Eskom	Matimba Power Station annual emission report	Matimba Power Station

Title:	**Matimba Power Station annual emission report for 2023/2024 financial year**	Document Identifier:	**RP/247/047**
		Plant Location:	**N/A**
		Area of Applicability:	**Matimba Power Station**
		Functional Area Applicability:	**Environment**
		Revision:	**1**
		Total Pages:	**21**
		Report Date:	**May 2024**
		Disclosure Classification:	**Controlled**

Compiled by	Reviewed by	Functional Responsibility	Authorized by
Kamogelo Kwata	**Helry Ramahlare**	**MC Mamabolo**	**Obakeng Mabotja**
Environmental Officer (GIT)	**Senior Advisor Environment**	**Environmental Manager**	**General Manager**
Date: 10.07.2024	Date: 10.07.2024	Date: 15/07/2024	Date: ----------

Content

1. Introduction

This annual emissions report is prepared as per the requirements of Section 7.7.3 of the Matimba Power Station's Atmospheric Emission License (AEL) "*The License Holder must complete and submit to the Licensing Authority, an annual Report. The report must include information for the year under review (i.e., annual year end of the company). The report must be submitted to the licensing authority not later than 60(sixty) days after the end of each reporting period"*, as well as in terms other reporting requirements listed in the Minimum Emission Standards. The emissions are for Matimba's 2023/2024 financial year, which covers the period from 1 April 2023 to 31 March 2024. The data presented in the report is the verified emissions of particulates, SO_2 and NO_x (as NO_2), as measured by installed CEMS. Greenhouse gas reporting is done in accordance with the National Greenhouse Gas Reporting Regulations.

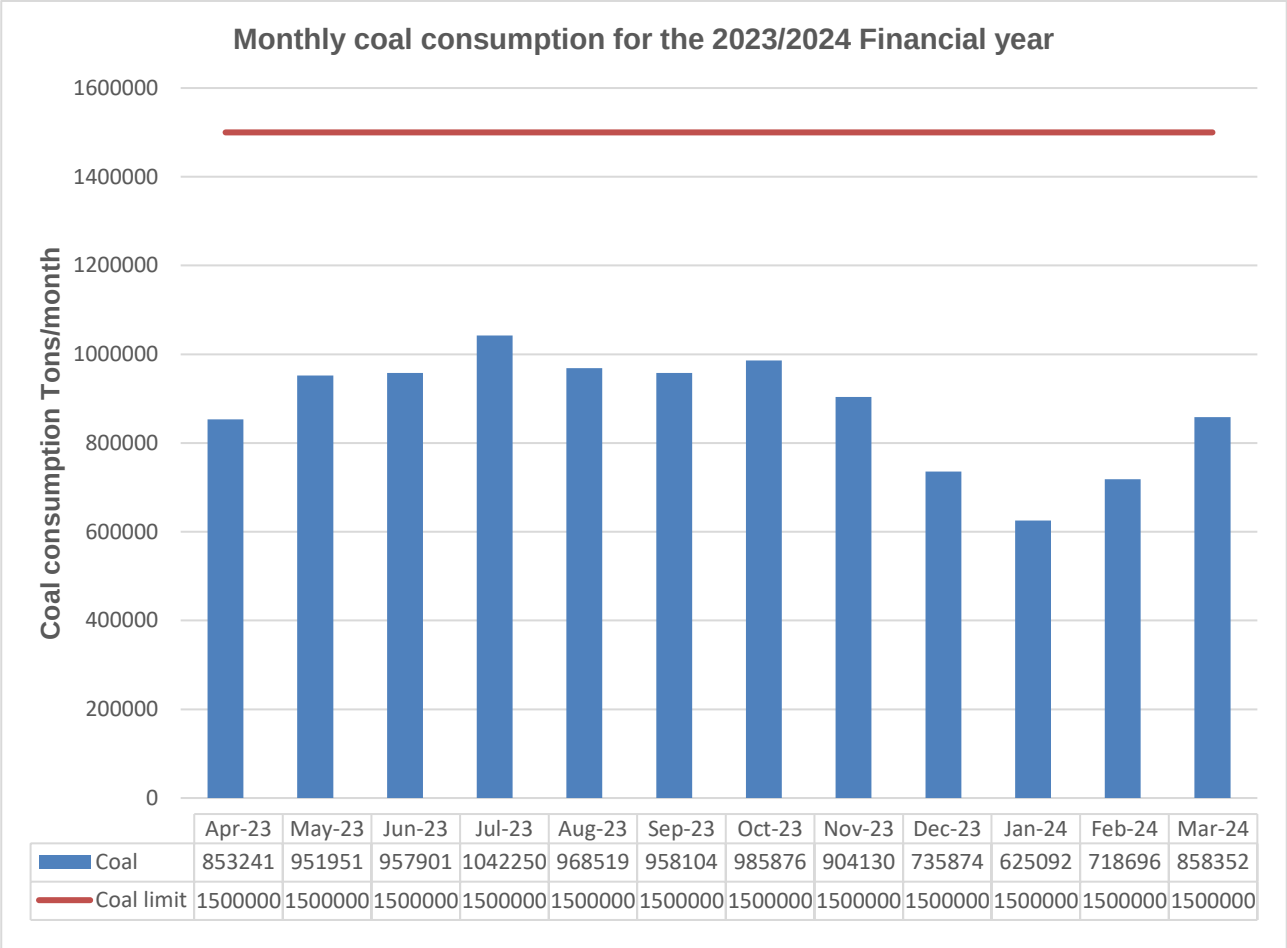
Table 1: Name, description and reference number of plant as specified in the AEL

Name of facility	Eskom Holdings SOC Limited Matimba Power Station
Description of facility	Electricity generation
Enterprise registration number	2002/015527/06
AEL reference number	H16/1/13-WDM05
AEL Issue Date and Validity	27 September 2022 – 27 September 2026

2. Annual emission information

2.1. Annual consumption rates

Figure 1 and Figure 2 below indicates the monthly coal and fuel oil consumption rates, respectively, in tons for the 2023/2024 financial year.



	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Coal	853241	951951	957901	1042250	968519	958104	985876	904130	735874	625092	718696	858352
Coal limit	1500000	1500000	1500000	1500000	1500000	1500000	1500000	1500000	1500000	1500000	1500000	1500000

Figure 1: Coal consumption for 2023/2024 financial year

Monthly coal consumption for the whole reporting period remained below the limit of 1 500 000 Tons per month.

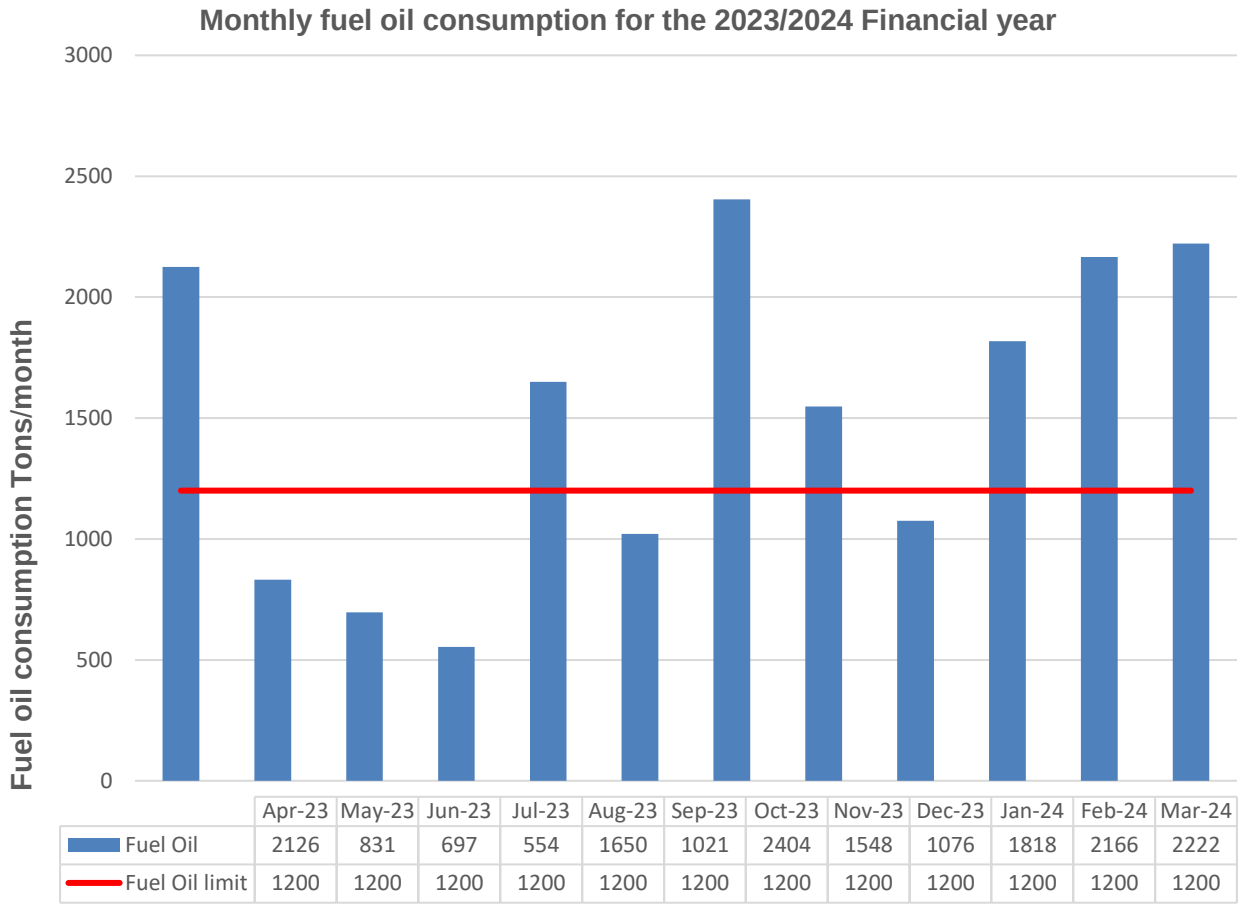
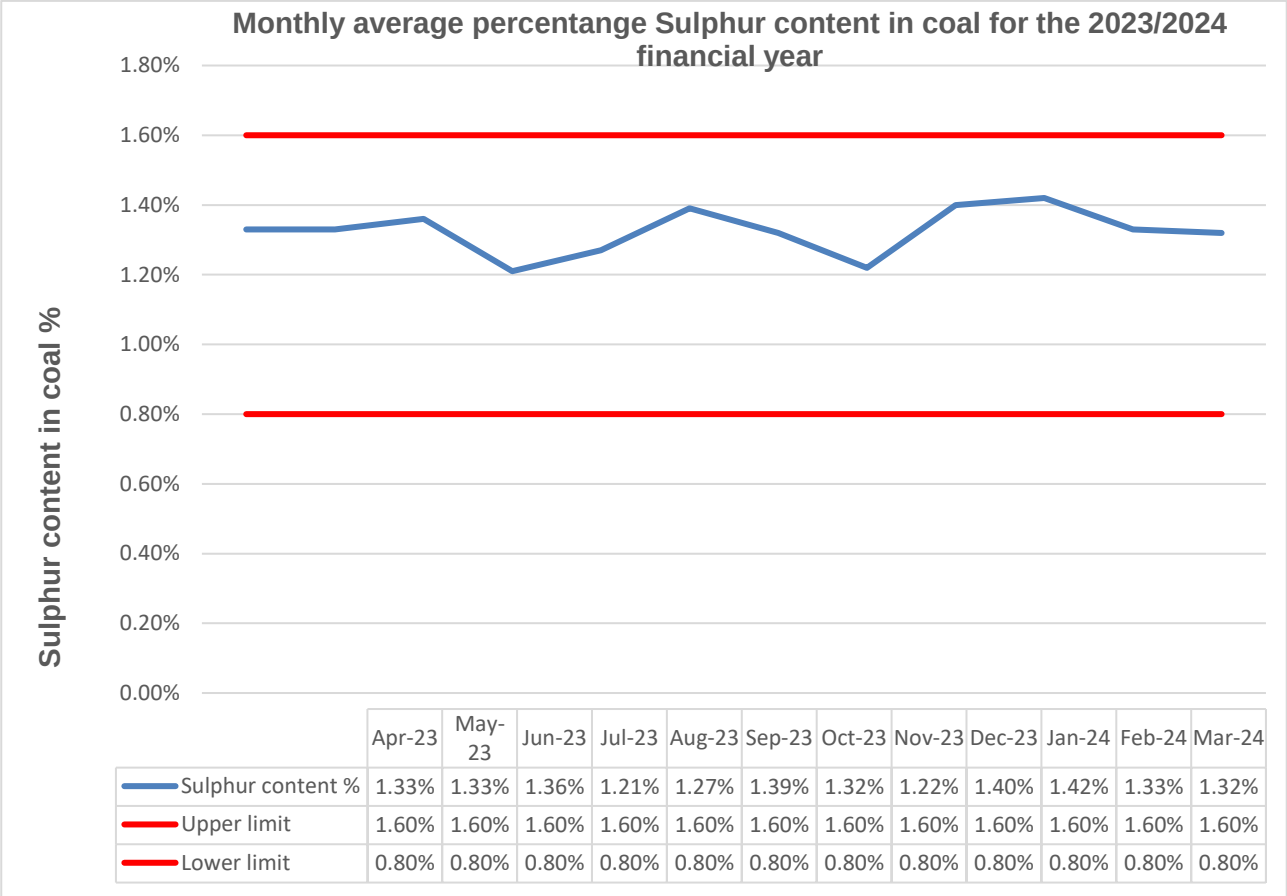


Figure 2: Fuel oil consumption for 2023/2024 Financial year

Matimba Power Station exceeded the monthly fuel oil usage limit of 1200 Tons per month in the month of April 2023, August 2023, October 2023, November 2023, January 2024, February 2024 and March 2024.The increased usage of fuel oil was due to multiple start-ups that had to be done after several unplanned unit trips and planned outages of units and the plants defects that resulted in operating with constant combustion support with fuel oil.

2.2. Energy source characteristics

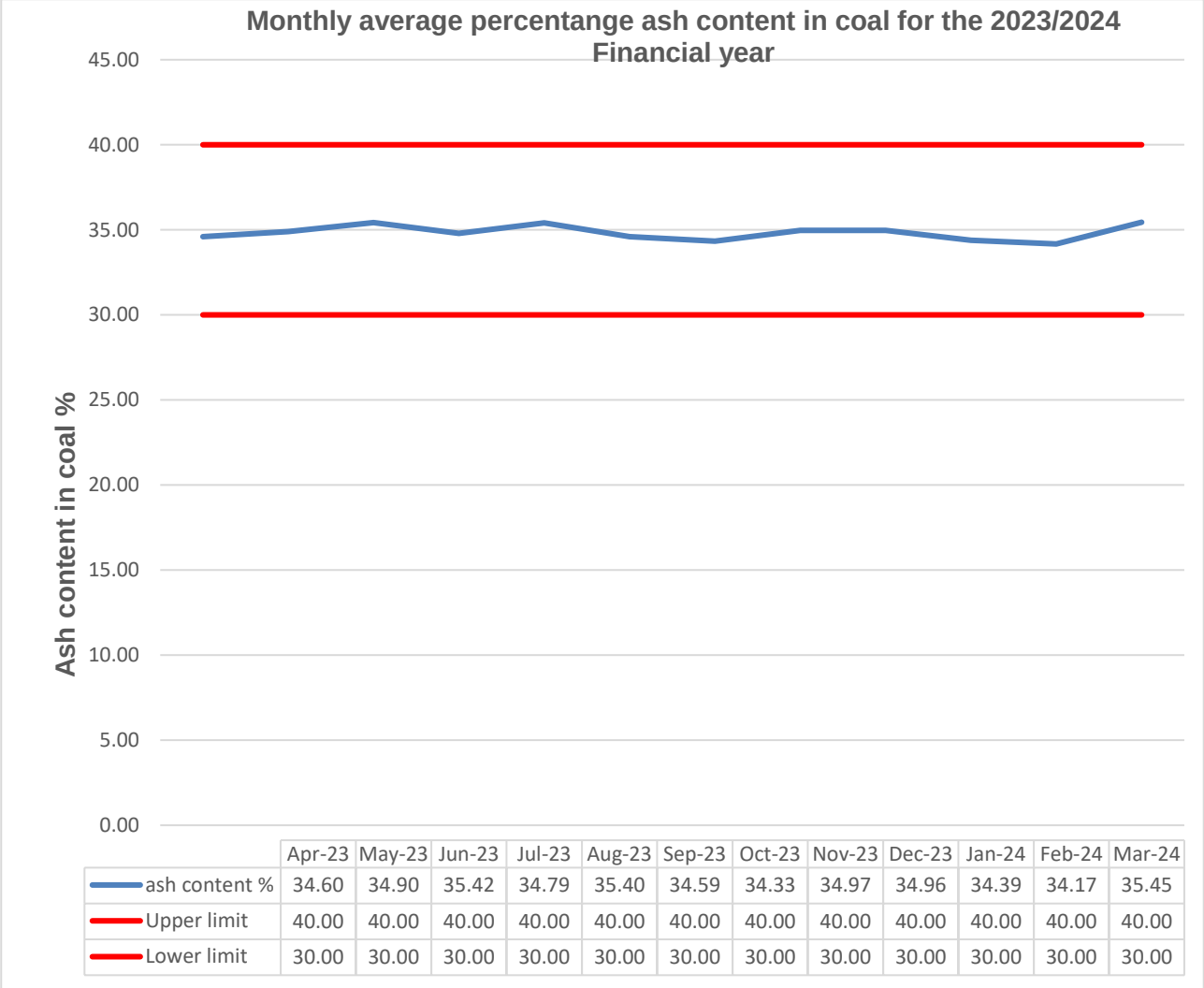
The figures 3, 4 and 5 below indicates the Sulphur content and ash content of the coal and Sulphur content of the fuel oil used in the 2023/2024 financial year.



	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Sulphur content %	1.33%	1.33%	1.36%	1.21%	1.27%	1.39%	1.32%	1.22%	1.40%	1.42%	1.33%	1.32%
Upper limit	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%
Lower limit	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%

Figure 3: Sulphur content in coal for 2023/2024 financial year

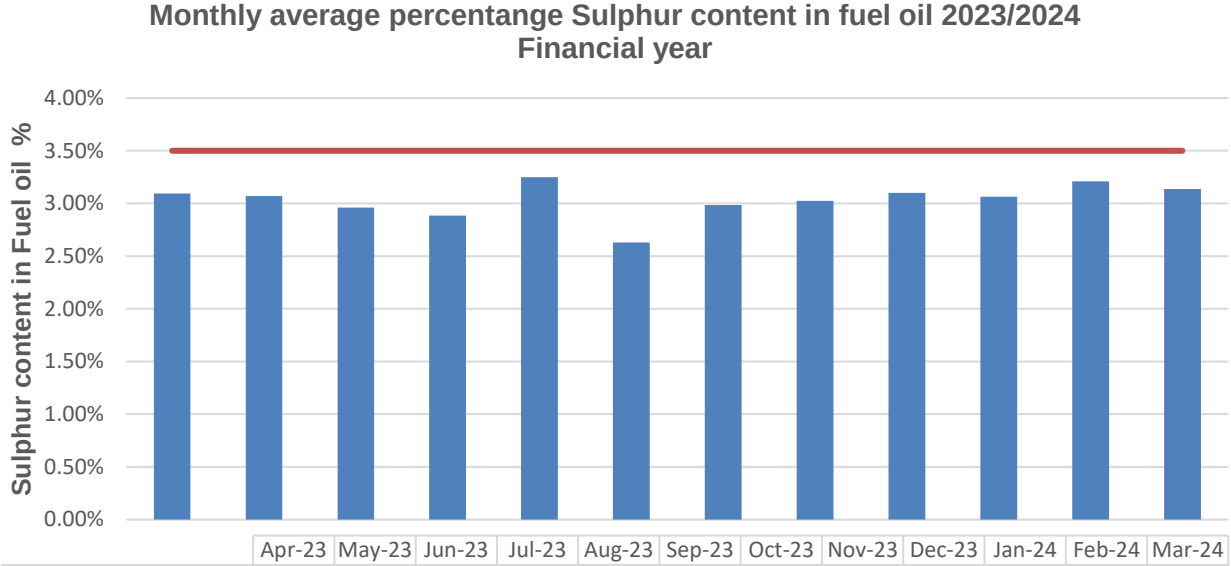
Monthly average Sulphur content of coal has remained within the specified range for 2023/2024 financial year.



	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
ash content %	34.60	34.90	35.42	34.79	35.40	34.59	34.33	34.97	34.96	34.39	34.17	35.45
Upper limit	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Lower limit	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00

Figure 4: Ash content in coal for 2023/2024 financial year

The monthly average ash content within the coal remained within the required limits.



	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Sulphur content %	3.10%	3.07%	2.96%	2.89%	3.25%	2.63%	2.99%	3.03%	3.10%	3.06%	3.21%	3.14%
Limit	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%

Figure 5: Sulphur content in fuel oil for 2023/2024 financial year

Sulphur content of the fuel oil has remained below the limit of 3,50% in the 2023/2024 financial year.

2.3. Emission trends

The emission tonnages in tables 3 below are that of the 2023/2024 financial year.

Table 2: General overview of emissions at Matimba Power Station 2023/2024

Power Station	Coal-fired emissions (tons/annum)	Fuel-oil emissions (tons/annum)	Total (tons/annum)
Matimba Power Station	**SO_2: 265 159,873** **PM: 9326,728** **NO_x: 48 300,766**	**SO_2: 774,24**	**SO_2: 265 934,113** **PM: 9326,728** **NO_x: 48 300,766**

Table 3: Pollutant Emission Trends

Month	PM (tons)	NO_x (tons)	SO_2 (tons)
April 2023	1161.7	3522.4	23395.6
May 2023	324.2	4233.3	27763.1
June 2023	1572.0	4424.1	27462.8
July 2023	769.0	4529.7	26246.7
August 2023	702.5	4038.0	22312.4
September 2023	867.7	4253.8	24233.6
October 2023	568.9	4363.1	24198.5
November 2023	583.4	3845.0	21000.7
December 2023	452.4	3076.9	17615.9
January 2024	844.6	2305.4	14293.7
February 2024	711.4	2743.3	16550.8
March 2024	769.1	3144.0	19456.9

Table 4: Total volatile organic compound emissions 2023/2024 financial year

Month	TVOC (Kg/month)
April 2023	0.54
May 2023	0.56
June 2023	0.56
July 2023	0.58
August 2023	0.61
September 2023	0.57
October 2023	0.66
November 2023	0.63
December 2023	0.60
January 2024	0.65
February 2024	0.63
March 2024	0.61

*Note: Total volatile organic compound emissions are calculated based on fuel oil quantities used within the specific month.

Figures 6 to 8 below illustrates the monthly tonnages of pollutants emitted in the 2023/2024 financial year.

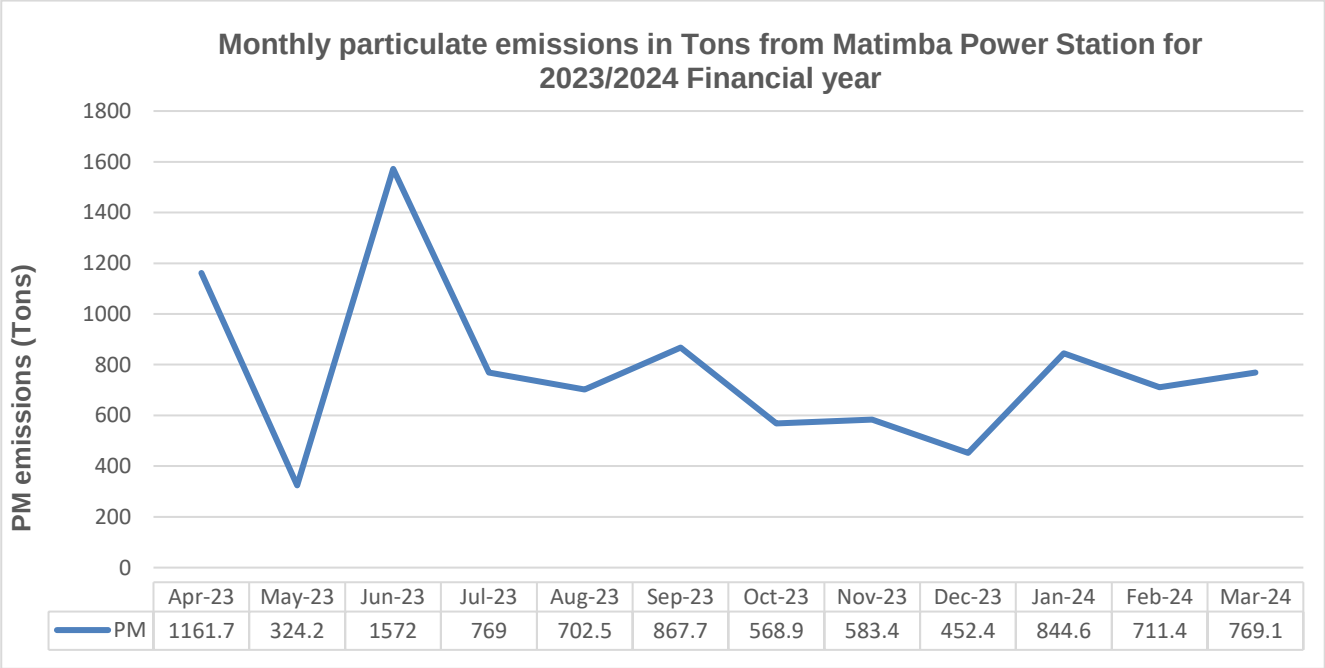


Figure 6: Monthly Particulate Emissions in tons from Matimba Power Station 2023/2024

Matimba experienced increases in particulate emissions tonnages in the financial year 2023/2024. The station experienced challenges with the downstream ash evacuation due to the unreliability and poor performance of the ash conveyance plant. The ash conveyance plant issues lead to backlogs at the dust handling plant i.e. high hopper levels and precipitator fields trip or failure, then high emissions. The daily average limit of 50mg/Nm^3 was exceeded 821 times in the period between April

2023 and March 2024, 4 Section 30 incidents in June 2023 were reported as a result of failure on the ash conveyance belts. Corrective actions to repair defective plant areas are underway. More information on exceedances will be provided in annexure 1. Detailed daily emission concentrations are illustrated in the monthly reports submitted to your office.

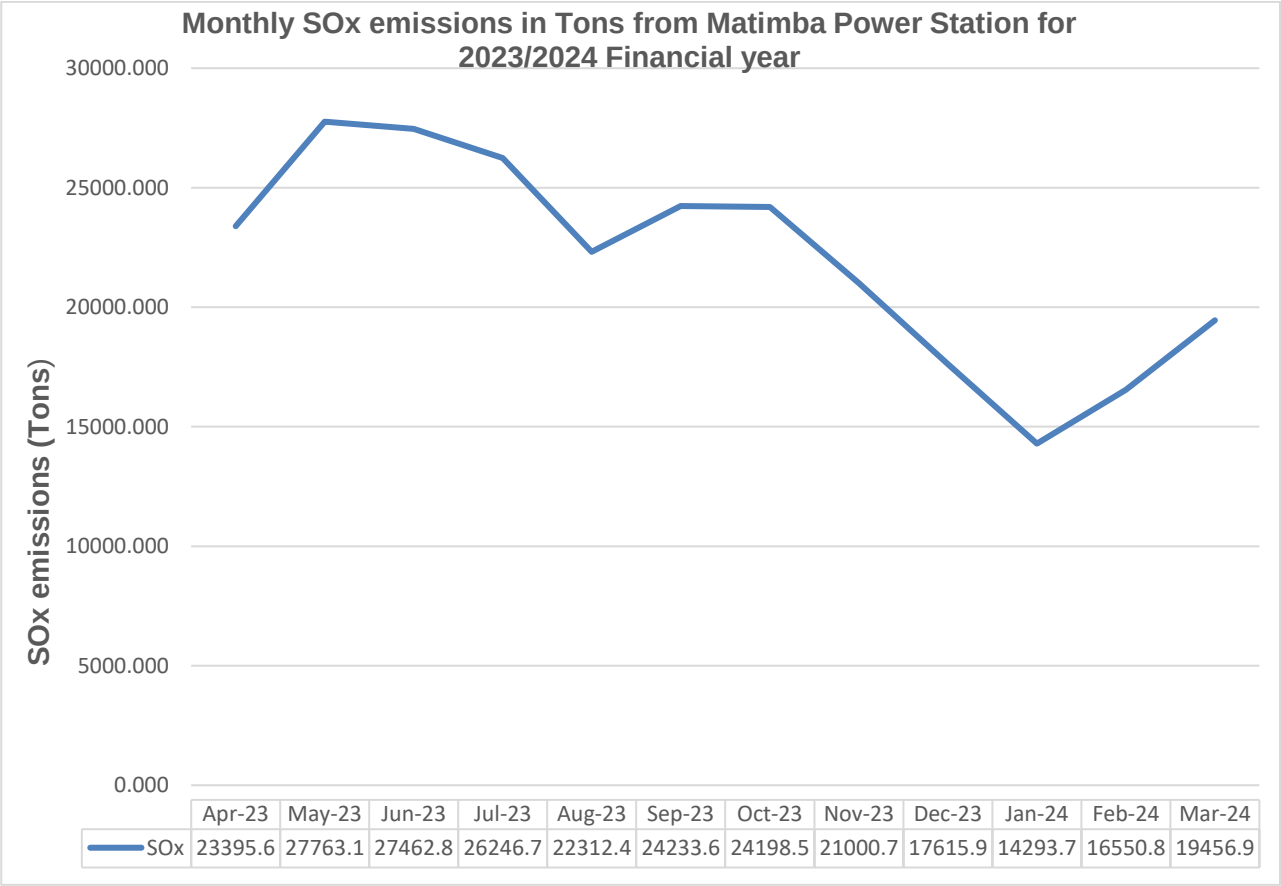


Figure 7: Monthly SO_2 Emissions in tons from Matimba Power Station 2023/2024

The reduction in SO_2 emissions in November 2023 was due to unit 2 taken on outage from November 2023 to February 2024 and unit 4 taken on outage from January 2024 to March 2024. Occasional daily peaks are still observed in the sulphur content of coal which leads to sporadic increases of the SOx emissions. Interventions such as blending high sulphur content coal with lower sulphur content coal, daily monitoring, and trending of sulphur content versus emissions is being conducted to manage the SO_2. There were 26 SOx daily exceedances in the reporting period. The causes for the exceedances were identified to be a defective analyser that drifted back from faulty readings after calibration is performed. Detailed daily emission concentrations are illustrated in the monthly reports submitted to your office.

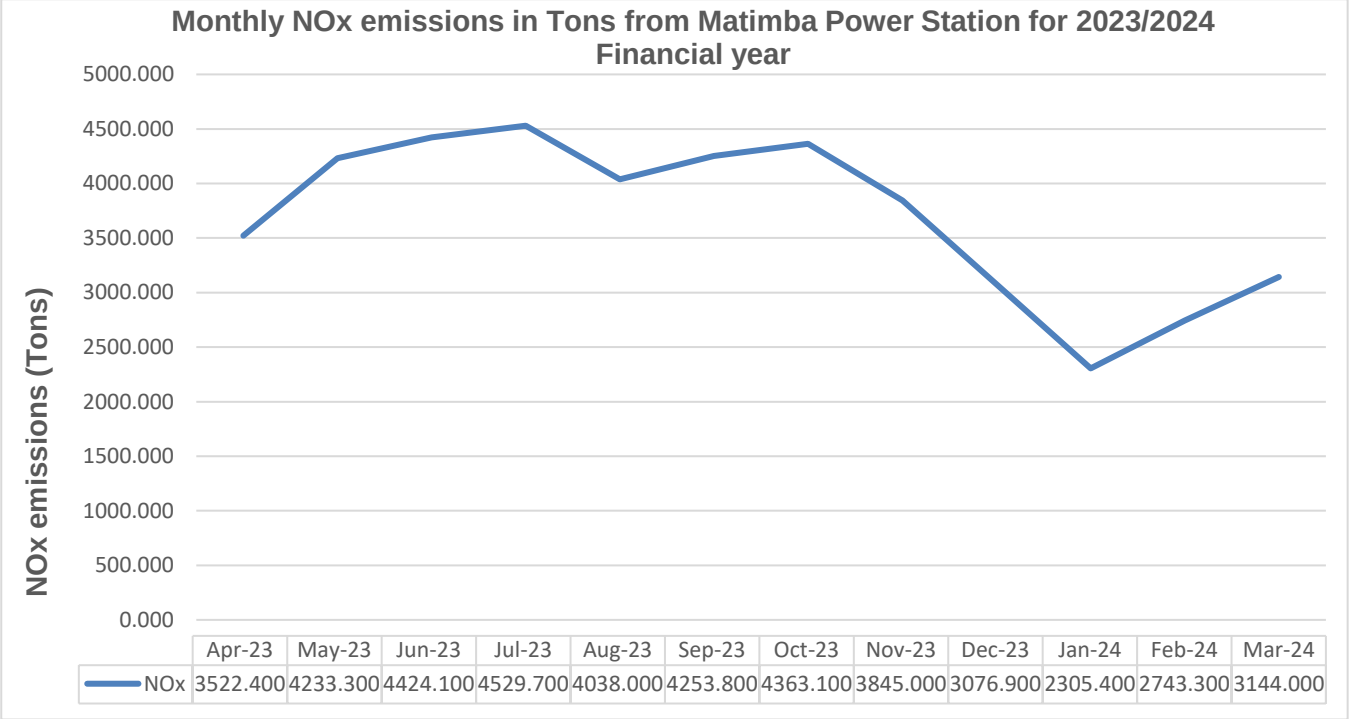


Figure 8: Monthly NO_2 Emissions in tons from Matimba Power Station 2023/2024

The reduction in NO_2 emissions in November 2023 was due to unit 2 taken on outage from November 2023 to February 2024 and unit 4 taken on outage from January 2024 to March 2024. There were 17 NOx daily exceedances in the reporting period. The causes for the exceedances were identified to be a defective analyser that drifted back from faulty readings after calibration is performed. Detailed daily emission concentrations are illustrated in the monthly reports submitted to your office.

2.4. Energy sent out

Figure 9 illustrates the monthly energy sentout for the 2023/2024 financial year

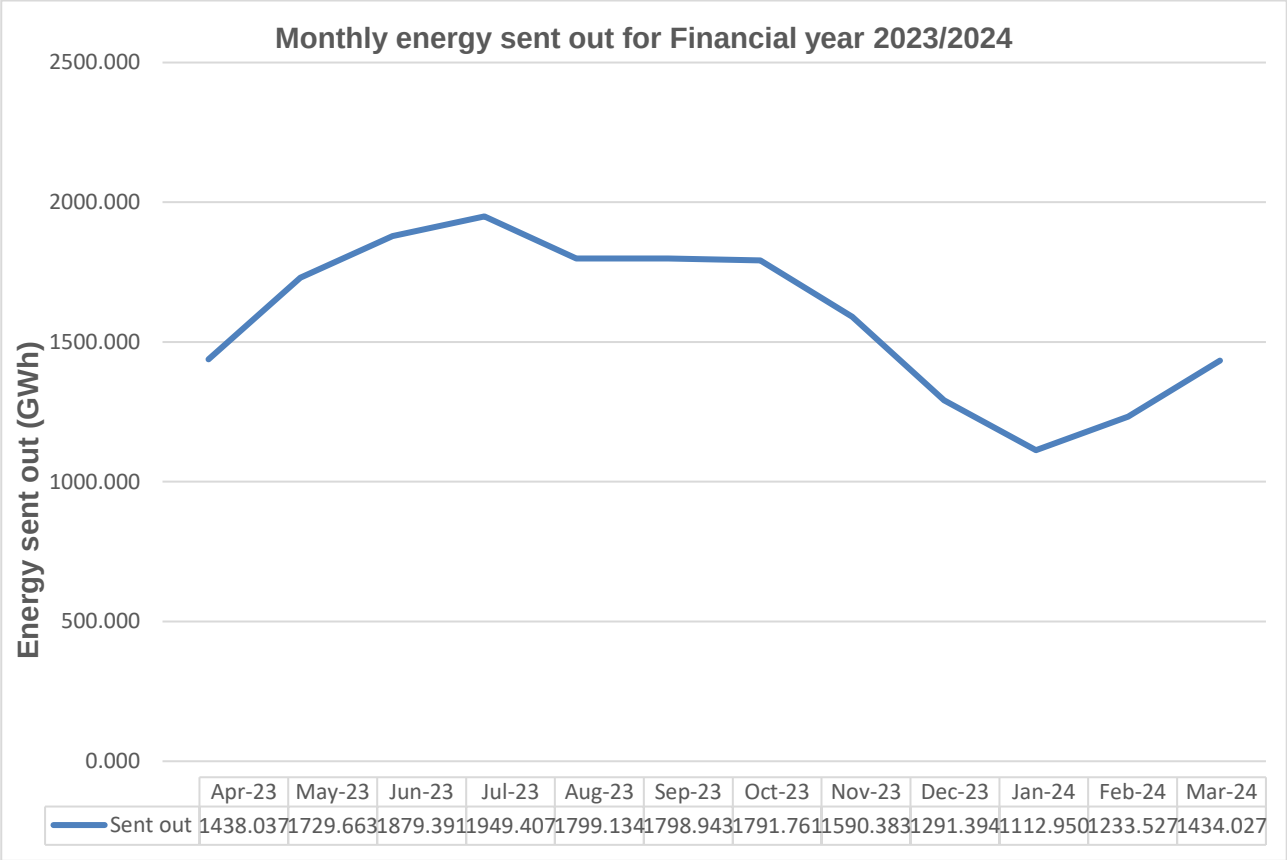


Figure 9: Monthly Energy Sent out GWh at Matimba Power Station 2023/2024

2.5. Ambient air quality monitoring

Matimba power Station monitors the effect of its emissions on the surrounding environment through an ambient air quality monitoring station located in the Marapong community. The Marapong ambient monitoring station was not available from October 2022 to March 2024 due to power interruptions and damaged analysers caused by power cable theft. The station is currently being relocated to a new place within Marapong community that will be secured and have better security to guard against cable theft incidents and was commissioned on the 20 March 2024. The details of the monitoring station unavailability and movement was communicated to the licencing authorities. The station has been utilising the Kroomdraai farm monitoring station for reporting the ambient Detailed ambient monitoring reports from Kroomdraai farm monitoring station were available and submitted to the licencing authority monthly along with the Matimba monthly emission report.

Table 5 and 6 below illustrates the compliance for the past financial year (April 2023 – March 2024) as per the National Air Quality Standards.

Ambient Monitoring station availability	**NO1**	**NO2**	**NOX**	**O3**	**PRS**	**RAD**	**RFL**	**SGT**	**S02**	**TMP**	**WDR**	**WSP**	**WVL**	**PM2.5**	**PM10**	**CO**	**HUM**	**Data Recovery**	**Station Availability**
Apr-23	85.8	85.8	85.8	86	99.7	99.7	99.7	99.7	85.7	99.7	99.7	99.7	99.7	73.8	69.4	85.8	99.7	91.5	86.5
May-23	84.5	84.5	84.5	85.2	100	100	100	100	84.7	100	100	100	100	30.5	85.5	85.2	100	89.7	85.8
Jun-23	96.5	96.5	96.5	96.8	100	100	100	100	96.4	100	100	100	100	93.9	88.2	94.6	100	97.6	97.4
Jul-23	69.9	69.9	69.9	70.6	100	100	100	100	68.1	100	100	100	100	49.6	71.5	37.4	100	82.8	72.8
Aug-23	84.3	84.3	84.3	84.9	100	100	100	100	76.7	100	100	100	100	0	85.5	84.4	100	87.3	100
Sep-23	74.6	74.4	74.4	77.6	100	100	100	100	71.3	99.9	100	100	100	0	58.3	77.6	100	82.8	79.3
Oct-23	84.9	84.9	84.9	86.8	100	100	100	100	84.4	100	100	100	100	0	15.7	86.7	100	84	87.4
Nov-23	69.4	69.4	69.4	76.3	99.9	99.9	99.7	99.9	70	99.9	99.9	99.9	99.9	0	52.2	75.7	99.9	81.3	82.4
Dec-23	89.5	89.5	89.5	91		100	100	100	86.2	100	100	100	100	0	0	91.4	100	84.5	91.5
Jan-24	82.9	82.9	82.9	85.8		100	100	100	78.8	100	100	100	100	0	0	85.3	100	81.2	86
Feb-24	21.3	21.3	21.3	68.6		100	100	100	44	100	100	100	100	0	0	68.3	100	65.3	73.1
Mar-24	0	0	0	81.3		100	100	100	61.3	100	100	100	100	0	0	23.5	100	60.4	83.9
Average	70.3	70.3	70.3	82.6	99.95	99.97	99.95	99.97	75.63	99.95	99.97	99.97	99.97	20.65	43.86	74.66	99.97	82.37	85.51

*ND= No Data

Average data recovery was below the required 90% for all the Months of 2023/2024 financial year. The poor performance was mostly due to cable thefts which resulted in frequent power interruptions and damages to the analysers.

The ambient monitoring station was relocated from the original location to Ditheku primary school. The station has been available since end of March 2024.

Table 5: National Ambient Air Quality Limits exceedances

	SO2 10-minute	SO2 hourly	SO2 daily	NO2 hourly	PM10 daily	PM2.5 daily	O3 8-hourly
Apr-23	**8**	**3**	**0**	**0**	**0**	**1**	**0**
May-23	14	5	1	0	0	0	0
Jun-23	11	2	0	0	0	2	0
Jul-23	2	1	0	0	2	2	0
Aug-23	4	3	0	0	3	ND	17
Sep-23	4	2	0	0	4	ND	69
Oct-23	3	4	0	0	2	ND	42
Nov-23	4	0	0	0	3	ND	0
Dec-23	3	1	0	0	0	ND	ND
Jan-24	11	6	2	0	ND	ND	0
Feb-24	3	1	0	ND	ND	ND	0
Mar-24	0	0	0	ND	ND	ND	0
Total exceedances	67	28	3	0	14	5	128
Allowed total exceedances	526	88	4	88	4	4	11

*ND= No Data

The number of exceedances of the PM_{10}, $PM_{2.5}$ and O_3 daily limits has exceeded their allowed number of exceedances per year of 4 and 11.

2.6. CEMS monitoring data availability.

Table 6: Monitoring data availability for Matimba Power Station 2023/2024

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
PM (%)	98.0	94.3	99.8	85.8	97.3	99.1
SO_2 (%)	99.6	83.5	99.9	98.2	86.6	98.2
NO_x (%)	99.6	77.5	99.9	98.1	83.4	98.1

Average monitor availability for the 2023/2024 financial year was above 80% for all the units. Unit 2 NOx monitor reliability was below 80% due to the defects experience on the monitor during the month of June 2023 where the monitor was found to be drifted from calibration. The unit 2 NOx monitor was repaired and calibrated, and results were normalised in July 2023.

2.7. Greenhouse gas emissions

Greenhouse Gas Reporting shall be done in accordance with the National Greenhouse Gas Reporting Regulations

2.8. Results of spot measurements or correlation tests:

Table 7: Dates of last full conducted CEMS verification tests for PM for unit 4 and 6 only

Name of service provider:	Stacklabs Environmental Services CC			
Address of service provider:	10 Chisel Street Boltonia Krugersdorp 1739			
Stack/ Unit	**PM**	**SO_2**	**NOx**	**CO_2**
1	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9
2	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9
3	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9
4	2021/07/13 14h31	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9
5	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9
6	2020/09/09 06h41	New sampling tests in table 9	New sampling tests in table 9	New sampling tests in table 9

Table 9: Dates of last conducted CEMS Spot verification tests for PM, SO_2 and NOx (without unit 4 and 6 PMs)

Name of service provider:		Levego Environmental services		
Address of service provider:		Building R6 Pineland site Ardeer Road Modderfontein 1645		
Stack/ Unit	**PM**	**SO_2**	**NOx**	**CO_2**
1	2023/08/01 19h33	2023/08/01 19:33	2023/08/01 19:33	2023/08/01 19:33
2	2023/07/29 21:17	2023/07/29 21:17	2023/07/29 21:17	2023/07/29 21:17
3	2023/08/06 03:00	2023/08/06 03:00	2023/08/06 03:00	2023/08/06 03:00
4	Dates in table 12 above	2023/08/04 19:39	2023/08/04 19:39	2023/08/04 19:39
5	2023/08/05 07:30	2023/08/05 07:30	2023/08/05 07:30	2023/08/05 07:30
6	Dates in table 12 above	2023/08/05 15:52	2023/08/05 15:52	2023/08/05 15:52

Note: The CEMS Spot verification tests for PM, SO_2 and NOx were performed in August 2023. PM spot verification test results for units 4 and 6 failed and old curves are still in use.

2.9. Action taken addressing complaints.

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modelling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
Manketti lodge And neighbouring farms August 2023	Operational changes -The ashing philosophy was updated to piggybacking format (increasing height of the dump by ashing on top of rehabilitated old ash body);	Average fugitive dust fallout for July 2023, August 2023, and September 2023 on the Ash dumping facility in all directions of communities where complain originated from was 742,89 mg/m2/day	N/A	Acquire additional resources to extend the dust suppression with water at the ash dump to cover the piggybacking area.	Completed
Marapong Community members (Social media) August 2023				Rehabilitation and covering of the exposed areas of the ash dump with topsoil.	Completed
Onverwacht counsellor July 2023				Covering the exposed longstanding with chemicals	Completed
Waterberg District Municipality (Air Quality) September 2023					
DA Lephalale Municipality February 2024					

2.10

3.10 Summary of exceedances of emission limits

Refer to Annexure 1 - AEL exceedance reporting tool 2023/2024

2.11 NAEIS reporting.

Matimba Power Station has submitted all emission data On the NAEIS system before the 30th of March 2024 and still awaiting auditing feedback from the DEFF system administrators.

3. Declaration of accuracy

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

I hereby declare the following:

- Normal operating conditions were maintained during emission tests.
- The information in this report is correct

Obakeng Mabotja
GENERAL MANAGER: MATIMBA POWER STATION