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Date:  
27 December 2018

Enquiries:

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Waterberg District Municipality  
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Lephalale Local Municipality  
E-mail:

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

Dear Mrs Thivhafuni

## **MATIMBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF NOVEMBER 2018**

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/A3.

## 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	1 253 233
	Fuel Oil	Tons/month	1 200	191.238
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate
	Energy	MW	4 212.6	2 446.407

## Abatement Technology

**Table 2:** Abatement Equipment Control Technology utilise.

Associated Unit	Technology Type	Actual Utilisation (%)
Unit 1	Electrostatic Precipitator	99.9
Unit 2	Electrostatic Precipitator	99.9
Unit 3	Electrostatic Precipitator	99.9
Unit 4	Electrostatic Precipitator	99.9
Unit 5	Electrostatic Precipitator	100
Unit 6	Electrostatic Precipitator	99.9

Associated Unit	Technology Type	Actual Utilisation (%)
Unit 1	SO <sub>3</sub> Plant	100
Unit 2	SO <sub>3</sub> Plant	99
Unit 3	SO <sub>3</sub> Plant	100
Unit 4	SO <sub>3</sub> Plant	98
Unit 5	SO <sub>3</sub> Plant	100
Unit 6	SO <sub>3</sub> Plant	100

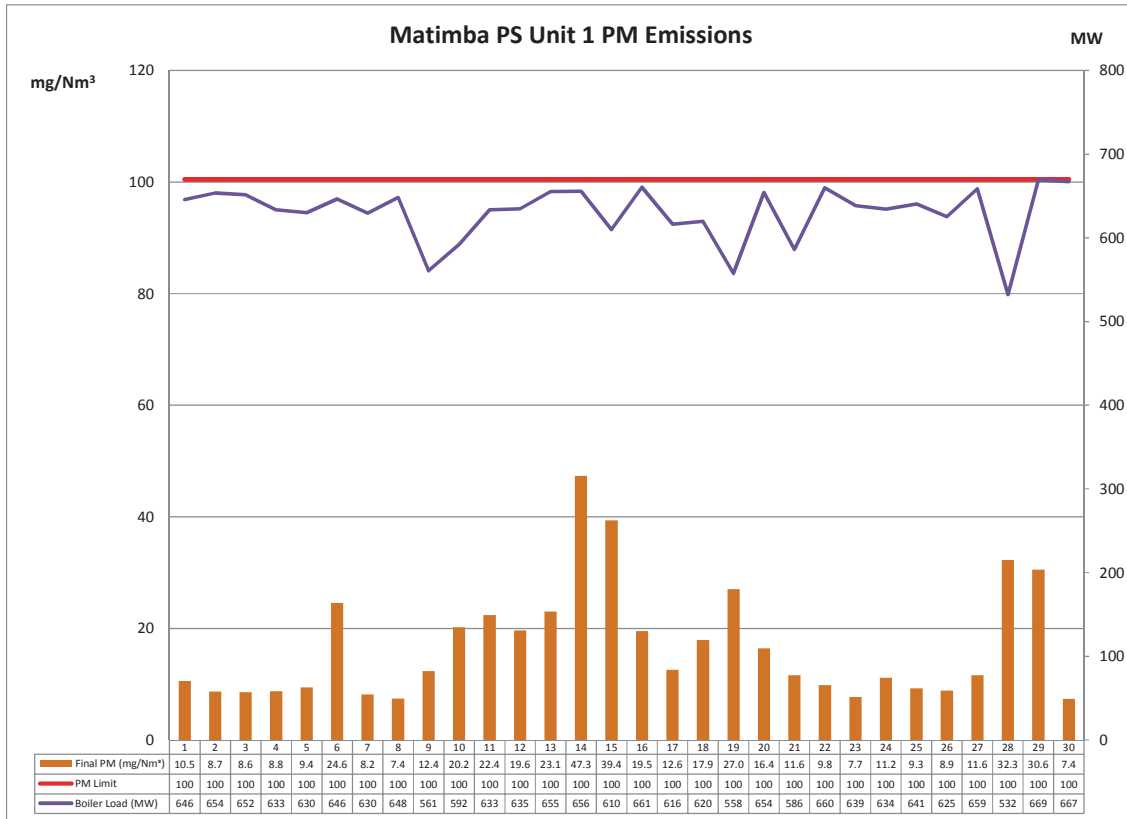
## Energy Source Characteristics

**Table 3:** Energy Source Material Characteristics.

	Characteristic	Stipulated Range (Unit)	Monthly Average Content
Coal burned	Sulphur Content	0.8-1.6%	1.3
	Ash Content	30-40%	31.91

# Emissions Reporting

## Unit 1 particulate emissions

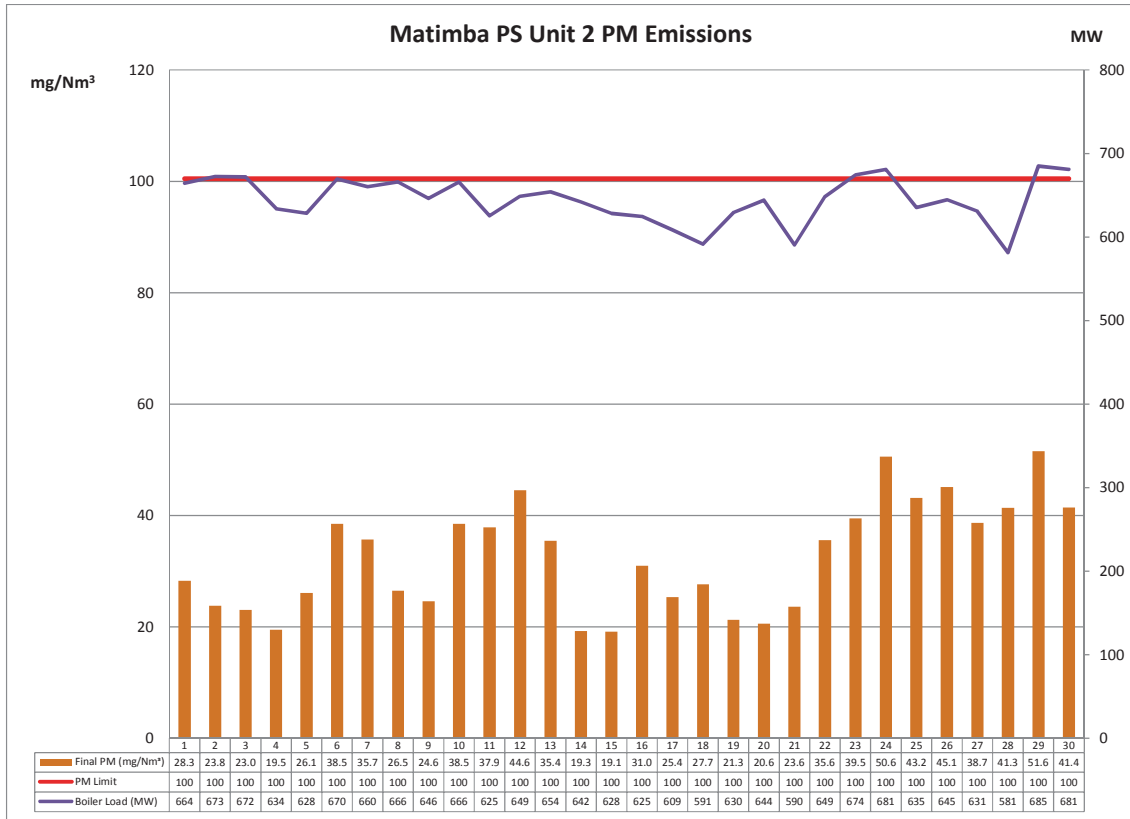


**Graph 1: Particulate matter daily average emissions against emission limit for unit 1 for the month of November 2018**

**Interpretation:**

All daily averages below particulate emission limit of 100 mg/Nm<sup>3</sup>.

## Unit 2 particulate emissions

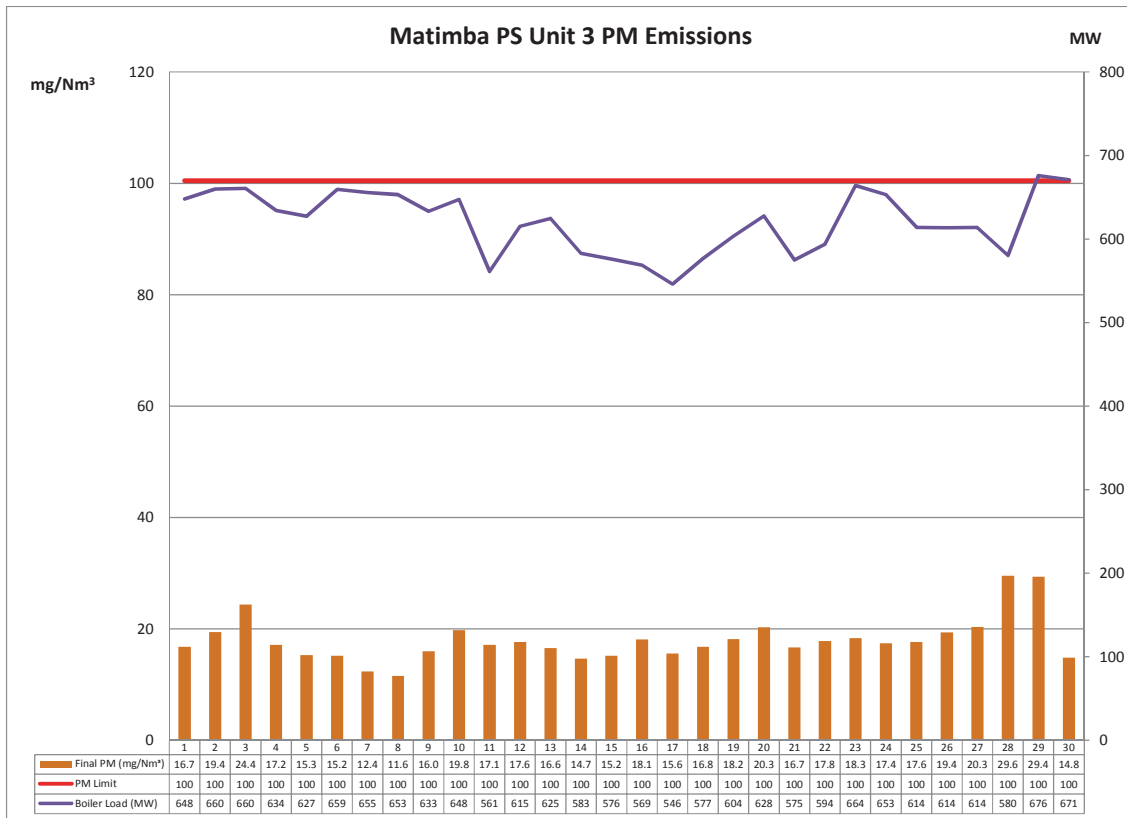


**Graph 2: Particulate matter daily average emissions against emission limit for unit 2 for the month of November 2018**

**Interpretation:**

All daily averages below particulate emission limit of 100 mg/Nm<sup>3</sup>.

### Unit 3 particulate emissions

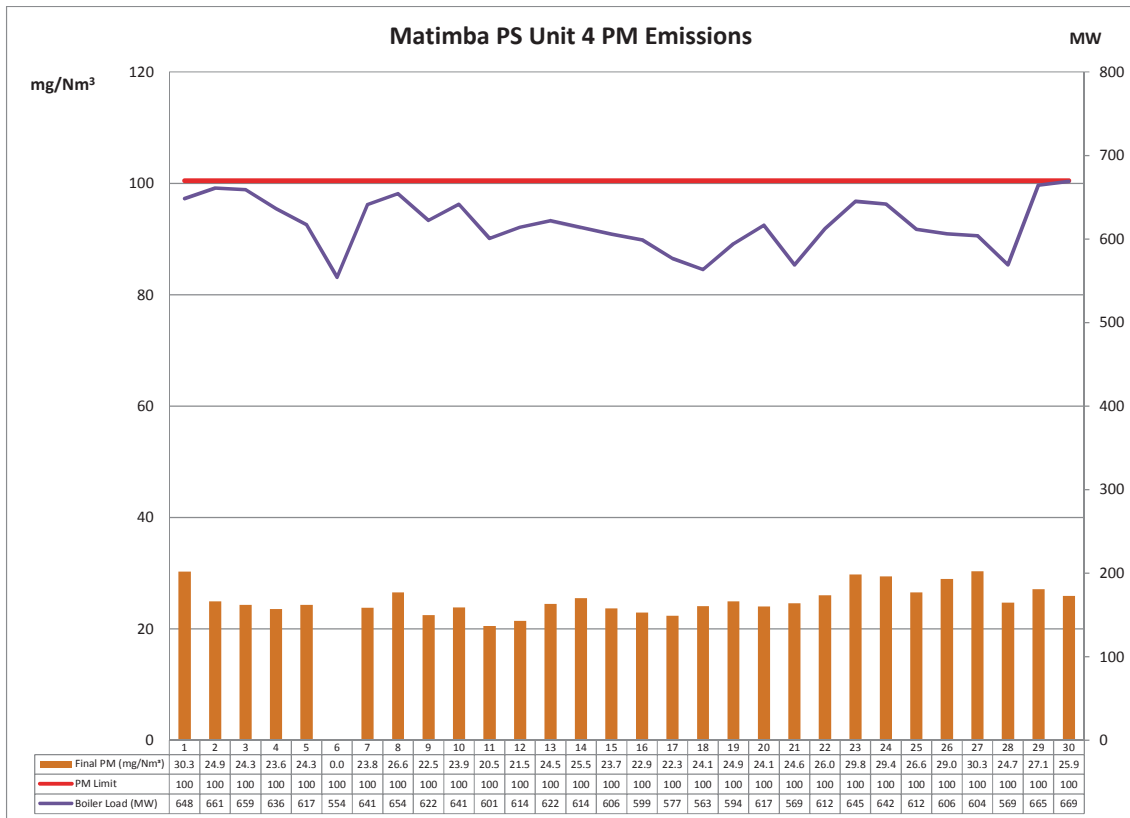


**Graph 3: Particulate matter daily average emissions against emission limit for unit 3 for the month of November 2018**

**Interpretation:**

All daily averages below particulate emission limit of 100 mg/Nm<sup>3</sup>.

## Unit 4 particulate emissions

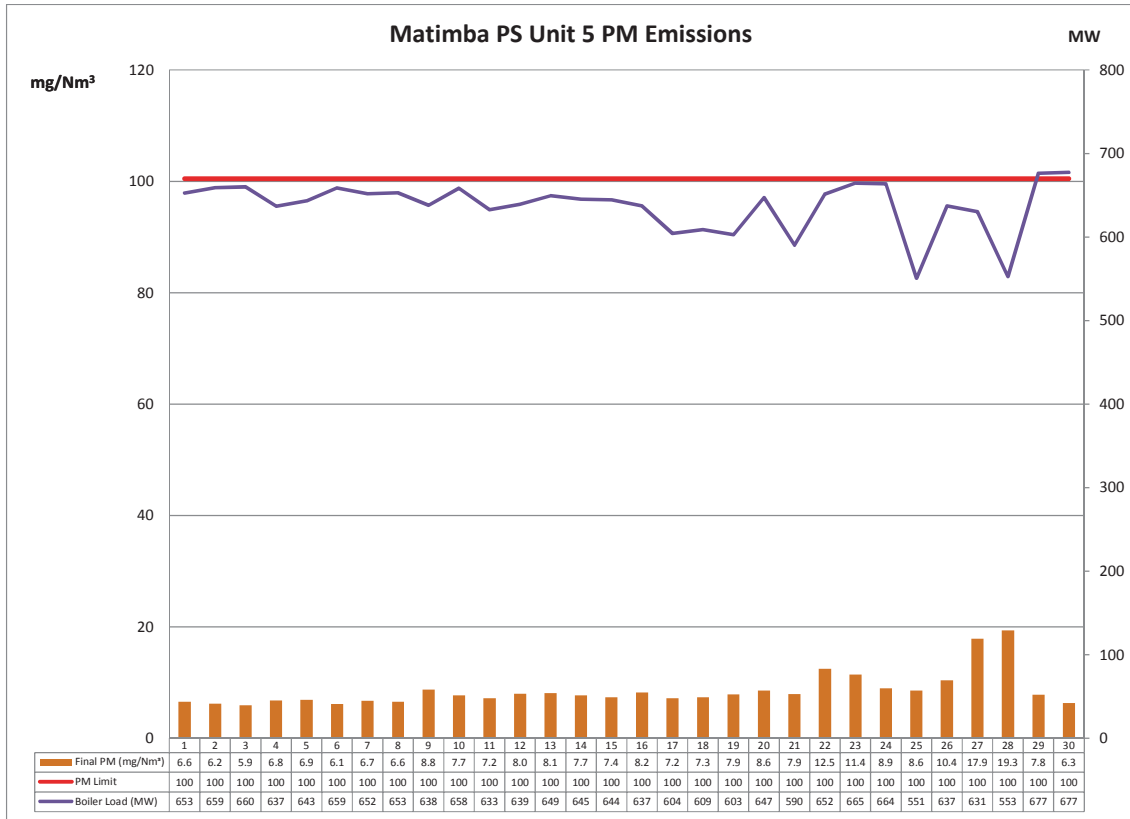


**Graph 4: Particulate matter daily average emissions against emission limit for unit 4 for the month of November 2018**

**Interpretation:**

All daily averages below particulate emission limit of 100 mg/Nm<sup>3</sup>.

## Unit 5 particulate emissions

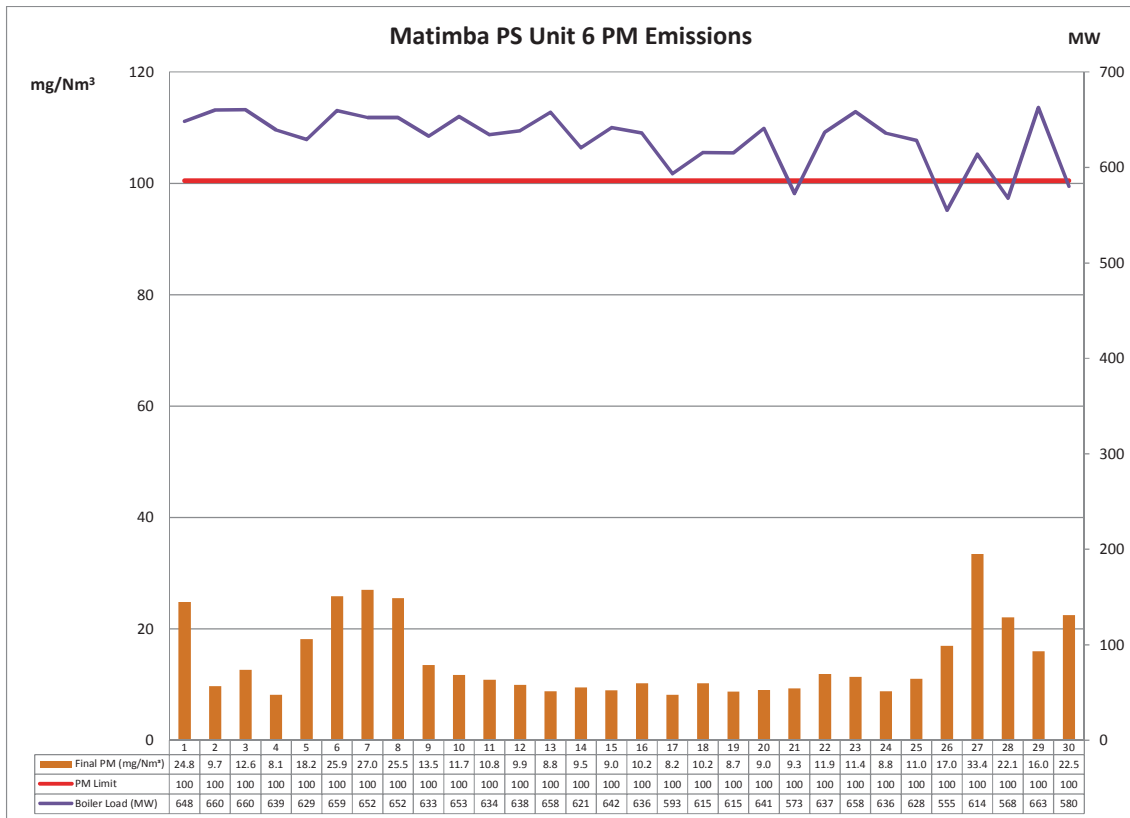


**Graph 5: Particulate matter daily average emissions against emission limit for unit 5 for the month of November 2018**

**Interpretation:**

All daily averages below particulate emission limit of 100 mg/Nm<sup>3</sup>.

## Unit 6 particulate emissions



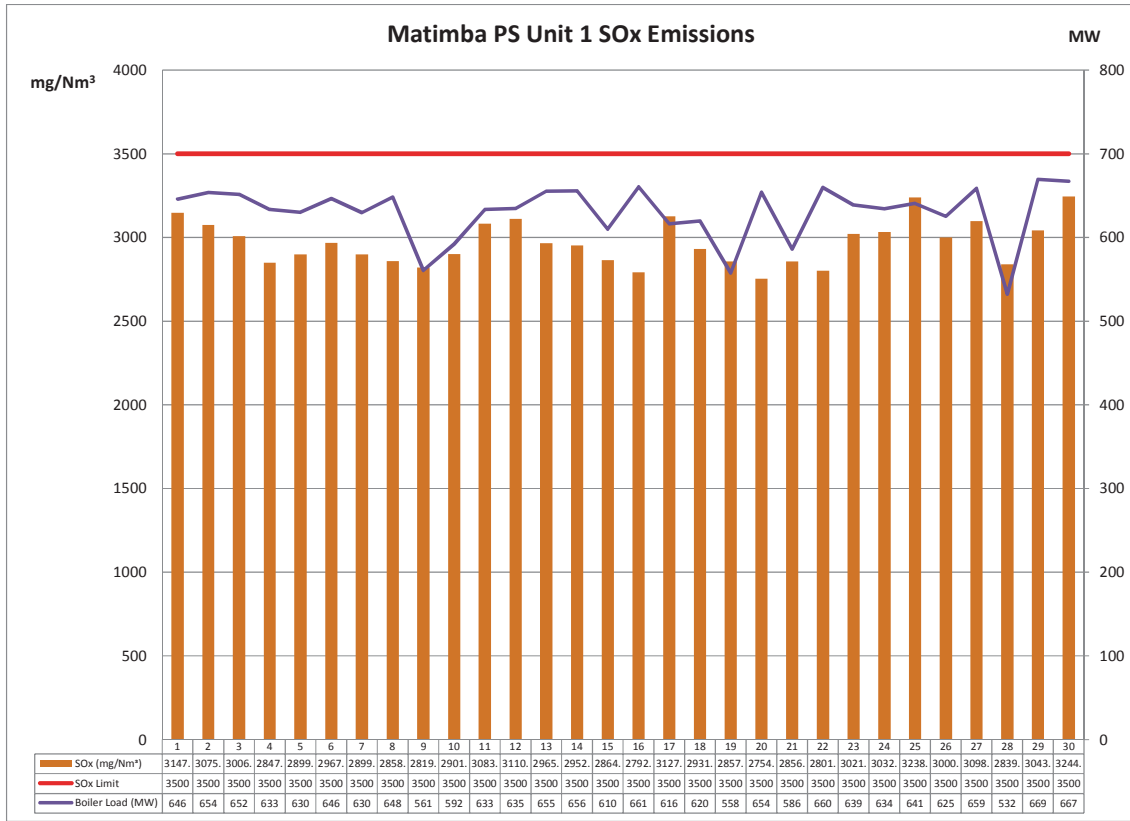
**Graph 6: Particulate matter daily average emissions against emission limit for unit 6 for the month of November 2018**

**Interpretation:**

All daily averages below particulate emission limit of 100 mg/Nm<sup>3</sup>.



## Unit 1 SO<sub>2</sub> emissions

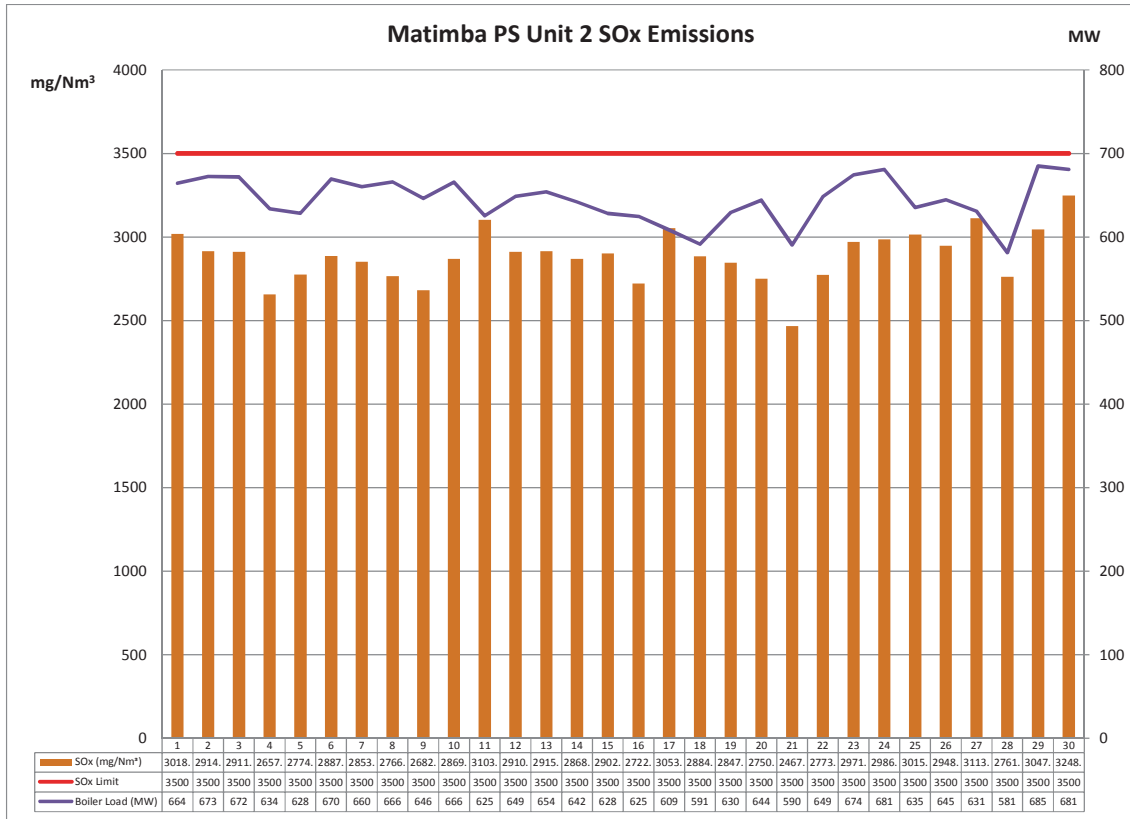


**Graph 7: SO<sub>2</sub> daily average emissions against emission limit for unit 1 for the month of November 2018**

**Interpretation:**

All daily averages below SO<sub>2</sub> emission limit of 3500 mg/Nm<sup>3</sup>.

## Unit 2 SO<sub>2</sub> emissions

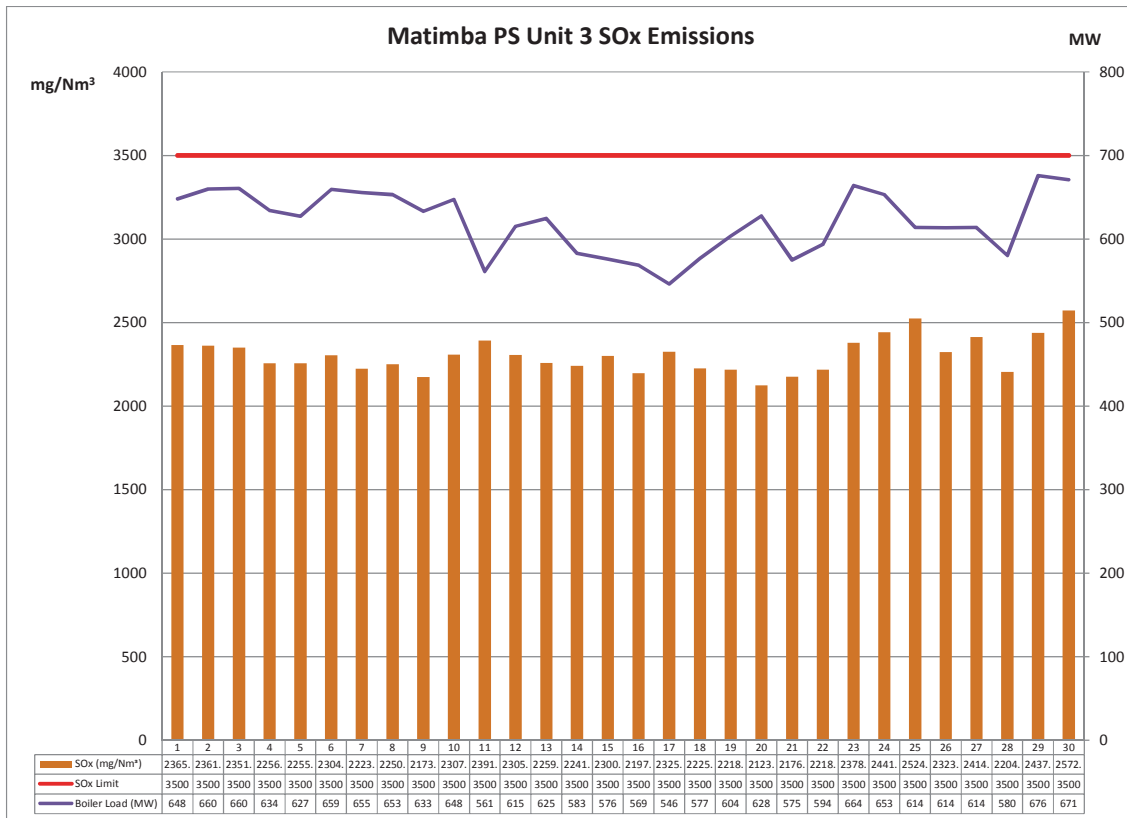


**Graph 8: SO<sub>2</sub> daily average emissions against emission limit for unit 2 for the month of November 2018**

**Interpretation:**

All daily averages below SO<sub>2</sub> emission limit of 3500 mg/Nm<sup>3</sup>.

### Unit 3 SO<sub>2</sub> emissions

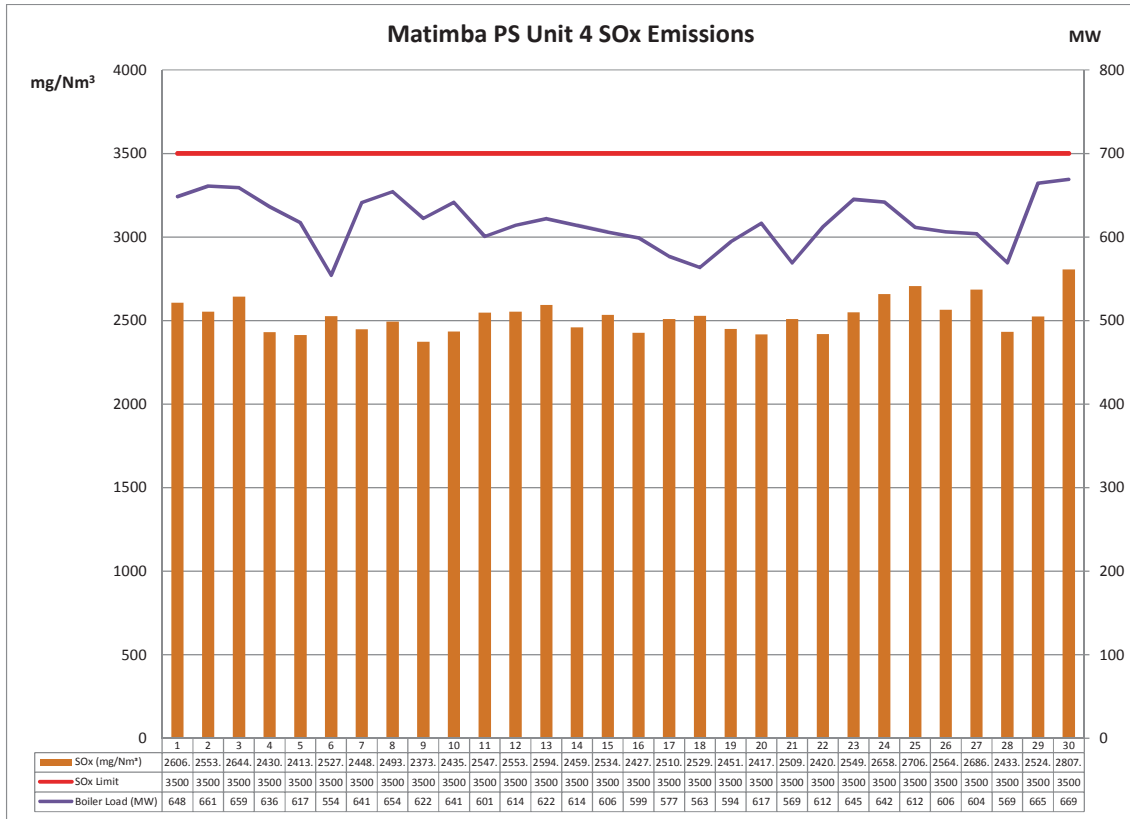


**Graph 9: SO<sub>2</sub> daily average emissions against emission limit for unit 3 for the month of November 2018**

**Interpretation:**

All daily averages below SO<sub>2</sub> emission limit of 3500 mg/Nm<sup>3</sup>.

## Unit 4 SO<sub>2</sub> emissions

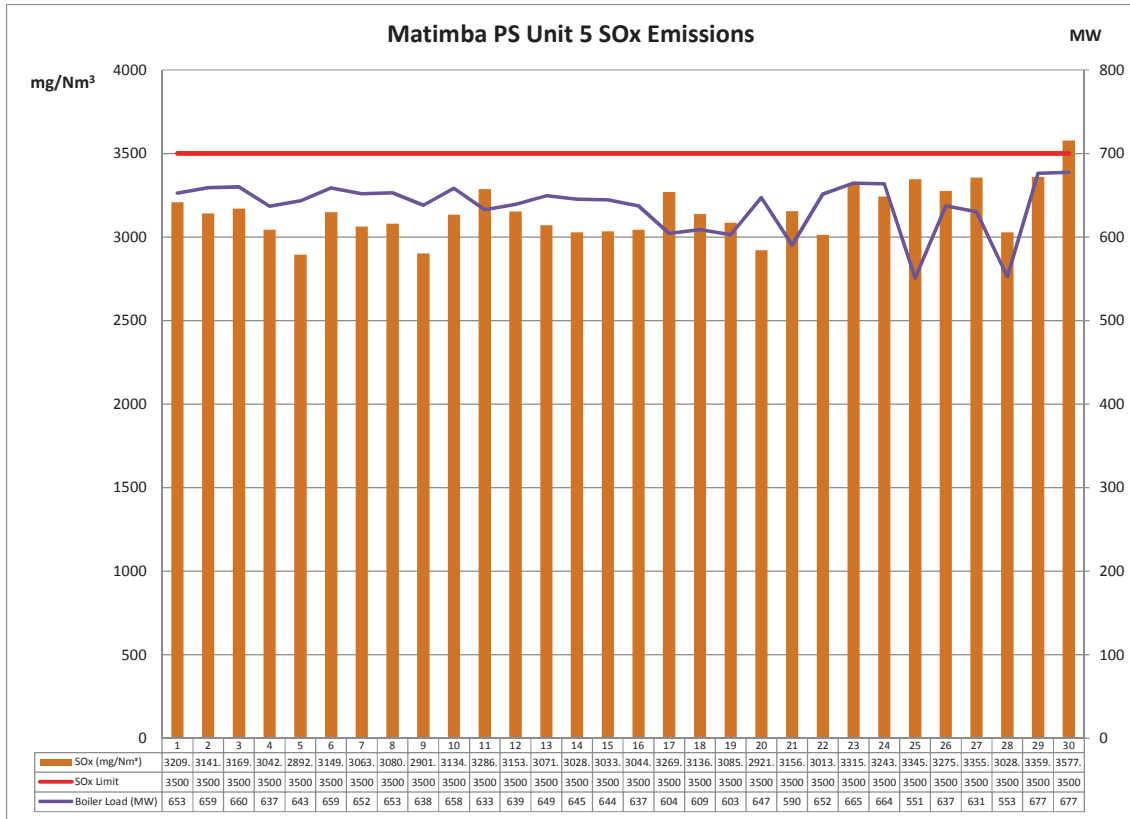


**Graph 10: SO<sub>2</sub> daily average emissions against emission limit for unit 4 for the month of November 2018**

**Interpretation:**

All daily averages below SO<sub>2</sub> emission limit of 3500 mg/Nm<sup>3</sup>.

## Unit 5 SO<sub>2</sub> emissions

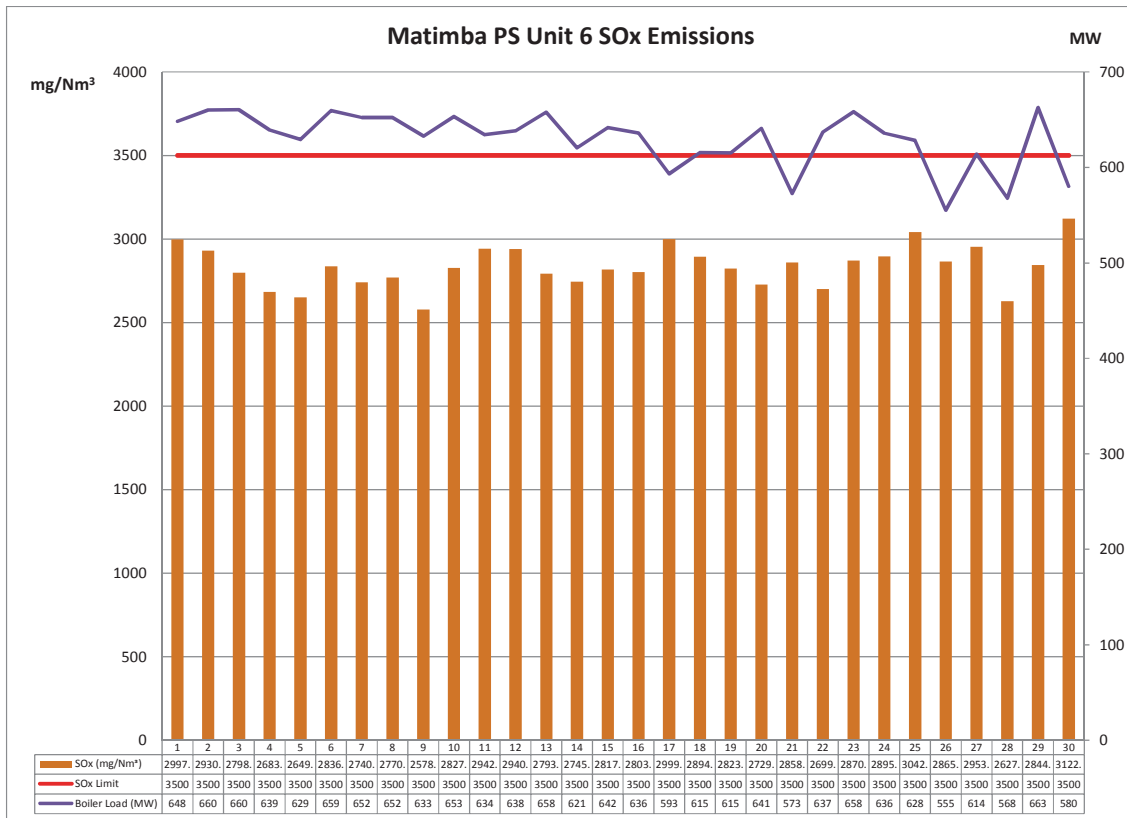


**Graph 11: SO<sub>2</sub> daily average emissions against emission limit for unit 5 for the month of November 2018**

**Interpretation:**

Limit was exceeded on day 30. Exceedance will be investigated.

## Unit 6 SO<sub>2</sub> emissions

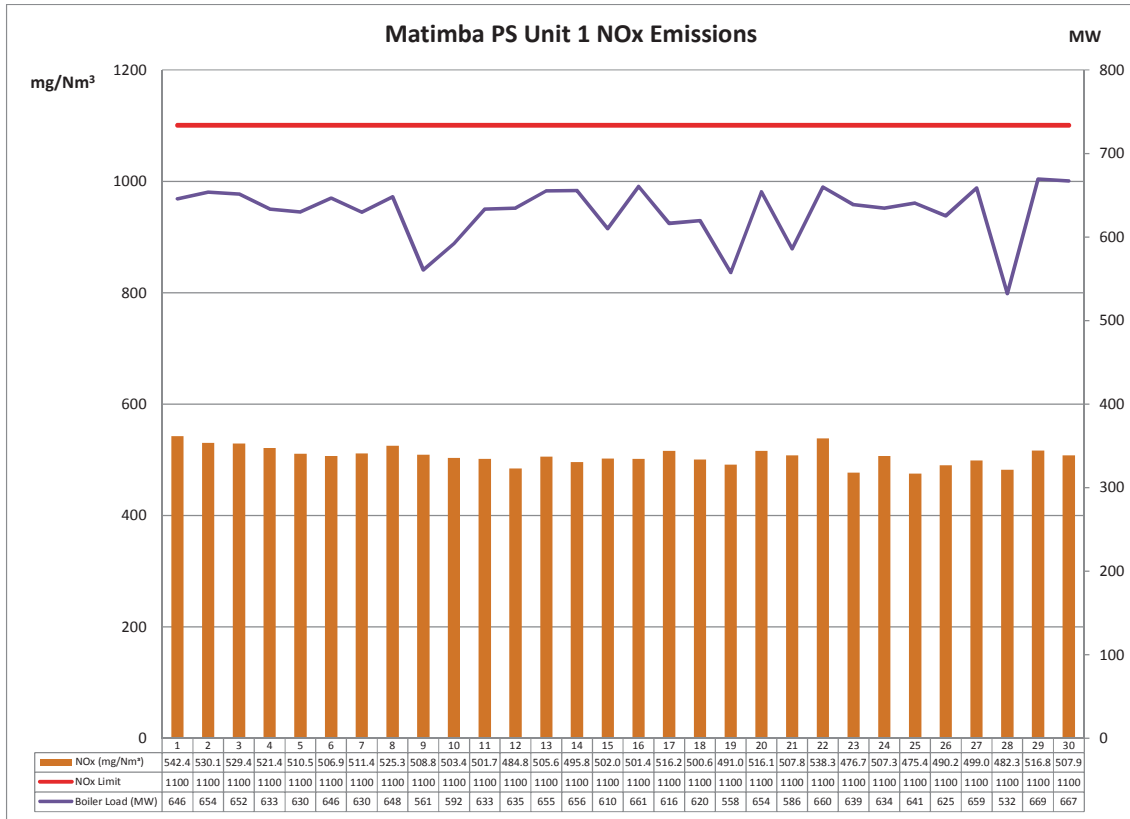


**Graph 12: SO<sub>2</sub> daily average emissions against emission limit for unit 6 for the month of November 2018**

**Interpretation:**

All daily averages below SO<sub>2</sub> emission limit of 3500 mg/Nm<sup>3</sup>.

## Unit 1 NO<sub>x</sub> emissions

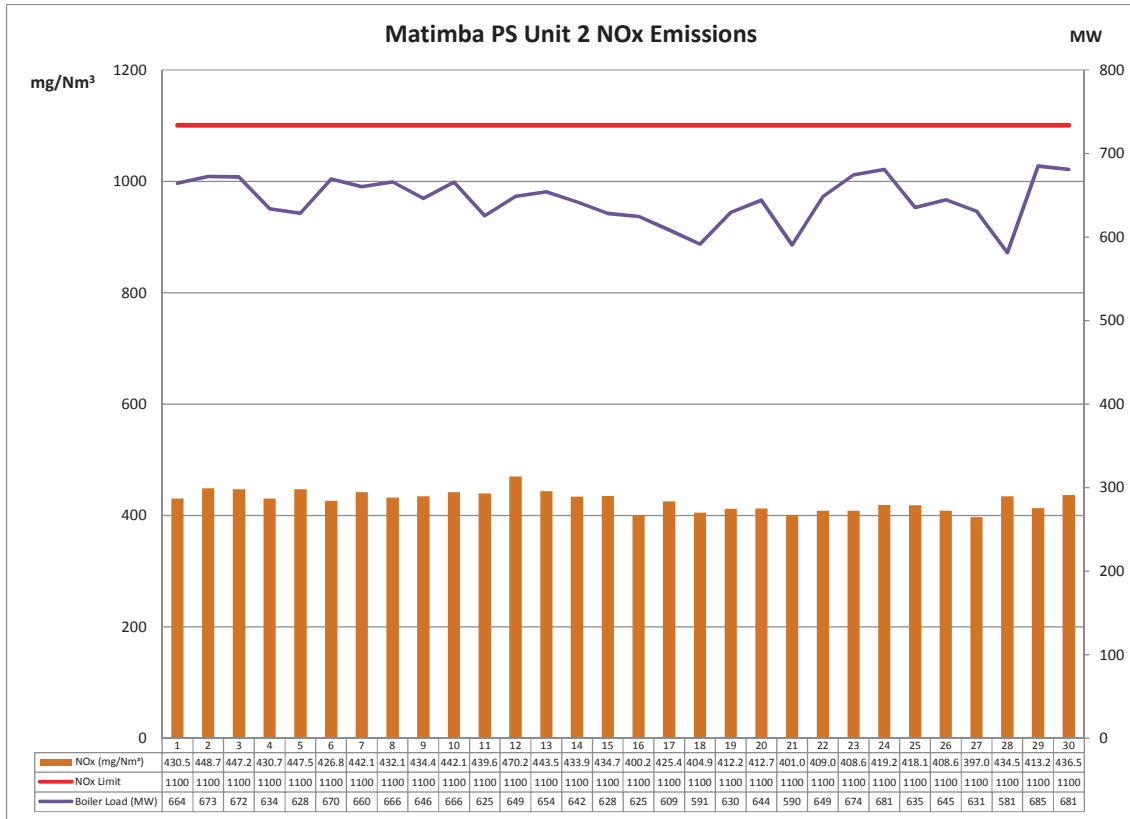


**Graph 13: NO<sub>x</sub> daily average emissions against emission limit for unit 1 for the month of November 2018**

**Interpretation:**

All daily averages below NO<sub>x</sub> emission limit of 1100 mg/Nm<sup>3</sup>.

## Unit 2 NO<sub>x</sub> emissions



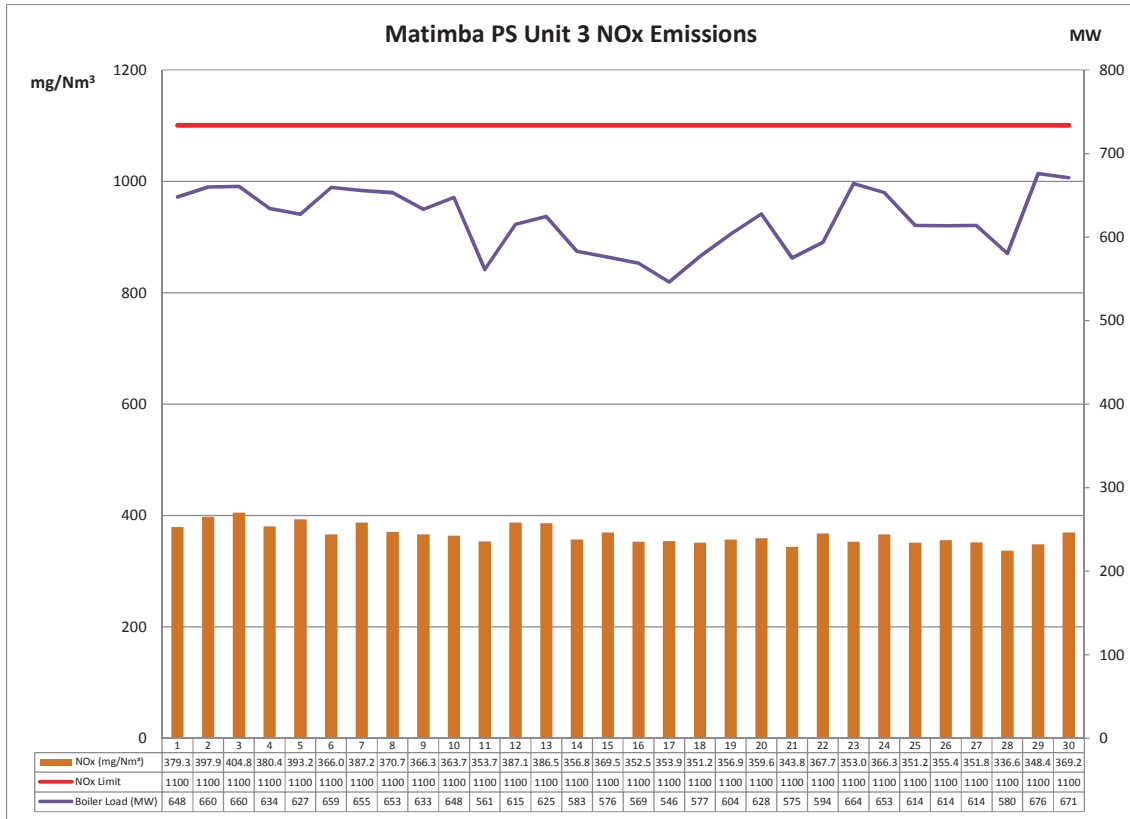
**Graph 14: NO<sub>x</sub> daily average emissions against emission limit for unit 2 for the month of November 2018**

**Interpretation:**

All daily averages below NO<sub>x</sub> emission limit of 1100 mg/Nm<sup>3</sup>.



### Unit 3 NO<sub>x</sub> emissions

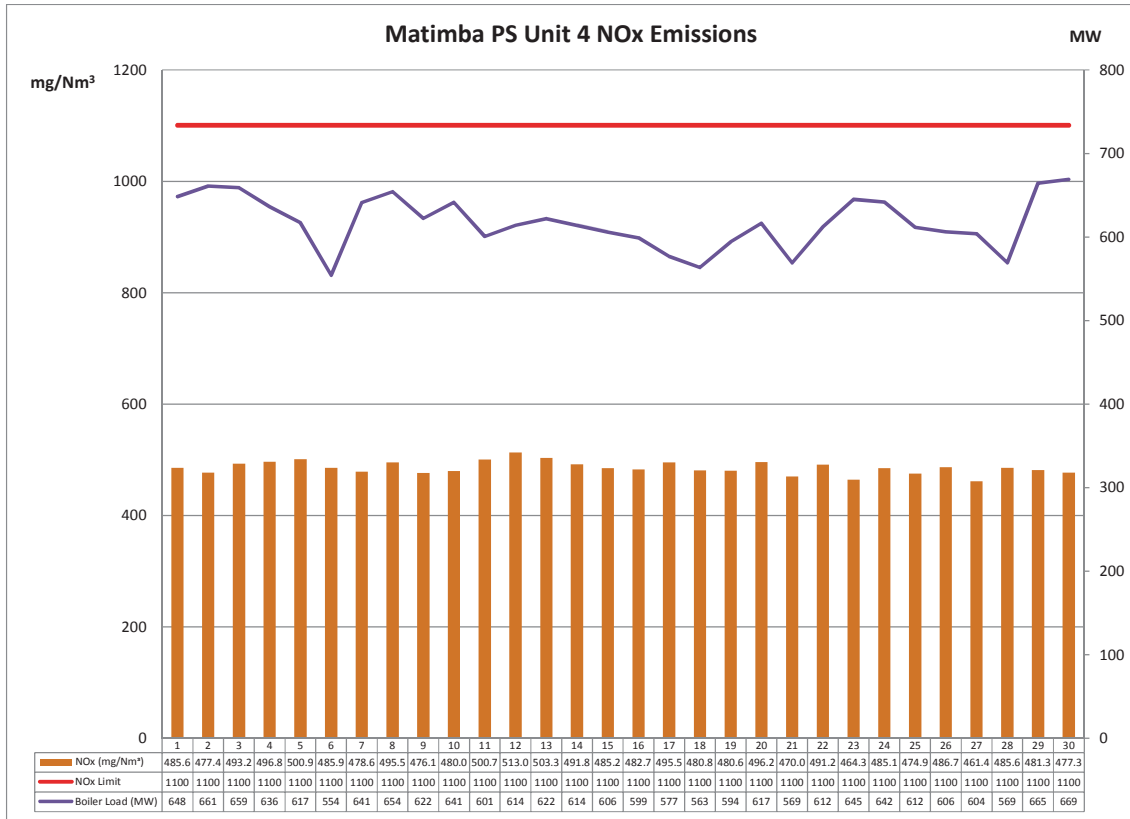


**Graph 15: NO<sub>x</sub> daily average emissions against emission limit for unit 3 for the month of November 2018**

**Interpretation:**

All daily averages below NO<sub>x</sub> emission limit of 1100 mg/Nm<sup>3</sup>.

## Unit 4 NO<sub>x</sub> emissions

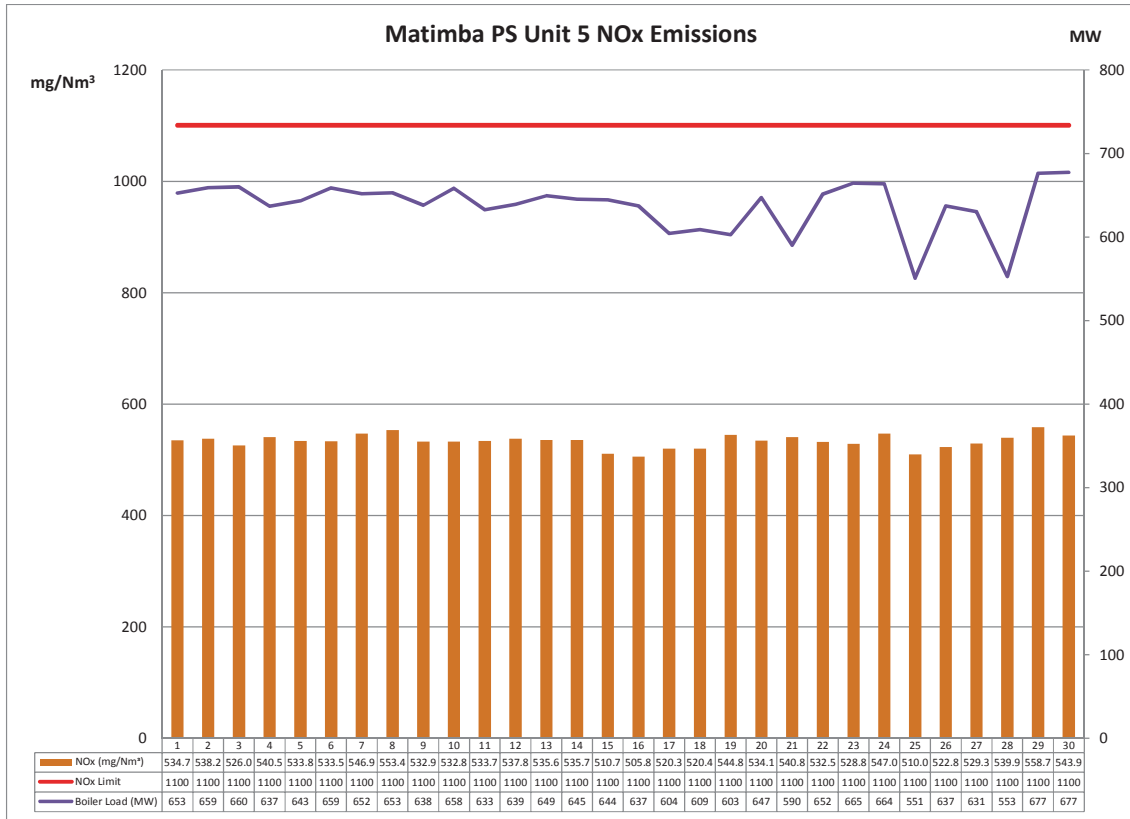


**Graph 16: NO<sub>x</sub> daily average emissions against emission limit for unit 4 for the month of November 2018**

**Interpretation:**

All daily averages below NO<sub>x</sub> emission limit of 1100 mg/Nm<sup>3</sup>.

## Unit 5 NO<sub>x</sub> emissions

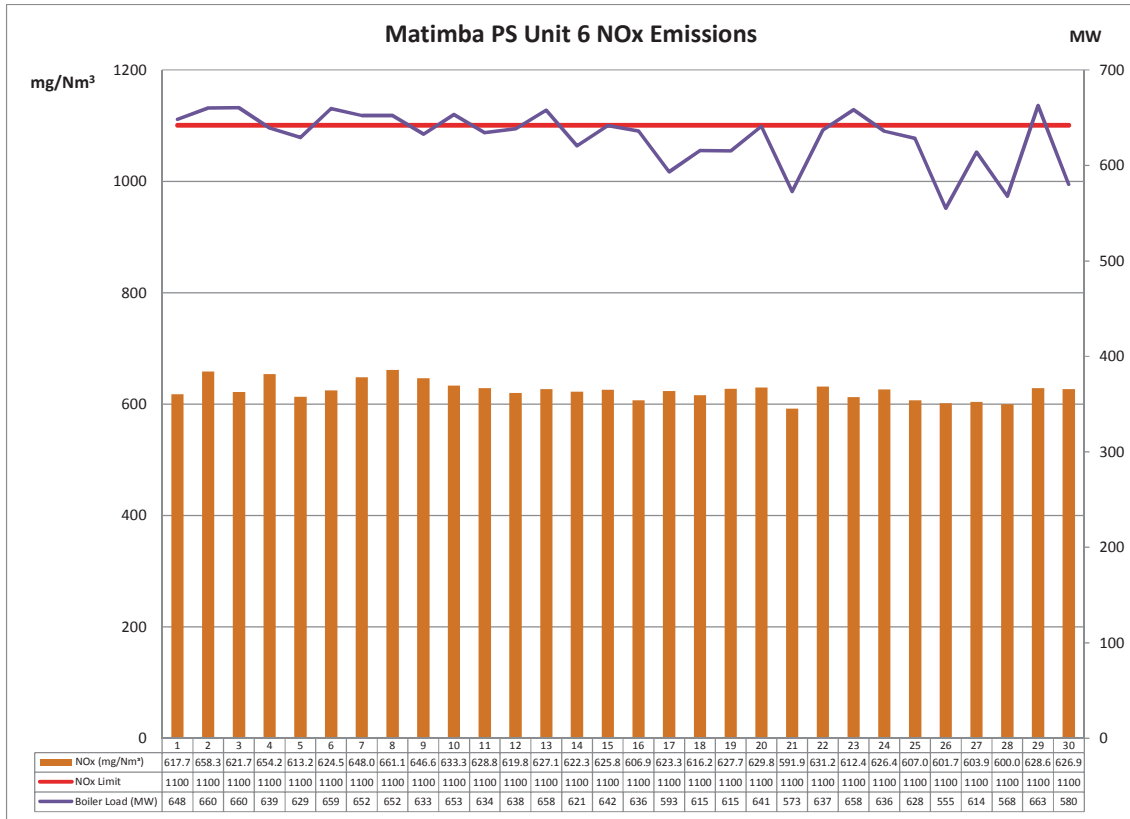


**Graph 17: NO<sub>x</sub> daily average emissions against emission limit for unit 5 for the month of November 2018**

**Interpretation:**

All daily averages below NO<sub>x</sub> emission limit of 1100 mg/Nm<sup>3</sup>.

## Unit 6 NO<sub>x</sub> emissions



**Graph 18: NO<sub>x</sub> daily average emissions against emission limit for unit 6 for the month of November 2018**

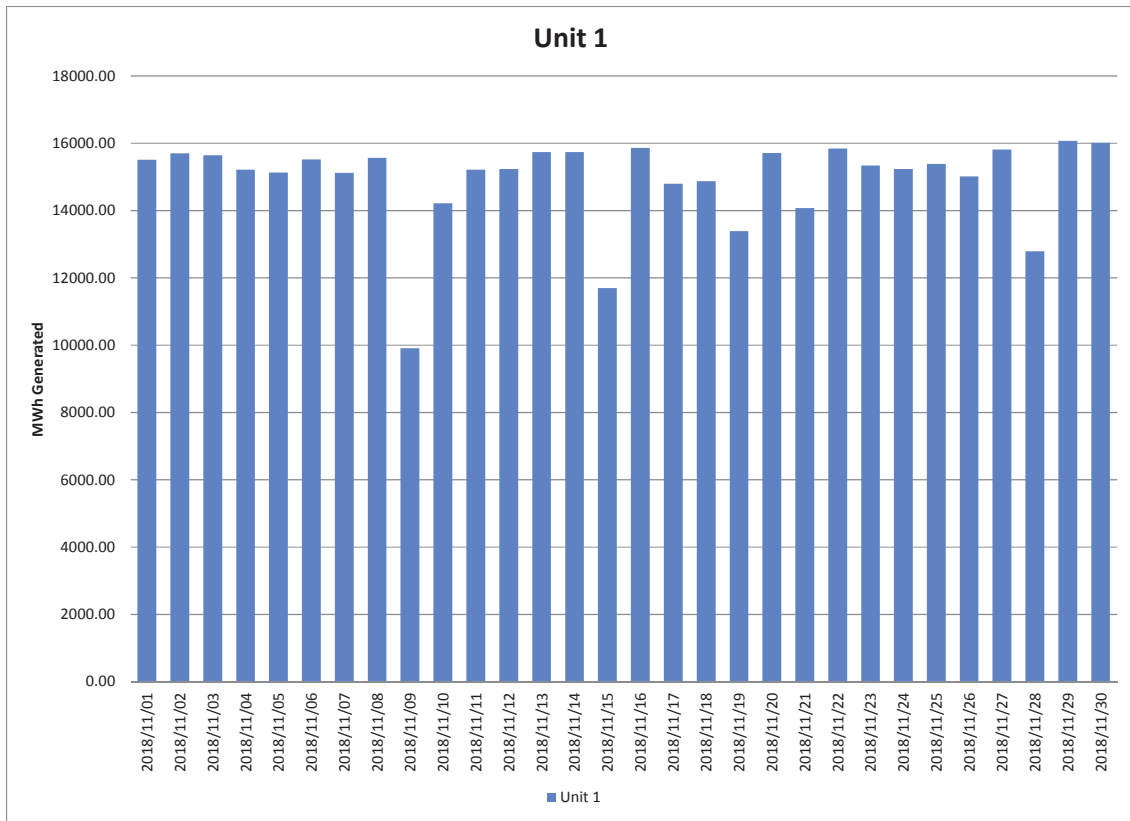
**Interpretation:**

All daily averages below NO<sub>x</sub> emission limit of 1100 mg/Nm<sup>3</sup>.

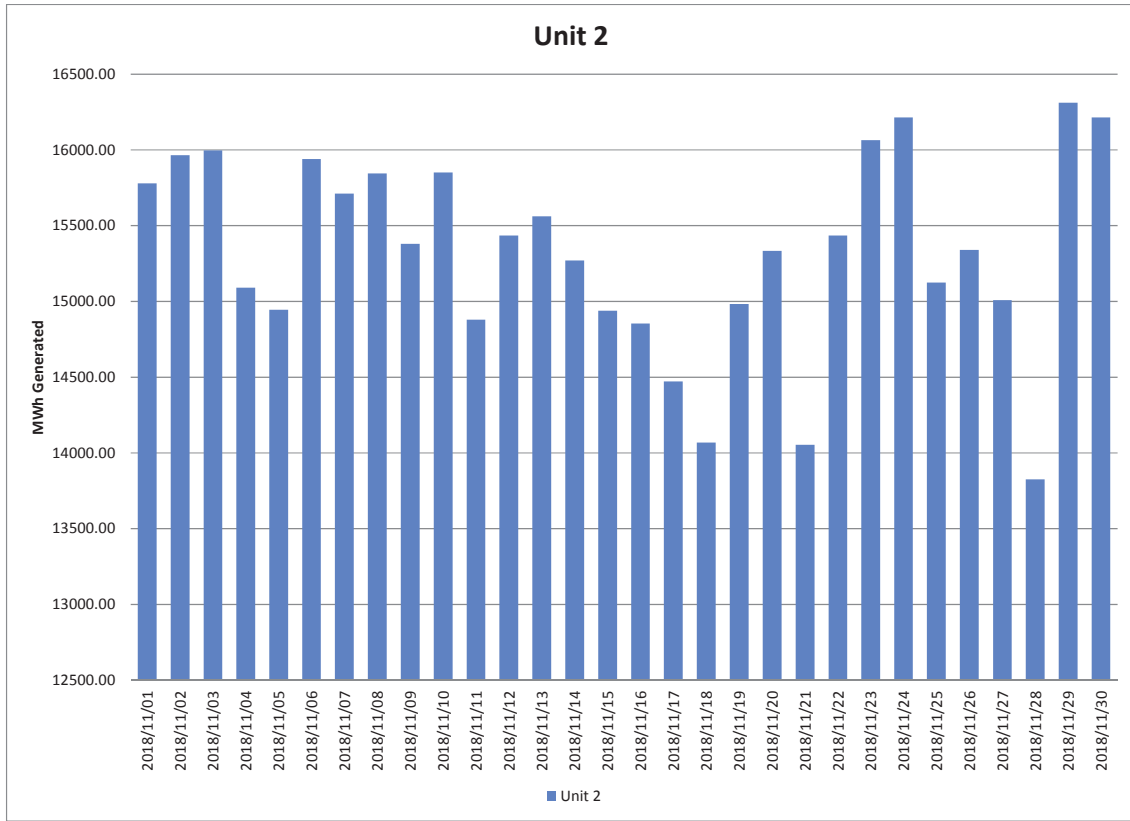
**Table 4:** Daily power generated per unit in MWh for the month of November 2018

Date	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
2018/11/01	15507.53	15778.60	15508.13	15491.47	15522.30	15466.33
2018/11/02	15695.07	15965.54	15791.80	15789.73	15678.90	15774.93
2018/11/03	15644.27	15997.00	15807.67	15749.33	15702.30	15774.33
2018/11/04	15210.33	15091.87	15183.00	15208.27	15148.80	15212.87
2018/11/05	15127.07	14945.27	15011.53	13871.93	15299.60	14973.07
2018/11/06	15520.67	15938.93	15772.93	6023.67	15669.60	15694.47
2018/11/07	15115.13	15711.47	15683.67	15319.93	15496.40	15535.13
2018/11/08	15559.87	15845.67	15627.13	15632.13	15524.20	15543.53
2018/11/09	9904.60	15379.53	15151.80	14868.13	15169.10	15074.80
2018/11/10	14213.60	15851.74	15497.67	15320.67	15654.20	15546.07
2018/11/11	15207.33	14879.67	13425.67	14347.13	15043.60	15091.47
2018/11/12	15235.87	15435.60	14722.33	14664.53	15200.50	15196.47
2018/11/13	15731.87	15561.60	14945.27	14860.13	15443.10	15666.07
2018/11/14	15740.40	15270.67	13950.33	14659.60	15346.70	14769.60
2018/11/15	11694.53	14939.00	13777.73	14472.53	15326.60	15272.87
2018/11/16	15857.47	14854.47	13604.67	14310.07	15154.00	15135.93
2018/11/17	14796.27	14471.00	13066.87	13773.87	14371.30	14116.27
2018/11/18	14877.13	14069.00	13804.20	13461.07	14486.30	14646.47
2018/11/19	13386.80	14983.20	14444.73	14196.87	14336.50	14652.07
2018/11/20	15707.27	15333.60	15024.80	14733.33	15393.20	15254.73
2018/11/21	14077.07	14054.47	13761.27	13597.27	14040.40	13629.87
2018/11/22	15840.27	15435.80	14205.60	14630.07	15497.50	15159.40
2018/11/23	15332.20	16063.13	15891.60	15413.87	15808.60	15663.27
2018/11/24	15230.73	16213.87	15630.13	15332.47	15785.40	15135.33
2018/11/25	15383.00	15123.60	14693.53	14612.07	13101.20	14945.47
2018/11/26	15016.33	15338.73	14681.40	14476.67	15156.80	13212.00
2018/11/27	15814.33	15009.27	14692.40	14428.33	14997.10	14605.27
2018/11/28	12784.53	13826.47	13892.27	13599.40	13155.30	13509.00
2018/11/29	16073.00	16310.60	16179.00	15874.07	16095.40	15771.67
2018/11/30	16017.00	16212.94	16061.67	15983.33	16111.80	3246.27

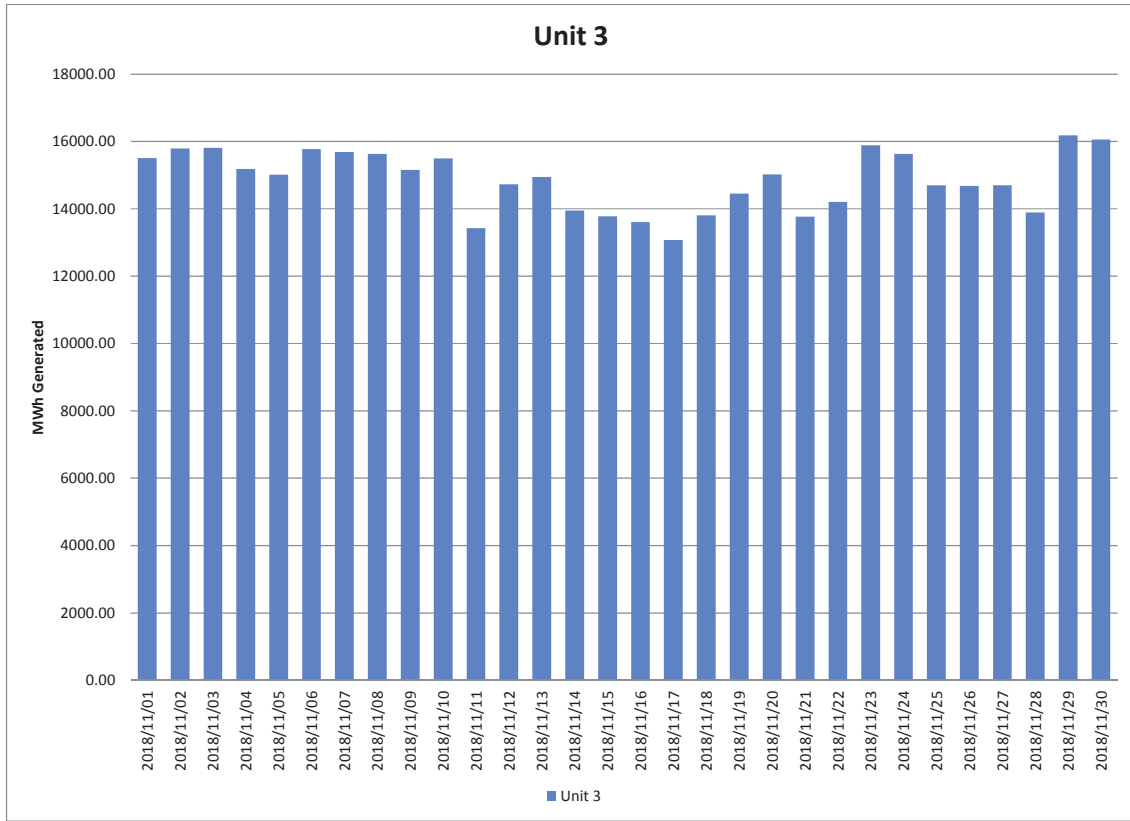
**Graph 19: Unit 1 daily generated power in MWh for the month of November 2018**



**Graph 20: Unit 2 daily generated power in MWh for the month of November 2018**

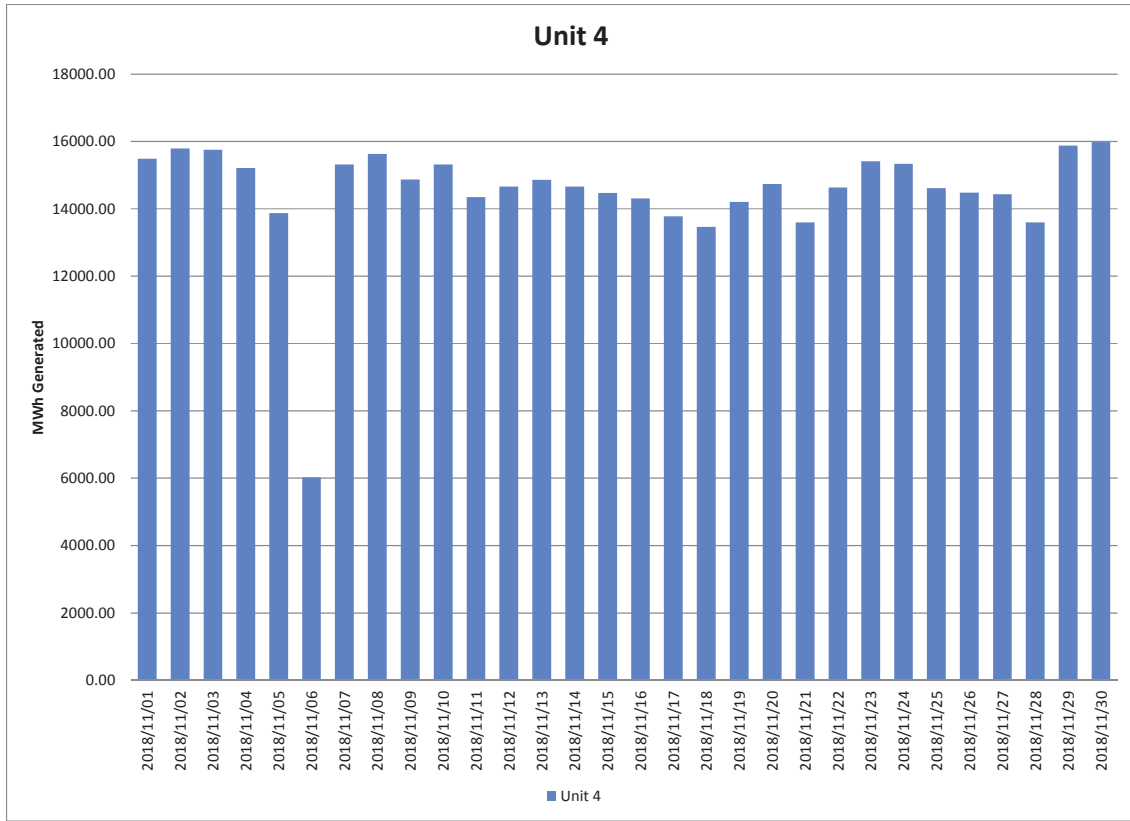


**Graph 21: Unit 3 daily generated power in MWh for the month of November 2018**

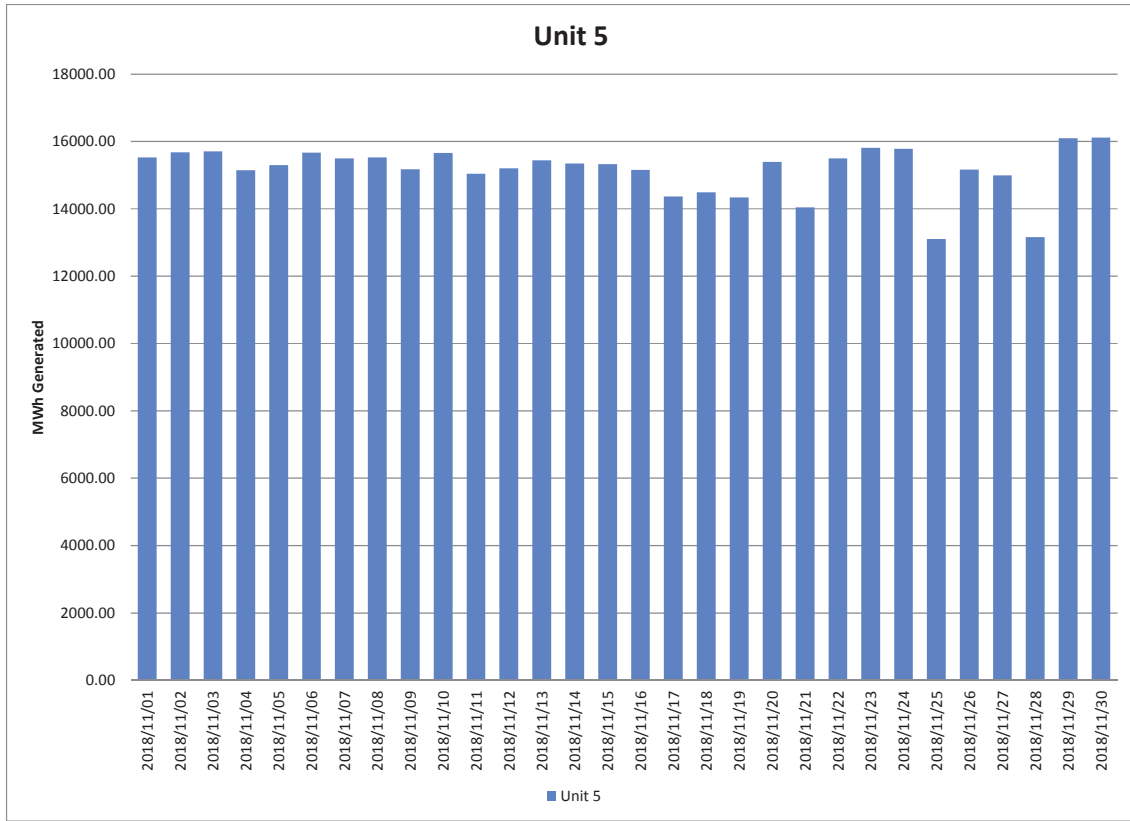




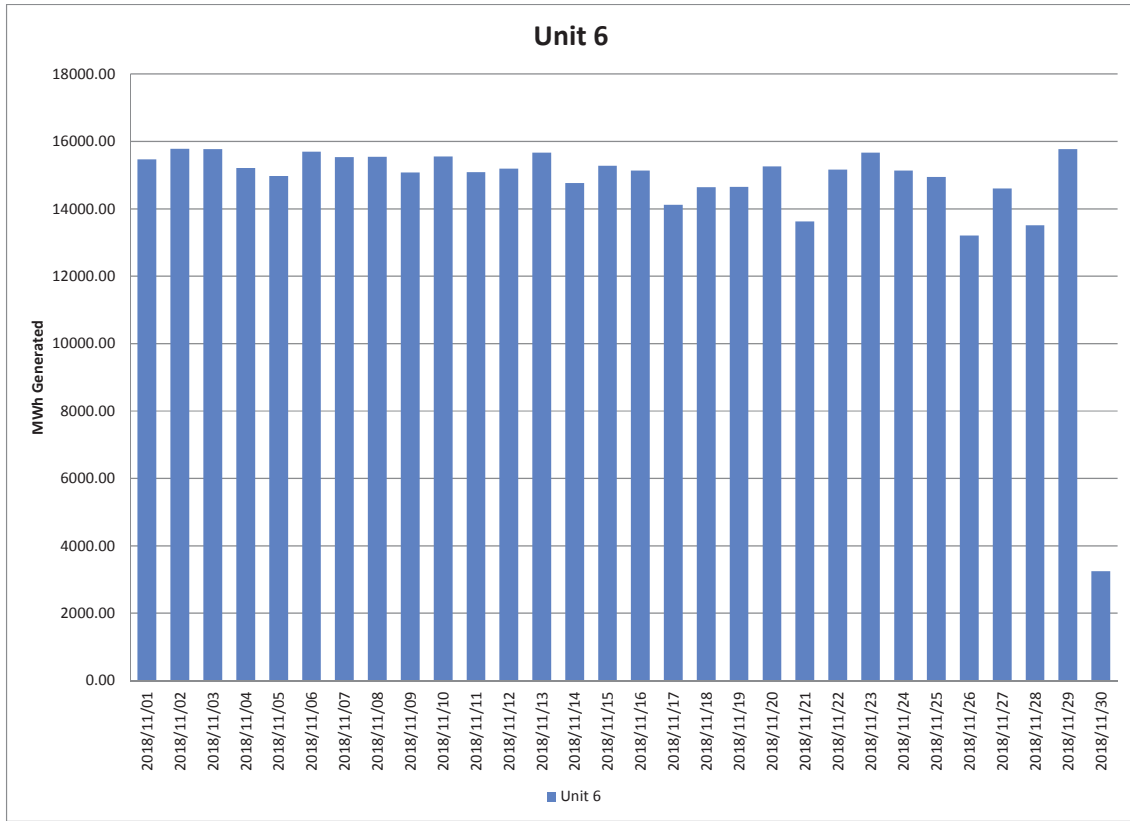
**Graph 22: Unit 4 daily generated power in MWh for the month of November 2018**



**Graph 23: Unit 5 daily generated power in MWh for the month of November 2018**



**Graph 24: Unit 6 daily generated power in MWh for the month of November 2018**



**Graph 25: Unit 1 daily average CO<sub>2</sub> emission concentration for the month of November 2018**

**Graph 26: Unit 2 daily average CO<sub>2</sub> emission concentration for the month of November 2018**

**Graph 27: Unit 3 daily average CO<sub>2</sub> emission concentration for the month of November 2018**

**Graph 28: Unit 4 daily average CO<sub>2</sub> emission concentration for the month of November 2018**

**Graph 29: Unit 5 daily average CO<sub>2</sub> emission concentration for the month of November 2018**



**Graph 30: Unit 6 daily average CO<sub>2</sub> emission concentration for the month of November 2018**

**Table 5:** Pollutant tonnages for the month of November 2018

Unit	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>2</sub> (tons)	CO (tons)	CO <sub>2</sub> (tons)
1	31.947	7 126.206	1 216.035	10.933	
2	74.991	10 672.906	1 574.776	8.138	
3	35.962	5 961.241	947.032	59.779	
4	45.147	6 469.233	1 243.636	5.705	
5	17.047	6 773.536	1 147.602	48.656	
6	30.112	6 116.828	1 350.807	5.906	
<b>SUM</b>	235.205	43 119.950	7 479.888	139.117	

**Table 6:** Reference values for data provided.

Reference value measured in stack.	Unit of measure	Monthly average values					
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Flue gas oxygen	%	6.458	5.851	4.593	4.579	8.000	6.972
Flue gas moisture	%	4.434	4.407	3.504	4.751	4.608	5.174
Flue gas velocity	m/s	28.354	41.473	26.339	26.823	27.897	27.156
Flue gas temperature	°C	138.003	136.119	131.453	127.743	126.223	135.670
Flue gas pressure	mBar	922.791	919.675	921.599	924.266	920.359	928.952

**Start-up information.**

**Table 7:** Start-up information

<b>Unit</b>	4	
<b>Fires in</b>	09H47	2018-11-06
<b>Synchronization with Grid</b>	13H05	2018-11-06
<b>Emissions below limit</b>	13H16	2018-11-06
<b>Fires in to synchronization</b>	3.3	Hours
<b>Synchronization to &lt; limit</b>	0.184	Hours

<b>Unit</b>	1	
<b>Fires in</b>	08H23	2018-11-09
<b>Synchronization with Grid</b>	14H42	2018-11-09
<b>Emissions below limit</b>	14H42	2018-11-09
<b>Fires in to synchronization</b>	6.317	Hours
<b>Synchronization to &lt; limit</b>	0	Hours

<b>Unit</b>	1	
<b>Fires in</b>	08H45	2018-11-15
<b>Synchronization with Grid</b>	12H23	2018-11-15
<b>Emissions below limit</b>	14H00	2018-11-15
<b>Fires in to synchronization</b>	3.633	Hours
<b>Synchronization to &lt; limit</b>	1	Hours

**Emergency Generation**

**Table 8:** Emergency Generation.


	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
<b>Emergency Generation hours declared by national Control</b>	412	441	441	423	441	423
<b>Emergency Hours declared including hours after stand down</b>	439	470	470	451	470	451
<b>Days over the Limit during Emergency Generation</b>	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 compounds estimates.

 CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	31 December 2018	
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	
<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-GENERAL	November	
<b>INFORMATION:</b>	<b>Data</b>	<b>Unit</b>
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:	<u>191.238</u>	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	26.22	°C
Daily maximum ambient temperature	32.63	°C
Daily minimum ambient temperature	20.19	°C
Daily ambient temperature range	12.44	°C
Daily total insolation factor	6.14	kWh/m <sup>2</sup> /day
Tank paint colour	<u>Grey/medium</u>	NA
Tank paint solar absorbance	0.68	NA
<b>FINAL OUTPUT:</b>	<b>Result</b>	<b>Unit</b>
Breathing losses:	0.59 kg/month	
Working losses:	0.01 kg/month	
<b><u>TOTAL LOSSES (Total TVOC Emissions for the month):</u></b>	<b>0.59 kg/month</b>	
*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 November 2018.

Unit	SO <sub>2</sub>	NO <sub>x</sub>	PM	CO <sub>2</sub>
1	96.7	96.3	100.0	
2	96.3	96.0	100.0	
3	96.7	96.7	100.0	
4	99.7	99.7	100.0	
5	96.5	96.5	100.0	
6	96.5	96.5	100.0	

## 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. S23° 40' 2.8" E027° 36' 34.8" 175m from ground level and 75m from the top.
  - b. Gas:
    - i. S23° 40' 2.8" E027° 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. S23° 40' 14.8" E027° 36' 47.5" 175m from ground level and 75m from the top.
  - b. Gas:
    - i. S23° 40' 14.8" E027° 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. One out of 32 precipitator fields is out of service. Repairs will be done during the next opportunity outage.
1. No abnormalities on the SO<sub>3</sub> plant. Preventative maintenance done during the month.

**Unit 2**

1. Three out of 32 precipitator fields is out of service. Repairs will be done during the next opportunity outage.
2. No abnormalities on the SO<sub>3</sub> plant. Preventative maintenance done during the month.

**Unit 3**

1. Three out of 32 precipitator fields is out of service. Repairs will be done during the next opportunity outage.
2. No abnormalities on the SO<sub>3</sub> plant. Preventative maintenance done during the month.

**Unit 4**

1. Four out of 32 precipitator fields is out of service. Repairs will be done during the next opportunity outage.
2. No abnormalities on the SO<sub>3</sub> plant. Preventative maintenance done during the month.

**Unit 5**

2. All precipitator fields in service.
3. No abnormalities on the SO<sub>3</sub> plant. Preventative maintenance done during the month.

**Unit 6**

1. One out of 32 precipitator fields are out of service. Repairs will be done during the next opportunity outage.
2. No abnormalities on the SO<sub>3</sub> plant. Preventative maintenance done during the month.

**CEMs**

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

**Particulate monitors**

1. No downtime, repairs or adjustments done on the particulate monitors.

**Air quality improvements**

1. None

**Social responsibility conducted**

No campaigns conducted in November 2018

**Sampling dates and times**

1. Continuous

**Attachments**

1. Matimba have not received the Marapong air quality monthly report for November 2018. As soon as the report is received it will be send separately.

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

*JOM-01-04*

**GENERAL MANAGER: MATIMBA POWER STATION**