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		<b>Review Date</b>	<b>February 2024</b>		

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Date: 2022/10/31

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Tel: 014 762 6820

Ref: H16/1/13-AEL/M1/R1 – October 2022

Dear Mr Koenaitse

## MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF OCTOBER 2022

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 is a reflection of Unit 1, 2, 3, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of October 2022 only.

## 1. Raw Materials and Products


TABLE 1: QUANTITY OF RAW MATERIALS AND PRODUCTS CONSUMPTION IN OCTOBER 2022

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – October 2022
	Coal	Tons/month	1 875 000	894 795,0
	Fuel Oil	Tons/month	20 000	1942
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of October 2022
	Energy	GWh	3 571.2	1895,19
	Ash Emitted	Tons/month	not specified	245,4

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**TABLE 2: DAILY CONSUMPTION AND PRODUCTION RATES**


Date	Reportable hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-Oct	24,0	Off	24,0		24,0	24,0	31012	750	Off	754		738	704
02-Oct	24,0	Off	24,0		24,0	24,0	30642	745	Off	747		676	768
03-Oct	24,0	Off	24,0		24,0	24,0	30750	736	Off	636		697	758
04-Oct	24,0	Off	24,0		24,0	24,0	32237	755	Off	712		754	718
05-Oct	24,0	Off	24,0		24,0	24,0	32649	730	Off	762		782	767
06-Oct	24,0	Off	24,0		24,0	24,0	31572	747	Off	762		729	745
07-Oct	24,0	Off	24,0		24,0	24,0	32116	753	Off	765		780	742
08-Oct	24,0	Off	24,0		24,0	24,0	32396	777	Off	784		792	768
09-Oct	24,0	Off	24,0		24,0	24,0	33309	786	Off	774		790	766
10-Oct	24,0	Off	24,0		2,0	24,0	25199	783	Off	760		716	765
11-Oct	24,0	Off	24,0		0,0	24,0	28224	754	Off	737		519	751
12-Oct	24,0	Off	24,0		19,8	24,0	31833	785	Off	745		791	770
13-Oct	24,0	Off	24,0		24,0	24,0	32296	789	Off	760		790	770
14-Oct	24,0	Off	24,0		24,0	24,0	32248	777	Off	732		784	766
15-Oct	24,0	Off	24,0		5,8	24,0	26147	783	Off	704		782	769
16-Oct	24,0	Off	24,0		0,0	24,0	22653	742	Off	688		Off	695
17-Oct	24,0	Off	24,0		0,0	24,0	22754	794	Off	580		Off	770
18-Oct	24,0	Off	24,0		0,0	5,2	25889	788	Off	580		588	697
19-Oct	24,0	Off	24,0		16,4	17,4	29526	772	Off	642		790	695
20-Oct	24,0	Off	24,0		24,0	24,0	31727	793	Off	675		792	770
21-Oct	24,0	Off	24,0		24,0	21,3	31019	788	Off	690		794	759
22-Oct	24,0	Off	24,0		24,0	0,0	25458	791	Off	700		794	55
23-Oct	24,0	Off	24,0		24,0	0,0	25380	780	Off	693		776	Off
24-Oct	24,0	Off	24,0		24,0	0,0	25221	769	Off	753		709	off
25-Oct	24,0	Off	24,0		24,0	0,0	26658	771	Off	777		763	259
26-Oct	24,0	Off	24,0		24,0	4,7	29237	759	Off	672		768	712
27-Oct	24,0	Off	24,0		24,0	24,0	29453	660	Off	691		776	754
28-Oct	24,0	Off	24,0		24,0	24,0	29115	699	Off	679		689	667
29-Oct	24,0	Off	24,0		24,0	24,0	27271	655	Off	650		645	676
30-Oct	24,0	Off	24,0		24,0	24,0	23268	506	Off	578		603	603
31-Oct	24,0	Off	24,0		24,0	24,0	27536	670	Off	697		687	729

NB: reportable hours less than 24 highlighted in pink

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## 2. Abatement Technology

Table 3: Abatement Equipment Control Technology efficiency for month of October 2022

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99,928%	100%
Unit 2	Fabric Filter Plant (FFP)	Unit off	Unit off
Unit 3	Fabric Filter Plant (FFP)	99,877%	100%
Unit 4	Fabric Filter Plant (FFP)	Unit off	Unit off
Unit 5	Fabric Filter Plant (FFP)	99,885%	100%
Unit 6	Fabric Filter Plant (FFP)	99,948%	100%

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

## 3. Energy Source Characteristics

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF OCTOBER 2022

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	1.33
<b>Ash Content</b>	35 - 39	33.74

TABLE 5: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF OCTOBER 2022

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	<b>Oil</b>	
<b>Sulphur Content</b>	0.5 - 3.5	2.45
<b>Ash Content</b>	0.02 - 0.1	0.025

## 4. Emissions Reporting

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

The emission limits are as follows:

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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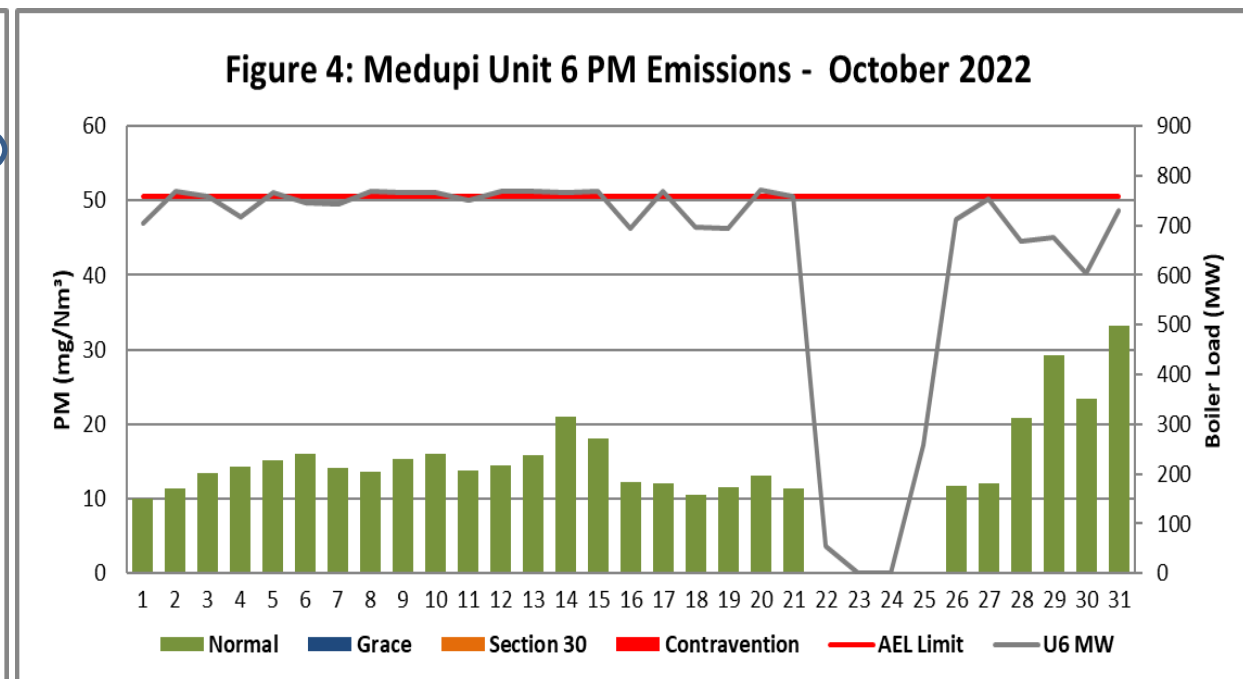
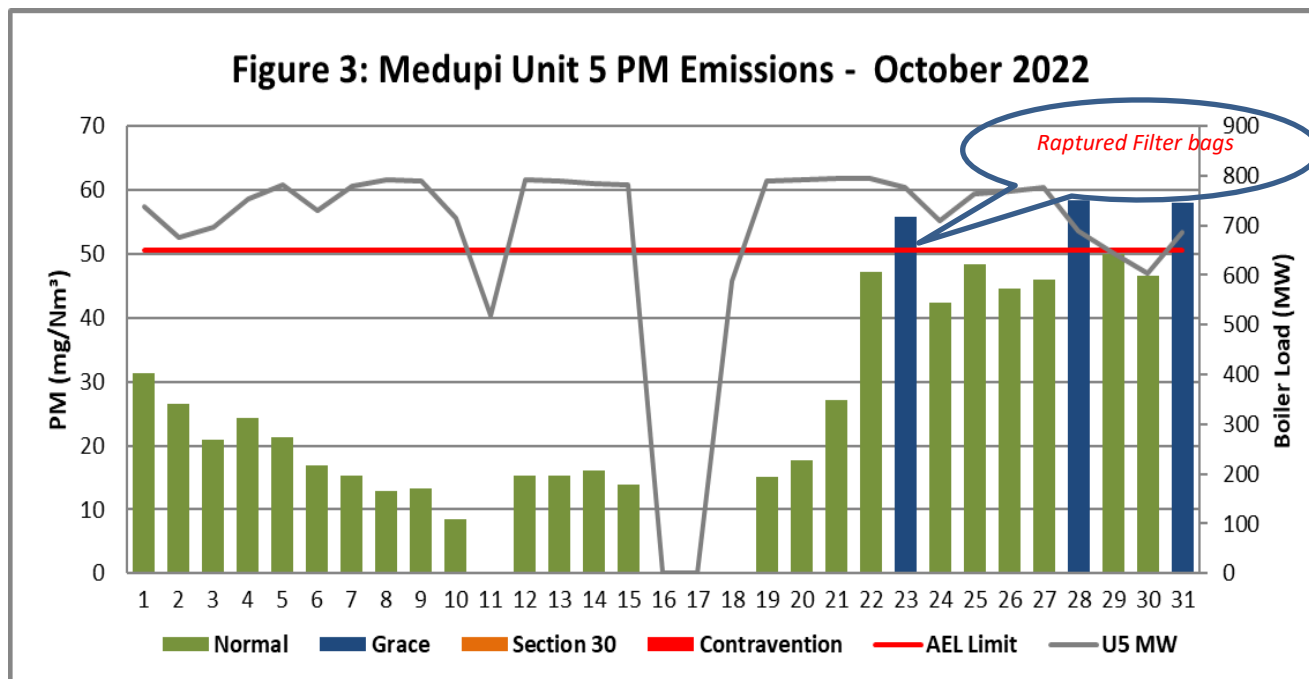
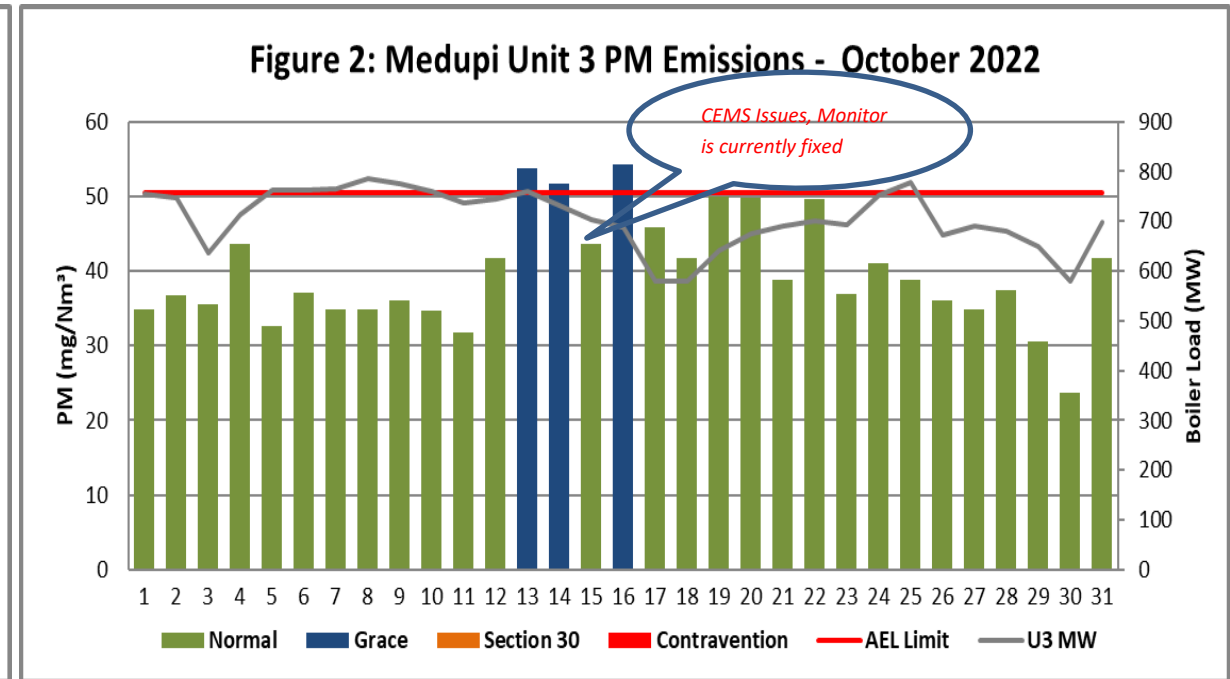
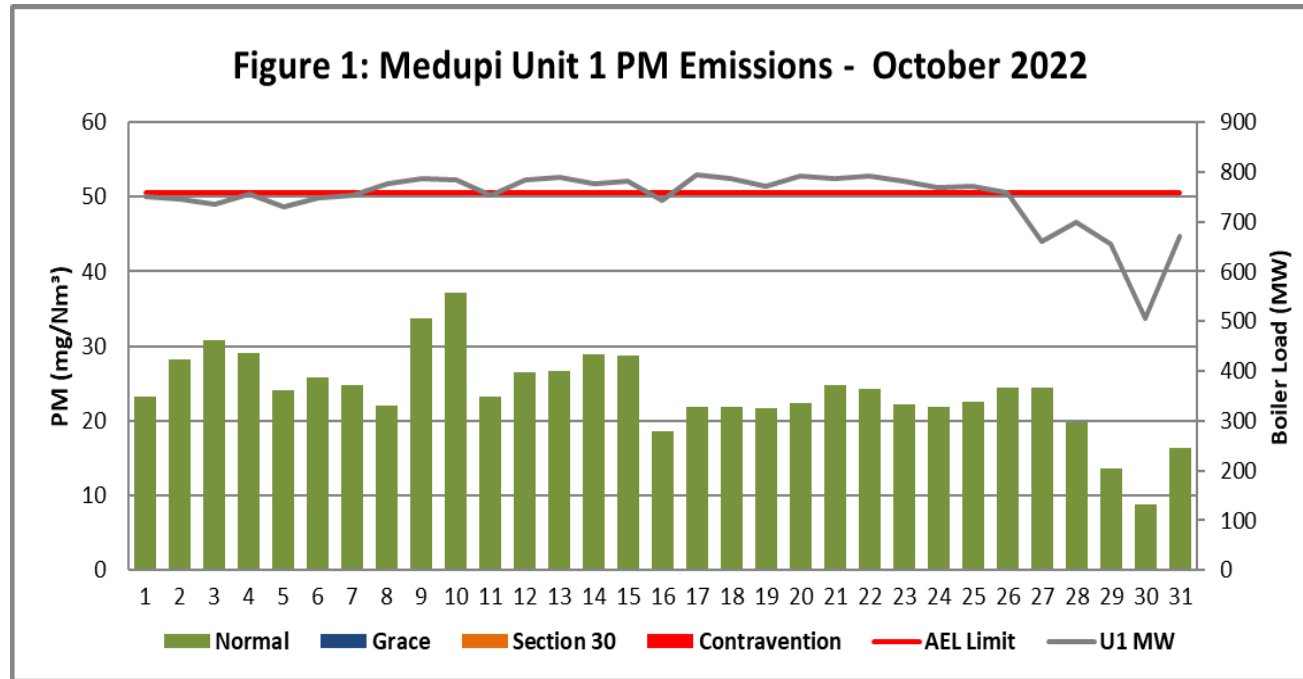
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#### PM Daily Averages



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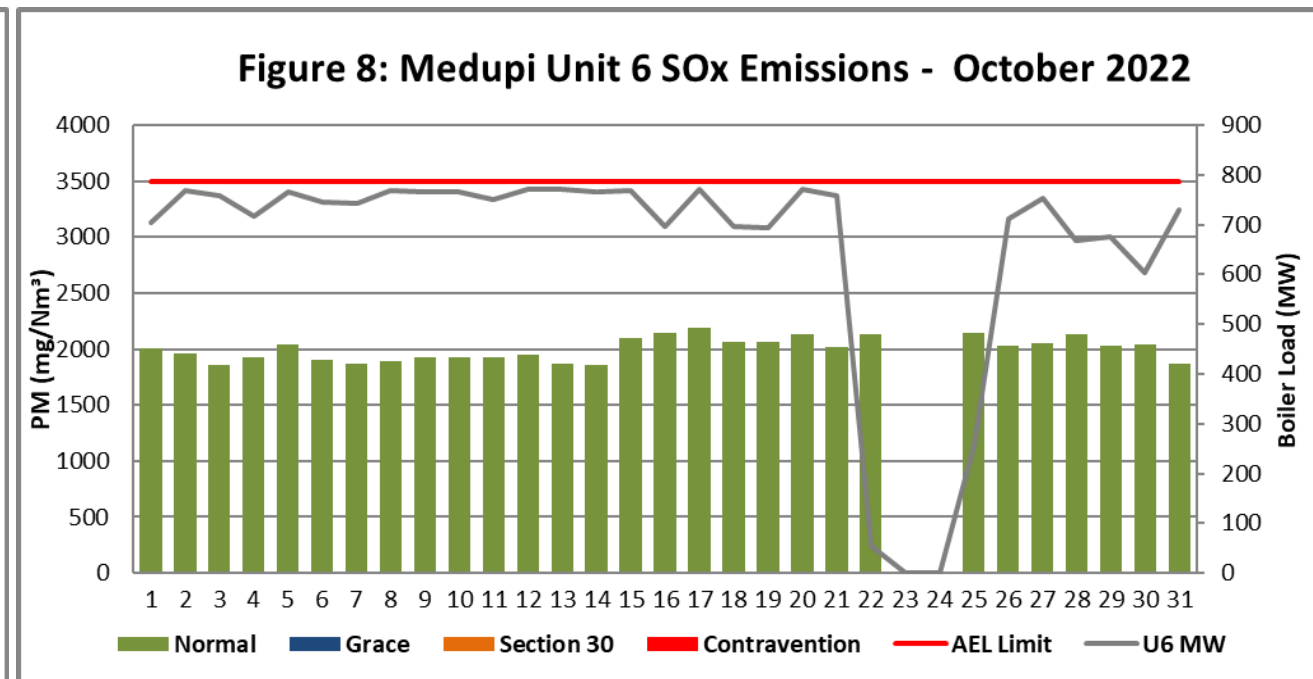
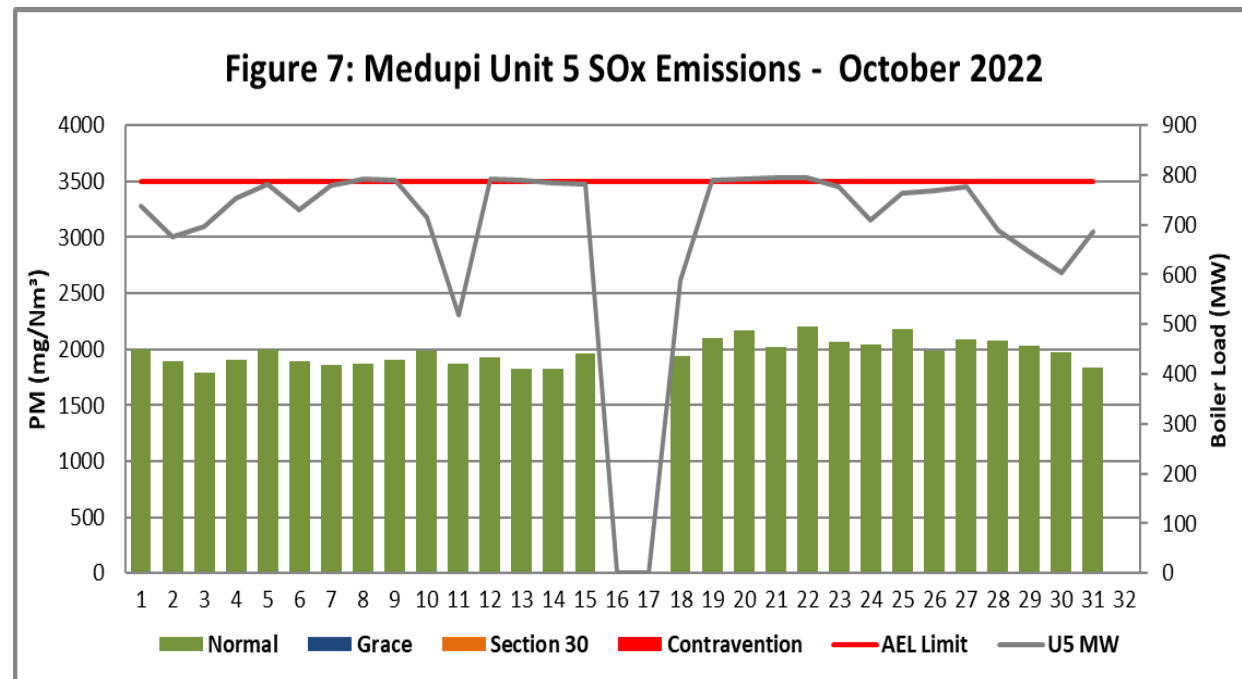
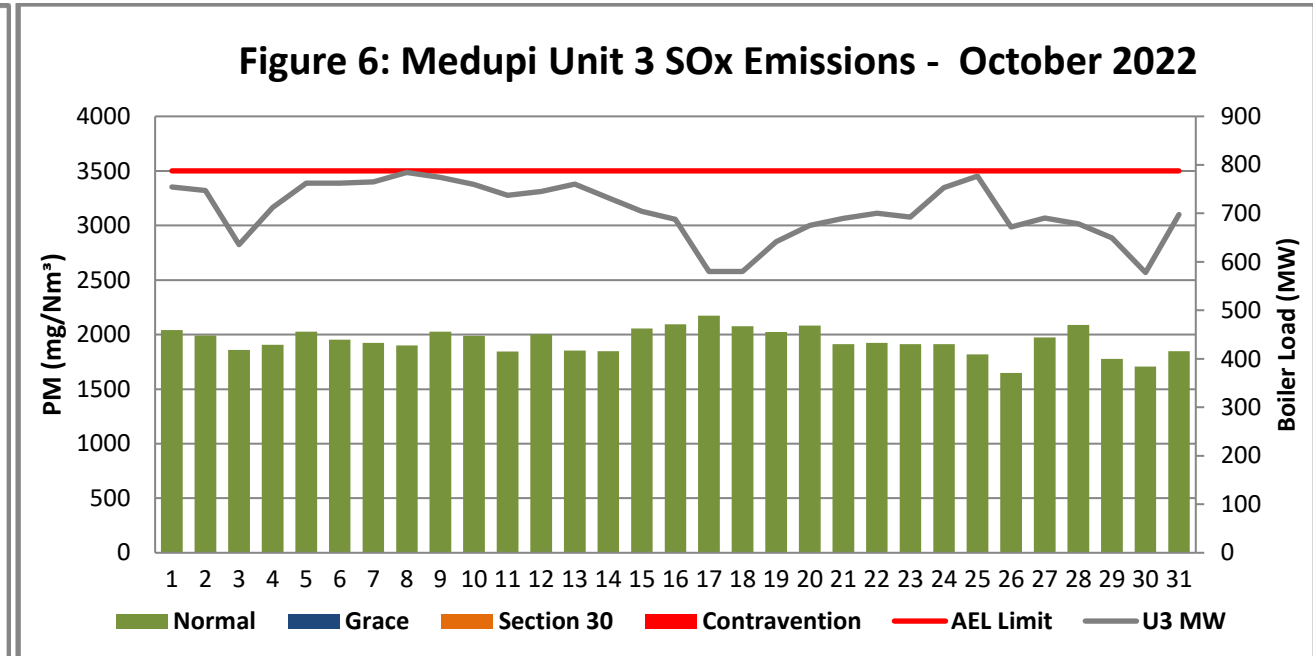
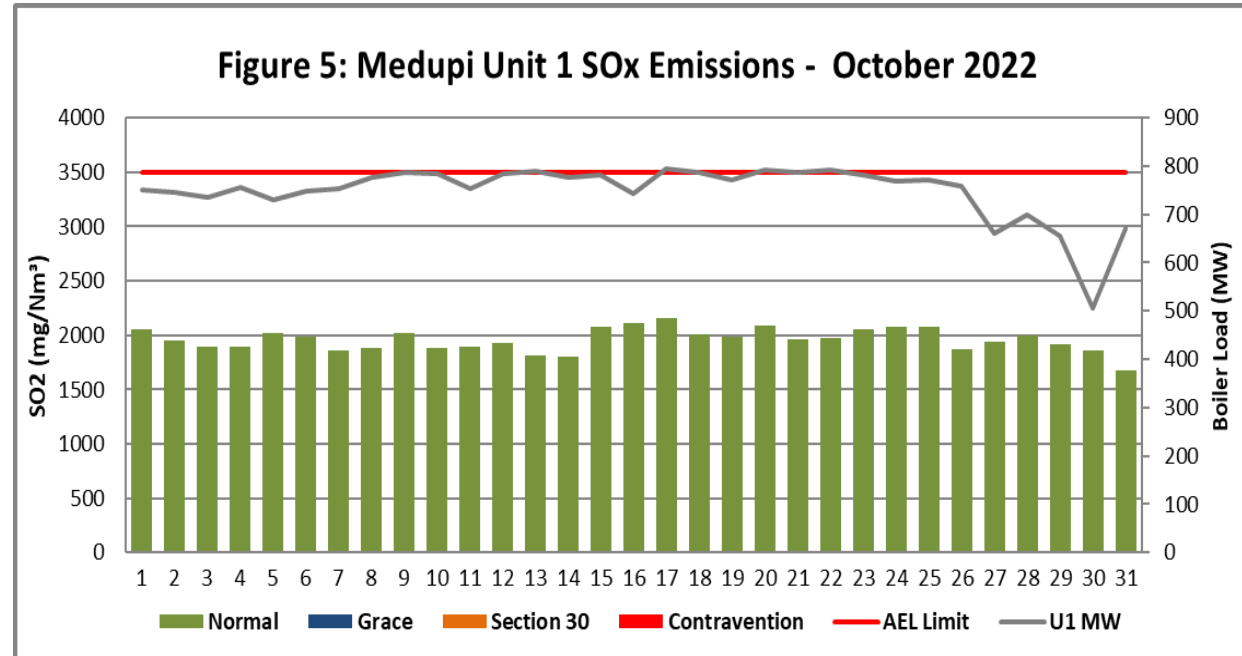
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#### SOx Daily Averages



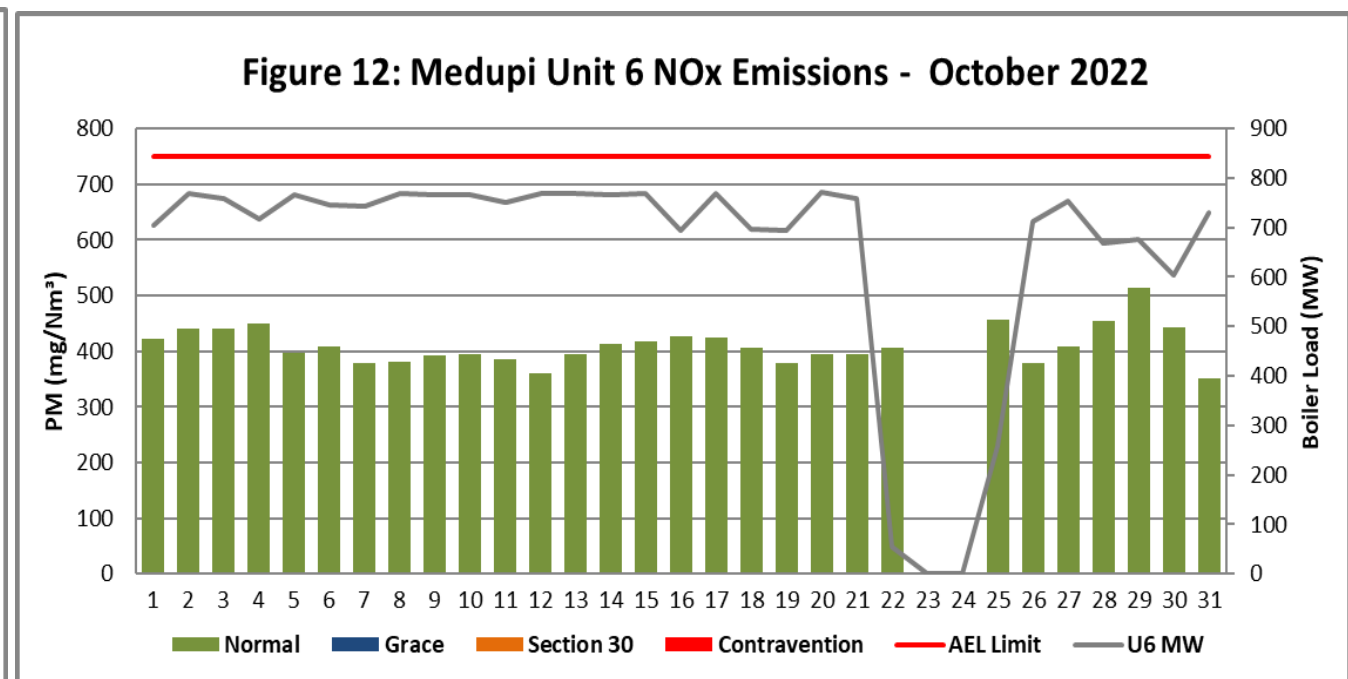
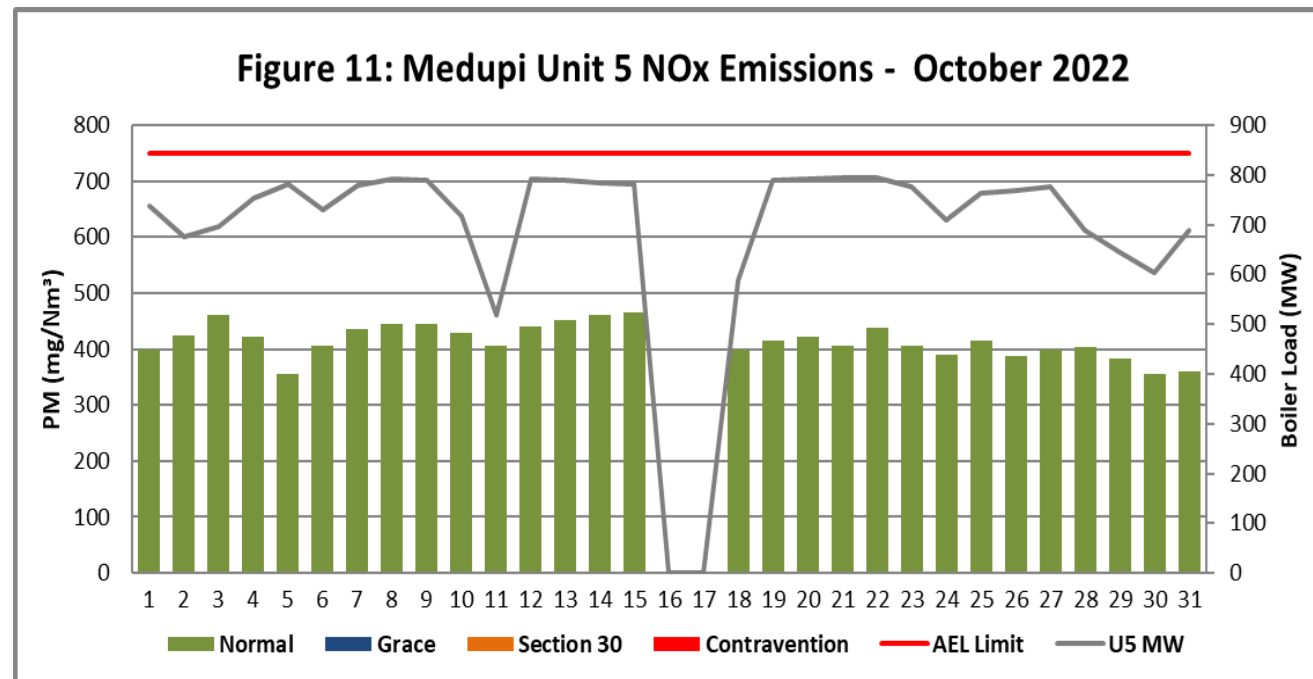
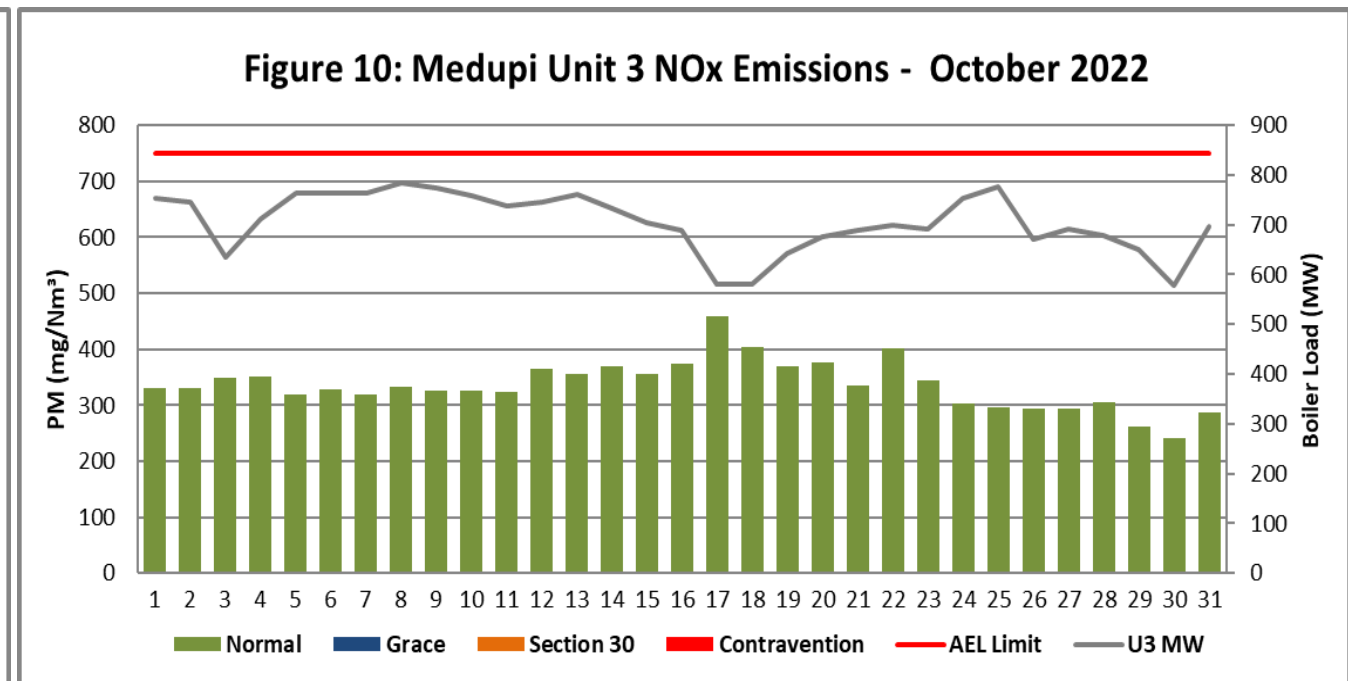
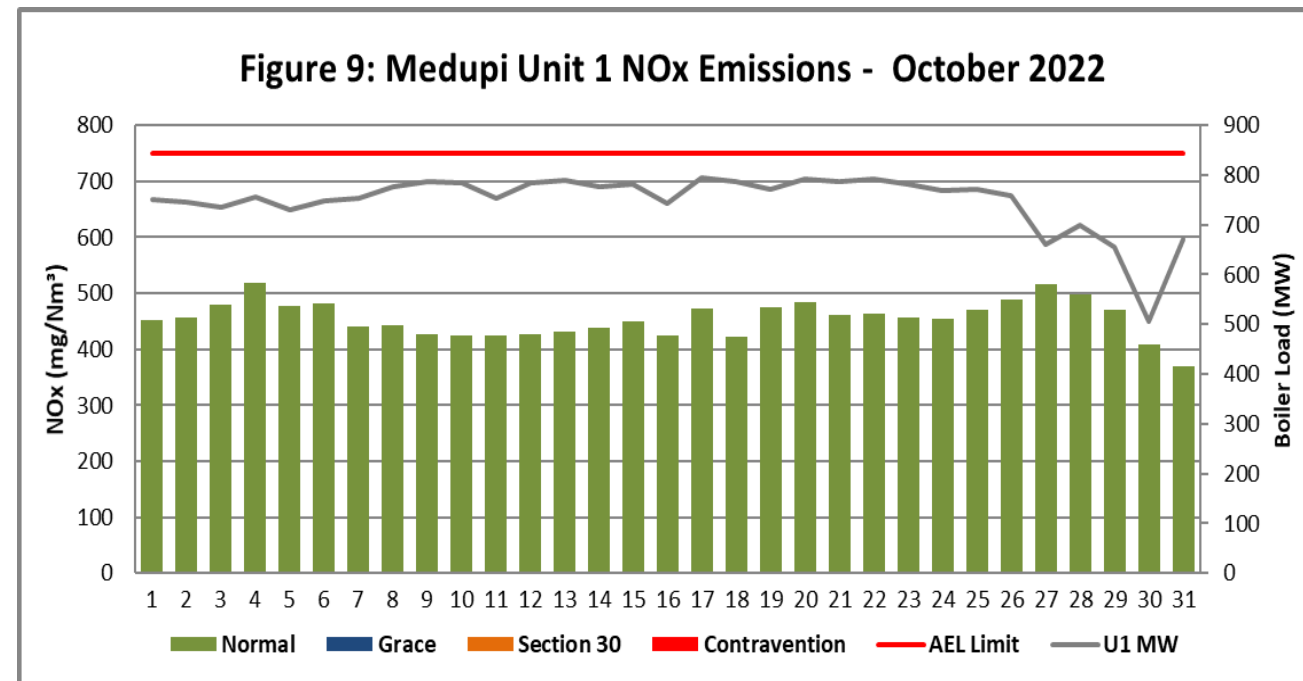
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4.2 NOx Daily Averages



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**TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF OCTOBER 2022**

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>2</sub>
Unit 1	55,0	4 444,5	1 032,8
Unit 2	Unit off	Unit off	Unit off
Unit 3	88,1	4 327,9	743,3
Unit 4	Unit off	Unit off	Unit off
Unit 5	70,0	4 741,6	991,9
Unit 6	32,2	4 315,8	887,2
<b>SUM</b>	<b>245,4</b>	<b>17 829,8</b>	<b>3 655,2</b>

**TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF OCTOBER 2022**

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	24,0	1 957,7	455,2
Unit 2	Unit off	Unit off	Unit off
Unit 3	39,8	1 942,0	336,5
Unit 4	Unit off	Unit off	Unit off
Unit 5	30,0	1 973,0	414,4
Unit 6	15,7	1 999,9	410,9

## 5. Continuous Emission Monitoring Systems (CEMS)

Unit 1, 2, 3, 5 and 6 Continuous Emission Monitoring Systems were in operation at all times when the unit was on load. For days where the CEMS were readings incorrectly are indicated on the performance graphs above.


**TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE**

Date	CEMS status	Comments
<b>13 October 2022-15 October 2022</b>	CEMS Faulty	The CEMS were fixed

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

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	CO <sub>2</sub>	O <sub>2</sub>
Unit 1	99,2	99,2	99,2	99,2	99,2
Unit 2	N/A	N/A	N/A	N/A	N/A
Unit 3	99,2	97,6	97,6	93,8	94,0
Unit 4	N/A	N/A	N/A	N/A	N/A
Unit 5	99,1	97,0	97,0	96,0	96,0
Unit 6	99,7	99,7	99,7	16,9	99,7

## 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 October 2022 was e-mailed to the Licensing Authority.

## 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 10: TOTAL VOLATILE ORGANIC COMPOUND (TVOC) FOR OCTOBER 2022

		
<b>CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*</b>		
<b>Date:</b>	Monday, 31 October 2022	
<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	
<p align="center"><b>MONTHLY INPUT DATA FOR THE STATION</b></p> <p align="center">Please only insert relevant monthly data inputs into the <b>blue cells</b> below</p> <p align="center">Choose from a dropdown menu in the <b>green cells</b></p> <p align="center">The total VOC emissions for the month are in the <b>red cells</b></p> <p align="center">IMPORTANT: Do not change <b>any</b> other cells without consulting the AQ CoE</p>		
<b>MONTH:</b>	October	
<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:	1942	tons/month
Molecular weight of the fuel oil:	166,00	Lb/lb-mole
<b>METEROLOGICAL DATA FOR THE MONTH</b>	<b>Data</b>	<b>Unit</b>
Daily average ambient temperature	26,19	°C
Daily maximum ambient temperature	33,65	°C
Daily minimum ambient temperature	19,11	°C
Daily ambient temperature range	14,54	°C
Daily total insolation factor	5,81	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:	0,74	kg/month
Working losses:	0,06	kg/month
<b>TOTAL LOSSES (Total TVOC Emissions for the month):</b>	<b>0,79</b>	<b>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, 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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## 9. Air quality improvements initiatives and public education and awareness campaigns

No awareness campaigns for this month.

## 10. Complaints Register


TABLE 6: COMPLAINTS FOR THE MONTH OF OCTOBER 2022

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   
 Environmental Officer

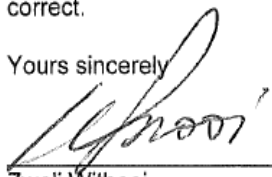
Verified by: Malose Langa   
 System Engineer Boiler

Supported by: Mokgadi Dikgale   
 Environmental Manager

Supported by: Jabulani Mkhathshwa p.p.   
 Engineering Group Manager

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

Yours sincerely

  
 Zwelli Witbooi  
 GENERAL MANAGER: MEDUPI POWER STATION

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