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Date: 11 February 2021

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Dear Mr. Hlanyane

## MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF NOVEMBER 2020

This serves as the monthly report required in terms of Majuba Power Station's Atmospheric Emission License (MPS/0014/2019/F03) under section 7 routine reporting and record keeping. The emissions are for the month of November 2020. Verified emissions of particulates are included. SO<sub>2</sub> and NO<sub>x</sub> (as NO<sub>2</sub>) emissions are included for all units. Greenhouse gasses are excluded as per the agreement reached between Eskom and the Department of Environmental, Forestry and Fisheries in the first quarter of 2017/18 financial year's MINTEC and MINMEC management meeting. This report was revised due to the unity factors were used for CO<sub>2</sub> instead of correction factors as CO<sub>2</sub> values were over- and/or understated on Units 2, 3 and 5.

### Raw Materials and Products

**Table 1. Quantity of Raw Materials and Products used/produced for the month of November 2020**

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of November 2020
	Coal	Tons/month	1 800 000	1 019 796
Fuel Oil	Tons/month	6 000	2 570	
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of November 2020
	Energy	GWh	4 110	1 897
	Ash	Tons/month	Not stated in the license	297 780

### Abatement Technology

**Table 2. Abatement Equipment Control Technology for the month of November 2020**

Associated Unit	Technology Type	Actual Utilisation (%) for the month of November 2020	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.96%
Unit 2	Fabric Filter Plant	100	Unit offline
Unit 3	Fabric Filter Plant	100	99.92%
Unit 4	Fabric Filter Plant	100	99.94%

Unit 5	Fabric Filter Plant	100	99.94%
Unit 6	Fabric Filter Plant	100	99.97%

\*Calculated from the assumption of 90% fly ash to 10% bottom ash and percentage ash as measured in coal.

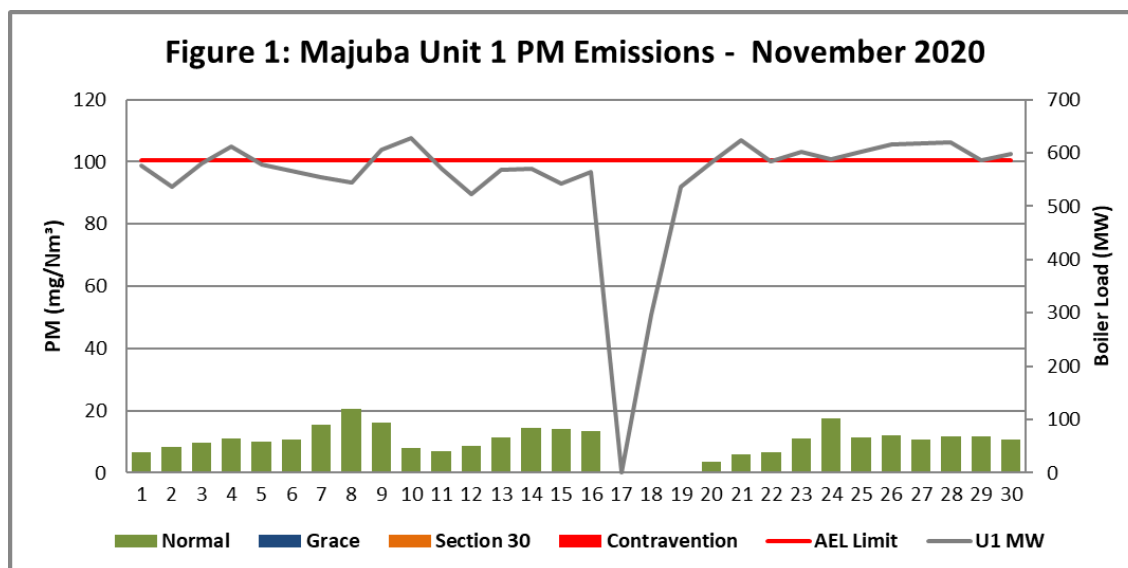
### Energy Source Characteristics

**Table 3. Energy Source Material Characteristics for the month of November 2020**

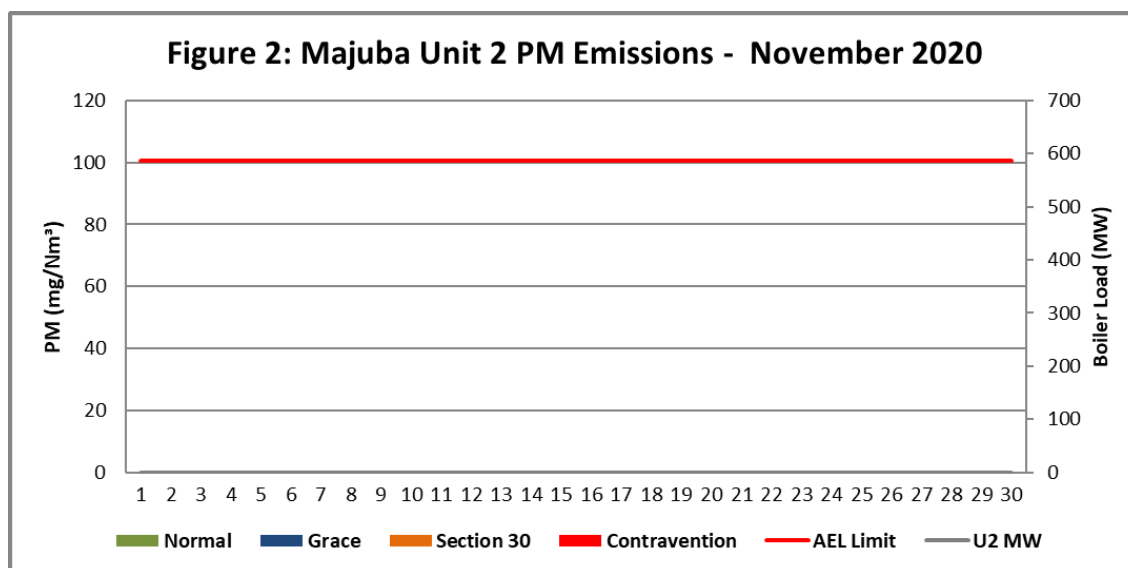
Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	Not available
Ash Content	28 to >30%	29.2%

\*Sulphur content is not available due to low data recovery on the continuous analyser and a faulty sulphur analyser in the coal lab.

### Emissions Reporting



**Figure 1. Particulate Matter emissions (daily averages) for the month of November 2020 against emission limit for Unit 1.**



**Figure 2. Particulate Matter emissions (daily averages) for the month of November 2020 against emission limit for Unit 2**

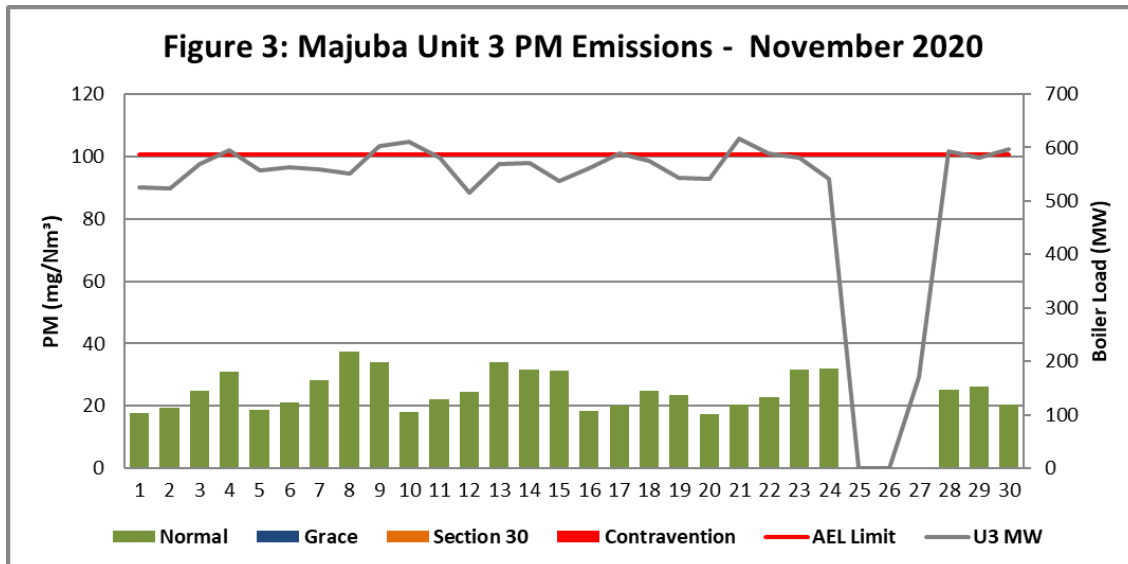


Figure 3. Particulate Matter emissions (daily averages) for the month of November 2020 against emission limit for Unit 3.

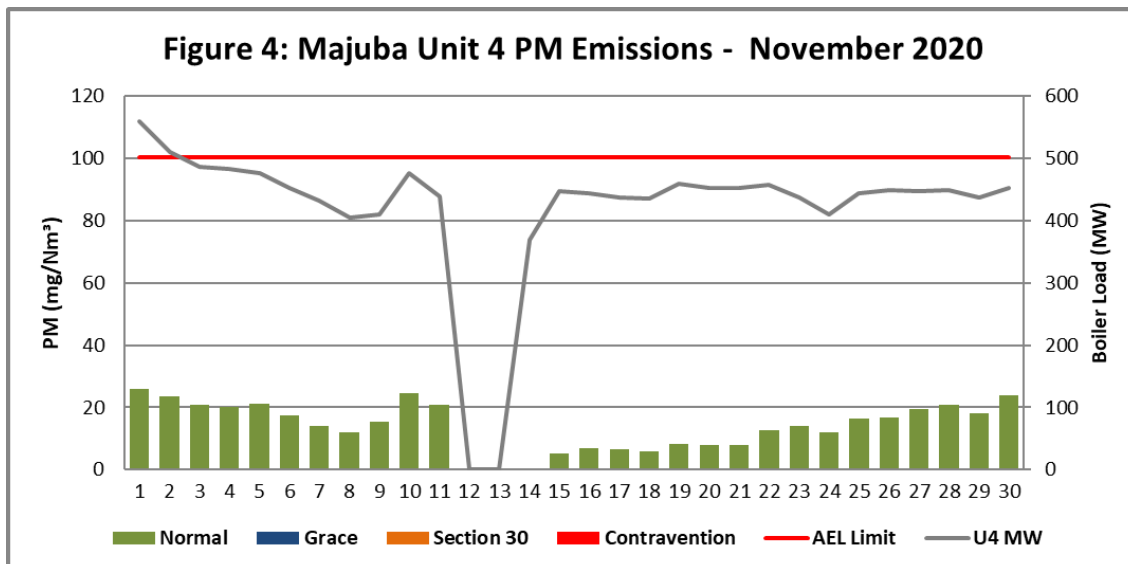


Figure 4. Particulate Matter emissions (daily averages) for the month of November 2020 against emission limit for Unit 4

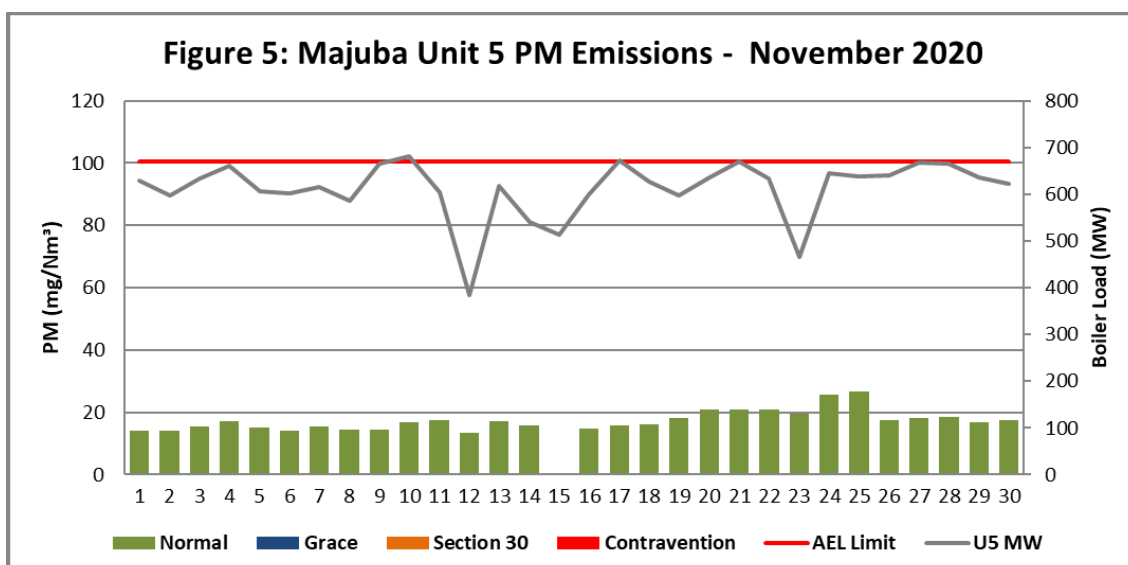
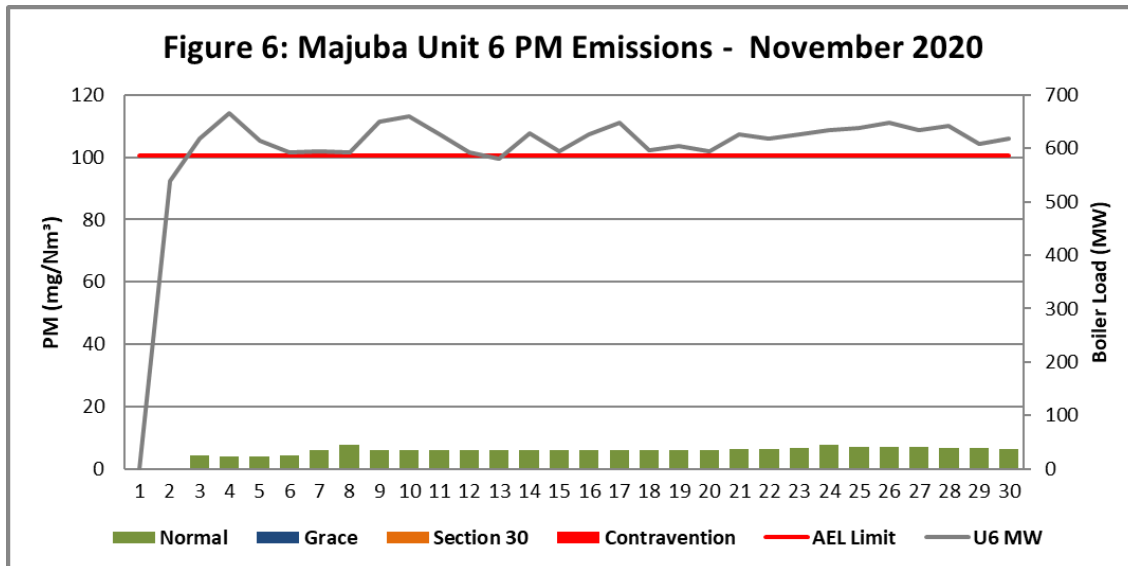
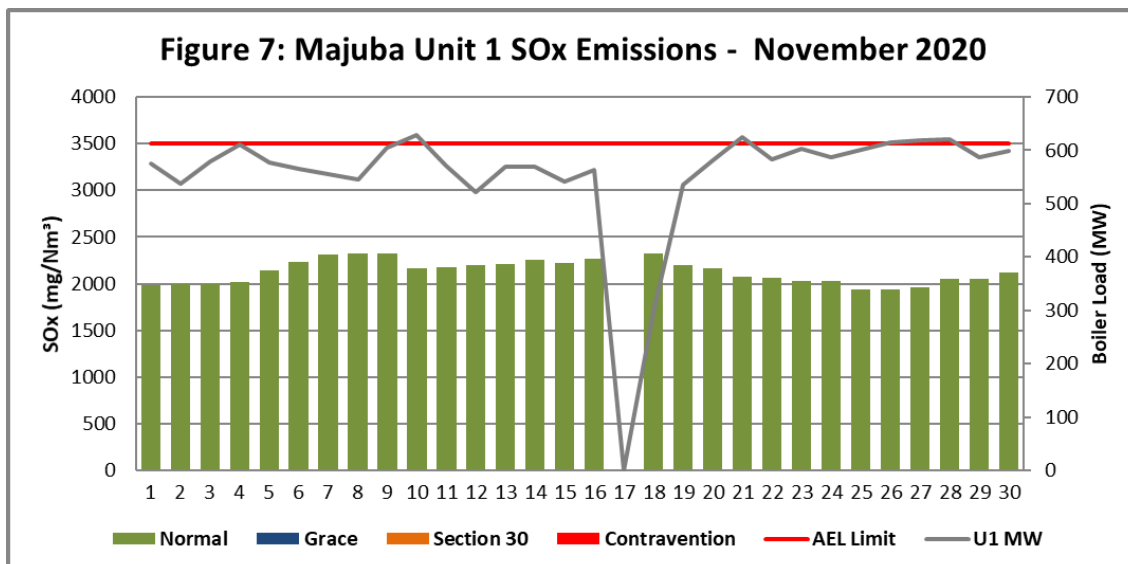


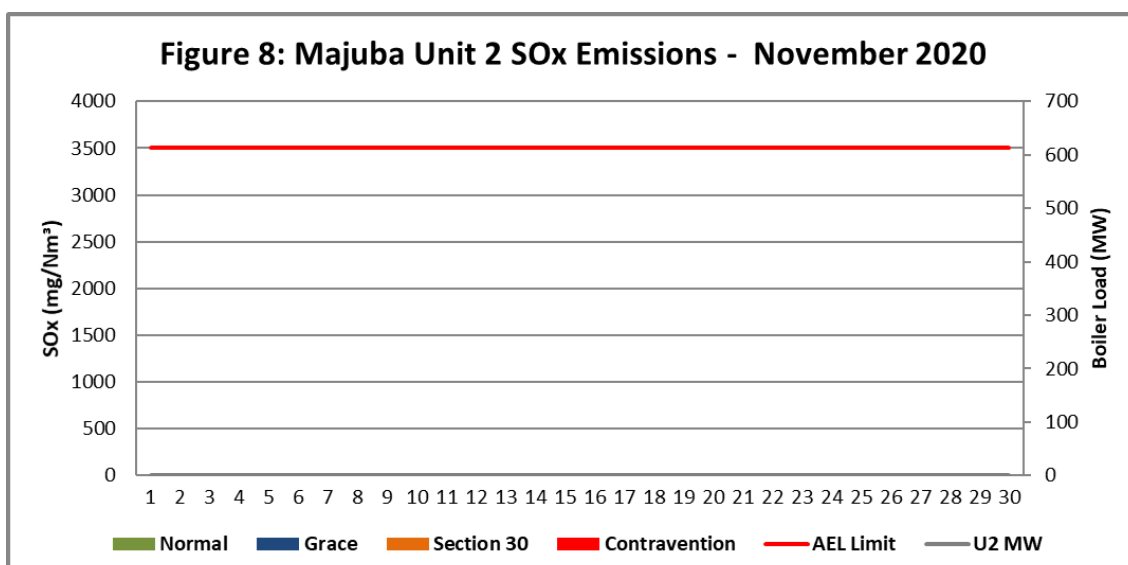
Figure 5. Particulate Matter emissions (daily averages) for the month of November 2020 against emission limit for Unit 5



**Figure 6. Particulate Matter emissions (daily averages) for the month of November 2020 against emission limit for Unit 6**



**Figure 7. SOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 1.**



**Figure 8. SOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 2**

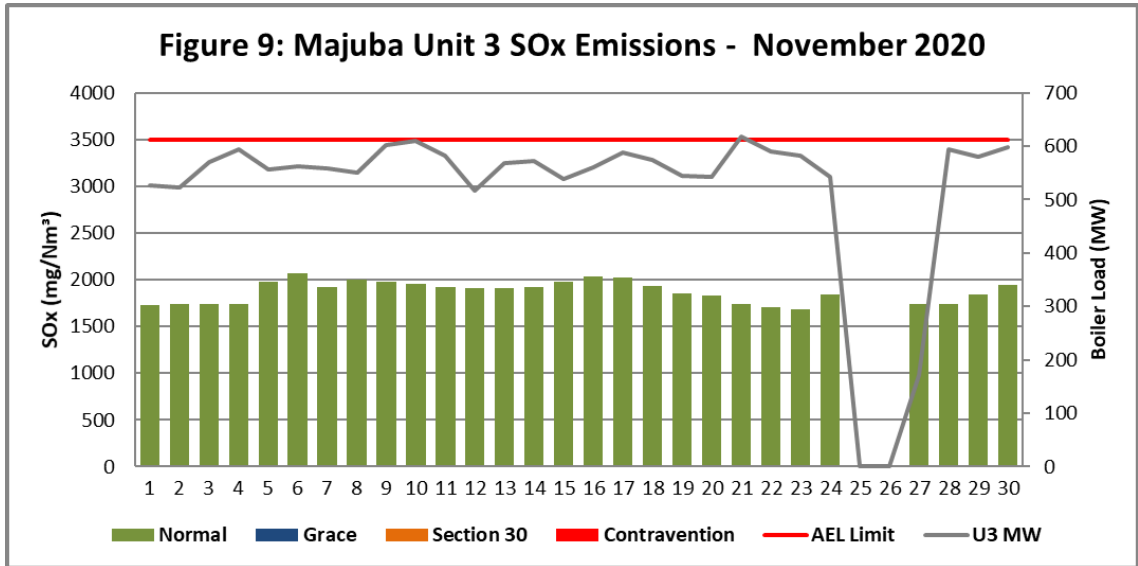


Figure 9. SOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 3.

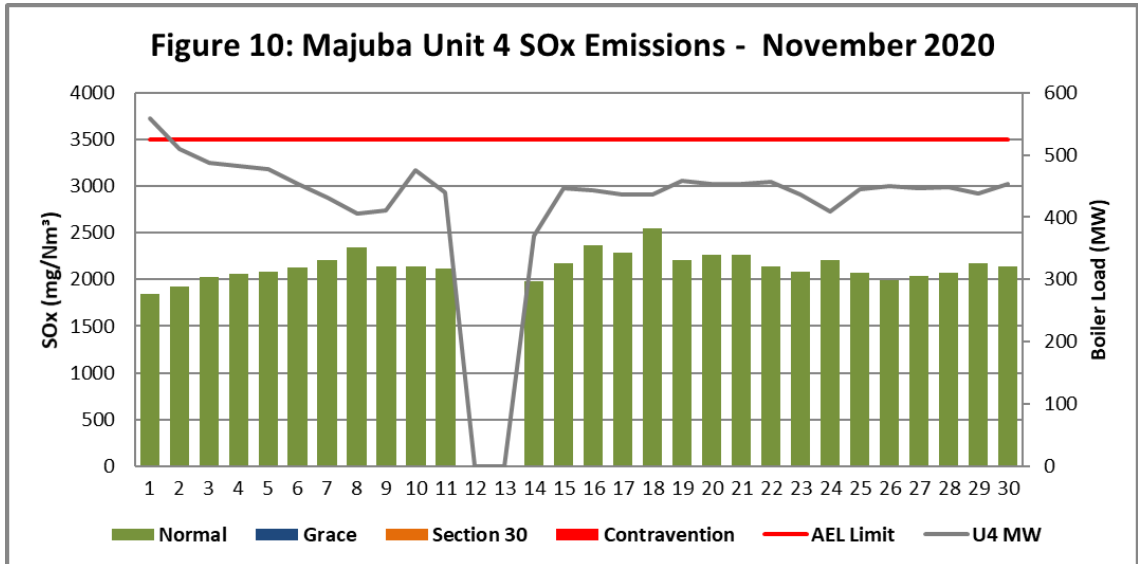


Figure 10. SOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 4

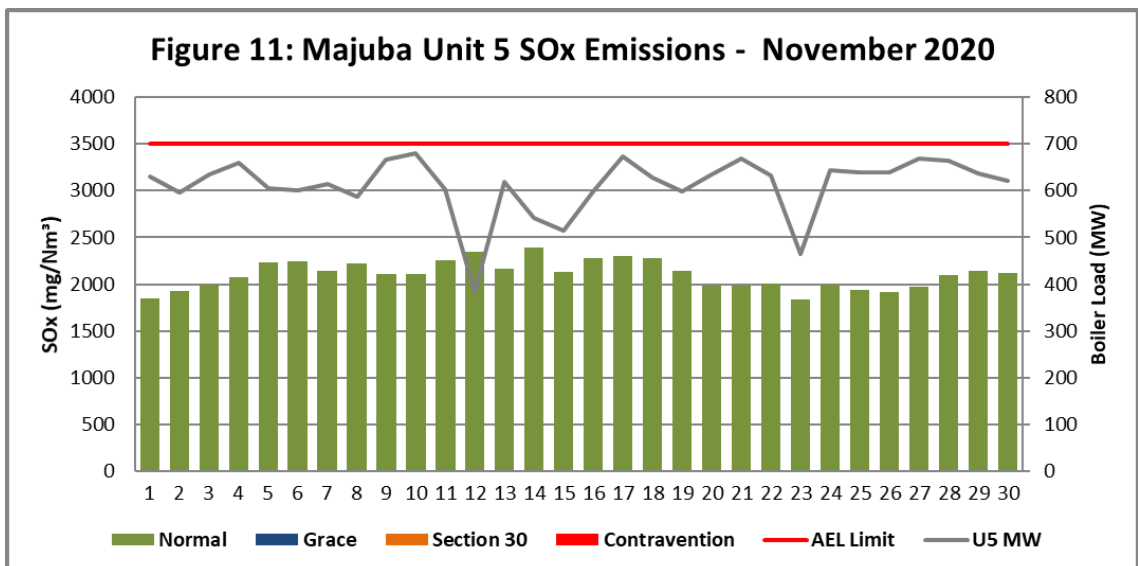


Figure 11. SOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 5

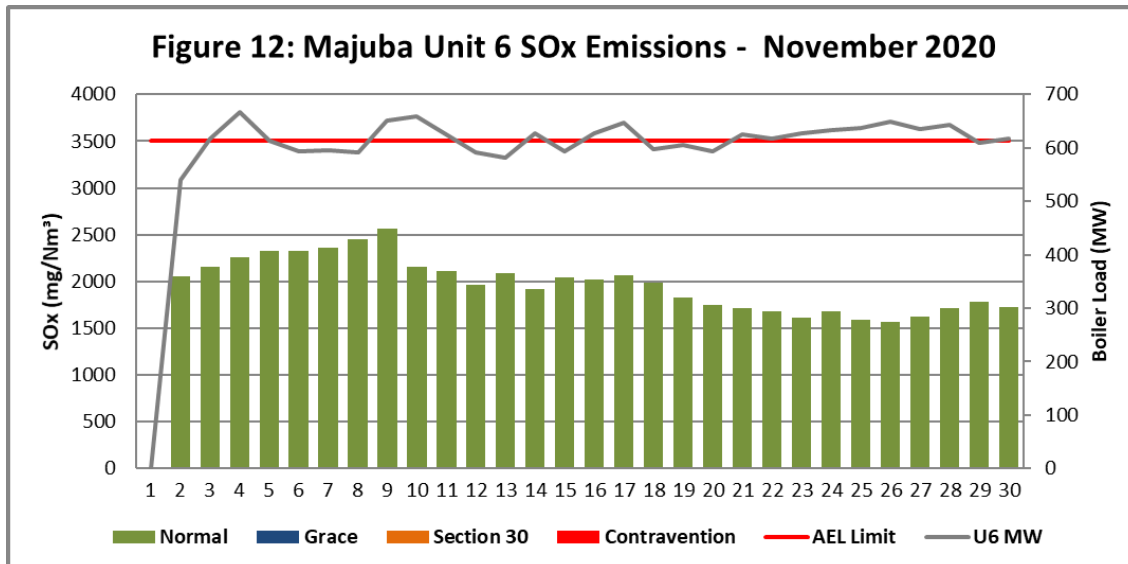


Figure 12. SOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 6

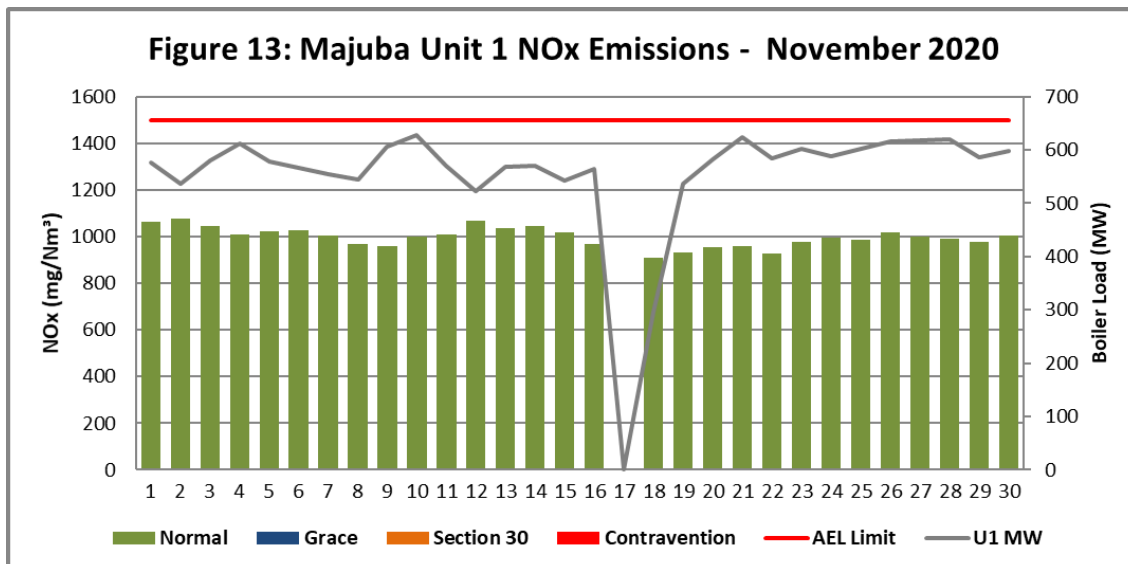


Figure 13. NOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 1.

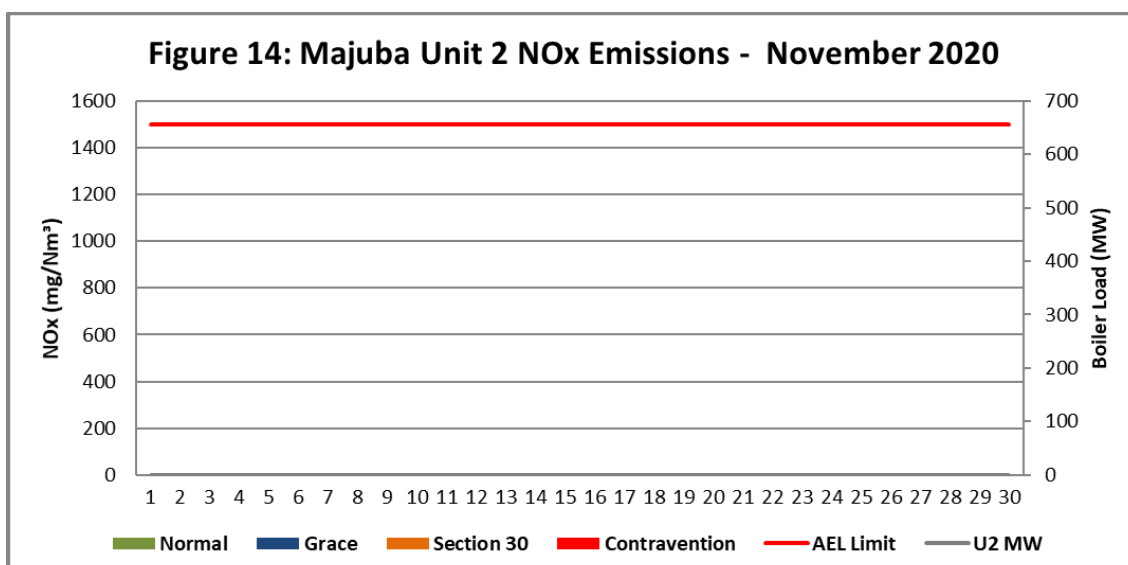


Figure 14. NOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 2

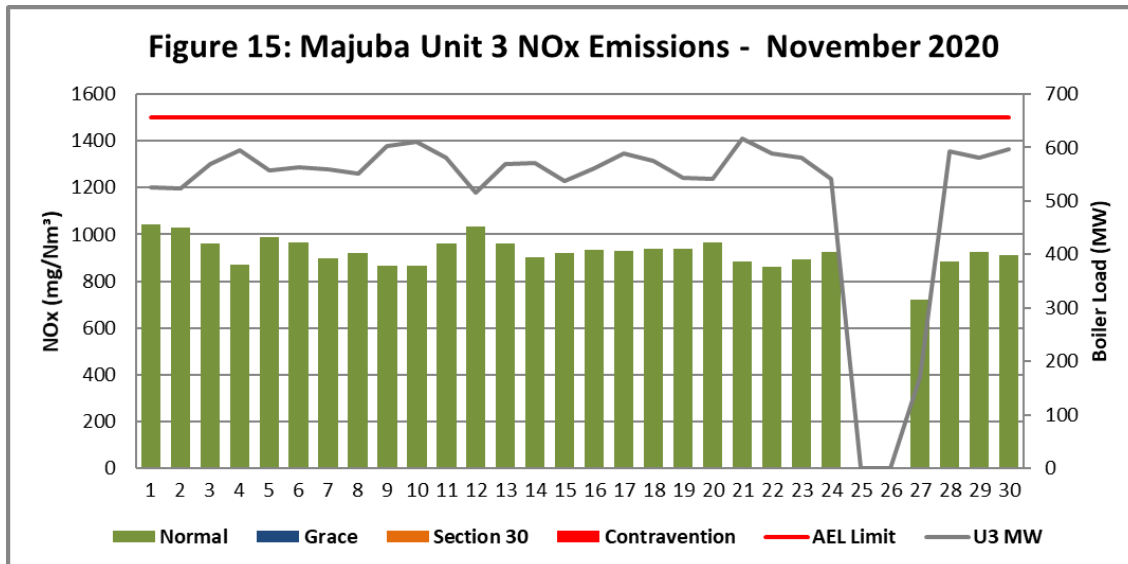


Figure 15. NOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 3.

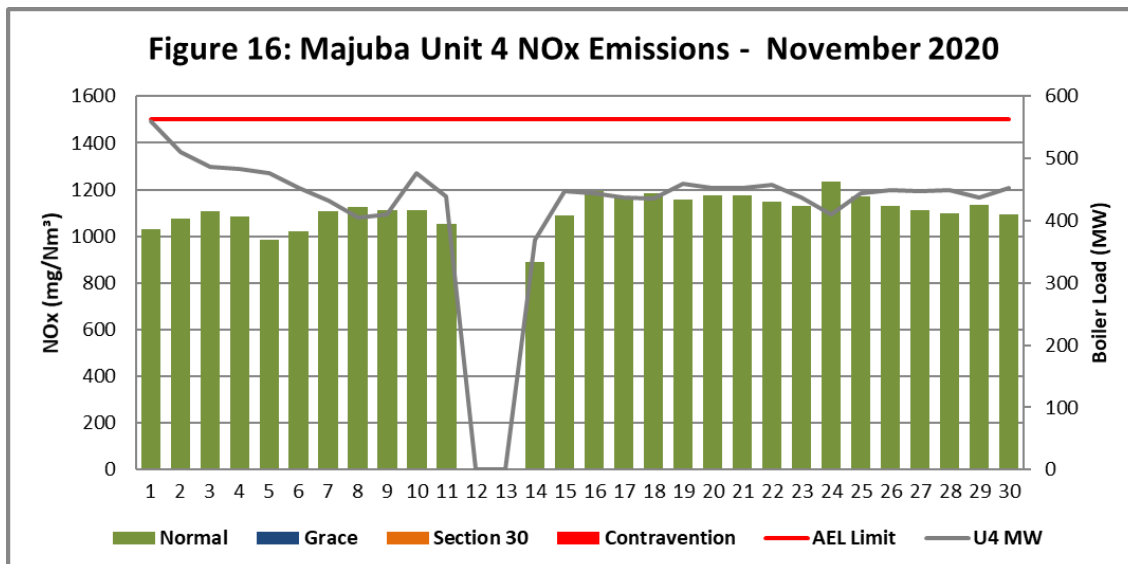


Figure 16. NOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 4

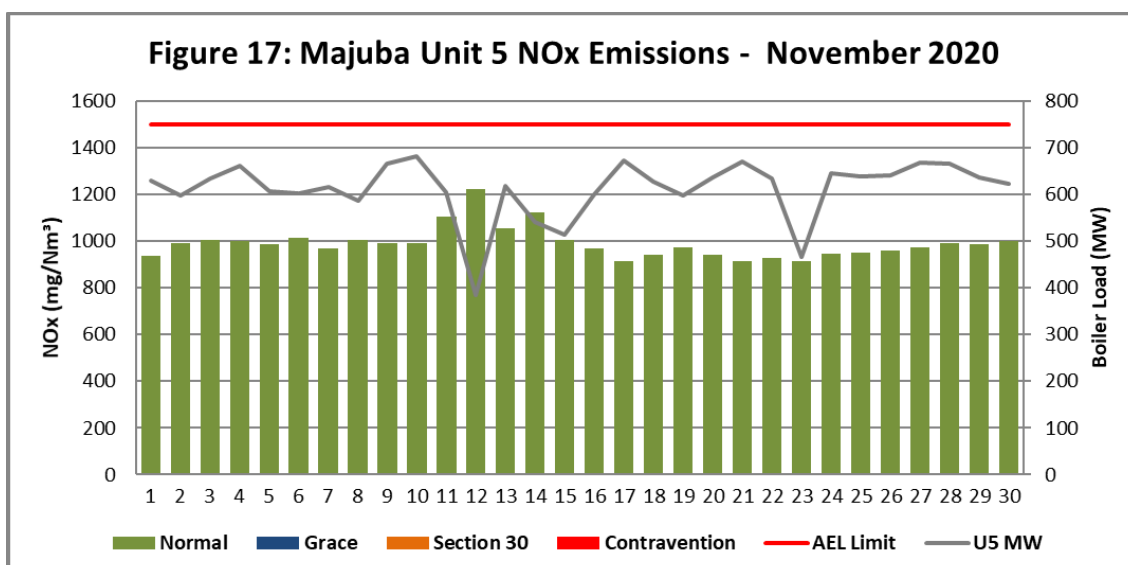


Figure 17. NOx emissions (daily averages) for the month of November 2020 against emission limit for Unit 5

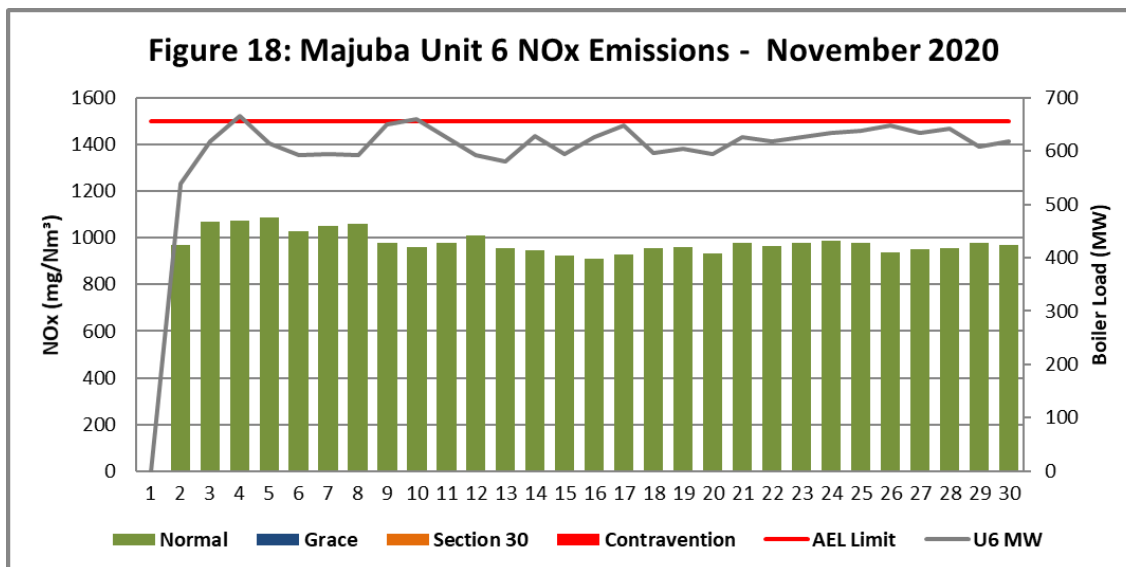


Figure 18. NOx emissions (daily averages) for the month November 2020 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of November 2020

Unit	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
1	19.9	3 962	1 870
2	Unit on outage		
3	41.2	3 208	1 589
4	25.1	3 491	1 814
5	38.3	4 870	2 281
6	14.4	4 753	2 369
<b>Sum</b>	<b>138.9</b>	<b>20 285</b>	<b>9 923</b>

Table 5: Average monthly concentrations (mg/Nm<sup>3</sup>) for the month of November 2020

Unit	PM (Mg/Nm <sup>3</sup> )	SO <sub>2</sub> (Mg/Nm <sup>3</sup> )	NO <sub>2</sub> (Mg/Nm <sup>3</sup> )
1	11.0	2 129.9	997.8
2	Unit on outage		
3	25.1	1 871.1	925.1
4	15.5	2 143.5	1 110.1
5	17.3	2 105.4	989.5
6	6.2	1 969.7	981.2

Table 6: Each unit and respective days operating in compliance to the AEL Emission Limits (SO<sub>x</sub>, NO<sub>x</sub> and PM)

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance
Unit 1	27	0	0	0	0
Unit 2	0	0	0	0	0
Unit 3	27	0	0	0	0
Unit 4	27	0	0	0	0
Unit 5	29	0	0	0	0
Unit 6	28	0	0	0	0



## CO<sub>2</sub> and O<sub>2</sub> Relationship

Date	Final Average CO <sub>2</sub> (%)						Final Average O <sub>2</sub> (%)						Final Average CO <sub>2</sub> + O <sub>2</sub> (%)					
	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6
31-Oct	11.1	9.7	11.5	10.0	11.7		9.0	11.8	9.6	10.5	7.8		20.1	21.5	21.0	20.5	19.5	
01-Nov	10.8		10.4	10.7	11.4		9.3		11.3	9.6	8.1		20.1		21.7	20.3	19.5	
02-Nov	10.2		10.3	10.0	10.9		9.9		11.1	10.5	8.7	8.5	20.2		21.4	20.5	19.6	
03-Nov	10.8		11.0	9.7	11.3	12.5	9.2		10.2	11.2	8.2	7.8	20.0		21.2	20.9	19.5	20.4
04-Nov	11.2		11.6	9.8	11.3	12.7	8.6		9.1	11.1	8.1	7.6	19.8		20.7	20.9	19.4	20.3
05-Nov	10.8		10.9	9.6	11.1	12.2	9.4		10.6	10.8	8.4	8.3	20.1		21.5	20.5	19.5	20.5
06-Nov	10.7		10.9	9.3	10.8	12.0	9.5		10.4	11.2	8.9	8.4	20.1		21.3	20.5	19.7	20.4
07-Nov	10.8		11.0	8.9	11.1	12.1	9.2		10.0	12.0	8.3	8.3	20.0		21.0	20.9	19.4	20.5
08-Nov	10.8		10.9	8.6	10.9	12.2	9.0		10.1	12.6	8.7	8.3	19.8		21.0	21.2	19.6	20.5
09-Nov	11.4		11.7	8.5	11.7	12.7	8.5		9.3	12.3	7.6	7.7	19.8		21.0	20.8	19.4	20.3
10-Nov	11.4		11.8	9.7	11.7	12.6	8.6		9.3	10.7	7.9	7.6	20.0		21.2	20.4	19.6	20.2
11-Nov	10.9		11.1	9.2	10.2	12.5	9.1		10.1	11.5	9.8	8.1	20.0		21.3	20.7	20.0	20.6
12-Nov	10.2		10.5		8.2	12.1	10.0		10.9		12.5	8.4	20.1		21.4		20.6	20.5
13-Nov	10.7		11.3		10.6	11.8	9.3		10.0		9.3	8.5	20.0		21.3		19.9	20.3
14-Nov	10.6		11.4		10.2	12.4	9.4		9.7	10.8	9.7	7.9	20.0		21.1		19.9	20.3
15-Nov	10.7		11.1	9.0		12.3	9.3		10.1	11.6	9.8	8.0	19.9		21.2	20.7		20.3
16-Nov	11.0		11.3	8.7	10.8	12.6	8.9		10.2	12.4	8.7	7.8	19.9		21.4	21.1	19.5	20.3
17-Nov			11.5	8.9	11.6	12.5			9.7	12.1	7.6	7.8			21.2	21.0	19.3	20.3
18-Nov			11.5	8.8	11.2	12.1	11.3		9.9	12.4	8.5	8.3			21.4	21.2	19.7	20.4
19-Nov			11.2	9.0	11.0	12.2	9.3		10.2	11.6	8.9	8.2			21.4	20.6	19.9	20.4
20-Nov	10.8		10.9	8.7	11.3	11.6	9.4		10.7	11.8	8.4	8.4	20.3		21.7	20.5	19.7	20.0
21-Nov	11.2		11.9	8.7	11.7		8.8		9.4	11.8	7.9	8.1	20.0		21.2	20.5	19.5	8.1
22-Nov	11.2		11.7	8.9	11.4		9.0		9.5	11.8	8.1	8.0	20.2		21.2	20.7	19.5	8.0
23-Nov	11.1		11.6	8.7	10.4		9.0		9.7	12.5	9.3	8.1	20.1		21.2	21.2	19.8	8.1
24-Nov	11.0		11.1	8.3	11.5		8.9		10.3	13.3	8.1	7.9	19.9		21.4	21.6	19.5	7.9
25-Nov	11.1			8.7	11.2		8.9			12.5	8.2	7.9	20.0			21.2	19.4	7.9
26-Nov	11.1			9.2	11.1		8.8			11.9	8.2	7.9	20.0			21.1	19.3	7.9
27-Nov	11.2			9.0	11.3	12.5	8.8		13.5	12.0	8.2	7.9	20.0			21.1	19.5	20.4
28-Nov	11.3		11.6	9.0	11.4	12.4	8.7		9.4	12.0	8.3	7.9	19.9		21.0	21.1	19.7	20.3
29-Nov	11.0		11.3	8.8	11.4	12.1	8.9		10.1	12.3	8.4	8.2	19.9		21.4	21.1	19.7	20.3
30-Nov	11.1		11.8	9.2	11.2	12.3	8.9		9.6	11.8	8.5	8.1	19.9		21.4	20.9	19.7	20.3
<b>Totals</b>	<b>10.9</b>		<b>11.2</b>	<b>9.1</b>	<b>11.0</b>	<b>12.3</b>	<b>9.2</b>		<b>10.2</b>	<b>11.7</b>	<b>8.6</b>	<b>8.1</b>	<b>20.0</b>		<b>21.3</b>	<b>20.9</b>	<b>19.6</b>	<b>17.7</b>

Calculation: CO<sub>2</sub>% + O<sub>2</sub>% = 19.5-21.5%

**Table 7: CO<sub>2</sub> and O<sub>2</sub> deviations of the Month of November 2020**

\*Blank spaces indicate that the unit was offline during that period

### Comments on the performance and availability of each unit

### Emergency Generation

**Table 8: Emergency Generation for the month of November 2020**

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
<b>Emergency Generation hours declared by national Control</b>	0	0	0	0	0	0
<b>Emergency Hours declared including hours after stand down</b>	0	0	0	0	0	0
<b>Hours over the Limit during Emergency Generation</b>	0	0	0	0	0	0

## Comments on the performance and availability of each unit

### UNIT 1

The unit base loaded for most days of the month and was off for one day. Seven fabric filter bags were replaced during the month.

### UNIT 2

The unit was on outage during the month. Twelve fabric filter bags were replaced during the month

### UNIT 3

The unit base loaded for most days of the month and was off for two days. Seventy fabric filter bags were replaced during the month.

### UNIT 4

The unit base loaded for most days of the month and was off for two days. Twenty-four fabric filter bags were replaced during the month.

### UNIT 5

The unit base loaded for the entire month. Thirty-eight fabric filter bags were replaced during the month.

### UNIT 6

The unit base loaded for most days of the month and was off for one day. Eleven fabric filter bags were replaced during the month.

## Complaints Register

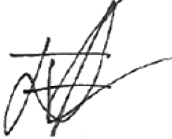
**Table 9: Complaints for the month of November 2020**

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
n/a	Littering around the nature reserve – large number of trucks	n/a	n/a	An action plan has been developed.	

**General**

Additional information demonstrating compliance with the emission license conditions is supplied in the annual emission reports sent to your office.

Report compiled by:



Faith Kagoda  
**ENVIRONMENTAL MANAGER: (MAJUBA)**

Date 11/02/2021

Report verified by:



Lindani Madonsela  
**BOILER ENGINEERING MANAGER: (MAJUBA)**

Date 16/02/2021

Hoping the above will meet your satisfaction

Yours sincerely



Bawinile Malope  
**ENGINEERING MANAGER: (MAJUBA)**

2021/02/22  
Date