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 MAY 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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**Date:**

Supported by

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**Date:** 28/07/2025

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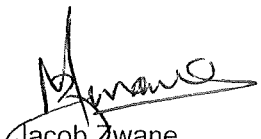
**Eskom Holdings SOC Ltd Reg No 2002/015527/30**

In partnership with

G20 SOUTH AFRICA 2025

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

Verified by



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**Date:** 29/07/2025

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**Date:** 2025/08/08

Eskom

MAY 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 May-2025 |
| | Coal | Tons | 2 260 000 | 809 607 |
| | Fuel Oil | Tons | 5 000 | 9843.350 |
| | | | | |
| Production Rates | Product / By-Product Name | Units | Maximum Production Capacity Permitted | Indicative Production Rate May-2025 |
| | Energy | GWh | 3 062.304 | 1 368.541 |
| | Ash | Tons | 770 000 | 260 693.454 |
| | RE Ash | kg/MWh | not specified | 19.391 |

*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) | 18.580 |
| Sulphur Content | % | <1 (%) | 0.760 |
| Ash Content | % | 40 (%) | 32.200 |

## 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 May-2025 | Technology Type | $SO_3$ Utlization May-2025 |
|---|---|---|---|---|
| Unit 1 | *ESP + $SO_3$* | *84.477%* | *$SO_3$* | *93.5%* |
| Unit 2 | *ESP + $SO_3$* | *78.341%* | *$SO_3$* | *93.5%* |
| Unit 3 | *ESP + $SO_3$* | *89.904%* | *$SO_3$* | *90.3%* |
| Unit 4 | *ESP + $SO_3$* | *97.008%* | *$SO_3$* | *38.7%* |
| Unit 5 | *ESP + $SO_3$* | *98.783%* | *$SO_3$* | *48.4%* |
| Unit 6 | *ESP + $SO_3$* | *83.589%* | *$SO_3$* | *67.7%* |

*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 | *29.9* | *100.0* | *100.0* | *96.8* |
| Unit 2 | *0.0* | *100.0* | *100.0* | *100.0* |
| Unit 3 | *28.7* | *100.0* | *100.0* | *100.0* |
| Unit 4 | *97.5* | *100.0* | *99.7* | *31.9* |
| Unit 5 | *99.7* | *100.0* | *99.4* | *100.0* |
| Unit 6 | *4.6* | *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 May 2025

| Associated Unit/Stack | PM (tons) | $SO_2$ (tons) | $NO_x$ (tons) |
|---|---|---|---|
| Unit 1 | 6 328.1 | 2 776 | 1 040 |
| Unit 2 | 10 043.8 | 3 160 | 1 305 |
| Unit 3 | 3 980.3 | 2 525 | 572 |
| Unit 4 | 709.0 | 1 753 | 614 |
| Unit 5 | 327.8 | 1 572 | 631 |
| Unit 6 | 5 147.9 | 2 665 | 1 088 |
| SUM | 26 536.89 | 14 451 | 5 249 |

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

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average PM (mg/Nm³) |
|---|---|---|---|---|---|---|
| Unit 1 | 0 | 1 | 0 | 30 | 31 | 3 789.7 |
| Unit 2 | 0 | 3 | 0 | 26 | 29 | 6 121.6 |
| Unit 3 | 0 | 3 | 0 | 22 | 25 | 3 052.8 |
| Unit 4 | 0 | 5 | 0 | 15 | 20 | 791.2 |
| Unit 5 | 0 | 4 | 0 | 14 | 18 | 455.4 |
| Unit 6 | 0 | 2 | 0 | 21 | 23 | 4 625.8 |
| SUM | **0** | **18** | **0** | **128** | **146** | |

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

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average $SO_2$ (mg/Nm³) |
|---|---|---|---|---|---|---|
| Unit 1 | 31 | 0 | 0 | 0 | 0 | 1 761.0 |
| Unit 2 | 30 | 0 | 0 | 0 | 0 | 1 769.2 |
| Unit 3 | 29 | 0 | 0 | 0 | 0 | 1 741.6 |
| Unit 4 | 23 | 0 | 0 | 0 | 0 | 1 883.1 |
| Unit 5 | 23 | 0 | 0 | 0 | 0 | 1 519.5 |
| Unit 6 | 24 | 0 | 0 | 0 | 0 | 2 009.6 |
| SUM | **160** | **0** | **0** | **0** | **0** | |

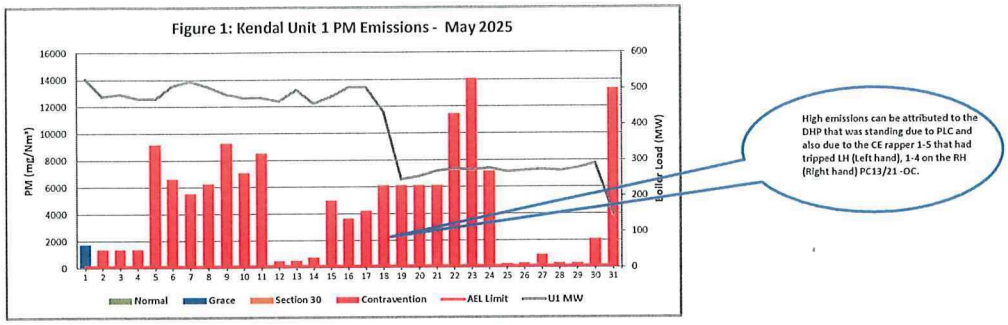
Table 6.4: Operating days in compliance to NOx AEL Limit - May 2025

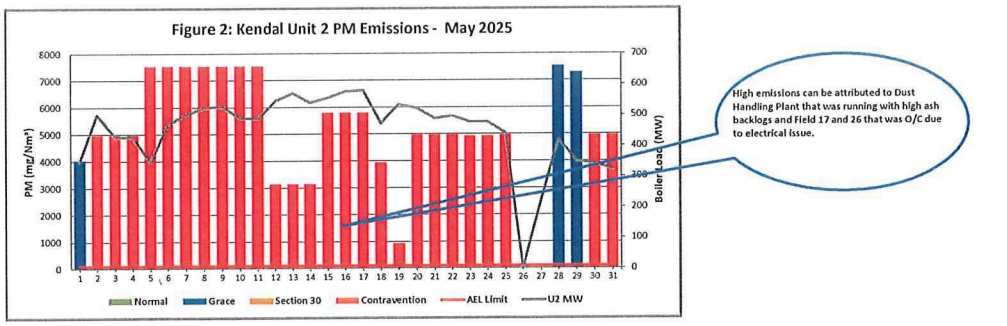
| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average NOx (mg/Nm³) |
|---|---|---|---|---|---|---|
| Unit 1 | 31 | 0 | 0 | 0 | 0 | 604.8 |
| Unit 2 | 30 | 0 | 0 | 0 | 0 | 716.7 |
| Unit 3 | 29 | 0 | 0 | 0 | 0 | 383.5 |
| Unit 4 | 23 | 0 | 0 | 0 | 0 | 637.7 |
| Unit 5 | 23 | 0 | 0 | 0 | 0 | 563.3 |
| Unit 6 | 24 | 0 | 0 | 0 | 0 | 779.2 |
| SUM | 160 | 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 |



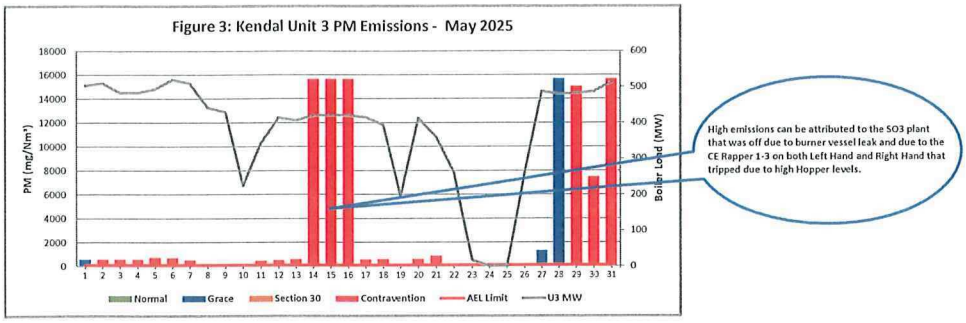


Figure 3: Kendal Unit 3 PM Emissions - May 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U3 MW
High emissions can be attributed to the SO3 plant that was off due to burner vessel leak and due to the CE Rapper 1-3 on both Left Hand and Right Hand that tripped due to high Hopper levels.

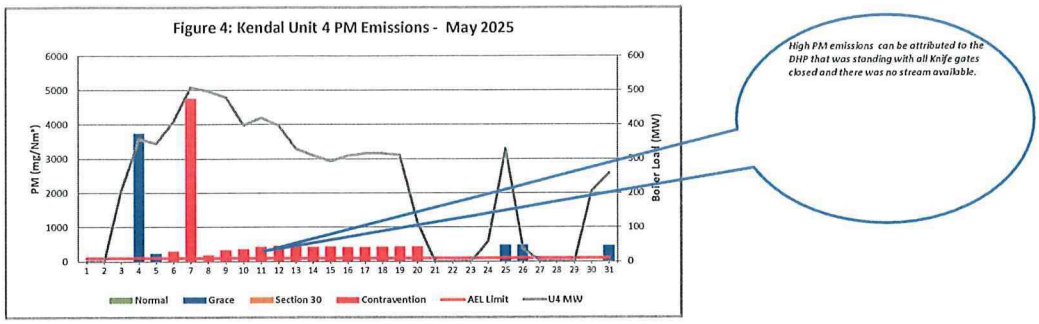


Figure 4: Kendal Unit 4 PM Emissions - May 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U4 MW
High PM emissions can be attributed to the DHP that was standing with all Knife gates closed and there was no stream available.

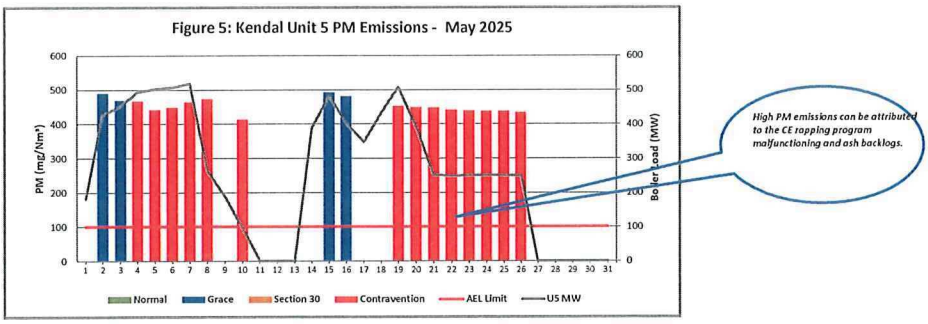


Figure 5: Kendal Unit 5 PM Emissions - May 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U5 MW
High PM emissions can be attributed to the CE rapping program malfunctioning and ash backlogs.

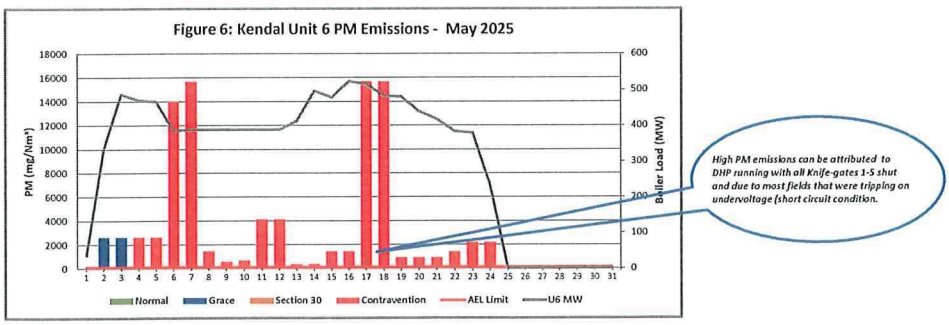


Figure 6: Kendal Unit 6 PM Emissions - May 2025
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U6 MW
High PM emissions can be attributed to DHP running with all Knife-gates 1-5 shut and due to most fields that were tripping on undervoltage (short circuit condition.

Figure 7: Kendal Unit 1 $SO_2$ Emissions - May 2025

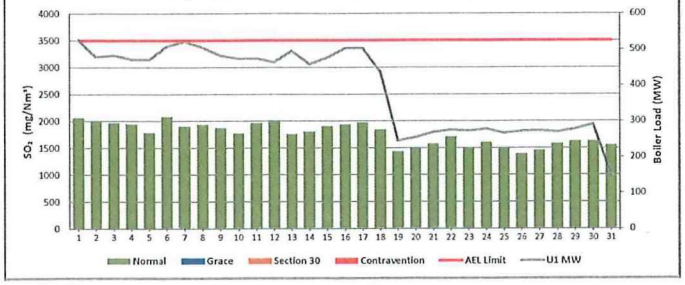



Figure 8: Kendal Unit 2 $SO_2$ Emissions - May 2025

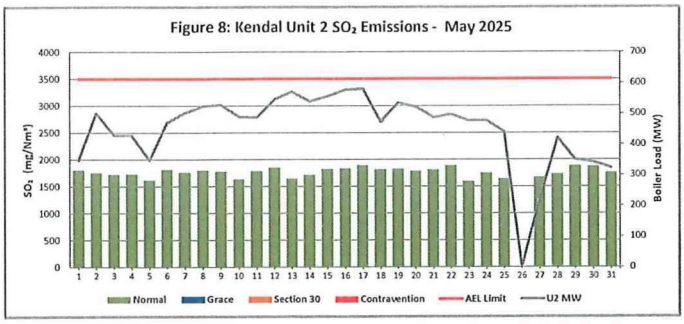



Figure 9: Kendal Unit 3 $SO_2$ Emissions - May 2025

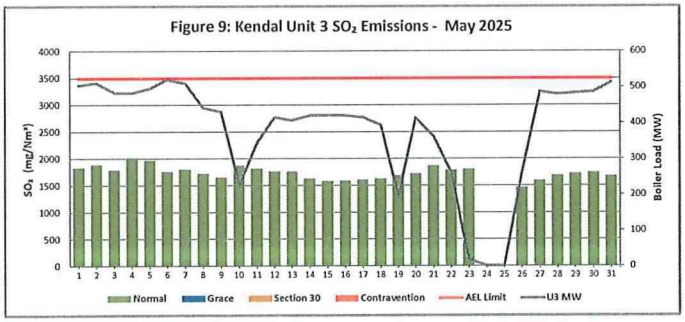


Figure 10: Kendal Unit 4 $SO_2$ Emissions - May 2025

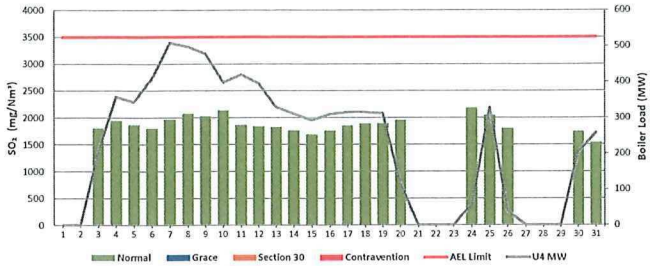



Figure 11: Kendal Unit 5 $SO_2$ Emissions - May 2025

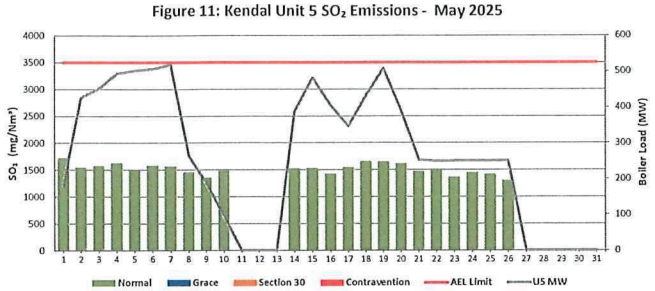



Figure 12: Kendal Unit 6 $SO_2$ Emissions - May 2025

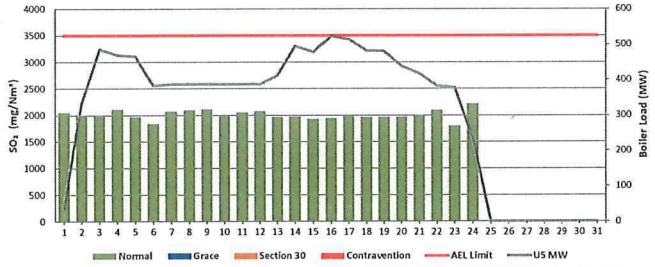



Figure 13: Kendal Unit 1 NOx Emissions - May 2025

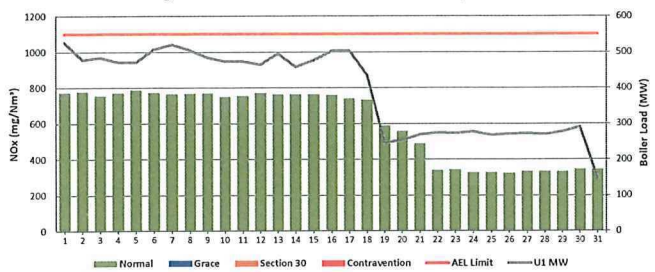


Figure 14: Kendal Unit 2 NOx Emissions - May 2025

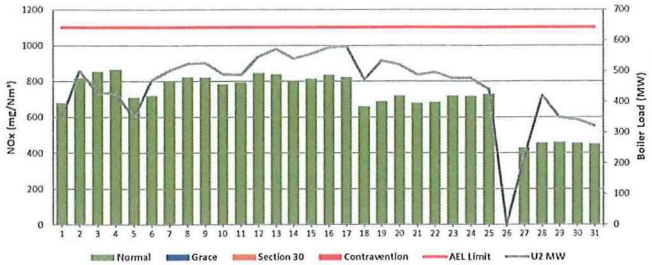



Figure 15: Kendal Unit 3 NOx Emissions - May 2025

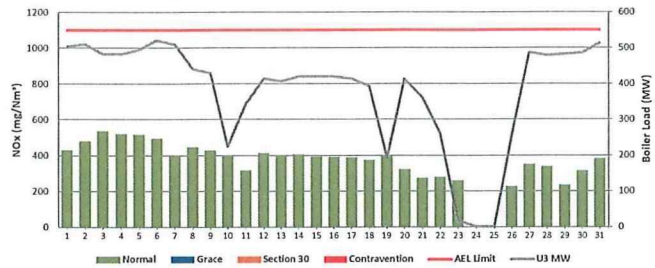



Figure 16: Kendal Unit 4 NOx Emissions - May 2025

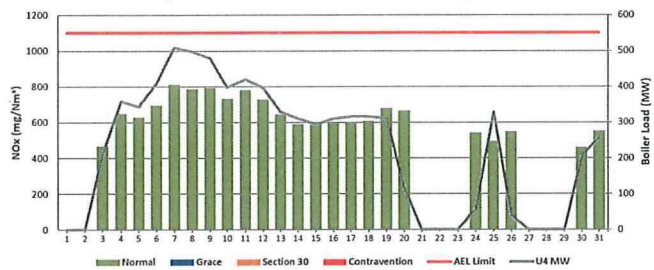



Figure 17: Kendal Unit 5 NOx Emissions - May 2025

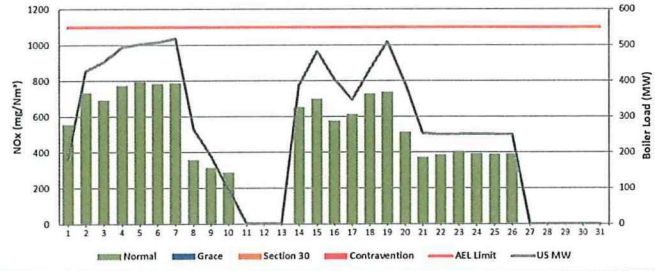
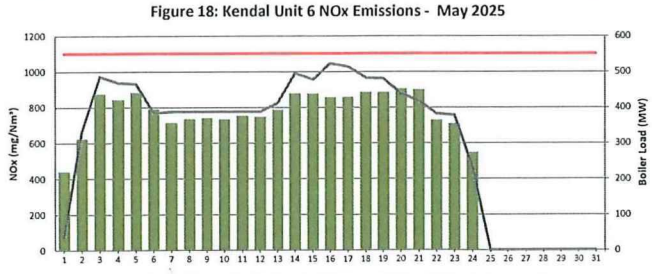



Figure 18: Kendal Unit 6 NOx Emissions - May 2025



## 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 |
|---|---|---|---|---|
| | | | | |
| | | | | |

**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

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

$\eta = 1 \quad \frac{(Dust\ Mission\ from\ AQR\ Report\ Dust\ Monitor\ (tons)}{(Coal\ Burnt\ (tons) * \%Ash\ Content * 80\%)} \times 100$

**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 02 sensors are faulty as they all need to be replaced Unit 5 and 4 O2 sensors were replaced in July 2025 and the process of replacing the othere sensors is in progress
- The PM monitors were not 100% reliable due ash backlog dust flooded the dust motors

- Unit 1
- Findings The high emissions can be attributed to the DHP that was standing due to PLC and also due to the CE rapper 1 5 that had tripped LH (Left hand) 1 4 on the RH (Right hand) PC13/21 OC
- Resolution Plant repaired

- Unit 2
- Findings The high emissions can be attributed to the Dust Handling Plant that was running with high ash backlogs and Field 17 and 26 that was O/C due to electrical issue
- Resolution Plant repaired

- Unit 3
- Findings The high PM emissions can be attributed to the SO3 plant that was off due to burner vessel leak and due to the CE Rapper 1 3 on both Left Hand and Right Hand that tripped due to high Hopper levels
- Resolution Plant repaired

- Unit 4
- Findings The high PM emissions can be attributed to the SO3 plant that was off due to the DHP that was standing with all Knife gates closed and there was no stream available
- Resolution Plant repaired

- Unit 5
- Findings High PM emissions can be attributed to the CE rapping program malfunctioning and ash backlogs
- Resolution Plant repaired

- Unit 6
- Findings High PM emissions can be attributed to the DHP that was running with all knife-gates 1 5 shut and due to most fields that were tripping on undervoltage (short circuit condition
- Resolution Plant repaired