Eskom

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Date
28 July 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 APRIL 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:

Supported by

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Date: 28/07/2025

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In partnership with

G20 SOUTH AFRICA 2025

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

Verified by

Jacob Zwane
BOILER ENGINEERING: SENIOR SYSTEM ENGINEER- KENDAL POWER STATION
Date: 29/07/2025

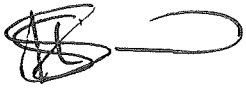
Validated by

Tendani Rasivhetshele
BOILER ENGINEERING MANAGER-KENDAL POWER STATION
Date:

Supported by

Phindile Takane
ENGINEERING MANAGER-KENDAL POWER STATION
Date: 4-08-2025

Approved by



Tshepiso Temo
GENERAL MANAGER-KENDAL POWER STATION
Date: 2025/08/08

Eskom

APRIL 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	Maximum Permitted Consumption Rate	Consumption Rate Apr-2025
	Coal	Tons	2 260 000	808 686
	Fuel Oil	Tons	5 000	6188.490
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Indicative Production Rate Apr-2025
	Energy	GWh	2 963.520	1 399.571
	Ash	Tons	770 000	257 809.097
	RE Ash	kg/MWh	not specified	7.068

Note: Maximum energy rate is as per the maximum capacity stated in the AEL: [4 116 MW] x 24 hrs x days in Month/1000 to convert to GWh

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	16-24 (MJ/kg)	18.710
Sulphur Content	%	<1 (%)	0.760
Ash Content	%	40 (%)	31.880

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO_2	NOx
Unit 1	100	3500	1100
Unit 2	100	3500	1100
Unit 3	100	3500	1100
Unit 4	100	3500	1100
Unit 5	100	3500	1100
Unit 6	100	3500	1100

4 ABATEMENT TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Apr-2025	Technology Type	SO_3 Utlization Apr-2025
Unit 1	*ESP + SO_3*	*95.315%*	*SO_3*	*73.3%*
Unit 2	*ESP + SO_3*	*91.157%*	*SO_3*	*100.0%*
Unit 3	*ESP + SO_3*	*98.852%*	*SO_3*	*100.0%*
Unit 4	*ESP + SO_3*	*Off-line*	*SO_3*	*Off-line*
Unit 5	*ESP + SO_3*	*98.396%*	*SO_3*	*50.0%*
Unit 6	*ESP + SO_3*	*93.938%*	*SO_3*	*93.3%*

Note: ESP plant does not have bypass mode operation, hence plant 100% Utilised

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 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO_2	NO	O_2
Unit 1	*68.7*	*100.0*	*100.0*	*100.0*
Unit 2	*1.0*	*100.0*	*100.0*	*100.0*
Unit 3	*71.5*	*100.0*	*100.0*	*96.7*
Unit 4	*Off*	*Off*	*Off*	*Off*
Unit 5	*97.7*	*94.4*	*94.4*	*83.3*
Unit 6	*22.9*	*100.0*	*100.0*	*100.0*

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of April 2025

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	1 752.7	2 983	1 086
Unit 2	4 441.1	3 226	1 424
Unit 3	592.5	2 421	1 090
Unit 4	Off	Off	Off
Unit 5	344.0	1 330	584
Unit 6	2 762.5	3 715	1 548
SUM	9 892.76	13 675	5 732

Table 6.2: Operating days in compliance to PM AEL Limit - April 2025

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	2	8	0	11	19	1 212.2
Unit 2	0	0	0	30	30	2 426.0
Unit 3	6	5	0	19	24	308.2
Unit 4	Off	Off	Off	Off	Off	Off
Unit 5	0	0	0	14	14	475.9
Unit 6	4	2	0	23	25	1 569.2
SUM	12	15	0	97	112	

Table 6.3: Operating days in compliance to SO_2 AEL Limit - April 2025

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO_2 (mg/Nm³)
Unit 1	25	0	0	0	0	2 151.7
Unit 2	30	0	0	0	0	1 733.3
Unit 3	30	0	0	0	0	1 250.2
Unit 4	Off	Off	Off	Off	Off	Off
Unit 5	15	0	0	0	0	1 594.1
Unit 6	29	0	0	0	0	1 966.2
SUM	129	0	0	0	0	

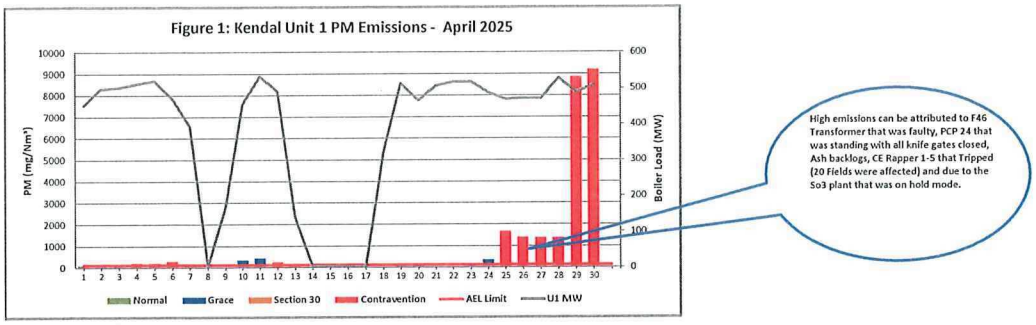
Table 6.4: Operating days in compliance to NOx AEL Limit - April 2025

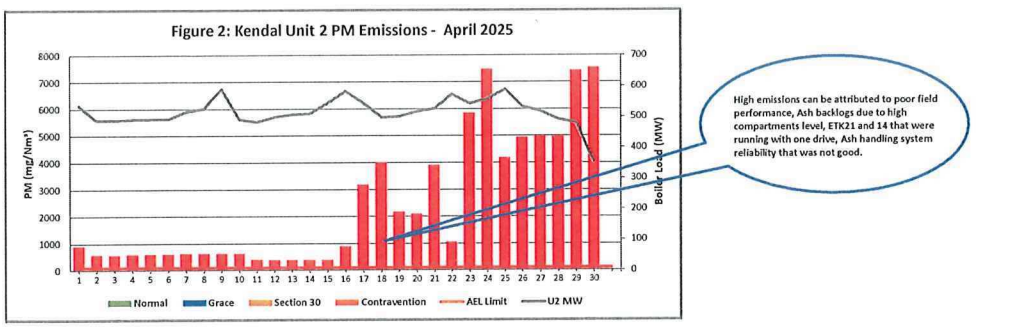
Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	25	0	0	0	0	778.6
Unit 2	30	0	0	0	0	765.4
Unit 3	30	0	0	0	0	565.1
Unit 4	Off	Off	Off	Off	Off	Off
Unit 5	15	0	0	0	0	703.0
Unit 6	29	0	0	0	0	817.2
SUM	129	0	0	0	0	

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

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





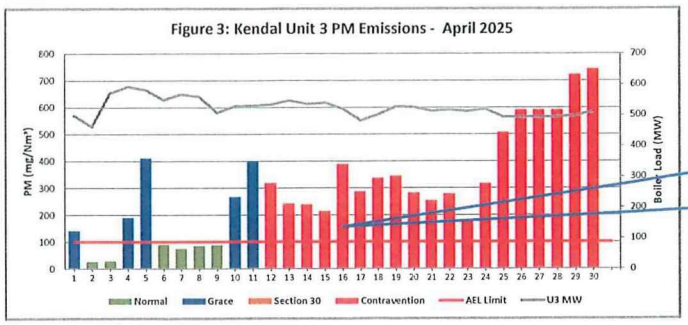


Figure 3: Kendal Unit 3 PM Emissions - April 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U3 MW
High emissions can be attributed to fans filures, Pcp 11-24 kngife gates 1-3 were closed, Ash backlogs affected by the Ash handling system that had to be restored.

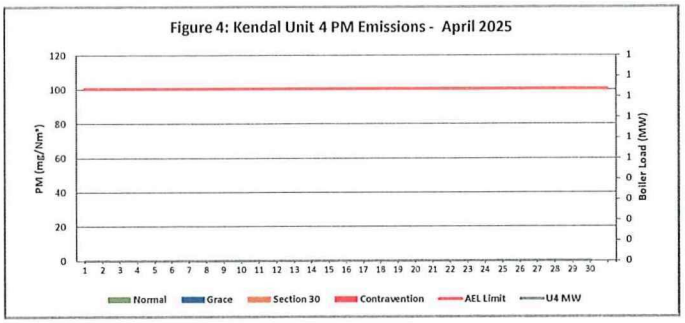


Figure 4: Kendal Unit 4 PM Emissions - April 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U4 MW

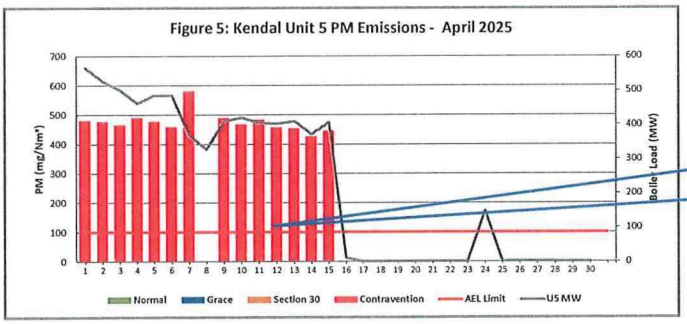


Figure 5: Kendal Unit 5 PM Emissions - April 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U5 MW
High PM emissions can be attributed to the PCP24 Gearbox that had failed, RHS fields that were all off, Ash backlogs, due to high compartments levels and PCP 24 standing with all kg closed.

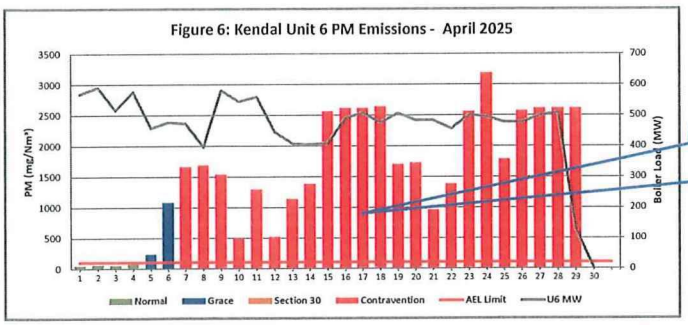


Figure 6: Kendal Unit 6 PM Emissions - April 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U6 MW
High PM emissions can be attributed to High Ash backlogs, PCP 11 standing with all Kg closed, poor fields performance, most fields were tripping on undervoltage (short circuit condition), CE Rapper 1-5 Tripped (20 Fields were Affected) and PCP14 Chocked.

Figure 7: Kendal Unit 1 SO_2 Emissions - April 2025

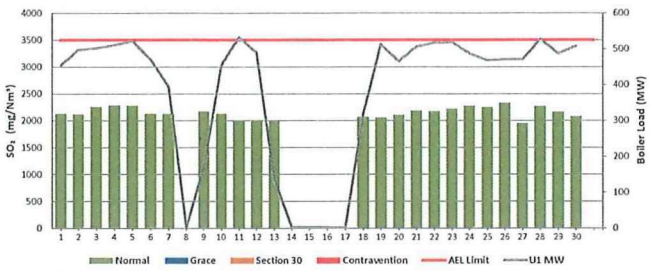


Figure 8: Kendal Unit 2 SO_2 Emissions - April 2025

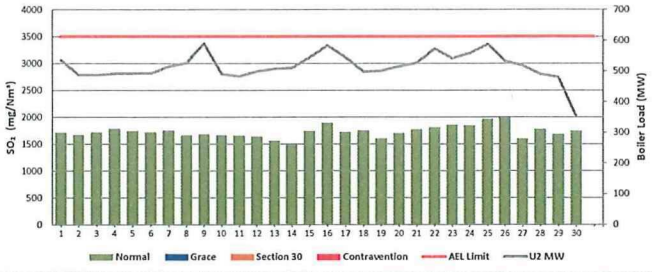
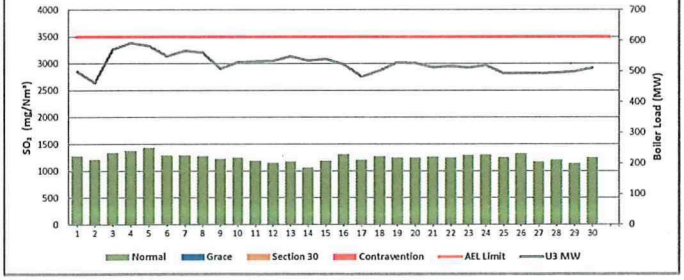


Figure 9: Kendal Unit 3 SO_2 Emissions - April 2025



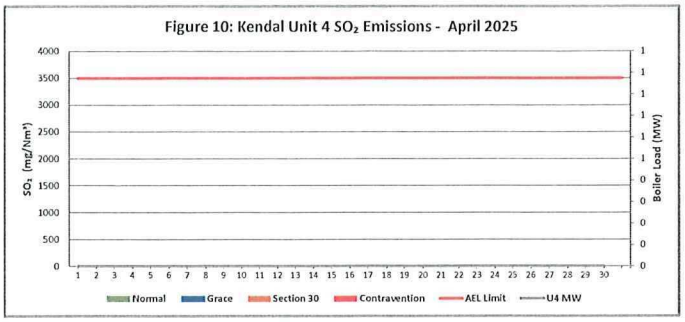


Figure 10: Kendal Unit 4 SO_2 Emissions - April 2025
SO_2 (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U4 MW

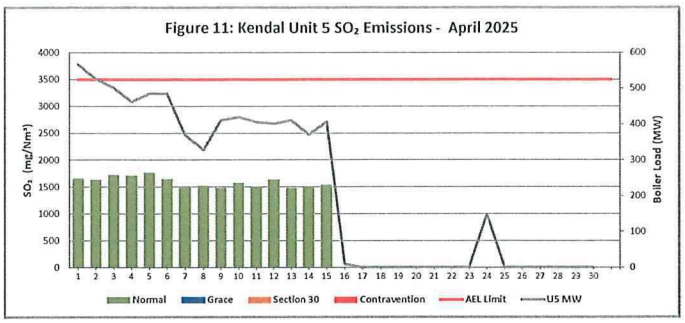


Figure 11: Kendal Unit 5 SO_2 Emissions - April 2025
SO_2 (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U5 MW

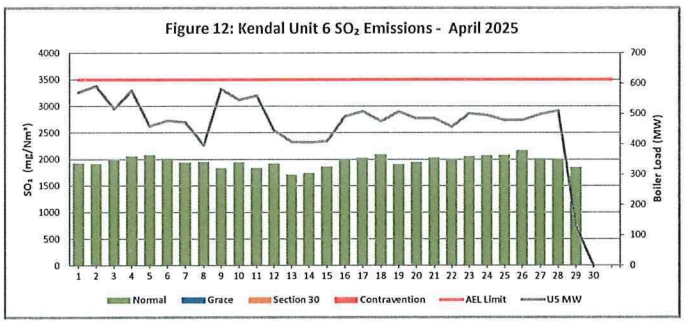


Figure 12: Kendal Unit 6 SO_2 Emissions - April 2025
SO_2 (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U5 MW

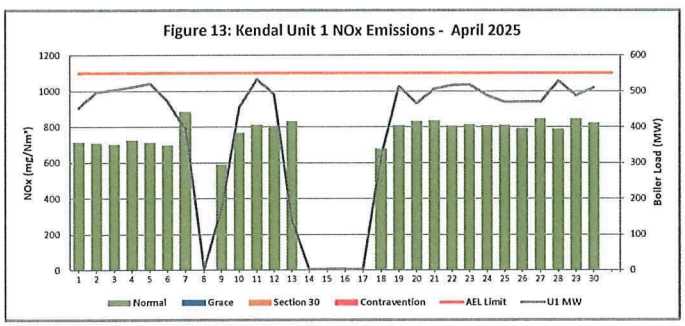


Figure 13: Kendal Unit 1 NOx Emissions - April 2025
NOx (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U1 MW

Figure 14: Kendal Unit 2 NOx Emissions - April 2025

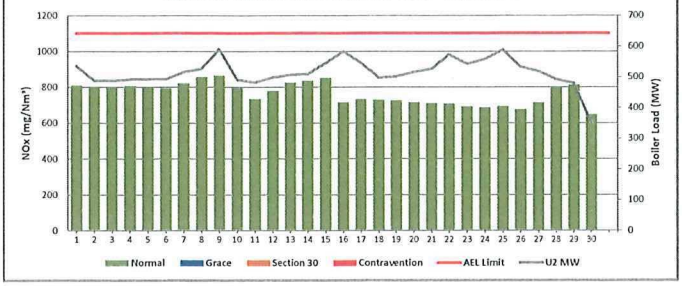


Figure 15: Kendal Unit 3 NOx Emissions - April 2025

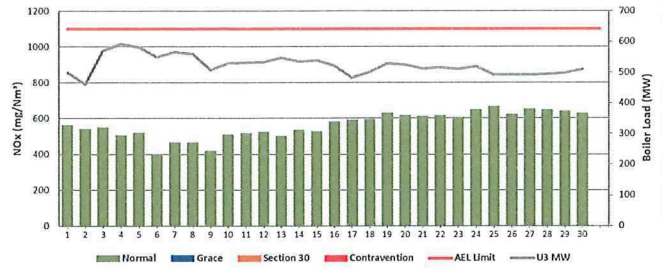


Figure 16: Kendal Unit 4 NOx Emissions - April 2025

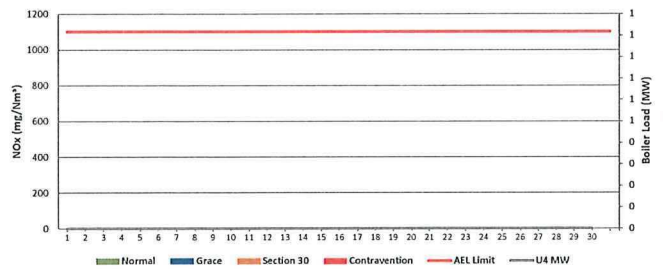


Figure 17: Kendal Unit 5 NOx Emissions - April 2025

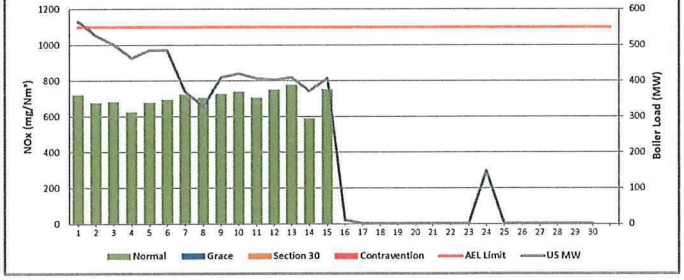
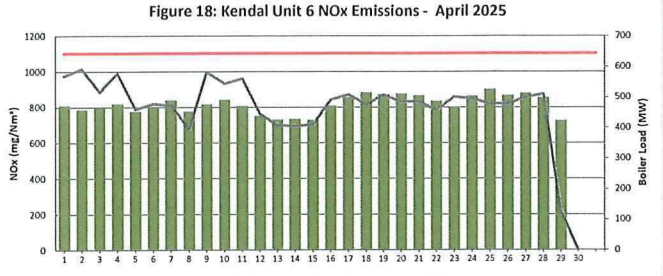


Figure 18: Kendal Unit 6 NOx Emissions - April 2025



7 COMPLAINTS

There were no complaints for this months

Source Code / Name	Root Cause Analysis	Calculation of Impacts / emissions associated	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence

ADDENDUM TO MONTHLY EMISSIONS REPORT

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

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

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

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 3 5 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 unit 2 4 5 and 6 O2 sensors were faulty Unit 5 and 4 O2 sensors were replaced in July 2025 and the process of replacing the othere sensors is in progress
- The PM montiors were not 100% reliable due ash backlog dust flooded the dust motors

- Unit 1
- Findings The high emissions can be attributed to F46 Transformer that was faulty, PCP 24 that was standing with all knife gates closed, Ash backlogs CE Rapper 1-5 Tripped (20 Fields were affected) and due to the So3 plant that was on hold mode
- Resolution Plant repaired

- Unit 2
- Findings The high emissions can be attributed to poor field performance, Ash backlogs due to high compartments level, ETK21 and 14 that were running with one drive, Ash handling system reliability that was not good
- Resolution Plant repaired

- Unit 3
- Findings The high PM emissions can be attributed to fans filures, Pcp 11 24 kngife gates 1 3 were closed Ash backlogs affected by the Ash handling system that had to be restored
- Resolution Palnt repaired

- Unit 4
- Unit was off

- Unit 5
- Findings High PM emissions can be attributed to the PCP24 Gearbox that had failed, RHS fields that were all off Ash backlogs, due to high compartments levels and PCP 24 standing with all kg closed
- Resolution Plant repaired

- Unit 6
- Findings High PM emissions can be attributed to High Ash backlogs, PCP 11 that was standing with all knife gates closed, poor fields performance, most fields were tripping on undervoltage (short circuit condition), CE Rapper 1-5 Tripped (20 Fields were affected) and PCP14 Chocked
- Resolution Plant repaired