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Stanley Koenaitse

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Modimolle  
0510

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Date: 2022/08/31

Enquiries: MF Dikgale

Tel: 014 762 6820

Ref: H16/1/13-AEL/M1/R1 – August 2022

Dear Mr Koenaitse

## MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF AUGUST 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 August 2022 only.

### 1. Raw Materials and Products


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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – August 2022
	Coal	Tons/month	1 875 000	1 014 856
	Fuel Oil	Tons/month	20 000	1 500
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of August 2022
	Energy	GWh	3 571.2	2348
	Ash Emitted	Tons/month	not specified	270.7

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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-August	24.0	24.0	24.0	0.0	2.3	24.0	28310	Off	719	772		590	769
02-August	24.0	24.0	24.0	0.0	21.1	24.0	28058	Off	710	706		611	565
03-August	24.0	24.0	24.0	0.0	24.0	24.0	29680	Off	723	754		678	721
04-August	24.0	24.0	24.0	0.0	24.0	24.0	29231	Off	696	773		679	716
05-August	24.0	24.0	24.0	0.0	24.0	24.0	29959	Off	747	791		717	672
06-August	24.0	24.0	24.0	0.0	24.0	24.0	27950	679	747	791		731	729
07-August	0.0	24.0	24.0	0.0	24.0	24.0	26675	Off	595	704		622	646
08-August	0.0	24.0	24.0	0.0	24.0	24.0	33273	610	664	744		648	727
09-August	15.8	24.0	24.0	0.0	24.0	24.0	34865	649	642	691		673	705
10-August	24.0	24.0	24.0	0.0	24.0	24.0	35129	667	647	656		637	714
11-August	24.0	24.0	0.0	0.0	12.3	24.0	30447	561	632	Off		667	734
12-August	24.0	24.0	0.0	0.0	8.3	24.0	26954	561	632	Off		632	673
13-August	24.0	24.0	0.0	0.0	24.0	24.0	32394	560	625	503		617	665
14-August	24.0	24.0	20.3	0.0	24.0	24.0	33243	560	562	651		607	653
15-August	24.0	24.0	24.0	0.0	24.0	24.0	37488	678	711	766		698	754
16-August	24.0	24.0	24.0	0.0	24.0	24.0	38297	717	711	766		754	749
17-August	24.0	24.0	24.0	0.0	24.0	24.0	37776	709	691	722		765	732
18-August	24.0	24.0	24.0	0.0	24.0	24.0	35571	677	670	675		784	667
19-August	24.0	24.0	24.0	0.0	24.0	24.0	37813	733	687	737		785	746
20-August	24.0	24.0	24.0	0.0	24.0	24.0	36897	727	708	742		736	706
21-August	24.0	24.0	24.0	0.0	24.0	24.0	34281	679	666	705		651	642
22-August	24.0	24.0	24.0	0.0	0.7	24.0	36246	709	711	753		630	737
23-August	24.0	24.0	24.0	0.0	0.0	24.0	33376	736	740	715		510	730
24-August	24.0	24.0	24.0	0.0	9.3	24.0	33052	649	619	630		655	644
25-August	0.0	24.0	24.0	0.0	24.0	24.0	27476	Off	636	700		681	680
26-August	0.0	17.2	23.6	0.0	24.0	24.0	34094	612	607	699		698	701
27-August	23.3	5.6	0.0	0.0	24.0	24.0	30610	564	679	402		727	709
28-August	24.0	24.0	17.8	0.0	24.0	24.0	32583	550	720	478		696	696
29-August	24.0	24.0	24.0	0.0	24.0	24.0	34932	537	711	573		771	668
30-August	24.0	24.0	24.0	0.0	24.0	24.0	31563	580	307	617		782	773
31 August	24.0	24.0	24.0	0.0	24.0	24.0	36633	541	723	750		624	601

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 August 2022

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.929%	100%
Unit 2	Fabric Filter Plant (FFP)	99.923%	100%
Unit 3	Fabric Filter Plant (FFP)	99.921%	100%
Unit 4	Fabric Filter Plant (FFP)		
Unit 5	Fabric Filter Plant (FFP)	99.948%	100%
Unit 6	Fabric Filter Plant (FFP)	99.847%	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 AUGUST 2022

Characteristic	Stipulated Range (% by weight on a dry basis)	Monthly Average Content (% by weight on a dry basis)
	<b>Coal</b>	
Sulphur Content	1.3 - 2.2	1.3
Ash Content	35 - 39	33.7

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

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	<b>Oil</b>	
Sulphur Content	0.5 - 3.5	2.2
Ash Content	0.02 - 0.1	0.03

## 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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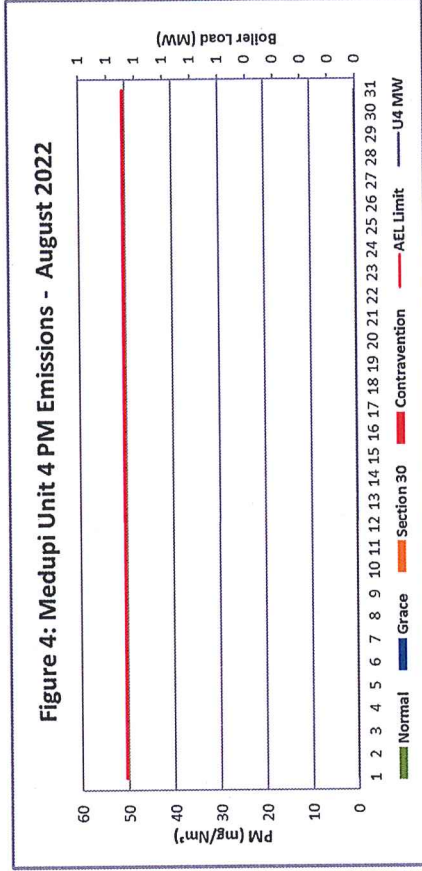
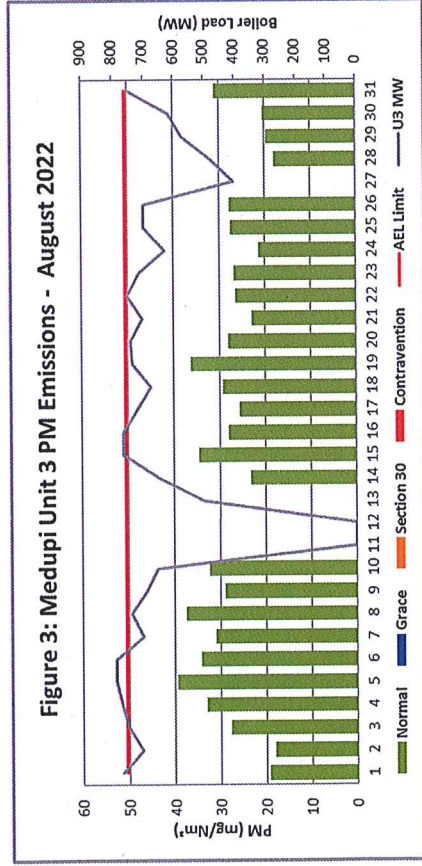
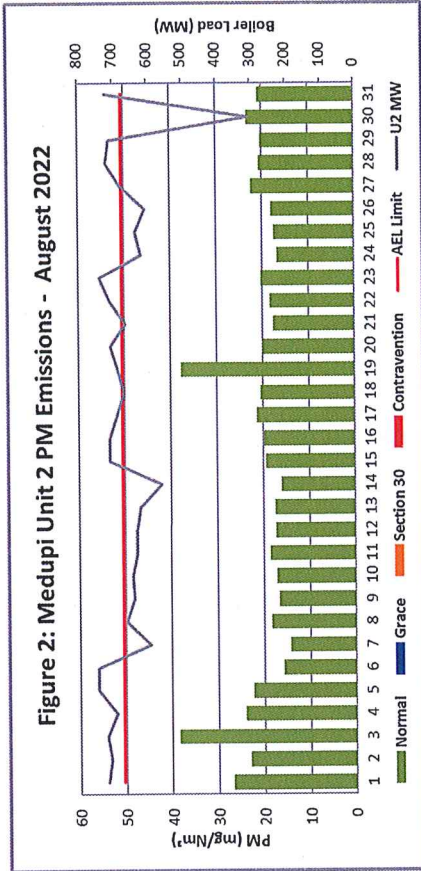
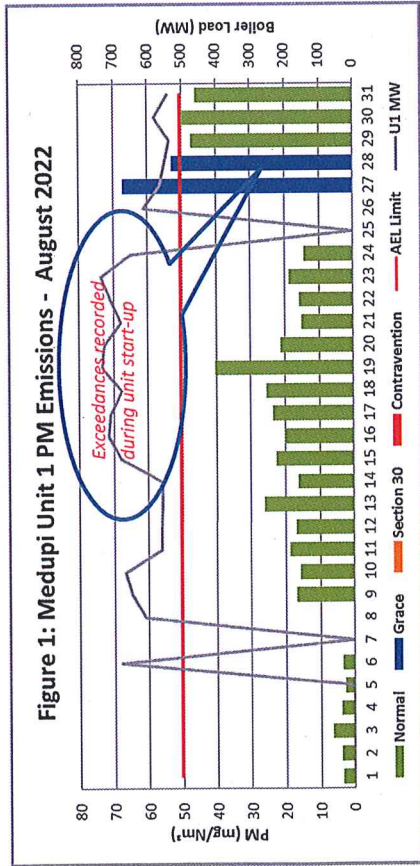
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PM Daily Averages



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Figure 5: Medupi Unit 5 PM Emissions - August 2022

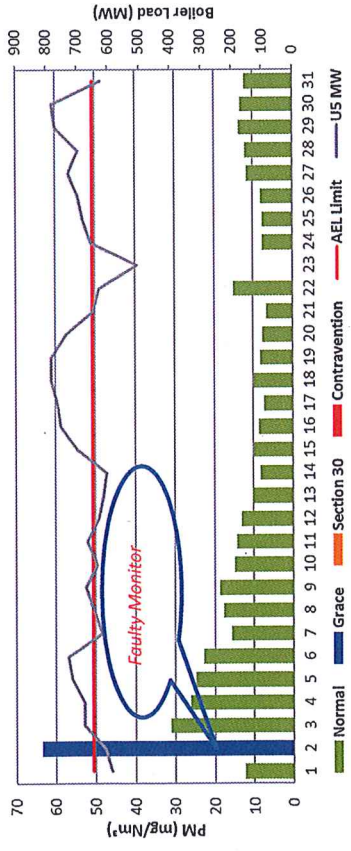


Figure 6: Medupi Unit 6 PM Emissions - August 2022

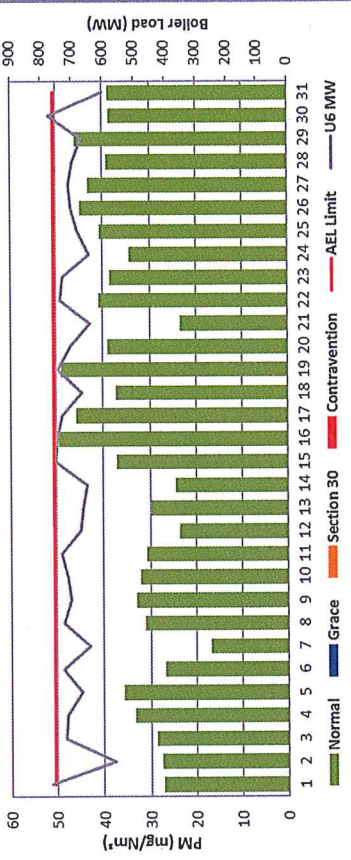


Figure 7: Medupi Unit 1 SOx Emissions - August 2022

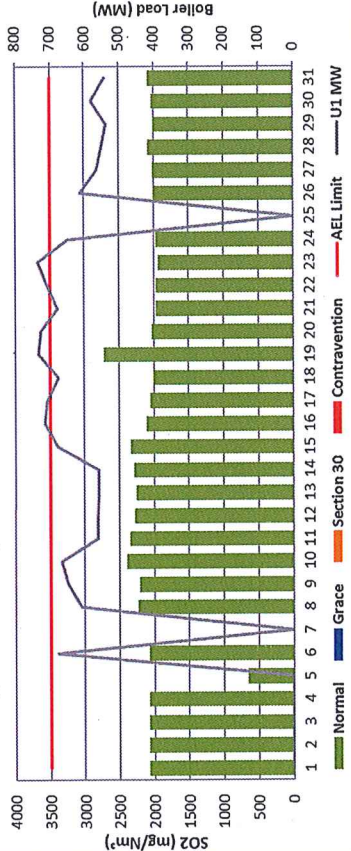
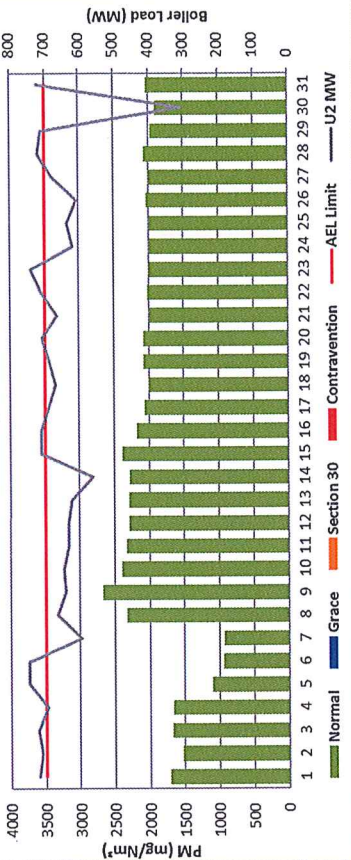


Figure 8: Medupi Unit 2 SOx Emissions - August 2022



SOx Daily Averages

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Figure 9: Medupi Unit 3 SOx Emissions - August 2022

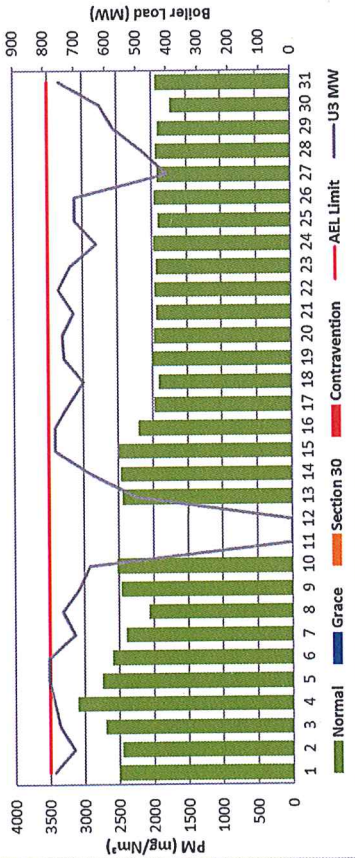


Figure 10: Medupi Unit 4 SOx Emissions - August 2022

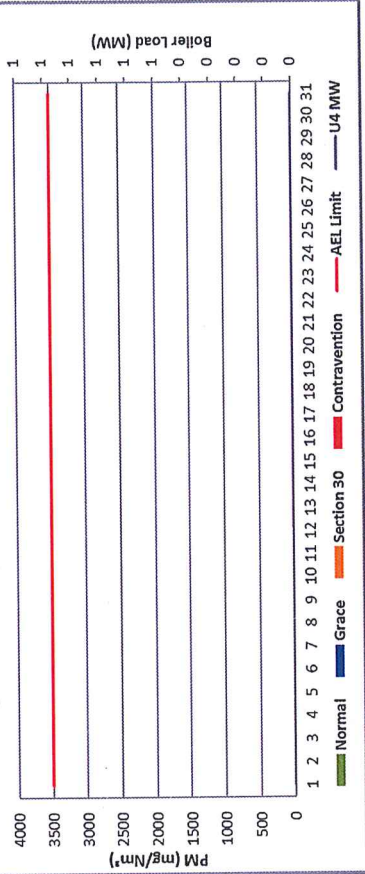


Figure 11: Medupi Unit 5 SOx Emissions - August 2022

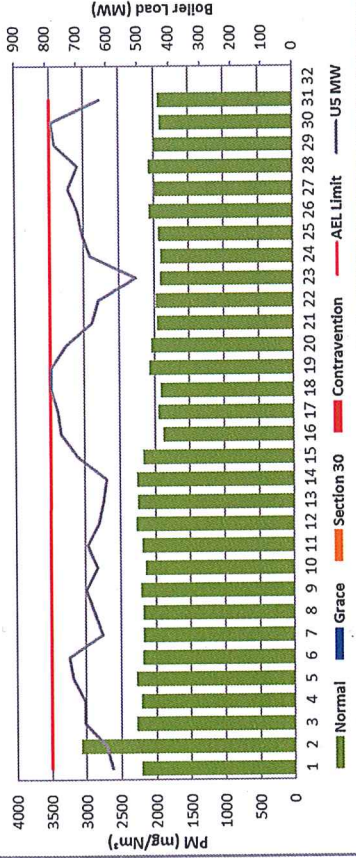
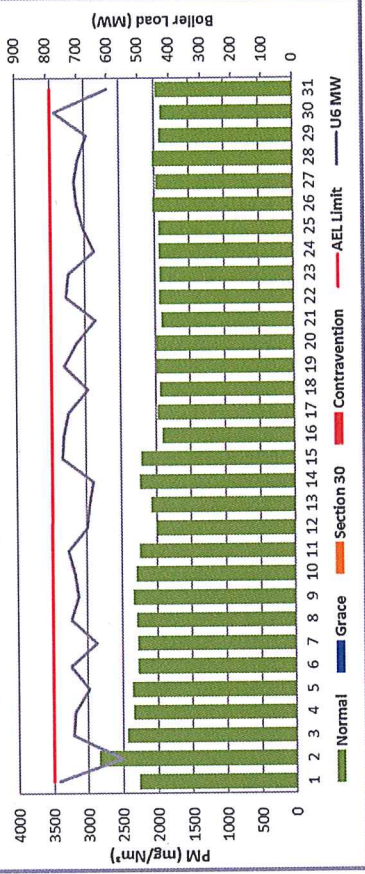


Figure 12: Medupi Unit 6 SOx Emissions - August 2022



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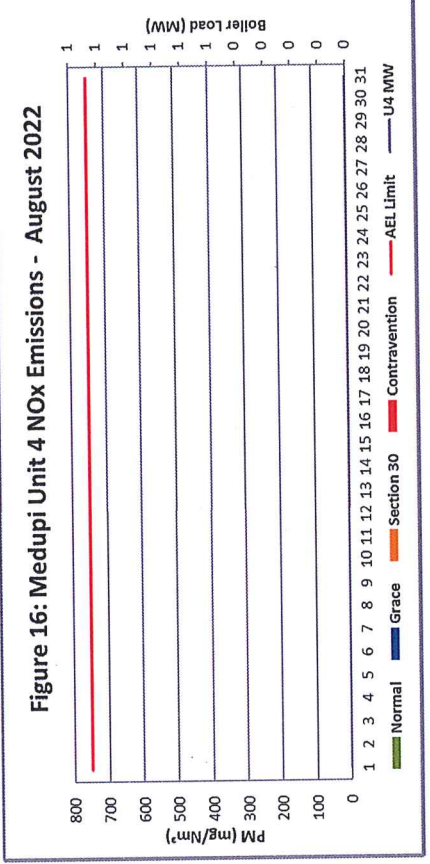
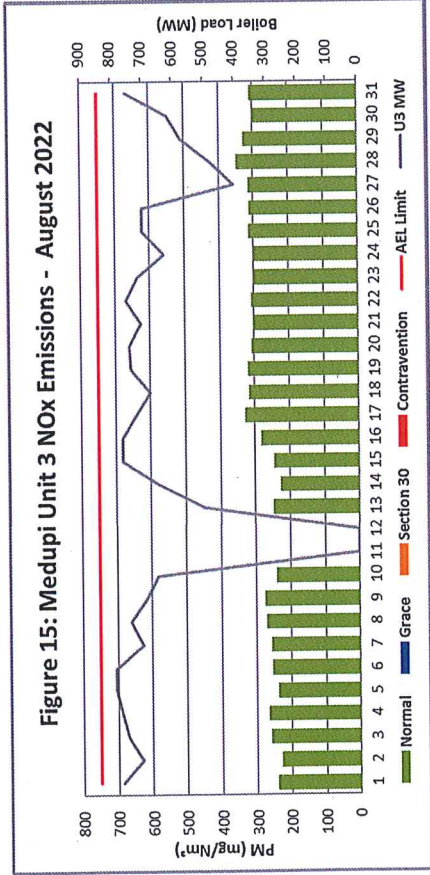
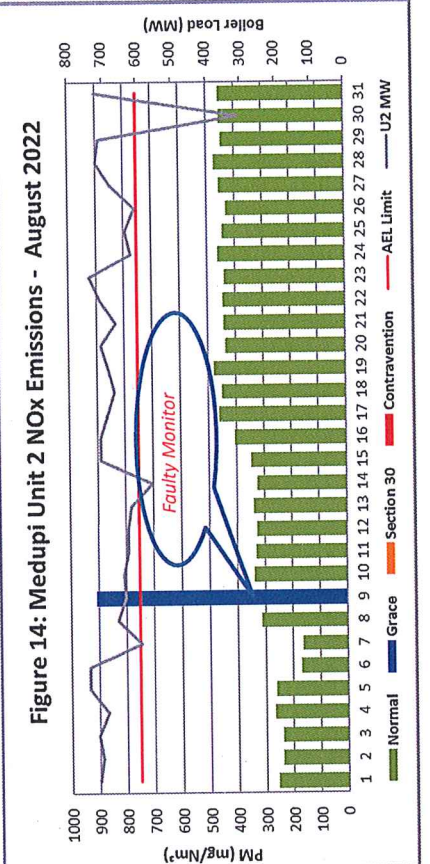
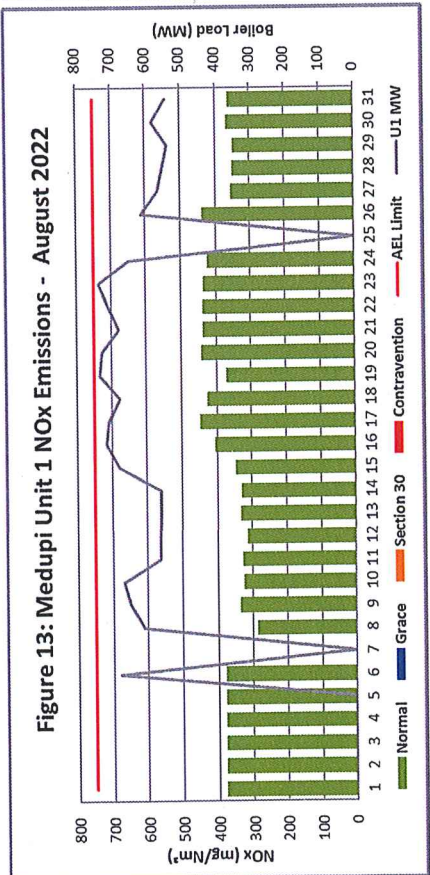
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4.2 NOx Daily Averages



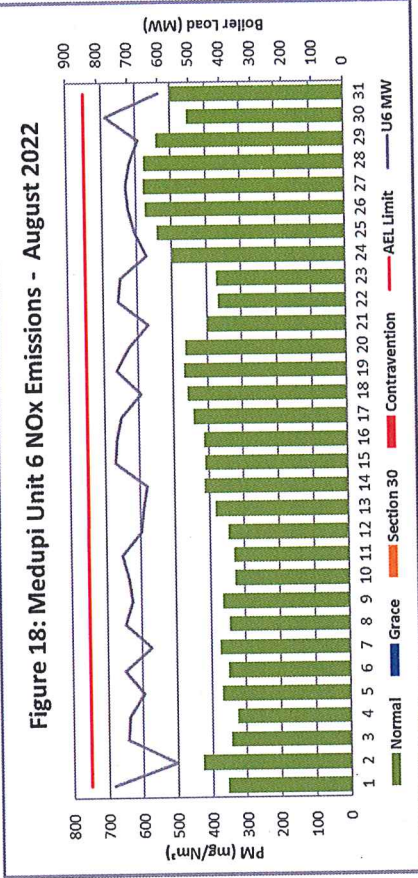
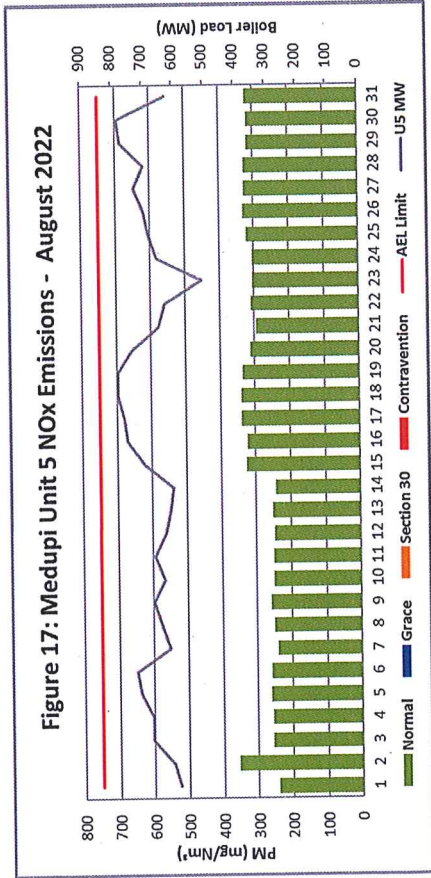
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Medupi Power Station graphical representation of the daily average emissions

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

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>2</sub>
Unit 1	33.7	3 444.1	629.8
Unit 2	51.6	5 131.0	1 017.6
Unit 3	51.1	4 326.9	538.4
Unit 4	0.0	0.0	0.0
Unit 5	32.6	5 368.3	750.0
Unit 6	101.7	6 108.1	1 217.0
SUM	270.7	24 378.4	4 152.9

**TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF AUGUST 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	22.9	2 083.1	377.0
Unit 2	20.7	1 964.1	387.2
Unit 3	27.7	2 213.3	284.6
Unit 4			
Unit 5	15.1	2 118.2	293.4
Unit 6	35.1	2 123.0	423.3

## 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	Time	CEMS status	Comments
N/A	N/A	N/A	N/A

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TABLE 9: CEMS MONITOR RELIABILITY

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	100.0	77.4	76.6	72.9
Unit 2	97.8	97.0	88.4	90.5
Unit 3	96.3	97.8	96.9	53.4
Unit 4				
Unit 5	100.0	99.9	99.7	97.9
Unit 6	100.0	99.6	96.4	27.3

## 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 August 2022 was emailed 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 AUGUST 2022**

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<b>CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*</b>		
Date:	Tuesday, 30 August 2022	
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	
<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		
MONTH:	August	
<b>GENERAL INFORMATION:</b>		
	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:	1500	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
<b>METEROLOGICAL DATA FOR THE MONTH</b>		
	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 <sup>2</sup> /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
<b>FINAL OUTPUT:</b>		
	Result	Unit
Breathing losses:	0.72 kg/month	
Working losses:	0.04 kg/month	
<b>TOTAL LOSSES (Total TVOC Emissions for the month):</b>	<b>0.77 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 campaign.

## 10. Complaints Register


TABLE 6: COMPLAINTS FOR THE MONTH OF AUGUST 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:** Thabo Khoza   
**Senior Environmental Advisor**

**Verified by:** Malose Langa   
**System Engineer Boiler**

**Supported by:** Mokgadi Dikgale   
**Environmental Manager**

**Supported by:** Jabulani Mkhathshwa   
**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**

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