

	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	September2022		
		Review Date	September2024		

Stanley Koenaitse

Waterberg District Municipality
Private Bag X1018
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0510

skoenaite@waterberg.gov.za

Date: 2024/01/31

Enquiries: MF Dikgale

Tel: 014 762 6820

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

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF JANUARY 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 January 2024 only.

1. Raw Materials and Products

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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – January2024
	Coal	Tons/month	1 875 000	866499
	Fuel Oil	Tons/month	20 000	858
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of January 2024
	Energy	GWh	3 571.2	1850.72
	Ash Emitted	Tons/month	not specified	199.41

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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-Jan	24.0	24.0	24.0	0.0	0.0	24.0	27406	708	693	646	Off	Off	550
02-Jan	24.0	24.0	24.0	0.0	0.0	24.0	28471	752	716	671	Off	Off	550
03-Jan	24.0	24.0	24.0	0.0	0.0	24.0	28294	648	713	648	Off	Off	550
04-Jan	24.0	24.0	24.0	0.0	0.0	24.0	28796	769	716	641	Off	Off	550
05-Jan	24.0	24.0	24.0	0.0	0.0	24.0	27066	666	729	657	Off	Off	550
06-Jan	24.0	24.0	24.0	0.0	0.0	24.0	25500	681	667	596	Off	Off	550
07-Jan	24.0	24.0	24.0	0.0	0.0	24.0	27922	746	699	652	Off	Off	550
08-Jan	24.0	24.0	24.0	0.0	0.0	24.0	28567	746	699	652	Off	Off	550
09-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29052	763	666	674	Off	Off	615
10-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29561	774	710	668	Off	Off	611
11-Jan	24.0	24.0	24.0	0.0	0.0	24.0	30208	757	683	675	Off	Off	737
12-Jan	24.0	24.0	24.0	0.0	0.0	24.0	27426	721	646	614	Off	Off	649
13-Jan	24.0	24.0	24.0	0.0	0.0	24.0	27770	757	621	717	Off	Off	623
14-Jan	24.0	24.0	24.0	0.0	0.0	24.0	26709	711	609	675	Off	Off	596
15-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29657	698	674	762	Off	Off	760
16-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29754	778	617	732	Off	Off	723
17-Jan	23.9	24.0	24.0	0.0	0.0	24.0	24648	616	588	588	Off	Off	661
18-Jan	0.0	24.0	24.0	0.0	0.0	24.0	26067	518	628	670	Off	Off	741
19-Jan	18.3	24.0	24.0	0.0	0.0	24.0	28749	753	719	701	Off	Off	711
20-Jan	24.0	24.0	24.0	0.0	0.0	24.0	27953	659	681	717	Off	Off	715
21-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29119	712	659	676	Off	Off	675
22-Jan	24.0	24.0	24.0	0.0	0.0	24.0	28864	705	678	698	Off	Off	621
23-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29322	750	719	612	Off	Off	731
24-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29085	701	661	697	Off	Off	741
25-Jan	24.0	24.0	24.0	0.0	0.0	24.0	29969	740	743	701	Off	Off	756
26-Jan	24.0	24.0	24.0	0.0	0.0	24.0	30120	748	770	652	Off	Off	775
27-Jan	24.0	24.0	24.0	0.0	0.0	24.0	32051	748	770	652	Off	Off	774
28-Jan	19.9	24.0	24.0	0.0	0.0	24.0	29217	771	664	643	Off	Off	774
29-Jan	0.0	24.0	24.0	0.0	0.0	24.0	22726		668	721	Off	Off	771
30-Jan	0.0	24.0	24.0	0.0	0.0	24.0	22740		761	658	Off	Off	772
31-Jan	0.0	24.0	24.0	0.0	0.0	24.0	23710		749	693	Off	Off	772

NB: Operating hours less than 24 highlighted in pink; Unit OFF highlighted in Red.

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2. Abatement Technology

Table 2: Abatement Equipment Control Technology efficiency for month of January2024

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.959%	100%
Unit 2	Fabric Filter Plant (FFP)	99.863%	100%
Unit 3	Fabric Filter Plant (FFP)	99.858%	100%
Unit 4	Fabric Filter Plant (FFP)	Off	off
Unit 5	Fabric Filter Plant (FFP)	Off	off
Unit 6	Fabric Filter Plant (FFP)	99.976%	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 JANUARY 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	1.43
Ash Content	35 - 39	35.13

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

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
Oil		
Sulphur Content	0.5 - 3.5	2.45
Ash Content	0.02 - 0.1	0.13

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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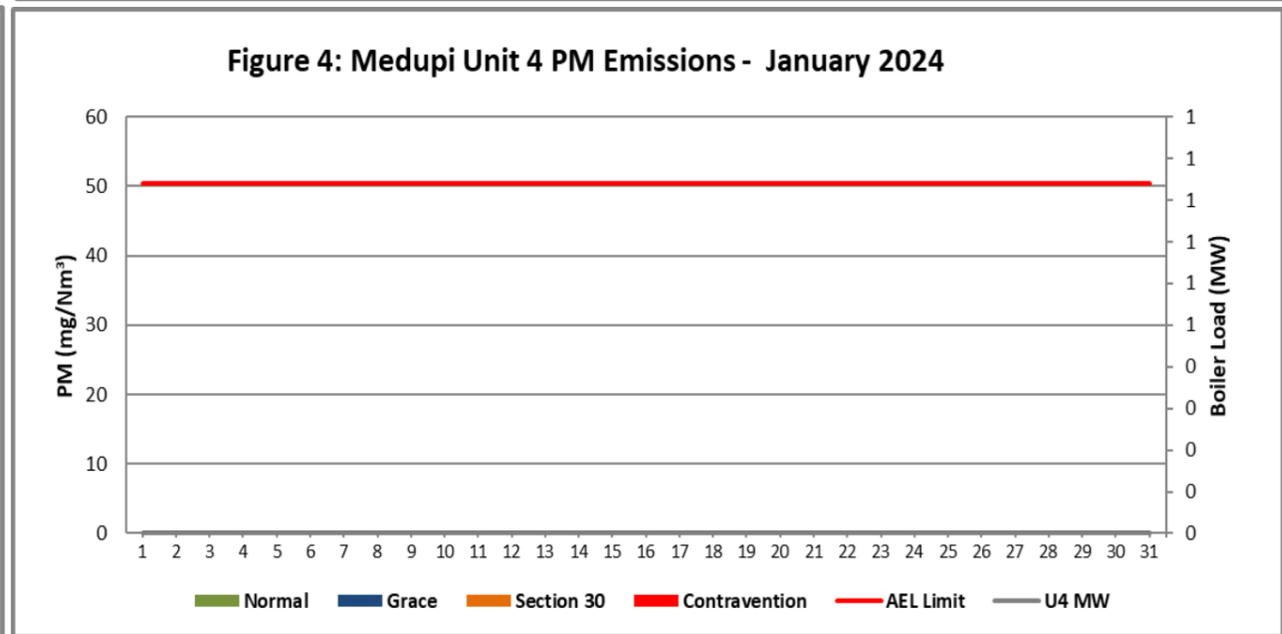
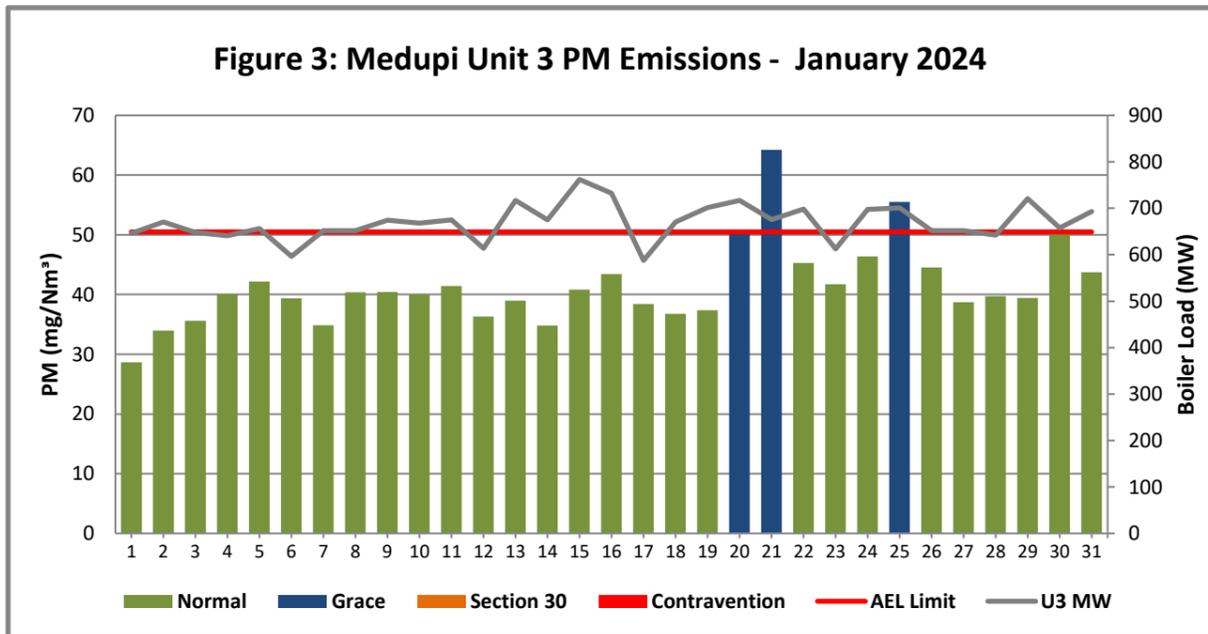
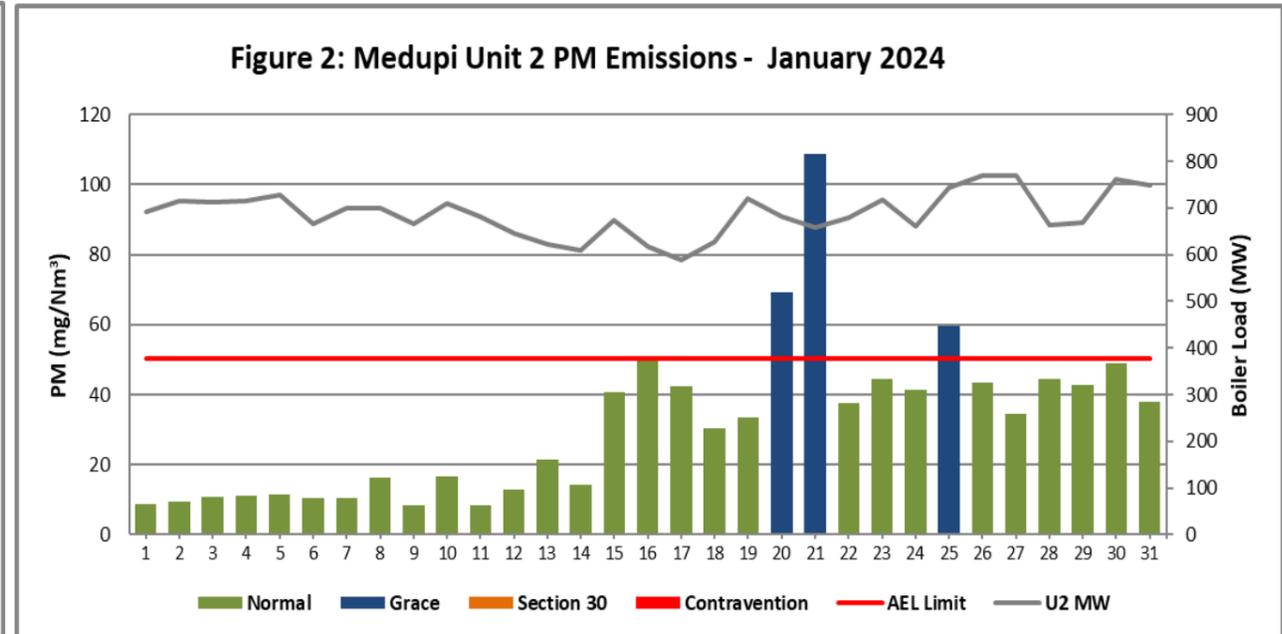
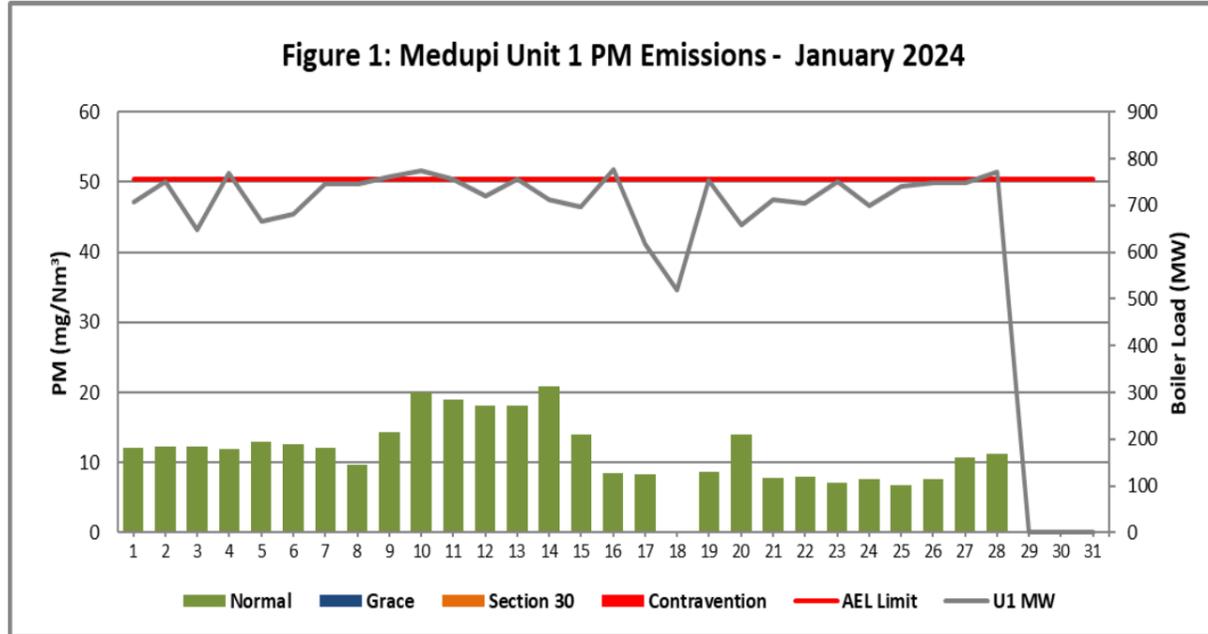
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4.1 PM Daily Averages



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Figure 5: Medupi Unit 5 PM Emissions - January 2024

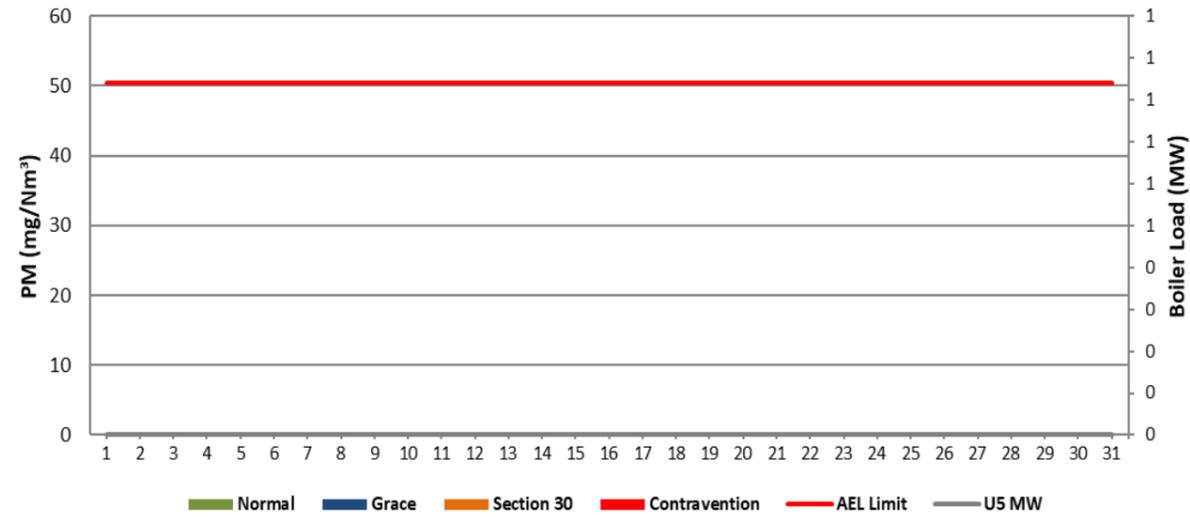
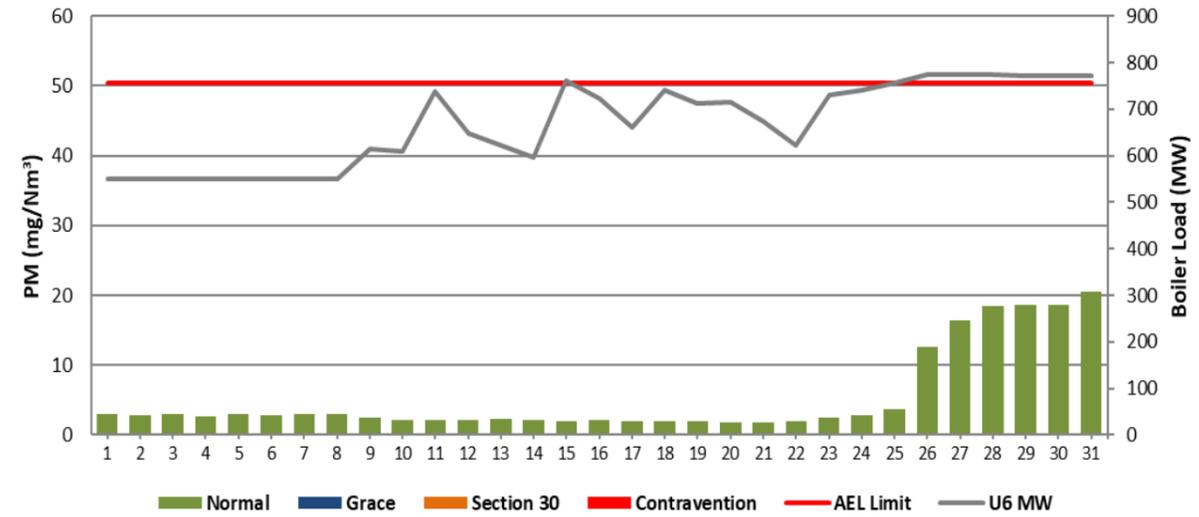


Figure 6: Medupi Unit 6 PM Emissions - January 2024



4.2 SOx Daily Averages

Figure 7: Medupi Unit 1 SO₂ Emissions - January 2024

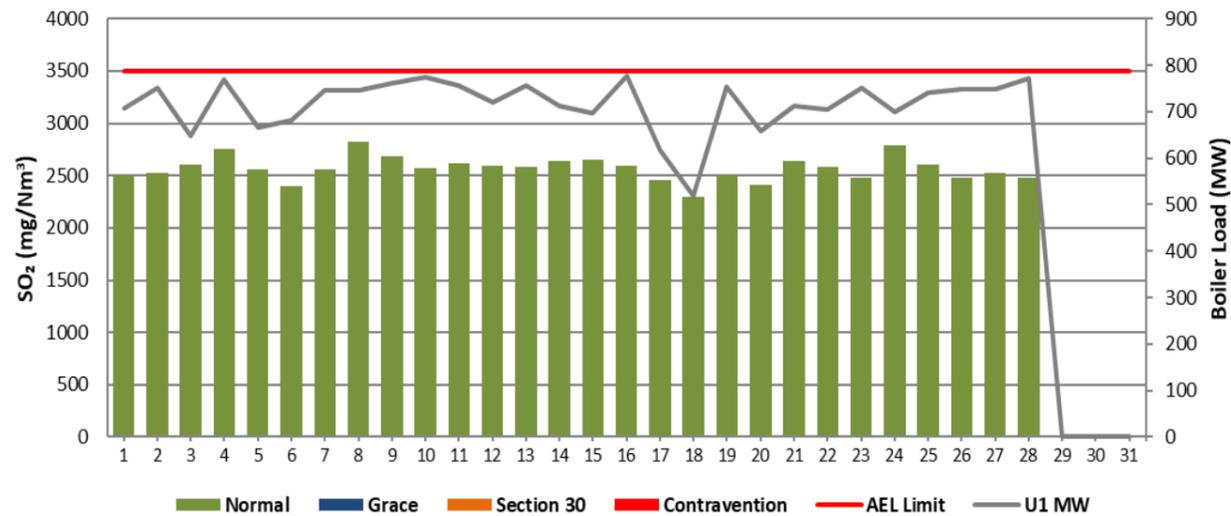
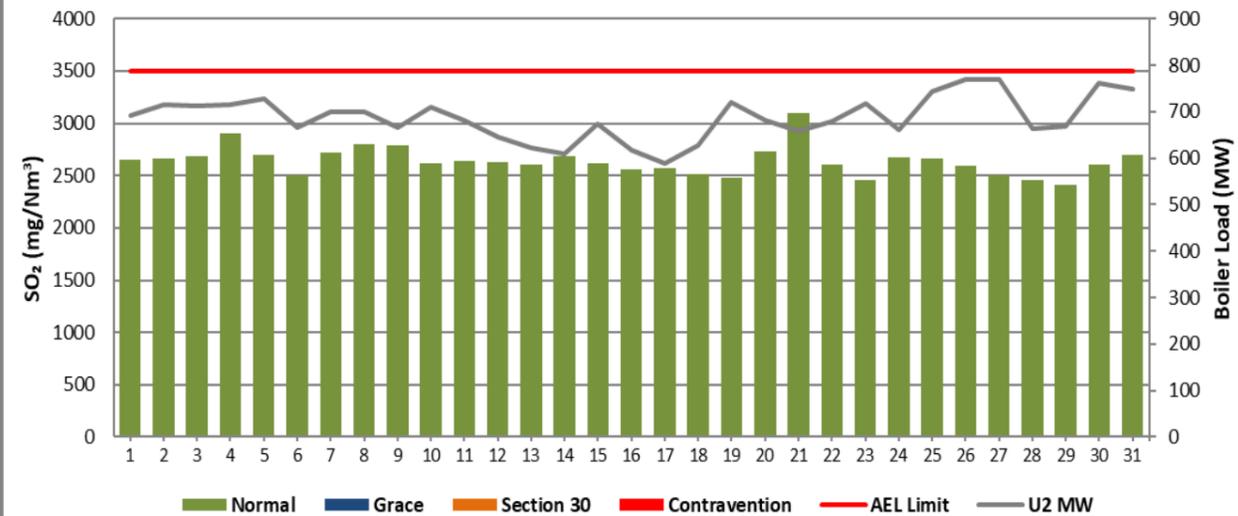


Figure 8: Medupi Unit 2 SO₂ Emissions - January 2024



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Figure 9: Medupi Unit 3 SO₂ Emissions - January 2024

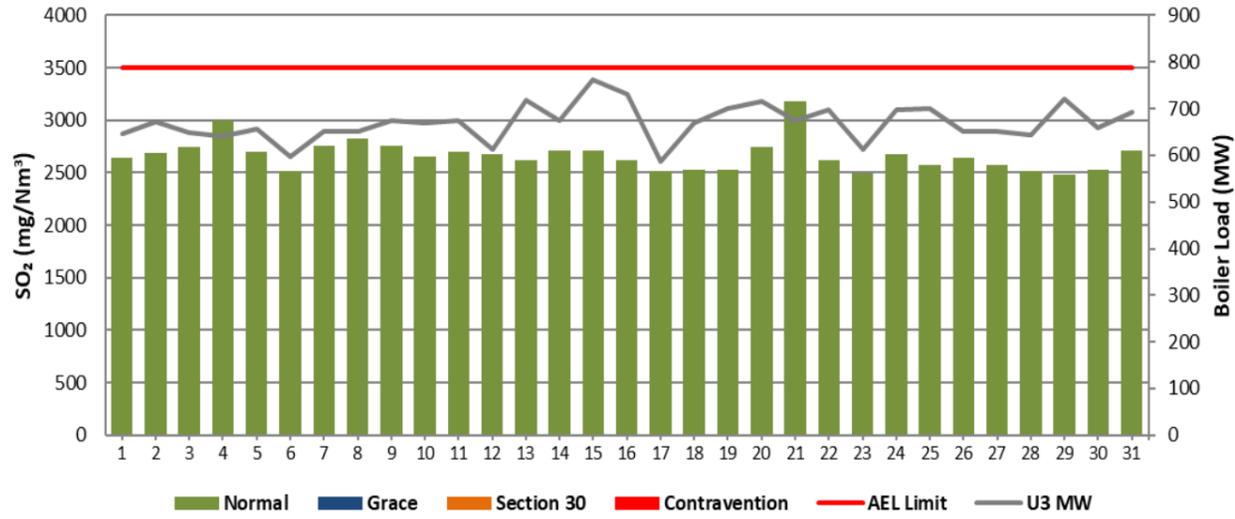


Figure 10: Medupi Unit 4 SO₂ Emissions - January 2024

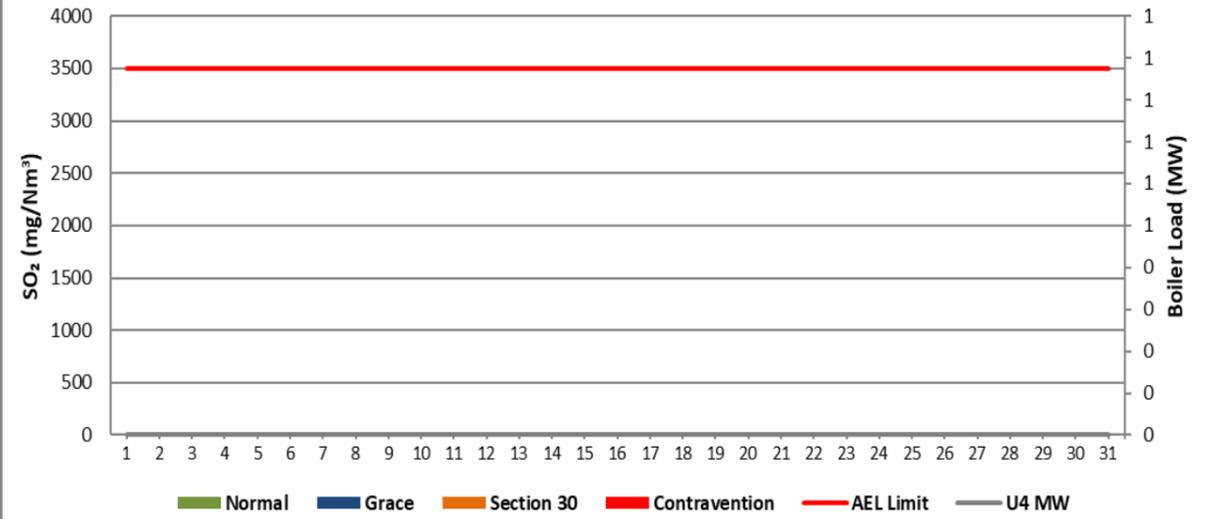


Figure 11: Medupi Unit 5 SO₂ Emissions - January 2024

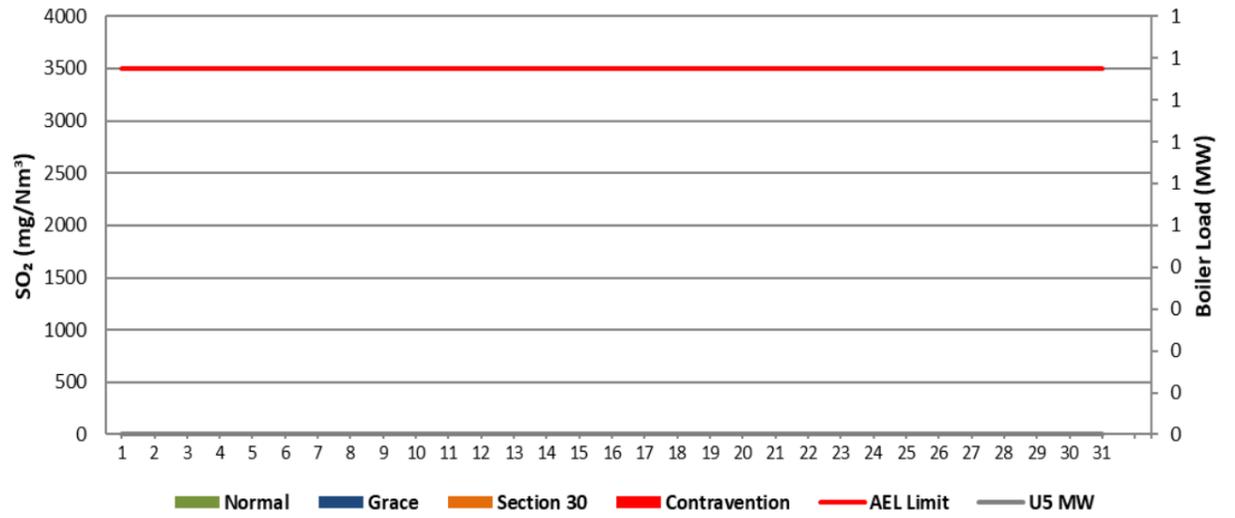
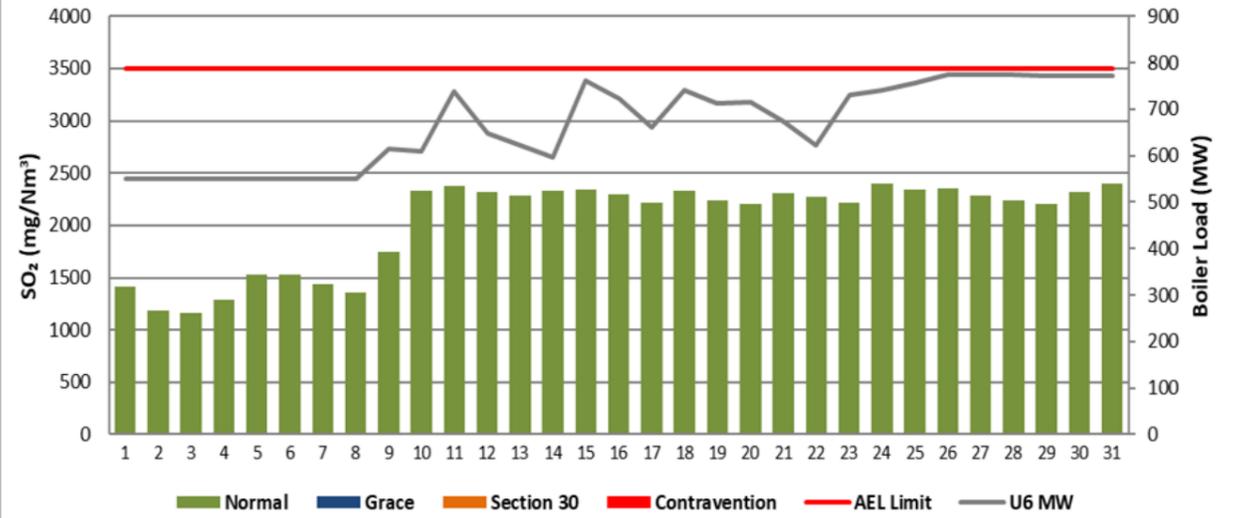


Figure 12: Medupi Unit 6 SO₂ Emissions - January 2024



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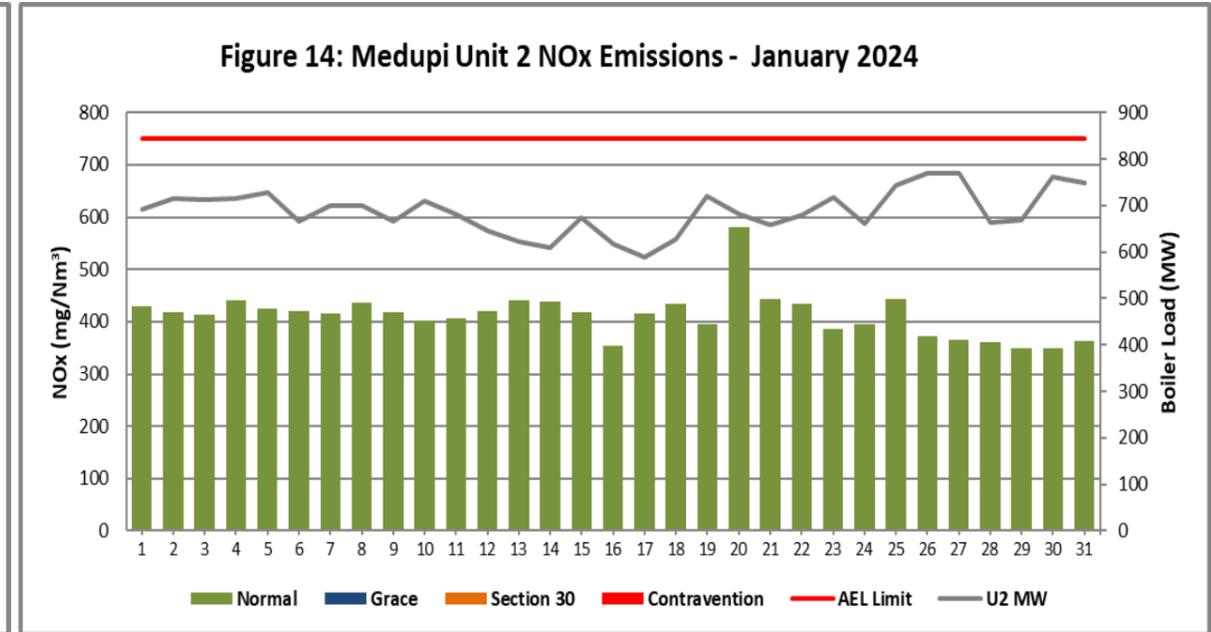
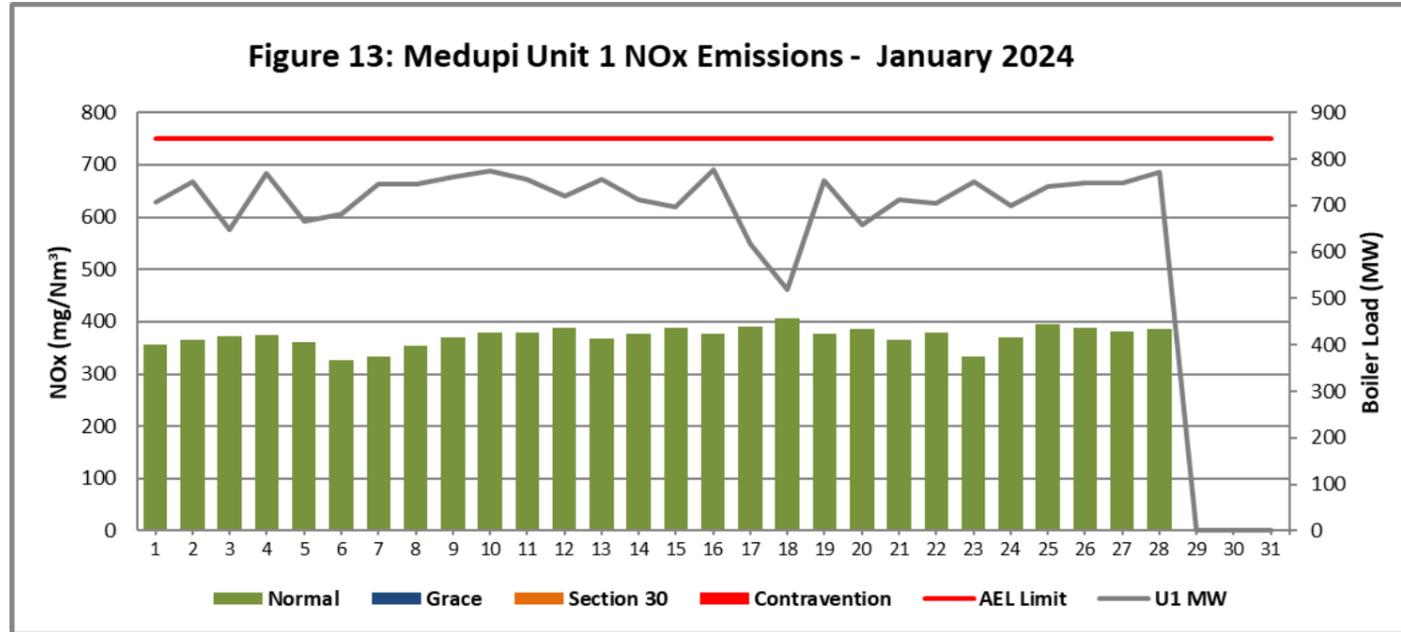
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4.3 NOx Daily Averages



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Figure 15: Medupi Unit 3 NOx Emissions - January 2024

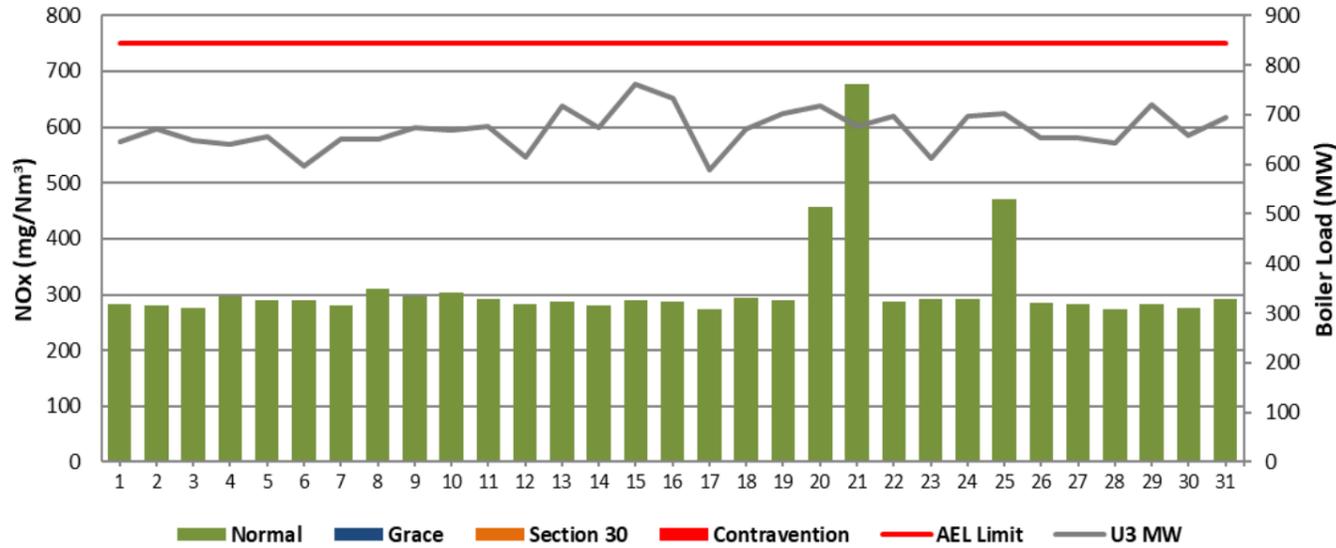


Figure 16: Medupi Unit 4 NOx Emissions - January 2024

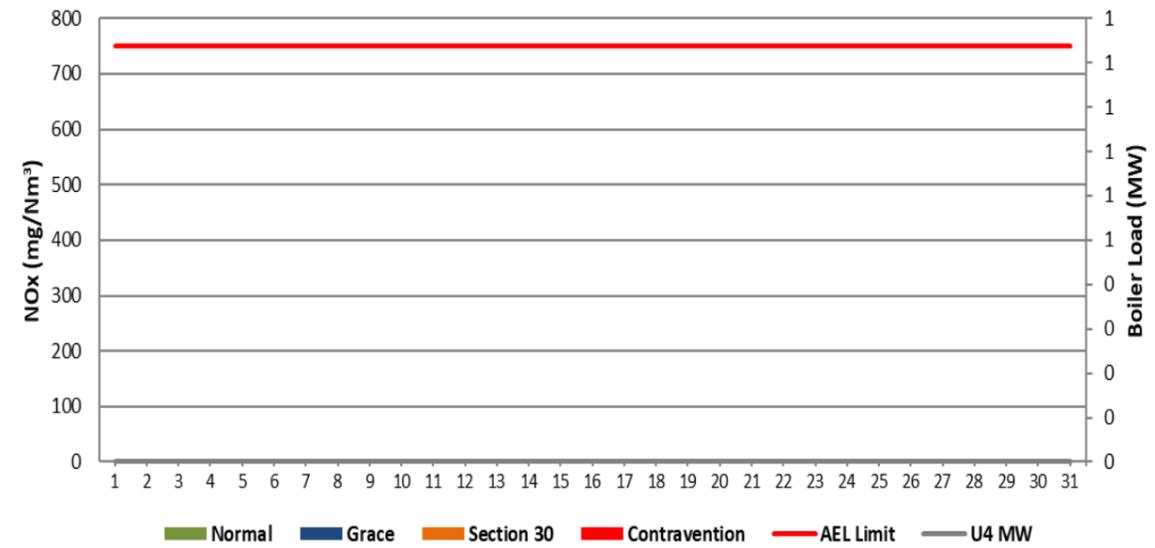


Figure 17: Medupi Unit 5 NOx Emissions - January 2024

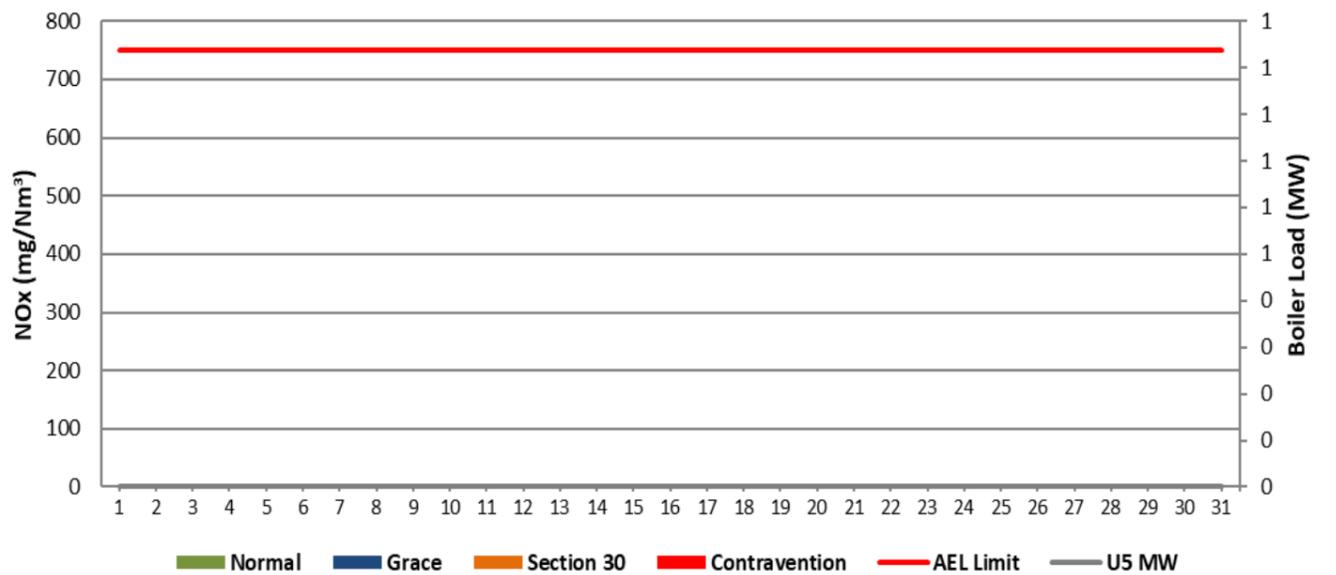
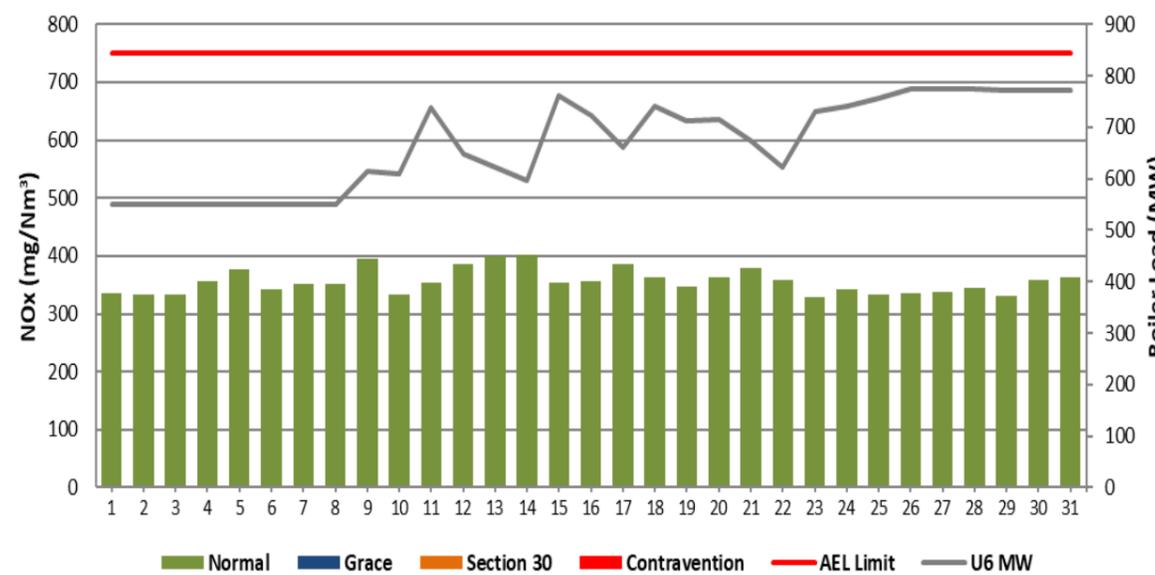


Figure 18: Medupi Unit 6 NOx Emissions - January 2024



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TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF JANUARY 2024

Associated Unit/Stack	PM	SO ₂	NO ₂
Unit 1	22.9	4 981.8	718.5
Unit 2	82.2	6 861.9	1 070.7
Unit 3	81.5	5 239.1	611.2
Unit 4	Off	Off	Off
Unit 5	Off	Off	Off
Unit 6	12.9	4 626.1	787.8
SUM (Tons)	199.4	21 708.9	3 188.2

TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF JANUARY 2024

Associated Unit/Stack	Average PM (mg/Nm ³)	Average SO _x (mg/Nm ³)	Average NO _x (mg/Nm ³)
Unit 1	12.1	2 568.1	372.1
Unit 2	31.7	2 638.6	412.5
Unit 3	41.7	2 665.3	311.1
Unit 4	Off	Off	off
Unit 5	Off	Off	off
Unit 6	5.4	2040.0	355.9

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. However, there were days where the monitors were faulty and reading incorrect values. Table 8

TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE/MALFUNCTIONING

Date	CEMS status	Comments
20-21&25 Jan 2024	Unit 2	Unit 2 experienced CEMS issues for 3 days from 20 – 21&25 January 2024.
08 – 31 Jan 2024	Unit 3	Unit 3 experienced CEMS issues for 3 days from 20 – 21&25 January 2024.

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TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)

Associated Unit/Stack	PM	SO ₂	NO ₂	O ₂
Unit 1	100.0	95.1	95.1	96.9
Unit 2	99.2	95.6	93.1	98.3
Unit 3	99.2	0	0	0
Unit 4	Off	Off	Off	Off
Unit 5	Off	Off	Off	Off
Unit 6	100.0	98.5	99.9	99.9

Notes: SO₂, O₂ and NO was Changed to a Unity Factor (1) for accurate reporting, there was a step change in the performance of the Unit 3 gas Monitor.

6. CEMS Calibration certificates and equipment used for calibration.

A service provider was appointed to calibrate CEMS equipment at Medupi Power Station, calibration certificates to be made available upon request. The service appointed for the CEMS calibration is in a process of obtaining SANAS accreditation. Verification of the CEMS after calibration is conducted internally by Eskom.

7. Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring and Dust fall-out report for January 2024 was e-mailed to the Licensing Authority.

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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.

TABLE 10: TOTAL VOLATILE ORGANIC COMPOUND (TVOC) FOR JANUARY 2024

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Wednesday, 31 January 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:	January	
GENERAL INFORMATION:		
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:	858	tons/month
Molecular weight of the fuel oil:		Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
Daily average ambient temperature	25.11	°C
Daily maximum ambient temperature	31.57	°C
Daily minimum ambient temperature	17.48	°C
Daily ambient temperature range	14.10	°C
Daily total insolation factor	5.87	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
Breathing losses:	0.74 kg/month	
Working losses:	0.02 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.76 kg/month	
<small>*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, Trittech 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.</small>		

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

No awareness campaign for January 2024

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10. Complaints Register

TABLE 5: COMPLAINTS FOR THE MONTH OF JANUARY 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
N/A	N/A	N/A	N/A	N/A	N/A

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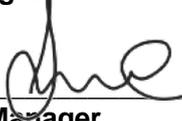
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Compiled by: Lutendo Murovhi  Date: 28 February 2024
Environmental Officer

Verified by: Malose Langa  Date: 28/02/2024
System Engineer Boiler

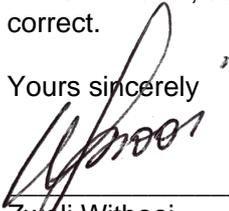
Verified by: Shu Mpangase  Date: 29/02/2024
System Engineer C&I

Supported by: Mokgadi Dikgale  Date: 29/02/2024
Environmental Manager

Supported by: Jabulani Mkhatshwa  Date: 2024-02-29
Engineering Group Manager

I Zweli Witbooi, declares that the information provided in this report is accurate and correct.

Yours sincerely



 Zweli Witbooi
GENERAL MANAGER: MEDUPI POWER STATION

Date: 2024/02/29

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