Eskom

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Date:
29 September 2025

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Dear Ms. Nompumelelo Simelane

Ref: Kendal Power Station AEL (17/4/AEL/MP312/11/15)

SUBMISSION OF KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF AUGUST 2025.

This is a monthly report required in terms of Section 7.4 in the Kendal Power Station's Atmospheric Emission License. The emissions are for Eskom Kendal Power Station.

Compiled by:

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OFFICER ENVIRONMENTAL MANAGEMENT - KENDAL POWER STATION
Date: 29/09/2025

Supported by:

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Date: 29/09/2025

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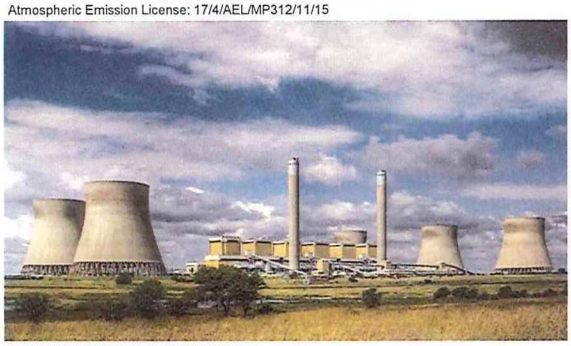
Eskom

AUGUST 2025

KENDAL POWER STATION MONTHLY EMISSIONS REPORT

Atmospheric Emission License: 17/4/AEL/MP312/11/15



1 RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Max Permitted Consumption Rate	Consumption Rate Aug-2025
	Coal	Tons	2 260 000	523319
	Fuel Oil	Tons	5 000	10682.770
Production Rates	Product / By-Product Name	Units	Max Production Capacity Permitted	Indicative Production Rate Aug-2025
	Energy	GWh	3 062.304	895.222
	Ash	Tons	770 000	161 705.571
	RE Ash	kg/MWh	not specified	2.115

Note: Max energy rate = AEL capacity [4,116 MW] × 24 hrs × days in month ÷ 1,000 (to convert to GWh).

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	16-24 (MJ/kg)	19.170
Sulphur Content	%	<1 (%)	0.760
Ash Content	%	40 (%)	30.9

3 EMISSION LIMITS (mg/Nm³)

	Daily Limit		
Associated Unit/Stack	PM	SO_2	NO_x
Unit 1	100	3000	750
Unit 2	100	3000	750
Unit 3	100	3000	750
Unit 4	100	3000	750
Unit 5	100	3000	750
Unit 6	100	3000	750

4 ABATEMENT TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	ESP Efficiency	Technology Type	SO_2 Plant Utilization
Unit 1	ESP + SO_2	99.770%	SO_2	Off-line
Unit 2	ESP + SO_2	99.672%	SO_2	32.3%
Unit 3	ESP + SO_2	99.537%	SO_2	28.6%
Unit 4	ESP + SO_2	Off-line	SO_2	Off-line
Unit 5	ESP + SO_2	98.464%	SO_2	29.0%
Unit 6	ESP + SO_2	99.320%	SO_2	19.4%

Note: The ESP plant does not have a bypass mode; therefore, it operates at 100% utilization.

There is no Sulphur value for SO3 utilization due to switch failure on the server, however DCS signals used for its tripping alarms were used to get its utilization values. Sulphur flow will be available once we have commissioned the new PI system.

5 DATA RELIABILITY (%)

Associated Unit/Stack	PM	SO_2	NO	O_2
Unit 1	100.0	100.0	82.2	100.0
Unit 2	1.7	100.0	100.0	100.0
Unit 3	100.0	100.0	99.3	100.0
Unit 4	Off	Off	Off	Off
Unit 5	97.5	61.8	61.8	99.9
Unit 6	76.8	100.0	100.0	89.3

Note: NO_x emissions are measured as NO in PPM. The final NO_x value is expressed as total NO_2 equivalent.

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for August 2025

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	32.1	929	430
Unit 2	951.8	1 432	680
Unit 3	105.6	1 199	249
Unit 4	Off	Off	Off
Unit 5	593.5	3 116	1 106
Unit 6	210.1	1 719	778
SUM	1 893.04	8 395	3 243

Table 6.2: PM AEL Daily Compliance - August 2025

Associated Unit/Stack	Normal	Grace	Section 30	NC	Total Exceedance	Mnth Avg (mg/Nm³)
Unit 1	8	3	0	0	3	69.1
Unit 2	0	3	0	12	15	1 299.3
Unit 3	9	4	0	7	11	151.2
Unit 4	Off	Off	Off	Off	Off	Off
Unit 5	1	5	0	21	26	391.9
Unit 6	12	4	0	10	14	214.0
SUM	30	19	0	50	69	

Table 6.3: SO_2 AEL Daily Compliance - August 2025

Associated Unit/Stack	Normal	Grace	Section 30	NC	Total Exceedance	Mnth Avg (mg/Nm³)
Unit 1	12	0	0	0	0	1 827.3
Unit 2	17	0	0	0	0	1 571.8
Unit 3	24	0	0	0	0	1 507.0
Unit 4	Off	Off	Off	Off	Off	Off
Unit 5	29	0	0	0	0	1 941.0
Unit 6	28	0	0	0	0	1 772.3
SUM	110	0	0	0	0	

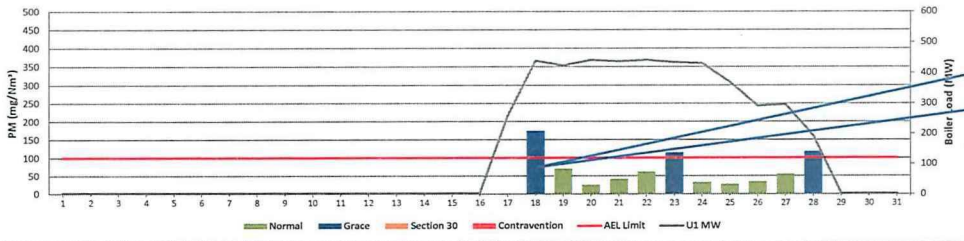
Table 6.4: NO_x AEL Daily Compliance - August 2025

Associated Unit/Stack	Normal	Grace	Section 30	NC	Total Exceedance	Mnth Avg (mg/Nm³)
Unit 1	4	3	0	5	8	814.9
Unit 2	8	5	0	4	9	730.9
Unit 3	24	0	0	0	0	303.1
Unit 4	Off	Off	Off	Off	Off	Off
Unit 5	19	2	0	8	10	684.0
Unit 6	17	7	0	4	11	747.3
SUM	72	17	0	21	38	

Table 6.5: Legend Description

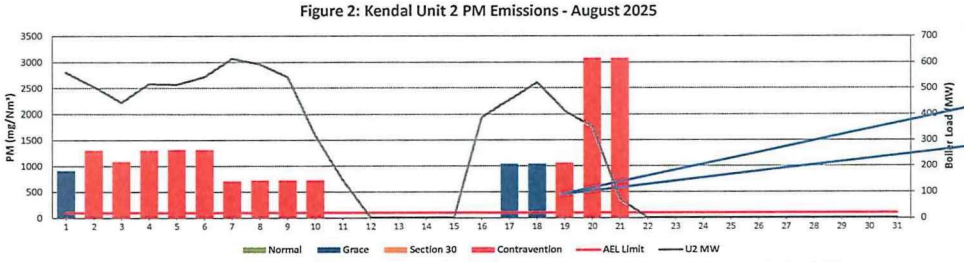
Condition	Colour	Description
Normal	GREEN	Emissions below Emission Limit Value (ELV)
Grace	BLUE	Emissions above the ELV during grace period
Section 30	ORANGE	Emissions above ELV during a NEMA S30 incident
Contravention	RED	Emissions above ELV but outside grace or S30 incident conditions

Figure 1: Kendal Unit 1 PM Emissions - August 2025



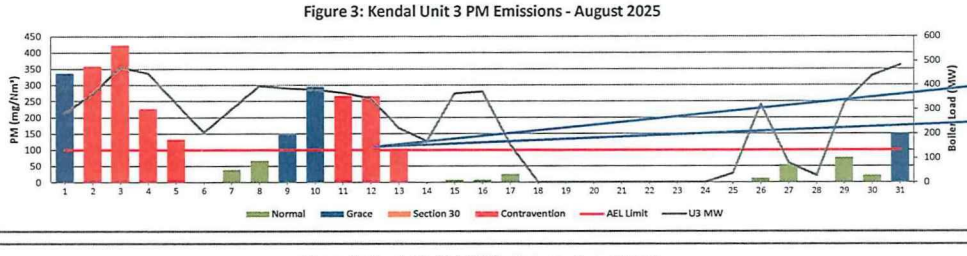
High PM emissions can be attributed to ash backlogs that affected F11, F21, F31, and F42. Gearbox issues on CE Rapper No. 7 Right Hand (F37/F47) and tripping of CE Rappers on F26 further contributed to the problem. A faulty transformer on F46.

Figure 2: Kendal Unit 2 PM Emissions - August 2025



High PM emissions can be attributed to unreliable DHP system due to vacuum issues, which led to ash backlogs. Faulty controllers on F17 and F36, a malfunctioning CE Rapper motor on F13, and the SO_3 plant failing to operate due to no sulphur flow.

Figure 3: Kendal Unit 3 PM Emissions - August 2025



High PM emissions can be attributed to the soothblowing that was incomplete and the shutdown of PCP11–24 knife gates 1–4. Short circuits on F21 and F41, and an open output condition on F42.

Figure 4: Kendal Unit 4 PM Emissions - August 2025

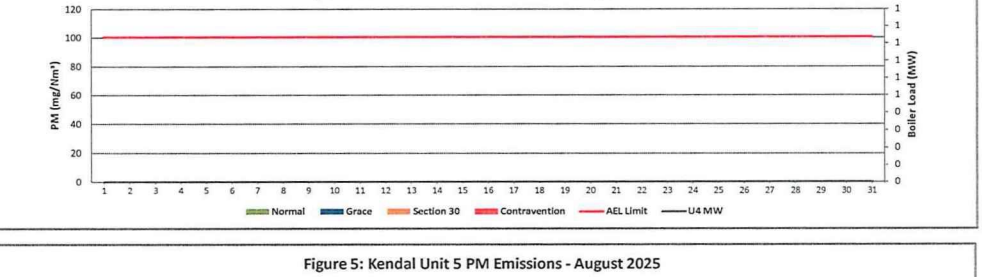
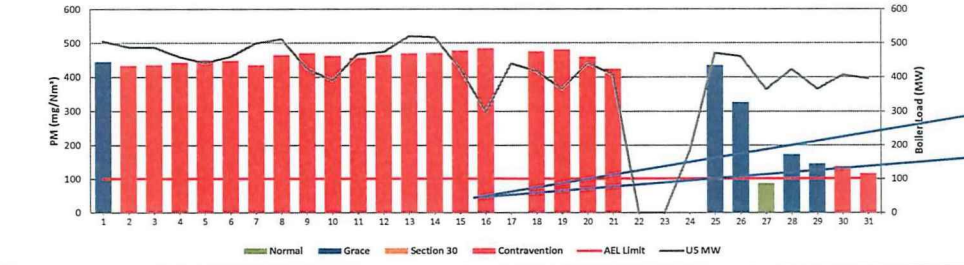
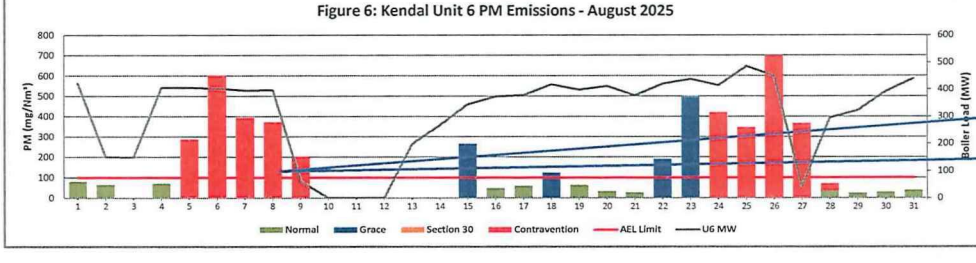


Figure 5: Kendal Unit 5 PM Emissions - August 2025



High PM emissions can be attributed to the SO_3 plant that was on hold mode due to low BET levels, communication bus faults on F13, and ash backlogs with ten fields that was showing internal damage. The DHP remained offline with all knife gates shut, and only four pulse controllers were operational in Stream 1. Signal issues on CE Rapper No. 5 LH.

Figure 6: Kendal Unit 6 PM Emissions - August 2025



High PM emissions can be attributed to low high-voltage DC conditions on F37 and F47, with multiple fields (F31–F47) having tripped due to low voltage. Malfunctioning RH CE Rappers 1–4, permanently open circuits on F11 and F21 due to structural damage, ash backlogs, a failed fan on F12, and low coolant levels on F31.

Figure 7: Kendal Unit 1 SO_2 Emissions - August 2025

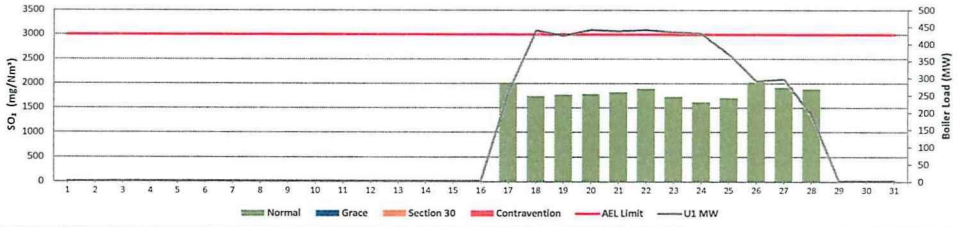


Figure 8: Kendal Unit 2 SO_2 Emissions - August 2025

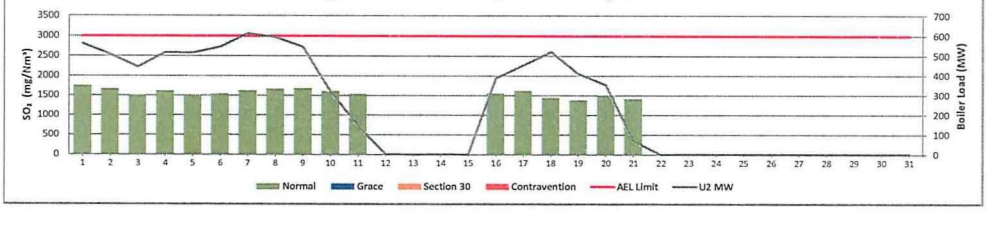


Figure 9: Kendal Unit 3 SO_2 Emissions - August 2025

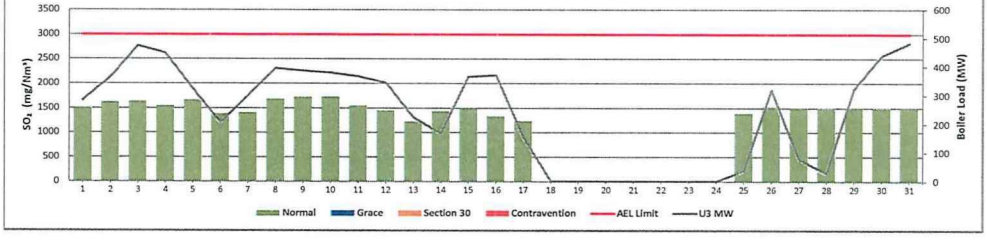


Figure 10: Kendal Unit 4 SO_2 Emissions - August 2025

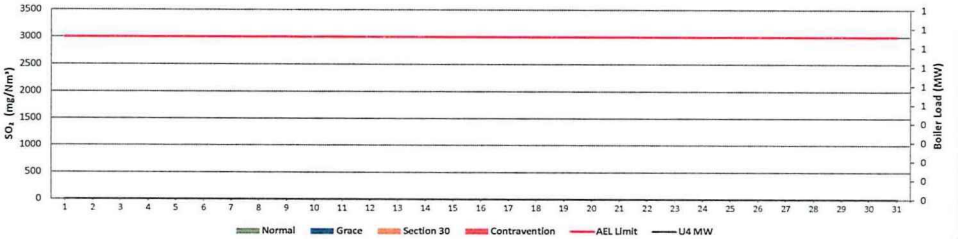


Figure 11: Kendal Unit 5 SO_2 Emissions - August 2025

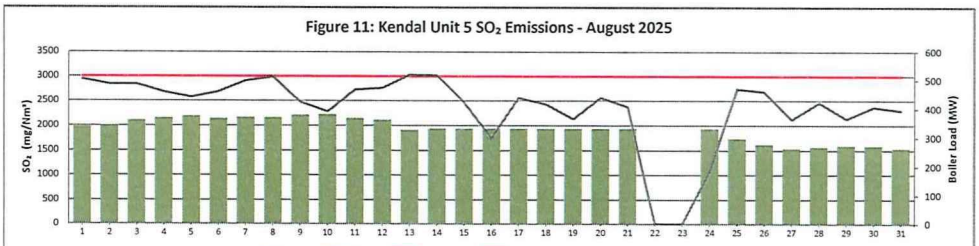


Figure 12: Kendal Unit 6 SO_2 Emissions - August 2025

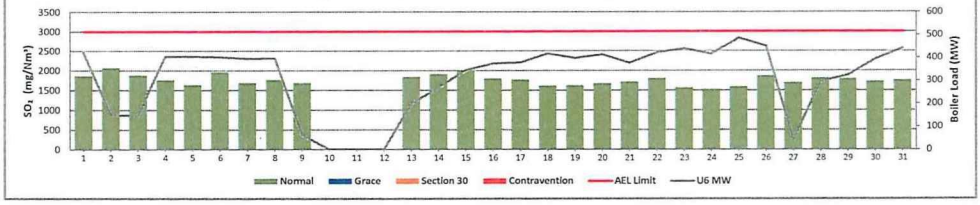
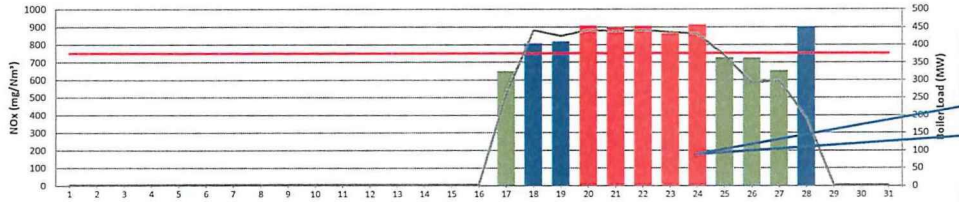
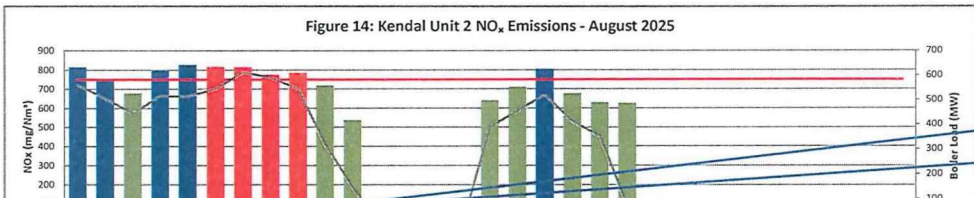


Figure 13: Kendal Unit 1 NO_x Emissions - August 2025



The station's gas monitors appear to be malfunctioning and providing inaccurate readings. Restoration efforts are currently underway, after which a verification process will be conducted to ensure accuracy.

Figure 14: Kendal Unit 2 NO_x Emissions - August 2025



The station's gas monitors appear to be malfunctioning and providing inaccurate readings. Restoration efforts are currently underway, after which a verification process will be conducted to ensure accuracy.

Figure 15: Kendal Unit 3 NO_x Emissions - August 2025

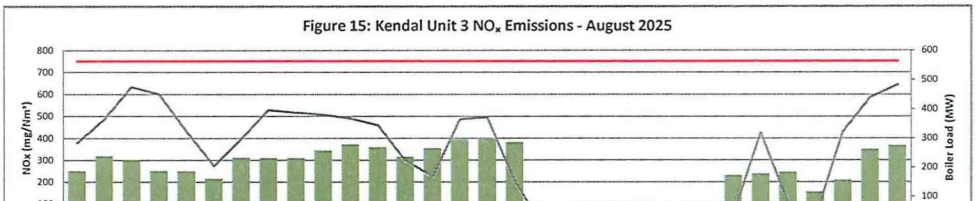


Figure 16: Kendal Unit 4 NO_x Emissions - August 2025

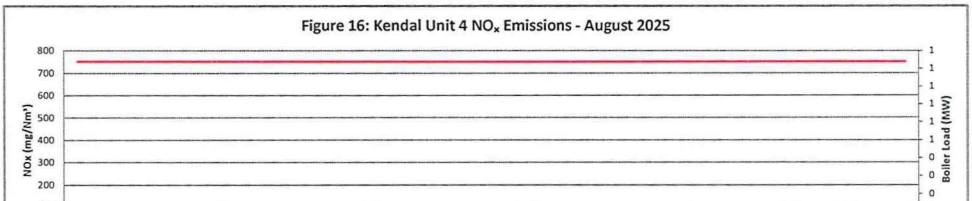
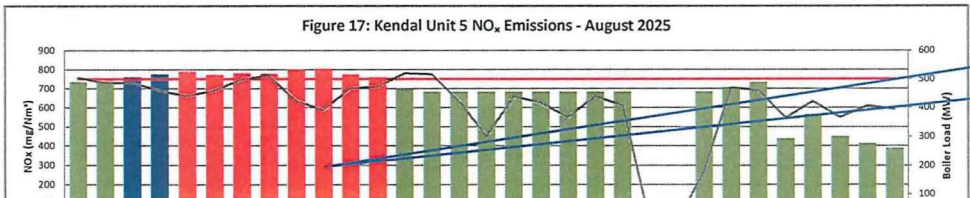
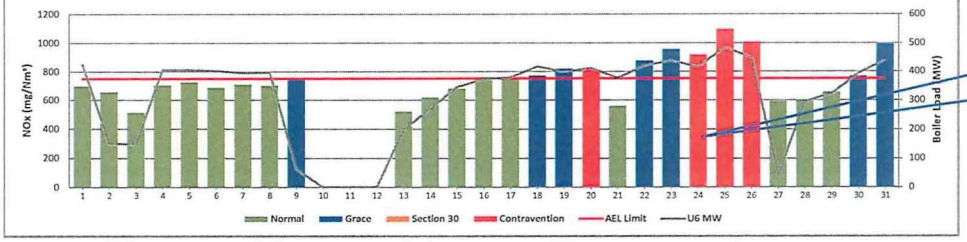


Figure 17: Kendal Unit 5 NO_x Emissions - August 2025



The station's gas monitors appear to be malfunctioning and providing inaccurate readings. Restoration efforts are currently underway, after which a verification process will be conducted to ensure accuracy.

Figure 18: Kendal Unit 6 NO_x Emissions - August 2025



The station's gas monitors appear to be malfunctioning and providing inaccurate readings. Restoration efforts are currently underway, after which a verification process will be conducted to ensure accuracy.

7 COMPLAINTS

There were no complaints for this months

Source Code / Name	Root Cause	Calculation of Impacts /	Dispersion modeling of	Measures implemented

8 GENERAL

Abatement Technology-Table 4

In order to achieve the required operational dust removal efficiency based on measured values, several assumptions such as
- Coal ash content (%) and burnt rate mass
- Fly : Coarse ash ratio of 80:20 - 80% of fly-ash mass obtained from burnt coal goes to ESP
- Measurement of dust emission by Dust Monitor over a period of time (monthly)

Operational Dust Removal Efficiency

$\eta = (1 - (Output/Input)) \times 100$

$\eta = 1 - \frac{(DustEmissionFromAQR\ ReportDustMonitor(tons)}{(CoalBurnt(tons) * \%AshContent * 80\%)} \times 100$

Monitor Reliability-Table 5
In terms of the minimum emissions standard, the requirement is that a monitor should be 80% reliable on a monthly average.
The **monitor reliability** refers to **data reliability** because the assumed value of 99.325% reliability is compared to the dust concentration signal. If the dust concentration signal is above 99.325% opacity,the data information is no longer reliable because the monitor reading is out of its maximum reading range. The data reliability looks at how many times did the dust concentration signal go above 98% over a period of time e.g 24hours
The formula is as follows:
= (1 – (count hours above 99.325%/24hours))x 100

Emissions Performance:
- Average velocity values from the latest correlation report were used on the gaseous emissions on Units due to defective CEMS monitors and velocity correction factors were set M=1 and C=0
- Unit 2 and 6 maxed out, meaning the emissions were higher than what the monitor was correlated for, in which case we use surrogate values. This is attributed to abnormal plant conditions.
- Please note that the reported figures in tonnage calculation are the figures after the station used the maxing out quantification exercise which is the use of "surrogate values" on days when the monitor maxed out.
- Flow was not working for the whole month because of sensors that are faulty and the sensors have to be replaced on all the units. The process for procuring new sensors is in progress.
- Correlation curves for units 1,4 and 5 were changed to suite changes of the data signals from *AAA* to *HME* data values because of the damaged cables for *AAA* signal giving vaues that were not reliable.
- Surrogation values were recalculated after updating raw data based on curves update.
- The QAL 2 average values for gaseous were used as raw data in cases where the monitor had an error, were used as surogation values.
- The O2 sensors for unit 2, 3 and 6 are faulty they all need to be replaced. Unit 5 and 4 O2 sensors were replaced in July 2025 and the process of replacing the other sensors is in progress.
- The PM montiors were not 100% reliable due ash backlogs, dust flooded the dust motors.

- **Unit 1**

Findings: High PM emissions can be attributed to ash backlogs that affected F11, F21, F31, and F42. Gearbox issues on CE Rapper No. 7 Right Hand (F37/F47) and tripping of CE Rappers on F26 further contributed to the problem. A faulty transformer on F46.
- Resolution: Plant repaired.

- **Unit 2**

Findings: High PM emissions can be attributed to unreliable DHP system due to vacuum issues, which led to ash backlogs. Faulty controllers on F17 and F36, a malfunctioning CE Rapper motor on F13, and the SO_3 plant failing to operate due to no sulphur flow.
- Resolution: Plant repaired.

- **Unit 3**

Findings: High PM emissions can be attributed to the soothblowing that was incomplete and the shutdown of PCP11–24 knife gates 1–4. Short circuits on F21 and F41, and an open output condition on F42.
- Resolution: Plant repaired.

- **Unit 4**

Findings: unit was off
- Resolution: Plant repaired.

- **Unit 5**

Findings: High PM emissions can be attributed to the SO_3 plant that was on hold mode due to low BET levels, communication bus faults on F13, and ash backlogs with ten fields that was showing internal damage. The DHP remained offline with all knife gates shut, and only four pulse controllers were operational in Stream 1. Signal issues on CE Rapper No. 5 LH.
- Resolution: Plant repaired.

- **Unit 6**

Findings: High PM emissions can be attributed to low high-voltage DC conditions on F37 and F47, with multiple fields (F31–F47) having tripped due to low voltage. Malfunctioning RH CE Rappers 1–4, permanently open circuits on F11 and F21 due to structural damage, ash backlogs, a failed fan on F12, and low coolant levels on F31.
- Resolution: Plant repaired.

9 Complaints and S30 Incidents Register

Refer to Addendum (If any)

Boiler Plant Engineering Manager — Date: 30/09/2025

Engineering Manager — Date: 01/10/2025

Environmental Manager — Date: 29/09/2025

Compiled by	Environmental Officer
For	Nkangala District Municipality
Copies	Generation Environmental Management
	Generation Compliance Management
	Generation Asset Management
	Kendal Power Station
	Air Quality Officer
	D Herbst
	B Mccourt
	R Rampiar
	E Patel
	Engineering Manager
	Operating Manager
	Maintenance Manager
	Production Manager
	Boiler Engineering Manager
	System Engineer
	Environmental Manager