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 Gert Sibande District Municipality
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Date: 11 February 2021

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Dear Mr. Hlanyane

MAJUBA POWER STATION'S REVISED MONTHLY EMISSIONS REPORT FOR THE MONTH OF DECEMBER 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 December 2020. Verified emissions of particulates are included. SO₂ and NO_x (as NO₂) 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 CO₂ instead of correction factors as CO₂ 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 December 2020

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of December 2020
	Coal	Tons/month	1 800 000	999 914
Fuel Oil	Tons/month	6 000	3 837	

Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of December 2020
	Energy	GWh	4 110	1 823.6
Ash	Tons/month	Not stated in the license	290 975	

Abatement Technology

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

Associated Unit	Technology Type	Actual Utilisation (%) for the month of December 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	99.93%
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 December 2020

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	0.8%
Ash Content	28 to >30%	29.1%

Emissions Reporting

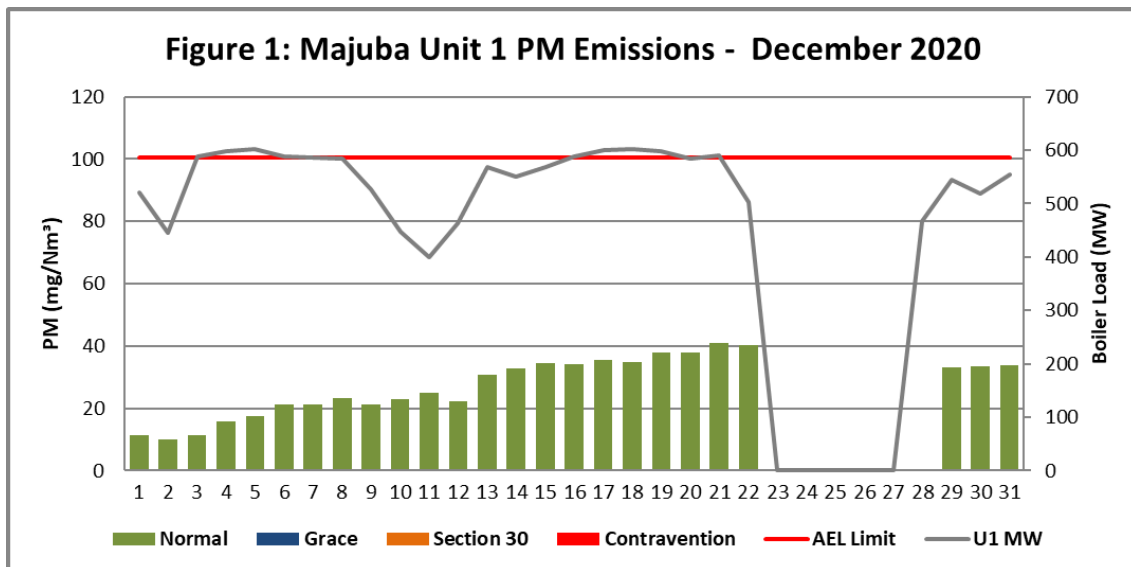


Figure 1. Particulate Matter emissions (daily averages) for the month of December 2020 against emission limit for Unit 1.

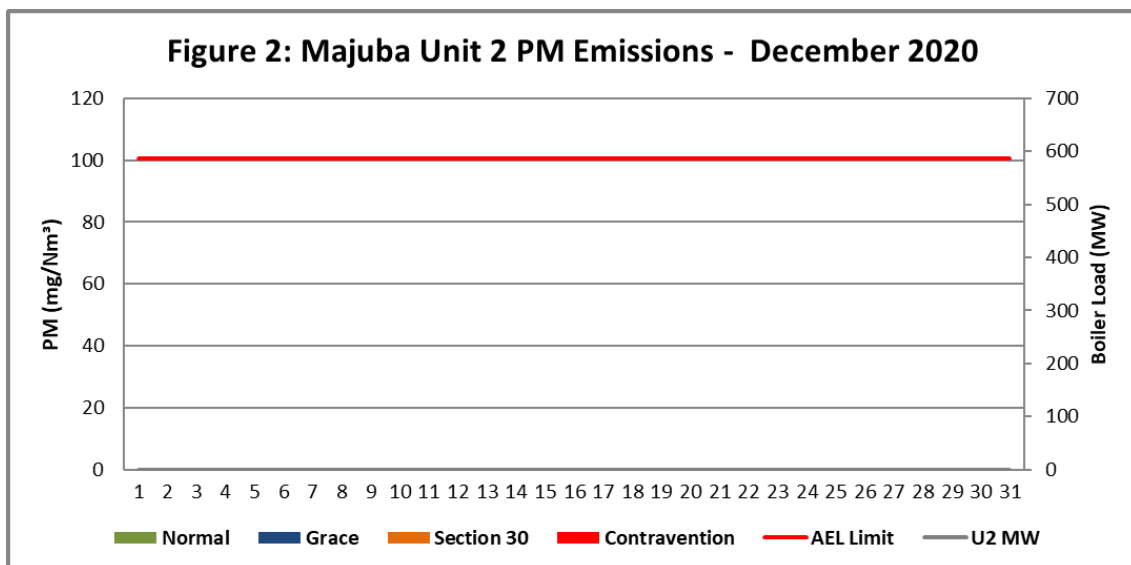


Figure 2. Particulate Matter emissions (daily averages) for the month of December 2020 against emission limit for Unit 2. The unit was on outage for the entire month.

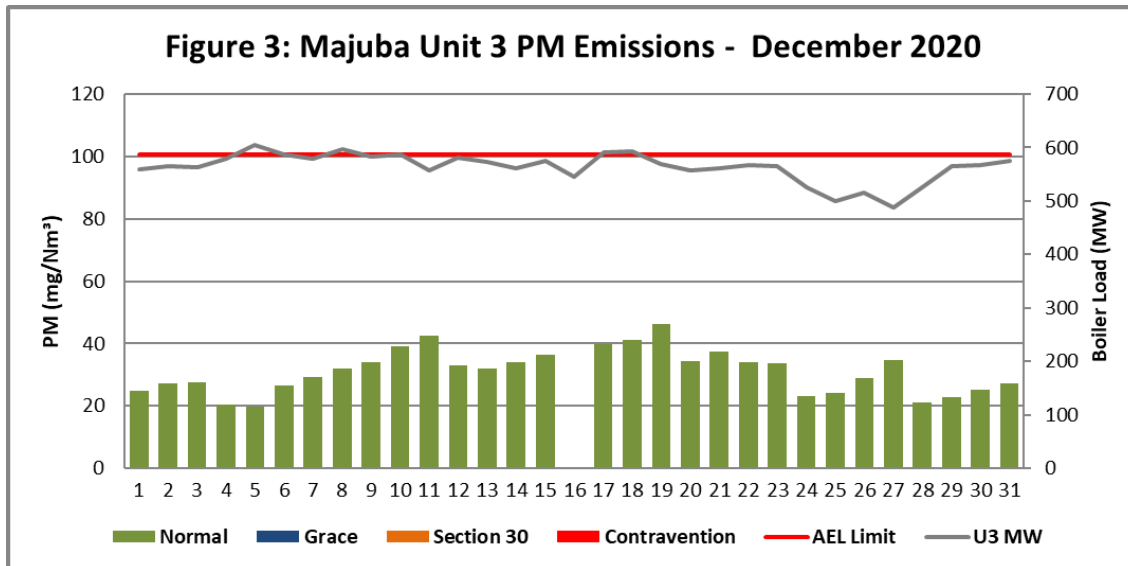


Figure 3. Particulate Matter emissions (daily averages) for the month of December 2020 against emission limit for Unit 3.

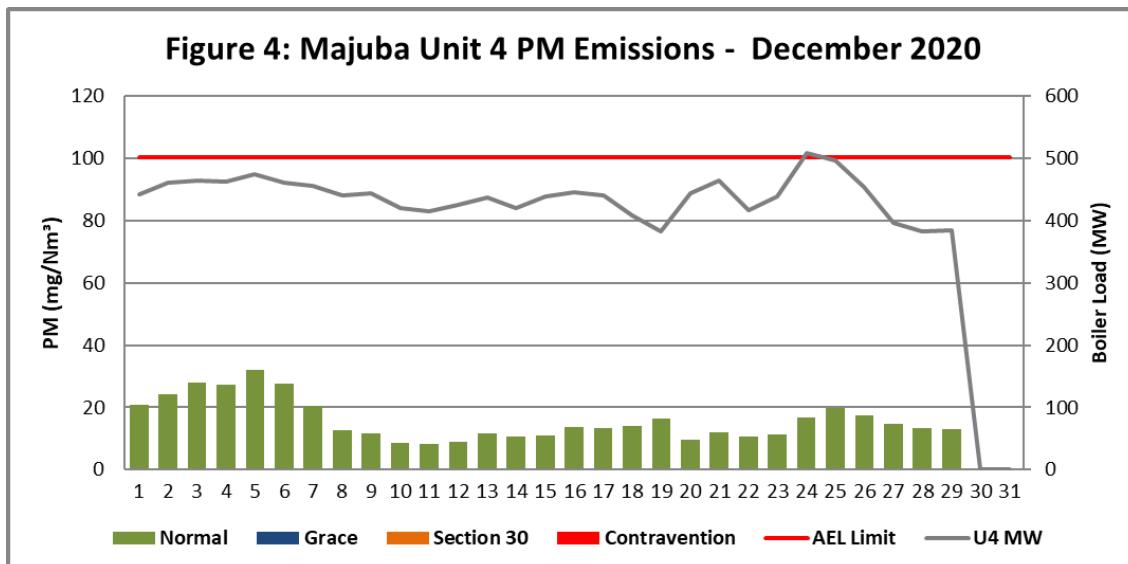


Figure 4. Particulate Matter emissions (daily averages) for the month of December 2020 against emission limit for Unit 4

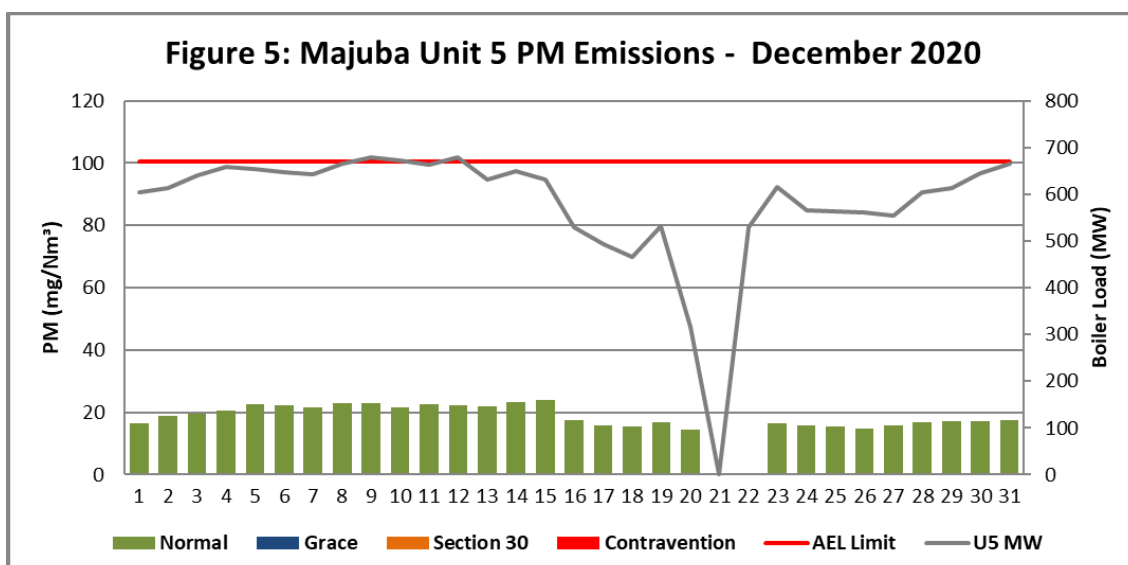


Figure 5. Particulate Matter emissions (daily averages) for the month of December 2020 against emission limit for Unit 5

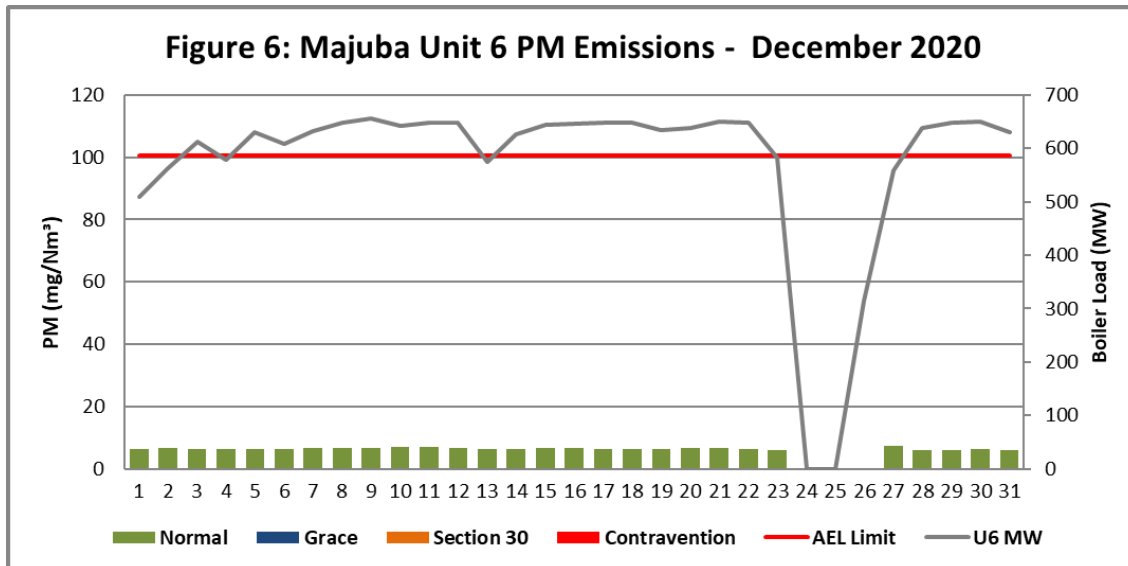


Figure 6. Particulate Matter emissions (daily averages) for the month of December 2020 against emission limit for Unit 6

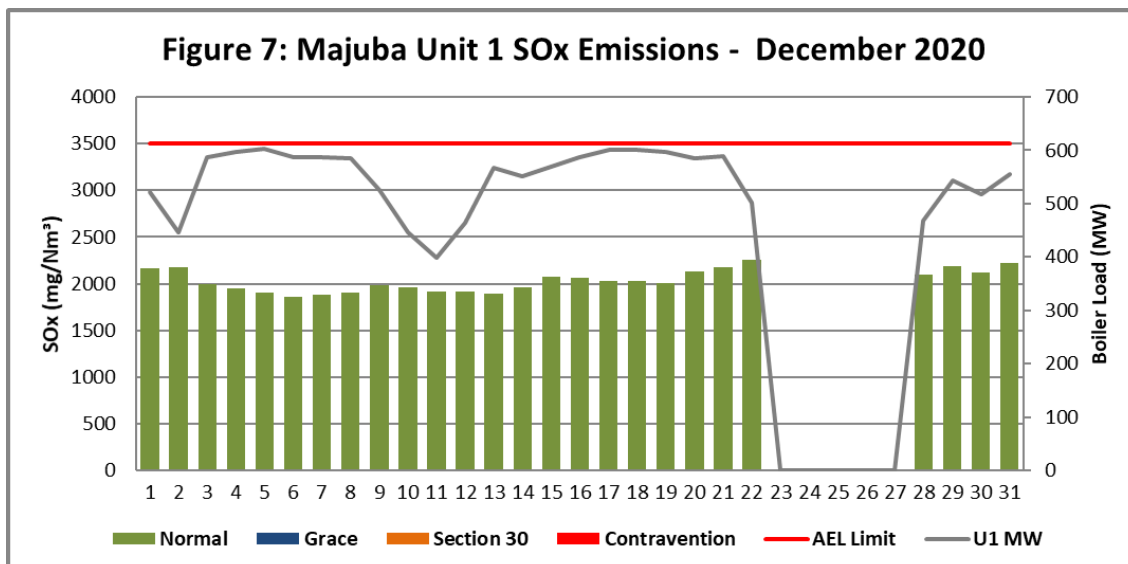


Figure 7. SOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 1.

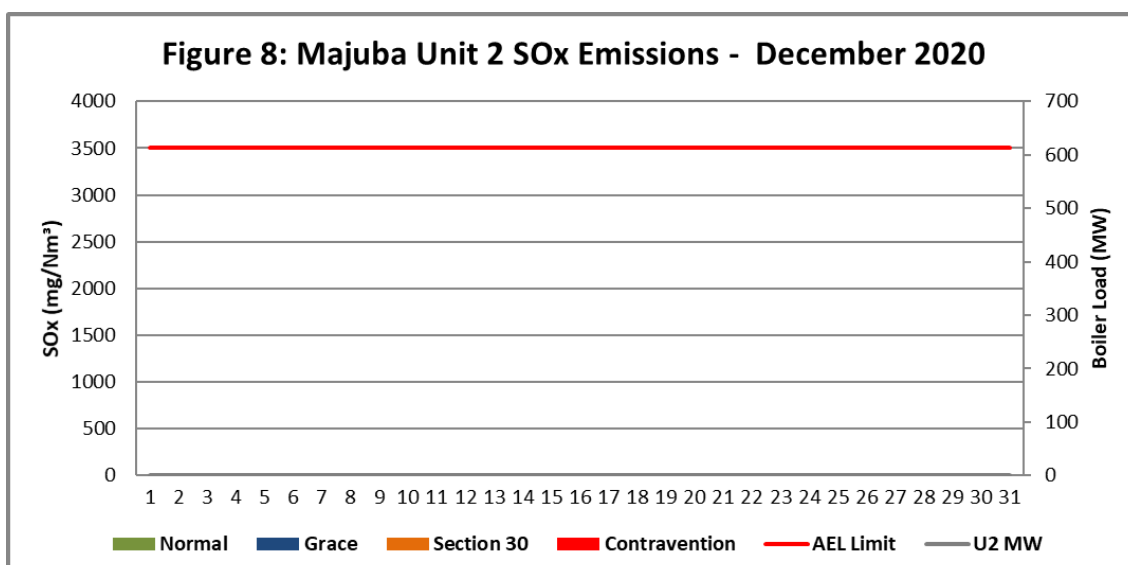


Figure 8. SOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 2. The unit was on outage for the entire month

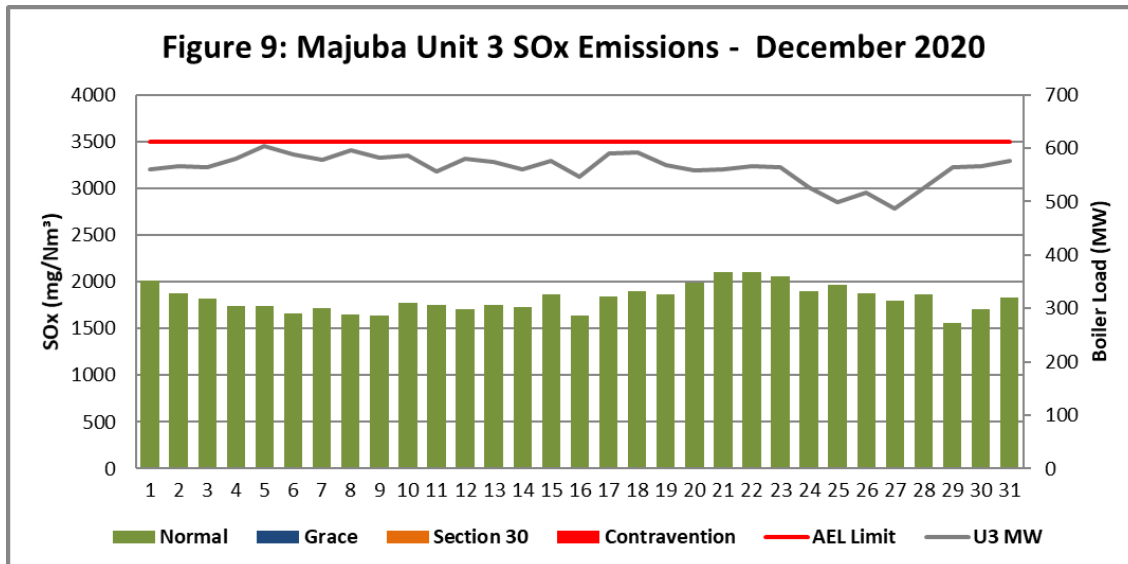


Figure 9. SOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 3.

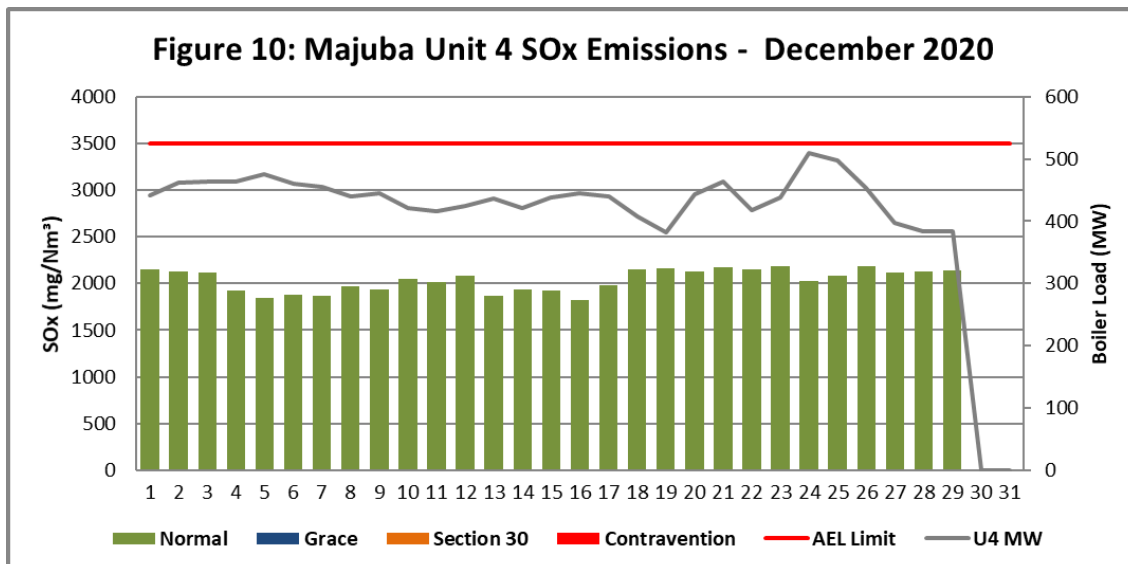


Figure 10. SOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 4

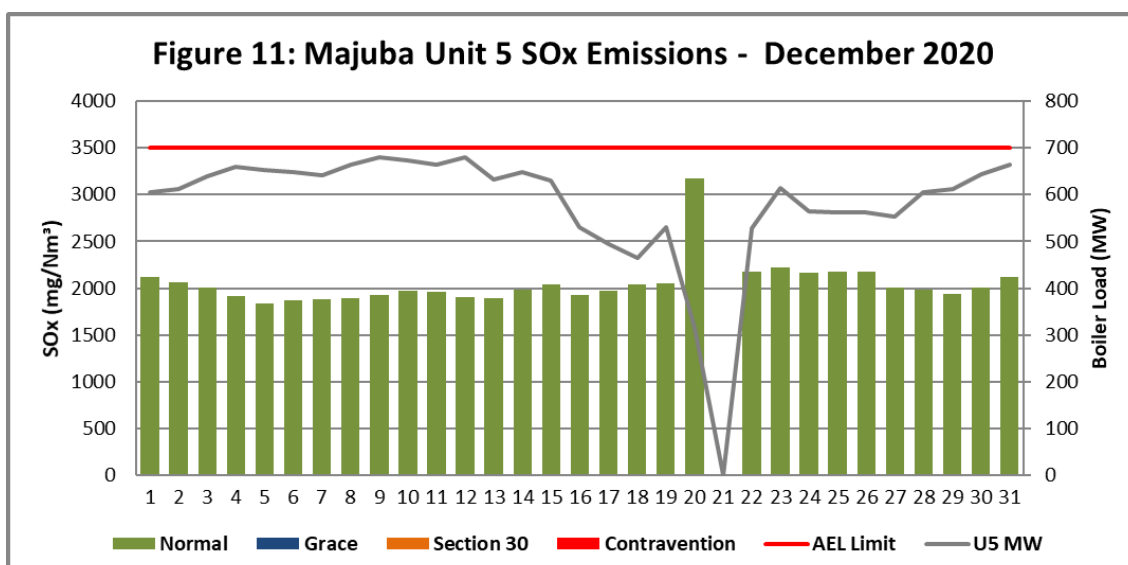


Figure 11. SOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 5

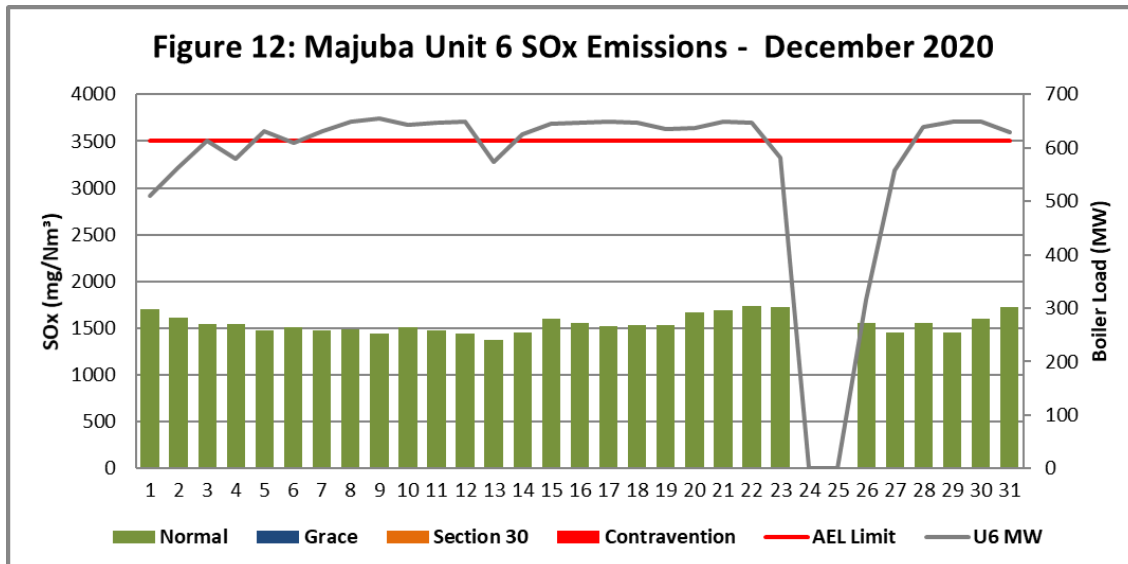


Figure 12. SOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 6

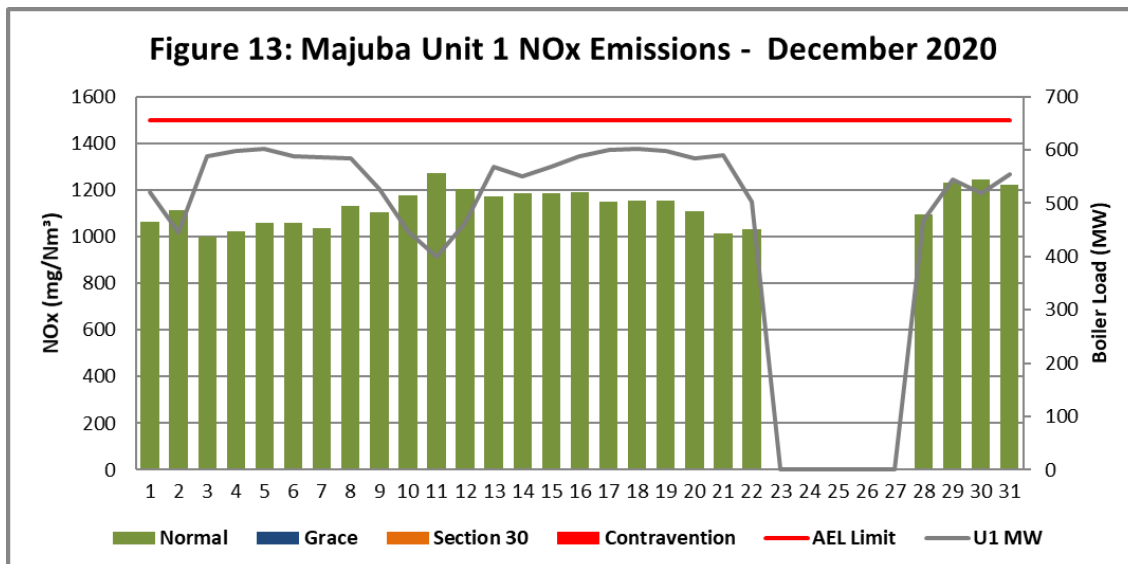


Figure 13. NOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 1.

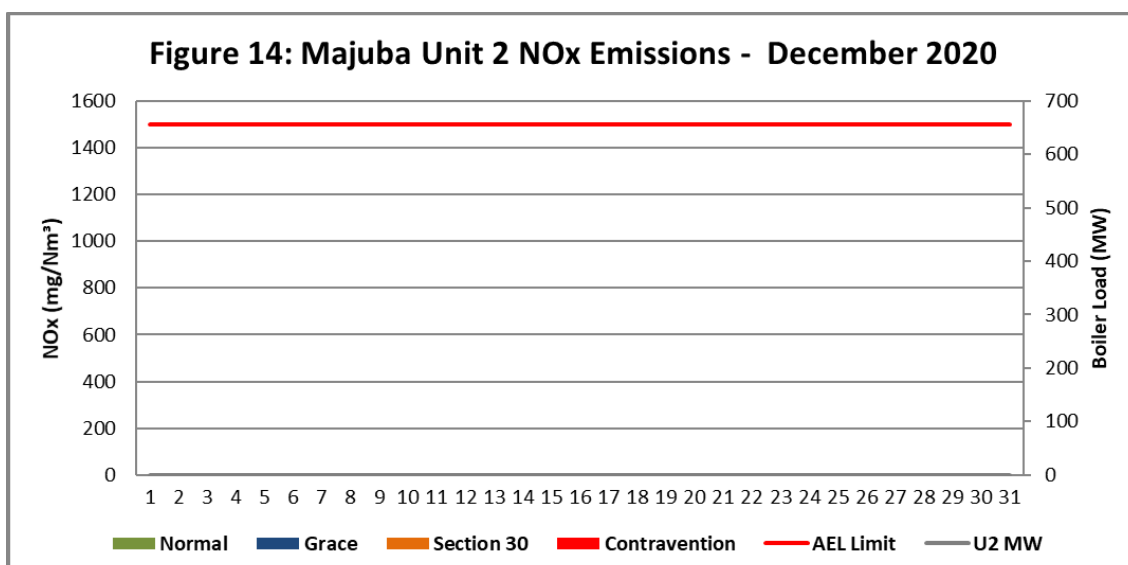


Figure 14. NOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 2. The unit was on outage for the entire month.

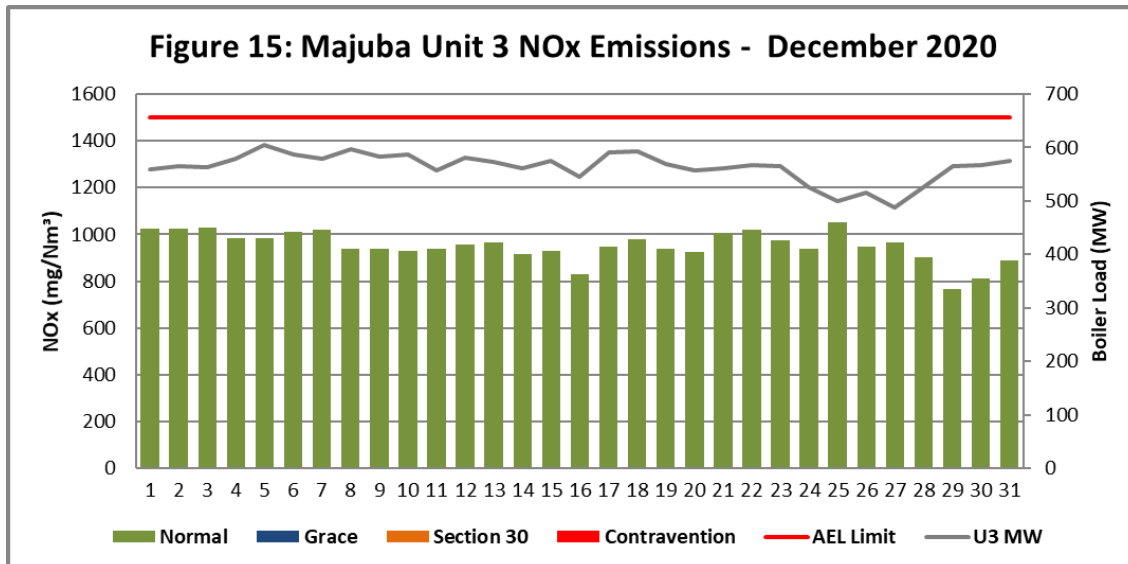


Figure 15. NOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 3.

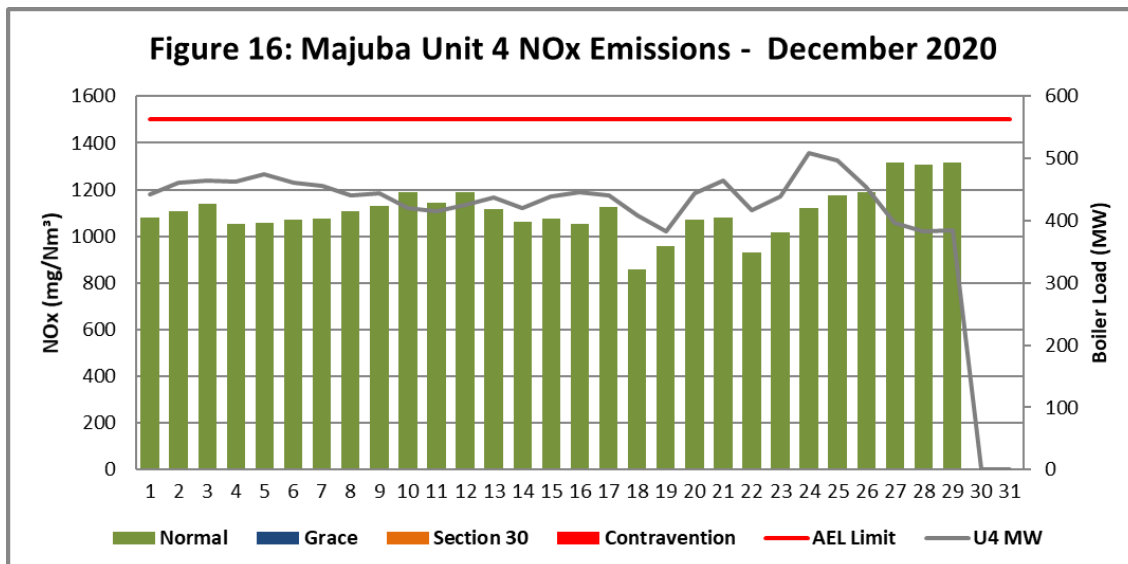


Figure 16. NOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 4

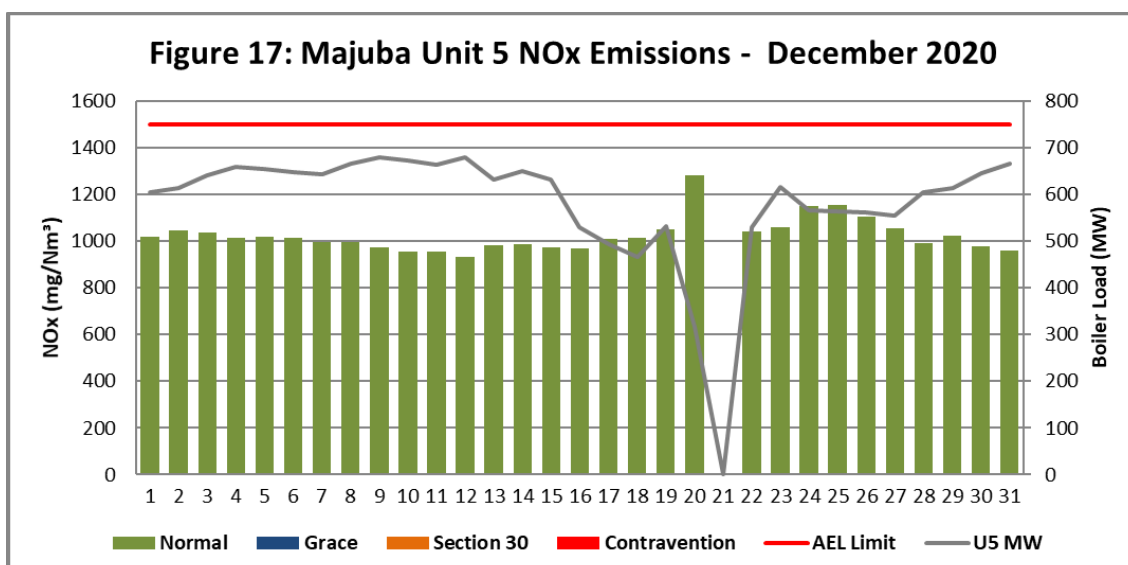


Figure 17. NOx emissions (daily averages) for the month of December 2020 against emission limit for Unit 5

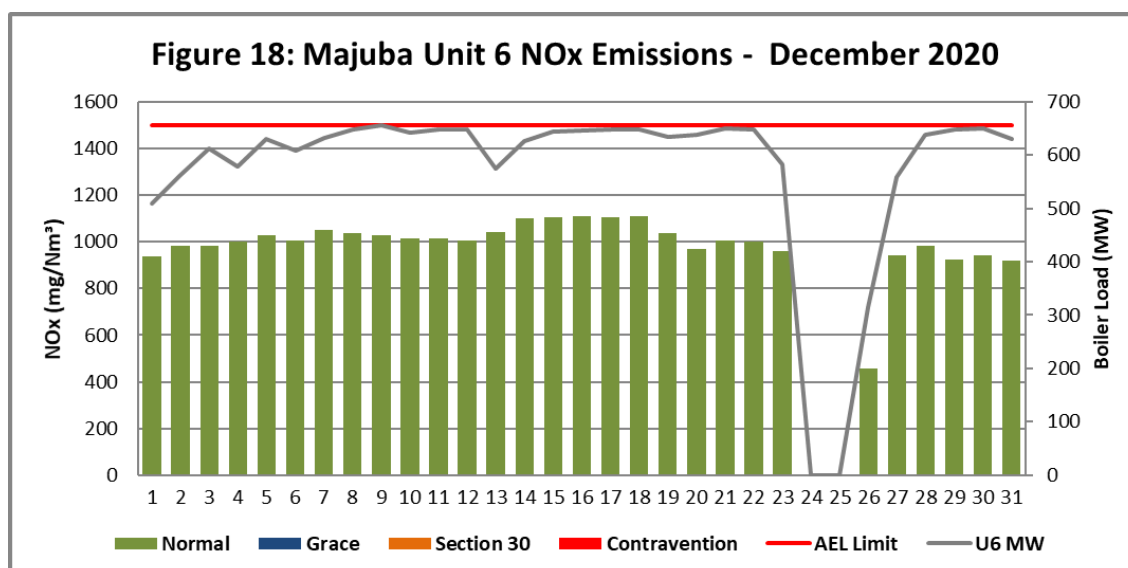


Figure 18. NOx emissions (daily averages) for the month December 2020 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of December 2020

Unit	PM (tons)	SO ₂ (tons)	NO _x (tons)
1	42.9	3 294	1 829
2	Unit on outage		
3	57.1	3 472	1 818
4	26.5	3 459	1 881
5	42.9	4 578	2 315
6	14.6	3 566	2 334
Sum	184.0	18 369	10 176

Table 5: Average monthly concentrations (mg/Nm³) for the month of December 2020

Unit	PM (Mg/Nm ³)	SO ₂ (Mg/Nm ³)	NO ₂ (Mg/Nm ³)
1	27.3	2 032.2	1 130.0
2	Unit on outage		
3	31.1	1 820.0	951.2
4	15.8	2 037.3	1 107.5
5	19.0	2 046.2	1 023.6
6	6.5	1 549.4	993.0

Table 6: Each unit and respective days operating in compliance to the AEL Emission Limits (SO_x, NO_x and PM)

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance
Unit 1	25	0	0	0	0
Unit 2	Unit on outage				
Unit 3	30	0	0	0	0
Unit 4	29	0	0	0	0
Unit 5	29	0	0	0	0
Unit 6	28	0	0	0	0

CO₂ and O₂ Relationship

Date	Final Average CO ₂ (%)						Final Average O ₂ (%)						Final Average CO ₂ + O ₂ (%)					
	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6
01-Dec	10.2		11.0	8.8	10.9	11.5	9.9		10.8	11.9	8.9	8.8	20.1		21.7	20.7	19.9	20.3
02-Dec	9.3		11.2	9.1	10.9	11.8	10.9		10.6	11.9	9.0	8.7	20.2		21.8	21.0	19.9	20.5
03-Dec	10.6		11.0	9.2	10.9	12.0	9.3		10.6	11.9	8.8	8.6	20.0		21.7	21.1	19.8	20.6
04-Dec	10.9		11.2	9.4	11.3	11.8	9.0		10.3	11.2	8.4	8.8	19.9		21.5	20.6	19.8	20.6
05-Dec	11.1		11.6	9.5	11.4	12.3	8.8		9.8	11.0	8.4	8.1	19.9		21.4	20.5	19.8	20.5
06-Dec	10.9		11.4	9.3	11.4	12.3	9.0		10.0	11.2	8.4	8.2	19.9		21.4	20.6	19.7	20.5
07-Dec	10.9		11.2	9.1	11.5	12.4	9.1		10.3	11.5	8.2	8.1	20.0		21.5	20.7	19.7	20.5
08-Dec	10.6		11.7	9.4	11.5	12.4	9.6		9.5	11.5	8.1	8.1	20.2		21.3	20.8	19.6	20.5
09-Dec	10.4		11.5	9.3	11.7	12.5	9.8		9.6	11.5	7.9	7.9	20.2		21.1	20.8	19.6	20.5
10-Dec	9.3		11.6	9.1	11.8	12.5	10.9		9.7	11.8	7.9	8.0	20.3		21.3	20.9	19.6	20.4
11-Dec	8.3		11.4	9.1	11.7	12.5	12.3		10.1	11.8	8.0	7.9	20.6		21.5	20.9	19.7	20.4
12-Dec	9.1		11.6	8.6	11.9	12.5	11.3		10.1	12.8	7.8	7.9	20.4		21.7	21.4	19.7	20.5
13-Dec	10.7		11.5	8.8	11.4	11.7	9.5		9.9	12.1	8.3	8.8	20.2		21.4	20.9	19.7	20.5
14-Dec	10.3		11.3	8.9	11.4	12.4	10.1		10.1	11.9	8.4	8.1	20.4		21.4	20.8	19.7	20.5
15-Dec	10.6		11.4	9.0	11.2	12.5	9.7		9.8	11.7	8.3	7.9	20.3		21.2	20.8	19.5	20.4
16-Dec	10.9		11.4	9.4	10.3	12.6	9.4		8.9	11.1	9.4	7.9	20.3		20.4	20.5	19.7	20.5
17-Dec	11.0		11.7	9.4	10.0	12.5	9.2		9.8	11.4	10.2	8.0	20.2		21.4	20.8	20.2	20.5
18-Dec	11.0		11.8	9.3	9.8	12.5	9.1		10.1	11.5	10.5	8.0	20.1		22.0	20.8	20.3	20.5
19-Dec	10.9		11.7	9.1	10.0	12.4	9.2		10.0	11.8	10.3	8.0	20.2		21.7	21.0	20.2	20.4
20-Dec	10.7		11.4	9.8	7.4	12.4	9.6		10.1	10.7	13.7	8.0	20.3		21.5	20.5	21.1	20.4
21-Dec	10.8		11.2	9.8		12.4	9.4		10.6	10.6		8.0	20.2		21.8	20.5		20.4
22-Dec	10.1		11.2	9.3	9.0	12.5	10.3		10.9	11.4	10.6	7.9	20.4		22.1	20.7	19.6	20.5
23-Dec			11.3	9.5	9.6	12.1			10.7	11.0	10.3	8.3			22.0	20.5	19.9	20.4
24-Dec			11.0	10.3	9.2				10.7	10.1	11.1				21.6	20.4	20.3	
25-Dec			10.4	10.2	9.2				11.5	10.6	11.2				21.9	20.8	20.4	
26-Dec			10.7	9.5	9.6	9.8			10.9	11.5	10.6	10.5			21.6	21.0	20.2	20.3
27-Dec			10.5	8.4	10.4	11.4			11.1	12.9	9.6	8.9			21.6	21.3	20.0	20.4
28-Dec	9.8		10.8	8.1	11.1	12.5	10.4		10.6	13.3	8.6	8.0	20.3		21.4	21.4	19.7	20.5
29-Dec	10.3		11.7	8.1	11.0	12.6	10.3		9.5	13.2	8.7	8.0	20.5		21.2	21.3	19.8	20.6
30-Dec	9.9		11.6		11.2	12.5	10.8		9.7		8.3	8.0	20.6		21.4		19.5	20.5
31-Dec	10.3		11.5		11.4	12.3	10.1		9.8		8.0	8.3	20.4		21.3		19.5	20.6
Totals	10.4		11.3	9.2	10.7	12.2	9.9		10.2	11.6	9.2	8.3	20.2		21.5	20.8	19.9	20.5

Calculation: CO₂% + O₂% = 19.5-21.5%

Table 7: CO₂ and O₂ deviations of the Month of December 2020

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

Emergency Generation

Table 8: Emergency Generation for the month of December 2020

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Emergency Generation hours declared by national Control	0	0	0	0	0	0
Emergency Hours declared including hours after stand down	0	0	0	0	0	0
Hours over the Limit during Emergency Generation	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 five days. Four fabric filter bags were replaced during the month.

UNIT 2

The unit was on outage for the entire month. Five cells (Cell 13, 14, 23, 24 and 12) were re-bagged during the Outage.

UNIT 3

The unit base loaded for the entire month Thirty-six 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. No fabric filter bags were replaced during the month.

UNIT 5

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

UNIT 6

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

Complaints Register

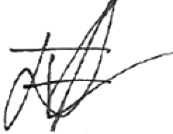
Table 9: Complaints for the month of December 2020

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
	No complaints were received during December 2020				

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