



REPORT

Annual Air Quality Report - 2017

Richards Bay Clean Air Association (RBCAA)

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List of Abbreviations and Terms

Chemical Formulae	
As	Arsenic
C ₆ H ₆	Benzene
BTEX	Benzene, Ethylbenzene, Toluene & Xylene
Cd	Cadmium
CaO	Calcium oxide / Lime
CaOH	Calcium hydroxide
CO ₂	Carbon dioxide
CO	Carbon monoxide
CH ₂ Cl ₂	Dichloromethane
CH ₃ -S-S-CH ₃	Dimethyl disulphide
CH ₃ -S-CH ₃	Dimethyl sulphide
C ₈ H ₁₀	Ethylbenzene
Pb	Lead
CH ₄	Methane
C ₄ H ₈ O	Methyl ethyl ketone
CH ₃ S-H	Methyl mercaptan
Ni	Nickle
NO ₂	Nitrogen dioxide
NO	Nitrogen oxide
NO _x	Nitrogen oxides
PM ₁₀	Particulates with an aerodynamic diameter of less than 10 µm
PM _{2.5}	Particulates with an aerodynamic diameter of less than 2.5 µm
PAH	Polycyclic aromatic compounds
Na ₂ CO ₃	Sodium bicarbonate
NaOH	Sodium hydroxide / Caustic soda / Soda ash
SO ₂	Sulphur dioxide
H ₂ SO ₄	Sulphuric acid
H ₂ SO ₃	Sulphurous acid
C ₇ H ₈	Toluene
TRS	Total Reduced Sulphur

TSP	Total Suspended Particulates
VOC	Volatile Organic Compounds
C ₈ H ₁₀	Xylene
Countries	
EU	European Union
RSA	South Africa
UK	United Kingdom
US	United States
Direction	
N	North
NNE	North-North-East
NE	North-East
ENE	East-North-East
E	East
ESE	East-South-East
SE	South-East
SSE	South-South-East
S	South
SSW	South-South-West
SW	South-West
WSW	West-South-West
W	West
WNW	West-North-West
NW	North West
NNW	North-North-West
Environmental management	
AQIA	Air Quality Impact Assessment
AQMP	Air Quality Management Plan
AQMPr	Air Quality Management Programme
CS	Concept Study
DMP	Dust Management Plan
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan

LoM	Life of Mine
PFS	Pre-Feasibility Study
S&SD	Safety and Sustainable Development
S&EIA	Social and Environmental Impact Assessment
WRD	Waste Rock Dump
Equipment	
PiD	Photo Ionisation Detector
Health	
COHb	Carboxyhaemoglobin
LOAEL	Lowest Observed Adverse Effect Level
NOAEL	No Observed Adverse Effect Level
MSDS	Material safety data sheets
Measurement	
amsl	Above mean sea level
asl	Above sea level
BDL	Below detection limit
°	Degrees
°C	Degrees Celsius
g/s	Grams per second
K	Kelvin
km	Kilometre
km/h	Kilometre per hour
m	Metres
m/s	Metres per second
µg	Microgram
µg/m ³	Micrograms per cubic meter
mg	Milligrams
mg/m ³	Milligrams per cubic meter
mg/m ² /day	Milligrams per meter squared per day
ppb	Parts per billion
tpa	Tons per annum
t/day	Tons per day
t/hr	Tons per hour

Organisations	
EA-NPI	Environment Australia - National Pollutant Inventory
EC	European Commission
IFC	International Finance Corporation
SANAS	South African National Accreditation System
UE-EA	United Kingdom - Environmental Agency
UK-EA	European Union - Environmental Agency
US-EPA	United States - Environmental Protection Agency
WHO	World Health Organisation

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Complaints Log

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1.0 INTRODUCTION

This 20th annual air quality report summarises the meteorology, sulphur dioxide (SO₂), total reduced sulphur (TRS) and fine particulate (PM₁₀) monitoring conducted by the Richards Bay Clean Air Association (RBCAA) during 2017. The monitoring network consists of 9 stations (Figure 1). In addition, measured SO₂ concentrations over various time scales are compared to concentrations predicted by the CALPUFF air pollution dispersion model. Simulated SO₂ concentrations are based on ambient meteorological conditions and the regional emission inventory. The objective of this report is to highlight certain incidents and exceedances of the applicable PM₁₀, SO₂ and TRS ambient air quality standards.

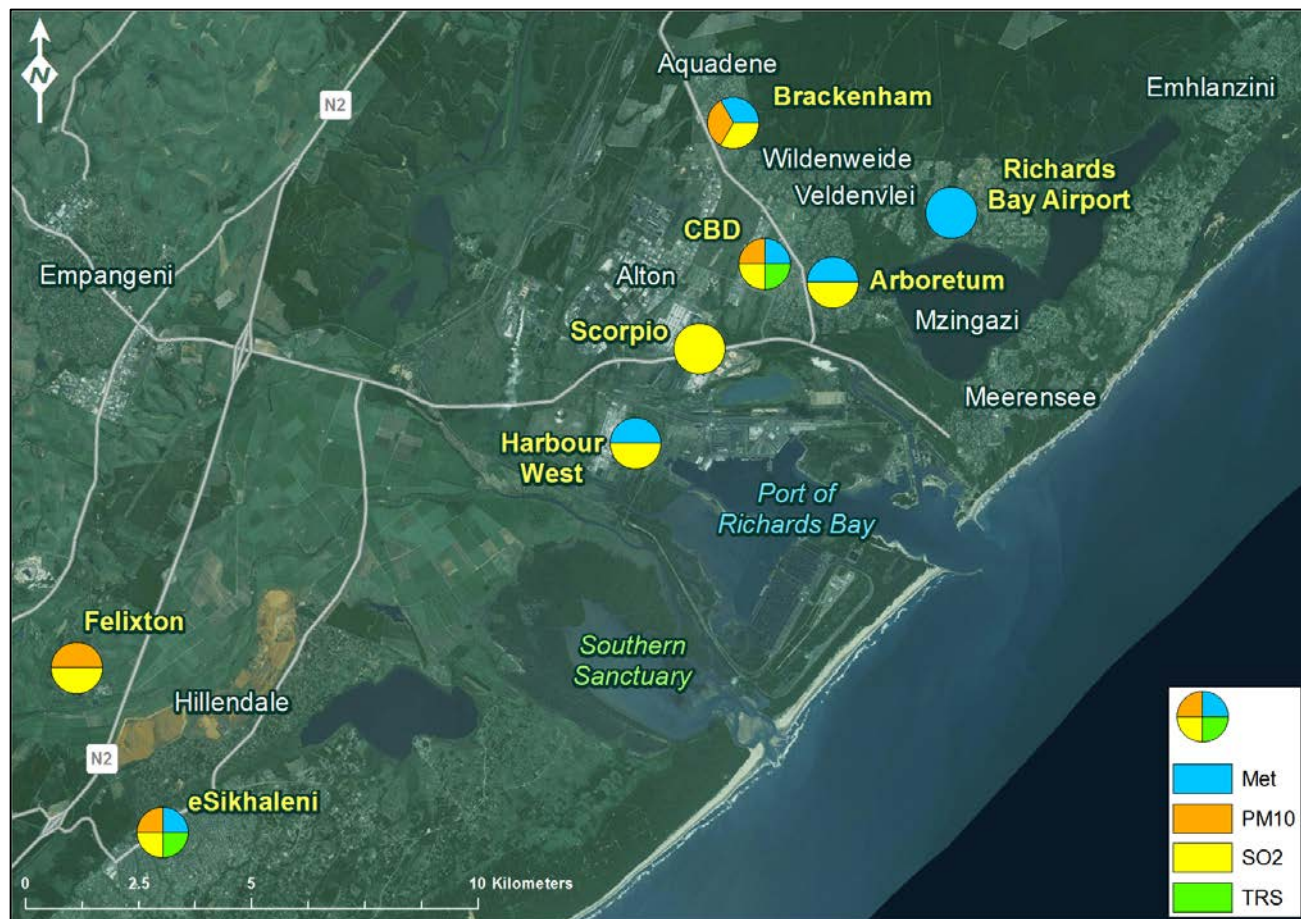


Figure 1: Locality map

2.0 METEOROLOGY

2.1 Wind Roses

MM5¹ modelled and measured annual wind roses for 2017 at Arboretum are presented in Figure 2. They indicate that wind blew predominantly along the NE and SW axis. NE wind is generally associated with fair weather, while SW wind is usually associated with the passage of coastal lows, cold fronts and inclement weather.

¹ The Penn State University (PSU) / National Centre for Atmospheric Research (NCAR) meso-scale model is a limited-area, non-hydrostatic or hydrostatic (Version 2 only), terrain-following sigma-coordinate model designed to simulate or predict meso-scale and regional-scale atmospheric circulation. It has been developed at PSU and NCAR as a community meso-scale model and is continuously being improved by contributions from users at several universities and government laboratories. The Fifth-Generation PSU / NCAR Meso-scale Model is known as MM5.

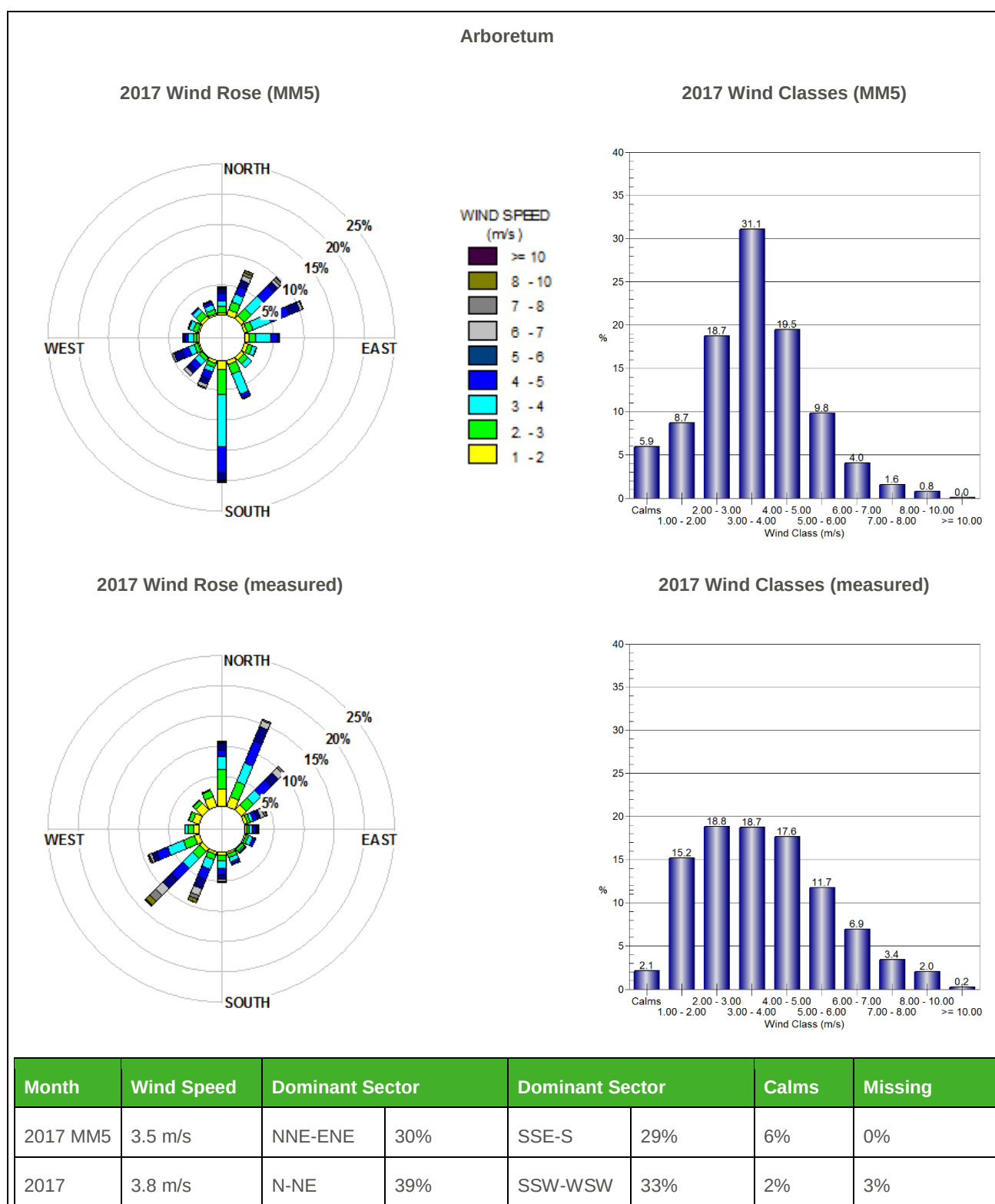


Figure 2: Wind roses

2.2 Seasonal and Diurnal Wind Roses

Seasonal and diurnal wind roses for 2017 can be seen in Figure 3 and Figure 4. Note the increase in light (1 to 3 m/s) to moderate (3 to 6 m/s) wind from the NNW during winter (and the seasonal increase in fresh (6 to 8 m/s) to strong (> 8 m/s) N to NE wind during periods that include spring and early summer.



Figure 3: Seasonal wind roses

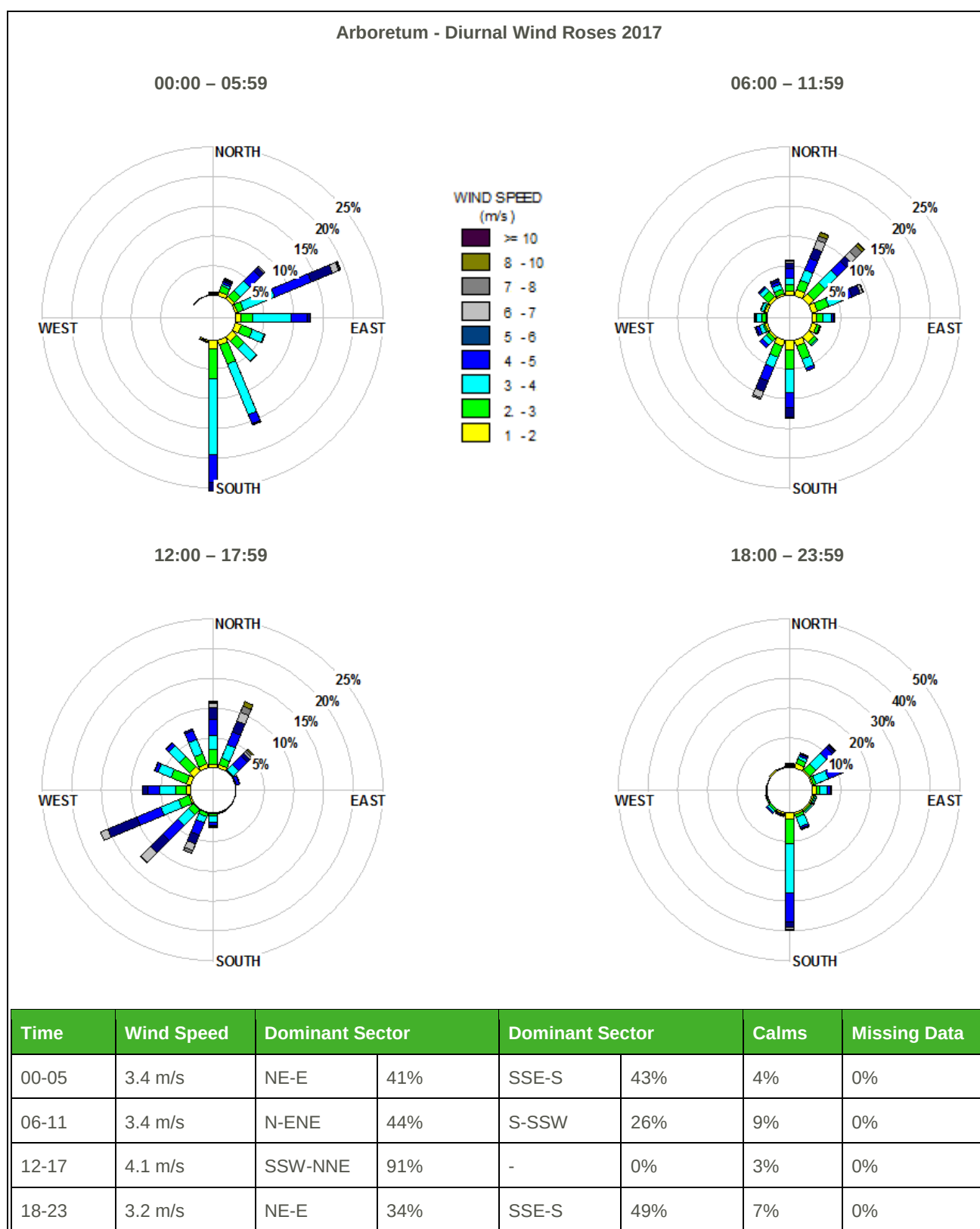


Figure 4: Diurnal wind roses

Strong southerly to SSW wind occurs throughout the year, typically associated with the arrival of coastal lows and cold fronts. Coastal lows tend to be more frequent during the summer months; hence the slightly higher proportion of these winds.

2.3 Rainfall

Rainfall measured at various locations is summarized in Table 1.

Table 1: Rainfall

Month	CBD (mm)	Felixton (mm)
January	277	193
February	345	277
March	142	101
April	22	116
May	476	286
June	62	24
July	25	27
August	75	54
September	51	95
October	94	119
November	144	82
December	260	138
Minimum	22	24
Average	164	126
Maximum	476	286
Total	1973	1512

3.0 AIR QUALITY COMPLAINTS

Detailed complaint records are maintained, updated and distributed to the RBCAA's complaints mailing list on a weekly basis. The following sections summarise and analyse the complaints received during 2017. Please see APPENDIX D for the Complaints Log.

3.1 Field Observations

The maximum number of complaints received in a single year was 397 in 2004, this stabilised at approximately 200 between 2010 and 2015, and decreased to 100 in 2017 (Figure 5). The historical count of complaints per month for the last five years is reflected in Figure 6.

A large portion of the complaints received in May, June and July were attributed to Mondi Richards Bay (odour & clinical symptoms), and in August to Foskor (odour & clinical symptoms, plus abnormal visible emissions).

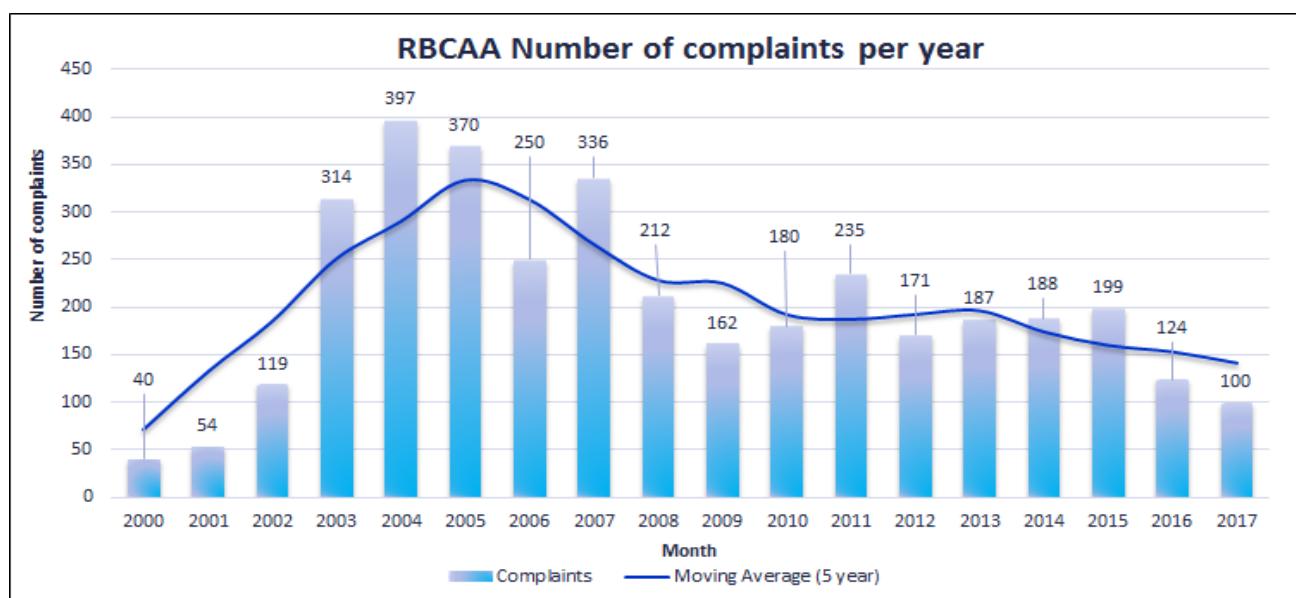


Figure 5: Complaints - historical annual comparison

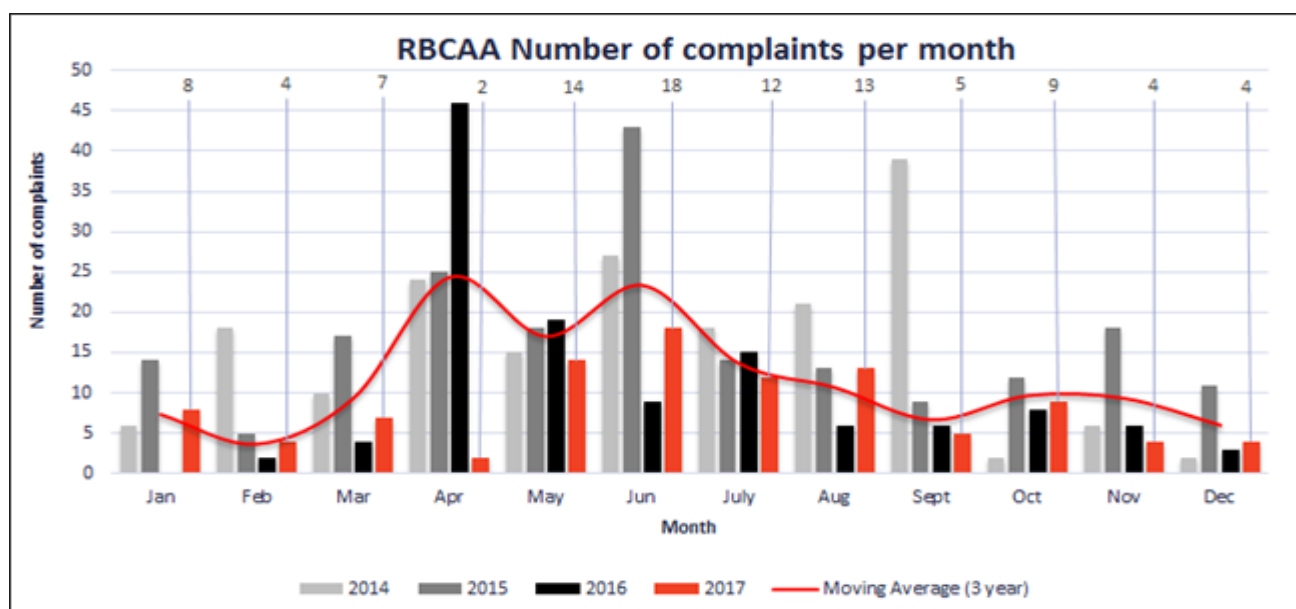


Figure 6: Complaints - historical monthly comparison

3.2 Complaints distribution

The distribution of complaints in 2017 by region, source and type are presented in Figure 7, complaints received were allocated as follows: Mondi Richards Bay (44%); Foskor (20%); Unresolved (9%); South 32 - Hillside (5%); Port of Richards Bay (5%); and, others (17%). Distributions for 2016 are included for comparison.

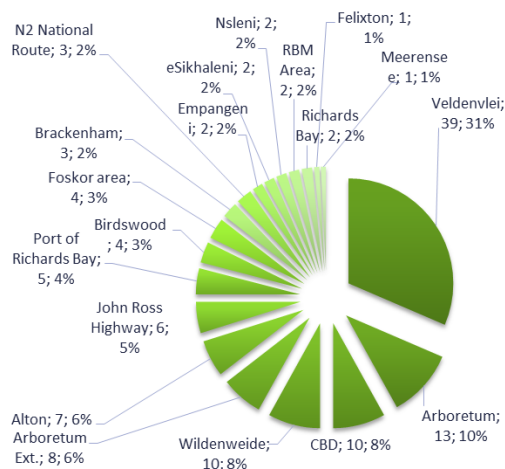
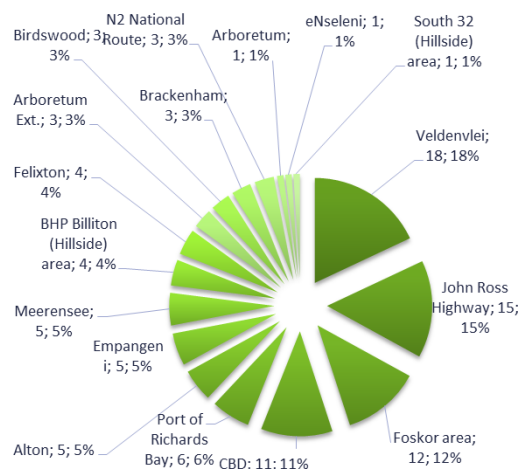
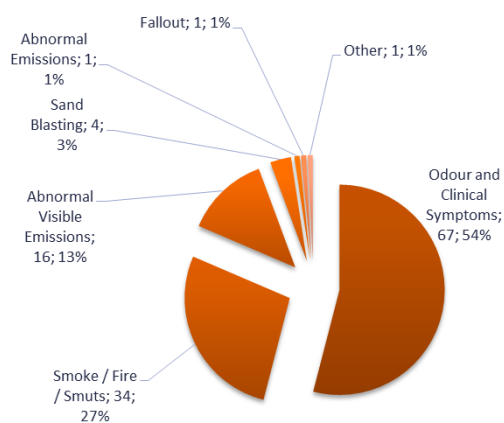
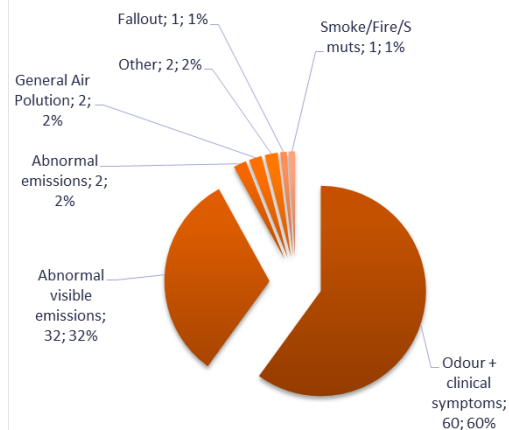
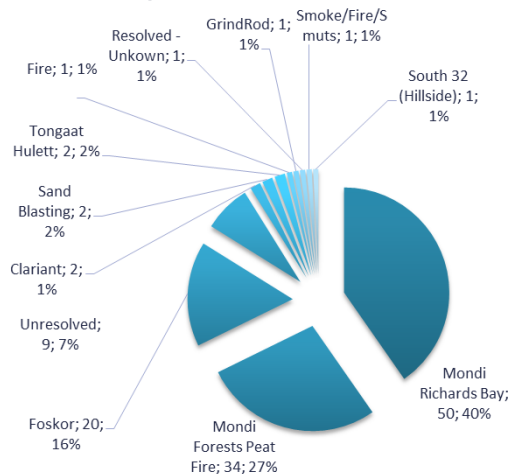
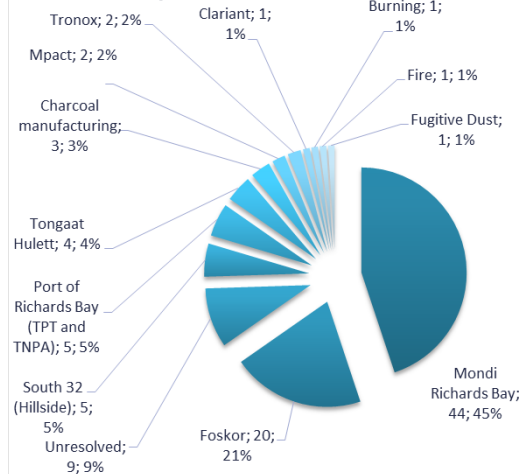
2016: Complaints - Region**2017: Complaints - Region****2016: Complaints - Type****2017: Complaints - Type****2016: Complaints - Source****2017: Complaints - Source**

Figure 7: Complaints - region, type and source

4.0 FINE PARTICULATE MONITORING

The term "particulate matter" (PM) refers to both solid particles and liquid droplets found in the atmosphere. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. These solid and liquid particles can vary in size. Particles less than 10 micrometres (μm) in diameter are classified as PM_{10} .

PM_{10} can be inhaled and accumulate in deep within the respiratory system. Exposure to sustained high concentrations may result in:

- Reduced lung development in children;
- Allergy related inflammatory reactions of the airway;
- Asthma, nasal congestion and sinus problems;
- Increase in symptoms associated with the lower respiratory tract; and
- In severe cases, reduction in life expectancy.

TEOM's (particulate analysers) at Brackenhams, CBD, Mtunzini and eSikhaleni stations measure PM_{10} data continuously. PM_{10} monitoring undertaken at Felixton is done so with the use of an E-Sampler; an alternative sampling methodology to that used at the other stations.

4.1 PM_{10} Data Capture

The percentage of valid data received from the PM_{10} analysers for 2017 is shown in Table 2.

Table 2: PM_{10} data capture

Station	Station Availability (%)	PM_{10} (%)
Brackenhams	99	100
CBD	99	97
Felixton	93	96
eSikhaleni	94	89
Notes: • Red - Not acceptable for statistical purposes (<80%); • Yellow – Acceptable for statistical purposes but does not meet SANAS data capture requirements (<90%); • White – Meets SANAS data capture requirements ($\geq 90\%$); and • Blue - RBCAA Target ($\geq 98\%$).		
Missing Data: eSikhaleni (PM_{10}) - power failures and instrument not restarting (Apr, May & Sep – Dec).		

4.2 PM_{10} Ambient Air Quality Standards

Ambient air quality standards for PM_{10} are listed below (Table 3).

Table 3: PM₁₀ ambient air quality standards

Variable	Organisation	Daily average	Annual average
PM ₁₀	NEM: AQA ^[a]	75 µg/m ³ ^[b]	40 µg/m ³ ^[c]
	WHO/IFC ^[d]	50 µg/m ³ ^[b]	20 µg/m ³ ^[c]
Notes: a) SA Government Gazette 32816 (24 th December 2009) in terms of the National Environmental Management: Air Quality Act No. 39 of 2004, effective from 2015 (RSA-NEMAQA, 2009); b) Not to be exceeded more than 4 times in one year; c) Not to be exceeded; and d) World health Organisation/International Finance Corporation (WHO, 2015) (IFC, 2007).			

4.3 PM₁₀ Compliance

A summary of the PM₁₀ exceedances and breakdown per station is presented in Table 4.

Table 4: PM₁₀ station exceedance summary

Standard / Guideline / Target	Station	Count
NEM: AQA Daily Standard (75 µg/m ³)	Brackenham	3
	CBD	0
	eSikhaleni	1
	Felixton	9
	Mtunzini	0
NEM: AQA Annual Standard (40 µg/m ³)	Not Exceeded	
WHO Daily Guideline (50 µg/m ³)	Brackenham	11
	CBD	4
	eSikhaleni	4
	Felixton	57
	Mtunzini	3
WHO Annual Guideline (20 µg/m ³)	Brackenham	1
	CBD	1
	eSikhaleni	1
	Felixton	1
	Mtunzini	1

Maximum and annual average concentrations for PM₁₀ are provided in Table 5.

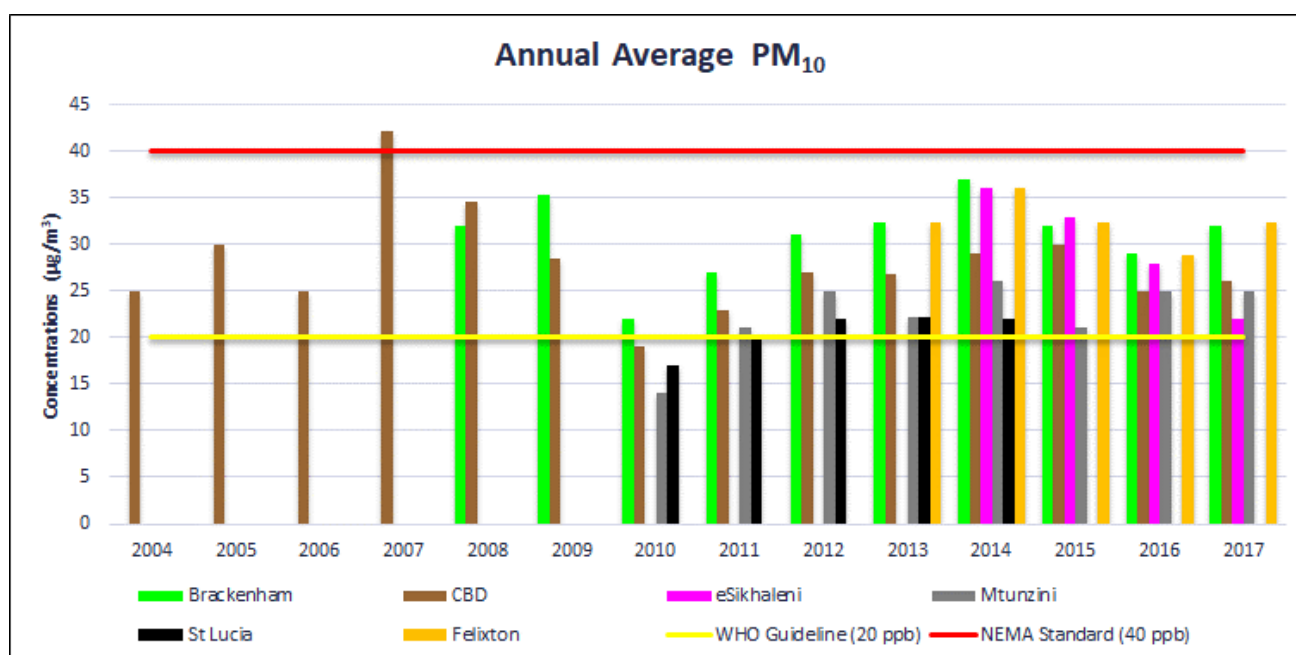
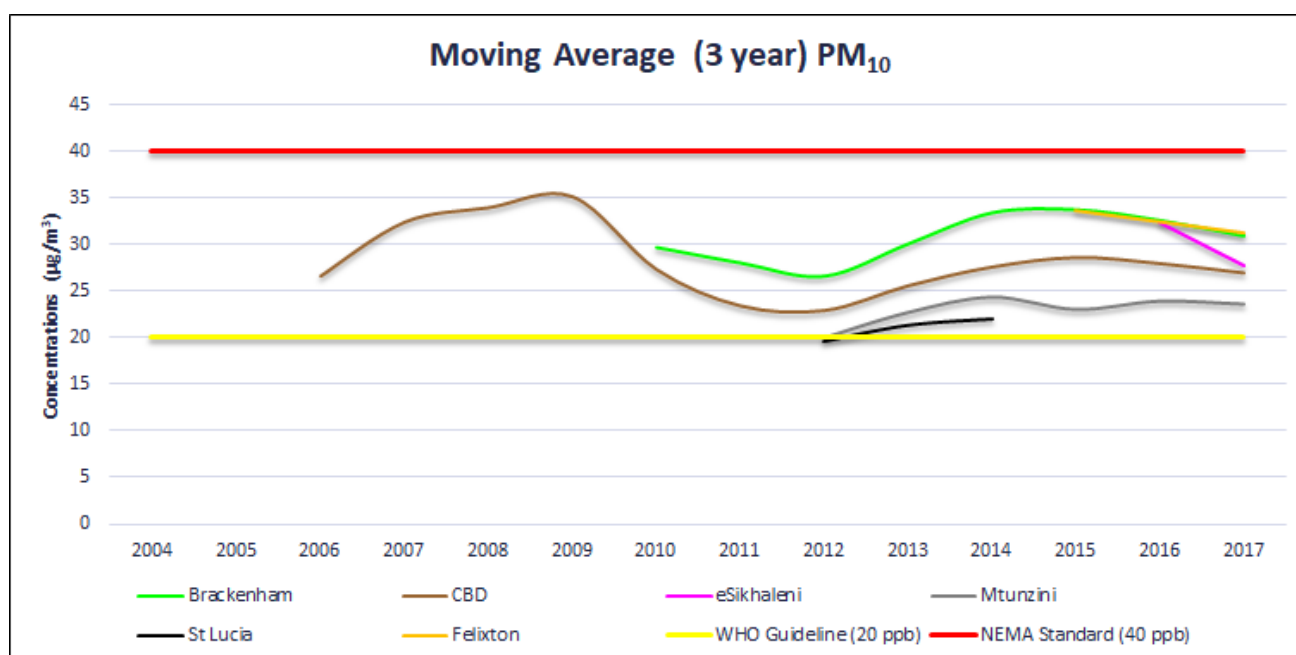
Table 5: PM₁₀ maximum and annual average concentrations

Station		South Africa NEM: AQA Daily Standard (75 µg/m ³)	International WHO Daily Guideline (50 µg/m ³)	South Africa NEM: AQA Annual Standard (40 µg/m ³)	International WHO Annual Guideline (20 µg/m ³)
Brackenham	% of guideline	129%	194%	80%	160%
	µg/m ³ TEOM	97	97	32	32
	Date & Time	2017/09/13	2017/09/13	2017/09	2017/09
CBD	% of guideline	83%	124%	65%	130%
	µg/m ³ TEOM	62	62	26	26
	Date & Time	2017/06/08	2017/06/08	2017/06	2017/06
eSikhaleni	% of guideline	101%	152%	55%	110%
	µg/m ³ TEOM	76	76	22	22
	Date & Time	2017/09/13	2017/09/13	2017/09	2017/09
Mtunzini	% of guideline	89%	134%	63%	125%
	µg/m ³ TEOM	67	67	25	25
	Date & Time	2017/09/13	2017/09/13	2017/09	2017/09
Felixton	% of guideline	163%	245%	81%	162%
	µg/m ³ E-sampler	122	122	32	32
	Date & Time	2017/10/19	2017/10/19	2017/10	2017/10
Notes: The table is colour coded according to the level of concentration recorded. The colour scale ranges from blue (indicating a low concentration relative to the standard), to red (indicating an exceedance of the standard).					

4.4 PM₁₀ Annual Averages

Annual average concentrations and trends dating back to 2004 are illustrated in Figure 8 and Figure 9. A decreasing trend is noticeable from 2009 to 2012; this has reversed and stabilised since then, it is particularly noticeable at Brackenham, CBD, and Felixton. The reversal could be as a result of the proliferation of stockpiles in the area as well as the reduction in amount of rainfall.

During 2016 NEM: AQA PM₁₀ Annual Limit (40 µg/m³) was not exceeded, the WHO PM₁₀ Annual Guideline (20 µg/m³) was exceeded at Brackenham, CBD, eSikhaleni, Mtunzini, and, Felixton.

Figure 8: PM₁₀ annual average concentrationsFigure 9: PM₁₀ 3 year moving average

4.5 PM₁₀ Seasonal Concentrations

Seasonal PM₁₀ concentrations for 2017 are provided in Figure 10. The NEM: AQA and WHO annual standard / guideline is used for comparative purposes.

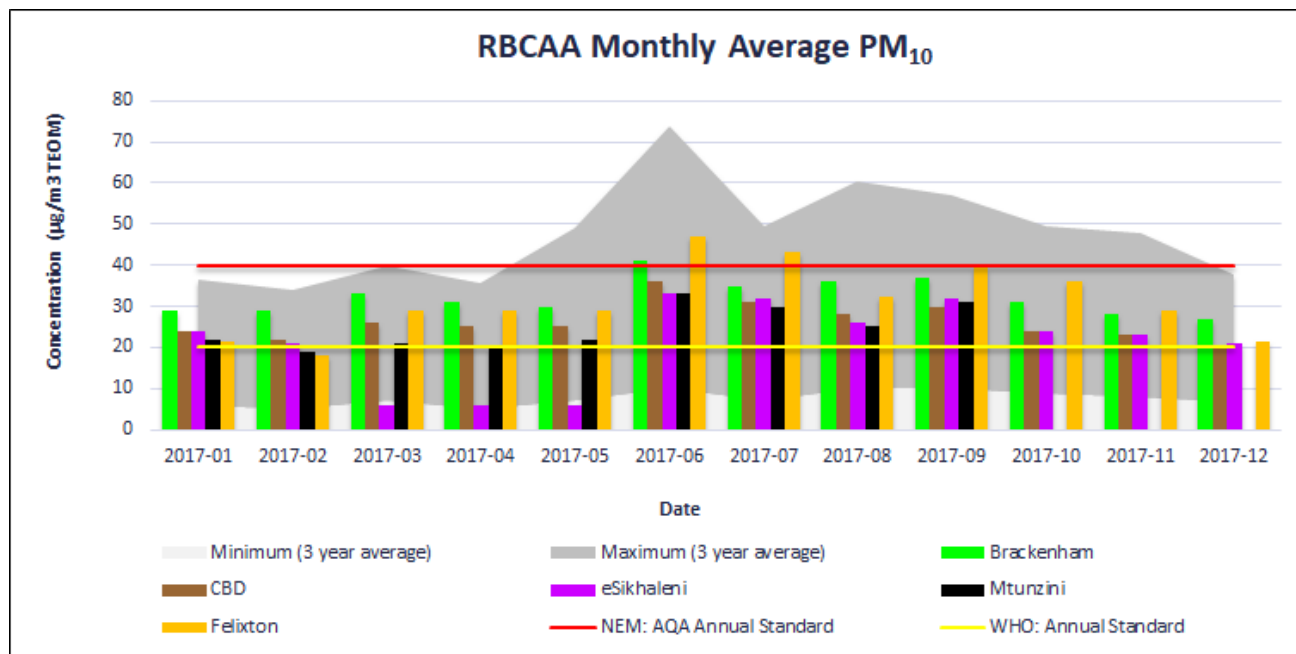


Figure 10: PM₁₀ seasonal concentrations

4.6 PM₁₀ Diurnal Averages

Diurnal PM₁₀ concentrations are shown below (Figure 11).

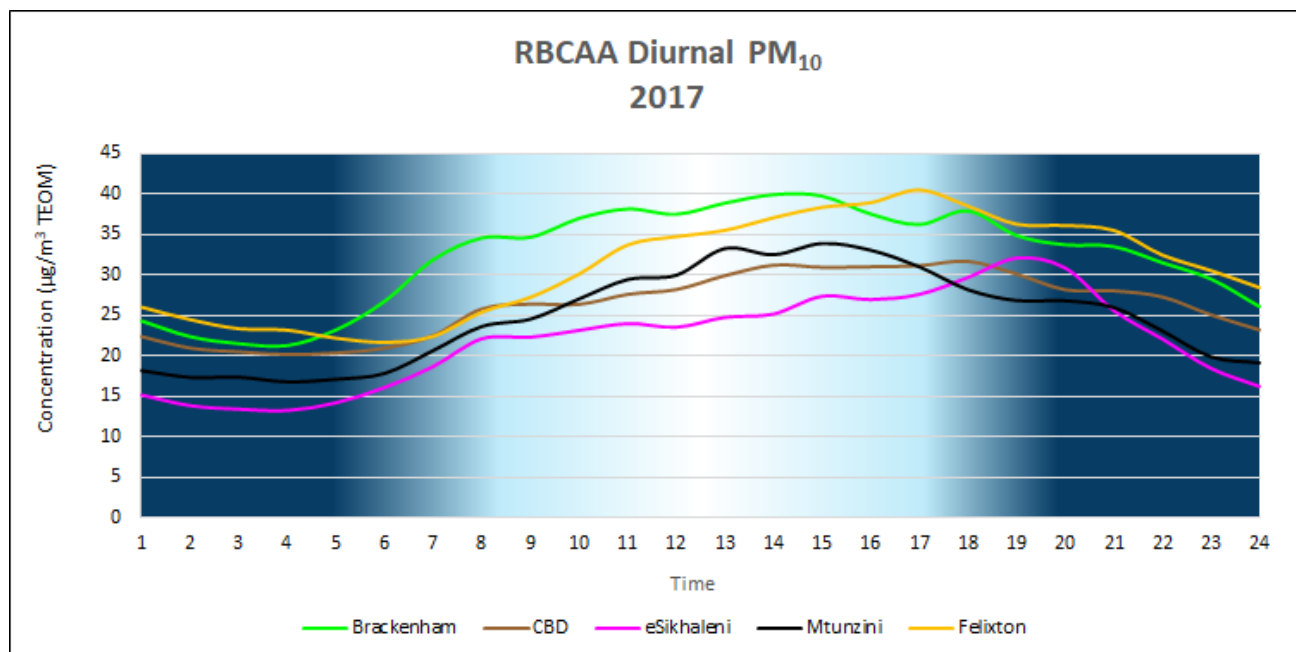


Figure 11: PM₁₀ diurnal concentrations

4.7 PM₁₀ Daily Averages

Daily average PM₁₀ concentrations are shown below (Figure 12). There were 4 measured exceedances of the NEM: AQA PM₁₀ Daily Limit (75 µg/m³), and 22 of the WHO Daily Guideline (50 µg/m³) (Figure 12).

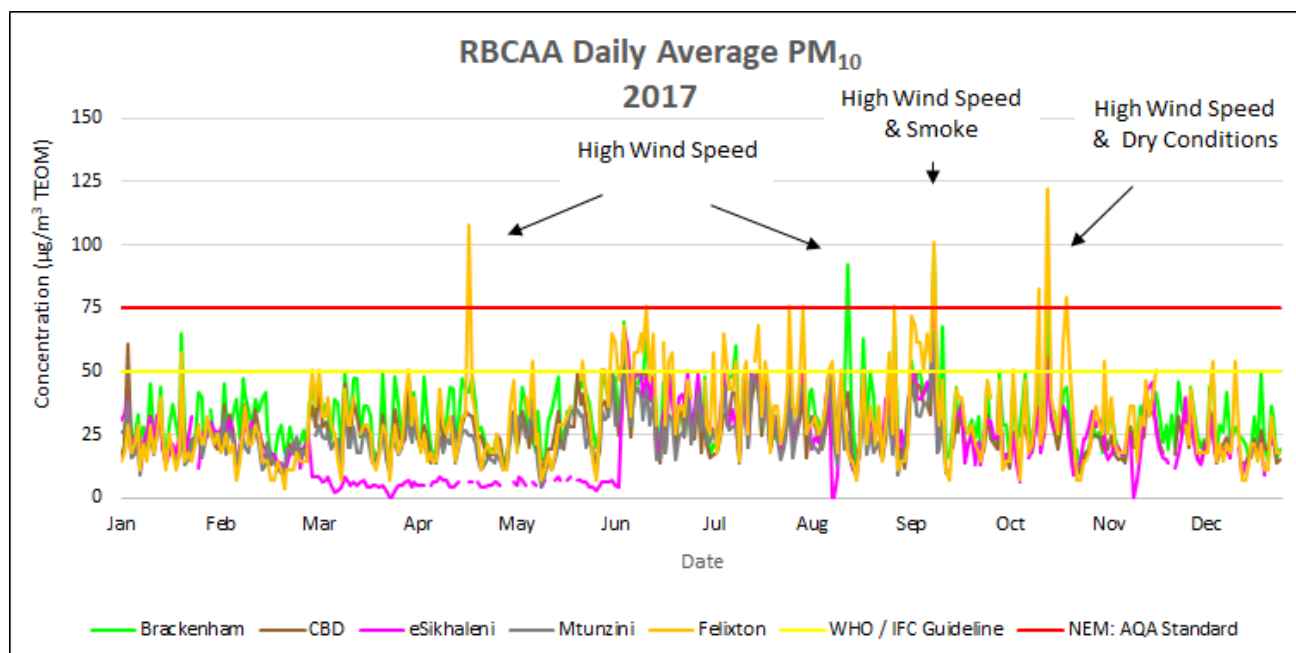


Figure 12: PM₁₀ daily average concentrations

Table 6: PM₁₀ NEMA: AQA daily exceedances

Standard / Guideline / Target	Station	Date	Value (µg/m³)	Association
NEM: AQA Daily Standard (75 µg/m³)	Brackenham	2017-08-17	92	Very high windspeeds and dusty conditions
		2017-09-13	97	High windspeeds and dusty/smoky conditions
		2017-10-19	82	High windspeeds and dusty/dry conditions
	eSikhaleni	2017-09-13	77	High windspeeds and dusty/smoky conditions
	Felixton	2017-04-20	108	
		2017-06-15	76	
		2017-07-30	76	
		2017-08-03	76	
		2017-09-01	76	
		2017-09-13	101	
		2017-10-16	83	
		2017-10-19	122	
		2017-10-25	79	
Missing Data: eSikhaleni (PM ₁₀) - power failures and instrument not restarting (Apr, May & Sep – Dec).				

5.0 SULPHUR DIOXIDE MONITORING

Sulphur dioxide (SO₂) is one of a group of highly reactive gasses known as “oxides of sulphur.” Anthropogenic sources include; fossil fuel combustion (particularly coal burning power plants) industrial processes such as wood pulping, paper manufacture, petroleum and metal refining, metal smelting (particularly from sulphide containing ores, e.g. lead, silver and zinc ores) and vehicle tailpipe emissions. Natural sources of SO₂ emissions include; geothermal activity (including hot springs and volcanic activity), and the natural decay of vegetation on land, in wetlands and in oceans.

SO₂ is linked with adverse effects on the respiratory system as it is highly soluble and thus readily absorbed by the mucous membranes of the nose and upper respiratory tract. Exposure to high concentrations may result in:

- Reduction in lung function (especially in asthmatics and children);
- Wheezing and coughing; and
- In severe cases, reduction in life expectancy.

5.1 SO₂ Data Capture

The percentage of valid data received from the SO₂ analysers for 2017 is shown in Table 7.

Table 7: SO₂ data capture

Station	Station Availability (%)	SO ₂ (%)
Arboretum	98	94
Brackenham	99	99
CBD	99	97
Harbour West	100	99
Scorpio	98	99
Felixton	93	93
eSikhaleni	94	90
Notes: a) Red - Not acceptable for statistical purposes (<80%); b) Yellow – Acceptable for statistical purposes but does not meet SANAS data capture requirements (<90%); c) White – Meets SANAS data capture requirements (>=90%); and d) Blue - RBCAA Target (>=98%).		

5.2 SO₂ Ambient Air Quality Standards

South African ambient air quality standards for SO₂ are listed below (Table 8).

Table 8: SO₂ ambient air quality standards

Variable	Organisation	10-min average	Hourly average	Daily average	Annual average
SO ₂	NEM: AQA ^[a]	500 µg/m ³ ^[b]	350 µg/m ³ ^[c]	125 µg/m ³ ^[d]	50 µg/m ³ ^[e]
		191 ppb ^[b]	134 ppb ^[c]	48 ppb ^[d]	19 ppb ^[e]
	WHO / IFC ^[f]	500 µg/m ³	-	20 µg/m ³	-
		191 ppb	-	8 ppb	-

Notes:

- a) SA Government Gazette 32816 (published 24th December 2009) in terms of the National Environmental Management: Air Quality Act 39 of 2004 (RSA-NEMAQA, 2009);
- b) Not to be exceeded more than 526 times in one year;
- c) Not to be exceeded more than 88 times in one year;
- d) Not to be exceeded more than 4 times in one year;
- e) Not to be exceeded; and
- f) World health Organisation/International Finance Corporation (WHO, 2015) (IFC, 2007).

5.3 SO₂ Compliance

A summary of the SO₂ exceedances and breakdown per station is presented in Table 9. SO₂ exceedances can be associated with emissions as a result of process upsets (i.e. planned maintenance, plant shutdowns or start-up), leaks in equipment, pipe lines, seals, valves (fugitive emissions) or a particular event (e.g. fires or emergency shutdowns).

Table 9: SO₂ station exceedance summary

Standard / Guideline / Target	Station	Count
NEM: AQA 10-minute Standard (191 ppb)	Arboretum	0
	Brackenham	0
	CBD	0
	eSikhaleni	0
	Felixton	0
	Harbour West	3
	Scorpio	7
NEM: AQA Hourly Standard (134 ppb)	Not Exceeded	
NEM: AQA Daily Standard (48 ppb)	Not Exceeded	
NEM: AQA Annual Standard (19 ppb)	Not Exceeded	
WHO 10-minute Guideline (191 ppb)	Arboretum	0
	Brackenham	0
	CBD	0

Standard / Guideline / Target	Station	Count
	eSikhaleni	0
	Felixton	0
	Harbour West	3
	Scorpio	7
WHO Daily Standard (8 ppb)	Arboretum	1
	Brackenham	0
	CBD	42
	eSikhaleni	0
	Felixton	0
	Harbour West	105
	Scorpio	127

Maximum and annual average concentrations for SO₂ are provided in Table 10.

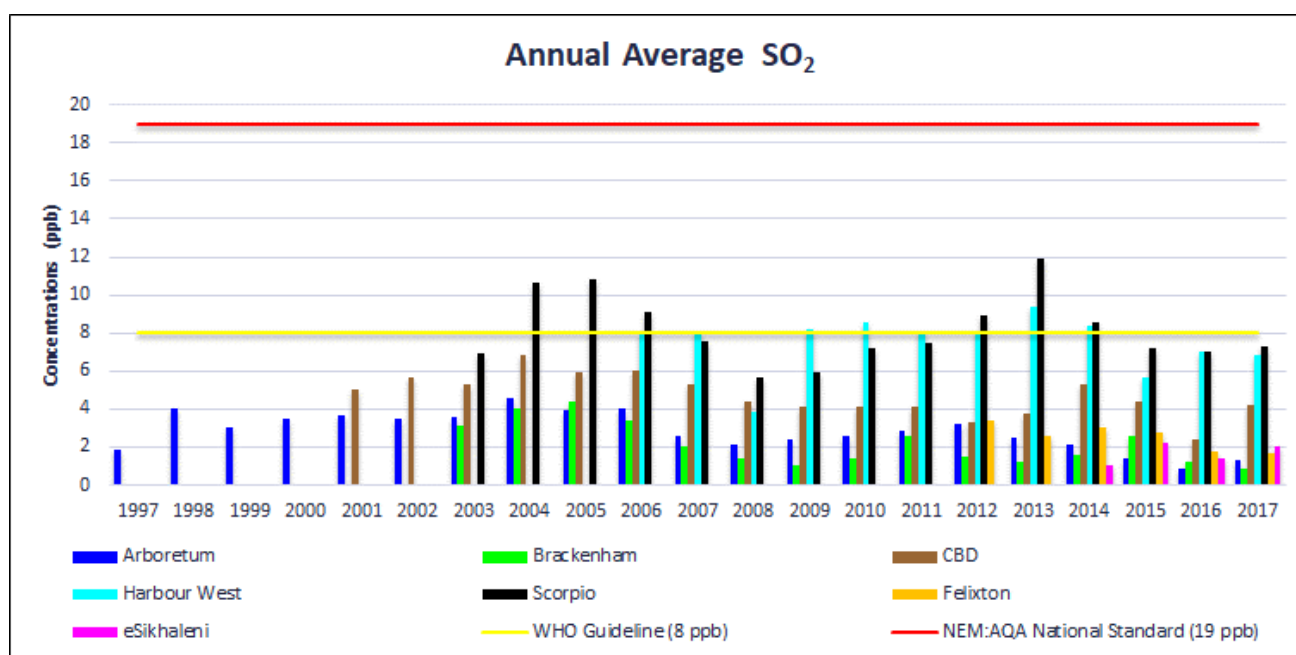
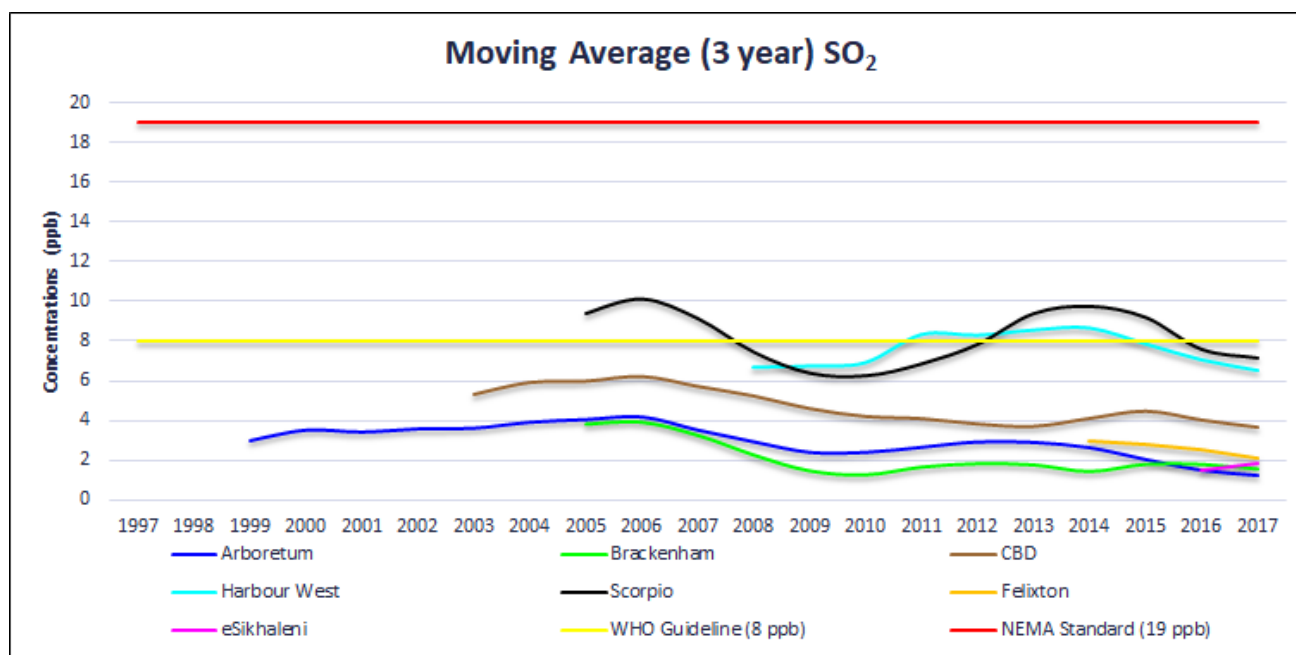
Table 10: SO₂ maximum and monthly average concentrations

Station		National & International NEM: AQA & WHO 10-minute Standard 500 µg/m ³ 191 ppb	National NEM: AQA 1-hour Standard 350 µg/m ³ 134 ppb	National NEM: AQA 24-hour Standard 125 µg/m ³ 48 ppb	International WHO 24-hour Guideline 20 µg/m ³ 8 ppb	National NEM: AQA Annual Standard 50 µg/m ³ 19 ppb
Arboretum	% of guideline	71%	29%	19%	114%	7%
	(ppb)	135	40	9	9	1
	Date & time	2017/03/10 11:50	2017/09/08 04:00	2017/08/19	2017/08/19	2017/03
Brackenham	% of guideline	8%	11%	13%	78%	5%
	(ppb)	14	14	6	6	1
	Date & time	2017/03/10 11:50	2017/09/08 04:00	2017/08/19	2017/08/19	2017/03
CBD	% of guideline	74%	47%	68%	410%	22%
	(ppb)	142	63	33	33	4
	Date & time	2017/01/29 21:30	2017/05/13 12:00	2017/05/13	2017/05/13	2017/01
Harbour West	% of guideline	140%	96%	77%	463%	36%
	(ppb)	267	128	37	37	7
	Date & time	2017/09/19 00:40	2017/09/19 00:00	2017/09/22	2017/09/22	2017/09
Scorpio	% of guideline	142%	97%	73%	439%	38%

Station		National & International NEM: AQA & WHO 10-minute Standard 500 µg/m ³ 191 ppb	National NEM: AQA 1-hour Standard 350 µg/m ³ 134 ppb	National NEM: AQA 24-hour Standard 125 µg/m ³ 48 ppb	International WHO 24-hour Guideline 20 µg/m ³ 8 ppb	National NEM: AQA Annual Standard 50 µg/m ³ 19 ppb
	(ppb)	272	130	35	35	7
	Date & time	2017/01/04 17:50	2017/09/03 12:00	2017/06/28	2017/06/28	2017/01
Felixton	% of guideline	33%	27%	16%	99%	9%
	(ppb)	63	36	8	8	2
	Date & time	2017/08/24 19:20	2017/08/24 19:00	2017/04/20	2017/04/20	2017/08
eSikhaleni	% of guideline	65%	18%	15%	89%	11%
	(ppb)	124	24	7	7	2
	Date & time	2017/05/26 12:20	2017/05/26 12:00	2017/12/03	2017/12/03	2017/05
Notes: The table is colour coded according to the level of concentration recorded. The colour scale ranges from blue (indicating a low concentration relative to the standard), to red (indicating an exceedance of the standard).						

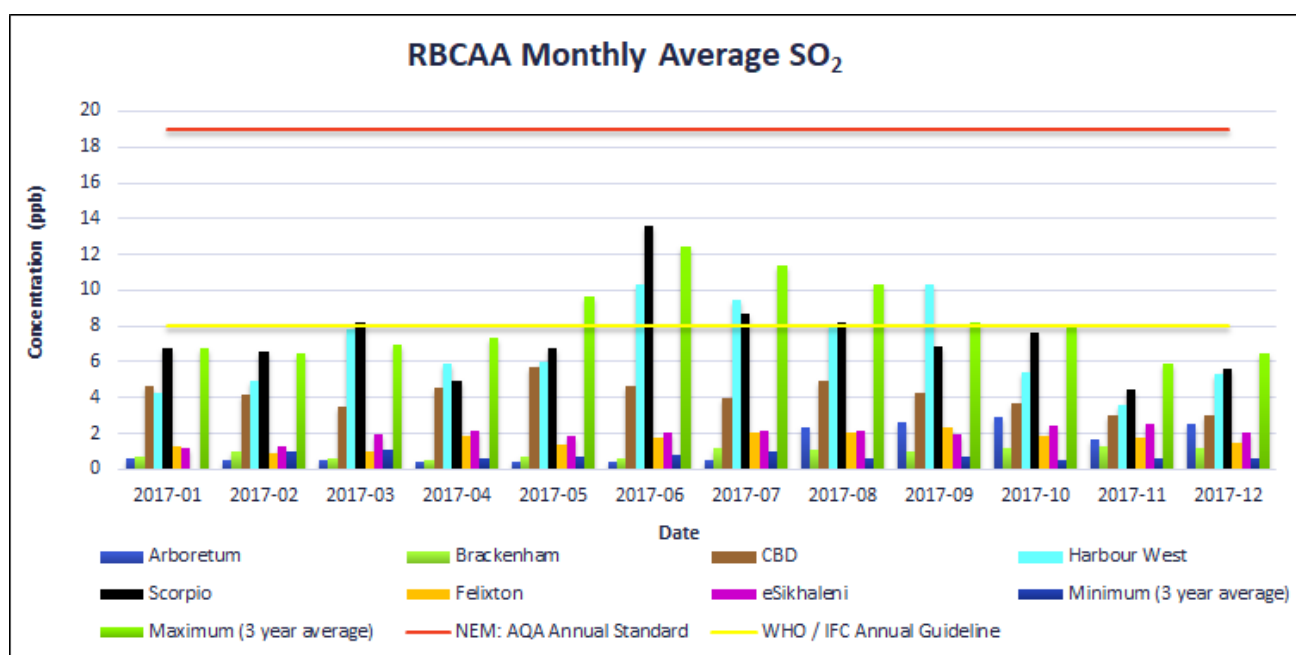
5.4 SO₂ Annual Averages

Annual average SO₂ concentrations and trends are illustrated in Figure 13 and Figure 14. At Scorpio and Harbour West, stations located close to industries, there was a decrease in concentrations from 2006 to 2010, this trend has since then reversed from 2010 to 2014 but seems to be decreasing again (from 2014 to 2017). At Arboretum, Brackenham, and CBD, stations situated in residential areas concentrations seem to be slowly decreasing. The decrease in SO₂ concentrations from 2014 to 2016, could be linked to numerous shut downs at Foskop, the Foskop A-plant had a long shut in 2015, that overlapped with the 2016 annual shut. During 2017 NEM: AQA SO₂ Annual limit (19 ppb) was not exceeded.

Figure 13: SO₂ annual average concentrationsFigure 14: SO₂ 3 year moving average

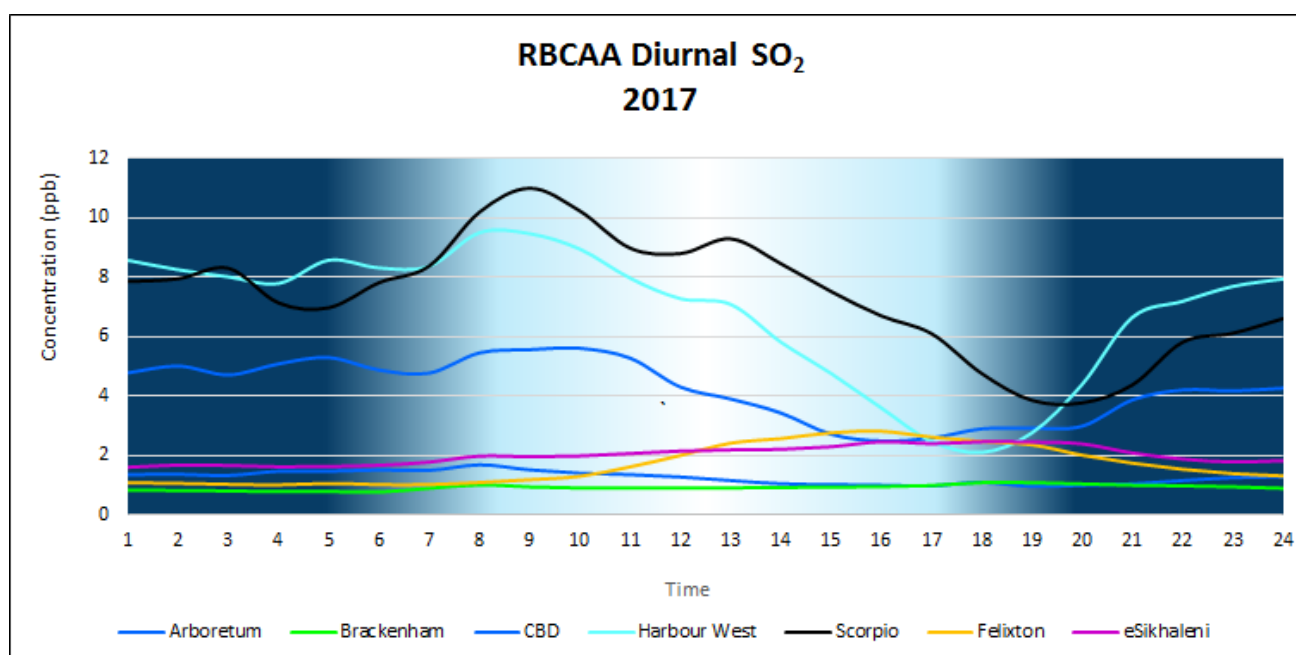
5.5 SO₂ Seasonal Concentrations

The seasonal SO₂ concentrations for 2017 are provided in Figure 15.

Figure 15: SO₂ seasonal concentrations

5.6 SO₂ Diurnal Average

Diurnal SO₂ concentrations are shown below (Figure 16).

Figure 16: SO₂ diurnal concentrations

5.7 SO₂ Daily Averages

The daily average SO₂ concentrations are shown below (Figure 17). There were no exceedances of the NEM: AQA SO₂ Daily Limit (48 ppb), the WHO Daily Guideline (8 ppb) was exceeded 275 times (see APPENDIX E).

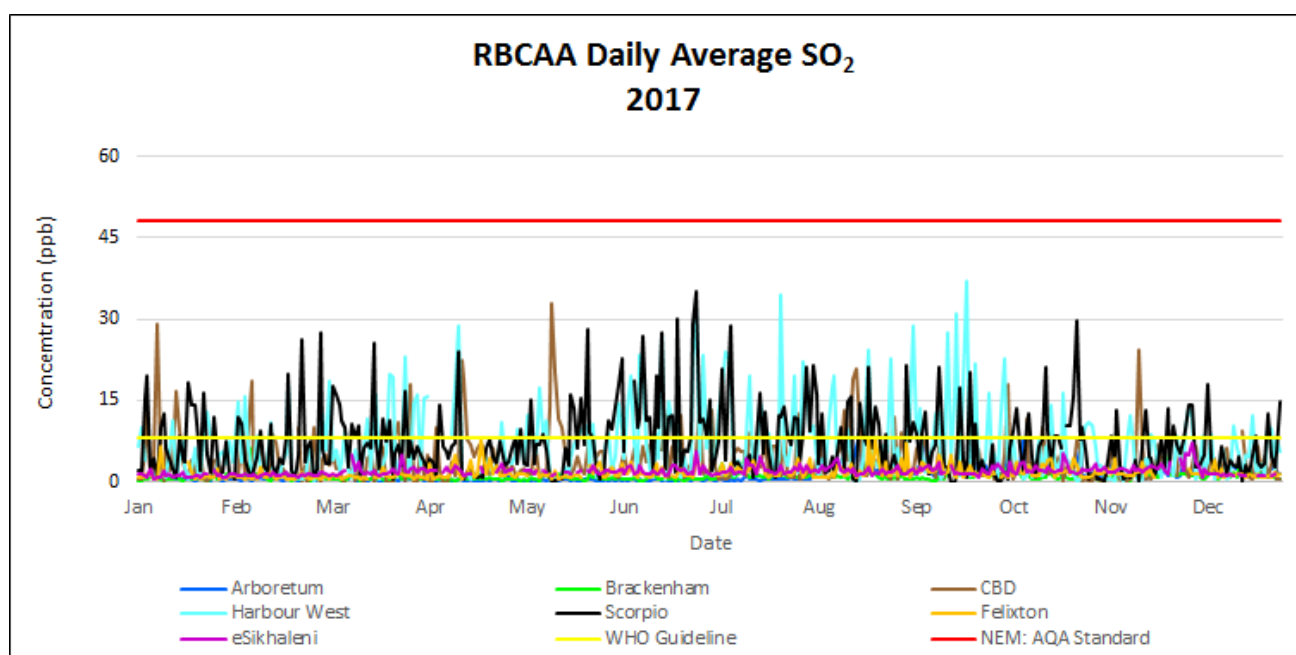


Figure 17: SO₂ daily average concentrations

5.8 SO₂ Hourly Averages

Hourly average SO₂ concentrations are shown below (Figure 18). There were no measured exceedances of the NEM: AQA Hourly Standard (134 ppb).

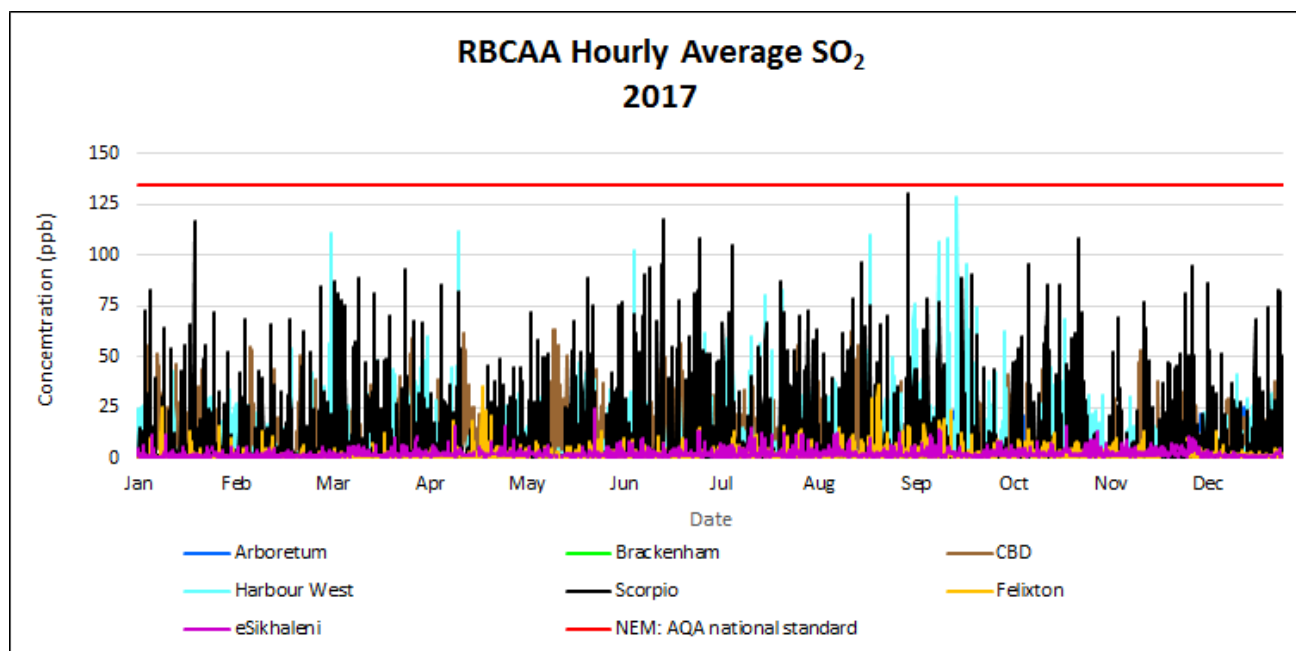
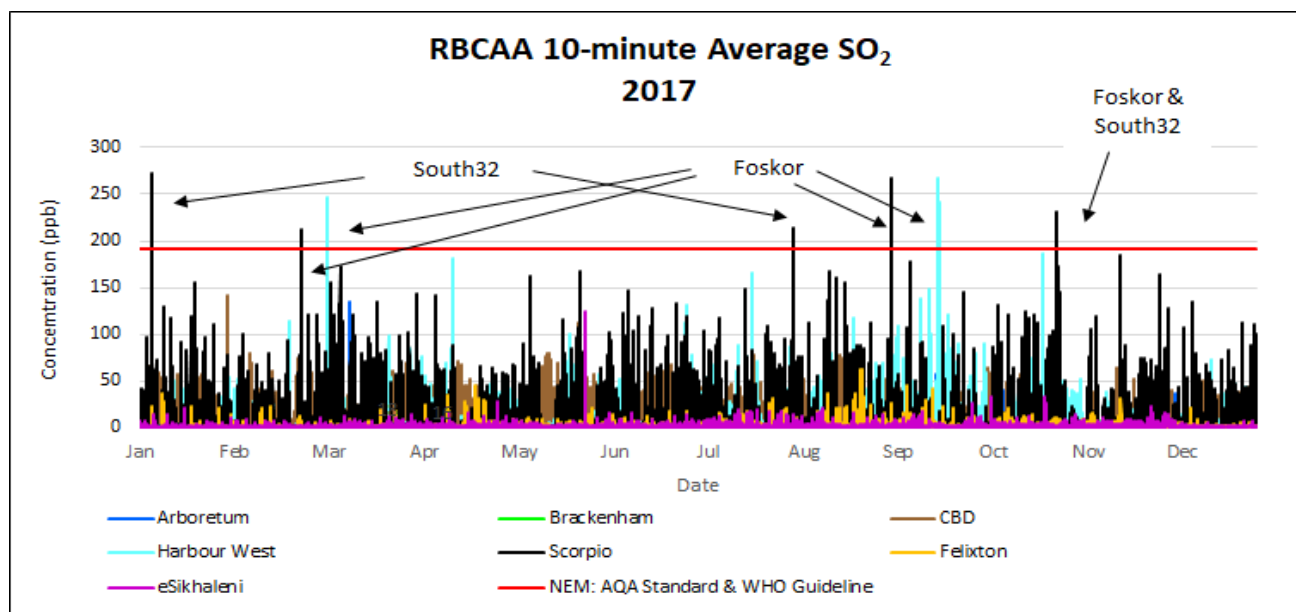


Figure 18: SO₂ maximum hourly average concentrations

5.9 SO₂ 10-minute Averages

10-minute average SO₂ concentrations are shown below (Figure 19). There were 10 measured exceedances of the NEM: AQA and WHO/IFC 10-minute Standards (191 ppb).

Figure 19: SO₂ 10-minute average concentrationsTable 11: SO₂ 10-minute exceedances

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
NEMAQA & WHO 10-minute Standard / Guideline (191 ppb)	Harbour West	2017/03/03 06:40	247	Foskor
		2017/09/19 00:40	267	Foskor
		2017/09/19 03:20	241	Foskor
	Scorpio	2017/01/04 17:50	272	South 32
		2017/02/22 16:40	213	Foskor
		2017/08/02 12:00	214	South32
		2017/09/03 12:40	200	Foskor
		2017/09/03 12:50	267	Foskor
		2017/10/27 16:40	231	Foskor & South32
		2017/10/27 16:50	193	Foskor & South32

5.10 SO₂ Model Correlation

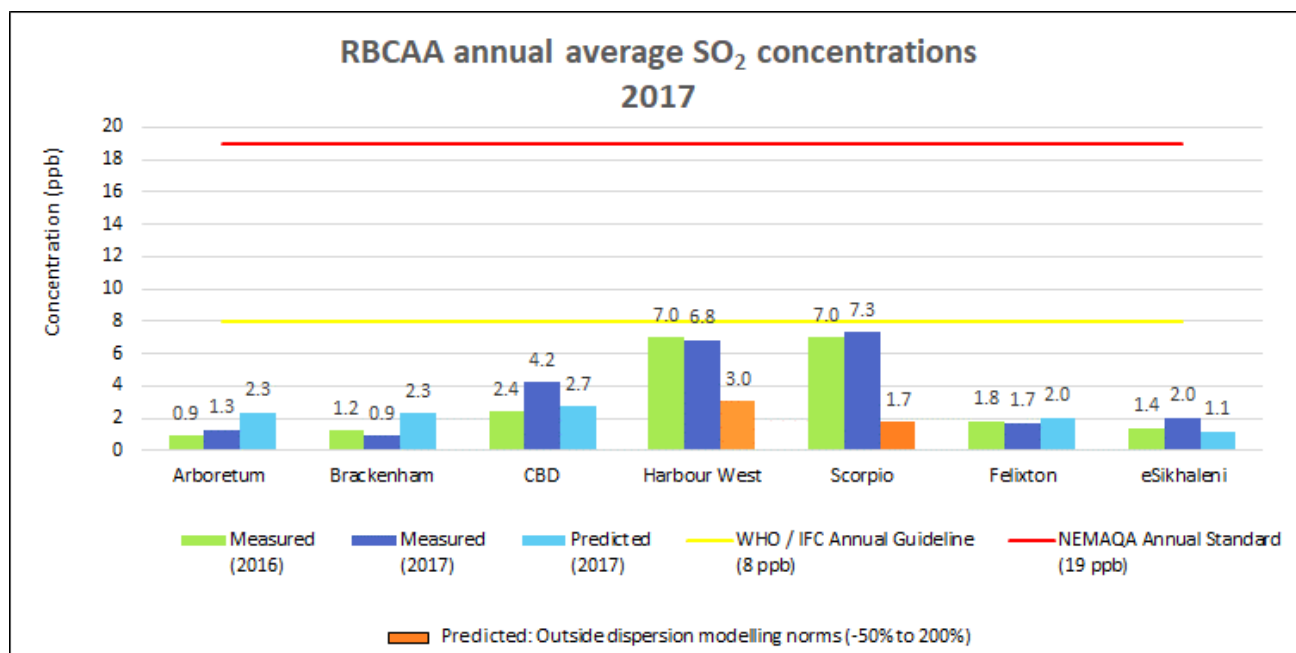


Figure 20: SO₂ annual average concentration and prediction

Annual average SO₂ concentration measured at each of the RBCAA stations, and the CALPUFF predicted average for the month are shown in Figure 20. The Annual average for the same period the previous year is also provided. Compared to the previous year Annual average SO₂ concentrations values at all stations with the exception of CBD were similar (within 10% of each other). Annual average predicted values at most stations were within accepted dispersion modelling norms (-50% to 200%), Harbour West and Scorpio were under-predicted, the cause of the under predictions at these stations is most likely as a result of a combination of local fugitive emissions unaccounted for in the model, and the model's tendency to under predict in the near field. Compared to the measurements predicted values at Harbour West and Scorpio were lower, and at Arboretum, Brackenham, CBD, Felixton and eSikhaleni similar (within 10% of each other).

5.11 SO₂ Annual Average Prediction (NEMA)

The following plots of the annual average SO₂ concentrations are provided:

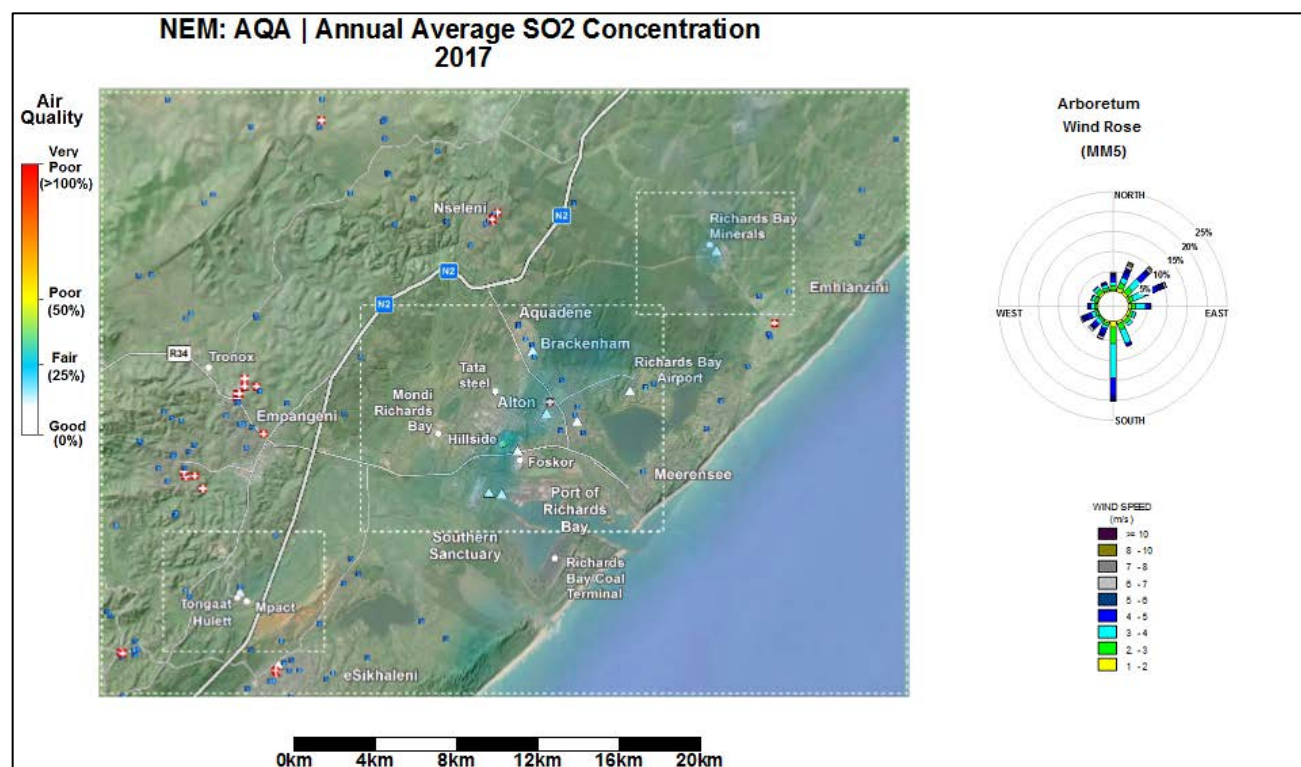
- Regional (Figure 21);
- Richards Bay Figure 22);
- Felixton (Figure 23); and
- RBM (Figure 24).

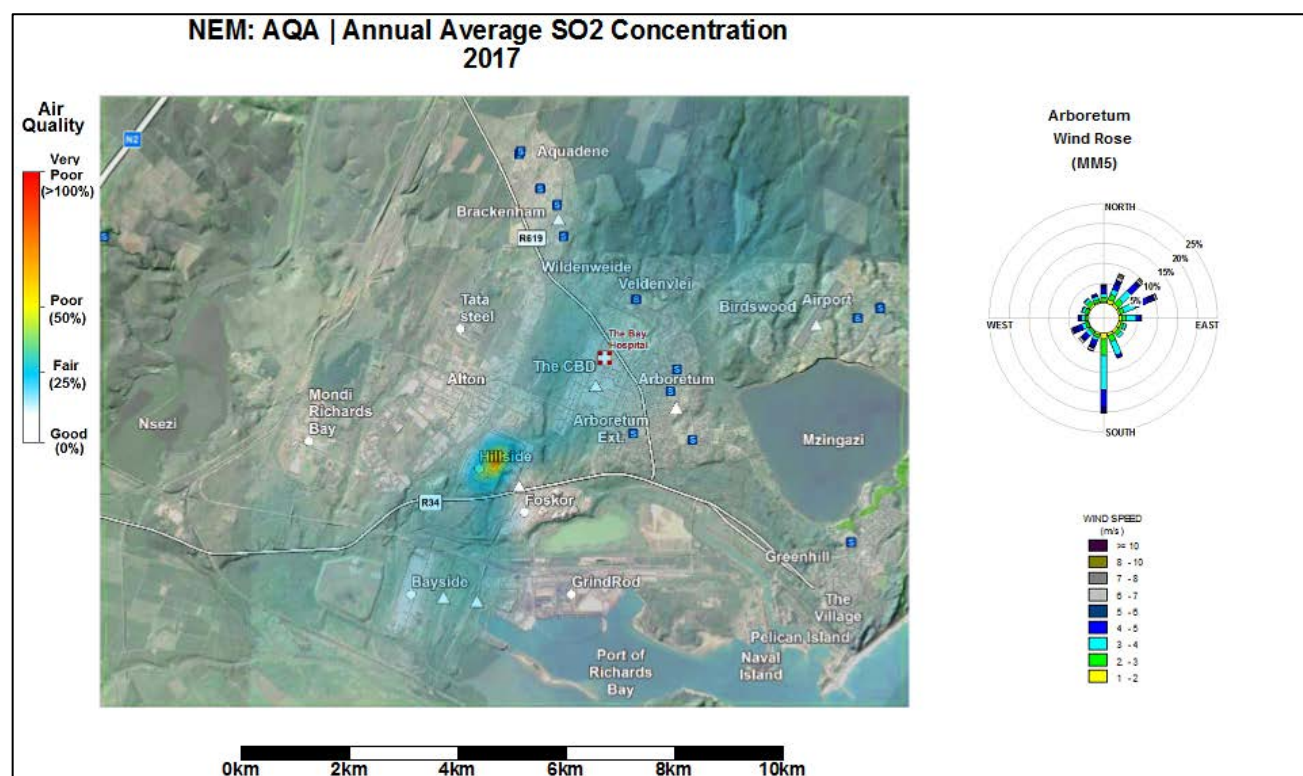
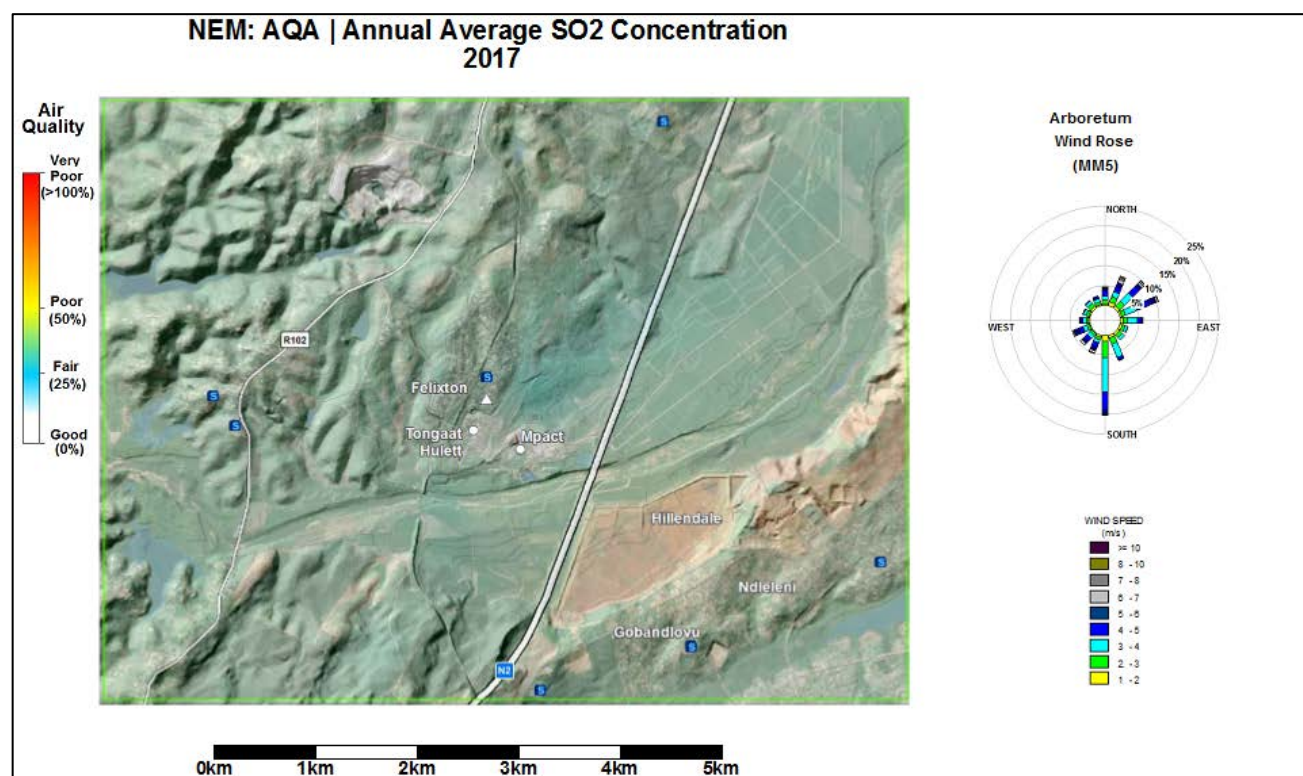
The plots are colour coded according to the Air Quality Index (AQI) in Table 12 The colour scale ranges from blue (indicating a low concentration relative to the standard / guideline), to red (indicating an exceedance of the standard / guideline).

Table 12: SO₂ annual air quality index

Air Quality Rating	Percentage of NEM: AQA SO ₂ Annual Limit Value	Effects
Good	0% - 25%	No known harmful effects to soil, water, vegetation, animals, visibility or human health.
Fair	26% - 50%	Adequate protection against harmful effects to soil, water, vegetation, animals, visibility or human health.
Poor	51% - 100%	Not all aspects of the environment are adequately protected from adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.
Very Poor	>100%	In this range, further deterioration of air quality and continued high readings could pose a risk to public health.

The model did not predict any annual average SO₂ concentrations greater than the NEM: AQA SO₂ Annual Average Standard Limit (19 ppb). The half-guideline was also not predicted to be exceeded.

Figure 21: SO₂ annual average prediction (regional map)

Figure 22: SO₂ annual average prediction (Richards Bay map)Figure 23: SO₂ annual average prediction (Felixton map)

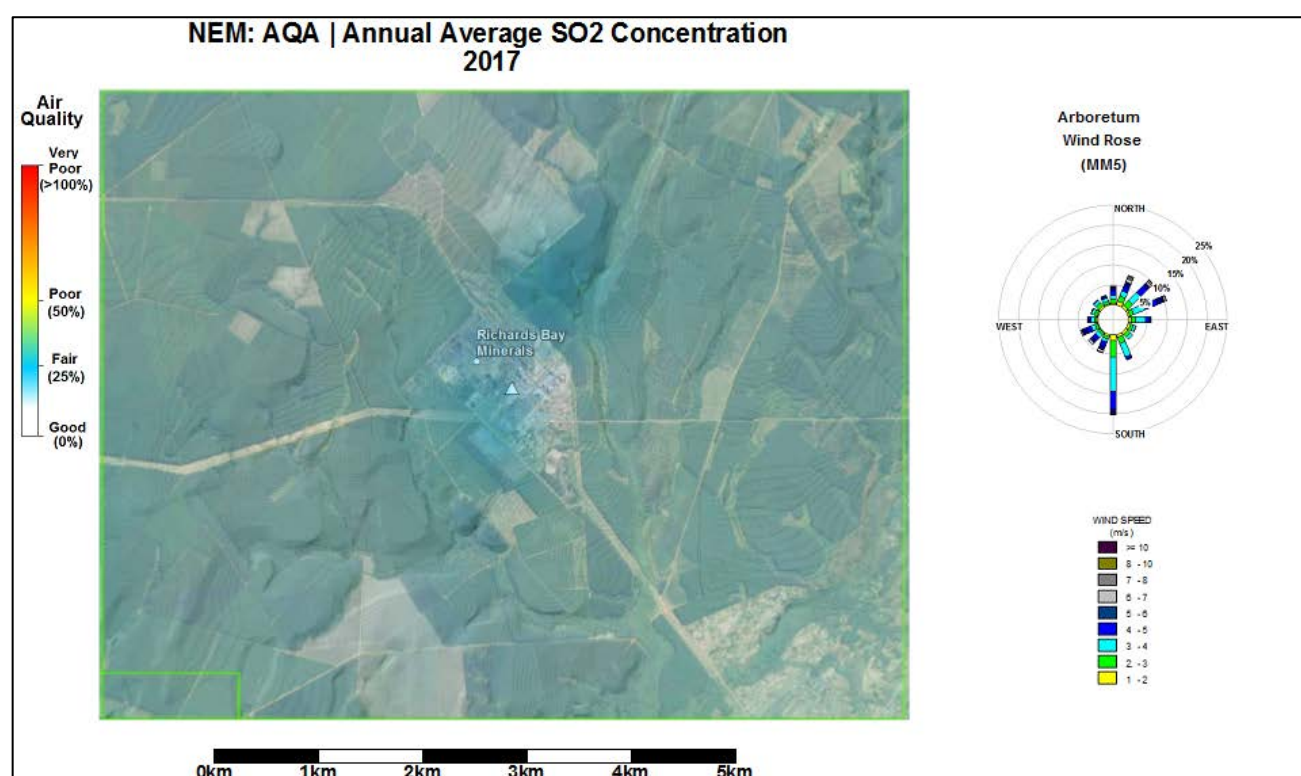


Figure 24: SO₂ annual average prediction (RBM map)

5.12 SO₂ Annual Average Prediction (WHO)

The following plots of the annual average SO₂ concentrations are provided:

- Regional (Figure 25);
- Richards Bay Figure 26);
- Felixton (Figure 27); and
- RBM (Figure 28).

The plots are colour coded according to the Air Quality Index (AQI) in Table 13. The colour scale ranges from blue (indicating a low concentration relative to the standard / guideline), to red (indicating an exceedance of the standard / guideline).

Table 13: SO₂ annual air quality index

Air Quality Rating	Percentage of WHO SO ₂ Annual Limit Value
Good	0% - 25%
Fair	26% - 50%
Poor	51% - 100%
Very Poor	>100%

The model did not predict any annual average SO₂ concentrations greater than the WHO SO₂ Annual Average Guideline Limit (8 ppb). The half-guideline includes Hillside Aluminium.

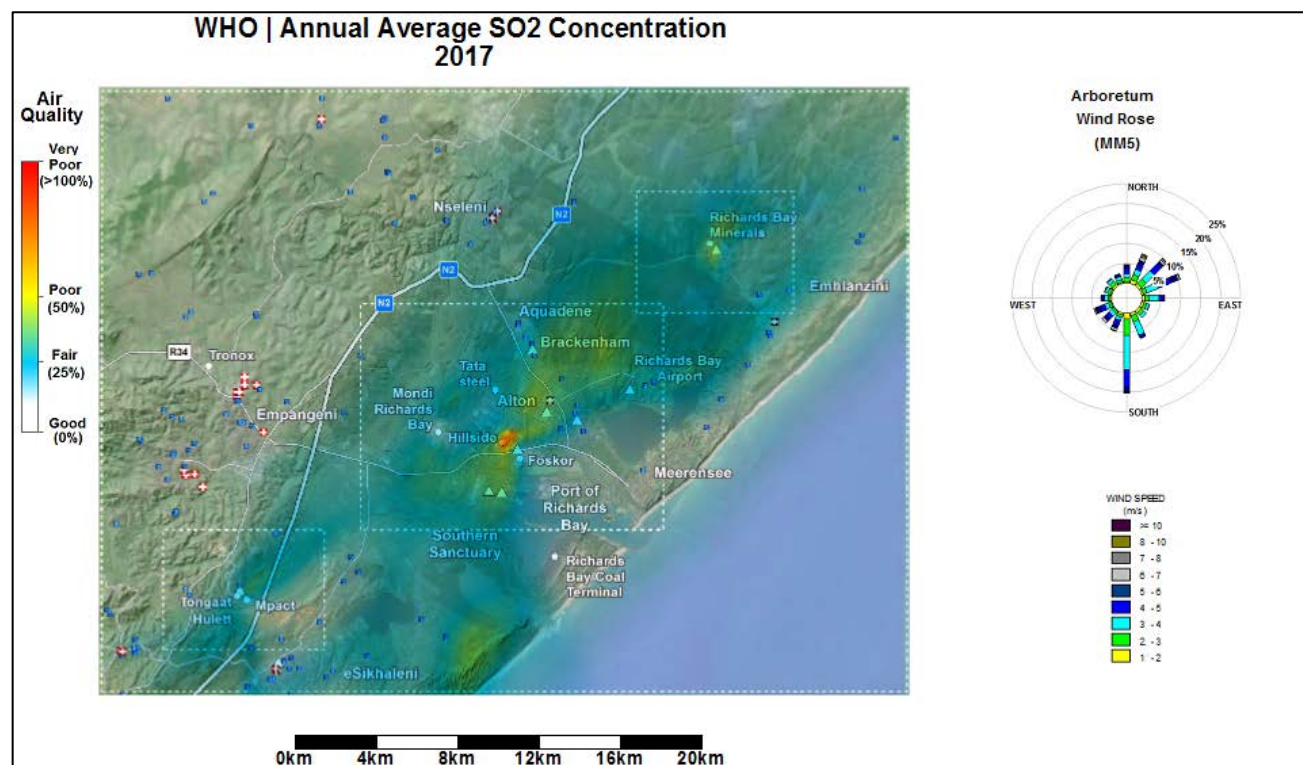


Figure 25: SO₂ annual average prediction (regional map)

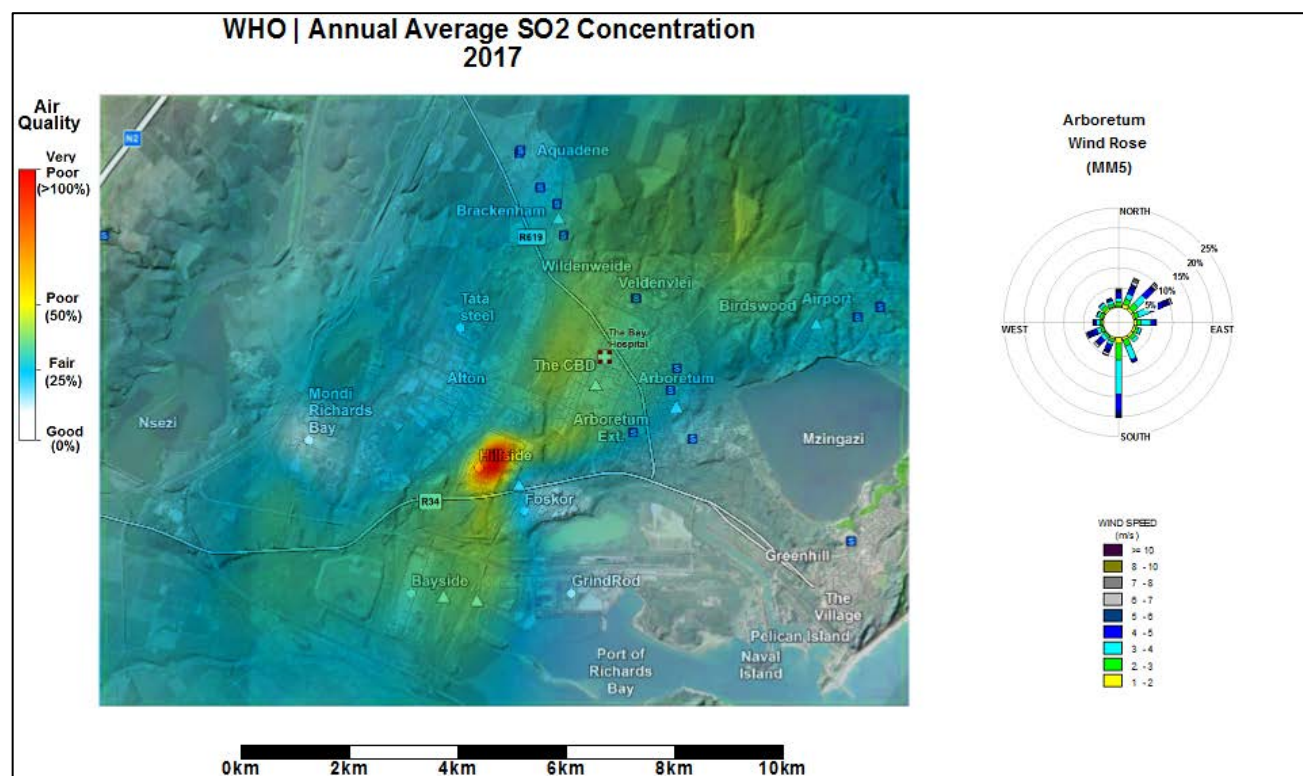
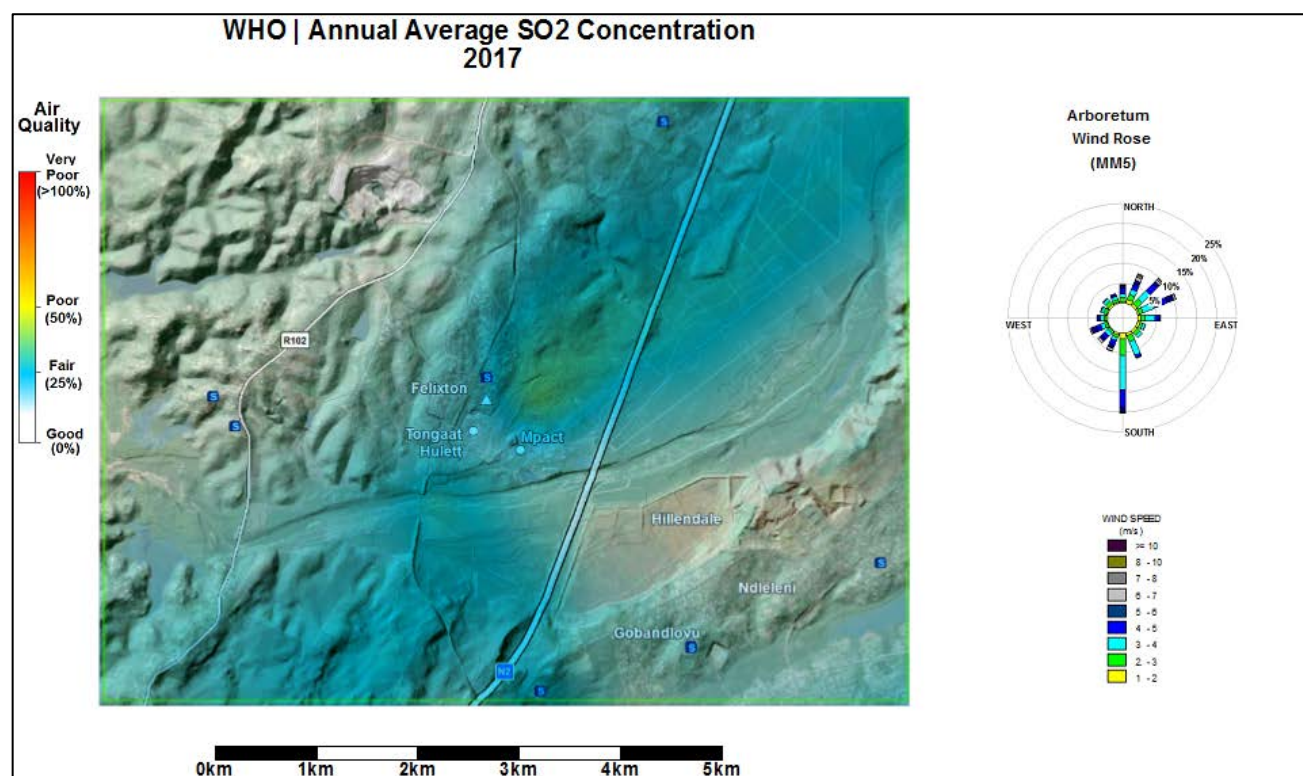
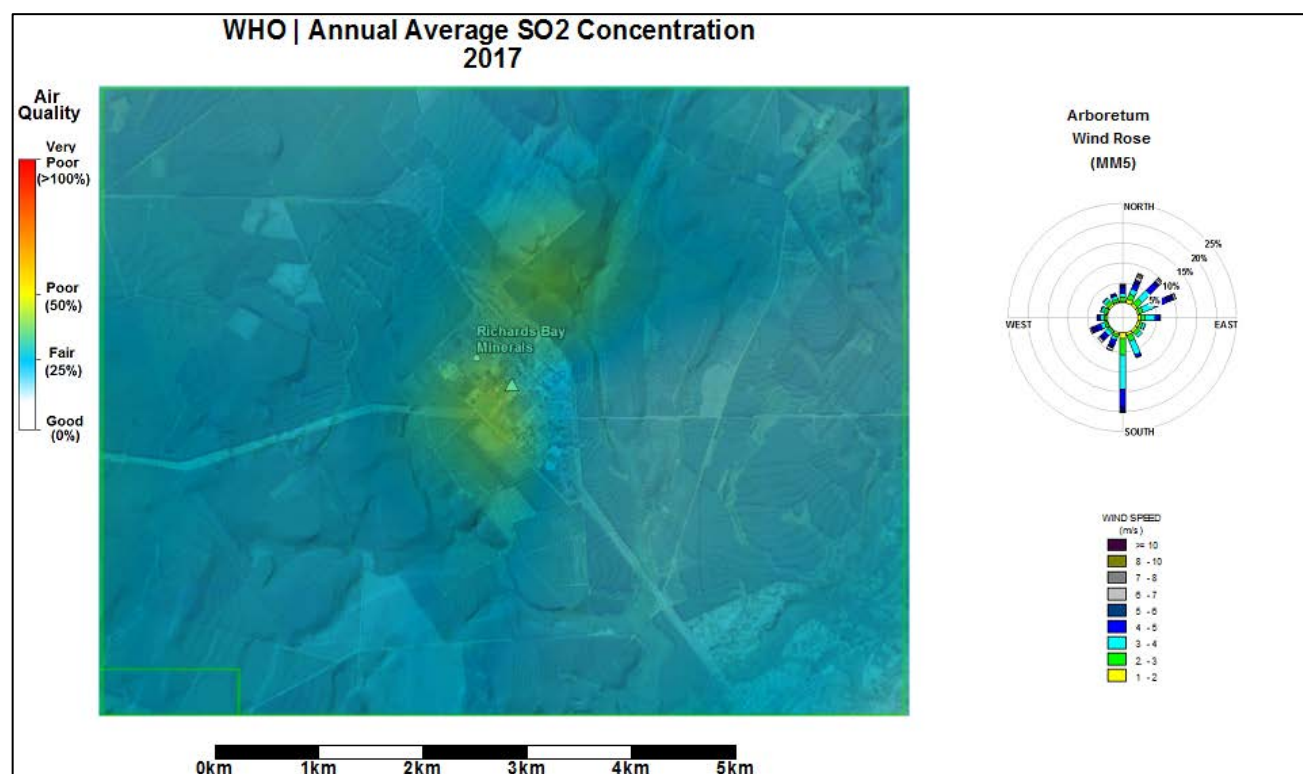


Figure 26: SO₂ annual average prediction (Richards Bay map)

Figure 27: SO₂ annual average prediction (Felixton map)Figure 28: SO₂ annual average prediction (RBM map)

5.13 SO₂ Daily Predicted Maxima (NEMA)

The following plots of SO₂ daily predicted maxima are provided:

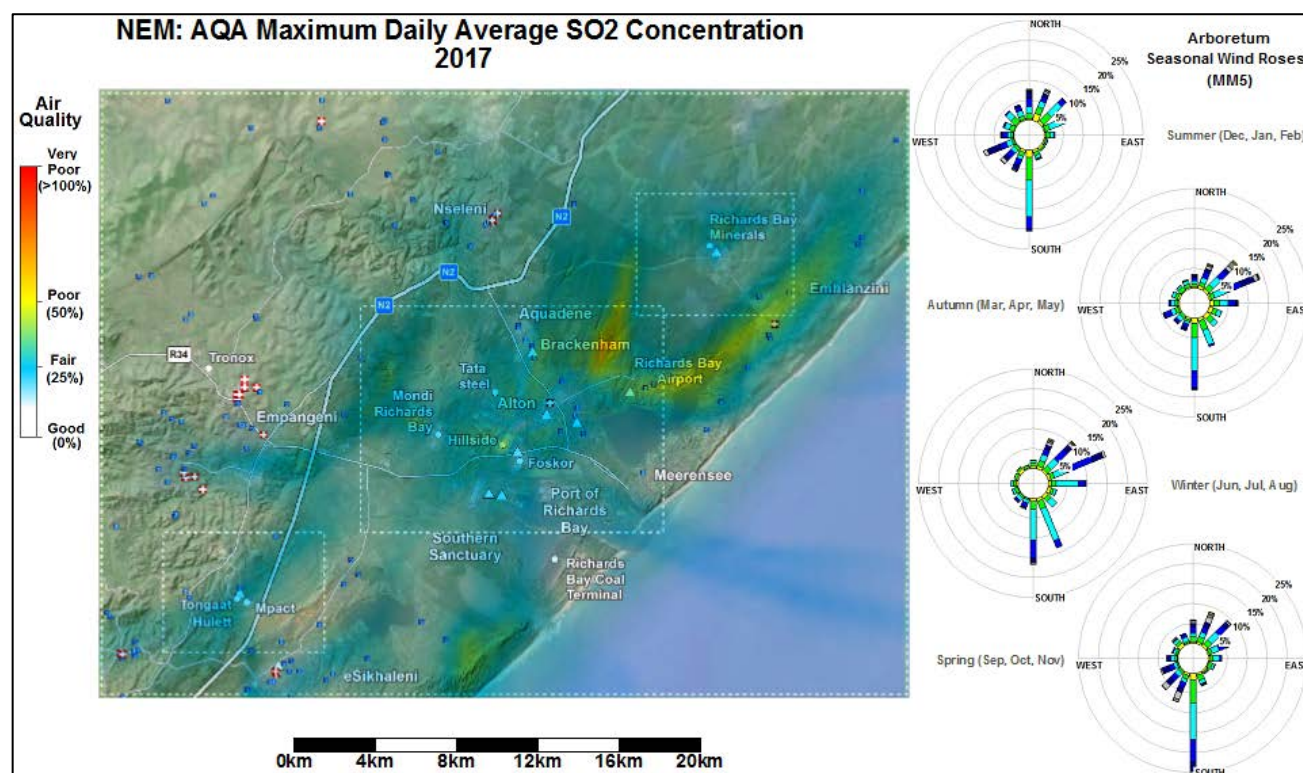
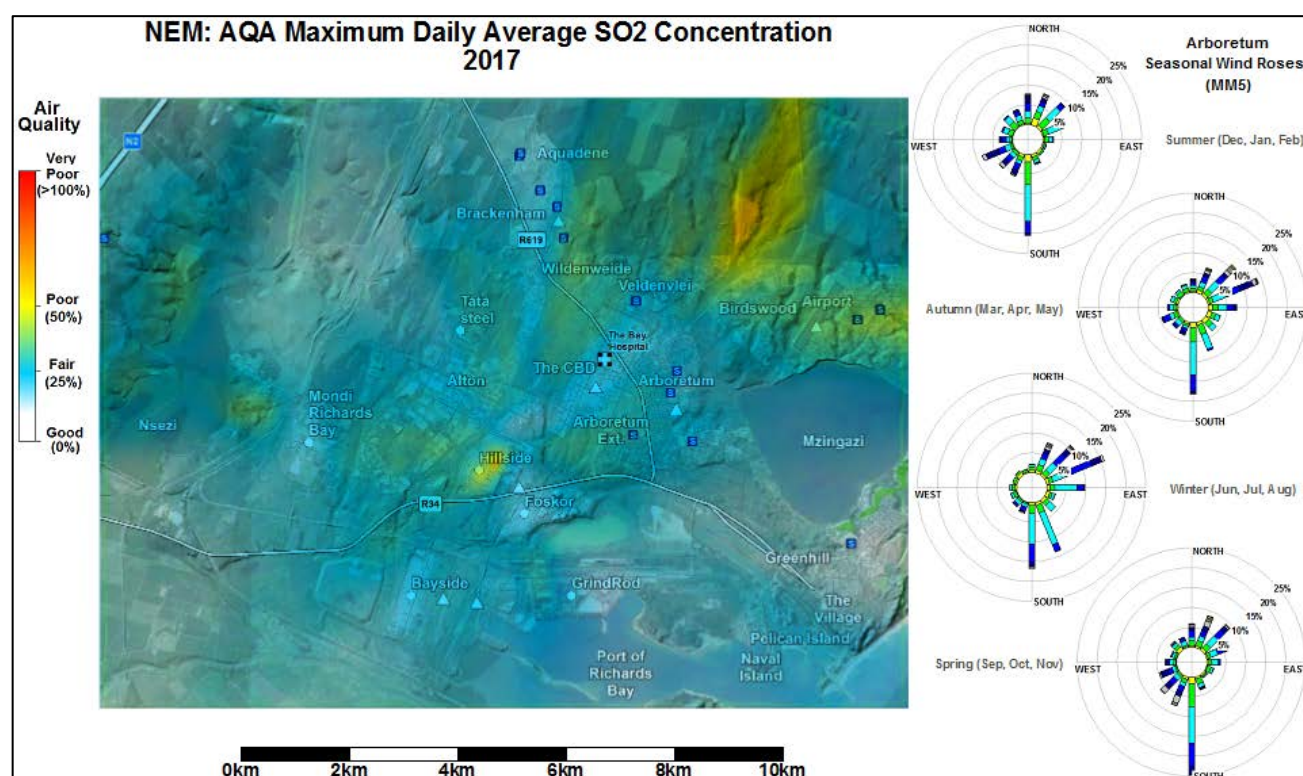
- Regional (Figure 29);
- Richards Bay (Figure 30);
- Felixton (Figure 31); and
- RBM (Figure 32).

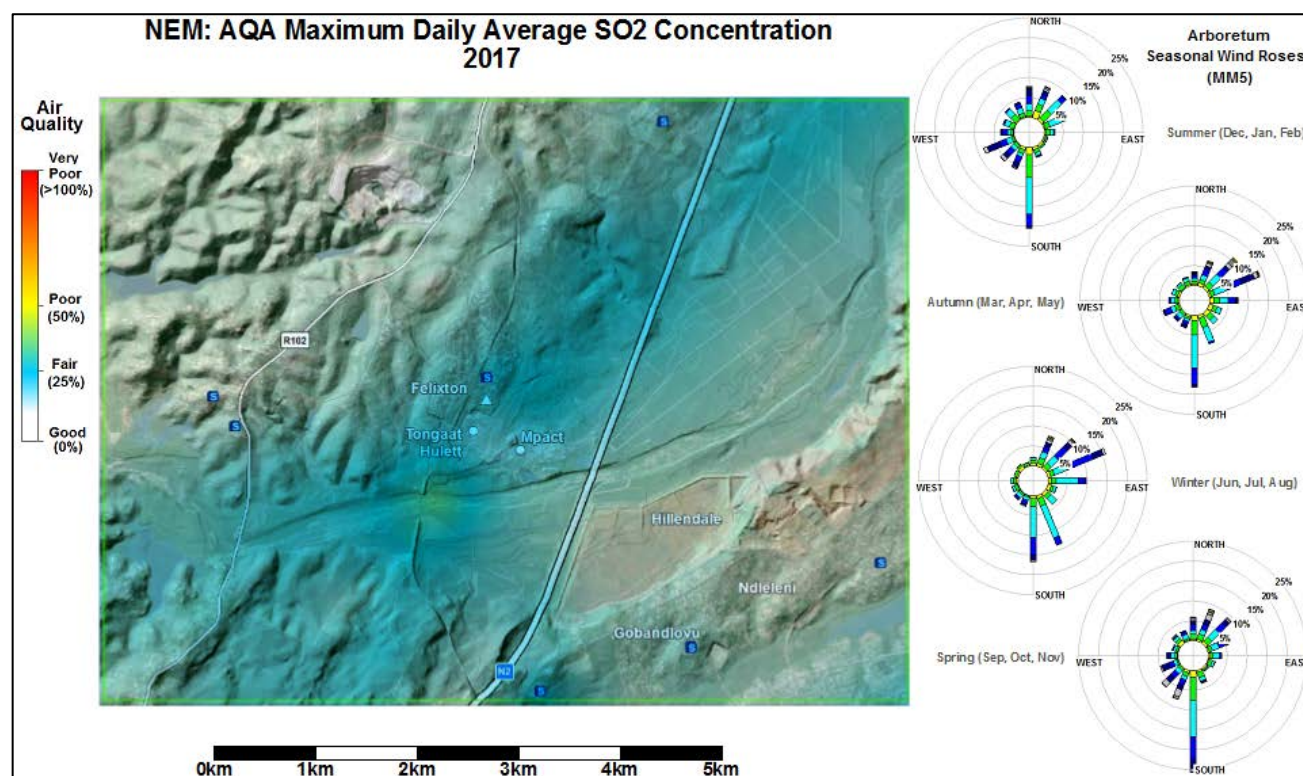
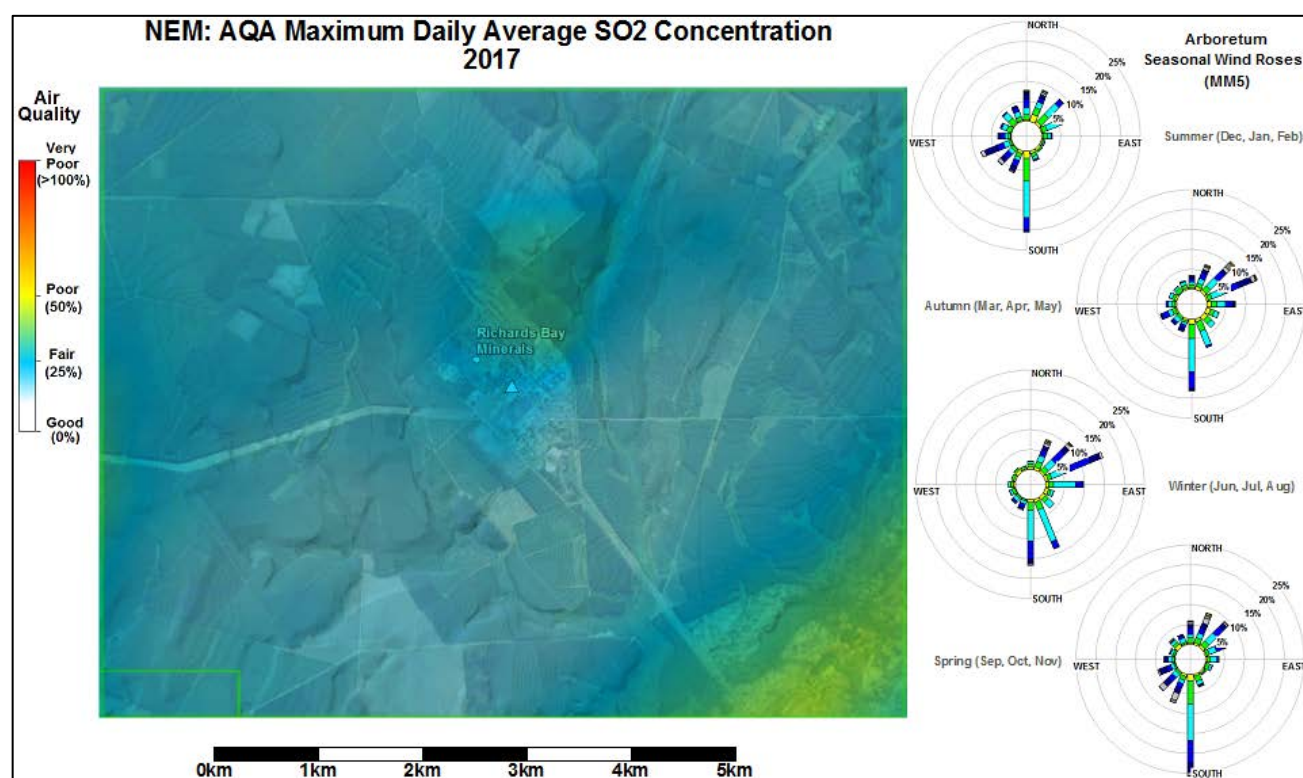
The plots are colour coded according to the Air Quality Index (AQI) in Table 14. The colour scale ranges from blue (indicating a low concentration relative to the standard / guideline), to red (indicating an exceedance of the standard / guideline).

Table 14: SO₂ daily air quality index

Air Quality Rating	Percentage of NEM: AQA SO ₂ Daily Limit Value	Effects
Good	0% - 25%	No known harmful effects to soil, water, vegetation, animals, visibility or human health.
Fair	26% - 50%	Adequate protection against harmful effects to soil, water, vegetation, animals, visibility or human health.
Poor	51% - 100%	Not all aspects of the environment are adequately protected from adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.
Very Poor	>100%	In this range, further deterioration of air quality and continued high readings could pose a risk to public health.

The model did not predict maximum daily average SO₂ concentrations greater than the NEM: AQA SO₂ Daily Average Standard Limit (48 ppb). The half-guideline was also not predicted to be exceeded.

Figure 29: SO₂ maximum daily average prediction (regional map)Figure 30: SO₂ maximum daily average prediction (Richards Bay map)

Figure 31: SO₂ maximum daily average prediction (Felixton map)Figure 32: SO₂ maximum daily average prediction (RBM map)

5.14 SO₂ Daily Predicted Maxima (WHO)

The following plots of SO₂ daily predicted maxima are provided:

- Regional (Figure 33);
- Richards Bay (Figure 34);
- Felixton (Figure 35); and
- RBM (Figure 36).

The plots are colour coded according to the Air Quality Index (AQI) in Table 15. The colour scale ranges from blue (indicating a low concentration relative to the standard / guideline), to red (indicating an exceedance of the standard / guideline).

Table 15: SO₂ daily air quality index

Air quality Rating	Percentage of WHO SO ₂ Daily Limit Value
Good	0% - 25%
Fair	26% - 50%
Poor	51% - 100%
Very Poor	>100%

The model predicted maximum daily average SO₂ concentrations greater than the WHO Daily Average Guideline Limit (8 ppb) over Alton; Aquadene; Arboretum; Arboretum Extension; Bayside Aluminium; Birdwood; Brackenham; CBD; Felixton; Foskop; Hillside Aluminium; Mandlazini Agri-Village; Mondi Richards Bay; Mzingazi Agri-Village; Port of Richards Bay; Richards Bay Minerals; Richards Bay Alloys; Veldenvlei; and, Wildenweide. The half-guideline includes Empangeni; Esikhawini; Tronox; Greenhill; Meerensee; Nseleni; Richards Bay Coal Terminal; the Southern Sanctuary; and, Vulindlela.

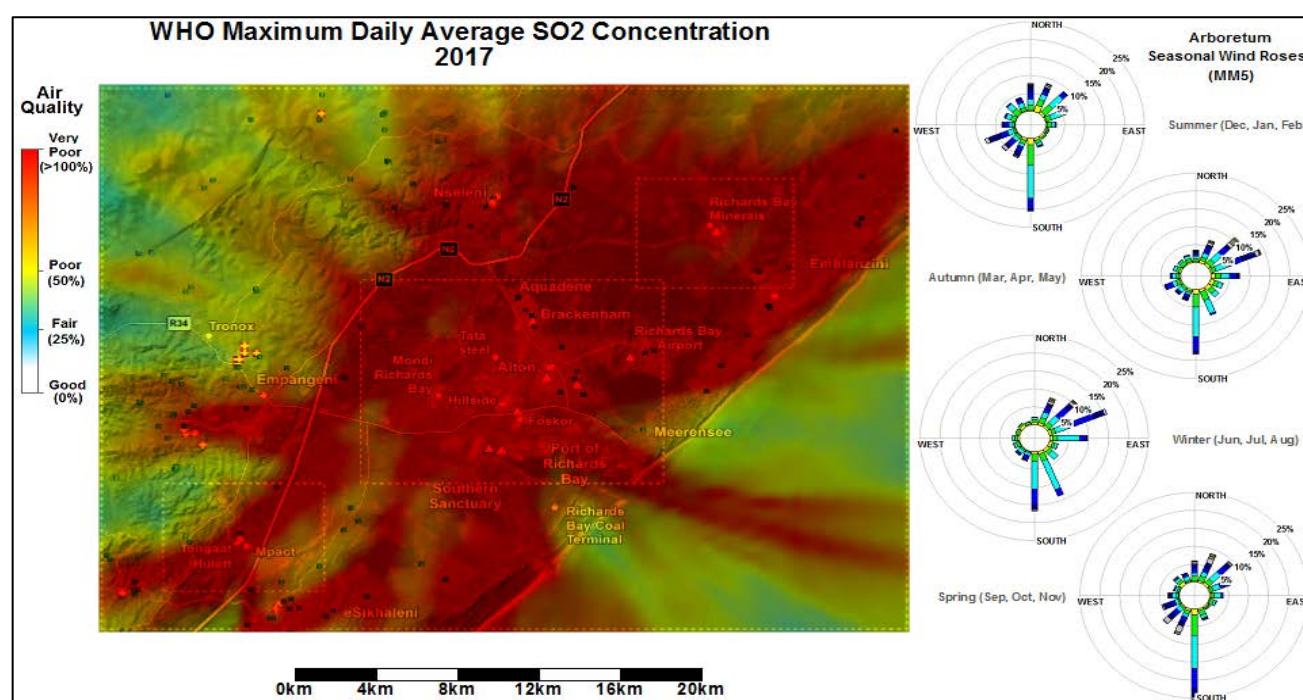
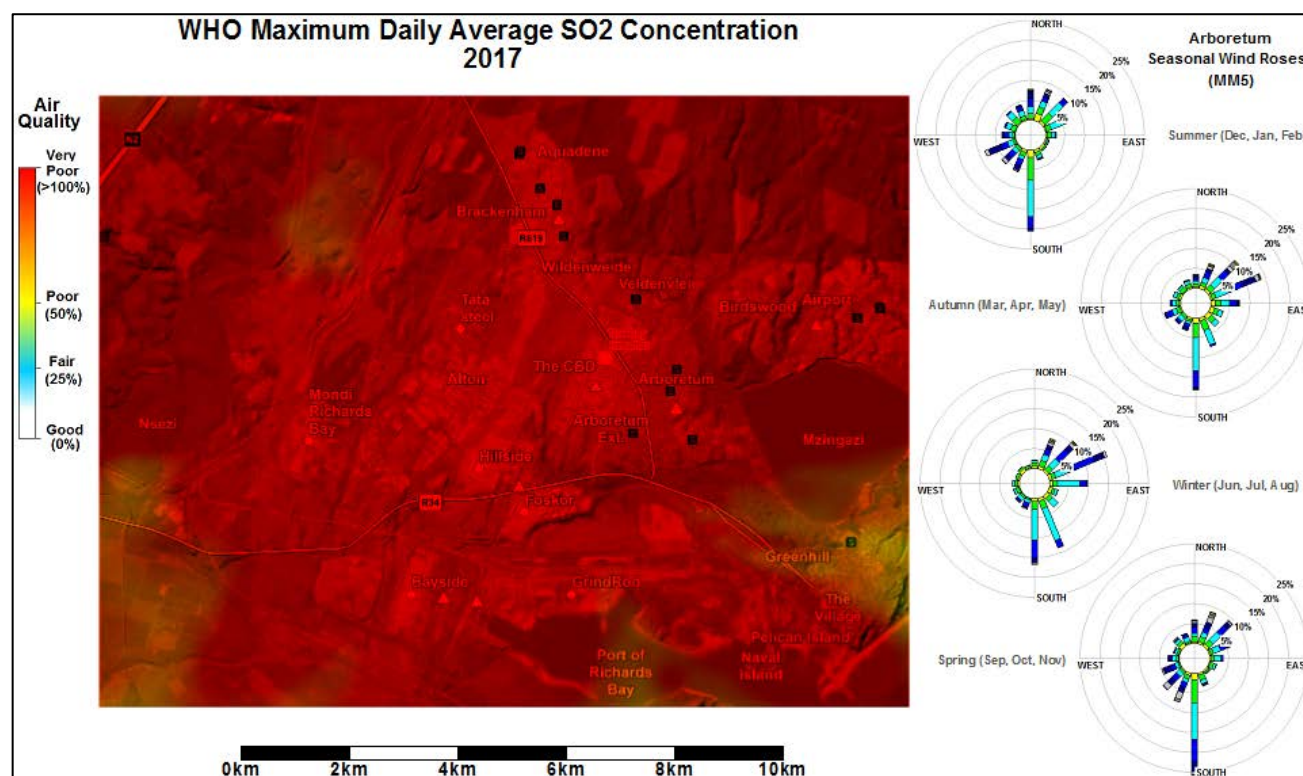
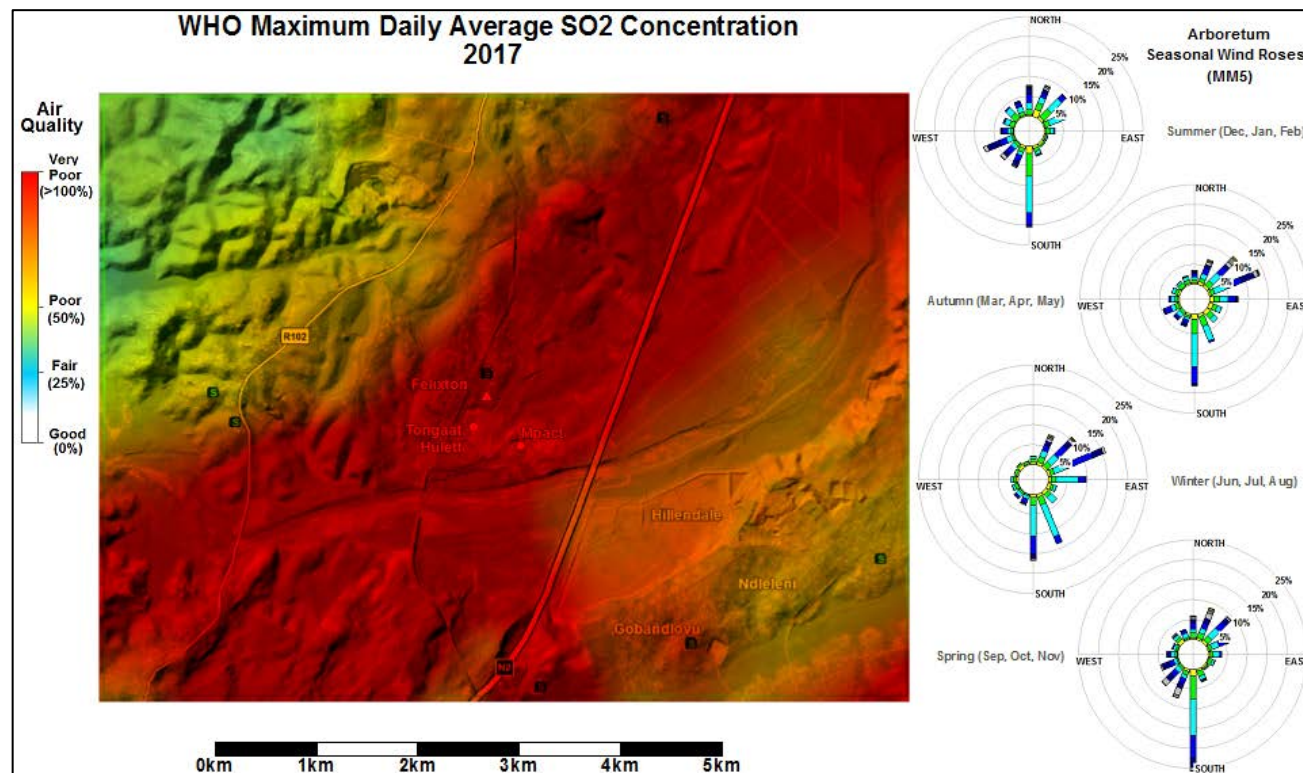


Figure 33: SO₂ maximum daily average prediction (regional map)

Figure 34: SO₂ maximum daily average prediction (Richards Bay map)Figure 35: SO₂ maximum daily average prediction (Felixton map)

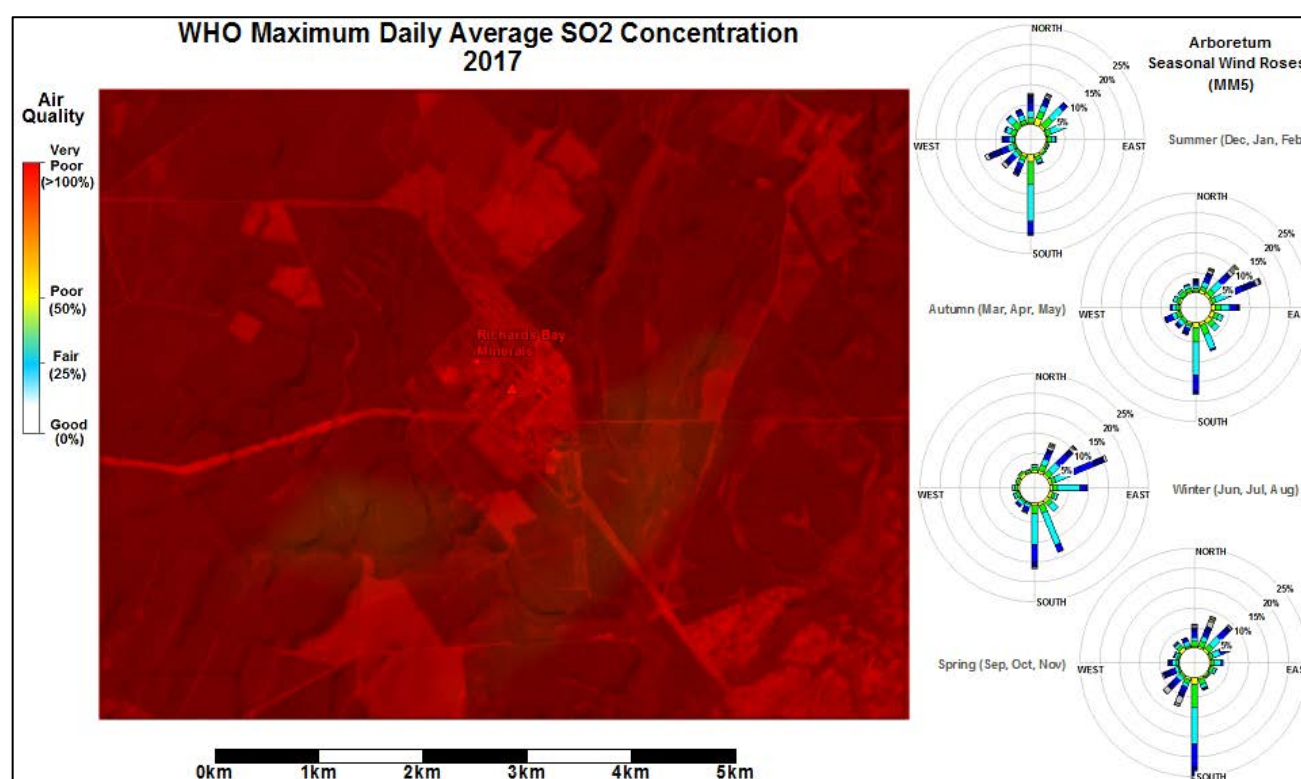


Figure 36: SO₂ maximum daily average prediction (RBM map)

5.15 SO₂ Hourly Predicted Maxima (NEMA)

The following plots SO₂ hourly predicted maxima are provided:

- Regional (Figure 37);
- Richards Bay (Figure 38);
- Felixton (Figure 39); and
- RBM (Figure 40).

The plots are colour coded according to the Air Quality Index (AQI) (Table 16). The colour scale ranges from blue (indicating a low concentration relative to the standard / guideline), to red (indicating an exceedance of the standard / guideline).

Table 16: SO₂ hourly air quality index

Air Quality Rating	Percentage of NEM: AQA SO ₂ Hourly Limit Value	Effects
Good	0% - 25%	No known harmful effects to soil, water, vegetation, animals, visibility or human health.
Fair	26% - 50%	Adequate protection against harmful effects to soil, water, vegetation, animals, visibility or human health.
Poor	51% - 100%	Not all aspects of the environment are adequately protected from adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.

Air Quality Rating	Percentage of NEM: AQA SO ₂ Hourly Limit Value	Effects
Very Poor	>100%	In this range, further deterioration of air quality and continued high readings could pose a risk to public health.

The model did not predict maximum hourly average SO₂ concentrations greater than the NEM; AQA SO₂ Hourly Average Standard Limit (134 ppb). The half-guideline was also not predicted to be exceeded.

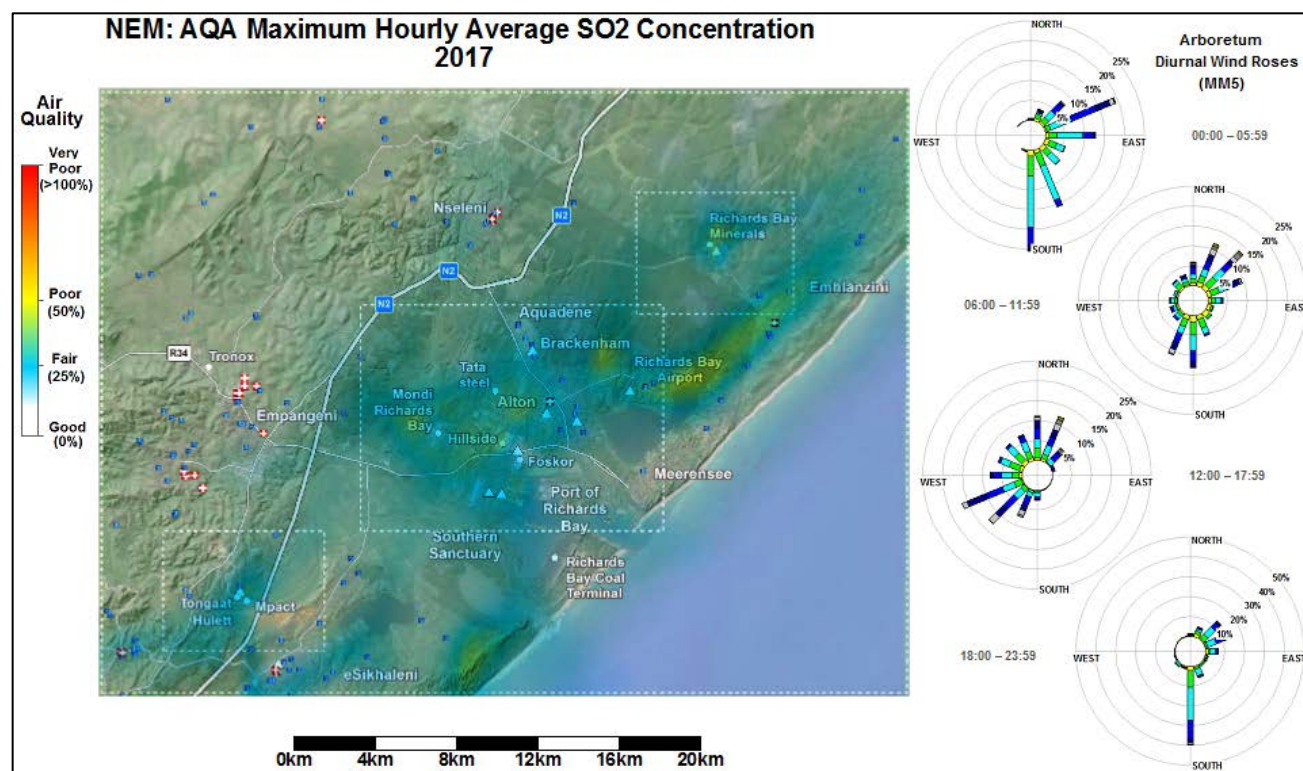
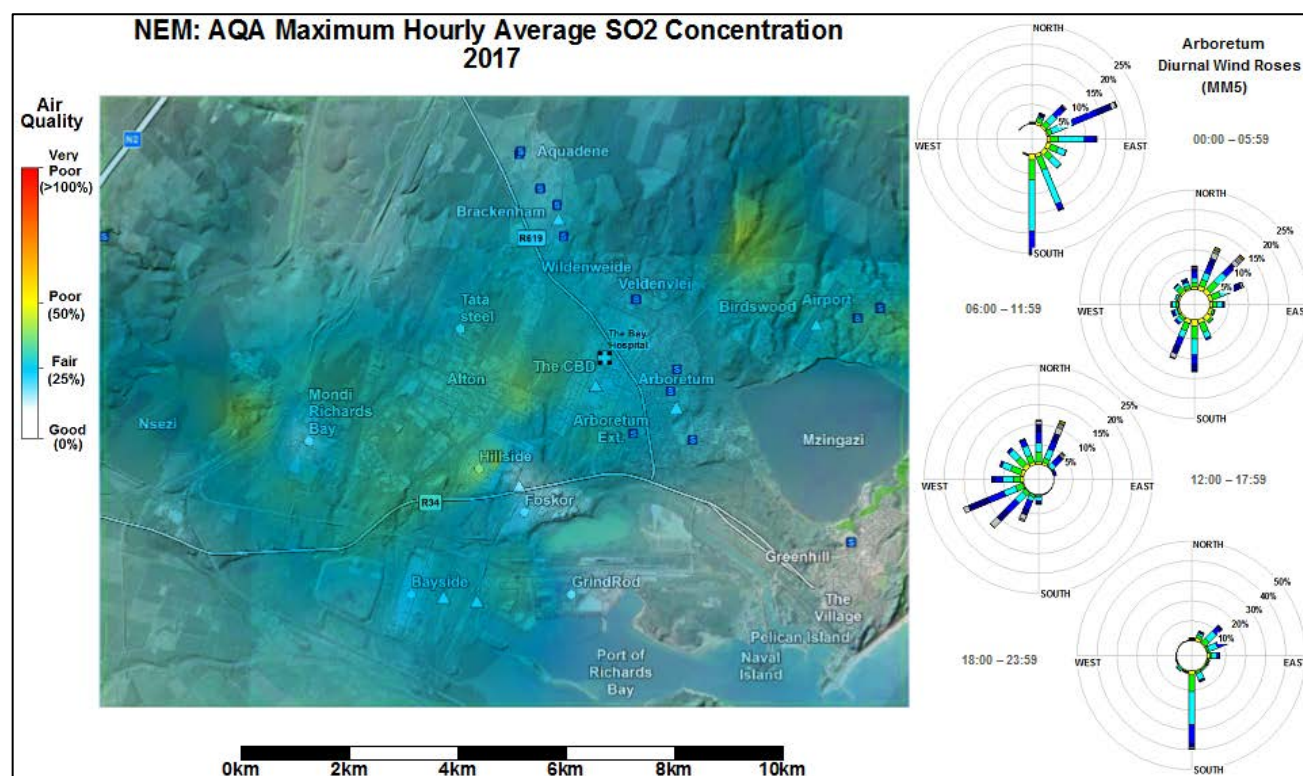
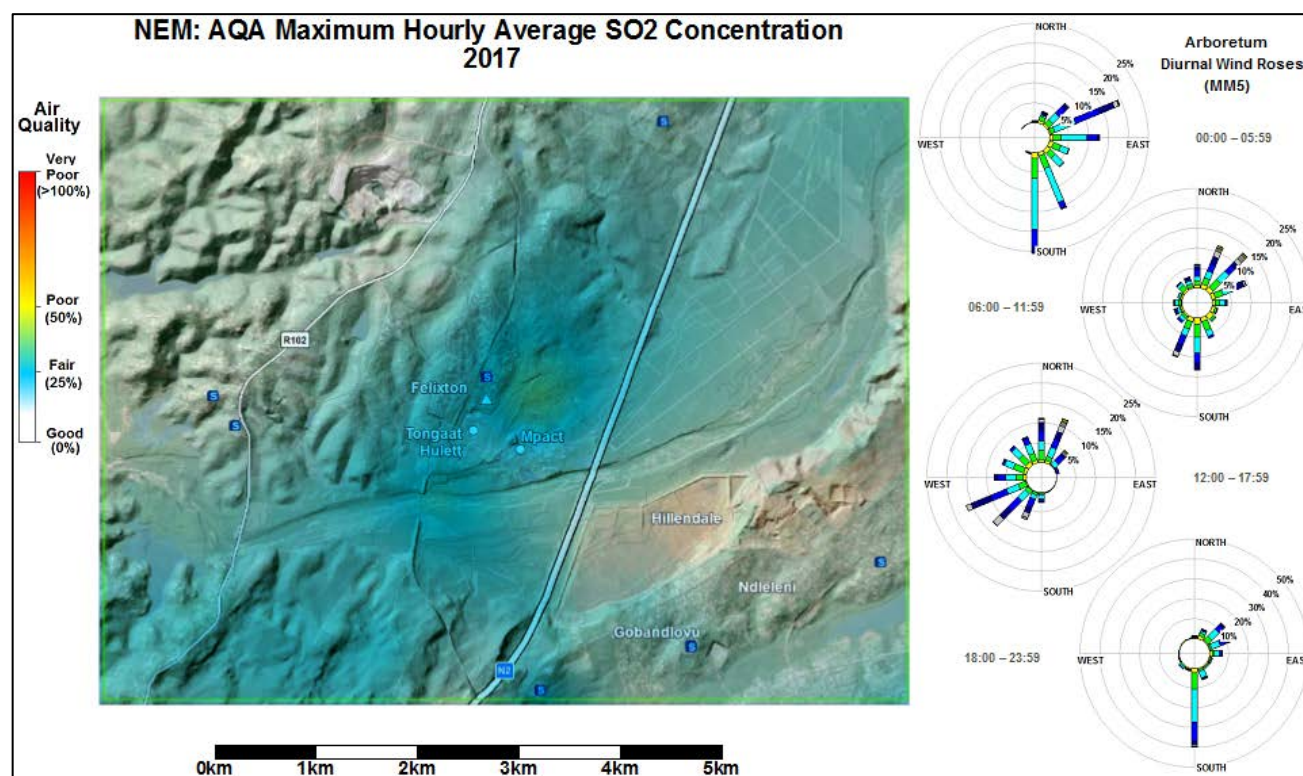


Figure 37: SO₂ maximum hourly average prediction (regional map)

Figure 38: SO₂ maximum hourly average prediction (Richards Bay map)Figure 39: SO₂ maximum hourly average prediction (Felixton map)

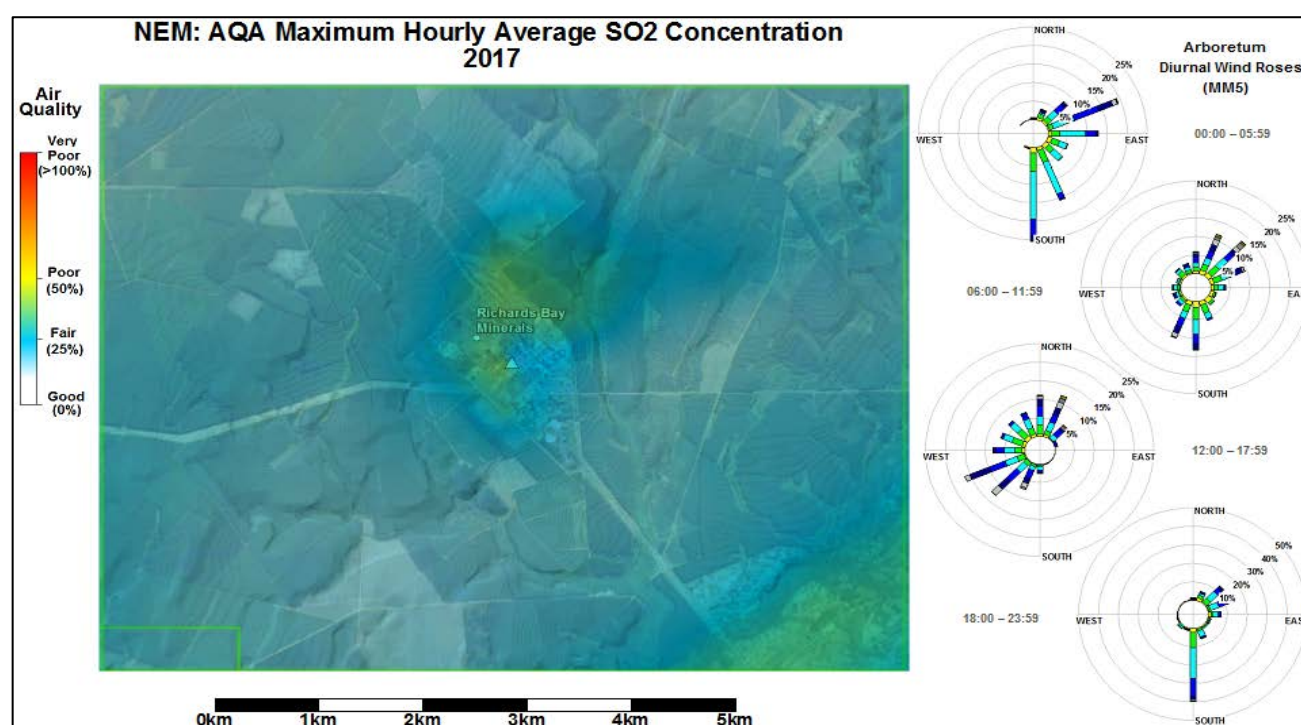


Figure 40: SO₂ maximum hourly average prediction (RBM map)

5.16 SO₂ 10-minute Predicted Maxima (NEMA & WHO)

The following plots of SO₂ 10-minute predicted maxima are provided:

- Regional (Figure 41);
- Richards Bay (Figure 42);
- Felixton (Figure 43); and
- RBM (Figure 44).

The plots are colour coded according to the Air Quality Index (AQI) in Table 16. The colour scale ranges from blue (indicating a low concentration relative to the standard / guideline), to red (indicating an exceedance of the standard / guideline).

Table 17: SO₂ 10-minute air quality index

Air Quality Rating	Percentage of NEM: AQA / WHO SO ₂ 10-minute Limit Value	Effects
Good	0% - 25%	No known harmful effects to soil, water, vegetation, animals, visibility or human health.
Fair	26% - 50%	Adequate protection against harmful effects to soil, water, vegetation, animals, visibility or human health.
Poor	51% - 100%	Not all aspects of the environment are adequately protected from adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.

Air Quality Rating	Percentage of NEM: AQA / WHO SO ₂ 10-minute Limit Value	Effects
Very Poor	>100%	In this range, further deterioration of air quality and continued high readings could pose a risk to public health.

The model did not predict maximum 10-minute average SO₂ concentrations greater than the NEM; AQA or WHO SO₂ 10-minute Average Limit (191 ppb). The half-guideline was also not predicted to be exceeded.

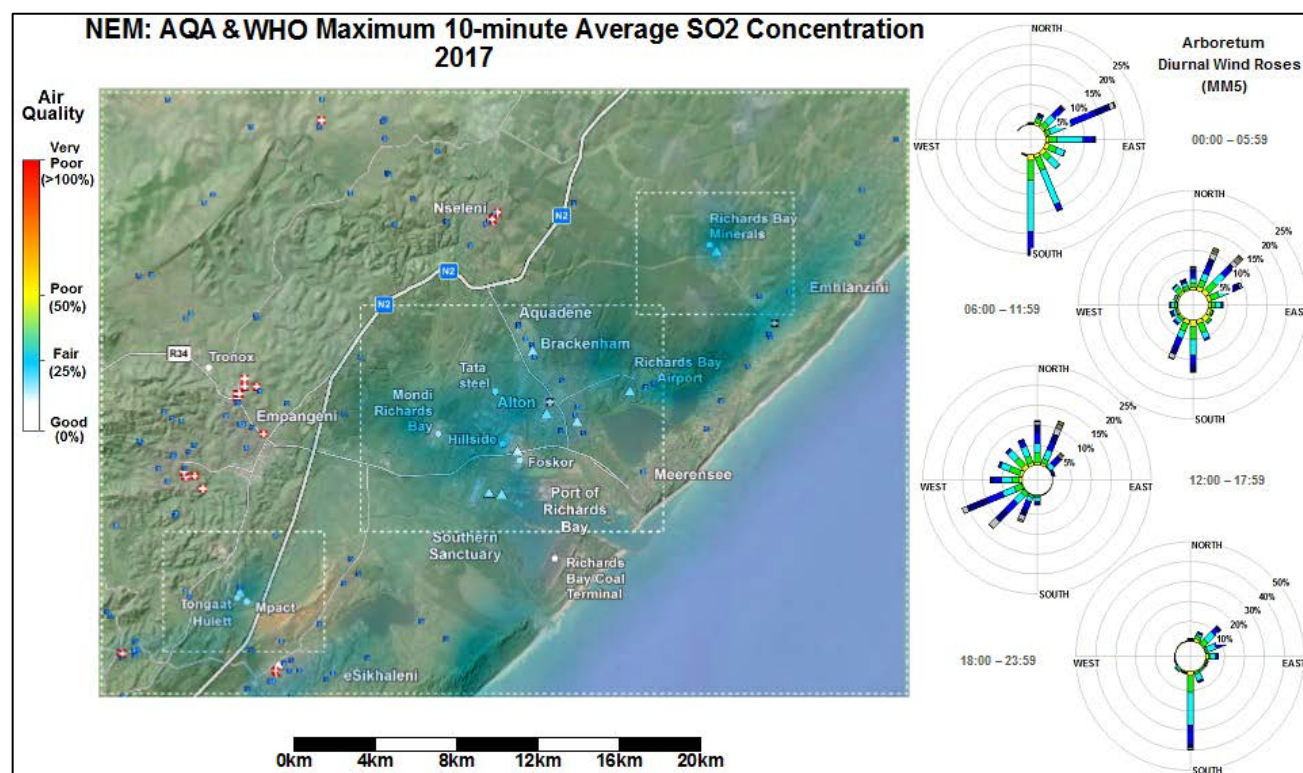
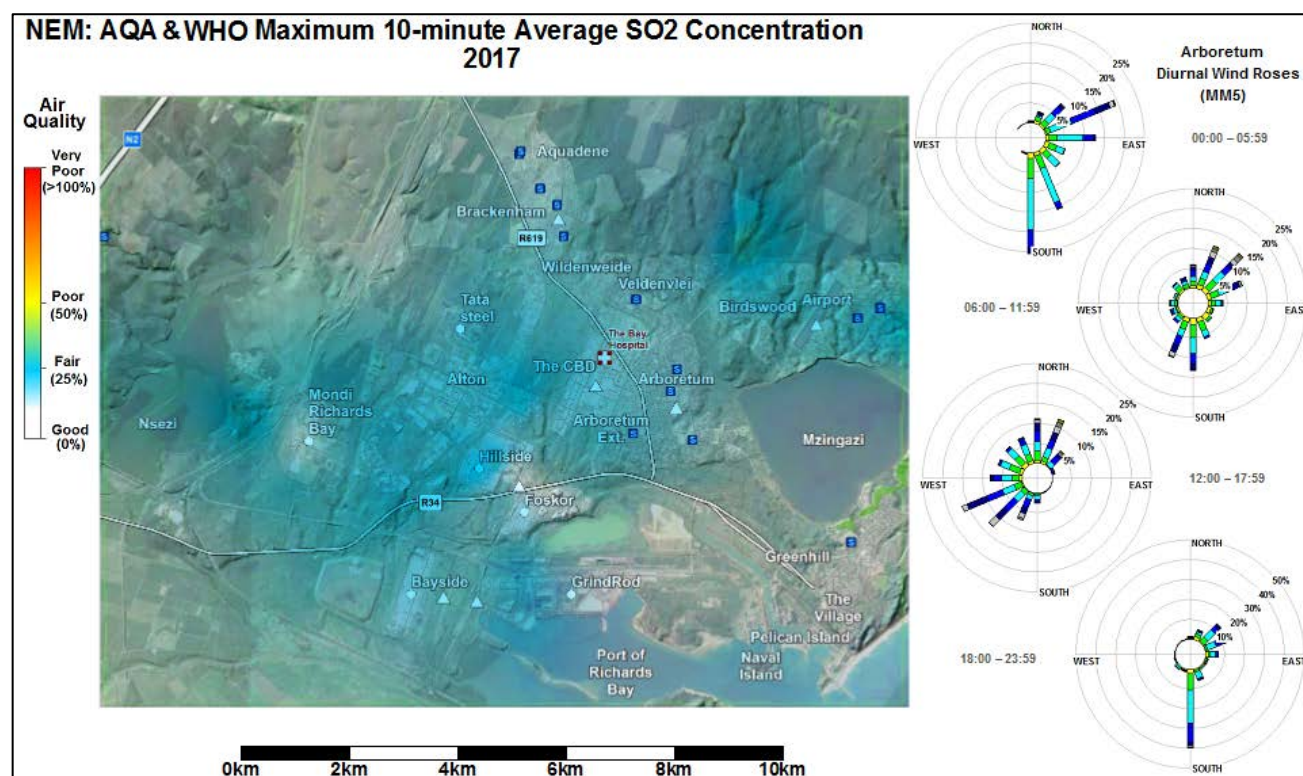
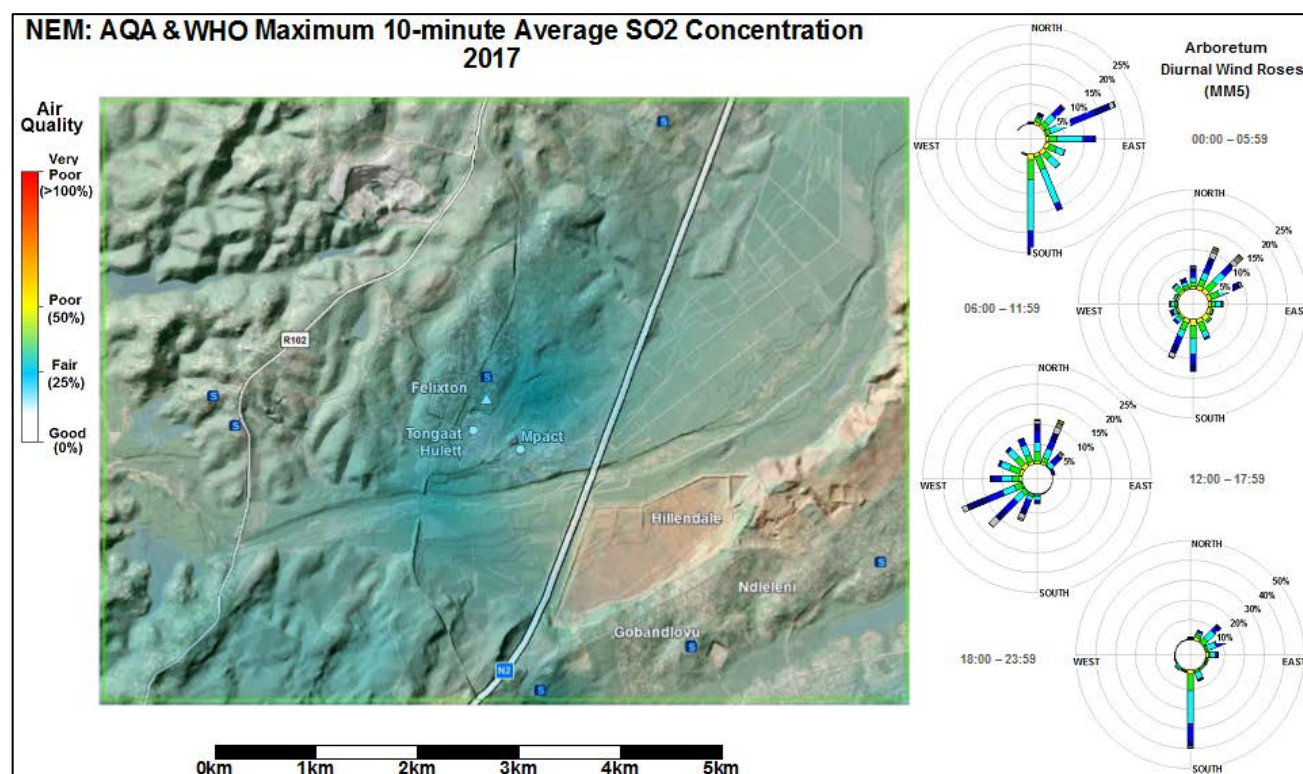
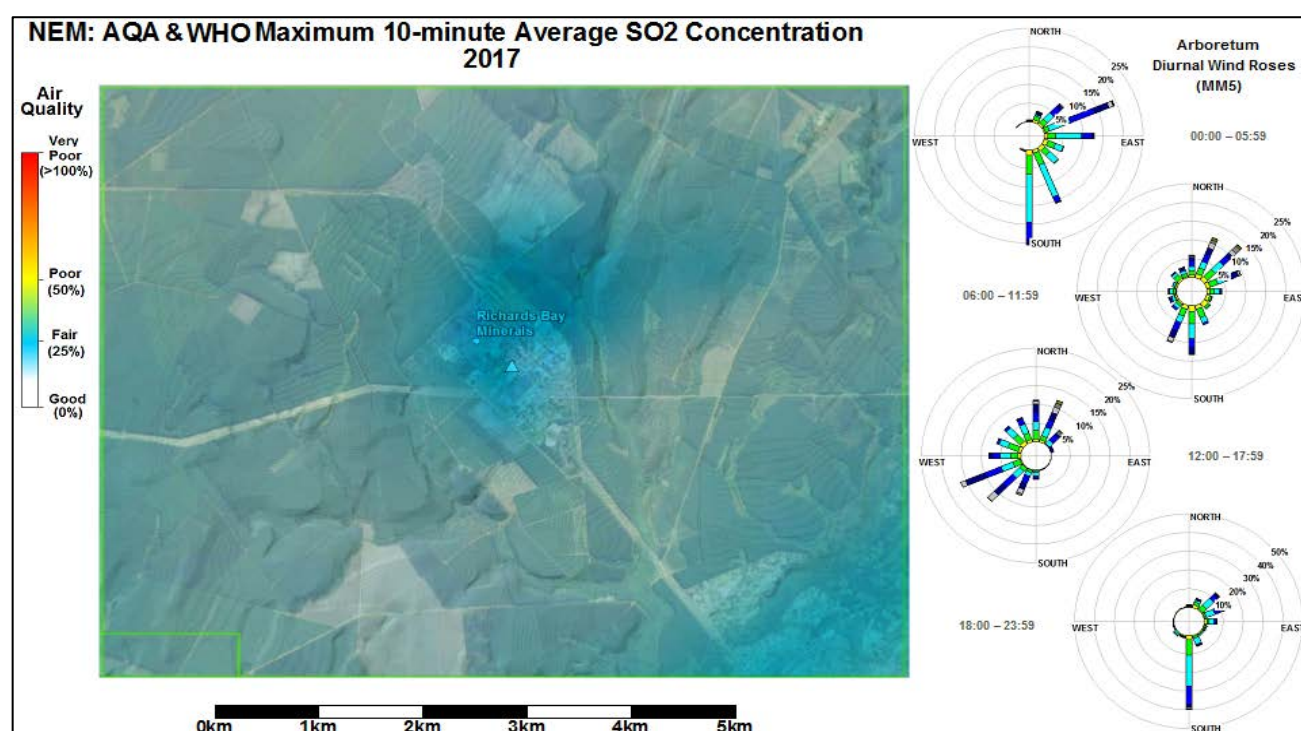


Figure 41: SO₂ maximum 10-minute average prediction (regional map)

Figure 42: SO₂ maximum 10-minute average prediction (Richards Bay map)Figure 43: SO₂ maximum 10-minute average prediction (Felixton map)

Figure 44: SO₂ maximum 10-minute average prediction (RBM map)

5.17 SO₂ Prediction Summary

Area	Percentage of NEM: AQA Standard				Percentage of WHO Guideline		
Standard	Annual	Daily	Hourly	10-minute	Annual	Daily	10-minute
Limit Value	19	48	134	191	8	8	191
Alton	10%	29%	30%	21%	23%	171%	21%
Aquadene	9%	19%	20%	14%	21%	116%	14%
Arboretum	10%	23%	23%	16%	24%	135%	16%
Arboretum Extension	9%	26%	25%	18%	22%	154%	18%
Bayside Aluminium	14%	22%	25%	18%	32%	133%	18%
Birdswood	14%	35%	29%	22%	34%	211%	22%
Brackenham	12%	24%	22%	16%	28%	145%	16%
CBD	15%	23%	26%	19%	36%	136%	19%
Empangeni	3%	9%	10%	7%	7%	57%	7%
Esikhawini	8%	15%	18%	14%	19%	88%	14%
Tronox	2%	8%	7%	5%	4%	46%	5%
Felixton	8%	20%	23%	17%	19%	121%	17%
Foskor	10%	19%	21%	15%	24%	114%	15%
Greenhill	4%	14%	10%	8%	9%	84%	8%

Area	Percentage of NEM: AQA Standard				Percentage of WHO Guideline		
Hillside Aluminium	39%	41%	31%	22%	93%	247%	22%
Mandlazini Agri-Village	12%	47%	34%	25%	29%	281%	25%
Meerensee	4%	12%	8%	7%	8%	73%	7%
Mondi Richards Bay	6%	21%	21%	15%	15%	124%	15%
Mzingazi Agri-Village	7%	26%	19%	12%	17%	157%	12%
Nseleni	7%	15%	14%	11%	16%	91%	11%
Port of Richards Bay	8%	24%	22%	16%	19%	143%	16%
Richards Bay Coal Terminal	5%	12%	13%	10%	11%	75%	10%
Richards Bay Minerals	13%	25%	22%	18%	31%	148%	18%
Southern Sanctuary	10%	17%	18%	13%	24%	100%	13%
Richards Bay Alloys	11%	29%	28%	20%	26%	174%	20%
Veldenvlei	15%	25%	24%	18%	35%	150%	18%
Vulindlela	6%	16%	18%	13%	14%	96%	13%
Wildenweide	16%	32%	25%	18%	38%	191%	18%

6.0 TOTAL REDUCED SULPHUR MONITORING (TRS)

Total Reduced Sulphur (TRS) is measured by at CBD. Total reduced sulphur compounds, often associated with rotten egg or cooked cabbage odour, refer to a gaseous mixture of compounds consisting mainly of hydrogen sulphide (H_2S), methyl mercaptan (CH_3S-H), dimethyl sulphide (CH_3-S-CH_3) and dimethyl disulphide ($CH_3-S-S-CH_3$). While there are other ambient TRS compounds, these four are the most common, abundant and the ones generally referred to in discussions about TRS. Once released into the atmosphere, oxidation products of TRS compounds, such as sulphuric acid, contribute to the acidity of the environment.

The most commonly reported health concerns related to TRS substances are nausea and headaches, although each component has its own characteristics and effects.

6.1 TRS Data Capture

The percentage of valid data received from the TRS analysers for 2017 is shown in Table 7.

Table 18: TRS ambient air quality standards.

Station	Station Availability (%)	TRS (%)
CBD	99	97
eSikhaleni	94	90
Notes: - Red - Not acceptable for statistical purposes (<80%); - Yellow – Acceptable for statistical purposes but does not meet SANAS data capture requirements (<90%); - White – Meets SANAS data capture requirements (>=90%); and		

Station	Station Availability (%)	TRS (%)
Blue - RBCAA Target ($\geq 98\%$).		
Missing Data: eSikhaleni (TRS) - power failures (Apr, May, Sep, & Nov - Dec).		

6.2 TRS Ambient Air Quality Standards

There are no South African standards for TRS.

The World Health Organization (WHO) recommends that in order to avoid substantial complaints about odour annoyance among the exposed population, hydrogen sulphide concentrations should not be allowed to exceed $7 \mu\text{g}/\text{m}^3$ (5 ppb), with a 30-minute averaging period (WHO, 2000).

The Ontario Ministry for the Environment (OME) has derived the following standards for TRS for the Pulp and Paper sector (OME, 1999):

- A 24-hour average Ambient Air Quality Criterion (AAQC) of $14 \mu\text{g}/\text{m}^3$ (10.1 ppb) for TRS, based on the adverse effects on the respiratory system (nasal lesions) of this mixture;
- A 10-minute average AAQC of $13 \mu\text{g}/\text{m}^3$ (9.3 ppb) for TRS, based on odour effects; and
- A 30-minute standard of $10 \mu\text{g}/\text{m}^3$ (7.2 ppb) for TRS; based on both odour and health effects of this mixture.

For all other sectors (including sectors such as Iron & Steel; Petroleum Refineries, Municipal Sewage Treatment Plants):

- A 24-hour average AAQC of $7 \mu\text{g}/\text{m}^3$ (5.0 ppb) for TRS based on the adverse effects on the respiratory system of this mixture;
- A 10-minute average AAQC of $13 \mu\text{g}/\text{m}^3$ (9.3 ppb) for TRS based on odour effects; and
- A 30-minute standard of $10 \mu\text{g}/\text{m}^3$ (7.2 ppb) for TRS; based on both odour and health effects of this mixture.

The RBCAA has decided to implement the:

- WHO 30-minute H_2S guideline;
- OME daily and 10-minute standards for Pulp and Paper sector; in addition
- RBCAA established a correlation between TRS concentrations exceeding 4.5 ppb and the number of complaints received, the RBCAA has therefore set this as its own 10-minute target.

6.3 TRS Compliance

A summary of the TRS exceedances and breakdown per station is presented below (Table 19)

Table 19: TRS station exceedances summary.

Standard / Guideline / Target	Station	Count
RBCAA 10-minute Target (4.5 ppb)	CBD	410
	eSikhaleni	210
OME 10-minute TRS health standard (9.3 ppb)	CBD	10
	eSikhaleni	43

Standard / Guideline / Target	Station	Count
WHO 30-minute H ₂ S Guideline (5.0 ppb)	CBD	65
	eSikhaleni	41

TRS exceedances can be associated with emissions as a result of process upsets (i.e. planned maintenance, plant shutdowns or start-up), leaks in equipment, pipe lines, seals, valves (fugitive emissions) or particular events (e.g. fires or emergency shutdowns). Most of the TRS exceedances recorded during 2017 were allocated to Mondi. Maximum and Annual average concentrations for TRS are provided in Table 20.

Table 20: TRS maximum and monthly concentrations

Station		Local RBCAA 10-minute Guideline 5.9 µg/m ³ 4.5ppb	Local OME 10-minute Guideline 13 µg/m ³ 9.3ppb	Local WHO 30-minute Guideline 7 µg/m ³ 5.0 ppb	Local OME Daily Guideline 14 µg/m ³ 10.1 ppb	Annual Average
CBD	% of guideline	393%	190%	202%	23%	-
	(ppb)	17.7	17.7	10.1	2.3	0.7
	Date & time	2017/08/28 01:10	2017/08/28 01:10	2017/08/28 01:00	2017/01/07	2017/08
eSikhaleni	% of guideline	391%	189%	232%	31%	-
	(ppb)	17.6	17.6	11.6	3.1	1.4
	Date & time	2017/03/17 19:20	2017/03/17 19:20	2017/03/17 19:00	2017/08/07	2017/03
Notes: The table is colour coded according to the level of concentration recorded. The colour scale ranges from blue (indicating a low concentration relative to the standard), to red (indicating an exceedance of the standard).						

6.4 TRS Annual Average Concentration

Annual average TRS concentrations are illustrated in Figure 45. There was a marked decrease in annual average TRS concentrations from 2008 to 2011, concentrations seem to have stabilised since then though. In 2010 Mondi Richards Bay commissioned Phase 1 of their Odour Abatement Project, this involved installing carbon filters on all their odorous venting points. This would have resulted in a decrease in ambient TRS and does not explain the increase between 2010 and 2012 as Mondi continued with various smaller odour abatement projects during this time which should have resulted in a further decrease in TRS. It is possible that weather conditions may have played a role. In 2012 Mondi Richards Bay commissioned Phase 2 of the Odour Abatement Project which successfully reduced TRS emissions from their Chip Bin. However during the winter of 2012 they experienced a problem of fugitive odour from their effluent plant due to a turpentine tube condenser that was taken out of service for repairs, the odour impact was unknown at the time. This was addressed in 2012 and as a result 2013 TRS decreased. Ambient TRS increased again in 2014 due to mill power instability, 2015 to 2017 also proved to be difficult years with an increase in fugitive emissions from the effluent plant because of decreased water consumption.

The following specific problems were reported by Mondi during 2017:

- February – Mondi Landfill Leachate Pond;
- March – Start up after annual shut, emergency ponds;
- May – Flare trip, Venting of NCG through carbon filters;
- July – Flare, corroded nozzles;
- August and September – White Liquor Clari Disc low efficiency, use of ECO filters;
- October – Leaks on softwood NCG line; and
- December – Mondi Effluent Plant.

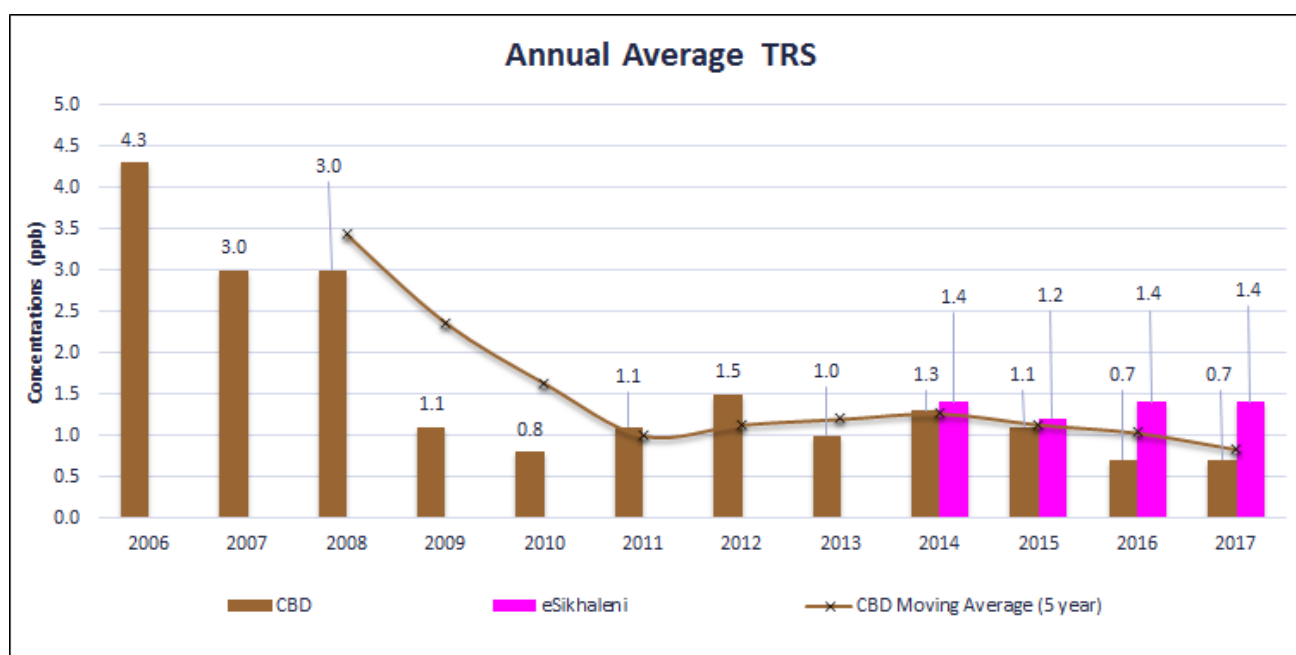


Figure 45: TRS annual average concentrations

6.5 TRS Seasonal Concentrations

The seasonal TRS concentrations in 2017 are provided in Figure 46.

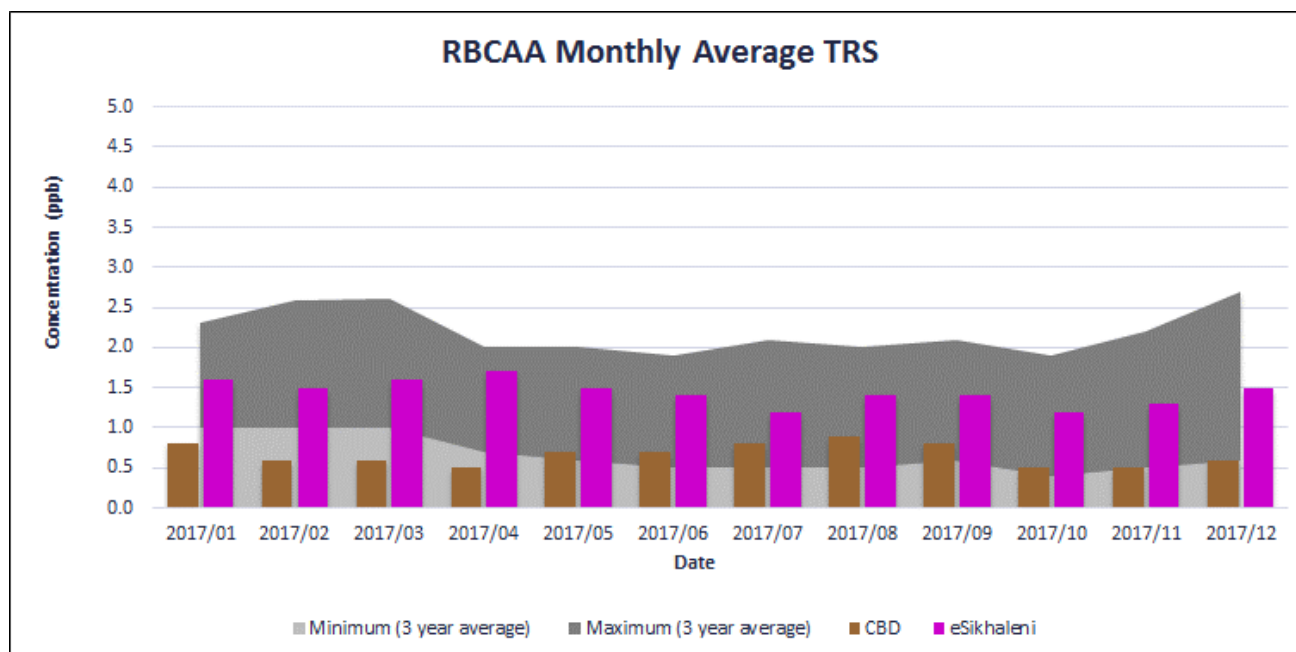


Figure 46: TRS seasonal concentrations

6.6 TRS Diurnal Concentrations

The diurnal TRS concentrations are shown below (Figure 47).

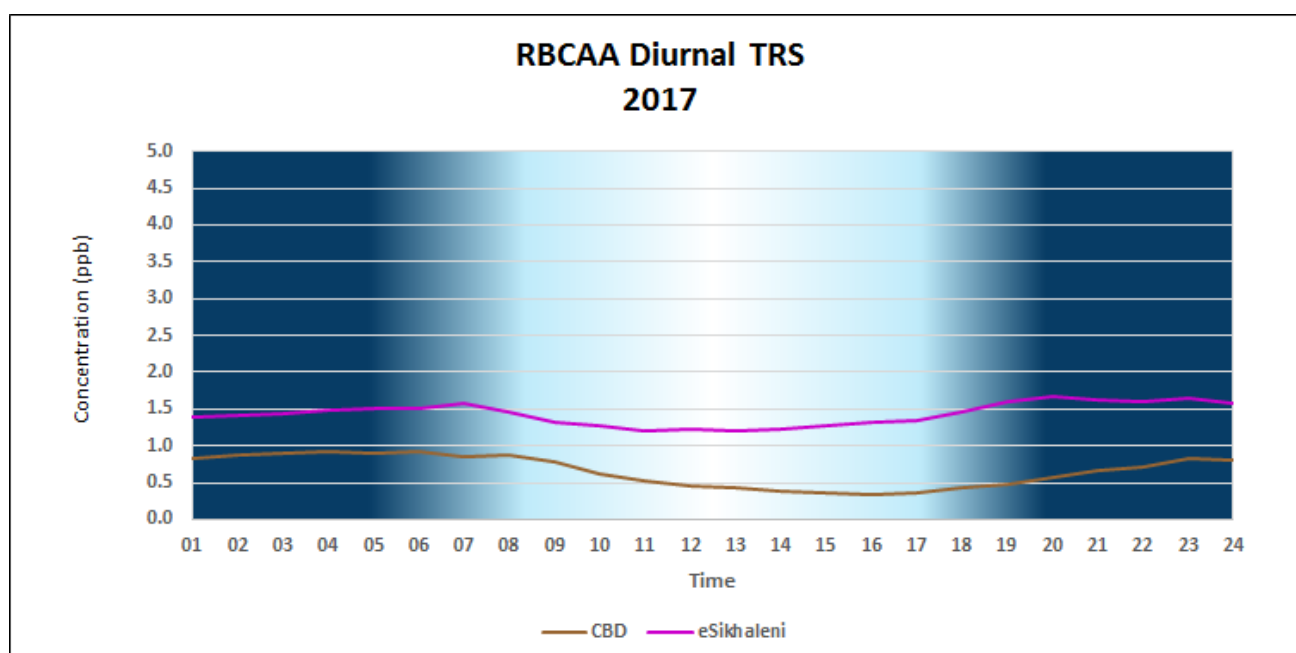


Figure 47: TRS diurnal concentrations

6.7 TRS Daily Averages

Daily average TRS concentrations at CBD are shown below (Figure 49). There were no measured exceedances of the OME daily TRS Standard (10.1 ppb).

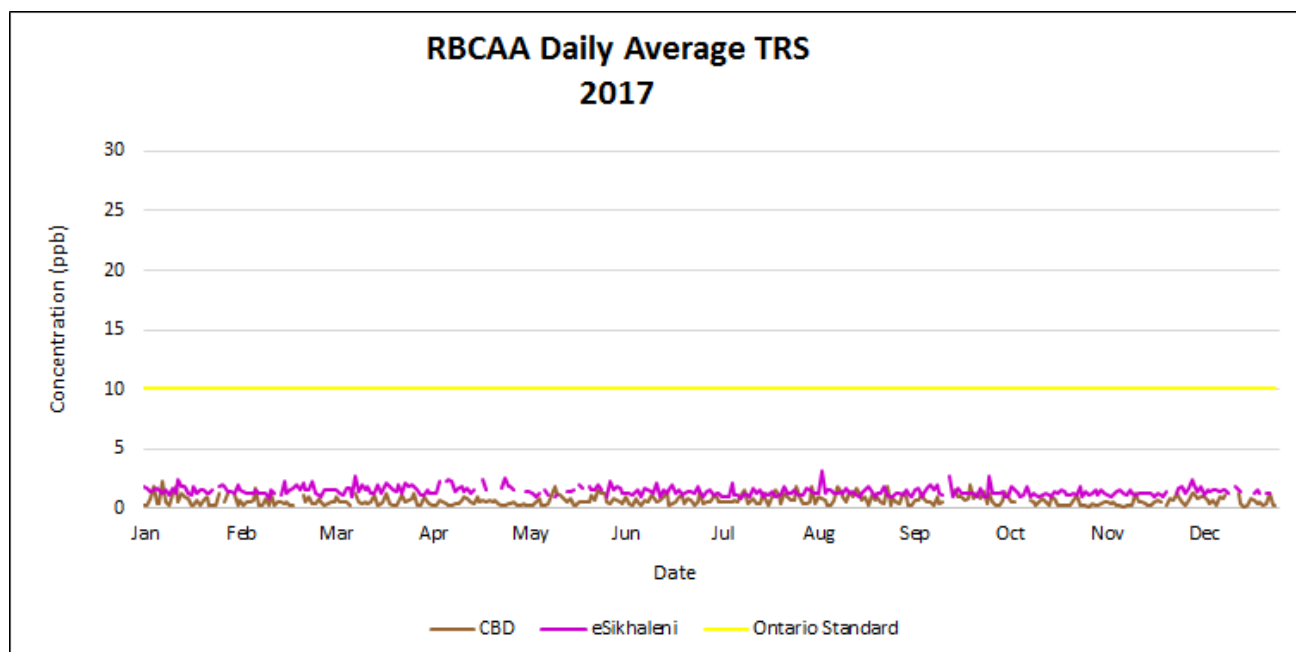


Figure 48: TRS daily average concentration

Table 21: TRS missing data

Missing Data
eSikhaleni (TRS) - power failures (Apr, May, Sep, & Nov - Dec).

6.8 TRS 30-minute Averages

The 30-minute average TRS concentrations at CBD are shown below (Figure 49). There were 106 measured exceedances of the WHO 30-minute H_2S Guideline (5.0 ppb).

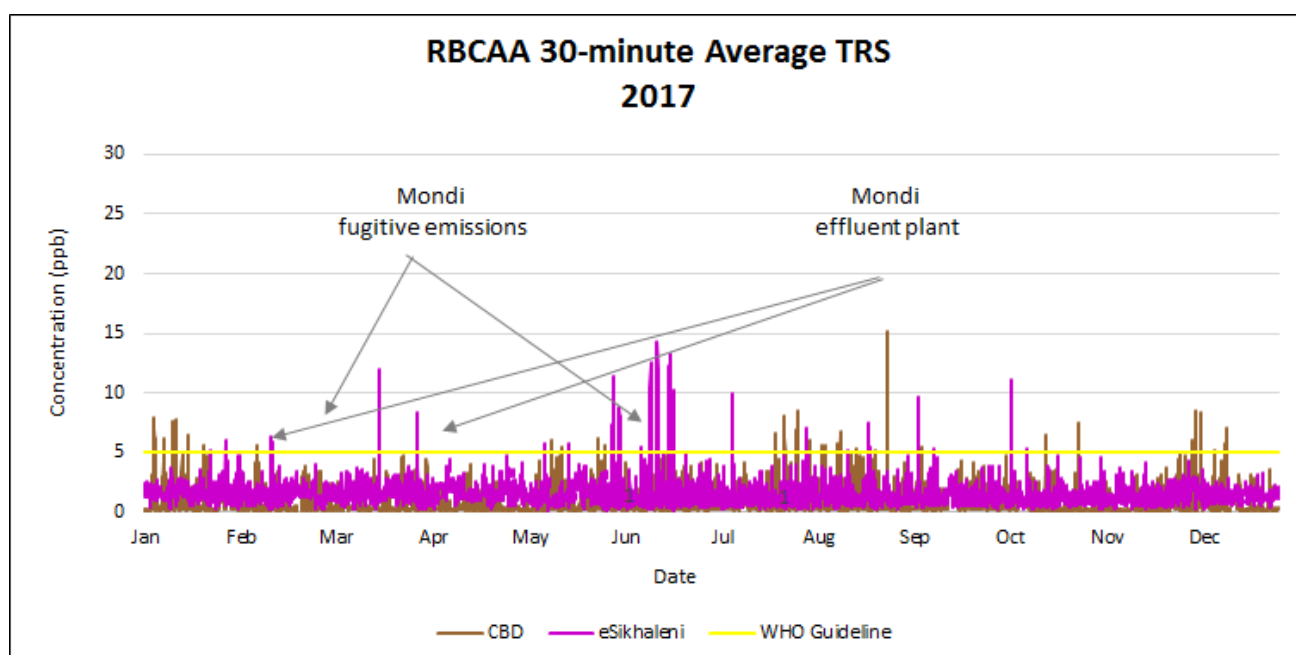


Figure 49: TRS 30-minute average concentration

6.9 TRS 10-minute Averages

The 10-minute average TRS concentrations are shown below (Figure 50). There were 620 measured exceedances of the RBCAA 10-minute Target (4.5 ppb), and 53 measured exceedances of the OME 10-minute TRS Standard (9.3 ppb).

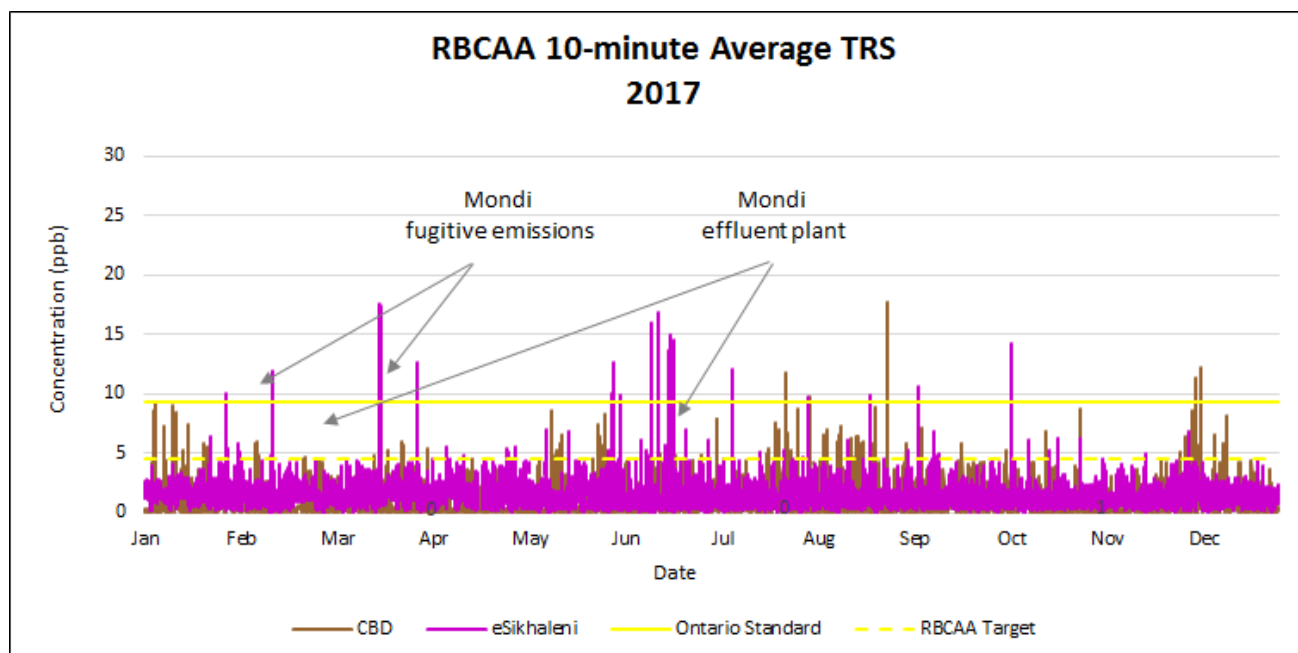


Figure 50: TRS 10-minute average concentrations

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APPENDIX A

Quality Assurance

The SO₂ concentrations reported are determined by a United States Environmental Protection Agency (US EPA) equivalent method EQSA-0193-092. SO₂ and TRS measurements allow for a maximum precision error of 10% of the reported value. A tolerance around the zero point of plus or minus 5 ppb is allowed. All effort is made to reduce the error to a minimum. In terms of quality assurance standards, data collection must be above 90% to be valid for statistical analysis.

Table A1: Quality Assurance

Test	Range	Action
Zero	Zero 0 to 2 ppb	Leave as is.
	-2 to 0 ppb	Set to zero.
	-5 to -2 ppb and 2 to 5 ppb	Adjust data set to re-zero all data
	Outside above limits invalidate and recalibrate.	If specific reason can be identified for deviation, data can be adjusted.
Span	Span Plus or minus 3% deviation.	Leave as is.
	-10 to -3% and 3 to 10% deviation.	Scale data set by opposite corresponding percentage.
	Outside above limits invalidate and recalibrate.	If specific reason can be identified for deviation, data can be adjusted.

APPENDIX B

Emission Inventory

Table B1: Emission Inventory

Industry	Description	SO ₂ Emission Rate (g/s)	SO ₂ Emission 2017 (t)	SO ₂ Emission 2017 (t)	SO ₂ Contribution (%)
Foskor	Acid Plant	75.8	2390	2401	13%
	Boiler	0.3	11		
Tongaat Hulett	Boiler	10.0	185	185	1%
Mondi	Flume 1	44.9	1417	3080	17%
	Flume 2	26.5	836		
	Power Boiler	25.2	795		
	Incinerator	0.3	8		
	Bleach Plant	0.8	24		
Mpact	Babcock	8.9	281	816	5%
	JT Boiler	16.6	524		
	Oil Burner	0.3	11		
RBM	Char Plant	14.9	468	542	3%
	Miscellaneous	1.1	34		
	MSP (Drier)	1.2	38		
	Smokers	0.0	1		
South32	FTC	59.8	1885	10561	59%
	GTC 1	62.0	1955		
	GTC 2	53.3	1680		
	GTC 3	50.1	1579		
	GTC 4	50.1	1579		
	GTC 5	51.7	1630		
	Potrooms	8.0	254		
Tronox	Tank 1	8.0	251	251	1%
Total		569.7	17836	17836	100%

Notes:

- Mtunzini and St Lucia stations were baseline stations; and
- The St Lucia monitoring station was decommissioned and eSikhaleni monitoring station commissioned in 2014.

APPENDIX C

Operational Report

Table C1: Data Capture

Station	Station Availability (%)	PM ₁₀ (%)	SO ₂ (%)	TRS (%)
Arboretum	98		94	
Brackenham	99	100	99	
CBD	99	97	97	97
Harbour West	100		99	
Scorpio	98		99	
Felixton	93	96	93	
eSikhaleni	94	89	90	90
Mtunzini	98	93		
Average	97	95	96	93
Notes: • Red - Not acceptable for statistical purposes (<80%); • Yellow – Acceptable for statistical purposes but does not meet SANAS data capture requirements (<90%); • White – Meets SANAS data capture requirements (>=90%); and • Blue - RBCAA Target (>=98%).				
Missing Data: • eSikhaleni (PM₁₀) - power failures and instrument not restarting (Apr, May & Sep - Dec); • eSikhaleni (TRS) - power failures (Apr, May, Sep, Nov - Dec); and • Mtunzini (Station) - decommissioned in September.				

Table C2: Network maintenance

Action	Dates
Particulate Calibrations	1 - 2 March 2017
Trace Gas Calibrations	27 - 29 March 2017 13 - 14 July 2017 29 - 30 November 2017
Meteorological Calibrations	18 - 19 January 2017
Mtunzini Decommissioned	19 September 2017
eNseleni Commissioned	12 December 2017

Table C3: Particulate analyser status

Serial	Purchased	Age	Type	Site	Status
248970311	Jan 2004	14 years	PM ₁₀	eSikhaleni	OK
274100812	Dec 2008	09 years	PM ₁₀	Mtunzini	OK
273580810	Feb 2009	09 years	PM ₁₀	CBD	OK
206850912	Jan 2010	08 years	PM ₁₀	Brackenham	OK
E-sampler	Mar 2012	05 years	PM ₁₀	Felixton	OK
Note: Red – Older than 10 years.					

Table C4: Trace gas analyser status

Serial	Purchased	Age	Type	Location	Status
3020	May 2017	00 years	SO ₂	Arboretum	OK - Spare
2793	Jan 2017	01 years	SO ₂	Harbour West	OK
85B	Jan 1997	21 years	SO ₂	C&M	Written off, to be used for spares for the RBCAA
92B	Mar 1997	20 years	SO ₂	Brackenham	OK
M2015-M736	Mar 1997	20 years	SO ₂	Scorpio	OK (installed on 28 October 2016)
M714	Oct 2005	12 years	SO ₂	C&M	Written off, to be used for spares for the RBCAA
M2812	Sep 2006	11 years	SO ₂	Harbour West	Spare, running parallel
1980	Jul 2008	09 years	SO ₂	Arboretum	OK
3055	May 2011	06 years	TRS	CBD TRS	Returned from repairs 27 Nov 2017
253	Mar 2012	05 years	SO ₂	Felixton	OK
593	Apr 2013	04 years	SO ₂	CBD	OK
1049	Feb 2014	04 years	TRS	eSikhaleni	OK
1540	Mar 2015	02 years	SO ₂	eSikhaleni	OK
Note: Red – Older than 10 years.					

APPENDIX D

Complaints Log

Table D1: Complaints Log – January 2017

No.	Complainant	Date and Time	Location	Description	Results	Resolution
2	R Camminga (083 251 4969)	5/01/2017 08:00	John Ross Highway	Excessive emissions emanating from the Mondi plant. Mondi has been notified.	Mondi RB 09/01/2017: Candice Webb responded: Source and Nature of Emissions: Mondi has identified the Power Boiler as the source of the emissions. Peak and Average Ambient Concentrations of PM Emissions: Compliance with Permits: There was no contravention in existing permits for point source emissions. Root Cause of Incident and Corrective Action: We are currently experiencing difficulties with the precipitator on Power Boiler 1. The boiler has been shut down until root cause is identified and resolved. Mondi plans to fly in a precipitator specialist this week to assist in this process.	Resolved - Mondi Richards Bay
3	Ms Andia Pienaar (083 501 7317)	7/01/2017 16:45	9 Kiaatkim – Arboretum	“Bad Odour – Bitter\Metallic. Causes shortness of breath, sneezing and coughing”. The complaint was accompanied by elevated SO ₂ levels measured at the RBCAA CBD station. Foskor and South32 were informed by the RBCAA and requested to investigate their processes.	South 32 09/01/2017: Allison Gerber responded: Please see the graphs below with Hillside's avg hourly SO ₂ emissions over the 6 & 7 January. There were no spikes and all emissions were within the permitted point source limits. I have checked with operations and there were no abnormal occurrences over the weekend. Elevated SO ₂ at CBD - due to the wind direction (SW) Hillside may have contributed to the elevated SO ₂ levels at the CBD station. Complaint at 9 Kiatkim – due to the wind direction (SW) Hillside could not have been the source. An odour is not associated with the aluminium process. Foskor 10/01/2017 Mannana Ntoampe responded: Peak Concentrations: The highest SO ₂ emissions of 220 ppm were recorded for C Stack, these were however within stipulated AEL limits. Compliance with Permits: There was no contravention in existing permits.	Resolved - Foskor

No.	Complainant	Date and Time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: Sulphuric Acid Plants were operating normally during this time with no SO ₂ exceedances: There were no start-ups or any reported gas leaks. Granulation and Phosphoric Acid Plants were also operating normally. Based on wind direction, it is likely that Foskor impacted Arboretum at the time.	
4	S Camminga (083 251 4969)	8/01/2017 16:45	Heideheuvel, Veldenvlei	Pungent Foskor odour causing burning of the eyes and nose. Prevailing winds prior to and at the time of the complaint depicted in the attached google image.	Foskor 11/01/2017 Mannana Ntoampe responded: Peak Concentrations: The highest SO ₂ emissions of 272 ppm were recorded for C Stack, these were however within stipulated AEL limits. Compliance with Permits: There was no contravention in existing permits. Root Cause of Incident and Corrective Action: Sulphuric Acid Plants were operating normally during this time with no SO ₂ exceedances: There were no start-ups or any reported gas leaks. Granulation Plant was operating normally and there was no ammonia offloading during this time. Phosphoric Acid Plants were also operating normally and the pH of the buoyant effluent used to slurry gypsum was within specification. No root cause identified. Based on wind direction, it is likely that Foskor impacted Veldenvlei at the time.	Resolved - Foskor
5	S Camminga (083 251 4969)	11/01/2017 05:00	Heideheuvel – Veldenvlei	Lingering background Mondi odour – woke with an unexplained headache.	Mondi RB 16/01/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time.	Resolved - Mondi Richards Bay

No.	Complainant	Date and Time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: Mondi has investigated and identified an effluent pH dip as the source of the odour. Corrective action includes an improvement on existing environmental risk assessment tools for planned maintenance.	
6	Anonymous	21/01/2017 08:02	Empangeni	Excessive Emissions emanating from the Tronox Smelter (Photographs attached).The RBCAA informed Tronox at 09h35.	Tronox 16/01/2017: Kerseree Govender: responded: At this time, a metal tap was in progress. This is part of normal operations and the duration of the tap was 30 minutes. The fumex dust extraction system was running at the time. However due to the metal temperatures being slightly elevated, this would generate a bit extra fumes than normal. Steps were taken to normalise temperatures. The south westerly wind direction also contributed to the visibility of the fumes.	Resolved - Tronox
7	S Govender (082 450 4187)	27/01/2017 11:37	John Ross Highway	Very Strong Mondi Odour	Mondi RB 02/02/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi identified a leak on the Soft Wood Non-Condensable Gas line as the source of the odour. The soft wood line was slowed, and the leak repaired.	Resolved - Mondi Richards Bay
8	D Barton-Hobbs (082 895 2009)	27/01/2017 12:30	John Ross Highway	Strong Mondi odour.	Mondi RB 02/02/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's There were no exceedance of Mondi's Air Emission Licence limits during this time.	Resolved - Mondi Richards Bay

No.	Complainant	Date and Time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: Mondi identified a leak on the Soft Wood Non-Condensable Gas line as the source of the odour. The soft wood line was slowed, and the leak repaired.	
Indirect Complaints						
1	Esikhawini Residence	2/01/2017 16:30	Foskor	Dark smoke coming from Foskor	Foskor 10/01/2017 Mannana Ntoampe responded: Nature of Complaint: Esikhawini Residence, 2 January, 16h30, "Dark smoke coming from Foskor. The highest SO₂ emissions of 397 ppm were recorded for the A&B Stack, these were however within stipulated AEL limits. Compliance with Permits: There was no contravention in existing permits. Root Cause of Incident and Corrective Action: Sulphuric Acid Plants were operating normally during this time and there were no gas leaks reported. Granulation and Phosphoric Acid Plants were also operating normally The dark smoke given the description of the complaint could have been from another source. Note there was a report of veld fire within the vicinity but exact time and date could not be confirmed.	Resolved - Fire

Table D2: Complaints Log – February 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	Mr Reddy 078 894 3265	11/02/2017 17:00	Felixton Village	"Rotten Egg" odour.	Mondi RB 23/02/2017: Candice Webb responded: Based on stable plant conditions, prevailing wind direction, and low ambient TRS measured at two stations, it is unlikely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time.	Unresolved
2	Mr Reddy 078 894 3265	12/02/2017 11:00	Felixton Village	"Rotten Egg" odour.	Mondi RB 23/02/2017: Candice Webb responded: Based on stable plant conditions, and low ambient TRS measured at two stations, it is unlikely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time.	Unresolved
3	Brian Plowes	15/02/2017 07:00	10 Chinkerinchee, Veldenvlei	"This morning when I got out to my car I noticed a light dusting of some form of industrial fall out on my car" Photo attached.	South 32 20/02/2017: Allison Gerber responded: Hillside has investigated your complaint and have determined that Hillside is not responsible due to wind direction. From the attached wind direction download from the RBCAA the CBD wind direction, from 00:00 15 Feb – 07:00 15 Feb, moved between 260° - 280° which was a westerly wind. For Hillside to have impacted Veldenvlei the wind direction would have to be 220° - 240° as per the below picture.	Unresolved
4	S Camminga (083 251 4969)	28/02/2017 09:00	Richards Bay CBD	Abnormal emissions emanating from the Foskor AIB stack. Dark and descending before dissipating. I was unable to reach Foskor, so informed the City of uMhlathuze Air Quality Unit.	Foskor 03/03/2017 Mannana Ntoampe responded: The Sulphuric Acid 'B' Plant was scheduled to start-up on 28 February but the heat-up continued until 01 March 2017. As per the attached notification in the ZO, "A visible plume of water vapour will be evident during the heat up process due to the condensation of the Sasol gas which is used for heating the plants. Slight sulphurous emissions in the form of a visible plume will be evident indicating the readiness of the plants to resume production". The "B" Plant started on 1 March at 17h30 as per attached start-up notification and the emissions observed in both days were a result of the condensation of the Sasol gas during heat-up. Also attached is a picture taken on 28 February on receipt of the complaint through the municipality. Feedback was provided via the municipality at the time.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					It is important to note that depending on the angle and position from which the stack is viewed as well as sun reflection, the clarity of the stack and the colour may differ. O ₂ emissions for all the stacks were within limits.	

Table D3: Complaints Log – March 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	S Camminga (083 251 4969)	01/03/2017 12:20	Richards Bay CBD	Abnormal emissions emanating from the Foskor A\B stack. I was unable to reach Foskor, so informed the City of uMhlathuze Air Quality Unit.	Foskor 03/03/2017 Mannana Ntoampe responded: The Sulphuric Acid 'B' Plant was scheduled to start-up on 28 February but the heat-up continued until 01 March 2017. As per the attached notification in the ZO, "A visible plume of water vapour will be evident during the heat up process due to the condensation of the Sasol gas which is used for heating the plants. Slight sulphurous emissions in the form of a visible plume will be evident indicating the readiness of the plants to resume production". The "B" Plant started on 1 March at 17h30 as per attached start-up notification and the emissions observed in both days were a result of the condensation of the Sasol gas during heat-up. Also attached is a picture taken on 28 February on receipt of the complaint through the municipality. Feedback was provided via the municipality at the time. It is important to note that depending on the angle and position from which the stack is viewed as well as sun reflection, the clarity of the stack and the colour may differ. O ₂ emissions for all the stacks were within limits.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
2	Anonymous	06/03/2017 12:20	Heatonville turnoff, Empangeni	Excessive smoke from a charcoal manufacturing facility. Persons being affected claim that the emissions are significantly affecting their health and causing respiratory problems. (location indicated on attached Google image). This complaint will be brought to the attention of the City of uMhlathuze Air Quality Management Unit.		Resolved – Charcoal manufacturing
3	D Savides (072 392 0511)	11/03/2017 11:25	Meerensee	Excessive Emissions emanating from the RBM facility. (Photo attached). RBM is kindly requested to respond.	RBM 15/03/2017 Lourens Britz responded: Origin of the smoke: On Saturday 11 March from 11:10 to 12:10 our Char plant had to start up after a shut. The start-up process entails the use of a diesel burner to ignite the anthracite in the plant. This process usually lasts for less than 1 hour before the anthracite is successfully ignited. Following this, the diesel burner is switched off and the anthracite burns on its own. RBM's AEL - UDM/10-11/AEL 0007/1: RBM does have a licence for listed activity 3: Carbonization and Coal Gasification, Sub category 3.4 and our permit does make provision for sporadic start-ups. Please see extract of our permit. During this event we did not exceed our licence conditions.	Resolved - Richards Bay Minerals
4	R Camminga (083 251 4969)	20/03/2017 07:15	Heideheuvel – Veldenvlei	Mondi odour causing headache.	Mondi RB 29/03/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, and plant conditions at the time of the complaint, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: During this time, Mondi was in a shutdown mode and the effluent emergency ponds were full of effluent. Mondi suspects fugitive emissions from the ponds contributed to the increase in ambient TRS. The ponds are in the process of being emptied.	
5	S Camminga (083 251 4969)	20/03/2017 07:15	Heideheuvel – Veldenvlei	Mondi odour causing headache.	Mondi RB 29/03/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, and plant conditions at the time of the complaint, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: During this time, Mondi was in a shutdown mode and the effluent emergency ponds were full of effluent. Mondi suspects fugitive emissions from the ponds contributed to the increase in ambient TRS. The ponds are in the process of being emptied.	Resolved - Mondi Richards Bay
6	R Camminga (083 251 4969)	20/03/2017 22:45	CBD & Veldenvlei	Pungent Mondi Guava odour.	Mondi RB 29/03/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, and plant conditions at the time of the complaint, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: During this time, Mondi was in a shutdown mode and the effluent emergency ponds were full of effluent.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Mondi suspects fugitive emissions from the ponds contributed to the increase in ambient TRS. The ponds are in the process of being emptied.	
7	S Camminga (083 251 4969)	20/03/2017 22:45	CBD & Veldenvlei	Pungent Mondi Guava odour.	Mondi RB 29/03/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, and plant conditions at the time of the complaint, it is likely that Mondi is the source of odour. Compliance with Permit/s: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: During this time, Mondi was in a shutdown mode and the effluent emergency ponds were full of effluent. Mondi suspects fugitive emissions from the ponds contributed to the increase in ambient TRS. The ponds are in the process of being emptied.	Resolved - Mondi Richards Bay

Table D4: Complaints Log – April 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	Anonymous	13/04/2017 09:46	Heatonville turnoff, Empangeni	It has been reported to the Richards Bay Clean Air Association (RBCAA) that there is a charcoal manufacturing facility located west of Empangeni (location depicted on the attached Google image), at the Heatonville turn-off which is a source of significant emissions. (Photographs attached).	RBCAA, Municipality and DEAT officials visited plant.	Resolved - Charcoal manufacturing

No.	Complainant	Date and time	Location	Description	Results	Resolution
				The emissions are reportedly affecting the health of people living in close proximity to the facility, causing significant respiratory problems. This has been going on for months and was reported by the RBCAA to the City of uMhlathuze Air Quality Management Unit for investigation on 6 March 2017. The City forwarded the complaint to Ms Nozipho Khathi at the District Municipality on 8 March 2017. There has been no improvement in the situation. The RBCAA will take the matter up with the Department of Environmental Affairs.		
2	Anonymous	24/04/2017 15:00	Bronze Bar – Alton	"Pungent odour".	South 32 25/04/2017: Allison Gerber responded: Hillside's operations are not inherently odour producing. There were no abnormal occurrences that could have contributed to a 'pungent odour'. Foskor 25/04/2017 Mannana Ntoampe responded: • Sulphuric Acid Plants were operating normally during this time • There were no start-ups or any reported gas leaks during this period. • Granulation and Phosphoric Acid Plants were also operating normally • No root cause was identified however cooler weather conditions usually cause emissions to build up at the ground level resulting in poor dispersion. This might have contributed to the odour. • Based on Wind direction and cooler weather conditions on the day, Foskor could have contributed to the odour.	Resolved - Foskor

Table D5: Complaints Log – May 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	S Camminga (083 251 4969)	02/05/2017 12:45	Port of Richards Bay	RBCAA received a complaint regarding dust emanating from the loading of a vessel in the Port, which the RBCAA reported to the City's Air Quality Management Unit	UMhlathuze Municipality 03/05 2017 Lindiwe Khumalo responded: The City of uMhlathuze: Air Quality Management Unit visited the site and fumes of dust were evident as per photos attached. A meeting was held with the Port Management including the Environmental Manager: Miss Mthembu) and Operations Manager: Mabika. The following Actions were taken: • The Loading of the cargo which was found to be chloride was stopped. • Discussions with regards to the root cause and preventative measures were done • The Negative impact the cargo has on the environment was discussed. Corrective Actions: A detailed report which includes mitigation measures to be taken by the facility to avoid the re-occurrence of the similar incident was requested within 24- hours of the complaint. • This includes ensuring that a proper chute is used when loading chloride • The facility was also requested to ensure that Chloride cargo gets loaded when the environmental conditions are not windy • The facility was requested to submit a detailed plan for fixing the conveyor belt housing so as to ensure dust generated is minimal. A closer monitoring into the facility will be done so as to ensure that similar incidents are not happening in the future. This include spot-on visit to the facility. A detailed report from the facility will be provided as soon as it gets received. TPT 03/05/2017 Nokhutula Mthembu responded:	Resolved - Port of Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					We hereby acknowledge that there was dust emanating from the loading of Chloride within the Port of Richards Bay on 02/05/2017. We understand the negative air quality impact this has caused. As stated previously the terminal has put mitigation measures in place i.e. installation of Cleveland Chute during loading as dust suppression. The Cleveland Chute had been damaged two weeks ago and spare parts have been ordered, which had not arrived yet. It is therefore out of service at present. The Chloride vessel had been waiting out at sea for an extended period of time and desperately needed to complete its business. Due to public holidays and long weekends Transnet Port Terminals is also experiencing a backlog of vessels. The planning department was under pressure to clear this backlog. The Chloride vessel was placed at Berth 703. Unfortunately TPT had to start working the vessel to avoid further delays. Correction: Vessel was stopped immediately - Non-conformance has been issued to Export. Corrective Action: Procurement has placed an emergency notice on the spares order. Planning to ensure that all Chloride Vessels will be worked at Berth 704 using the Cleveland Chute. The chute will be maintained always to ensure that it's in a working condition.	
2	Anonymous	08/05/2017 05:00	Airfern Angel–Brackenham	"Metal type smell that leaves a taste in the mouth" causing irritation of nose and chest.	Richards Bay Alloys 09/05/2017: Franz Schmidt responded: A preliminary investigation indicated no abnormal operation or any venting during the 12 hours prior to the complaint (night shift 18h00 – 06h00 7/8 May).	Unresolved

No.	Complainant	Date and time	Location	Description	Results	Resolution
				The same odour was detected in Ceramic Curve a while later. Complainant is adamant that it was not a Mondi or Peat Fire type smell.	The scrubbers were fully operational and furnace running at normal load. I will revert if further information surfaces.	
3	D Savides 072 392 0511	17/05/2017 06:00	Cassia Close – Arboretum Extension	Strong “Cat Urine” odour	Mondi RB 19/05/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction and upset process conditions, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a non-condensable gas vent due to a deviation from operating protocols.	Resolved - Mondi Richards Bay
4	Hillside Employees	17/05/2017 07:00	Hillside parking and admin building	“Cat Urine” odour causing irritation of the throat, headache and tight chest.	Mondi RB 19/05/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction and upset process conditions, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a non-condensable gas vent due to a deviation from operating protocols.	Resolved - Mondi Richards Bay
5	Thelma Lourie (035-753 5959)	17/05/2017 08:15	32 Crayfish Creek, Meerensee	Pungent lingering odour causing irritation of the nose.	Mondi RB 19/05/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction and upset process conditions, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action:	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Mondi has investigated and identified root cause as a non-condensable gas vent due to a deviation from operating protocols.	
6	Anonymous	17/05/2017 08:34	Heatonville turnoff, Empangeni	Air Pollution from Charcoal Manufacturing Facility. It has been brought to the attention of the chards Bay Clean Air Association (RBCAA) that the Charcoal facility located west of Empangeni is now starting the firing-up processes late afternoon, around 17h00, which is reportedly having an even more significant impact on the community. The smoke reportedly now hangs in the air the entire night filtering into the homes of sleeping occupants. The RBCAA has reported this to the City of uMhlathuze Air Quality Management Unit.		Resolved - Charcoal manufacturing
7	N. Okello	17/05/2017 09:20	Pelserplaat – Meerensee	"Pungent guava-like smell in house, causing nausea and irritation of the nose."	Mondi RB 19/05/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction and upset process conditions, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a non-condensable gas vent due to a deviation from operating protocols.	Resolved - Mondi Richards Bay
8	S Camminga (083 251 4969)	17/05/2017 09:45	Heideheuvel – Veldenvlei	Pungent Mondi 'Guava' odour causing nausea.	Mondi RB 19/05/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction and upset process conditions, it is likely that Mondi is the source of odour. Compliance with Permit's:	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a non-condensable gas vent due to a deviation from operating protocols.	
9	Skhumbuzo Mpungose	17/05/2017 13:14	Veldenvlei	Mondi odour around Veldenvlei	Mondi RB 19/05/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction and upset process conditions, it is likely that Mondi is the source of odour. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a non-condensable gas vent due to a deviation from operating protocols.	Resolved - Mondi Richards Bay
10	Anonymous	23/05/2017 07:25	N2 opposite Felixton Industry	"Foul effluent type smell"	Mpact 29/05/2017: Siyabonga Buthelezi responded: Mpact investigated the above-mentioned odour complaint. During the times of the complaints No TRS exceedances were recorded at the ESikhaleni Station. Mpact Felixton did not experience any upset conditions that could have resulted to Odour complaints. However based on the wind direction Mpact is likely the source of the "Odour N2 near Felixton - 23 & 24 May" complaint	Resolved - Mpact
11	Andries Thele (082 576 1403)	23/05/2017 08:35	31 Alumina Alley VCE Electrical – Alton	Fine white dust falling out on premises causing irritation. The fallout had been occurring for the past 4 days. The RBCAA forwarded the complaint to the City of uMhlathuze Air Quality Monitoring Unit for investigation.	uMhlathuze Municipality 30/05 2017 Sabelo Gwala responded: Following the complaint of dust at Sprint Logistics the City of uMhlathuze (AQMU) visited the facility and the following was observed: Cars and trees as far as approximately 300 meters from the facility were covered in white powder. When we got to the facility we spoke to Salim Khan.	Resolved - Fugitive Dust

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Salim took us to the warehouse where the incident took place. He explained to us that they were offloading lime (powder) from the tanker using a compressor. That operation created a plume of dust that was observed in the neighbouring facilities. Salim said they stopped the operation as soon as they realise there was too much dust being generated. We could not verify the truthfulness of that since the tanker was no longer there and it might happen that they were finished offloading. Upon inquiry if they have had such incidents he said they have never had the problem since they usually receive the cargo in side tipper and not much dust is generated. In order to avoid occurrences of this nature they are going to stick to receiving cargo in side tipper. The facility was requested to inform the Air Quality management before commencing such activity in future so that preventative measures will be employed to avoid re-occurrence of the similar incident.	
12	Anonymous	24/05/2017 07:30	N2 opposite Felixton Industry	"Foul effluent type smell"	Mpact 29/05/2017: Siyabonga Buthelezi responded: Mpact investigated the above-mentioned odour complaint. During the times of the complaints No TRS exceedances were recorded at the ESikhaleni Station. Mpact Felixton did not experience any upset conditions that could have resulted to Odour complaints. However based on the wind direction Mpact is likely the source of the "Odour N2 near Felixton - 23 & 24 May" complaint	Resolved - Mpact

No.	Complainant	Date and time	Location	Description	Results	Resolution
13	Sumaya Khan 084 774 0074	25/05/2017 02:00	59 Airfern Angel – Brackenhams	"Suffocating metal type smell, catching in the throat and causing coughing. It's the same smell we complained about when Tata Steel was operational". The above complaint was received at 06h30, at which time the complainant said that the intensity of the odour was significantly less than during the early hours of the morning. I drove out to Brackenhams and at 06h45 and simultaneously alerted Richards Bay Alloys. I did pick up an odour, although not pungent, which I am unable to identify. I can state with certainty that it was not a Mondi or a peat fire or and acidic sulphurous smell.	Richards Bay Alloys 19/05/2017: Franz Schmidt responded: On receiving the alert from RBCAA (06h45) a team was dispatched downwind towards Brackenhams to investigate any abnormal smells in the area. Team members were in Brackenhams from 7h15 to 7h45 but could not detect any odour that could be described in the terms of the complaint. Inspection of production logs and interviews with production personnel did not indicate any abnormal operation. No vent stack opening instances were recorded and both scrubbers were operating at normal capacity during (the 12 hour – 18h00 – 06h00) night shift at Richards Bay Alloys on 24/25 May 2017.	Unresolved
14	R Camminga (083 251 4969)	31/05/2017 16:30	Richards Bay CBD	Excessive emission emanating from Mondi (see attached photographs). The RBCAA informed Mondi of the complaint at 16h32.	Mondi RB 07/06/2017: Candice Webb responded: Source and Nature of Emissions. Mondi Recovery Boiler 1 was the source of the emission. Peak and Average Point Source Concentrations of Emissions. Compliance with Permit's. There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: The main collecting conveyor drive motor on the precipitator failed. Immediate action taken: • The boiler load was reduced and measures taken to get the precipitators back into full operation in order to bring emissions under control.	Resolved - Mondi Richards Bay

Table D6: Complaints Log – June 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	D Savides 072 392 0511	02/06/2017 08:55	John Ross Highway	Significant black smoke emanating from Industry at Felixton, stretching across the horizon towards ESikhaleni.	Mpact Felixton: 2/06/2017: Maggy Odaya responded: Kindly note, as per prior notifications, Mpact Paper, Felixton mill is currently on shutdown since Monday 29th May until July 10th.	Resolved – Tongaat Hulett
2	Siyabonga Ziqubu- uMhlathuze municipality	02/06/2017 09:10	Alton - Richard Bay Alloys	Dust emission. Please find attached 2 photographs of the dust emissions. Please provide the cause of excessive dust and the mitigation measures to be implemented.	Richards Bay Alloys: 20/06/2017: Franz Schmidt responded: A preliminary investigation into the problem indicated that excessive fines received in the ore from the mine was responsible for the dust emissions at the Briquetting Building (normally dust is contained at the dryer building and does not manifest in the Briquetting Building). The immediate action taken by Production (after your visit at approx. 15h00 on 2 June 2017) was to divert the dust collected away from the Briquetting Building onto the ground from where it could be recovered. This interim solution resolved the atmospheric emissions at the Briquetting Building, but created subsequent dust handling problems at ground level, evident during your visit on Tuesday 7 June 2017. We are currently investigating several process avenues to handle dust in such an event. The root cause (excessive fines from the mine) is directly being addressed with the mine.	Resolved - Richards Bay Alloys
3	S Camminga (083 251 4969)	06/06/2017 18:20	John Ross Highway adjacent to Mondi	Pungent Mondi Odour.	Mondi RB 08/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a leak on the non-condensable gas line. The leak was repaired on 7th June.	
4	R Camminga (083 251 4969)	06/06/2017 18:20	John Ross Highway adjacent to Mondi	Pungent Mondi Odour.	Mondi RB 08/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a leak on the non-condensable gas line. The leak was repaired on 7th June.	Resolved - Mondi Richards Bay
5	S Camminga (083 251 4969)	06/06/2017 22:40	John Ross Highway adjacent to Mondi	Pungent Nauseating Mondi "Cat Urine" Odour. Really intense – worst I have smelt in a very long time.	Mondi RB 08/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a leak on the non-condensable gas line. The leak was repaired on 7th June.	Resolved - Mondi Richards Bay
6	R Camminga (083 251 4969)	06/06/2017 22:40	John Ross Highway adjacent to Mondi	Pungent Nauseating Mondi "Cat Urine" Odour. Really intense – worst I have smelt in a very long time.	Mondi RB 08/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits:	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a leak on the non-condensable gas line. The leak was repaired on 7th June.	
7	B Visser	08/06/2017 09:00	Richards Bay CBD - Alton Vicinity of Hillside	Excessive alumina dust emanating from South 32 (see attached photographs).	South 32 13/06/2017: Allison Gerber responded: Source and Nature of Emissions: Fugitive alumina dust emissions from a spillage on top of the 55kt Alumina Silo Met Conditions: 05:00 – 09:00 wind direction ranged from 221, 214, 249, and 222. Root Cause of Incident: Water ingress from the blanking flange during heavy rains while 40kt alumina silo was out of operation resulted in a blockage on the 40kt silo main air slide. This resulted in the 55kt silo distribution bin being overfilled. Corrective Actions: • Alumina material cleaned up • Unblocked the air slide and tested the route. • Proper sealing around the blanking flange when the silo is out of operation.	Resolved - South 32 (Hillside)
8	S Camminga (083 251 4969)	08/06/2017 09:50	Vicinity of Hillside	Alumina spillage visible on the top of the silo (same silo as depicted in the photographs provided by B Visser). Hillside was notified at the time.	South 32 13/06/2017: Allison Gerber responded: Source and Nature of Emissions: Fugitive alumina dust emissions from a spillage on top of the 55kt Alumina Silo Met Conditions: 05:00 – 09:00 wind direction ranged from 221, 214, 249, and 222. Root Cause of Incident: Water ingress from the blanking flange during heavy rains while 40kt alumina silo was out of operation resulted in a blockage on the 40kt silo main air slide. This resulted in the 55kt silo distribution bin being overfilled. Corrective Actions: • Alumina material cleaned up • Unblocked the air slide and tested the route. • Proper sealing around the blanking flange when the silo is out of operation.	Resolved - South 32 (Hillside)

No.	Complainant	Date and time	Location	Description	Results	Resolution
9	Tamlyn 076 920 8852	11/06/2017 09:00	Launder Lane - Meerensee	Bad "gas smell"	Mondi RB 13/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. However at this stage Mondi has been unable to identify the source. The Odour Abatement Task Team continues to investigate as a matter of urgency.	Resolved - Mondi Richards Bay
10	Tamlyn 076 920 8852	12/06/2017 09:00	ZO Offices - R.Bay CBD	PUNGENT "gas smell" same odour as detected in Meerensee the day before. The RBCAA contacted the City of uMhlathuze Air Quality Unit at 09h15. They confirmed that they had detected a very strong gas smell at around 09h00 and had sent officials out to investigate. I drove to the ZO offices at 09h45, where I detected a strong Mondi "guava" odour. The complainant confirmed that it was the same odour detected earlier and in Meerensee yesterday.	Mondi RB 13/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. However at this stage Mondi has been unable to identify the source. The Odour Abatement Task Team continues to investigate as a matter of urgency.	Resolved - Mondi Richards Bay
11	S Camminga (083 251 4969)	12/06/2017 09:45	Outside ZO Office – R. Bay CBD	Nauseating Mondi "guava" odour.	Mondi RB 13/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits:	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. However at this stage Mondi has been unable to identify the source. The Odour Abatement Task Team continues to investigate as a matter of urgency.	
12	S Govender 082 450 4187	13/06/2017 06:00	Pelican Parade – Birdswood	"Very concentrated Guava odour".	Mondi RB 15/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. Two malodorous leaks have been repaired; one on a CPX tank and one on a methanol line. Mondi apologises for the odours.	Resolved - Mondi Richards Bay
13	S Camminga (083 251 4969)	13/06/2017 07:00	Heideheuvel – Veldenvlei	Nauseating Mondi guava odour.	Mondi RB 15/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. Two malodorous leaks have been repaired; one on a CPX tank and one on a methanol line. Mondi apologises for the odours.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
14	R Camminga (083 251 4969)	13/06/2017 07:00	Heideheuvel – Veldenvlei	Nauseating Mondi guava odour.	Mondi RB 15/06/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. Two malodorous leaks have been repaired; one on a CPX tank and one on a methanol line. Mondi apologises for the odours.	Resolved - Mondi Richards Bay
15	S Camminga (083 251 4969)	14/06/2017 09:00	Heideheuvel – Veldenvlei	Pungent nauseating Mondi "guava" odour.	Mondi RB 15/06/2017: Candice Webb responded: Source and Nature of Emissions: Source and Nature of Emissions Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. Two malodorous leaks have been repaired; one on a CPX tank and one on a methanol line.	Resolved - Mondi Richards Bay
16	S Dewey	14/06/2017 09:00	Heideheuvel – Veldenvlei	Pungent nauseating Mondi "guava" odour.	Mondi RB 15/06/2017: Candice Webb responded: Source and Nature of Emissions: Source and Nature of Emissions Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: Mondi has undertaken an intensive investigation. Two malodorous leaks have been repaired; one on a CPX tank and one on a methanol line.	
17	Anonymous	26/06/2017 07:30	Port of Richards Bay	Significant dust being generated from loading activities within the Port of Richards Bay (See attached photograph). The complaint was brought to the attention of the City of uMhlathuze Air Quality Management Unit.		Resolved - Port of Richards Bay
18	S Camminga (083 251 4969)	27/06/2017 10:55	Vicinity of Hillside	Abnormal emissions emanating from the Hillside facility. (see attached photograph)	South 32 29/06/2017: Allison Gerber responded: Source and Nature of Emissions: Fugitive dust from GTC 2 alumina handling tower. Met Conditions: High wind speeds. Root Cause of Incident: Incorrect sequence of the mode selection during start-up of airlift blower NBL005, this resulted in NBL005 tripping. The fresh alumina feed was still running and hence caused a spillage and fugitive dust in the alumina handling tower when the blower tripped. Corrective Actions • Fresh alumina feed was stopped • Breakdown notification was loaded for the instrument artisan to re-boot the level 1.5 panel screen. Was started from the level 1.5 control room. Preventative Actions: • Toolbox talk on equipment changeover will be re-communicated with the team.	Resolved - South 32 (Hillside)

Table D7: Complaints Log – July 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	Anonymous	01/07/2017 07:15	Birdswood	"Potent rotten egg smell in the air."	Mondi RB 05/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Average Ambient Concentrations of Emissions and Met Conditions RBCAA stations. Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has identified fugitive emissions as result of mill instability as the source of the odour.	Resolved - Mondi Richards Bay
2	David Davidson (082 887 0221)	03/07/2017 10:35	Nseleni railway station	Pungent "cat urine" odour.	Mondi RB 04/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Peak and Average Ambient Concentrations of Emissions and Met Conditions: Compliance with Permits: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has identified fugitive emissions as result of mill outage as the source of the odour. The outage was communicated to local authorities as is required.	Resolved - Mondi Richards Bay
3	Anonymous	07/07/2017 09:00	Port of Richards Bay	Alumina Spill (photographs attached) TPT and South32 are kindly requested to investigate and provide feedback to the RBCAA.	South 32 10/07/2017: Alison Gerber responded: Root Cause of Incident: South32 can't confirm the root cause as this area is maintained and operated by TPT. There has been chronic equipment malfunction in this area, South32 has raised this concern with TPT. TPT owns and operates conveyor belt LOO which feeds South32's conveyor NCV003. Corrective Actions: South32 has cleaned the area.	Resolved - Port of Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Preventative Actions: South32 has previously installed a chute with pipes leading to a bin on the ground floor for TPT cleaners to keep the area spillage free. The issue has been highlighted on several occasions to TPT and to the Terminal Manager. South32 will continue to engage with TPT around this issue.	
4	Anita 082 893 9673	14/07/2017 07:15	Vicinity of Foskor	"Just passed Foskor. Very bad smells. My son actually had to use his asthma pump" Foskor was notified.	Foskor 14/07/2017: Sandile Mdamba responded: Peak Concentrations of SO ₂ Emissions: The highest SO ₂ emissions of 445 ppm were recorded for the B Plant but, these were within the AEL limits. Root Cause: • None identified • There were no process upsets • There were no sulphur fires during this period • There were no point source exceedances • There were no gas leaks reported. Based on wind direction at the time Foskor could have contributed to the odour.	Resolved - Foskor
5	S Camminga 083 515 2384	19/07/2017 07:25	Heideheuvel – Veldenvlei	Pungent Mondi "guava" odour.	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's. There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	Resolved - Mondi Richards Bay
6	R Camminga 083 515 2384	19/07/2017 07:25	Heideheuvel – Veldenvlei	Pungent Mondi "guava" odour.	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	
7	S Govender 082 450 4187	19/07/2017 11:00	John Ross vicinity of Mondi	Mondi "guava" odour	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's. There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	Resolved - Mondi Richards Bay
8	S Govender 082 450 4187	19/07/2017 15:00	John Ross vicinity of Mondi	Mondi "guava" odour	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
9	S Govender 082 450 4187	20/07/2017 07:45	Vicinity of R. Bay Civic Centre	Sulphurous Foskor type odour	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	Resolved - Mondi Richards Bay
10	L Savides 072 392 0511	20/07/2017 07:59	Cassia Close - Arboretum Ext	"Cabbage" odour	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	Resolved - Mondi Richards Bay
11	S Camminga 083 515 2384	20/07/2017 08:40	Heideheuvel – Veldenvlei	Mondi "Guava" odour	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Odour levels were brought under control by increasing temperature and reducing air ingress.	
12	R Camminga 083 515 2384	20/07/2017 08:40	Heideheuvel – Veldenvlei	Mondi “Guava” odour	Mondi RB 25/07/2017: Candice Webb responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Investigations identified that the efficiency of Non Condensable Gas (NCGs) combustion in the Flare was compromised. Odour levels were brought under control by increasing temperature and reducing air ingress.	Resolved - Mondi Richards Bay

Table D8: Complaints Log – August 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	Anonymous (Felixton resident)	15/08/2017 09:35	Felixton Village	“Clouds of black smoke billowing from one of the industries in Felixton”. Complainant was not sure which industry and raised concern regarding the level of pollution and proximity to the school. MPACT and TONGAAT-HULETT are kindly requested to investigate.	Mpact 21/08/2017 Siyabonga Buthelezi responded: Please note MPACT Felixton investigated the “Clouds of black smoke billowing from one of the industries in Felixton- 15 August - 09h35” complaint received via RBCAA on 15 August. No incidents such as upset operating conditions and/or soot blowing activities were undertaken by the mill during the time of the complaint period. All boilers were running at low throughputs at the time and were not emitting clouds of black smoke. Based on the findings MPACT Felixton is not the source of the “Clouds of black smoke billowing from one of the industries in Felixton” complaint.	Resolved - Tonga Hulett

No.	Complainant	Date and time	Location	Description	Results	Resolution
2	Anonymous (Business located in Alton.	15/08/2017 21:00	Bauxite Bay, Alton	Offensive odour emanating from the CLARIANT Facility in Bauxite Bay, Alton. Complainant says that employees have complained about the same problem occurring at night on several occasions. The RBCAA has been unable to reach CLARIANT telephonically. The complaint will be forwarded via email and reported to the Municipality's Air Quality Management Unit.	Clariant 01/09/2017 FJ du Toit responded: Incident: Complain of chemical odours: Investigation: The R Bay production facility operates on a batch basis 24 hrs day, 7 days a week. Batches are scheduled back to back during production campaigns. The result of this is that any step in the process can occur at any time during the day. Processes are not scheduled in such a way that certain steps occur at night. At the time of the incident there were no unusual occurrences such as equipment trips, process upsets or power outages reported on our site and production staff did not report any elevated odours. There were however two operations in progress which could potentially cause some odours namely Batch make up, during which amines are added to the mixtures from drums, the amines have a strong ammonia like odour. Empty drums were placed outside the production hall on the road for removal and some of the drums were not capped, which could be a potential of the source of the odours. Calcination of templated material. The template is an organic amine, which can produce ammonia like odours, especially during upset conditions in a calciner, of which none was reported at the time of the complaint. Cause. The most likely cause could be found is the placement of empty drums on the outside of the plant without being fully closed. Mitigation. Ensure that drums and flobins are closed after charging raw materials Do not store amine drums or flobins outside on the road after batch preparation.	Resolved - Clariant

No.	Complainant	Date and time	Location	Description	Results	Resolution
3	S Camminga 083 515 2384	17/08/2017 12:00	Richards Bay CBD	Pungent Foskop odour causing burning of the eyes.	Foskop 18/08/2017 Mannana Ntoampe responded: Peak Concentrations of SO ₂ Emissions: The highest SO ₂ emissions of 590 ppm were recorded for the A & B stack but these were within the AEL limits. Root Cause: Non-identified • There were no process upsets • There were no point source exceedances • There were no gas leaks reported. Note: The Sulphuric Acid "A" Plant started-up at 11h50 on a start-up scrubber. There were no process upsets or exceedances during the start-up period. All the other plants (Phosphoric Acid and Granulation Plants) were operating normally. Based on wind direction at the time and prevailing weather conditions it is possible that Foskop contributed to the odour.	Resolved - Foskop
4	2. D Savides Zululand Observer	17/08/2017 14:45	ZO Offices Dollar Drive Richards Bay	Pungent Foskop odour for most of the day.	Foskop 18/08/2017 Mannana Ntoampe responded: Peak Concentrations of SO ₂ Emissions: The highest SO ₂ emissions of 590 ppm were recorded for the A & B stack but these were within the AEL limits. Root Cause: Non-identified • There were no process upsets • There were no point source exceedances • There were no gas leaks reported. Note: The Sulphuric Acid "A" Plant started-up at 11h50 on a start-up scrubber. There were no process upsets or exceedances during the start-up period. All the other plants (Phosphoric Acid and Granulation Plants) were operating normally. Based on wind direction at the time and prevailing weather conditions it is possible that Foskop contributed to the odour.	Resolved - Foskop

No.	Complainant	Date and time	Location	Description	Results	Resolution
5	Staff Zululand Observer	17/08/2017 14:45	ZO Offices Dollar Drive Richards Bay	Pungent Foskor odour for most of the day.	Foskor 18/08/2017 Mannana Ntoampe responded: Peak Concentrations of SO ₂ Emissions: The highest SO ₂ emissions of 590 ppm were recorded for the A & B stack but these were within the AEL limits. Root Cause: Non-identified • There were no process upsets • There were no point source exceedances • There were no gas leaks reported. Note: The Sulphuric Acid "A" Plant started-up at 11h50 on a start-up scrubber. There were no process upsets or exceedances during the start-up period. All the other plants (Phosphoric Acid and Granulation Plants) were operating normally. Based on wind direction at the time and prevailing weather conditions it is possible that Foskor contributed to the odour.	Resolved - Foskor
6	Trish 035 – 799 0500	18/08/2017 03:45	John Ross Parkway towards Empangeni.	I was travelling in a westerly direction along the John Ross Parkway towards Empangeni. Before the area of subsidence in the road and Woodchip Glade, I could see a constant flow of white emissions pouring out of the chimneys at Foskor. What was different was the emissions appeared to be coming down from the chimneys, floating above the bushes on the left side of the road and then as it drifted over the road, it dropped right down to the level of the road. It appeared like mist and the cars were having to drive through it, from just after the entrance to Foskor to just before the bridge.	Foskor 01/09/2017 Mannana Ntoampe responded: Background: Sulphuric acid "A" plant was on shut since 14 May 2017. The plant was restarted on 10 August 2017 After the plant was put back into operation, it was noted that the stack was more visible than usual. On inspection, it was discovered that the down comer spouts in the Final Absorption Tower were blocked. This affected acid distribution in the Final Absorption Tower resulting in the plume observed on the day of the complaint. The final absorption tower is of the packed bed scrubber type. During the shut the entire bed of ceramic saddles was removed, washed and replaced. All the broken saddles were removed and replaced with new saddles. The troughs were also removed and replaced.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
				Being aware of the problems which have been caused by these emissions, I drove on the left shoulder of the road so to avoid having to drive through it. I didn't notice any smell because I had all the windows closed as the wind was blowing strongly from the south/southeast and it was quite cold."	Root Cause: During replacement of saddles some debris of ceramic remained in the final acid circulation tank resulting in the blockage of the spouts/troughs. This in turn affected the distribution of the sulphuric acid over the final Tower troughs resulting in unusual stack visibility. Corrective and preventative Action: A plant was stopped for cleaning of the final Acid Circulation Tank on the day. The final acid circulation tank pump strainer mesh aperture size has been decreased to increase interception of debris from the circulation tank. This prevents it from entering the spouts. The final Tower cleaning was repeated several times and the debris slowly worked its way out of the system. With each cleaning, the amount of debris collected decreased. It is important to note that as the plant continues to run and the plant stabilises the system will clean up. In cases where the stack visibility is unusual the plant will be stopped for cleaning. The engineers on site are monitoring the plant performance closely and since the above actions were implemented, there has been a noticeable improvement.	
7	S Camminga 083 515 2384	21/08/2017 10:40	Richards Bay CBD	Abnormal Emissions emanating from the Foskor A/B Stack. Foskor was informed.	Foskor 23/08/2017 Sandile Mdamba responded: S Camminga, Richards Bay CBD, 21 August, 10h40, Abnormal Emissions emanating from the Foskor A/B Stack. Peak Concentrations of SO ₂ Emissions: The highest SO ₂ emissions of 419 ppm were recorded for the main Stack, these were within permit limits. Compliance with Permits: • There was no contravention in existing permits.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Root Cause of Incident and Corrective Action: Sulphuric Acid "A" Plant had been off since May 2017. Some debris on the spouts/down corners of Final Tower troughs have been noticed. This happens after long shuts and in turn affects acid distribution on the peripheral of the tower. A Plant was stopped to clean the troughs of the Final Absorption Tower. Foskor operators and engineers will thus continue monitoring the main stack more especially the 'A' plant.	
8	Anonymous	21/08/2017 17:10	Harbour Arterial, adjacent to Foskor	Spillage of light yellow product all over the road and verges and trucks servicing Foskor obstructing traffic flow (see attached photographs)	Foskor 29/08/2017 Mannana Ntoampe responded: Please kindly see below the response to the complaint logged on 21 August. Nature of the complaint: • Anonymous, Harbour Arterial, adjacent to Foskor, 21 August, 17h10, Spillage of light yellow product all over the road and verges and trucks servicing Foskor obstructing traffic flow (see attached photographs) Background: In the week of 17 August 2017 the sulphur levels were approaching low levels in the sulphur store at Foskor. At the time, Foskor was expecting a sulphur vessel to berth at Berth 701 on 18 August 2017 and off-load via conveyor. However, the sulphur vessel could not berth as planned due to berth congestion caused by another vessel. With stocks at Foskor running low the only option was to use an alternative berth (Berth 606). Berth 606 is not linked to the conveyor system and road transport was used instead to transport sulphur from the port to Foskor. On the 20th of August 2017, a truck loaded with fertilizer broke down on the Foskor weigh bridge.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					This caused congestion as traffic flow was severely disrupted with only one weigh bridge available. Attempts to organize the removal of the truck took longer than anticipated. The congestion of traffic on the day of the complaint was caused by: • Trucks that were transporting sulphur to Foskor • Trucks coming to Foskor site to load Breakdown of a truck on one of the weigh bridges Root cause: • Spillages were a result of use of road transport instead of the conveyor system • Some of the trucks used for transporting of sulphur were back tippers instead of side tippers • A truck breakdown at the weigh bridge caused significant disruption of traffic flow, Preventative/Corrective Actions: • Sulphur spillages were cleaned from the road • Only site tippers will be used in cases where Foskor has to use road transport, Inbound bulk material will only be transported to site via a conveyor system unless there is an emergency • The agreement between Foskor and the customers has now been amended to allow Foskor to remove the truck after an hour of breakdown if the customer has not done so .i.e. a customer now only has an hour to remove the truck when there is a break down after which Foskor will remove it • Alternative staging options and areas are being investigated to cater for overflow of the Foskor staging area. Foskor is currently negotiating with companies that has such facilities for additional staging.	

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Improvement of flow of trucks by designating personnel to coordinate truck movement in and out of Foskor	
9	S Camminga 083 515 2384	22/08/2017 11:10	Harbour Arterial, adjacent to Foskor	Pungent acidic Foskor odour.	Foskor 11/09/2017 Mannana Ntoampe responded: Nature of complaint: S Camminga, Harbour Arterial south of the Foskor plant, 22 August, 11h10, Pungent acidic Foskor odour. Peak Concentrations: • The highest SO₂ emissions of 405 ppm were recorded for Sulphuric 'AB' Stack, these were within stipulated AEL limits. Compliance with Permits • There was no contravention in existing permits Root Cause of Incident and Corrective Action: • The Granulation Plant was operating normally and there was no ammonia offloading during this time • Phosphoric Acid Plants were also operating normally. The pH of the Buoyant Effluent used to slurry gypsum was within specification • Sulphuric Acid Plants were operating normally during this time with no SO₂ point source exceedances • There were no start-ups or any reported gas leaks during this period. Based on wind direction, Foskor could have contributed to the odour.	Resolved - Foskor
10	S Camminga 083 515 2384	22/08/2017 11:10	Harbour Arterial, adjacent to Foskor	Foskor trucks obstructing traffic and causing significant dust generation due to spillages of sulphur and a "greyish" product which smells like fertilizer covering the road surface. The photographs below are self-explanatory.	Foskor 29/08/2017 Mannana Ntoampe responded: Nature of the complaint, • S Camminga 083 515 2384, Harbour Arterial adjacent to Foskor Plant, 22 Aug, 11h10, Foskor trucks obstructing traffic and causing significant dust generation due to spillages of sulphur and a "greyish" product which smells like fertilizer covering the road surface. The photographs below are self-explanatory. Background: In the week of 17 August 2017 the sulphur levels were approaching low levels in the sulphur store at Foskor.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					At the time, Foskor was expecting a sulphur vessel to berth at Berth 701 on 18 August 2017 and off-load via conveyor. However, the sulphur vessel could not berth as planned due to berth congestion caused by another vessel. With stocks at Foskor running low the only option was to use an alternative berth (Berth 606). Berth 606 is not linked to the conveyor system and road transport was used instead to transport sulphur from the port to Foskor. On the 20th of August 2017, a truck loaded with fertilizer broke down on the Foskor weigh bridge. This caused congestion as traffic flow was severely disrupted with only one weigh bridge available. Attempts to organize the removal of the truck took longer than anticipated. The congestion of traffic on the day of the complaint was caused by: • Trucks that were transporting sulphur to Foskor • Trucks coming to Foskor site to load Breakdown of a truck on one of the weigh bridges Root cause • Spillages were a result of use of road transport instead of the conveyor system • Some of the trucks used for transporting of sulphur were back tippers instead of side tippers • Some of the trucks leaving site had loaded fertilizer. Fertilizer debris from the trucks could be the greyish material seen on the day • A truck breakdown at the weigh bridge caused significant disruption of traffic flow Preventative/Corrective Actions • All the spillages were cleaned from the road • Only site tippers will be used in cases where Foskor has to use road transport • Inbound bulk material will only be transported to site via a conveyor system unless there is an emergency	

No.	Complainant	Date and time	Location	Description	Results	Resolution
					• The agreement between Foskor and the customers has now been amended to allow Foskor to remove the truck after an hour of breakdown if the customer has not done so .i.e. a customer now only has an hour to remove the truck when there is a break down after which Foskor will remove it • Alternative staging options and areas are being investigated to cater for overflow of the Foskor staging area. Foskor is currently negotiating with companies that has such facilities for additional staging • Improvement of flow of trucks by designating personnel to coordinate truck movement in and out of Foskor.	
11	S Camminga 083 515 2384	22/08/2017 11:12	Harbour Arterial	Significant Alumina Dust emanating from the Hillside plant.	South 32 25/08/2017 Alison Gerber responded: Source and Nature of Emissions: Visible bath fugitive dust was observed during the loading of bath material from the tanker to the bath silo at GTC1 hall A. This was the result of the de-dusting unit on top of the bath silo not operating efficiently. Met Conditions: CBD Station - WD 74° (ENE) WS 1.7. Root Cause of Incident: Bath silo de-dusting unit not operating efficiently. Corrective Actions: • Tanker offloading were stopped immediately on notification of the complaint • De-dusting unit cartridges were replaced. Preventative Actions: • Investigate the opportunity for offline de-dusting unit inspections.	Resolved - South 32 (Hillside)
12	Anonymous	23/08/2017 07:25	N2 opposite Felixton industry	"Foul industrial effluent odour".	Resolved - Foskor	Resolved - Tongaat Hulett

No.	Complainant	Date and time	Location	Description	Results	Resolution
13	Anonymous	23/08/2017 07:30	John Ross	"Black smoke from Foskor stack".	Foskor 23/08/2017 Sandile Mdamba responded: Nature of complaint: Anonymous, John Ross 23 August, 07h30, Black smoke from Foskor stack. Peak Concentrations of SO ₂ Emissions. The highest SO ₂ emissions of 410 ppm were recorded for the main Stack, these were within permit limits. Compliance with Permits: • There was no contravention in existing permits. Root Cause of Incident and Corrective Action: Sulphuric Acid "A" Plant had been off since May 2017. Some debris on the spouts /down corners of Final Tower troughs have been noticed. This happens after long shuts and in turn affects acid distribution on the peripheral of the tower. A Plant was stopped to clean the troughs of the Final Absorption Tower. Foskor operators and engineers will thus continue monitoring the main stack more especially the 'A' plant.	Resolved - Foskor

Table D9: Complaints Log – September 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	D Savides (072 392 0511)	02/09/2017 15:40	Vicinity of Foskor Plant	"Coming back from Empangeni saw big cloud of heavy black smoke from Foskor. By the time I could stop it was grey. Coming from the centre of the plant." (photo attached)	Foskor 05/09/2017 Sandile Mdamba responded: Nature of complaint: "Coming back from Empangeni saw big cloud of heavy black smoke from Foskor. By the time I could stop it was grey. Coming from the centre of the plant." (photo attached) Background: In the Sulphuric Acid production, there is cooling involved. Acid is cooled by circulating water between the acid coolers/heat exchangers and the cooling towers.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					The Purpose of the cooling tower is to maintain lower water temperature by removing heat from the water. This is achieved by evaporating water molecules into the atmosphere. In the process of cooling, evaporation occurs and under cooler ambient air conditions, vapour condenses. This forms a fog which looks like a smoke which is particularly more visible in the mornings and afternoons. Observation: On the day and time of the complaint, the temperature was below room temperature and this was conducive for the formation of fog. What was observed in the picture was fog emanating from the sulphuric Plant cooling towers.	
2	R Camminga (083 251 4969)	03/09/2017 09:09	Richards Bay CBD Foskor area	Abnormal emissions emanating from the Foskor plant. (Photo attached)	Foskor 05/09/2017 Sandile Mdamba responded: Background: During the reaction of Phosphoric acid with ammonia which is the process used in the manufacture of Granular fertilizer, water vapour is generated. When there are blockages of stack drain, the vapour emitted via the stack looks "abnormal" Root cause: • Blockages of stack drain • Granulation plant is running at slightly higher rates due to seasonal demand of fertilizer Corrective/ Preventative measures • The stack was cleaned • The cleaning and maintenance schedule has been aligned to match the current production rates .Granulation Plant has three scrubbers in continuous operation to scrub and assist recover any losses from the stack. These scrubbers are interlocked to trip the plant if any one of them is operating inefficiently.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
3	Anonymous	03/09/2017 10:24	John Ross	"Foul odour on the John Ross, appears to be coming from the water collecting near the sink hole".		Unresolved
4	R Camminga (083 251 4969)	03/09/2017 18:08	John Ross \ North Central Arterial Intersection- Foskor area	Abnormal emissions emanating from the Foskor Plant. (photo attached)	Foskor 05/09/2017 Sandile Mdamba responded: Background: During the reaction of Phosphoric acid with ammonia which is the process used in the manufacture of Granular fertilizer, water vapour is generated. When there are blockages of stack drain, the vapour emitted via the stack looks "abnormal" Root cause: • Blockages of stack drain • Granulation plant is running at slightly higher rates due to seasonal demand of fertilizer Corrective/ Preventative measures • The stack was cleaned • The cleaning and maintenance schedule has been aligned to match the current production rates .Granulation Plant has three scrubbers in continuous operation to scrub and assist recover any losses from the stack. These scrubbers are interlocked to trip the plant if any one of them is operating inefficiently.	Resolved - Foskor
Indirect Complaints						
5	Complaint received by TNPA.	06/09/2017	South 32 harbour silo	Fugitive dust on the harbour silo and forwarded the attached photo.	South 32 08/09/2017: Alison Gerber responded: Source and Nature of Emissions: On the 5 Sept the Harbour team had a breakdown (notification 3011732227) on the Port route to Silo 1. The air slide and receiving bin blocked up whilst unblocking the route there was dust and with the high wind speed yesterday it was difficult to control the Alumina dust. The overland was on scheduled maintenance so we had no alternative, but to unblock the route and continue with the discharge. Root Cause of Incident: Air slide and receiving bin on silo 1 blocked.	Resolved - South 32 (Hillside)

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Corrective Actions: • Notification loaded for the breakdown • Cleaning team dispatched on the day to complainant premises for clean-up.	

Table D10: Complaints Log – October 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	S Camminga 083 515 2384	03/10/2017 11:40	Richards Bay CBD	Bad Stack A\B Plant – Excessive emissions which appeared to be dropping down from the top of the stack. Attempts to contact Foskor at the time were unsuccessful.	Foskor 04/10/2017 Mannana Ntoampe responded: Root cause: • The Sulphuric Acid “A” Plant was started on the 10th of August 2017 after the shut on 14 May 2017. Upon starting the Plant, it was noticed that there were blockages of the spouts /down corners of Final Tower troughs. This had an effect on acid distribution on the peripheral of the tower resulting in unusual stack visibility. Corrective and Preventative Action : • “A” Plant production rates were reduced • The plant was stopped on the 4th of October for cleaning, It is important to note that as the plant continues to run, the system will clean up. Since the start-up, there has been noticeable improvement over time. The engineers on site will continue monitoring the plant performance closely. The municipality contacted Foskor as per attached communication and a response has been sent to them as well. RBCAA 05/10/2017 Sandy Camminga responded: The RBCAA however remains extremely concerned.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					On 1st September, in response to the complaint of 18th August, Foskor stated that the root cause of the blockages was ceramic debris that remained in the final acid circulation tank. Which in turn affected the distribution of the sulphuric acid over the Final Tower troughs resulting in unusual stack visibility. Foskor further stated that the following corrective action had been taken 'A' Plant was stopped for cleaning of the Final Tower and Final Acid Circulation Tank on the day. Ø The final acid circulation tank pump strainer mesh aperture size has been decreased to increase interception of debris from the circulation tank. This prevents it from entering the spouts. Ø The Final Tower cleaning was repeated several times and the debris slowly worked its way out of the system. With each cleaning, the amount of debris collected decreased. Foskor went on to say that; "It is important to note that as the plant continues to run and the plant stabilises, the system will clean up. In cases where the stack visibility is unusual, the plant will be stopped for cleaning. The engineers on site are monitoring the plant performance closely and since the above actions were implemented, there has been a noticeable improvement." It has been just over a month since Fokor made the above statements, and still the plant is experiencing blockages. There is obviously a significant impact on emissions, which Fokor refers to as "unusual stack visibility". It is known that dense emissions with a tendency to "drop" from the stack are indicative of high SO₃ levels.	

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Foskor is kindly requested to report back on the following; 1. Why the plant continues to experience blockages. 2. Impact on air emissions. 3. Compliance with AEL. 4. Stack emission results from 14th August – current.	
2	S Camminga 083 515 2384	05/10/2017 17:00	Heideheuvel - Veldenvlei	Pungent nauseating “guava” odour.	Mondi RB 06/10/2017: Ruan Nell responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit(s): There were no exceedance of Mondi’s Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi undertook an intensive investigation. The odour dashboard did not register any abnormalities during this time. All plants completed their odour checklists. Mondi was however conducting maintenance on our TRS scrubber and as a result the NCG gasses were burned in the flare. Mondi suspects that combustion of the un-scrubbed gasses in the flare resulted in the odour. Actions taken: The NCG gasses were redirected to the Kiln for combustion. Maintenance work on the TRS scrubber will conclude today and the scrubber put back in service at 16:00.	Resolved - Mondi Richards Bay
3	Demian Van Loggerenberg 082 725 8730	05/10/2017 17:00	Arum Lily – Veldenvlei	Pungent Mondi odour. Complainant stated was the worst Mondi odour experienced in a very long time.	Mondi RB 06/10/2017: Ruan Nell responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit(s): There were no exceedance of Mondi’s Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi undertook an intensive investigation. The odour dashboard did not register any abnormalities during this time.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					All plants completed their odour checklists. Mondi was however conducting maintenance on our TRS scrubber and as a result the NCG gasses were burned in the flare. Mondi suspects that combustion of the un-scrubbed gasses in the flare resulted in the odour. Actions taken: The NCG gasses were redirected to the Kiln for combustion. Maintenance work on the TRS scrubber will conclude today and the scrubber put back in service at 16:00.	
4	R Camminga (083 251 4969)	12/10/2017 07:10	John Ross Highway	PUNGENT Mondi Guava odour causing nausea.	Mondi RB 13/10/2017: Ruan Nell responded: Source and Nature of Emissions: Based on wind direction, it is likely that Mondi is the source of odour. Compliance with Permit's: There were no exceedance of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and identified root cause as a leak in the non-condensable gas system. Actions taken: The plant was stopped and the leak repaired.	Resolved - Mondi Richards Bay
5	Anonymous	16/10/2017 12:15	Felixton Village	Thick brown smoke emanating from the Tongaat Hulett plant.		Resolved - Tonga Hulett
6	Anonymous	18/10/2017 08:25	Port of Richards Bay	Significant dust emanating from loading activities at Berth 703. The complaint was at the time reported to the City's Air Quality Management Unit (AQMU), who immediately investigated. Please see attached feedback from CoU AQMU	UMhlathuze Municipality 18/10/2017: Siyabonga Ziqubu responded: Inspection conducted 08:45, At 8:45 I was denied entry by the TNPA new security. They wanted the permit/letter that gives municipal authorities permission to enter the port. I went back to office to print the bylaws. When we arrived on site at 9:05, the facility had already stopped loading.	Resolved - Port of Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Through our engagement with the TPT the facility have admitted that they were loading Sulphate cargo that was blended with Chloride. The sulphate in its normal state is not dusty but because it was blended with Chloride it caused a lot of dust. The facility indicated that sulphates cargo is normally loaded without a chute because it is heavy (it damages the chute). Current mitigations (tabled after the meeting). The facility will not load the remaining Sulphate cargo in berth 703 they will use skips to prevent excessive dust emissions. The facility will hold a meeting with the customer of the cargo, operations and planning department to Draft mitigation measures. The facility will submit the mitigations to prevent future occurrence before the end of Friday. If the facility fails to implement the mitigation measures and should the dust incident re-occur the Municipality will issue a compliance notice to the facility. The mitigation measures will be forwarded to you after submission by the TPT facility.	
7	R Camminga (083 251 4969)	23/10/2017 18:20	Heideheuvel – Veldenvlei	Pungent Mondi guava odour causing nausea.	Mondi RB 26/10/2017: Nosipho Ntombelal responded: Source and Nature of Emissions: Based on wind direction prior to the complaint time, it is likely that Mondi is the source of odour. Average Ambient Concentrations of Emissions and Met Conditions RBCAA stations: Compliance with Permit's: There were no exceedances of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and following were found: • no upset plant conditions were experienced prior and during the time of the complaint;	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					• The level recorded prior and during the time of the complaint were below the limit • The Shift Foreman conducted an inspection at the relevant sections and no discrepancies were found. Actions taken: No Action was taken. Continuous Emission Inspections are being conducted on the mill.	
8	S Camminga (083 251 4969)	23/10/2017 18:20	Heideheuvel – Veldenvlei	Pungent Mondi guava odour causing nausea.	Mondi RB 26/10/2017: Nosipho Ntombelal responded: Source and Nature of Emissions: Based on wind direction prior to the complaint time, it is likely that Mondi is the source of odour. Average Ambient Concentrations of Emissions and Met Conditions RBCAA stations: Compliance with Permits: There were no exceedances of Mondi's Air Emission Licence limits during this time. Root Cause of Incident and Corrective Action: Mondi has investigated and following were found: • no upset plant conditions were experienced prior and during the time of the complaint; • The level recorded prior and during the time of the complaint were below the limit; • The Shift Foreman conducted an inspection at the relevant sections and no discrepancies were found. Actions taken: No Action was taken. Continuous Emission Inspections are being conducted on the mill.	Resolved - Mondi Richards Bay
9	Franz Schmidt 083 675 8356	24/10/2017 05:50 to 06:10	Port of Richards Bay	Significant dust emitted from Port activities in the vicinity of Berths 701 – 704, dispersing towards Casuarinas causing lung and eye irritation. Looked like it could have been coal dust.		Resolved - Port of Richards Bay

Table D11: Complaints Log – November 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	Demian van Loggerenberg (082 725 8730)	24/11/2017 07:150	106 Alumina Alley – Alton	Pungent “Cat Urine” odour. Mondi has been notified.	Mondi RB 29/11/2017: Brendan Crawford responded: 1. Nature of Complaint : Demian van Loggerenberg (082 725 8730), 106 Alumina Alley – Alton, Friday 24 November, 07h15, Pungent “Cat Urine” odour. 2. Source and Nature of Emissions: Based on prevailing wind conditions prior to the complaint it is possible that an odour emanating from Mondi could have impacted on the complainant. At the time of visiting the complaint site the odour was no longer detectable, most likely due to a change in wind direction. The most likely source of the odour would have been the Effluent Emergency Pond 2 which was full at the time with effluent from the recent CRU1 Water Wash. The Hytec station was broken into on the morning of the 24th November 2017 and all electrical cables stolen. Hence there is no data available from the Hytec station from 24th November 2017 from 01:30am. Compliance with Permits: There were no exceedances of any of the compliance limits on Mondi’s Air Emission Licence before, during and after the complaint. Root Cause of Incident and Corrective Action: Mondi has investigated and the following were found: • The site of the complaint was found to be in the prevailing wind direction from Mondi during the hours between 5:50am and 6:50am. A delayed effect could be attributed to the very low wind speeds giving any fugitive emissions time to “sit” in the area. • Due to a recent water wash shut on CRU1 effluent that did not meet compliance specifications was routed to the emergency ponds for dilution.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Mondi acknowledges that the nature of the effluent in the ponds may result in nuisance odours and is currently taking steps to remediate the situation. During the investigation there was very little odour prevalent at the pond. • There were no upset plant conditions experienced before, during and after the complaint. • The highest reading TRS reading recorded at the CBD station 2 hours prior to the complaint is 0.84ppb which is below the 5 ppb WHO limit, however TRS would not relate to a "Cat Urine" odour which is most indicative of Ammonia and Ammonia based compounds. Actions taken: • The effluent in the ponds is currently being diluted and directed to the primary clarifiers for pumping to sea outfall. Since the initial investigation the pond level has reduced by 25% and continues to drop. • Mondi is currently awaiting quotes for repairs to the Hytec monitoring station and is reviewing its security measures. In the interim the mobile monitoring station is being relocated to a similar wind vector.	
2	S Camminga 083 515 2384	28/11/2017 09:45	Foskor Plant	Dense white emission (A+B stack)		Resolved - Foskor
3	D Savides (072 392 0511)	29/11/2017 22:10	Cassia Close – Arboretum	Acrid odour "like rotting waste".		Unresolved

No.	Complainant	Date and time	Location	Description	Results	Resolution
4	Marshall Naidoo	30/11/2017 07:32	Brackenham resident	Can someone please investigate the pollution in Richards Bay, I am a resident from Brackenham and my kids and myself are frequently coughing it is definitely being triggered by and emitted gas or a raw product being blown in the direction of our houses. I am looking at this in a serious light especially if my kids are involved. I have spoken to other residents and they are complaining of the same symptoms.		Unresolved

Table D12: Complaints Log – December 2017

No.	Complainant	Date and time	Location	Description	Results	Resolution
1	S Camminga 083 515 2384	03/12/2017 14:30	CBD - Foskor Plant	Foskor odour and bad A\B stack. The emissions were dense to the point where the top of the stack was not visible. (Photo attached) This is all the more concerning given that B plant is on shutdown.	Foskor 05/12/2017 Mannana Ntoampe responded: Root cause: • Bad stack High acid temperature as a result of insufficient cooling • Foskor odour: On the day of the complaint, there was a gas leak reported on the first pass outlet of the "A" Plant. The leak was reported at 07h00 and repaired by 08h00. Corrective and Preventative Action: Bad stack: The cooling system was modified such that "B" Plant cooling tower fans are used in parallel with 'A' Plant cooling towers. The 'B' Plant cooling towers were not operational prior since the Plant is currently on shut. The A plant cooling water which is usually distributed between A and B cooling towers is only restricted to A plant cooling towers. This was achieved by spading cooling water to B Plant cooling towers.	Resolved - Foskor

No.	Complainant	Date and time	Location	Description	Results	Resolution
					Foskor has also requested consultants to further investigate the recurring problem of stack visibility on the A/B stack. • Foskor Odour The gas leak was repaired online. Even though the leak was repaired prior, it could have contributed to the odour depending meteorological data on the day.	
2	Anonymous	11/12/2017 10:40	Tronox CPC Plant Empangeni	The Richards Bay Clean Air Association (RBCAA) has received a complaint from a member of the public, who wishes to remain anonymous, regarding abnormal emissions from the TRONOX plant west of Empangeni. Since TRONOX has withdrawn as a member of the RBCAA, we hereby refer this complaint to the City of uMhlathuze Air Quality Management Unit. Abnormal emissions were observed emanating from the Tronox facility on Sunday 11 December at 10h40.	Tronox 12/12/2017 Sipho Mkhwanazi responded: Source of pollution or potential pollution: During the above mentioned times, metal taps were being conducted on the furnaces. It could be the case that some fumes escaped the fumex due to the wind direction and /or speed. It must be noted that this part of the operation on the furnaces are not abnormal. On these days the fume extraction system on the smelter was functioning. Any risk posed by the incident to public health, safety and property: None. Toxicity of substances or by-products released by the incident: Non Toxic. Immediate measures taken to minimize impacts: None part of normal operations. Root causes of the incident, whether direct or indirect, including equipment, technology, systems, or management failure: Fumes caused by metal tapings. This is part of the operations at the furnaces. A Fumex is in place to minimize the emissions from the furnaces. The indirect cause was the wind direction and speed forcing fumes from inside the furnace to the outside. Measures taken to avoid a recurrence of the incident: Project in place to improve fumex system.	Resolved - Tronox

No.	Complainant	Date and time	Location	Description	Results	Resolution
3	Anonymous	12/12/2017 08:40	Klipviskinkle (Meerensee)	The Richards Bay Clean Air Association (RBCAA) yesterday received a call from a member of the public, who did not wish to identify themselves, complaining of poor air quality arising from a resident who is allegedly burning refuse on an ongoing basis. The location of the burning has been reported as being in Klipviskinkle (Meerensee), in the cul-de-sac, opposite number 19. The complainant did not know the number of the house where the person is burning refuse.		Resolved - Burning of domestic refuse
4	R Eaton (083 296 7616)	11/12/2017 17:30	John Ross Highway	Pungent odour, described as a "cat urine" type odour.	Mondi RB 13/12/2017: Brendan Crawford responded: Source and Nature of Emissions: Based on prevailing wind conditions during the complaint it is possible that an odour emanating from Mondi could have impacted on the complainant. At the time the H2S emissions from the Effluent Plant stack had increased due to a dip in the effluent pH. There were no exceedances recorded on any of the monitoring stations, including Alton which is located within the wind vector. Hytec station is still offline due to the burglary incident. Compliance with Permits: There were no exceedances of any of the compliance limits on Mondi's Air Emission Licence before, during and after the complaint. Root Cause of Incident and Corrective Action: Mondi has investigated and the following were found: • The site of the complaint was found to be in the prevailing wind direction from Mondi especially between 17:30pm and 18:30pm.	Resolved - Mondi Richards Bay

No.	Complainant	Date and time	Location	Description	Results	Resolution
					• A dip in the effluent pH was observed at 16:15pm. This was due to a Cation Regen in the Demin plant. The Demin Buffer tank was full so it could not contain the full acidic load at the time. • There were no upset plant conditions experienced before, during and after the complaint. • The highest TRS reading recorded at the CBD station before, during and after the complaint was 0.4 ppb which was well below the 5 ppb WHO limit. • Since the increase in effluent H₂S emissions only lasted for 20 minutes no further action was taken. • The BU is looking at optimising the level control loop to better control the Demin Buffer tank levels.	

APPENDIX E

PM₁₀ Exceedance Log

Table E1: PM₁₀ Exceedance Log

Standard / Guideline / Target	Station	Date	Value (µg/m ³)	Association
NEM: AQA Daily Standard (75 µg/m ³)	Brackenham	2017-08-17	92	Very high windspeeds and dusty conditions
		2017-09-13	97	High windspeeds and dusty/smoky conditions
		2017-10-19	82	High windspeeds and dusty/dry conditions
	eSikhaleni	2017-09-13	77	High windspeeds and dusty/smoky conditions
	Felixton	2017-04-20	108	
		2017-06-15	76	
		2017-07-30	76	
		2017-08-03	76	
		2017-09-01	76	
		2017-09-13	101	
		2017-10-16	83	
		2017-10-19	122	
		2017-10-25	79	
WHO Daily Guideline (50 µg/m ³)	Brackenham	2017-01-20	65	High wind speeds and construction work on site
		2017-06-08	70	High wind speeds and dry dusty conditions.
		2017-06-15	63	Dry dusty windy conditions
		2017-07-13	60	Dry dusty windy conditions
		2017-08-17	92	Very high windspeeds and dusty conditions
		2017-08-22	63	High windspeeds and very dusty conditions
		2017-09-01	69	High Wind Speeds
		2017-09-06	54	Dry dusty windy conditions
		2017-09-13	97	High windspeeds and dusty/smoky conditions
		2017-09-16	68	Very High wind Speeds
		2017-10-19	82	High windspeeds and dusty/dry conditions
	CBD	2017-01-03	61	High wind speeds and fires in the area
		2017-06-08	62	High wind speeds and dry dusty conditions.
		2017-09-13	61	High windspeeds and dusty/smoky conditions
		2017-10-19	56	High windspeeds and dusty/dry conditions
	eSikhaleni	2017-06-08	66	High wind speeds and dry dusty conditions.
		2017-06-09	62	Dry dusty conditions

Standard / Guideline / Target	Station	Date	Value (µg/m3)	Association
		2017-09-13	77	High windspeeds and dusty/smoky conditions
		2017-10-19	51	High windspeeds and dusty/dry conditions
	Felixton	2017-01-20	58	
		2017-03-02	50	
		2017-03-04	50	
		2017-04-01	50	
		2017-04-20	108	
		2017-05-10	54	
		2017-05-26	54	
		2017-06-01	50	
		2017-06-02	50	
		2017-06-04	65	
		2017-06-05	61	
		2017-06-07	54	
		2017-06-08	68	
		2017-06-09	50	
		2017-06-11	58	
		2017-06-12	58	
		2017-06-13	65	
		2017-06-14	58	
		2017-06-15	76	
		2017-06-17	65	
		2017-06-20	61	
		2017-06-22	54	
		2017-06-23	58	
		2017-07-06	58	
		2017-07-09	65	
		2017-07-10	50	
		2017-07-13	54	
		2017-07-16	54	
		2017-07-19	54	

Standard / Guideline / Target	Station	Date	Value (µg/m3)	Association
		2017-07-20	68	
		2017-07-22	54	
		2017-07-30	76	
		2017-08-03	76	
		2017-08-11	50	
		2017-08-12	54	
		2017-08-15	50	
		2017-08-22	50	
		2017-08-30	58	
		2017-09-01	76	
		2017-09-06	72	
		2017-09-07	68	
		2017-09-08	61	
		2017-09-09	61	
		2017-09-10	50	
		2017-09-11	65	
		2017-09-12	54	
		2017-09-13	101	
		2017-10-08	50	
		2017-10-16	83	
		2017-10-19	122	
		2017-10-24	61	
		2017-10-25	79	
		2017-10-26	50	
		2017-11-06	54	
		2017-11-22	50	
		2017-12-10	54	
		2017-12-17	54	
	Mtunzini	2017-06-08	65	High wind speeds and dry dusty conditions.
		2017-09-01	60	High Wind Speeds
		2017-09-13	66	High windspeeds and dusty/smoky conditions

APPENDIX F

SO₂ Exceedance Log

Table F1: SO₂ Exceedance Log

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
NEMAQA & WHO 10-minute Standard (191 ppb)	Harbour West	2017/03/03 06:40	247	Foskor
		2017/09/19 00:40	267	Foskor
		2017/09/19 03:20	241	Foskor
	Scorpio	2017/01/04 17:50	272	South 32
		2017/02/22 16:40	213	Foskor
		2017/08/02 12:00	214	South32
		2017/09/03 12:40	200	Foskor
		2017/09/03 12:50	267	Foskor
		2017/10/27 16:40	231	Foskor & South32
		2017/10/27 16:50	193	Foskor & South32
WHO Daily Guideline (8 ppb)	Arboretum	2017/08/19	9	*
	CBD	2017/01/04	14	*
		2017/01/07	29.2	*
		2017/01/13	16.8	*
		2017/01/14	9.4	*
		2017/02/05	10	*
		2017/02/06	19	*
		2017/02/21	10	*
		2017/02/26	10	*
		2017/03/24	8	*
		2017/03/25	11	*
		2017/03/28	10	*
		2017/03/29	18	*
		2017/04/06	10	*
		2017/04/14	23	*
		2017/04/15	19	*
		2017/05/12	13	*
		2017/05/13	33	*
		2017/05/14	20	*
		2017/05/15	12	*
		2017/05/16	10	*
		2017/05/25	8	*
		2017/06/18	12	*
		2017/06/23	12	*
		2017/06/29	14	*
		2017/07/03	13	*
		2017/07/15	9	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/07/26	9	*
		2017/07/30	13	*
		2017/08/06	10	*
		2017/08/14	13	*
		2017/08/16	13	*
		2017/08/17	19	*
		2017/08/18	21	*
		2017/08/19	10	*
		2017/08/30	12	*
		2017/09/01	9	*
		2017/09/20	9	*
		2017/10/05	18	*
		2017/10/11	12	*
		2017/10/16	10	*
		2017/11/16	24	*
		2017/12/19	9	*
	Harbour West	2017/01/02	10	*
		2017/01/12	11.3	*
		2017/01/22	8	*
		2017/01/23	13	*
		2017/01/24	8	*
		2017/02/02	15	*
		2017/02/04	16	*
		2017/02/12	11	*
		2017/02/18	18	*
		2017/02/28	12	*
		2017/03/01	13	*
		2017/03/03	19	*
		2017/03/08	9	*
		2017/03/15	12	*
		2017/03/17	13	*
		2017/03/18	16	*
		2017/03/22	20	*
		2017/03/23	19	*
		2017/03/27	23	*
		2017/03/30	15	*
		2017/03/31	16	*
		2017/04/02	16	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/04/03	16	*
		2017/04/11	9	*
		2017/04/12	18	*
		2017/04/13	28	*
		2017/05/02	10	*
		2017/05/05	12	*
		2017/05/06	12	*
		2017/05/09	17	*
		2017/05/10	9	*
		2017/05/11	11	*
		2017/05/22	10	*
		2017/05/23	10	*
		2017/05/24	10	*
		2017/05/26	11	*
		2017/05/31	9	*
		2017/06/03	14	*
		2017/06/04	10	*
		2017/06/06	13	*
		2017/06/07	20	*
		2017/06/10	23	*
		2017/06/11	18	*
		2017/06/15	9	*
		2017/06/17	27	*
		2017/06/19	15	*
		2017/06/20	11	*
		2017/06/22	15	*
		2017/06/27	22	*
		2017/06/28	32	*
		2017/06/30	23	*
		2017/07/02	354	*
		2017/07/05	13	*
		2017/07/06	17	*
		2017/07/07	24	*
		2017/07/08	23	*
		2017/07/09	19	*
		2017/07/15	20	*
		2017/07/18	15	*
		2017/07/19	12	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/07/21	9	*
		2017/07/25	35	*
		2017/07/29	20	*
		2017/08/01	22	*
		2017/08/02	19	*
		2017/08/03	9	*
		2017/08/04	10	*
		2017/08/09	11	*
		2017/08/10	18	*
		2017/08/11	20	*
		2017/08/15	10	*
		2017/08/21	18	*
		2017/08/22	24	*
		2017/08/29	23	*
		2017/09/04	12	*
		2017/09/05	29	*
		2017/09/07	14	*
		2017/09/12	13	*
		2017/09/13	13	*
		2017/09/16	28	*
		2017/09/18	16	*
		2017/09/19	31	*
		2017/09/21	18	*
		2017/09/22	37	*
		2017/09/25	22	*
		2017/09/29	17	*
		2017/10/03	13	*
		2017/10/04	23	*
		2017/10/19	14	*
		2017/10/23	16	*
		2017/10/30	10	*
		2017/10/31	11	*
		2017/11/01	10	*
		2017/11/13	13	*
		2017/11/20	9	*
		2017/11/28	8	*
		2017/12/01	10	*
		2017/12/02	14	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/12/03	12	*
		2017/12/06	8	*
		2017/12/09	9	*
		2017/12/16	10	*
		2017/12/22	12	*
		2017/12/27	10	*
		2017/12/28	10	*
	Scorpio	2017/01/03	16	*
		2017/01/04	20	*
		2017/01/08	10.1	*
		2017/01/09	12.8	*
		2017/01/14	8.4	*
		2017/01/17	18.3	*
		2017/01/18	15	*
		2017/01/19	14	*
		2017/01/22	16	*
		2017/01/25	12	*
		2017/02/02	12	*
		2017/02/03	11	*
		2017/02/09	10	*
		2017/02/12	11	*
		2017/02/13	9	*
		2017/02/17	8	*
		2017/02/18	20	*
		2017/02/22	26	*
		2017/02/28	28	*
		2017/03/04	18	*
		2017/03/05	17	*
		2017/03/06	14	*
		2017/03/07	11	*
		2017/03/08	10	*
		2017/03/10	11	*
		2017/03/11	8	*
		2017/03/12	10	*
		2017/03/17	26	*
		2017/03/20	12	*
		2017/03/22	11	*
		2017/03/27	17	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/04/07	14	*
		2017/04/13	24	*
		2017/05/01	8	*
		2017/05/03	10	*
		2017/05/06	15	*
		2017/05/10	9	*
		2017/05/19	16	*
		2017/05/20	14	*
		2017/05/22	15	*
		2017/05/24	28	*
		2017/05/25	9	*
		2017/05/26	8	*
		2017/05/31	11	*
		2017/06/01	10	*
		2017/06/02	14	*
		2017/06/03	18	*
		2017/06/04	23	*
		2017/06/08	19	*
		2017/06/09	10	*
		2017/06/10	12	*
		2017/06/11	27	*
		2017/06/12	11	*
		2017/06/13	12	*
		2017/06/15	20	*
		2017/06/16	10	*
		2017/06/17	28	*
		2017/06/19	12	*
		2017/06/20	12	*
		2017/06/22	30	*
		2017/06/26	8	*
		2017/06/27	29	*
		2017/06/28	35	*
		2017/06/29	11	*
		2017/06/30	12	*
		2017/07/01	9	*
		2017/07/02	12	*
		2017/07/06	21	*
		2017/07/08	21	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/07/09	29	*
		2017/07/18	17	*
		2017/07/20	13	*
		2017/07/24	12	*
		2017/07/25	12	*
		2017/07/26	14	*
		2017/07/27	9	*
		2017/07/29	12	*
		2017/07/30	12	*
		2017/08/01	9	*
		2017/08/02	21	*
		2017/08/03	9	*
		2017/08/05	16	*
		2017/08/07	13	*
		2017/08/13	10	*
		2017/08/15	15	*
		2017/08/16	16	*
		2017/08/19	15	*
		2017/08/20	8	*
		2017/08/22	21	*
		2017/08/24	14	*
		2017/08/25	11	*
		2017/08/27	9	*
		2017/09/03	23	*
		2017/09/05	11	*
		2017/09/06	9	*
		2017/09/08	9	*
		2017/09/09	13	*
		2017/09/13	21	*
		2017/09/14	15	*
		2017/09/20	17	*
		2017/09/23	20	*
		2017/09/25	11	*
		2017/10/07	9	*
		2017/10/08	14	*
		2017/10/11	11	*
		2017/10/12	13	*
		2017/10/17	21	*

Standard / Guideline / Target	Station	Date	Value (ppb)	Association
		2017/10/18	9	*
		2017/10/20	9	*
		2017/10/21	8	*
		2017/10/24	10	*
		2017/10/25	10	*
		2017/10/26	16	*
		2017/10/27	30	*
		2017/10/29	10	*
		2017/11/07	8	*
		2017/11/09	13	*
		2017/11/18	13	*
		2017/11/25	14	*
		2017/11/27	10	*
		2017/12/01	10	*
		2017/12/02	14	*
		2017/12/03	14	*
		2017/12/08	18	*
		2017/12/23	9	*
		2017/12/27	13	*
		2017/12/31	15	*
Note: * Exceedances of the WHO guideline do not require investigation				

APPENDIX G

TRS Exceedance Log

Table G1: TRS Exceedance Log

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
RBCAA 10-minute Target (4.5 ppb)	CBD	2017/01/03 23:30:00	6.0	Mondi
		2017/01/03 23:40:00	8.0	Mondi
		2017/01/03 23:50:00	7.0	Mondi
		2017/01/04 00:00:00	6.0	Mondi
		2017/01/04 00:50:00	6.0	Mondi
		2017/01/04 01:00:00	6.0	Mondi
		2017/01/04 02:40:00	5.0	Mondi
		2017/01/04 02:50:00	7.0	Mondi
		2017/01/04 03:00:00	9.0	Mondi
		2017/01/04 03:10:00	7.0	Mondi
		2017/01/04 03:20:00	8.0	Mondi
		2017/01/04 03:30:00	7.0	Mondi
		2017/01/04 03:40:00	7.0	Mondi
		2017/01/04 03:50:00	6.0	Mondi
		2017/01/04 04:00:00	5.0	Mondi
		2017/01/04 07:40:00	5.0	Mondi
		2017/01/04 07:50:00	6.0	Mondi
		2017/01/04 08:00:00	5.0	Mondi
		2017/01/04 08:10:00	9.0	Mondi
		2017/01/04 08:20:00	7.0	Mondi
		2017/01/04 08:30:00	6.0	Mondi
		2017/01/04 08:40:00	6.0	Mondi
		2017/01/04 09:00:00	7.0	Mondi
		2017/01/04 09:10:00	5.0	Mondi
		2017/01/04 09:20:00	6.0	Mondi
		2017/01/07 03:20:00	5.0	Mondi
		2017/01/07 04:40:00	5.0	Mondi
		2017/01/07 04:50:00	7.0	Mondi
		2017/01/07 05:00:00	6.0	Mondi
		2017/01/07 05:20:00	5.0	Mondi
		2017/01/07 05:30:00	7.0	Mondi
		2017/01/07 05:40:00	6.0	Mondi
		2017/01/07 05:50:00	6.0	Mondi
		2017/01/07 06:00:00	5.0	Mondi
		2017/01/07 06:10:00	6.0	Mondi
		2017/01/07 06:50:00	5.0	Mondi
		2017/01/07 07:00:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/01/07 07:10:00	5.0	Mondi
		2017/01/07 07:20:00	6.0	Mondi
		2017/01/07 07:40:00	5.0	Mondi
		2017/01/07 07:50:00	5.0	Mondi
		2017/01/07 08:10:00	5.0	Mondi
		2017/01/07 08:40:00	6.0	Mondi
		2017/01/10 01:40:00	7.0	Mondi
		2017/01/10 01:50:00	8.0	Mondi
		2017/01/10 02:00:00	8.0	Mondi
		2017/01/10 02:10:00	9.0	Mondi
		2017/01/10 02:20:00	5.0	Mondi
		2017/01/10 04:00:00	5.0	Mondi
		2017/01/11 00:00:00	6.0	Unresolved
		2017/01/11 00:10:00	8.0	Unresolved
		2017/01/11 00:20:00	8.0	Unresolved
		2017/01/11 00:30:00	8.0	Unresolved
		2017/01/11 00:40:00	6.0	Unresolved
		2017/01/11 01:20:00	5.0	Unresolved
		2017/01/11 01:30:00	8.0	Unresolved
		2017/01/11 01:40:00	6.0	Unresolved
		2017/01/11 01:50:00	7.0	Unresolved
		2017/01/11 02:50:00	6.0	Unresolved
		2017/01/11 03:00:00	7.0	Unresolved
		2017/01/11 03:10:00	8.0	Unresolved
		2017/01/11 03:20:00	7.0	Unresolved
		2017/01/11 03:30:00	6.0	Unresolved
		2017/01/11 03:50:00	5.0	Unresolved
		2017/01/13 03:10:00	5.0	Mondi
		2017/01/13 05:00:00	5.0	Mondi
		2017/01/13 05:10:00	5.0	Mondi
		2017/01/13 05:20:00	5.0	Mondi
		2017/01/13 05:30:00	5.0	Mondi
		2017/01/13 05:40:00	5.0	Mondi
		2017/01/13 06:20:00	5.0	Mondi
		2017/01/15 04:20:00	5.0	Mondi
		2017/01/15 04:30:00	5.0	Mondi
		2017/01/15 05:20:00	8.0	Mondi
		2017/01/15 05:30:00	7.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/01/15 05:40:00	6.0	Mondi
		2017/01/15 05:50:00	6.0	Mondi
		2017/01/20 01:30:00	5.0	Mondi
		2017/01/20 02:30:00	6.0	Mondi
		2017/01/20 02:40:00	6.0	Mondi
		2017/01/20 02:50:00	5.0	Mondi
		2017/01/21 03:10:00	6.0	Mondi
		2017/01/21 03:20:00	5.0	Mondi
		2017/01/21 03:50:00	5.0	Mondi
		2017/02/05 20:50:00	6.0	Mondi
		2017/02/05 23:00:00	5.0	Mondi
		2017/02/06 01:30:00	5.0	Mondi
		2017/02/06 04:30:00	5.0	Mondi
		2017/02/06 05:30:00	6.0	Mondi
		2017/02/06 05:40:00	6.0	Mondi
		2017/02/06 05:50:00	5.0	Mondi
		2017/02/06 06:10:00	5.0	Mondi
		2017/02/06 08:30:00	5.0	Mondi
		2017/02/06 22:50:00	5.0	Mondi
		2017/02/06 23:00:00	5.0	Mondi
		2017/02/21 03:00:00	5.0	Mondi
		2017/02/21 17:20:00	5.0	Mondi
		2017/03/15 22:40:00	5.0	Mondi
		2017/03/20 01:40:00	5.0	Mondi
		2017/03/20 03:50:00	5.0	Mondi
		2017/03/24 20:10:00	5.0	Mondi
		2017/03/24 20:20:00	6.0	Mondi
		2017/03/25 01:50:00	5.0	Mondi
		2017/03/25 04:30:00	6.0	Mondi
		2017/03/25 04:40:00	5.0	Mondi
		2017/03/25 05:20:00	5.0	Mondi
		2017/04/01 20:10:00	5.0	Mondi
		2017/04/01 21:10:00	5.0	Mondi
		2017/05/11 04:00:00	5.0	Mondi
		2017/05/12 00:30:00	5.0	Mondi
		2017/05/12 00:40:00	9.0	Mondi
		2017/05/12 00:50:00	5.0	Mondi
		2017/05/12 12:00:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/05/13 03:20:00	5.0	Mondi
		2017/05/13 09:20:00	5.0	Mondi
		2017/05/13 11:20:00	5.0	Mondi
		2017/05/13 12:20:00	5.0	Mondi
		2017/05/13 12:30:00	5.0	Mondi
		2017/05/13 13:00:00	5.0	Mondi
		2017/05/13 13:20:00	5.0	Mondi
		2017/05/14 01:50:00	5.0	Mondi
		2017/05/14 22:10:00	6.0	Mondi
		2017/05/14 22:20:00	5.0	Mondi
		2017/05/15 00:30:00	5.0	Mondi
		2017/05/15 00:40:00	5.0	Mondi
		2017/05/15 01:10:00	6.0	Mondi
		2017/05/15 01:40:00	6.0	Mondi
		2017/05/15 02:10:00	5.0	Mondi
		2017/05/15 03:20:00	5.0	Mondi
		2017/05/15 04:10:00	5.0	Mondi
		2017/05/15 04:20:00	6.0	Mondi
		2017/05/15 05:00:00	5.0	Mondi
		2017/05/15 05:10:00	6.0	Mondi
		2017/05/15 05:20:00	5.0	Mondi
		2017/05/15 06:10:00	5.0	Mondi
		2017/05/27 02:10:00	7.0	Mondi
		2017/05/27 02:20:00	6.0	Mondi
		2017/05/27 02:30:00	6.0	Mondi
		2017/05/27 02:40:00	6.0	Mondi
		2017/05/27 02:50:00	7.0	Mondi
		2017/05/27 03:00:00	7.0	Mondi
		2017/05/27 03:10:00	6.0	Mondi
		2017/05/27 04:50:00	6.0	Mondi
		2017/05/27 05:00:00	5.0	Mondi
		2017/05/27 05:10:00	5.0	Mondi
		2017/05/27 05:20:00	6.0	Mondi
		2017/05/27 05:30:00	6.0	Mondi
		2017/05/27 05:40:00	6.0	Mondi
		2017/05/27 08:00:00	5.0	Mondi
		2017/05/28 04:50:00	5.0	Mondi
		2017/05/28 06:40:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/05/28 07:40:00	6.0	Mondi
		2017/05/28 07:50:00	5.0	Mondi
		2017/05/28 08:00:00	5.0	Mondi
		2017/05/28 09:00:00	5.0	Mondi
		2017/05/28 10:30:00	5.0	Mondi
		2017/05/29 01:00:00	6.0	Unresolved
		2017/05/29 01:10:00	8.0	Unresolved
		2017/05/29 05:50:00	5.0	Unresolved
		2017/05/29 07:00:00	7.0	Unresolved
		2017/05/29 07:10:00	6.0	Unresolved
		2017/06/13 07:10:00	5.0	Mondi
		2017/06/13 19:30:00	5.0	Mondi
		2017/06/16 01:40:00	5.0	Unresolved
		2017/06/17 21:10:00	5.0	Unresolved
		2017/06/17 21:50:00	5.0	Unresolved
		2017/06/17 22:00:00	5.0	Unresolved
		2017/06/17 22:10:00	5.0	Unresolved
		2017/06/17 22:30:00	5.0	Unresolved
		2017/06/18 03:20:00	5.0	Unresolved
		2017/06/18 03:30:00	5.0	Unresolved
		2017/06/18 03:40:00	5.0	Unresolved
		2017/06/20 22:10:00	5.0	Unresolved
		2017/06/20 22:20:00	5.0	Unresolved
		2017/07/04 04:10:00	5.0	Mondi
		2017/07/04 05:50:00	5.0	Mondi
		2017/07/04 06:20:00	5.0	Mondi
		2017/07/04 06:30:00	8.0	Mondi
		2017/07/20 08:50:00	5.0	Mondi
		2017/07/20 09:00:00	5.0	Mondi
		2017/07/20 20:20:00	5.0	Mondi
		2017/07/22 23:00:00	5.0	Mondi
		2017/07/22 23:10:00	5.0	Mondi
		2017/07/22 23:50:00	7.0	Mondi
		2017/07/23 00:00:00	8.0	Mondi
		2017/07/23 00:10:00	6.0	Mondi
		2017/07/23 00:20:00	6.0	Mondi
		2017/07/23 00:30:00	5.0	Mondi
		2017/07/23 01:10:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/07/23 01:20:00	8.0	Mondi
		2017/07/23 08:00:00	5.0	Mondi
		2017/07/23 23:30:00	7.0	Mondi
		2017/07/23 23:40:00	5.0	Mondi
		2017/07/24 01:40:00	5.0	Mondi
		2017/07/24 04:10:00	5.0	Mondi
		2017/07/24 04:20:00	5.0	Mondi
		2017/07/24 04:30:00	5.0	Mondi
		2017/07/24 06:00:00	5.0	Mondi
		2017/07/26 02:40:00	10.0	Mondi
		2017/07/26 02:50:00	12.0	Mondi
		2017/07/26 03:20:00	5.0	Mondi
		2017/07/26 03:30:00	7.0	Mondi
		2017/07/26 03:40:00	7.0	Mondi
		2017/07/26 03:50:00	5.0	Mondi
		2017/07/26 04:10:00	5.0	Mondi
		2017/07/26 04:20:00	6.0	Mondi
		2017/07/27 00:40:00	5.0	Mondi
		2017/07/27 00:50:00	6.0	Mondi
		2017/07/27 02:00:00	7.0	Mondi
		2017/07/27 22:30:00	5.0	Mondi
		2017/07/27 22:40:00	5.0	Mondi
		2017/07/29 22:20:00	5.0	Mondi
		2017/07/29 23:40:00	7.0	Mondi
		2017/07/29 23:50:00	9.0	Mondi
		2017/07/30 00:00:00	7.0	Mondi
		2017/07/30 00:10:00	8.0	Mondi
		2017/07/30 00:20:00	5.0	Mondi
		2017/07/30 01:10:00	6.0	Mondi
		2017/07/30 01:20:00	8.0	Mondi
		2017/07/30 01:30:00	9.0	Mondi
		2017/07/30 01:40:00	9.0	Mondi
		2017/07/30 01:50:00	8.0	Mondi
		2017/07/30 02:00:00	8.0	Mondi
		2017/07/30 02:10:00	8.0	Mondi
		2017/07/30 02:20:00	5.0	Mondi
		2017/07/30 02:50:00	5.0	Mondi
		2017/07/30 03:00:00	6.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/07/30 04:50:00	5.0	Mondi
		2017/07/30 05:00:00	5.0	Mondi
		2017/08/03 03:10:00	7.0	Mondi
		2017/08/03 03:20:00	10.0	Mondi
		2017/08/03 03:30:00	8.0	Mondi
		2017/08/07 08:00:00	7.0	Mondi
		2017/08/07 08:10:00	6.0	Mondi
		2017/08/08 08:40:00	7.0	Mondi
		2017/08/08 08:50:00	6.0	Mondi
		2017/08/08 09:00:00	5.0	Mondi
		2017/08/08 09:10:00	6.0	Mondi
		2017/08/08 09:20:00	5.0	Mondi
		2017/08/12 02:10:00	5.0	Mondi
		2017/08/12 02:20:00	5.0	Mondi
		2017/08/12 02:30:00	5.0	Mondi
		2017/08/12 02:40:00	5.0	Mondi
		2017/08/12 02:50:00	5.0	Mondi
		2017/08/12 03:00:00	5.0	Mondi
		2017/08/12 03:10:00	6.0	Mondi
		2017/08/12 03:20:00	6.0	Mondi
		2017/08/12 03:30:00	5.0	Mondi
		2017/08/12 04:30:00	5.0	Mondi
		2017/08/12 04:40:00	5.0	Mondi
		2017/08/12 06:50:00	5.0	Mondi
		2017/08/12 07:00:00	7.0	Mondi
		2017/08/12 07:10:00	5.0	Mondi
		2017/08/12 07:20:00	5.0	Mondi
		2017/08/12 07:30:00	5.0	Mondi
		2017/08/12 07:40:00	5.0	Mondi
		2017/08/12 07:50:00	5.0	Mondi
		2017/08/12 21:20:00	6.0	Mondi
		2017/08/12 21:30:00	7.0	Mondi
		2017/08/12 21:40:00	6.0	Mondi
		2017/08/12 21:50:00	7.0	Mondi
		2017/08/12 22:00:00	7.0	Mondi
		2017/08/12 22:10:00	6.0	Mondi
		2017/08/12 22:20:00	5.0	Mondi
		2017/08/12 22:30:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/08/12 22:50:00	5.0	Mondi
		2017/08/13 00:50:00	5.0	Mondi
		2017/08/13 01:00:00	6.0	Mondi
		2017/08/13 01:10:00	5.0	Mondi
		2017/08/13 02:10:00	5.0	Mondi
		2017/08/13 02:20:00	6.0	Mondi
		2017/08/13 02:30:00	7.0	Mondi
		2017/08/13 02:40:00	5.0	Mondi
		2017/08/13 05:00:00	5.0	Mondi
		2017/08/16 01:40:00	5.0	Mondi
		2017/08/16 04:40:00	6.0	Mondi
		2017/08/16 04:50:00	6.0	Mondi
		2017/08/16 05:40:00	6.0	Mondi
		2017/08/16 05:50:00	6.0	Mondi
		2017/08/16 06:00:00	6.0	Mondi
		2017/08/16 07:30:00	6.0	Mondi
		2017/08/16 21:10:00	5.0	Mondi
		2017/08/17 21:40:00	5.0	Mondi
		2017/08/17 21:50:00	5.0	Mondi
		2017/08/18 00:40:00	5.0	Mondi
		2017/08/18 02:10:00	5.0	Mondi
		2017/08/18 02:40:00	5.0	Mondi
		2017/08/18 02:50:00	5.0	Mondi
		2017/08/18 03:00:00	5.0	Mondi
		2017/08/18 03:20:00	5.0	Mondi
		2017/08/18 03:30:00	5.0	Mondi
		2017/08/18 05:20:00	5.0	Mondi
		2017/08/18 05:30:00	5.0	Mondi
		2017/08/18 06:00:00	5.0	Mondi
		2017/08/18 06:20:00	6.0	Mondi
		2017/08/18 06:30:00	6.0	Mondi
		2017/08/18 06:40:00	5.0	Mondi
		2017/08/18 07:00:00	6.0	Mondi
		2017/08/18 07:20:00	6.0	Mondi
		2017/08/18 07:30:00	6.0	Mondi
		2017/08/18 08:20:00	5.0	Mondi
		2017/08/18 08:30:00	6.0	Mondi
		2017/08/19 03:50:00	6.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/08/19 06:05:00	6.0	Mondi
		2017/08/19 06:40:00	5.0	Mondi
		2017/08/20 03:30:00	6.0	Mondi
		2017/08/20 03:40:00	6.0	Mondi
		2017/08/23 04:50:00	6.0	Mondi
		2017/08/23 05:00:00	6.0	Mondi
		2017/08/24 08:20:00	7.0	Mondi
		2017/08/24 08:30:00	9.0	Mondi
		2017/08/24 08:40:00	6.0	Mondi
		2017/08/28 00:50:00	7.0	Unknown Source
		2017/08/28 01:00:00	16.0	Unknown Source
		2017/08/28 01:10:00	18.0	Unknown Source
		2017/08/28 01:20:00	12.0	Unknown Source
		2017/08/28 01:30:00	6.0	Unknown Source
		2017/08/28 01:40:00	5.0	Unknown Source
		2017/08/28 02:20:00	5.0	Unknown Source
		2017/08/28 02:50:00	6.0	Unknown Source
		2017/08/28 03:00:00	7.0	Unknown Source
		2017/08/28 03:10:00	8.0	Unknown Source
		2017/08/28 03:20:00	9.0	Unknown Source
		2017/08/28 03:30:00	6.0	Unknown Source
		2017/08/28 03:50:00	5.0	Unknown Source
		2017/08/28 04:20:00	6.0	Unknown Source
		2017/08/28 04:30:00	9.0	Unknown Source
		2017/08/28 04:40:00	6.0	Unknown Source
		2017/08/28 05:00:00	8.0	Unknown Source
		2017/08/28 05:10:00	11.0	Unknown Source
		2017/08/28 05:20:00	9.0	Unknown Source
		2017/08/28 05:30:00	5.0	Unknown Source
		2017/08/28 05:40:00	6.0	Unknown Source
		2017/08/28 05:50:00	6.0	Unknown Source
		2017/09/02 19:50:00	5.0	Mondi
		2017/09/02 20:30:00	6.0	Mondi
		2017/09/02 20:40:00	5.0	Mondi
		2017/09/08 02:10:00	7.0	Mondi
		2017/09/08 02:20:00	6.0	Mondi
		2017/09/08 02:30:00	5.0	Mondi
		2017/09/08 02:40:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/09/08 06:30:00	5.0	Mondi
		2017/09/08 06:40:00	5.0	Mondi
		2017/09/20 23:30:00	5.0	Mondi
		2017/09/21 00:50:00	6.0	Unallocated
		2017/09/21 02:10:00	5.0	Unallocated
		2017/09/21 02:30:00	5.0	Unallocated
		2017/09/21 02:40:00	5.0	Unallocated
		2017/10/05 08:40:00	5.0	Mondi
		2017/10/05 08:50:00	5.0	Mondi
		2017/10/05 10:40:00	5.0	Mondi
		2017/10/17 21:00:00	5.0	Mondi
		2017/10/17 21:10:00	5.0	Mondi
		2017/10/17 21:30:00	7.0	Mondi
		2017/10/17 21:40:00	7.0	Mondi
		2017/10/17 21:50:00	6.0	Mondi
		2017/10/17 22:00:00	6.0	Mondi
		2017/10/18 00:30:00	7.0	Mondi
		2017/10/18 00:40:00	7.0	Mondi
		2017/10/28 20:30:00	5.0	Mondi
		2017/10/28 20:40:00	9.0	Mondi
		2017/10/28 20:50:00	8.0	Mondi
		2017/10/28 21:00:00	6.0	Mondi
		2017/10/28 21:10:00	6.0	Mondi
		2017/10/28 21:20:00	5.0	Mondi
		2017/10/28 21:30:00	5.0	Mondi
		2017/10/28 23:20:00	5.0	Mondi
		2017/11/30 00:30:00	5.0	Unknown Source
		2017/11/30 05:20:00	5.0	Unknown Source
		2017/11/30 05:30:00	5.0	Unknown Source
		2017/11/30 05:50:00	5.0	Unknown Source
		2017/12/01 22:20:00	5.0	Mondi
		2017/12/01 22:30:00	6.0	Mondi
		2017/12/03 23:10:00	7.0	Mondi
		2017/12/04 00:30:00	9.0	Mondi
		2017/12/04 00:50:00	5.0	Mondi
		2017/12/04 01:00:00	6.0	Mondi
		2017/12/04 05:00:00	5.0	Mondi
		2017/12/04 22:50:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/12/05 03:30:00	6.0	Mondi
		2017/12/05 03:40:00	7.0	Mondi
		2017/12/05 07:20:00	9.0	Mondi
		2017/12/05 07:30:00	11.0	Mondi
		2017/12/05 07:40:00	8.0	Mondi
		2017/12/05 07:50:00	6.0	Mondi
		2017/12/05 08:00:00	5.0	Mondi
		2017/12/05 08:10:00	5.0	Mondi
		2017/12/05 21:00:00	6.0	Mondi
		2017/12/05 22:30:00	5.0	Mondi
		2017/12/07 02:00:00	5.0	Mondi
		2017/12/07 02:10:00	6.0	Mondi
		2017/12/07 02:20:00	5.0	Mondi
		2017/12/07 02:30:00	5.0	Mondi
		2017/12/07 02:40:00	8.0	Mondi
		2017/12/07 02:50:00	12.0	Mondi
		2017/12/07 03:00:00	10.0	Mondi
		2017/12/11 04:00:00	6.0	Mondi
		2017/12/11 04:10:00	6.0	Mondi
		2017/12/13 20:50:00	6.0	Mondi
		2017/12/14 23:00:00	6.0	Mondi
		2017/12/14 23:10:00	6.0	Mondi
		2017/12/14 23:20:00	5.0	Mondi
		2017/12/15 03:10:00	6.0	Mondi
		2017/12/15 03:20:00	8.0	Mondi
		2017/12/15 03:30:00	8.0	Mondi
		2017/12/15 03:40:00	8.0	Mondi
		2017/12/15 03:50:00	5.0	Mondi
		2017/12/15 04:10:00	7.0	Mondi
		2017/12/15 05:00:00	7.0	Mondi
		2017/12/15 05:10:00	6.0	Mondi
RBCAA 10-minute Target (4.5 ppb)	eSikhaleni	2017/01/22 03:30:00	6.0	Mondi
		2017/01/22 03:40:00	5.0	Mondi
		2017/01/27 01:40:00	10.0	Unresolved
		2017/01/27 01:50:00	6.0	Unresolved
		2017/01/27 18:40:00	5.0	Unresolved
		2017/01/28 00:10:00	5.0	Unresolved
		2017/01/28 00:20:00	5.0	Unresolved

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/01/31 03:30:00	5.0	Mondi
		2017/01/31 03:40:00	6.0	Mondi
		2017/01/31 20:10:00	5.0	Mondi
		2017/01/31 20:40:00	5.0	Mondi
		2017/01/31 20:50:00	5.0	Mondi
		2017/01/31 21:00:00	5.0	Mondi
		2017/02/10 21:00:00	5.0	Mondi
		2017/02/10 23:00:00	12.0	Mondi
		2017/02/10 23:30:00	10.0	Mondi
		2017/02/10 23:40:00	6.0	Mondi
		2017/02/11 04:30:00	6.0	Mondi
		2017/02/11 04:40:00	7.0	Mondi
		2017/02/11 05:10:00	6.0	Mondi
		2017/02/11 05:30:00	6.0	Mondi
		2017/02/11 05:40:00	5.0	Mondi
		2017/02/25 06:30:00	5.0	Mondi
		2017/03/17 19:10:00	13.0	Mondi
		2017/03/17 19:20:00	18.0	Mondi
		2017/03/17 19:30:00	17.0	Mondi
		2017/03/17 19:40:00	13.0	Mondi
		2017/03/17 19:50:00	6.0	Mondi
		2017/03/29 22:30:00	13.0	Mondi
		2017/03/29 22:40:00	9.0	Mondi
		2017/04/08 04:00:00	6.0	
		2017/05/30 02:30:00	5.0	Unresolved
		2017/05/31 06:10:00	5.0	Unresolved
		2017/05/31 06:20:00	5.0	Unresolved
		2017/05/31 08:10:00	10.0	Unresolved
		2017/05/31 08:20:00	8.0	Unresolved
		2017/05/31 08:50:00	5.0	Unresolved
		2017/05/31 22:10:00	5.0	Unresolved
		2017/05/31 22:20:00	9.0	Unresolved
		2017/05/31 22:30:00	13.0	Unresolved
		2017/05/31 22:40:00	12.0	Unresolved
		2017/05/31 22:50:00	10.0	Unresolved
		2017/05/31 23:00:00	8.0	Unresolved
		2017/06/02 09:20:00	5.0	Mondi
		2017/06/02 09:30:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/06/02 22:50:00	6.0	Mondi
		2017/06/02 23:00:00	8.0	Mondi
		2017/06/02 23:10:00	9.0	Mondi
		2017/06/02 23:20:00	9.0	Mondi
		2017/06/02 23:30:00	8.0	Mondi
		2017/06/02 23:40:00	7.0	Mondi
		2017/06/02 23:50:00	7.0	Mondi
		2017/06/03 00:00:00	5.0	Unresolved
		2017/06/03 07:30:00	7.0	Unresolved
		2017/06/03 07:40:00	10.0	Unresolved
		2017/06/03 07:50:00	7.0	Unresolved
		2017/06/03 08:00:00	5.0	Unresolved
		2017/06/03 08:10:00	5.0	Unresolved
		2017/06/09 20:30:00	5.0	Mondi
		2017/06/09 20:40:00	6.0	Mondi
		2017/06/09 20:50:00	5.0	Mondi
		2017/06/09 21:00:00	5.0	Mondi
		2017/06/11 06:40:00	5.0	Mondi
		2017/06/11 20:40:00	5.0	Mondi
		2017/06/12 22:10:00	12.0	Unresolved
		2017/06/12 22:20:00	16.0	Unresolved
		2017/06/12 22:30:00	14.0	Unresolved
		2017/06/12 22:40:00	14.0	Unresolved
		2017/06/12 22:50:00	9.0	Unresolved
		2017/06/13 01:00:00	10.0	Mondi
		2017/06/13 01:10:00	10.0	Mondi
		2017/06/13 01:50:00	13.0	Mondi
		2017/06/13 02:00:00	8.0	Mondi
		2017/06/15 02:20:00	5.0	Unresolved
		2017/06/15 02:30:00	6.0	Unresolved
		2017/06/15 02:40:00	5.0	Unresolved
		2017/06/15 03:00:00	5.0	Unresolved
		2017/06/15 03:10:00	7.0	Unresolved
		2017/06/15 03:20:00	14.0	Unresolved
		2017/06/15 03:30:00	17.0	Unresolved
		2017/06/15 03:40:00	13.0	Unresolved
		2017/06/15 03:50:00	13.0	Unresolved
		2017/06/15 04:00:00	14.0	Unresolved

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/06/15 04:10:00	12.0	Unresolved
		2017/06/15 04:20:00	9.0	Unresolved
		2017/06/15 04:30:00	10.0	Unresolved
		2017/06/15 04:40:00	8.0	Unresolved
		2017/06/15 04:50:00	7.0	Unresolved
		2017/06/15 05:00:00	6.0	Unresolved
		2017/06/15 05:10:00	5.0	Unresolved
		2017/06/15 05:20:00	5.0	Unresolved
		2017/06/17 06:30:00	5.0	Unresolved
		2017/06/17 06:40:00	5.0	Unresolved
		2017/06/17 07:30:00	6.0	Unresolved
		2017/06/17 07:40:00	5.0	Unresolved
		2017/06/18 19:50:00	5.0	Unresolved
		2017/06/18 20:00:00	12.0	Unresolved
		2017/06/18 20:10:00	14.0	Unresolved
		2017/06/18 20:20:00	11.0	Unresolved
		2017/06/18 20:30:00	7.0	Unresolved
		2017/06/18 20:50:00	5.0	Unresolved
		2017/06/18 21:00:00	5.0	Unresolved
		2017/06/18 21:50:00	8.0	Unresolved
		2017/06/18 22:00:00	8.0	Unresolved
		2017/06/19 00:40:00	7.0	Unresolved
		2017/06/19 00:50:00	10.0	Unresolved
		2017/06/19 01:00:00	11.0	Unresolved
		2017/06/19 01:10:00	14.0	Unresolved
		2017/06/19 01:20:00	15.0	Unresolved
		2017/06/19 01:30:00	11.0	Unresolved
		2017/06/19 01:40:00	7.0	Unresolved
		2017/06/19 01:50:00	5.0	Unresolved
		2017/06/19 02:00:00	5.0	Unresolved
		2017/06/19 02:10:00	6.0	Unresolved
		2017/06/19 02:20:00	6.0	Unresolved
		2017/06/19 02:30:00	6.0	Unresolved
		2017/06/20 05:50:00	9.0	Unresolved
		2017/06/20 06:00:00	14.0	Unresolved
		2017/06/20 06:10:00	7.0	Unresolved
		2017/06/20 06:20:00	10.0	Unresolved
		2017/06/20 06:30:00	8.0	Unresolved

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/06/20 06:40:00	6.0	Unresolved
		2017/06/20 07:00:00	9.0	Unresolved
		2017/06/20 07:10:00	9.0	Unresolved
		2017/06/20 07:20:00	6.0	Unresolved
		2017/06/20 07:30:00	6.0	Unresolved
		2017/06/20 08:20:00	6.0	Unresolved
		2017/06/20 08:50:00	7.0	Unresolved
		2017/06/20 09:00:00	6.0	Unresolved
		2017/06/22 22:20:00	5.0	Unresolved
		2017/06/24 22:20:00	7.0	Unresolved
		2017/07/01 22:20:00	6.0	Unknown source
		2017/07/09 04:50:00	5.0	Mondi
		2017/07/09 05:50:00	6.0	Mondi
		2017/07/09 06:00:00	10.0	Mondi
		2017/07/09 06:10:00	12.0	Mondi
		2017/07/09 06:20:00	8.0	Mondi
		2017/07/09 06:30:00	5.0	Mondi
		2017/07/18 06:20:00	5.0	Mondi
		2017/07/25 18:40:00	5.0	Mondi
		2017/07/25 18:50:00	5.0	Mondi
		2017/07/25 19:00:00	5.0	Mondi
		2017/07/28 18:50:00	5.0	Mondi
		2017/07/31 18:10:00	5.0	Mondi
		2017/08/02 07:00:00	5.0	Unknown Source
		2017/08/02 07:10:00	7.0	Unknown Source
		2017/08/02 07:20:00	8.0	Unknown Source
		2017/08/02 07:30:00	10.0	Unknown Source
		2017/08/02 07:40:00	7.0	Unknown Source
		2017/08/02 07:50:00	5.0	Unknown Source
		2017/08/02 08:00:00	6.0	Unknown Source
		2017/08/02 08:10:00	5.0	Unknown Source
		2017/08/02 08:50:00	5.0	Unknown Source
		2017/08/02 09:00:00	5.0	Unknown Source
		2017/08/02 17:50:00	5.0	Unknown Source
		2017/08/02 18:10:00	5.0	Unknown Source
		2017/08/02 18:20:00	6.0	Unknown Source
		2017/08/15 04:30:00	6.0	Mondi
		2017/08/15 04:40:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/08/15 05:10:00	5.0	Mondi
		2017/08/15 20:30:00	5.0	Mondi
		2017/08/22 06:30:00	5.0	Mondi
		2017/08/22 06:40:00	10.0	Mondi
		2017/08/22 06:50:00	8.0	Mondi
		2017/08/22 07:00:00	5.0	Mondi
		2017/08/22 07:10:00	7.0	Mondi
		2017/09/02 21:00:00	5.0	Mondi
		2017/09/02 21:10:00	5.0	Mondi
		2017/09/02 21:20:00	5.0	Mondi
		2017/09/06 21:30:00	7.0	Mondi
		2017/09/06 21:40:00	7.0	Mondi
		2017/09/06 21:50:00	10.0	Mondi
		2017/09/06 22:00:00	10.0	Mondi
		2017/09/06 22:10:00	11.0	Mondi
		2017/09/06 22:20:00	8.0	Mondi
		2017/09/06 22:30:00	7.0	Mondi
		2017/09/06 22:40:00	6.0	Mondi
		2017/09/12 00:40:00	5.0	Mondi
		2017/09/12 00:50:00	7.0	Mondi
		2017/09/12 01:00:00	6.0	Mondi
		2017/09/13 06:30:00	5.0	Mondi
		2017/09/13 09:20:00	5.0	Mondi
		2017/09/13 09:30:00	5.0	Mondi
		2017/10/07 02:20:00	10.0	Mondi
		2017/10/07 02:30:00	14.0	Mondi
		2017/10/07 02:40:00	11.0	Mondi
		2017/10/07 02:50:00	8.0	Mondi
		2017/10/07 03:00:00	5.0	Mondi
		2017/10/07 03:10:00	6.0	Mondi
		2017/10/07 03:20:00	6.0	Mondi
		2017/10/07 03:30:00	5.0	Mondi
		2017/10/07 03:40:00	5.0	Mondi
		2017/10/07 03:50:00	5.0	Mondi
		2017/10/12 05:30:00	6.0	Mondi
		2017/10/12 05:40:00	6.0	Mondi
		2017/10/12 06:00:00	5.0	Mondi
		2017/10/12 06:50:00	5.0	Mondi

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/10/18 22:50:00	5.0	Mondi
		2017/10/18 23:00:00	5.0	Mondi
		2017/10/21 20:50:00	6.0	Mondi
		2017/10/21 21:00:00	6.0	Mondi
		2017/10/21 22:30:00	5.0	Mondi
		2017/10/21 22:40:00	6.0	Mondi
		2017/10/29 05:10:00	5.0	Mondi
		2017/10/29 05:20:00	5.0	Mondi
		2017/10/29 07:20:00	6.0	Mondi
		2017/10/29 07:30:00	6.0	Mondi
		2017/11/19 04:30:00	5.0	Unknown Source
		2017/11/19 04:40:00	5.0	Unknown Source
		2017/12/02 22:30:00	7.0	Mondi
OME 10-minute TRS health standard (9.3 ppb)	CBD	2017/07/26 02:40:00	10.0	Mondi
		2017/07/26 02:50:00	12.0	Mondi
		2017/08/03 03:20:00	10.0	Mondi
		2017/08/28 01:00:00	16.0	Unknown Source
		2017/08/28 01:10:00	18.0	Unknown Source
		2017/08/28 01:20:00	12.0	Unknown Source
		2017/08/28 05:10:00	11.0	Unknown Source
		2017/12/05 07:30:00	11.0	Mondi
		2017/12/07 02:50:00	12.0	Mondi
		2017/12/07 03:00:00	10.0	Mondi
OME 10-minute TRS health standard (9.3 ppb)	eSikhaleni	2017/01/27 01:40:00	10.0	Unresolved
		2017/02/10 23:00:00	12.0	Mondi
		2017/02/10 23:30:00	10.0	Mondi
		2017/03/17 19:10:00	13.0	Mondi
		2017/03/17 19:20:00	18.0	Mondi
		2017/03/17 19:30:00	17.0	Mondi
		2017/03/17 19:40:00	13.0	Mondi
		2017/03/29 22:30:00	13.0	Mondi
		2017/05/31 08:10:00	10.0	Unresolved
		2017/05/31 22:30:00	13.0	Unresolved
		2017/05/31 22:40:00	12.0	Unresolved
		2017/05/31 22:50:00	10.0	Unresolved
		2017/06/03 07:40:00	10.0	Unresolved
		2017/06/12 22:10:00	12.0	Unresolved
		2017/06/12 22:20:00	16.0	Unresolved

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/06/12 22:30:00	14.0	Unresolved
		2017/06/12 22:40:00	14.0	Unresolved
		2017/06/13 01:00:00	10.0	Mondi
		2017/06/13 01:10:00	10.0	Mondi
		2017/06/13 01:50:00	13.0	Mondi
		2017/06/15 03:20:00	14.0	Unresolved
		2017/06/15 03:30:00	17.0	Unresolved
		2017/06/15 03:40:00	13.0	Unresolved
		2017/06/15 03:50:00	13.0	Unresolved
		2017/06/15 04:00:00	14.0	Unresolved
		2017/06/15 04:10:00	12.0	Unresolved
		2017/06/15 04:30:00	10.0	Unresolved
		2017/06/18 20:00:00	12.0	Unresolved
		2017/06/18 20:10:00	14.0	Unresolved
		2017/06/18 20:20:00	11.0	Unresolved
		2017/06/19 00:50:00	10.0	Unresolved
		2017/06/19 01:00:00	11.0	Unresolved
		2017/06/19 01:10:00	14.0	Unresolved
		2017/06/19 01:20:00	15.0	Unresolved
		2017/06/19 01:30:00	11.0	Unresolved
		2017/06/20 06:00:00	14.0	Unresolved
		2017/06/20 06:20:00	10.0	Unresolved
		2017/09/06 21:50:00	10.0	Mondi
		2017/09/06 22:00:00	10.0	Mondi
		2017/09/06 22:10:00	11.0	Mondi
		2017/10/07 02:20:00	10.0	Mondi
		2017/10/07 02:30:00	14.0	Mondi
		2017/10/07 02:40:00	11.0	Mondi
WHO 30-minute H ₂ S Guideline (5.0 ppb)	CBD	2017/01/03 23:30:00	7.0	Mondi
		2017/01/04 02:30:00	5.0	Mondi
		2017/01/04 03:00:00	8.0	Mondi
		2017/01/04 03:30:00	6.0	Mondi
		2017/01/04 08:00:00	7.0	Mondi
		2017/01/04 08:30:00	5.0	Mondi
		2017/01/04 09:00:00	6.0	Mondi
		2017/01/07 05:30:00	6.0	Mondi
		2017/01/07 07:00:00	5.0	Mondi
		2017/01/10 01:30:00	6.0	Mondi

Standard/Guideline/Target	Station	Date	Value (µg/m ³)	Allocation
		2017/01/10 02:00:00	8.0	Mondi
		2017/01/11 00:00:00	8.0	Unresolved
		2017/01/11 00:30:00	6.0	Unresolved
		2017/01/11 01:30:00	7.0	Unresolved
		2017/01/11 03:00:00	7.0	Unresolved
		2017/01/15 05:30:00	6.0	Mondi
		2017/01/20 02:30:00	6.0	Mondi
		2017/02/06 05:30:00	6.0	Mondi
		2017/05/12 00:30:00	6.0	Mondi
		2017/05/15 05:00:00	6.0	Mondi
		2017/05/27 02:00:00	6.0	Mondi
		2017/05/27 02:30:00	6.0	Mondi
		2017/05/27 03:00:00	6.0	Mondi
		2017/05/27 05:00:00	5.0	Mondi
		2017/05/27 05:30:00	5.0	Mondi
		2017/05/29 07:00:00	6.0	Unresolved
		2017/07/23 00:00:00	7.0	Mondi
		2017/07/26 02:30:00	8.0	Mondi
		2017/07/26 03:30:00	6.0	Mondi
		2017/07/29 23:30:00	6.0	Mondi
		2017/07/30 00:00:00	7.0	Mondi
		2017/07/30 01:00:00	6.0	Mondi
		2017/07/30 01:30:00	8.0	Mondi
		2017/07/30 02:00:00	7.0	Mondi
		2017/08/03 03:00:00	6.0	Mondi
		2017/08/07 08:00:00	6.0	Mondi
		2017/08/08 08:30:00	6.0	Mondi
		2017/08/08 09:00:00	5.0	Mondi
		2017/08/12 03:00:00	6.0	Mondi
		2017/08/12 07:00:00	6.0	Mondi
		2017/08/12 21:30:00	7.0	Mondi
		2017/08/12 22:00:00	6.0	Mondi
		2017/08/18 07:00:00	5.0	Mondi
		2017/08/24 08:30:00	5.0	Mondi
		2017/08/28 01:00:00	15.0	Unknown Source
		2017/08/28 01:30:00	5.0	Unknown Source
		2017/08/28 03:00:00	8.0	Unknown Source
		2017/08/28 04:30:00	6.0	Unknown Source

Standard/Guideline/Target	Station	Date	Value (µg/m³)	Allocation
		2017/08/28 05:00:00	9.0	Unknown Source
		2017/08/28 05:30:00	6.0	Unknown Source
		2017/09/08 02:00:00	5.0	Mondi
		2017/10/17 21:30:00	6.0	Mondi
		2017/10/18 00:30:00	6.0	Mondi
		2017/10/28 20:30:00	8.0	Mondi
		2017/10/28 21:00:00	6.0	Mondi
		2017/12/04 00:30:00	6.0	Mondi
		2017/12/05 03:30:00	6.0	Mondi
		2017/12/05 07:30:00	8.0	Mondi
		2017/12/07 02:00:00	5.0	Mondi
		2017/12/07 02:30:00	8.0	Mondi
		2017/12/11 04:00:00	5.0	Mondi
		2017/12/14 23:00:00	6.0	Mondi
		2017/12/15 03:00:00	6.0	Mondi
		2017/12/15 03:30:00	7.0	Mondi
		2017/12/15 05:00:00	5.0	Mondi
WHO 30-minute H2S Guideline (5.0 ppb)	eSikhaleni	2017/01/22 03:30:00	5.0	Mondi
		2017/01/27 01:30:00	6.0	Unresolved
		2017/02/10 23:00:00	6.0	Mondi
		2017/02/10 23:30:00	6.0	Mondi
		2017/02/11 04:30:00	6.0	Mondi
		2017/03/17 19:00:00	11.0	Mondi
		2017/03/17 19:30:00	12.0	Mondi
		2017/03/29 22:30:00	8.0	Mondi
		2017/05/31 08:00:00	7.0	Unresolved
		2017/05/31 22:00:00	6.0	Unresolved
		2017/05/31 22:30:00	11.0	Unresolved
		2017/06/02 23:00:00	9.0	Mondi
		2017/06/02 23:30:00	7.0	Mondi
		2017/06/03 07:30:00	8.0	Unresolved
		2017/06/09 20:30:00	6.0	Mondi
		2017/06/12 22:00:00	10.0	Unresolved
		2017/06/12 22:30:00	12.0	Unresolved
		2017/06/13 01:00:00	8.0	Mondi
		2017/06/13 01:30:00	6.0	Mondi
		2017/06/15 02:30:00	5.0	Unresolved
		2017/06/15 03:00:00	8.0	Unresolved

Standard/Guideline/Target	Station	Date	Value ($\mu\text{g}/\text{m}^3$)	Allocation
		2017/06/15 03:30:00	14.0	Unresolved
		2017/06/15 04:00:00	12.0	Unresolved
		2017/06/15 04:30:00	8.0	Unresolved
		2017/06/15 05:00:00	5.0	Unresolved
		2017/06/18 20:00:00	12.0	Unresolved
		2017/06/18 20:30:00	6.0	Unresolved
		2017/06/19 00:30:00	7.0	Unresolved
		2017/06/19 01:00:00	13.0	Unresolved
		2017/06/19 01:30:00	8.0	Unresolved
		2017/06/19 02:00:00	6.0	Unresolved
		2017/06/20 06:00:00	10.0	Unresolved
		2017/06/20 06:30:00	6.0	Unresolved
		2017/06/20 07:00:00	8.0	Unresolved
		2017/09/06 21:30:00	8.0	Mondi
		2017/09/06 22:00:00	10.0	Mondi
		2017/09/06 22:30:00	6.0	Mondi
		2017/09/12 00:30:00	5.0	Mondi
		2017/10/07 02:30:00	11.0	Mondi
		2017/10/07 03:00:00	6.0	Mondi
		2017/10/12 05:30:00	5.0	Mondi

APPENDIX H

Meteorological Monitoring

METEOROLOGICAL MONITORING

Meteorological Data Capture

The percentage of valid data received from the meteorological network for 2017 is shown in

Table H1: Meteorological data capture.

Station	Height (m)	Station Availability (%)	Wind Direction & Speed (%)	Temperature (%)	Relative Humidity (%)	Pressure (%)	Solar Radiation (%)	Rain (%)
Airport	2	80		80	80	80	42	
Airport	10	80	77					
Arboretum	3	97		96				
Arboretum	18	97	97					
CBD	2	98		98	98			98
CBD	10	98	88					
eSikhaleni	2	91		91				
eSikhaleni	9	91	91					
Mtunzini	2	99		98	98			
Mtunzini	9	99	93					
Brackenham	3	100		99				
Brackenham	10	100	93					
Harbour West	2	100		100				
Harbour West	10	100	97					

Notes:

- Red - Not acceptable for statistical purposes (<80%);
- Yellow – Acceptable for statistical purposes but does not meet SANAS data capture requirements (<90%);
- White – Meets SANAS data capture requirements (>=90%); and,
- Blue - RBCAA Target (>=98%)

Missing Data:

- Airport (Station, Temperature, Relative Humidity, Pressure) - station struck by lightning, router and logger faulty (Jan - Mar);
- Airport (Wind Speed and Direction) - station struck by lightning, anemometer faulty (Jan - April);
- Airport (Solar Radiation) - station struck by lightning, solar radiation sensor faulty (Jan - Jul);
- CBD (Wind Speed and Direction) - anemometer faulty, worn bearing (April - May); and,
- Mtunzini (Station) - decommissioned in September.

Wind Field

Monthly wind roses for 2017 and 2016 at Arboretum are presented in Figure A. They indicate that wind blew predominantly along the NE and SW axis. NE wind is generally associated with fair weather, while SW wind is usually associated with the passage of coastal lows, cold fronts and inclement weather.

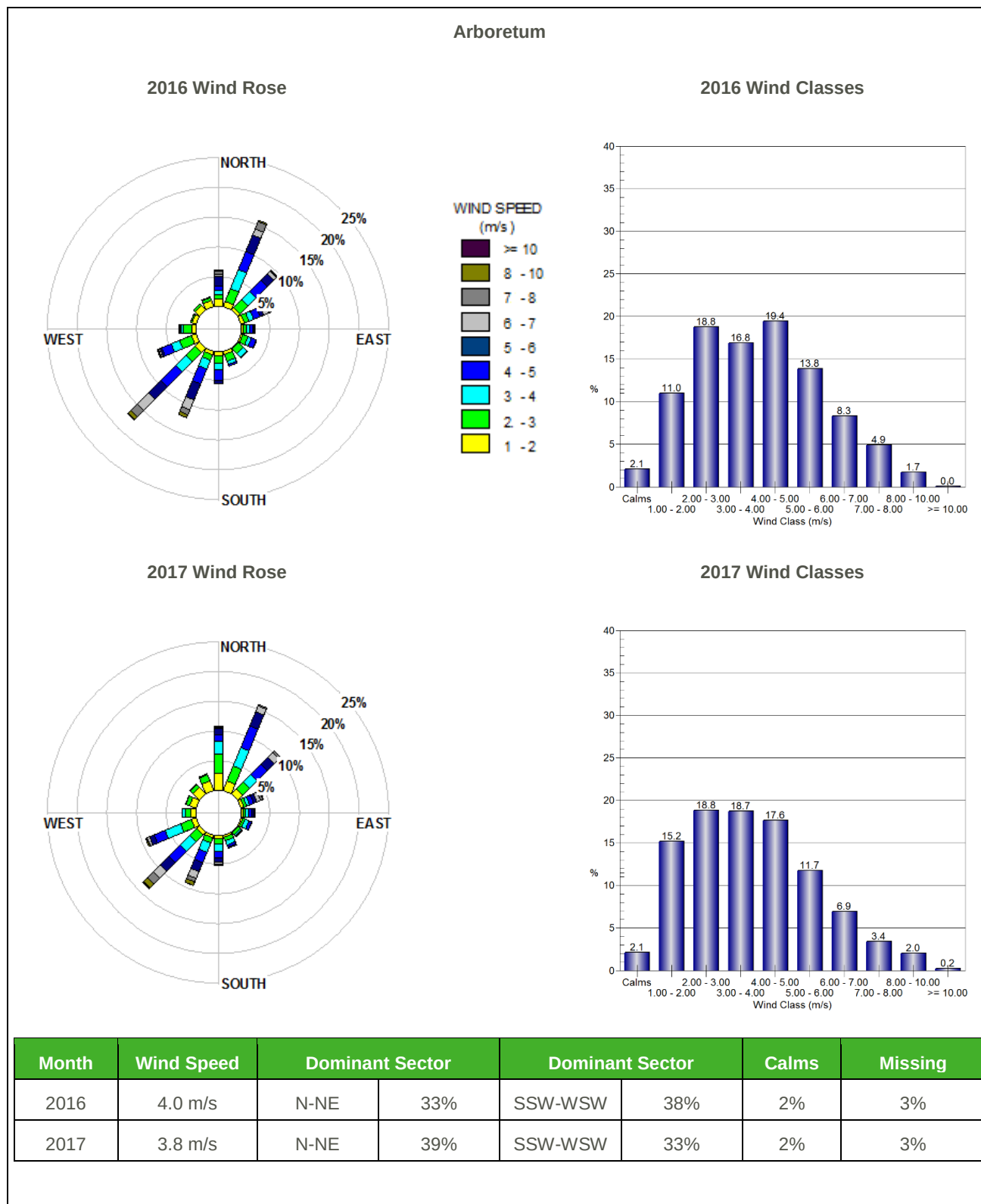
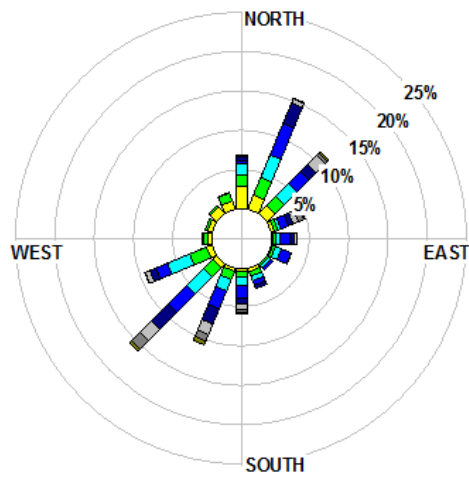


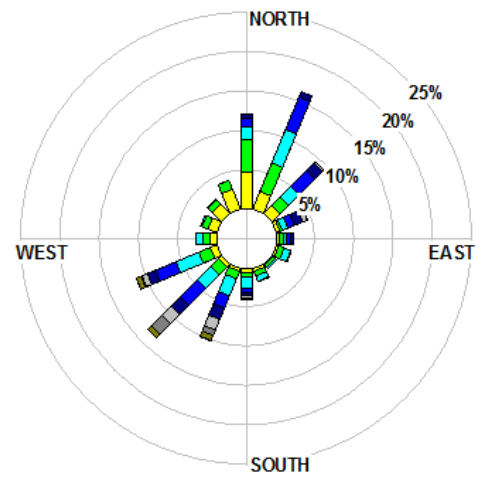
Figure H1: Wind roses

Arboretum - Seasonal Wind Roses 2017

Summer (Dec, Jan, Feb)



Autumn (Mar, Apr, May)



Winter (Jun, Jul, Aug)



Spring (Sep, Oct, Nov)



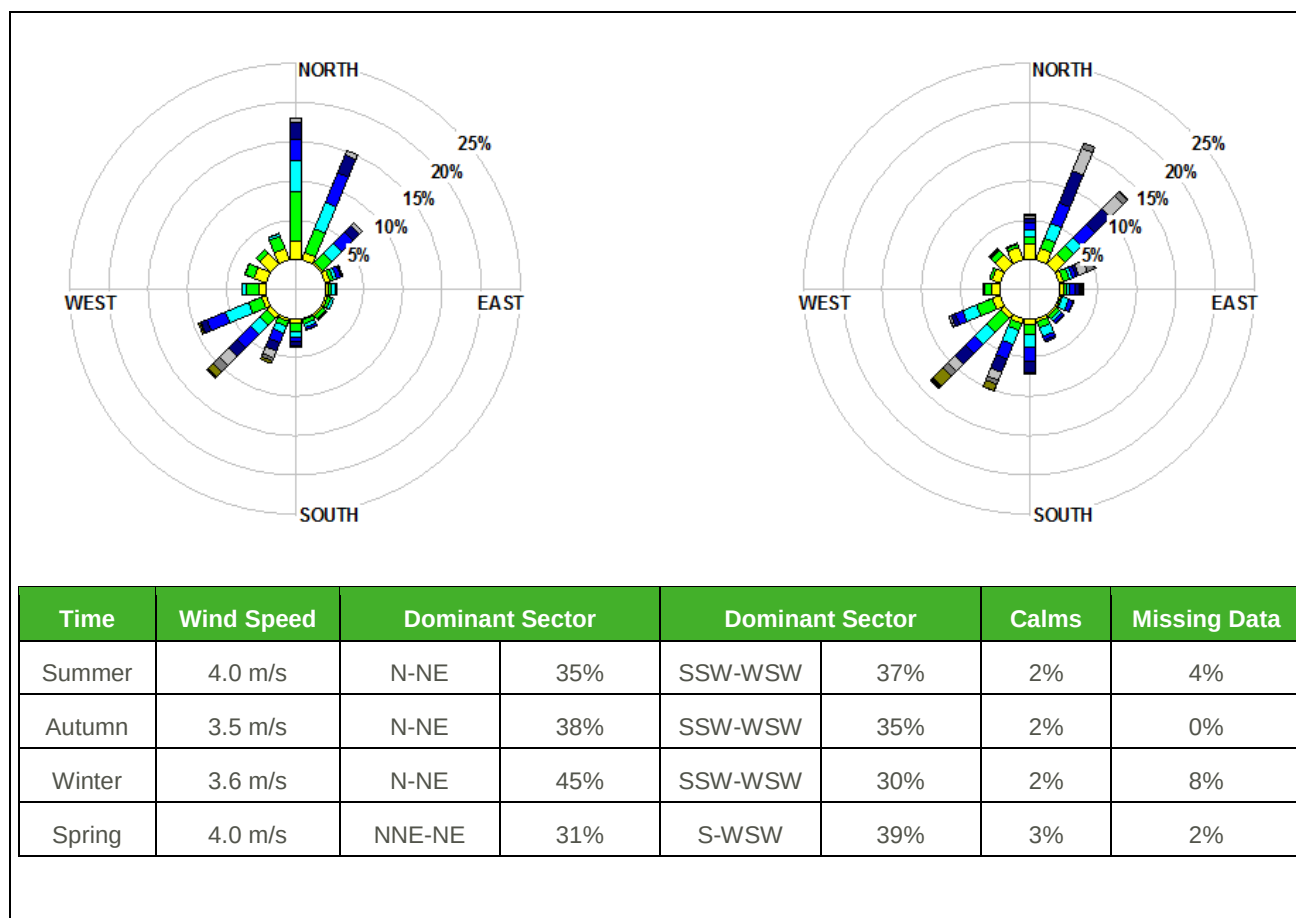
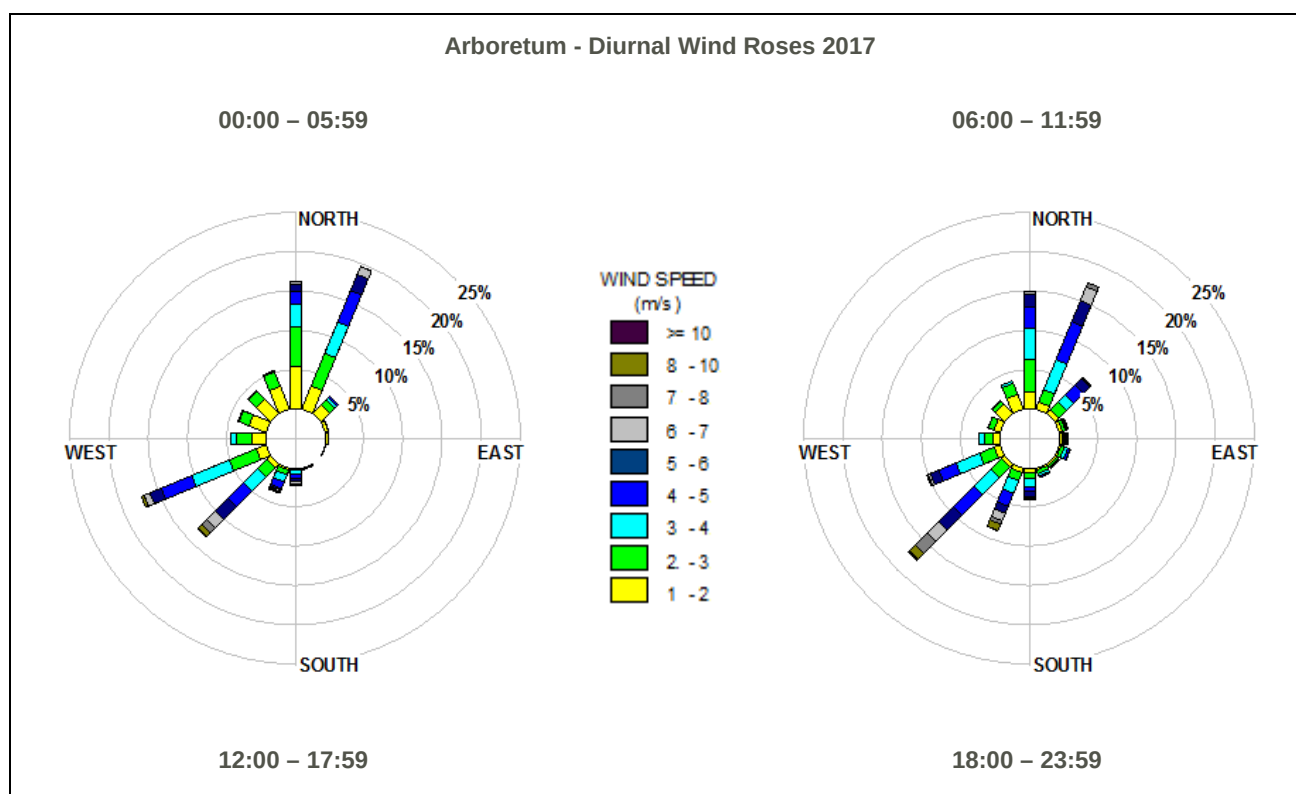


Figure H2: Seasonal wind roses



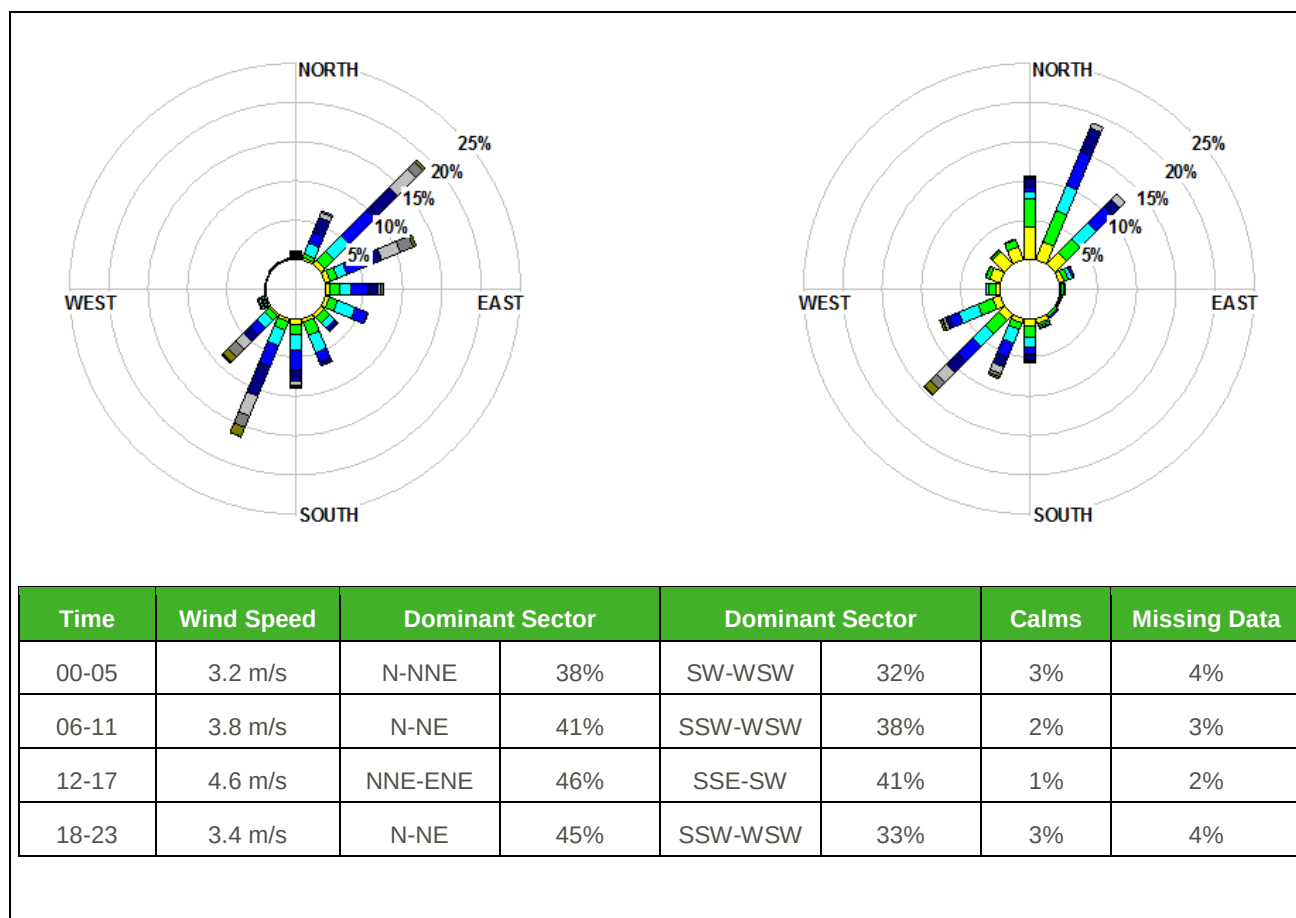


Figure H3: Diurnal wind roses

Seasonal wind roses for 2016 can be seen in Figure B and Figure C. Note the increase in light (1 to 3 m/s) to moderate (3 to 6 m/s) wind from the NNW during winter (and the seasonal increase in fresh (6 to 8 m/s) to strong (> 8 m/s) N to NE wind during periods that include spring and early summer. Strong southerly to SSW wind occurs throughout the year, typically associated with the arrival of coastal lows and cold fronts. Coastal lows tend to be more frequent during the summer months; hence the slightly higher proportion of these winds. NNW to WNW wind is largely in the form of land breezes at night and early morning, particularly during the cooler and more stable autumn and winter months.

APPENDIX I

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