.8%**	**0.2%**	**0.0%**	**0.0%**	**0**	**0**



Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Stoughton

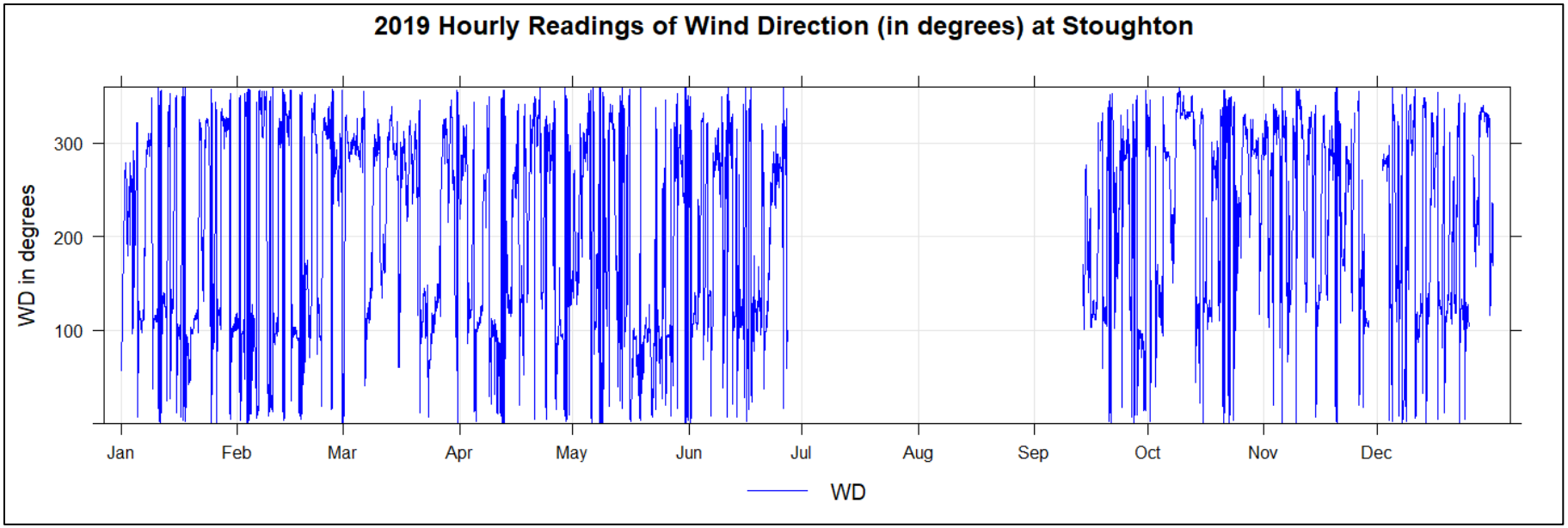
Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	718	4.6	26.3	Jan 12 19:00	12.1	Jan 15	96.5%	19.9%	35.2%	32.4%	8.9%	0.1%	0.0%	0	0
February 2019	672	4.8	17.5	Feb 23 05:00	11.2	Feb 24	100.0%	18.6%	31.5%	44.6%	5.2%	0.0%	0.0%	0	0
March 2019	711	6.5	30.8	Mar 10 21:00	18.4	Mar 11	95.6%	10.1%	25.0%	46.2%	9.3%	4.6%	0.4%	0	0
April 2019	720	3.6	20.9	Apr 26 03:00	6.8	Apr 24	100.0%	28.1%	37.5%	33.5%	0.8%	0.1%	0.0%	0	0
May 2019	737	7.2	35.9	May 29 22:00	21.6	May 29	99.1%	14.7%	25.5%	37.5%	15.7%	3.4%	2.3%	0	0
June 2019	631	7.7	52.3	Jun 05 23:00	19.3	Jun 06	87.6%	19.6%	15.4%	29.2%	17.6%	4.2%	1.7%	0	0
July 2019															
August 2019															
September 2019	327	2.8	18.6	Sep 19 12:00	8.6	Sep 19	45.4%	24.3%	8.5%	11.1%	1.5%	0.0%	0.0%	0	0
October 2019	713	2.7	16.9	Oct 15 02:00	5.7	Oct 04	95.8%	48.9%	26.6%	18.4%	1.9%	0.0%	0.0%	0	0
November 2019	544	4.4	34.8	Nov 08 17:00	8.8	Nov 09	75.6%	24.7%	20.1%	23.3%	6.5%	0.7%	0.1%	0	0
December 2019	740	4.9	20.5	Dec 22 13:00	9.0	Dec 20	99.5%	20.2%	27.2%	44.4%	7.7%	0.1%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6513**	**4.9**	**52.3**	**Jun 05**	**21.6**	**May 29**	**74.3%**	**19.0%**	**21.0%**	**26.6%**	**6.3%**	**1.1%**	**0.4%**	**0**	**0**




2019 Daily Concentration Readings of PM2.5 in µg/m3 at Stoughton
PM2.5 in µg/m3
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
PM2.5
SEQG Limit = 28 µg/m3
Average 5

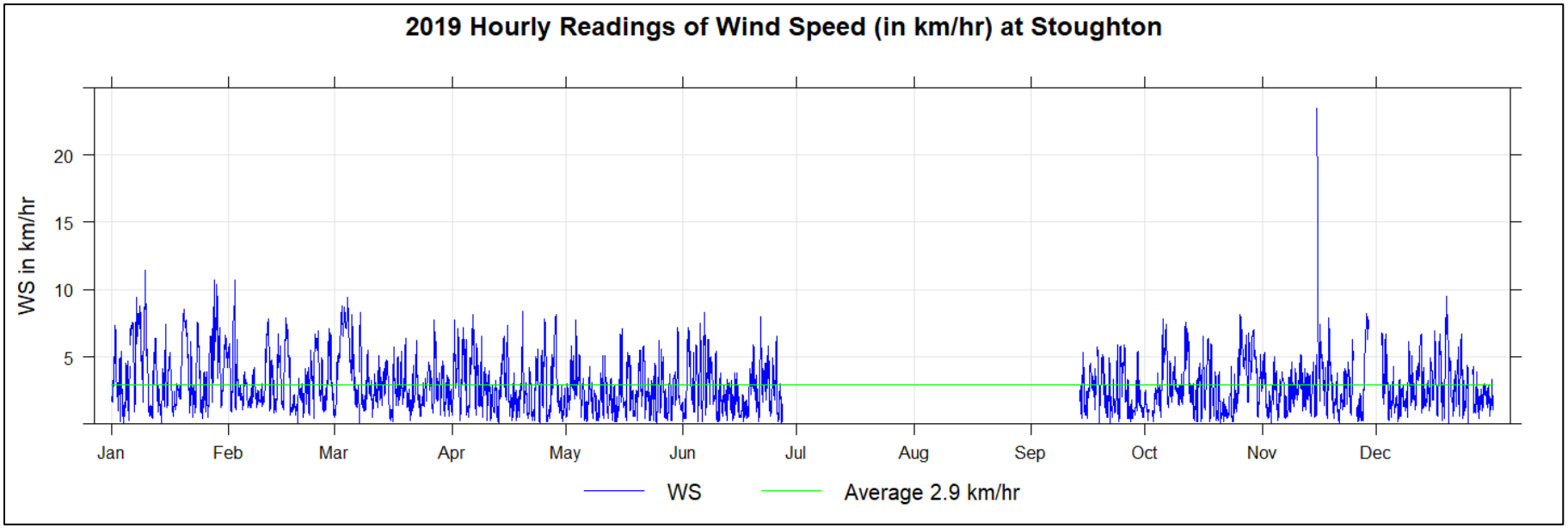
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Stoughton

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	336	5.0%	0.1%	0.0%	0.0%	0.0%	0.0%	5.1%
NNE	228	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%
NE	105	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%
ENE	163	2.4%	0.1%	0.0%	0.0%	0.0%	0.0%	2.5%
E	582	4.8%	2.9%	1.1%	0.0%	0.0%	0.0%	8.8%
ESE	849	5.4%	5.2%	2.2%	0.0%	0.0%	0.0%	12.8%
SE	491	3.4%	3.2%	0.8%	0.0%	0.0%	0.0%	7.4%
SSE	274	3.6%	0.5%	0.0%	0.0%	0.0%	0.0%	4.1%
S	178	2.6%	0.1%	0.0%	0.0%	0.0%	0.0%	2.7%
SSW	111	1.5%	0.2%	0.0%	0.0%	0.0%	0.0%	1.7%
SW	225	2.6%	0.8%	0.1%	0.0%	0.0%	0.0%	3.4%
WSW	285	2.7%	1.3%	0.3%	0.0%	0.0%	0.0%	4.3%
W	492	3.6%	3.1%	0.8%	0.0%	0.0%	0.0%	7.4%
WNW	805	4.5%	5.6%	2.0%	0.0%	0.0%	0.0%	12.1%
NW	797	5.7%	5.1%	1.1%	0.0%	0.0%	0.0%	12.0%
NNW	727	7.7%	2.8%	0.5%	0.0%	0.0%	0.0%	10.9%
Total	**6648**	**60.9%**	**30.9%**	**8.2%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Stoughton
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

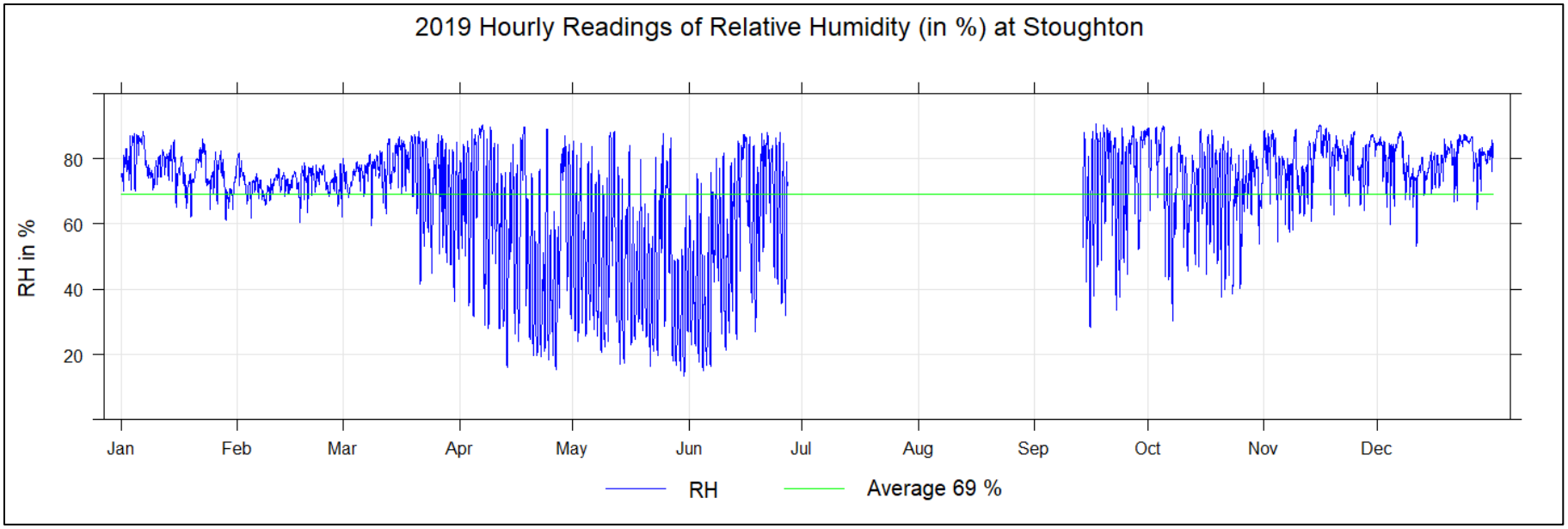
Wind Speed Frequency Distribution of 1-hr Averages - Stoughton

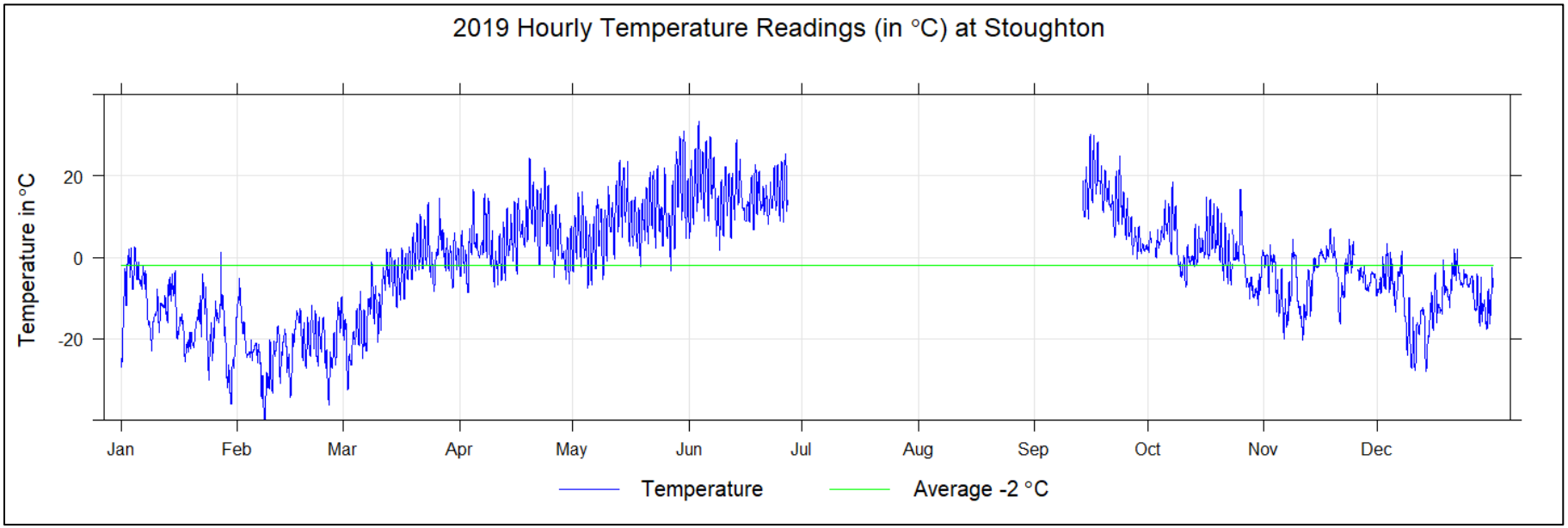
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	743	3.9	11.4	Jan 09 20:00	7.5	Jan 20	99.9%	45.3%	32.9%	21.6%	0.0%	0.0%	0.0%	0	0
February 2019	670	3.2	10.7	Feb 02 13:00	6.3	Feb 16	99.7%	59.2%	28.1%	12.4%	0.0%	0.0%	0.0%	0	0
March 2019	742	3.2	9.4	Mar 04 09:00	7.6	Mar 03	99.7%	56.2%	33.2%	10.3%	0.0%	0.0%	0.0%	0	0
April 2019	717	2.9	8.4	Apr 19 16:00	5.8	Apr 06	99.6%	60.6%	31.1%	7.9%	0.0%	0.0%	0.0%	0	0
May 2019	737	2.3	7.7	May 03 17:00	4.2	May 15	99.1%	73.3%	23.1%	2.7%	0.0%	0.0%	0.0%	0	0
June 2019	631	2.7	8.3	Jun 06 16:00	5.6	Jun 02	87.6%	55.8%	27.2%	4.6%	0.0%	0.0%	0.0%	0	0
July 2019															
August 2019															
September 2019	407	2.3	5.9	Sep 25 14:00	3.9	Sep 25	56.5%	39.9%	16.7%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	717	3.0	8.1	Oct 26 04:00	6.3	Oct 26	96.4%	56.5%	30.8%	9.1%	0.0%	0.0%	0.0%	0	0
November 2019	643	2.7	23.5	Nov 15 11:00	6.8	Nov 28	89.3%	56.8%	28.1%	4.2%	0.3%	0.0%	0.0%	0	0
December 2019	674	2.8	9.5	Dec 19 15:00	5.9	Dec 19	90.6%	59.5%	25.9%	5.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6681**	**2.9**	**23.5**	**Nov 15**	**7.6**	**Mar 03**	**76.3%**	**46.7%**	**23.0%**	**6.5%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Stoughton

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	77	99.9%	942	99.9%	-14.3	99.9%
February 2019	73	100.0%	946	100.0%	-22.0	100.0%
March 2019	74	99.9%	946	99.9%	-6.1	99.9%
April 2019	58	100.0%	941	100.0%	5.0	100.0%
May 2019	48	99.1%	942	99.1%	9.9	99.1%
June 2019	57	87.6%	939	87.6%	15.9	87.6%
July 2019						
August 2019						
September 2019	74	56.5%	938	56.5%	12.1	56.5%
October 2019	72	96.4%	940	96.4%	1.6	96.4%
November 2019	79	96.3%	943	96.3%	-5.0	96.3%
December 2019	79	99.9%	940	100.0%	-10.1	99.9%
Average	69	93.5%	942	93.6%	-1.3	93.5%

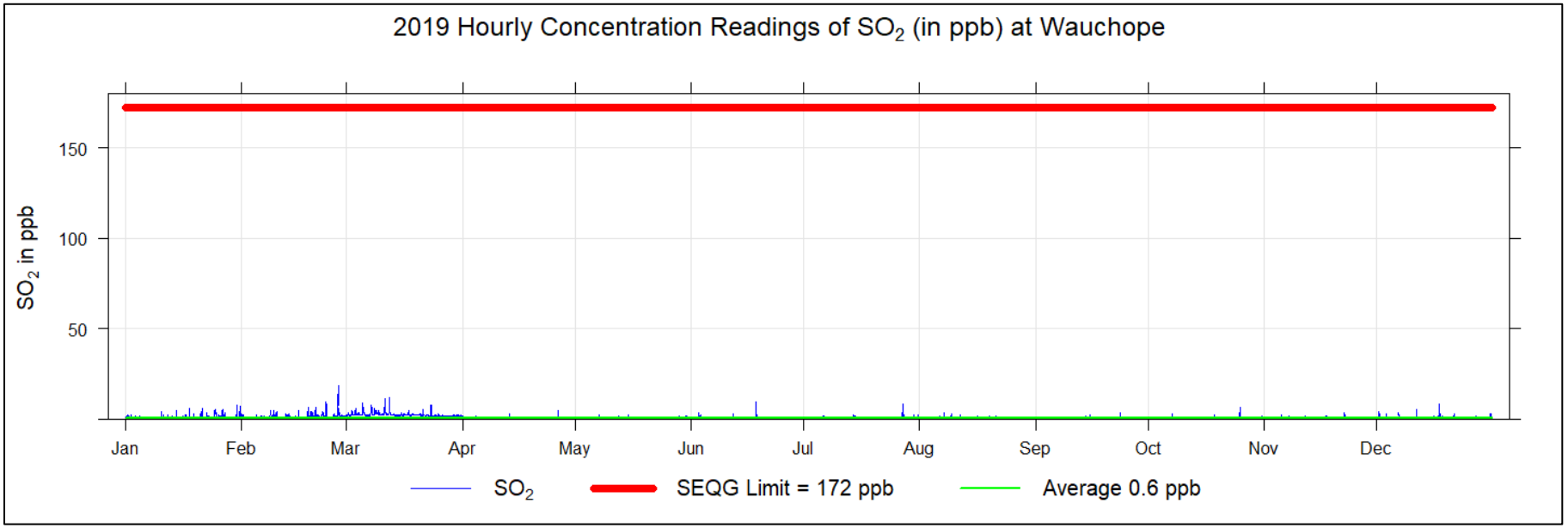

2019 Hourly Readings of Relative Humidity (in %) at Stoughton
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 69 %

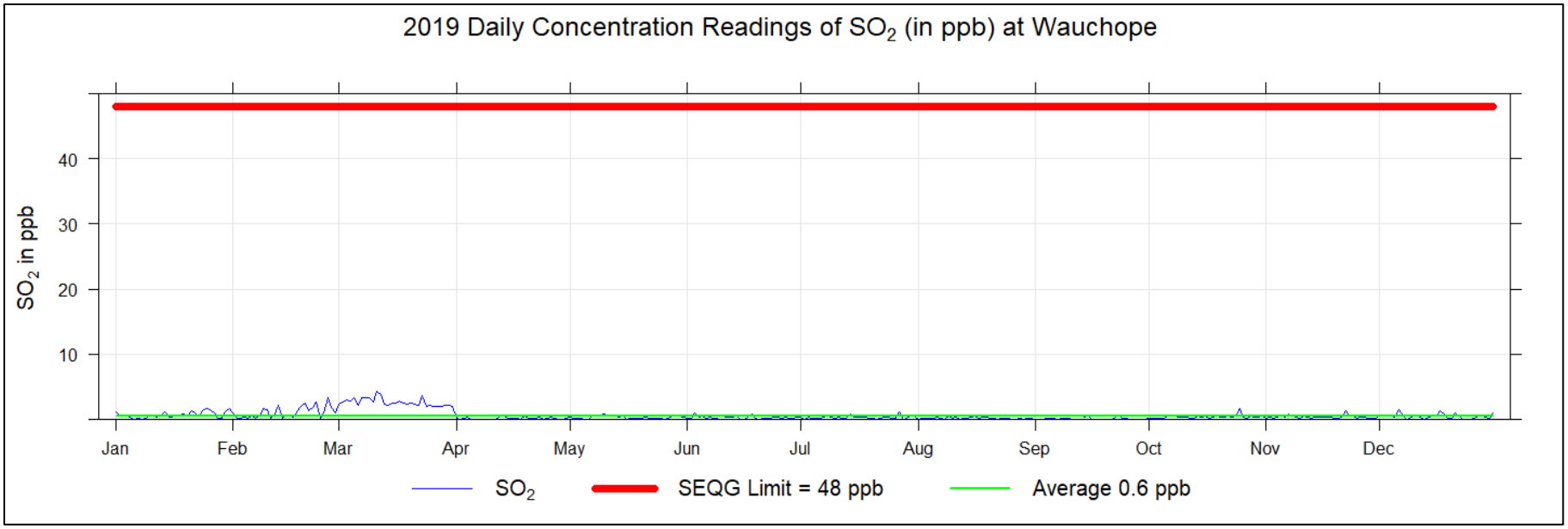

2019 Hourly Temperature Readings (in °C) at Stoughton
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average -2 °C

APPENDIX F
Wauchope Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Wauchope

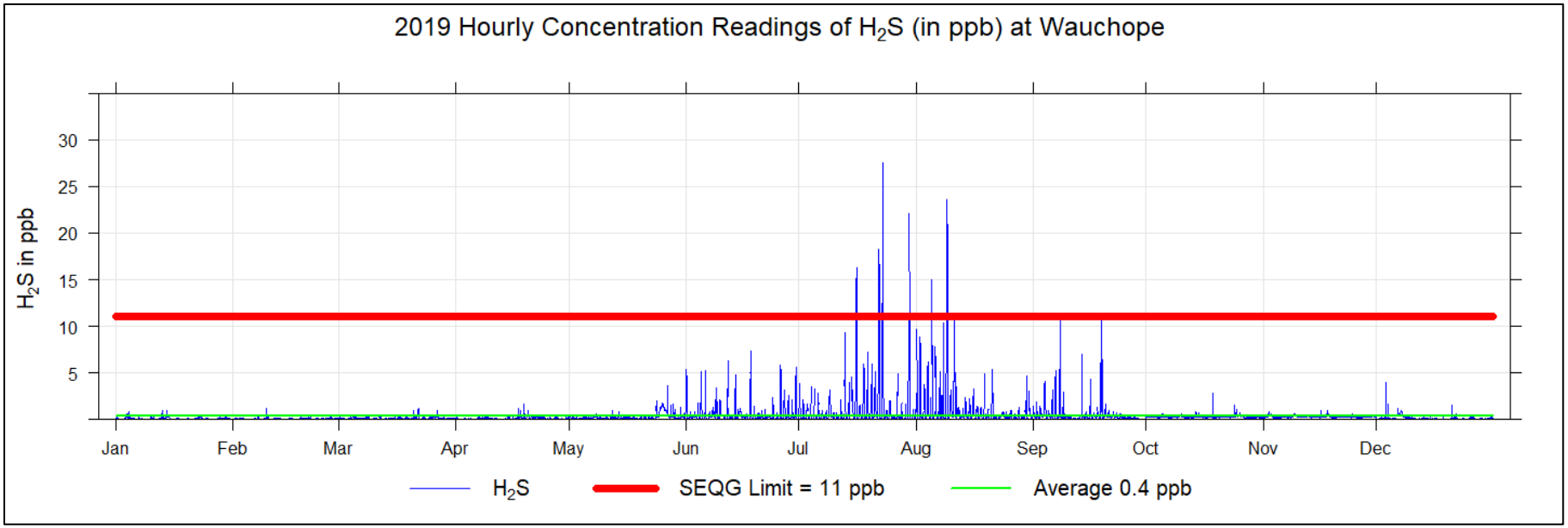
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	0.7	8.1	Jan 30 17:00	1.7	Jan 25	100.0%	80.6%	18.3%	1.1%	0.0%	0.0%	0.0%	0	0
February 2019	672	1.1	18.6	Feb 26 19:00	3.3	Feb 26	100.0%	66.7%	31.5%	1.6%	0.1%	0.0%	0.0%	0	0
March 2019	744	2.6	12.3	Mar 12 10:00	4.3	Mar 11	100.0%	4.7%	92.2%	2.7%	0.4%	0.0%	0.0%	0	0
April 2019	716	0.2	4.9	Apr 26 09:00	0.7	Apr 13	99.4%	96.9%	2.5%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	738	0.3	2.7	May 15 06:00	0.9	May 10	99.2%	96.5%	2.7%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	708	0.3	9.7	Jun 18 09:00	1.1	Jun 03	98.3%	94.7%	3.5%	0.1%	0.0%	0.0%	0.0%	0	0
July 2019	744	0.3	8.3	Jul 27 11:00	1.2	Jul 27	100.0%	96.5%	3.2%	0.3%	0.0%	0.0%	0.0%	0	0
August 2019	738	0.2	3.5	Aug 07 13:00	0.6	Aug 09	99.2%	96.8%	2.4%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	720	0.1	3.8	Sep 23 13:00	0.7	Sep 23	100.0%	98.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	742	0.4	6.8	Oct 25 13:00	1.7	Oct 25	99.7%	96.6%	2.8%	0.3%	0.0%	0.0%	0.0%	0	0
November 2019	720	0.4	3.8	Nov 22 10:00	1.4	Nov 22	100.0%	95.6%	4.4%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	0.5	8.7	Dec 17 17:00	1.3	Dec 17	99.9%	90.2%	9.4%	0.3%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8729**	**0.6**	**18.6**	**Feb 26**	**4.3**	**Mar 11**	**99.6%**	**84.6%**	**14.5%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**

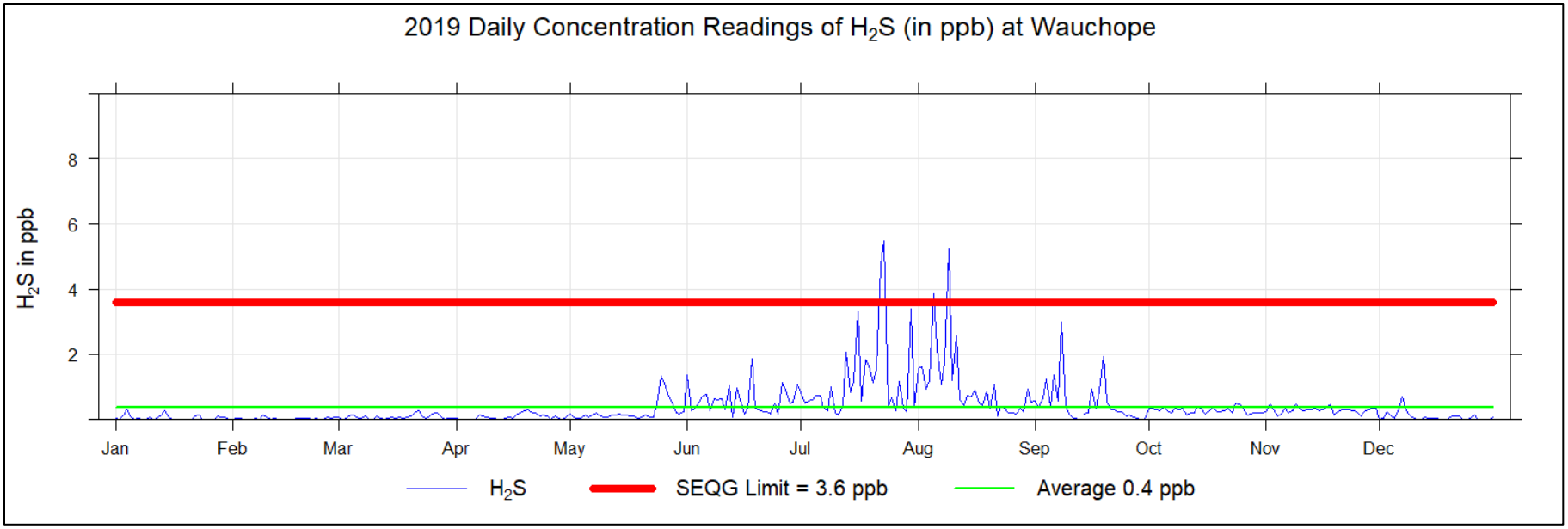



2019 Daily Concentration Readings of SO2 (in ppb) at Wauchope
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 0.6 ppb

Hydrogen Sulphide (H_2S) Frequency Distribution of 1-hr Averages - Wauchope

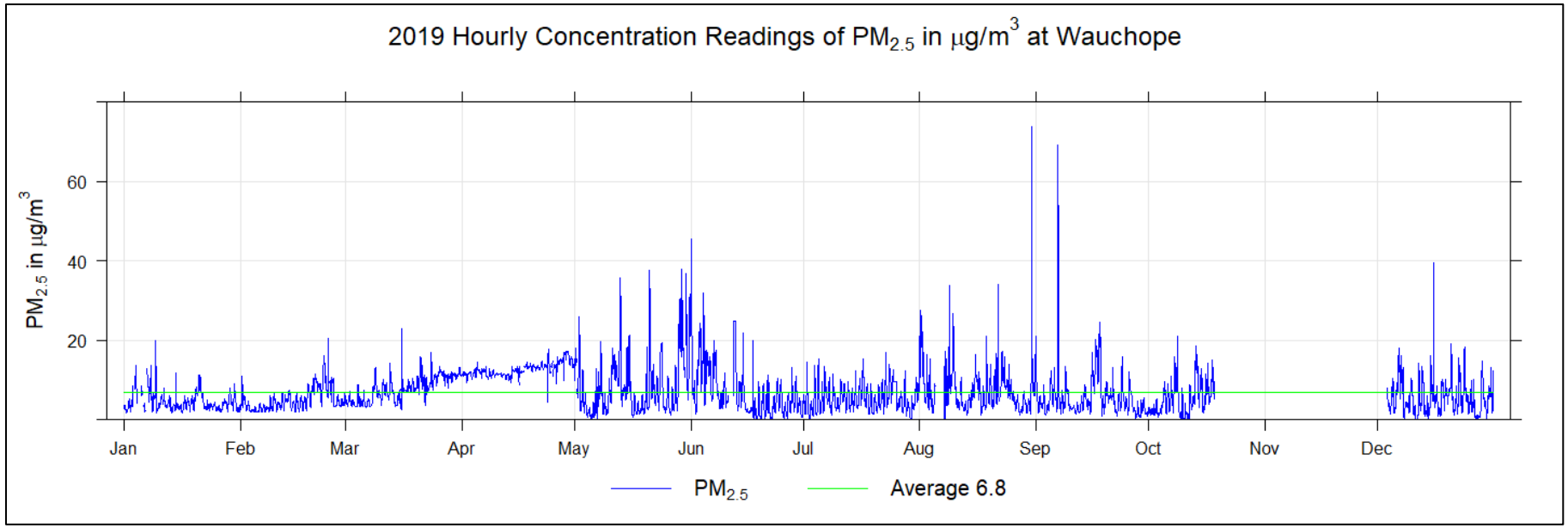
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 3 (ppb)	3 to 5 (ppb)	5 to 8 (ppb)	8 to 11 (ppb)	> 11 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	0.1	1.0	Jan 14 10:00	0.3	Jan 05	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	672	0.0	1.2	Feb 09 20:00	0.1	Feb 10	100.0%	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	743	0.1	1.2	Mar 22 03:00	0.3	Mar 22	99.9%	99.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	716	0.1	2.1	Apr 25 08:00	0.3	Apr 20	99.4%	99.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	738	0.2	3.6	May 27 04:00	1.3	May 25	99.2%	93.5%	5.5%	0.1%	0.0%	0.0%	0.0%	0	0
June 2019	719	0.6	7.3	Jun 18 04:00	1.9	Jun 18	99.9%	85.7%	9.9%	2.8%	1.5%	0.0%	0.0%	0	0
July 2019	744	1.2	27.5	Jul 23 05:00	5.5	Jul 23	100.0%	76.9%	13.4%	4.2%	3.0%	0.7%	1.9%	2	14
August 2019	738	1.1	23.6	Aug 09 06:00	5.2	Aug 09	99.2%	76.6%	14.4%	3.1%	2.8%	1.3%	0.9%	2	7
September 2019	720	0.5	11.4	Sep 08 05:00	3.0	Sep 08	100.0%	90.6%	6.0%	1.8%	1.0%	0.4%	0.3%	0	2
October 2019	742	0.3	2.8	Oct 18 16:00	0.5	Oct 24	99.7%	99.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	720	0.3	1.0	Nov 18 01:00	0.5	Nov 18	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	0.1	4.0	Dec 03 12:00	0.7	Dec 07	99.9%	99.3%	0.4%	0.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8739**	**0.4**	**27.5**	**Jul 23**	**5.5**	**Jul 23**	**99.8%**	**93.3%**	**4.3%**	**1.0%**	**0.7%**	**0.2%**	**0.3%**	**4**	**23**

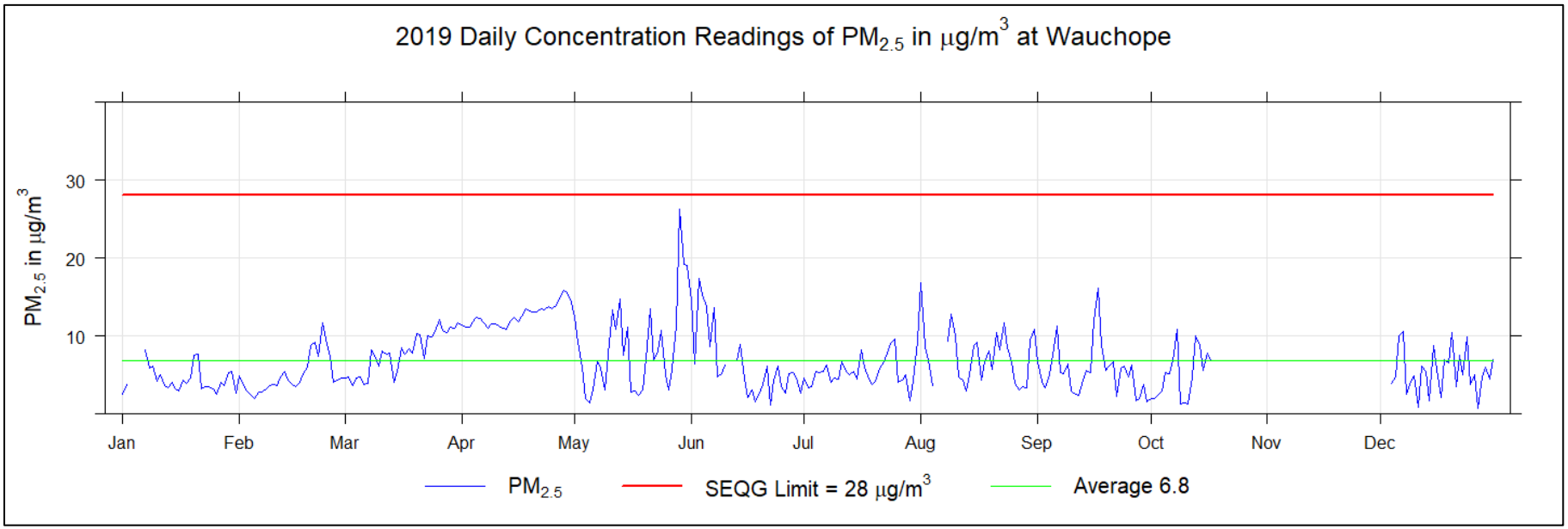



2019 Daily Concentration Readings of H2S (in ppb) at Wauchope
H2S in ppb
8
6
4
2
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
H2S
SEQG Limit = 3.6 ppb
Average 0.4 ppb

Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Wauchope

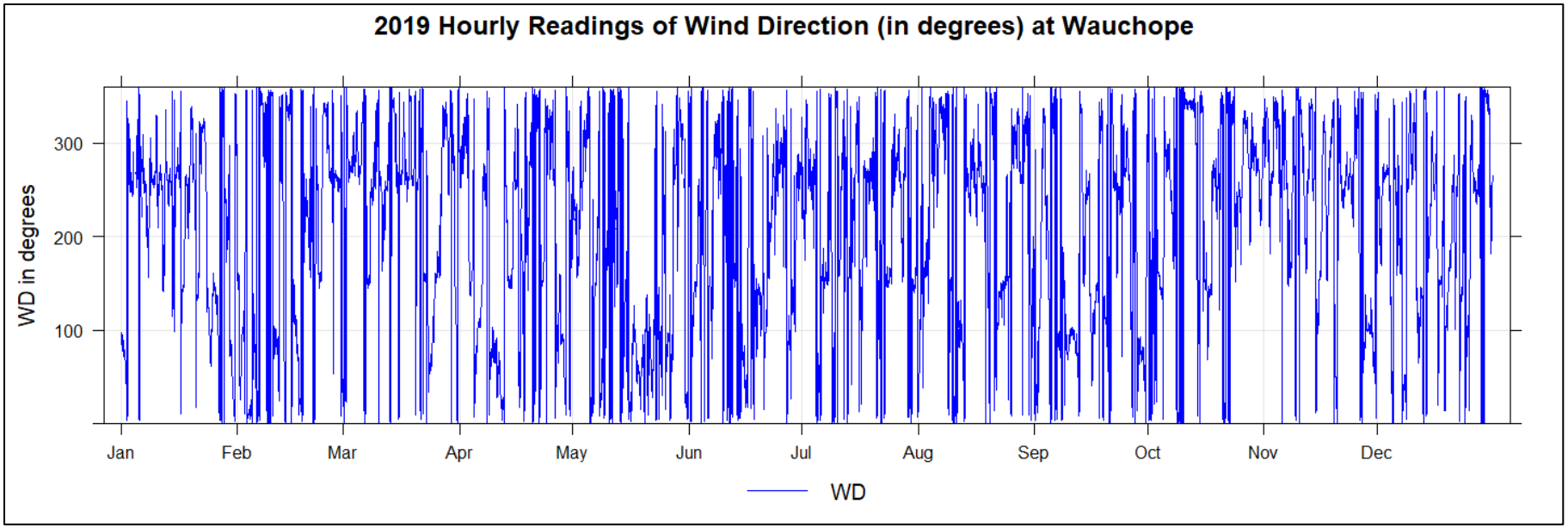
Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	744	4.5	19.9	Jan 09 07:00	8.2	Jan 31	100.0%	5.2%	46.8%	37.0%	3.8%	0.0%	0.0%	0	0
February 2019	671	5.0	20.5	Feb 24 09:00	11.7	Feb 24	99.9%	9.1%	40.0%	45.1%	5.7%	0.1%	0.0%	0	0
March 2019	743	7.8	22.9	Mar 16 00:00	12.0	Mar 26	99.9%	0.0%	15.6%	55.1%	29.0%	0.1%	0.0%	0	0
April 2019	716	12.6	17.8	Apr 24 00:00	15.9	Apr 28	99.4%	0.0%	0.0%	1.7%	96.8%	0.0%	0.0%	0	0
May 2019	737	8.4	37.9	May 29 14:00	26.2	May 29	99.1%	14.4%	19.8%	36.3%	20.0%	4.2%	4.2%	0	0
June 2019	681	6.8	45.6	Jun 01 01:00	17.4	Jun 30	94.6%	17.4%	21.5%	35.7%	13.8%	4.7%	0.7%	0	0
July 2019	744	5.4	21.1	Jul 31 22:00	9.5	Jul 25	100.0%	13.4%	26.9%	51.5%	7.5%	0.1%	0.0%	0	0
August 2019	682	7.4	73.8	Aug 30 21:00	16.9	Aug 01	91.7%	5.8%	20.2%	46.5%	16.4%	2.3%	0.7%	0	0
September 2019	720	5.5	69.1	Sep 06 22:00	16.1	Sep 17	100.0%	17.1%	31.5%	39.9%	9.7%	1.4%	0.4%	0	0
October 2019	423	5.2	21.0	Oct 08 16:00	10.8	Oct 08	56.9%	13.4%	12.4%	20.7%	7.7%	0.1%	0.0%	0	0
November 2019															
December 2019	683	5.4	39.5	Dec 15 23:00	10.6	Dec 07	91.8%	19.5%	20.7%	38.7%	11.4%	0.0%	0.1%	0	0
			MAXIMUM VALUES												
Annual	**7544**	**6.7**	**73.8**	**Aug 30**	**26.2**	**May 29**	**86.1%**	**9.6%**	**21.2%**	**34.1%**	**18.5%**	**1.1%**	**0.5%**	**0**	**0**




2019 Daily Concentration Readings of PM2.5 in µg/m3 at Wauchope
PM2.5 in µg/m3
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
PM2.5
SEQG Limit = 28 µg/m3
Average 6.8

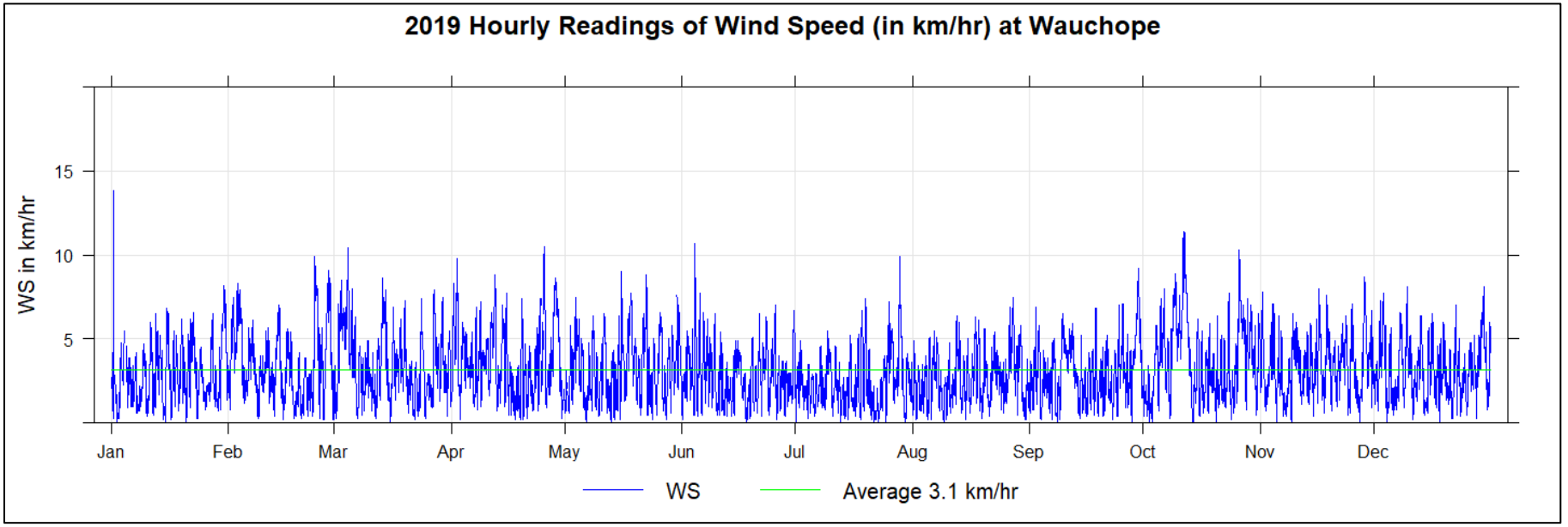
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Wauchope

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	873	4.7%	3.9%	1.4%	0.0%	0.0%	0.0%	10.0%
NNE	478	2.8%	2.0%	0.6%	0.0%	0.0%	0.0%	5.5%
NE	247	1.6%	1.1%	0.1%	0.0%	0.0%	0.0%	2.8%
ENE	352	1.6%	1.8%	0.6%	0.0%	0.0%	0.0%	4.0%
E	506	2.1%	3.2%	0.5%	0.0%	0.0%	0.0%	5.8%
ESE	355	2.5%	1.5%	0.1%	0.0%	0.0%	0.0%	4.1%
SE	439	2.7%	2.3%	0.0%	0.0%	0.0%	0.0%	5.0%
SSE	728	5.4%	2.8%	0.2%	0.0%	0.0%	0.0%	8.3%
S	233	2.6%	0.1%	0.0%	0.0%	0.0%	0.0%	2.7%
SSW	179	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%	2.0%
SW	354	3.4%	0.7%	0.0%	0.0%	0.0%	0.0%	4.1%
WSW	790	6.2%	2.6%	0.2%	0.0%	0.0%	0.0%	9.0%
W	1119	5.2%	5.9%	1.7%	0.0%	0.0%	0.0%	12.8%
WNW	504	2.9%	1.9%	0.9%	0.0%	0.0%	0.0%	5.8%
NW	598	2.9%	3.0%	1.0%	0.0%	0.0%	0.0%	6.8%
NNW	982	4.4%	4.6%	2.2%	0.0%	0.0%	0.0%	11.2%
Total	**8737**	**52.9%**	**37.6%**	**9.5%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Wauchope
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

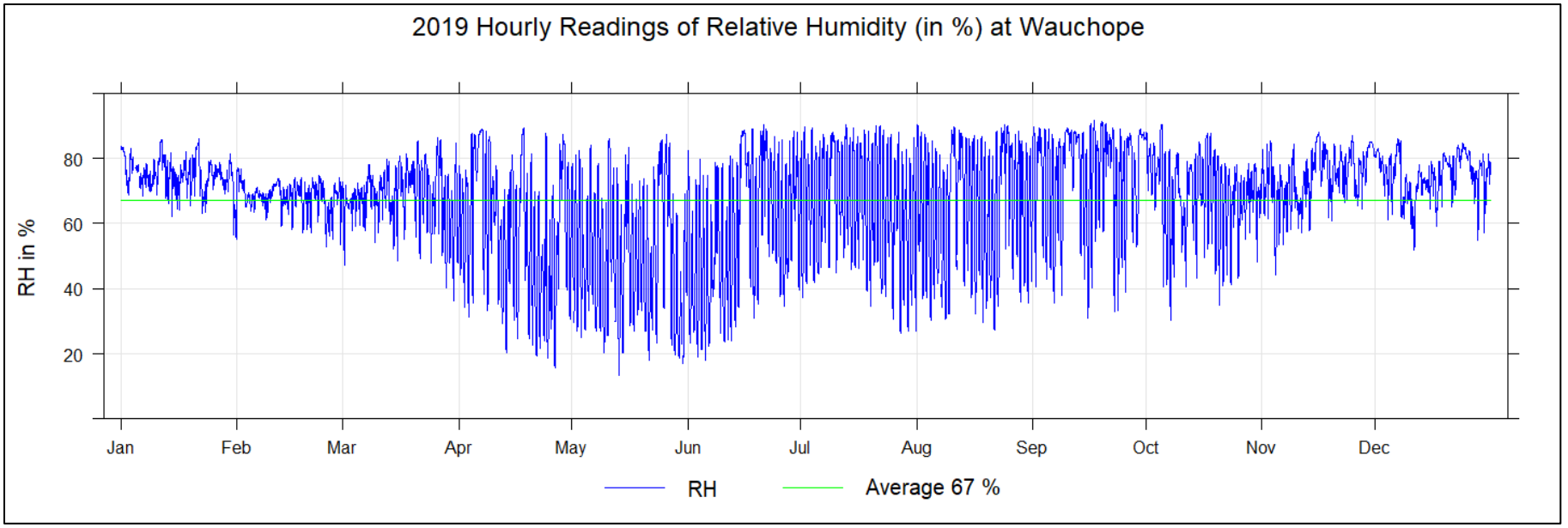
Wind Speed Frequency Distribution of 1-hr Averages - Wauchope

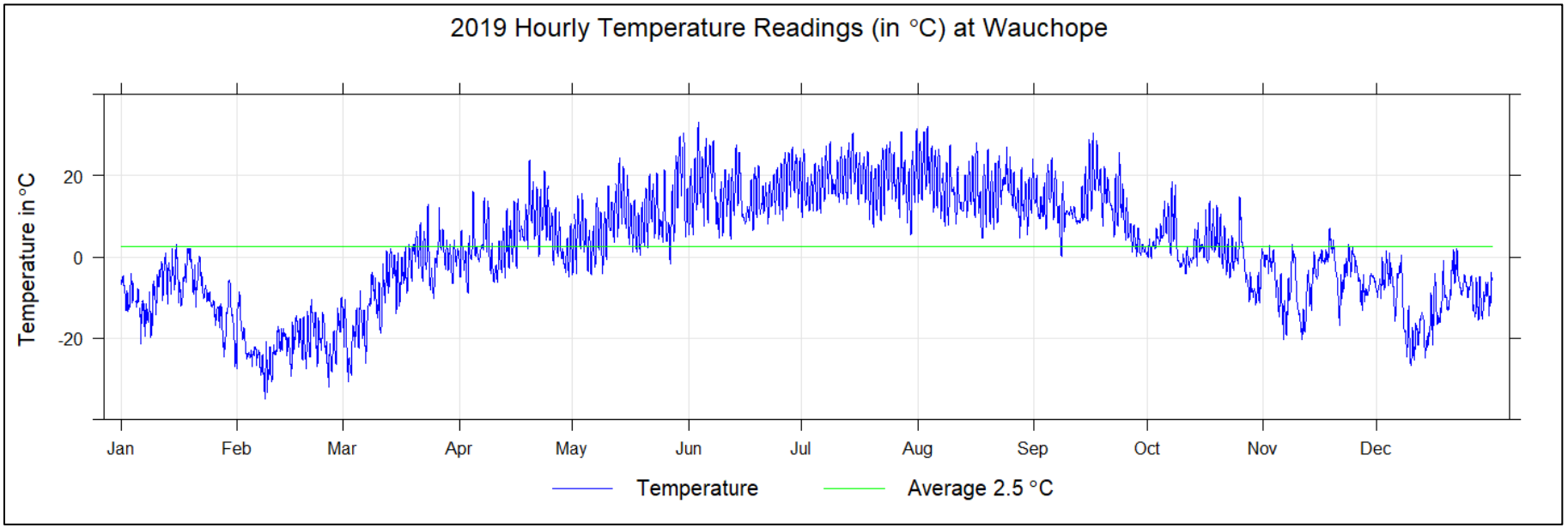
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	729	2.9	13.8	Jan 01 13:00	5.8	Jan 30	98.0%	57.4%	36.0%	4.4%	0.1%	0.0%	0.0%	0	0
February 2019	672	3.4	9.9	Feb 23 21:00	7.5	Feb 27	100.0%	49.9%	37.1%	13.1%	0.0%	0.0%	0.0%	0	0
March 2019	744	3.4	10.4	Mar 04 14:00	7.1	Mar 04	100.0%	49.6%	36.6%	13.8%	0.0%	0.0%	0.0%	0	0
April 2019	716	3.6	10.5	Apr 25 12:00	7.5	Apr 28	99.4%	46.0%	37.4%	16.1%	0.0%	0.0%	0.0%	0	0
May 2019	737	3.2	9.0	May 15 23:00	6.1	May 18	99.1%	49.9%	41.4%	7.8%	0.0%	0.0%	0.0%	0	0
June 2019	720	2.7	10.7	Jun 04 10:00	4.4	Jun 04	100.0%	60.8%	35.3%	3.9%	0.0%	0.0%	0.0%	0	0
July 2019	744	2.5	9.9	Jul 28 15:00	5.3	Jul 28	100.0%	72.2%	24.1%	3.8%	0.0%	0.0%	0.0%	0	0
August 2019	742	2.7	7.5	Aug 27 14:00	5.2	Aug 27	99.7%	63.0%	34.7%	2.0%	0.0%	0.0%	0.0%	0	0
September 2019	720	3.0	9.2	Sep 29 18:00	7.0	Sep 29	100.0%	54.2%	41.0%	4.9%	0.0%	0.0%	0.0%	0	0
October 2019	744	3.7	11.4	Oct 11 15:00	8.0	Oct 11	100.0%	44.6%	39.2%	16.1%	0.0%	0.0%	0.0%	0	0
November 2019	719	3.4	8.7	Nov 28 14:00	6.2	Nov 28	99.9%	47.2%	44.2%	8.5%	0.0%	0.0%	0.0%	0	0
December 2019	744	3.2	8.1	Dec 09 20:00	5.4	Dec 03	100.0%	51.5%	42.9%	5.6%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8731**	**3.1**	**13.8**	**Jan 01**	**8.0**	**Oct 11**	**99.7%**	**53.9%**	**37.5%**	**8.3%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Wauchope

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	75	98.0%	941	98.0%	-9.4	98.0%
February 2019	68	100.0%	946	100.0%	-21.2	100.0%
March 2019	68	100.0%	945	100.0%	-6.2	100.0%
April 2019	58	99.4%	941	99.4%	4.6	99.4%
May 2019	50	99.1%	942	99.1%	9.7	99.1%
June 2019	59	100.0%	940	100.0%	16.6	100.0%
July 2019	66	100.0%	942	100.0%	19.0	100.0%
August 2019	66	99.7%	942	99.7%	16.9	99.7%
September 2019	75	100.0%	941	100.0%	12.1	100.0%
October 2019	69	100.0%	940	100.0%	1.7	100.0%
November 2019	74	100.0%	943	100.0%	-5.3	100.0%
December 2019	75	100.0%	940	100.0%	-10.7	100.0%
Average	67	99.7%	942	99.7%	2.3	99.7%

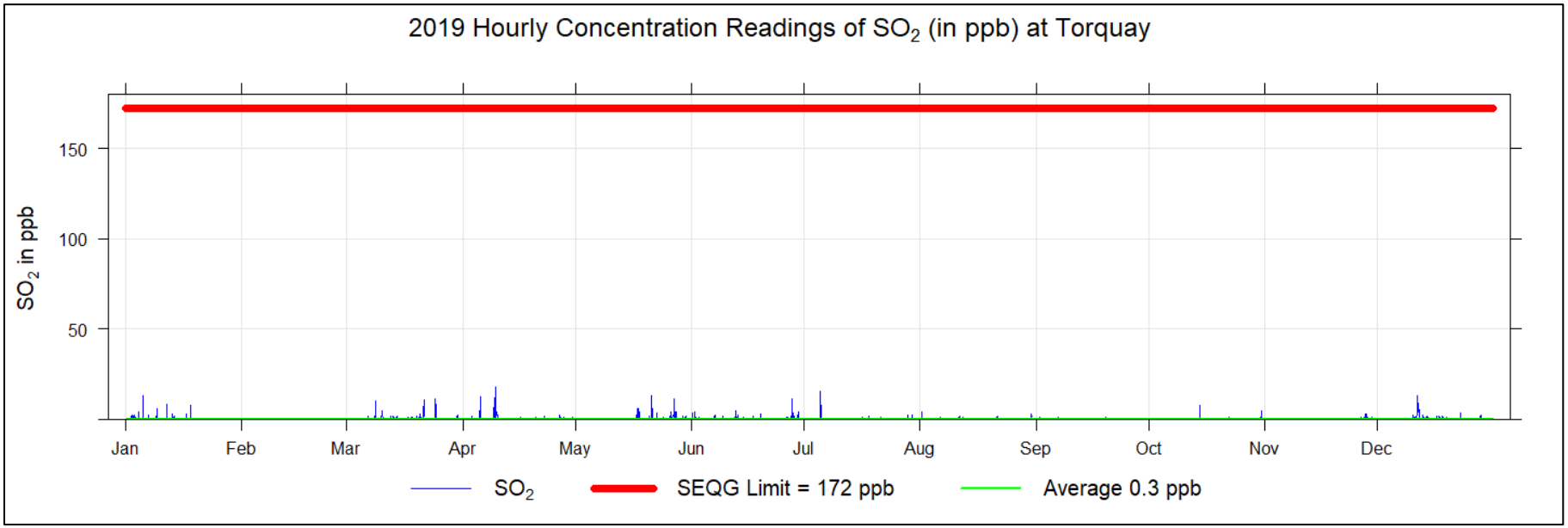

2019 Hourly Readings of Relative Humidity (in %) at Wauchope
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 67 %

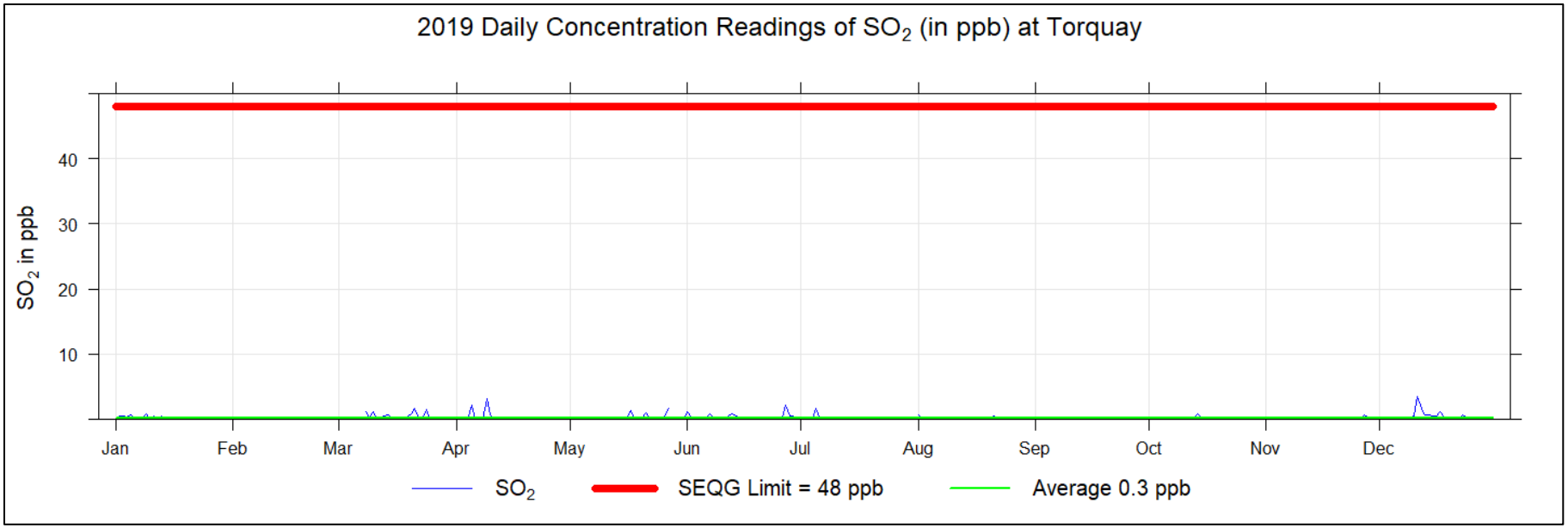

2019 Hourly Temperature Readings (in °C) at Wauchope
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 2.5 °C

APPENDIX G
Torquay Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Torquay

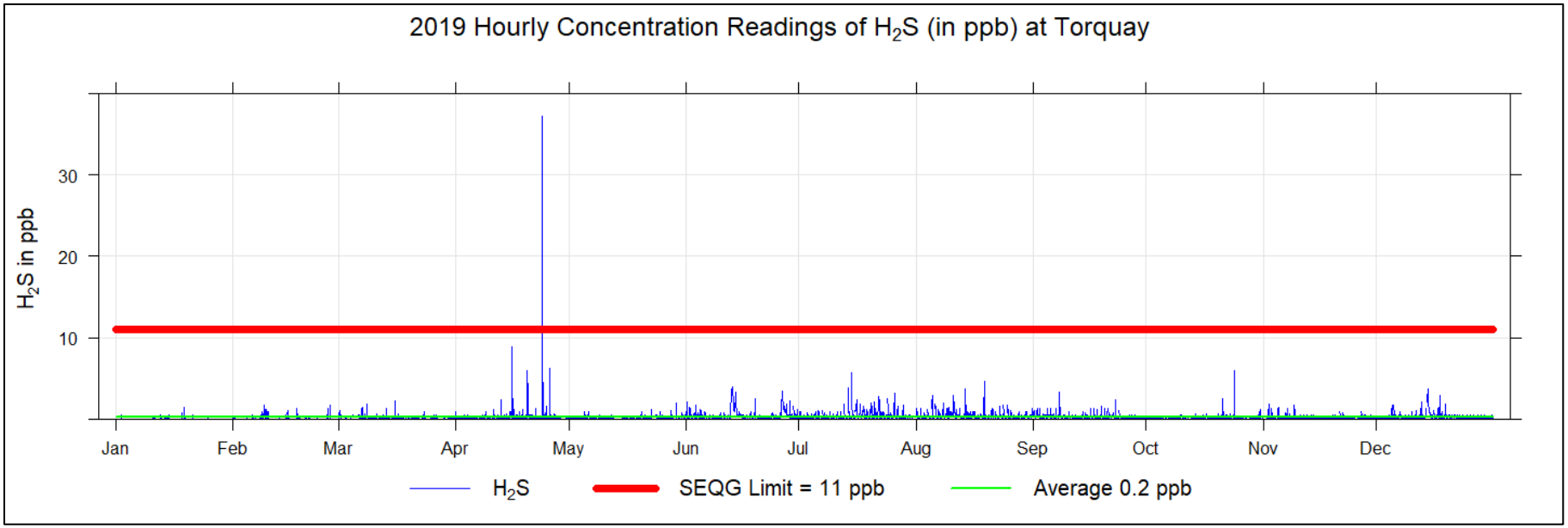
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	419	0.3	13.1	Jan 05 16:00	0.9	Jan 09	56.3%	51.7%	3.9%	0.5%	0.1%	0.0%	0.0%	0	0
February 2019															
March 2019	559	0.4	11.3	Mar 24 16:00	1.7	Mar 21	75.1%	68.3%	5.8%	0.7%	0.4%	0.0%	0.0%	0	0
April 2019	665	0.3	18.0	Apr 09 15:00	3.1	Apr 09	92.4%	86.8%	4.3%	0.8%	0.4%	0.0%	0.0%	0	0
May 2019	621	0.2	13.1	May 21 10:00	1.7	May 27	83.5%	79.3%	3.5%	0.4%	0.3%	0.0%	0.0%	0	0
June 2019	685	0.3	11.7	Jun 27 22:00	2.2	Jun 27	95.1%	88.5%	6.0%	0.6%	0.1%	0.0%	0.0%	0	0
July 2019	689	0.1	15.5	Jul 05 11:00	1.8	Jul 05	92.6%	91.4%	0.8%	0.1%	0.3%	0.0%	0.0%	0	0
August 2019	711	0.2	4.1	Aug 01 12:00	0.7	Aug 01	95.6%	93.7%	1.9%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	685	0.1	1.5	Sep 01 20:00	0.3	Sep 06	95.1%	94.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	713	0.2	8.0	Oct 14 16:00	0.8	Oct 14	95.8%	95.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0	0
November 2019	688	0.2	3.0	Nov 27 17:00	0.6	Nov 27	95.6%	94.6%	1.0%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	709	0.5	13.4	Dec 11 18:00	3.5	Dec 11	95.3%	88.0%	5.9%	1.1%	0.3%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7144**	**0.3**	**18.0**	**Apr 09**	**3.5**	**Dec 11**	**81.6%**	**78.2%**	**2.9%**	**0.4%**	**0.2%**	**0.0%**	**0.0%**	**0**	**0**

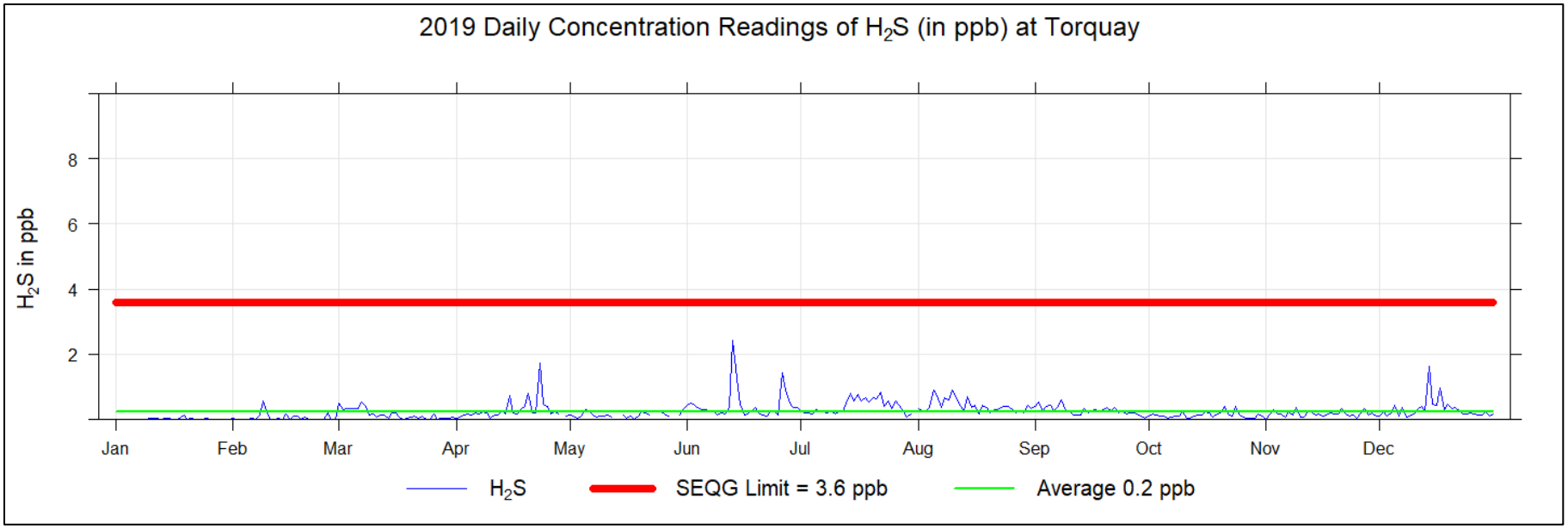



2019 Daily Concentration Readings of SO2 (in ppb) at Torquay
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 0.3 ppb

Hydrogen Sulphide (H_2S) Frequency Distribution of 1-hr Averages - Torquay

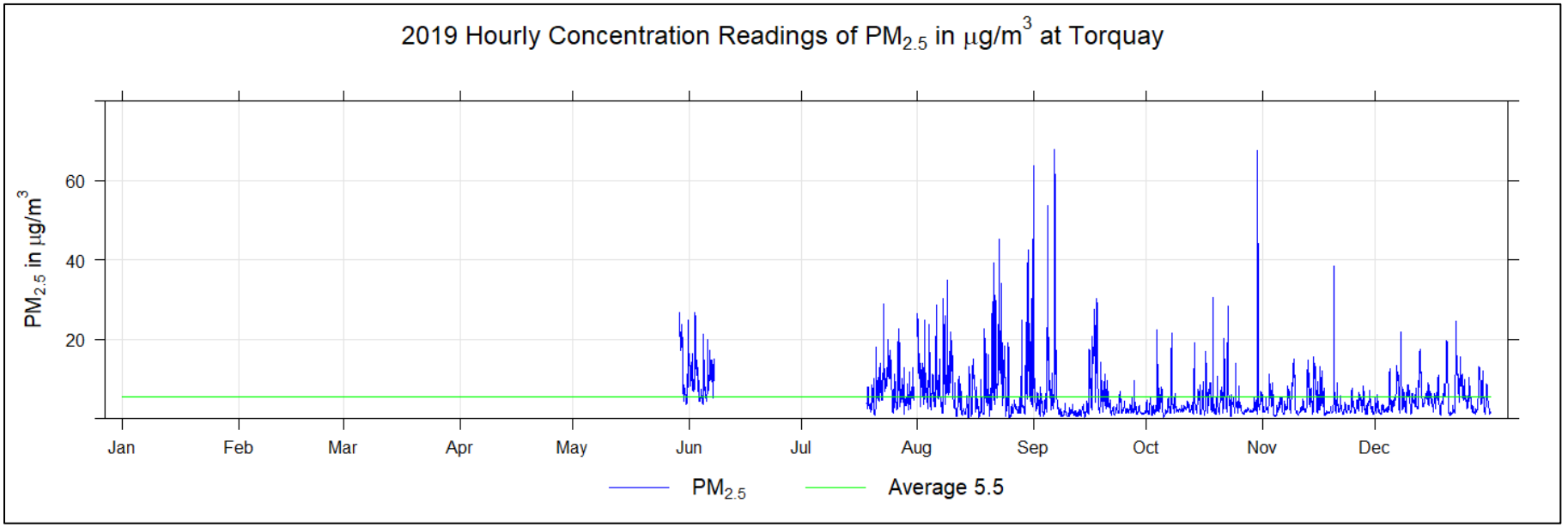
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 3 (ppb)	3 to 5 (ppb)	5 to 8 (ppb)	8 to 11 (ppb)	> 11 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	741	0.0	1.5	Jan 19 01:00	0.2	Jan 20	99.6%	99.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	630	0.1	1.8	Feb 09 08:00	0.6	Feb 10	93.8%	92.7%	1.0%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	706	0.2	2.3	Mar 15 23:00	0.5	Mar 07	94.9%	93.3%	1.6%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	665	0.3	37.2	Apr 23 21:00	1.7	Apr 23	92.4%	90.3%	1.1%	0.4%	0.3%	0.1%	0.1%	0	1
May 2019	621	0.2	2.0	May 29 13:00	0.3	May 31	83.5%	83.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	677	0.4	4.0	Jun 13 09:00	2.4	Jun 13	94.0%	84.7%	7.6%	1.7%	0.0%	0.0%	0.0%	0	0
July 2019	689	0.4	5.7	Jul 14 22:00	0.8	Jul 22	92.6%	84.8%	7.3%	0.4%	0.1%	0.0%	0.0%	0	0
August 2019	711	0.4	4.7	Aug 19 07:00	0.9	Aug 10	95.6%	87.8%	7.5%	0.3%	0.0%	0.0%	0.0%	0	0
September 2019	685	0.3	3.3	Sep 08 01:00	0.6	Sep 08	95.1%	92.4%	2.6%	0.1%	0.0%	0.0%	0.0%	0	0
October 2019	713	0.1	6.0	Oct 24 07:00	0.4	Oct 21	95.8%	95.3%	0.4%	0.0%	0.1%	0.0%	0.0%	0	0
November 2019	688	0.2	1.9	Nov 02 10:00	0.4	Nov 09	95.6%	94.7%	0.8%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	709	0.3	4.5	Dec 17 03:00	1.6	Dec 14	95.3%	90.1%	5.0%	0.3%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8235**	**0.2**	**37.2**	**Apr 23**	**2.4**	**Jun 13**	**94.0%**	**90.7%**	**3.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0**	**1**

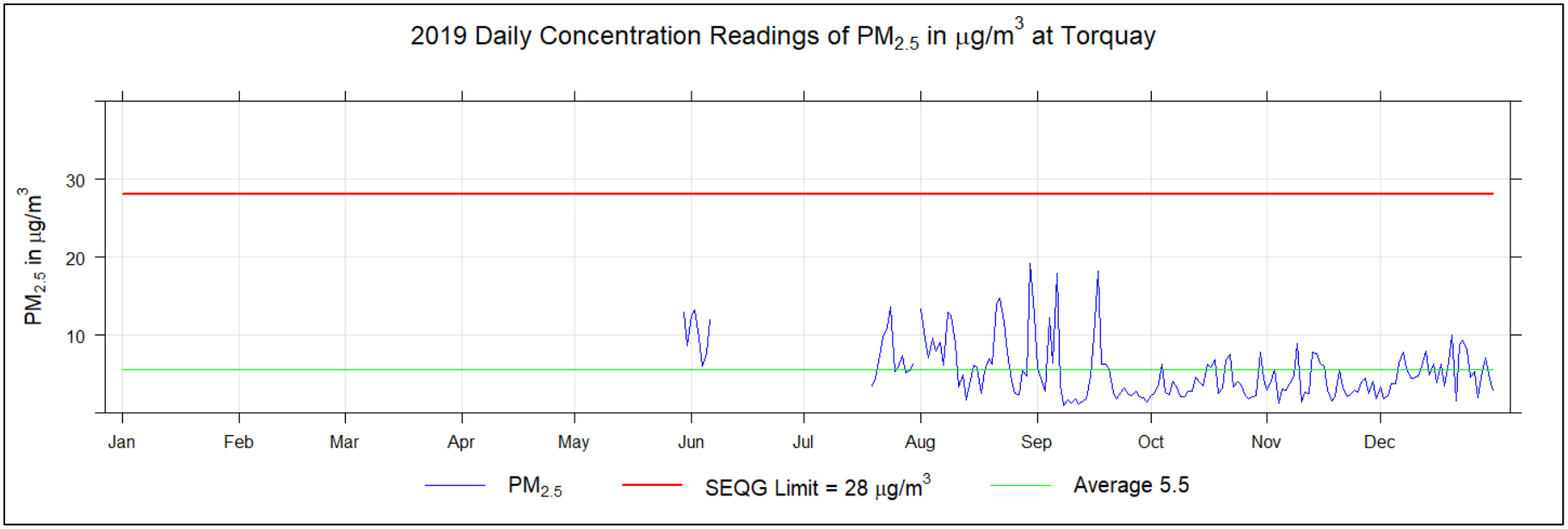



2019 Daily Concentration Readings of H2S (in ppb) at Torquay
H2S in ppb
8
6
4
2
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
H2S
SEQG Limit = 3.6 ppb
Average 0.2 ppb

Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Torquay

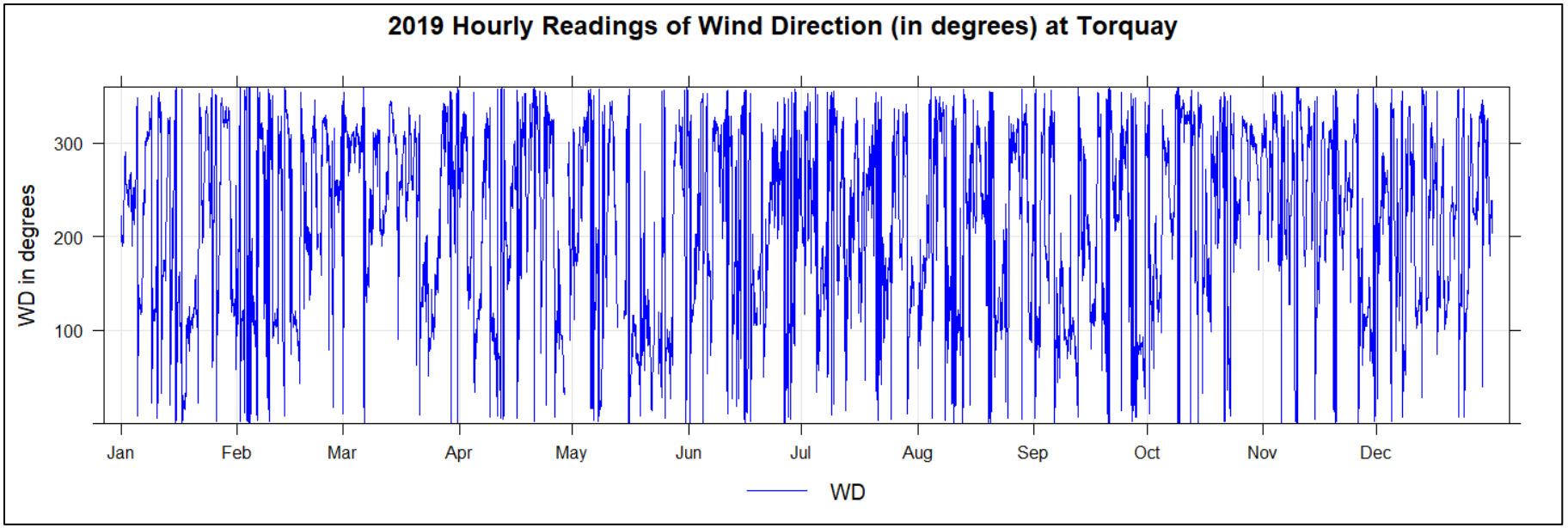
Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019															
February 2019															
March 2019															
April 2019															
May 2019	59	12.7	26.6	May 29 15:00	13.0	May 31	7.9%	0.0%	0.3%	3.9%	1.6%	2.2%	0.0%	0	0
June 2019	161	10.2	26.6	Jun 02 17:00	13.1	Jun 02	22.4%	0.0%	0.6%	12.1%	9.0%	0.7%	0.0%	0	0
July 2019	300	7.0	28.8	Jul 22 23:00	13.6	Jul 24	40.3%	2.8%	8.3%	20.8%	7.7%	0.5%	0.1%	0	0
August 2019	744	7.8	63.7	Aug 31 22:00	19.2	Aug 30	100.0%	18.1%	21.6%	32.5%	20.8%	4.6%	2.3%	0	0
September 2019	720	4.6	67.7	Sep 06 13:00	18.2	Sep 17	100.0%	42.8%	26.9%	22.2%	4.6%	1.7%	1.8%	0	0
October 2019	744	3.8	67.4	Oct 30 19:00	7.8	Oct 30	100.0%	34.3%	36.7%	24.1%	3.9%	0.7%	0.4%	0	0
November 2019	720	3.8	38.3	Nov 20 00:00	8.9	Nov 30	100.0%	32.4%	35.6%	26.8%	5.1%	0.0%	0.1%	0	0
December 2019	744	5.2	24.5	Dec 22 15:00	10.0	Dec 20	100.0%	20.8%	25.5%	42.6%	10.6%	0.4%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**4192**	**6.9**	**67.7**	**Sep 06**	**19.2**	**Aug 30**	**47.9%**	**12.6%**	**13.0%**	**15.5%**	**5.3%**	**0.9%**	**0.4%**	**0**	**0**




2019 Daily Concentration Readings of PM2.5 in µg/m3 at Torquay
PM2.5 in µg/m3
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
PM2.5
SEQG Limit = 28 µg/m3
Average 5.5

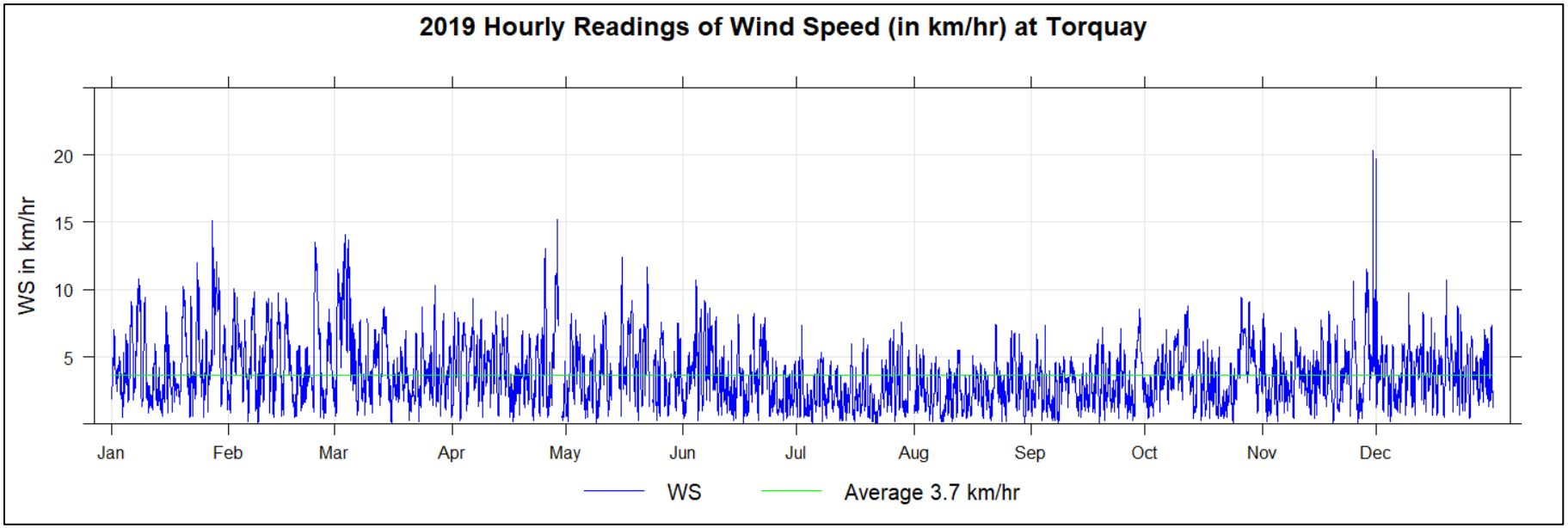
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Torquay

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	403	1.9%	2.0%	0.8%	0.0%	0.0%	0.0%	4.7%
NNE	200	1.3%	0.8%	0.2%	0.0%	0.0%	0.0%	2.3%
NE	151	1.1%	0.5%	0.1%	0.0%	0.0%	0.0%	1.8%
ENE	278	1.6%	1.1%	0.5%	0.0%	0.0%	0.0%	3.2%
E	467	2.3%	2.3%	0.7%	0.0%	0.0%	0.0%	5.4%
ESE	695	3.1%	3.0%	2.0%	0.0%	0.0%	0.0%	8.1%
SE	515	2.9%	2.4%	0.7%	0.0%	0.0%	0.0%	6.0%
SSE	439	2.8%	1.9%	0.4%	0.0%	0.0%	0.0%	5.1%
S	467	2.5%	2.5%	0.4%	0.0%	0.0%	0.0%	5.4%
SSW	436	3.3%	1.6%	0.2%	0.0%	0.0%	0.0%	5.1%
SW	632	4.5%	2.7%	0.2%	0.0%	0.0%	0.0%	7.3%
WSW	694	4.4%	3.1%	0.6%	0.0%	0.0%	0.0%	8.1%
W	553	3.5%	2.6%	0.2%	0.0%	0.0%	0.0%	6.4%
WNW	763	4.6%	3.3%	1.0%	0.0%	0.0%	0.0%	8.9%
NW	1157	4.1%	5.0%	4.1%	0.3%	0.0%	0.0%	13.5%
NNW	750	2.4%	3.9%	2.3%	0.1%	0.0%	0.0%	8.7%
Total	**8600**	**46.2%**	**38.6%**	**14.7%**	**0.5%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Torquay
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

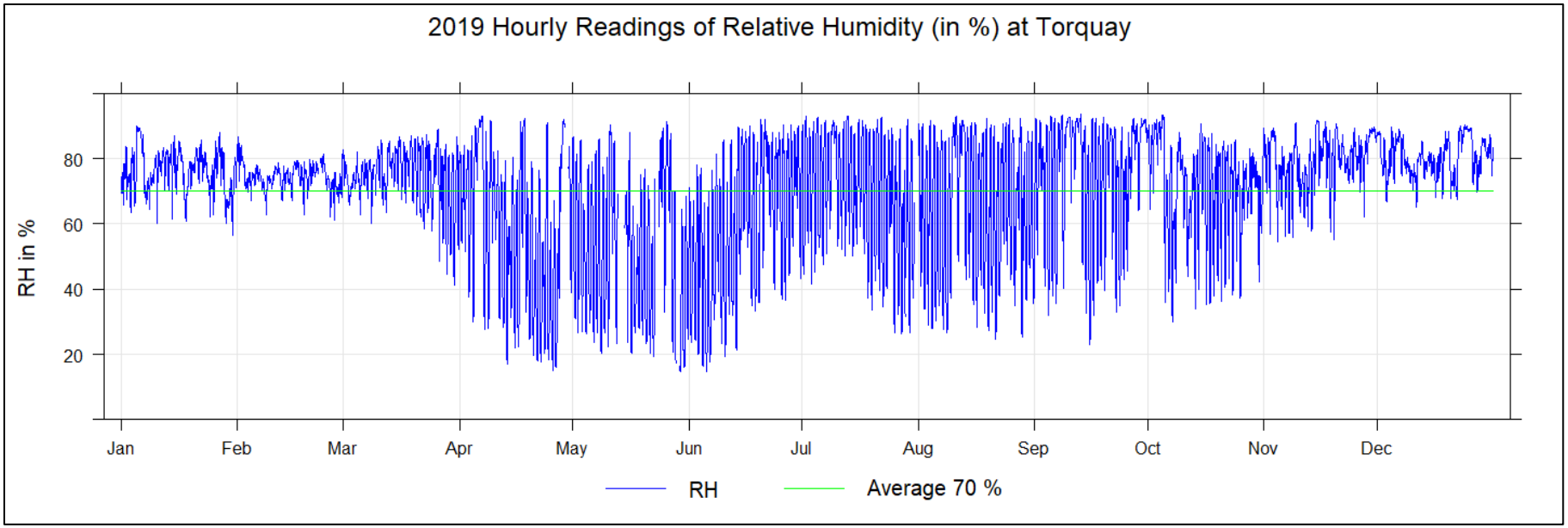
Wind Speed Frequency Distribution of 1-hr Averages

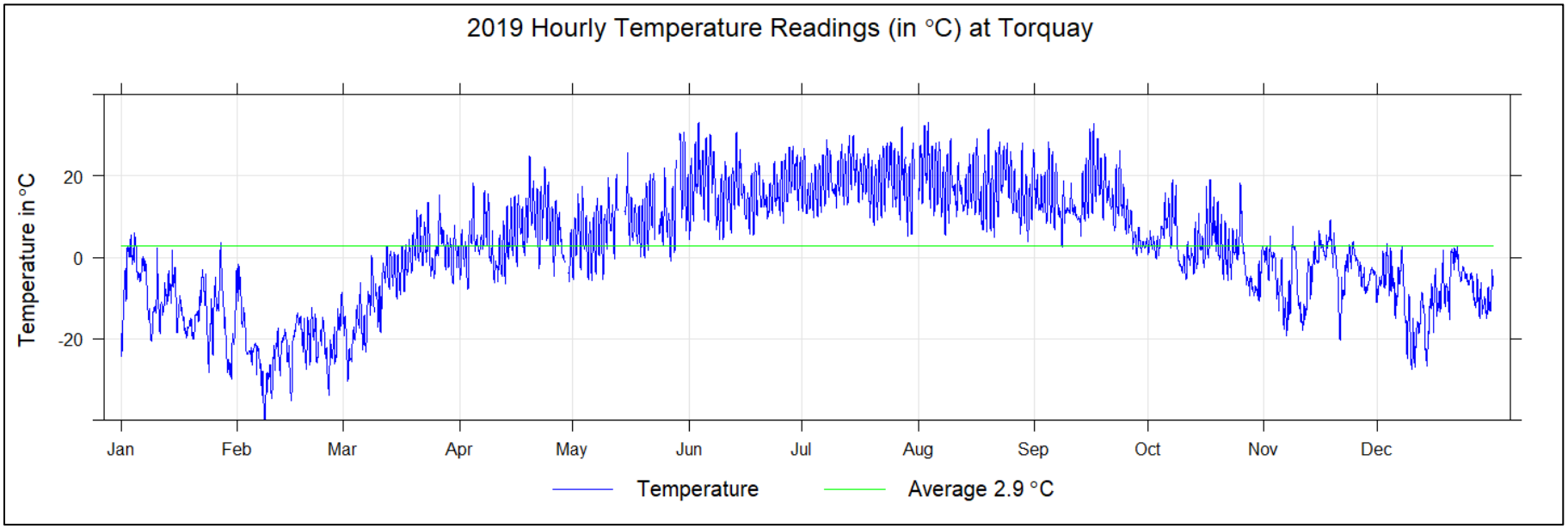
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	742	4.5	15.1	Jan 27 17:00	9.5	Jan 29	99.7%	38.8%	35.5%	24.6%	0.8%	0.0%	0.0%	0	0
February 2019	662	4.6	13.5	Feb 23 19:00	9.4	Feb 25	98.5%	33.6%	37.2%	26.5%	1.2%	0.0%	0.0%	0	0
March 2019	738	4.5	14.1	Mar 03 15:00	11.5	Mar 03	99.2%	35.2%	40.6%	20.8%	2.6%	0.0%	0.0%	0	0
April 2019	696	4.2	15.2	Apr 28 18:00	10.1	Apr 28	96.7%	36.5%	38.8%	20.7%	0.7%	0.0%	0.0%	0	0
May 2019	652	4.0	12.4	May 15 19:00	7.2	May 18	87.6%	35.5%	32.8%	19.2%	0.1%	0.0%	0.0%	0	0
June 2019	718	3.4	10.7	Jun 04 09:00	6.4	Jun 04	99.7%	50.7%	35.0%	14.0%	0.0%	0.0%	0.0%	0	0
July 2019	720	2.4	7.6	Jul 28 13:00	4.3	Jul 28	96.8%	68.1%	25.8%	2.8%	0.0%	0.0%	0.0%	0	0
August 2019	744	2.5	7.4	Aug 22 14:00	4.9	Aug 22	100.0%	65.9%	31.7%	2.4%	0.0%	0.0%	0.0%	0	0
September 2019	720	2.9	8.5	Sep 29 11:00	6.9	Sep 29	100.0%	58.8%	36.5%	4.7%	0.0%	0.0%	0.0%	0	0
October 2019	744	3.6	9.4	Oct 26 10:00	7.1	Oct 26	100.0%	43.5%	43.1%	13.3%	0.0%	0.0%	0.0%	0	0
November 2019	720	3.7	20.3	Nov 30 05:00	8.8	Nov 28	100.0%	43.1%	43.3%	13.3%	0.3%	0.0%	0.0%	0	0
December 2019	744	3.9	19.7	Dec 01 02:00	5.9	Dec 09	100.0%	35.3%	54.7%	9.7%	0.3%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8600**	**3.7**	**20.3**	**Nov 30**	**11.5**	**Mar 03**	**98.2%**	**45.5%**	**37.9%**	**14.3%**	**0.5%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Torquay

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	76	99.7%	947	99.7%	-11.2	99.7%
February 2019	74	98.5%	951	98.5%	-21.7	98.5%
March 2019	75	99.2%	951	99.2%	-4.8	99.2%
April 2019	58	96.7%	944	96.7%	5.8	96.7%
May 2019	52	87.6%	946	87.6%	9.4	87.6%
June 2019	60	99.7%	943	99.7%	17.1	99.7%
July 2019	70	96.8%	946	96.8%	19.0	96.8%
August 2019	66	100.0%	946	100.0%	17.7	100.0%
September 2019	76	100.0%	944	100.0%	13.1	100.0%
October 2019	71	100.0%	945	100.0%	2.4	100.0%
November 2019	79	100.0%	947	100.0%	-3.8	100.0%
December 2019	80	100.0%	944	100.0%	-9.0	100.0%
Average	70	98.2%	946	98.2%	2.8	98.2%

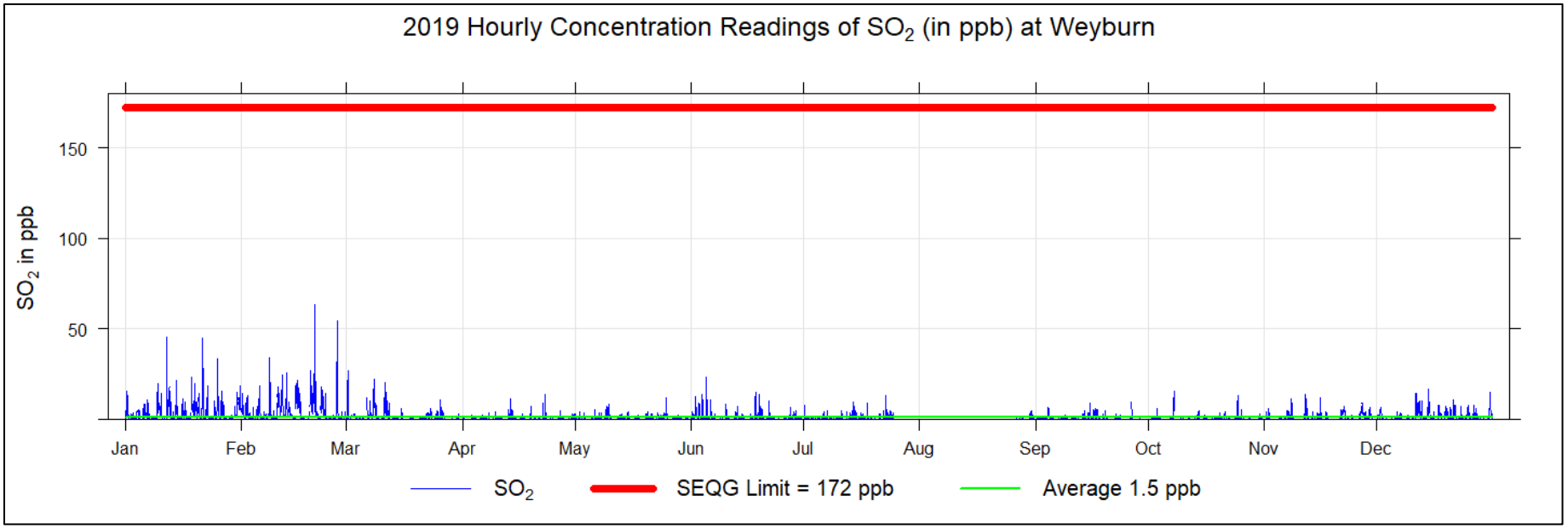

2019 Hourly Readings of Relative Humidity (in %) at Torquay
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 70 %

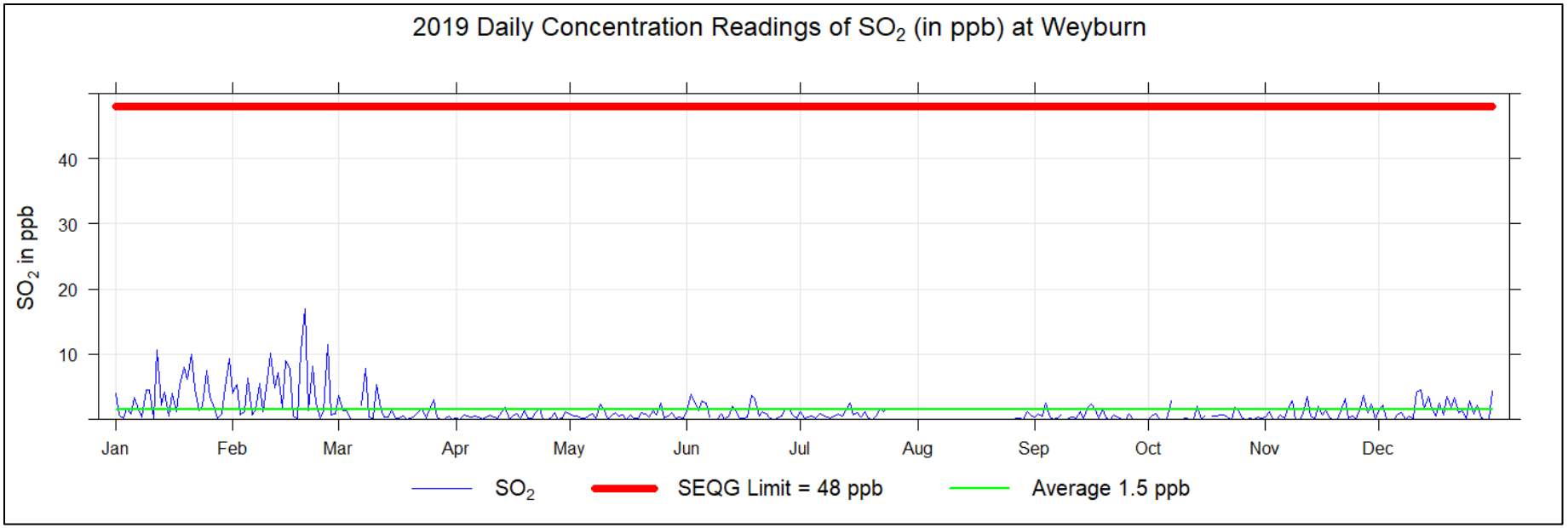

2019 Hourly Temperature Readings (in °C) at Torquay
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 2.9 °C

APPENDIX H
Weyburn Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Weyburn

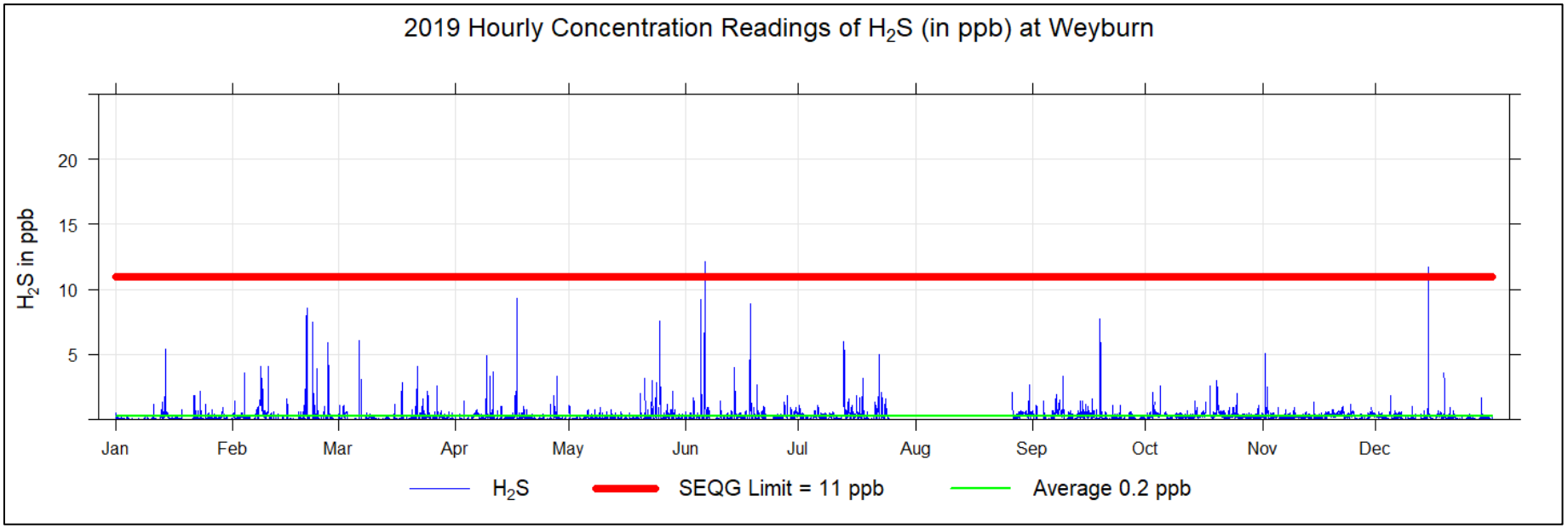
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	742	3.6	45.7	Jan 12 01:00	10.6	Jan 12	99.7%	50.3%	25.5%	14.2%	9.7%	0.0%	0.0%	0	0
February 2019	667	4.6	63.4	Feb 20 15:00	16.9	Feb 20	99.3%	41.8%	31.7%	12.2%	13.1%	0.4%	0.0%	0	0
March 2019	718	1.3	26.9	Mar 01 09:00	7.8	Mar 08	96.5%	71.4%	20.0%	3.1%	2.0%	0.0%	0.0%	0	0
April 2019	716	0.5	13.8	Apr 23 01:00	1.9	Apr 14	99.4%	86.9%	11.5%	0.7%	0.3%	0.0%	0.0%	0	0
May 2019	740	0.7	11.9	May 25 08:00	2.6	May 25	99.5%	82.1%	15.9%	1.2%	0.3%	0.0%	0.0%	0	0
June 2019	719	1.2	23.6	Jun 05 03:00	3.8	Jun 02	99.9%	75.3%	18.6%	4.6%	1.4%	0.0%	0.0%	0	0
July 2019	574	0.8	13.0	Jul 22 22:00	2.6	Jul 14	77.2%	62.6%	13.2%	1.2%	0.1%	0.0%	0.0%	0	0
August 2019	127	0.4	4.9	Aug 30 21:00	1.1	Aug 30	17.1%	15.1%	2.0%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	714	0.6	9.6	Sep 26 14:00	2.5	Sep 04	99.2%	84.3%	13.2%	1.7%	0.0%	0.0%	0.0%	0	0
October 2019	672	0.5	15.8	Oct 07 23:00	2.9	Oct 07	90.3%	81.0%	7.8%	0.8%	0.7%	0.0%	0.0%	0	0
November 2019	717	1.0	13.7	Nov 12 00:00	3.7	Nov 27	99.6%	74.9%	19.9%	4.3%	0.6%	0.0%	0.0%	0	0
December 2019	743	1.6	16.7	Dec 14 22:00	4.5	Dec 12	99.9%	65.3%	25.7%	7.4%	1.5%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7849**	**1.4**	**63.4**	**Feb 20**	**16.9**	**Feb 20**	**89.6%**	**66.0%**	**17.0%**	**4.2%**	**2.4%**	**0.0%**	**0.0%**	**0**	**0**

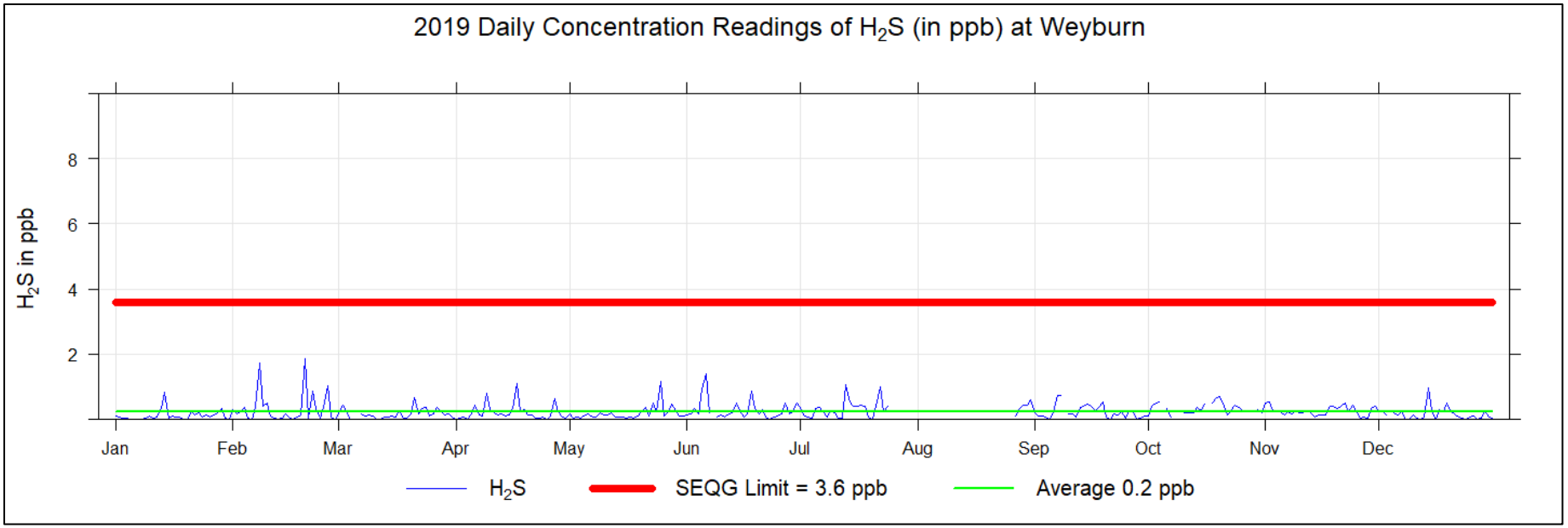



2019 Daily Concentration Readings of SO2 (in ppb) at Weyburn
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 1.5 ppb

Hydrogen Sulphide (H_2S) Frequency Distribution of 1-hr Averages - Weyburn

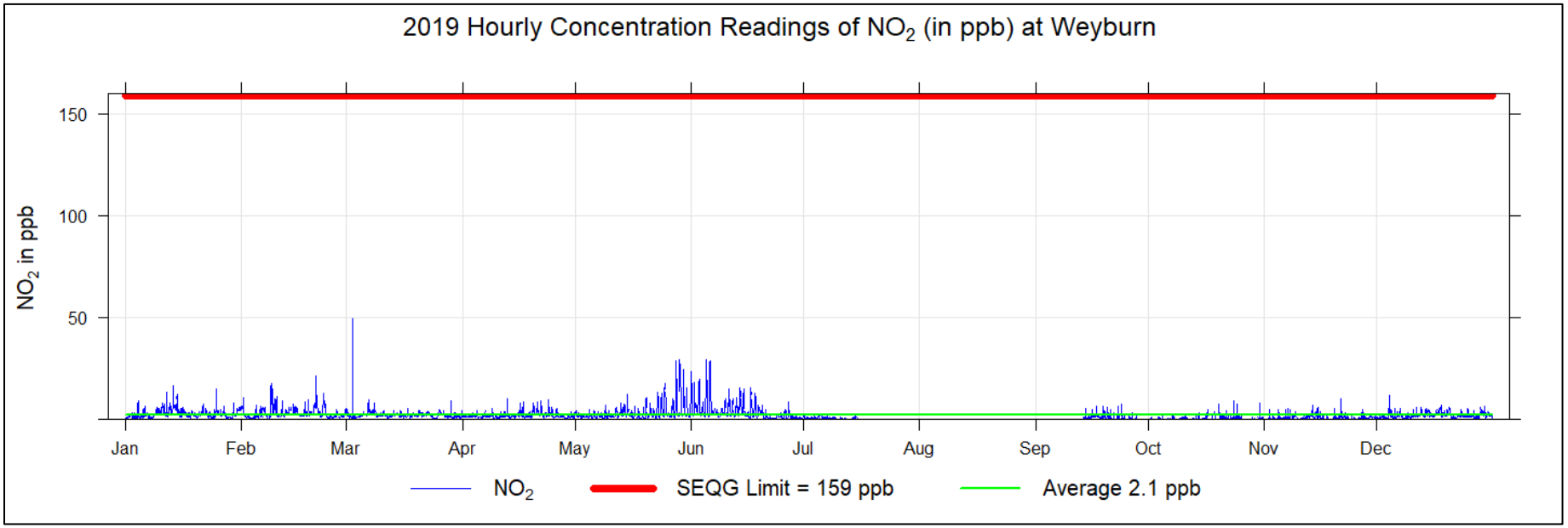
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 3 (ppb)	3 to 5 (ppb)	5 to 8 (ppb)	8 to 11 (ppb)	> 11 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	0.1	5.4	Jan 14 03:00	0.8	Jan 15	100.0%	98.7%	1.2%	0.0%	0.1%	0.0%	0.0%	0	0
February 2019	662	0.3	8.6	Feb 20 15:00	1.9	Feb 21	98.5%	91.4%	5.2%	1.0%	0.7%	0.1%	0.0%	0	0
March 2019	717	0.2	6.1	Mar 06 12:00	0.7	Mar 31	96.4%	94.1%	1.7%	0.4%	0.1%	0.0%	0.0%	0	0
April 2019	717	0.2	9.3	Apr 17 07:00	1.1	Apr 17	99.6%	97.1%	1.7%	0.6%	0.0%	0.3%	0.0%	0	0
May 2019	740	0.2	7.6	May 25 02:00	1.2	May 25	99.5%	96.8%	2.0%	0.4%	0.3%	0.0%	0.0%	0	0
June 2019	719	0.3	12.1	Jun 06 02:00	1.4	Jun 06	99.9%	95.6%	3.5%	0.4%	0.0%	0.3%	0.1%	0	1
July 2019	574	0.3	6.0	Jul 13 01:00	1.1	Jul 13	77.2%	72.6%	3.9%	0.4%	0.3%	0.0%	0.0%	0	0
August 2019	126	0.4	2.7	Aug 31 04:00	0.6	Aug 31	16.9%	16.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
September 2019	715	0.2	7.7	Sep 18 23:00	0.7	Sep 07	99.3%	95.4%	3.5%	0.1%	0.3%	0.0%	0.0%	0	0
October 2019	672	0.3	3.0	Oct 19 22:00	0.7	Oct 31	90.3%	87.5%	2.8%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	0.3	5.1	Nov 01 15:00	0.5	Nov 02	99.6%	98.3%	1.0%	0.1%	0.1%	0.0%	0.0%	0	0
December 2019	743	0.2	11.7	Dec 14 23:00	1.0	Dec 14	99.9%	98.4%	1.1%	0.1%	0.1%	0.0%	0.1%	0	1
			MAXIMUM VALUES												
Annual	**7846**	**0.3**	**12.1**	**Jun 06**	**1.9**	**Feb 21**	**89.6%**	**86.7%**	**2.3%**	**0.3%**	**0.2%**	**0.1%**	**0.0%**	**0**	**2**

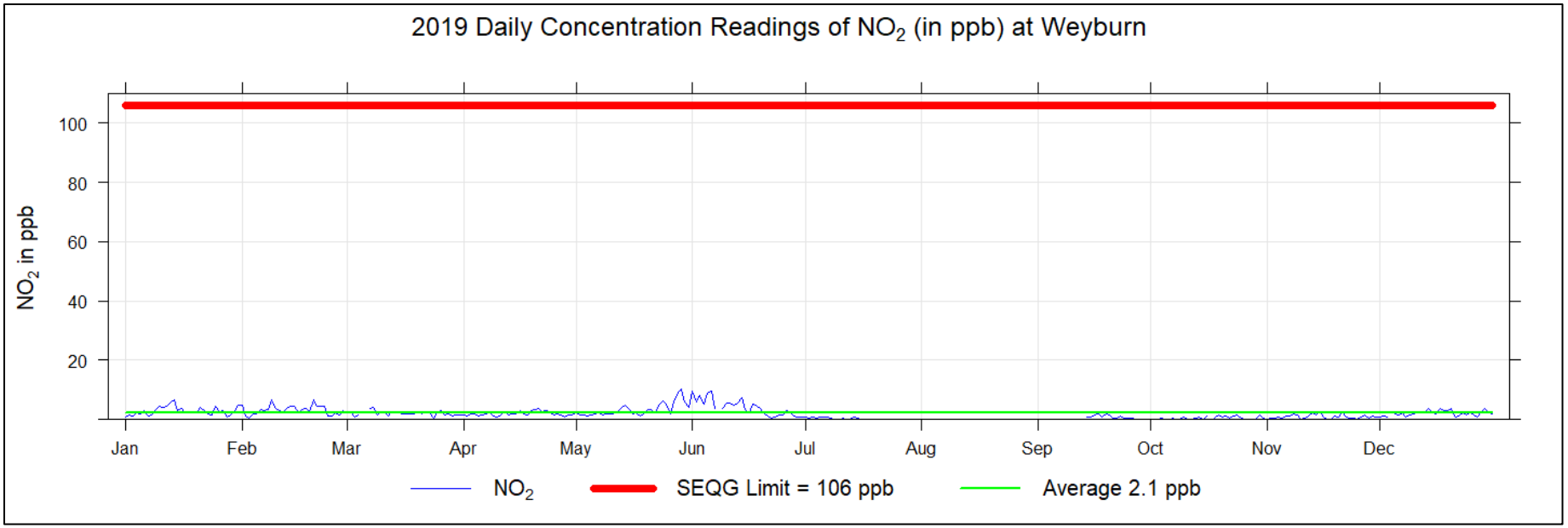



2019 Daily Concentration Readings of H2S (in ppb) at Weyburn
H2S in ppb
8
6
4
2
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
H2S
SEQG Limit = 3.6 ppb
Average 0.2 ppb

Nitrogen Dioxide (NO_2) Frequency Distribution of 1-hr Averages - Weyburn

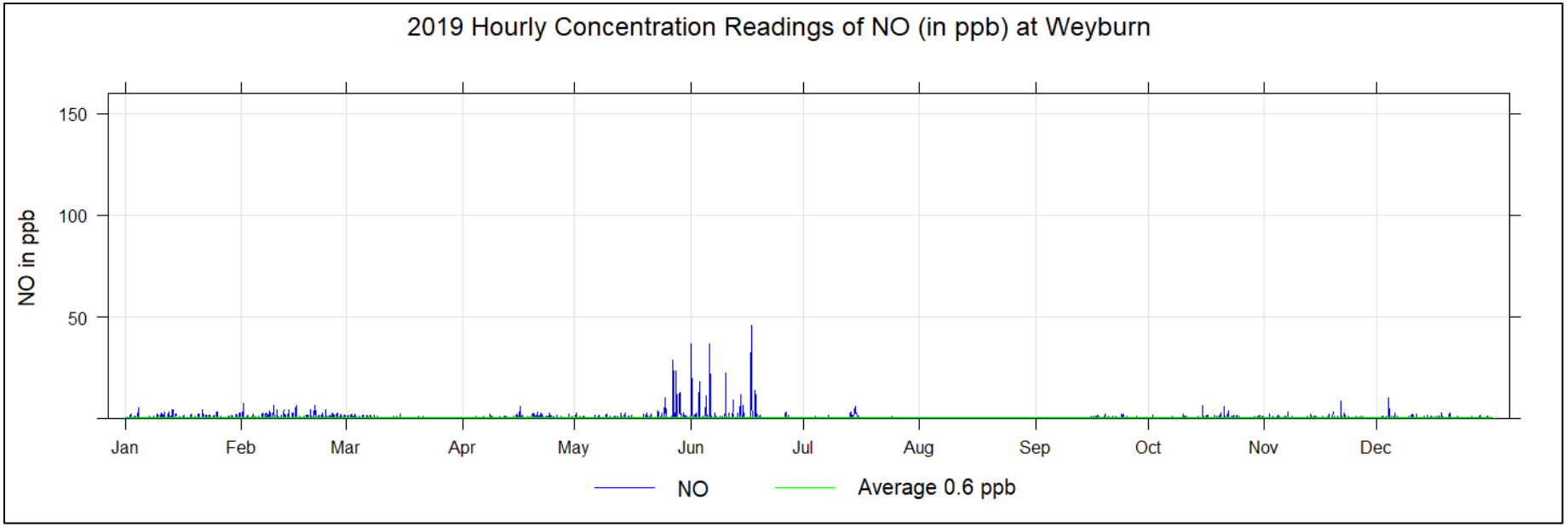
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	2.8	16.6	Jan 13 19:00	6.7	Jan 14	100.0%	87.2%	12.4%	0.4%	0.0%	0.0%	0.0%	0	0
February 2019	664	3.2	21.4	Feb 20 19:00	6.6	Feb 09	98.8%	80.7%	17.7%	0.4%	0.0%	0.0%	0.0%	0	0
March 2019	718	2.2	49.7	Mar 02 16:00	4.1	Mar 08	96.5%	94.8%	1.6%	0.0%	0.1%	0.0%	0.0%	0	0
April 2019	719	1.9	10.4	Apr 12 23:00	3.7	Apr 21	99.9%	96.0%	3.9%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	739	3.3	29.2	May 28 23:00	10.3	May 29	99.3%	82.1%	14.5%	2.7%	0.0%	0.0%	0.0%	0	0
June 2019	720	4.0	29.1	Jun 04 23:00	9.7	Jun 06	100.0%	76.5%	18.9%	4.6%	0.0%	0.0%	0.0%	0	0
July 2019	556	0.4	2.1	Jul 14 23:00	0.9	Jul 14	74.7%	74.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019															
September 2019	413	0.8	7.4	Sep 23 20:00	2.0	Sep 17	57.4%	56.4%	1.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	672	0.5	9.0	Oct 23 20:00	1.4	Oct 30	90.3%	89.1%	1.2%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	0.9	10.4	Nov 21 09:00	2.7	Nov 15	99.6%	98.2%	1.4%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	2.1	11.5	Dec 04 09:00	3.7	Dec 20	99.9%	95.4%	4.4%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7405**	**2.0**	**49.7**	**Mar 02**	**10.3**	**May 29**	**84.5%**	**77.5%**	**6.3%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of NO2 (in ppb) at Weyburn
NO2 in ppb
100
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
NO2
SEQG Limit = 106 ppb
Average 2.1 ppb

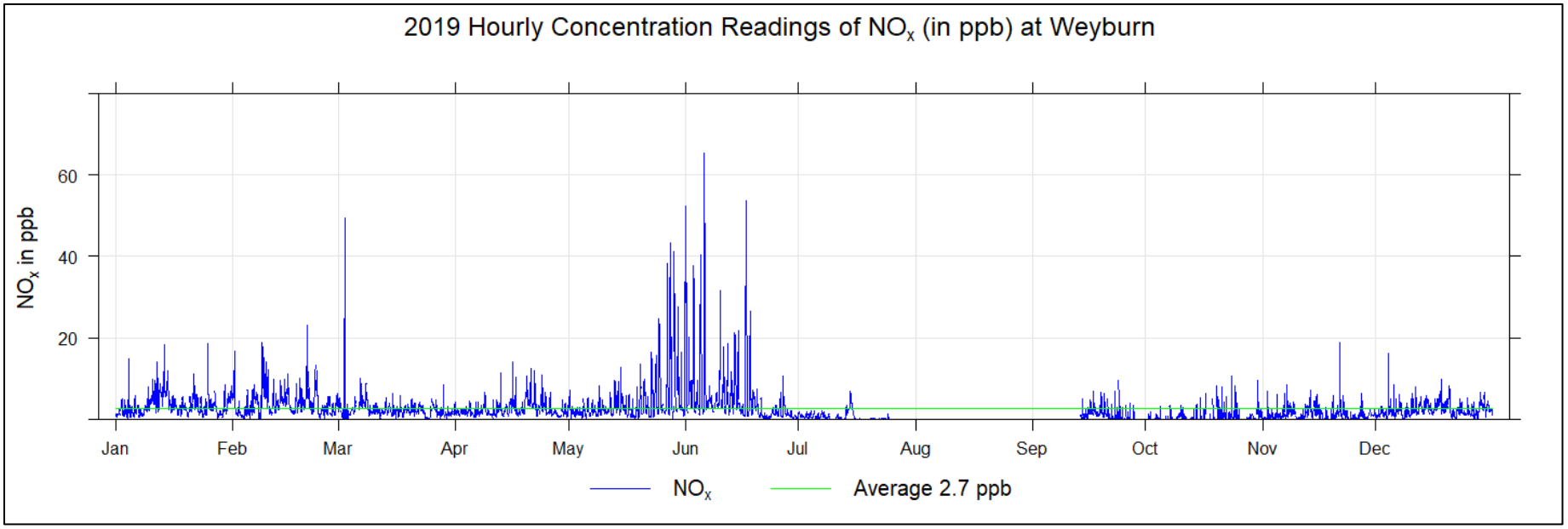
Nitric Oxide (NO) Frequency Distribution of 1-hr Averages - Weyburn

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	0.6	5.7	Jan 04 11:00	1.7	Jan 13	100.0%	99.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
February 2019	664	0.9	7.4	Feb 01 11:00	2.1	Feb 20	98.8%	97.5%	1.3%	0.0%	0.0%	0.0%	0.0%	0	0
March 2019	718	0.3	2.5	Mar 02 07:00	0.6	Mar 07	96.5%	96.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
April 2019	719	0.6	6.2	Apr 16 07:00	1.3	Apr 21	99.9%	99.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	739	0.9	29.1	May 27 06:00	3.5	May 27	99.3%	96.8%	2.0%	0.5%	0.0%	0.0%	0.0%	0	0
June 2019	720	1.5	45.8	Jun 17 03:00	8.7	Jun 17	100.0%	94.0%	3.9%	1.1%	1.0%	0.0%	0.0%	0	0
July 2019	556	0.3	6.0	Jul 14 18:00	2.5	Jul 14	74.7%	74.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019															
September 2019	413	0.3	2.1	Sep 23 20:00	0.7	Sep 24	57.4%	57.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	672	0.4	6.4	Oct 15 12:00	1.0	Oct 21	90.3%	90.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	0.4	8.5	Nov 21 09:00	1.1	Nov 21	99.6%	99.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
December 2019	743	0.4	10.2	Dec 04 07:00	0.7	Dec 10	99.9%	99.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7405**	**0.6**	**45.8**	**Jun 17**	**8.7**	**Jun 17**	**84.5%**	**83.6%**	**0.7%**	**0.1%**	**0.1%**	**0.0%**	**0.0%**	**0**	**0**



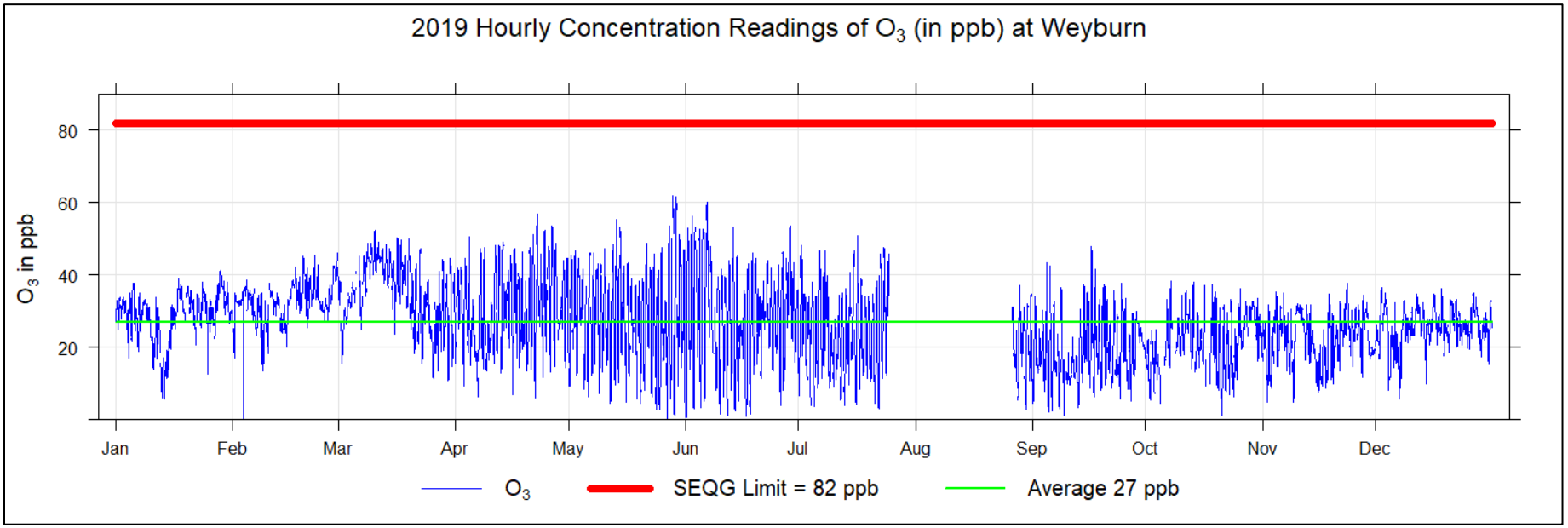
Oxides of Nitrogen (NO_X) Frequency Distribution of 1-hr Averages - Weyburn

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	3.5	18.7	Jan 25 08:00	7.5	Jan 13	100.0%	81.0%	18.4%	0.5%	0.0%	0.0%	0.0%	0	0
February 2019	664	4.0	23.1	Feb 20 19:00	8.6	Feb 20	98.8%	72.3%	25.6%	0.9%	0.0%	0.0%	0.0%	0	0
March 2019	718	2.3	49.5	Mar 02 16:00	4.5	Mar 08	96.5%	93.3%	3.1%	0.0%	0.1%	0.0%	0.0%	0	0
April 2019	719	2.5	14.2	Apr 16 07:00	5.0	Apr 21	99.9%	92.8%	7.1%	0.0%	0.0%	0.0%	0.0%	0	0
May 2019	739	4.1	45.0	May 31 23:00	13.3	May 29	99.3%	79.3%	15.7%	3.2%	1.1%	0.0%	0.0%	0	0
June 2019	720	5.5	65.4	Jun 06 01:00	18.0	Jun 01	100.0%	72.6%	19.4%	5.4%	2.5%	0.0%	0.0%	0	0
July 2019	556	0.6	7.0	Jul 14 18:00	3.5	Jul 14	74.7%	74.1%	0.7%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019															
September 2019	413	1.0	9.5	Sep 23 20:00	2.6	Sep 17	57.4%	56.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0	0
October 2019	672	0.8	10.7	Oct 23 20:00	2.2	Oct 30	90.3%	88.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0	0
November 2019	717	1.2	18.9	Nov 21 09:00	3.6	Nov 21	99.6%	96.9%	2.5%	0.1%	0.0%	0.0%	0.0%	0	0
December 2019	743	2.4	16.2	Dec 04 09:00	4.3	Dec 20	99.9%	93.3%	6.3%	0.3%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7405**	**2.5**	**65.4**	**Jun 06**	**18.0**	**Jun 01**	**84.5%**	**74.9%**	**8.4%**	**0.9%**	**0.3%**	**0.0%**	**0.0%**	**0**	**0**



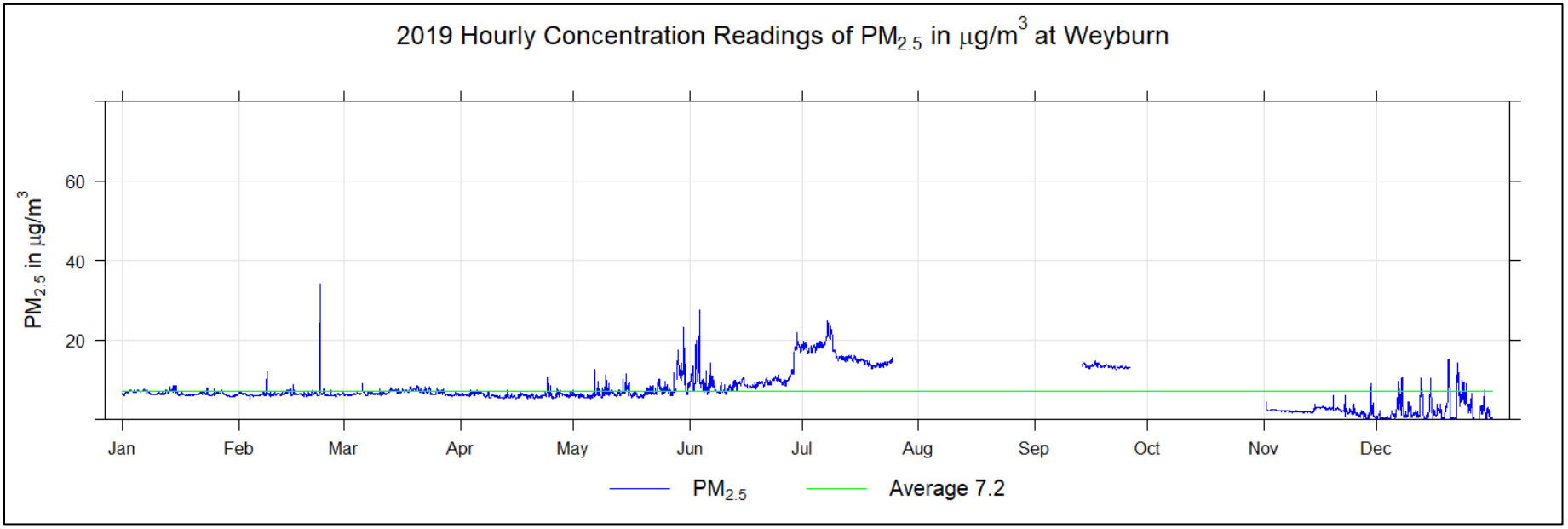
Ozone (O_3) Frequency Distribution of 1-hr Averages - Weyburn

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 10 (ppb)	10 to 20 (ppb)	20 to 40 (ppb)	40 to 60 (ppb)	60 to 82 (ppb)	> 82 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	744	28.9	41.4	Jan 28 19:00	38.6	Jan 28	100.0%	1.1%	9.1%	83.9%	1.5%	0.0%	0.0%	0	0
February 2019	667	32.7	46.1	Feb 28 17:00	40.7	Feb 28	99.3%	0.0%	1.3%	86.2%	7.7%	0.0%	0.0%	0	0
March 2019	720	34.4	52.3	Mar 10 16:00	45.9	Mar 10	96.8%	0.0%	7.3%	54.4%	30.6%	0.0%	0.0%	0	0
April 2019	720	30.6	56.7	Apr 22 18:00	38.1	Apr 25	100.0%	1.4%	17.5%	53.6%	23.2%	0.0%	0.0%	0	0
May 2019	740	28.7	62.0	May 28 17:00	34.3	May 30	99.5%	8.7%	17.9%	47.3%	20.4%	0.5%	0.0%	0	0
June 2019	719	28.6	60.0	Jun 06 17:00	40.1	Jun 28	99.9%	10.6%	15.8%	49.0%	19.3%	0.0%	0.0%	0	0
July 2019	574	24.3	50.8	Jul 16 17:00	32.6	Jul 08	77.2%	7.5%	23.3%	36.4%	6.9%	0.0%	0.0%	0	0
August 2019	125	20.0	37.2	Aug 28 16:00	22.3	Aug 29	16.8%	2.7%	5.9%	7.7%	0.0%	0.0%	0.0%	0	0
September 2019	713	19.3	47.8	Sep 16 16:00	27.1	Sep 15	99.0%	12.1%	42.6%	38.3%	1.3%	0.0%	0.0%	0	0
October 2019	671	21.6	38.2	Oct 07 16:00	30.8	Oct 29	90.2%	6.7%	30.0%	50.1%	0.0%	0.0%	0.0%	0	0
November 2019	716	22.3	37.7	Nov 23 10:00	30.6	Nov 10	99.4%	3.5%	33.1%	58.9%	0.0%	0.0%	0.0%	0	0
December 2019	743	25.8	36.4	Dec 02 14:00	31.6	Dec 16	99.9%	0.9%	9.3%	84.4%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**7852**	**26.4**	**62.0**	**May 28**	**45.9**	**Mar 10**	**89.6%**	**4.6%**	**17.8%**	**54.0%**	**9.2%**	**0.0%**	**0.0%**	**0**	**0**



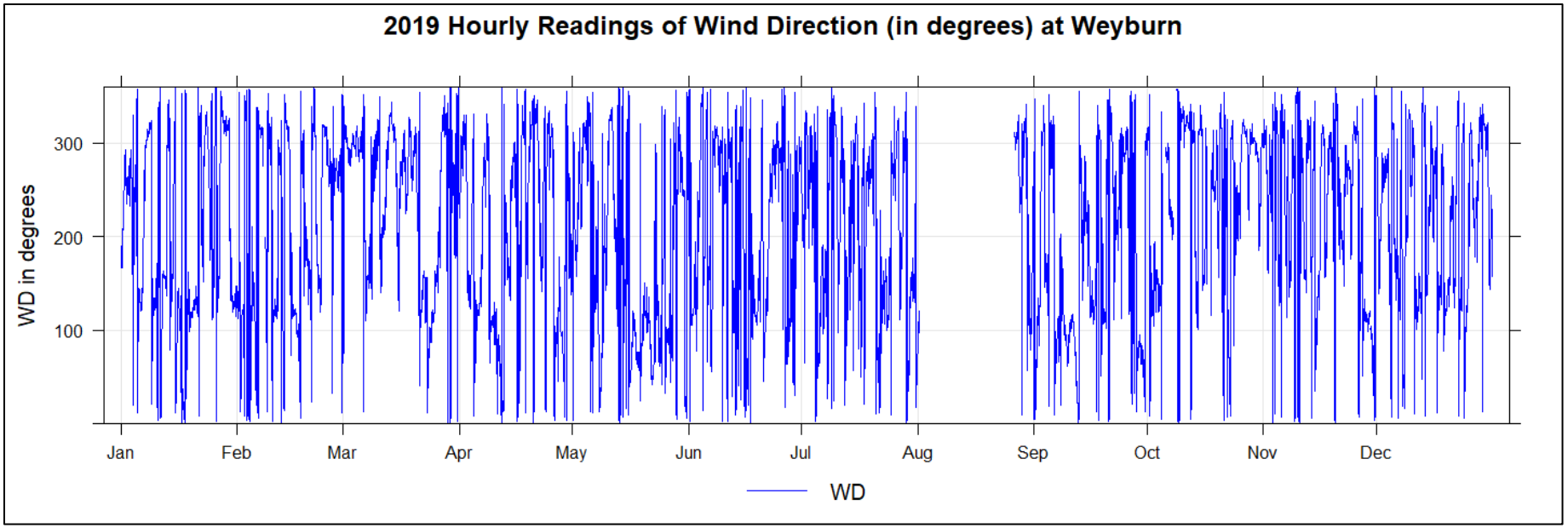
Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Weyburn

Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	744	6.6	8.6	Jan 15 04:00	7.6	Jan 15	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0	0
February 2019	669	6.4	34.1	Feb 22 12:00	8.2	Feb 23	99.6%	0.0%	0.0%	99.0%	0.4%	0.0%	0.1%	0	0
March 2019	740	6.8	8.9	Mar 05 18:00	7.9	Mar 20	99.5%	0.0%	0.0%	99.5%	0.0%	0.0%	0.0%	0	0
April 2019	720	6.1	10.7	Apr 24 01:00	7.3	Apr 24	100.0%	0.0%	0.0%	99.7%	0.3%	0.0%	0.0%	0	0
May 2019	740	7.2	23.1	May 30 13:00	12.7	May 30	99.5%	0.0%	0.0%	91.3%	8.1%	0.1%	0.0%	0	0
June 2019	720	9.8	27.6	Jun 03 17:00	18.6	Jun 29	100.0%	0.0%	0.0%	72.8%	26.7%	0.6%	0.0%	0	0
July 2019	576	16.2	24.7	Jul 07 20:00	21.3	Jul 08	77.4%	0.0%	0.0%	0.0%	71.5%	5.9%	0.0%	0	0
August 2019															
September 2019	307	13.4	14.7	Sep 17 01:00	13.9	Sep 17	42.6%	0.0%	0.0%	0.0%	42.6%	0.0%	0.0%	0	0
October 2019															
November 2019	704	2.2	9.0	Nov 29 14:00	3.5	Nov 29	97.8%	42.8%	51.1%	1.8%	0.0%	0.0%	0.0%	0	0
December 2019	744	2.4	15.1	Dec 20 03:00	6.9	Dec 20	100.0%	50.8%	19.5%	17.2%	2.6%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**6664**	**7.7**	**34.1**	**Feb 22**	**21.3**	**Jul 08**	**76.1%**	**7.8%**	**5.9%**	**48.1%**	**12.7%**	**0.6%**	**0.0%**	**0**	**0**



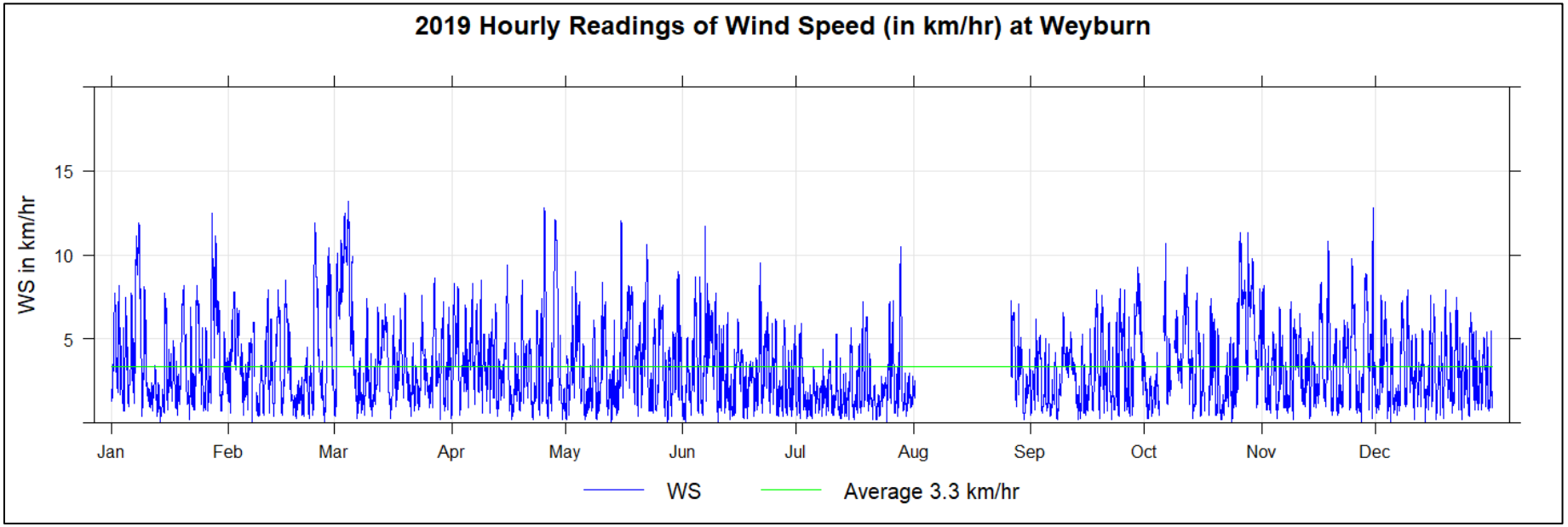
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Weyburn

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	261	1.6%	1.4%	0.2%	0.0%	0.0%	0.0%	3.2%
NNE	248	1.4%	1.2%	0.4%	0.0%	0.0%	0.0%	3.1%
NE	199	1.1%	1.0%	0.3%	0.0%	0.0%	0.0%	2.5%
ENE	271	1.7%	1.0%	0.6%	0.0%	0.0%	0.0%	3.4%
E	361	2.0%	1.7%	0.8%	0.0%	0.0%	0.0%	4.5%
ESE	788	4.5%	3.8%	1.5%	0.0%	0.0%	0.0%	9.8%
SE	513	5.4%	1.0%	0.0%	0.0%	0.0%	0.0%	6.4%
SSE	624	7.3%	0.5%	0.0%	0.0%	0.0%	0.0%	7.8%
S	371	4.5%	0.1%	0.0%	0.0%	0.0%	0.0%	4.6%
SSW	326	3.7%	0.3%	0.0%	0.0%	0.0%	0.0%	4.1%
SW	367	3.3%	1.1%	0.1%	0.0%	0.0%	0.0%	4.6%
WSW	509	3.6%	2.2%	0.5%	0.0%	0.0%	0.0%	6.3%
W	656	3.9%	3.1%	1.2%	0.0%	0.0%	0.0%	8.2%
WNW	867	4.3%	3.7%	2.8%	0.0%	0.0%	0.0%	10.8%
NW	1220	3.4%	6.7%	4.9%	0.1%	0.0%	0.0%	15.2%
NNW	460	2.3%	2.7%	0.7%	0.0%	0.0%	0.0%	5.7%
Total	**8041**	**54.2%**	**32.0%**	**13.6%**	**0.2%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Weyburn
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

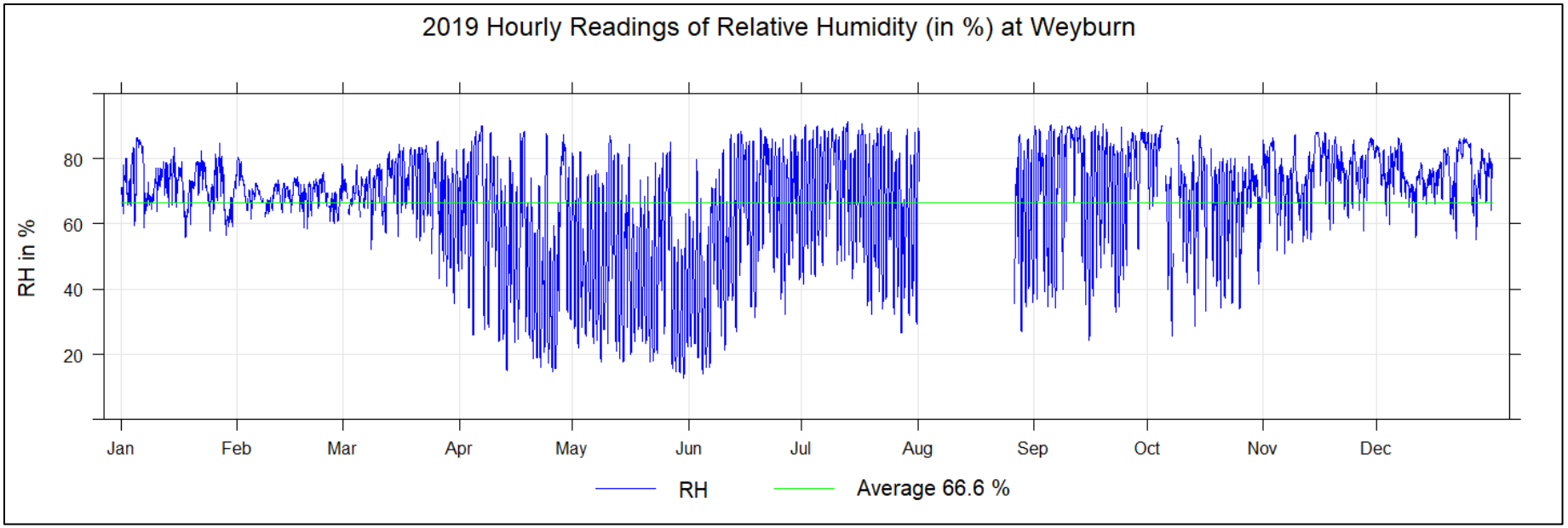
Wind Speed Frequency Distribution of 1-hr Averages - Weyburn

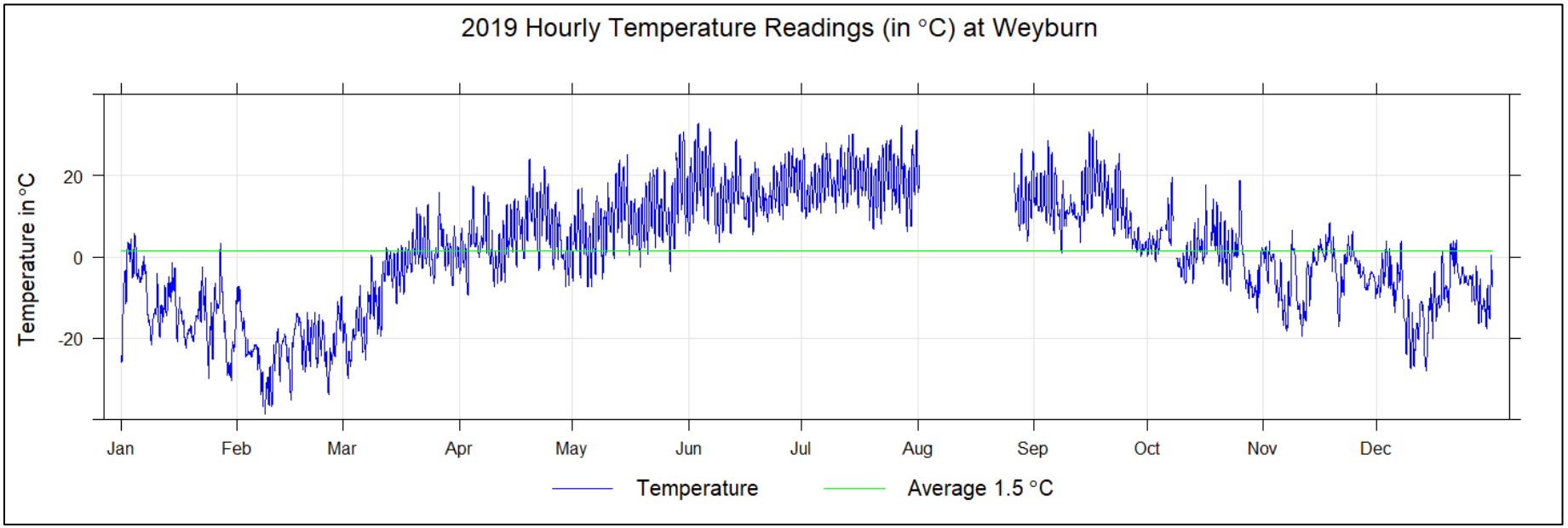
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	744	3.7	12.5	Jan 27 14:00	8.4	Jan 09	100.0%	54.0%	24.9%	21.0%	0.1%	0.0%	0.0%	0	0
February 2019	649	3.6	11.9	Feb 23 18:00	8.1	Feb 28	96.6%	49.6%	29.8%	17.3%	0.0%	0.0%	0.0%	0	0
March 2019	739	3.9	13.2	Mar 04 16:00	10.9	Mar 04	99.3%	48.1%	33.1%	16.8%	1.3%	0.0%	0.0%	0	0
April 2019	720	3.6	12.8	Apr 25 11:00	10.3	Apr 28	100.0%	49.4%	34.4%	15.6%	0.6%	0.0%	0.0%	0	0
May 2019	740	3.5	12.0	May 15 18:00	6.7	May 22	99.5%	52.6%	29.6%	17.3%	0.0%	0.0%	0.0%	0	0
June 2019	720	3.1	11.7	Jun 06 23:00	5.9	Jun 07	100.0%	58.2%	32.1%	9.7%	0.0%	0.0%	0.0%	0	0
July 2019	744	2.1	10.5	Jul 28 12:00	5.4	Jul 28	100.0%	79.8%	16.0%	4.2%	0.0%	0.0%	0.0%	0	0
August 2019	138	3.0	7.3	Aug 26 18:00	5.0	Aug 27	18.5%	11.4%	5.5%	1.6%	0.0%	0.0%	0.0%	0	0
September 2019	719	3.1	9.3	Sep 29 04:00	7.6	Sep 29	99.9%	52.4%	37.9%	9.6%	0.0%	0.0%	0.0%	0	0
October 2019	675	3.8	11.3	Oct 28 09:00	8.9	Oct 26	90.7%	41.8%	29.2%	19.8%	0.0%	0.0%	0.0%	0	0
November 2019	717	3.4	12.8	Nov 30 09:00	7.5	Nov 28	99.6%	49.3%	37.1%	13.1%	0.1%	0.0%	0.0%	0	0
December 2019	744	3.0	7.9	Dec 09 15:00	5.1	Dec 03	100.0%	59.5%	33.5%	7.0%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8049**	**3.3**	**13.2**	**Mar 04**	**10.9**	**Mar 04**	**91.9%**	**50.5%**	**28.5%**	**12.7%**	**0.2%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Weyburn

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	72	100.0%	948	100.0%	-12.5	100.0%
February 2019	69	96.6%	951	96.6%	-22.1	96.6%
March 2019	70	99.2%	951	99.2%	-5.2	99.2%
April 2019	56	100.0%	946	100.0%	5.3	100.0%
May 2019	47	99.5%	947	99.5%	10.0	99.5%
June 2019	59	100.0%	944	100.0%	16.7	100.0%
July 2019	68	100.0%	947	100.0%	18.9	100.0%
August 2019	64	18.5%	949	18.5%	14.5	18.5%
September 2019	73	99.9%	945	99.9%	12.6	99.9%
October 2019	68	90.7%	947	90.7%	1.3	90.7%
November 2019	76	100.0%	948	100.0%	-4.1	100.0%
December 2019	75	100.0%	945	100.0%	-9.2	100.0%
Average	66	92.0%	947	92.0%	2.2	92.0%

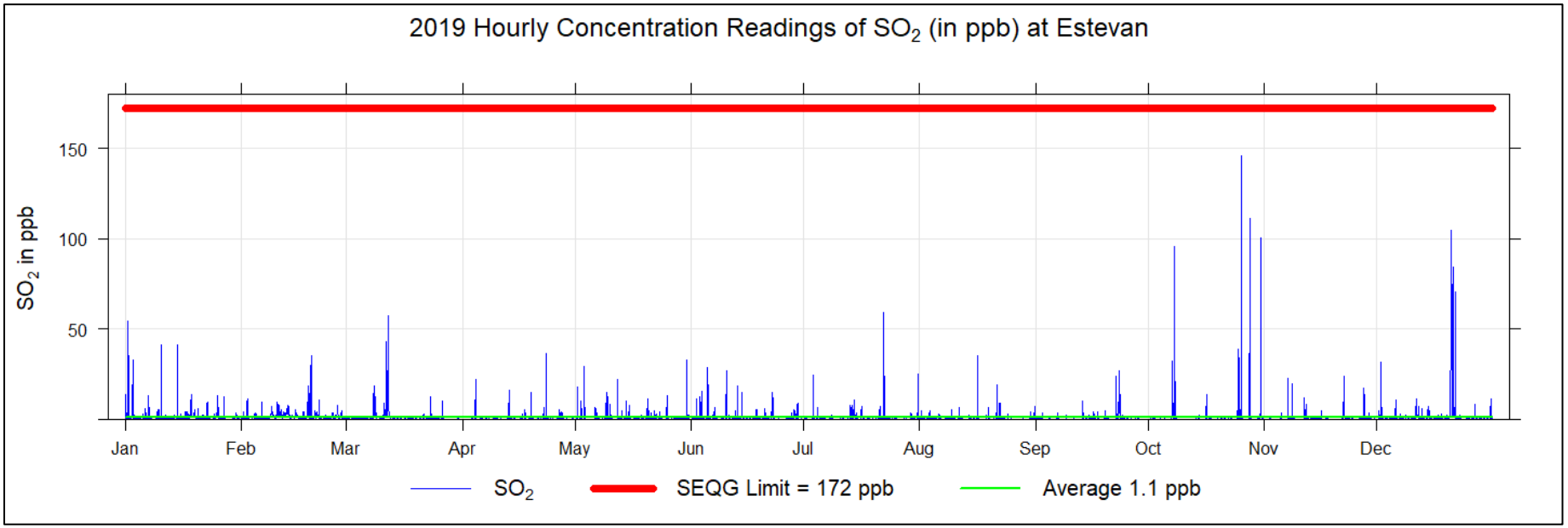

2019 Hourly Readings of Relative Humidity (in %) at Weyburn
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 66.6 %

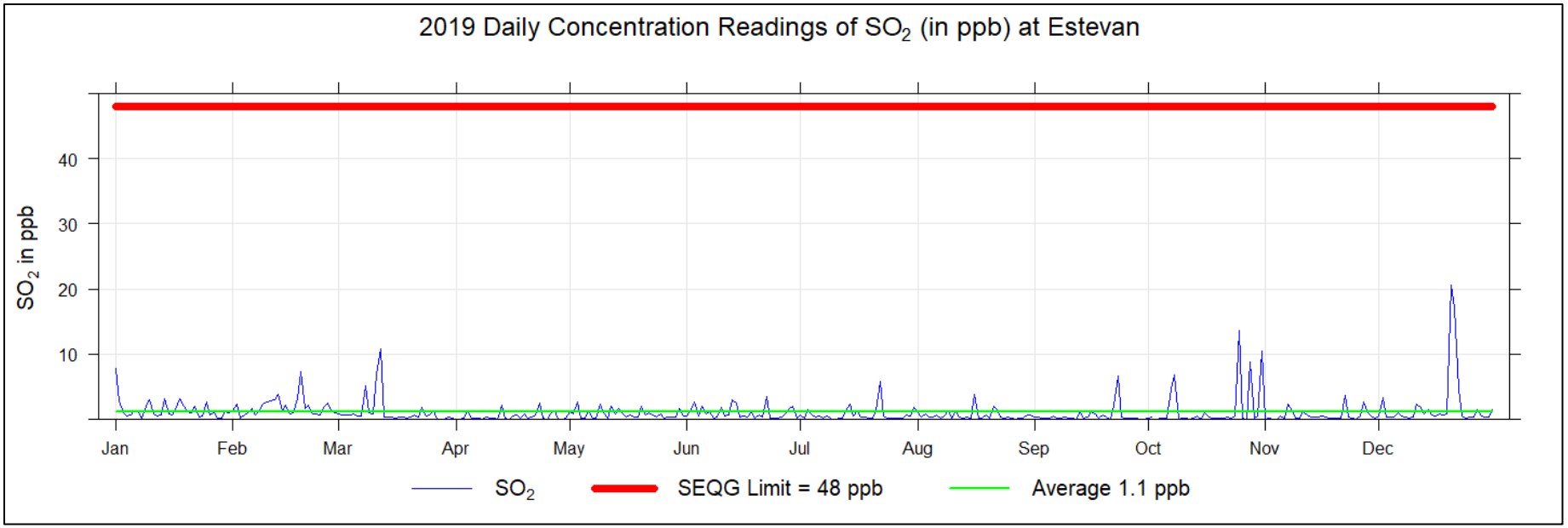

2019 Hourly Temperature Readings (in °C) at Weyburn
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 1.5 °C

APPENDIX I
Estevan Station: Continuous Monitoring Data

Sulphur Dioxide (SO_2) Frequency Distribution of 1-hr Averages - Estevan

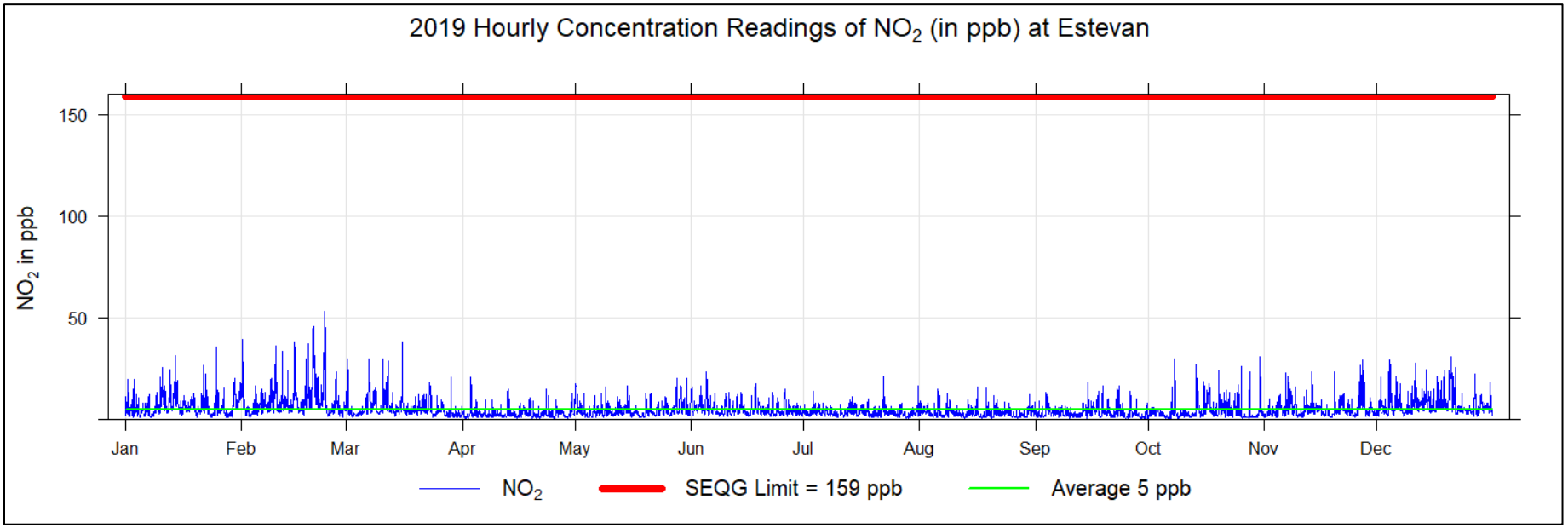
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 1 (ppb)	1 to 5 (ppb)	5 to 10 (ppb)	10 to 50 (ppb)	50 to 172 (ppb)	> 172 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	733	1.5	54.2	Jan 01 18:00	7.8	Jan 01	98.5%	68.3%	25.4%	3.0%	1.7%	0.1%	0.0%	0	0
February 2019	671	1.9	35.4	Feb 19 14:00	7.4	Feb 19	99.9%	48.7%	45.4%	4.3%	1.5%	0.0%	0.0%	0	0
March 2019	744	1.2	57.5	Mar 12 02:00	10.8	Mar 12	100.0%	80.0%	16.3%	1.5%	2.2%	0.1%	0.0%	0	0
April 2019	712	0.5	36.4	Apr 23 09:00	2.5	Apr 23	98.9%	92.8%	4.4%	0.8%	0.8%	0.0%	0.0%	0	0
May 2019	743	0.9	32.8	May 30 22:00	2.7	May 03	99.9%	87.2%	9.3%	1.7%	1.6%	0.0%	0.0%	0	0
June 2019	720	1.0	29.0	Jun 05 11:00	3.5	Jun 22	100.0%	83.5%	12.2%	1.9%	2.4%	0.0%	0.0%	0	0
July 2019	732	0.8	59.3	Jul 22 11:00	5.9	Jul 22	98.4%	88.3%	7.4%	1.6%	0.9%	0.1%	0.0%	0	0
August 2019	744	0.6	35.4	Aug 16 10:00	3.9	Aug 16	100.0%	90.5%	7.7%	1.2%	0.7%	0.0%	0.0%	0	0
September 2019	720	0.6	27.1	Sep 23 08:00	6.7	Sep 23	100.0%	92.1%	5.7%	0.7%	1.5%	0.0%	0.0%	0	0
October 2019	736	1.7	145.7	Oct 25 21:00	13.6	Oct 25	98.9%	90.9%	4.0%	1.1%	2.3%	0.7%	0.0%	0	0
November 2019	718	0.6	23.8	Nov 22 09:00	3.8	Nov 22	99.7%	91.8%	5.8%	0.7%	1.4%	0.0%	0.0%	0	0
December 2019	742	2.1	104.5	Dec 20 22:00	20.6	Dec 20	99.7%	80.4%	14.4%	1.9%	1.9%	1.2%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8715**	**1.1**	**145.7**	**Oct 25**	**20.6**	**Dec 20**	**99.5%**	**83.1%**	**13.0%**	**1.7%**	**1.6%**	**0.2%**	**0.0%**	**0**	**0**

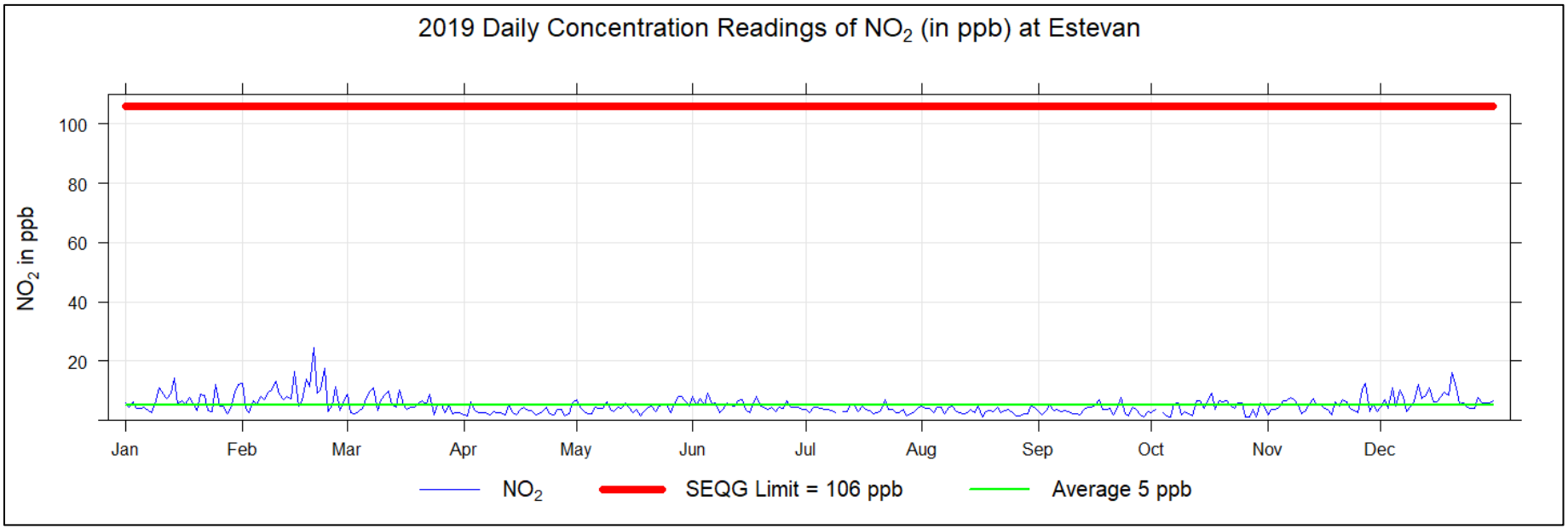



2019 Daily Concentration Readings of SO2 (in ppb) at Estevan
SO2 in ppb
40
30
20
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
SO2
SEQG Limit = 48 ppb
Average 1.1 ppb

Nitrogen Dioxide (NO_2) Frequency Distribution of 1-hr Averages - Estevan

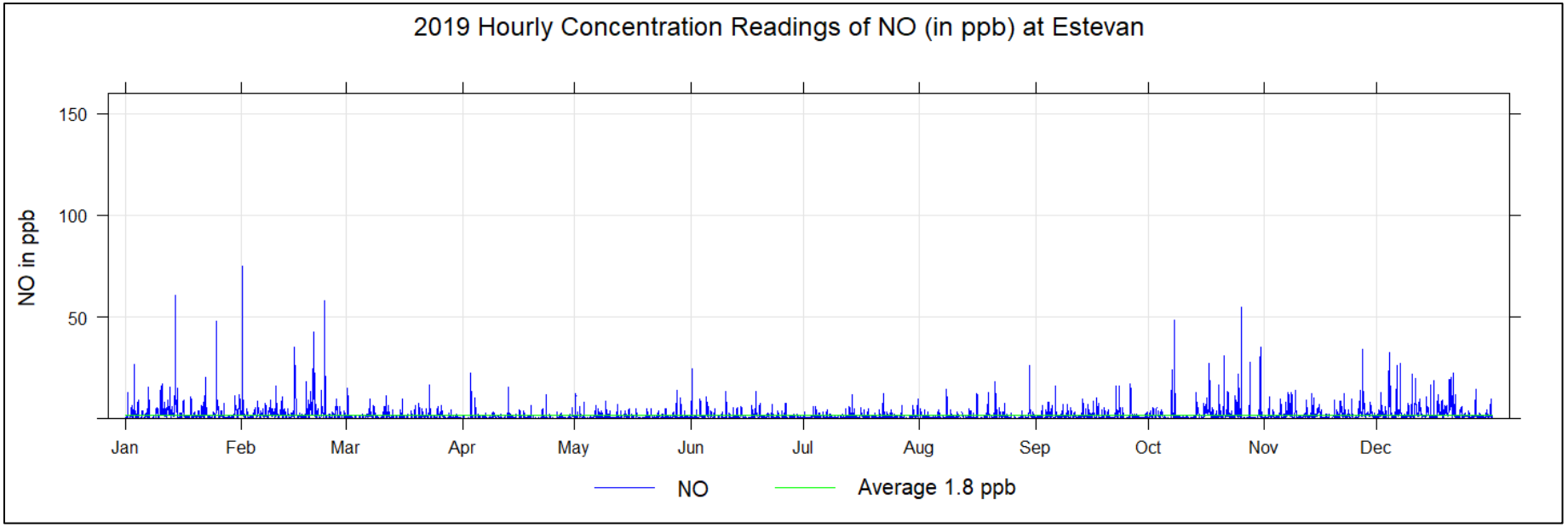
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	731	6.5	35.9	Jan 25 08:00	14.2	Jan 14	98.3%	46.2%	45.6%	5.9%	0.5%	0.0%	0.0%	0	0
February 2019	671	9.1	53.2	Feb 23 07:00	24.4	Feb 20	99.9%	33.6%	51.9%	10.7%	3.6%	0.0%	0.0%	0	0
March 2019	744	5.5	37.7	Mar 15 21:00	10.9	Mar 08	100.0%	65.1%	30.1%	4.3%	0.5%	0.0%	0.0%	0	0
April 2019	712	2.9	20.7	Apr 03 04:00	6.1	Apr 03	98.9%	88.5%	9.6%	0.8%	0.0%	0.0%	0.0%	0	0
May 2019	743	4.5	20.1	May 28 03:00	8.2	May 29	99.9%	72.2%	25.7%	2.0%	0.0%	0.0%	0.0%	0	0
June 2019	720	5.2	23.6	Jun 05 03:00	9.0	Jun 05	100.0%	62.5%	35.8%	1.7%	0.0%	0.0%	0.0%	0	0
July 2019	732	3.6	21.2	Jul 22 11:00	7.0	Jul 22	98.4%	81.0%	17.1%	0.3%	0.0%	0.0%	0.0%	0	0
August 2019	743	3.3	15.8	Aug 16 10:00	5.2	Aug 30	99.9%	83.9%	15.7%	0.3%	0.0%	0.0%	0.0%	0	0
September 2019	720	3.5	18.2	Sep 14 20:00	7.6	Sep 23	100.0%	80.8%	18.6%	0.6%	0.0%	0.0%	0.0%	0	0
October 2019	735	4.2	30.9	Oct 30 18:00	9.2	Oct 17	98.8%	75.3%	19.9%	3.5%	0.1%	0.0%	0.0%	0	0
November 2019	715	5.2	29.2	Nov 27 06:00	12.3	Nov 27	99.3%	65.3%	30.8%	3.2%	0.0%	0.0%	0.0%	0	0
December 2019	741	7.3	30.7	Dec 20 22:00	16.3	Dec 20	99.6%	40.5%	51.1%	7.9%	0.1%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8707**	**5.1**	**53.2**	**Feb 23**	**24.4**	**Feb 20**	**99.4%**	**66.4%**	**29.2%**	**3.4%**	**0.4%**	**0.0%**	**0.0%**	**0**	**0**




2019 Daily Concentration Readings of NO2 (in ppb) at Estevan
NO2 in ppb
100
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
NO2
SEQG Limit = 106 ppb
Average 5 ppb

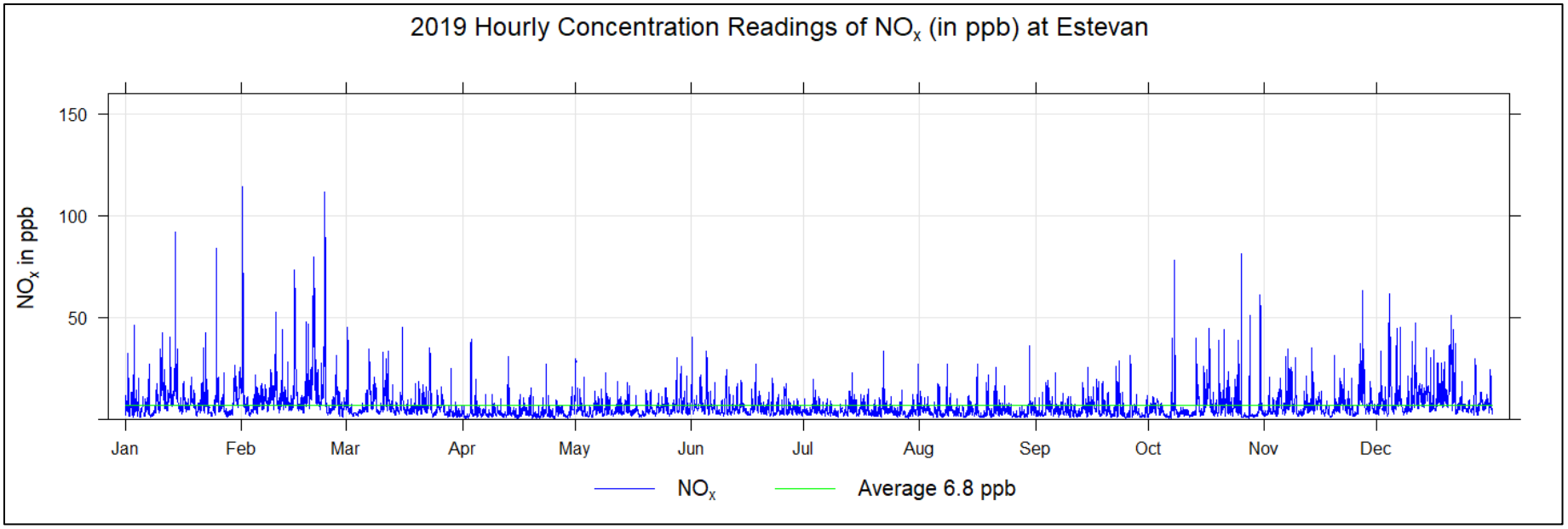
Nitric Oxide (NO) Frequency Distribution of 1-hr Averages - Estevan

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	731	2.7	60.5	Jan 14 07:00	9.7	Jan 14	98.3%	83.9%	12.1%	1.7%	0.5%	0.0%	0.0%	0	0
February 2019	671	3.3	74.8	Feb 01 08:00	12.4	Feb 20	99.9%	85.6%	10.9%	2.5%	0.9%	0.0%	0.0%	0	0
March 2019	744	1.3	16.7	Mar 23 06:00	3.4	Mar 01	100.0%	96.2%	3.4%	0.4%	0.0%	0.0%	0.0%	0	0
April 2019	712	0.8	22.5	Apr 03 07:00	4.3	Apr 03	98.9%	96.9%	1.4%	0.6%	0.0%	0.0%	0.0%	0	0
May 2019	743	1.1	13.9	May 28 06:00	2.7	May 28	99.9%	97.6%	2.3%	0.0%	0.0%	0.0%	0.0%	0	0
June 2019	720	1.3	24.5	Jun 01 06:00	4.0	Jun 01	100.0%	95.3%	4.4%	0.3%	0.0%	0.0%	0.0%	0	0
July 2019	732	1.0	12.4	Jul 22 11:00	2.5	Jul 22	98.4%	96.4%	2.0%	0.0%	0.0%	0.0%	0.0%	0	0
August 2019	743	1.2	26.3	Aug 30 07:00	4.2	Aug 30	99.9%	96.8%	2.7%	0.4%	0.0%	0.0%	0.0%	0	0
September 2019	720	1.6	17.2	Sep 26 07:00	3.6	Sep 23	100.0%	93.8%	5.7%	0.6%	0.0%	0.0%	0.0%	0	0
October 2019	735	2.3	54.9	Oct 25 21:00	6.5	Oct 25	98.8%	88.6%	7.7%	1.9%	0.7%	0.0%	0.0%	0	0
November 2019	715	2.2	34.4	Nov 27 06:00	6.3	Nov 27	99.3%	87.9%	11.3%	0.0%	0.1%	0.0%	0.0%	0	0
December 2019	741	2.9	32.4	Dec 04 08:00	9.5	Dec 20	99.6%	84.9%	12.4%	2.2%	0.1%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8707**	**1.8**	**74.8**	**Feb 01**	**12.4**	**Feb 20**	**99.4%**	**92.0%**	**6.3%**	**0.9%**	**0.2%**	**0.0%**	**0.0%**	**0**	**0**



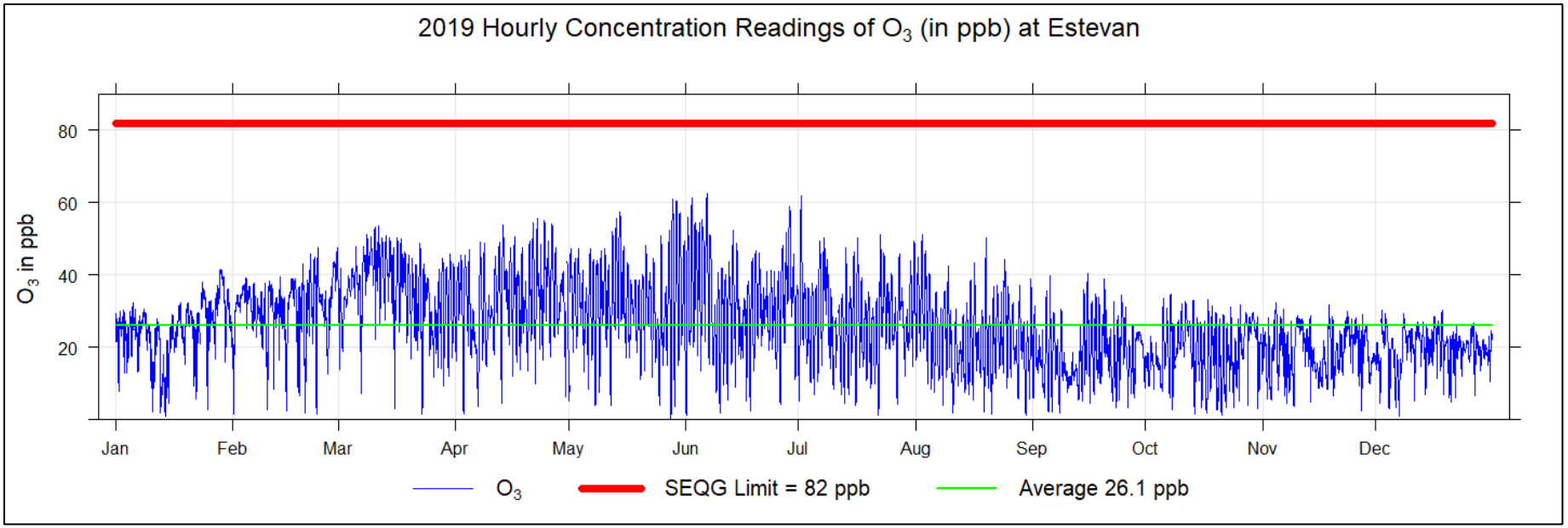
Oxides of Nitrogen (NO_X) Frequency Distribution of 1-hr Averages - Estevan

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 5 (ppb)	5 to 15 (ppb)	15 to 30 (ppb)	30 to 100 (ppb)	100 to 159 (ppb)	> 159 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	731	9.2	91.7	Jan 14 07:00	23.9	Jan 14	98.3%	34.9%	49.1%	11.4%	2.8%	0.0%	0.0%	0	0
February 2019	671	12.3	114.0	Feb 01 08:00	36.7	Feb 20	99.9%	18.6%	59.1%	15.8%	6.1%	0.3%	0.0%	0	0
March 2019	744	6.8	45.4	Mar 01 08:00	13.4	Mar 08	100.0%	52.4%	39.4%	6.5%	1.7%	0.0%	0.0%	0	0
April 2019	712	3.8	39.4	Apr 03 07:00	10.4	Apr 03	98.9%	81.3%	16.0%	1.0%	0.7%	0.0%	0.0%	0	0
May 2019	743	5.6	30.6	May 28 04:00	10.8	May 28	99.9%	62.0%	33.9%	3.9%	0.1%	0.0%	0.0%	0	0
June 2019	720	6.4	40.2	Jun 01 06:00	12.2	Jun 01	100.0%	50.7%	42.9%	5.7%	0.7%	0.0%	0.0%	0	0
July 2019	732	4.6	33.6	Jul 22 11:00	9.5	Jul 22	98.4%	68.3%	29.2%	0.8%	0.1%	0.0%	0.0%	0	0
August 2019	743	4.5	36.0	Aug 30 07:00	9.4	Aug 30	99.9%	70.4%	26.9%	2.4%	0.1%	0.0%	0.0%	0	0
September 2019	720	5.1	31.3	Sep 26 07:00	11.2	Sep 23	100.0%	65.0%	30.8%	4.0%	0.1%	0.0%	0.0%	0	0
October 2019	735	6.6	81.1	Oct 25 21:00	15.4	Oct 17	98.8%	63.3%	26.1%	6.9%	2.6%	0.0%	0.0%	0	0
November 2019	715	7.3	63.5	Nov 27 06:00	18.5	Nov 27	99.3%	49.2%	40.4%	8.1%	1.7%	0.0%	0.0%	0	0
December 2019	741	10.2	61.6	Dec 04 08:00	25.8	Dec 20	99.6%	22.8%	59.9%	12.5%	4.3%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8707**	**6.9**	**114.0**	**Feb 01**	**36.7**	**Feb 20**	**99.4%**	**53.4%**	**37.7%**	**6.5%**	**1.7%**	**0.0%**	**0.0%**	**0**	**0**



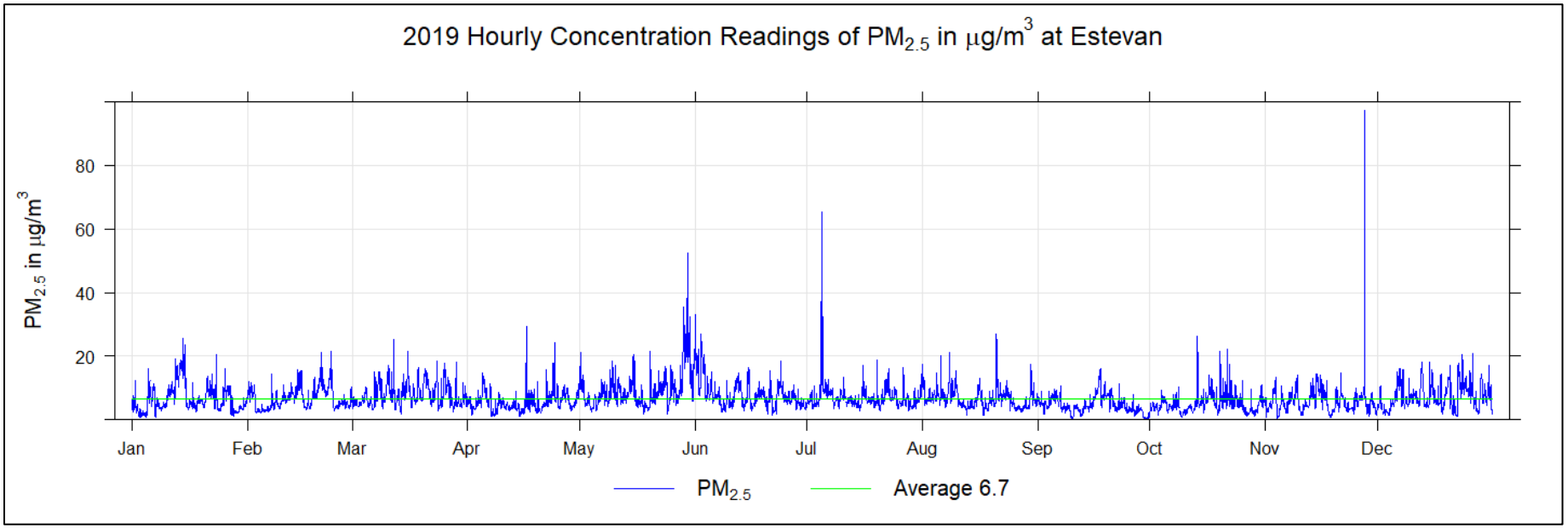
Ozone (O_3) Frequency Distribution of 1-hr Averages - Estevan

Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 10 (ppb)	10 to 20 (ppb)	20 to 40 (ppb)	40 to 60 (ppb)	60 to 82 (ppb)	> 82 (ppb)	Reportable Incidents 24-hr	1-hr
January 2019	733	24.7	41.7	Jan 28 22:00	37.6	Jan 28	98.5%	5.5%	14.2%	76.9%	1.9%	0.0%	0.0%	0	0
February 2019	671	30.9	47.5	Feb 28 16:00	41.5	Feb 28	99.9%	3.3%	6.3%	82.9%	7.4%	0.0%	0.0%	0	0
March 2019	744	35.2	53.4	Mar 11 16:00	45.7	Mar 09	100.0%	1.6%	6.5%	55.8%	36.2%	0.0%	0.0%	0	0
April 2019	712	32.8	55.7	Apr 22 17:00	41.4	Apr 24	98.9%	1.9%	10.0%	59.0%	27.9%	0.0%	0.0%	0	0
May 2019	743	32.1	61.0	May 28 17:00	41.7	May 14	99.9%	4.3%	11.7%	56.7%	26.3%	0.8%	0.0%	0	0
June 2019	720	31.8	62.6	Jun 06 16:00	46.5	Jun 06	100.0%	5.3%	13.1%	55.8%	24.9%	1.0%	0.0%	0	0
July 2019	732	27.4	62.0	Jul 01 15:00	36.4	Jul 08	98.4%	5.4%	20.3%	60.3%	12.2%	0.1%	0.0%	0	0
August 2019	744	22.8	51.2	Aug 02 18:00	35.5	Aug 03	100.0%	10.3%	32.0%	52.3%	5.4%	0.0%	0.0%	0	0
September 2019	720	17.9	40.5	Sep 15 15:00	25.6	Sep 15	100.0%	16.3%	46.5%	37.1%	0.1%	0.0%	0.0%	0	0
October 2019	735	19.1	34.7	Oct 07 15:00	27.4	Oct 29	98.8%	13.7%	38.6%	46.5%	0.0%	0.0%	0.0%	0	0
November 2019	718	19.0	32.3	Nov 04 13:00	26.8	Nov 10	99.7%	7.9%	45.8%	46.0%	0.0%	0.0%	0.0%	0	0
December 2019	741	19.7	30.3	Dec 02 14:00	25.7	Dec 08	99.6%	5.9%	38.4%	55.2%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8713**	**26.1**	**62.6**	**Jun 06**	**46.5**	**Jun 06**	**99.5%**	**6.8%**	**23.7%**	**56.9%**	**11.9%**	**0.2%**	**0.0%**	**0**	**0**



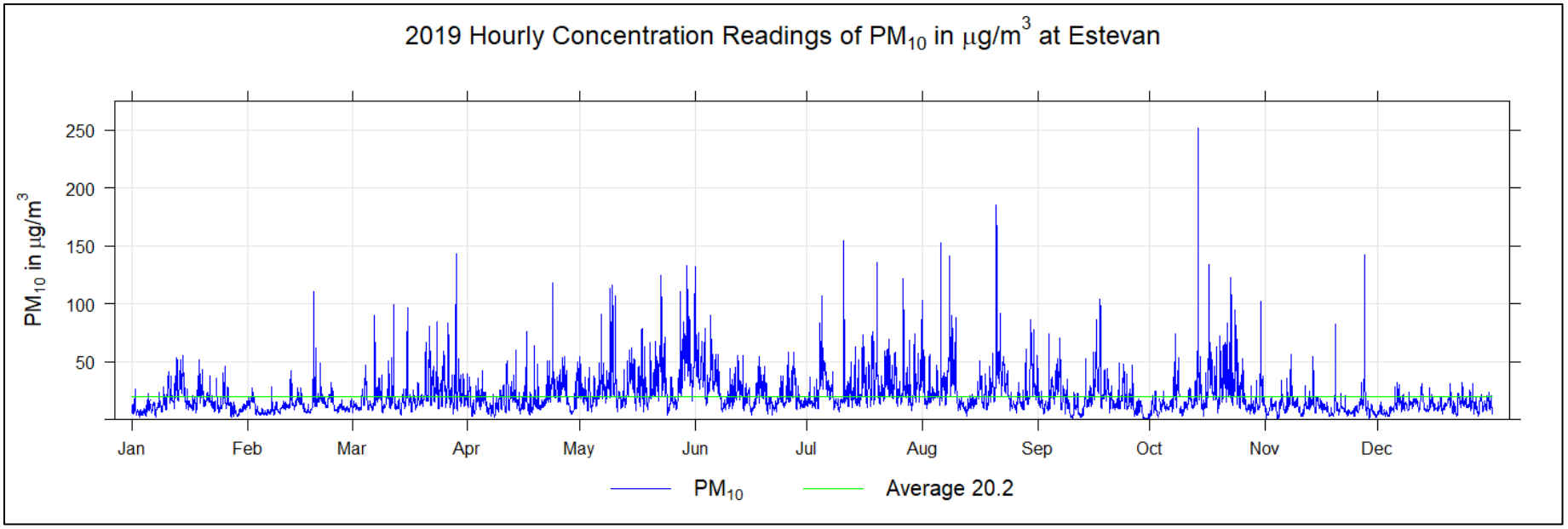
Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$) Frequency Distribution of 1-hr Averages - Estevan

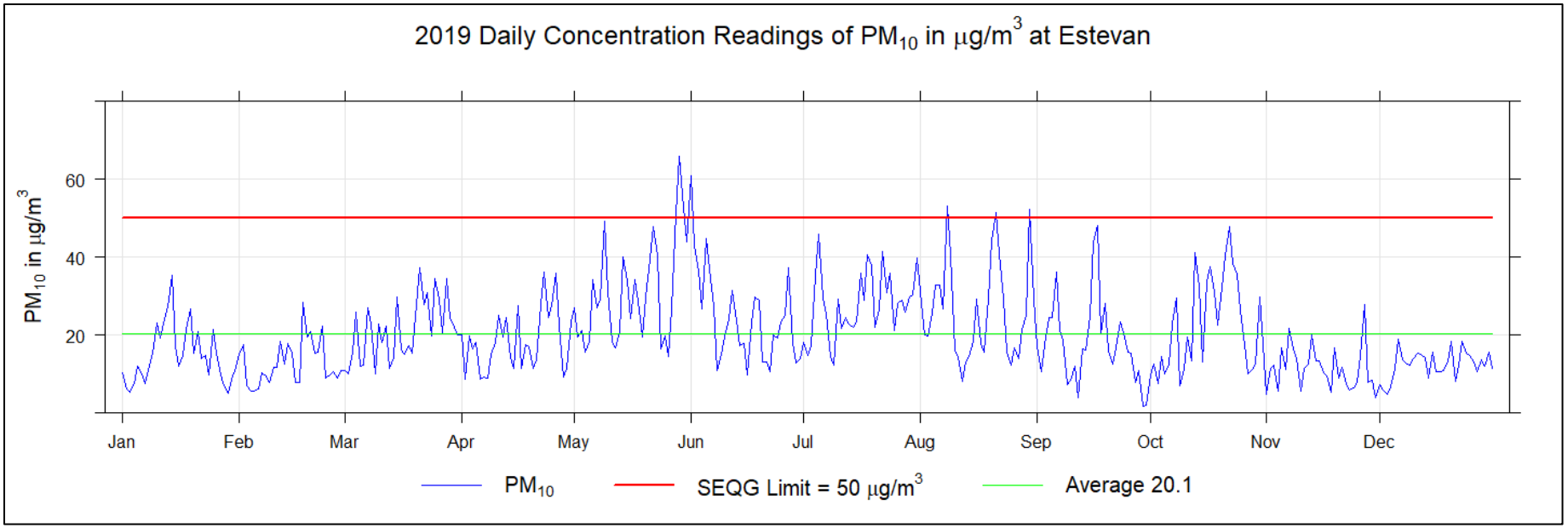
Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	740	6.5	25.7	Jan 14 17:00	17.5	Jan 15	99.5%	8.3%	23.7%	50.4%	16.3%	0.8%	0.0%	0	0
February 2019	671	6.8	21.6	Feb 23 07:00	12.9	Feb 21	99.9%	0.0%	26.6%	55.5%	17.1%	0.6%	0.0%	0	0
March 2019	744	7.8	25.3	Mar 12 02:00	13.2	Mar 20	100.0%	0.1%	8.6%	67.7%	23.0%	0.5%	0.0%	0	0
April 2019	714	5.5	29.3	Apr 16 20:00	11.1	Apr 24	99.2%	5.4%	30.1%	56.8%	6.3%	0.4%	0.1%	0	0
May 2019	744	9.2	52.5	May 29 22:00	24.9	May 29	100.0%	0.5%	9.0%	58.7%	25.5%	4.6%	1.6%	0	0
June 2019	720	7.8	33.0	Jun 01 00:00	19.1	Jun 01	100.0%	0.7%	15.1%	61.8%	20.0%	2.1%	0.3%	0	0
July 2019	740	6.8	65.3	Jul 04 21:00	13.4	Jul 05	99.5%	0.0%	9.0%	82.5%	7.1%	0.3%	0.5%	0	0
August 2019	744	6.5	26.9	Aug 20 20:00	9.9	Aug 30	100.0%	0.8%	21.5%	65.5%	11.7%	0.5%	0.0%	0	0
September 2019	720	4.6	15.9	Sep 17 19:00	12.6	Sep 17	100.0%	12.6%	37.1%	46.8%	3.5%	0.0%	0.0%	0	0
October 2019	738	5.0	26.2	Oct 13 18:00	8.9	Oct 17	99.2%	9.1%	31.9%	53.1%	4.4%	0.7%	0.0%	0	0
November 2019	718	5.8	97.3	Nov 27 14:00	12.6	Nov 27	99.7%	9.6%	25.4%	55.4%	9.0%	0.0%	0.3%	0	1
December 2019	742	7.4	20.9	Dec 26 15:00	12.8	Dec 23	99.7%	5.5%	14.1%	55.1%	24.7%	0.3%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8735**	**6.6**	**97.3**	**Nov 27**	**24.9**	**May 29**	**99.7%**	**4.4%**	**20.9%**	**59.2%**	**14.1%**	**0.9%**	**0.2%**	**0**	**1**



Particulate Matter less than 10 microns in diameter (PM_{10}) Frequency Distribution of 1-hr Averages - Estevan

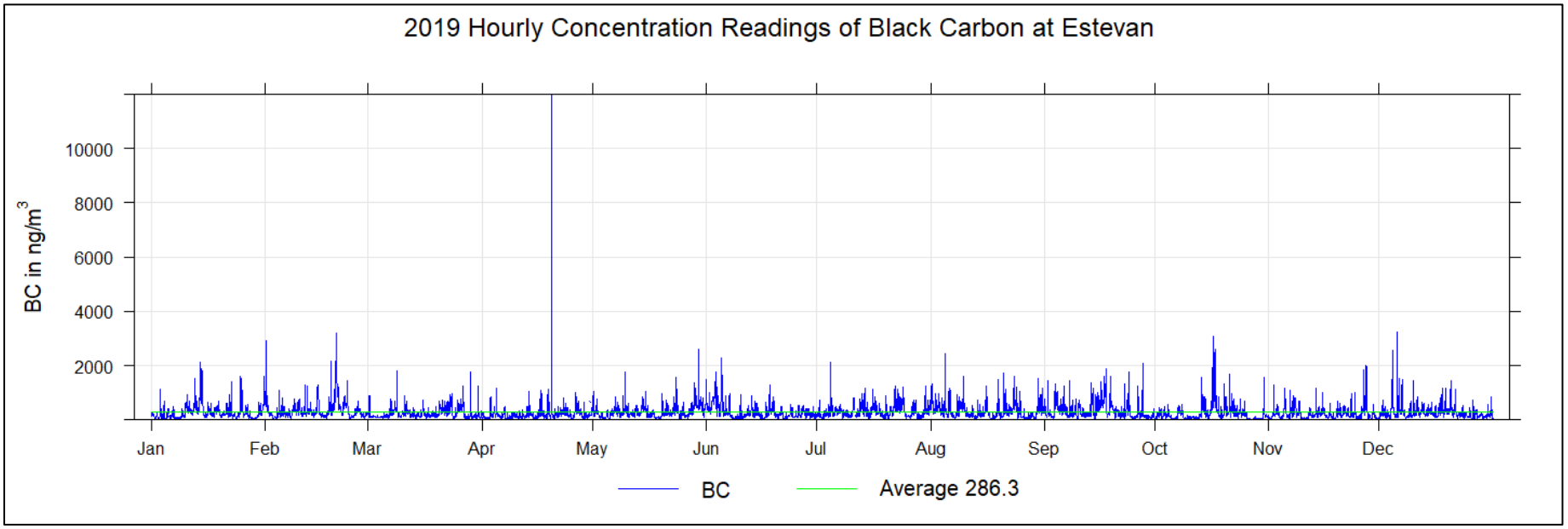
Month	Valid Hours	Monthly Average ($\mu g/m^3$)	MAXIMUM VALUES 1-hr ($\mu g/m^3$)	Date	24-hr ($\mu g/m^3$)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 2 ($\mu g/m^3$)	2 to 4 ($\mu g/m^3$)	4 to 10 ($\mu g/m^3$)	10 to 20 ($\mu g/m^3$)	20 to 28 ($\mu g/m^3$)	> 28 ($\mu g/m^3$)	Reportable Incidents 24-hr	1-hr
January 2019	740	14.9	55.7	Jan 14 14:00	35.4	Jan 14	99.5%	0.0%	4.6%	29.8%	43.7%	19.2%	2.2%	0	0
February 2019	671	12.8	110.6	Feb 18 18:00	28.5	Feb 18	99.9%	0.0%	0.6%	40.3%	49.6%	8.2%	1.2%	0	0
March 2019	744	21.2	142.9	Mar 28 20:00	37.1	Mar 21	100.0%	0.0%	0.3%	14.2%	47.7%	28.8%	9.0%	0	0
April 2019	714	18.4	118.1	Apr 23 21:00	36.0	Apr 23	99.2%	0.1%	1.9%	22.2%	41.4%	28.2%	5.3%	0	0
May 2019	744	30.9	132.9	May 29 19:00	66.0	May 29	100.0%	0.0%	0.1%	5.2%	26.9%	43.3%	24.5%	3	0
June 2019	720	24.4	132.3	Jun 01 00:00	61.0	Jun 01	100.0%	0.0%	0.3%	9.9%	39.0%	38.3%	12.5%	1	0
July 2019	740	27.7	154.1	Jul 10 22:00	46.0	Jul 05	99.5%	0.0%	0.0%	2.8%	37.1%	42.5%	17.1%	0	0
August 2019	744	26.1	185.6	Aug 20 20:00	53.0	Aug 08	100.0%	0.0%	0.3%	7.4%	40.6%	36.3%	15.5%	3	0
September 2019	720	18.0	104.4	Sep 17 16:00	48.1	Sep 17	100.0%	5.4%	5.8%	18.6%	37.1%	24.9%	8.2%	0	0
October 2019	738	22.7	252.0	Oct 13 23:00	47.7	Oct 22	99.2%	0.1%	1.7%	21.9%	35.2%	27.6%	12.6%	0	0
November 2019	718	11.4	142.5	Nov 27 14:00	27.9	Nov 27	99.7%	1.8%	7.9%	42.9%	39.4%	6.5%	1.1%	0	0
December 2019	742	12.4	32.0	Dec 06 08:00	19.0	Dec 06	99.7%	0.0%	3.4%	36.0%	51.5%	8.9%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8735**	**20.1**	**252.0**	**Oct 13**	**66.0**	**May 29**	**99.7%**	**0.6%**	**2.2%**	**20.8%**	**40.7%**	**26.2%**	**9.2%**	**7**	**0**

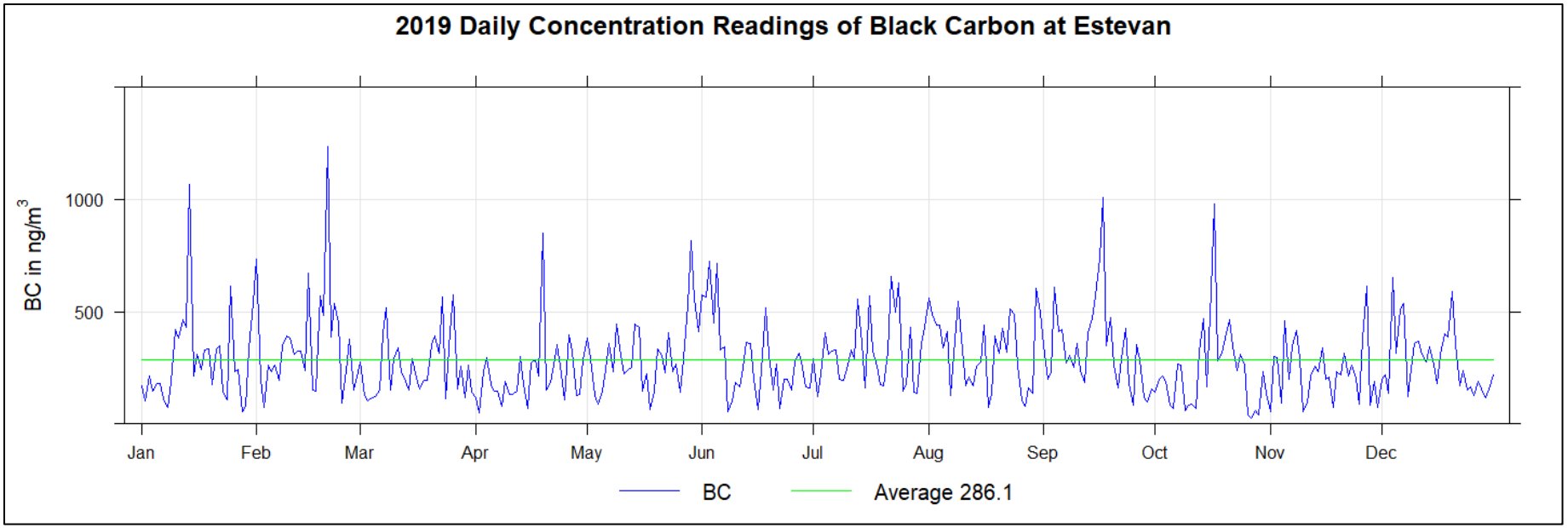



2019 Daily Concentration Readings of PM10 in µg/m3 at Estevan
PM10 in µg/m3
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
PM10
SEQG Limit = 50 µg/m3
Average 20.1

Black Carbon (BC) Frequency Distribution of 1-hr Averages - Estevan

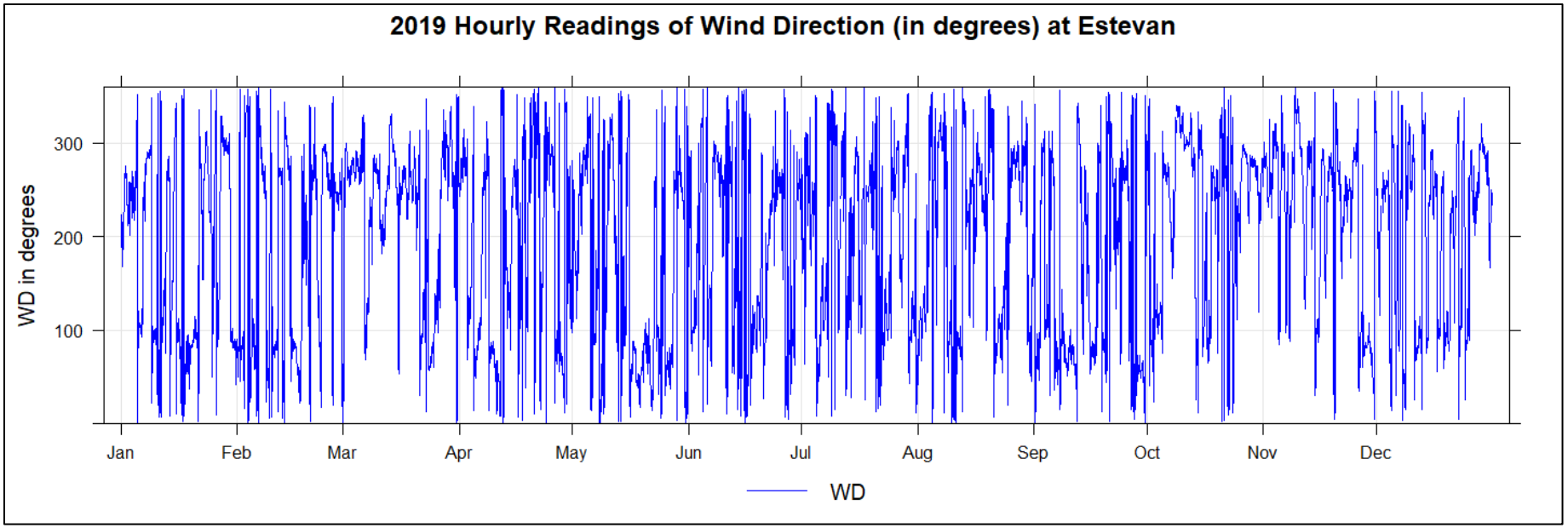
Month	Valid Hours	Monthly Average (ppb)	MAXIMUM VALUES 1-hr (ppb)	Date	24-hr (ppb)	Date	Operational time (%)	% of Readings in Concentration Range 0 to 100 (ng/m^3)	100 to 300 (ng/m^3)	300 to 500 (ng/m^3)	500 to 1000 (ng/m^3)	1000 to 2500 (ng/m^3)	> 2500 (ng/m^3)	Reportable Incidents 24-hr	1-hr
January 2019	741	283	2111	Jan 14 07:00	1068	Jan 14	99.6%	23.9%	40.9%	20.8%	11.3%	2.7%	0.0%	31	20
February 2019	671	357	3213	Feb 20 06:00	1235	Feb 20	99.9%	9.7%	50.1%	21.0%	13.7%	5.1%	0.3%	28	36
March 2019	744	253	1817	Mar 08 19:00	576	Mar 26	100.0%	16.1%	56.5%	16.5%	9.9%	0.9%	0.0%	31	7
April 2019	709	219	11995	Apr 19 19:00	848	Apr 19	98.5%	28.8%	52.6%	11.1%	5.0%	0.8%	0.1%	30	7
May 2019	744	300	2611	May 29 19:00	816	May 29	100.0%	14.0%	49.1%	22.4%	12.9%	1.5%	0.1%	31	12
June 2019	720	291	2278	Jun 05 04:00	726	Jun 03	100.0%	20.1%	46.3%	18.6%	12.9%	2.1%	0.0%	30	15
July 2019	737	315	2104	Jul 04 21:00	655	Jul 22	99.1%	10.1%	48.1%	24.9%	14.5%	1.5%	0.0%	31	11
August 2019	743	325	2424	Aug 04 21:00	604	Aug 30	99.9%	16.8%	42.9%	20.6%	17.1%	2.6%	0.0%	31	19
September 2019	720	342	2070	Sep 27 15:00	1006	Sep 17	100.0%	16.7%	41.7%	21.0%	16.3%	4.4%	0.0%	30	32
October 2019	739	238	3069	Oct 16 18:00	980	Oct 17	99.3%	38.7%	35.9%	13.8%	8.5%	2.2%	0.3%	28	18
November 2019	718	233	1987	Nov 27 09:00	615	Nov 27	99.7%	29.9%	44.6%	16.7%	7.1%	1.5%	0.0%	30	11
December 2019	742	282	3230	Dec 05 20:00	652	Dec 04	99.7%	14.1%	55.4%	18.8%	8.2%	3.0%	0.3%	31	24
			MAXIMUM VALUES												
Annual	**8728**	**287**	**11995**	**Apr 19**	**1235**	**Feb 20**	**99.6%**	**19.9%**	**47.0%**	**18.9%**	**11.4%**	**2.3%**	**0.1%**	**362**	**212**




2019 Daily Concentration Readings of Black Carbon at Estevan
BC in ng/m3
1000
500
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
BC
Average 286.1

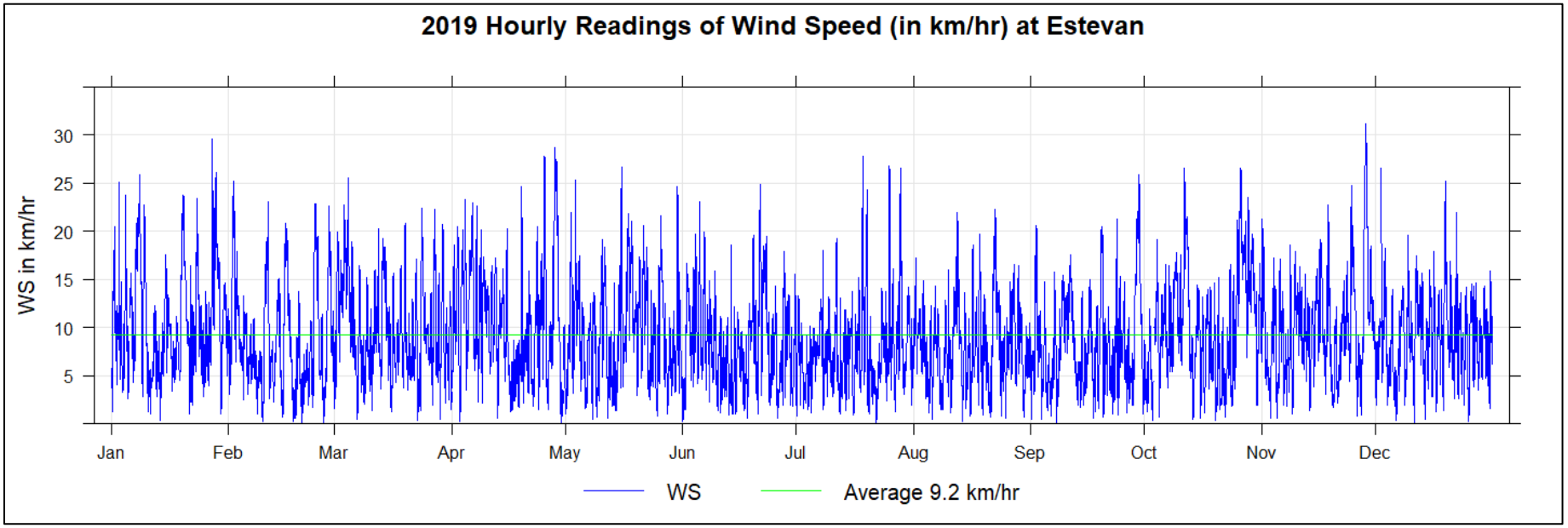
Wind Speed and Wind Direction Frequency Distribution of 1-hr Averages - Estevan

Month	Valid Hours	% of Readings in Concentration Range						Total %
		0 to 3	3 to 6	6 to 12	12 to 24	24 to 30	> 30	
N	201	1.9%	0.4%	0.0%	0.0%	0.0%	0.0%	2.3%
NNE	242	2.3%	0.4%	0.0%	0.0%	0.0%	0.0%	2.8%
NE	384	3.2%	1.1%	0.1%	0.0%	0.0%	0.0%	4.4%
ENE	620	4.2%	2.7%	0.2%	0.0%	0.0%	0.0%	7.1%
E	1066	6.8%	4.8%	0.6%	0.0%	0.0%	0.0%	12.2%
ESE	522	4.2%	1.8%	0.0%	0.0%	0.0%	0.0%	6.0%
SE	337	2.6%	1.3%	0.0%	0.0%	0.0%	0.0%	3.9%
SSE	207	2.1%	0.3%	0.0%	0.0%	0.0%	0.0%	2.4%
S	228	2.2%	0.4%	0.0%	0.0%	0.0%	0.0%	2.6%
SSW	269	2.3%	0.7%	0.0%	0.0%	0.0%	0.0%	3.1%
SW	521	4.3%	1.6%	0.1%	0.0%	0.0%	0.0%	6.0%
WSW	1040	8.6%	3.0%	0.3%	0.0%	0.0%	0.0%	11.9%
W	1210	10.6%	3.2%	0.1%	0.0%	0.0%	0.0%	13.8%
WNW	1016	5.4%	5.5%	0.7%	0.0%	0.0%	0.0%	11.6%
NW	519	3.7%	2.2%	0.1%	0.0%	0.0%	0.0%	5.9%
NNW	359	2.9%	1.2%	0.0%	0.0%	0.0%	0.0%	4.1%
Total	**8741**	**67.3%**	**30.6%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**


2019 Hourly Readings of Wind Direction (in degrees) at Estevan
WD in degrees
300
200
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
WD

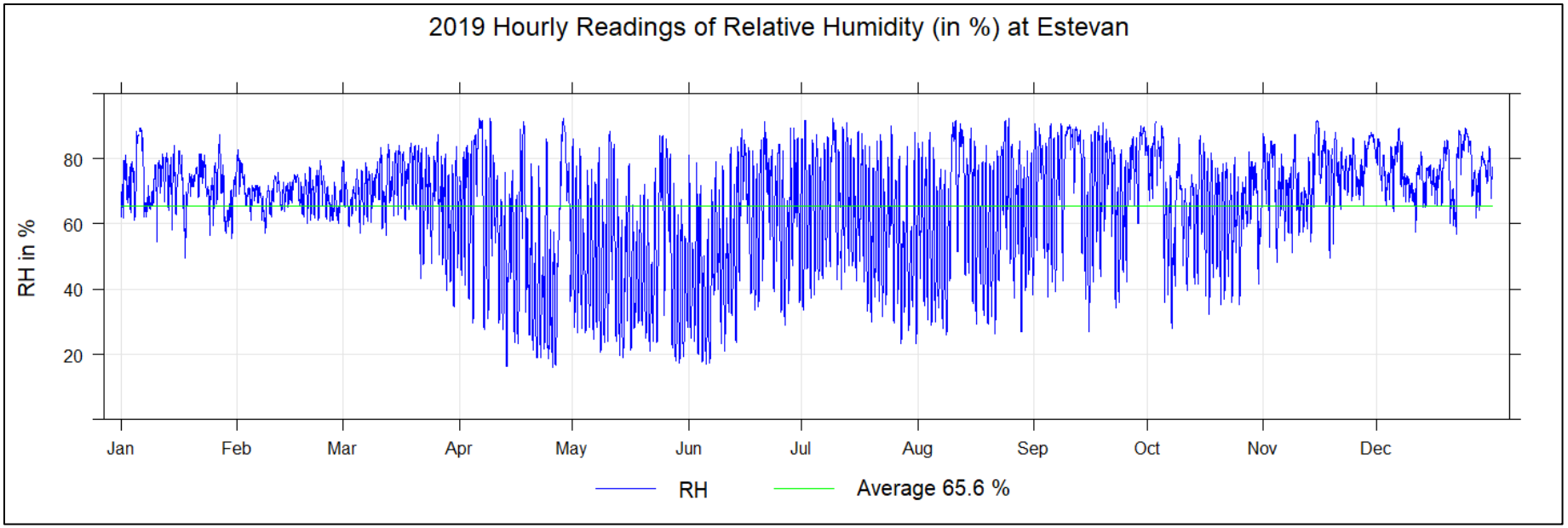
Wind Speed Frequency Distribution of 1-hr Averages - Estevan

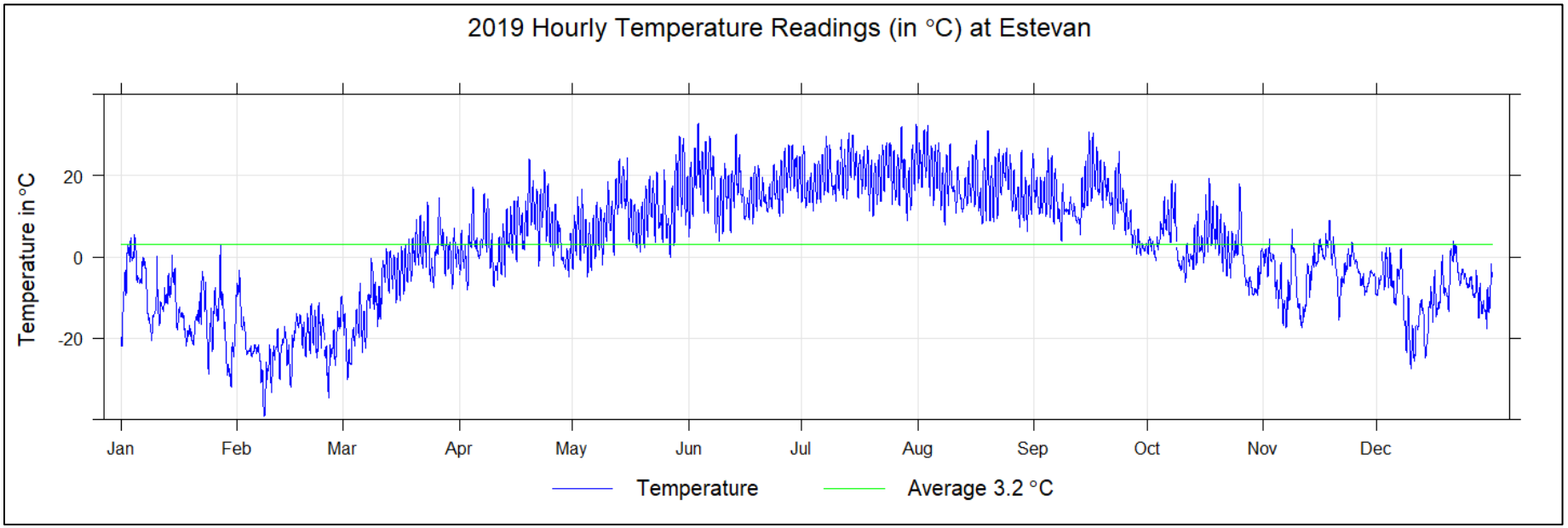
Month	Valid Hours	Monthly Average (m/s)	MAXIMUM VALUES 1-hr (m/s)	Date	24-hr (m/s)	Date	Operational time (%)	% of Readings in Concentration Range 1 to 3 (m/s)	3 to 6 (m/s)	6 to 12 (m/s)	12 to 24 (m/s)	24 to 30 (m/s)	> 30 (m/s)	Reportable Incidents 24-hr	1-hr
January 2019	742	3.1	8.2	Jan 27 16:00	5.4	Jan 08	99.7%	59.0%	36.4%	4.6%	0.0%	0.0%	0.0%	0	0
February 2019	671	2.9	7.0	Feb 02 07:00	5.0	Feb 02	99.9%	64.5%	31.4%	4.1%	0.0%	0.0%	0.0%	0	0
March 2019	744	3.0	7.1	Mar 04 13:00	4.8	Mar 04	100.0%	58.5%	40.1%	1.5%	0.0%	0.0%	0.0%	0	0
April 2019	717	3.3	8.0	Apr 28 08:00	6.4	Apr 28	99.6%	51.5%	43.9%	4.7%	0.0%	0.0%	0.0%	0	0
May 2019	744	3.0	7.4	May 15 19:00	4.5	May 17	100.0%	59.0%	38.9%	2.2%	0.0%	0.0%	0.0%	0	0
June 2019	720	2.8	6.9	Jun 21 11:00	4.2	Jun 22	100.0%	68.2%	30.6%	1.2%	0.0%	0.0%	0.0%	0	0
July 2019	743	2.6	7.7	Jul 18 15:00	3.6	Jul 28	99.9%	80.2%	17.5%	2.3%	0.0%	0.0%	0.0%	0	0
August 2019	744	2.7	6.2	Aug 22 14:00	4.6	Aug 22	100.0%	72.1%	27.4%	0.5%	0.0%	0.0%	0.0%	0	0
September 2019	720	2.8	7.2	Sep 29 13:00	5.7	Sep 29	100.0%	65.7%	32.8%	1.5%	0.0%	0.0%	0.0%	0	0
October 2019	739	3.3	7.4	Oct 11 14:00	5.7	Oct 26	99.3%	51.0%	46.0%	3.0%	0.0%	0.0%	0.0%	0	0
November 2019	718	3.0	8.7	Nov 28 12:00	6.9	Nov 28	99.7%	58.2%	38.7%	3.1%	0.0%	0.0%	0.0%	0	0
December 2019	742	2.7	7.4	Dec 02 12:00	4.2	Dec 19	99.7%	64.4%	34.6%	1.1%	0.0%	0.0%	0.0%	0	0
			MAXIMUM VALUES												
Annual	**8744**	**2.9**	**8.7**	**Nov 28**	**6.9**	**Nov 28**	**99.8%**	**62.7%**	**34.8%**	**2.5%**	**0.0%**	**0.0%**	**0.0%**	**0**	**0**



Meterology - Estevan

Month	Relative Humidity		Barometric Pressure		Temperature	
	Average (%)	Operational (%)	Average (hPa)	Operational (%)	Average (°C)	Operational (%)
January 2019	72	99.7%	948.7	99.7%	-12.2	99.7%
February 2019	69	99.9%	952.5	99.9%	-21.2	99.9%
March 2019	70	100.0%	952.3	100.0%	-5.2	100.0%
April 2019	56	99.6%	946.6	99.6%	5.5	99.6%
May 2019	49	100.0%	947.7	100.0%	10.5	100.0%
June 2019	57	100.0%	945.1	100.0%	17.6	100.0%
July 2019	62	99.9%	947.7	99.9%	20.3	99.9%
August 2019	63	100.0%	947.5	100.0%	18.2	100.0%
September 2019	74	100.0%	946.3	100.0%	13.2	100.0%
October 2019	66	99.3%	946.7	99.3%	2.5	99.3%
November 2019	75	99.7%	949.2	99.7%	-4.0	99.7%
December 2019	76	99.7%	946.2	99.7%	-9.2	99.7%
Average	66	99.8%	948	99.8%	3.0	99.8%


2019 Hourly Readings of Relative Humidity (in %) at Estevan
RH in %
80
60
40
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
RH
Average 65.6 %


2019 Hourly Temperature Readings (in °C) at Estevan
Temperature in °C
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Temperature
Average 3.2 °C

APPENDIX J
Summary of Exceedances

Stoughton H_2S 1-Hour Detailed Exceedance Summary

Date and Time	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	SO2 (ppb)	H_2S (ppb)	$PM_{2.5}$ (µg/m³)	T (°C)	RH (%)	WS (m/s)	WD (deg)	BP (hPa)
Wed October-23-19 15:00	-	-	-	-	13.3	16.9	1.7	6.7	41.1	4.2	311.6	947

Wauchope H_2S 1-Hour Detailed Exceedance Summary

Date and Time	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	SO2 (ppb)	H_2S (ppb)	$PM_{2.5}$ (µg/m³)	T (°C)	RH (%)	WS (m/s)	WD (deg)	BP (hPa)
Tue July-16-19 04:00	-	-	-	-	0.1	11.0	8.3	14.4	84.0	1.1	328.0	941
Tue July-16-19 05:00	-	-	-	-	0.2	14.0	7.8	13.5	85.7	1.0	348.9	941
Tue July-16-19 06:00	-	-	-	-	0.1	16.3	7.3	12.9	86.6	1.2	12.8	942
Mon July-22-19 03:00	-	-	-	-	0.2	11.3	6.5	10.1	88.9	0.6	8.5	953
Mon July-22-19 04:00	-	-	-	-	0.1	18.3	5.9	9.3	89.2	0.7	11.3	953
Mon July-22-19 05:00	-	-	-	-	0.1	14.9	5.1	9.0	89.9	0.6	0.5	953
Mon July-22-19 06:00	-	-	-	-	0.1	16.6	5.6	9.1	89.8	0.7	4.2	953
Mon July-22-19 07:00	-	-	-	-	0.1	14.2	6.5	12.0	89.1	0.6	14.0	954
Tue July-23-19 03:00	-	-	-	-	0.1	17.0	9.4	11.8	87.8	0.5	349.7	952
Tue July-23-19 04:00	-	-	-	-	0.1	14.9	7.9	11.1	87.6	0.5	10.4	952
Tue July-23-19 05:00	-	-	-	-	0.1	27.5	7.1	10.4	88.8	0.5	355.8	951
Tue July-23-19 06:00	-	-	-	-	0.1	14.5	7.2	10.6	88.0	0.3	336.6	952
Tue July-23-19 07:00	-	-	-	-	0.2	22.1	7.8	14.0	83.8	0.3	18.5	952
Tue July-30-19 04:00	-	-	-	-	0.0	11.3	3.0	6.5	73.9	0.1	127.6	946
Tue July-30-19 06:00	-	-	-	-	0.0	22.1	3.2	5.8	77.4	0.3	16.7	946
Mon August-05-19 03:00	-	-	-	-	0.3	14.0	8.4	11.6	85.5	0.4	249.0	942
Mon August-05-19 04:00	-	-	-	-	0.2	15.0	-	11.0	85.3	1.2	258.1	942
Fri August-09-19 01:00	-	-	-	-	0.0	16.4	13.1	9.3	76.3	0.6	15.7	943
Fri August-09-19 04:00	-	-	-	-	0.0	17.3	8.5	9.3	73.1	0.5	10.1	943
Fri August-09-19 05:00	-	-	-	-	0.1	13.9	8.3	8.8	74.8	0.1	50.6	943
Fri August-09-19 06:00	-	-	-	-	0.1	23.6	6.6	7.9	78.0	0.5	10.9	943
Fri August-09-19 07:00	-	-	-	-	0.0	18.4	6.8	9.5	75.4	0.6	29.0	943
Sun August-11-19 05:00	-	-	-	-	0.1	11.0	4.1	8.2	84.8	1.8	6.4	947
Sun September-08-19 05:00	-	-	-	-	0.0	11.4	2.0	0.3	83.5	0.5	15.3	949
Sun September-08-19 06:00	-	-	-	-	0.0	10.5	1.8	0.2	83.8	0.3	4.5	949
Thu September-19-19 05:00	-	-	-	-	0.0	11.1	1.8	8.5	90.1	0.4	4.4	942

Glen Ewen H_2S 1-Hour Detailed Exceedance Summary

Date and Time	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	SO2 (ppb)	H_2S (ppb)	$PM_{2.5}$ ($\mu g/m^3$)	T (^oC)	RH (%)	WS (m/s)	WD (deg)	BP (hPa)
Tue April-23-19 23:00	0.2	3.2	3.4	28.4	0.2	13.3	-	10.3	49.8	0.5	278.3	942
Tue June-04-19 22:00	0.0	6.2	6.1	40.5	0.7	34.1	-	16.6	34.5	0.8	357.8	947
Tue June-04-19 23:00	0.0	9.9	9.9	34.0	1.9	42.2	-	14.4	40.7	0.4	351.5	948
Wed June-05-19 00:00	0.1	9.5	9.6	29.4	3.1	28.6	-	12.6	44.7	0.9	344.0	948
Wed June-05-19 01:00	0.0	8.4	8.4	31.9	3.9	17.6	-	11.8	45.8	0.4	318.1	948
Wed June-05-19 02:00	0.3	13.7	14.0	21.2	3.3	13.2	-	9.4	52.0	0.1	316.3	948
Wed June-05-19 03:00	0.2	13.7	13.9	14.9	2.7	11.3	-	7.6	59.3	0.4	279.2	948
Wed June-05-19 04:00	0.2	10.7	10.9	13.5	2.4	11.2	-	5.8	69.5	0.2	289.8	948

Weyburn O_3 8-Hour Detailed Exceedance Summary

Date and Time	SO_2 (ppb)	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	H_2S (ppb)	$PM_{2.5}$ (µg/m³)	WSs (km/hr)	WD (deg)	RH (%)	T (°C)
Fri August-10-18 17:00	2.6	0.3	1.4	1.7	67.9	0.5	37.1	1.4	143	24	34

Esterhazy O_3 8-Hour Detailed Exceedance Summary

Date and Time	SO_2 (ppb)	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	H_2S (ppb)	$PM_{2.5}$ (µg/m³)	WSs (km/hr)	WD (deg)	RH (%)	T (°C)
Thu September-20-18 09:00		0.2	2.6	2.6	65.7		5.4	2.7	282	66	-0.9

Estevan PM_{10} 24-Hour Detailed Exceedance Summary

Date and Time	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	SO2 (ppb)	PM_{10} (ppb)	$PM_{2.5}$ (µg/m³)	T (°C)	RH (%)	WS (m/s)	WD (deg)
Tue May-28-19	2.8	8.2	11.0	35.4	0.4	53.0	16.1	15.2	39.0	1.5	-
Wed May-29-19	1.4	8.4	9.8	36.2	0.5	66.4	25.4	21.3	36.4	1.8	277.5
Thu May-30-19	0.9	6.6	7.5	36.2	1.8	53.4	-	20.9	38.9	3.2	237.2
Sat June-01-19	4.0	8.6	12.6	29.4	0.5	61.6	19.6	15.5	46.8	1.0	-
Thu August-08-19	1.6	4.2	5.9	23.3	0.5	52.0	9.8	17.6	47.2	0.8	-
Wed August-21-19	2.5	4.6	7.2	19.5	2.0	52.9	-	16.8	53.9	1.2	-
Fri August-30-19	4.2	5.3	9.5	15.4	0.6	54.0	10.2	13.0	62.8	1.4	-

Wauchope H_2S 24-Hour Detailed Exceedance Summary

Date and Time	NO (ppb)	NO_2 (ppb)	NO_X (ppb)	O_3 (ppb)	SO2 (ppb)	H_2S (ppb)	$PM_{2.5}$ (µg/m³)	T (°C)	RH (%)	WS (m/s)	WD (deg)
Mon July-22-19	-	-	-	-	0.2	4.8	-	18.9	64.0	0.7	-
Tue July-23-19	-	-	-	-	0.4	5.5	-	20.0	63.0	1.4	-
Mon August-05-19	-	-	-	-	0.2	3.9	-	19.2	60.6	2.5	-
Fri August-09-19	-	-	-	-	0.6	5.2	-	18.6	56.6	1.3	-

APPENDIX K
SESAA Financial Statements

Southeast Saskatchewan Airshed Association Inc.

Financial Statements

December 31, 2019

Management's Responsibility

To the Members of Southeast Saskatchewan Airshed Association Inc.:

Management is responsible for the preparation and presentation of the accompanying financial statements, including responsibility for significant accounting judgments and estimates in accordance with Canadian accounting standards for not-for-profit organizations. This responsibility includes selecting appropriate accounting principles and methods, and making decisions affecting the measurement of transactions in which objective judgment is required.

In discharging its responsibilities for the integrity and fairness of the financial statements, management designs and maintains the necessary accounting systems and related internal controls to provide reasonable assurance that transactions are authorized, assets are safeguarded and financial records are properly maintained to provide reliable information for the preparation of financial statements.

The Board of Directors is composed entirely of Directors who are neither management nor employees of the Organization. The Board is responsible for overseeing management in the performance of its financial reporting responsibilities and for approving the financial information. The Board fulfils these responsibilities by reviewing the financial information prepared by management and discussing relevant matters with management and external auditors.

MNP LLP is appointed by the directors to audit the financial statements and report directly to them; their report follows. The external auditors have full and free access to, and may meet periodically and separately with, both the Board and management to discuss their audit findings.

March 19, 2020

Independent Auditor's Report

To the Board of Southeast Saskatchewan Airshed Association Inc.:

Opinion

We have audited the financial statements of Southeast Saskatchewan Airshed Association Inc. (the "Organization"), which comprise the statement of financial position as at December 31, 2019, and the statements of revenue and expenses and changes in net assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Organization as at December 31, 2019, and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor’s Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Organization in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Organization’s ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Organization or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Organization’s financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Organization’s internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Organization’s ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Organization to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Estevan, Saskatchewan

March 19, 2020

Chartered Professional Accountants

Southeast Saskatchewan Airshed Association Inc.

Statement of Financial Position

As at December 31, 2019

	2019	2018
Assets		
Current		
Cash	**162,457**	151,491
Marketable securities *(Note 3)*	**102,374**	101,814
Prepaid expenses and deposits	**4,778**	4,603
Government remittances receivable	**-**	4,812
	269,609	262,720
Capital assets *(Note 4)*	**261,832**	327,289
	531,441	590,009
Liabilities		
Current		
Accounts payable and accruals	**31,704**	30,984
Government remittances payable	**1,299**	-
Current portion deferred contributions *(Note 5)*	**11,913**	27,363
	44,916	58,347
Deferred contributions *(Note 5)*	**29,783**	41,696
	74,699	100,043
Net Assets		
Unrestricted net assets	**456,742**	489,966
	531,441	590,009

Approved on behalf of the Board of Directors

Director

Director

The accompanying notes are an integral part of these financial statements

Southeast Saskatchewan Airshed Association Inc.
Statement of Revenue and Expenses and Changes in Net Assets
For the year ended December 31, 2019

	2019	*2018*
Revenue		
Membership fees	**237,071**	249,461
Amortization of deferred contributions *(Note 5)*	**27,363**	56,856
	264,434	306,317
Expenses		
Advertising	**1,681**	1,890
Air monitoring	**108,634**	103,554
Amortization	**65,457**	70,165
Bank charges	**134**	247
Insurance	**10,475**	9,141
Management fees *(Note 7)*	**45,450**	49,380
Meetings	**840**	737
Office	**6,315**	9,555
Professional fees	**7,540**	7,668
Repairs and maintenance	**50,188**	20,781
Travel	**1,504**	2,056
	298,218	275,174
(Deficiency) excess of revenue over expenses before other items	**(33,784)**	31,143
Other items		
Interest income	**560**	557
(Deficiency) excess of revenue over expenses	**(33,224)**	31,700
Net assets, beginning of year	**489,966**	458,266
Net assets, end of year	**456,742**	489,966

The accompanying notes are an integral part of these financial statements

Southeast Saskatchewan Airshed Association Inc.

Statement of Cash Flows

For the year ended December 31, 2019

	2019	*2018*
Cash provided by (used for) the following activities:		
Operating		
Cash receipts from membership fees	**236,449**	249,463
Cash paid to suppliers	**(225,483)**	(210,827)
Cash receipts from interest	**560**	557
Cash received from grants	**-**	59,566
	11,526	98,759
Investing		
Purchase of equipment	**-**	(93,261)
Purchase of marketable securities	**(102,374)**	(101,814)
Redemption of marketable securities	**101,814**	101,257
	(560)	(93,818)
Increase in cash resources	**10,966**	4,941
Cash resources, beginning of year	**151,491**	146,550
Cash resources, end of year	**162,457**	151,491

The accompanying notes are an integral part of these financial statements

1. Incorporation and nature of the organization

Southeast Saskatchewan Airshed Association Inc. (the "Organization") was incorporated under The Non-Profit Corporations Act, 1995 on October 7, 2005, and is exempt from income taxes. In order to maintain its status as a not-for-profit organization under the Act, the Organization must meet certain requirements within the Act. In the opinion of management these requirements have been met.

The Organization collects and monitors ambient air quality data in Southeast Saskatchewan and makes this data available to all members.

2. Significant accounting policies

The financial statements have been prepared in accordance with Canadian accounting standards for Not-for-profit organizations as issued by the Accounting Standards Board in Canada and include the following significant accounting policies:

Cash and cash equivalents

Cash and cash equivalents include balances with banks and short-term investments with maturities of three months or less.

Marketable securities

Marketable securities with prices quoted in an active market are measured at fair value while those that are not quoted in an active market are measured at cost less impairment.

Equipment

Purchased capital assets are recorded at cost. Contributed capital assets are recorded at fair value at the date of contribution if fair value can be reasonably determined.

Amortization is provided using the declining balance method at rates intended to amortize the cost of assets over their estimated useful lives.

	Rate
Equipment	20 %

Revenue recognition

The Organization follows the deferral method of accounting for contributions. Restricted contributions are recognized as revenue in the year in which the related expenses are incurred. Unrestricted contributions, including membership fees are recognized as revenue when received.

Financial instruments

The Organization recognizes its financial instruments when the Organization becomes party to the contractual provisions of the financial instrument. All financial instruments are initially recorded at their fair value, including financial assets and liabilities originated and issued in a related party transaction with management.

At initial recognition, the Organization may irrevocably elect to subsequently measure any financial instrument at fair value. The Organization has not made such an election during the year. The Organization subsequently measures marketable securities with prices quoted in an active market at fair value. All other financial assets and liabilities are subsequently measured at amortized cost.

Transaction costs and financing fees are added to the carrying amount for those financial instruments subsequently measured at amortized cost or cost.

2. Significant accounting policies *(Continued from previous page)*

Financial asset impairment

The Organization assesses impairment of all of its financial assets measured at cost or amortized cost. The Organization groups assets for impairment testing when available information is not sufficient to permit identification of each individually impaired financial asset in the group. When there is an indication of impairment, the Organization determines whether it has resulted in a significant adverse change in the expected timing or amount of future cash flows during the year. If so, the Organization reduces the carrying amount of any impaired financial assets to the highest of: the present value of cash flows expected to be generated by holding the assets; the amount that could be realized by selling the assets; and the amount expected to be realized by exercising any rights to collateral held against those assets. Any impairment, which is not considered temporary, is included in current year excess of revenue over expenses.

The Organization reverses impairment losses on financial assets when there is a decrease in impairment and the decrease can be objectively related to an event occurring after the impairment loss was recognized. The amount of the reversal is recognized in the excess of revenue over expenses in the year the reversal occurs.

Measurement uncertainty

The preparation of financial statements in conformity with Canadian accounting standards for not-for-profit organizations requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period.

Amortization is based on the estimated useful lives of equipment.

These estimates and assumptions are reviewed periodically and, as adjustments become necessary they are reported in excess of revenue over expenses in the periods in which they become known.

Long-lived assets

Long-lived assets consist of equipment. Long-lived assets held (or used) are measured and amortized as described in the applicable accounting policies.

When the Organization determines that a long-lived asset no longer has any long-term service potential to the Organization, the excess of its net carrying amount over any residual value is recognized as an expense in the statement of revenue and expenses. Write-downs are not reversed.

3. Marketable securities

	2019	*2018*
Measured at cost:		
CIBC GIC	**102,374**	101,814

The GIC was issued December 19, 2019 and matures December 21, 2020, bearing interest at 2.00% (2018 - 0.55%) per annum.

4. Capital assets

	Cost	***Accumulated amortization***	***2019 Net book value***	*2018 Net book value*
Equipment	**931,101**	**669,269**	**261,832**	327,289

5. Deferred contributions

Deferred capital contributions consist of the unamortized amount of contributions received for the purchase of equipment. Recognition of these amounts as revenue is deferred to periods when the related equipment are amortized. Changes in deferred capital contributions are as follows:

	2019	*2018*
Balance, beginning of year	**69,059**	66,350
Amount received during the year	**-**	59,565
Less: Amount recognized as revenue during the year	**(27,363)**	(56,856)
Balance, end of year	**41,696**	69,059
Less: current portion	**11,913**	27,363
Balance, end of year	**29,783**	41,696

6. Financial instruments

The Organization, as part of its operations, carries a number of financial instruments. It is management's opinion that the Organization is not exposed to significant interest, currency, credit, liquidity or other price risks arising from these financial instruments except otherwise disclosed.

Liquidity risk

Liquidity risk is the risk that the Organization will encounter difficulty in meeting obligations associated with financial liabilities. The Organization's exposure to liquidity risk is dependent on the collection of membership fee revenue and obligations to sustain operations.

7. Related party transactions

The Organization has entered into a contract agreement for management services with Terry Gibson Consulting Inc., expiring November 30, 2019. The contract was renewed on December 1, 2019 and extends to November 30, 2021. The contract is based on hours required, to a maximum of $60,000. Any overage is required to be approved by the Board of Directors. Included in expenses for the current year are $45,450 (2018 - $49,380) of management fees. The expenses were incurred in the normal course of operations and measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

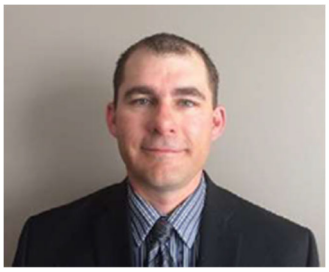
8. Commitment

The entity has the following commitment for operations:

2020	$91,000
2021	$45,500

APPENDIX L
Board of Directors

Neil Hungle **EHSS Senior Manager (Board Chair)**



Mr. Hungle was born and raised in rural Saskatchewan (Dilke) and has a BaSc Degree from University of Regina (Industrial Systems Engineering). He started career in 1999 and joined Mosaic Potash in 2005. Neil started at Belle Plaine as a maintenance engineer, Production Supt and Maintenance Supt. (8 years), transferred to working in Esterhazy as the EHSS Senior Manager for K1, K2 and Inflow.

Imran Maqsood, Ph.D., P.Eng. Senior Engineer, Environment, SaskPower (Vice-Chair)

Dr. Imran Maqsood is a Senior Engineer at SaskPower, where he provides technical, environmental and regulatory decision-making support to the company's operational groups. Dr. Maqsood came from the Saskatchewan Ministry of Environment as the Manager of Air Science & Monitoring for the province. Previously, he has held the positions of Senior Air Quality Scientist at the ministry and Adjunct Professor at University of Regina. He is a member in good standing with the Association of Professional Engineers and Geoscientists of Saskatchewan. Dr. Maqsood has produced over 50 publications in peer-reviewed journals and conferences.

Stuart Goranson **Field Regulatory Coordinator, Crescent Point Energy (Secretary Treasurer)**

Stuart Goranson is a Field Regulatory Coordinator with Crescent Point Energy. Stuart's main focus is ensuring operational regulatory compliance in Crescent Point's Saskatchewan operations. Stuart is a registered Professional Engineer with a degree in Environmental Systems Engineering.

Kristin Waroma **Health Representative**

Kristin Waroma is the Senior Public Health Inspector for Sun Country Health Region based in the Weyburn office. She has been working in public health since 2008. Her health inspector duties include water, wastewater, food safety, communicable disease control, recreational water, land use reviews, tobacco control, indoor and outdoor air quality and many other programs. She enjoys the challenges of working in busy Southeastern Saskatchewan.

Gerald Knibbs **Councillor, Rural Municipality of Tecumseh Number 65**

Mr. Knibbs is an organic grain farmer near Stoughton. He currently serves as a counsellor for the R.M. of Tecumsch. He and his wife Dawn were born and raised in the area and are currently raising their family in their community. Air and water quality are important issues now and in the future.

Twila Walkeden **City of Weyburn**

Twila Walkeden is the Executive Director of the Weyburn Chamber of Commerce and Weyburn Regional Economic Development. She has past professional expertise in the environmental science sector working with both oil and gas companies and regulators in southern Saskatchewan. Twila represents the City of Weyburn on the SESAA Board of Directors.

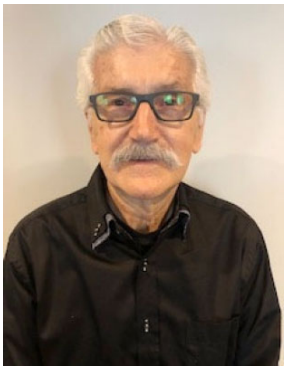
Kelly Gervais **Senior Production Engineer, Whitecap Resources Inc.**

Kelly was born and raised in Redvers, Saskatchewan. After graduating from University of Saskatchewan in 2005 with bachelor's degree in Mechanical Engineering, he moved to Calgary to start a career in oil and gas industry. He has been a Production Engineer Whitecap Resources (previously Cenovus/EnCana) for the past 15 years and has been living in Weyburn since 2011.

Randal Miiller **Manager, Estevan District Area IV, Saskatchewan Ministry of Energy & Resources**

Randal is a longtime rural Estevan resident who grew up surrounded by the local farming and S.E. Saskatchewan oilfield activities. In 1985 he started his career in the oil industry and have thoroughly enjoyed all the challenges and rewards encountered over the years. In 2007 Randal began his career with the Ministry of Energy & Resources and currently is the Manager for Estevan District Area IV.

Dennis Moore **Urban Municipality**



Dennis was born and raised on farm in the Carlyle area. He has worked in retail for over 40 years and has owned and operated two retail stores. Mr. Moore has been an active Rotarian for 38 years and is in his 3rd term as Councillor for the City of Estevan. He is the Chairman for South East Transportation Planning Committee advising the Minister of Highways on road conditions in south east Sask. Dennis is an active volunteer and is on many committees.

Terry Gibson **Executive Director**

Mr. Gibson brings nearly 35 years of Public Health/Environmental Health experience to the position. He has held the positions of President of the Saskatchewan Public Health Association and Vice-Chair of the Saskatchewan Epidemiology Association. He teaches Public Health Protection at the University of Saskatchewan Master of Public Health Program and has served on many provincial and national boards and committees. Terry is committed to working with industry and regulators in a consensus decision making process to ensure that the health of the environment of south east Saskatchewan is always protected.

APPENDIX M
SESAA Members

- 101033165 Saskatchewan Ltd.
- 618555 Saskatchewan Ltd.
- TDL Petroleum
- Abenteuer Resources Corp.
- Admiralty Oils
- Advantage Oil and Gas
- Aldon Oils Ltd.
- Antoinway Resources
- Apache Canada Ltd.
- ARC Resources
- Astra Oil Corp
- ATCO Energy Solutions
- AvenEx Energy
- Barracuda Energy
- Base Resources Inc.
- Baytex
- Black Rider Resources Inc.
- Bluebird Resources
- Bonterra Energy
- Border Energy Ltd
- Brown Bros. Resources
- Brownstone Resources Ltd.
- Bulldog Oil
- Gas Burgess Creek
- Caje Holdings Ltd.
- Canada Capital Energy
- Canadian Natural Resources Limited
- Can Era Energy Corp.
- Canamax Energy Capital Energy Corp.
- Caprice Resources Cenovus Energy Inc.
- C-Group Energy Cheveyo Energy
- Chinook Iteration Clan Oil
- Coast Resources
- Condor Canada
- Conoco Phillips
- Contact Exploration
- Crescent Point Resources Partnership
- Daylight Energy
- Devon Canada Corporation
- Diaz Resources Ltd.
- EERG Energy ULC
- Elanco Exploration
- Elkhorn Resources
- Elswick Energy Ltd.
- Enermark Inc.
- Enerplus Corporation
- Fairborne Energy Ltd.
- Federated Co-op
- Firesky Energy
- Flagstone Energy
- Frank R. Lee Investments
- Freehold Royalties
- Freemantle Petroleum
- GKN Resources Ltd.
- Golden Key Oil
- Gold River Oil and Gas
- Grand Bow Petroleum Limited
- Halvar Resources
- Harvest Operations
- Highrock Energy
- Hillsdale Drilling
- Hummingbird Energy Inc. (Virtus Group)
- Husky Oil Operations Limited
- JDM Petroleum
- Jedi Exploration & Development
- K and S Investments Ltd.
- Kenwood Resources Ltd.
- Keystone Royalty
- Kinwest 2008 Energy
- Kiwi Resources Ltd.
- Kootenay Energy
- Lakeco Holdings
- Lakeview Energy
- Legacy Oil and Gas
- Lightstream Resources Ltd.
- Long Fortune Petroleum
- Longview Oil
- Magellan Resources Ltd.
- Mancal Energy Inc.
- Marquee Energy LTD
- Midale Petroleums Ltd.
- Molopo Energy
- Mosaic
- NAL Resources Limited

- Nexxtep Resources
- Noramera Bioenergy
- Novus Energy Inc.
- Nuloch Resources Inc.
- Omatius Oil & Gas Ltd.
- Oneex Operations
- Openfield Oil
- Painted Pony Petroleum
- Pemoco Ltd.
- Penn West Petroleum Ltd.
- Petrex Energy
- Petro One Energy
- Pinecrest Energy
- Phase Energy Ltd.
- Pinto Resources
- Plains Midstream
- Potash Corp.
- Powder Mountain
- Prairie Mines and Royalty
- Primrose Drilling Ventures Ltd.
- Questerre Energy Corporation Red Beds Resources Ltd.
- Regent Resources Ltd.
- Renegade Petroleum
- Ridgeback Resources
- Rife Resources
- Runcible Oil Corp.
- Saskatchewan Environmental Industry and Managers Association SEIMA
- SaskEnergy Incorporated/Transgas Limited
- SaskPower
- Prairie Mines & Royalty ULC
- Silver Bay Resources Ltd.
- Skywest Energy
- Southern Exploration
- Spartan Energy
- Spectrum Resources Group
- Spyglass Resources
- Southern Exploration
- Steel Reef
- Sure Energy Inc.
- T-45 Oil Corporation
- TAQA North
- T. Bird Oil Ltd.
- Tetonka Resources
- Texalta Petroleum Ltd.
- TORC Oil and Gas
- Triwest Exploration
- Valleyview Petroleums Ltd.
- Vermilion Energy
- Villanova Resources Inc.
- Villanova 4 Oil
- Viterra Inc.
- Willbrow Resources
- Williston Hunter Canada Inc.
- Zargon Oil & Gas Lt