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Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of September 2021
	Energy	GWh	3571,2	1 826
Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption - September 2021
	Coal	Tons/month	1 875 000	940 180
	Fuel Oil	Tons/month	20 000	1 883

TABLE 1: QUANTITY OF RAW MATERIALS AND PRODUCTS CONSUMPTION IN SEPTEMBER 2021

**1. Raw Materials and Products**

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 September 2021 only. This report supersedes the previous submission made for the month on September 2021.

**MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF SEPTEMBER 2021**


Dear Mr Koenaite

Ref: H16/1/13-AEL/M1/R1 – September 2021 rev 1

[skoenaite@waterberg.gov.za](mailto:skoenaite@waterberg.gov.za)

Stanley Koenaite  
 Waterberg District Municipality  
 Private Bag X1018  
 Modimolle  
 0510

Date: 2021/09/30  
 Enquiries: MF Dikgale  
 Tel: 014 762 6375

		Medupi Power Station Monthly Emissions Report		Template Identifier	240-43921804	Rev	6
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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-Sep	24.0	24.0	24.0	24.0	24.0	24.0	34702	633	718	686			
02-Sep	24.0	24.0	24.0	24.0	24.0	24.0	36137	703	740	685			
03-Sep	24.0	24.0	24.0	24.0	24.0	24.0	37388	666	737	743			
04-Sep	24.0	24.0	24.0	24.0	24.0	24.0	36466	616	725	705			
05-Sep	24.0	24.0	24.0	24.0	24.0	24.0	31630	375	730	583			
06-Sep	24.0	24.0	24.0	24.0	24.0	24.0	28588	591	725	600			
07-Sep	24.0	24.0	24.0	24.0	24.0	24.0	27451	600	743	541			
08-Sep	24.0	24.0	24.0	24.0	24.0	24.0	28135	746	777	555			
09-Sep	24.0	24.0	24.0	24.0	24.0	24.0	26557	637	724	619			
10-Sep	24.0	24.0	24.0	24.0	24.0	24.0	25580	Off	726	730			
11-Sep	24.0	24.0	24.0	24.0	24.0	24.0	21058	Off	778	657			
12-Sep	24.0	24.0	24.0	24.0	24.0	24.0	22534	Off	729	688			
13-Sep	24.0	24.0	24.0	24.0	24.0	24.0	22575	Off	717	672			
14-Sep	24.0	24.0	24.0	24.0	24.0	24.0	23858	300	747	662			
15-Sep	24.0	24.0	24.0	24.0	24.0	24.0	30776	644	718	686			
16-Sep	24.0	24.0	24.0	24.0	24.0	24.0	30934	594	600	660			
17-Sep	24.0	24.0	24.0	24.0	24.0	24.0	35859	675	738	618			
18-Sep	24.0	24.0	24.0	24.0	24.0	24.0	34520	617	700	514			
19-Sep	24.0	24.0	24.0	24.0	24.0	24.0	35554	599	682	648			
20-Sep	24.0	24.0	24.0	24.0	24.0	24.0	39536	633	742	781			
21-Sep	24.0	24.0	24.0	24.0	24.0	24.0	35808	542	680	609			
22-Sep	24.0	24.0	24.0	24.0	24.0	24.0	29283	499	789	541			
23-Sep	24.0	24.0	24.0	24.0	24.0	24.0	32032	502	672	559			
24-Sep	24.0	24.0	24.0	24.0	24.0	24.0	30538	459	605	530			
25-Sep	24.0	24.0	24.0	24.0	24.0	24.0	34556	491	704	723			
26-Sep	24.0	24.0	24.0	24.0	24.0	24.0	33672	560	671	577			
27-Sep	24.0	24.0	24.0	24.0	24.0	24.0	26657	472	670	Off			
28-Sep	24.0	24.0	24.0	24.0	24.0	24.0	28104	339	594	507			
29-Sep	24.0	24.0	24.0	24.0	24.0	24.0	35115	418	775	696			
30-Sep	24.0	24.0	24.0	24.0	24.0	24.0	33233	432	670	697			

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 September 2021

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	Fabric Filter Plant (FFP)	99.917%
Unit 2	Fabric Filter Plant (FFP)	99.936%
Unit 3	Fabric Filter Plant (FFP)	99.911%
Unit 4	Fabric Filter Plant (FFP)	-
Unit 5	Fabric Filter Plant (FFP)	99.911%
Unit 6	Fabric Filter Plant (FFP)	99.893%

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

## 3. Energy Source Characteristics

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF SEPTEMBER 2021

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	1.350
Ash Content	35 - 39	34.000

TABLE 5: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF SEPTEMBER 2021

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
Oil		
Sulphur Content	0.5 - 3.5	2.2
Ash Content	0.02 - 0.1	0.030

## 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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PM Daily Averages

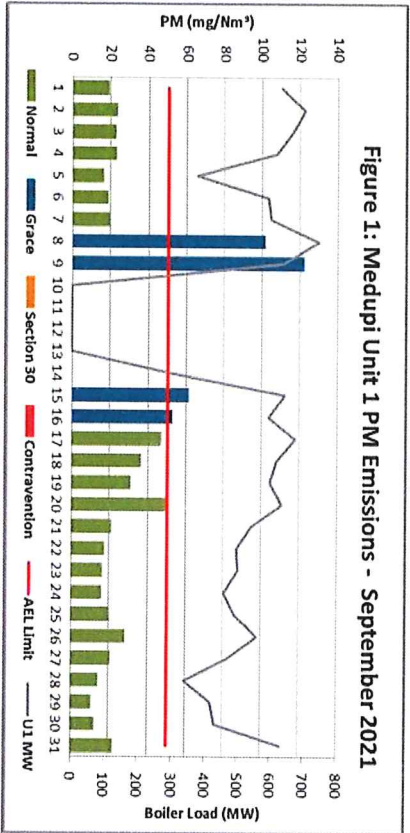


Figure 1: Medupi Unit 1 PM Emissions - September 2021

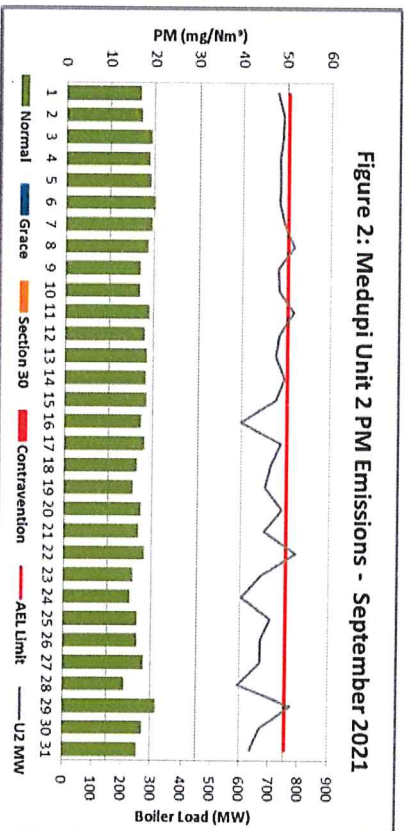


Figure 2: Medupi Unit 2 PM Emissions - September 2021

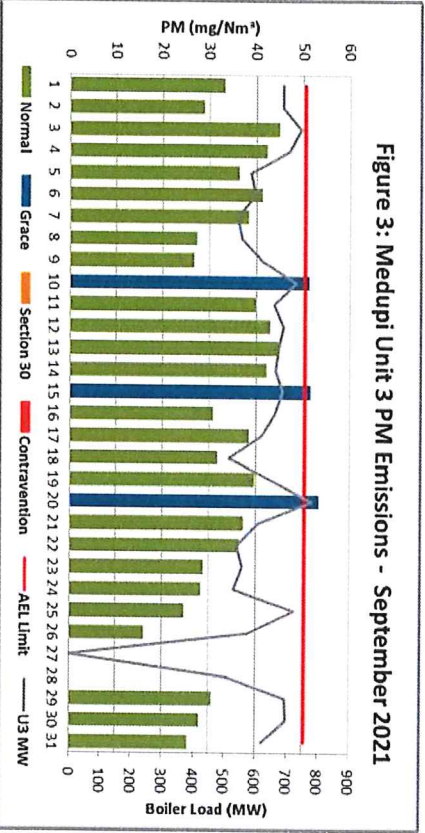


Figure 3: Medupi Unit 3 PM Emissions - September 2021

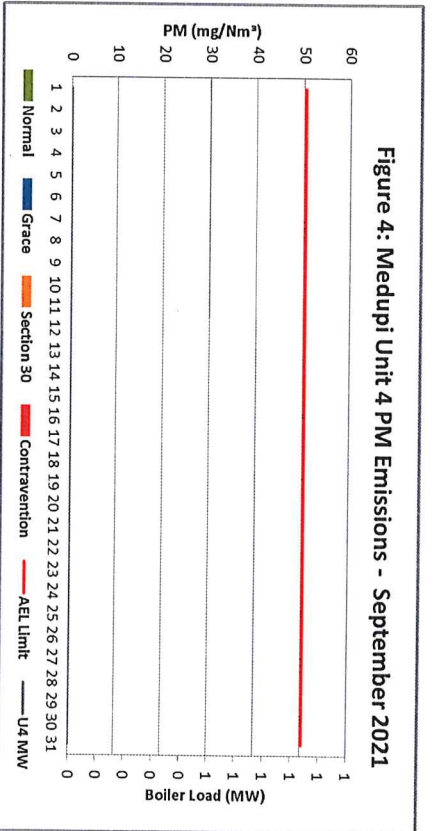


Figure 4: Medupi Unit 4 PM Emissions - September 2021

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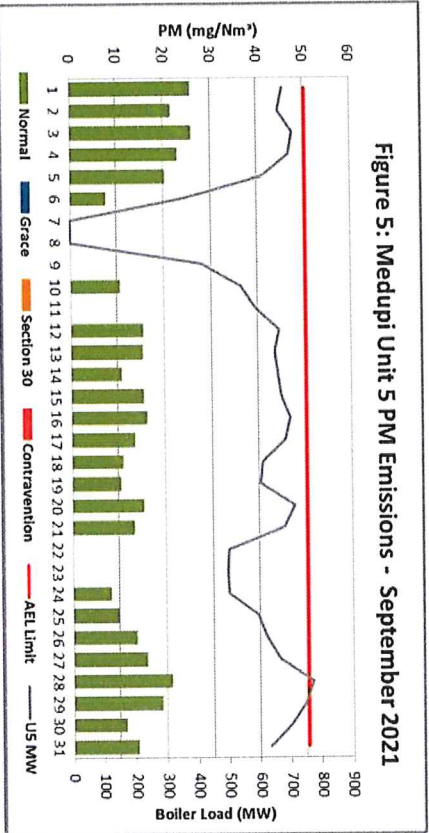


Figure 5: Medupi Unit 5 PM Emissions - September 2021

SOx Daily Averages

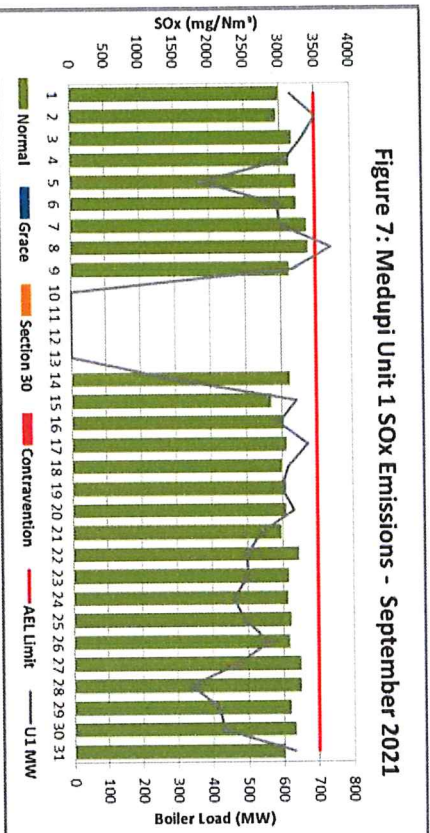


Figure 7: Medupi Unit 1 SOx Emissions - September 2021

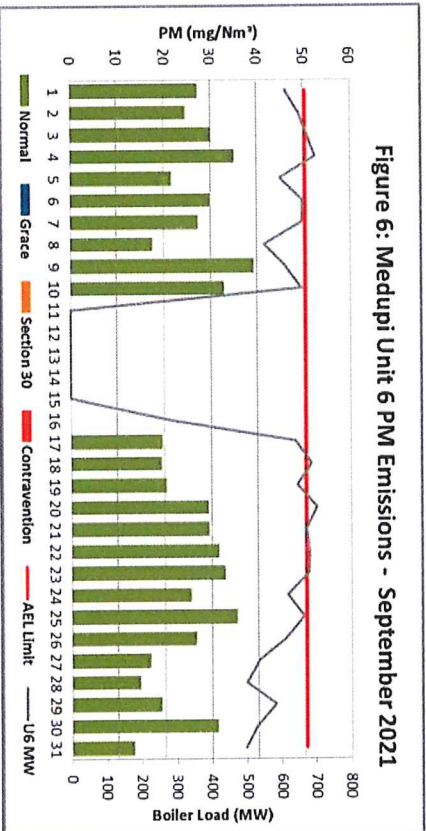


Figure 6: Medupi Unit 6 PM Emissions - September 2021

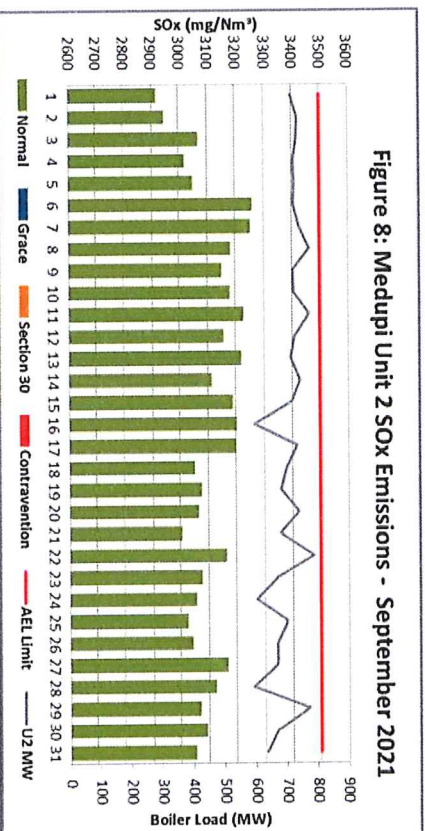


Figure 8: Medupi Unit 2 SOx Emissions - September 2021

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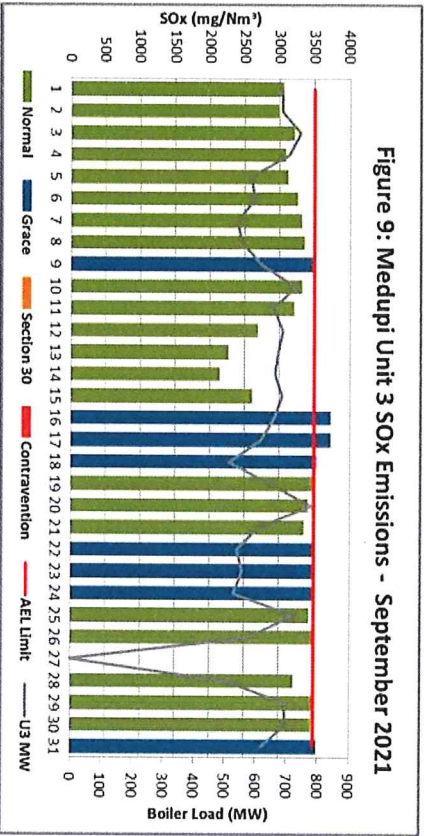


Figure 9: Medupi Unit 3 SOx Emissions - September 2021

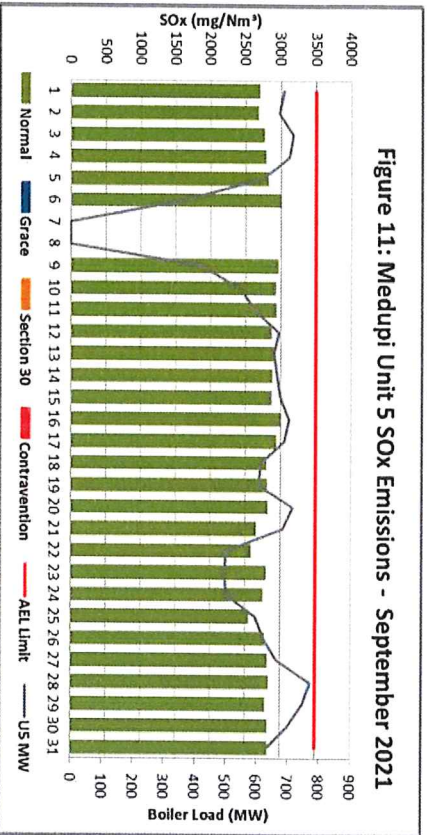


Figure 11: Medupi Unit 5 SOx Emissions - September 2021

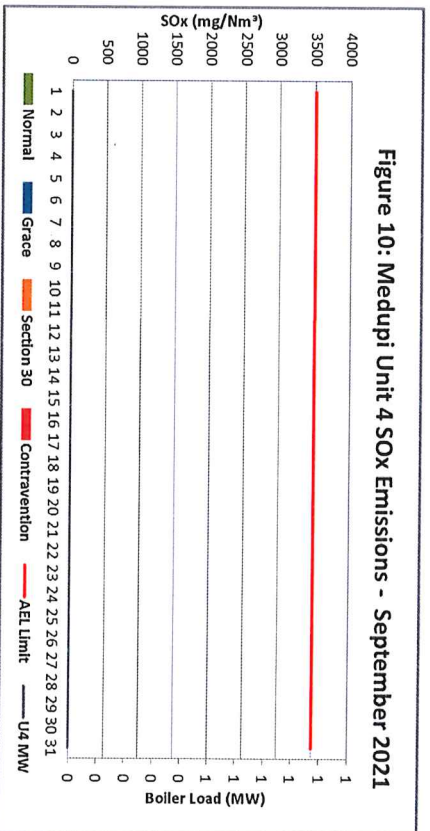


Figure 10: Medupi Unit 4 SOx Emissions - September 2021

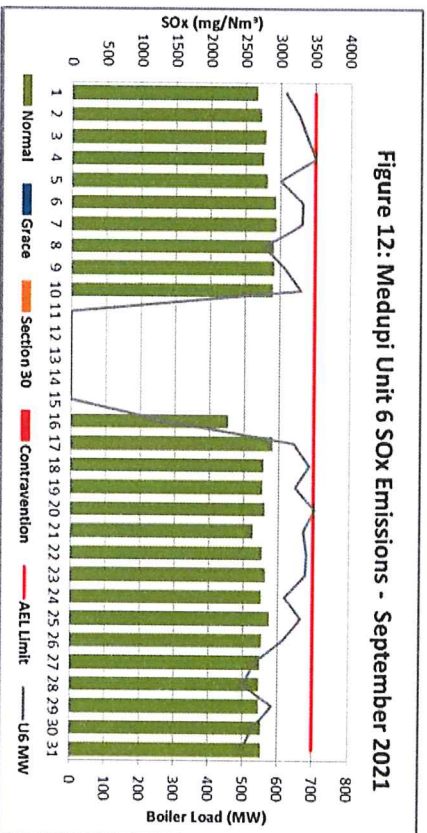


Figure 12: Medupi Unit 6 SOx Emissions - September 2021

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NOx Daily Averages

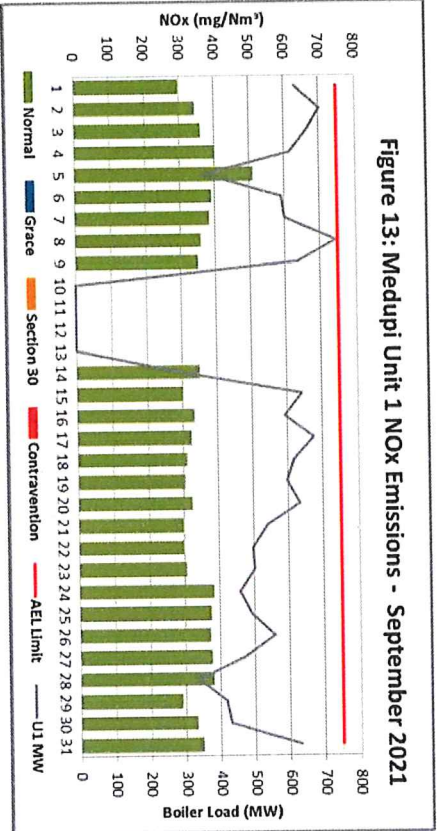


Figure 13: Medupi Unit 1 NOx Emissions - September 2021

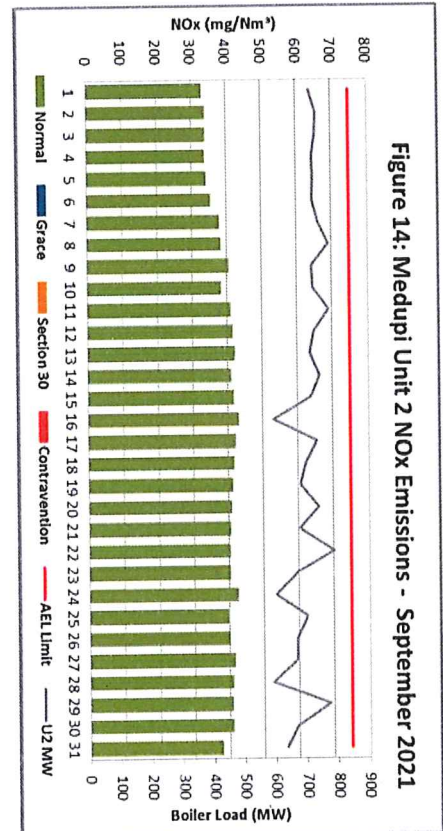


Figure 14: Medupi Unit 2 NOx Emissions - September 2021

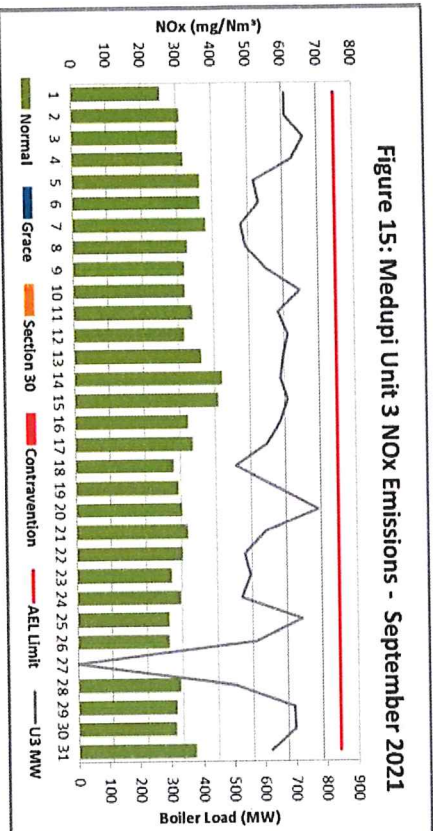


Figure 15: Medupi Unit 3 NOx Emissions - September 2021

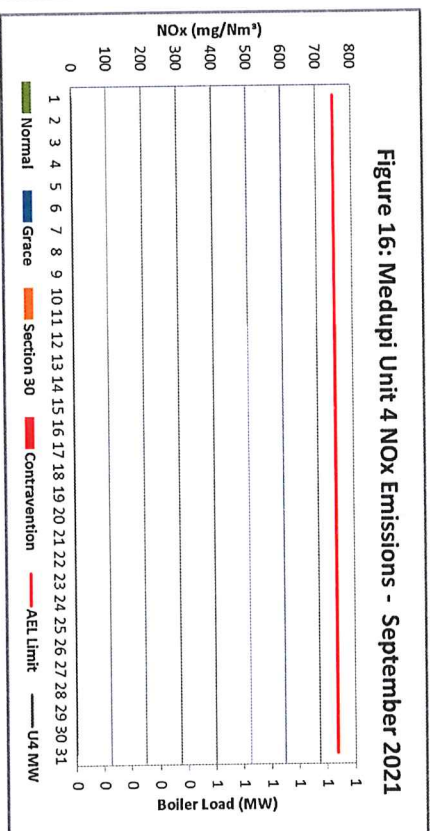


Figure 16: Medupi Unit 4 NOx Emissions - September 2021

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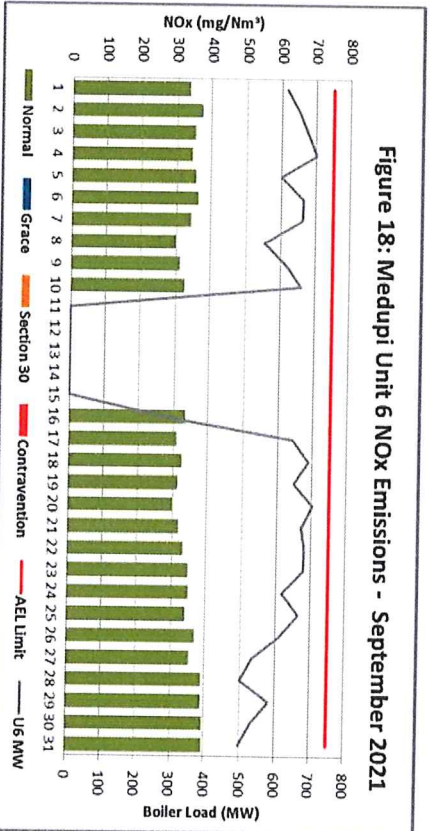
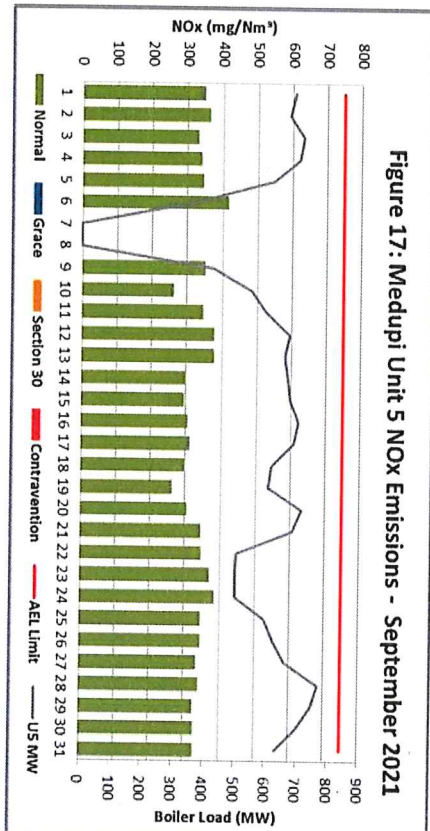
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Medupi Power Station graphical representation of the daily average emissions

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TABLE 7: MONTHLY TONNAGES FOR THE MONTH OF SEPTEMBER 2021

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>2</sub>
Unit 1	39.2	3 988	444
Unit 2	46.8	8 197	1 043
Unit 3	55.2	5 247	509
Unit 4			
Unit 5	47.7	9 199	1 084
Unit 6	52.0	5 963	731
SUM	240.9	32 594	3 810

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

TABLE 7: CEMS MONITOR RELIABILITY

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	99.5	91.0	91.0	91.0
Unit 2	100.0	100.0	100.0	100.0
Unit 3	99.9	100.0	100.0	99.5
Unit 4				
Unit 5	100.0	99.5	100.0	99.7
Unit 6	100.0	99.7	99.7	98.7

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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 SEPTEMBER 2021

CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*	
Date:	2022/09/31
Station:	Medupi Power Station
Province:	Limopo Province
Tank no.:	1-2
Description:	Outdoor fuel oil storage tank
Tank Type:	Vertical fixed roof (vented to atmosphere)
Material stored:	Fuel Oil 150
<p style="text-align: center;"><b>MONTHLY INPUT DATA FOR THE STATION</b></p> <p>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></p> <p style="text-align: center;">IMPORTANT: Do not change <i>any</i> other cells without consulting the AQ CoE</p>	
MONTH:	September
GENERAL INFORMATION:	
Unit	Data
Total number of fuel oil tanks:	2
Height of tank*:	14.2
Diameter of tank:	12
Net fuel oil throughput for the month:	1 883
Molecular weight of the fuel oil:	166.00
METEOROLOGICAL DATA FOR THE MONTH	
Unit	Data
Daily average ambient temperature	23.43
Daily minimum ambient temperature	31.06
Daily maximum ambient temperature	16.52
Daily ambient temperature range	14.54
Daily total insolation factor	4.41
Tank paint colour	Aluminium/Specular
Tank paint solar absorbance	0.39
FINAL OUTPUT:	
Breathing losses:	0.69 kg/month
Working losses:	0.05 kg/month
<b>TOTAL LOSSES (Total TVOC Emissions for the month):</b>	<b>0.75 kg/month</b>
<p>*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.</p>	

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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 SEPTEMBER 2021

Source Code/ Name	N/A
Air pollution complaints received	No complaints received
Calculation of Impacts/ emissions associated with the incident	N/A
Date of complaint and date of response by the license holder	N/A
Results of investigation	N/A
Action taken to resolve the complaint	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 Mkhatsywa  
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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