Eskom

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Date:
09 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 JULY 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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ENVIRONMENTAL SENIOR ADVISOR- KENDAL POWER STATION
Date: 09/09/2025

Supported by:

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KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF JULY 2025

Verified by

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Date: 2025/09/19

Eskom

JULY 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 Jul 2025
	Coal	Tons	2 260 000	771 295
	Fuel Oil	Tons	5 000	13053.650
Production Rates	Product / By-Product Name	Units	Max Production Capacity Permitted	Indicative Production Rate Jul-2025
	Energy	GWh	3 062.304	1 277.496
	Ash	Tons	770 000	247 971.343
	RE Ash	kg/MWh	not specified	4.530

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)	18.750
Sulphur Content	%	<1 (%)	0.860
Ash Content	%	40 (%)	32.150

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_3 Plant Utilization
Unit 1	ESP + SO_3	96.009%	SO_3	51.6%
Unit 2	ESP + SO_3	97.788%	SO_3	100.0%
Unit 3	ESP + SO_3	99.220%	SO_3	90.3%
Unit 4	ESP + SO_3	99.690%	SO_3	29.0%
Unit 5	ESP + SO_3	98.478%	SO_3	64.5%
Unit 6	ESP + SO_3	89.452%	SO_3	74.2%

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.

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

5 DATA RELIABILITY (%)

Associated Unit/Stack	PM	SO_2	NO	O_2
Unit 1	62.8	100.0	57.5	99.8
Unit 2	39.5	100.0	100.0	100.0
Unit 3	99.6	99.6	99.6	99.6
Unit 4	100.0	100.0	93.9	80.1
Unit 5	100.0	100.0	100.0	100.0
Unit 6	27.2	100.0	100.0	100.0

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 July 2025

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	588 7	807	212
Unit 2	1 126 4	2 877	1 324
Unit 3	377 6	3 105	669
Unit 4	51 9	1 197	221
Unit 5	587 5	2 253	979
Unit 6	3 055 3	1 649	548
SUM	5 787 39	11 889	3 953

Table 6 2 PM AEL Daily Compliance - July 2025

Associated Unit/Stack	Normal	Grace	Section 30	NC	Total Exceedance	Mnth Avg (mg/Nm³)
Unit 1	0	0	0	18	18	1 524 5
Unit 2	0	0	0	29	29	724 4
Unit 3	1	3	0	25	28	252 5
Unit 4	7	3	0	5	8	127 4
Unit 5	0	1	0	25	26	444 6
Unit 6	1	3	0	19	22	5 558 3
SUM	9	10	0	121	131	

Table 6 3 SO_2 AEL Daily Compliance - July 2025

Associated Unit/Stack	Normal	Grace	Section 30	NC	Total Exceedance	Mnth Avg (mg/Nm³)
Unit 1	18	0	0	0	0	1 999 0
Unit 2	31	0	0	0	0	1 615 6
Unit 3	30	0	0	0	0	1 873 4
Unit 4	18	0	0	0	0	1 961 1
Unit 5	29	0	0	0	0	1 540 8
Unit 6	25	0	0	0	0	2 054 9
SUM	151	0	0	0	0	

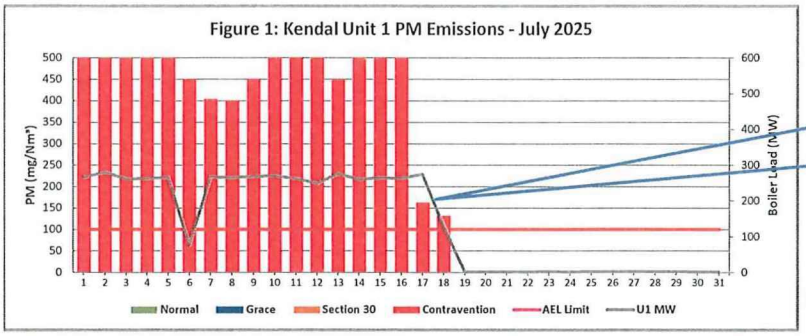
Table 6.4: NO_x AEL Daily Compliance - July 2025

Associated Unit/Stack	Normal	Grace	Section 30	NC	Total Exceedance	Mnth Avg (mg/Nm³)
Unit 1	18	0	0	0	0	522.3
Unit 2	19	6	0	6	12	729.7
Unit 3	30	0	0	0	0	399.6
Unit 4	18	0	0	0	0	356.8
Unit 5	29	0	0	0	0	654.1
Unit 6	15	6	0	4	10	615.9
SUM	129	12	0	10	22	

Table 6.5: Legend Description

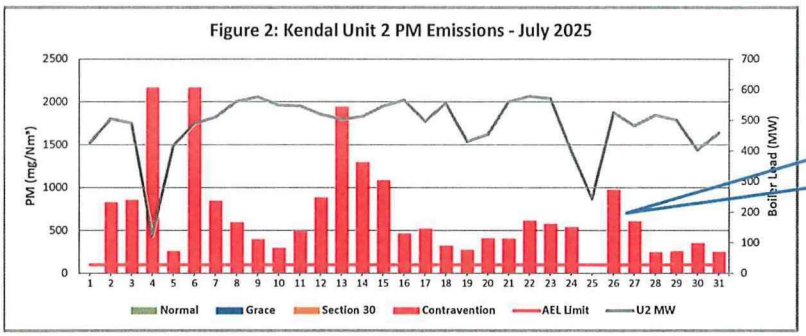
Condition	Colour	Description
Normal	GREEN	Emissions below Emission Limit Value (ELV)
Grace	BLUE	Emissions above the ELV during grace period
Section 30	ORANGE	Emissions above ELV during a NEMA S30 incident
Contravention	RED	Emissions above ELV but outside grace or S30 incident conditions

Figure 1: Kendal Unit 1 PM Emissions - July 2025



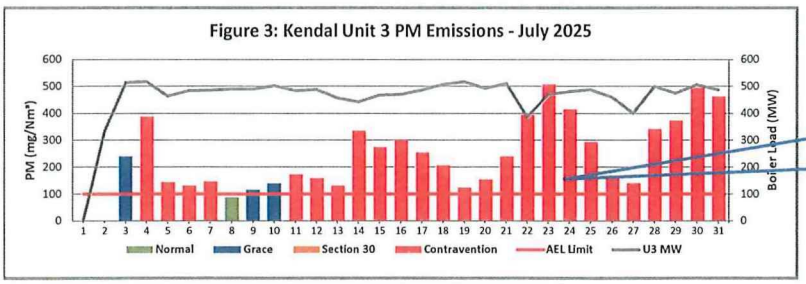
High PM emissions were attributed to PAH leakage, faulty HV units on F22 and F34, and a faulty fan on F31. Ash backlogs, and low secondary voltage was observed on F32, F41, and F42. All DHPs were not in service due to high compartment levels. Precipitator chains 12 and 24 were standing, and controller faults occurred on F17 and F36.

Figure 2: Kendal Unit 2 PM Emissions - July 2025



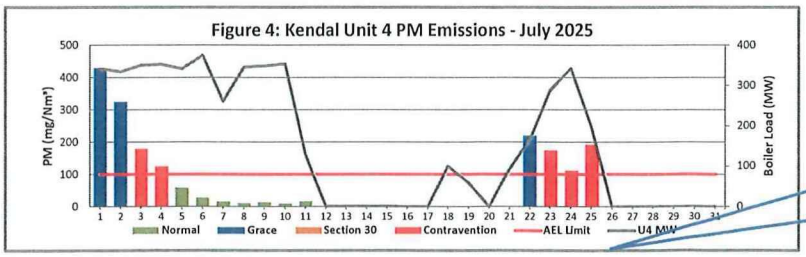
High PM emissions can be attributed to High Fields F11–F44 that were isolated, F13 CE rapper motor that were faulty and ash backlogs.

Figure 3: Kendal Unit 3 PM Emissions - July 2025



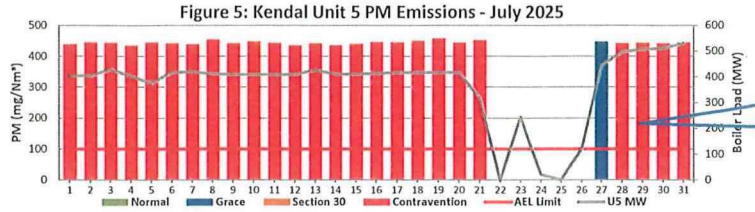
High PM emissions can be attributed to ash backlogs. High spark activity that was observed on F13, F32, F41, F45, and F46, while F43 was tripping on open output. The SO_3 plant was not in service, CE rapper 1 RH units were tripping on F31 and F41, and the F33 circuit breaker was faulty.

Figure 4: Kendal Unit 4 PM Emissions - July 2025



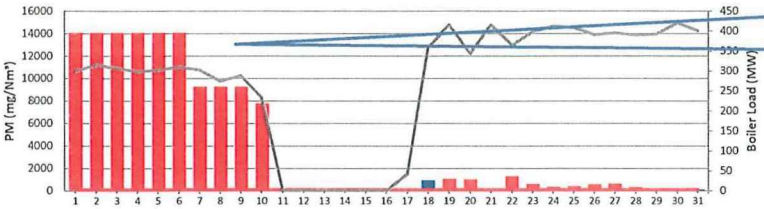
High PM emissions can be attributed to the unit light-up and cold start that were in progress. The F43 fan was faulty, communication bus faults occurred on F12 and F37. The unit was operating on oil support and the SO_3 plant was not in service.

Figure 5: Kendal Unit 5 PM Emissions - July 2025



High PM emissions can be attributed to high and low BETs, communication bus faults on F33, F35, and F47. Presence of ash backlokage. DHP was standing, and the unit was not in service due to low steam temperature.

Figure 6: Kendal Unit 6 PM Emissions - July 2025



High PM emissions can be attributed to low high-voltage DC conditions on F27 and F47, with multiple fields (F31–F47) having tripped due to low voltage. Ash backlogs were present, and the SO_3 plant was not in service. F11 and F21 were permanently out of commission due to structural damage.

Figure 7: Kendal Unit 1 SO_2 Emissions - July 2025

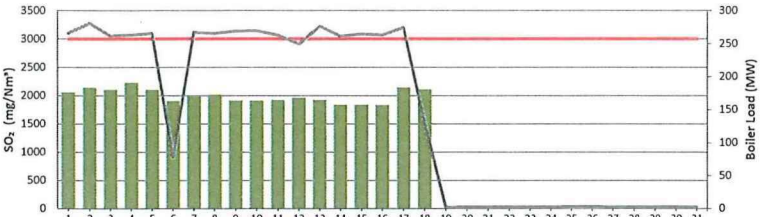


Figure 8: Kendal Unit 2 SO_2 Emissions - July 2025

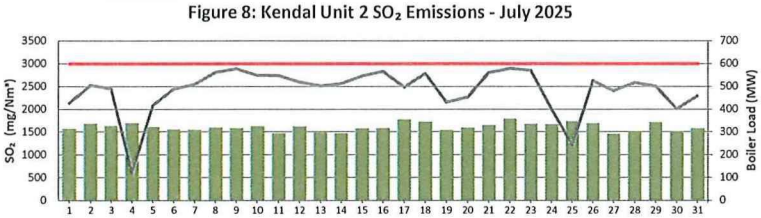


Figure 9: Kendal Unit 3 SO_2 Emissions - July 2025

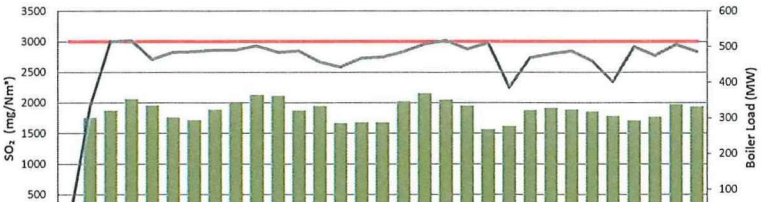


Figure 10: Kendal Unit 4 SO_2 Emissions - July 2025

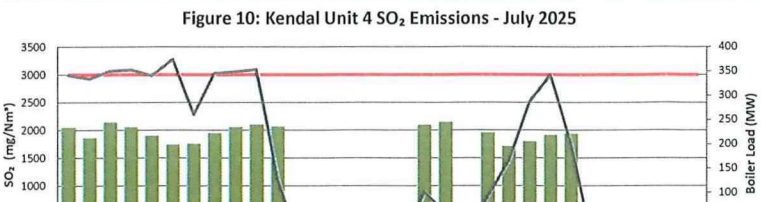


Figure 11: Kendal Unit 5 SO_2 Emissions - July 2025

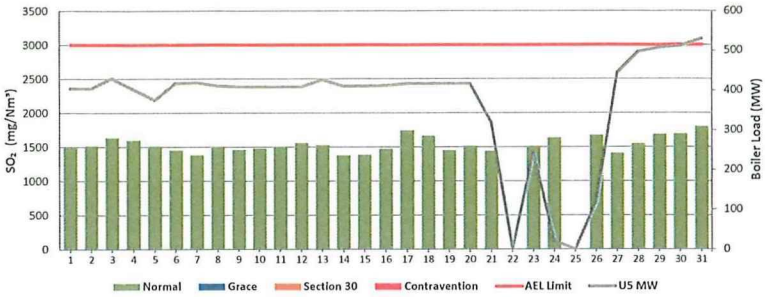


Figure 12: Kendal Unit 6 SO_2 Emissions - July 2025

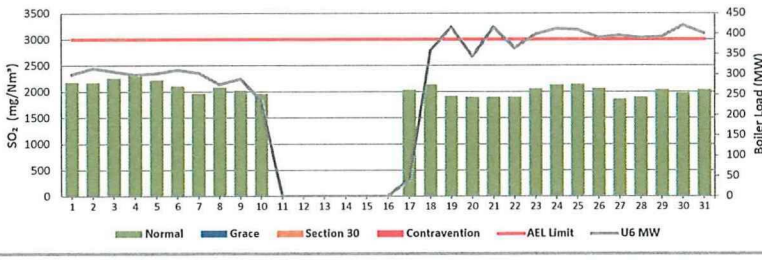


Figure 13: Kendal Unit 1 NO_x Emissions - July 2025

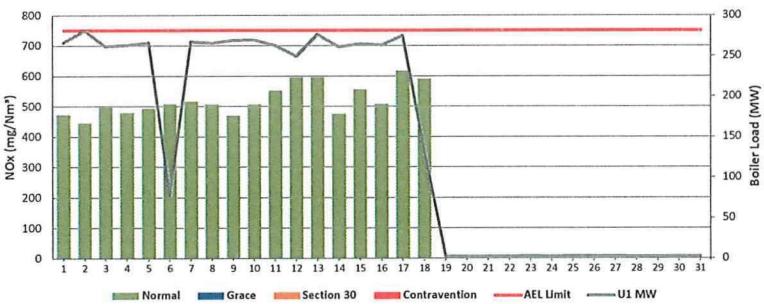
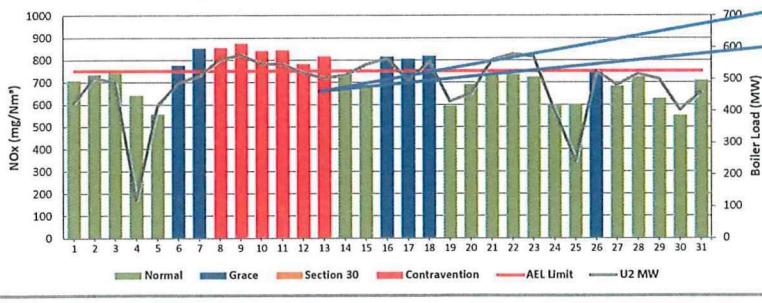


Figure 14: Kendal Unit 2 NO_x Emissions - July 2025



Process Engineering is still investigating the NOx exceedance to verify whether it is a genuine exceedance or a result of monitoring equipment issues

Figure 15: Kendal Unit 3 NO_x Emissions - July 2025

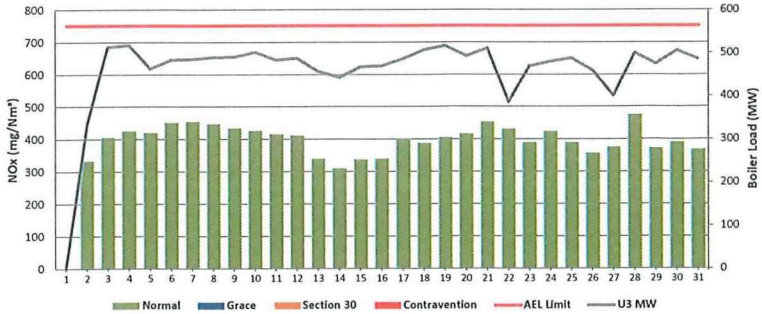


Figure 16: Kendal Unit 4 NO_x Emissions - July 2025

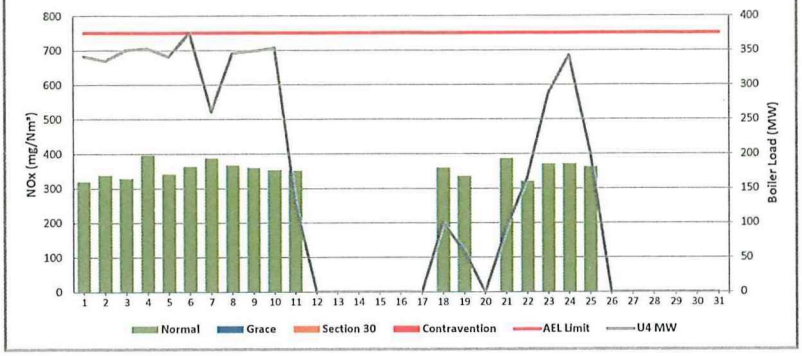


Figure 17: Kendal Unit 5 NO_x Emissions - July 2025

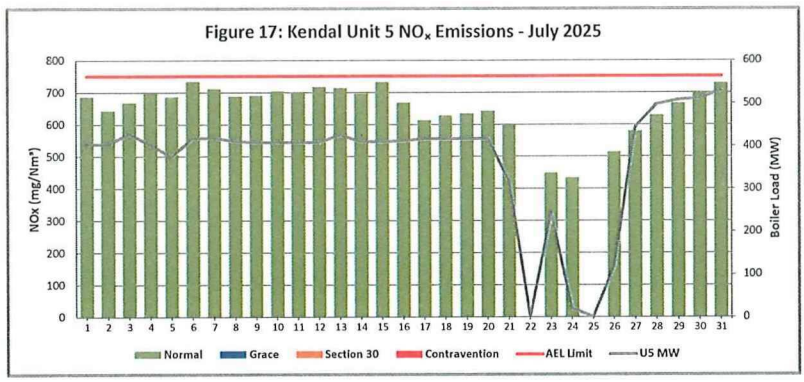
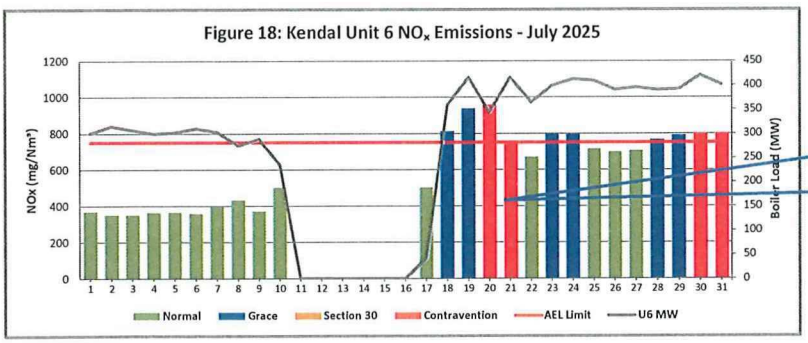


Figure 18: Kendal Unit 6 NO_x Emissions - July 2025



Process Engineering is still investigating the NOx exceedance to verify whether it is a genuine exceedance or a result of monitoring equipment issues

7 COMPLAINTS

There were no complaints for this months

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

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 1,2 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 02 sensors for unit 2 and 5 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 were attributed to PAH leakage, faulty HV units on F22 and F34, and a faulty fan on F31 Ash backlogs, and low secondary voltage was observed on F32, F41, and F42 All DHPs were not in service due to high compartment levels Precipitator chains 12 and 24 were standing and controller faults occurred on F17 and F36
Resolution Plant repaired

- **Unit 2**

Findings High PM emissions can be attributed to High Fields F11–F44 that were isolated, F13 CE rapper motor that were faulty and ash backlogs
- Resolution Plant repaired

- ***Unit 3***

Findings High PM emissions can be attributed to ash backlogs High spark activity that was observed on F13, F32, F41, F45, and F46, while F43 was tripping on open output The SO_3 plant was not in service, CE rapper 1 RH units were tripping on F31 and F41, and the F33 circuit breaker was faulty Resolution Plant repaired

- **Unit 4**

Findings High PM emissions can be attributed to the unit light-up and cold start that were in progress The F43 fan was faulty, communication bus faults occurred on F12 and F37 The unit was operating on oil support and the SO_3 plant was not in service
- Resolution Plant repaired

- **Unit 5**

Findings High PM emissions can be attributed to high and low BETs, communication bus faults on F33, F35, and F47 *Presence of ash* backlokage DHP was standing, and the unit was not in service due to low steam temperature
Resolution Plant repaired

- **Unit 6**

Findings High PM emissions can be attributed to low high-voltage DC conditions on F27 and F47, with multiple fields (F31–F47) having tripped due to low voltage Ash backlogs were present, and the SO_3 plant was not in service F11 and F21 were permanently out of commission due to structural damage
- Resolution Plant repaired

Boiler Plant Engineering Manager	Date	Environmental Manager	Date
Engineering Manager	Date		

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