Eskom

Ms Mpho Nembilwi
Nkangala District Municipality
PO BOX 437
MIDDLEBURG
1050

Date:
06 April 2020

Enquiries:
Livhuwani Tshilate
017 615 2317

Ref*:* 17/4/AEL/MP312/11/09

Dear Ms Nembilwi

KRIEL POWER STATION'S MONTHLY STACK EMISSIONS REPORT FOR THE MONTH OF MARCH 2020

This serves as the monthly report required in terms of Section 7.2.1 in Kriel Power Station's Atmospheric Emission License 17/4/AEL/MP312/11/09. The emissions are for the month of March 2020. Verified emissions of particulates matter, SO_2 and NO_x (as NO_2) are also included.

Raw Materials and Products

Table 1: Quantity of Raw Materials and Products used/produced for the month of March 2020

Raw Materials and Products used	**Raw Material Type**	**Units**	**Maximum Permitted Consumption / Rate (Quantity)**	**Consumption / Rate in Month of March 2020**
	Coal	Tons/month	1 227 600	703 404
	Fuel Oil	Tons/month	5 000	5 694.92
Production Rates	**Product/ By-Product Name**	**Unit**	**Maximum Production Capacity Permitted (Quantity)**	**Production Rate in Month of March 2020**
	Ash	Tons/month	not specified	500.58
	RE PM	kg/MWh	not specified	0.40

1/…

Abatement Technology

Table 2: Abatement Equipment Control Technology for March 2020.

Associated Unit/Stack	Technology Type	Actual Efficiency (%) March 2020
Unit 1	ESP	100.0
Unit 2	ESP	95.0
Unit 3	ESP	96.7
Unit 4	ESP	98.1
Unit 5	ESP	0.0 (**On outage**)
Unit 6	ESP	91.3

Energy Source Characteristics

Table 3: Energy Source Material Characteristics for the month of March 2020

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6-1.2 (%)	0.84
Ash Content	21-36 (%)	26.13

Monthly Monitor Reliability

Associated Unit/Stack	PM (%)	SOx (%)	NOx (%)
North	94%	100%	100%
South	100%	83%	52% - Monitor failed on the 16th of March 2020.

Emissions Reporting

GRAPH LEGEND	
	Final daily emissions average in mg/Nm3 released within a particular day
	Final monthly emissions average in mg/Nm3 released within the whole month
	Emissions limit as per the AEL

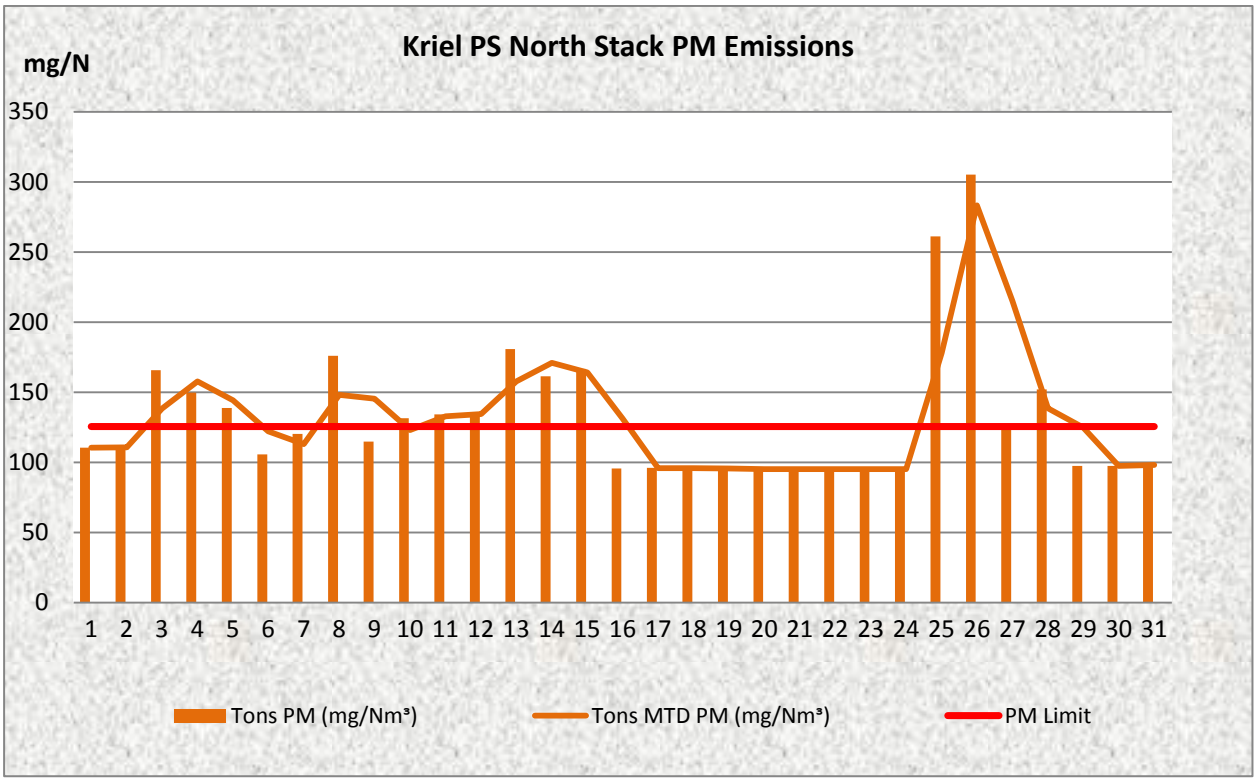

Figure 1: PM emissions (daily averages) for the month of March 2020 against emission limit for the North Stack

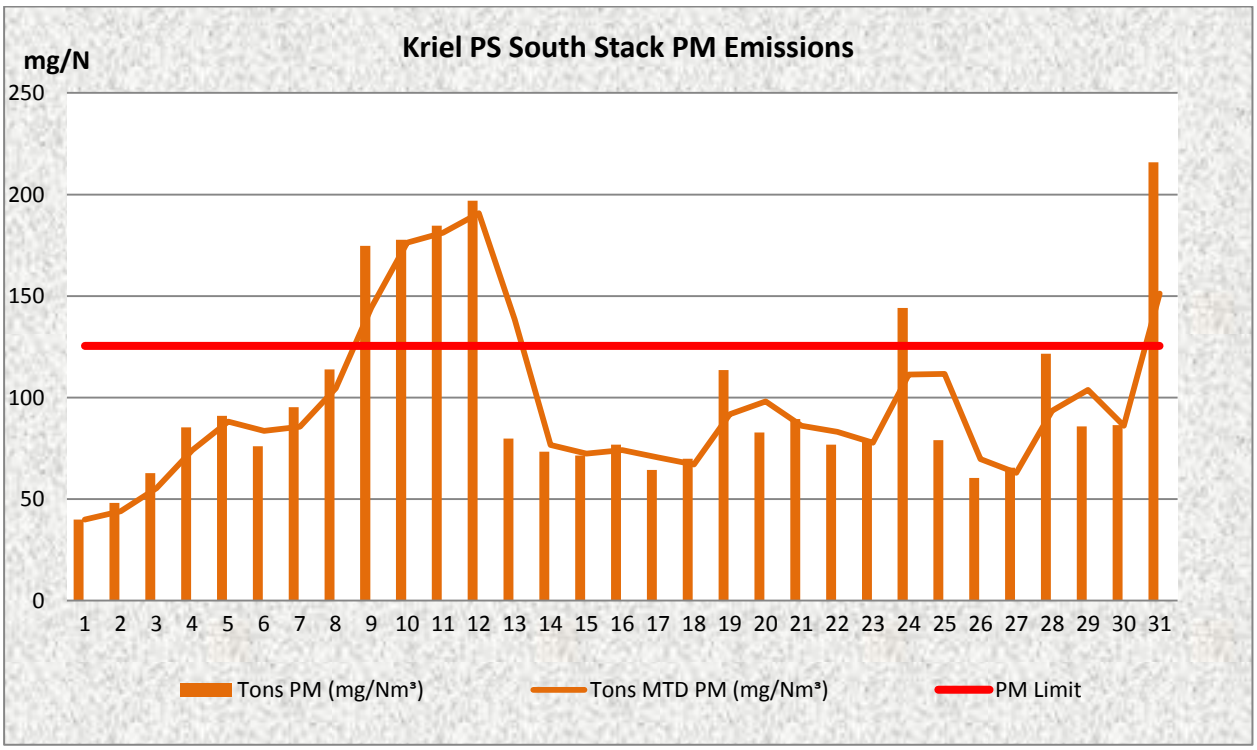

Figure 2: PM emissions (daily averages) for the month of March 2020 against emission limit for the South Stack

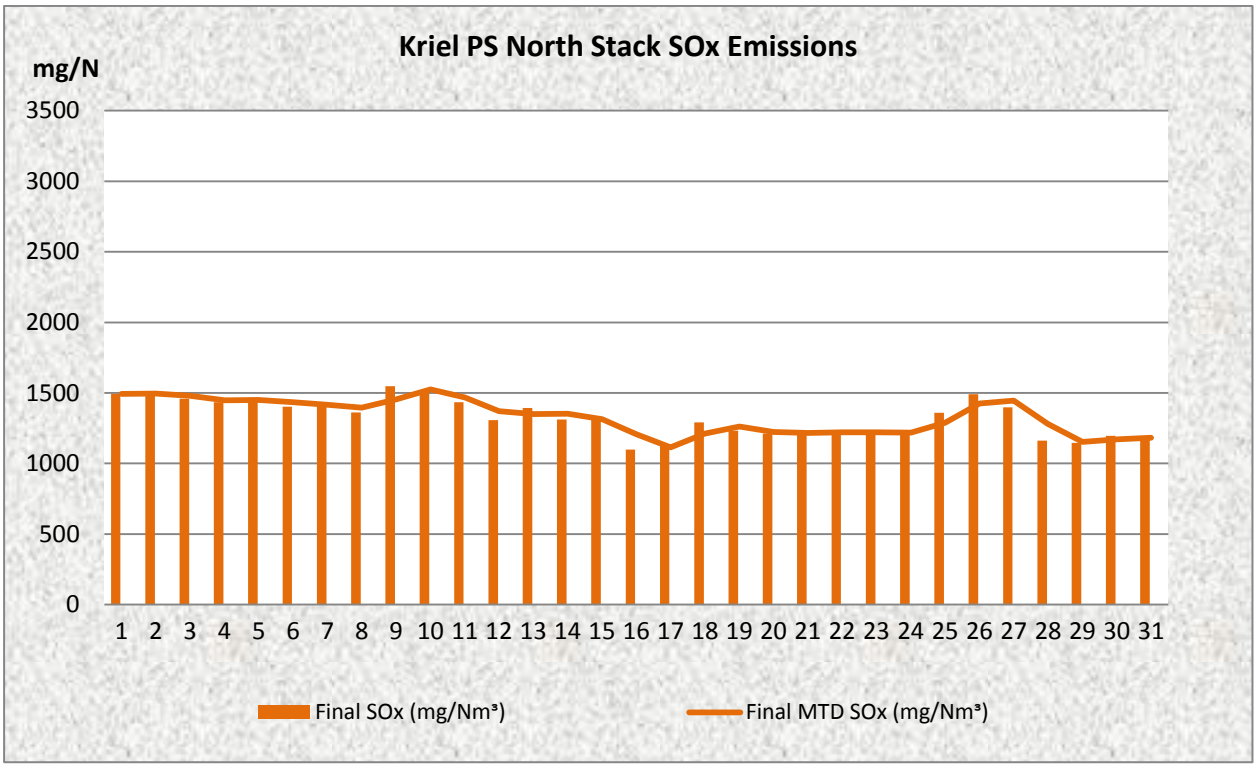

Figure 3. SO2 emissions (daily averages) for the month of March 2020 against emission limit for the North Stack. The SOx Limit is 3500mg/Nm3.

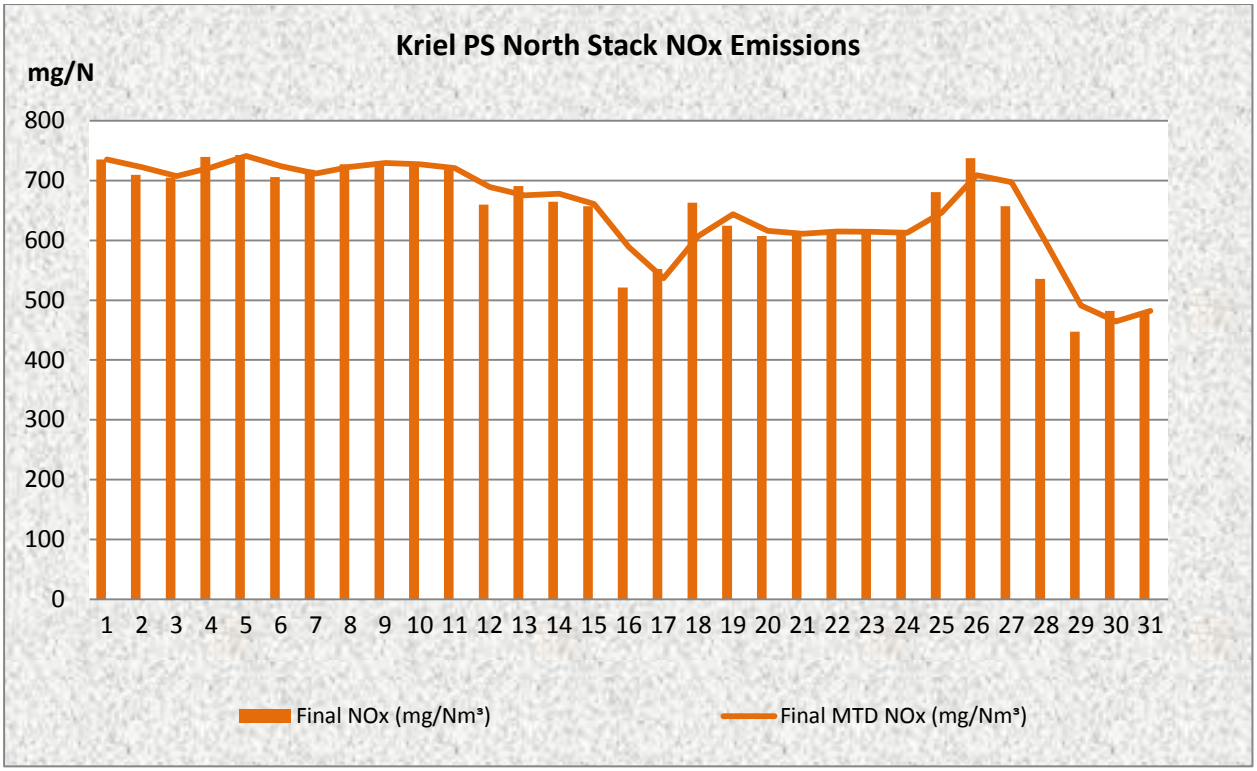

Figure 4. NO2 emissions (daily averages) for the month of March 2020 against emission limit for the North Stack. The NOx Limit is 1600mg/Nm3.

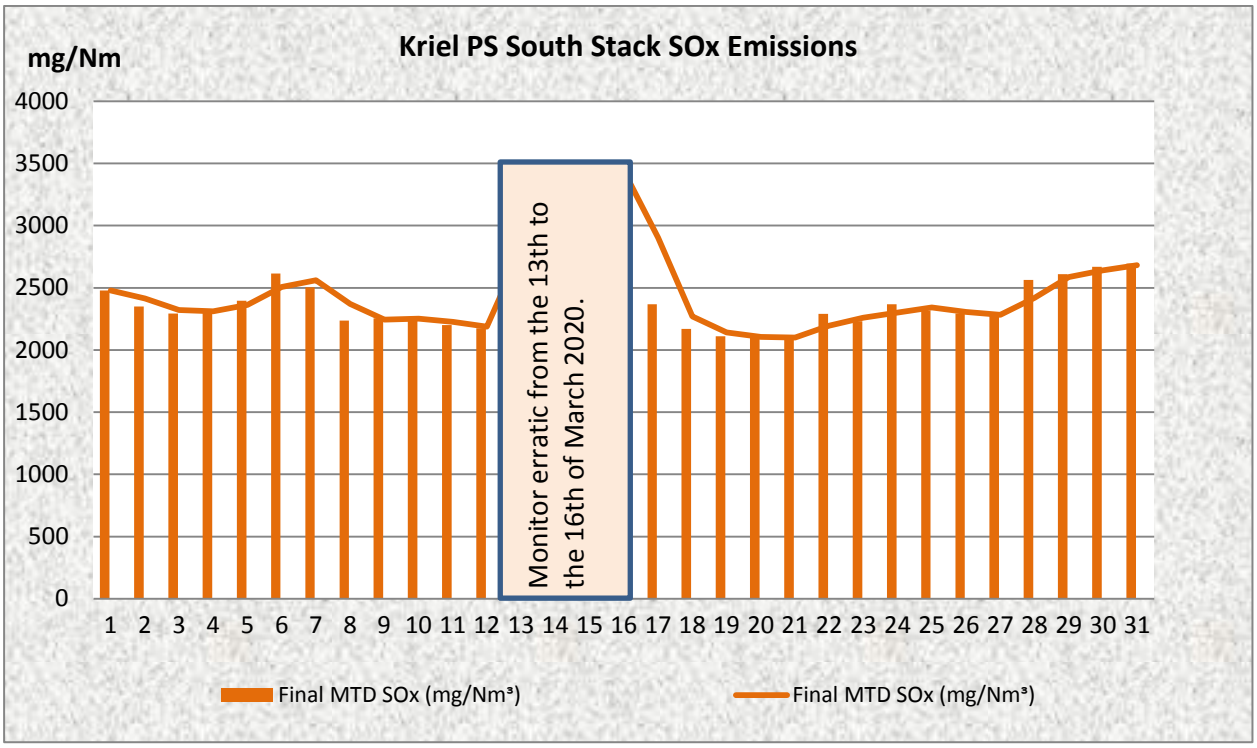

Figure 5. SO2 emissions (daily averages) for the month of March 2020 against emission limit for the South Stack. The SOx Limit is 3500mg/Nm3.

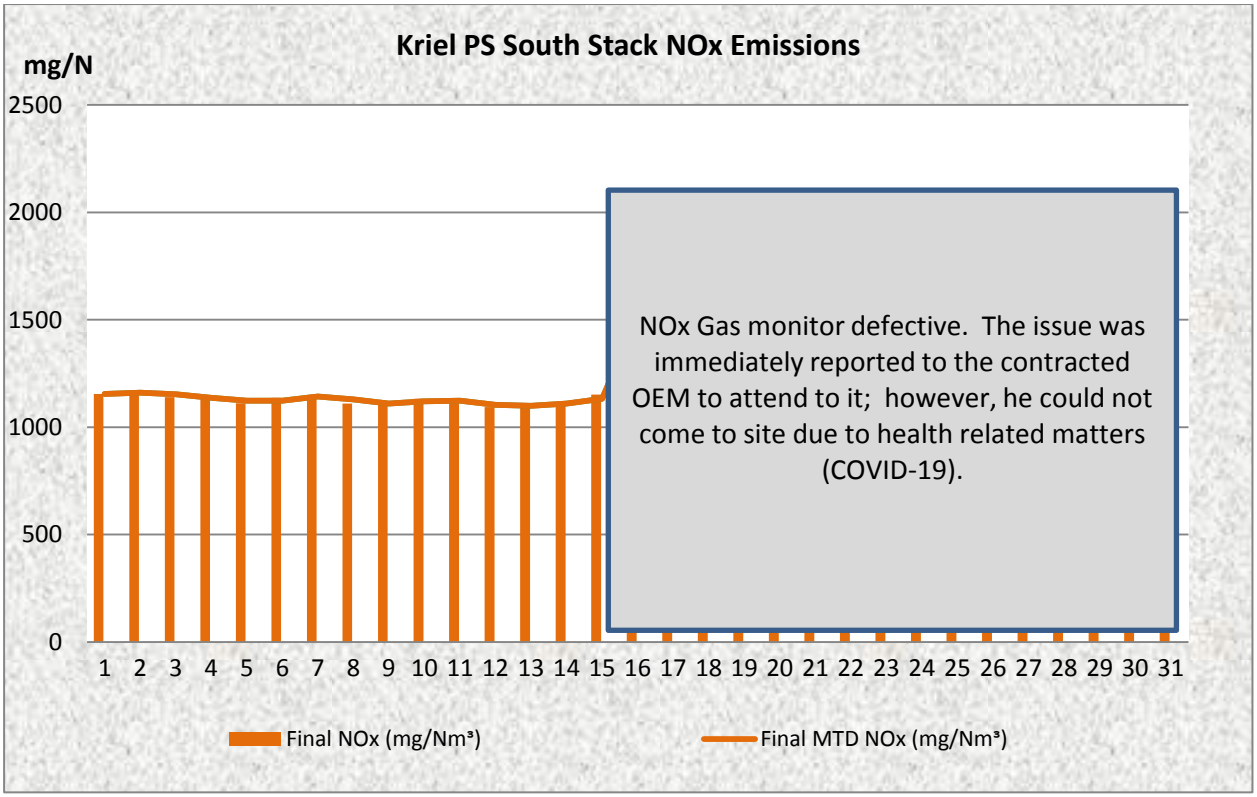

Figure 6. NO2 emissions (daily averages) for the month of March 2020 against emission limit for the South Stack. The NOx Limit is 1600mg/Nm3.

Table 4: Monthly tonnages for the month March 2020

Unit	PM (tons)	SO_2 (tons)	NO_2 (tons)
SUM	500.58	8037.4	4703.2

Table 5: Each unit and respective days operating under normal operation, days in grace period, and section 30 days respectively

	Operating Days (DD:HH:MM)			
Unit	**Normal operation**	**In grace period**	**Under S 30**	**Unit off load**
1	20:13:40	00:00:00	00:00:00	10:10:20
2	20:11:00	00:00:00	00:00:00	10:13:00
3	26:14:50	00:00:00	00:00:00	04:09:10
4	31:00:00	00:00:00	00:00:00	00:00:00
5	00:00:30	00:00:00	00:00:00	30:23:30
6	31:00:00	00:00:00	00:00:00	00:00:00

Light up information

Table 6: PM Start-up information for the month of March 2020

North Stack	*Event 1*		*Event 2*		*Event 3*	
Unit No.	*Unit 1*		*Unit 3*		*Unit 1*	
Fires in	*06:35 PM*	*2020/03/06*	*01:45 AM*	*2020/03/19*	*07:30 AM*	*2020/03/22*
Synchronisation with Grid	*03:50 AM*	*2020/03/07*	*07:35 AM*	*2020/03/20*	*01:25 PM*	*2020/03/22*
Emissions below limit from Sync (Date and Time)						
Fires in to synchronization	*00:09:15*	Hrs (dd:hh:mm)	*01:05:50*	Hrs (dd:hh:mm)	*00:05:55*	Hrs (dd:hh:mm)
Synchronization to < limit (Duration	*did not go above limit*	Hrs (dd:hh:mm)	*did not go above limit*	Hrs (dd:hh:mm)	*did not go above limit*	Hrs (dd:hh:mm)

North Stack …cont.	Event 4		*Event 5*	
Unit No.	Unit 2		*Unit 2*	
Fires in	07:25 PM	2020/03/19	*04:10 PM*	*2020/03/22*
Synchronisation with Grid	12:05 AM	2020/03/20	*11:50 AM*	*2020/03/24*
Emissions below limit from Sync				
Fires in to synchronization	00:04:40	Hrs (dd:hh:mm)	*01:19:40*	Hrs (dd:hh:mm)
Synchronization to < limit	did not go above limit	Hrs (dd:hh:mm)	*did not go above limit*	Hrs (dd:hh:mm)

Table 7. Point Source emissions released during start-up (fires-in) for the month of March-2020 in mg/Nm3

North Stack Emission Average from Fires-in to Synchronisation (Date and Time)							
Unit	**Fires-In**		**Synchronisation**		**PM**	**SO_2**	**NO_x**
Unit 1	2020/03/06	06:35 PM	2020/03/07	03:50 AM	387.5	1161.1	568.2
Unit 3	2020/03/19	01:45 AM	2020/03/20	07:35 AM	436.4	995.1	514.6
Unit 1	2020/03/22	07:30 AM	2020/03/22	01:25 PM	504.6	943.7	447.0
Unit 2	2020/03/19	07:25 PM	2020/03/20	12:05 AM	437.4	1099.2	579.4
Unit 2	2020/03/22	04:10 PM	2020/03/24	11:50 AM	682.6	1251.8	645.2

Table 8. Point Source emissions released during Shut-down (SD) for the month of March-2020 in mg/Nm3

North Stack Emission Average Breaker Open (BO) to Draft Group Shut Down (SD) (Date & Time)							
Unit	**Breaker Open**		**DG SD**		**PM**	**SO_2**	**NO_x**
Unit 1	2020/03/03	02:05 PM	2020/03/04	02:15 AM	176.2	1004.3	483.1
Unit 3	2020/03/14	10:30 PM	2020/03/15	11:00 AM	163.9	938.1	453.8
Unit 1	2020/03/20	02:45 AM	2020/03/20	04:05 PM	316.3	945.1	450.7
Unit 2	2020/03/15	02:10 PM	2020/03/16	04:30 AM	145.8	646.8	301.2
Unit 2	2020/03/18	08:40 PM	2020/03/19	07:30 AM	359.8	836.0	424.1
Unit 3	2020/03/18	06:50 AM	2020/03/18	04:40 PM	368.5	883.7	434.6
Unit 3 SO3	2020/03/20	04:05 PM	2020/03/22	07:30 AM	207.0	1315.4	641.9

South Stack Emission Average Breaker Open (BO) to Draft Group Shut Down (SD) (Date & Time)							
Unit	**Breaker Open**		**DG SD**		**PM**	**SO_2**	**NO_x**
Unit 5	2020/03/17	07:55 AM	2020/03/17	12:40 PM	75.5	14.4	2253.3
Unit 5	2020/03/20	01:15 AM	2020/03/20	06:15 AM	92.8	1793.7	1900.1
Unit 5	2020/03/21	10:20 AM	2020/03/21	03:15 PM	90.2	1862.9	1926.9
Unit 5	2020/03/27	03:15 PM	2020/03/28	12:20 AM	232.7	1931.2	2024.5
Unit 5	2020/03/28	02:35 PM	2020/03/28	09:25 PM	177.0	2190.1	2071.5
Unit 5	2020/03/29	07:10 AM	2020/03/29	09:10 PM	323.4	2140.7	2114.2
Unit 5	2020/03/30	09:50 PM	2020/03/31	12:30 PM	355.5	1926.9	1946.5

Complaints Register

Table 9: Complaints for the month of March 2020.

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
There was no complaint related to air quality received during the month of March 2020.					

General

The particulate matter (PM10) emissions on the north and south common stacks were within the **monthly limit** during the month of March 2020; North stack recorded the monthly PM10 average emissions figure of **125mg/Nm3** while south stack recorded PM10 monthly average figure of **99mg/Nm3**. The gaseous (NOx & SOx) emissions on the north and south common stacks were also within the **daily limit** during the month of March 2020; **refer to graphs above**. NOx Emissions Monitor for south stack was unavailable from the 16th to 31st of March 2020 due to a defect. Refer to a summary below for more detail.

Fuel oil limit of 5000 tons/month was exceeded by 14% during the month of March 2020 due to multiple units' light-ups and unit 5 commissioning from long term outage. This matter has been reported to the licencing authority.

NB: The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission reports sent to your office.

<u>NOx Online Gaseous Emissions Monitor Failure for south stack</u>

On the 16th of March 2020, the NOx online gas emissions monitor for south stack became faulty. The maintenance team immediately assessed the defect to understand its nature; the preliminary investigation findings indicated that the monitor was reading erratic data which requires the expertise of the contracted Original Equipment Manufacturer (OEM) to further diagnose and repair the problem.

The OEM was due to come to Kriel Power Station on the 24th of March 2020 for routine calibration and maintenance of all the gas monitors; however, this visit was cancelled as the OEM indicated that the responsible technician was under quarantine after travelling to Italy. The company further indicated that they are no longer allowing their personnel to go to any site with more than 100 employees.

This incident has impacted on Kriel Power Station's statutory reporting requirements of NOx emissions on south stack. However, based on the investigation on maximum emissions release rate conducted at the south stack, NOx emissions at Kriel Power Station has never came close to exceeding the limit during Plant Start-Up, Upset or Maintenance and Shutdown Conditions. Based on previous readings during normal operations, the NOx emission limit has not been exceeded then either.

In a nutshell, the current Covid-19 pandemic has disturbed the routine maintenance of gas monitors at Kriel Power Station as the OEM indicated that their team can only come to site after the current Covid-19 lockdown is lifted. This ultimately means that the south stack NOx monitor will only be repaired immediately after the lockdown is lifted. Kriel Power Station will provide feedback on the status of NOx gas monitor for south stack through the upcoming monthly emissions reports.