

	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	7
		Document Identifier	240-88543153	Rev	2
		Effective Date	December2024		
		Review Date	December2027		

Stanley Koenaitse
Waterberg District Municipality
Private Bag X1018
Modimole
0510
skoenaite@waterberg.gov.za

Date: 2025/01/30
Enquiries: MF Dikgale
Tel: 014 762 6820
Email: DikgalMF@eskom.co.za

Ref: H16/1/13-AEL/M1/R1 – December 2024

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF DECEMBER 2024

This document serves as the monthly emissions report required in terms of Section 7.7.1 of Medupi Power Station Provisional Atmospheric Emission License (AEL), H16/1/13-AEL/M1/R1.

This report reflects Unit 1, 2, 3, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of December 2024 only.

1. Raw Materials and Products

TABLE 1: QUANTITY OF RAW MATERIALS AND PRODUCTS CONSUMPTION IN DECEMBER 2024

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – December 2024
	Coal	Tons/month	1 875 000	861 395
	Fuel Oil	Tons/month	20 000	2772
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of December 2024
	Energy	GWh	3 571.2	1951.57
	Ash Emitted	Tons/month	not specified	218.0

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Date	Daily Reportable Hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-Dec	24.0	24.0	24.0	0.0	24.0	24.0	33128	600	652	583	Off	545	570
02-Dec	24.0	24.0	24.0	0.0	24.0	24.0	33309	600	610	685	Off	401	570
03-Dec	24.0	24.0	14.8	0.0	24.0	24.0	30850	600	610	715	Off	440	510
04-Dec	24.0	24.0	0.0	0.0	24.0	24.0	30607	600	610	553	Off	498	551
05-Dec	24.0	24.0	17.0	0.0	24.0	24.0	31148	600	610	531	Off	560	321
06-Dec	24.0	24.0	24.0	0.0	24.0	24.0	32746	595	610	600	Off	560	332
07-Dec	15.8	24.0	24.0	0.0	24.0	24.0	30478	582	744	600	Off	560	339
08-Dec	0.5	24.0	24.0	0.0	24.0	24.0	32728	594	687	600	Off	621	343
09-Dec	24.0	24.0	24.0	0.0	24.0	24.0	34609	724	600	600	Off	564	388
10-Dec	24.0	24.0	24.0	0.0	24.0	24.0	34790	704	579	590	Off	560	538
11-Dec	24.0	24.0	24.0	0.0	24.0	24.0	31604	749	416	600	Off	566	489
12-Dec	24.0	24.0	24.0	0.0	24.0	24.0	35367	720	644	600	Off	569	573
13-Dec	24.0	24.0	24.0	0.0	24.0	24.0	35198	655	774	600	Off	550	522
14-Dec	24.0	24.0	0.8	0.0	24.0	24.0	29680	769	777	429	Off	492	649
15-Dec	24.0	24.0	0.0	0.0	24.0	24.0	27054	634	647	Off	Off	551	611
16-Dec	24.0	24.0	0.0	0.0	24.0	24.0	28490	658	707	Off	Off	560	695
17-Dec	24.0	24.0	0.0	0.0	24.0	24.0	27989	671	666	Off	Off	482	679
18-Dec	24.0	4.8	0.0	0.0	3.0	24.0	18781	776	711	Off	Off	324	646
19-Dec	24.0	0.0	0.0	0.0	4.9	24.0	24976	748	620	Off	Off	516	720
20-Dec	24.0	13.5	0.0	0.0	24.0	24.0	28992	770	794	Off	Off	572	720
21-Dec	24.0	24.0	0.0	0.0	24.0	24.0	27995	739	793	Off	Off	597	720
22-Dec	24.0	24.0	0.0	0.0	24.0	24.0	26930	671	766	Off	Off	510	683
23-Dec	24.0	24.0	0.0	0.0	24.0	24.0	25555	633	772	Off	Off	597	451
24-Dec	23.6	24.0	0.0	0.0	24.0	24.0	23761	603	710	Off	Off	600	485
25-Dec	0.0	24.0	0.0	0.0	24.0	8.6	17929	583	645	Off	Off	600	532
26-Dec	19.1	24.0	0.0	0.0	24.0	0.0	20593	658	713	153	Off	600	Off
27-Dec	24.0	24.0	0.0	0.0	21.2	0.0	24608	746	746	362	Off	589	409
28-Dec	24.0	24.0	7.6	0.0	0.0	12.3	30364	742	784	715	Off	Off	700
29-Dec	24.0	24.0	24.0	0.0	0.0	24.0	30639	774	753	769	Off	Off	694
30-Dec	24.0	24.0	4.2	0.0	0.0	24.0	28073	791	762	650	Off	Off	699
31-Dec	24.0	24.0	0.0		0.0	24.0	26016	794	789	689	Off	Off	679

NB: Operating hours less than 24 highlighted in pink.

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2. Abatement Technology

TABLE 2: ABATEMENT EQUIPMENT CONTROL TECHNOLOGY EFFICIENCY FOR MONTH OF DECEMBER 2024

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.932%	100%
Unit 2	Fabric Filter Plant (FFP)	99.895%	100%
Unit 3	Fabric Filter Plant (FFP)	99.957%	100%
Unit 4	Fabric Filter Plant (FFP)	Off	Off
Unit 5	Fabric Filter Plant (FFP)	99.968%	100%
Unit 6	Fabric Filter Plant (FFP)	99.864%	100%

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

3. Energy Source Characteristics

TABLE 3: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF DECEMBER 2024

Characteristic	Stipulated Range (% by weight on a dry basis)	Monthly Average Content (% by weight on a dry basis)
Coal		
Sulphur Content	1.3 - 2.2	1.35
Ash Content	35 - 39	34.32

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF DECEMBER 2024

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
Oil		
Sulphur Content	0.5 - 3.5	2.4
Ash Content	0.02 - 0.1	0.010

4. Emissions Reporting

Medupi Power Station uses Continuous Emission Monitoring System which uses the extractive method for analysis.

The emission limits are as follows:

SO₂ Monthly = 3500 mg/Nm³

Dust Daily= 50 mg/Nm³

NO₂ Daily= 750 mg/Nm³



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4.1 PM Daily Averages

Figure 1: Medupi Unit 1 PM Emissions - December 2024

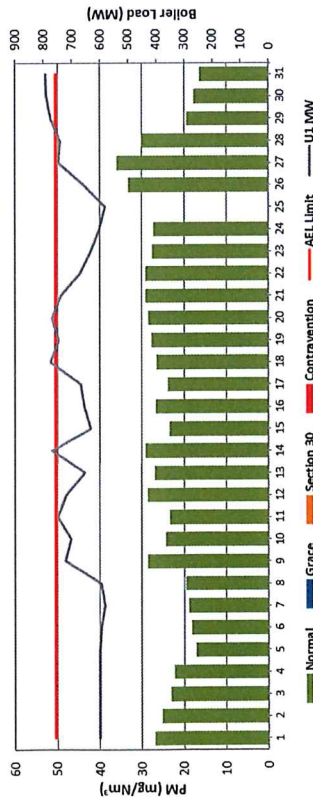


Figure 2: Medupi Unit 2 PM Emissions - December 2024

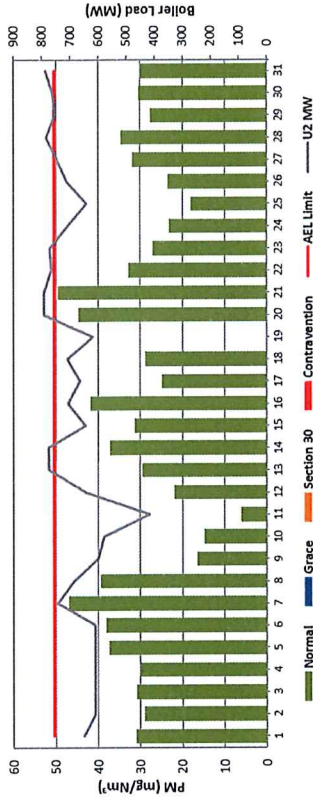


Figure 3: Medupi Unit 3 PM Emissions - December 2024

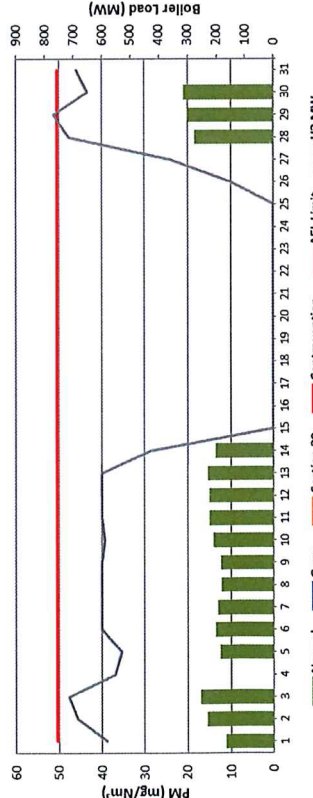
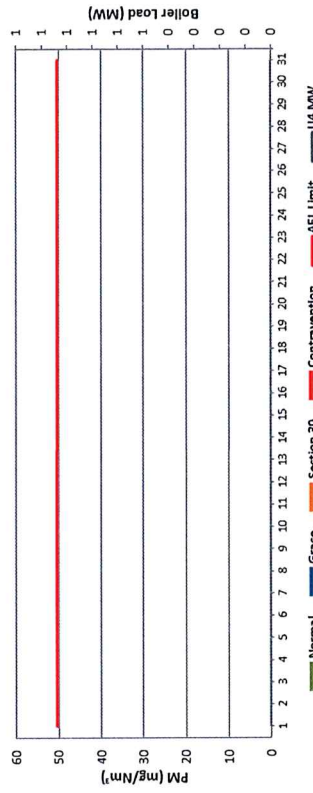
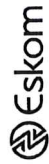


Figure 4: Medupi Unit 4 PM Emissions - December 2024





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Figure 5: Medupi Unit 5 PM Emissions - December 2024

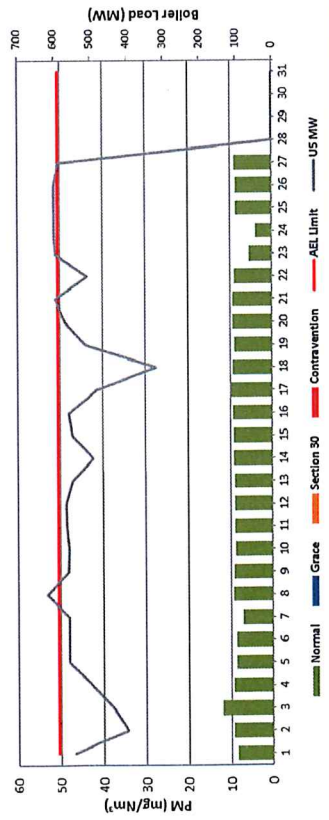


Figure 6: Medupi Unit 6 PM Emissions - December 2024

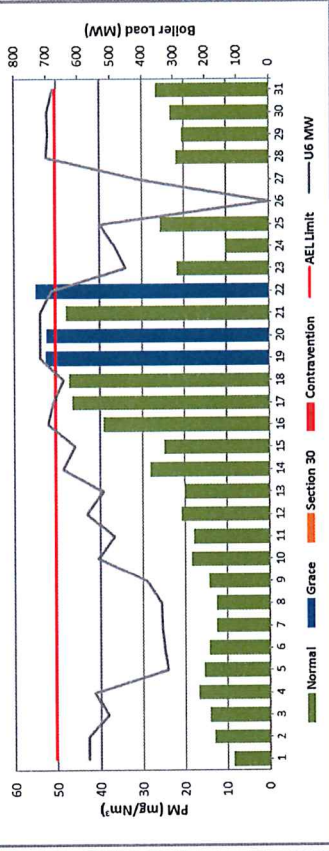


Figure 7: Medupi Unit 1 SO₂ Emissions - December 2024

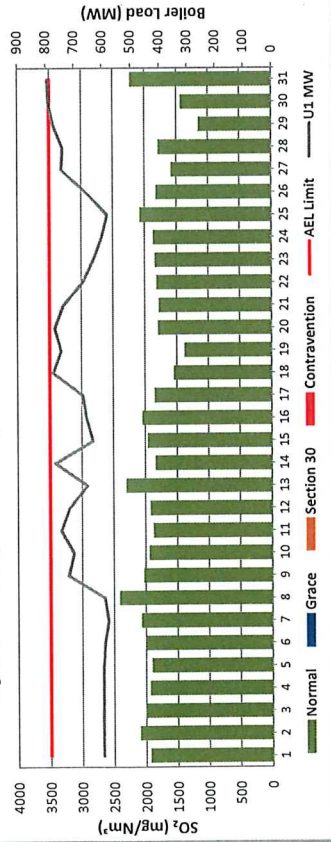
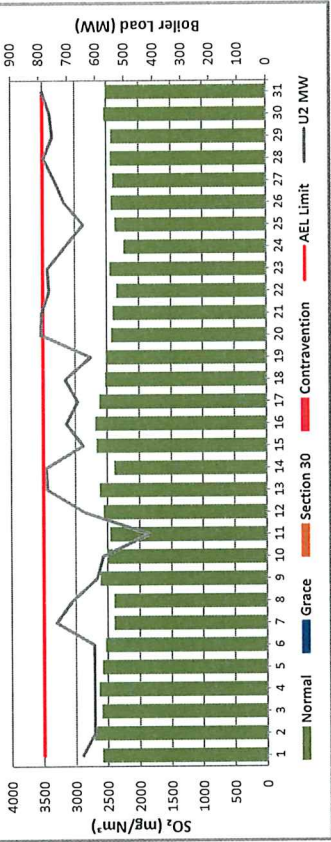
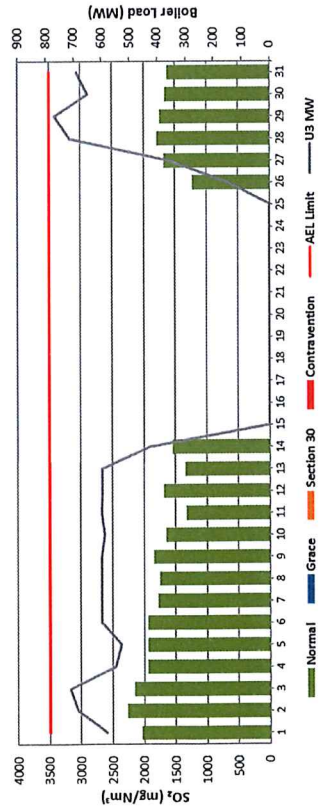
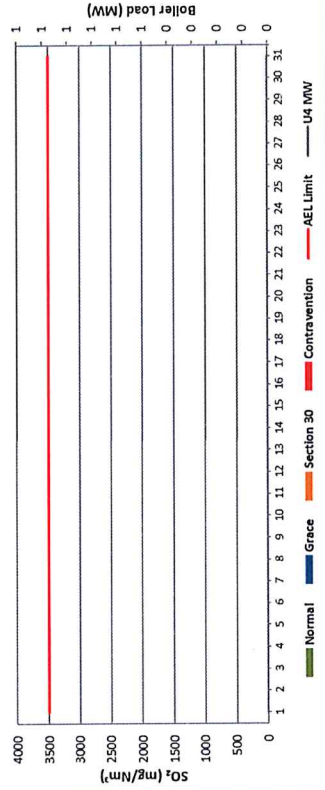
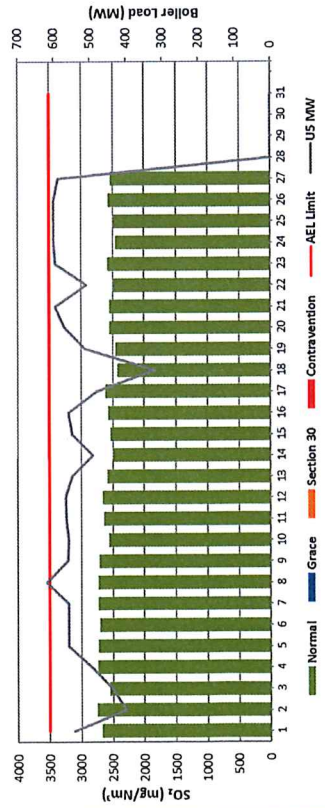
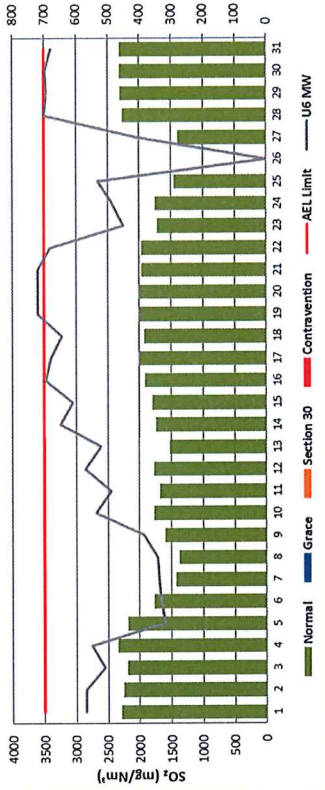


Figure 8: Medupi Unit 2 SO₂ Emissions - December 2024



4.2 SOx Daily Averages

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Figure 9: Medupi Unit 3 SO₂ Emissions - December 2024

Figure 10: Medupi Unit 4 SO₂ Emissions - December 2024

Figure 11: Medupi Unit 5 SO₂ Emissions - December 2024

Figure 12: Medupi Unit 6 SO₂ Emissions - December 2024


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4.3 NOx Daily Averages

Figure 13: Medupi Unit 1 NOx Emissions - December 2024

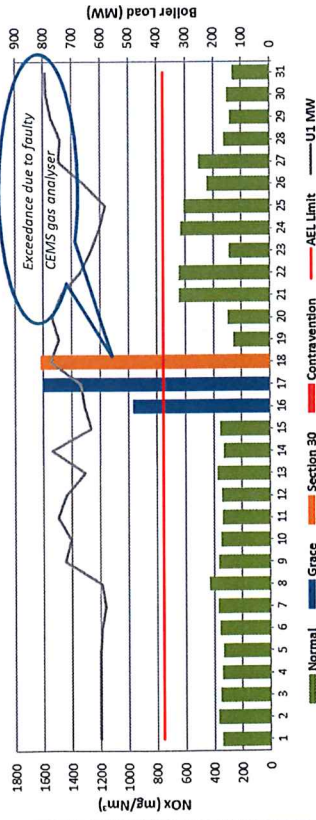


Figure 14: Medupi Unit 2 NOx Emissions - December 2024

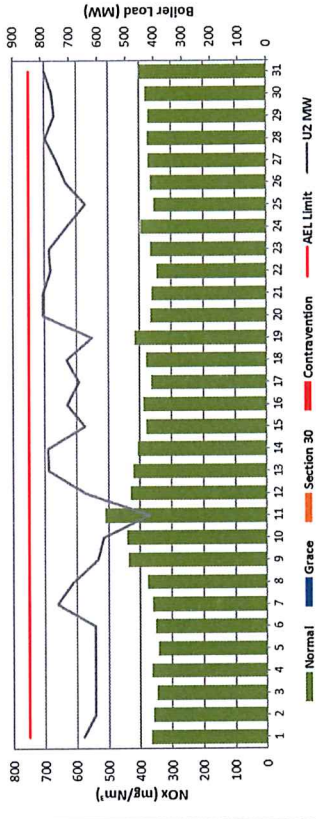


Figure 15: Medupi Unit 3 NOx Emissions - December 2024

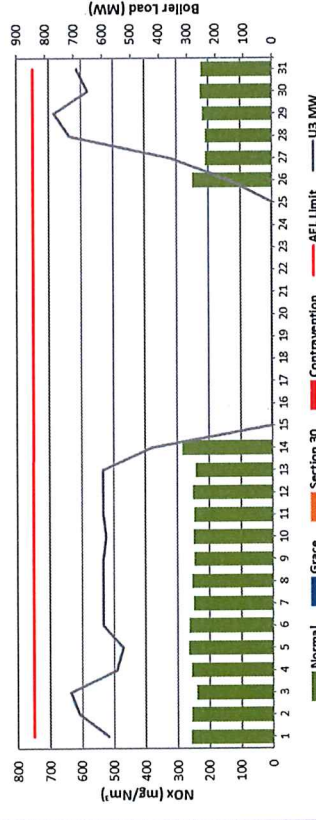
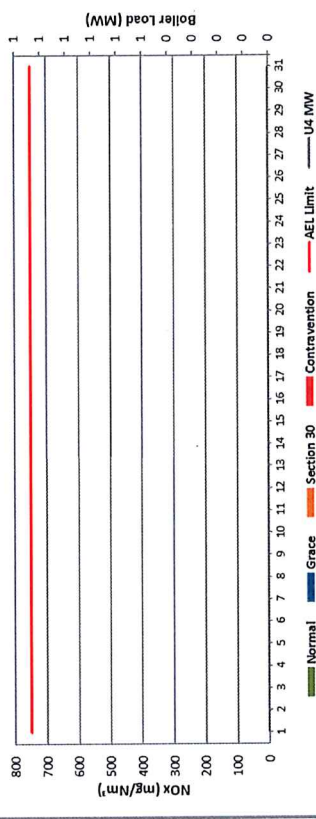


Figure 16: Medupi Unit 4 NOx Emissions - December 2024





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Figure 17: Medupi Unit 5 NOx Emissions - December 2024

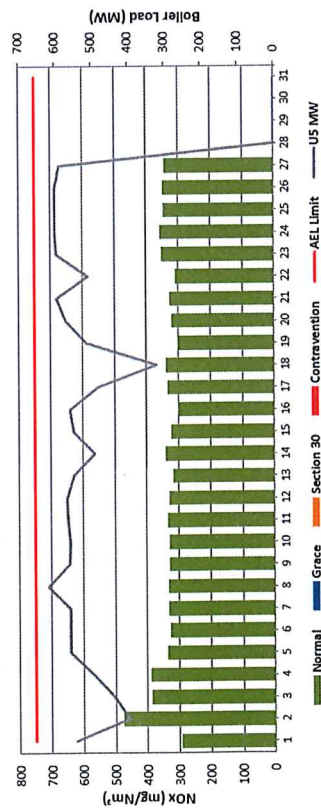
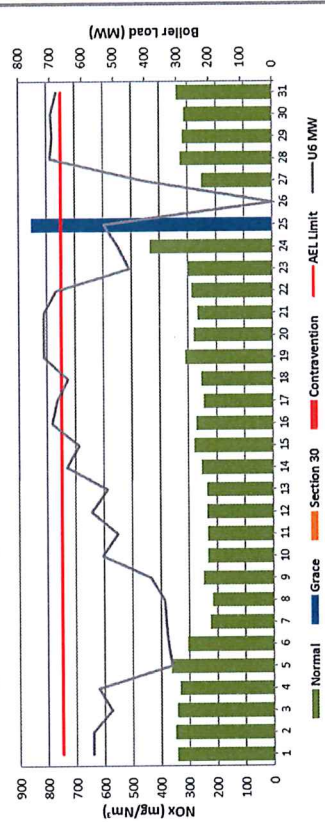


Figure 18: Medupi Unit 6 NOx Emissions - December 2024



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TABLE 5: MONTHLY TONNAGES FOR THE MONTH OF DECEMBER 2024

Associated Unit/Stack	PM	SO ₂	NO ₂
Unit 1	31.2	3 120.0	552.4
Unit 2	61.2	6 781.7	972.4
Unit 3	33.4	4 217.1	607.9
Unit 4	Off	Off	Off
Unit 5	31.8	6 300.3	661.2
Unit 6	51.2	5 109.6	803.3
SUM (Tons)	218.0	21 175.9	3 494.6

TABLE 6: MONTHLY AVERAGES FOR THE MONTH OF DECEMBER 2024

Associated Unit/Stack	Average PM (mg/Nm ³)	Average SO _x (mg/Nm ³)	Average NO _x (mg/Nm ³)
Unit 1	25.2	1 882.3	487.1
Unit 2	30.3	2 501.5	384.2
Unit 3	15.0	1 746.5	244.9
Unit 4	Off	Off	Off
Unit 5	8.8	2 600.8	339.3
Unit 6	25.6	1 901.9	307.8

5. Continuous Emission Monitoring Systems (CEMS)

Unit 1, 2, 3, 5 and 6 Continuous Emission Monitoring Systems were always in operation when the unit was on load.

TABLE 7: PERIODS DURING WHICH CEMS WAS INOPERATIVE/MALFUNCTIONING

Date	CEMS status	Comments
16 – 18 December 2024	Unit 1 Multi Gas Analyser (MGA23) has been unreliable, as a result data availability and accuracy for the monthly emissions monitoring report and continuous monitoring is compromised.	Recovery plan enclosed in the notification was submitted to the authorities on the 9 th of January 2025.

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TABLE 8: CEMS MONITOR RELIABILITY PERCENTAGE (%)

Associated Unit/Stack	PM	SO ₂	NO ₂	O ₂
Unit 1	99.0	91.4	79.3	96.8
Unit 2	100.0	99.9	96.1	96.6
Unit 3	100.0	100.0	92.5	99.4
Unit 4	Off	Off	Off	Off
Unit 5	100.0	99.8	99.7	97.7
Unit 6	100.0	99.2	99.0	99.9

6. CEMS Calibration certificates and equipment used for calibration.

A service provider was appointed to calibrate CEMS equipment at Medupi Power Station, calibration certificates are in place and may be made available upon request. Verification of the CEMS after calibration is conducted internally by Eskom.

7. Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring report and Dust Fallout Monitoring report for the month of December 2024 will be submitted before the end of January 2025.

8. Visual inspection of the exterior walls of the fuel oil tanks and TVOC Estimation

Visual inspection was conducted and there were no leaks observed on the exterior walls of the fuel oil tanks.

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TABLE 9: TOTAL VOLATILE ORGANIC COMPOUND (TVOC) FOR DECEMBER 2024

 Eskom		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Tuesday, 31 December 2024	
Station:	Medupi Power Station	
Province:	Limpopo Province	
Tank no.	1-2	
Description:	Outdoor fuel oil storage tank	
Tank Type:	Vertical fixed roof (vented to atmosphere)	
Material stored:	Fuel Oil 150	
MONTHLY INPUT DATA FOR THE STATION Please only insert relevant monthly data inputs into the <i>blue cells</i> below Choose from a dropdown menu in the <i>green cells</i> The total VOC emissions for the month are in the <i>red cells</i> IMPORTANT: Do not change <i>any</i> other cells without consulting the AQ CoE		
MONTH:	December	
GENERAL INFORMATION:	Data	Unit
Total number of fuel oil tanks:	2	NA
Height of tank:*	14.2	m
Diameter of tank:	12	m
Net fuel oil throughput for the month:	2772	tons/month
Molecular weight of the fuel oil:		Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH	Data	Unit
Daily average ambient temperature	27.35	°C
Daily maximum ambient temperature	33.26	°C
Daily minimum ambient temperature	21.97	°C
Daily ambient temperature range	11.30	°C
Daily total insolation factor	6.12	kWh/m²/day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:	Result	Unit
Breathing losses:	0.69	kg/month
Working losses:	0.08	kg/month
TOTAL LOSSES (Total TVOC Emissions for the month):	0.77	kg/month
*Calculations performed on this spreadsheet are taken from the USEPA AP-42- Section 7.1 Organic Liquid Storage Tanks - January 1996. This spreadsheet is derived from materials provided by Jimmy Peress, PE, Tritech Consulting Engineers, 85-93 Chevy Chase Street, Jamaica, NY 11432 USA, Tel - 718-454-3920, Fax - 718-454-6330, e-mail - PeressJ@nyc.rr.com.		

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9. Air quality improvements initiatives and public education and awareness campaigns

No awareness campaign conducted for December 2024.

10. Complaints Register

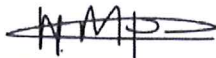
TABLE 10: COMPLAINTS FOR THE MONTH OF DECEMBER 2024

Name/ Source Code	Air pollution complaints received	Calculation of Impacts/ emissions associated with the incident	Date of complaint and date of response by the license holder	Results of investigation	Action taken to resolve the complaint
No complaints were received for the month of December 2024					

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Compiled By: Ramokone Makgoka
Officer Environmental Management
 Date: 24/01/2025

Verified by: Malose Langa
System Engineer Boiler
 Date: 2025/01/24

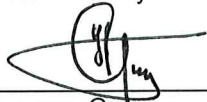
Verified by: Shu Mpangase
System Engineer C&I
 Date: 24/01/2025

Supported by: Thabo Khoza
Environmental Management Manager (Acting)
 Date: 2025/01/27

Supported by: Sithokozile Hlongwa
Engineering Group Manager (Acting)
 Date: 28.01.2025

I Thozama Gangi, declares that the information provided in this report is accurate and correct.

Yours sincerely


 Thozama Gangi
GENERAL MANAGER (Acting): MEDUPI POWER STATION

Date: 30/01/2025