Annual | 2018

GOLDCORP

Ambient Air Monitoring Report

Goldcorp Canada Ltd.
Porcupine Gold Mines
Hollinger Open Pit

Report prepared by Rotek Environmental Inc., 15 Keefer Court, Hamilton Ontario, L8E 4V4, 905 573 9533

Table of Contents

Tables

Figures

Figures (continued)

Appendices

Executive Summary

Porcupine Gold Mines is a subsidiary of Goldcorp Canada Ltd., situated in Timmins, Ontario.

In order to monitor potential air quality effects and ensure mitigation efforts are effective, Goldcorp has established an ambient air monitoring network. The data generated are used to assess the air quality where people live, measure compliance with provincial standards, compare changes to air quality over time, provide information about regional background levels of monitored pollutants, inform the public and raise awareness of local air quality.

The ambient air monitoring network has been approved by the Ministry of the Environment Conservation and Parks (MECP) and will continue to operate throughout the life of the mining operations. In accordance with MECP`s reporting requirements, this is the Annual Ambient Air Monitoring Report for 2018.

Conclusions:

During 2018 there were:

a) No exceedances of the continuous NO_2 24 hour and 1 hour running average AAQCs or of the ½ hour running average O.Reg 419/05 standard.

b) 20 exceedances of the continuous PM_{10} 24 hour running average AAQC, 1 at STN72135, 14 at STN72139, 3 at STN72140 and 2 at STN72141.

c) 3 exceedances of the non-continuous 24 hour clock TSP AAQC, 1 at STN72135, 1 at STN72136 and 1 at STN72137.

d) 5 exceedances of the non-continuous 24 hour clock PM_{10} AAQC at STN72136.

e) No exceedances of the non-continuous 24 hour clock TSP or PM_{10} Suspended Metals AAQCs, standards or guidelines.

f) 12 exceedances of the non-continuous 30 day standard for Total Dustfall, 1 at STN72137, 1 at STN72142 and 10 at STN72143.

g) A summary of exceedances potentially associated with the Hollinger Open Pit (HOP) operations can be found in Table 27.

h) Network annual PM_{10} averages were 12 µg/m^3 at STN72135, 19 µg/m^3 at STN72139, 12 µg/m^3 at STN72140 and 9 µg/m^3 at STN72141. No average was available from STN72138 which remained decommissioned during 2018.

i) 36 calibrations were conducted on continuous samplers, all of which met criteria.

j) The percentage of continuous valid pollutant data recovery was 98.0% for 2018, exceeding the ministry's minimum target of 90% and desirable target of 95%. The overall percentage of non-continuous valid pollutant data recovery was 99.1%.

1.0 Introduction

Porcupine Gold Mines is a subsidiary of Goldcorp Canada Ltd., situated in Timmins, Ontario.

In order to monitor potential air quality effects and ensure mitigation efforts are effective, Goldcorp has established an ambient air monitoring network. The network reports continuous and non-continuous measurements of air quality data at various sites located around Goldcorp's Porcupine mining operations. The data generated are used to assess the air quality where people live, measure compliance with provincial standards, compare changes to air quality over time, provide information about regional background levels of monitored pollutants, inform the public and raise awareness of local air quality.

The ambient air monitoring network has been approved by the Ministry of the Environment Conservation and Parks (MECP) and will continue to operate throughout the life of the mining operations. In accordance with MECP`s reporting requirements, this is the Annual Ambient Air Monitoring Report for 2018.

2.0 Goldcorp - Ambient Air Monitoring Network

The ambient air monitoring network consists of a meteorological station and 5 continuous stations that report data for Total Suspended Particulate (TSP), Inhalable Particulate (PM_{10}) and Nitrogen Oxides (NO_X). In addition, there are 6 stations that collect non-continuous data for TSP, PM_{10}, metals, Total Dustfall, passive Sulphur Dioxide (SO_2) and passive Nitrogen Dioxide (NO_2).

2.1 Parameters Monitored

2.1.1 Particulate Matter (PM)

Particulate Matter (PM) consists of airborne particles in solid or liquid form, except pure water, that are microscopic in size. Particulate matter is classified according to its size. The MECP identifies the following sizes of PM:

1) **Settleable Particulate Matter (Total Dustfall) -** Dustfall consists of very coarse particulate matter fractions that settle quickly under the influence of gravity.

2) **Suspended Particulate Matter (SP or TSP)** - airborne particulate matter with an upper size limit of approximately 44 micro metres (µm) in aerodynamic equivalent diameter.

3) **Particulate Matter < 10 microns (PM_{10})** - airborne particulate matter with a mass median diameter less than 10 µm.

4) **Particulate Matter < 2.5 microns ($PM_{2.5}$)** - airborne particulate matter with a mass median diameter less than 2.5 µm.

2.1.2 Metals

A number of trace metals which can cause human health impacts are present in airborne particulate matter. Concentrations of trace metals can be determined in a laboratory by analyzing the particulate matter collected on filters.

2.1.3 Nitrogen Oxides (NO, NO_2, NO_X)

Nitrogen Oxides (NO_X) are usually defined as the sum of Nitric Oxide (NO) and Nitrogen Dioxide (NO_2). NO_2 is a reddish brown gas with a pungent and irritating odour. It transforms in the air to form gaseous nitric acid and organic nitrates. NO_2 also plays a major role in atmospheric reactions that produce ground level ozone, a major component of smog.

In the case of air quality assessments, e.g. air quality reports such as the current report, NO_2, not NO_x, is the reference contaminant. NO_X Ambient Air Quality Criteria (AAQC) with 1 hour and 24 hour averaging times should only be compared to monitored NO_2 data.

2.1.4 Sulphur Dioxide (SO_2)

Sulphur Dioxide (SO_2) is a colourless gas that smells like burnt matches. SO_2 belongs to the family of sulphur oxide (SO_X) gases, these gases dissolve easily in water. Sulphur is prevalent in many raw materials. SO_X gases are formed when fuels containing sulphur are burned, when gasoline is extracted from oil or when metals are processed from sulphide ores.

2.2 Sampling Program Methodology

The Goldcorp ambient air monitoring network utilizes various types of sampling equipment. AirPointer® samplers measure continuous TSP, PM_{10} and Nitrogen Oxides. Hivol, Dustfall and passive samplers are used to measure non-continuous TSP, PM_{10}, metals, Total Dustfall, SO_2 and NO_2 data. Station locations are illustrated in Figure 1. The parameters monitored are listed in Table 1 and station Universal Transverse Mercator (UTM) data are tabulated in Table 2.

- **AirPointer® - Continuous TSP**

  TSP data is continuously monitored throughout the year by an Airpointer® system utilizing a Thermo Scientific model ADR1500 Dust Monitor. The ADR1500 utilizes light scattering photometer (nephelometer) technology to measure airborne particulate. The intensity of the light scattered by airborne particles passing through the sensing chamber is linearly proportional to their concentration. AirPointer® TSP measurements cannot be used to report exceedances because the measurement method is not officially designated. The collected TSP data is considered as “indicative” and should be used only for information purposes.

- **AirPointer® - Continuous PM_{10}**

  PM_{10} data is continuously monitored throughout the year by an AirPointer® system utilizing a Thermo Scientific model 5030 SHARP. The 5030 SHARP automatically measures and records airborne particulate concentration levels in micrograms per cubic metre ($\mu g/m^3$) using a combination of beta attenuation and light scattering technology.

- **AirPointer® - Continuous Nitrogen Oxides**

  NO, NO_2 and NO_X are continuously monitored throughout the year by an AirPointer® system utilizing a Thermo Scientific model 42i. The model 42i uses chemiluminescence technology to measure the amount of Nitrogen Oxides in the air.

- **Hivol - Non-continuous TSP and PM_{10}**

  Non-continuous TSP and PM_{10} samples are collected every 6 days according to the National Air Pollutant Surveillance (NAPS) schedule. Samples are collected on filter media for a 24 hour period from midnight to midnight. TSP samples are collected with a Tisch model 5170 Hivol sampler. PM_{10} samples are collected with a Tisch model 6070 Hivol sampler.

  Hivol samplers draw ambient air at a constant flow rate in order to collect suspended particulate matter onto a filter. Each filter is weighed before and after exposure to determine the total loading due to collected particulate.

  Non-continuous TSP and PM_{10} Hivol samplers meet US EPA and International Particulate Monitoring Regulations.

- **Hivol - Non-continuous Metals**

  TSP Hivol filters are analyzed every 18 days (NAPS schedule) by an accredited laboratory for a specified list of metals. PM_{10} Hivol filters are analyzed every 30 days. Metal concentrations are determined using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Results are reported in $\mu g/m^3$, analyses include; Arsenic (As), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe, as Fe_2O_3), Lead (Pb), Magnesium (Mg, as MgO), Manganese (Mn), Nickel (Ni), Selenium (Se), Sulphur (S), Vanadium (V), Zinc (Zn) and Sulphate (SO_4).

- **Non-continuous Total Dustfall**

  Containers (Dustfall jars) of a standard size and shape are set up at selected sampling sites so that particulate matter can settle into them for periods of about 30 days. The collected samples are then sent to an accredited laboratory for analyses of both soluble and insoluble portions which are combined to calculate the Total Dustfall. Results are reported as grams per square metre per 30 days ($g/m^2/30d$).

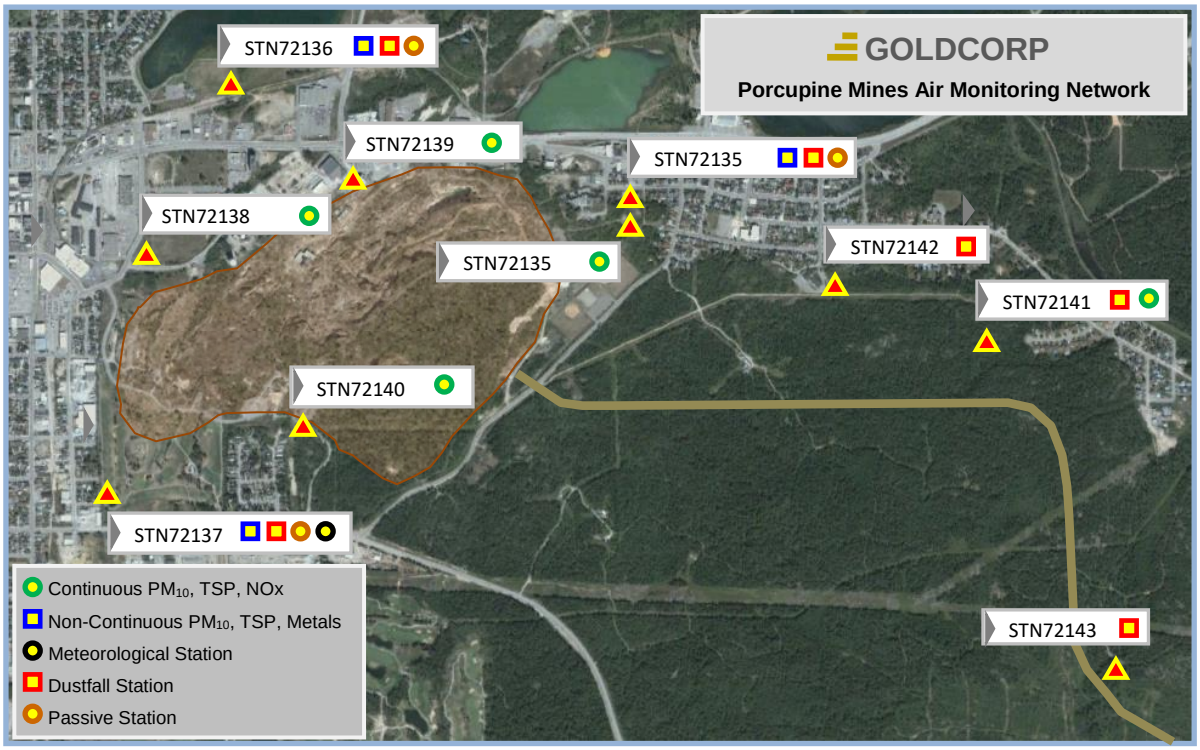
- **Non-continuous Passive SO_2 / NO_2**

  Passive sampling utilizes laboratory prepared filter cartridges which are installed at selected sampling sites for exposure to ambient air for periods of about 30 days. After exposure the cartridges are removed and submitted to an accredited laboratory for analysis. The analysis provides an estimate of monthly average spatial concentrations for SO_2 and NO_2. SO_2 analysis is determined by ion chromatography and NO_2 analysis is determined by spectrophotometry.

- **Meteorological Data**

  Meteorological data is monitored continuously throughout the year by a 5 metre meteorological station. Parameters monitored include; Wind Speed (WS), Wind Direction (WD), Ambient Temperature (AT), Relative Humidity (RH), Barometric Pressure (BP) and Precipitation (PRECP).

Goldcorp Air Monitoring Network Overview - Figure 1



Porcupine Gold Mines Ambient Air Monitoring Network		By : DC	**Figure 1**	ROTEK
	True North	Approx. Scale :	1:24000	
Goldcorp - Porcupine Gold Mines - Timmins, Ontario		Date Revised :	01 March, 2016	

Parameters Monitored at Each Station - Table 1

Station Identifier	TSP	HiVol TSP	PM_{10}	HiVol PM_{10}	NO_x	Metals	Passive SO_2	Passive NO_2	Total Dustfall	MET
STN72135 - Hollinger Ext.	✓		✓		✓					
STN72138 - Hollinger Park	✓		✓		✓					
STN72139 - Hollinger Office	✓		✓		✓					
STN72140 - Goldmine Tour	✓		✓		✓					
STN72141 - Claimpost Trail	✓		✓		✓				✓	
STN72135 - Extendicare		✓		✓		✓	✓	✓	✓	
STN72136 - MRCA		✓		✓		✓	✓	✓	✓	
STN72137 - Shania Twain		✓		✓		✓	✓	✓	✓	✓
STN72142 - Aura Lake									✓	
STN72143 - Snowmobile Crossing									✓	

UTM Station Coordinates - Table 2

UTM Coordinate Datum				
Station Identifier	**UTM Zone**	**Easting**	**Northing**	**Elevation**
STN72135 - Hollinger Ext.	17 U	477690.00	5369095.00	329 metres
STN72138 - Hollinger Park	17 U	476172.60	5368991.69	318 metres
STN72139 - Hollinger Office	17 U	476860.57	5369232.07	326 metres
STN72140 - Goldmine Tour	17 U	476626.00	5368461.41	324 metres
STN72141 - Claimpost Trail	17 U	478831.56	5368717.43	319 metres
STN72135 - Extendicare	17 U	477683.00	5369104.00	327 metres
STN72136 - MRCA	17 U	476416.81	5369518.75	312 metres
STN72137 - Shania Twain	17 U	476064.20	5368291.07	314 metres
STN72142 - Aura Lake	17 U	478337.11	5368893.25	333 metres
STN72143 - Snowmobile Crossing	17 U	479158.24	5367586.26	323 metres

2.3 Summary of Network Operations

Air quality data and instrument performance are evaluated daily. Site visits to the non-continuous samplers are conducted weekly and continuous monitoring sites are visited as needed. Service logs, data and edit records are retained in a historical database.

STN72138 (Hollinger Park) was decommissioned on June 7th, 2017 to accommodate construction activities that the City of Timmins is conducting at the public park. No data are available for 2018 from this location.

During 2018 there were 36 calibrations on the continuous samplers, all of which met criteria. Details are found in Appendix C.

2.3.1 Continuous Data

Data loggers are programmed to continuously scan the outputs from each of the continuous analyzers and process both five minute and hourly data averages. The data loggers have the capability to store several years' worth of data.

An Envitech Envista Air Resource Manager (ARM) application is used to poll the station data loggers and retrieve the collected data on an hourly basis. The data are then verified, quality assured and archived in a central database. The central database is backed up daily for contingency.

2.3.2 Non-continuous Data

TSP and PM_{10} samples are collected on filter media on a 6 day National Air Pollution Surveillance (NAPS) schedule. Gravimetric results (total loading) are calculated and reported for each filter. Metal analyses are conducted on every third TSP filter and every fifth PM_{10} filter. Filters are removed as soon as possible after exposure and submitted to an accredited laboratory for analysis. Laboratory reports are quality assured and submitted to the MECP.

Dustfall data is collected using Dustfall jars on a monthly schedule. At the end of each month the exposed jars are retrieved and submitted for analyses.

Passive SO_2 and NO_2 data are collected on passive filter cartridges on a monthly schedule. At the end of each month, exposed cartridges are retrieved and submitted for analyses.

2.3.3 Quality Assurance

Quality assurance measures are implemented to ensure data integrity. The operation, service and maintenance of the stations and sampling equipment are in accordance with the manufacturers' operations manuals and protocols as outlined in the MECP's 'Operations Manual for Air Quality Monitoring in Ontario', July 2018.

3.0 MECP - AAQCs, Standards and Guidelines

The MECP's AAQCs, standards and guidelines are based on the best scientific information available and are set at a level that safeguards human health and the natural environment. The effects considered may be based on health, odour, vegetation, soiling, visibility, corrosion or other effects. The relevant continuous PM_{10} and Nitrogen Oxides (as NO_2), AAQC and O. Reg 419/05

standards are summarized in Table 3. Non-continuous TSP, PM_{10}, Metals and Total Dustfall AAQCs, standards and guidelines are summarized in Tables 4, 5 and 6. There are no listed AAQCs, standards or guidelines for passive SO_2 / NO_2 monitoring.

Continuous Ambient Air Quality Criteria and Standards - Table 3

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
Particulate Matter < 10µm – PM_{10}	Interim AAQC	24 Hr	Running	50	µg/m^3
Nitrogen Dioxide – NO_2	AAQC	24 Hr	Running	100	ppb
Nitrogen Dioxide – NO_2	AAQC	1 Hr	Running	200	ppb
Nitrogen Dioxide – NO_2	Standard	½ Hr	Running	250	ppb

Non-continuous TSP Ambient Air Quality Criteria and Standards - Table 4

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
TSP	AAQC	24 Hr	Clock	120	µg/m^3
Arsenic (As)	AAQC	24 Hr	Clock	0.3	µg/m^3
Cadmium (Cd)	AAQC	24 Hr	Clock	0.025	µg/m^3
Chromium (Cr)	AAQC	24 Hr	Clock	0.5	µg/m^3
Cobalt (Co)	AAQC	24 Hr	Clock	0.1	µg/m^3
Copper (Cu)	AAQC	24 Hr	Clock	50	µg/m^3
Iron (Fe)	AAQC	24 Hr	Clock	25	µg/m^3
Lead (Pb)	AAQC	24 Hr	Clock	0.5	µg/m^3
Magnesium (Mg)	AAQC	24 Hr	Clock	120	µg/m^3
Manganese (Mn)	AAQC	24 Hr	Clock	0.4	µg/m^3
Nickel (Ni)	AAQC	24 Hr	Clock	0.2	µg/m^3
Selenium (Se)	AAQC	24 Hr	Clock	10	µg/m^3
Vanadium (V)	AAQC	24 Hr	Clock	2	µg/m^3
Zinc (Zn)	AAQC	24 Hr	Clock	120	µg/m^3

Non-continuous TSP Ambient Air Quality Criteria and Standards - Table 4 (cont.)

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
Copper (Cu)	Standard	24 Hr	Clock	50	µg/m^3
Iron (Fe)	Standard	24 Hr	Clock	25	µg/m^3
Lead (Pb)	Standard	24 Hr	Clock	0.5	µg/m^3
Magnesium (Mg)	Standard	24 Hr	Clock	120	µg/m^3
Manganese (Mn)	Standard	24 Hr	Clock	0.4	µg/m^3
Nickel (Ni)	Standard	24 Hr	Clock	2	µg/m^3
Vanadium (V)	Standard	24 Hr	Clock	2	µg/m^3
Zinc (Zn)	Standard	24 Hr	Clock	120	µg/m^3
Arsenic (As)	Guideline	24 Hr	Clock	0.3	µg/m^3
Chromium (Cr)	Guideline	24 Hr	Clock	1.5	µg/m^3
Cobalt (Co)	Guideline	24 Hr	Clock	0.1	µg/m^3
Manganese (Mn)	Guideline	24 Hr	Clock	2.5	µg/m^3
Selenium (Se)	Guideline	24 Hr	Clock	10	µg/m^3

Non-continuous PM_{10} Ambient Air Quality Criteria - Table 5

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
PM_{10}	Interim AAQC	24 Hr	Clock	50	µg/m^3
Manganese (Mn)	AAQC	24 Hr	Clock	0.2	µg/m^3
Nickel (Ni)	AAQC	24 Hr	Clock	0.1	µg/m^3

Non-continuous Total Dustfall Standard - Table 6

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
Total Dustfall	Standard	30 days	Clock	7.0	g/m^2/30d

4.0 Continuous Data Statistics

The continuous data statistics are summarized in the accompanying tables and include:

- Maximum 24 hour running average
- Number of exceedances > 24 hour running average
- Number of valid clock hours
- Monthly and annual arithmetic means
- Overall percent valid data
- Maximum ½ hour running averages (NO_2 only)
- Maximum 1 hour running averages (NO_2 only)
- Number of exceedances > ½ hour running average (NO_2 only)
- Number of exceedances > 1 hour running average (NO_2 only)

STN72135 PM_{10} Data Statistics Summary - Table 7

STN72135	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**
	µg/m^3	No.	Hrs	µg/m^3	%
January	25	0	744	8	100.0
February	26	0	672	12	100.0
March	36	0	729	12	98.0
April	47	0	720	17	100.0
May	47	0	735	17	98.8
June	36	0	719	14	99.9
July	48	0	741	19	99.6
August	70	1	742	18	99.7
September	20	0	720	8	100.0
October	20	0	739	7	99.3
November	45	0	720	11	100.0
December	19	0	737	8	99.1
Totals		1	8718		
Annual Mean				12	99.5

STN72138 PM_{10} Data Statistics Summary - Table 8

STN72138	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**
	µg/m^3	No.	Hrs	µg/m^3	%
January	ins*	n/a*	0	ins*	0.0
February	ins*	n/a*	0	ins*	0.0
March	ins*	n/a*	0	ins*	0.0
April	ins*	n/a*	0	ins*	0.0
May	ins*	n/a*	0	ins*	0.0
June	ins*	n/a*	0	ins*	0.0
July	ins*	n/a*	0	ins*	0.0
August	ins*	n/a*	0	ins*	0.0
September	ins*	n/a*	0	ins*	0.0
October	ins*	n/a*	0	ins*	0.0
November	ins*	n/a*	0	ins*	0.0
December	ins*	n/a*	0	ins*	0.0
Totals		n/a*	0		
Annual Mean				ins*	0.0

ins* - insufficient data to calculate mean. n/a* - not applicable.

STN72139 PM_{10} Data Statistics Summary - Table 9

STN72139	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**
	µg/m^3	No.	Hrs	µg/m^3	%
January	28	0	744	12	100.0
February	40	0	672	17	100.0
March	42	0	744	15	100.0
April	63	2	720	26	100.0
May	75	5	744	31	100.0
June	60	1	711	22	98.8
July	73	2	743	27	99.9
August	62	4	695	27	93.4
September	43	0	720	18	100.0
October	39	0	738	13	99.2
November	47	0	713	14	99.0
December	32	0	726	11	97.6
Totals		14	8670		
Annual Mean				19	99.0

STN72140 PM_{10} Data Statistics Summary - Table 10

STN72140	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**
	µg/m^3	No.	Hrs	µg/m^3	%
January	21	0	741	8	99.6
February	17	0	672	7	100.0
March	79	1	673	16	90.5
April	93	2	720	21	100.0
May	36	0	744	14	100.0
June	22	0	718	13	99.7
July	46	0	743	15	99.9
August	35	0	742	17	99.7
September	20	0	720	9	100.0
October	10	0	733	4	98.5
November	42	0	710	9	98.6
December	23	0	742	9	99.7
Totals		3	8658		
Annual Mean				12	98.9

STN72141 PM_{10} Data Statistics Summary - Table 11

STN72141	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**	**PM_{10}**
	µg/m^3	No.	Hrs	µg/m^3	%
January	15	0	740	6	99.5
February	15	0	672	7	100.0
March	88	1	744	11	100.0
April	174	1	720	17	100.0
May	39	0	744	11	100.0
June	29	0	719	10	99.9
July	38	0	742	11	99.7
August	29	0	738	12	99.2
September	18	0	720	7	100.0
October	16	0	740	3	99.5
November	24	0	711	5	98.8
December	24	0	744	6	100.0
Totals		2	8734		
Annual Mean				9	99.7

STN72135 NO_2 Data Statistics Summary - Table 12

STN72135	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	14	40	41	0	0	0	743	5	99.9
February	17	44	46	0	0	0	671	7	99.9
March	12	36	37	0	0	0	742	3	99.7
April	15	42	42	0	0	0	718	5	99.7
May	11	39	40	0	0	0	729	5	98.0
June	14	44	45	0	0	0	621	5	86.3
July	6	21	23	0	0	0	677	3	91.0
August	9	24	27	0	0	0	714	3	96.0
September	7	25	25	0	0	0	719	3	99.9
October	10	29	31	0	0	0	739	4	99.3
November	12	29	31	0	0	0	718	4	99.7
December	14	37	40	0	0	0	743	5	99.9
Totals				0	0	0	8534		
Annual Mean								4	97.4

STN72138 NO_2 Data Statistics Summary - Table 13

STN72138	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
February	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
March	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
April	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
May	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
June	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
July	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
August	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
September	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
October	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
November	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
December	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
Totals				n/a*	n/a*	n/a*	0		
Annual Mean								ins*	0.0

ins* - insufficient data to calculate mean. n/a* - not applicable.

STN72139 NO_2 Data Statistics Summary - Table 14

STN72139	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	17	36	41	0	0	0	743	7	99.9
February	20	44	44	0	0	0	671	9	99.9
March	18	39	42	0	0	0	742	5	99.7
April	20	62	70	0	0	0	719	7	99.9
May	15	40	40	0	0	0	743	6	99.9
June	11	27	31	0	0	0	709	5	98.5
July	10	36	39	0	0	0	742	5	99.7
August	12	27	32	0	0	0	731	5	98.3
September	16	36	38	0	0	0	718	6	99.7
October	11	23	34	0	0	0	741	5	99.6
November	13	28	32	0	0	0	717	5	99.6
December	17	42	47	0	0	0	743	7	99.9
Totals				0	0	0	8719		
Annual Mean								6	99.5

STN72140 NO_2 Data Statistics Summary - Table 15

STN72140	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	17	41	42	0	0	0	740	7	99.5
February	15	53	59	0	0	0	671	6	99.9
March	22	57	57	0	0	0	742	11	99.7
April	17	58	63	0	0	0	719	7	99.9
May	10	39	45	0	0	0	663	5	89.1
June	15	62	67	0	0	0	714	5	99.2
July	6	17	21	0	0	0	739	2	99.3
August	7	21	23	0	0	0	699	2	94.0
September	6	18	21	0	0	0	711	2	98.8
October	7	17	19	0	0	0	584	2	78.5
November	9	33	36	0	0	0	582	3	80.8
December	16	34	43	0	0	0	743	4	99.9
Totals				0	0	0	8307		
Annual Mean								5	94.9

STN72141 NO_2 Data Statistics Summary - Table 16

STN72141	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	**NO_2**	**NO_2**	**NO_2**	**NO_2**	**NO_2**	**NO_2**	**NO_2**	**NO_2**	**NO_2**
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	24	56	57	0	0	0	667	5	89.7
February	23	58	62	0	0	0	669	9	99.6
March	18	79	80	0	0	0	743	4	99.9
April	34	82	91	0	0	0	719	6	99.9
May	21	67	68	0	0	0	741	6	99.6
June	11	36	38	0	0	0	705	4	97.9
July	7	23	23	0	0	0	689	2	92.6
August	7	19	20	0	0	0	737	2	99.1
September	4	14	14	0	0	0	526	ins*	73.1
October	7	19	20	0	0	0	659	2	88.6
November	9	23	26	0	0	0	712	3	98.9
December	15	35	36	0	0	0	743	4	99.9
Totals				0	0	0	8310		
Annual Mean								4	94.9

ins* - insufficient data to calculate mean.

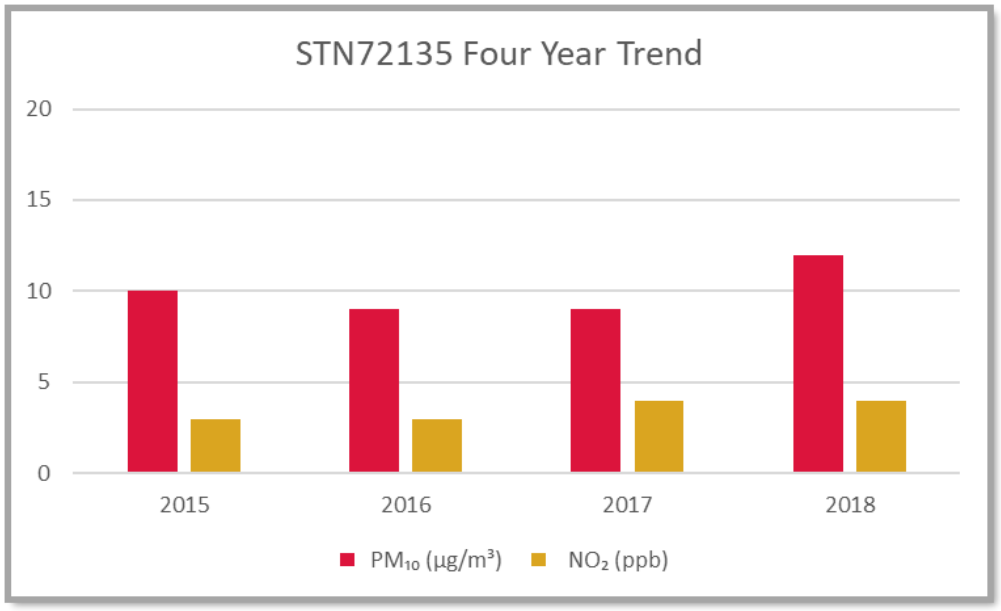
4.1 Year to Year Data Comparison Statistics - Table 17

Station	Pollutant	Units	2015 Annual Mean	2016 Annual Mean	2017 Annual Mean	2018 Annual Mean
STN72135	PM_{10}	$\mu g/m^3$	10	9	9	12
STN72138	PM_{10}	$\mu g/m^3$	14	12	ins*	ins*
STN72139	PM_{10}	$\mu g/m^3$	16	16	16	19
STN72140	PM_{10}	$\mu g/m^3$	11	10	11	12
STN72141	PM_{10}	$\mu g/m^3$	7	10	8	9
STN72135	NO_2	ppb	3	3	4	4
STN72138	NO_2	ppb	4	3	ins*	ins*
STN72139	NO_2	ppb	5	5	7	6
STN72140	NO_2	ppb	3	4	5	5
STN72141	NO_2	ppb	2	3	4	4

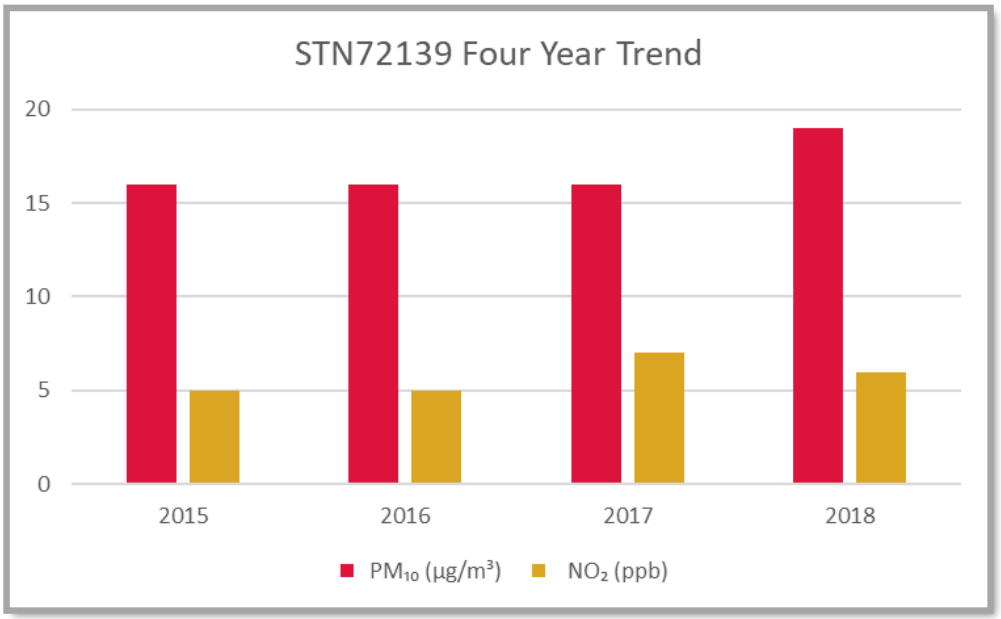
ins* - insufficient data to calculate mean.

Table 17 represents the four year trend of the network annual mean concentrations. Figures 2 through 5 graphically illustrate annual trends for both PM_{10} and NO_2.

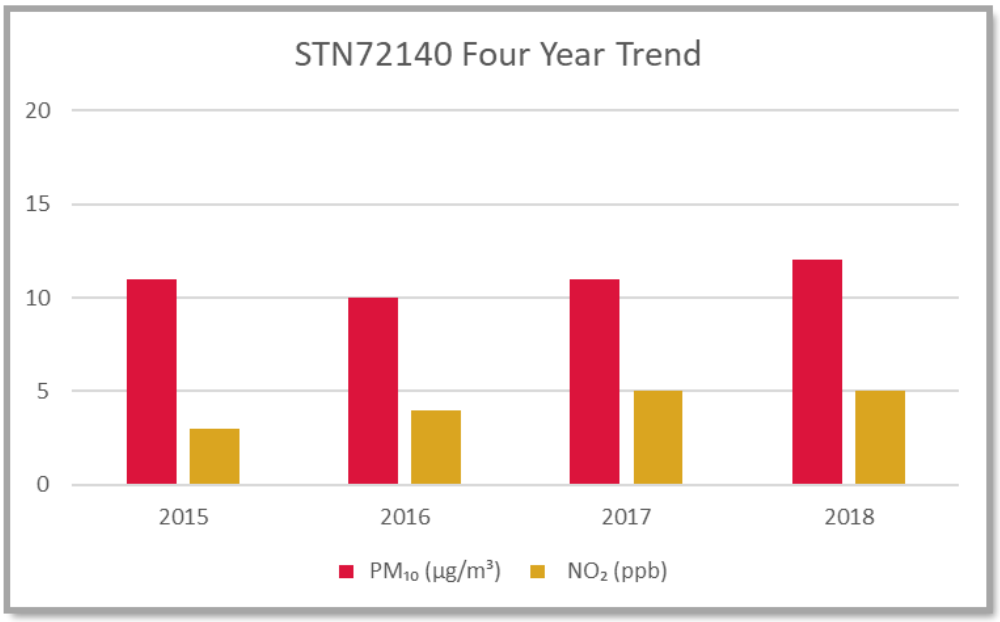
STN72135 PM_{10} and NO_2 Four Year Annual Average Trend - Figure 2



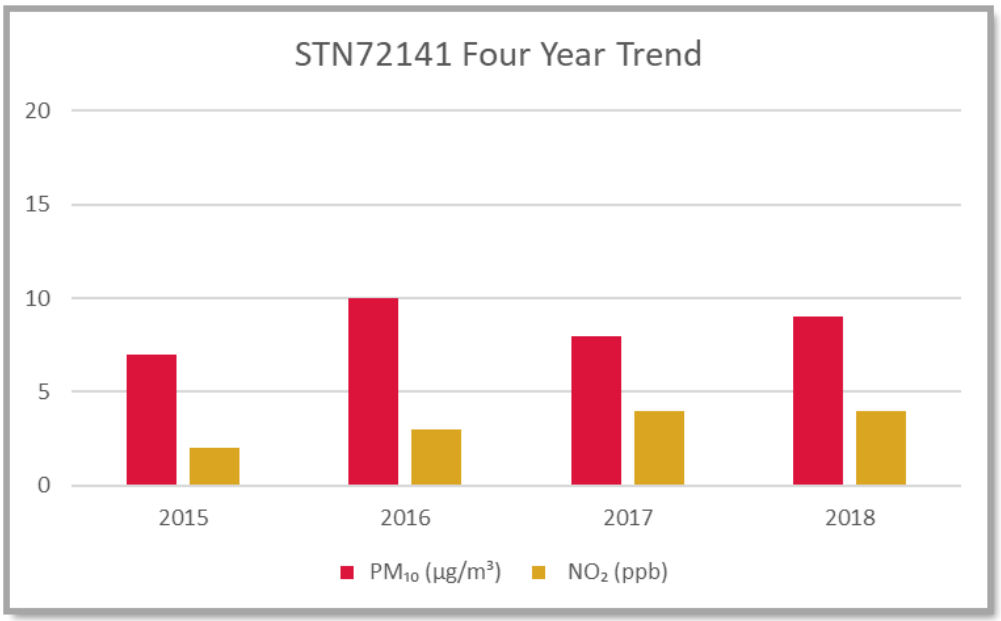
STN72139 PM_{10} and NO_2 Four Year Annual Average Trend - Figure 3



STN72140 PM_{10} and NO_2 Four Year Annual Average Trend - Figure 4



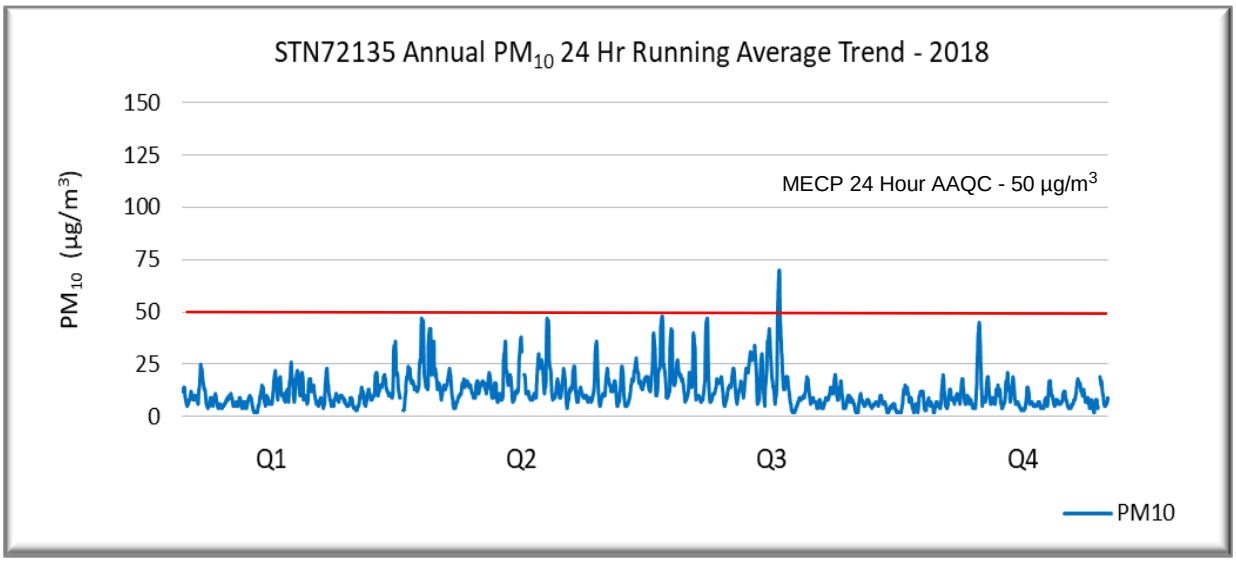
STN72141 PM_{10} and NO_2 Four Year Annual Average Trend - Figure 5



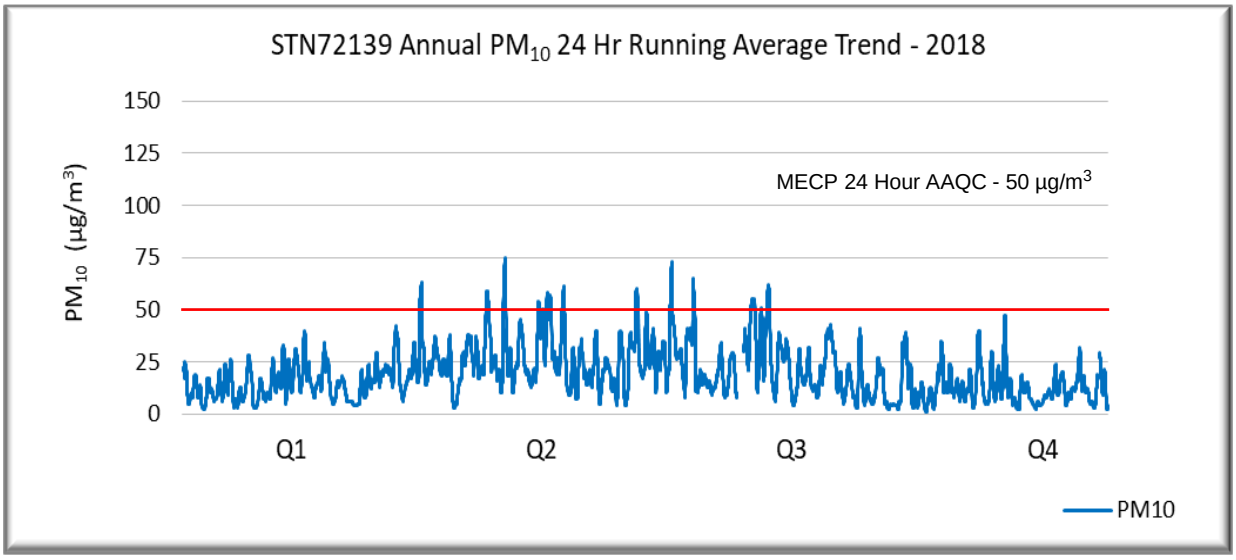
4.2 Continuous PM_{10} 24 Hr Running Average Trends

Figures 6 through 9 illustrate annual 24 hour running average trends for PM_{10}. The Hollinger Park site (STN72138) remains decommissioned and there are no data to report.

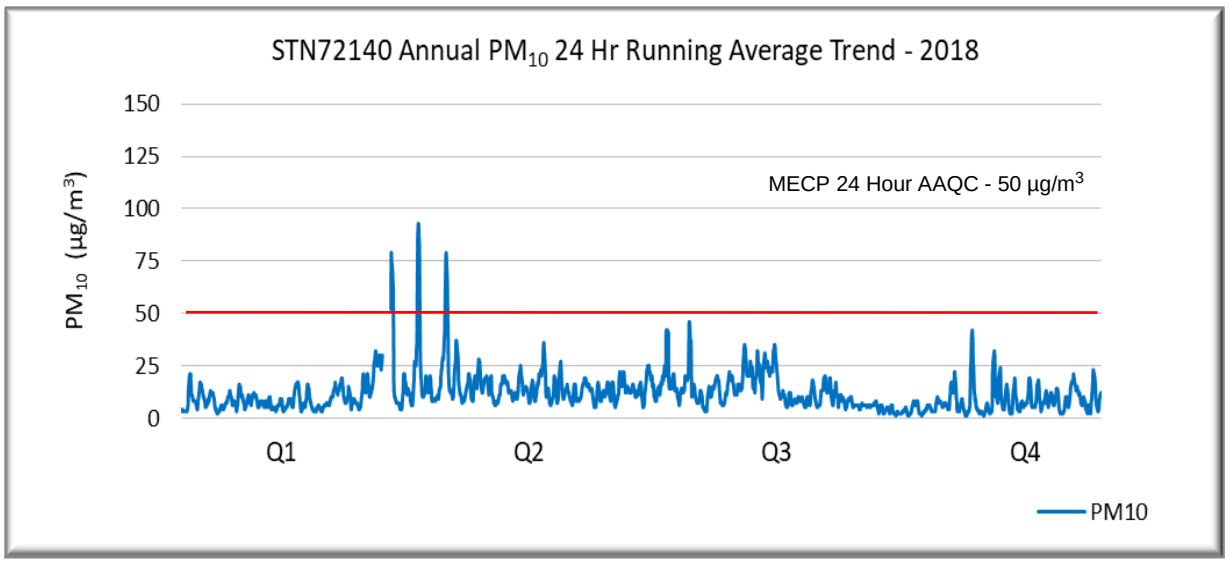
STN72135 PM_{10} 24 Hr Running Average Trend - Figure 6



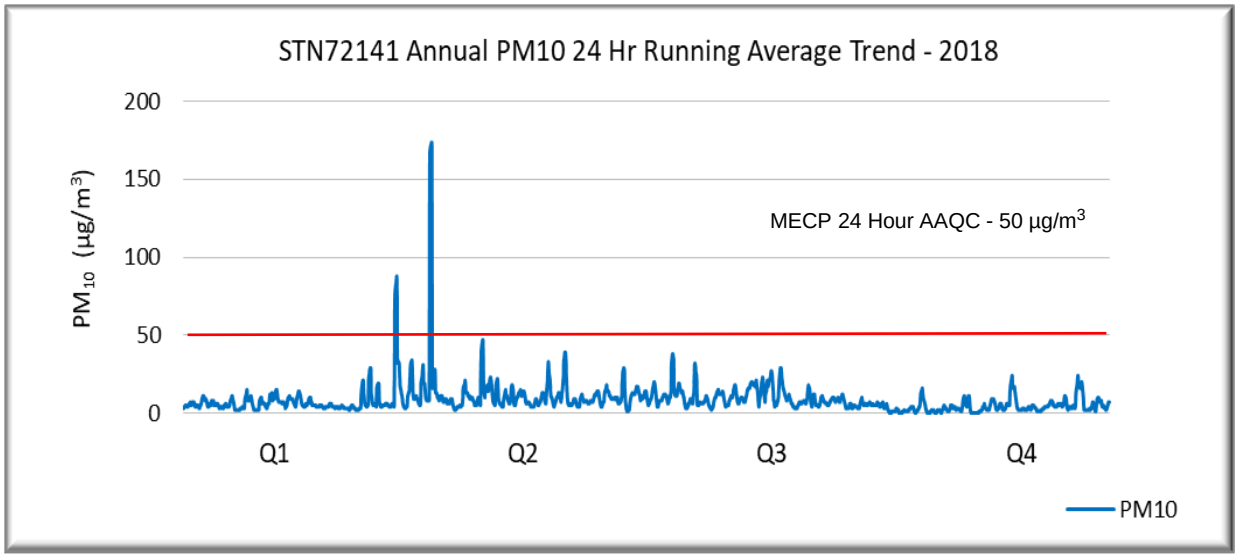
STN72139 PM_{10} 24 Hr Running Average Trend - Figure 7



STN72140 PM_{10} 24 Hr Running Average Trend - Figure 8



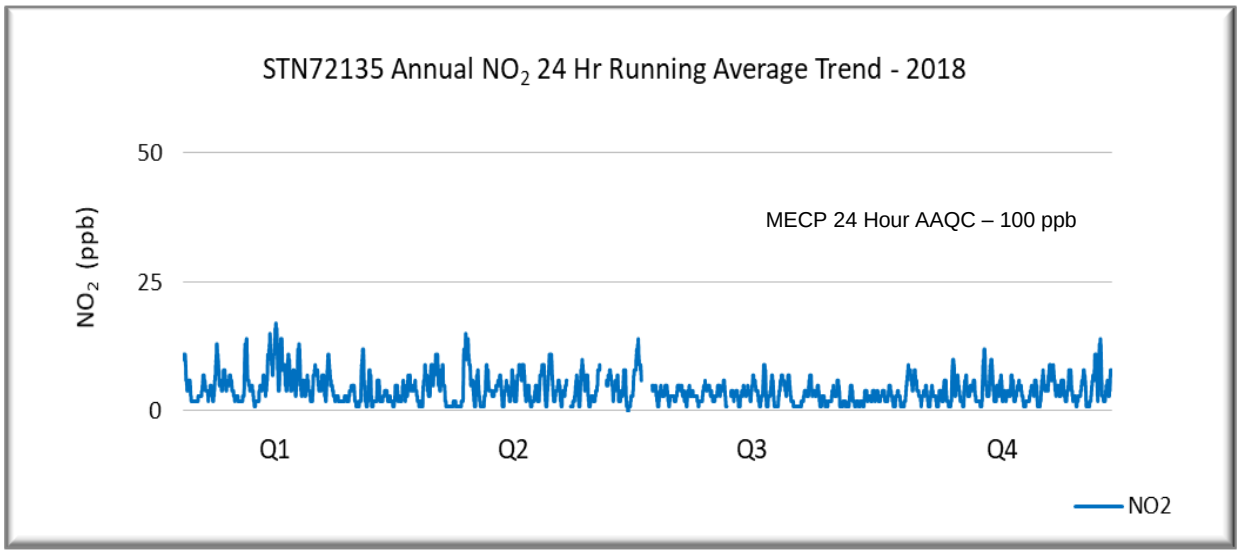
STN72141 PM_{10} 24 Hr Running Average Trend - Figure 9



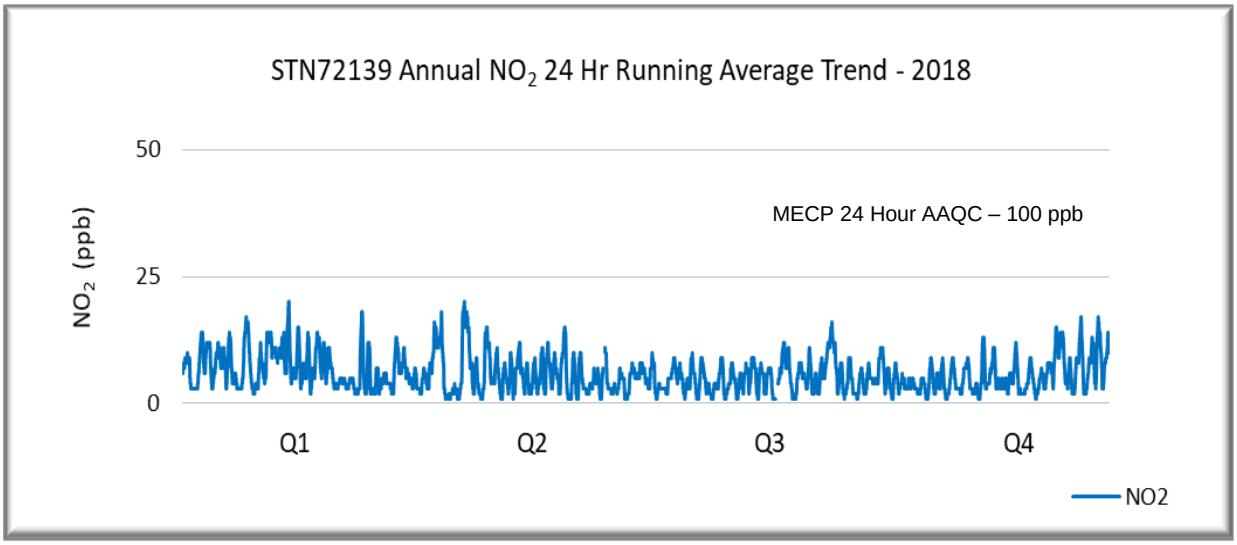
4.3 Continuous NO_2 24 Hr Running Average Trends

Figures 10 through 13 illustrate annual 24 hour running average trends for NO_2. The Hollinger Park site (STN72138) remains decommissioned and there are no data to report.

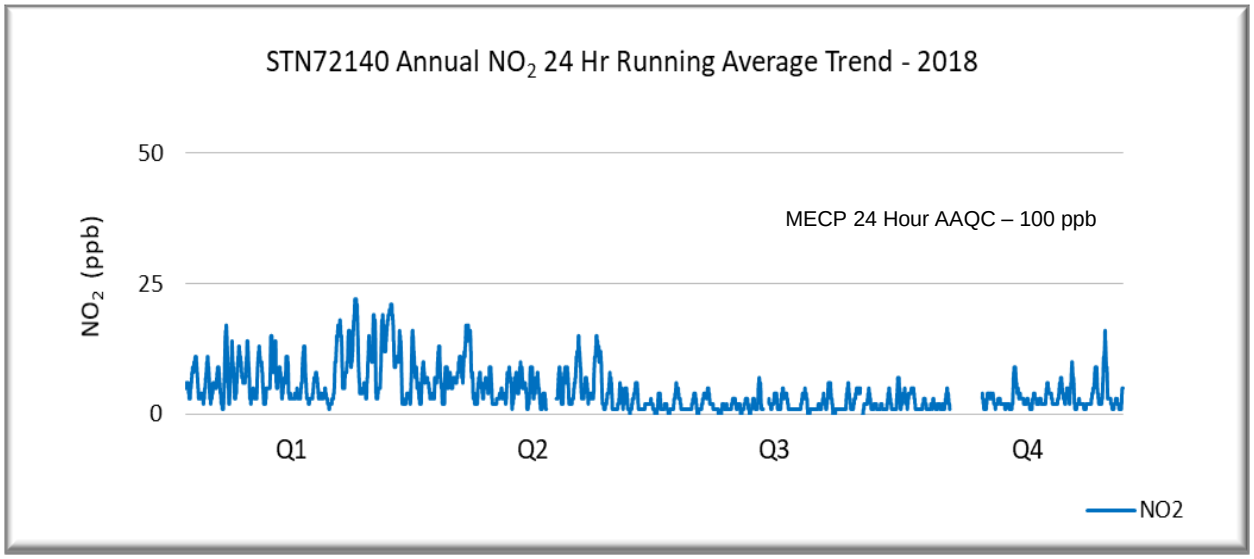
STN72135 NO_2 24 Hr Running Average Trend - Figure 10



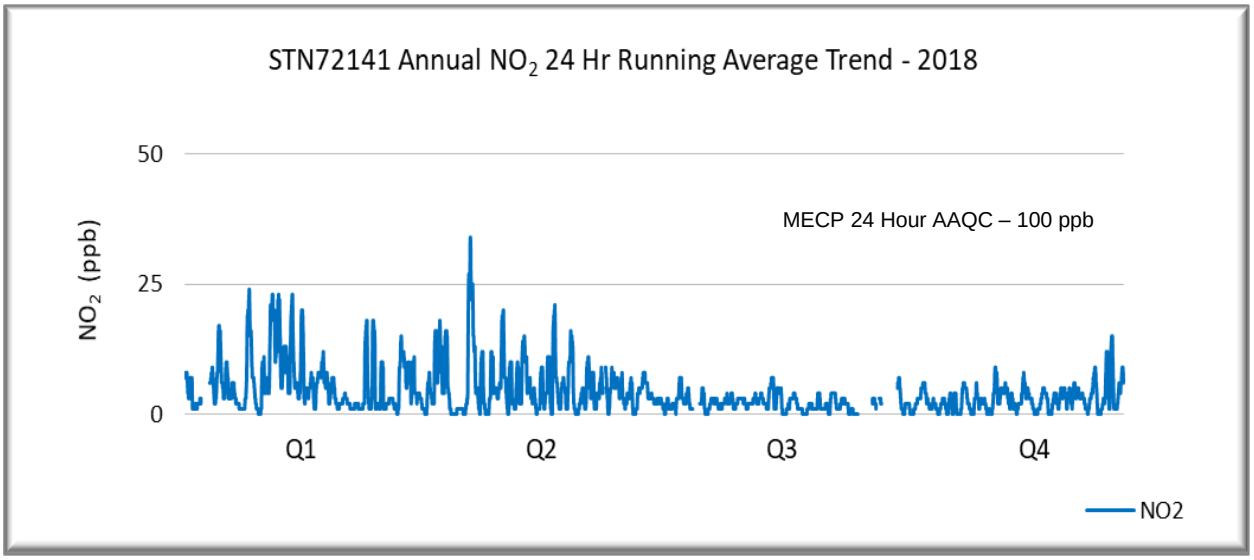
STN72139 NO_2 24 Hr Running Average Trend - Figure 11



STN72140 NO_2 24 Hr Running Average Trend - Figure 12



STN72141 NO_2 24 Hr Running Average Trend - Figure 13



5.0 Non-continuous Data Statistics

Non-continuous TSP, PM_{10} and suspended metal data statistics have been summarized in Tables 18 and 19 and include:

- Reportable Detection Limit (RDL)
- Annual Maximum 24 hour clock value
- Annual Average 24 hour clock arithmetic mean

Geometric means and additional information on non-continuous data can be found in Appendix B.

For statistic trending and as per MECP guidelines, non-detect results are reported as half of the Reportable Detection Limit for all non-continuous parameters.

Non-continuous TSP Data Summary - Table 18

Station		STN72135 Extendicare		STN72136 MRCA		STN72137 Shania Twain	
Parameter	RDL µg/m³	Annual Max µg/m³	Annual Avg µg/m³	Annual Max µg/m³	Annual Avg µg/m³	Annual Max µg/m³	Annual Avg µg/m³
TSP	3	141	36	121	38	139	32
Arsenic	0.0037	0.0062	0.0021	0.0019	0.0019	0.0041	0.0020
Cadmium	0.0012	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Chromium	0.0031	0.0239	0.0045	0.0205	0.0039	0.0116	0.0032
Cobalt	0.0012	0.0047	0.0011	0.0026	0.0008	0.0028	0.0008
Copper	0.0031	0.1660	0.0847	0.2470	0.0585	0.2150	0.0664
Iron	0.0310	8.0300	1.6345	4.4700	1.0406	4.1000	0.9902
Lead	0.0018	0.0179	0.0033	0.0161	0.0037	0.1110	0.0085
Magnesium	0.0310	2.9800	0.6351	2.4900	0.5163	1.7400	0.4300
Manganese	0.00061	0.1540	0.0340	0.0900	0.0214	0.0887	0.0201
Nickel	0.0018	0.0139	0.0030	0.0110	0.0027	0.0067	0.0023
Selenium	0.0061	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031
Sulphur	0.0150	1.8600	0.3278	0.6260	0.2492	0.5800	0.2271
Vanadium	0.0031	0.0144	0.0032	0.0078	0.0021	0.0054	0.0020
Zinc	0.0031	0.0333	0.0157	0.0442	0.0176	0.0288	0.0149
Sulphate	0.0500	5.5800	0.9835	1.8800	0.7480	1.7400	0.6810

Non-continuous PM_{10} Data Summary - Table 19

Station		STN72135 Extendicare		STN72136 MRCA		STN72137 Shania Twain	
Parameter	RDL µg/m³	Annual Max µg/m³	Annual Avg µg/m³	Annual Max µg/m³	Annual Avg µg/m³	Annual Max µg/m³	Annual Avg µg/m³
PM_{10}	3	49	16	80	24	46	16
Arsenic	0.0037	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
Cadmium	0.0012	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Chromium	0.0031	0.0058	0.0021	0.0067	0.0026	0.0092	0.0029
Cobalt	0.0012	0.0014	0.0007	0.0006	0.0006	0.0006	0.0006
Copper	0.0031	0.0565	0.0198	0.0699	0.0294	0.0468	0.0206
Iron	0.0310	1.9600	0.4904	1.8000	0.6769	2.1600	0.5393
Lead	0.0018	0.0062	0.0027	0.0155	0.0038	0.0262	0.0043
Magnesium	0.0310	0.8140	0.1973	0.9430	0.3092	0.8420	0.2228
Manganese	0.0006	0.0393	0.0101	0.0349	0.0143	0.0534	0.0116
Nickel	0.0018	0.0042	0.0015	0.0043	0.0022	0.0050	0.0016
Selenium	0.0061	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031
Sulphur	0.0150	0.4490	0.2424	0.7490	0.3079	0.4520	0.2485
Vanadium	0.0031	0.0016	0.0016	0.0016	0.0016	0.0044	0.0018
Zinc	0.0031	0.0178	0.0098	0.0255	0.0149	0.0222	0.0110
Sulphate	0.0500	1.3400	0.7254	2.2400	0.9225	1.3600	0.7446

Non-continuous Total Dustfall and Passive SO_2 / NO_2 data statistics have been summarized in Tables 20 and 21.

Non-continuous Total Dustfall Data Summary - Table 20

Month	STN72135 Extendicare	STN72136 MRCA	STN72137 Shania Twain	STN72141 Claimpost	STN72142 Aura Lake	STN72143 Snowmobile Crossing
	g/m^2/30d	g/m^2/30d	g/m^2/30d	g/m^2/30d	g/m^2/30d	g/m^2/30d
January	1.10	0.86	0.65	1.20	0.86	3.80
February	2.30	0.82	0.57	1.50	1.00	13.00
March	1.30	0.78	7.80	4.10	1.40	14.00
April	2.50	1.30	2.20	6.50	2.70	24.00
May	3.50	3.80	3.00	5.70	11.00	36.00
June	4.60	3.30	2.20	3.00	2.20	35.00
July	3.50	2.70	4.60	4.50	2.70	58.00
August	3.50	2.40	2.10	4.10	2.60	48.00
September	1.50	2.00	1.20	2.80	2.00	29.00
October	1.60	1.40	1.70	2.60	1.50	25.00
November	1.60	0.78	0.61	2.10	0.83	17.00
December	1.50	1.30	0.95	1.30	0.80	6.20

Non-continuous Passive SO_2 / NO_2 Data Summary - Table 21

Month	STN72135 Extendicare	STN72136 MRCA	STN72137 Shania Twain	STN72135 Extendicare	STN72136 MRCA	STN72137 Shania Twain
	SO_2	SO_2	SO_2	NO_2	NO_2	NO_2
	ppb	ppb	ppb	ppb	ppb	ppb
January	0.30	0.60	0.40	3.10	0.05	0.05
February	0.20	0.40	0.20	3.70	2.70	2.00
March	0.20	0.30	0.30	0.80	1.40	1.50
April	0.05	0.05	0.10	1.30	0.90	1.00
May	0.05	0.05	0.05	1.50	1.60	1.20
June	0.10	0.05	0.05	1.80	1.00	0.70
July	0.70	0.50	0.30	1.50	1.00	0.70
August	0.10	0.20	0.30	1.90	1.00	0.90
September	0.10	0.10	0.05	1.70	1.60	0.90
October	0.05	0.05	0.05	2.50	2.00	1.80
November	0.20	0.30	0.20	2.20	2.70	2.50
December	0.10	0.10	0.10	2.90	5.10	2.00

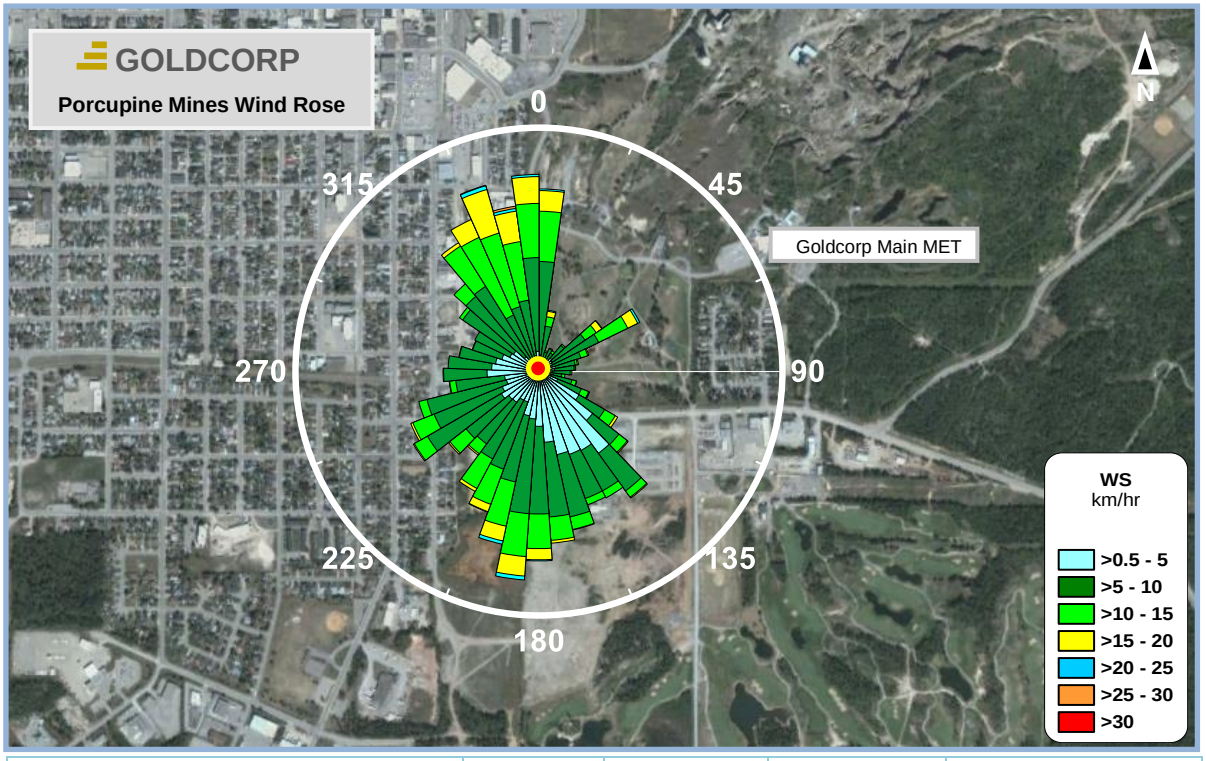
6.0 Wind Frequency Distribution

To illustrate wind frequency distribution information, distributions of wind speeds, and the frequency of the varying wind directions, we have included a wind rose graphic superimposed on an aerial view of the Goldcorp mine property.

Wind roses summarize the occurrence of winds at a location, showing their strength, direction and frequency. Each branch of the rose represents wind coming from that direction, with north to the top of the graphic. The branches are divided into segments of different colours, which represent wind speed ranges from that direction. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

The majority and magnitude of branches in the 2018 wind rose below indicate predominant wind directions out of the southeast to southwest sector and from north to northwest (these branches represent the plot data when the wind was blowing from this vector). Table 22 summarizes the wind frequency distribution in tabular format.

Wind Frequency Distribution - Wind Rose - Figure 14



Wind Rose – Annual, 2018 Meteorological Station		By : JP	**Figure 14**	ROTEK
	True North	Approx. Scale :	1:19000	
Goldcorp - Porcupine Gold Mines - Timmins, Ontario		Date Revised :	28 Mar, 2019	

Wind Frequency Distribution - Table 22

Wind Speed Class	0.5 - 5	6 - 10	11 - 15	16 - 20	21 - 25	26 - 30	> 30	All
	km/hr	km/hr	km/hr	km/hr	km/hr	km/hr	km/hr	
Wind Direction	%	%	%	%	%	%	%	%
N	1.66	6.78	4.80	2.48	0.23	0.06	0.00	16.01
NE	1.49	3.13	1.10	0.38	0.06	0.00	0.00	6.16
E	1.58	2.30	0.37	0.05	0.01	0.00	0.00	4.31
SE	7.88	4.39	1.01	0.11	0.01	0.00	0.00	13.40
S	7.00	8.71	3.52	1.06	0.17	0.00	0.00	20.46
SW	4.32	7.71	2.70	0.31	0.01	0.00	0.00	15.05
W	5.02	5.67	0.34	0.01	0.00	0.00	0.00	11.04
NW	2.47	6.97	3.49	0.64	0.01	0.00	0.00	13.58
All	31.42	45.66	17.33	5.04	0.50	0.06	0.00	100.00

7.0 Valid Data Percentages

Overall, the percentage of continuous valid pollutant data recovery was 98.0% for 2018, exceeding the Ministry's minimum target of 90% and desirable target of 95%. The overall percentage of non-continuous valid pollutant data recovery was 99.1%.

7.1 Invalid Data Summary

Data are reported in Eastern Standard Time (EST) time beginning. In this format, a value reported at 10:00 Hrs represents the data collected from 10:00 to 11:00 Hrs (EST).

Notwithstanding the minimum 90% valid data performance measure, emitters are to notify (as soon as practical) the MECP of any system or equipment failures resulting in missing data of 24 hours or more in length and of the plans and schedule for repairing the failed system or equipment. Tables 23 and 24 detail problems that resulted in significant data losses along with remedial actions.

Invalid Continuous Data Summary - Table 23

Station	Parameter	Start Date	Start Time EST	End Date	End Time EST	Description	Corrective Action
STN72138	PM_{10}	Jan 01	00:00	Dec 31	23:00	Site Decommissioned	Recommission Site
STN72138	TSP	Jan 01	00:00	Dec 31	23:00	Site Decommissioned	Recommission Site
STN72138	NO, NO_2, NO_X	Jan 01	00:00	Dec 31	23:00	Site Decommissioned	Recommission Site
STN72140	TSP	Jan 03	23:00	Jan 07	12:00	Heater Malfunction	Stabilized Heater
STN72141	TSP	Jan 06	23:00	Jan 09	18:00	Pump Failure	Replaced Pump
STN72141	NO, NO_2, NO_X	Jan 06	23:00	Jan 09	18:00	Pump Failure	Replaced Pump
STN72140	PM_{10}	Mar 21	10:00	Mar 24	08:00	Tape Break	Replaced Tape
STN72140	NO, NO_2, NO_X	May 21	05:00	May 24	12:00	PMT Failure	Installed Spare Unit
STN72135	NO, NO_2, NO_X	May 31	12:00	Jun 01	11:00	Unstable Response	Stabilized Response
STN72135	NO, NO_2, NO_X	Jun 13	10:00	Jun 15	14:00	Unstable Response	Stabilized Response
STN72135	NO, NO_2, NO_X	Jun 29	20:00	Jun 30	23:00	Unstable Response	Stabilized Response
STN72135	NO, NO_2, NO_X	Jul 01	00:00	Jul 03	12:00	Unstable Response	Stabilized Response
STN72141	NO, NO_2, NO_X	Jul 17	06:00	Jul 19	09:00	PMT Failure	Stabilized Response
STN72135	NO, NO_2, NO_X	Aug 02	10:00	Aug 03	11:00	Unstable Response	Stabilized Response
STN72139	PM_{10}	Aug 07	13:00	Aug 09	12:00	Tape Error	Reset Tape
STN72140	NO, NO_2, NO_X	Aug 13	15:00	Aug 15	08:00	Unstable Response	Stabilized Response
STN72141	NO, NO_2, NO_X	Sep 20	07:00	Sep 24	13:00	PMT Failure	Stabilized Response
STN72141	NO, NO_2, NO_X	Sep 28	16:00	Sep 30	23:00	PMT Failure	Repaired PMT
STN72141	NO, NO_2, NO_X	Oct 01	00:00	Oct 04	08:00	PMT Failure	Repaired PMT
STN72140	NO, NO_2, NO_X	Oct 25	12:00	Nov 06	10:00	Flow Leak	Repaired Leak

STN72138 (Hollinger Park) remained decommissioned in 2018.

Invalid Non-continuous Data Summary - Table 24

Station	Parameter	Start Date	Start Time EST	End Date	End Time EST	Description	Corrective Action
STN72137	PM_{10}	Apr 20	00:00	Apr 20	23:00	Motor Failure	Replaced Motor
STN72135	TSP	Dec 28	00:00	Dec 28	23:00	Filter Issue	Non-recoverable
STN72135	PM_{10}	Dec 28	00:00	Dec 28	23:00	Filter Issue	Non-recoverable
STN72136	TSP	Dec 28	00:00	Dec 28	23:00	Filter Issue	Non-recoverable
STN72136	PM_{10}	Dec 28	00:00	Dec 28	23:00	Filter Issue	Non-recoverable
STN72137	TSP	Dec 28	00:00	Dec 28	23:00	Filter Issue	Non-recoverable
STN72137	PM_{10}	Dec 28	00:00	Dec 28	23:00	Filter Issue	Non-recoverable

8.0 Data Editing

A data validation process to filter out erroneous data is critical to maximize data integrity. Validation can be done using automated or manual procedures. Regardless of the process followed, judgment to accept or reject suspicious or unusual data is required. Many factors need to be considered during this process by qualified staff with an understanding of local pollutant and climatic conditions as well as knowledge of air monitoring principles and analyzer behaviour.

Data edit logs are submitted with each quarterly report and are retained in a historical data base at Rotek Environmental Inc.

9.0 Exceedance Summary

This report summarizes the continuous and non-continuous monitoring results according to MECP reporting requirements. The continuous and non-continuous data sets are provided in separate appendices to this report.

When reporting the number of continuous exceedances, there may be multiple consecutive running averages that exceed the AAQC or standard. If the consecutive averages occur within a single clock based averaging period, they are to be reported as a single exceedance. If they are spread across 2 clock based averaging periods and more than 24 consecutive hours, they are to be reported as 2 exceedances. The exceedance value reported is the highest recorded value during the exceedance episode.

A 24 hour clock average is defined as the midnight to midnight average. A 24 hour running average is the average of the current hour and the preceding 23 hours.

<u>During 2018 there were</u>:

a) No exceedances of the continuous NO_2 24 hour and 1 hour running average AAQCs or of the ½ hour running average O.Reg 419/05 standard.

b) 20 exceedances of the continuous PM_{10} 24 hour running average AAQC, 1 at STN72135, 14 at STN72139, 3 at STN72140 and 2 at STN72141.

c) 3 exceedances of the non-continuous 24 hour clock TSP AAQC, 1 at STN72135, 1 at STN72136 and 1 at STN72137.

d) 5 exceedances of the non-continuous 24 hour clock PM_{10} AAQC at STN72136.

e) No exceedances of the non-continuous 24 hour clock TSP or PM_{10} Suspended Metals AAQCs, standards or guidelines.

f) 12 exceedances of the non-continuous 30 day standard for Total Dustfall, 1 at STN72137, 1 at STN72142, and 10 at STN72143.

Continuous exceedances are summarized in Table 25. Non-continuous exceedances are summarized in Table 26. Not all exceedances can be attributed to the Hollinger Open Pit (HOP) operations**.** Exceedances potentially associated with HOP operations are listed in Table 27.

Table 25 is a summary of the continuous exceedances which are graphically illustrated in Figures 15 to 34. Exceedances are calculated based on 24 hour running averages while pollution roses are generated using hourly values. For this reason, dates identified on the referenced pollution roses may not always correspond to the exceedance start and end dates listed below.

Continuous Parameter Exceedance Summary - Table 25

Station	Parameter	Criterion Exceeded	Exceedance Count	Start Date	Start Time	End Date	End Time	Exceedance Value	Figure Reference
STN72140	PM_{10}	24 Hr Interim AAQC	1	Mar 25	02:00	Mar 26	01:00	79 µg/m^3	15
STN72141	PM_{10}	24 Hr Interim AAQC	1	Mar 25	05:00	Mar 26	04:00	88 µg/m^3	16
STN72140	PM_{10}	24 Hr Interim AAQC	1	Apr 04	12:00	Apr 05	13:00	93 µg/m^3	17
STN72139	PM_{10}	24 Hr Interim AAQC	1	Apr 04	16:00	Apr 05	11:00	63 µg/m^3	18
STN72141	PM_{10}	24 Hr Interim AAQC	1	Apr 07	22:00	Apr 08	23:00	174 µg/m^3	19
STN72140	PM_{10}	24 Hr Interim AAQC	1	Apr 15	13:00	Apr 16	14:00	79 µg/m^3	20
STN72139	PM_{10}	24 Hr Interim AAQC	1	Apr 30	20:00	May 01	21:00	59 µg/m^3	21
STN72139	PM_{10}	24 Hr Interim AAQC	1	May 07	14:00	May 08	13:00	75 µg/m^3	22
STN72139	PM_{10}	24 Hr Interim AAQC	1	May 21	06:00	May 21	15:00	54 µg/m^3	23
STN72139	PM_{10}	24 Hr Interim AAQC	1	May 24	16:00	May 25	07:00	58 µg/m^3	24
STN72139	PM_{10}	24 Hr Interim AAQC	1	May 25	16:00	May 26	10:00	57 µg/m^3	25
STN72139	PM_{10}	24 Hr Interim AAQC	1	May 30	23:00	May 31	15:00	61 µg/m^3	26
STN72139	PM_{10}	24 Hr Interim AAQC	1	Jun 28	22:00	Jun 29	20:00	60 µg/m^3	27
STN72139	PM_{10}	24 Hr Interim AAQC	1	Jul 12	08:00	Jul 13	06:00	73 µg/m^3	28
STN72139	PM_{10}	24 Hr Interim AAQC	1	Jul 21	08:00	Jul 21	22:00	65 µg/m^3	29
STN72139	PM_{10}	24 Hr Interim AAQC	1	Aug 13	06:00	Aug 14	03:00	55 µg/m^3	30
STN72139	PM_{10}	24 Hr Interim AAQC	1	Aug 14	10:00	Aug 14	18:00	55 µg/m^3	31
STN72139	PM_{10}	24 Hr Interim AAQC	1	Aug 17	06:00	Aug 17	10:00	51 µg/m^3	32
STN72139	PM_{10}	24 Hr Interim AAQC	1	Aug 19	12:00	Aug 20	14:00	62 µg/m^3	33
STN72135	PM_{10}	24 Hr Interim AAQC	1	Aug 23	19:00	Aug 24	16:00	70 µg/m^3	34

Table 26 is a summary of non-continuous exceedances. Non-continuous exceedances cannot be graphically illustrated by a pollution rose since the exceedance values consist of only a single data point.

Non-continuous Parameter Exceedance Summary - Table 26

Station	Parameter	Criterion Exceeded	Exceedance Count	Start Date	Start Time	End Date	End Time	Exceedance Value
STN72143	Total Dustfall	30 Day Standard	1	Feb 01	00:00	Feb 28	23:00	13.0 g/m^2/30d
STN72137	Total Dustfall	30 Day Standard	1	Mar 01	00:00	Mar 31	23:00	7.8 g/m^2/30d
STN72143	Total Dustfall	30 Day Standard	1	Mar 01	00:00	Mar 31	23:00	14.0 g/m^2/30d
STN72136	PM_{10}	24 Hr Interim AAQC	1	Mar 27	00:00	Mar 27	23:00	60 µg/m^3
STN72143	Total Dustfall	30 Day Standard	1	Apr 01	00:00	Apr 30	23:00	24.0 g/m^2/30d
STN72135	TSP	24 Hr Clock AAQC	1	Apr 08	00:00	Apr 08	23:00	141 µg/m^3
STN72137	TSP	24 Hr Clock AAQC	1	Apr 14	00:00	Apr 14	23:00	139 µg/m^3
STN72136	TSP	24 Hr Clock AAQC	1	Apr 26	00:00	Apr 26	23:00	121 µg/m^3
STN72136	PM_{10}	24 Hr Interim AAQC	1	Apr 26	00:00	Apr 26	23:00	80 µg/m^3
STN72142	Total Dustfall	30 Day Standard	1	May 01	00:00	May 31	23:00	11.0 g/m^2/30d
STN72143	Total Dustfall	30 Day Standard	1	May 01	00:00	May 31	23:00	36.0 g/m^2/30d
STN72136	PM_{10}	24 Hr Interim AAQC	1	May 14	00:00	May 14	23:00	63 µg/m^3
STN72143	Total Dustfall	30 Day Standard	1	Jun 01	00:00	Jun 30	23:00	35.0 g/m^2/30d
STN72136	PM_{10}	24 Hr Interim AAQC	1	Jun 25	00:00	Jun 25	23:00	55 µg/m^3
STN72143	Total Dustfall	30 Day Standard	1	Jul 01	00:00	Jul 31	23:00	58.0 g/m^2/30d
STN72143	Total Dustfall	30 Day Standard	1	Aug 01	00:00	Aug 31	23:00	48.0 g/m^2/30d
STN72136	PM_{10}	24 Hr Interim AAQC	1	Aug 24	00:00	Aug 24	23:00	70 µg/m^3
STN72143	Total Dustfall	30 Day Standard	1	Sep 01	00:00	Sep 30	23:00	29.0 g/m^2/30d
STN72143	Total Dustfall	30 Day Standard	1	Oct 01	00:00	Oct 31	23:00	25.0 g/m^2/30d
STN72143	Total Dustfall	30 Day Standard	1	Nov 01	00:00	Nov 30	23:00	17.0 g/m^2/30d

Source Contribution Assessment of Exceedances - Table 27

Station	Parameter	Criterion Exceeded	Date	Exceedance Value	Potential Cause / Comments
STN72143	Total Dustfall	30 Day Standard	Feb 01	13.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72137	Total Dustfall	30 Day Standard	Mar 01	7.8 g/m^2/30d	Offsite roads, parking lots and possibly HOP operations.
STN72143	Total Dustfall	30 Day Standard	Mar 01	14.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72140	PM_{10}	24 Hr Interim AAQC	Mar 25	79 µg/m^3	Offsite sources, all stations showed an increase in dust levels, winds were from the south towards HOP operations.
STN72141	PM_{10}	24 Hr Interim AAQC	Mar 25	88 µg/m^3	Offsite sources and possibly HOP operations, all stations showed an increase in dust levels.
STN72136	PM_{10}	24 Hr Interim AAQC	Mar 27	60 µg/m^3	Offsite sources, all stations showed an increase in dust levels, HOP is typically not the cause due to distance from the station.
STN72143	Total Dustfall	30 Day Standard	Apr 01	24.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Apr 04	63 µg/m^3	Offsite roads, parking lots and possible HOP operations. Strong winds during this occurrence.
STN72140	PM_{10}	24 Hr Interim AAQC	Apr 04	93 µg/m^3	Un-vegetated control berm, offsite roads and HOP operations. Strong winds during this occurrence.
STN72141	PM_{10}	24 Hr Interim AAQC	Apr 07	174 µg/m^3	Offsite roads and possible contribution from Hollinger Haul Road operations.
STN72135	TSP	24 Hr Clock AAQC	Apr 08	141 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72137	TSP	24 Hr Clock AAQC	Apr 14	139 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72140	PM_{10}	24 Hr Interim AAQC	Apr 15	79 µg/m^3	Un-vegetated control berm, offsite roads and HOP operations.
STN72136	TSP	24 Hr Clock AAQC	Apr 26	121 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72136	PM_{10}	24 Hr Interim AAQC	Apr 26	80 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Apr 30	59 µg/m^3	Offsite roads, parking lots and HOP operations.
STN72142	Total Dustfall	30 Day Standard	May 01	11.0 g/m^2/30d	Offsite roads and possible HOP operations.
STN72143	Total Dustfall	30 Day Standard	May 01	36.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72139	PM_{10}	24 Hr Interim AAQC	May 07	75 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72136	PM_{10}	24 Hr Interim AAQC	May 14	63 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	May 21	54 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	May 24	58 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	May 25	57 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	May 30	61 µg/m^3	Offsite roads, parking lots and HOP operations.

Source Contribution Assessment of Exceedances - Table 27 (Continued)

Station	Parameter	Criterion Exceeded	Date	Exceedance Value	Potential Cause / Comments
STN72143	Total Dustfall	30 Day Standard	Jun 01	35.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72136	PM_{10}	24 Hr Interim AAQC	Jun 25	55 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Jun 28	60 µg/m^3	Contribution from fireworks festival and possible offsite roads, parking lots and HOP operations.
STN72143	Total Dustfall	30 Day Standard	Jul 01	58.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Jul 12	73 µg/m^3	Smoke from forest fires south of the station, offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Jul 21	65 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72143	Total Dustfall	30 Day Standard	Aug 01	48.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Aug 14	55 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Aug 17	51 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Aug 20	62 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72135	PM_{10}	24 Hr Interim AAQC	Aug 23	70 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72139	PM_{10}	24 Hr Interim AAQC	Aug 24	70 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72136	PM_{10}	24 Hr Interim AAQC	Aug 24	70 µg/m^3	Offsite roads, parking lots and possible HOP operations.
STN72143	Total Dustfall	30 Day Standard	Sep 01	29.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72143	Total Dustfall	30 Day Standard	Oct 01	25.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72143	Total Dustfall	30 Day Standard	Nov 01	17.0 g/m^2/30d	Station located within Goldcorp property boundaries. Data used for process operations.

Note: Site STN72143 (Snowmobile Crossing) is located on Goldcorp property. The data are used as a control indicator for process operations. Values from this location are included in this report for information purposes only.

10.0 Continuous PM_{10} Exceedance Episode Pollution Roses

The following PM_{10} pollution roses graphically illustrate the PM_{10} exceedance episodes.

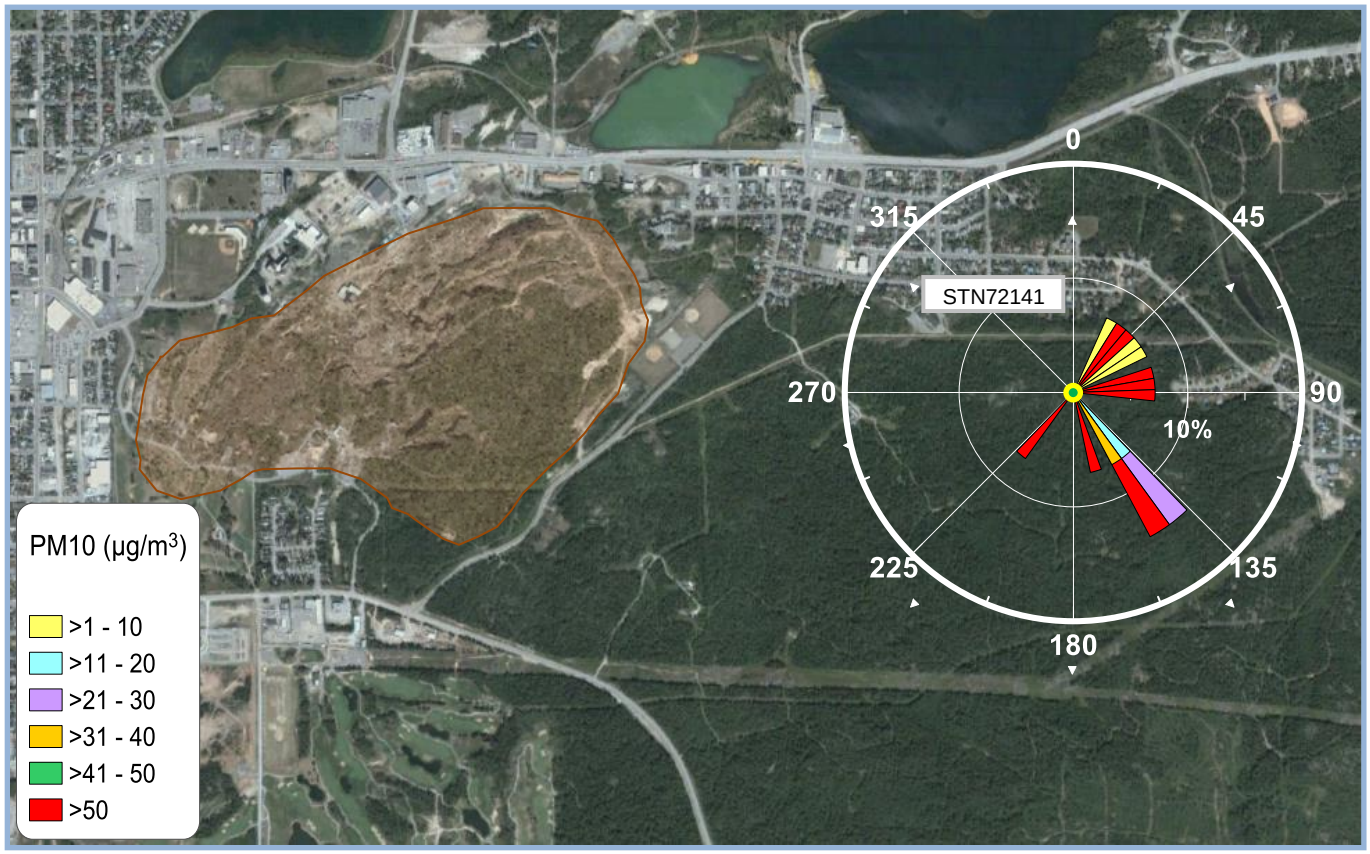
The rose branches show the percentage of time pollutants come from a particular direction. Branches should therefore point to the source of PM_{10}. The branches are divided into segments of different colours, with the colours representing PM_{10} concentration ranges. The length of each segment within a branch is proportional to the frequency of PM_{10} concentration ranges from that direction.

PM_{10} Pollution Rose – STN72140 March 25th - Figure 15

STN72140 PM_{10} Pollution Rose March 25, 2018		By : NZ	**Figure 15**	ROTEK
	True North	Approx. Scale :	1:21000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite sources, all stations showed an increase in dust levels and the winds were predominantly from the south towards the HOP operations. Wind speeds ranged from 1.6 to 8.6 km/h.

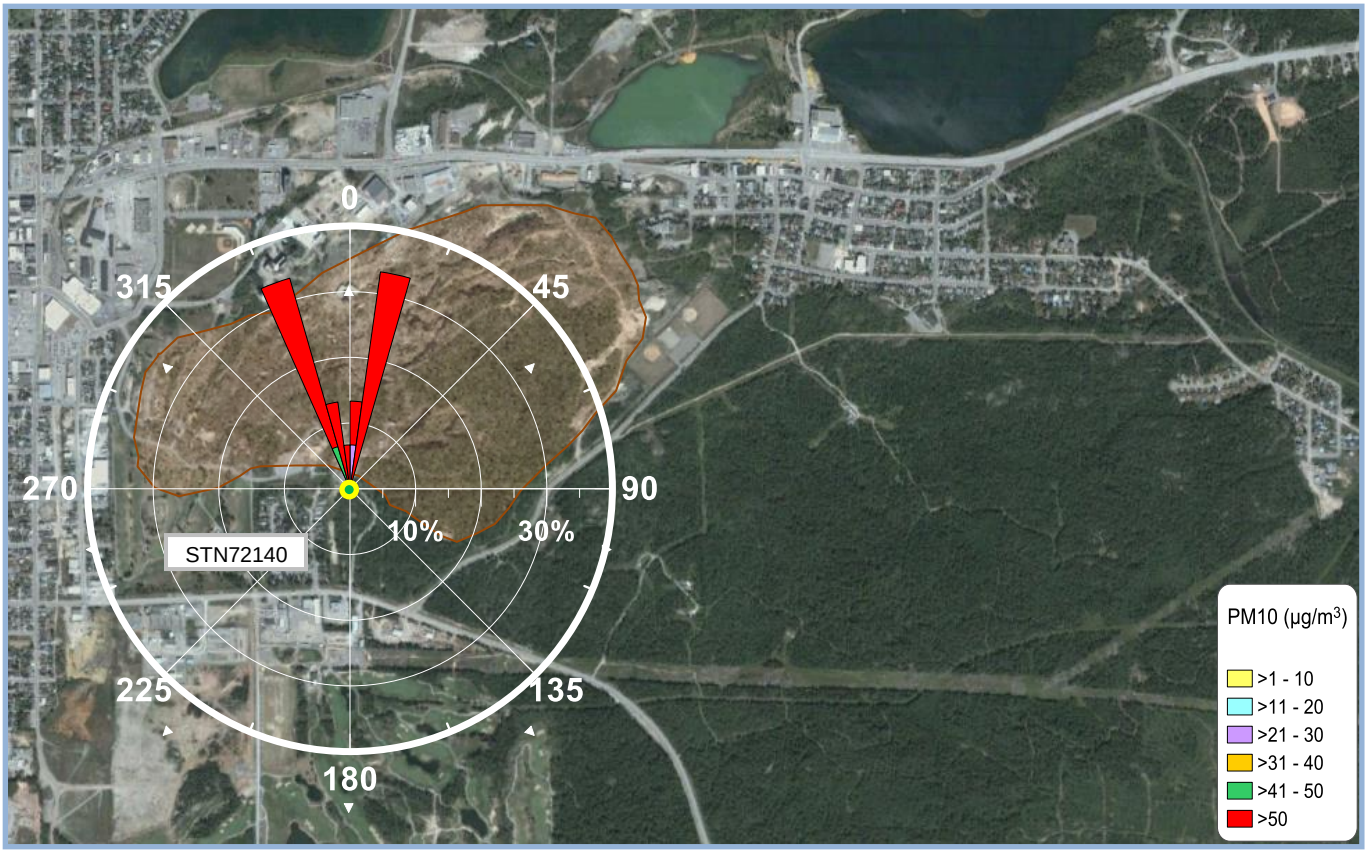
PM_{10} Pollution Rose – STN72141 March 25th - Figure 16



STN72141 PM_{10} Pollution Rose March 25, 2018		By : NZ	**Figure 16**	ROTEK
	True North	Approx. Scale :	1:21000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite sources and possibly HOP operations, all stations showed an increase in dust levels. Wind speeds ranged from 1.6 to 8.6 km/h.

PM_{10} Pollution Rose – STN72140 April 04th - Figure 17

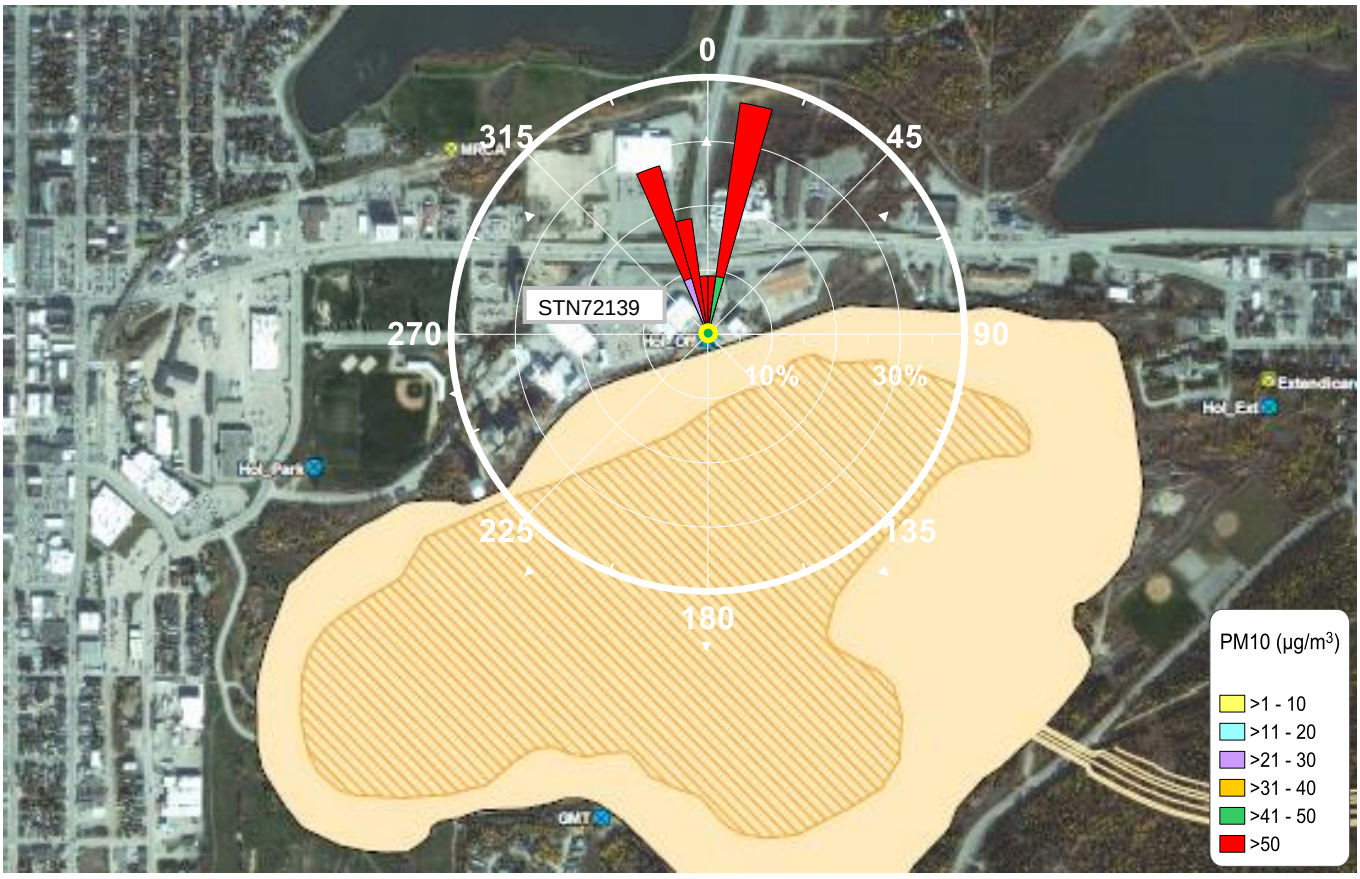


STN72140 PM_{10} Pollution Rose April 04, 2018		By : JP	**Figure 17**
	True North	Approx. Scale :	1:21000
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019

ROTEK

Exceedance is due to inhalable particulate (PM_{10}) levels from un-vegetated environmental control berm, offsite roads and HOP operations. Wind speeds ranged from 16.4 to 26.5 km/h.

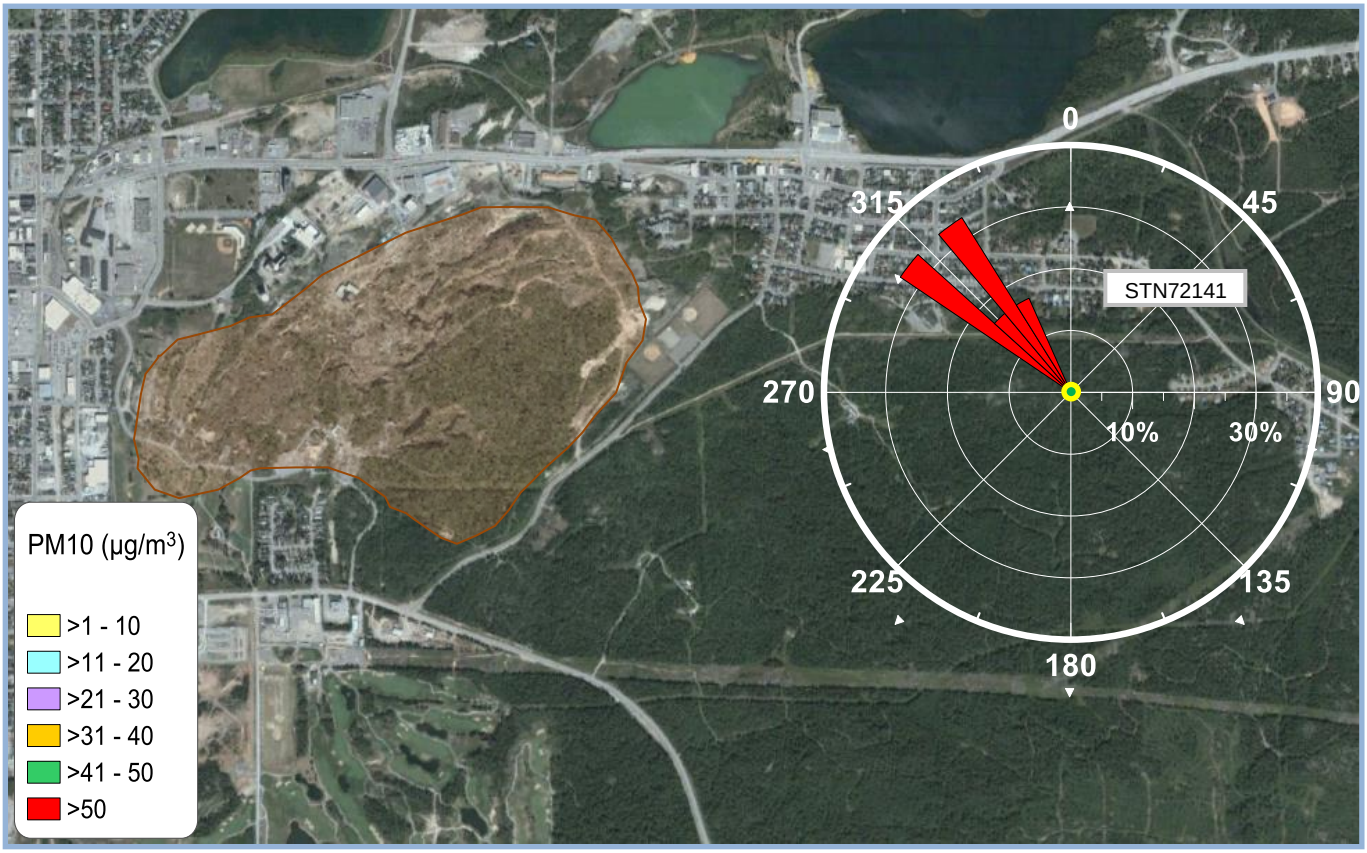
PM_{10} Pollution Rose – STN72139 April 04th - Figure 18



STN72139 PM_{10} Pollution Rose April 04, 2018		By : JP	**Figure 18**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 16.7 to 26.5 km/h.

PM_{10} Pollution Rose – STN72141 April 07th to April 08th - Figure 19



STN72141 PM_{10} Pollution Rose April 07 - 08, 2018		By : NZ	**Figure 19**	ROTEK
	True North	Approx. Scale :	1:21000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

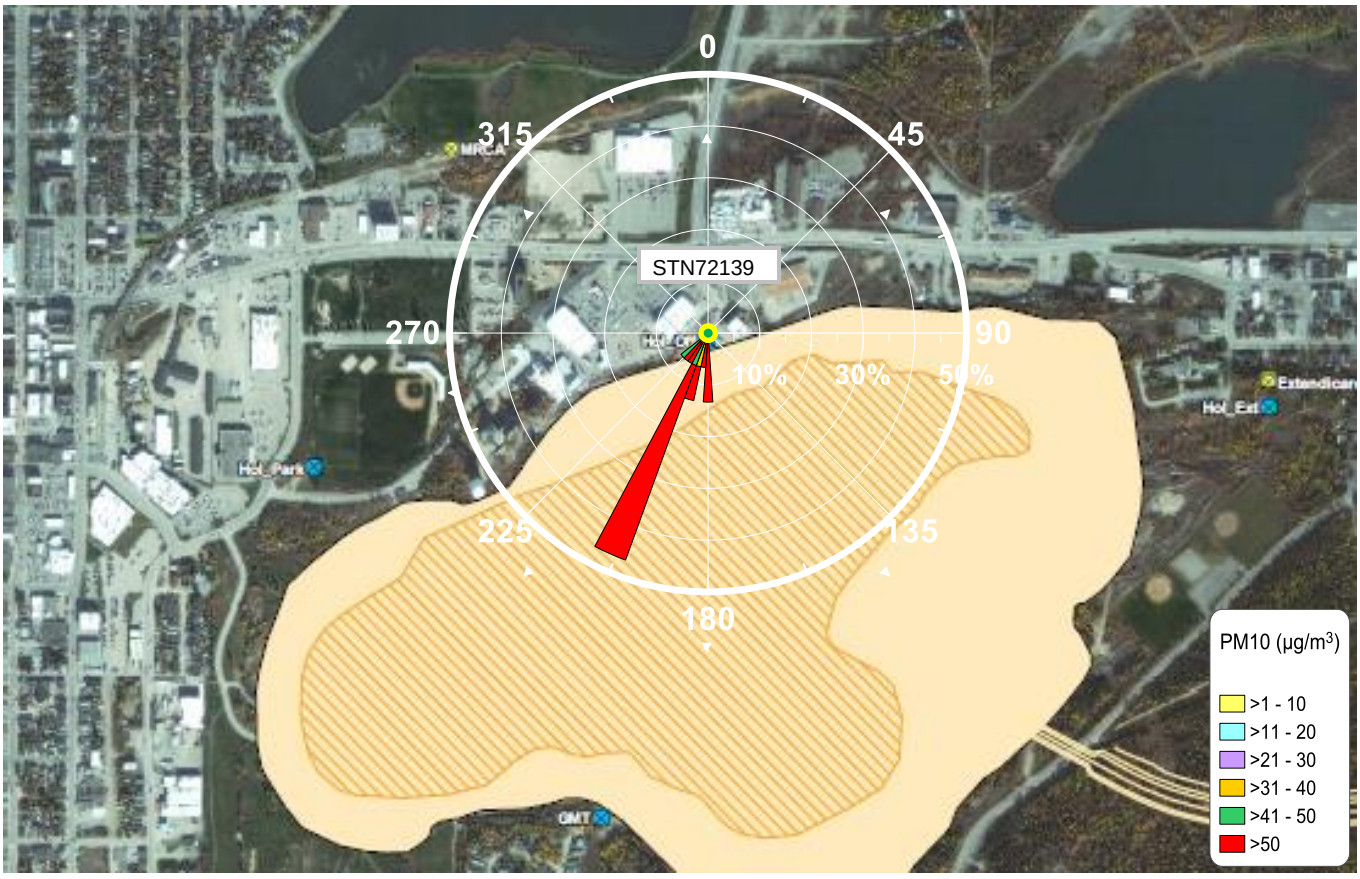
Exceedance is due to inhalable particulate (PM_{10}) levels from offsite sources and possible contributions from the Hollinger Haul Road operations. Wind speeds ranged from 5.5 to 13.5 km/h.

PM_{10} Pollution Rose – STN72140 April 15th - Figure 20

STN72140 PM_{10} Pollution Rose April 15, 2018		By : JP	**Figure 20**	ROTEK
	True North	Approx. Scale :	1:21000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from un-vegetated environmental control berm, offsite roads and HOP operations. Wind speeds ranged from 11.5 to 20.6 km/h.

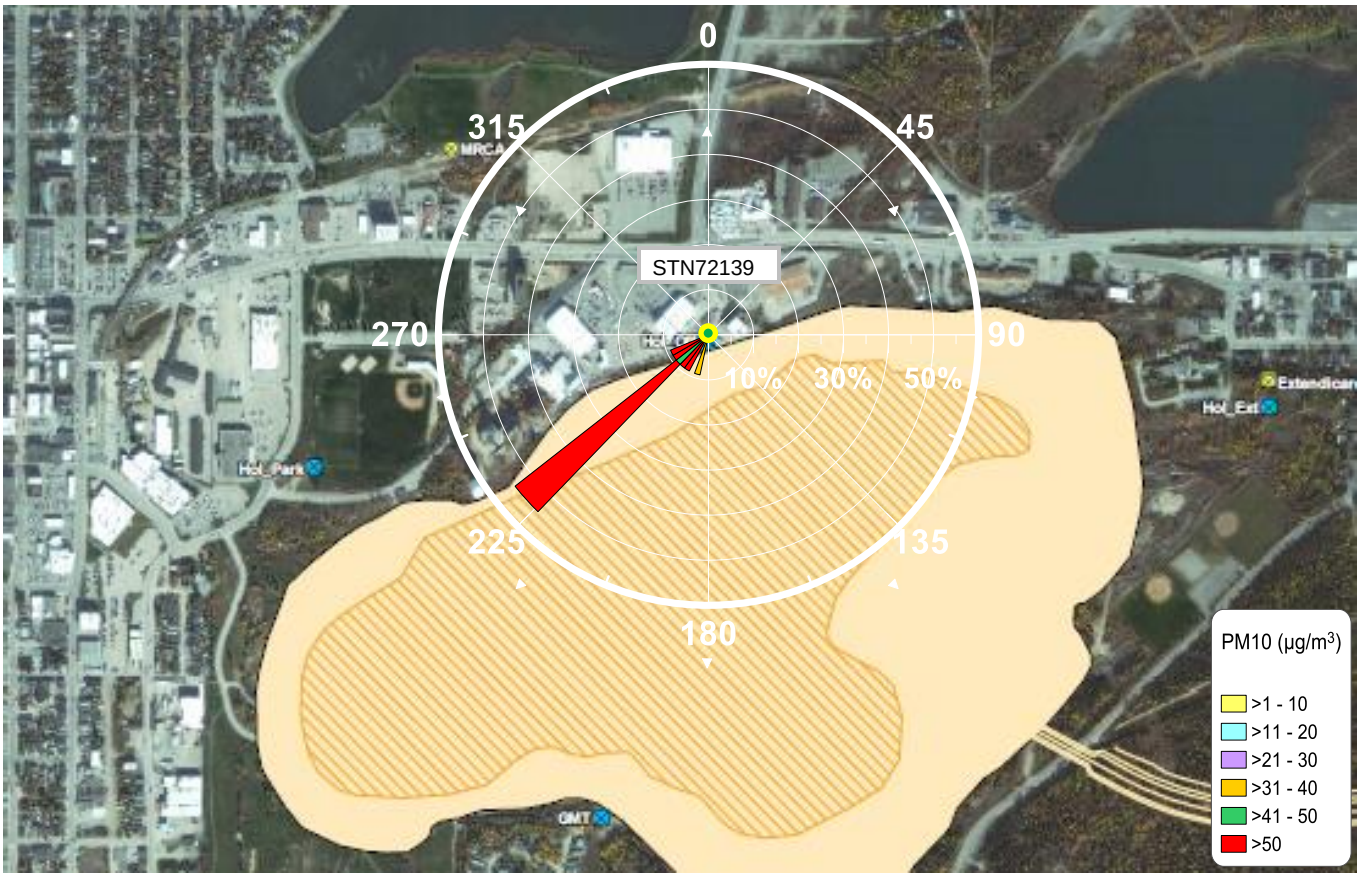
PM_{10} Pollution Rose – STN72139 April 30th to May 01st - Figure 21



STN72139 PM_{10} Pollution Rose April 30 - May 01, 2018		By : JP	**Figure 21**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and contribution from HOP operations. Wind speeds ranged from 6.3 to 14.4 km/h.

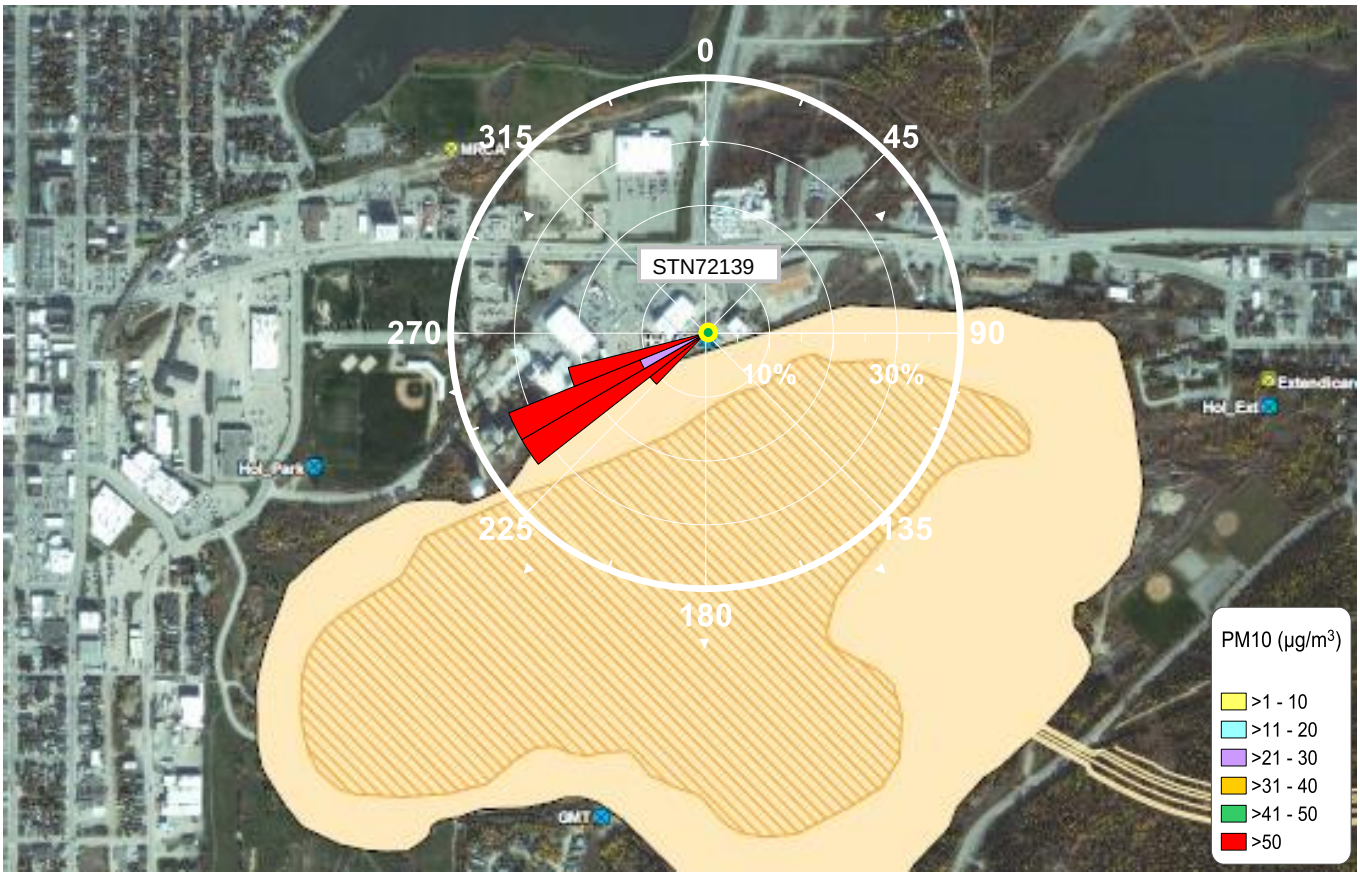
PM_{10} Pollution Rose – STN72139 May 07th - Figure 22



STN72139 PM_{10} Pollution Rose May 07, 2018	↑	By : JP	**Figure 22**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 8.9 to 14.8 km/h.

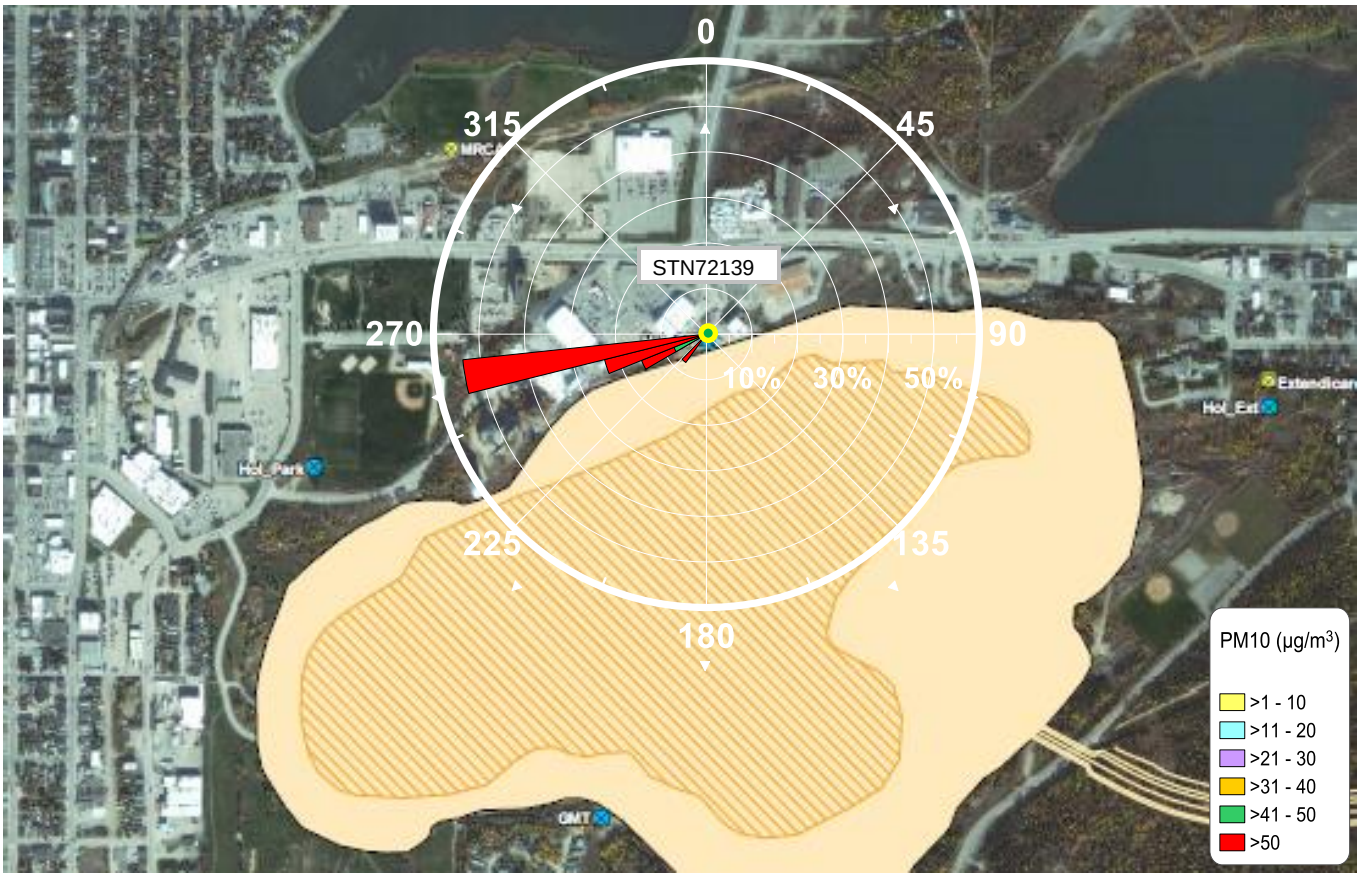
PM_{10} Pollution Rose – STN72139 May 20th to May 21st - Figure 23



STN72139 PM_{10} Pollution Rose May 20 - 21, 2018	↑ True North	By : JP	**Figure 23**	ROTEK
		Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 3.8 to 7.8 km/h.

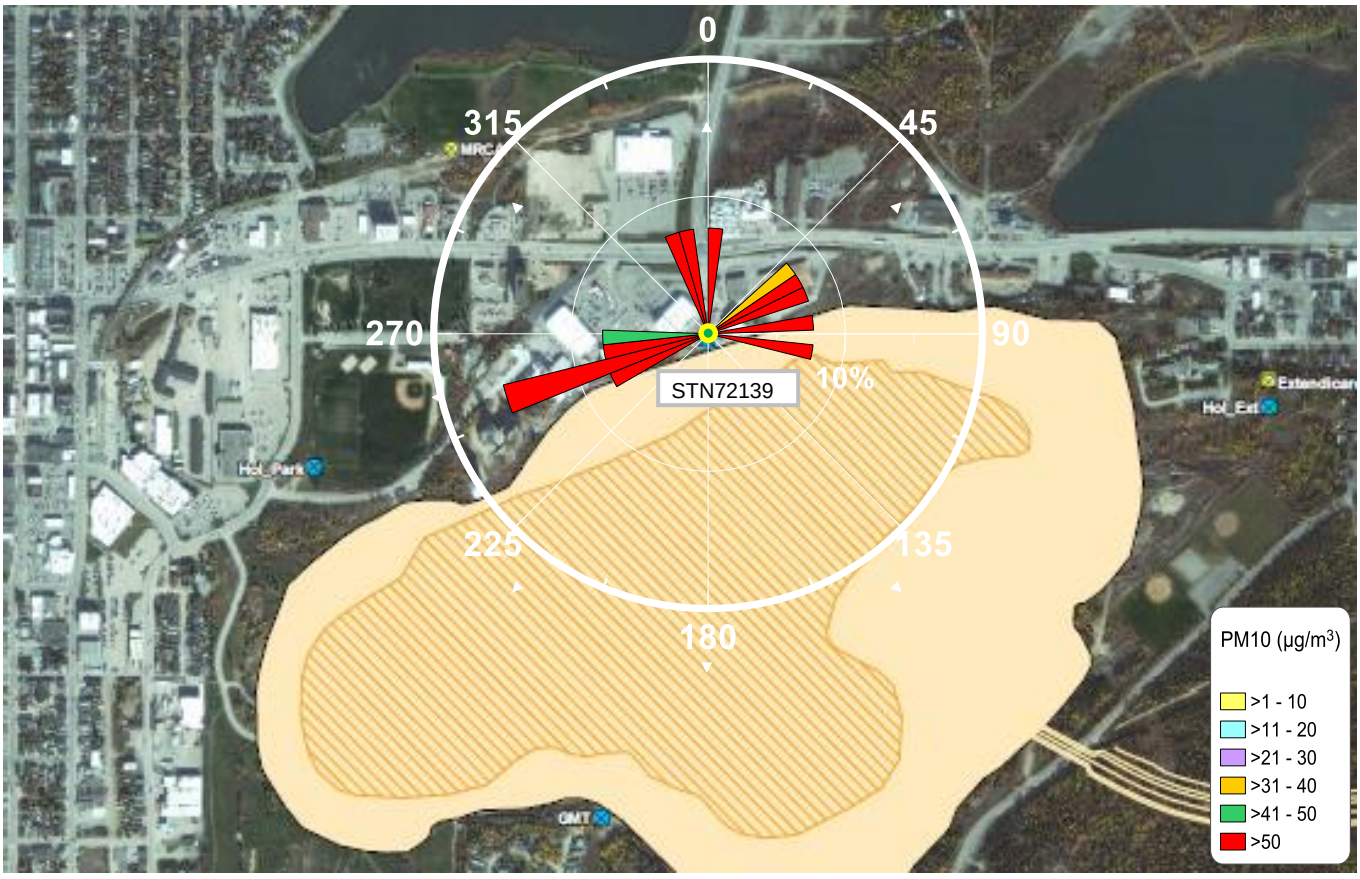
PM_{10} Pollution Rose – STN72139 May 24th - Figure 24



STN72139 PM_{10} Pollution Rose May 24, 2018		By : JP	**Figure 24**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 5.1 to 11.6 km/h.

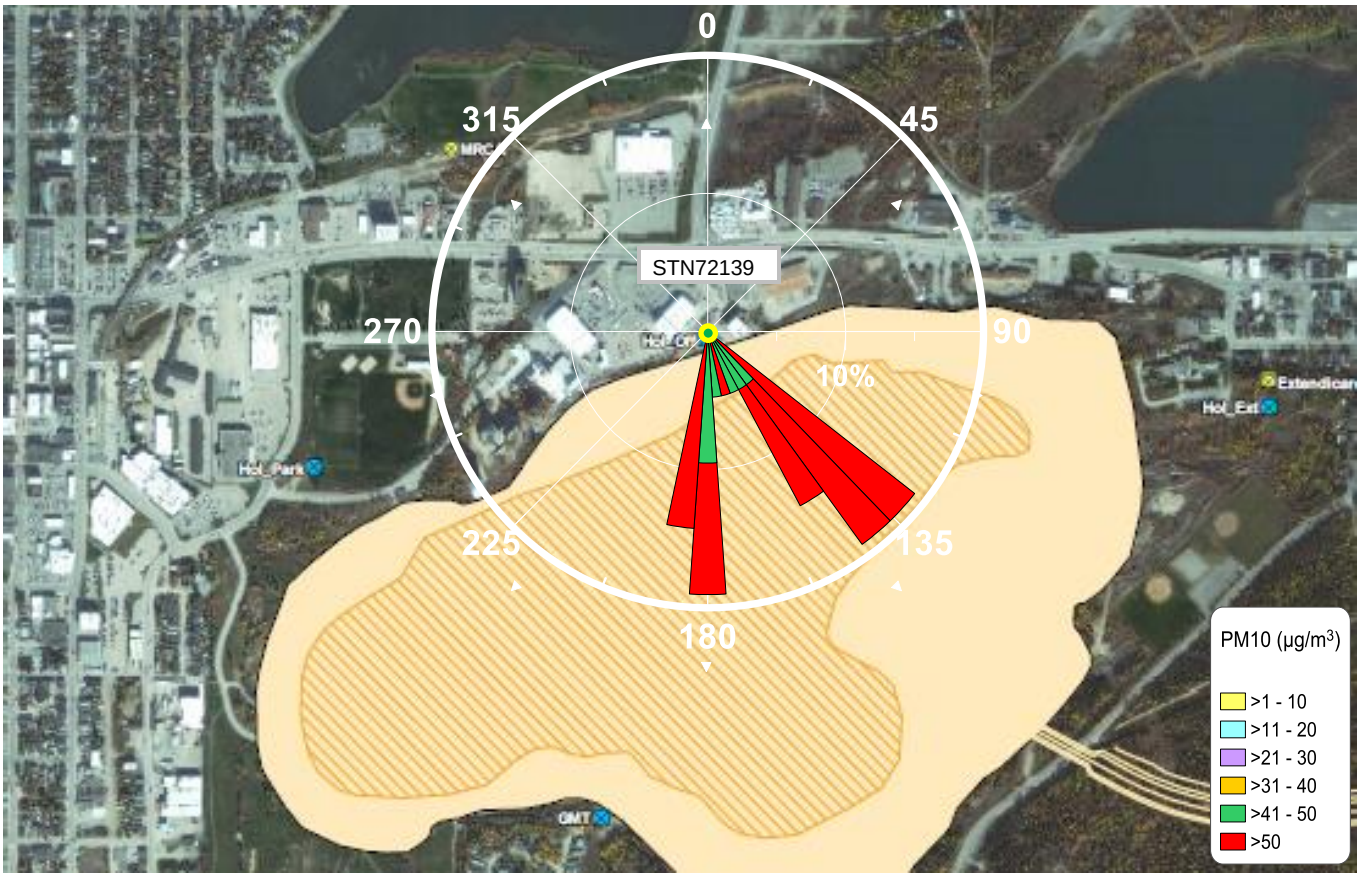
PM_{10} Pollution Rose – STN72139 May 25th - Figure 25



STN72139 PM_{10} Pollution Rose May 25, 2018	↑	By : JP	**Figure 25**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 2.2 to 14.8 km/h.

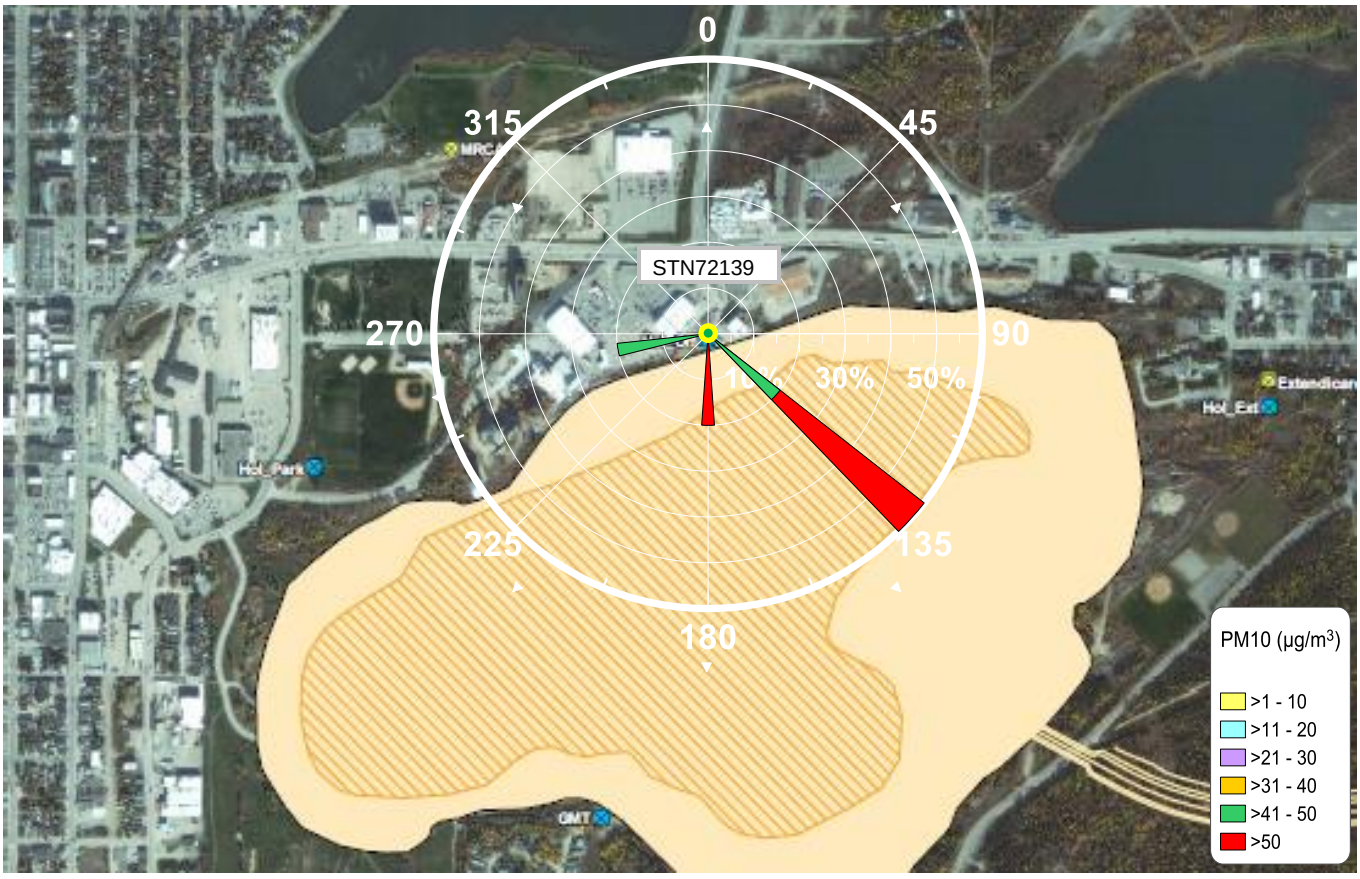
PM_{10} Pollution Rose – STN72139 May 30th to May 31st - Figure 26



STN72139 PM_{10} Pollution Rose May 30 - 31, 2018	↑	By : JP	**Figure 26**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and contribution from HOP operations. Wind speeds ranged from 4.4 to 14.8 km/h.

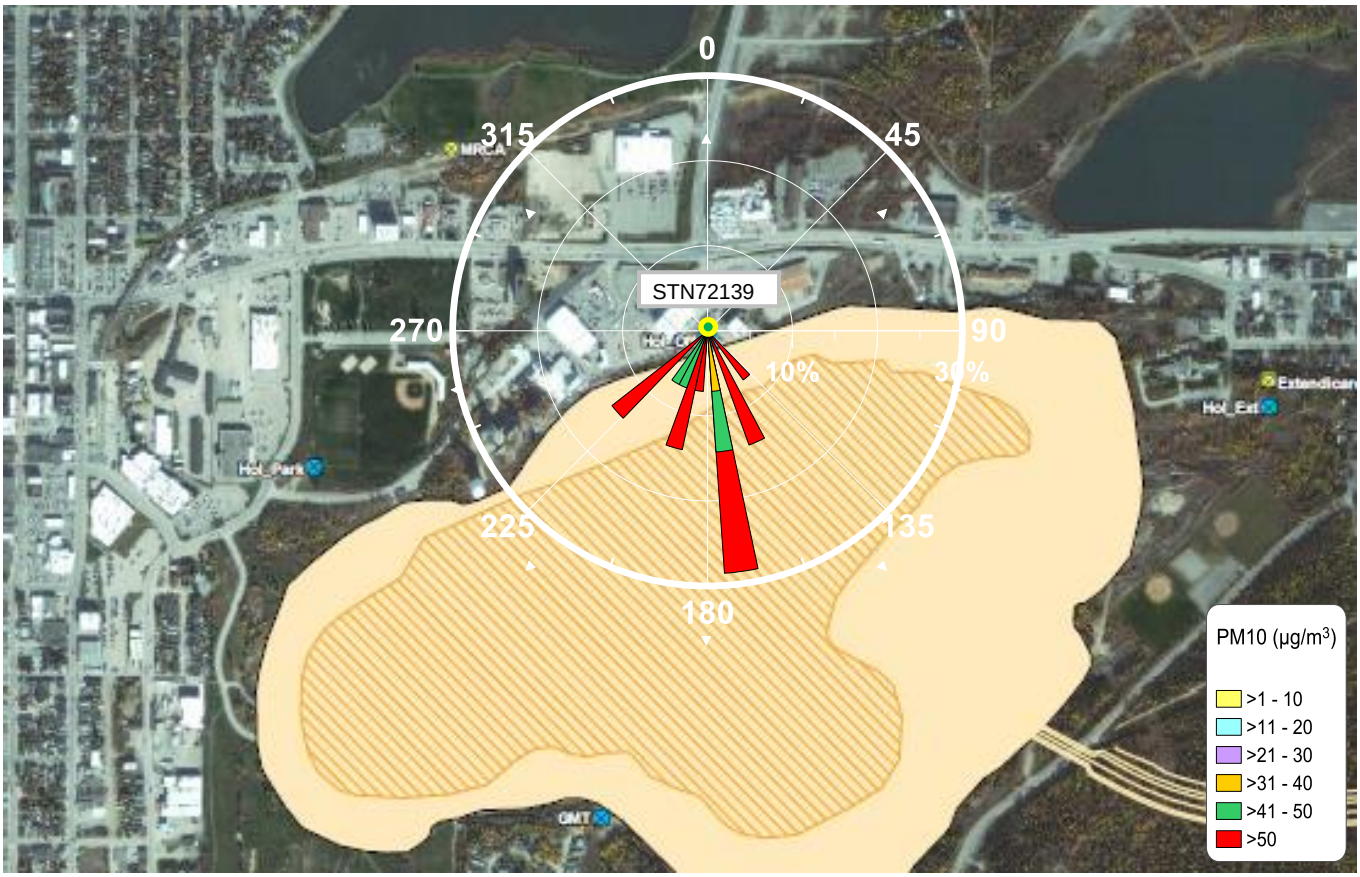
PM_{10} Pollution Rose – STN72139 June 28th - Figure 27



STN72139 PM_{10} Pollution Rose June 28, 2018		By : JP	**Figure 27**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels contributed from a localized fireworks festival and possible offsite roads, parking lots and HOP operations. Wind speeds ranged from 2.2 to 2.6 km/h.

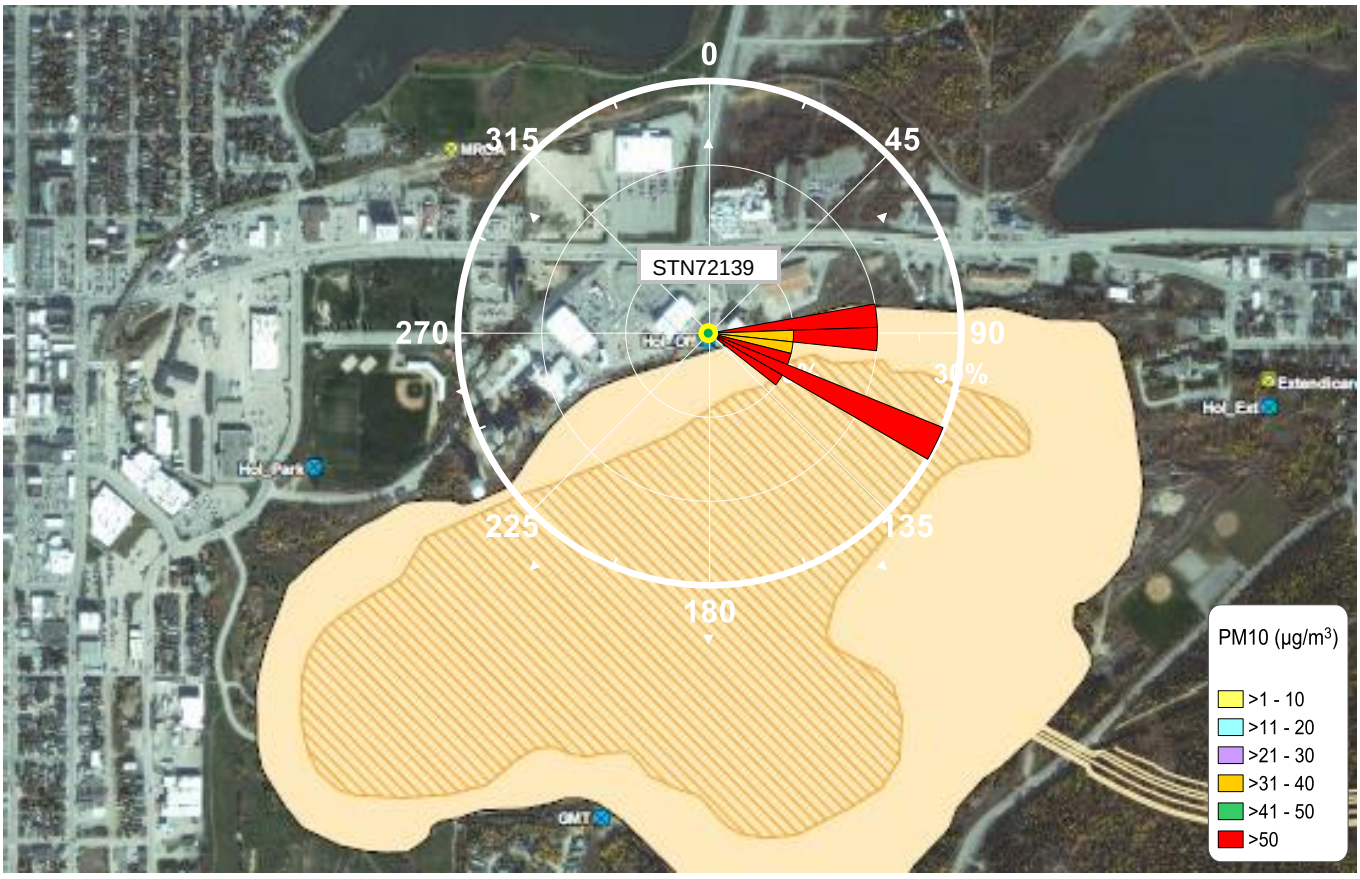
PM_{10} Pollution Rose – STN72139 July 12th - Figure 28



STN72139 PM_{10} Pollution Rose July 12, 2018	↑ True North	By : JP	**Figure 28**	ROTEK
		Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from forest fires to the south and possible contribution from HOP operations. Wind speeds ranged from 5.0 to 13.4 km/h.

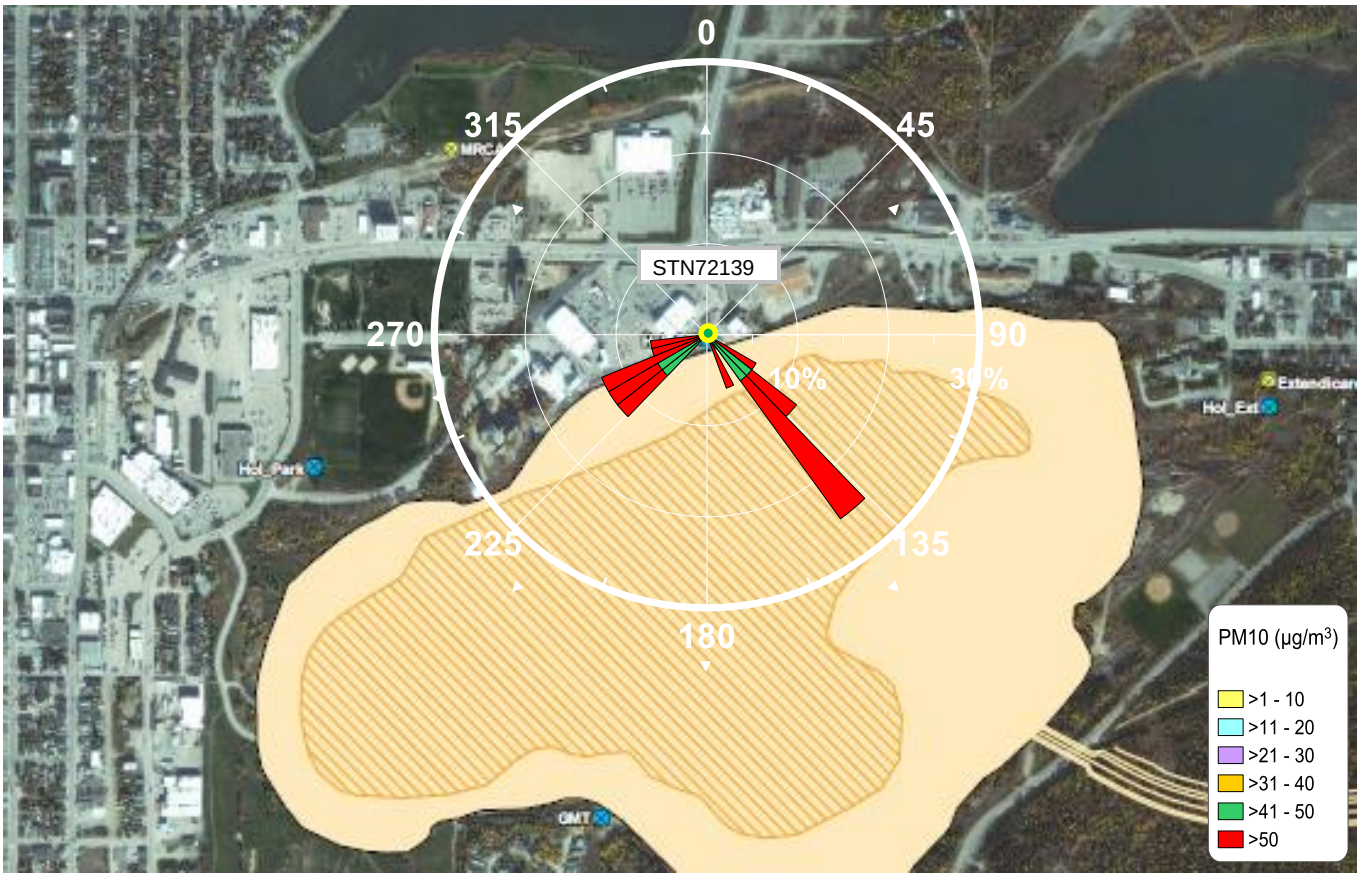
PM_{10} Pollution Rose – STN72139 July 21st - Figure 29



STN72139 PM_{10} Pollution Rose July 21, 2018	↑	By : JP	**Figure 29**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 3.9 to 8.6 km/h.

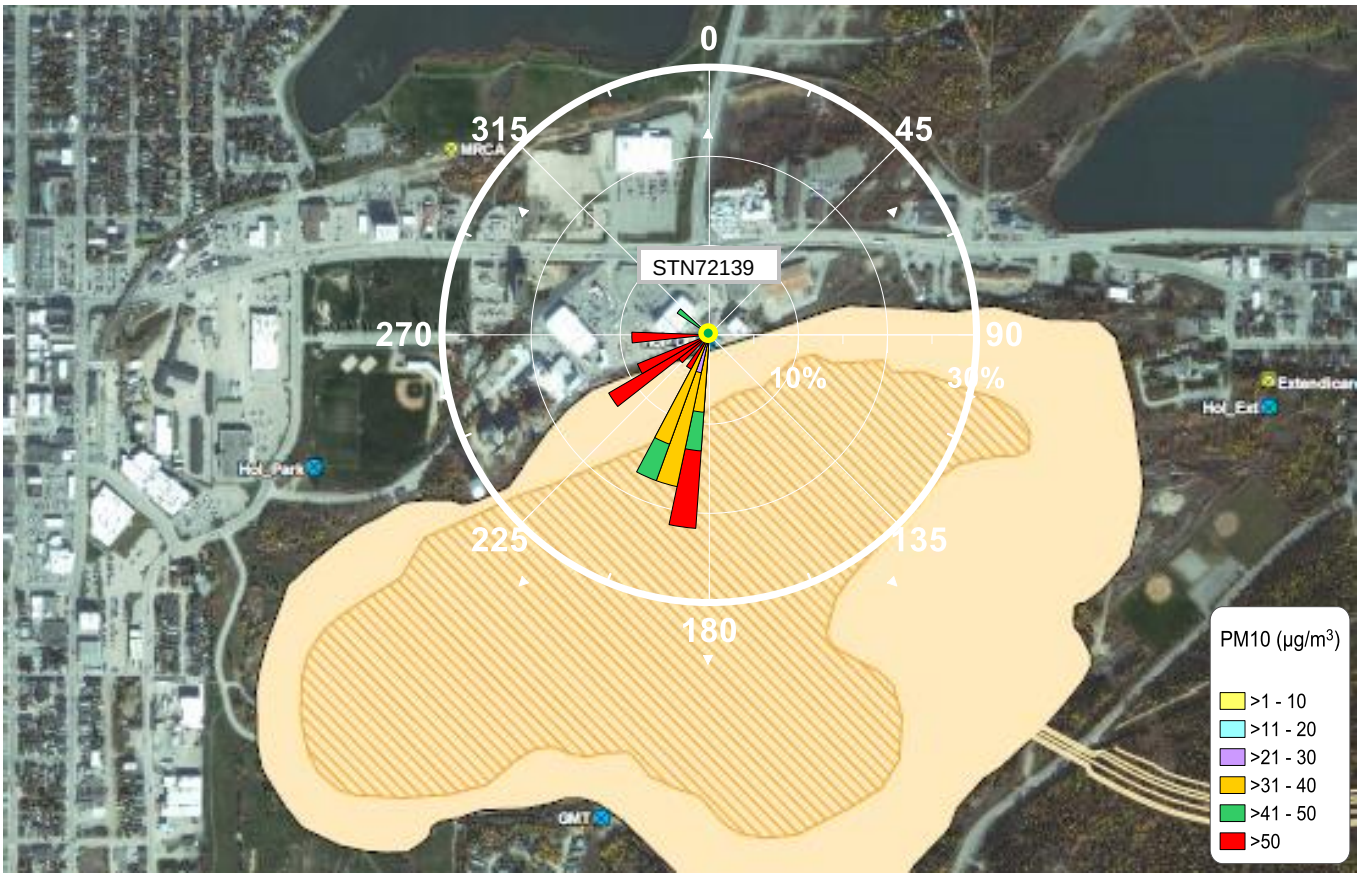
PM_{10} Pollution Rose – STN72139 August 12th to August 13th - Figure 30



STN72139 PM_{10} Pollution Rose August 12 - 13, 2018		By : JP	**Figure 30**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 1.9 to 6.5 km/h.

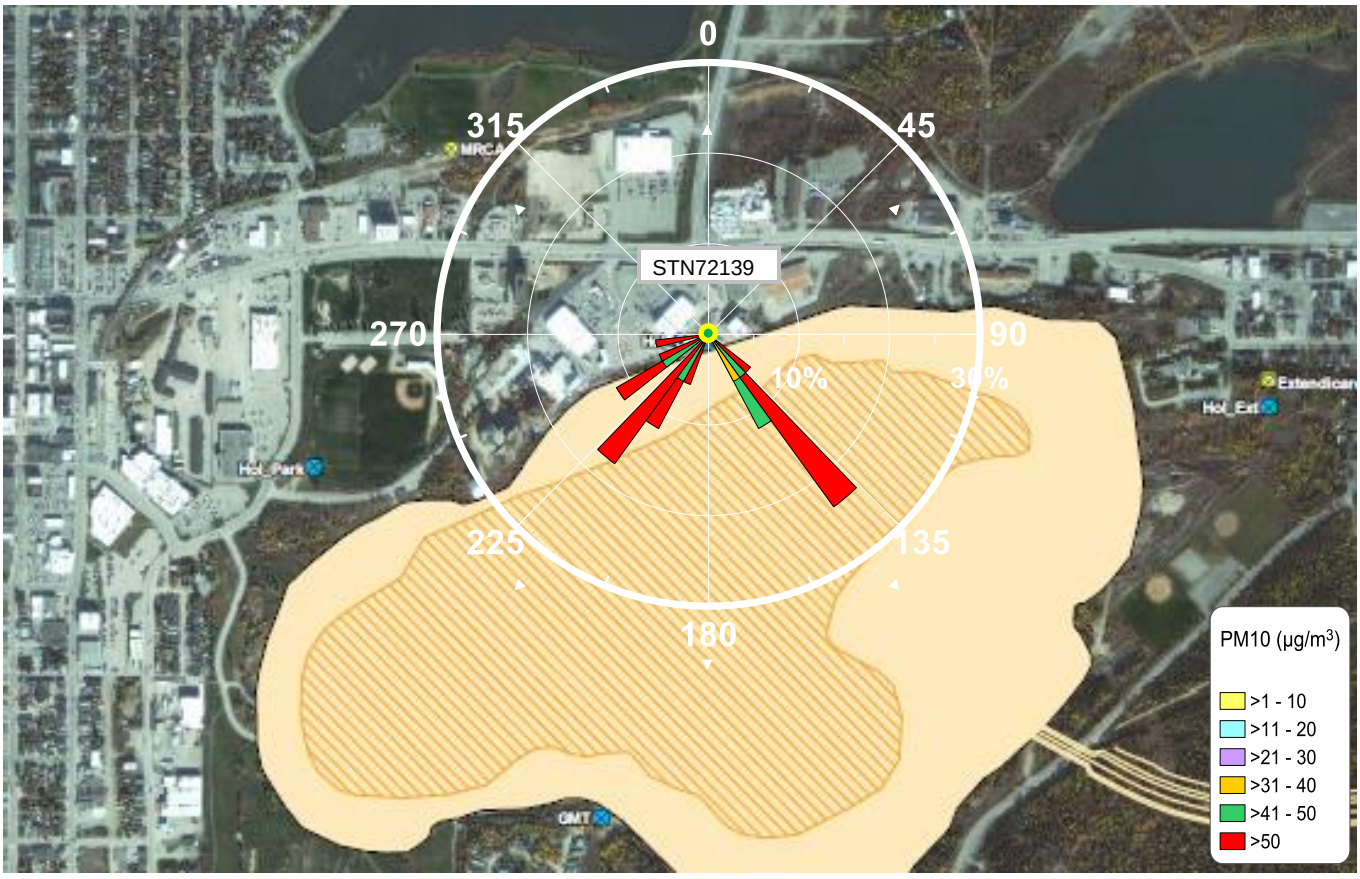
PM_{10} Pollution Rose – STN72139 August 13th to August 14th - Figure 31



STN72139 PM_{10} Pollution Rose August 13 - 14, 2018		By : JP	**Figure 31**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 5.5 to 12.3 km/h.

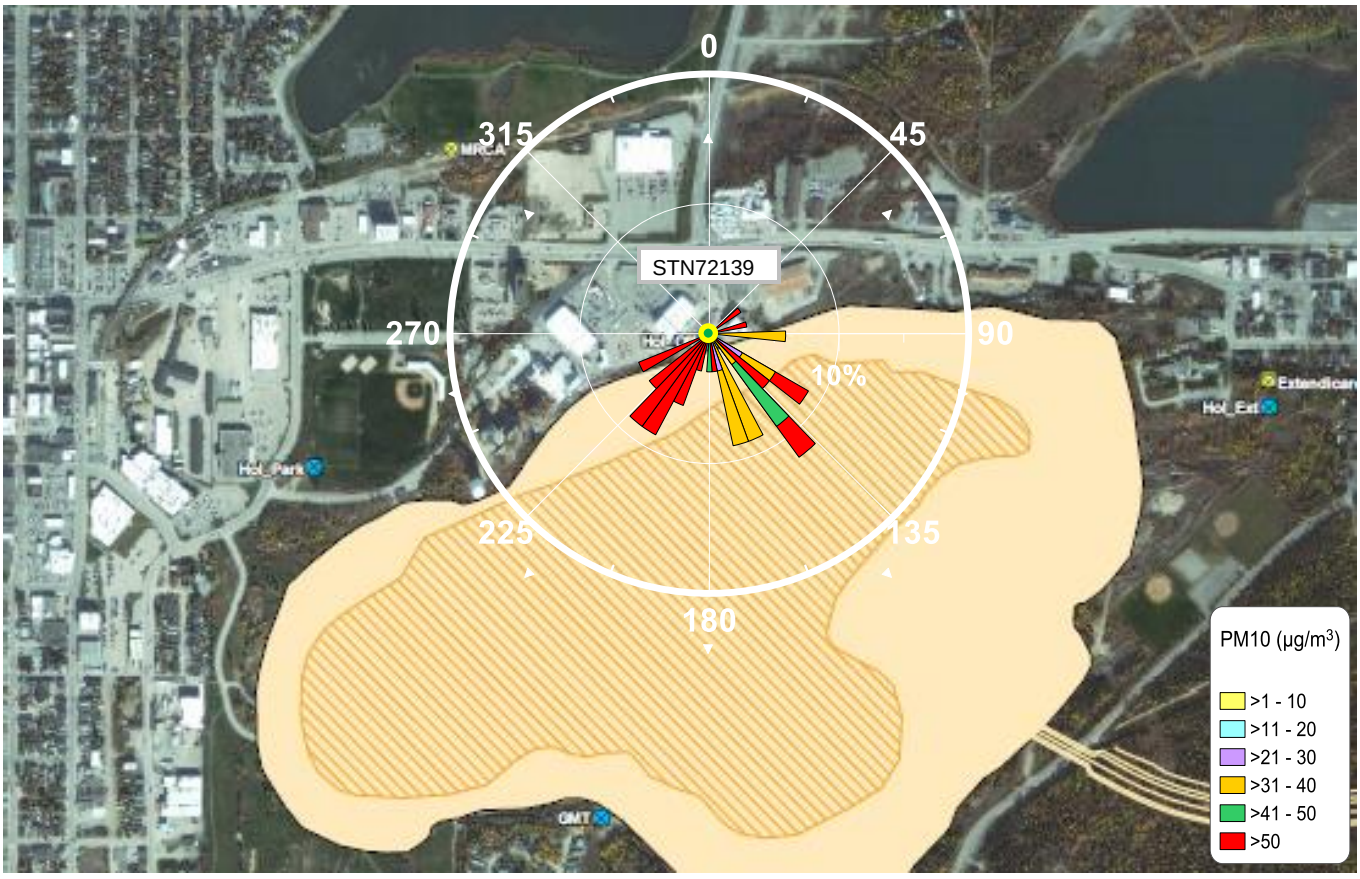
PM_{10} Pollution Rose – STN72139 August 16th to August 17th - Figure 32



STN72139 PM_{10} Pollution Rose August 16 - 17, 2018		By : JP	**Figure 32**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 1.4 to 9.2 km/h.

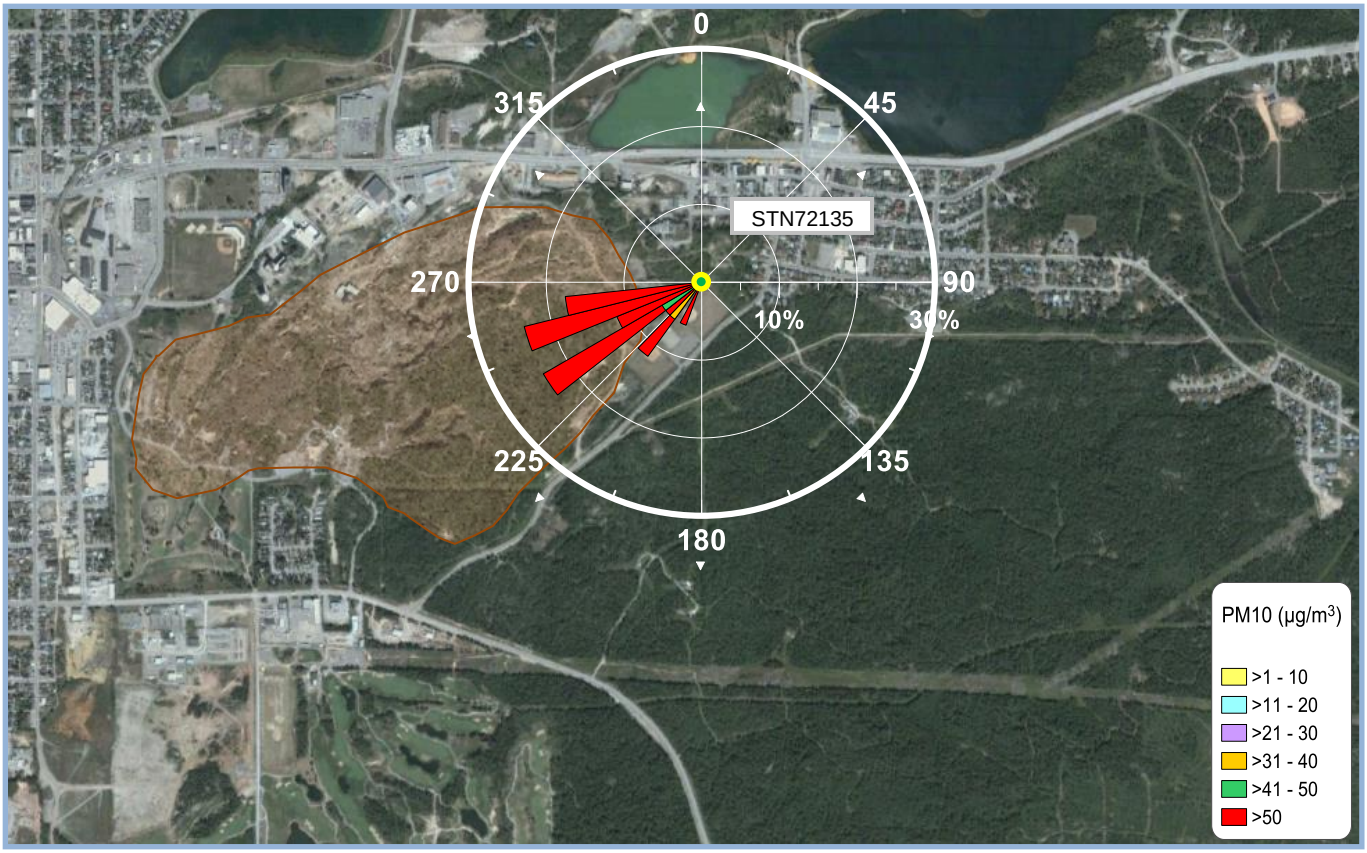
PM_{10} Pollution Rose – STN72139 August 18th to August 19th - Figure 33



STN72139 PM_{10} Pollution Rose August 18 - 19, 2018		By : JP	**Figure 33**	ROTEK
	True North	Approx. Scale :	1:12000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 2.0 to 13.0 km/h.

PM_{10} Pollution Rose – STN72135 August 23rd to August 24th - Figure 34



STN72135 PM_{10} Pollution Rose August 23 - 24, 2018		By : JP	**Figure 34**	ROTEK
	True North	Approx. Scale :	1:21000	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	22 March, 2019	

Exceedance is due to inhalable particulate (PM_{10}) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 2.2 to 10.5 km/h.

11.0 Conclusions

During 2018 there were:

a) No exceedances of the continuous NO_2 24 hour and 1 hour running average AAQCs or of the ½ hour running average O.Reg 419/05 standard.

b) 20 exceedances of the continuous PM_{10} 24 hour running average AAQC, 1 at STN72135, 14 at STN72139, 3 at STN72140 and 2 at STN72141.

c) 3 exceedances of the non-continuous 24 hour clock TSP AAQC, 1 at STN72135, 1 at STN72136 and 1 at STN72137.

d) 5 exceedances of the non-continuous 24 hour clock PM_{10} AAQC at STN72136.

e) No exceedances of the non-continuous 24 hour clock TSP or PM_{10} Suspended Metals AAQCs, standards or guidelines.

f) 12 exceedances of the non-continuous 30 day standard for Total Dustfall, 1 at STN72137, 1 at STN72142 and 10 at STN72143.

g) A summary of exceedances potentially associated to the Hollinger Open Pit (HOP) operations can be found in Table 27.

h) Network annual PM_{10} averages were 12 µg/m^3 at STN72135, 19 µg/m^3 at STN72139, 12 µg/m^3 at STN72140 and 9 µg/m^3 at STN72141. No average was available from STN72138 which remained decommissioned during 2018.

i) 36 calibrations were conducted on continuous samplers, all of which met criteria.

j) The percentage of continuous valid pollutant data recovery was 98.0% for 2018, exceeding the ministry's minimum target of 90% and desirable target of 95%. The overall percentage of non-continuous valid pollutant data recovery was 99.1%.

Annual | 2018

GOLDCORP

Ambient Air Monitoring Report

Appendix A
Continuous Data Statistics

GOLDCORP

2018 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average	Maximum ½ Hr Running Average	Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
Station	**Month**	**NO2**	**PM10**	**TSP**	**NO2**	**NO2**	**PM10**	**TSP**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**
		ppb	µg/m^3	µg/m^3	ppb	ppb	µg/m^3	µg/m^3	µg/m^3	µg/m^3	ppb	ppb	ppb	µg/m^3	µg/m^3	%	%	%	%	%
STN72135	January	14	25	31	40	41	19	29	42	43	1	5	6	8	10	99.9	99.9	99.9	100.0	99.9
	February	17	26	38	44	46	25	32	86	81	2	7	9	12	14	99.9	99.9	99.9	100.0	99.9
	March	12	36	40	36	37	34	37	133	158	1	3	4	12	14	99.7	99.7	99.7	98.0	99.7
	April	15	47	45	42	42	46	45	330	370	1	5	6	17	18	99.7	99.7	99.7	100.0	99.9
	May	11	47	79	39	40	45	76	161	231	1	5	5	17	21	98.0	98.0	98.0	98.8	99.6
	June	14	36	39	44	45	33	39	67	107	2	5	7	14	17	86.3	86.3	86.3	99.9	98.1
	July	6	48	114	21	23	47	110	310	634	1	3	5	19	34	91.0	91.0	91.0	99.6	99.5
	August	9	70	107	24	27	59	91	161	277	2	3	5	18	37	96.0	96.0	96.0	99.7	99.5
	September	7	20	36	25	25	16	27	46	68	2	3	4	8	14	99.9	99.9	99.9	100.0	99.9
	October	10	20	20	29	31	19	20	50	61	1	4	5	7	8	99.3	99.3	99.3	99.3	99.5
	November	12	45	39	29	31	40	33	74	64	2	4	6	11	10	99.7	99.7	99.7	100.0	99.9
	December	14	19	43	37	40	18	41	48	73	1	5	6	8	10	99.9	99.9	99.9	99.1	99.9
	Q1 Arithmetic Mean										1	5	6	10	12	99.8	99.8	99.8	99.3	99.8
	Q2 Arithmetic Mean										1	5	6	16	19	94.7	94.7	94.7	99.6	99.2
	Q3 Arithmetic Mean										2	3	5	15	28	95.6	95.6	95.6	99.8	99.6
	Q4 Arithmetic Mean										1	4	6	9	9	99.6	99.6	99.6	99.5	99.7
	Annual Arithmetic Mean										1	4	6	12	17	97.4	97.4	97.4	99.5	99.6

Exceedance Summary STN72135																	
Parameter		**Type**	**Averaging Type**	**Limit**	**Q1**			**Q2**			**Q3**			**Q4**			**Total**
					J	F	M	A	M	J	J	A	S	O	N	D	
Particulate Matter < 10 µm	**PM10**	AAQC	24 Hr Running	50 µg/m^3	0	0	0	0	0	0	0	1	0	0	0	0	1
Nitrogen Dioxide	**NO2**	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0

2018 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average	Maximum ½ Hr Running Average	Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
Station	**Month**	**NO2**	**PM10**	**TSP**	**NO2**	**NO2**	**PM10**	**TSP**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**
		ppb	µg/m^3	µg/m^3	ppb	ppb	µg/m^3	µg/m^3	µg/m^3	µg/m^3	ppb	ppb	ppb	µg/m^3	µg/m^3	%	%	%	%	%
STN72138	January	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	February	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	March	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	April	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	May	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	June	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	July	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	August	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	September	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	October	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	November	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	December	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	Q1 Arithmetic Mean										ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	Q2 Arithmetic Mean										ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	Q3 Arithmetic Mean										ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	Q4 Arithmetic Mean										ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0
	Annual Arithmetic Mean										ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0

Exceedance Summary STN72138

Parameter		**Type**	**Averaging Type**	**Limit**	**Q1**			**Q2**			**Q3**			**Q4**			**Total**
					J	F	M	A	M	J	J	A	S	O	N	D	
Particulate Matter < 10 µm	**PM10**	AAQC	24 Hr Running	50 µg/m^3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Nitrogen Dioxide	**NO2**	AAQC	24 Hr Running	100 ppb	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Nitrogen Dioxide	**NO2**	AAQC	1 Hr Running	200 ppb	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Nitrogen Dioxide	**NO2**	O. Reg 419/05	½ Hr Running	250 ppb	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0

ins* - insufficient data to calculate mean. n/a -not available. Site decommissioned in June 2017 to accommodate upgrades to the park.

2018 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average	Maximum ½ Hr Running Average	Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
Station	**Month**	**NO2**	**PM10**	**TSP**	**NO2**	**NO2**	**PM10**	**TSP**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**
		ppb	µg/m^3	µg/m^3	ppb	ppb	µg/m^3	µg/m^3	µg/m^3	µg/m^3	ppb	ppb	ppb	µg/m^3	µg/m^3	%	%	%	%	%
STN72139	January	17	28	46	36	41	27	45	90	110	6	7	13	12	18	99.9	99.9	99.9	100.0	99.9
	February	20	40	51	44	44	38	44	136	113	5	9	14	17	22	99.9	99.9	99.9	100.0	99.9
	March	18	42	42	39	42	39	38	110	136	3	5	8	15	17	99.7	99.7	99.7	100.0	99.9
	April	20	63	56	62	70	57	56	162	133	3	7	10	26	26	99.9	99.9	99.9	100.0	99.9
	May	15	75	87	40	40	70	87	201	178	3	6	9	31	33	99.9	99.9	99.9	100.0	99.9
	June	11	60	63	27	31	59	62	471	447	3	5	7	22	24	98.5	98.5	98.5	98.8	98.5
	July	10	73	148	36	39	73	144	420	627	3	5	8	27	40	99.7	99.7	99.7	99.9	99.7
	August	12	62	104	27	32	59	97	114	184	4	5	10	27	47	98.3	98.3	98.3	93.4	98.3
	September	16	43	50	36	38	40	45	155	181	6	6	11	18	22	99.7	99.7	99.7	100.0	99.7
	October	11	39	39	23	34	32	32	195	185	4	5	9	13	15	99.6	99.6	99.6	99.2	99.6
	November	13	47	48	28	32	36	44	127	91	4	5	8	14	13	99.6	99.6	99.6	99.0	99.7
	December	17	32	59	42	47	31	55	63	133	5	7	12	11	16	99.9	99.9	99.9	97.6	99.9
	Q1 Arithmetic Mean										5	7	12	15	19	99.8	99.8	99.8	100.0	99.9
	Q2 Arithmetic Mean										3	6	9	26	28	99.4	99.4	99.4	99.6	99.4
	Q3 Arithmetic Mean										4	5	9	24	36	99.2	99.2	99.2	97.8	99.2
	Q4 Arithmetic Mean										4	6	10	13	15	99.7	99.7	99.7	98.6	99.7
	Annual Arithmetic Mean										4	6	10	19	24	99.5	99.5	99.5	99.0	99.6

Exceedance Summary STN72139																		
Parameter		**Type**	**Averaging Type**	**Limit**	**Q1**			**Q2**			**Q3**			**Q4**			**Total**
					J	F	M	A	M	J	J	A	S	O	N	D	
Particulate Matter < 10 µm	**PM10**	AAQC	24 Hr Running	50 µg/m^3	0	0	0	2	5	1	2	4	0	0	0	0	14
Nitrogen Dioxide	**NO2**	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0

2018 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average	Maximum ½ Hr Running Average	Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
Station	**Month**	**NO2**	**PM10**	**TSP**	**NO2**	**NO2**	**PM10**	**TSP**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**	**NO**	**NO2**	**NOX**	**PM10**	**TSP**
		ppb	µg/m^3	µg/m^3	ppb	ppb	µg/m^3	µg/m^3	µg/m^3	µg/m^3	ppb	ppb	ppb	µg/m^3	µg/m^3	%	%	%	%	%
STN72140	January	17	21	25	41	42	18	23	52	46	3	7	10	8	12	99.5	99.5	99.5	99.6	88.3
	February	15	17	30	53	59	17	28	40	40	2	6	8	7	10	99.9	99.9	99.9	100.0	99.9
	March	22	79	63	57	57	62	49	287	247	5	11	16	16	16	99.7	99.7	99.7	90.5	99.7
	April	17	93	61	58	63	93	61	210	142	3	7	10	21	17	99.9	99.9	99.9	100.0	99.9
	May	10	36	42	39	45	31	41	139	105	2	5	6	14	15	89.1	89.1	89.1	100.0	99.9
	June	15	22	38	62	67	22	38	75	66	1	5	6	13	16	99.2	99.2	99.2	99.7	99.2
	July	6	46	96	17	21	41	94	305	401	1	2	3	15	27	99.3	99.3	99.3	99.9	99.5
	August	7	35	72	21	23	32	65	70	105	2	2	4	17	28	94.0	94.0	94.0	99.7	99.2
	September	6	20	26	18	21	19	21	58	50	1	2	4	9	11	98.8	98.8	98.8	100.0	98.8
	October	7	10	11	17	19	10	10	29	31	2	2	4	4	4	78.5	78.5	78.5	98.5	99.5
	November	9	42	32	33	36	38	26	157	78	1	3	4	9	9	80.8	80.8	80.8	98.6	99.2
	December	16	23	33	34	43	22	32	77	63	2	4	6	9	10	99.9	99.9	99.9	99.7	99.9
	Q1 Arithmetic Mean										3	8	11	10	12	99.7	99.7	99.7	96.7	96.0
	Q2 Arithmetic Mean										2	5	7	16	16	96.0	96.0	96.0	99.9	99.6
	Q3 Arithmetic Mean										1	2	3	14	22	97.3	97.3	97.3	99.9	99.1
	Q4 Arithmetic Mean										2	3	5	8	8	86.4	86.4	86.4	99.0	99.5
	Annual Arithmetic Mean										2	5	7	12	15	94.9	94.9	94.9	98.9	98.6

Exceedance Summary STN72140																		
Parameter		**Type**	**Averaging Type**	**Limit**	**Q1**			**Q2**			**Q3**			**Q4**			**Total**
					J	F	M	A	M	J	J	A	S	O	N	D	
Particulate Matter < 10 µm	**PM10**	AAQC	24 Hr Running	50 µg/m^3	0	0	1	2	0	0	0	0	0	0	0	0	3
Nitrogen Dioxide	**NO2**	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0

2018 Data Statistics

Station	Month	Maximum 24 Hr Running Average			Maximum 1 Hr Running Average	Maximum ½ Hr Running Average	Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
		NO2	PM10	TSP	NO2	NO2	PM10	TSP	PM10	TSP	NO	NO2	NOX	PM10	TSP	NO	NO2	NOX	PM10	TSP
		ppb	µg/m^3	µg/m^3	ppb	ppb	µg/m^3	µg/m^3	µg/m^3	µg/m^3	ppb	ppb	ppb	µg/m^3	µg/m^3	%	%	%	%	%
STN72141	January	24	15	19	56	57	15	17	47	46	3	5	8	6	6	89.7	89.7	89.7	99.5	90.1
	February	23	15	20	58	62	12	16	51	48	4	9	12	7	7	99.6	99.6	99.6	100.0	99.6
	March	18	88	58	79	80	86	57	810	446	3	4	7	11	8	99.9	99.9	99.9	100.0	99.9
	April	34	174	90	82	91	95	51	1232	570	5	6	11	17	12	99.9	99.9	99.9	100.0	99.9
	May	21	39	59	67	68	34	48	130	153	5	6	11	11	16	99.6	99.6	99.6	100.0	99.6
	June	11	29	61	36	38	21	59	139	111	4	4	8	10	14	97.9	97.9	97.9	99.9	97.9
	July	7	38	66	23	23	37	59	227	267	2	2	4	11	26	92.6	92.6	92.6	99.7	99.5
	August	7	29	53	19	20	25	48	63	73	2	2	5	12	24	99.1	99.1	99.1	99.2	99.1
	September	4	18	39	14	14	13	39	32	67	ins*	ins*	ins*	7	11	73.1	73.1	73.1	100.0	97.6
	October	7	16	13	19	20	15	13	38	47	2	2	4	3	3	88.6	88.6	88.6	99.5	99.3
	November	9	24	22	23	26	18	19	100	69	2	3	4	5	6	98.9	98.9	98.9	98.8	98.9
	December	15	24	24	35	36	20	22	68	39	3	4	6	6	7	99.9	99.9	99.9	100.0	99.9
	Q1 Arithmetic Mean										3	6	9	8	7	96.4	96.4	96.4	99.8	96.5
	Q2 Arithmetic Mean										5	5	10	13	14	99.1	99.1	99.1	100.0	99.1
	Q3 Arithmetic Mean										2	2	5	10	20	88.2	88.2	88.2	99.6	98.7
	Q4 Arithmetic Mean										2	3	5	4	5	95.8	95.8	95.8	99.4	99.4
	Annual Arithmetic Mean										3	4	7	9	12	94.9	94.9	94.9	99.7	98.4

Exceedance Summary STN72141

Parameter		Type	Averaging Type	Limit	Q1			Q2			Q3			Q4			Total
					J	F	M	A	M	J	J	A	S	O	N	D	
Particulate Matter < 10 µm	**PM10**	AAQC	24 Hr Running	50 µg/m^3	0	0	1	1	0	0	0	0	0	0	0	0	2
Nitrogen Dioxide	**NO2**	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	**NO2**	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0

ins* - insufficient data to calculate mean.

Annual 2018

GOLDCORP

Ambient Air Monitoring Report

Appendix B
Non-continuous Data Statistics

GOLDCORP

Goldcorp - TSP / Metals Report

Station : STN72135 TSP
Location : Extendicare
Reporting Period : 01 January to 31 December, 2018
Sample Matrix : Teflon Coated Filter
Method : IO-3.1
Valid Samples - Number / % : 60 / 98.4%

Parameter	TSP	As	Cd	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Se	S	V	Zn	SO_4
Name		Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulphur	Vanadium	Zinc	Sulphate
Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
AAQC	120	0.3	0.025	0.5	0.1	50	25	0.5	120	0.4	0.2	10	n/a	2	120	n/a
Standard	n/a	n/a	n/a	n/a	n/a	50	25	0.5	120	0.4	2	n/a	n/a	2	120	n/a
Guideline	n/a	0.3	n/a	1.5	0.1	n/a	n/a	n/a	n/a	2.5	n/a	10	n/a	n/a	n/a	n/a
RDL	3	0.0037	0.0012	0.0031	0.0012	0.0031	0.0310	0.0018	0.0310	0.0006	0.0018	0.0061	0.0150	0.0031	0.0031	0.0500
Date																
02-Jan-18	23															
08-Jan-18	19	0.0019	0.0006	0.0016	0.0006	0.1330	0.5730	0.0045	0.1760	0.0130	0.0009	0.0031	0.5060	0.0016	0.0251	1.5200
14-Jan-18	11															
20-Jan-18	9															
26-Jan-18	9	0.0019	0.0006	0.0016	0.0006	0.0343	0.2450	0.0009	0.0780	0.0057	0.0009	0.0031	0.5200	0.0016	0.0142	1.5600
01-Feb-18	31															
07-Feb-18	76															
13-Feb-18	28	0.0019	0.0006	0.0016	0.0006	0.0688	1.4900	0.0023	0.5030	0.0317	0.0022	0.0031	0.3670	0.0016	0.0195	1.1000
19-Feb-18	20															
25-Feb-18	22															
03-Mar-18	18	0.0019	0.0006	0.0016	0.0006	0.0968	0.3970	0.0009	0.2450	0.0078	0.0009	0.0031	0.2600	0.0016	0.0100	0.7800
09-Mar-18	13															
15-Mar-18	22															
21-Mar-18	47	0.0019	0.0006	0.0045	0.0006	0.0806	1.2500	0.0009	0.8100	0.0246	0.0035	0.0031	0.2330	0.0016	0.0181	0.7000
27-Mar-18	51															
02-Apr-18	52															
08-Apr-18	141	0.0062	0.0006	0.0239	0.0047	0.0940	8.0300	0.0033	2.9800	0.1540	0.0139	0.0031	0.4230	0.0144	0.0308	1.2700
14-Apr-18	55															
20-Apr-18	36															
26-Apr-18	61	0.0019	0.0006	0.0081	0.0015	0.0881	2.6900	0.0037	1.1700	0.0568	0.0048	0.0031	0.2970	0.0043	0.0149	0.8900
02-May-18	33															
08-May-18	71															
14-May-18	117	0.0019	0.0006	0.0126	0.0030	0.0607	5.5300	0.0070	2.3000	0.1160	0.0088	0.0031	1.8600	0.0094	0.0333	5.5800
20-May-18	75															
26-May-18	53															
01-Jun-18	32	0.0019	0.0006	0.0016	0.0006	0.0974	0.4200	0.0009	0.1900	0.0094	0.0009	0.0031	0.1050	0.0016	0.0090	0.3100
07-Jun-18	31															
13-Jun-18	30															
19-Jun-18	45	0.0019	0.0006	0.0045	0.0006	0.1650	1.4400	0.0179	0.5320	0.0283	0.0027	0.0031	0.1450	0.0016	0.0139	0.4400
25-Jun-18	27															

01-Jul-18	37															
07-Jul-18	103	0.0019	0.0006	0.0097	0.0025	0.0906	5.0200	0.0009	1.6300	0.1120	0.0068	0.0031	0.2670	0.0088	0.0232	0.8000
13-Jul-18	36															
19-Jul-18	59															
25-Jul-18	35	0.0019	0.0006	0.0032	0.0006	0.0883	0.9580	0.0037	0.4180	0.0200	0.0025	0.0031	0.2720	0.0016	0.0217	0.8200
31-Jul-18	42															
06-Aug-18	28															
12-Aug-18	70	0.0019	0.0006	0.0047	0.0014	0.1490	2.4000	0.0037	0.8440	0.0524	0.0039	0.0031	0.2430	0.0043	0.0176	0.7300
18-Aug-18	38															
24-Aug-18	90															
30-Aug-18	16	0.0019	0.0006	0.0016	0.0006	0.1660	0.3360	0.0009	0.1380	0.0072	0.0009	0.0031	0.0590	0.0016	0.0101	0.1800
05-Sep-18	16															
11-Sep-18	25															
17-Sep-18	29	0.0019	0.0006	0.0016	0.0006	0.0662	0.8680	0.0037	0.2820	0.0180	0.0009	0.0031	0.6020	0.0016	0.0130	1.8000
23-Sep-18	14															
29-Sep-18	15															
05-Oct-18	8	0.0019	0.0006	0.0016	0.0006	0.0512	0.2060	0.0009	0.0730	0.0043	0.0009	0.0031	0.0540	0.0016	0.0047	0.1600
11-Oct-18	8															
17-Oct-18	11															
23-Oct-18	5	0.0019	0.0006	0.0016	0.0006	0.0491	0.1530	0.0066	0.0610	0.0036	0.0009	0.0031	0.0700	0.0016	0.0057	0.2100
29-Oct-18	12															
04-Nov-18	90															
10-Nov-18	12	0.0019	0.0006	0.0016	0.0006	0.0341	0.2350	0.0009	0.0930	0.0044	0.0009	0.0031	0.0520	0.0016	0.0127	0.1600
16-Nov-18	16															
22-Nov-18	41															
28-Nov-18	5	0.0019	0.0006	0.0016	0.0006	0.0409	0.0860	0.0009	0.0400	0.0019	0.0009	0.0031	0.0670	0.0016	0.0049	0.2000
04-Dec-18	17															
10-Dec-18	9															
16-Dec-18	12	0.0019	0.0006	0.0016	0.0006	0.0397	0.3630	0.0009	0.1380	0.0080	0.0009	0.0031	0.1530	0.0016	0.0115	0.4600
22-Dec-18	5															
28-Dec-18	InVld															

Arithmetic Mean	36	0.0021	0.0006	0.0045	0.0011	0.0847	1.6345	0.0033	0.6351	0.0340	0.0030	0.0031	0.3278	0.0032	0.0157	0.9835
Geometric Mean	26	0.0020	0.0006	0.0029	0.0008	0.0755	0.7732	0.0021	0.3074	0.0164	0.0019	0.0031	0.2094	0.0023	0.0137	0.6290
Max	141	0.0062	0.0006	0.0239	0.0047	0.1660	8.0300	0.0179	2.9800	0.1540	0.0139	0.0031	1.8600	0.0144	0.0333	5.5800
Min	5	0.0019	0.0006	0.0016	0.0006	0.0341	0.0860	0.0009	0.0400	0.0019	0.0009	0.0031	0.0520	0.0016	0.0047	0.1600
No. of Samples	60	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
No. > AAQC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a
No. > Standard	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	0	n/a	n/a	0	0	n/a
No. > Guideline	n/a	0	n/a	0	0	n/a	n/a	n/a	n/a	0	n/a	0	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - TSP / Metals Report

Station : STN72136 TSP
Location : MRCA
Reporting Period : 01 January to 31 December, 2018
Sample Matrix : Teflon Coated Filter
Method : IO-3.1
Valid Samples - Number / % : 60 / 98.4%

Parameter	TSP	As	Cd	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Se	S	V	Zn	SO_4
Name		Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulphur	Vanadium	Zinc	Sulphate
Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
AAQC	120	0.3	0.025	0.5	0.1	50	25	0.5	120	0.4	0.2	10	n/a	2	120	n/a
Standard	n/a	n/a	n/a	n/a	n/a	50	25	0.5	120	0.4	2	n/a	n/a	2	120	n/a
Guideline	n/a	0.3	n/a	1.5	0.1	n/a	n/a	n/a	n/a	2.5	n/a	10	n/a	n/a	n/a	n/a
RDL	3	0.0037	0.0012	0.0031	0.0012	0.0031	0.0310	0.0018	0.0310	0.0006	0.0018	0.0061	0.0150	0.0031	0.0031	0.0500
Date																
02-Jan-18	14															
08-Jan-18	23	0.0019	0.0006	0.0016	0.0006	0.0462	0.4210	0.0022	0.2030	0.0142	0.0009	0.0031	0.5100	0.0016	0.0174	1.5300
14-Jan-18	34															
20-Jan-18	6															
26-Jan-18	62	0.0019	0.0006	0.0033	0.0006	0.0501	1.1500	0.0089	0.6040	0.0234	0.0052	0.0031	0.5280	0.0016	0.0145	1.5800
01-Feb-18	5															
07-Feb-18	10															
13-Feb-18	9	0.0019	0.0006	0.0016	0.0006	0.0288	0.1890	0.0009	0.0960	0.0044	0.0009	0.0031	0.3490	0.0016	0.0148	1.0500
19-Feb-18	10															
25-Feb-18	19															
03-Mar-18	10	0.0019	0.0006	0.0016	0.0006	0.0398	0.2100	0.0009	0.1310	0.0042	0.0009	0.0031	0.2330	0.0016	0.0080	0.7000
09-Mar-18	9															
15-Mar-18	20															
21-Mar-18	27	0.0019	0.0006	0.0016	0.0006	0.2470	0.5920	0.0009	0.3800	0.0115	0.0020	0.0031	0.1610	0.0016	0.0106	0.4800
27-Mar-18	80															
02-Apr-18	27															
08-Apr-18	43	0.0019	0.0006	0.0045	0.0006	0.0675	1.0900	0.0009	0.6300	0.0217	0.0030	0.0031	0.3320	0.0016	0.0200	1.0000
14-Apr-18	31															
20-Apr-18	54															
26-Apr-18	121	0.0019	0.0006	0.0205	0.0026	0.0806	4.4700	0.0070	2.4900	0.0900	0.0110	0.0031	0.4040	0.0078	0.0442	1.2100
02-May-18	44															
08-May-18	51															
14-May-18	95	0.0019	0.0006	0.0100	0.0018	0.0587	2.9600	0.0028	1.6100	0.0548	0.0066	0.0031	0.4210	0.0043	0.0377	1.2600
20-May-18	72															
26-May-18	86															
01-Jun-18	23	0.0019	0.0006	0.0016	0.0006	0.0219	0.2370	0.0009	0.1200	0.0050	0.0009	0.0031	0.0820	0.0016	0.0069	0.2500
07-Jun-18	31															
13-Jun-18	31															
19-Jun-18	38	0.0019	0.0006	0.0032	0.0006	0.0504	0.9250	0.0108	0.3480	0.0176	0.0021	0.0031	0.1040	0.0016	0.0179	0.3100
25-Jun-18	90															

01-Jul-18	45															
07-Jul-18	74	0.0019	0.0006	0.0079	0.0013	0.0480	2.4200	0.0026	1.0200	0.0506	0.0049	0.0031	0.2000	0.0034	0.0314	0.6000
13-Jul-18	66															
19-Jul-18	61															
25-Jul-18	42	0.0019	0.0006	0.0040	0.0006	0.1730	1.1000	0.0090	0.4380	0.0245	0.0028	0.0031	0.2780	0.0016	0.0148	0.8300
31-Jul-18	57															
06-Aug-18	30															
12-Aug-18	70	0.0019	0.0006	0.0051	0.0006	0.0668	1.9200	0.0042	0.7610	0.0408	0.0038	0.0031	0.2290	0.0016	0.0319	0.6900
18-Aug-18	71															
24-Aug-18	100															
30-Aug-18	52	0.0019	0.0006	0.0016	0.0006	0.0348	0.8630	0.0009	0.5050	0.0174	0.0041	0.0031	0.0750	0.0016	0.0179	0.2300
05-Sep-18	14															
11-Sep-18	110															
17-Sep-18	34	0.0019	0.0006	0.0016	0.0006	0.0164	0.7320	0.0009	0.3290	0.0156	0.0009	0.0031	0.6260	0.0016	0.0179	1.8800
23-Sep-18	14															
29-Sep-18	13															
05-Oct-18	18	0.0019	0.0006	0.0016	0.0006	0.0599	0.7260	0.0161	0.2920	0.0144	0.0009	0.0031	0.0790	0.0016	0.0148	0.2400
11-Oct-18	11															
17-Oct-18	11															
23-Oct-18	6	0.0019	0.0006	0.0016	0.0006	0.0237	0.1230	0.0009	0.0560	0.0029	0.0009	0.0031	0.0660	0.0016	0.0088	0.2000
29-Oct-18	11															
04-Nov-18	37															
10-Nov-18	7	0.0019	0.0006	0.0016	0.0006	0.0135	0.1290	0.0009	0.0570	0.0027	0.0009	0.0031	0.0430	0.0016	0.0086	0.1300
16-Nov-18	29															
22-Nov-18	30															
28-Nov-18	4	0.0019	0.0006	0.0016	0.0006	0.0072	0.0510	0.0009	0.0155	0.0012	0.0009	0.0031	0.0610	0.0016	0.0040	0.1800
04-Dec-18	3															
10-Dec-18	70															
16-Dec-18	20	0.0019	0.0006	0.0016	0.0006	0.0348	0.5030	0.0009	0.2400	0.0108	0.0009	0.0031	0.2030	0.0016	0.0102	0.6100
22-Dec-18	5															
28-Dec-18	InVld															

Arithmetic Mean	38	0.0019	0.0006	0.0039	0.0008	0.0585	1.0406	0.0037	0.5163	0.0214	0.0027	0.0031	0.2492	0.0021	0.0176	0.7480
Geometric Mean	26	0.0019	0.0006	0.0027	0.0007	0.0424	0.5981	0.0021	0.2845	0.0128	0.0019	0.0031	0.1873	0.0018	0.0149	0.5631
Max	121	0.0019	0.0006	0.0205	0.0026	0.2470	4.4700	0.0161	2.4900	0.0900	0.0110	0.0031	0.6260	0.0078	0.0442	1.8800
Min	3	0.0019	0.0006	0.0016	0.0006	0.0072	0.0510	0.0009	0.0155	0.0012	0.0009	0.0031	0.0430	0.0016	0.0040	0.1300
No. of Samples	60	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
No. > AAQC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a
No. > Standard	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	0	n/a	n/a	0	0	n/a
No. > Guideline	n/a	0	n/a	0	0	n/a	n/a	n/a	n/a	0	n/a	0	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - TSP / Metals Report

Station : STN72137 TSP
Location : Shania Twain Centre
Reporting Period : 01 January to 31 December, 2018
Sample Matrix : Teflon Coated Filter
Method : IO-3.1
Valid Samples - Number / % : 60 / 98.4%

Parameter	TSP	As	Cd	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Se	S	V	Zn	SO_4
Name		Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulphur	Vanadium	Zinc	Sulphate
Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
AAQC	120	0.3	0.025	0.5	0.1	50	25	0.5	120	0.4	0.2	10	n/a	2	120	n/a
Standard	n/a	n/a	n/a	n/a	n/a	50	25	0.5	120	0.4	2	n/a	n/a	2	120	n/a
Guideline	n/a	0.3	n/a	1.5	0.1	n/a	n/a	n/a	n/a	2.5	n/a	10	n/a	n/a	n/a	n/a
RDL	3	0.0037	0.0012	0.0031	0.0012	0.0031	0.0310	0.0018	0.0310	0.0006	0.0018	0.0061	0.0150	0.0031	0.0031	0.0500
Date																
02-Jan-18	10															
08-Jan-18	12	0.0019	0.0006	0.0016	0.0006	0.0335	0.0950	0.0019	0.0410	0.0030	0.0009	0.0031	0.4740	0.0016	0.0192	1.4200
14-Jan-18	2															
20-Jan-18	12															
26-Jan-18	7	0.0019	0.0006	0.0016	0.0006	0.0255	0.1160	0.0009	0.0400	0.0033	0.0009	0.0031	0.4620	0.0016	0.0115	1.3800
01-Feb-18	6															
07-Feb-18	10															
13-Feb-18	5	0.0019	0.0006	0.0016	0.0006	0.0341	0.1000	0.0009	0.0570	0.0027	0.0009	0.0031	0.2920	0.0016	0.0115	0.8800
19-Feb-18	36															
25-Feb-18	5															
03-Mar-18	25	0.0019	0.0006	0.0016	0.0006	0.0758	0.9830	0.0009	0.4230	0.0215	0.0022	0.0031	0.2740	0.0016	0.0113	0.8200
09-Mar-18	9															
15-Mar-18	26															
21-Mar-18	97	0.0041	0.0006	0.0073	0.0028	0.0538	4.1000	0.0009	1.7400	0.0887	0.0066	0.0031	0.2760	0.0054	0.0232	0.8300
27-Mar-18	24															
02-Apr-18	28															
08-Apr-18	27	0.0019	0.0006	0.0016	0.0006	0.2150	0.6540	0.0022	0.3190	0.0139	0.0009	0.0031	0.2020	0.0016	0.0114	0.6000
14-Apr-18	139															
20-Apr-18	73															
26-Apr-18	82	0.0019	0.0006	0.0116	0.0016	0.0843	2.7900	0.0052	1.4200	0.0540	0.0067	0.0031	0.3020	0.0045	0.0270	0.9100
02-May-18	44															
08-May-18	94															
14-May-18	75	0.0019	0.0006	0.0085	0.0013	0.0836	2.5300	0.0030	1.2100	0.0472	0.0052	0.0031	0.3030	0.0035	0.0288	0.9100
20-May-18	36															
26-May-18	42															
01-Jun-18	33	0.0019	0.0006	0.0016	0.0006	0.0858	0.6150	0.0009	0.2580	0.0127	0.0029	0.0031	0.0970	0.0016	0.0100	0.2900
07-Jun-18	44															
13-Jun-18	27															
19-Jun-18	43	0.0019	0.0006	0.0034	0.0006	0.1010	0.8090	0.1110	0.3120	0.0143	0.0020	0.0031	0.1280	0.0016	0.0149	0.3800
25-Jun-18	68															

01-Jul-18	25															
07-Jul-18	41	0.0019	0.0006	0.0045	0.0006	0.0757	1.0100	0.0009	0.4390	0.0198	0.0027	0.0031	0.1410	0.0016	0.0177	0.4200
13-Jul-18	38															
19-Jul-18	47															
25-Jul-18	42	0.0019	0.0006	0.0035	0.0006	0.1170	1.0800	0.0023	0.4340	0.0204	0.0044	0.0031	0.2860	0.0016	0.0192	0.8600
31-Jul-18	78															
06-Aug-18	23															
12-Aug-18	52	0.0019	0.0006	0.0046	0.0006	0.0853	1.3400	0.0087	0.5520	0.0275	0.0031	0.0031	0.2030	0.0016	0.0185	0.6100
18-Aug-18	86															
24-Aug-18	86															
30-Aug-18	26	0.0019	0.0006	0.0016	0.0006	0.0558	0.9050	0.0021	0.3360	0.0172	0.0019	0.0031	0.0700	0.0016	0.0156	0.2100
05-Sep-18	16															
11-Sep-18	44															
17-Sep-18	31	0.0019	0.0006	0.0016	0.0006	0.0347	0.8030	0.0009	0.3120	0.0171	0.0009	0.0031	0.5800	0.0016	0.0145	1.7400
23-Sep-18	24															
29-Sep-18	10															
05-Oct-18	17	0.0019	0.0006	0.0016	0.0006	0.0306	0.7790	0.0242	0.2610	0.0157	0.0009	0.0031	0.0690	0.0016	0.0106	0.2100
11-Oct-18	10															
17-Oct-18	14															
23-Oct-18	6	0.0019	0.0006	0.0016	0.0006	0.0416	0.1680	0.0009	0.0610	0.0035	0.0009	0.0031	0.0640	0.0016	0.0072	0.1900
29-Oct-18	9															
04-Nov-18	15															
10-Nov-18	17	0.0019	0.0006	0.0016	0.0006	0.0285	0.6540	0.0009	0.2550	0.0142	0.0009	0.0031	0.0690	0.0016	0.0109	0.2100
16-Nov-18	7															
22-Nov-18	5															
28-Nov-18	2	0.0019	0.0006	0.0016	0.0006	0.0335	0.0670	0.0009	0.0155	0.0013	0.0009	0.0031	0.0630	0.0016	0.0049	0.1900
04-Dec-18	4															
10-Dec-18	7															
16-Dec-18	11	0.0019	0.0006	0.0016	0.0006	0.0328	0.2050	0.0009	0.1150	0.0045	0.0009	0.0031	0.1860	0.0016	0.0106	0.5600
22-Dec-18	7															
28-Dec-18	InVld															

Arithmetic Mean	32	0.0020	0.0006	0.0032	0.0008	0.0664	0.9902	0.0085	0.4300	0.0201	0.0023	0.0031	0.2271	0.0020	0.0149	0.6810
Geometric Mean	21	0.0019	0.0006	0.0024	0.0007	0.0560	0.5692	0.0021	0.2340	0.0121	0.0017	0.0031	0.1803	0.0018	0.0137	0.5410
Max	139	0.0041	0.0006	0.0116	0.0028	0.2150	4.1000	0.1110	1.7400	0.0887	0.0067	0.0031	0.5800	0.0054	0.0288	1.7400
Min	2	0.0019	0.0006	0.0016	0.0006	0.0255	0.0670	0.0009	0.0155	0.0013	0.0009	0.0031	0.0630	0.0016	0.0049	0.1900
No. of Samples	60	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
No. > AAQC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	n/a
No. > Standard	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	0	n/a	n/a	0	0	n/a
No. > Guideline	n/a	0	n/a	0	0	n/a	n/a	n/a	n/a	0	n/a	0	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - PM10 / Metals Report

Station : STN72135 PM10
Location : Extendicare
Reporting Period : 01 January to 31 December, 2018
Sample Matrix : Teflon Coated Filter
Method : IO-3.1
Valid Samples - Number / % : 60 / 98.4%

Parameter	PM10	As	Cd	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Se	S	V	Zn	SO_4
Name		Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulphur	Vanadium	Zinc	Sulphate
Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
AAQC	50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.2	0.1	n/a	n/a	n/a	n/a	n/a
RDL	3	0.0037	0.0012	0.0031	0.0012	0.0031	0.0310	0.0018	0.0310	0.0006	0.0018	0.0061	0.0150	0.0031	0.0031	0.0500
Date																
02-Jan-18	12															
08-Jan-18	12															
14-Jan-18	5	0.0019	0.0006	0.0016	0.0006	0.0287	0.0700	0.0009	0.0350	0.0019	0.0009	0.0031	0.1820	0.0016	0.0077	0.5500
20-Jan-18	4															
26-Jan-18	6															
01-Feb-18	10															
07-Feb-18	21															
13-Feb-18	21	0.0019	0.0006	0.0016	0.0006	0.0190	0.9940	0.0026	0.3450	0.0212	0.0020	0.0031	0.3540	0.0016	0.0178	1.0600
19-Feb-18	22															
25-Feb-18	18															
03-Mar-18	6															
09-Mar-18	7															
15-Mar-18	13	0.0019	0.0006	0.0016	0.0006	0.0160	0.2230	0.0009	0.1440	0.0046	0.0009	0.0031	0.2590	0.0016	0.0087	0.7700
21-Mar-18	23															
27-Mar-18	18															
02-Apr-18	18															
08-Apr-18	43															
14-Apr-18	22	0.0019	0.0006	0.0016	0.0006	0.0132	0.5440	0.0009	0.3050	0.0113	0.0024	0.0031	0.4490	0.0016	0.0126	1.3400
20-Apr-18	16															
26-Apr-18	28															
02-May-18	17															
08-May-18	30															
14-May-18	49	0.0019	0.0006	0.0058	0.0014	0.0149	1.9600	0.0062	0.8140	0.0393	0.0042	0.0031	0.2610	0.0016	0.0175	0.7800
20-May-18	33															
26-May-18	15															
01-Jun-18	13															
07-Jun-18	15															
13-Jun-18	17	0.0019	0.0006	0.0016	0.0006	0.0565	0.1440	0.0052	0.0530	0.0033	0.0009	0.0031	0.2150	0.0016	0.0104	0.6500
19-Jun-18	24															
25-Jun-18	11															

01-Jul-18	21															
07-Jul-18	36															
13-Jul-18	22	0.0019	0.0006	0.0041	0.0006	0.0168	0.3230	0.0046	0.1070	0.0073	0.0023	0.0031	0.4320	0.0016	0.0077	1.2900
19-Jul-18	26															
25-Jul-18	21															
31-Jul-18	23															
06-Aug-18	18															
12-Aug-18	37	0.0019	0.0006	0.0016	0.0006	0.0217	0.8060	0.0033	0.2860	0.0167	0.0009	0.0031	0.1700	0.0016	0.0105	0.5100
18-Aug-18	23															
24-Aug-18	42															
30-Aug-18	10															
05-Sep-18	12															
11-Sep-18	14	0.0019	0.0006	0.0016	0.0006	0.0200	0.3360	0.0038	0.1010	0.0061	0.0009	0.0031	0.1540	0.0016	0.0080	0.4600
17-Sep-18	17															
23-Sep-18	7															
29-Sep-18	13															
05-Oct-18	2															
11-Oct-18	5	0.0019	0.0006	0.0016	0.0006	0.0121	0.1260	0.0021	0.0420	0.0025	0.0009	0.0031	0.0075	0.0016	0.0074	0.0250
17-Oct-18	4															
23-Oct-18	4															
29-Oct-18	2															
04-Nov-18	18															
10-Nov-18	7	0.0019	0.0006	0.0016	0.0006	0.0123	0.2490	0.0009	0.1010	0.0051	0.0009	0.0031	0.0630	0.0016	0.0046	0.1900
16-Nov-18	7															
22-Nov-18	15															
28-Nov-18	1.5															
04-Dec-18	5															
10-Dec-18	5	0.0019	0.0006	0.0016	0.0006	0.0061	0.1100	0.0009	0.0350	0.0023	0.0009	0.0031	0.3620	0.0016	0.0049	1.0800
16-Dec-18	6															
22-Dec-18	3															
28-Dec-18	InVld															
Arithmetic Mean	16	0.0019	0.0006	0.0021	0.0007	0.0198	0.4904	0.0027	0.1973	0.0101	0.0015	0.0031	0.2424	0.0016	0.0098	0.7254
Geometric Mean	12	0.0019	0.0006	0.0019	0.0006	0.0171	0.3077	0.0021	0.1216	0.0065	0.0013	0.0031	0.1748	0.0016	0.0090	0.5284
Max	49	0.0019	0.0006	0.0058	0.0014	0.0565	1.9600	0.0062	0.8140	0.0393	0.0042	0.0031	0.4490	0.0016	0.0178	1.3400
Min	2	0.0019	0.0006	0.0016	0.0006	0.0061	0.0700	0.0009	0.0350	0.0019	0.0009	0.0031	0.0075	0.0016	0.0046	0.0250
No. of Samples	60	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. > AAQC	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - PM10 / Metals Report

Station : STN72136 PM10
Location : MRCA
Reporting Period : 01 January to 31 December, 2018
Sample Matrix : Teflon Coated Filter
Method : IO-3.1
Valid Samples - Number / % : 60 / 98.4%

Parameter	PM10	As	Cd	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Se	S	V	Zn	SO_4
Name		Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulphur	Vanadium	Zinc	Sulphate
Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
AAQC	50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.2	0.1	n/a	n/a	n/a	n/a	n/a
RDL	3	0.0037	0.0012	0.0031	0.0012	0.0031	0.0310	0.0018	0.0310	0.0006	0.0018	0.0061	0.0150	0.0031	0.0031	0.0500
Date																
02-Jan-18	13															
08-Jan-18	16															
14-Jan-18	27	0.0019	0.0006	0.0016	0.0006	0.0431	0.5520	0.0026	0.2940	0.0153	0.0031	0.0031	0.2410	0.0016	0.0116	0.7200
20-Jan-18	5															
26-Jan-18	47															
01-Feb-18	4															
07-Feb-18	9															
13-Feb-18	8	0.0019	0.0006	0.0016	0.0006	0.0294	0.1810	0.0009	0.0900	0.0042	0.0009	0.0031	0.3190	0.0016	0.0130	0.9600
19-Feb-18	11															
25-Feb-18	19															
03-Mar-18	7															
09-Mar-18	7															
15-Mar-18	18	0.0019	0.0006	0.0016	0.0006	0.0699	0.2840	0.0009	0.2370	0.0058	0.0009	0.0031	0.3770	0.0016	0.0126	1.1300
21-Mar-18	20															
27-Mar-18	60															
02-Apr-18	19															
08-Apr-18	28															
14-Apr-18	20	0.0019	0.0006	0.0016	0.0006	0.0183	0.2650	0.0009	0.1490	0.0060	0.0009	0.0031	0.4310	0.0016	0.0133	1.2900
20-Apr-18	35															
26-Apr-18	80															
02-May-18	26															
08-May-18	34															
14-May-18	63	0.0019	0.0006	0.0067	0.0006	0.0200	1.8000	0.0022	0.9430	0.0331	0.0043	0.0031	0.7490	0.0016	0.0254	2.2400
20-May-18	40															
26-May-18	40															
01-Jun-18	17															
07-Jun-18	19															
13-Jun-18	19	0.0019	0.0006	0.0016	0.0006	0.0270	0.2570	0.0080	0.1060	0.0052	0.0027	0.0031	0.2140	0.0016	0.0101	0.6400
19-Jun-18	25															
25-Jun-18	55															

01-Jul-18	28															
07-Jul-18	46															
13-Jul-18	37	0.0019	0.0006	0.0039	0.0006	0.0503	0.9300	0.0020	0.3670	0.0196	0.0025	0.0031	0.4840	0.0016	0.0197	1.4500
19-Jul-18	38															
25-Jul-18	25															
31-Jul-18	37															
06-Aug-18	20															
12-Aug-18	48	0.0019	0.0006	0.0040	0.0006	0.0531	1.2300	0.0037	0.4850	0.0261	0.0025	0.0031	0.2020	0.0016	0.0230	0.6100
18-Aug-18	40															
24-Aug-18	70															
30-Aug-18	37															
05-Sep-18	9															
11-Sep-18	33	0.0019	0.0006	0.0037	0.0006	0.0170	1.5700	0.0155	0.4750	0.0349	0.0033	0.0031	0.2120	0.0016	0.0255	0.6400
17-Sep-18	20															
23-Sep-18	7															
29-Sep-18	7															
05-Oct-18	8															
11-Oct-18	4	0.0019	0.0006	0.0016	0.0006	0.0081	0.1030	0.0009	0.0330	0.0021	0.0009	0.0031	0.0200	0.0016	0.0090	0.0600
17-Oct-18	7															
23-Oct-18	2															
29-Oct-18	3															
04-Nov-18	14															
10-Nov-18	7	0.0019	0.0006	0.0016	0.0006	0.0053	0.2240	0.0009	0.1050	0.0051	0.0009	0.0031	0.0680	0.0016	0.0073	0.2000
16-Nov-18	24															
22-Nov-18	16															
28-Nov-18	2															
04-Dec-18	2															
10-Dec-18	34	0.0019	0.0006	0.0016	0.0006	0.0113	0.7270	0.0075	0.4260	0.0145	0.0035	0.0031	0.3780	0.0016	0.0080	1.1300
16-Dec-18	7															
22-Dec-18	4															
28-Dec-18	InVld															

Arithmetic Mean	24	0.0019	0.0006	0.0026	0.0006	0.0294	0.6769	0.0038	0.3092	0.0143	0.0022	0.0031	0.3079	0.0016	0.0149	0.9225
Geometric Mean	16	0.0019	0.0006	0.0022	0.0006	0.0228	0.4660	0.0023	0.2182	0.0100	0.0018	0.0031	0.2295	0.0016	0.0136	0.6872
Max	80	0.0019	0.0006	0.0067	0.0006	0.0699	1.8000	0.0155	0.9430	0.0349	0.0043	0.0031	0.7490	0.0016	0.0255	2.2400
Min	2	0.0019	0.0006	0.0016	0.0006	0.0053	0.1030	0.0009	0.0330	0.0021	0.0009	0.0031	0.0200	0.0016	0.0073	0.0600
No. of Samples	60	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. > AAQC	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - PM10 / Metals Report

Station : STN72137 PM10
Location : Shania Twain Centre
Reporting Period : 01 January to 31 December, 2018
Sample Matrix : Teflon Coated Filter
Method : IO-3.1
Valid Samples - Number / % : 59 / 96.7%

Parameter	PM10	As	Cd	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Se	S	V	Zn	SO_4
Name		Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulphur	Vanadium	Zinc	Sulphate
Units	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
AAQC	50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.2	0.1	n/a	n/a	n/a	n/a	n/a
RDL	3	0.0037	0.0012	0.0031	0.0012	0.0031	0.0310	0.0018	0.0310	0.0006	0.0018	0.0061	0.0150	0.0031	0.0031	0.0500
Date																
02-Jan-18	13															
08-Jan-18	12															
14-Jan-18	2	0.0019	0.0006	0.0016	0.0006	0.0122	0.0420	0.0027	0.0155	0.0012	0.0009	0.0031	0.1920	0.0016	0.0055	0.5700
20-Jan-18	6															
26-Jan-18	7															
01-Feb-18	8															
07-Feb-18	11															
13-Feb-18	17	0.0019	0.0006	0.0035	0.0006	0.0117	0.6450	0.0009	0.2690	0.0143	0.0020	0.0031	0.3480	0.0016	0.0165	1.0400
19-Feb-18	26															
25-Feb-18	13															
03-Mar-18	8															
09-Mar-18	9															
15-Mar-18	20	0.0019	0.0006	0.0016	0.0006	0.0088	0.5060	0.0009	0.2750	0.0102	0.0009	0.0031	0.3640	0.0016	0.0101	1.0900
21-Mar-18	37															
27-Mar-18	15															
02-Apr-18	13															
08-Apr-18	18															
14-Apr-18	46	0.0019	0.0006	0.0092	0.0006	0.0468	2.1600	0.0009	0.8420	0.0534	0.0050	0.0031	0.4480	0.0044	0.0222	1.3400
20-Apr-18	InVld															
26-Apr-18	38															
02-May-18	17															
08-May-18	37															
14-May-18	35	0.0019	0.0006	0.0043	0.0006	0.0226	1.1500	0.0022	0.5230	0.0207	0.0027	0.0031	0.2500	0.0016	0.0172	0.7500
20-May-18	20															
26-May-18	15															
01-Jun-18	15															
07-Jun-18	23															
13-Jun-18	14	0.0019	0.0006	0.0016	0.0006	0.0356	0.0780	0.0009	0.0380	0.0018	0.0009	0.0031	0.2000	0.0016	0.0076	0.6000
19-Jun-18	21															
25-Jun-18	28															

01-Jul-18	18															
07-Jul-18	17															
13-Jul-18	24	0.0019	0.0006	0.0016	0.0006	0.0251	0.3480	0.0009	0.1330	0.0067	0.0009	0.0031	0.4520	0.0016	0.0120	1.3600
19-Jul-18	24															
25-Jul-18	24															
31-Jul-18	43															
06-Aug-18	17															
12-Aug-18	30	0.0019	0.0006	0.0016	0.0006	0.0388	0.4250	0.0073	0.1760	0.0082	0.0009	0.0031	0.1460	0.0016	0.0105	0.4400
18-Aug-18	34															
24-Aug-18	41															
30-Aug-18	14															
05-Sep-18	11															
11-Sep-18	18	0.0019	0.0006	0.0016	0.0006	0.0131	0.5040	0.0009	0.1850	0.0097	0.0009	0.0031	0.1640	0.0016	0.0088	0.4900
17-Sep-18	16															
23-Sep-18	12															
29-Sep-18	5															
05-Oct-18	7															
11-Oct-18	3	0.0019	0.0006	0.0016	0.0006	0.0130	0.1010	0.0071	0.0155	0.0019	0.0009	0.0031	0.0075	0.0016	0.0082	0.0250
17-Oct-18	11															
23-Oct-18	2															
29-Oct-18	4															
04-Nov-18	8															
10-Nov-18	11	0.0019	0.0006	0.0048	0.0006	0.0110	0.3910	0.0009	0.1550	0.0084	0.0026	0.0031	0.0820	0.0016	0.0076	0.2500
16-Nov-18	6															
22-Nov-18	5															
28-Nov-18	2															
04-Dec-18	2															
10-Dec-18	7	0.0019	0.0006	0.0016	0.0006	0.0079	0.1220	0.0262	0.0460	0.0029	0.0009	0.0031	0.3280	0.0016	0.0052	0.9800
16-Dec-18	6															
22-Dec-18	5															
28-Dec-18	InVld															
Arithmetic Mean	16	0.0019	0.0006	0.0029	0.0006	0.0206	0.5393	0.0043	0.2228	0.0116	0.0016	0.0031	0.2485	0.0018	0.0110	0.7446
Geometric Mean	12	0.0019	0.0006	0.0023	0.0006	0.0172	0.3150	0.0020	0.1203	0.0067	0.0013	0.0031	0.1804	0.0017	0.0100	0.5459
Max	46	0.0019	0.0006	0.0092	0.0006	0.0468	2.1600	0.0262	0.8420	0.0534	0.0050	0.0031	0.4520	0.0044	0.0222	1.3600
Min	2	0.0019	0.0006	0.0016	0.0006	0.0079	0.0420	0.0009	0.0155	0.0012	0.0009	0.0031	0.0075	0.0016	0.0052	0.0250
No. of Samples	59	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. > AAQC	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - Dustfall Summary Report

Reporting Period : 01 January to 31 December, 2018

Sampling Method : BRL SOP-00121

Standard : 7.0 g/m^2/30d

	STN72135 Extendicare			STN72136 MRCA			STN72137 Shania Twain Centre		
Units	g/m²/30d			g/m²/30d			g/m²/30d		
RDL	0.01			0.01			0.01		
Month	Insoluble	Soluble	**Total Dustfall**	Insoluble	Soluble	**Total Dustfall**	Insoluble	Soluble	**Total Dustfall**
January	0.45	0.65	1.10	0.31	0.54	0.86	0.29	0.35	0.65
February	1.60	0.67	2.30	0.30	0.52	0.82	0.24	0.33	0.57
March	0.57	0.74	1.30	0.36	0.42	0.78	6.80	1.00	7.80
April	1.80	0.69	2.50	0.85	0.44	1.30	1.60	0.54	2.20
May	2.30	1.10	3.50	2.40	1.40	3.80	1.90	1.00	3.00
June	3.00	1.60	4.60	1.70	1.60	3.30	1.20	0.96	2.20
July	2.80	0.71	3.50	2.00	0.69	2.70	2.80	1.80	4.60
August	2.30	1.20	3.50	1.70	0.69	2.40	1.50	0.55	2.10
September	0.92	0.53	1.50	1.40	0.64	2.00	0.83	0.36	1.20
October	0.86	0.73	1.60	0.77	0.64	1.40	0.65	1.00	1.70
November	0.96	0.65	1.60	0.42	0.36	0.78	0.32	0.29	0.61
December	0.66	0.80	1.50	0.69	0.61	1.30	0.39	0.55	0.95
Annual Average	1.52	0.84	2.38	1.08	0.71	1.79	1.54	0.73	2.30
Annual Max	3.00	1.60	4.60	2.40	1.60	3.80	6.80	1.80	7.80
No. of Valid Samples	12	12	12	12	12	12	12	12	12
% Valid Data	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Samples > Standard	n/a	n/a	0	n/a	n/a	0	n/a	n/a	1

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - Dustfall Summary Report

Reporting Period : 01 January to 31 December, 2018

Sampling Method : BRL SOP-00121

Standard : 7.0 g/m^2/30d

	STN72141 Claimpost Trail			STN72142 Aura Lake			STN72143 Snowmobile Crossing		
Units	g/m²/30d			g/m²/30d			g/m²/30d		
RDL	0.01			0.01			0.01		
Month	Insoluble	Soluble	**Total Dustfall**	Insoluble	Soluble	**Total Dustfall**	Insoluble	Soluble	**Total Dustfall**
January	0.50	0.67	1.20	0.28	0.58	0.86	2.60	1.20	3.80
February	0.95	0.56	1.50	0.59	0.41	1.00	12.00	1.10	13.00
March	3.10	0.95	4.10	0.79	0.59	1.40	13.00	1.20	14.00
April	5.50	1.00	6.50	2.10	0.69	2.70	23.00	1.20	24.00
May	4.10	1.60	5.70	9.50	1.70	11.00	33.00	3.50	36.00
June	2.00	1.00	3.00	1.30	0.88	2.20	31.00	4.50	35.00
July	3.50	0.95	4.50	2.00	0.71	2.70	52.00	5.60	58.00
August	3.10	0.94	4.10	1.90	0.65	2.60	42.00	5.90	48.00
September	2.10	0.70	2.80	1.30	0.63	2.00	26.00	3.20	29.00
October	1.60	0.94	2.60	0.82	0.67	1.50	23.00	2.20	25.00
November	1.50	0.60	2.10	0.60	0.23	0.83	16.00	1.40	17.00
December	0.63	0.69	1.30	0.34	0.46	0.80	5.70	0.55	6.20
Annual Average	2.38	0.88	3.28	1.79	0.68	2.47	23.28	2.63	25.75
Annual Max	5.50	1.60	6.50	9.50	1.70	11.00	52.00	5.90	58.00
No. of Valid Samples	12	12	12	12	12	12	12	12	12
% Valid Data	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Samples > Standard	n/a	n/a	0	n/a	n/a	1	n/a	n/a	10

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

GOLDCORP

Goldcorp - Passive Sampling Report

Reporting Period : 01 January to 31 December 2018
Sampling Methods : Radiello F1 / APHA 4110

	STN72135 EXTENDICARE		STN72136 MRCA		STN72137 SHANIA TWAIN	
Parameter	**SO_2**	**NO_2**	**SO_2**	**NO_2**	**SO_2**	**NO_2**
Units	ppb	ppb	ppb	ppb	ppb	ppb
RDL	0.10	0.10	0.10	0.10	0.10	0.10
Month						
January	0.30	3.10	0.60	0.05	0.40	0.05
February	0.20	3.70	0.40	2.70	0.20	2.00
March	0.20	0.80	0.30	1.40	0.30	1.50
April	0.05	1.30	0.05	0.90	0.10	1.00
May	0.05	1.50	0.05	1.60	0.05	1.20
June	0.10	1.80	0.05	1.00	0.05	0.70
July	0.70	1.50	0.50	1.00	0.30	0.70
August	0.10	1.90	0.20	1.00	0.30	0.90
September	0.10	1.70	0.10	1.60	0.05	0.90
October	0.05	2.50	0.05	2.00	0.05	1.80
November	0.20	2.20	0.30	2.70	0.20	2.50
December	0.10	2.90	0.10	5.10	0.10	2.00
Annual Average	0.18	2.08	0.23	1.75	0.18	1.27
Annual Maximum	0.70	3.70	0.60	5.10	0.40	2.50
No. of Valid Samples	12	12	12	12	12	12
% Valid Data	100.0	100.0	100.0	100.0	100.0	100.0

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

Annual 2018

GOLDCORP

Ambient Air Monitoring Report

Appendix C
Calibration Summary

GOLDCORP CALIBRATION SUMMARY JUNE 2018

Station Identifier	STN72135	STN72138	STN72139	STN72140	STN72141
GC Serial Number	380	379	381	382	453
Station Name	Extendicare	Hollinger Park	Hollinger Office	Goldmine Tour	Claimpost Trail
Date	Jun-20	---	Jun-19	Jun-21	Jun-19
Time (EST)	11:00	---	15:00	8:00	14:00
SHARP Neph Zero response	4.5	---	2.7	0.6	6.8
SHARP Conc. Zero response	3.4	---	1.6	0.4	3.2
SHARP Zero reset	Yes	---	Yes	No	Yes
Flow rate response	Pass	---	Pass	Pass	Pass
Monitor calibration criteria	Pass	---	Pass	Pass	Pass
Date	Jun-20	---	Jun-19	Jun-21	Jun-19
Time (EST)	11:00	---	15:00	8:00	11:00
TSP Zero response	1.3	---	-0.3	-24.9	-6.4
TSP Zero reset	No	---	Yes	Yes	Yes
Flow rate response	Pass	---	Pass	Pass	Pass
Monitor calibration criteria	Pass	---	Pass	Pass	Pass
Date	Jun-20	---	Jun-19	Jun-21	Jun-19
Time (EST)	11:00	---	15:00	8:00	11:00
NO / NOX Zero response	-0.6 / 0.4	---	-0.2 / 0.0	0.1 / 0.5	2.0 / 3.9
NO / NOX Zero reset	Yes	---	No	No	Yes
NO / NOX Span input	760 / 761	---	760 / 761	760 / 761	760 / 761
NO / NOX Span response	833 / 820	---	740 / 738	822 / 807	820 / 822
NO / NOX Span tolerance	9.6 / 7.7	---	-2.6 / -3.0	8.2 / 6.0	7.9 / 8.0
NO / NOX Span reset	Yes	---	Yes	Yes	Yes
Monitor calibration criteria	Pass	---	Pass	Pass	Pass

GOLDCORP CALIBRATION SUMMARY AUGUST 2018

Station Identifier	STN72135	STN72138	STN72139	STN72140	STN72141
GC Serial Number	380	379	381	382	453
Station Name	Extendicare	Hollinger Park	Hollinger Office	Goldmine Tour	Claimpost Trail
Date	Aug-21	---	Aug-22	Aug-20	Aug-20
Time (EST)	9:00	---	7:00	12:00	15:00
SHARP Neph Zero response	4.5	---	2.7	0.6	6.8
SHARP Conc. Zero response	3.6	---	1.6	0.4	3.2
SHARP Zero reset	Yes	---	Yes	No	Yes
Flow rate response	Pass	---	Pass	Pass	Pass
Monitor calibration criteria	Pass	---	Pass	Pass	Pass
Date	Aug-21	---	Aug-22	Aug-20	Aug-20
Time (EST)	9:00	---	7:00	12:00	15:00
TSP Zero response	-1.0	---	-3.3	0.1	1.0
TSP Zero reset	Yes	---	Yes	No	No
Flow rate response	Pass	---	Pass	Pass	Pass
Monitor calibration criteria	Pass	---	Pass	Pass	Pass
Date	Aug-21	---	Aug-22	Aug-20	Aug-20
Time (EST)	9:00	---	7:00	12:00	15:00
NO / NOX Zero response	0.0 / 0.2	---	0.1 / 0.3	0.1 / 0.4	0.7 / 0.6
NO / NOX Zero reset	No	---	No	No	No
NO / NOX Span input	705 / 706	---	705 / 706	705 / 706	705 / 706
NO / NOX Span response	645 / 647	---	644 / 645	693 / 696	750 / 752
NO / NOX Span tolerance	-8.5 / -8.4	---	-8.7 / -8.6	-1.7 / -1.4	6.4 / 6.5
NO / NOX Span reset	Yes	---	Yes	Yes	Yes
Monitor calibration criteria	Pass	---	Pass	Pass	Pass

GOLDCORP CALIBRATION SUMMARY OCTOBER 2018

Station Identifier	STN72135	STN72138	STN72139	STN72140	STN72141
GC Serial Number	380	379	381	382	453
Station Name	Extendicare	Hollinger Park	Hollinger Office	Goldmine Tour	Claimpost Trail
Date	Oct-24	---	Oct-24	Oct-25	Oct-25
Time (EST)	11:00	---	15:00	10:00	11:00
SHARP Neph Zero response	-0.9	---	-4.7	2.4	-0.6
SHARP Conc. Zero response	-1.7	---	-11.6	1.7	-0.5
SHARP Zero reset	Yes	---	Yes	Yes	No
Flow rate response	Pass	---	Pass	Pass	Pass
Monitor calibration criteria	Pass	---	Pass	Pass	Pass
Date	Oct-24	---	Oct-24	Oct-25	Oct-25
Time (EST)	9:00	---	14:00	8:00	11:00
TSP Zero response	1.4	---	1.5	2.0	8.7
TSP Zero reset	No	---	Yes	Yes	Yes
Flow rate response	Pass	---	Pass	Pass	Pass
Monitor calibration criteria	Pass	---	Pass	Pass	Pass
Date	Oct-24	---	Oct-24	Oct-25	Oct-25
Time (EST)	9:00	---	14:00	8:00	11:00
NO / NOX Zero response	0.0 / 0.2	---	- 0.2 / 0.1	0.0 / 0.0	0.2 / 0.2
NO / NOX Zero reset	No	---	No	No	No
NO / NOX Span input	635 / 636	---	635 / 636	635 / 636	635 / 636
NO / NOX Span response	575 / 576	---	575 / 576	572 / 573	582 / 583
NO / NOX Span tolerance	-9.4 / -9.4	---	-9.4 / -9.4	-9.9 / -9.9	-8.3 / -8.3
NO / NOX Span reset	Yes	---	No	Yes	Yes
Monitor calibration criteria	Pass	---	Pass	Pass	Pass