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Date:
11 November 2020

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Ref: (12/4/12L-W4/A3)

Dear Mrs Thivhafuni

MATIMBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF OCTOBER 2020

This serves as the monthly report required in terms of Section 7.7.1 in Matimba Power Station's Atmospheric Emission License 12/4/12L-W4/A4.



Raw Materials and Products

Table 1: Quantity of Raw Materials and Products used/produced for the month.

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption Rate (Quantity)	Consumption Rate
	Coal	Tons/month	1 500 000	954 634
	Fuel Oil	Tons/month	1 200	1972,203
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate
	Energy	GWh	4 212.6	1797,822

Fuel oil usage for October 2020 exceeded the set limit of 1200 Tons/month. The exceedance was due to multiple start-ups of units that was required after unplanned trips and planned outages.

Abatement Technology

Table 2: Abatement Equipment Control Technology utilise.

Associated Unit	Technology Type	Actual Utilisation (%)
Unit 1	Electrostatic Precipitator	99,951%
Unit 2	Electrostatic Precipitator	99,936%
Unit 3	Electrostatic Precipitator	99,924%
Unit 4	Electrostatic Precipitator	99,946%
Unit 5	Electrostatic Precipitator	99,952%
Unit 6	Electrostatic Precipitator	99,918%

Associated Unit	Technology Type	Actual Utilisation (%)
Unit 1	SO ₃ Plant	94
Unit 2	SO ₃ Plant	0
Unit 3	SO ₃ Plant	86
Unit 4	SO ₃ Plant	92
Unit 5	SO ₃ Plant	98
Unit 6	SO ₃ Plant	98

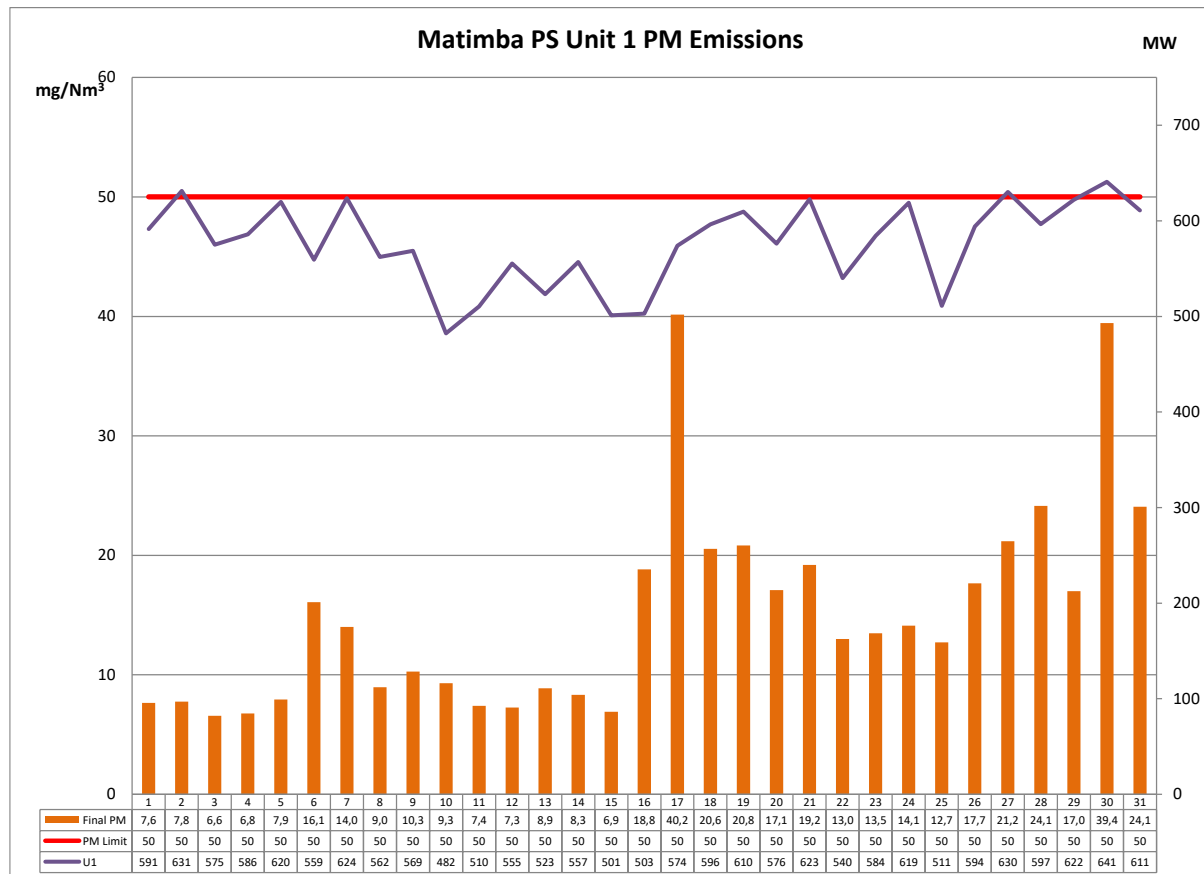
Energy Source Characteristics

Table 3: Energy Source Material Characteristics.

	Characteristic	Stipulated Range (Unit)	Monthly Average Content
Coal burned	Sulphur Content	0.8-1.6%	1,290%
	Ash Content	30-40%	33,228%

Emissions Reporting

Unit 1 particulate emissions

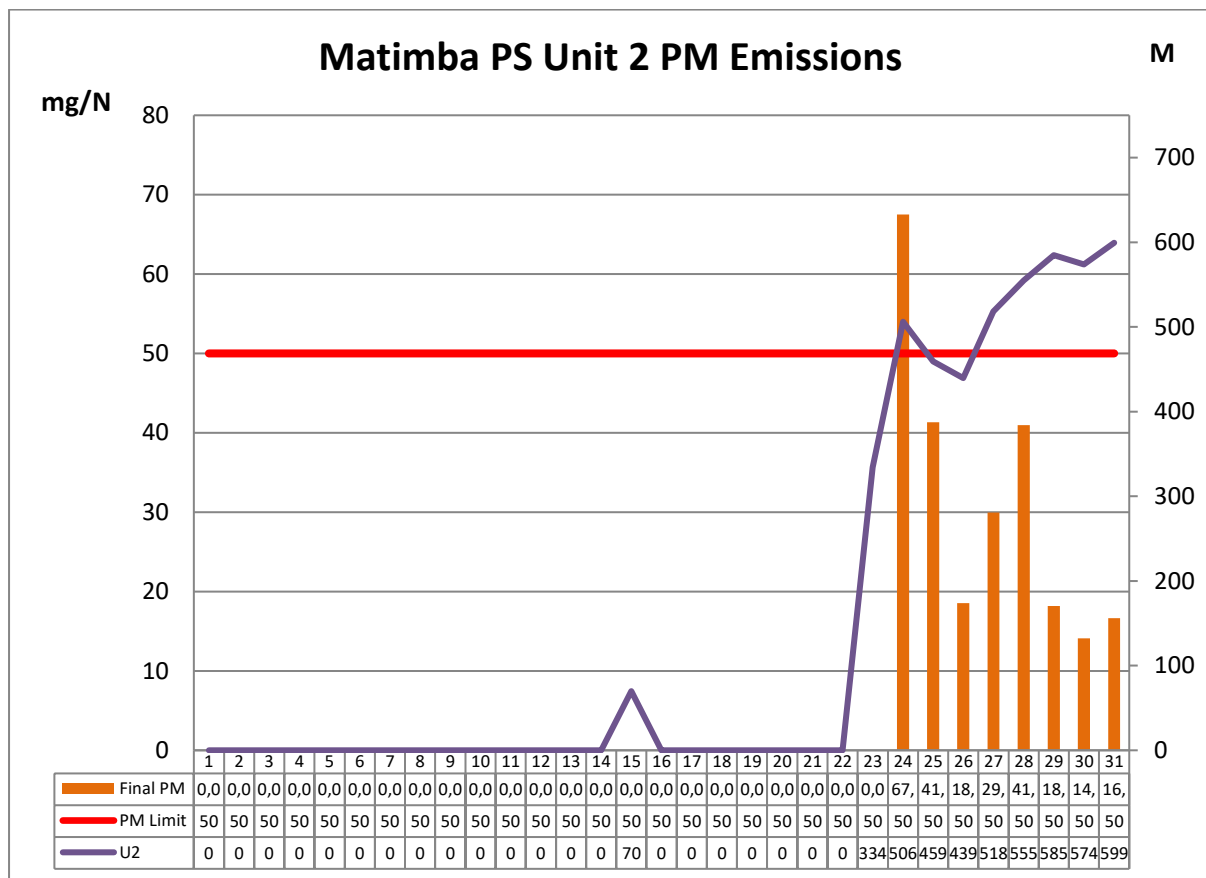


Graph 1: Particulate matter daily average emissions against emission limit for unit 1 for the month of October 2020

Interpretation:

All daily averages below particulate emission limit of 50 mg/Nm³.

Unit 2 particulate emissions



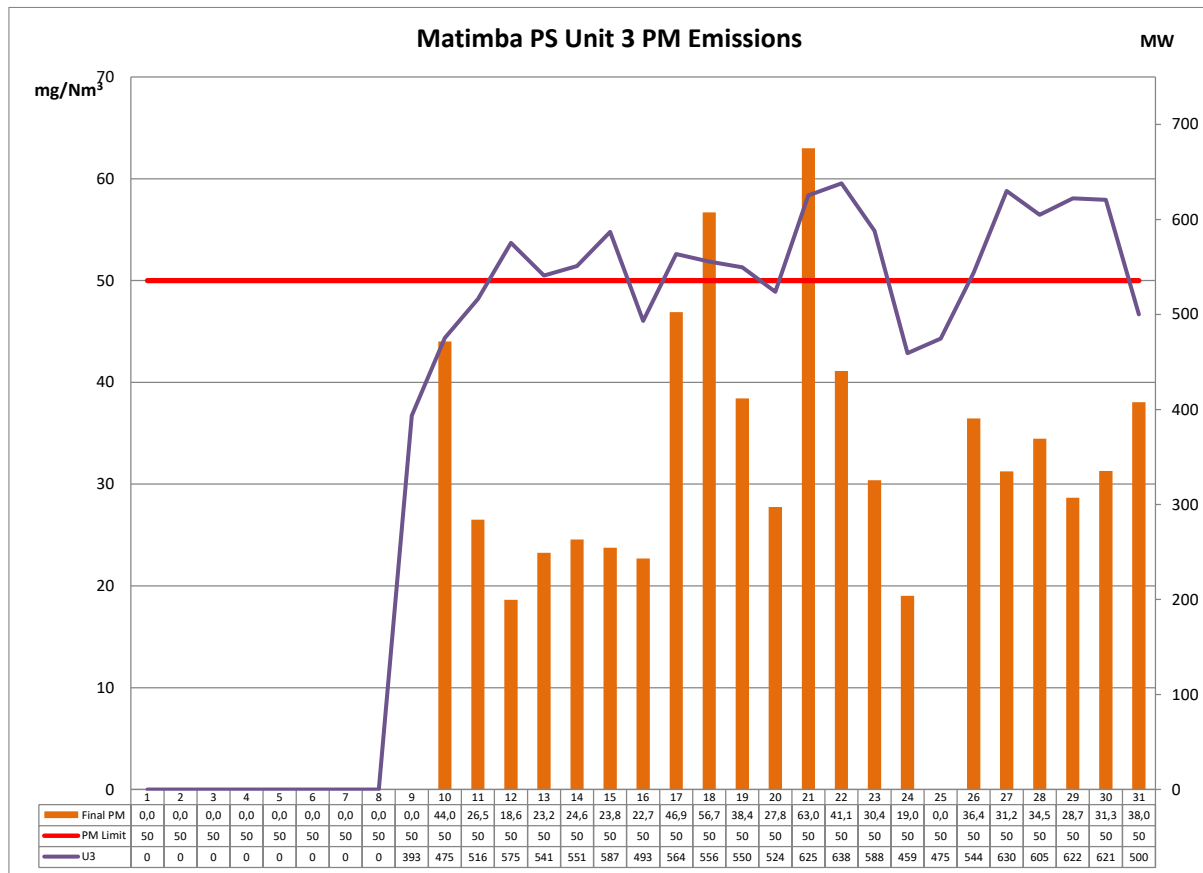
Graph 2: Particulate matter daily average emissions against emission limit for unit 2 for the month of October 2020

Interpretation:

Unit 2 exceeded the particulate emission limit of 50 mg/Nm³ on the 24th of October 2020. The exceedance occurred directly after unit light-up and did not exceed the 48hour grace period allowed.

Note: Matimba has submitted an application for postponement of the Minimum Emission Standards to the Department. As per the communication to Eskom on the 26th of March 2020 limits before April 2020 will still apply until the postponement applications has been concluded. The limit before April 2020 is 100mg/Nm³ and is for this reason not a reportable exceedance.

Unit 3 particulate emissions



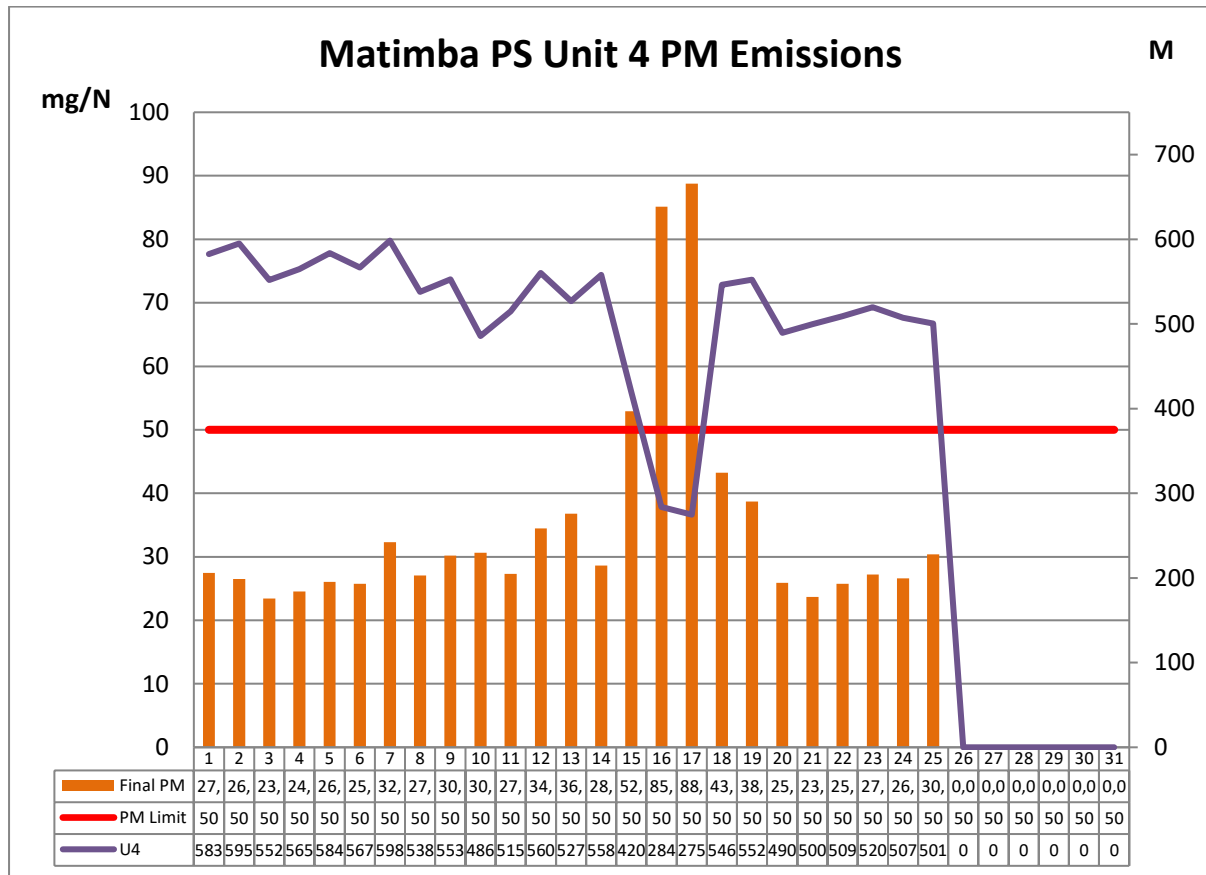
Graph 3: Particulate matter daily average emissions against emission limit for unit 3 for the month of October 2020

Interpretation:

Unit 3 exceeded the particulate emission limit of 50 mg/Nm³ on the 18th and 21st of October 2020. The exceedances did not exceed the 48hour grace period allowed.

Note: Matimba has submitted an application for postponement of the Minimum Emission Standards to the Department. As per the communication to Eskom on the 26th of March 2020 limits before April 2020 will still apply until the postponement applications has been concluded. The limit before April 2020 is 100mg/Nm³ and is for this reason not a reportable exceedance.

Unit 4 particulate emissions



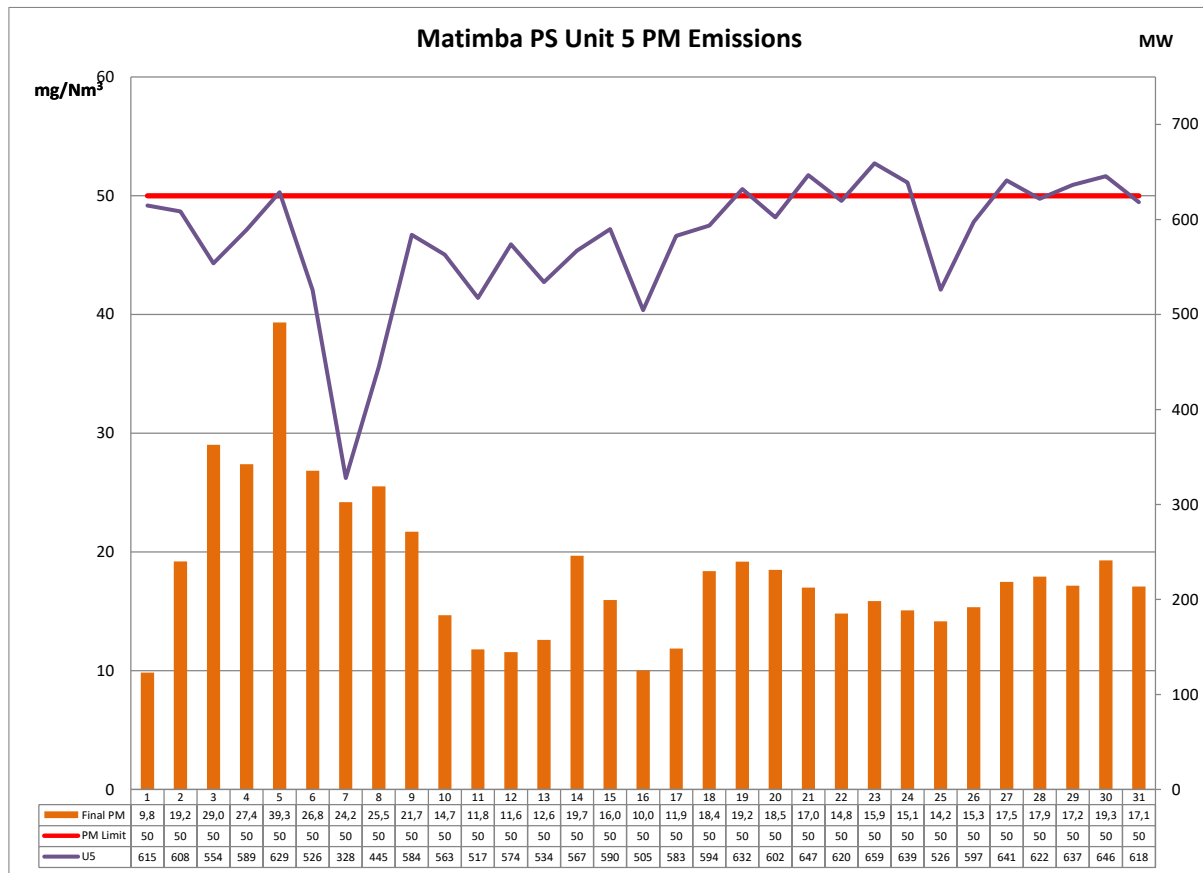
Graph 4: Particulate matter daily average emissions against emission limit for unit 4 for the month of October 2020

Interpretation:

Unit 4 exceeded the particulate emission limit of 50 mg/Nm³ on the 15th, 16th and 17th of October 2020.

Note: Matimba has submitted an application for postponement of the Minimum Emission Standards to the Department. As per the communication to Eskom on the 26th of March 2020 limits before April 2020 will still apply until the postponement applications has been concluded. The limit before April 2020 is 100mg/Nm³ and is for this reason not a reportable exceedance.

Unit 5 particulate emissions

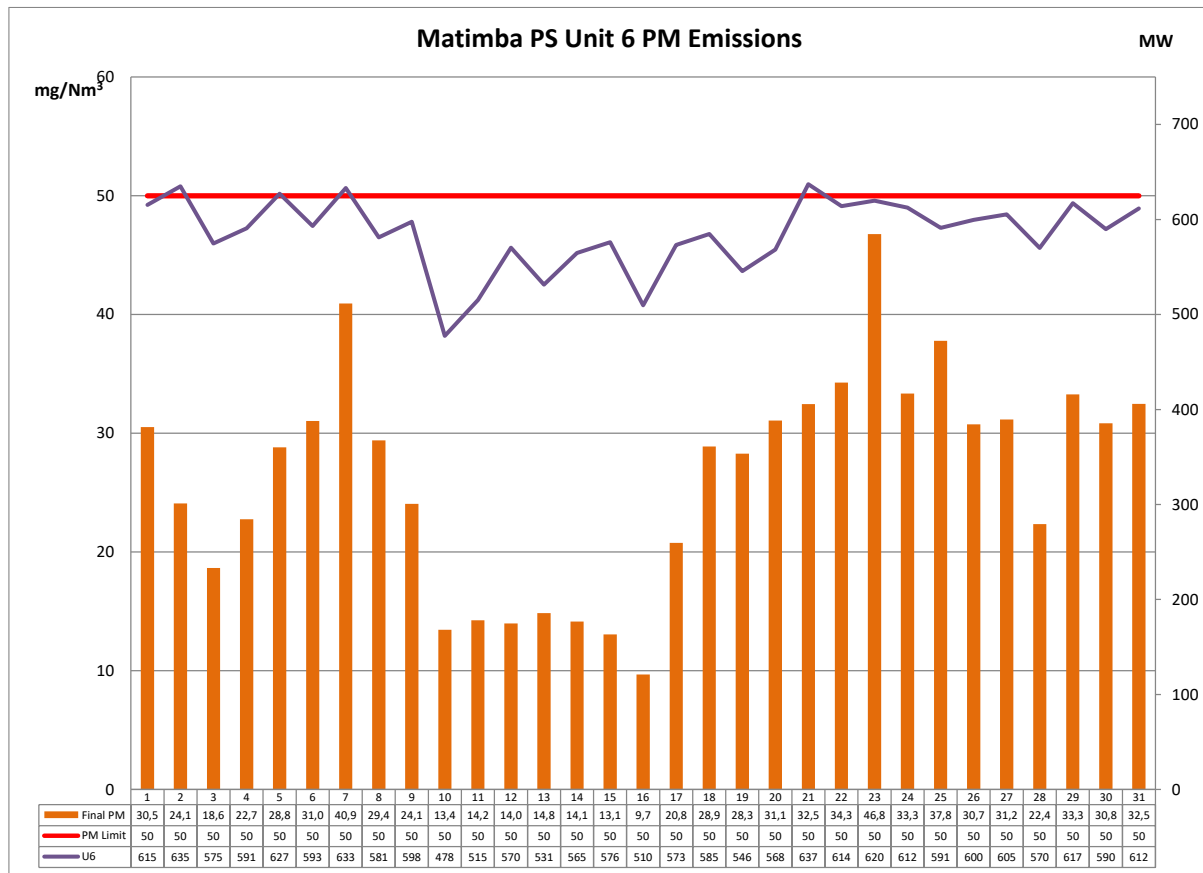


Graph 5: Particulate matter daily average emissions against emission limit for unit 5 for the month of October 2020

Interpretation:

All daily averages below particulate emission limit of 50 mg/Nm³.

Unit 6 particulate emissions

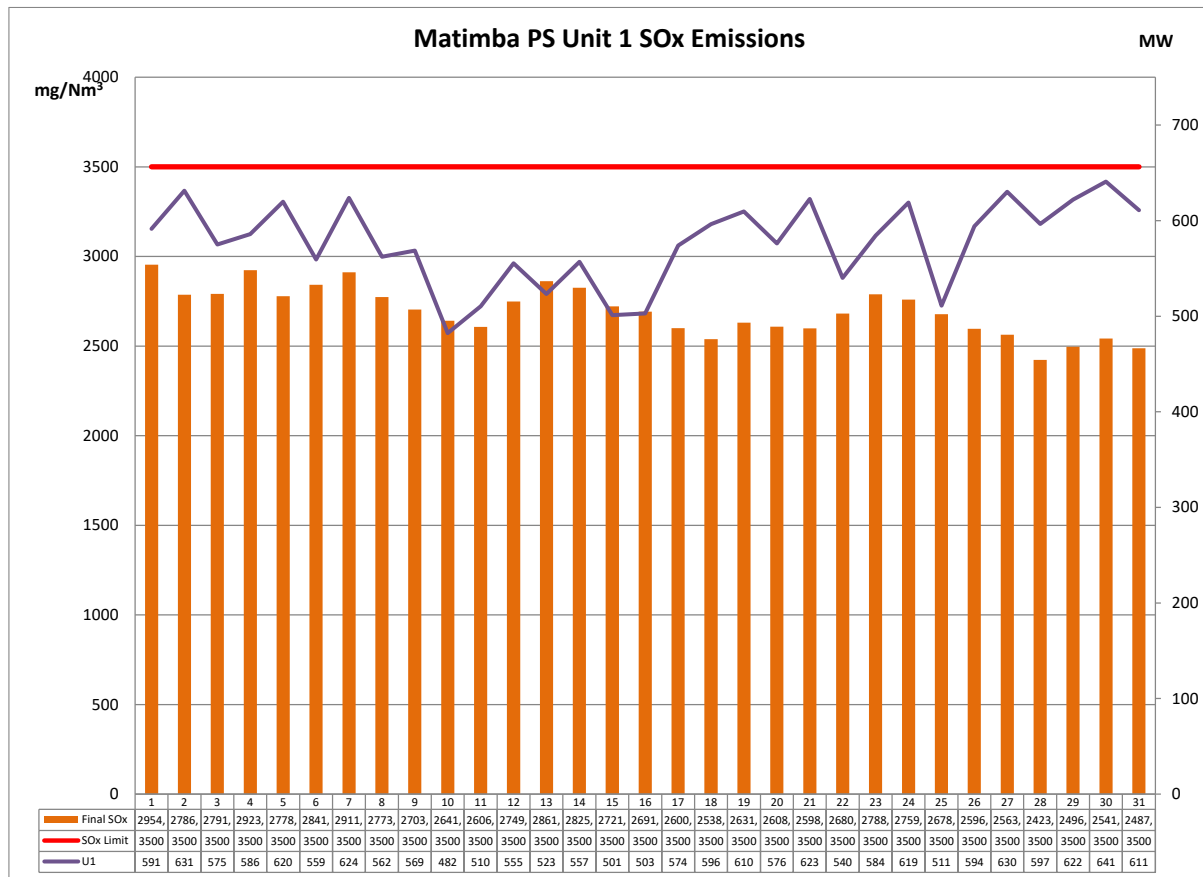


Graph 6: Particulate matter daily average emissions against emission limit for unit 6 for the month of October 2020

Interpretation:

All daily averages below particulate emission limit of 50 mg/Nm³.

Unit 1 SO₂ emissions

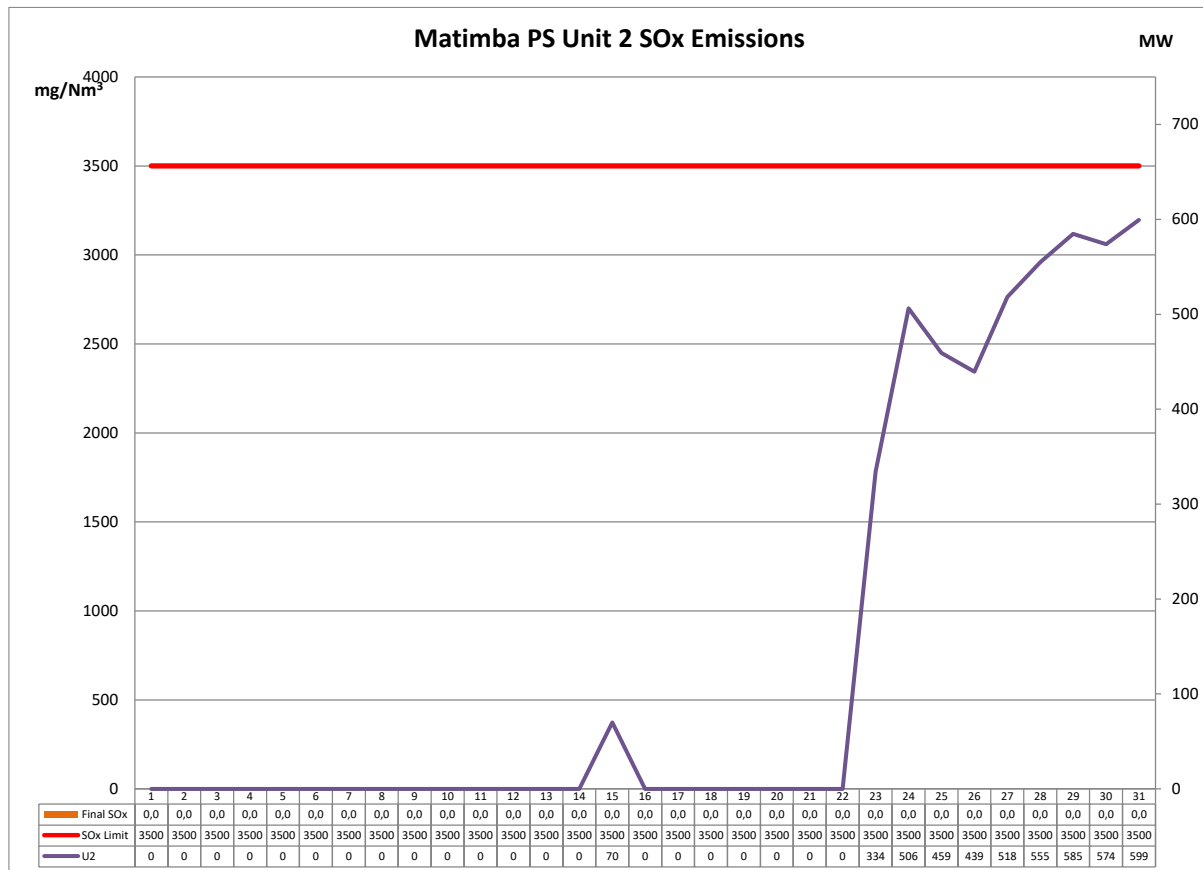


Graph 7: SO₂ daily average emissions against emission limit for unit 1 for the month of October 2020

Interpretation:

All daily averages below SO₂ emission limit of 3500 mg/Nm³.

Unit 2 SO₂ emissions

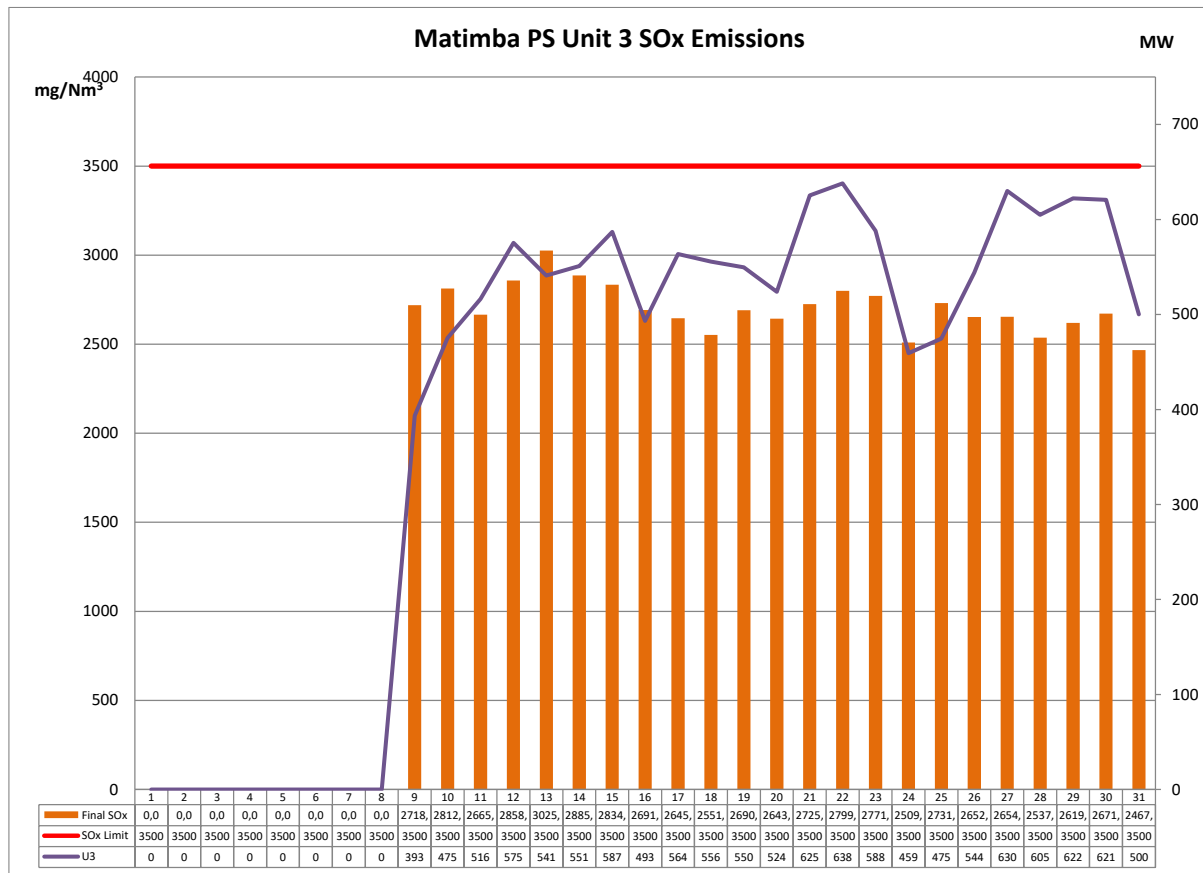


Graph 8: SO₂ daily average emissions against emission limit for unit 2 for the month of October 2020

Interpretation:

The gaseous monitors for unit 2 were found to be defective after start-up on the 22nd of October 2020. The monitors were repaired on the 3rd of November 2020.

Unit 3 SO₂ emissions

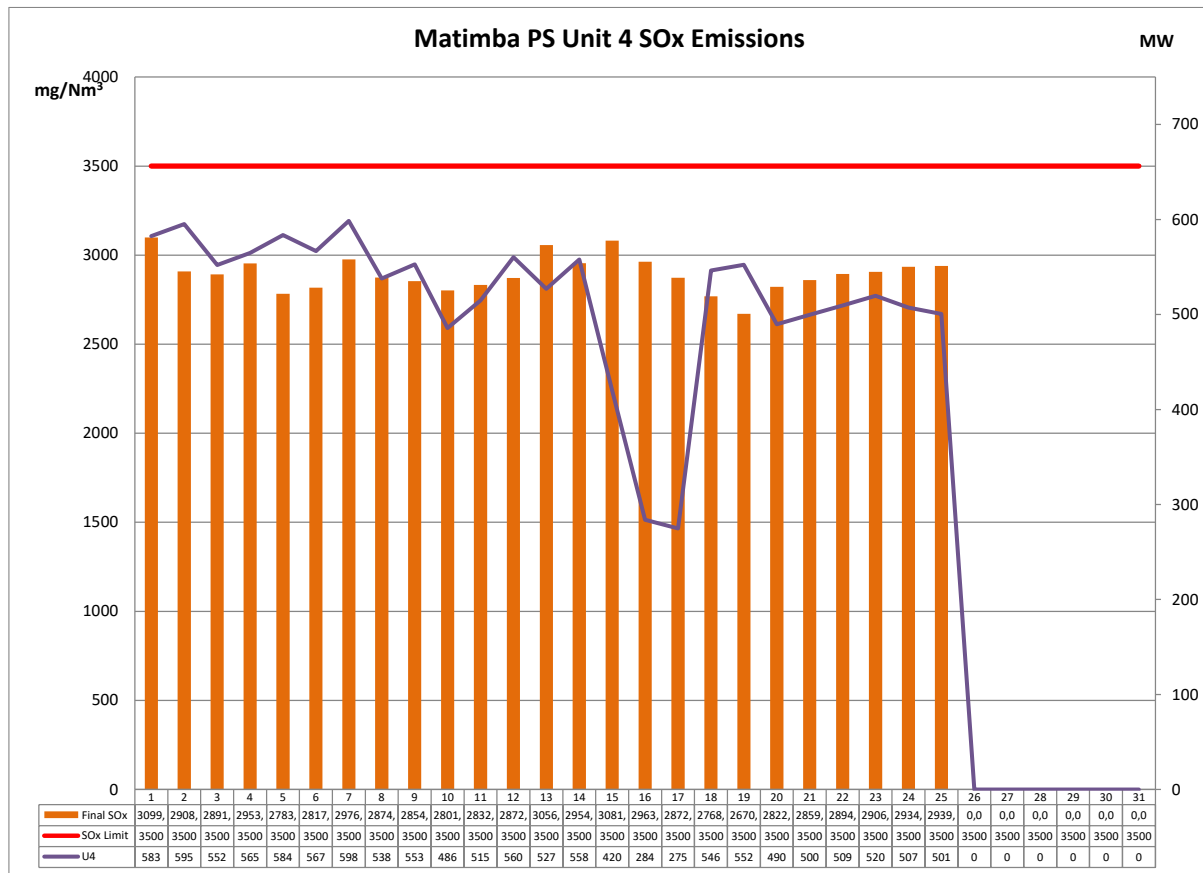


Graph 9: SO₂ daily average emissions against emission limit for unit 3 for the month of October 2020

Interpretation:

All daily averages below SO₂ emission limit of 3500 mg/Nm³.

Unit 4 SO₂ emissions

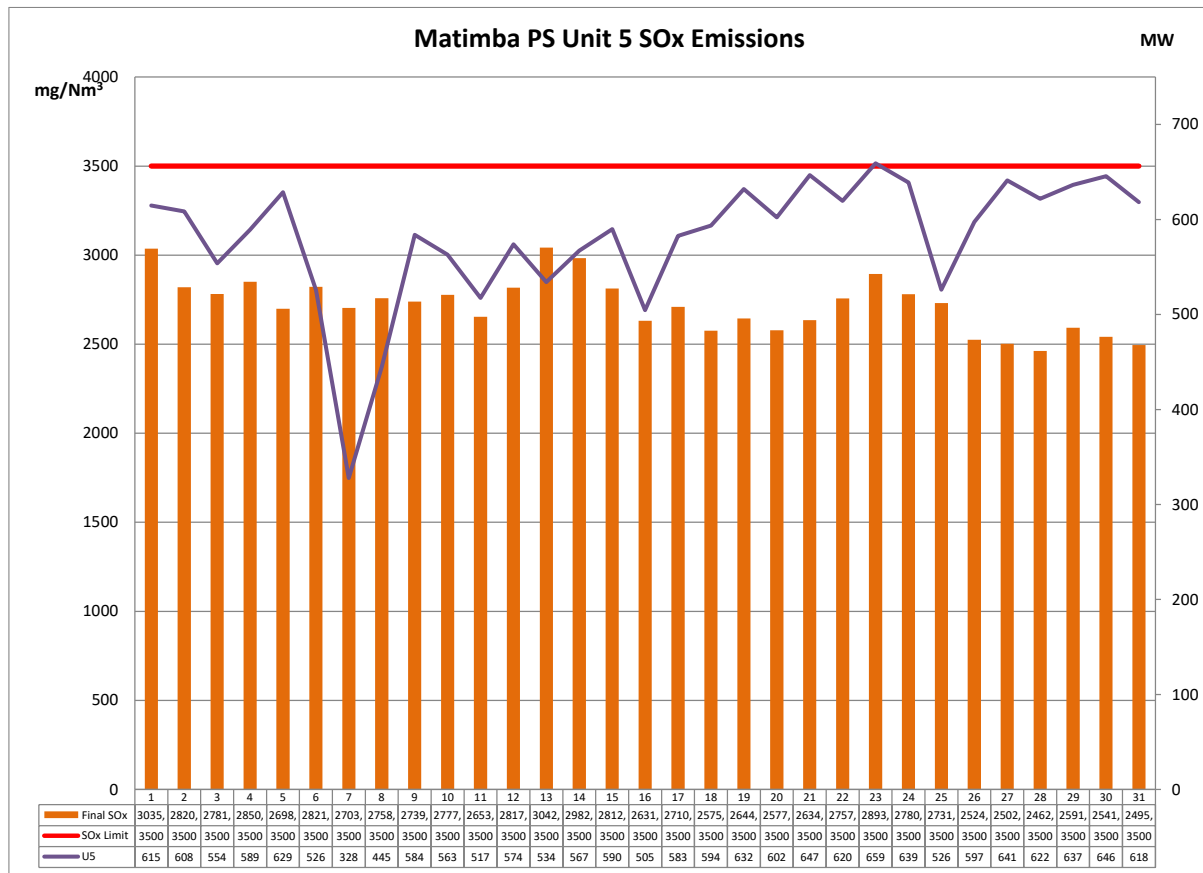


Graph 10: SO₂ daily average emissions against emission limit for unit 4 for the month of October 2020

Interpretation:

All daily averages below SO₂ emission limit of 3500 mg/Nm³.

Unit 5 SO₂ emissions

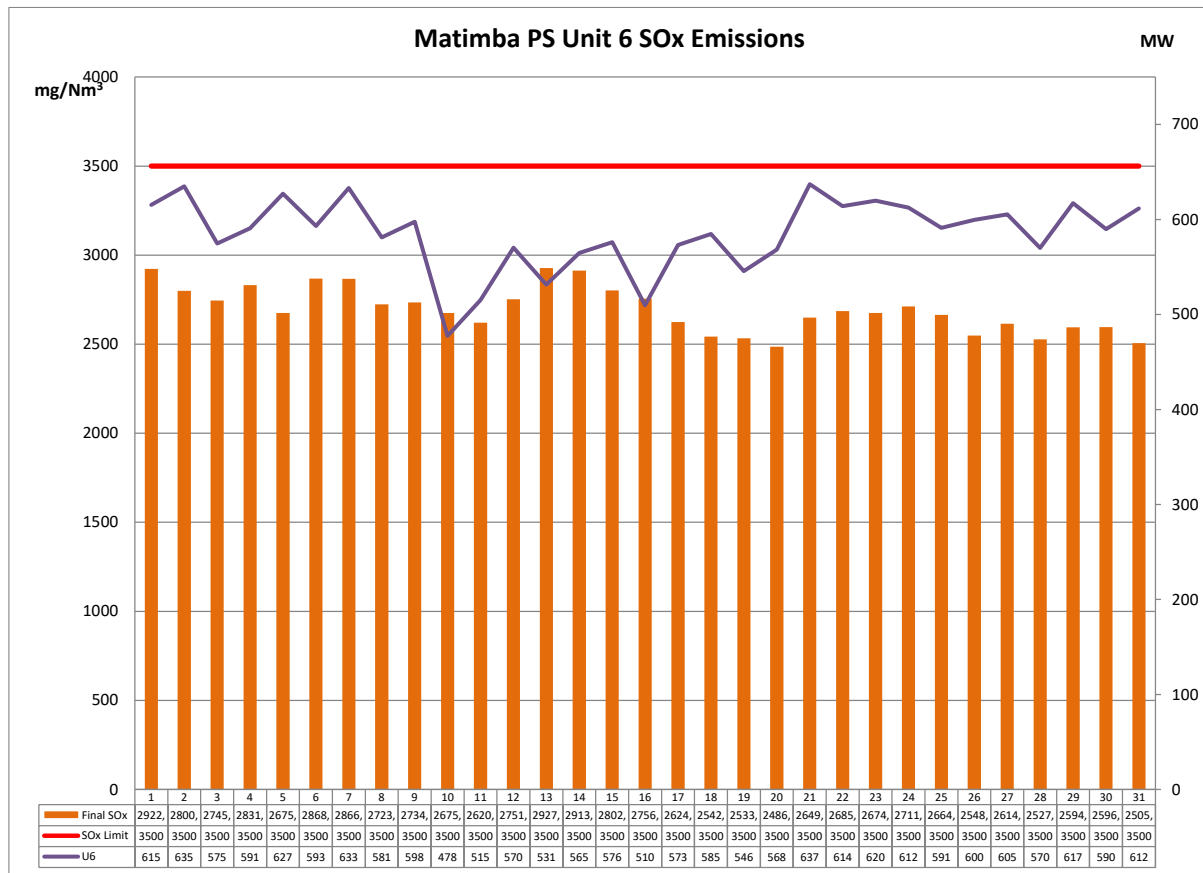


Graph 11: SO₂ daily average emissions against emission limit for unit 5 for the month of October 2020

Interpretation:

All daily averages below SO₂ emission limit of 3500 mg/Nm³.

Unit 6 SO₂ emissions

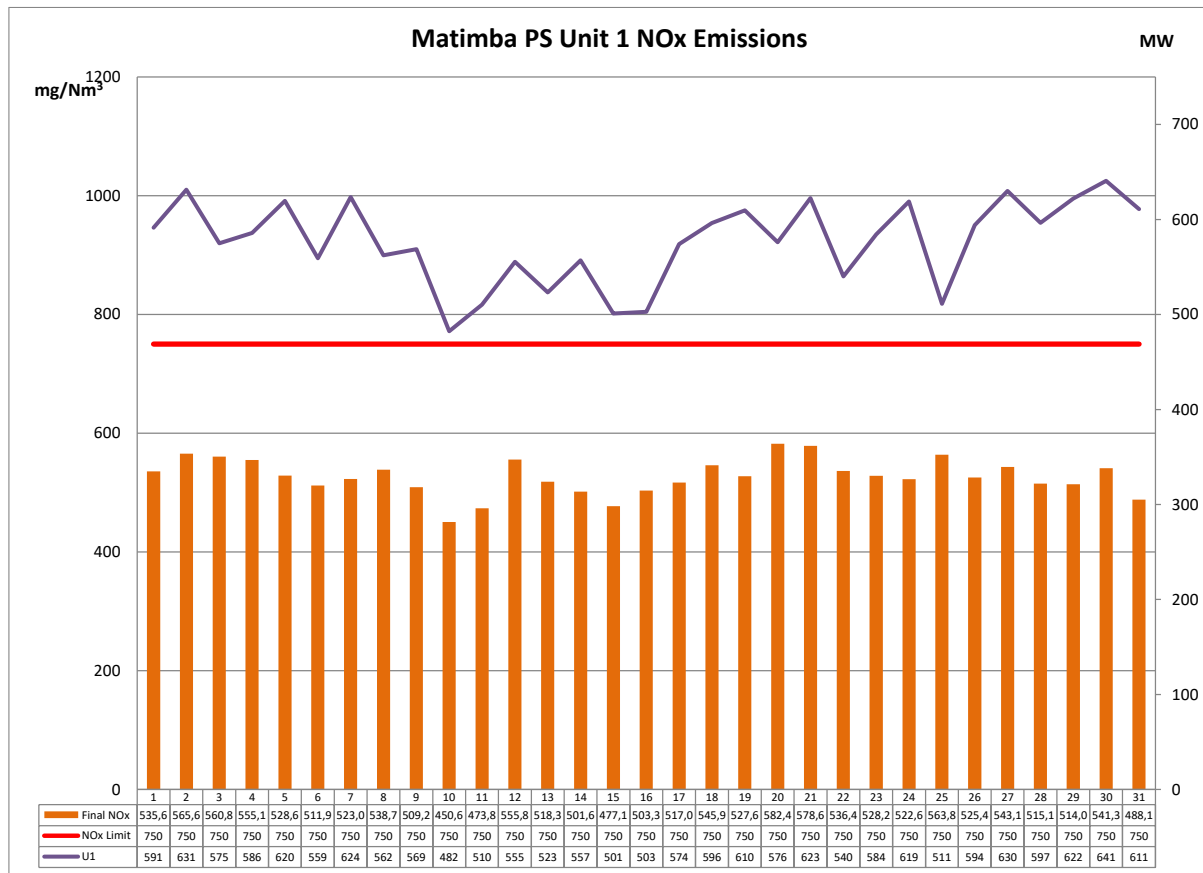


Graph 12: SO₂ daily average emissions against emission limit for unit 6 for the month of October 2020

Interpretation:

All daily averages below SO₂ emission limit of 3500 mg/Nm³.

Unit 1 NO_x emissions

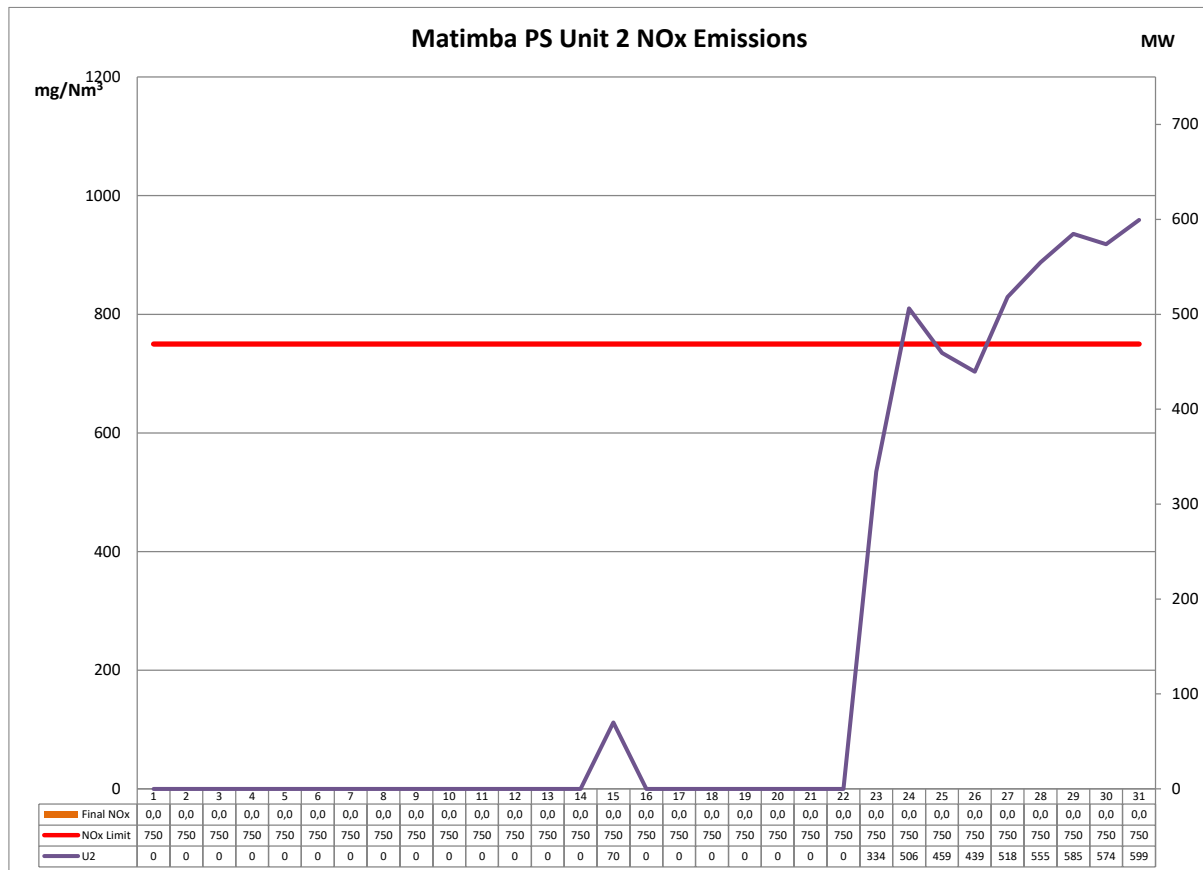


Graph 13: NO_x daily average emissions against emission limit for unit 1 for the month of October 2020

Interpretation:

All daily averages below NO_x emission limit of 750 mg/Nm³.

Unit 2 NO_x emissions

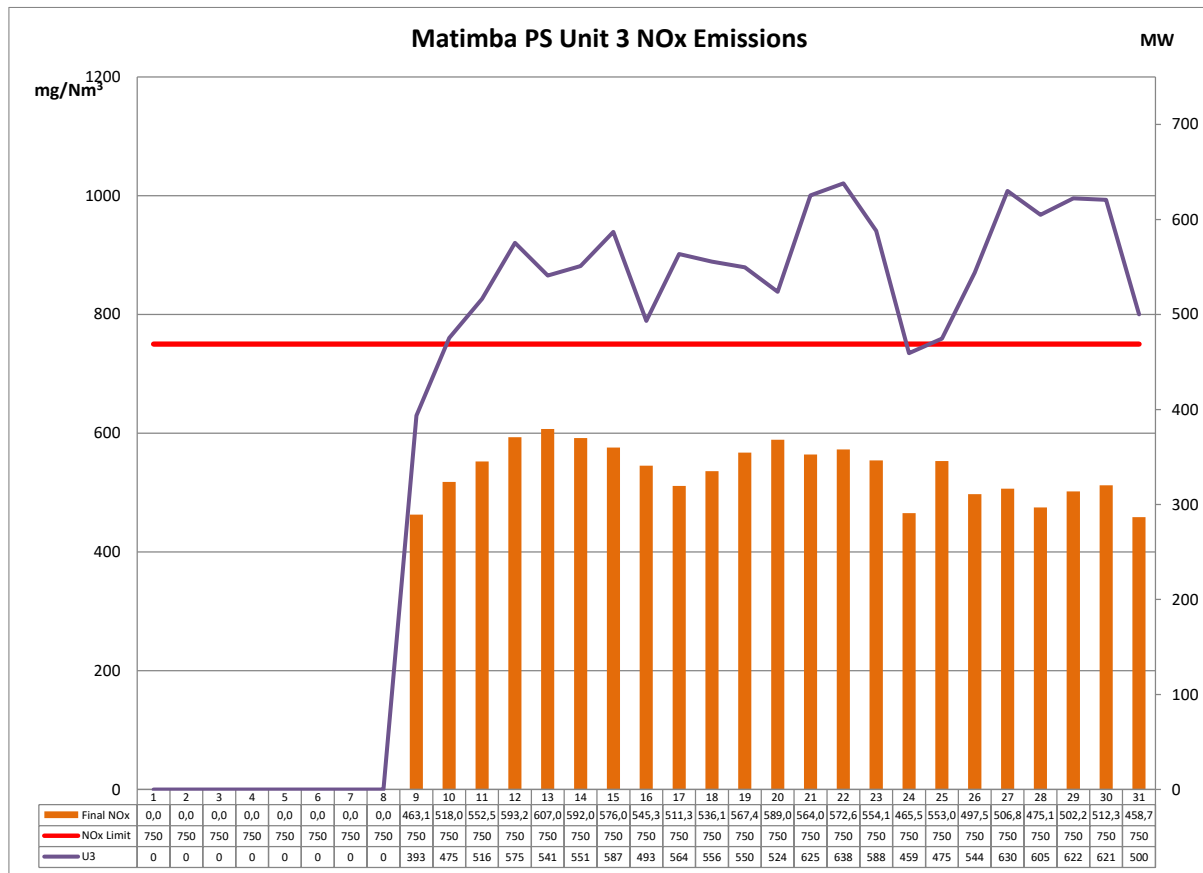


Graph 14: NO_x daily average emissions against emission limit for unit 2 for the month of October 2020

Interpretation:

The gaseous monitors for unit 2 were found to be defective after start-up on the 22nd of October 2020. The monitors were repaired on the 3rd of November 2020.

Unit 3 NO_x emissions

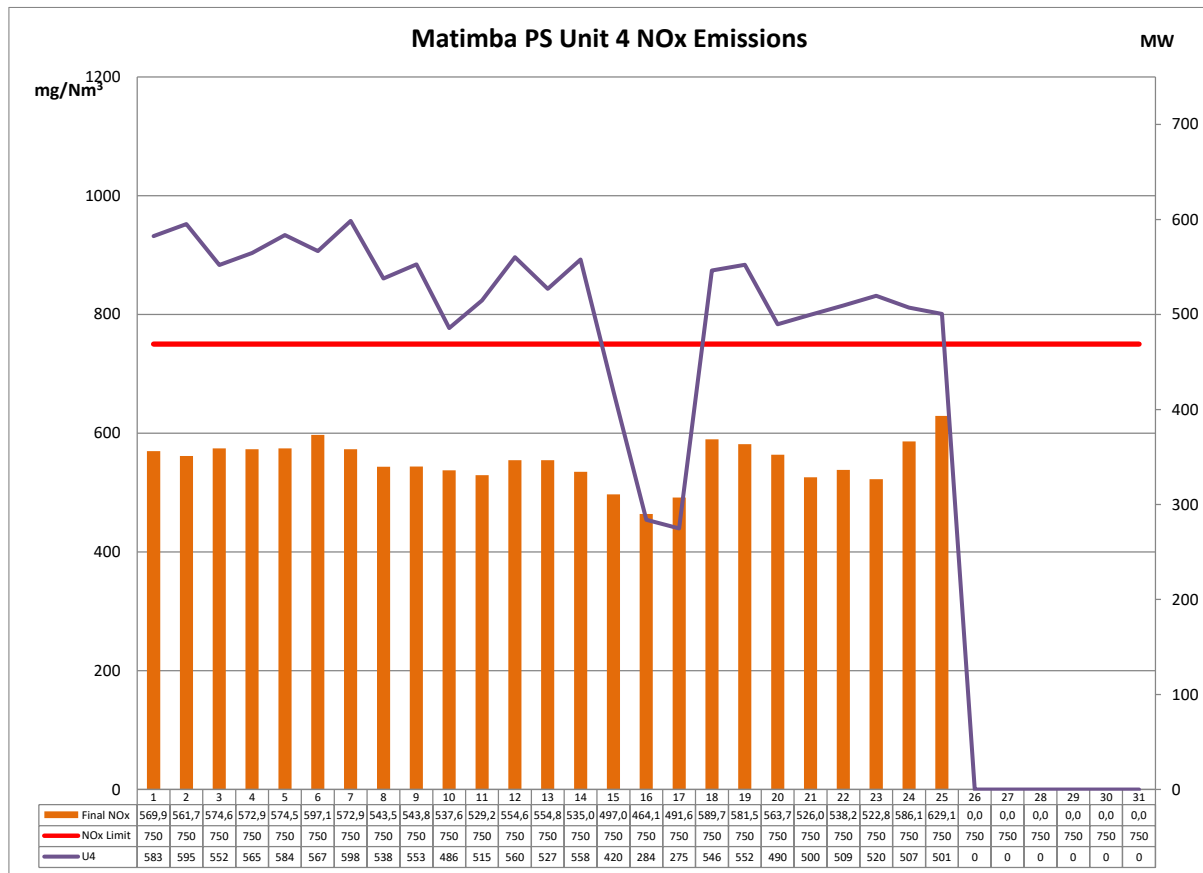


Graph 15: NO_x daily average emissions against emission limit for unit 3 for the month of October 2020

Interpretation:

All daily averages below NO_x emission limit of 750 mg/Nm³

Unit 4 NO_x emissions

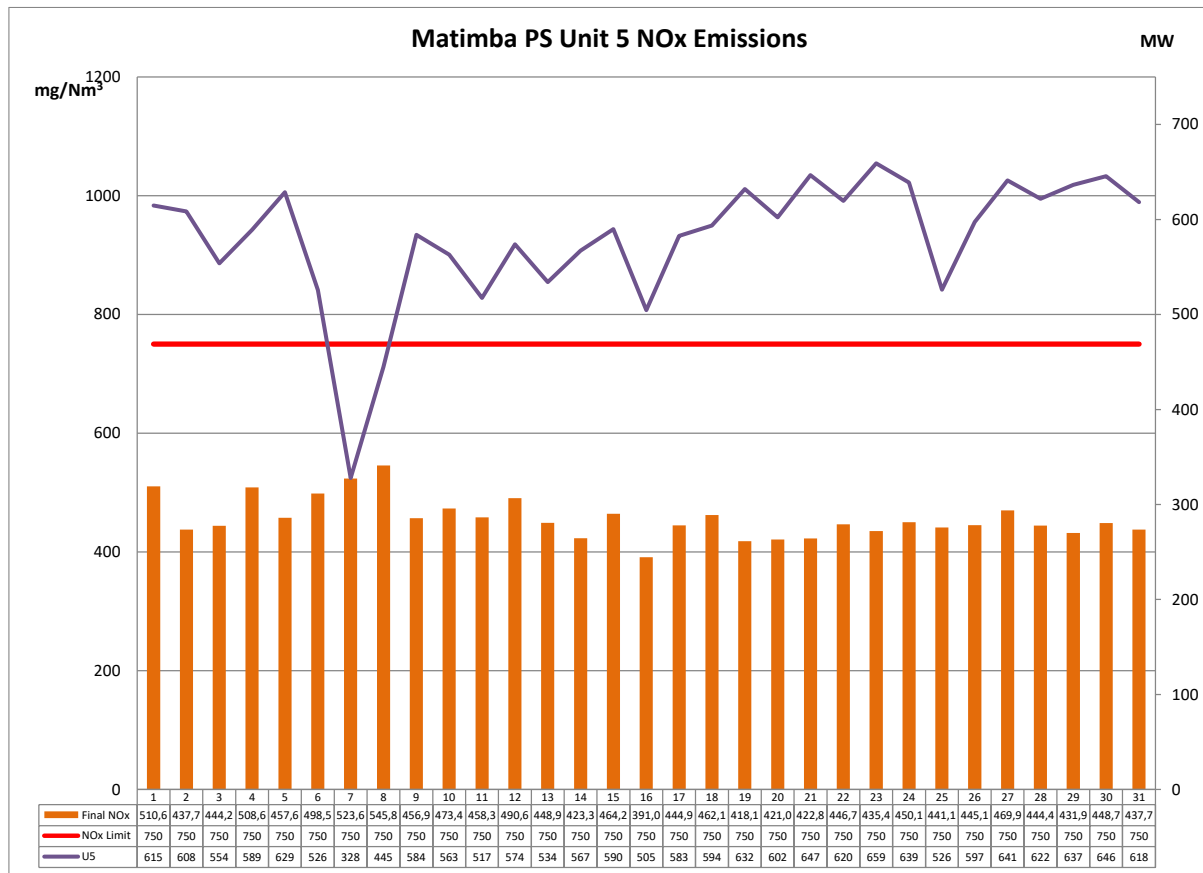


Graph 16: NO_x daily average emissions against emission limit for unit 4 for the month of October 2020

Interpretation:

All daily averages below NO_x emission limit of 750 mg/Nm³

Unit 5 NO_x emissions

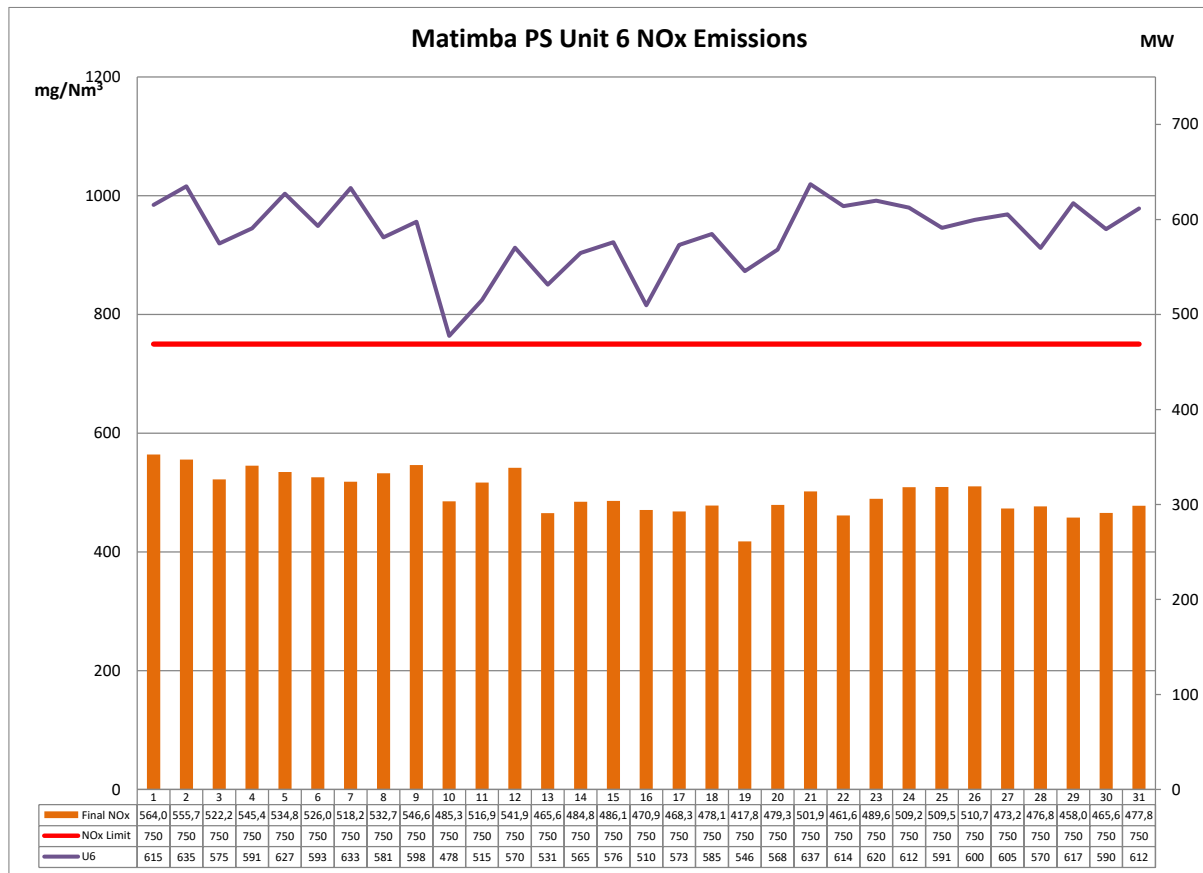


Graph 17: NO_x daily average emissions against emission limit for unit 5 for the month of October 2020

Interpretation:

All daily averages below NO_x emission limit of 750 mg/Nm³.

Unit 6 NO_x emissions



Graph 18: NO_x daily average emissions against emission limit for unit 6 for the month of October 2020

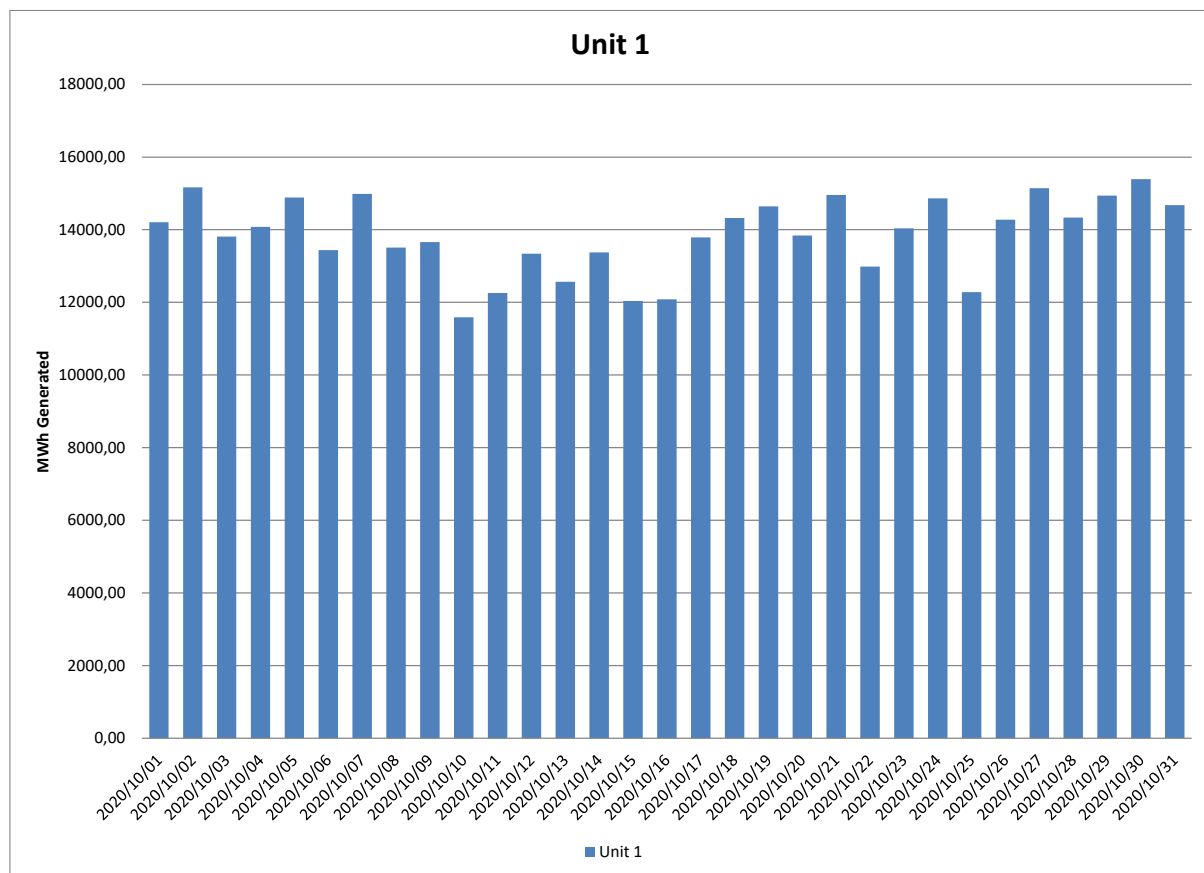
Interpretation:

All daily averages below NO_x emission limit of 750 mg/Nm³.

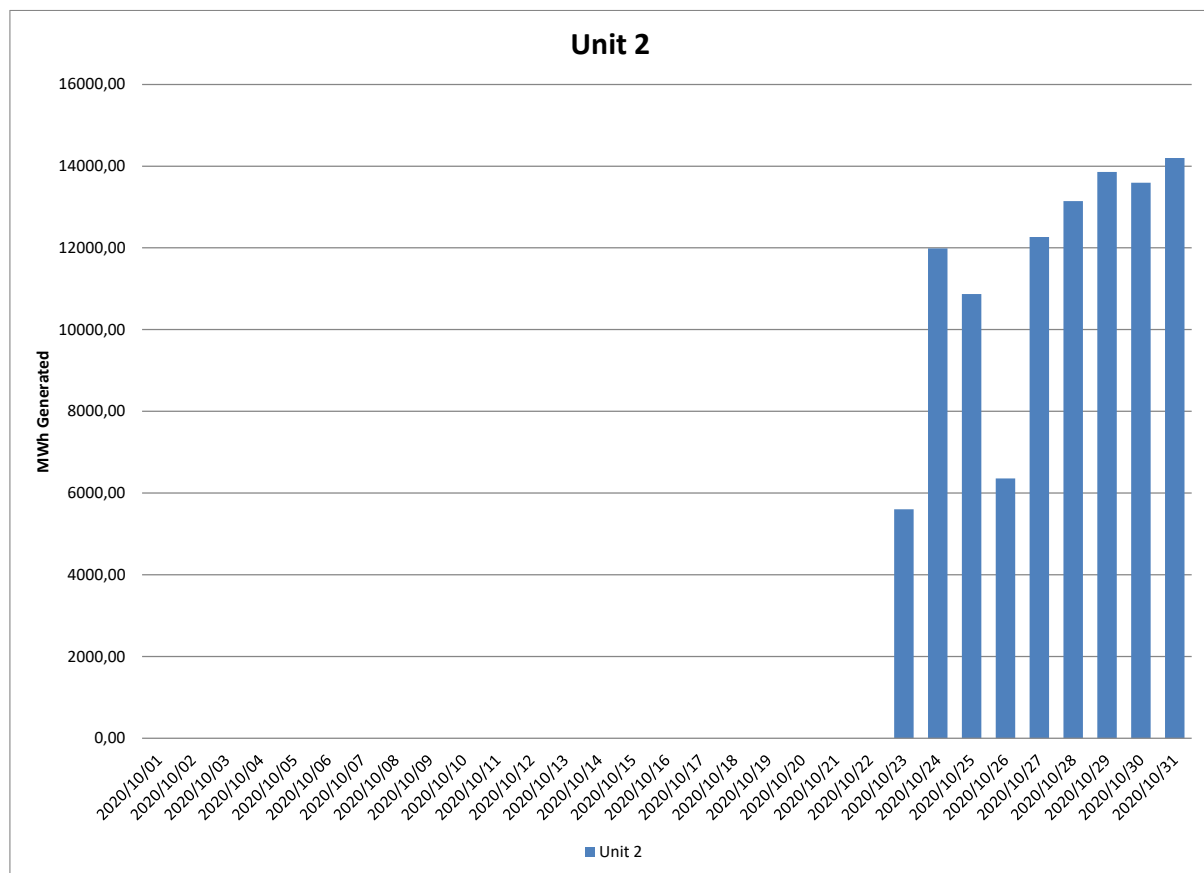
Table 4: Daily power generated per unit in MWh for the month of October 2020

Date	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
2020/10/01	14207,47	0,00	0,00	13921,80	14630,10	14730,80
2020/10/02	15163,40	0,00	0,00	14221,80	14479,30	15170,87
2020/10/03	13811,73	0,00	0,00	13193,00	13181,40	13700,33
2020/10/04	14076,07	0,00	0,00	13496,67	14022,70	14099,53
2020/10/05	14888,93	0,00	0,00	13944,87	14965,40	15011,13
2020/10/06	13438,47	0,00	0,00	13548,40	12518,80	14174,53
2020/10/07	14982,73	0,00	0,00	14302,87	7819,10	15124,53
2020/10/08	13507,07	0,00	0,00	12856,80	10591,90	13833,60
2020/10/09	13661,33	0,00	4597,67	13210,87	13893,80	14242,73
2020/10/10	11589,40	0,00	11344,73	11612,53	13401,30	11372,07
2020/10/11	12259,40	0,00	12327,13	12304,47	12320,40	12265,67
2020/10/12	13337,07	0,00	13734,73	13392,80	13660,20	13621,67
2020/10/13	12567,40	0,00	12914,13	12598,87	12716,70	12690,80
2020/10/14	13375,87	0,00	13154,47	13333,47	13498,80	13450,07
2020/10/15	12035,33	0,00	14012,80	10039,27	14039,70	13706,53
2020/10/16	12083,93	0,00	11777,33	6808,87	12014,10	12117,87
2020/10/17	13786,60	0,00	13456,20	6589,07	13864,10	13689,67
2020/10/18	14323,67	0,00	13267,87	13056,33	14125,90	13924,80
2020/10/19	14644,53	0,00	13126,60	13197,07	15034,00	12987,33
2020/10/20	13837,27	0,00	12510,27	11702,67	14328,90	13535,53
2020/10/21	14958,07	0,00	14931,67	11942,13	15387,20	15196,93
2020/10/22	12981,73	1,53	15235,20	12175,07	14742,50	14642,80
2020/10/23	14037,80	5601,60	14044,80	12416,27	15681,40	14774,47
2020/10/24	14865,87	11985,53	724,00	12126,47	15203,70	14598,20
2020/10/25	12281,60	10872,27	8225,20	6938,67	12524,10	14086,47
2020/10/26	14274,13	6355,93	12996,20	0,00	14215,30	14284,40
2020/10/27	15140,07	12264,80	15053,40	0,00	15250,70	14428,40
2020/10/28	14334,40	13145,93	14447,93	0,00	14795,40	13648,00
2020/10/29	14941,13	13855,40	14864,13	0,00	15142,00	14734,80
2020/10/30	15394,60	13594,67	14827,33	0,00	15359,30	14077,80
2020/10/31	14677,93	14199,53	11941,80	0,00	14707,10	14590,47

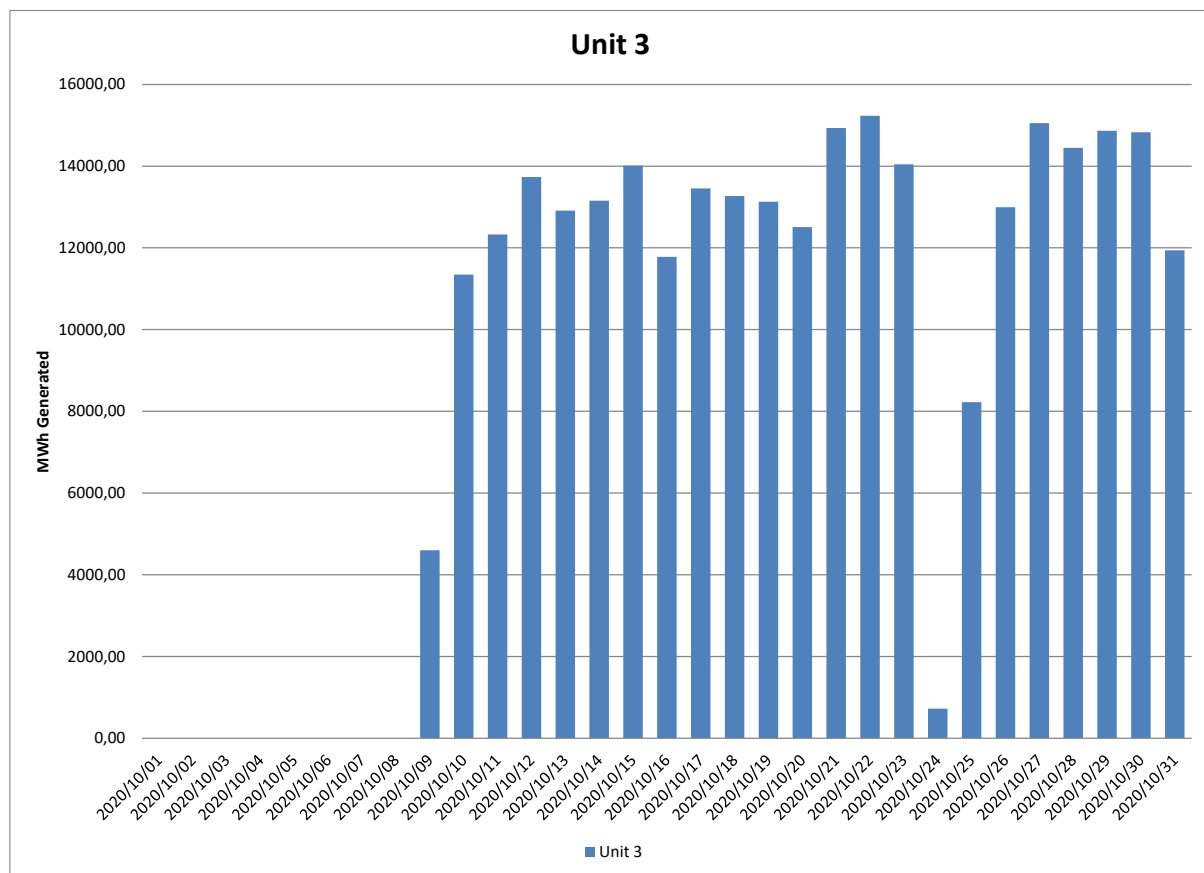
Graph 19: Unit 1 daily generated power in MWh for the month of October 2020



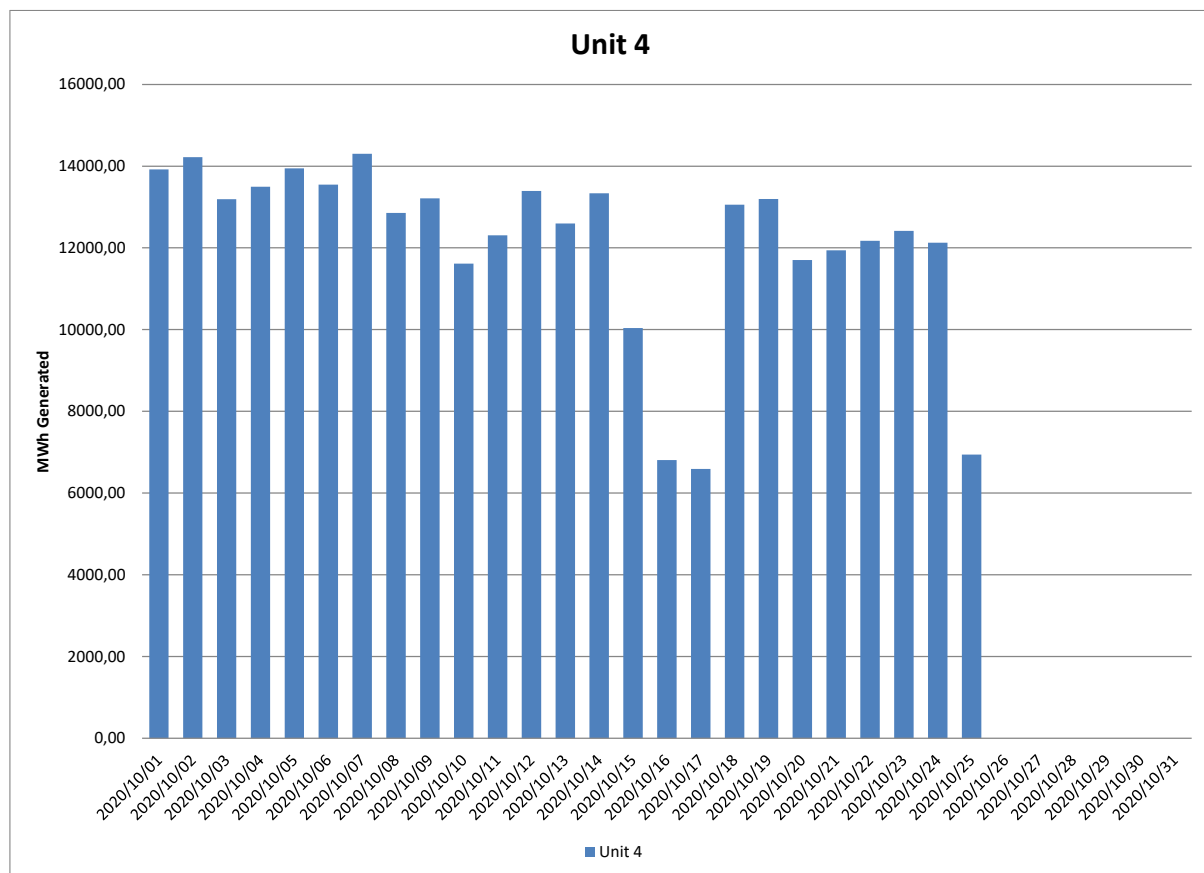
Graph 20: Unit 2 daily generated power in MWh for the month of October 2020



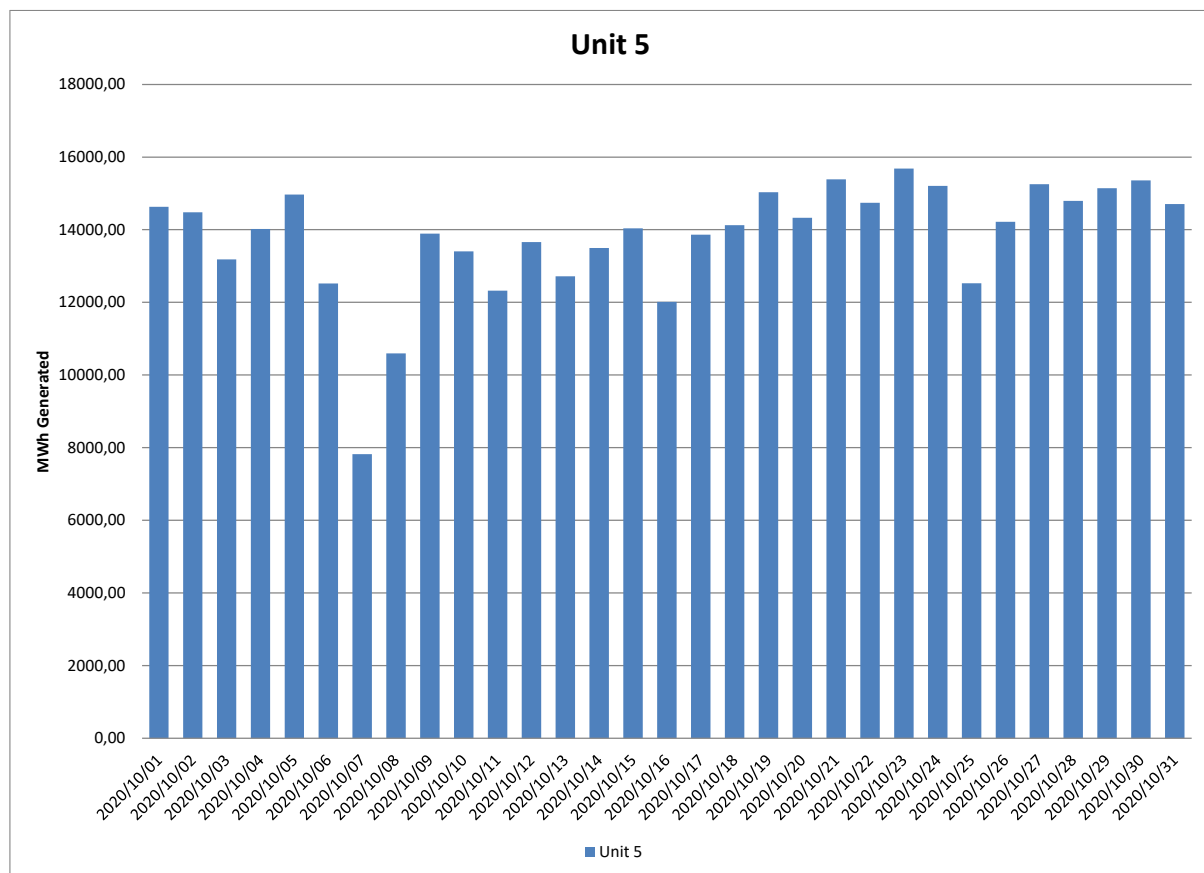
Graph 21: Unit 3 daily generated power in MWh for the month of October 2020



Graph 22: Unit 4 daily generated power in MWh for the month of October 2020



Graph 23: Unit 5 daily generated power in MWh for the month of October 2020



Graph 24: Unit 6 daily generated power in MWh for the month of October 2020

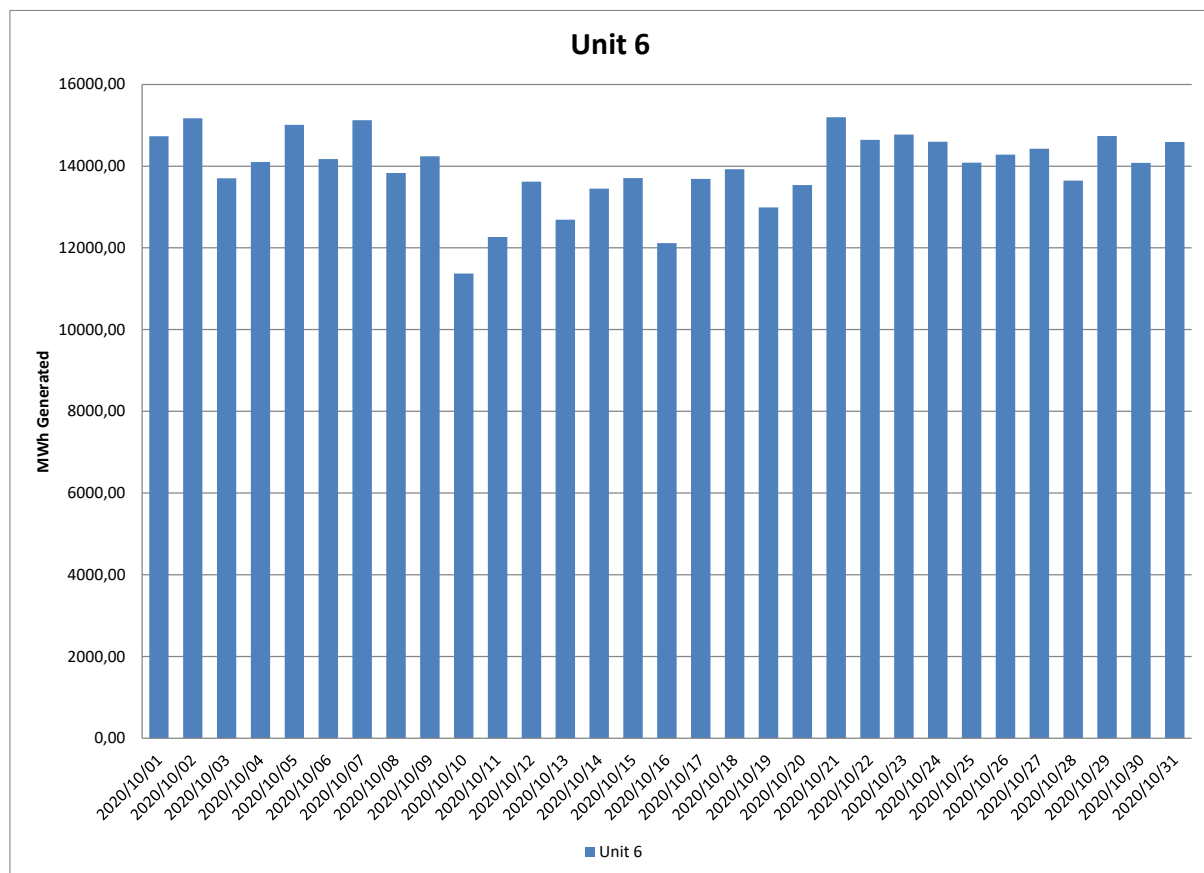


Table 5: Pollutant tonnages for the month of October 2020

Unit	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO (tons)	CO ₂ (tons)
1	35,112	5 896,152	1 156,605	25,761	412 622,958
2	9,610	0,000	0,000	0,000	0,000
3	45,186	4 180,667	833,239	17,886	271 822,166
4	47,561	4 255,113	815,887	39,933	269 459,133
5	36,447	5 474,041	916,283	75,340	353 682,419
6	56,091	6 072,616	1 125,894	41,348	392 265,359
SUM	230,007	25 878,590	4 847,908	200,269	1 699 852,034

Table 6: Reference values for data provided.

Compound / Parameter	Units of Measure	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Oxygen	%	8,10		7,45	8,52	8,57	7,77
Moisture	%	4,89	2,98	5,32	4,09	5,25	4,19
Velocity	m/s	28,1	26,9	27,2	24,1	26,6	28,2
Temperature	°C	144,6	126,6	134,9	129,3	131,6	120,5
Pressure	mBar	934,7	940,9	923,5	924,1	928,7	890,6

Start-up information.**Table 7:** Start-up information

Unit	2	
Fires in	22h34	2020-10-21
Synchronization with Grid	00h10	2020-10-23
Emissions below limit	02h00	2020-10-23
Fires in to synchronization	25.6	HOURS
Synchronization to < Emission limit	1.83	HOURS

Unit	2	
Fires in	11h24	2020-10-23
Synchronization with Grid	14h22	2020-10-23
Emissions below limit	16h01	2020-10-23
Fires in to synchronization	2.97	HOURS
Synchronization to < Emission limit	1.65	HOURS

Unit	2	
Fires in	09h10	2020-10-26
Synchronization with Grid	17h29	2020-10-26
Emissions below limit	22H00	2020-10-26
Fires in to synchronization	8.32	Hours
Synchronization to < Emission limit	4.52	Hours

Unit	3	
Fires in	05h13	2020-10-09
Synchronization with Grid	12h15	2020-10-09
Emissions below limit	15h03	2020-10-09
Fires in to synchronization	7.03	HOURS
Synchronization to < Emission limit	2.8	HOURS

Unit	3	
Fires in	00H59	2020-10-25
Synchronization with Grid	06H34	2020-10-25
Emissions below limit	09H01	2020-10-25
Fires in to synchronization	5.58	HOURS
Synchronization to < Emission limit	2.45	HOURS

Emergency Generation

Table 8: Emergency Generation.

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Emergency Generation hours declared by national Control	129	33	88	93	129	129
Emergency Hours declared including hours after stand down	146	38	98	105	146	146
Days over the Limit during Emergency Generation	0	0	0	0	0	0

Complaints Register

Table 9: Complaints.

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
None					

Table 10: Total volatile compound estimates.

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Wednesday, 11 November 2020	
Station:	Matimba Power Station	
Province:	Limpopo Province	
Tank no.	1-4	
Description:	Outdoor fuel oil storage tank	
Tank Type:	Vertical fixed roof (vented to atmosphere)	
Material stored:	Fuel Oil 150	
MONTHLY INPUT DATA FOR THE STATION Please only insert relevant monthly data inputs into the <u>blue cells</u> below Choose from a dropdown menu in the <u>green cells</u> The total VOC emissions for the month are in the <u>red cells</u> IMPORTANT: Do not change <u>any</u> other cells without consulting the AQ CoE		
MONTH:	October	
GENERAL INFORMATION:	Data	Unit
Total number of fuel oil tanks:	4	NA
Height of tank:	13,34	m
Diameter of tank:	9,53	m
Net fuel oil throughput for the month:	1972,203	tons/month
Molecular weight of the fuel oil:	166,00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH	Data	Unit
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/m²/day
Tank paint colour	Grey/medium	NA
Tank paint solar absorbance	0,68	NA
FINAL OUTPUT:	Result	Unit
Breathing losses:	0,60	kg/month
Working losses:	0,06	kg/month
TOTAL LOSSES (Total TVOC Emissions for the month):	0,65	kg/month
*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.		

Table 11: Average % availability of monitors for the month of October 2020.

Associated Unit/Stack	PM	SO ₂	NO	CO ₂
Unit 1	100,0	100,0	100,0	100,0
Unit 2	97,9	60,8	55,5	60,4
Unit 3	100,0	99,9	99,9	99,9
Unit 4	100,0	99,7	99,7	99,7
Unit 5	100,0	100,0	100,0	100,0
Unit 6	100,0	100,0	100,0	100,0

Ambient Air quality Monitoring

Three exceedance of the SO₂ 10 minute average limit and two exceedances of the SO₂ hourly limit were recorded in October 2020. No other parameters exceeded the set limits during the monitoring period.

Ambient PM₁₀ and NO₂ concentrations at Marapong monitoring site show influence of emissions from low level sources in the area, PM_{2.5} concentrations show influence of emissions from both low level sources and tall stack emitters while SO₂ concentrations show influence of emissions from tall stack emitters and other industrial activities.

The average data recovery for the period was 86.5% and the station availability was 99.7%.

Detailed results can be found in Attachment 1, "Marapong air quality monthly report for October 2020".

General

Name and reference number of the monitoring method used:

1. Particulate and gas monitoring according to standards
 - a. BS EN 14181:2004 - Quality Assurance of Automated Measuring Systems
 - b. ESKOM internal standard 240-56242363 Emissions Monitoring and Reporting Standard

Sampling locations:

1. Stack one
 - a. Particulates:
 - i. S23⁰ 40' 2.8" E027⁰ 36' 34.8" 175m from ground level and 75m from the top.
 - b. Gas:
 - i. S23⁰ 40' 2.8" E027⁰ 36' 34.8" 100m from ground level and 150m from the top.
 - c. Stack height
 - i. 250 meter consist of 3 flues
2. Stack two
 - a. Particulates:
 - i. S23⁰ 40' 14.8" E027⁰ 36' 47.5" 175m from ground level and 75m from the top.
 - b. Gas:
 - i. S23⁰ 40' 14.8" E027⁰ 36' 47.5" 100m from ground level and 150m from the top.
 - c. Stack height
 - i. 250 meter consist of 3 flues

Unit 1

1. 0 out of 32 precipitator fields is out of service.
2. No abnormalities on the SO₃ plant. Preventative maintenance done during the month.

Unit 2

1. Unit returned to service, all fields repaired.
2. SO₃ plant still off due to spare unavailability.

Unit 3

1. 2 out of 32 precipitator fields is out of service. Repairs will be done during the next opportunity outage.
2. No abnormalities on the SO₃ plant. Preventative maintenance done during the month.

Unit 4

1. All precipitator fields in service.
2. No abnormalities on the SO₃ plant. Preventative maintenance done during the month.

Unit 5

1. All precipitator fields in service.
2. No abnormalities on the SO₃ plant. Preventative maintenance done during the month.

Unit 6

1. 3 out of 32 precipitator fields is out of service. Repairs will be done during the next opportunity outage.
2. No abnormalities on the SO₃ plant. Preventative maintenance done during the month.

SO₃ common plant

1. No abnormalities on the sulphur storage plant.

CEMs

1. No adjustments done on the CEMs. Calibration is done every second week.

Particulate monitors

2. No downtime or repairs done on the particulate monitors.

Air quality improvements

1. None

Social responsibility conducted

No campaigns conducted in October 2020

Sampling dates and times

1. Continuous

Attachments

Monthly ambient air quality report

The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission report sent to your office.

Hoping the above will meet your satisfaction.

I hereby declare that the information in this report is correct.

Yours sincerely



Obakeng Mabotja

GENERAL MANAGER: MATIMBA POWER STATION