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		Effective Date	January 2021		
		Review Date	January 2024		

Phumudzo Thivhafuni

Date: 2021/06/30

Limpopo Dept. of Economic Development, Environment and Tourism

Enquiries: TR. Rammutla

Private Bag 9484
POLOKWANE
0700

Tel: 014 762 6375

ThivhafuniPO@ledet.gov.za

Ref: 12/4/12L-W2/A3 – Sep 2020 Rev1

Dear Phumudzo

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF SEPTEMBER 2020

This document serves as the monthly report required in terms of Section 7.7.1 of Medupi Power Station Provisional Atmospheric Emission License (AEL), 12/4/12L-W2/A3.

This report is a reflection of Unit 2, 3, 4, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of September 2020 only.

1. Raw Materials and Products

Table 1: Quantity of raw materials and products for Unit 2, 3, 4, 5 and 6 in September 2020

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 2, 3, 4, 5 and 6 consumption September 2020
	Coal	Tons/month	1 875 000	797 241
	Fuel Oil	Tons/month	40 000	2 194
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 2, 3, 4, 5 and 6 Production Rate in Month of September 2020
	Energy	MW	4 800	2 316
	Ash Emitted	Tons/month	not specified	256,9

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Table 2: Daily consumption and production rates

Date	Reportable hours of Operation					Coal usage	Production rate (MW)				
	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6		U2	U3	U4	U5	U6
01-September- 20	24,0	24,0	0,0	0,0	24,0	21268	627	739			627
02-September- 20	24,0	24,0	0,0	0,0	24,0	20184	659	592			616
03-September- 20	24,0	24,0	0,0	0,0	24,0	20188	691	569			610
04-September- 20	24,0	24,0	0,0	0,0	24,0	19728	684	615			542
05-September- 20	24,0	24,0	0,0	0,0	24,0	21465	590	664		309	641
06-September- 20	24,0	24,0	0,0	7,9	24,0	24908	586	589		584	582
07-September- 20	24,0	24,0	0,0	24,0	24,0	28546	746	667		691	615
07-September- 20	24,0	24,0	0,0	24,0	24,0	28061	752	669		603	608
09-September- 20	24,0	24,0	0,0	24,0	24,0	22956	610	507		514	494
10-September- 20	9,0	24,0	0,0	24,0	24,0	16515	481	381		452	459
11-September- 20	1,3	24,0	0,0	24,0	24,0	25360	631	590		574	570
12-September- 20	24,0	24,0	0,0	24,0	24,0	27274	703	658		574	541
13-September- 20	24,0	24,0	0,0	24,0	24,0	29307	652	648		648	637
14-September- 20	24,0	24,0	0,0	24,0	24,0	33261	722	634		581	570
15-September- 20	24,0	24,0	0,0	24,0	24,0	34242	733	663		569	589
16-September- 20	24,0	24,0	0,0	24,0	24,0	34382	764	589		568	630
17-September- 20	24,0	24,0	0,0	24,0	24,0	27239	753	600		605	498
18-September- 20	24,0	24,0	0,0	24,0	24,0	28288	766	600		616	603
19-September- 20	24,0	24,0	0,0	24,0	24,0	27734	656	600		549	571
20-September- 20	24,0	24,0	0,0	24,0	24,0	26793	490	600		512	454
21-September- 20	24,0	24,0	0,0	24,0	24,0	30215	557	600		505	499
22-September- 20	24,0	24,0	0,0	24,0	24,0	28422	702	600		575	463
23-September- 20	24,0	24,0	0,0	24,0	24,0	31312	497	625		588	470
24-September- 20	24,0	24,0	0,0	21,3	24,0	32199	623	597		553	471
25-September- 20	24,0	24,0	0,0	0,0	24,0	26061	586	622			484
26-September- 20	24,0	24,0	0,0	0,0	24,0	22854	472	558			539
27-September- 20	24,0	24,0	0,0	0,0	24,0	22523	502	472			502
28-September- 20	24,0	24,0	0,0	0,0	24,0	25528	641	542		365	536
29-September- 20	24,0	24,0	0,0	10,2	24,0	30828	493	578		565	487
30-September- 20	2,1	24,0	0,0	24,0	24,0	29600	691	489		585	603

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology efficiency for month of September 2020

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	Fabric Filter Plant (FFP)	-
Unit 2	Fabric Filter Plant (FFP)	99,942%
Unit 3	Fabric Filter Plant (FFP)	99,901%
Unit 4	Fabric Filter Plant (FFP)	-
Unit 5	Fabric Filter Plant (FFP)	99,920%
Unit 6	Fabric Filter Plant (FFP)	99,725%

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of September 2020

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	1.4
Ash Content	35 - 39	34.8

Table 5: Energy Source Material Characteristics for the month of September 2020

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	Oil	
Sulphur Content	0.5 - 3.5	2.2
Ash Content	0.02 - 0.1	0.01

4. Emissions Reporting

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

The emission limits are as follows:

SO₂ Monthly = 3500 mg/Nm³

Dust Daily= 50 mg/Nm³

NO₂ Daily= 750 mg/Nm³

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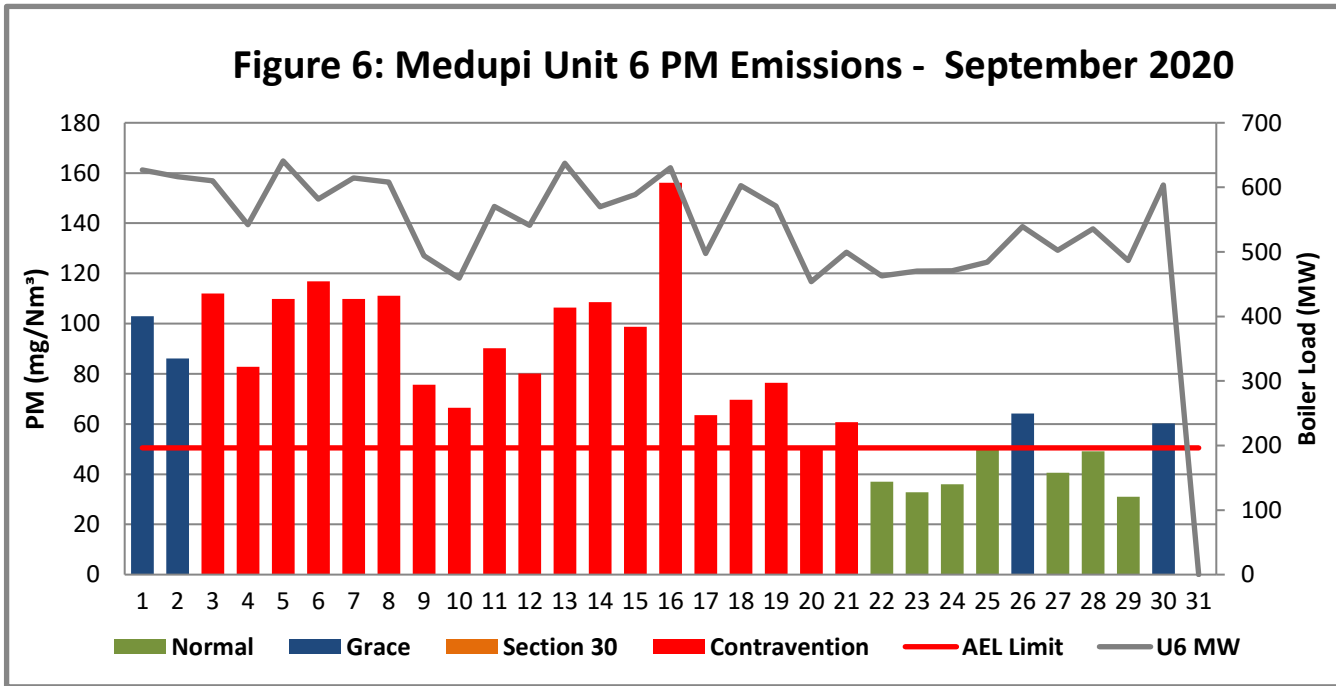
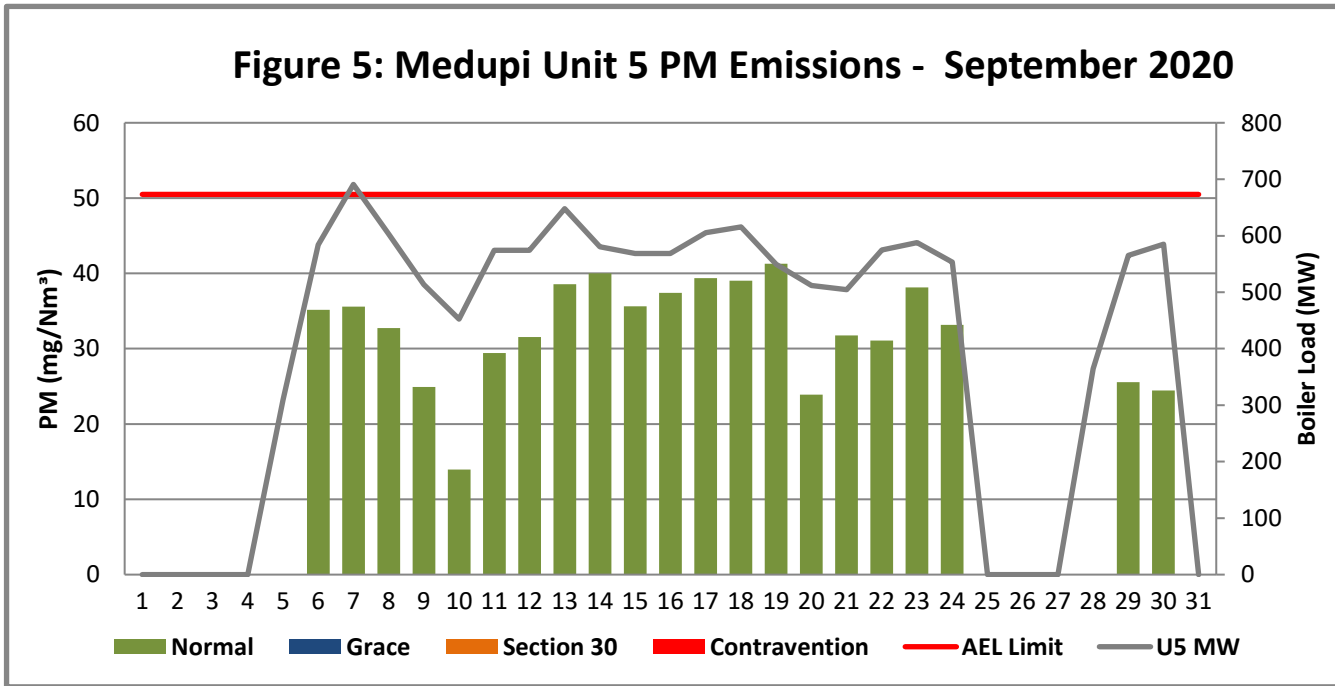
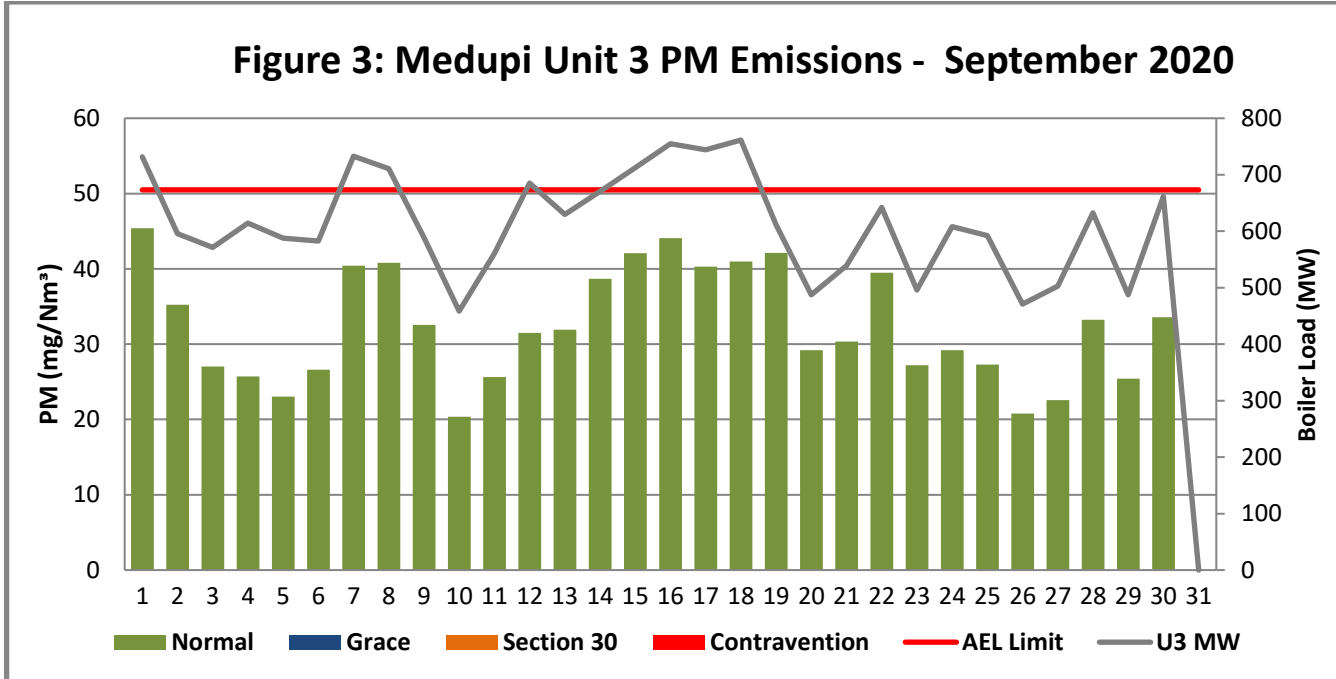
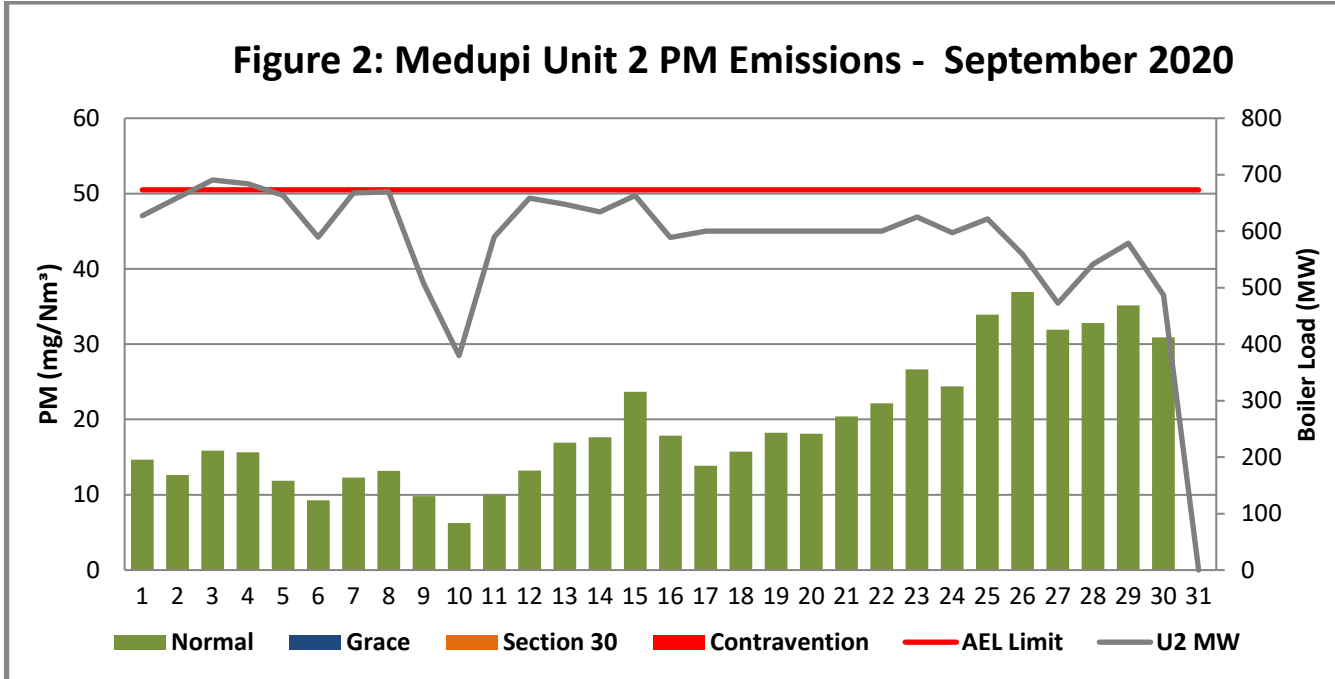
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Medupi Power Station graphical representation of the daily average emissions for particulates

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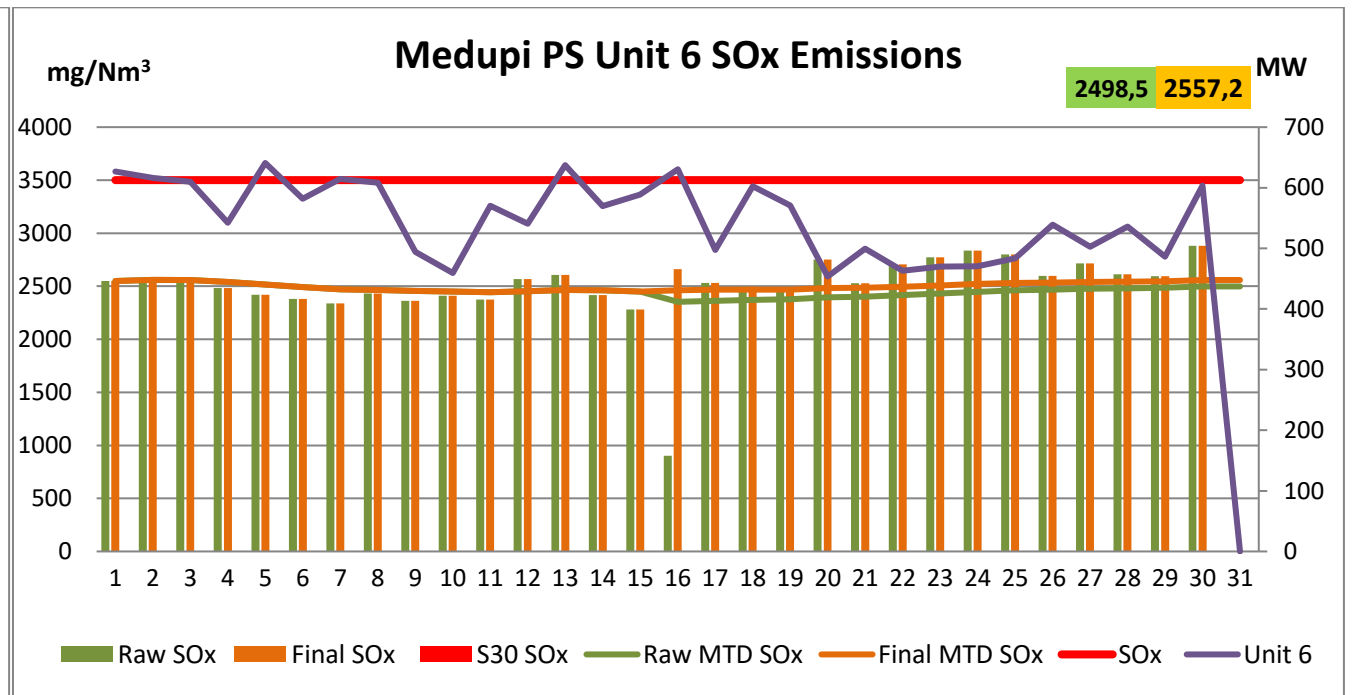
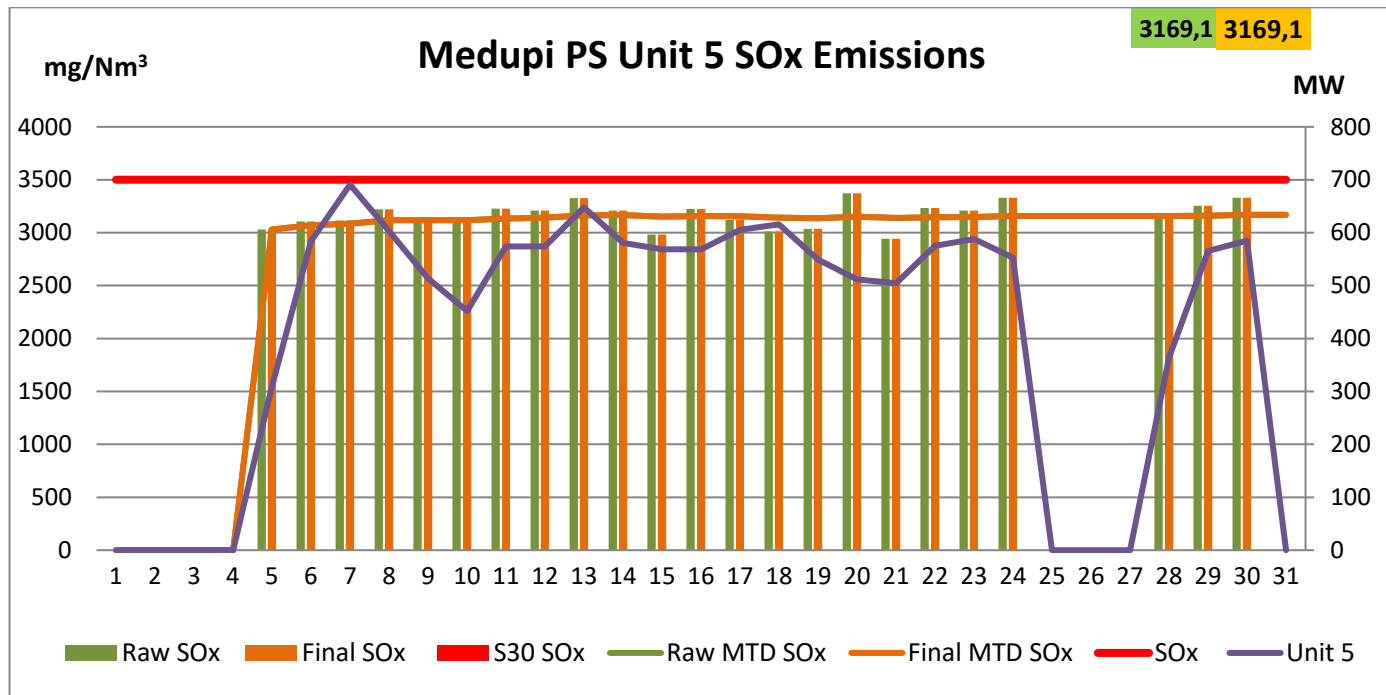
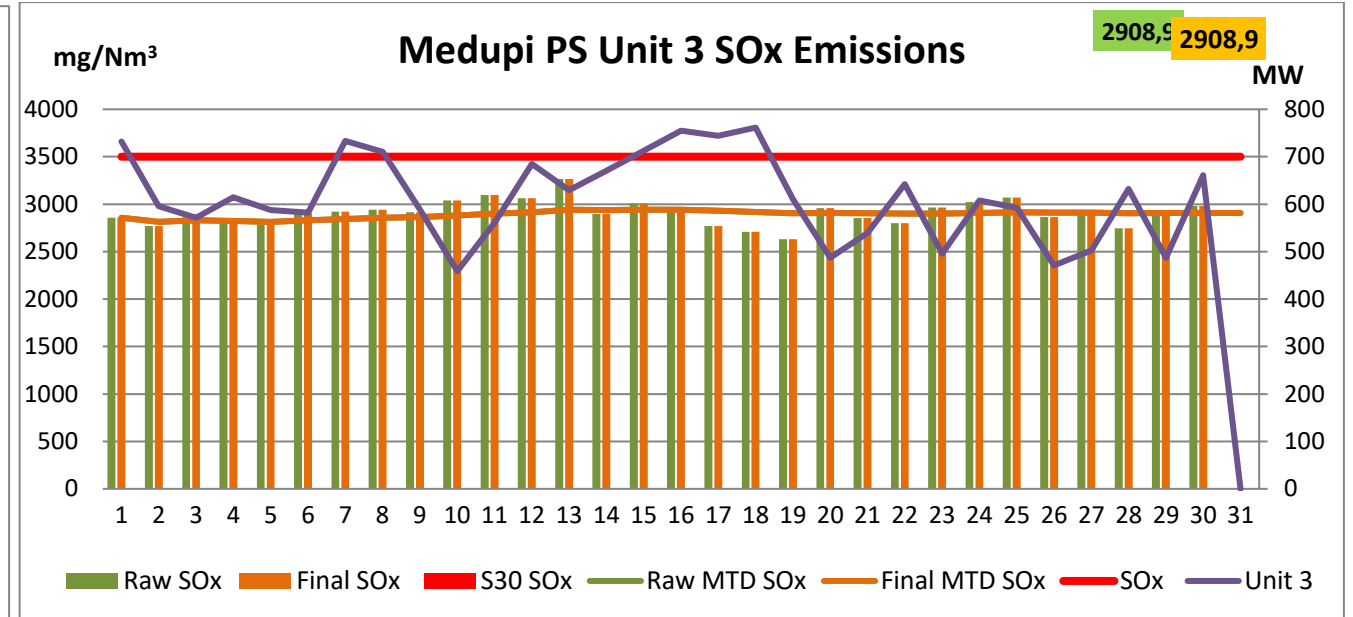
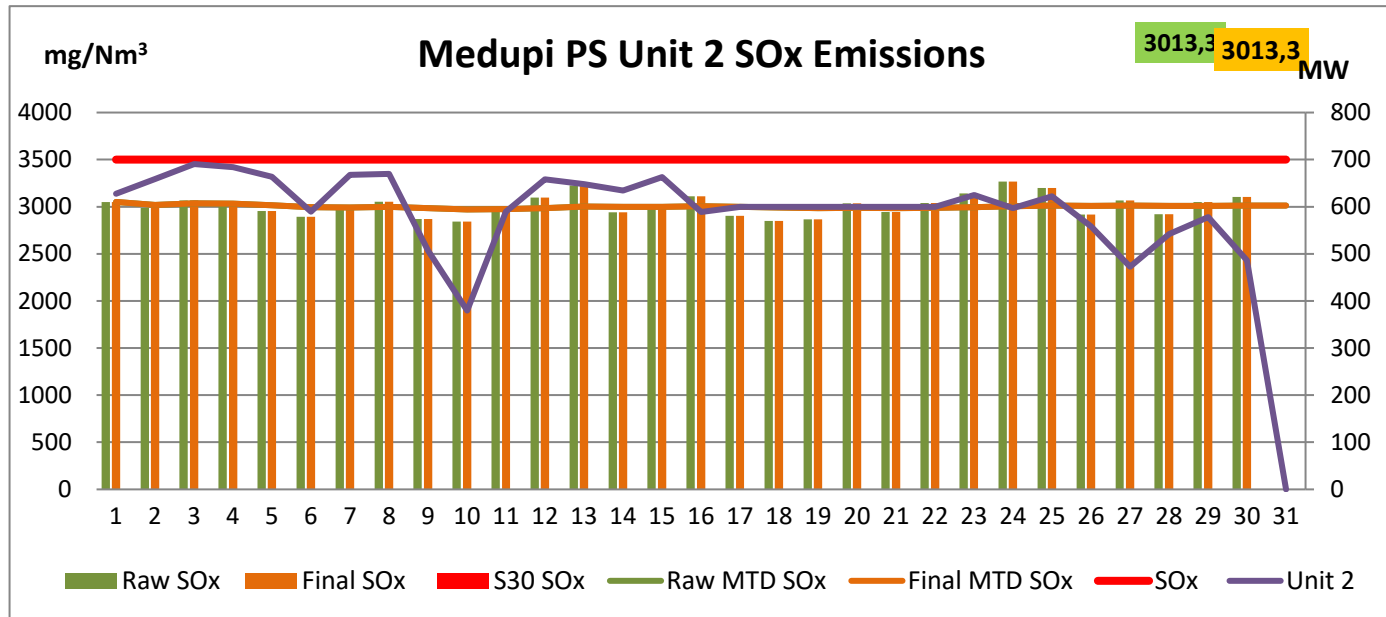
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Medupi Power Station graphical representation of the daily average emissions for SO₂

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Figure 14: Medupi Unit 2 NOx Emissions - September 2020

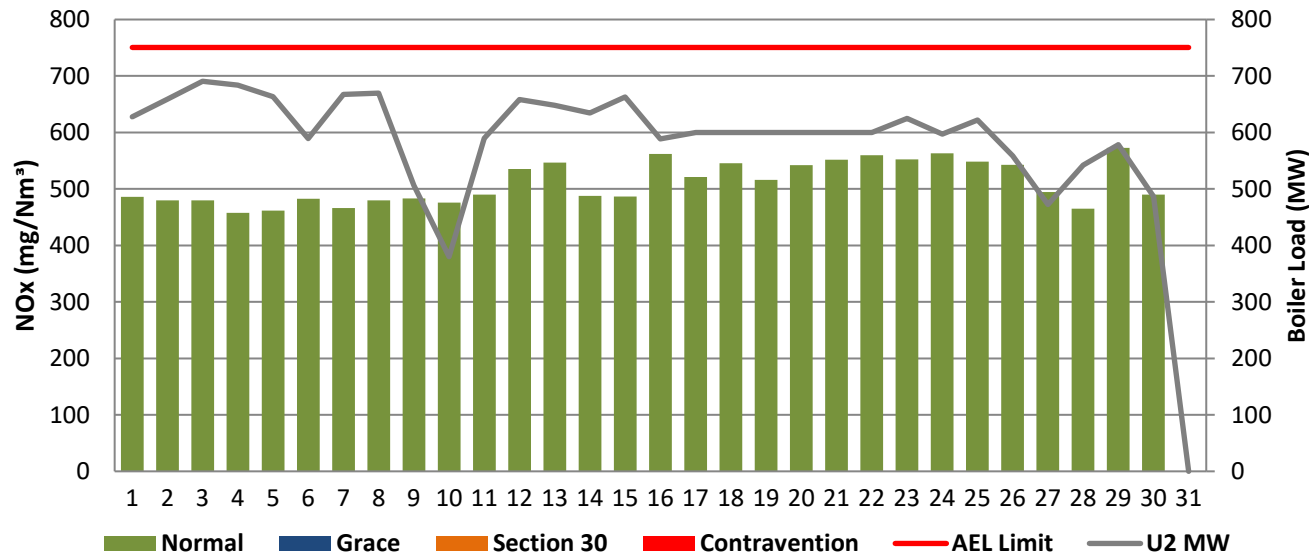


Figure 15: Medupi Unit 3 NOx Emissions - September 2020

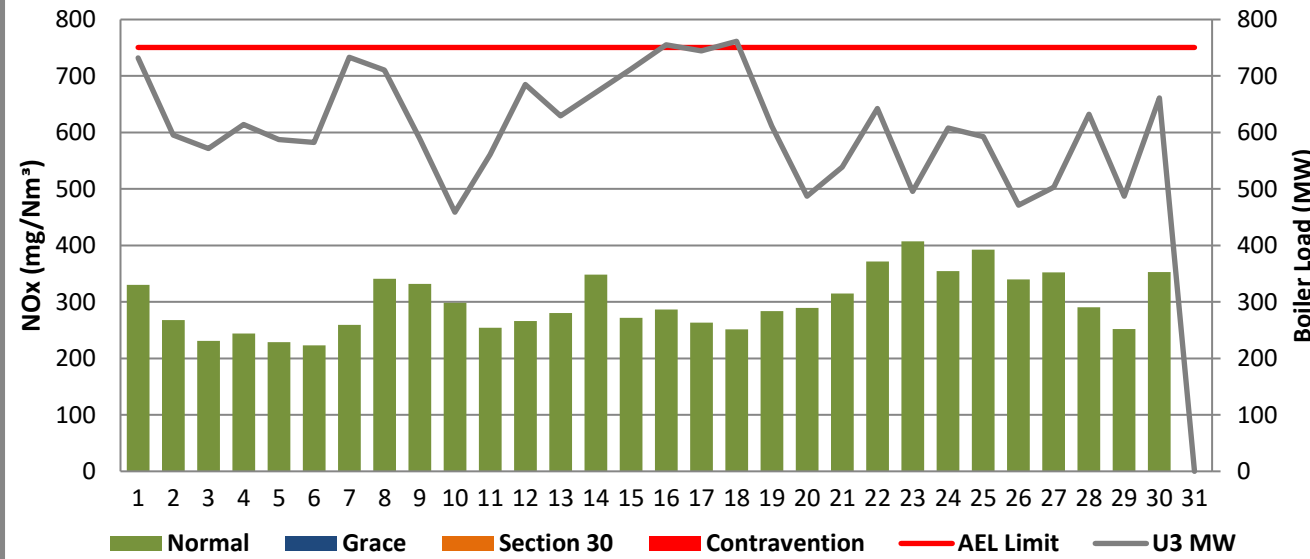


Figure 17: Medupi Unit 5 NOx Emissions - September 2020

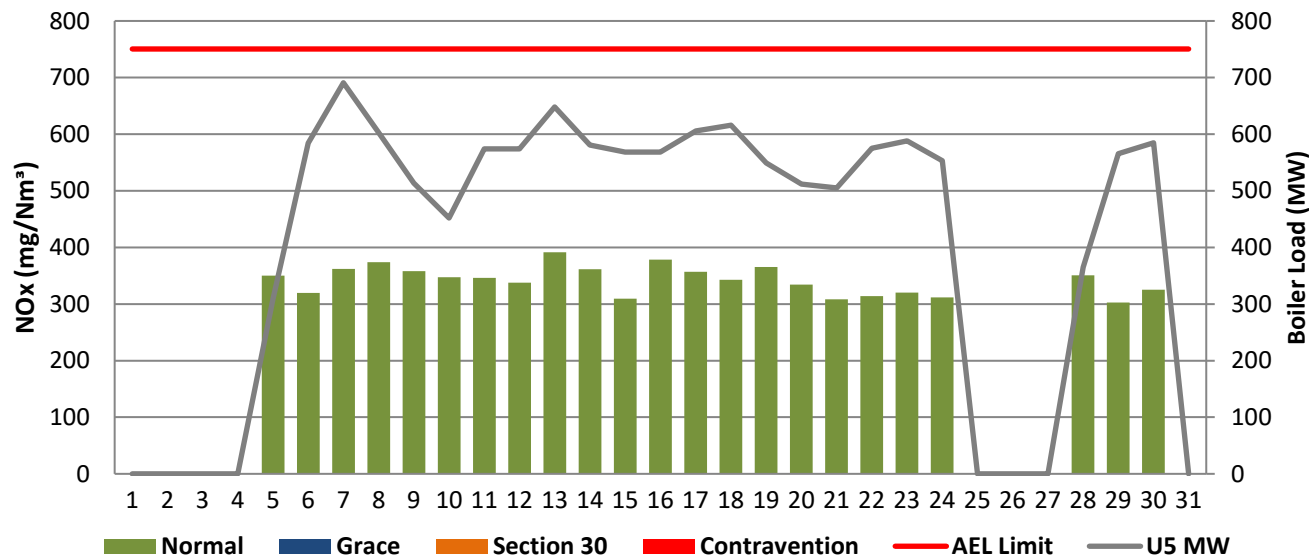
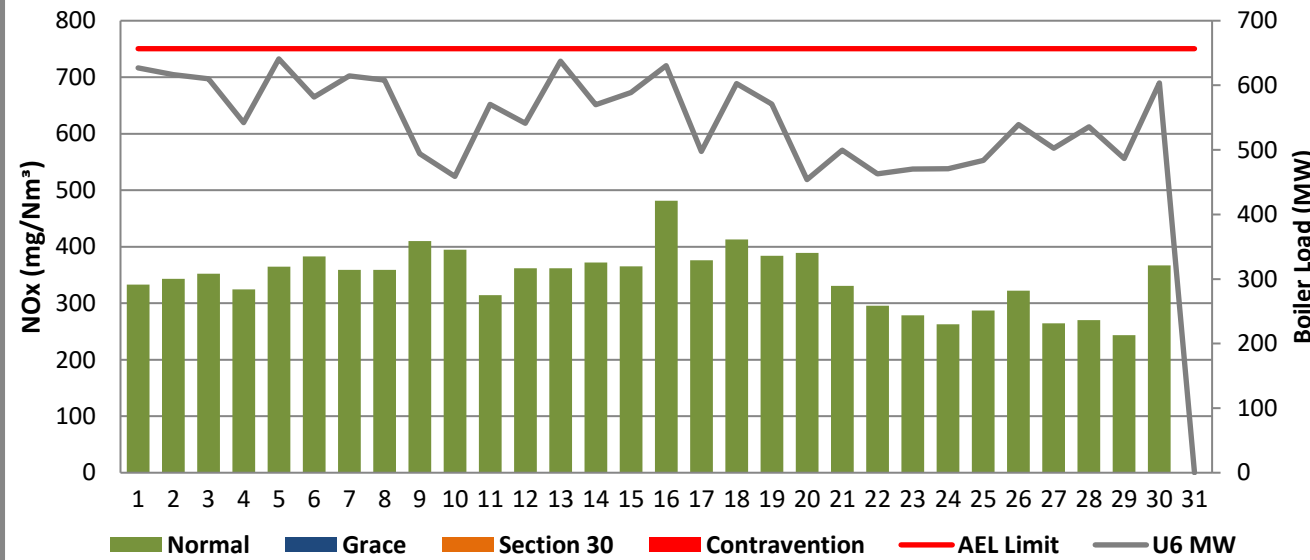


Figure 18: Medupi Unit 6 NOx Emissions - September 2020



Medupi Power Station graphical representation of the daily average emissions for NO₂

Note: Point 31 on all the graphs above represent emission for the first day of October 2020.

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Table 7: Monthly tonnages for the month of September 2020

Unit	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO (tons)
1	0.0	0	0	0
2	36.4	5951	1009	29
3	58,1	5 063	520	191
4	0,0	0	0	0
5	39,1	4 099	442	36
6	123,3	4 139	553	51
SUM	256,9	19 252	2 524	306

5. Shutdown/start-up information


Table 8: PM Start-up information for the month of September 2020

Unit No.	Unit 5	
Breaker Open (BO)	9:15 pm	2020/09/24
Draught Group (DG) Shut Down (SD)	11:05 am	2020/09/25
BO to DG SD (duration)	00:13:50	DD:HH:MM
Fires in time	12:25 pm	2020/09/27
Synch. to Grid (or BC)	1:45 pm	2020/09/28
Fires in to BC (duration)	01:01:20	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit
Emissions below limit from BC (duration)	n/a	DD:HH:MM

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6. Comments on the performance and availability of each unit

Medupi Power station complied with the average emissions limit for all pollutants in all units during the reporting period.

7. Continuous Emission Monitoring Systems (CEMS)

Unit 2, 3, 4, 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 ₂	NO	O ₂
Unit 1	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Unit 2	99,7	99,8	99,7	99,8
Unit 3	99,9	99,9	99,9	99,7
Unit 4	<i>Unit off</i>	<i>Unit off</i>	<i>Unit off</i>	<i>Unit off</i>
Unit 5	99,9	99,9	99,3	99,4
Unit 6	100,0	97,8	96,4	84,3


8. CEMS Calibration certificates and equipment used for calibration

See attached Appendix A

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9. 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.

10. Visual inspection of the exterior walls of the fuel oil tanks, fuel oil inventory data 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 2020

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	30 September 2020	
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	
<p align="center"> MONTHLY INPUT DATA FOR THE STATION Please only insert relevant monthly data inputs into the blue cells below Choose from a dropdown menu in the green cells The total VOC emissions for the month are in the red cells IMPORTANT: Do not change any other cells without consulting the AQ CoE </p>		
MONTH:	September	
GENERAL INFORMATION:		
	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:	2194	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	23.43	°C
Daily maximum ambient temperature	31.06	°C
Daily minimum ambient temperature	16.52	°C
Daily ambient temperature range	14.54	°C
Daily total insolation factor	4.41	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.69	kg/month
Working losses:	0.06	kg/month
TOTAL LOSSES (Total TVOC Emissions for the month):	0.75	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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11. Air quality improvements initiatives and public education and awareness campaigns

No awareness campaign.

12. Complaints Register


Table 9: Complaints for the month of September 2020

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: Lufuno Tshidzumba 
Senior Environmental Advisor

Verified by: Malose Langa 
System Engineer Boiler

Supported by: Sithokozile Hlongwa 
Boiler Engineering Manager

Supported by: Rosetta Rammutla 
Environmental Manager

Supported by: Jabulani Mkhathshwa 
Engineering Group Manager

I Dan Mashigo, declares that the information provided in this report is accurate and correct.


Yours sincerely


 Dan Mashigo
GENERAL MANAGER: MEDUPI POWER STATION (Acting)


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APPENDIX 1: CEMS Calibration certificates



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PO Box 328, ISANDO, SA, 1600
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www.e-analytics.co.za

Tel: 0861 000 032
Intl. Tel: +27 11 918 6994
Fax: +27 11 894 1037
CO REG #: 2004/007607/07
info@e-analytics.co.za


CALIBRATION CERTIFICATE


						CERTIFICATE NO:	
						3641	
CUSTOMER:	Eskom Medupi				JOB NO:	SC1757	
CONTACT NAME:	Lerato Sehume				TEL:	078 012 9038	
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	15711				
AUXILIARY EQUIPMENT:	Unit 2						

CHAN		PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE
CO	Zero	-1 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	837 ppm	835 ppm	CO	836.4 ppm	P20FO00332	2021-02-03
NO	Zero	-1 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	878 ppm	877 ppm	NO	876.7 ppm	P20FO00346	2021-01-21
SO2	Zero	-15 ppm	0	Air	20.95 %	Air	N/A
	Span	2203 ppm	2200 ppm	SO2	2200.0 ppm	P20FO00345	2021-02-21
O2	Zero	-0.08 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.10 %	20.95 %	Air	20.95 %	Air	N/A


REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.

Date of Calibration:
18 Aug 2020
Calibration Due Date:
Nov 2020
Technician:
J. Faber





Document Number: TH-PFC-002-F1 Rev 2





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Elemental Analytics
Analyser Specialists

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Intl. Tel: +27 11 918 6994
Fax: +27 11 894 1037
CO REG #: 2004/007607/07
info@e-analytics.co.za


CALIBRATION CERTIFICATE


		CERTIFICATE NO:	
		3642	
CUSTOMER:	Eskom Medupi	JOB NO:	SC1757
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	15712
AUXILIARY EQUIPMENT:	Unit 3		

CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE	
CO	Zero	-2 ppm	0 ppm	Air	20.95 %	N/A	
	Span	839 ppm	835 ppm	CO	836.4 ppm	P20F000332	2021-02-03
NO	Zero	-3 ppm	0 ppm	Air	20.95 %	N/A	
	Span	882 ppm	877 ppm	NO	876.7 ppm	P20F000346	2021-01-21
SO2	Zero	0 ppm	0	Air	20.95 %	N/A	
	Span	2249 ppm	2200 ppm	SO2	2200.0 ppm	P20F000345	2021-02-21
O2	Zero	-0.05 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	20.97 %	20.95 %	Air	20.95 %	Air	N/A


REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.

Date of Calibration:
18 Aug 2020
Calibration Due Date:
Nov 2020
Technician:
J. Faber





Document Number: TH-PFC-002-F1 Rev 2





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CALIBRATION CERTIFICATE


CERTIFICATE NO:					
3643					
CUSTOMER:	Eskom Medupi			JOB NO:	SC1757
CONTACT NAME:	Lerato Sehume			TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13668		
AUXILIARY EQUIPMENT:	Unit 4				

CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE	
CO	Zero	0 ppm	0 ppm	Air	20.95 %	N/A	
	Span	833 ppm	835 ppm	CO	836.4 ppm	P20F000332	2021-02-03
NO	Zero	-2 ppm	0 ppm	Air	20.95 %	N/A	
	Span	878 ppm	877 ppm	NO	876.7 ppm	P20F000346	2021-01-21
SO2	Zero	-9 ppm	0	Air	20.95 %	N/A	
	Span	2257 ppm	2200 ppm	SO2	2200.0 ppm	P20F000346	2021-02-21
O2	Zero	0.12 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.04 %	20.95 %	Air	20.95 %	N/A	N/A

REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.


Date of Calibration:
17 Aug 2020
Calibration Due Date:
Nov 2020
Technician:
J. Faber






SERVOMEX
A REASSEMBLY ADVANTAGE

Document Number: TH-PFC-002-F1 Rev 2



GMI





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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	January 2021		
		Review Date	January 2024		



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CALIBRATION CERTIFICATE


CERTIFICATE NO:
3644


CUSTOMER:	Eskom Medupi	JOB NO:	SC1757
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13670
AUXILIARY EQUIPMENT:	Unit 5		

CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE	
CO	Zero	-25 ppm	0 ppm	Air	20.95 %	N/A	
	Span	815 ppm	835 ppm	CO	836.4 ppm	P20FO00332	2021-02-03
NO	Zero	-18 ppm	0 ppm	Air	20.95 %	N/A	
	Span	857 ppm	877 ppm	NO	876.7 ppm	P20FO00346	2021-01-21
SO2	Zero	-34 ppm	0	Air	20.95 %	N/A	
	Span	2236 ppm	2200 ppm	SO2	2200.0 ppm	P20FO00345	2021-02-21
O2	Zero	0.05 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.13 %	20.95 %	Air	20.95 %	Air	N/A

REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.



Date of Calibration:
17 Aug 2020
Calibration Due Date:
Nov 2020
Technician:
J. Faber





SERVOMEX
A HEADSTART ADVANTAGE

Document Number: TH-PFC-002-F1 Rev 2






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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6	
		Document Identifier	240-88543153	Rev	2	
		Effective Date	January 2021			
		Review Date	January 2024			



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Analytical Specialists

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CALIBRATION CERTIFICATE


CERTIFICATE NO:					
3645					
CUSTOMER:	Eskom Medupi			JOB NO:	SC1757
CONTACT NAME:	Lerato Sehume			TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13669		
AUXILIARY EQUIPMENT:	Unit 6				

CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE	
CO	Zero	-5 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	831 ppm	835 ppm	CO	836.4 ppm	P20FO00332	2021-02-03
NO	Zero	-15 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	868 ppm	877 ppm	NO	876.7 ppm	P20FO00346	2021-01-21
SO2	Zero	-83 ppm	0	Air	20.95 %	Air	N/A
	Span	2389 ppm	2389 ppm	SO2	2200.0 ppm	P20FO00345	2021-02-21
O2	Zero	-0.36 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.34 %	20.95 %	Air	20.95 %	Air	N/A


REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. SO2 cell diagnostics is low and cell does not calibrate on cylinder value, but cell is still reacting, and O2 cell sensitivity start to go down. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.

Date of Calibration:
17 Aug 2020
Calibration Due Date:
Nov 2020
Technician:
J. Faber





SERVOMEX
A MEASUREMENT ADVANTAGE



TELEDYNE ANALYTICAL INSTRUMENTS
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Document Number: TH-PFC-002-F1 Rev 2

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