	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	August2022		
		Review Date	August2024		

Stanley Koenaitse

Waterberg District Municipality
Private Bag X1018
Modimole
0510

skoenaite@waterberg.gov.za

Date: 2023/08/31

Enquiries: MF Dikgale

Tel: 014 762 6820

Ref: H16/1/13-AEL/M1/R1 – August2023

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF AUGUST 2023

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 supersedes the report that was sent to the Department in September 2023, the report was revised due to findings from the Eskom Data Integrity review Audit of FY2023.

This report reflects Unit 1, 2, 3, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of August 2023 only.

1. Raw Materials and Products


TABLE 1: QUANTITY OF RAW MATERIALS AND PRODUCTS CONSUMPTION IN AUGUST 2023

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – August2023
	Coal	Tons/month	1 875 000	1 049 840.0
	Fuel Oil	Tons/month	20 000	997
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of August 2023
	Energy	GWh	3 571.2	2256.0
	Ash Emitted	Tons/month	not specified	209.8

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6	
		Document Identifier	240-88543153	Rev	2	
		Effective Date	August2022			
		Review Date	August2024			

Date	Reportable Hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-August	24.0	24.0	24.0	0.0	24.0	24.0	6976	660	724	632	Off	731	715
02-August	24.0	24.0	24.0	0.0	24.0	24.0	7582	709	680	650	Off	794	710
03-August	24.0	24.0	24.0	0.0	24.0	24.0	7612	701	701	641	Off	697	675
04-August	24.0	24.0	24.0	0.0	24.0	24.0	7961	732	729	659	Off	743	733
05-August	24.0	24.0	24.0	0.0	24.0	24.0	7425	703	726	656	Off	700	736
06-August	24.0	24.0	1.3	0.0	24.0	24.0	7335	680	679	380	Off	667	727
07-August	24.0	24.0	0.0	0.0	24.0	24.0	6925	655	709	Off	Off	710	703
08-August	24.0	24.0	0.0	0.0	24.0	24.0	7468	701	723	Off	Off	740	738
09-August	24.0	24.0	0.0	0.0	24.0	24.0	7598	698	726	Off	Off	725	728
10-August	24.0	24.0	0.0	0.0	24.0	24.0	7583	702	707	Off	Off	737	714
11-August	24.0	24.0	0.0	0.0	24.0	24.0	7510	720	713	Off	Off	714	714
12-August	24.0	24.0	0.0	0.0	24.0	24.0	7549	720	713	Off	Off	714	714
13-August	24.0	24.0	0.0	0.0	24.0	24.0	7647	715	725	Off	Off	730	701
14-August	24.0	24.0	0.0	0.0	24.0	24.0	7421	692	722	Off	Off	741	669
15-August	24.0	24.0	0.0	0.0	24.0	24.0	7212	667	598	334	Off	719	668
16-August	24.0	24.0	6.7	0.0	24.0	24.0	7142	686	695	628	Off	722	709
17-August	24.0	24.0	24.0	0.0	24.0	24.0	7427	704	718	649	Off	733	690
18-August	24.0	24.0	24.0	0.0	24.0	24.0	7594	696	735	670	Off	760	676
19-August	24.0	24.0	24.0	0.0	24.0	24.0	7393	696	726	655	Off	754	682
20-August	24.0	24.0	24.0	0.0	24.0	24.0	7536	698	702	637	Off	689	686
21-August	24.0	24.0	24.0	0.0	24.0	24.0	7112	655	670	603	Off	413	649
22-August	24.0	24.0	24.0	0.0	24.0	24.0	7037	630	690	625	Off	712	673
23-August	24.0	24.0	24.0	0.0	24.0	24.0	7637	695	716	631	Off	694	690
24-August	24.0	24.0	24.0	0.0	24.0	24.0	7690	700	710	614	Off	668	715
25-August	24.0	24.0	24.0	0.0	24.0	24.0	7457	739	687	636	Off	687	688
26-August	24.0	24.0	24.0	0.0	24.0	24.0	7546	679	676	660	Off	695	662
27-August	24.0	24.0	24.0	0.0	24.0	24.0	7562	700	722	659	Off	683	663
28-August	24.0	24.0	24.0	0.0	24.0	24.0	5997	684	703	659	Off	741	736
29-August	24.0	24.0	24.0	0.0	24.0	24.0	7674	715	693	665	Off	698	695
30-August	24.0	24.0	24.0	0.0	24.0	24.0	7902	716	721	672	Off	731	703
31-August	24.0	24.0	24.0	0.0	24.0	24.0	7414	692	692	666	Off	756	698

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	August2022		
		Review Date	August2024		

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

2. Abatement Technology

Table 2: Abatement Equipment Control Technology efficiency for month of August2023

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.907%	100%
Unit 2	Fabric Filter Plant (FFP)	99.888%	100%
Unit 3	Fabric Filter Plant (FFP)	99.907%	100%
Unit 4	Fabric Filter Plant (FFP)	off	off
Unit 5	Fabric Filter Plant (FFP)	99.947%	100%
Unit 6	Fabric Filter Plant (FFP)	99.967%	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 AUGUST 2023

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	1.34
Ash Content	35 - 39	34.41

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF AUGUST 2023

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
Oil		
Sulphur Content	0.5 - 3.5	2.3
Ash Content	0.02 - 0.1	0.035

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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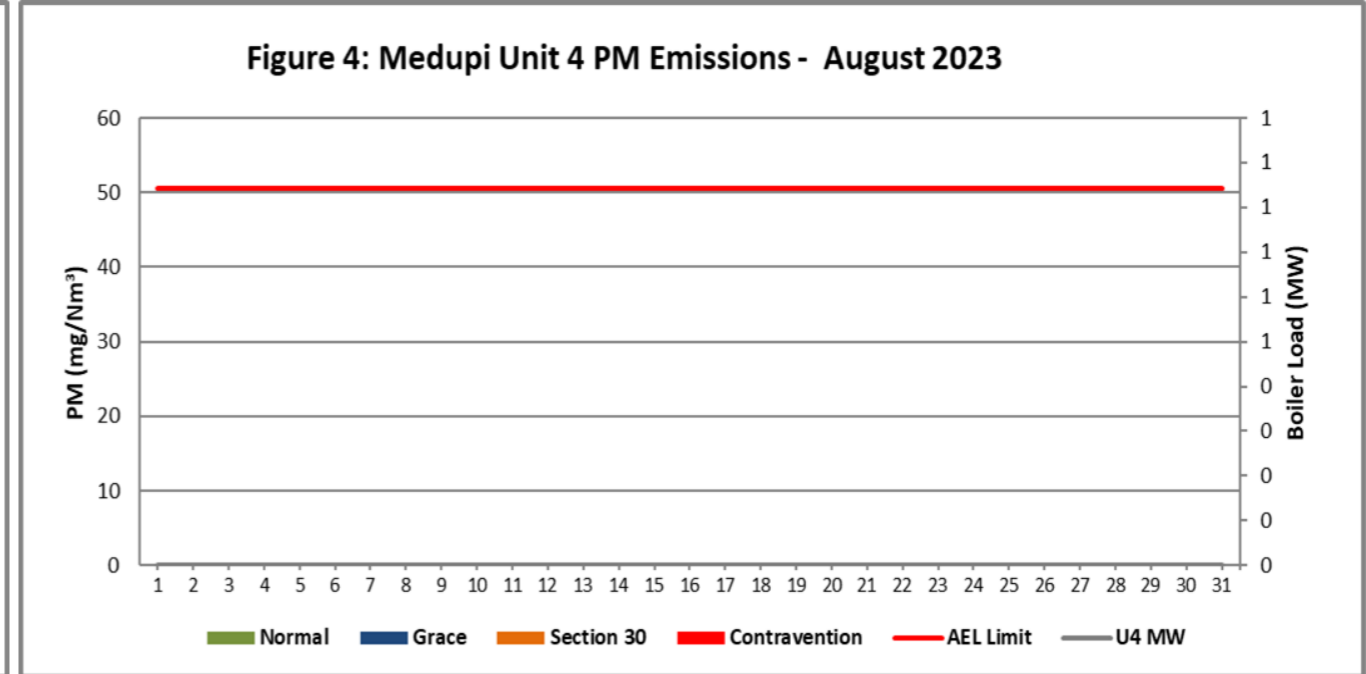
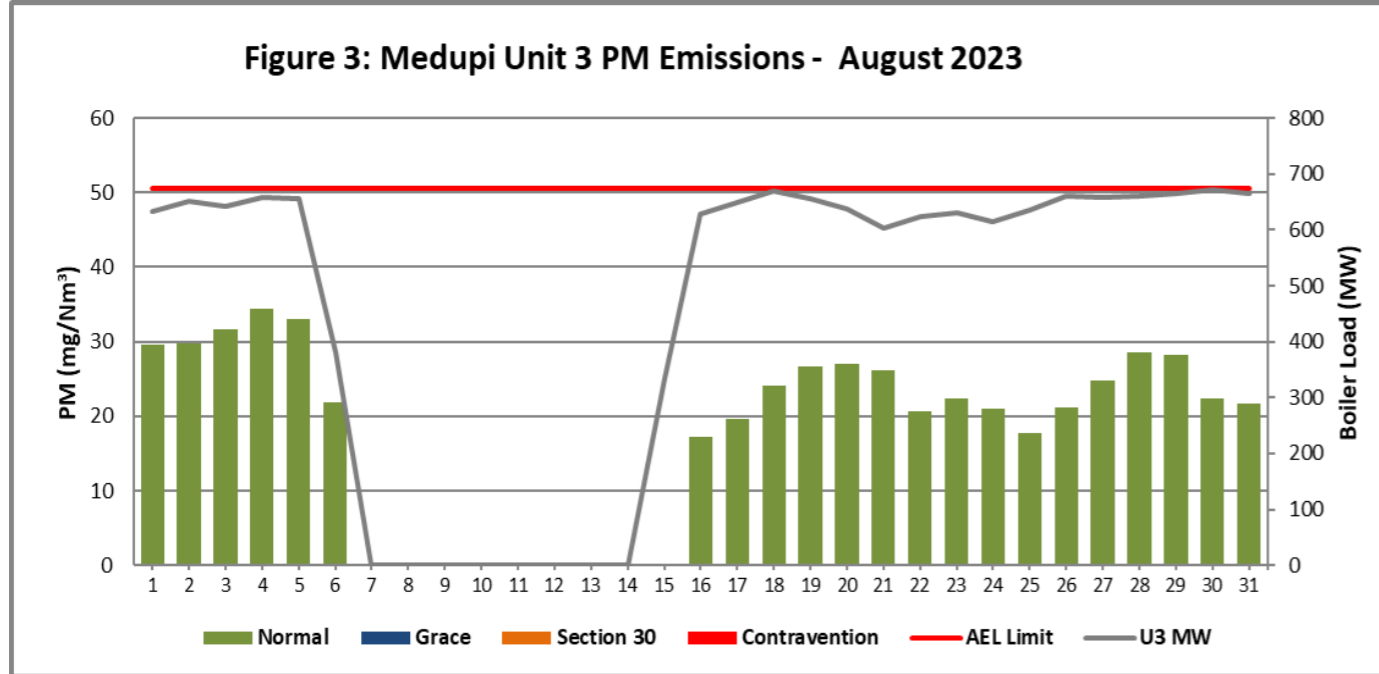
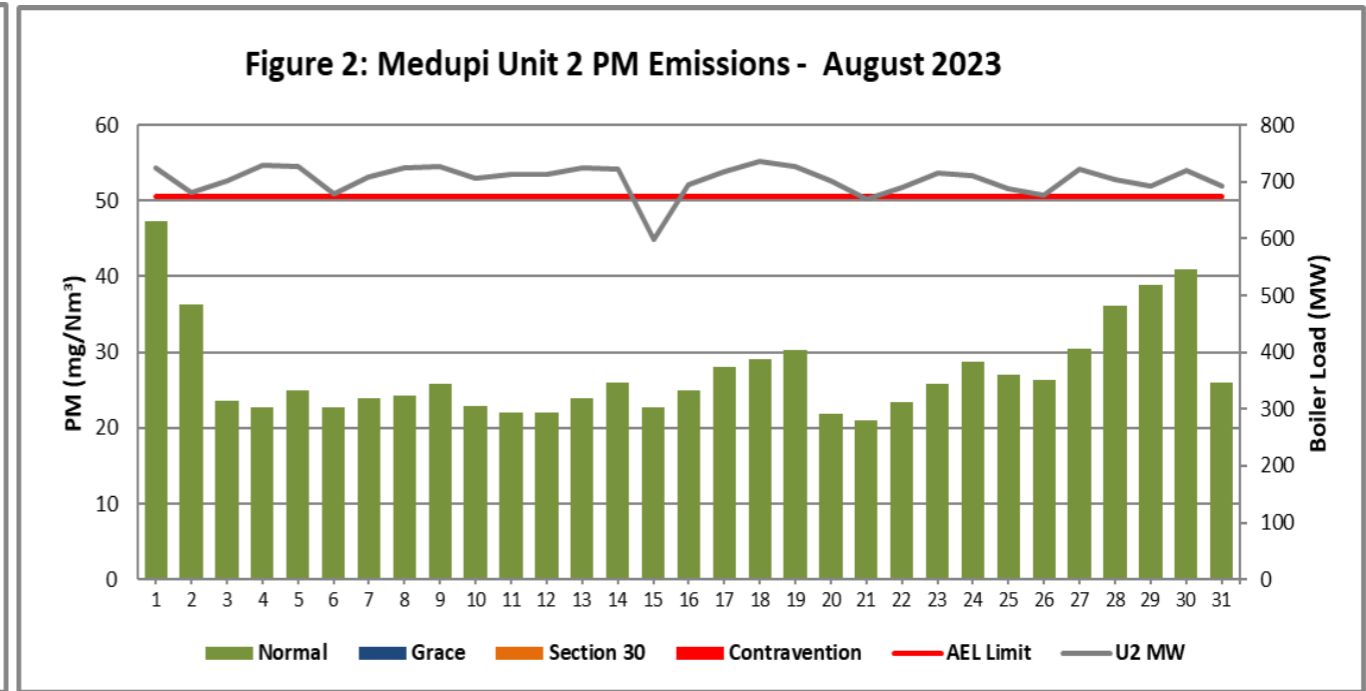
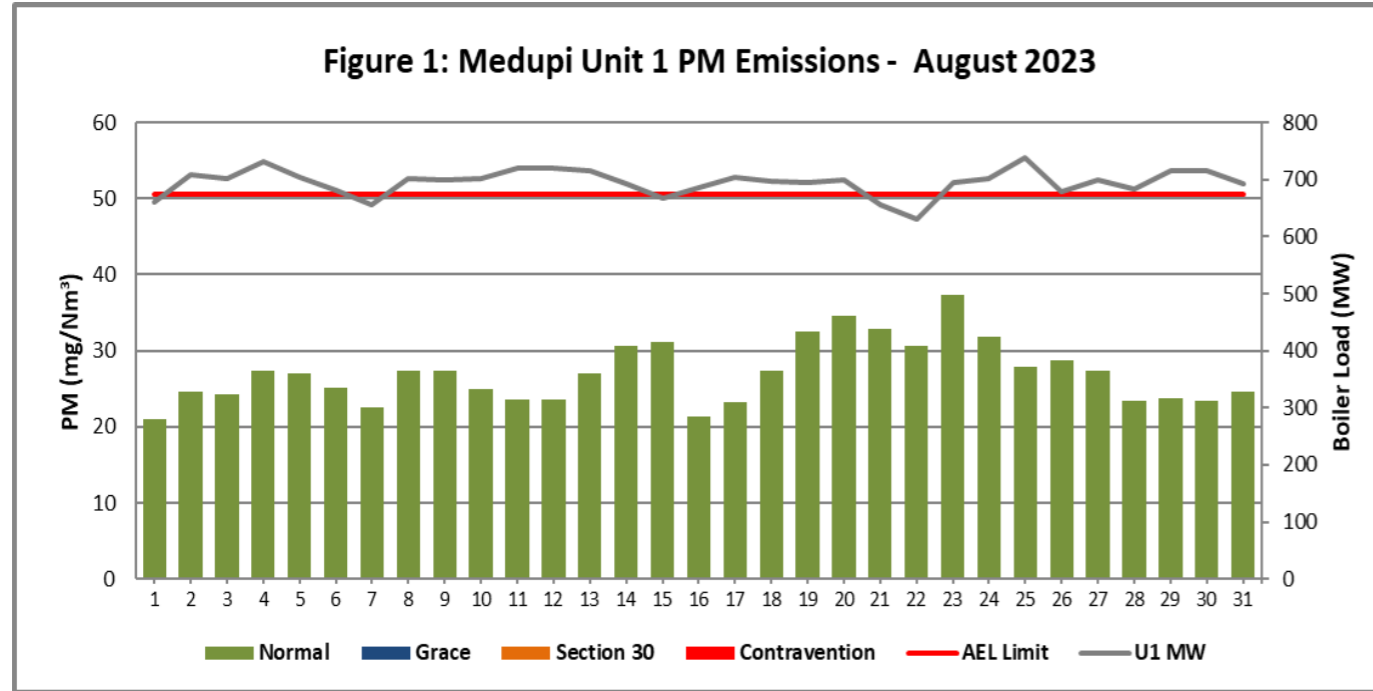
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Medupi Power Station Monthly Emissions Report

Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	August2022		
Review Date	August2024		

4.1 PM Daily Averages



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Medupi Power Station Monthly Emissions Report

Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	August2022		
Review Date	August2024		

Figure 5: Medupi Unit 5 PM Emissions - August 2023

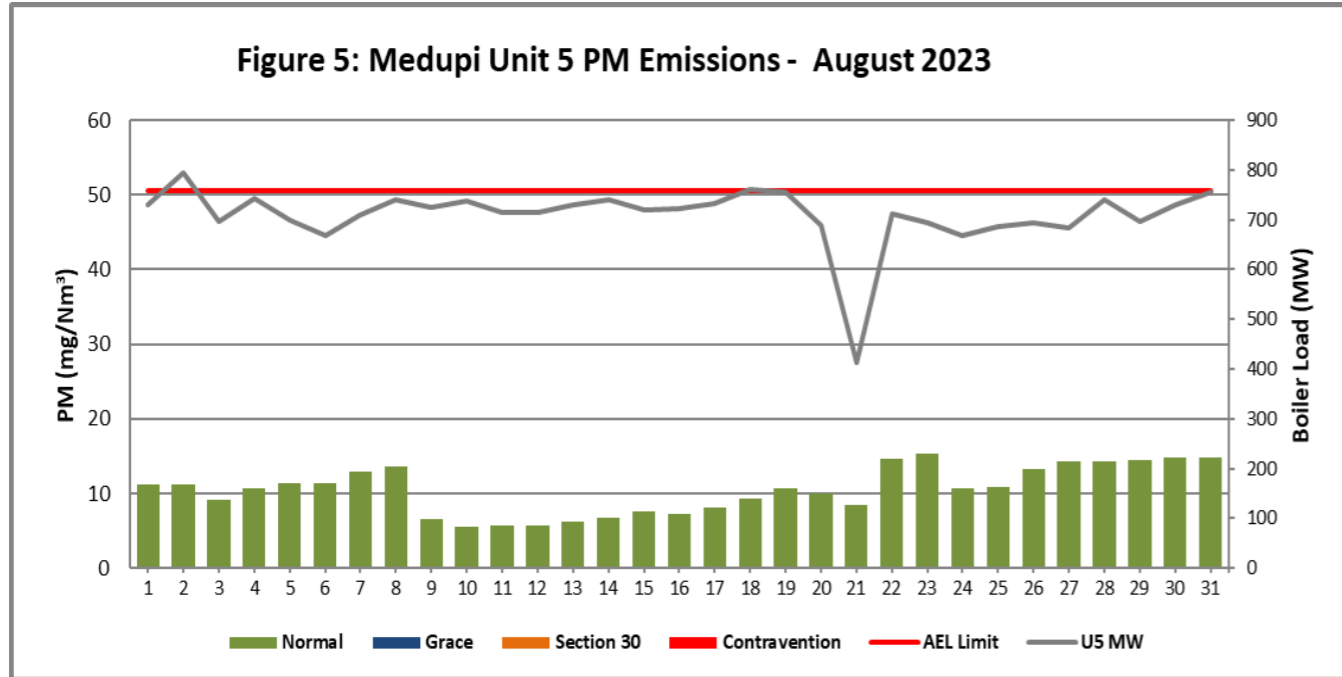
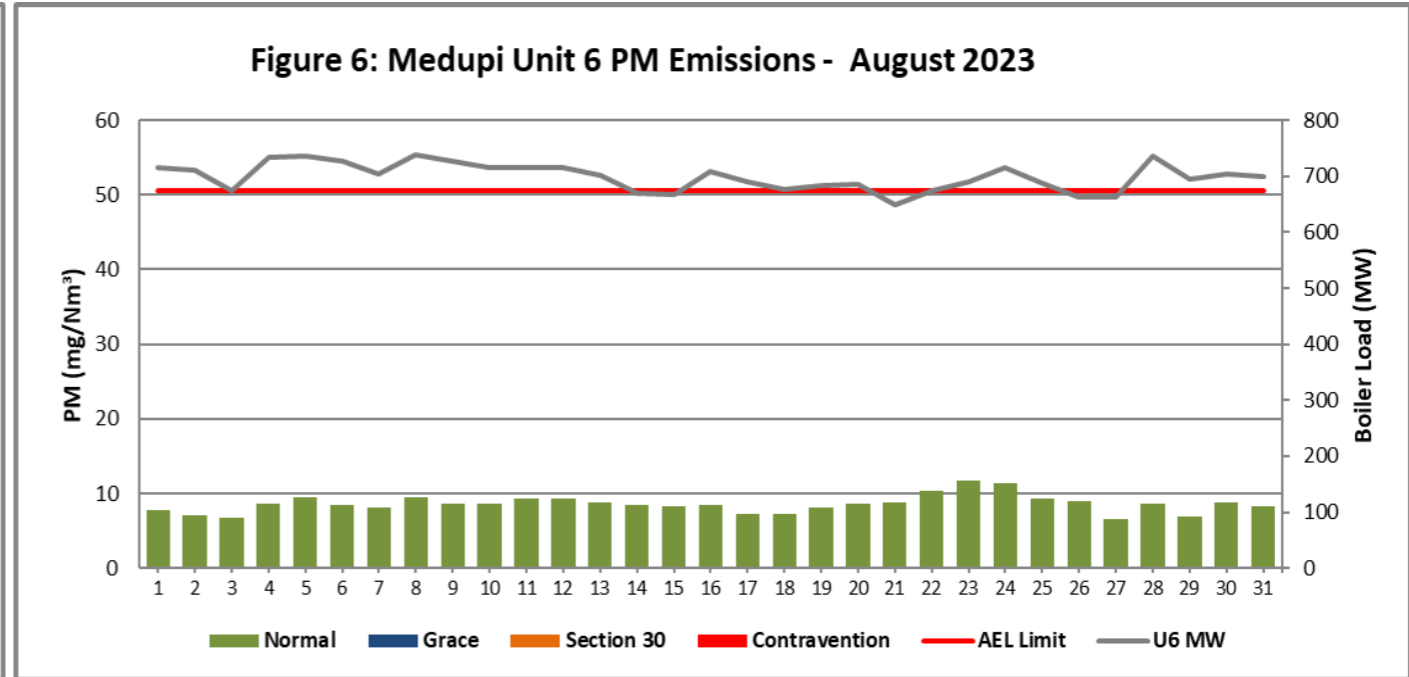


Figure 6: Medupi Unit 6 PM Emissions - August 2023



4.2 SOx Daily Averages

Figure 7: Medupi Unit 1 SO₂ Emissions - August 2023

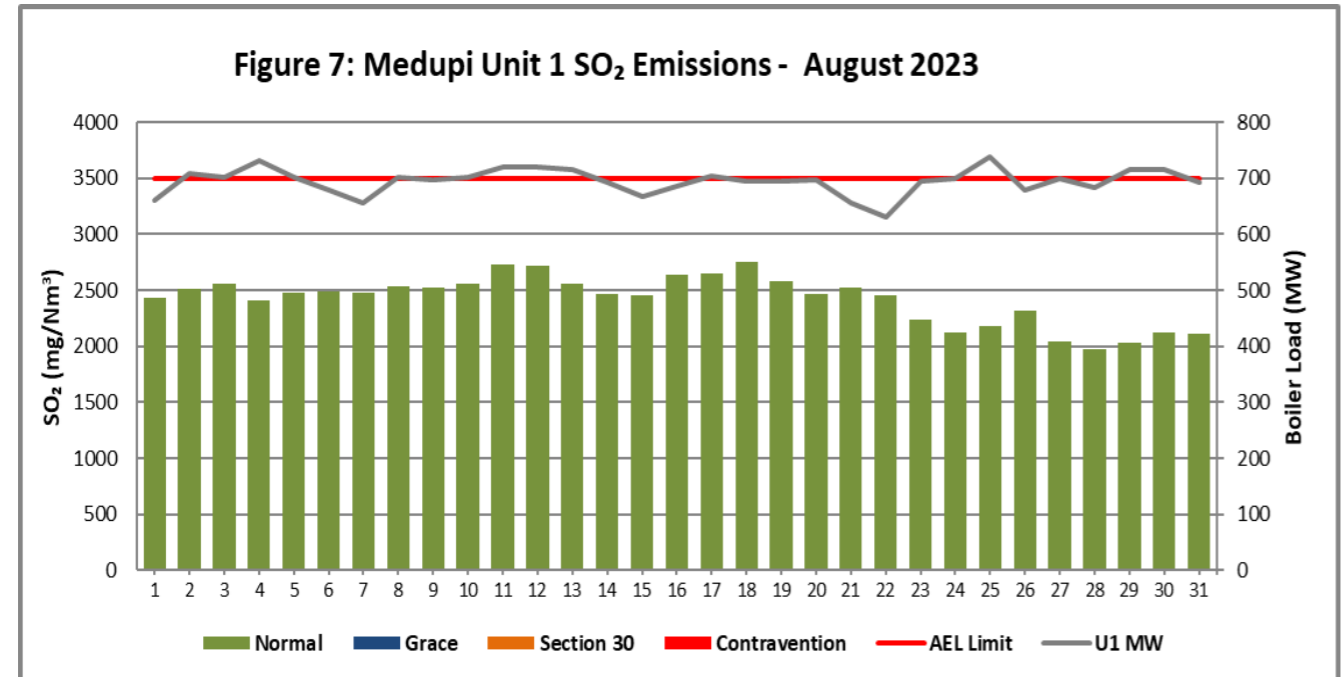
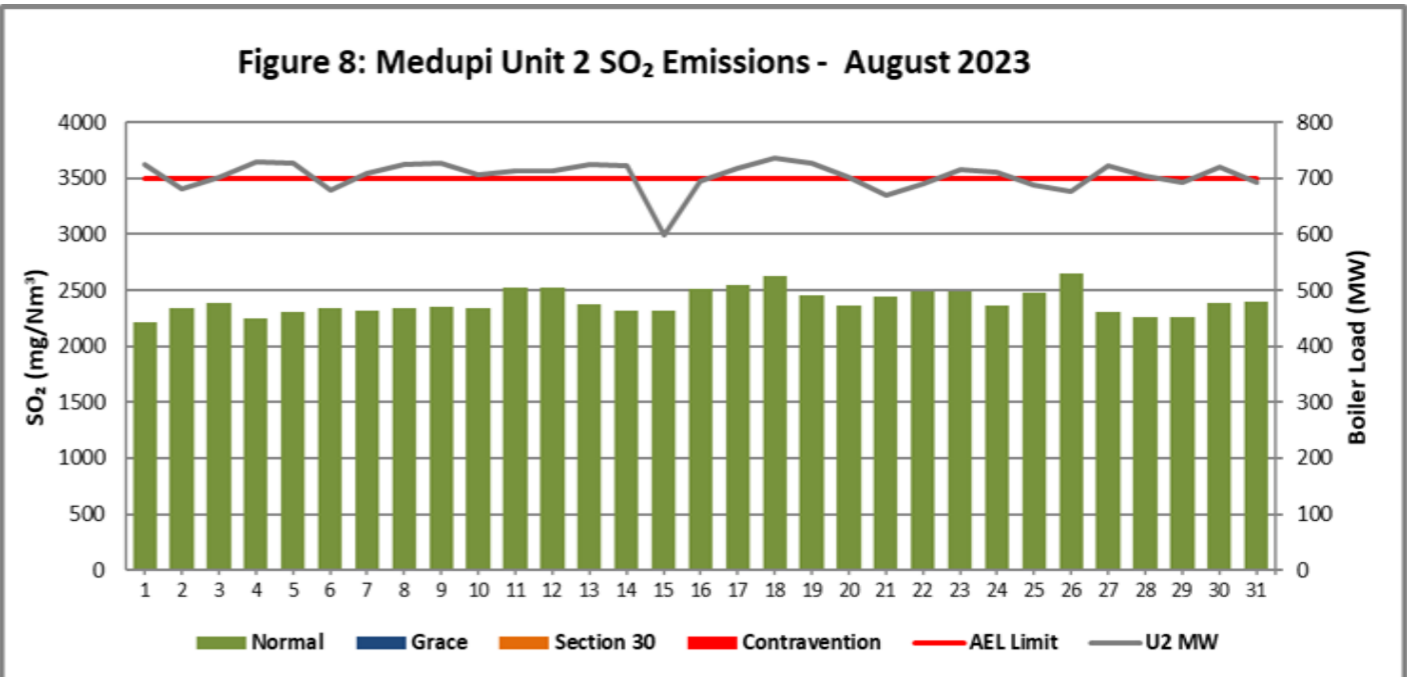


Figure 8: Medupi Unit 2 SO₂ Emissions - August 2023



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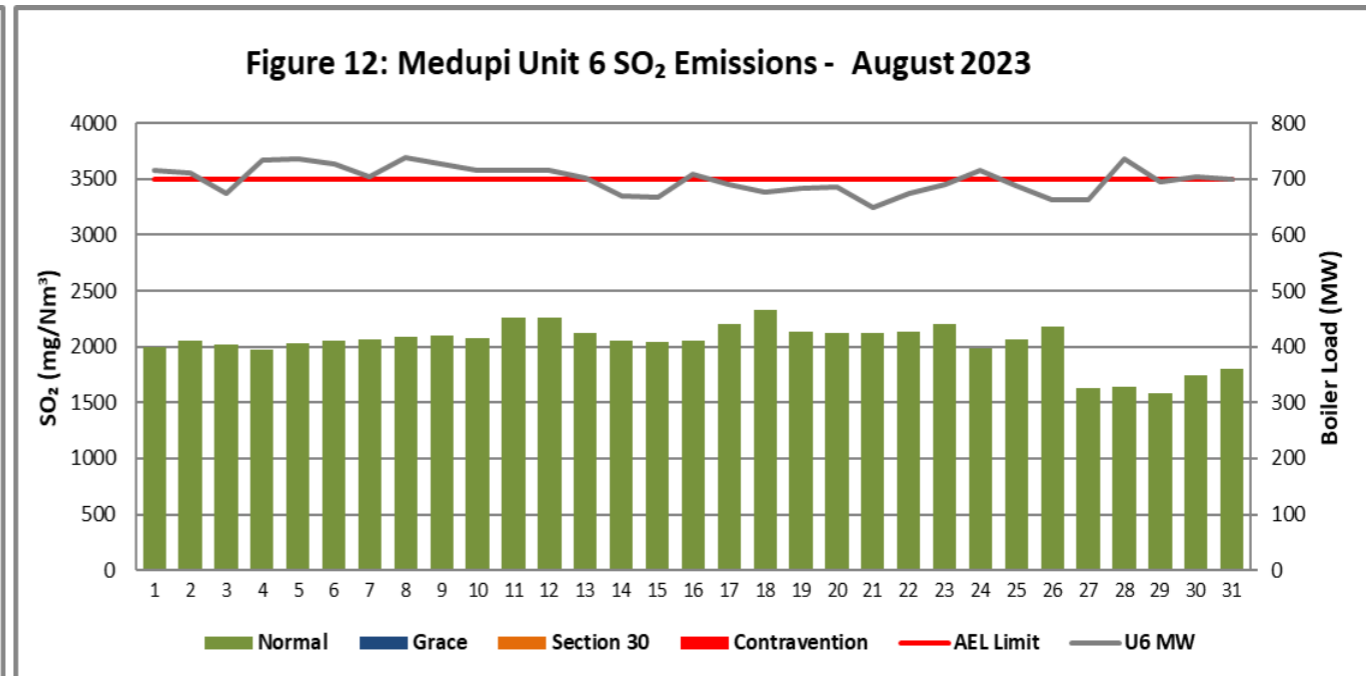
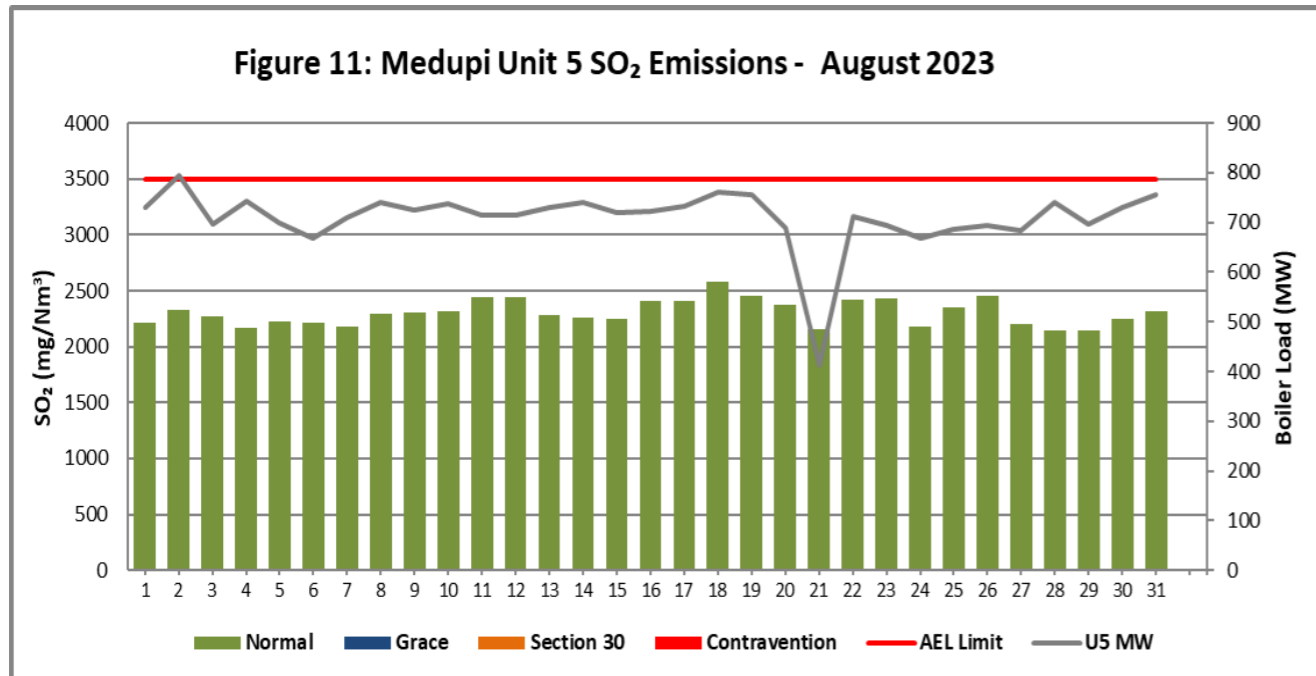
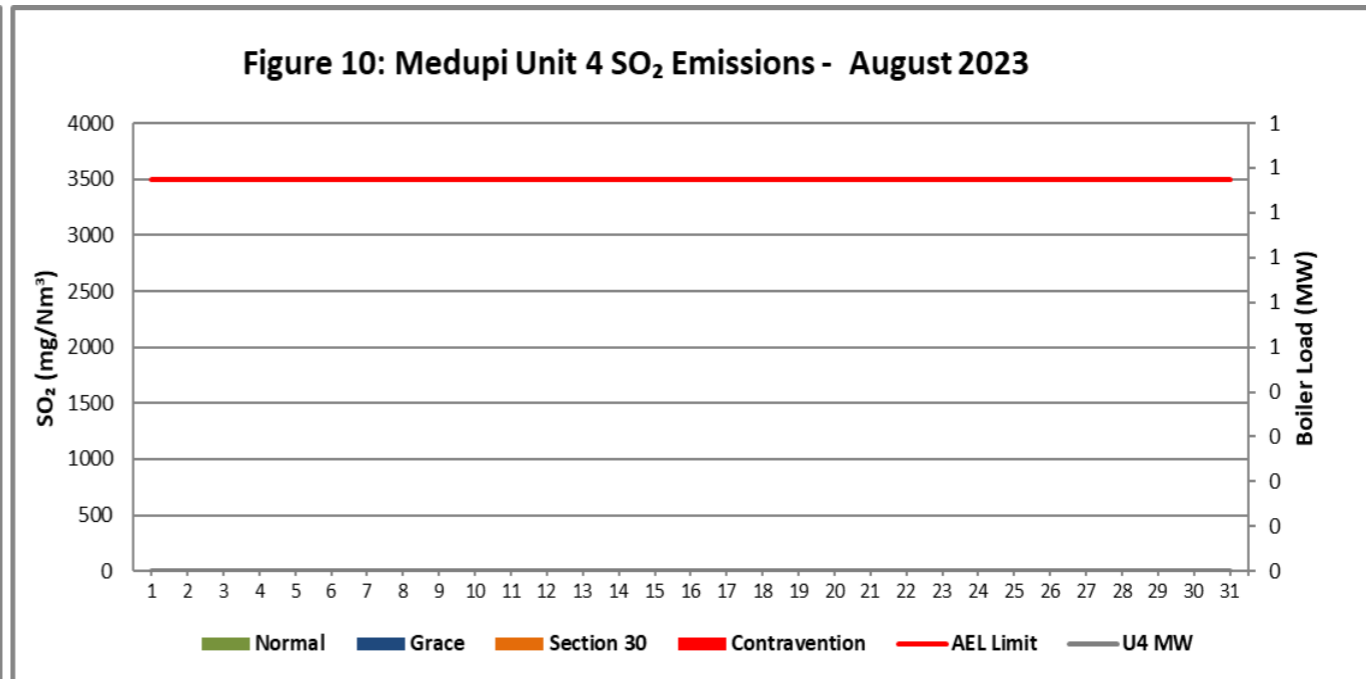
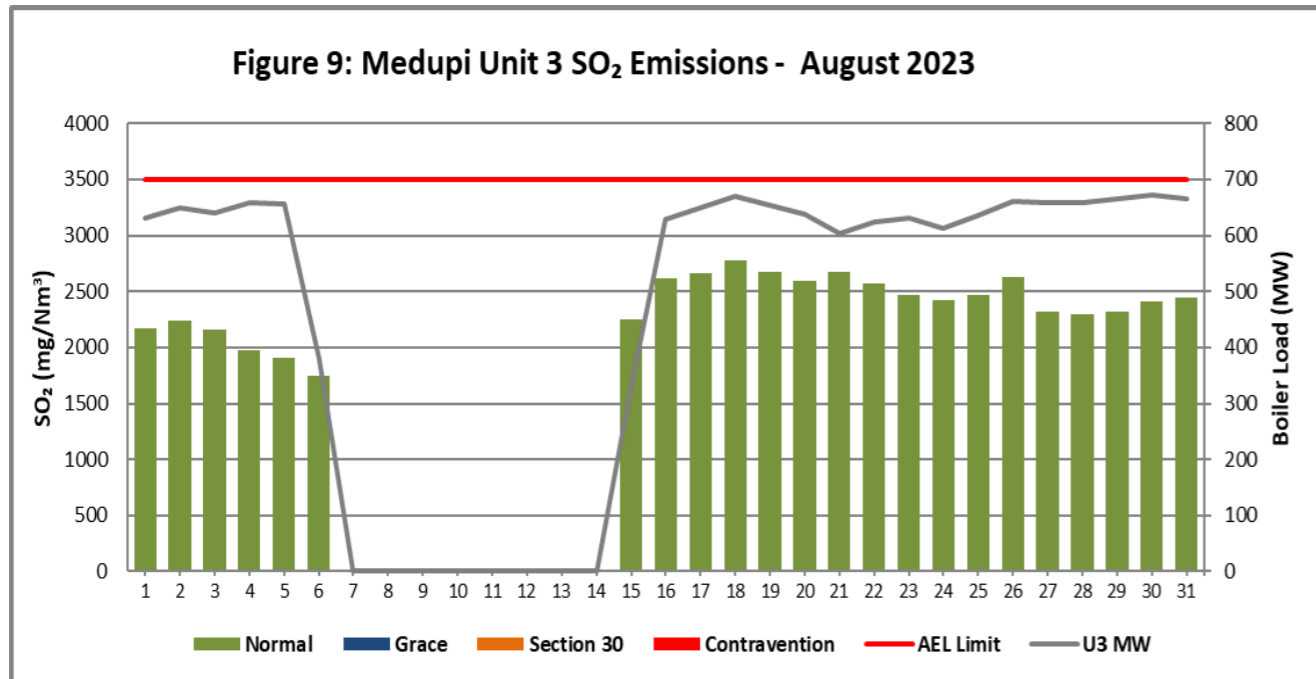
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Medupi Power Station Monthly Emissions Report

Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	August2022		
Review Date	August2024		



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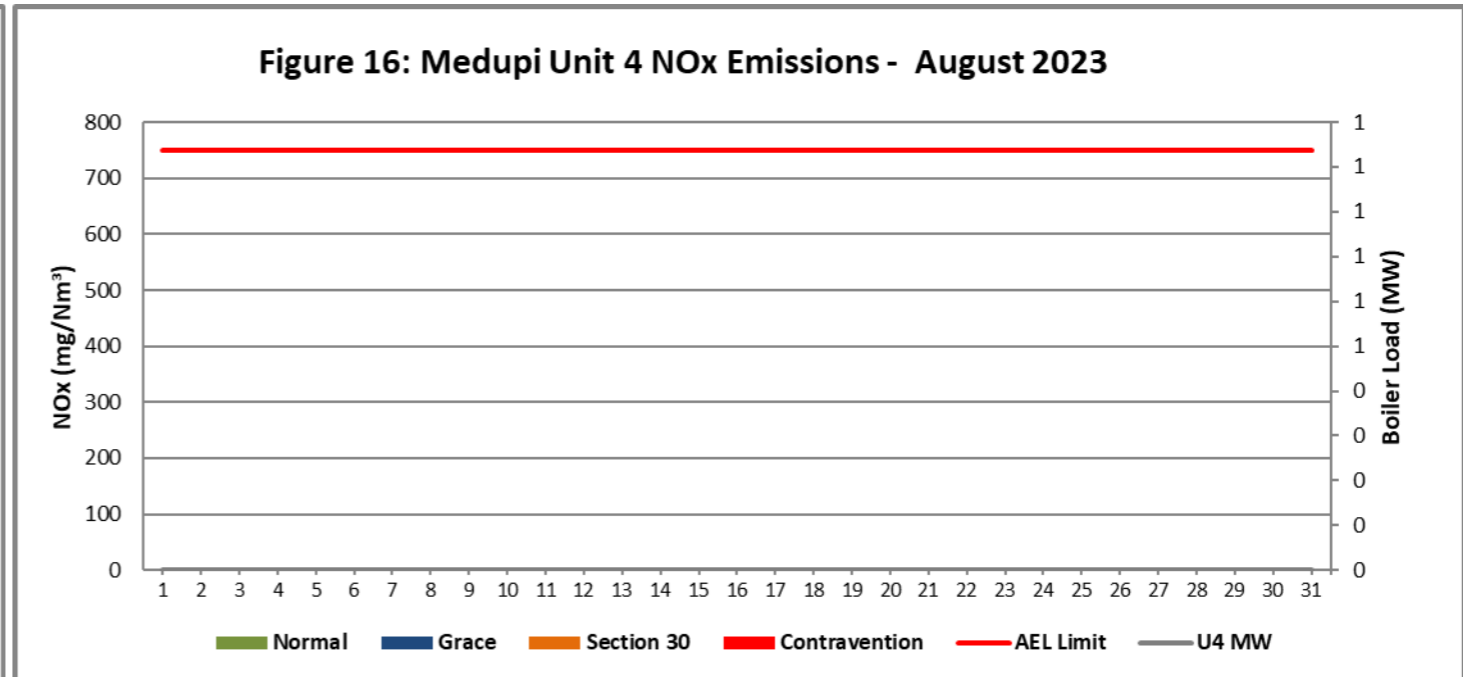
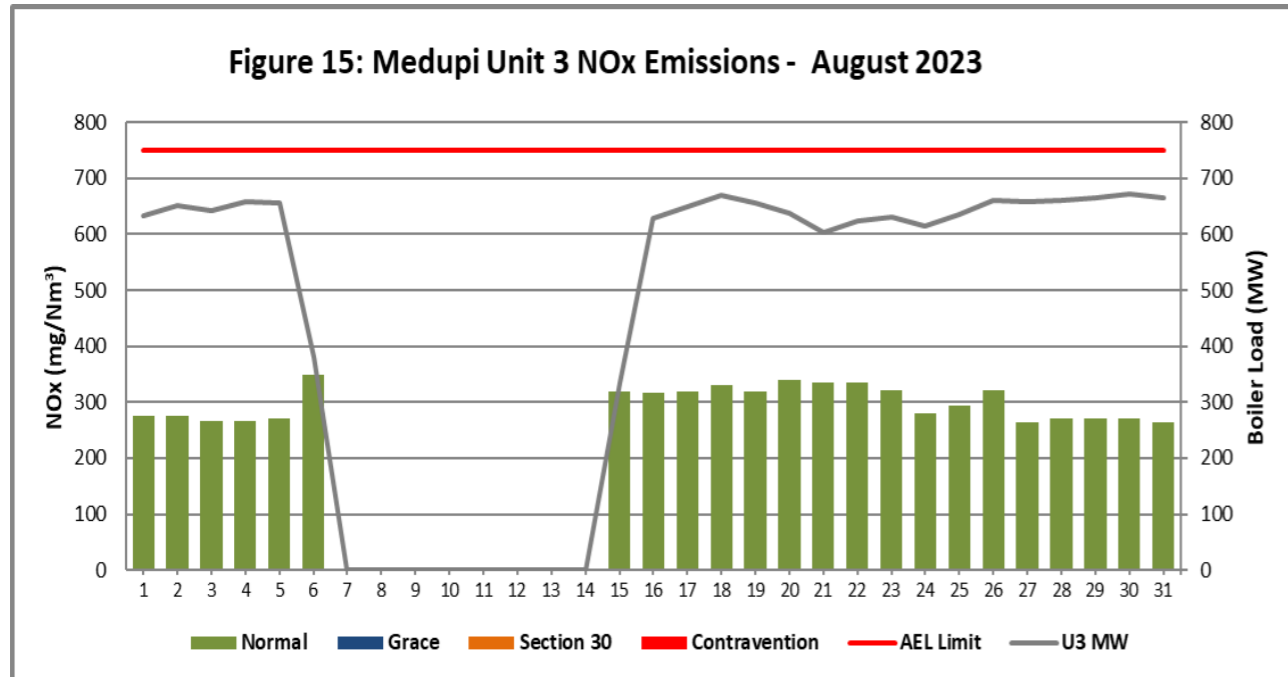
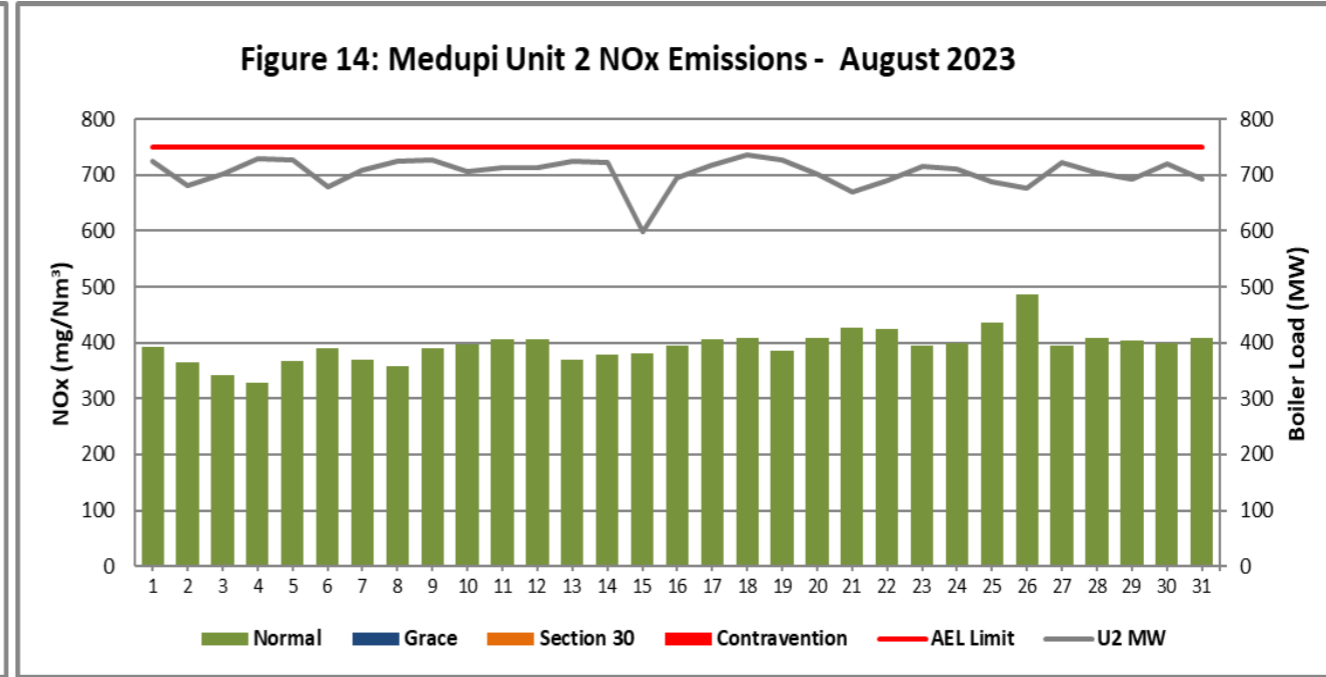
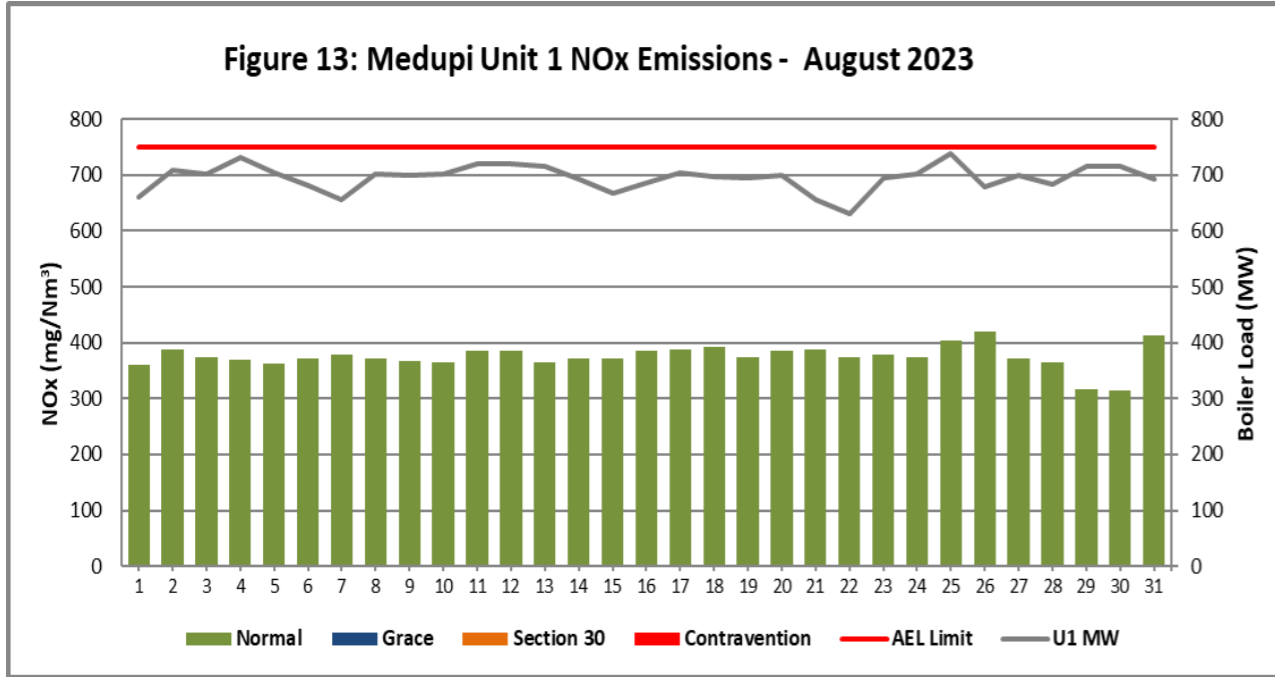
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Medupi Power Station Monthly Emissions Report

Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	August2022		
Review Date	August2024		

4.3 NOx Daily Averages



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Medupi Power Station Monthly Emissions Report

Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	August2022		
Review Date	August2024		

Figure 17: Medupi Unit 5 NOx Emissions - August 2023

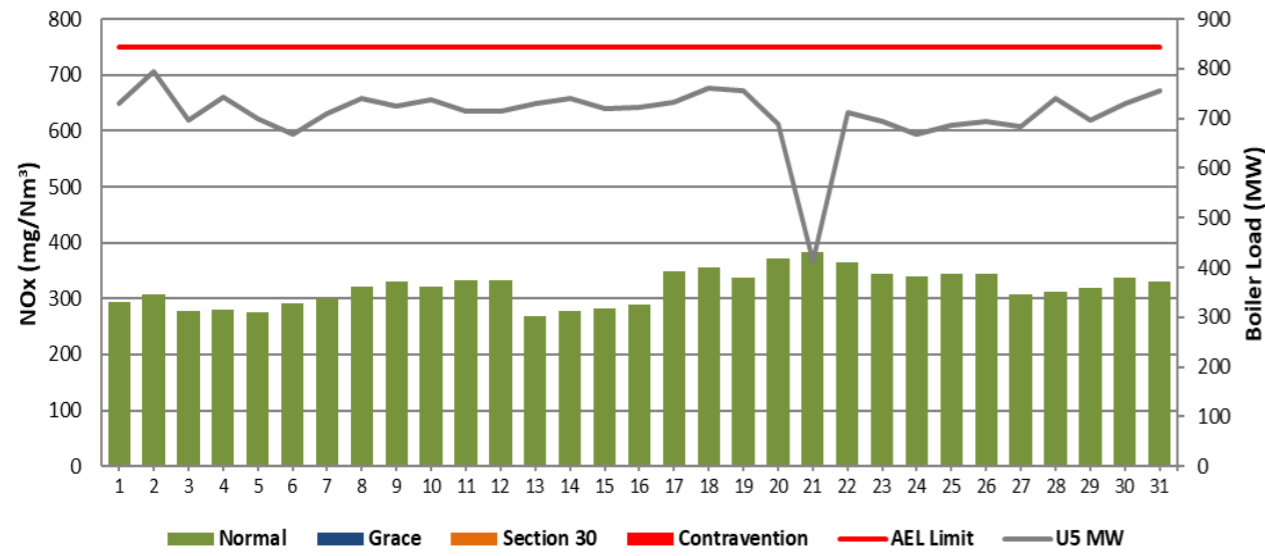
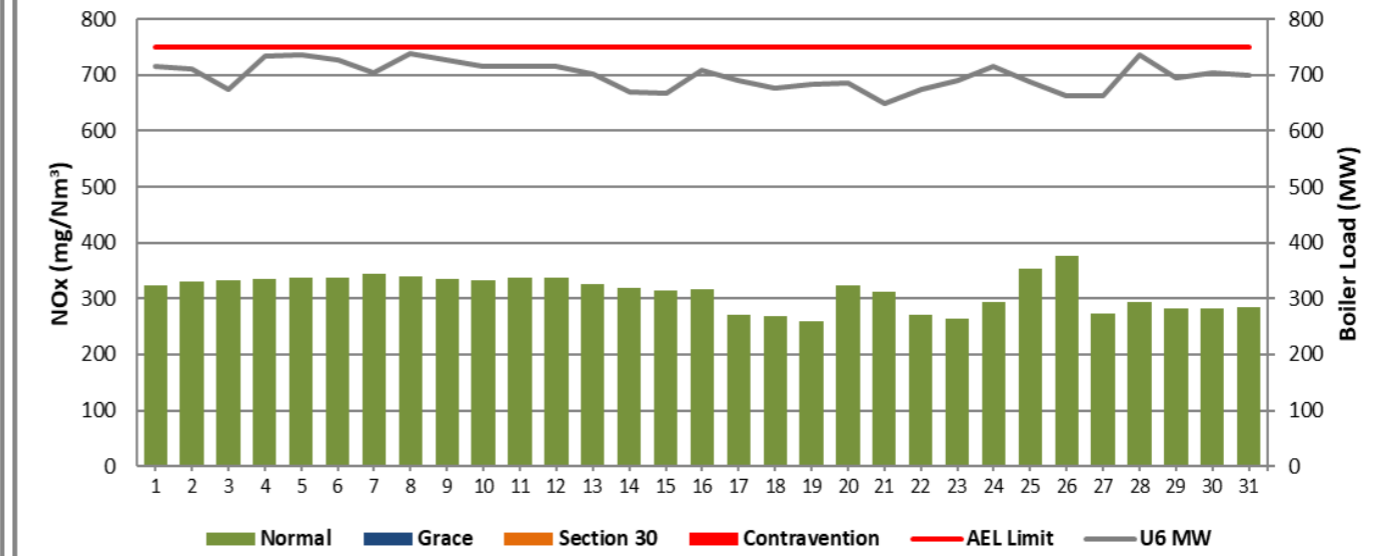


Figure 18: Medupi Unit 6 NOx Emissions - August 2023



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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	August2022		
		Review Date	August2024		

TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF AUGUST 2023

Associated Unit/Stack	PM	SO ₂	NO ₂
Unit 1	56.3	5 037.8	779.2
Unit 2	69.2	6 053.0	996.0
Unit 3	35.4	2 998.8	366.5
Unit 4	off	off	off
Unit 5	30.3	6 649.0	919.6
Unit 6	18.6	4 398.1	678.1
SUM (Tons)	209.8	25 136.7	3 739.4

TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF AUGUST 2023

Associated Unit/Stack	Average PM (mg/Nm ³)	Average SO ₂ (mg/Nm ³)	Average NO ₂ (mg/Nm ³)
Unit 1	27.0	2 423.1	375.0
Unit 2	27.4	2 394.8	394.3
Unit 3	29.9	2 382.8	298.7
Unit 4	off	off	off
Unit 5	10.5	2 304.2	320.0
Unit 6	8.6	2 035.2	312.9

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.

TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE

Date	CEMS status	Comments
N/A	N/A	N/A

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6	
		Document Identifier	240-88543153	Rev	2	
		Effective Date	August2022			
		Review Date	August2024			

TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)

Associated Unit/Stack	PM	SO ₂	NO ₂	O ₂
Unit 1	100.0	99.3	99.3	99.3
Unit 2	99.9	99.9	99.7	99.7
Unit 3	100.0	0	0	0
Unit 4	off	off	off	off
Unit 5	99.9	100.0	100.0	99.9
Unit 6	99.9	100.0	99.9	98.7

Note: 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 August2023 was e-mailed to the Licensing Authority.

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	August2022		
		Review Date	August2024		

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 AUGUST 2023

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Thursday, 31 August 2023	
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:	August	
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:	997	tons/month
Molecular weight of the fuel oil:		Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	20.46	°C
Daily maximum ambient temperature	28.86	°C
Daily minimum ambient temperature	12.76	°C
Daily ambient temperature range	16.09	°C
Daily total insolation factor	4.23	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.72 kg/month	
Working losses:	0.03 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.75 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, 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.</small>		

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6	
		Document Identifier	240-88543153	Rev	2	
		Effective Date	August2022			
		Review Date	August2024			

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

No awareness campaigns for this month.

10. Complaints Register


TABLE 5: COMPLAINTS FOR THE MONTH OF AUGUST 2023

Source Code/ Name	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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		Document Identifier	240-88543153	Rev	2
		Effective Date	August2022		
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Compiled by: Lutendo Murovhi *Nemutankhatho* Date: 18/12/2023
 Environmental Officer

Verified by: Malose Langa *[Signature]* Date: 2023/12/20
 System Engineer Boiler

Verified by: Nontuthuko Mpangase *[Signature]* Date: 2023/12/20
 System Engineer C&I

Supported by: Mokgadi Dikgale *[Signature]* Date: 2023/12/21
 Environmental Manager

Supported by: Jabulani Mkhathswa *[Signature]* Date: 2023/12/21
 Engineering Group Manager

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

Yours sincerely

[Signature]

Zweli Witbooi
 GENERAL MANAGER: MEDUPI POWER STATION

Date: 2023/12/21

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