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Stanley Koenaitse

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Modimolle  
0510

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*Date: 2022/03/31*

*Enquiries: MF. Dikgale*

*Tel: 014 762 6820*

Ref: H16/1/13-AEL/M1/R1 – March 2022

Dear Mr Koenaitse

### **MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF MARCH 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 March 2022 only.

## **1. Raw Materials and Products**

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

<b>Raw Materials and Products used</b>	<b>Raw Material Type</b>	<b>Unit</b>	<b>Maximum Permitted Consumption/ Rate (Quantity)</b>	<b>Consumption - March 2022</b>
	Coal	Tons/month	1 875 000	979744
	Fuel Oil	Tons/month	20 000	3110
<b>Production Rates</b>	<b>Product/ By-Product Name</b>	<b>Unit</b>	<b>Maximum Production Capacity Permitted (Quantity)</b>	<b>Production Rate in Month of March 2022</b>
	Energy	GWh	3571,2	2072,78
	Ash Emitted	Tons	not specified	317,7

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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
01/03/22	24,0	23,1	24,0		0,0	24,0	30243	794	778	665		off	628
02/03/22	24,0	0,0	24,0		0,0	24,0	29272	794	703	790		off	623
03/03/22	24,0	19,2	12,2		0,0	24,0	29622	794	794	685		off	580
04/03/22	24,0	24,0	11,6		0,0	24,0	30977	794	792	794		off	620
05/03/22	24,0	24,0	24,0		0,0	24,0	30724	756	725	794		off	635
06/03/22	24,0	24,0	24,0		0,0	24,0	29162	775	664	794		off	569
07/03/22	24,0	24,0	15,7		0,0	24,0	30253	769	782	784		188	655
08/03/22	24,0	24,0	0,0		15,3	24,0	30388	794	794			587	643
09/03/22	24,0	24,0	0,0		24,0	24,0	33492	791	787	492		790	546
10/03/22	24,0	24,0	10,3		24,0	24,0	36742	787	774	742		790	509
11/03/22	24,0	24,0	24,0		24,0	24,0	37025	795	749	686		790	594
12/03/22	24,0	24,0	0,6		11,9	24,0	33651	794	777	709		602	524
13/03/22	24,0	24,0	21,5		6,1	24,0	34766	745	697	678		614	605
14/03/22	24,0	24,0	24,0		24,0	15,4	38051	726	705	750		749	639
15/03/22	24,0	24,0	24,0		10,3	3,9	36423	769	790	738		557	727
16/03/22	24,0	24,0	24,0		0,0	24,0	33756	761	743	736		381	732
17/03/22	23,9	24,0	24,0		3,7	24,0	38197	765	756	720		715	705
18/03/22	0,0	23,0	24,0		24,0	24,0	30988	418	719	779		757	706
19/03/22	4,2	0,0	24,0		24,0	24,0	27968	725	off	694		727	580
20/03/22	23,1	0,0	24,0		24,0	24,0	27678	760	off	653		721	580
21/03/22	0,0	0,0	24,0		24,0	24,0	22770	461	off	793		778	580
22/03/22	4,4	0,0	24,0		24,0	24,0	29742	791	off	757		712	571
23/03/22	24,0	0,0	24,0		24,0	24,0	29082	776	off	735		700	560
24/03/22	24,0	0,0	24,0		24,0	24,0	29310	782	off	773		701	570
25/03/22	24,0	0,0	24,0		24,0	16,2	27757	785	off	649		677	559
26/03/22	21,6	0,0	24,0		24,0	0,0	31017	776	576	685		597	577
27/03/22	0,0	14,6	24,0		24,0	20,9	27419	452	599	636		560	619
28/03/22	0,0	24,0	24,0		24,0	13,6	31362	617	669	691		622	551
29/03/22	10,8	24,0	24,0		0,2	6,4	31254	759	695	725		460	578
30/03/22	24,0	24,0	24,0		0,0	24,0	33373	789	770	738		724	580
31/03/22	24,0	24,0	24,0		0,0	24,0	37280	782	786	779		661	580

NB: reportable hours less than 24 highlighted in pink and Unit 4 is off since August 2021

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## 2. Abatement Technology

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

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	Fabric Filter Plant (FFP)	99,957%
Unit 2	Fabric Filter Plant (FFP)	99,923%
Unit 3	Fabric Filter Plant (FFP)	99,929%
Unit 4	Fabric Filter Plant (FFP)	
Unit 5	Fabric Filter Plant (FFP)	99,798%
Unit 6	Fabric Filter Plant (FFP)	99,827%

## 3. Energy Source Characteristics

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF MARCH 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	1,41
Ash Content	35 - 39	34,44

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

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
<b>Oil</b>		
Sulphur Content	0.5 - 3.5	2,1
Ash Content	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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4.1 PM Emissions

Figure 1: Medupi Unit 1 PM Emissions - March 2022

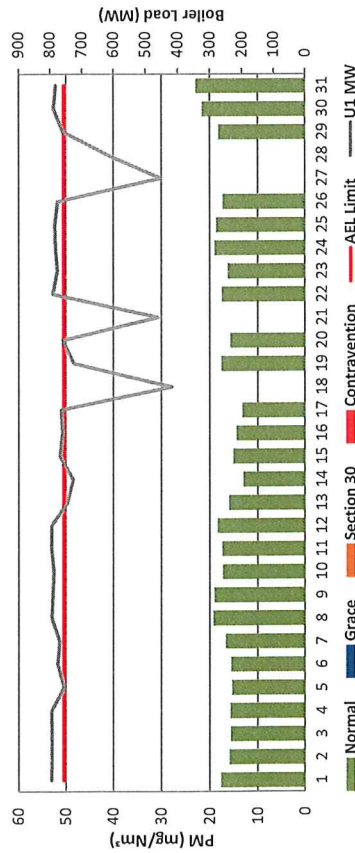


Figure 2: Medupi Unit 2 PM Emissions - March 2022

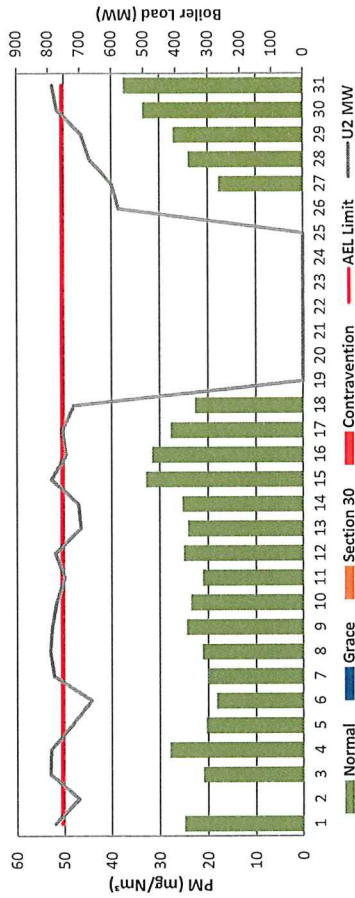


Figure 3: Medupi Unit 3 PM Emissions - March 2022

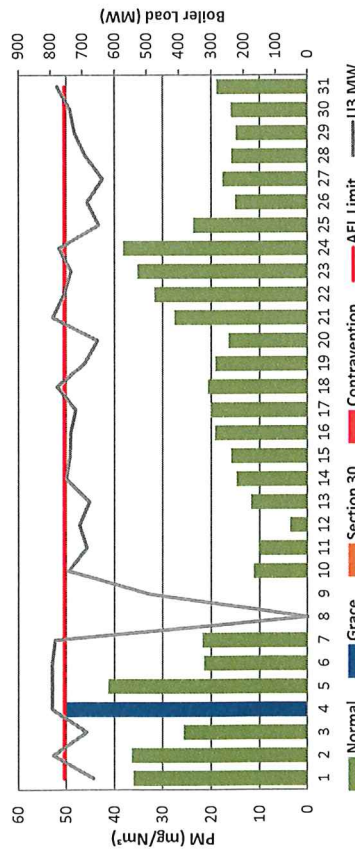
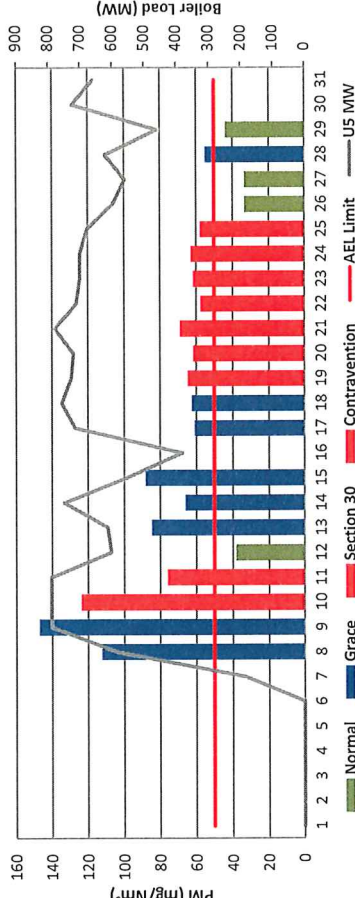


Figure 4: Medupi Unit 5 PM Emissions - March 2022

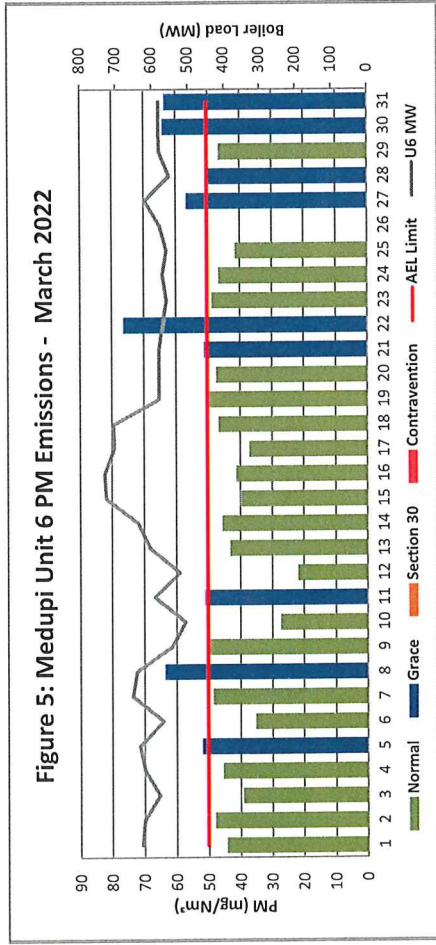


Unit 5 PM Exceedances - Correlation tests were conducted from 11 to 14 March 2022; upon receiving the report the new curve was implemented and it was discovered that the unit had exceeded its AEL limit for a period of Seventeen (17) days, 8 days within grace period and 9 days as Legal contravention

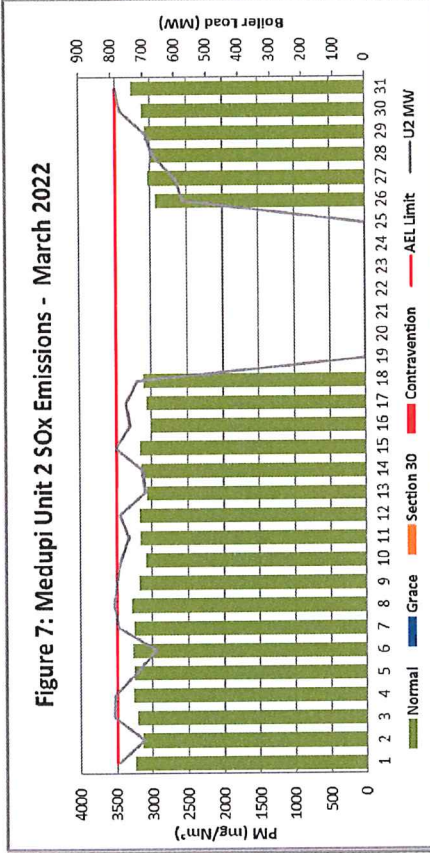
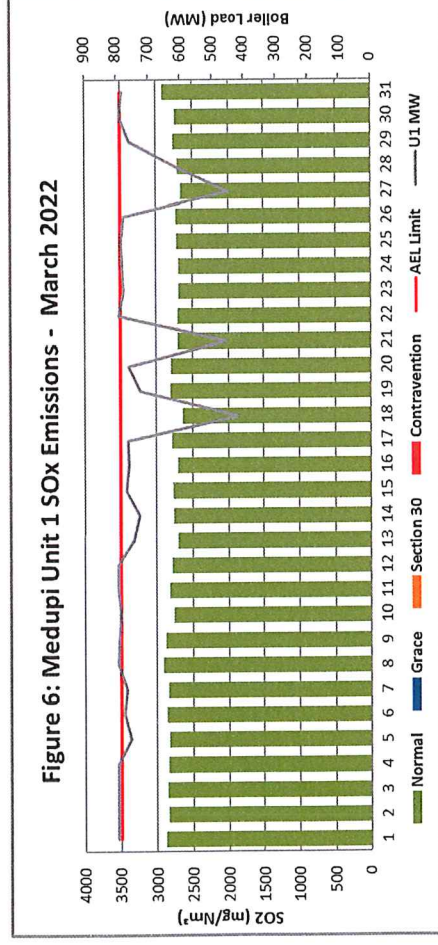
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**4.2 SOX Emissions**



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Figure 8: Medupi Unit 3 SOx Emissions - March 2022

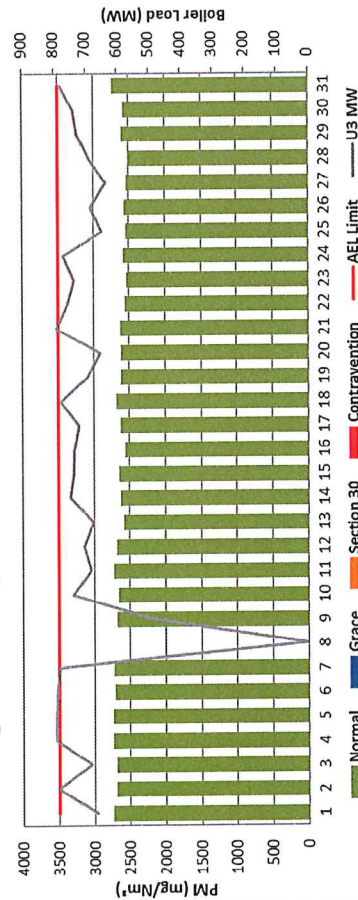


Figure 9: Medupi Unit 5 SOx Emissions - March 2022

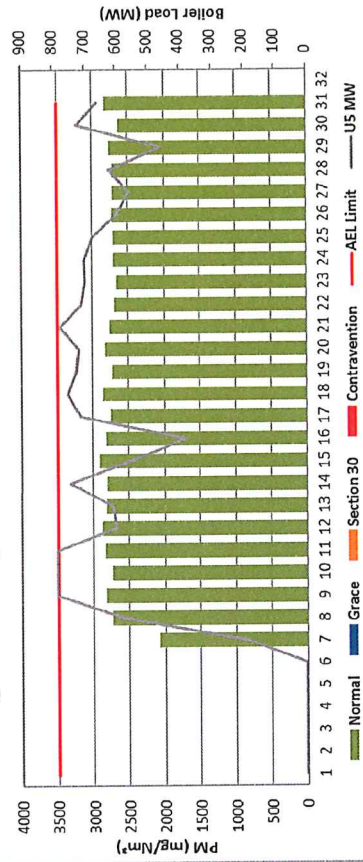
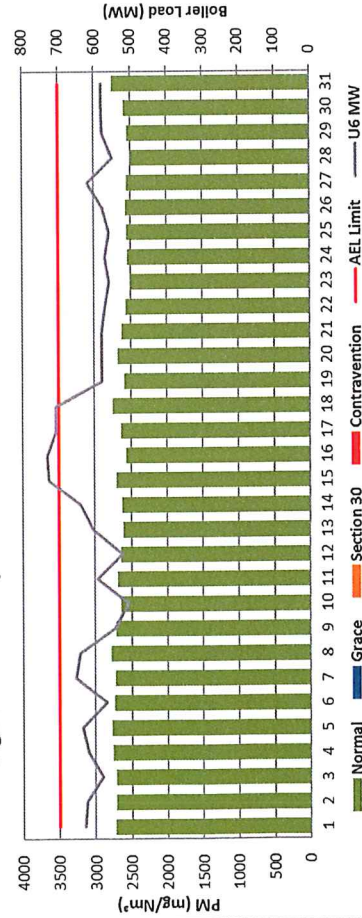


Figure 10: Medupi Unit 6 SOx Emissions - March 2022



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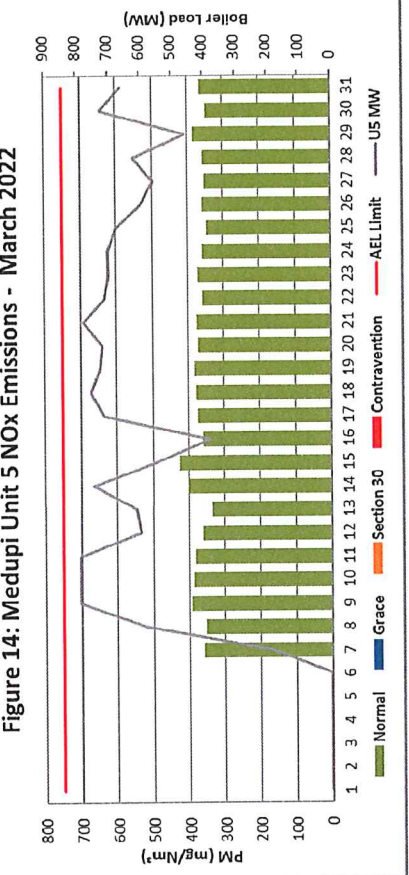
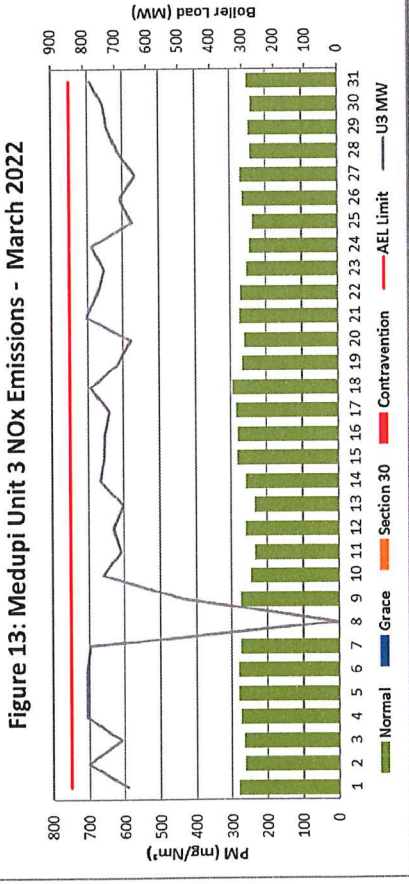
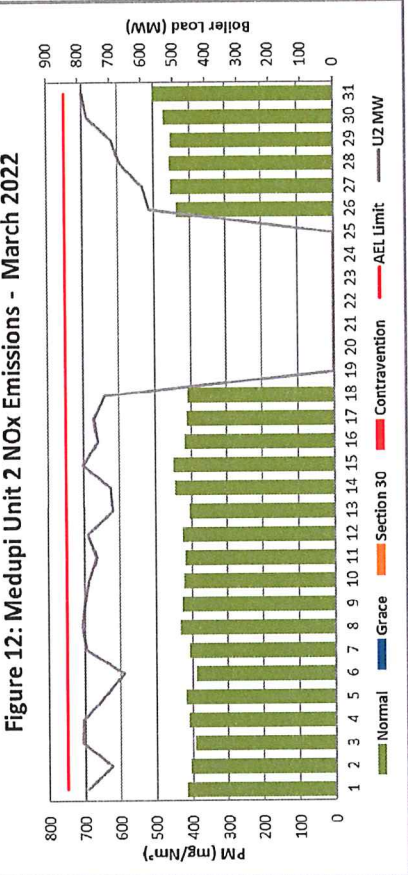
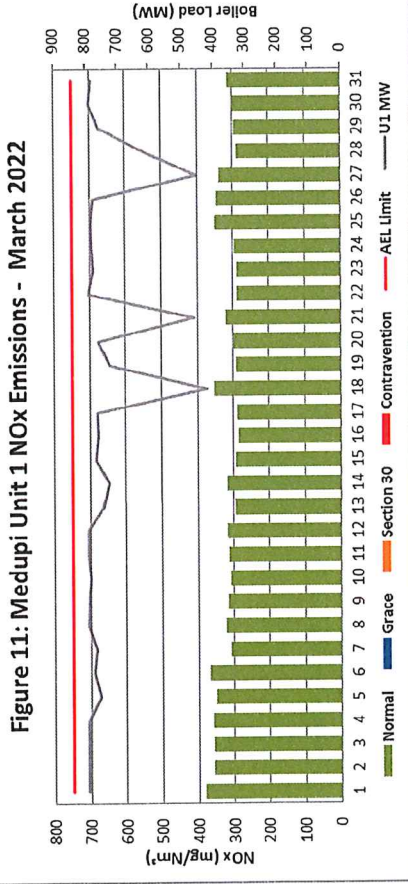
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4.3 NOx Emissions



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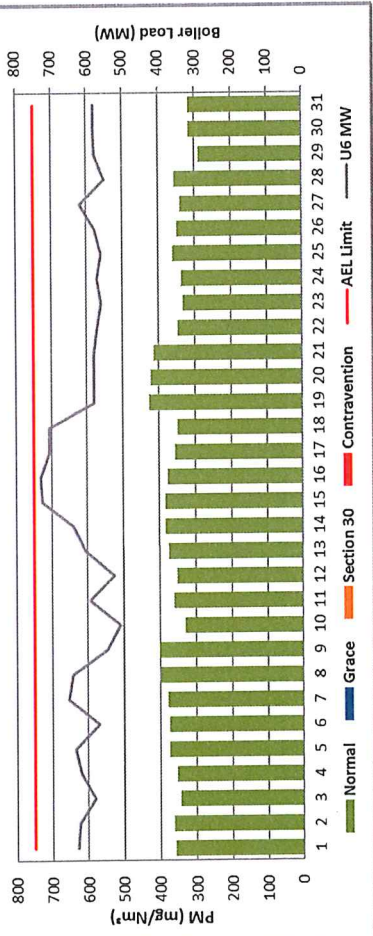
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Figure 15: Medupi Unit 6 NOx Emissions - March 2022




Medupi Power Station graphical representation of the daily average emissions

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**TABLE 7: MONTHLY TONNAGES FOR THE MONTH OF MARCH 2022**

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>2</sub>
Unit 1	31,2	5 696,4	651,0
Unit 2	44,6	6 021,7	817,2
Unit 3	49,6	6 253,2	625,5
Unit 4	0,0	0,0	0,0
Unit 5	89,5	4 311,9	579,3
Unit 6	102,7	6 338,9	864,6
<b>SUM</b>	<b>317,7</b>	<b>28 622,1</b>	<b>3 537,6</b>

## 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.

**TABLE 6: PERIODS DURING WHICH CEMS WAS INOPERATIVE**

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

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TABLE 7: CEMS MONITOR RELIABILITY

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	100,0	100,0	99,7	99,7
Unit 2	100,0	99,8	99,3	98,8
Unit 3	100,0	99,7	99,4	99,4
Unit 4				
Unit 5	100,0	99,8	99,8	97,7
Unit 6	95,7	100,0	100,0	100,0

## 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.

## 7. Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring and Dust fall-out report are emailed to the Licensing authority on a monthly basis.


## 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 8: TOTAL VOLATILE ORGANIC COMPOUND (TVOC) FOR MARCH 2022**

		
<b>CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*</b>		
<b>Date:</b>	Thursday, 31 March 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	
<b>MONTHLY INPUT DATA FOR THE STATION</b> Please only insert relevant monthly data inputs into the <b>blue cells</b> below Choose from a dropdown menu in the <b>green cells</b> The total VOC emissions for the month are in the <b>red cells</b> <b>IMPORTANT:</b> Do not change <b>any</b> other cells without consulting the AQ CoE		
<b>MONTH:</b>	March	
<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:	3110	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	23,67	°C
Daily maximum ambient temperature	30,21	°C
Daily minimum ambient temperature	17,89	°C
Daily ambient temperature range	12,31	°C
Daily total insolation factor	5,08	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>
<b>Breathing losses:</b>	0,68 kg/month	
<b>Working losses:</b>	0,09 kg/month	
<b>TOTAL LOSSES (Total TVOC Emissions for the month):</b>	0,77 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.

## 10. Complaints Register


TABLE 9: COMPLAINTS FOR THE MONTH OF MARCH 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 Nemutamba Nemutamba  
**Environmental Officer**

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

**Supported by:** Mokgadi Dikgale MF Dikgale  
**Environmental Manager ( Acting)**

**Supported by:** Jabulani Mkhathshwa JM  
**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 (Acting)**

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