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		<b>Review Date</b>	<b>May 2024</b>		

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Date: 2023/05/31

Enquiries: MF Dikgale

Tel: 014 762 6820

Ref: H16/1/13-AEL/M1/R1 – May 2023

Dear Mr Koenaitse

## MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF MAY 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 June 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 May 2023 only.

## 1. Raw Materials and Products


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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – May 2023
	Coal	Tons/month	1 875 000	1028997
	Fuel Oil	Tons/month	20 000	1556
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of May 2023
	Energy	GWh	3 571.2	2151.15
	Ash Emitted	Tons/month	not specified	275.9

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Date	Reportable hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-May	11.3	24.0	24.0	0.0	24.0	24.0	38450	701	730	743	Off	634	735
02-May	24.0	24.0	24.0	0.0	24.0	24.0	38409	742	719	750	Off	651	740
03-May	24.0	24.0	24.0	0.0	24.0	24.0	38519	734	727	739	Off	667	704
04-May	24.0	24.0	24.0	0.0	24.0	24.0	38832	759	769	750	Off	661	731
05-May	24.0	24.0	24.0	0.0	24.0	24.0	38496	716	772	750	Off	679	716
06-May	24.0	2.2	13.6	0.0	24.0	1.8	25106	737	651	750	Off	659	528
07-May	9.6	14.2	0.0	0.0	24.0	9.1	26626	636	749	117	Off	657	720
08-May	0.0	24.0	17.3	0.0	24.0	5.2	28442	Off	783	573	Off	672	669
09-May	0.0	24.0	24.0	0.0	24.0	16.3	30944	Off	785	711	Off	672	761
10-May	0.0	24.0	24.0	0.0	24.0	10.8	29121	Off	758	697	Off	661	720
11-May	0.0	9.0	24.0	0.0	24.0	0.0	23225	Off	683	731	Off	661	620
12-May	0.0	0.0	24.0	0.0	24.0	7.1	21942	Off	Off	709	Off	652	696
13-May	0.0	0.0	24.0	0.0	24.0	0.0	21495	Off	Off	706	Off	666	694
14-May	0.0	0.0	24.0	0.0	24.0	20.3	21696	Off	Off	692	Off	632	700
15-May	0.0	0.0	24.0	0.0	24.0	24.0	24570	523	Off	732	Off	554	704
16-May	14.1	0.0	24.0	0.0	24.0	24.0	34457	701	545	671	Off	655	751
17-May	24.0	19.4	24.0	0.0	24.0	24.0	36854	723	687	673	Off	681	736
18-May	24.0	24.0	24.0	0.0	24.0	24.0	35851	720	699	636	Off	661	686
19-May	24.0	24.0	24.0	0.0	24.0	24.0	37172	727	718	601	Off	650	780
20-May	24.0	24.0	24.0	0.0	24.0	24.0	36017	675	714	561	Off	648	777
21-May	24.0	24.0	24.0	0.0	24.0	24.0	37114	660	696	667	Off	755	750
22-May	24.0	24.0	12.7	0.0	24.0	17.2	33550	628	727	652	Off	649	739
23-May	24.0	24.0	8.4	0.0	24.0	0.0	34791	678	721	690	Off	663	652
24-May	24.0	24.0	24.0	0.0	24.0	17.9	37046	692	696	700	Off	676	740
25-May	24.0	24.0	24.0	0.0	24.0	24.0	37086	657	672	690	Off	665	730
26-May	24.0	24.0	24.0	0.0	24.0	24.0	37175	639	709	685	Off	667	731
27-May	24.0	24.0	24.0	0.0	24.0	24.0	38072	655	707	700	Off	652	740
28-May	24.0	24.0	24.0	0.0	24.0	24.0	36978	653	725	693	Off	681	752
29-May	24.0	24.0	24.0	0.0	24.0	24.0	37322	662	700	685	Off	666	754
30-May	24.0	24.0	24.0	0.0	24.0	24.0	37551	664	705	700	Off	669	754
31-May	24.0	24.0	24.0	0.0	24.0	24.0	36088	610	717	696	Off	650	737

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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 May 2023**

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.907%	100%
Unit 2	Fabric Filter Plant (FFP)	99.896%	100%
Unit 3	Fabric Filter Plant (FFP)	99.916%	100%
Unit 4	Fabric Filter Plant (FFP)	off	Off
Unit 5	Fabric Filter Plant (FFP)	99.826%	100%
Unit 6	Fabric Filter Plant (FFP)	99.980%	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 MAY 2023**

Characteristic	Stipulated Range (% by weight on a dry basis)	Monthly Average Content (% by weight on a dry basis)
	<b>Coal</b>	
<b>Sulphur Content</b>	1.3 - 2.2	1.45
<b>Ash Content</b>	35 - 39	35.48

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

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	<b>Oil</b>	
<b>Sulphur Content</b>	0.5 - 3.5	2.25
<b>Ash Content</b>	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:

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SO<sub>2</sub> Monthly = 3500 mg/Nm<sup>3</sup>

Dust Daily= 50 mg/Nm<sup>3</sup>

NO<sub>2</sub> Daily= 750 mg/Nm<sup>3</sup>

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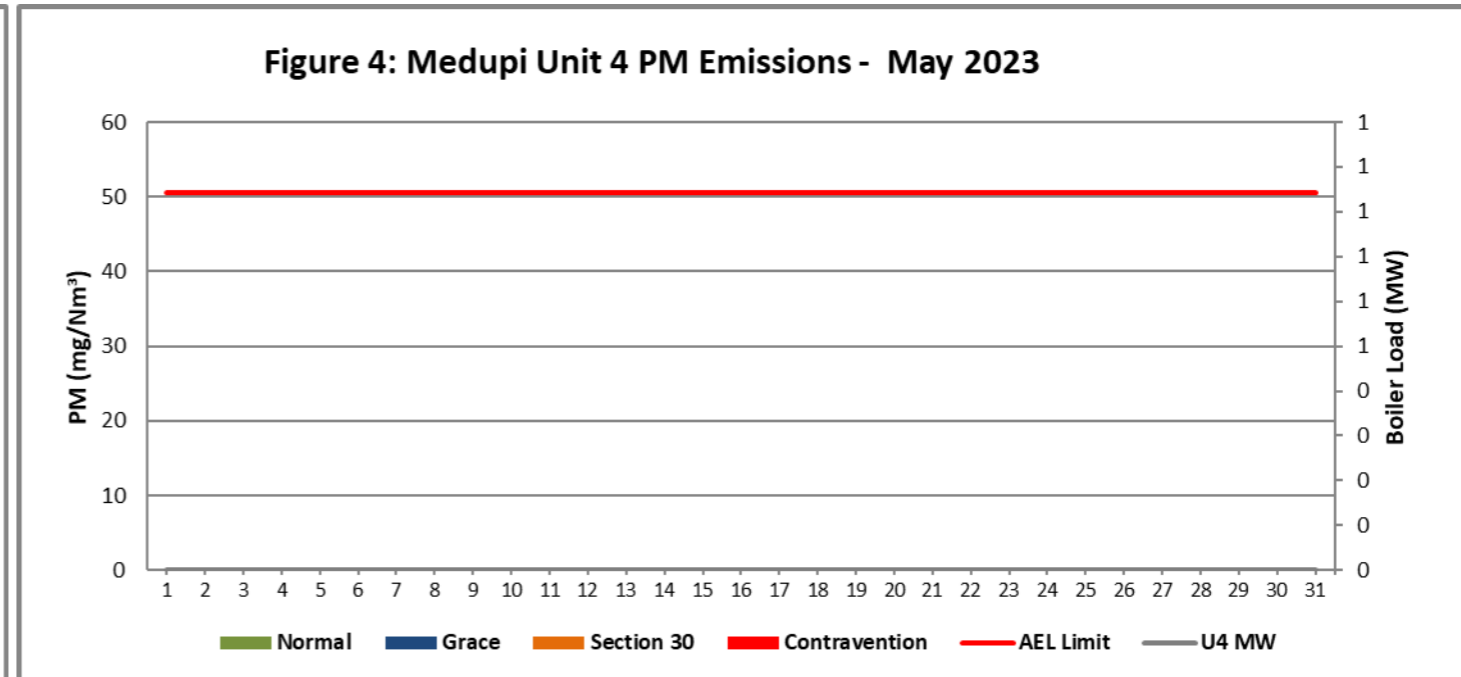
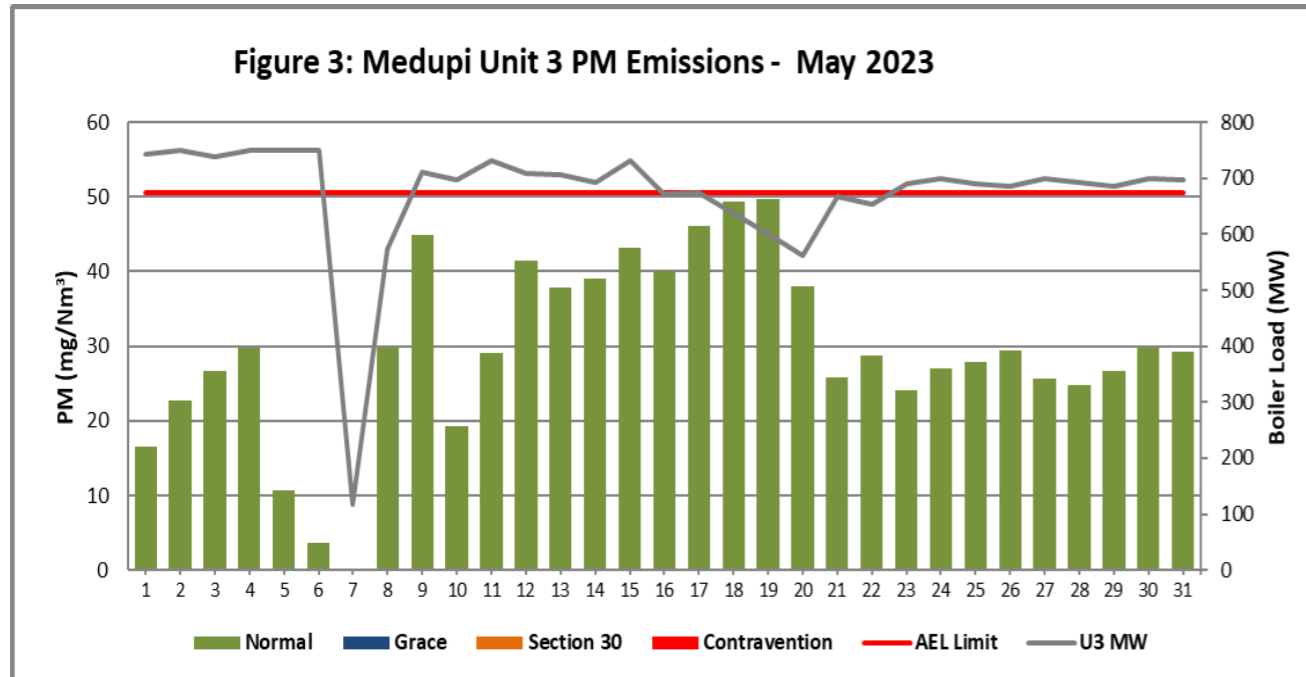
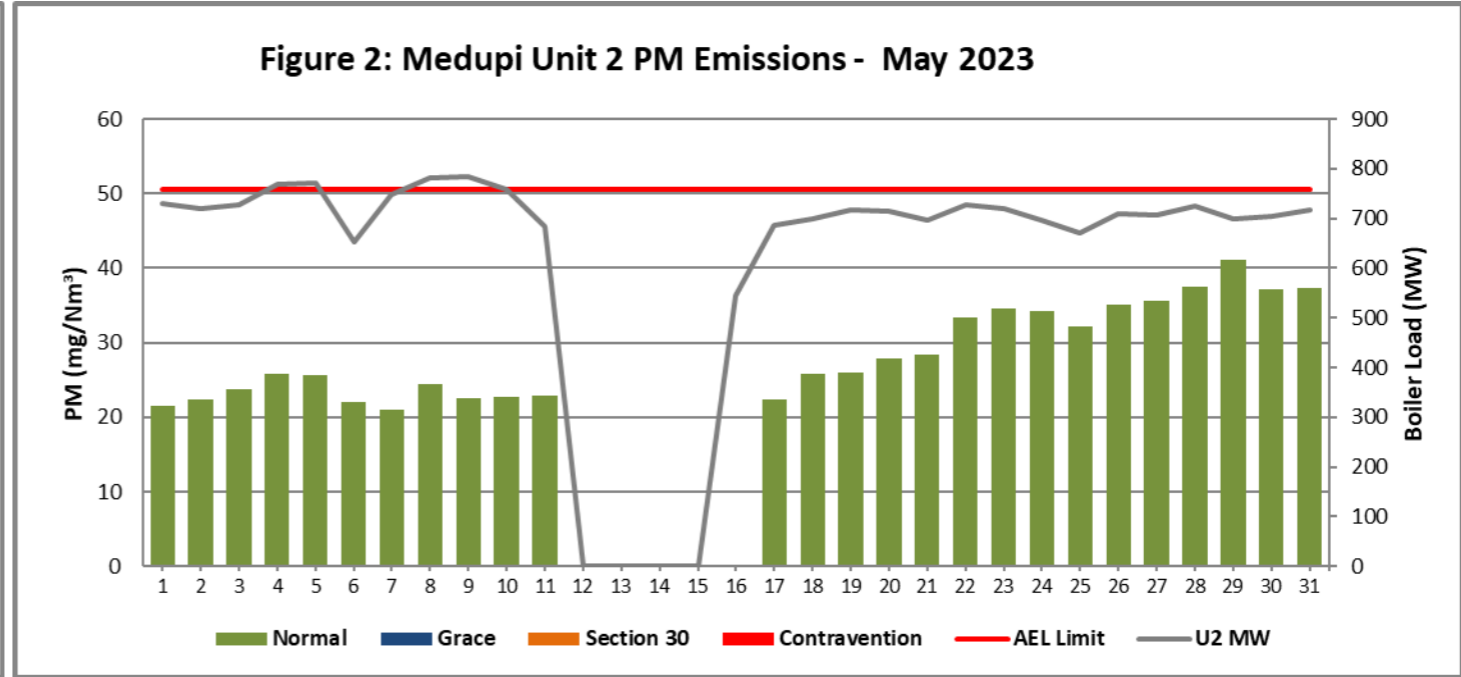
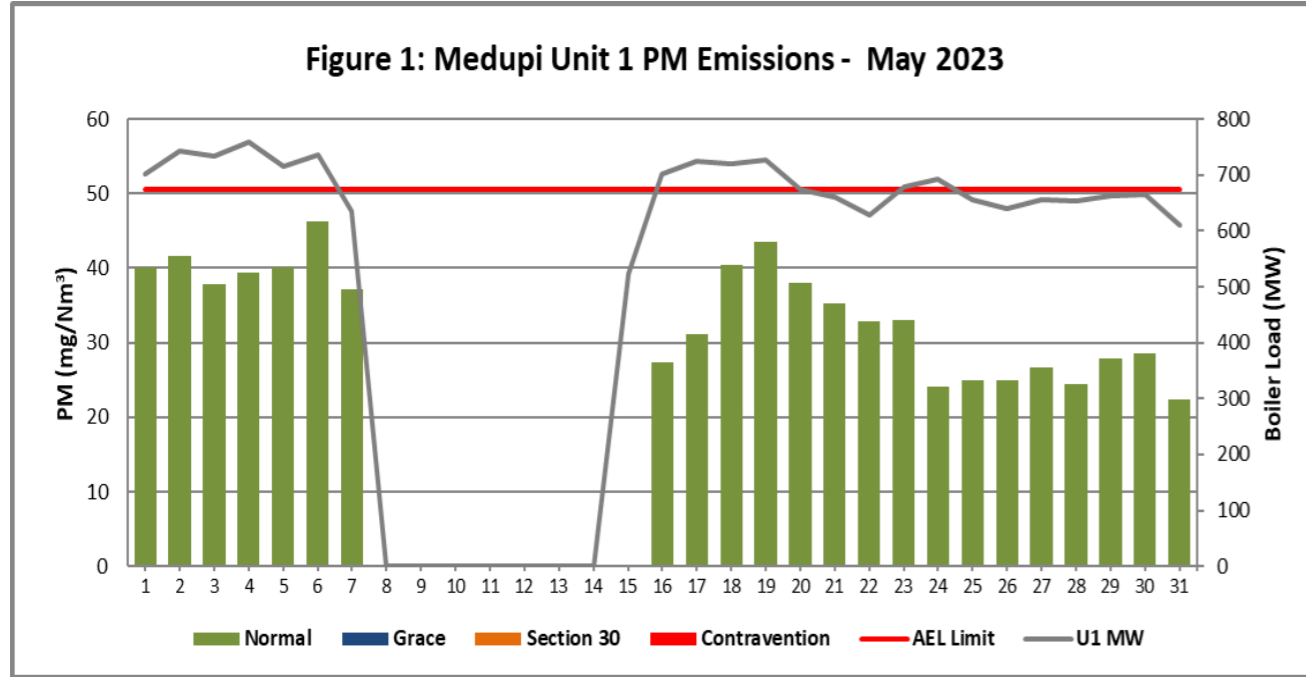
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## 4.1 PM Daily Averages



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Figure 5: Medupi Unit 5 PM Emissions - May 2023

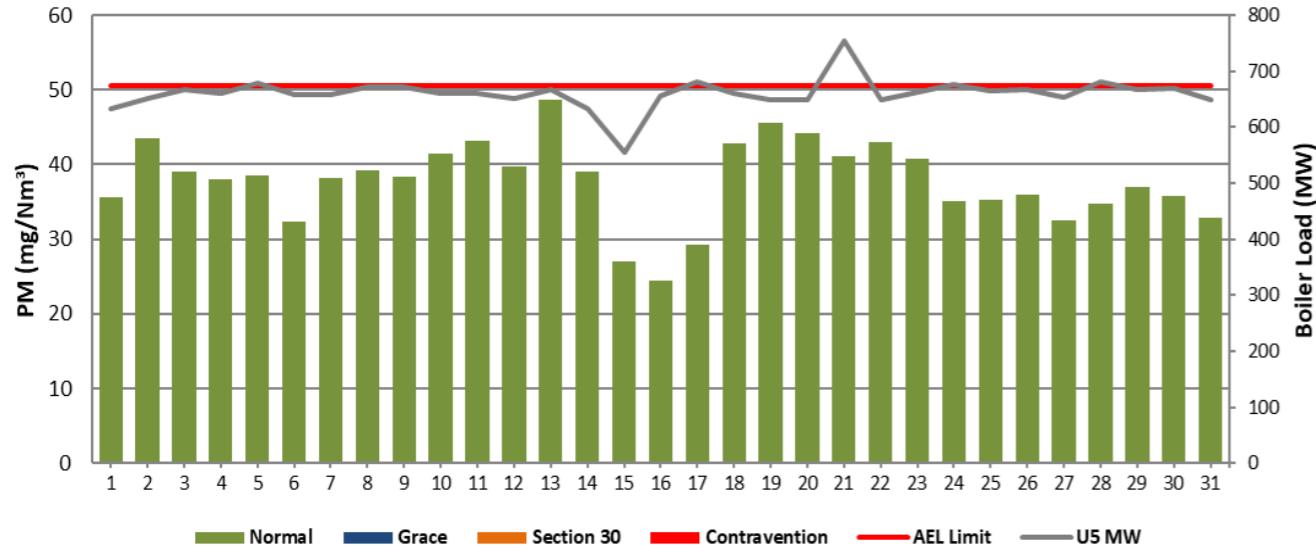
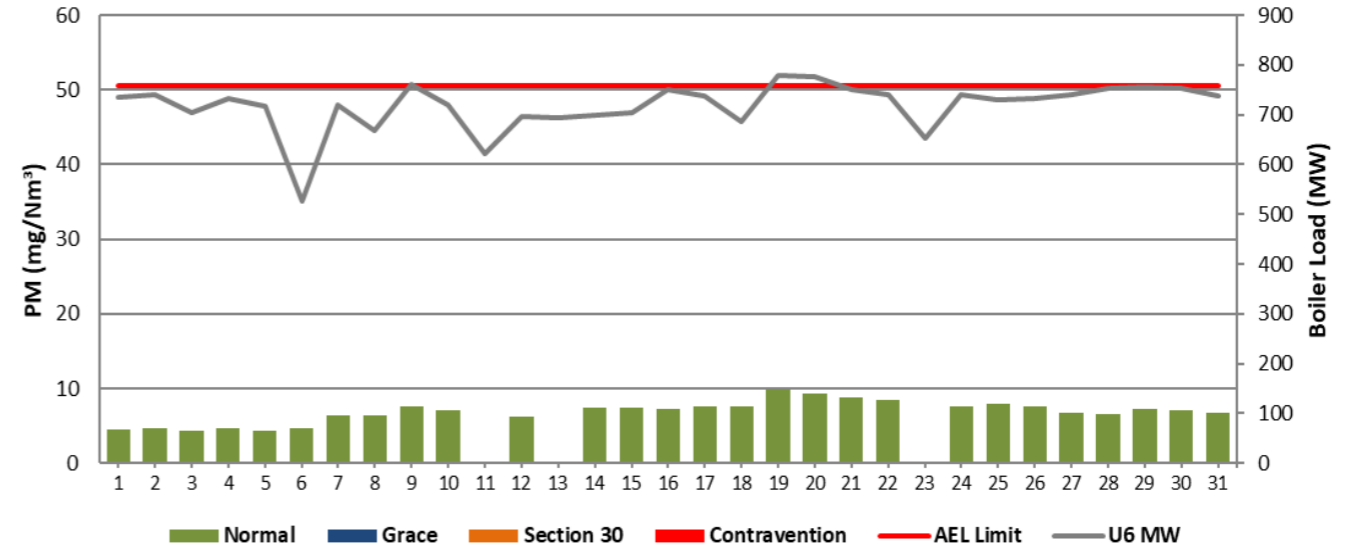


Figure 6: Medupi Unit 6 PM Emissions - May 2023



4.2 SOx Daily Averages

Figure 7: Medupi Unit 1 SO<sub>2</sub> Emissions - May 2023

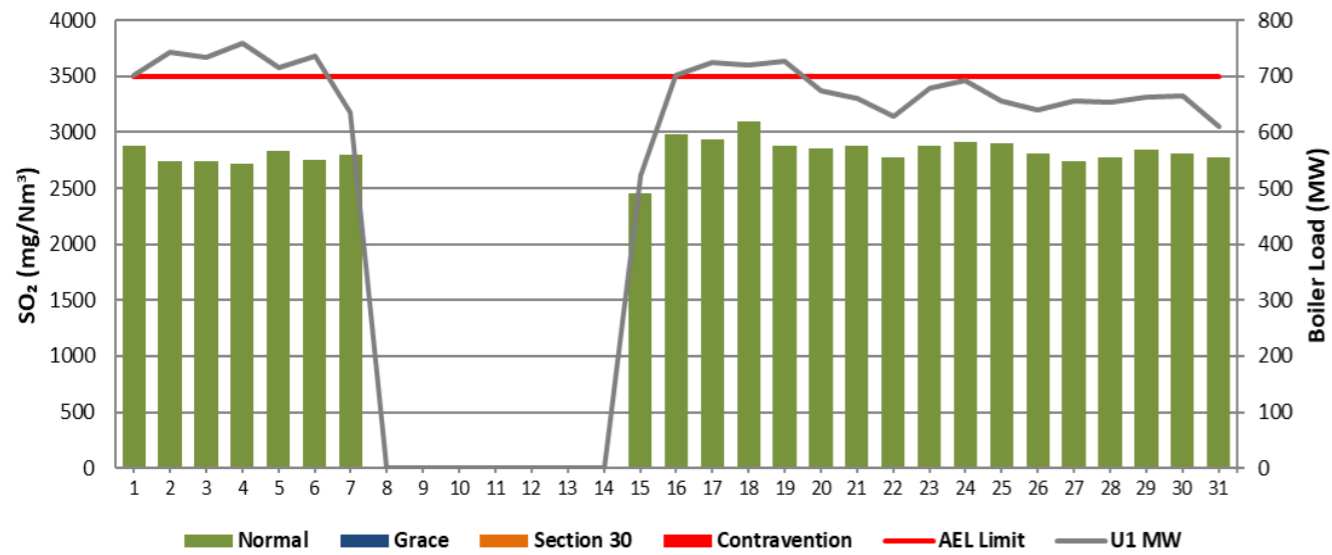
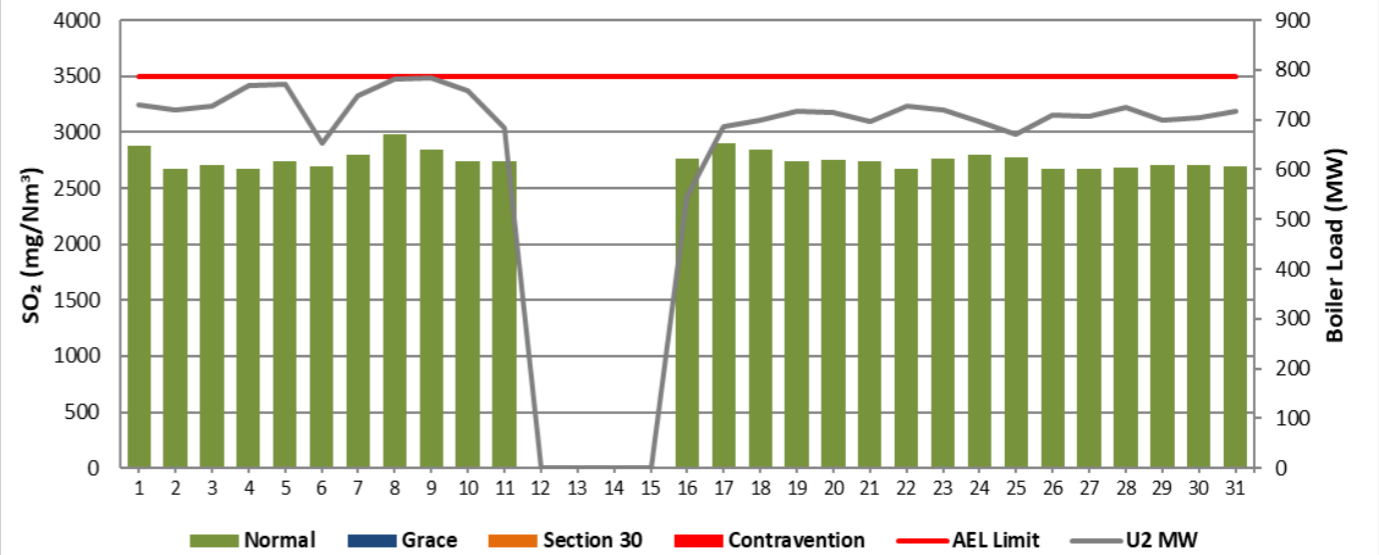


Figure 8: Medupi Unit 2 SO<sub>2</sub> Emissions - May 2023



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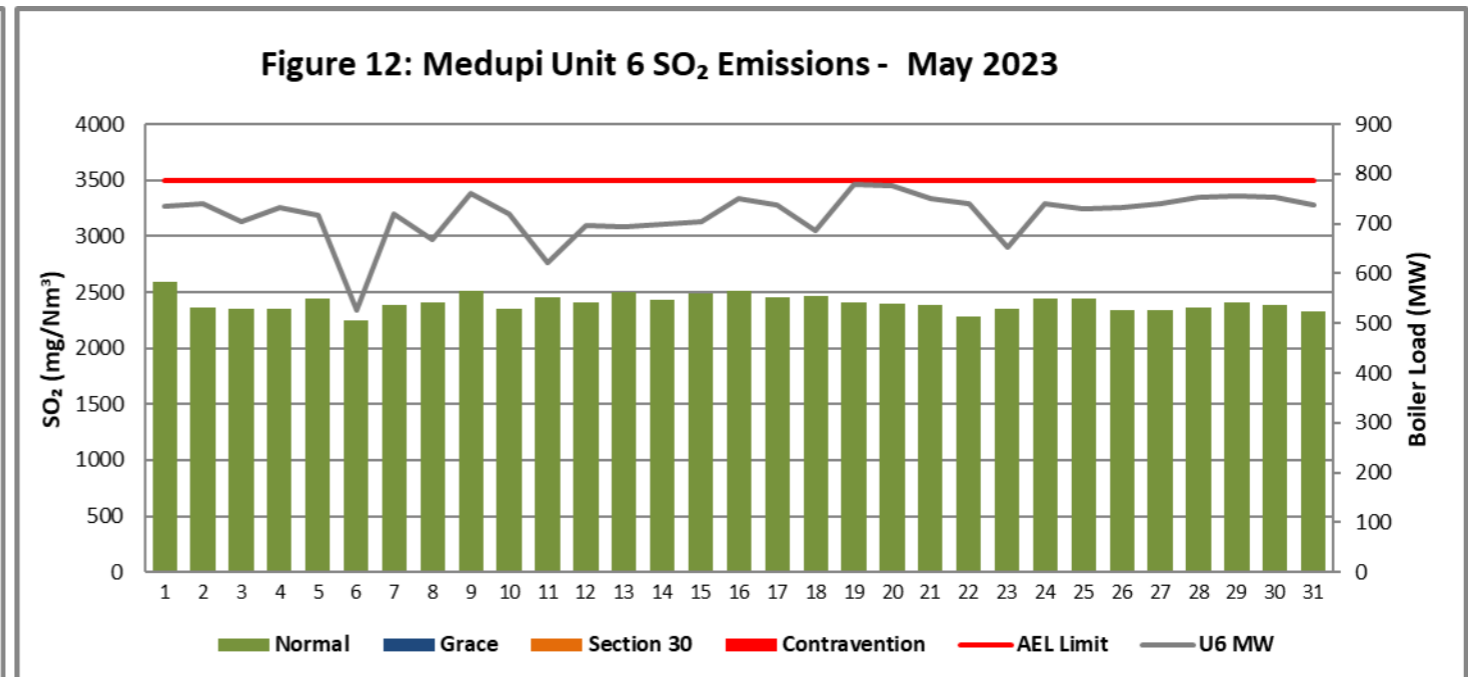
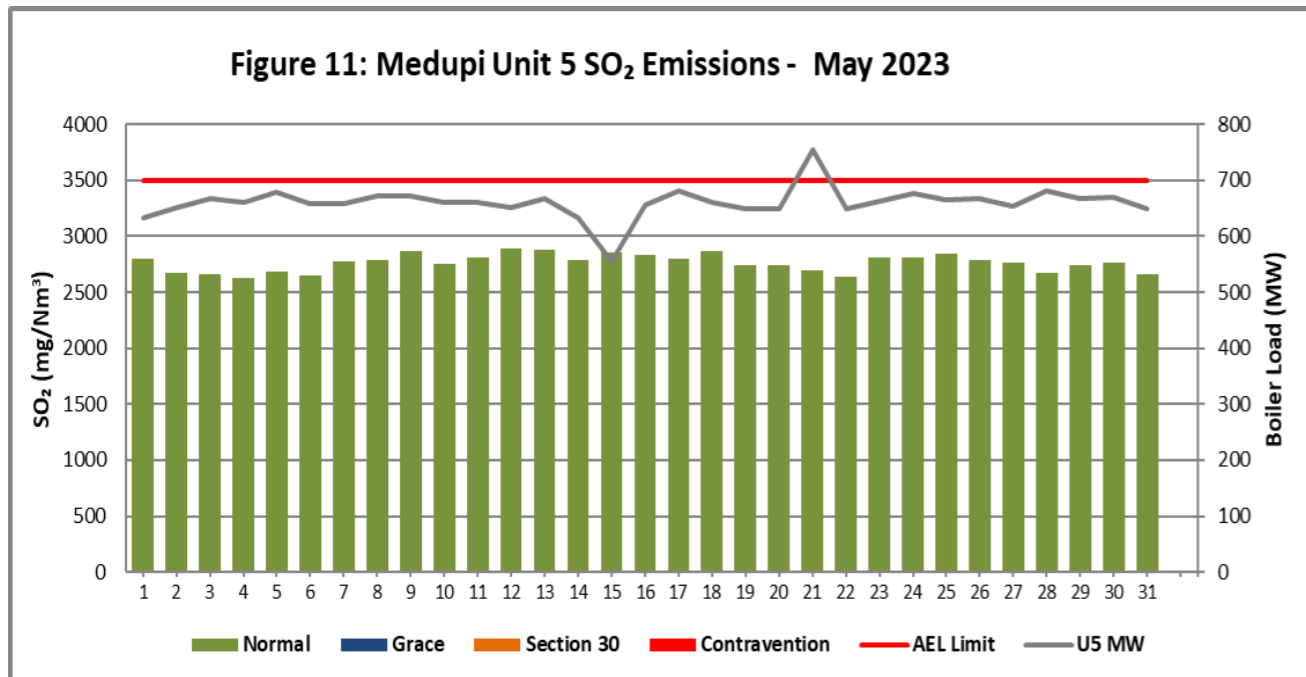
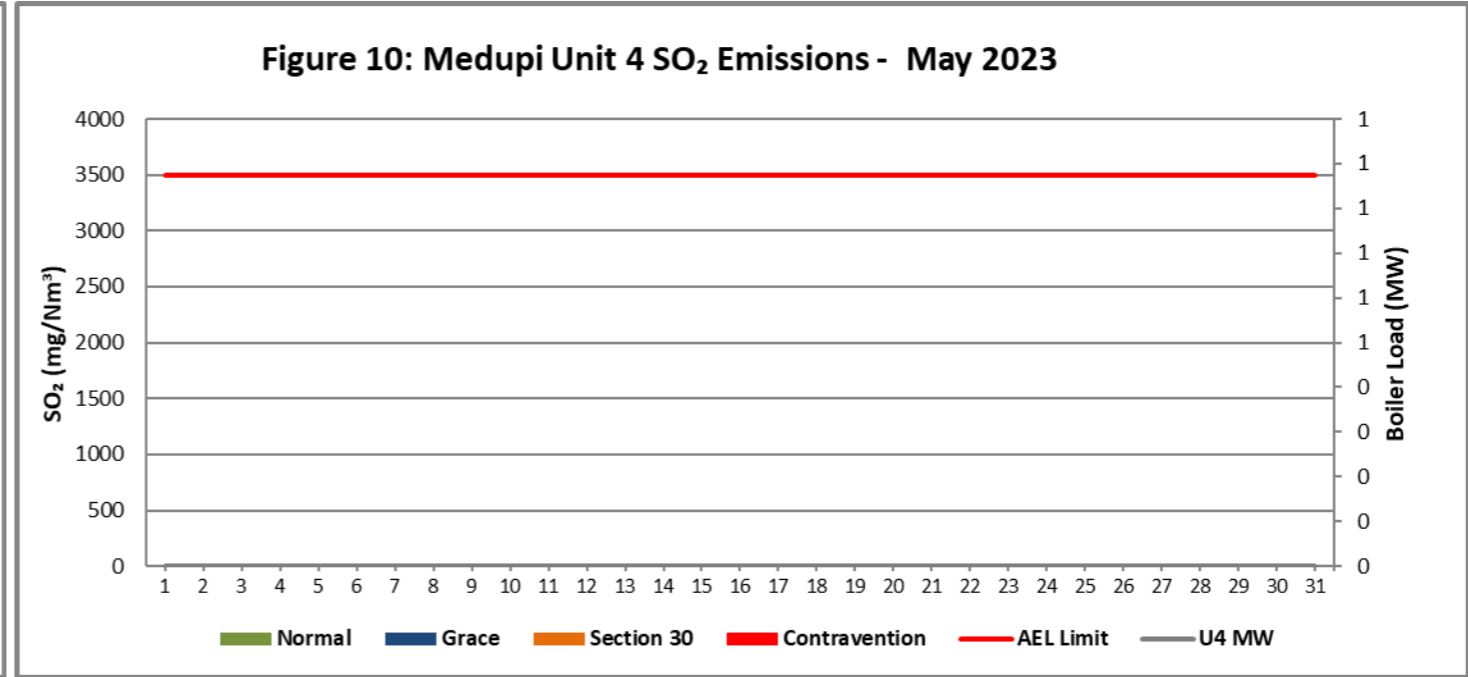
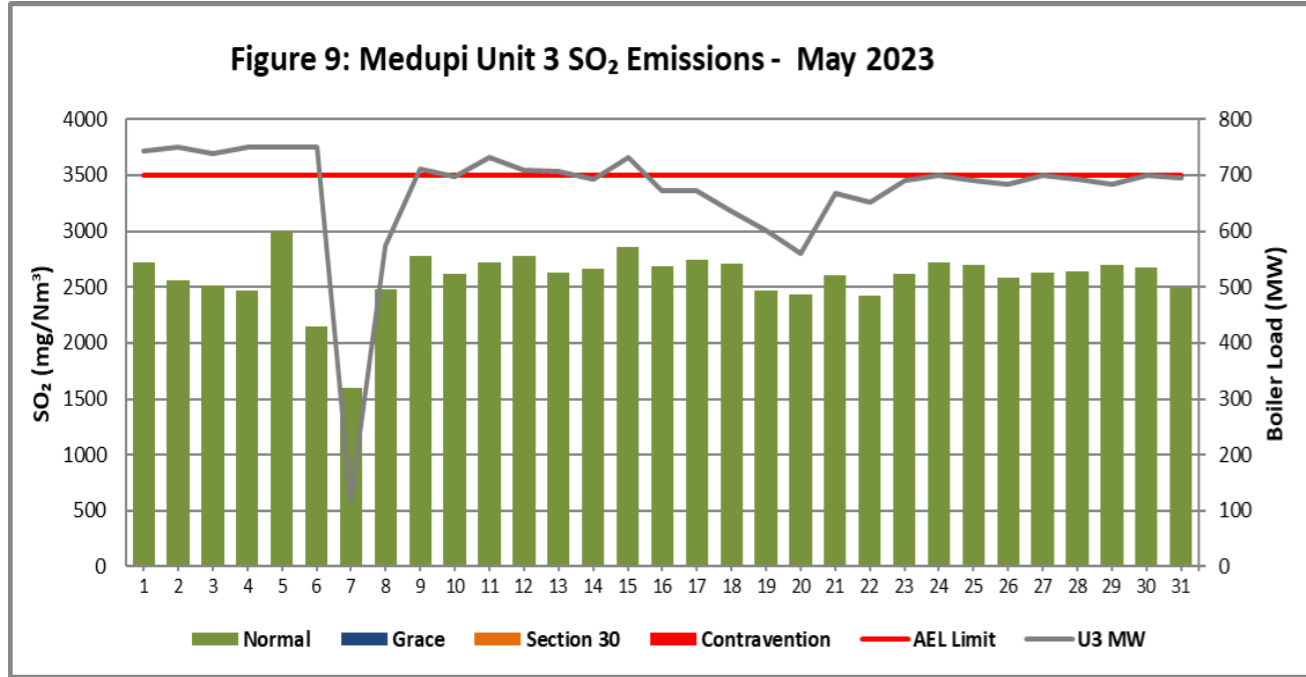
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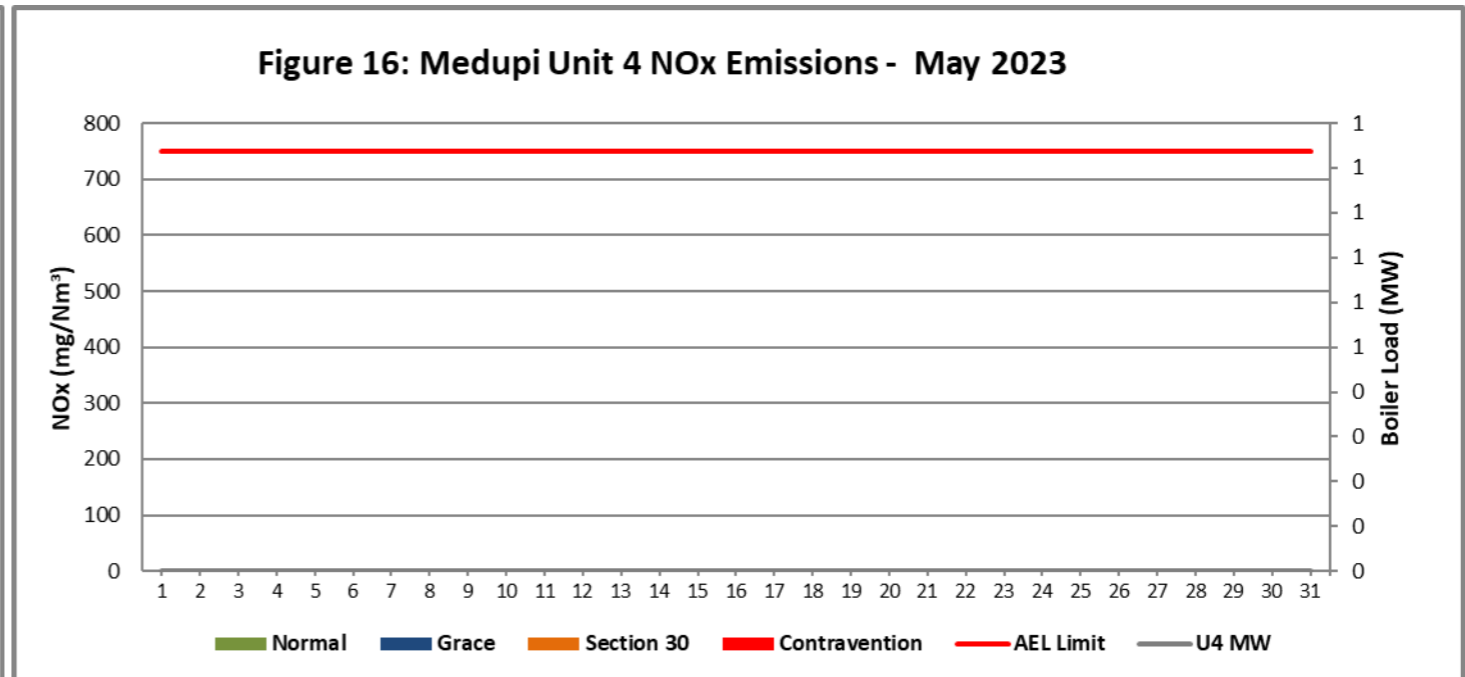
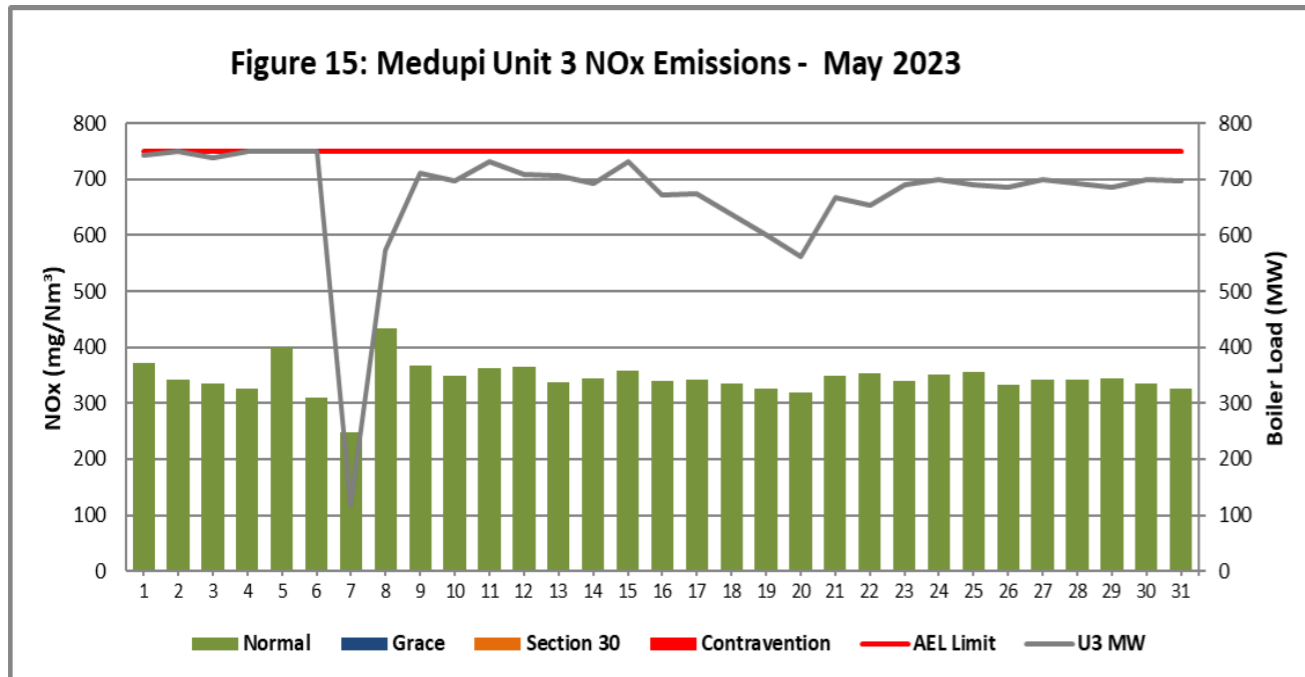
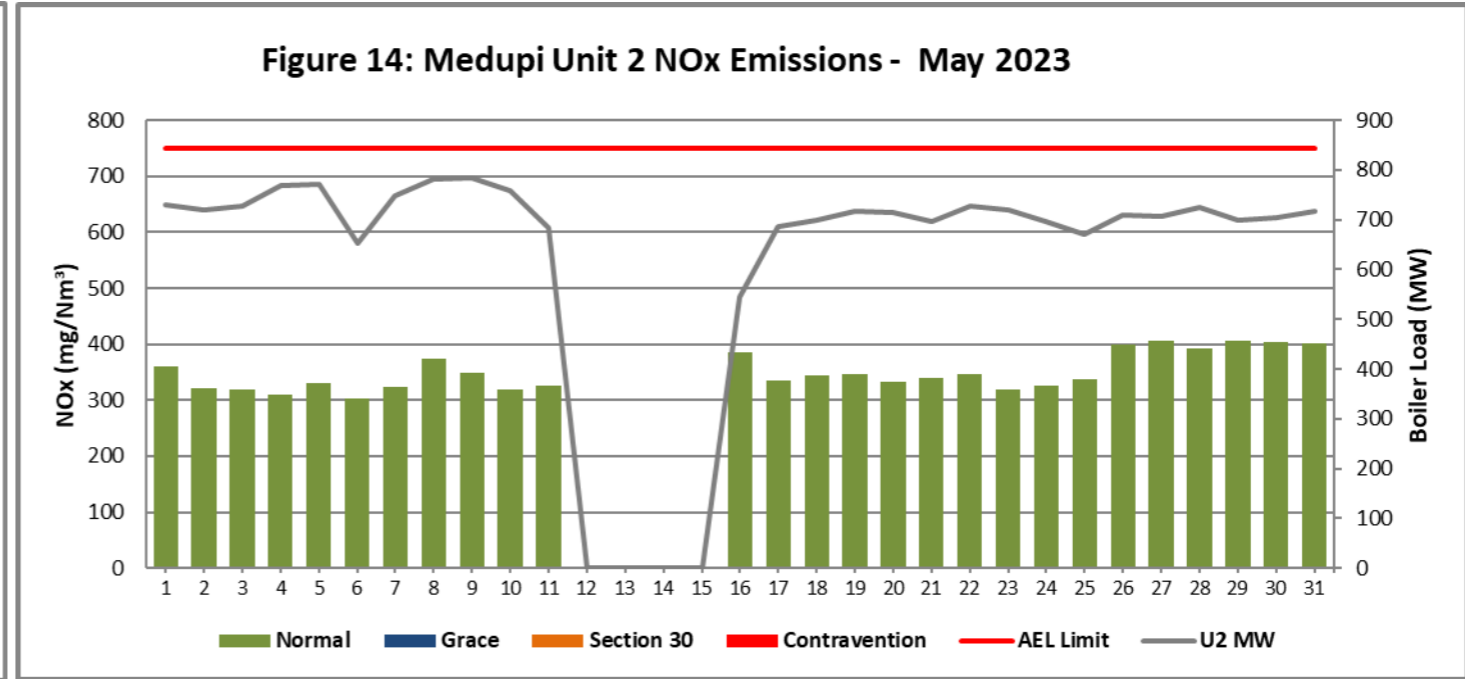
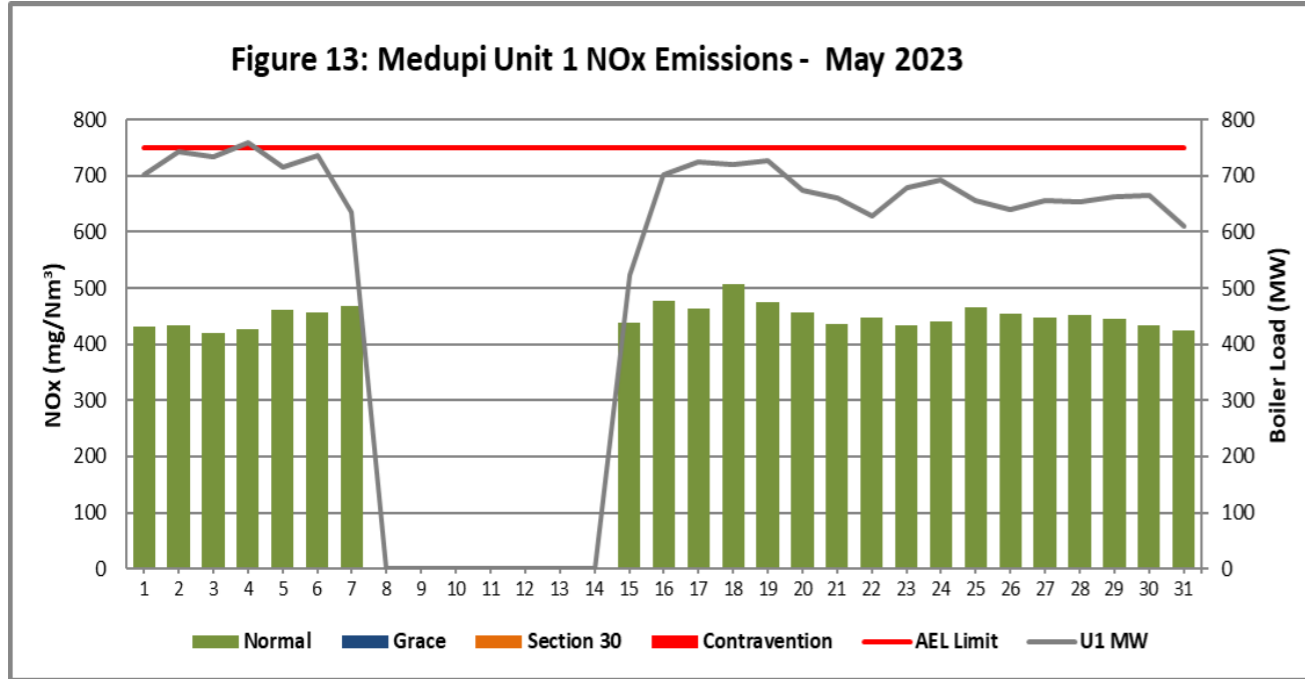
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#### 4.3 NOx Daily Averages



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Figure 17: Medupi Unit 5 NOx Emissions - May 2023

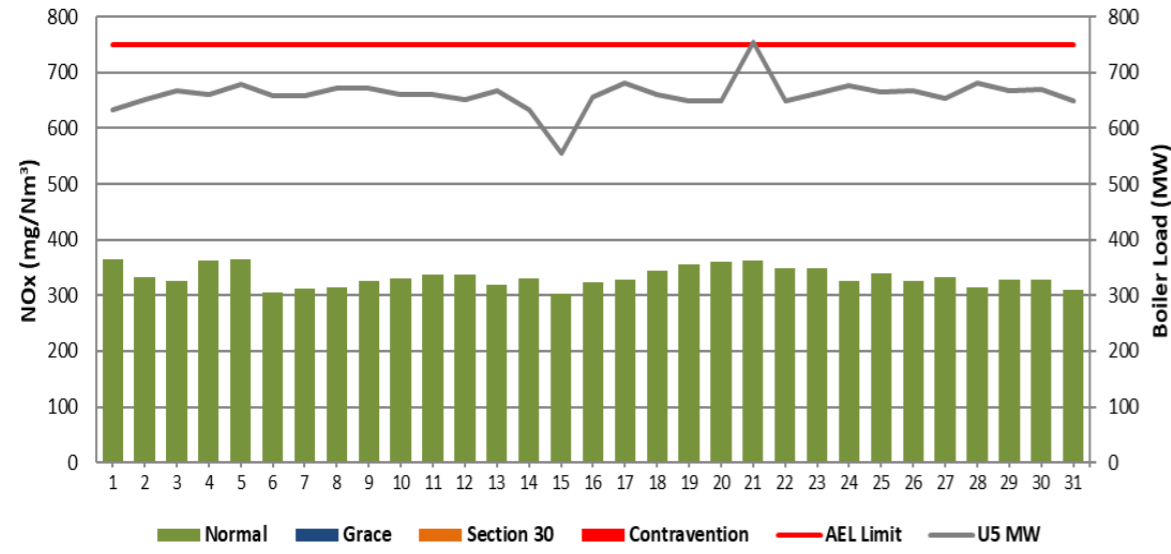
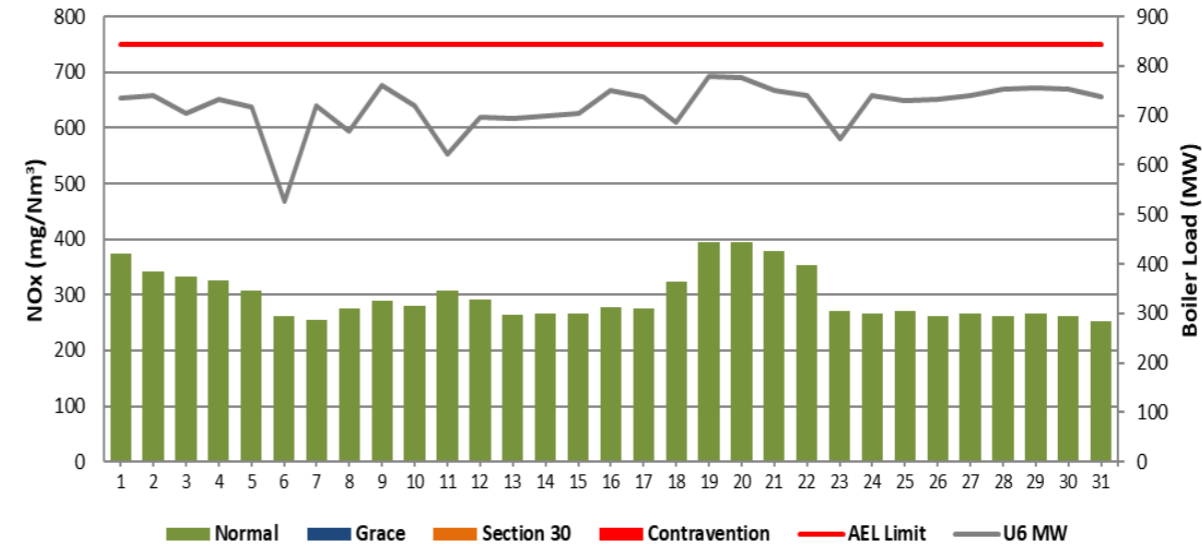



Figure 18: Medupi Unit 6 NOx Emissions - May 2023



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**TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF MAY 2023**

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>2</sub>
Unit 1	50.3	4 537.0	720.4
Unit 2	58.9	6 006.1	763.9
Unit 3	57.9	5 103.5	675.8
Unit 4	off	off	off
Unit 5	97.2	7 098.3	857.2
Unit 6	11.5	4 837.2	599.6
<b>SUM (Tons)</b>	<b>275.9</b>	<b>27 582.1</b>	<b>3 617.0</b>

**TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF MAY 2023**

Associated Unit/Stack	Average PM (mg/Nm <sup>3</sup> )	Average SO <sub>x</sub> (mg/Nm <sup>3</sup> )	Average NO <sub>x</sub> (mg/Nm <sup>3</sup> )
Unit 1	33.4	2 822.0	449.7
Unit 2	28.6	2 753.3	350.2
Unit 3	30.9	2 590.3	344.4
Unit 4	off	off	Off
Unit 5	37.8	2 762.2	333.5
Unit 6	6.9	2 406.4	297.4

## 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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**TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)**

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>2</sub>
Unit 1	98.7	99.8	99.8	99.2
Unit 2	98.9	99.7	99.7	99.7
Unit 3	98.2	0	0	0
Unit 4	Off	off	off	off
Unit 5	99.5	100.0	100.0	100.0
Unit 6	100.0	99.9	99.9	99.8

Note: SO<sub>2</sub>, O<sub>2</sub> 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 May 2023 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 MAY 2023**

		
<b>CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*</b>		
<b>Date:</b>	Wednesday, 31 May 2023	
<b>Station:</b>	Medupi Power Station	
<b>Province:</b>	Limpopo Province	
<b>Tank no.</b>	1-2	
<b>Description:</b>	Outdoor fuel oil storage tank	
<b>Tank Type:</b>	Vertical fixed roof (vented to atmosphere)	
<b>Material stored:</b>	Fuel Oil 150	
<b>MONTHLY INPUT DATA FOR THE STATION</b> 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		
<b>MONTH:</b>	May	
<b>GENERAL INFORMATION:</b>	<b>Data</b>	<b>Unit</b>
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:	1556	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
<b>METEOROLOGICAL DATA FOR THE MONTH</b>	<b>Data</b>	<b>Unit</b>
Daily average ambient temperature	19.51	°C
Daily maximum ambient temperature	28.42	°C
Daily minimum ambient temperature	12.06	°C
Daily ambient temperature range	15.04	°C
Daily total insolation factor	3.91	kWh/m <sup>2</sup> /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
<b>FINAL OUTPUT:</b>	<b>Result</b>	<b>Unit</b>
Breathing losses:	0.70 kg/month	
Working losses:	0.04 kg/month	
<b>TOTAL LOSSES (Total TVOC Emissions for the month):</b>	<b>0.74 kg/month</b>	
<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 campaigns for this month.

## 10. Complaints Register


TABLE 5: COMPLAINTS FOR THE MONTH OF MAY 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	No complaints received	N/A	N/A	N/A	N/A

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Compiled by: Lutendo Murovhi Nemutamba 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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