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Date: 08 February 2024

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## MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF JANUARY 2024

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 January 2024. 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 Forestry, Fisheries and the Environmental in the first quarter of 2017/18 financial year's MINTEC and MINMEC management meeting.

### Raw Materials and Products

**Table 1. Quantity of Raw Materials and Products used/produced for the month of January 2024**

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of January 2024
	Coal	Tons/month	1 800 000	802 053
	Fuel Oil	Tons/month	6 000	6 390.7
Production Rates	Product/ By-Product Name	Unit	Maximum Production Rate Permitted (Quantity)	Production Rate in Month of January 2024
	Energy	*GWh	*3 058	1337.48
	Ash	Tons/month	Not stated in the license	229 627.69

\*Majuba AEL stipulates a maximum production capacity of 4110 MW. This equates to a production rate of 3058 GWh per month when converted, as indicated above. This is to align to the monthly production rates reported.

### Abatement Technology

**Table 2. Abatement Equipment Control Technology for the month of January 2024**

Associated Unit	Technology Type	Actual Utilisation (%) for the month of January 2024	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.90
Unit 2	Fabric Filter Plant	100	99.96
Unit 3	Fabric Filter Plant	100	99.93
Unit 4	Fabric Filter Plant	100	99.98
Unit 5	Fabric Filter Plant	100	99.87

Generation Division  
 Majuba Power Station  
 Between Amersfoort and Volksrust  
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Unit 6	Fabric Filter Plant	100	99.87
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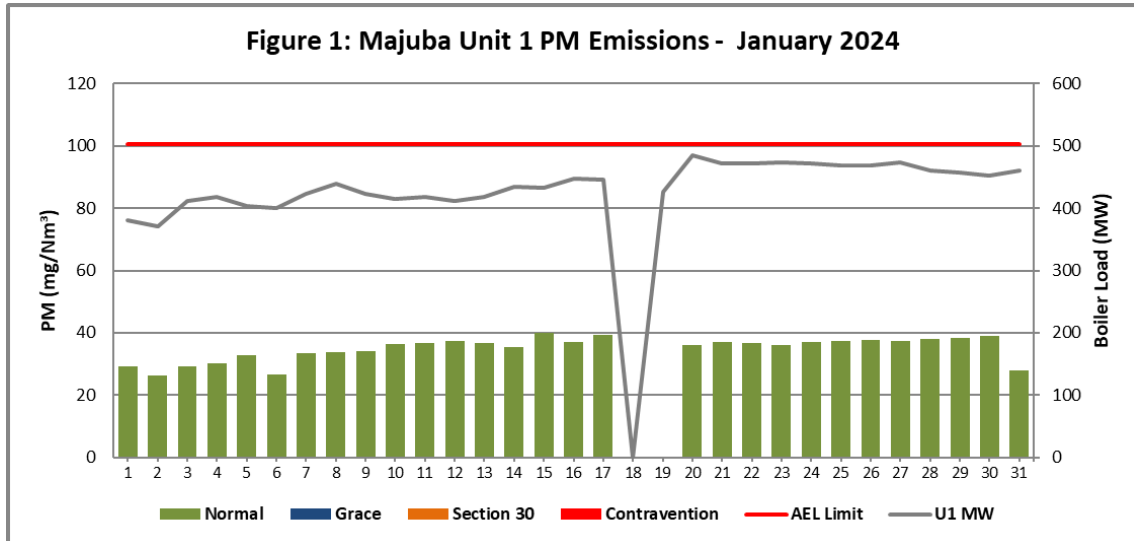
\*Calculated from the assumption of 90% fly ash to 10% bottom ash and percentage ash as measured in coal.

### Energy Source Characteristics

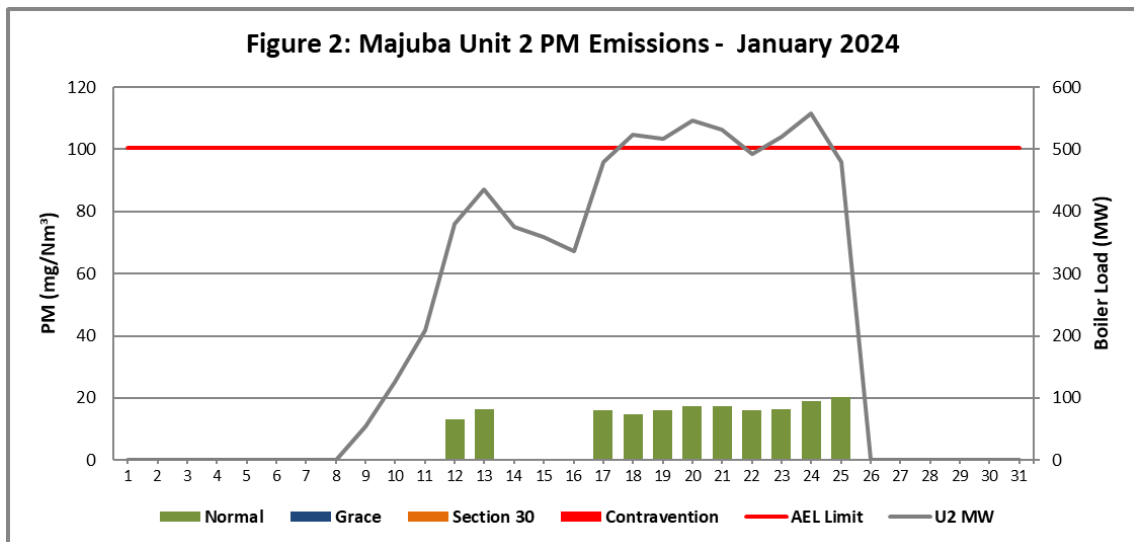
**Table 3. Energy Source Material Characteristics for the month of January 2024**

Characteristic	Stipulated Limit (Unit)	Monthly Average Content
Sulphur Content	0.94%	0.65
Ash Content	30%	28.63

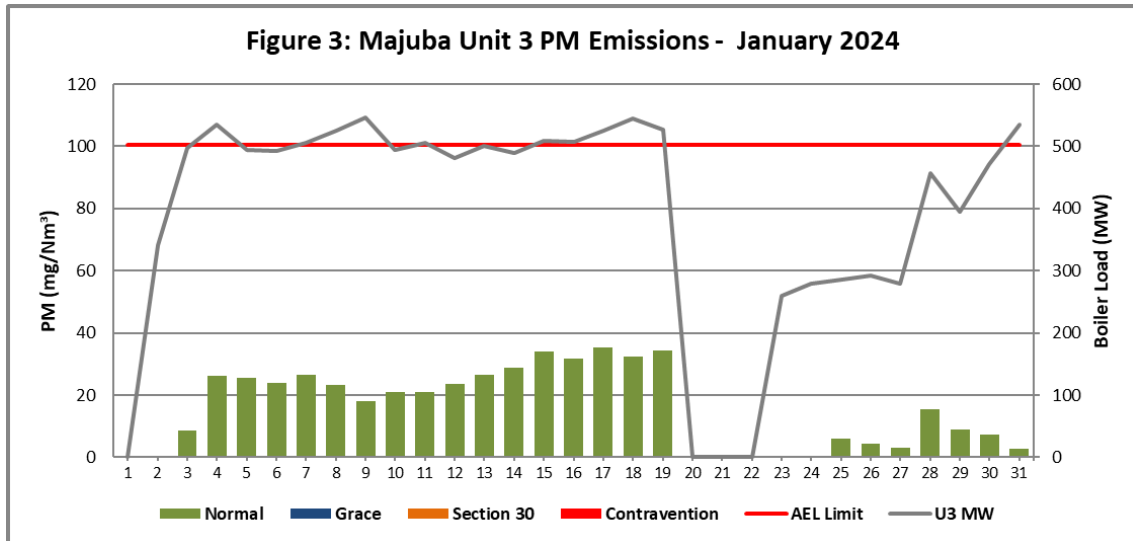
### Emissions Reporting



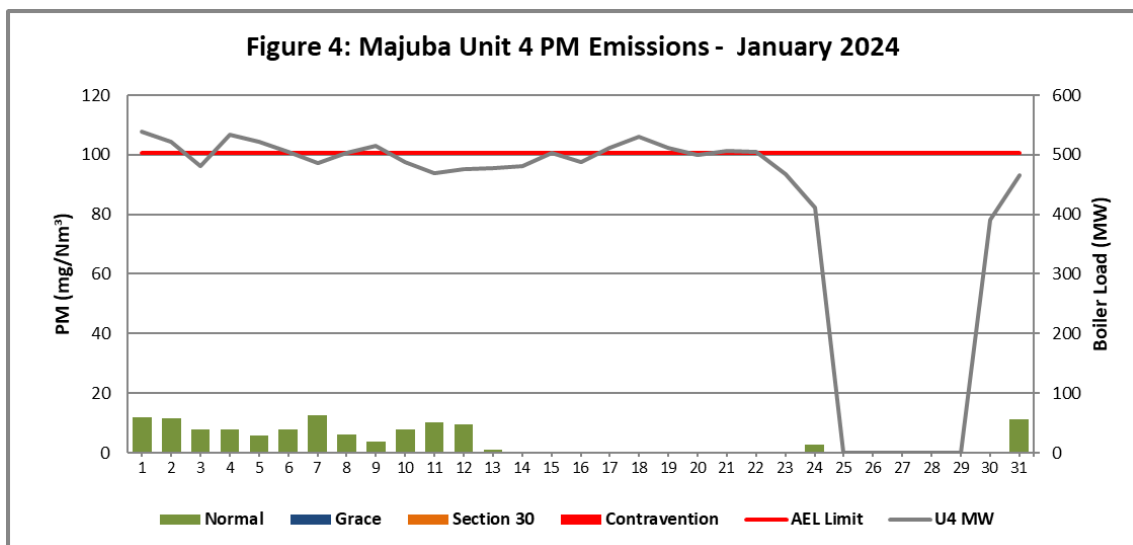
**Figure 1. Particulate Matter emissions (daily averages) for the month of January 2024 against emission limit for Unit 1.**



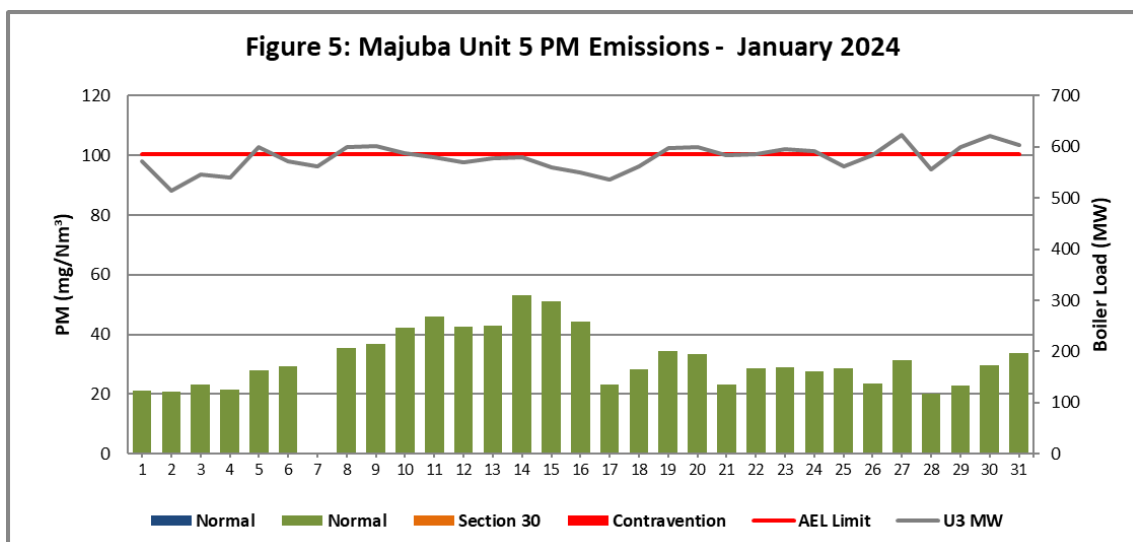
**Figure 2. Particulate Matter emissions (daily averages) for the month of January 2024 against emission limit for Unit 2.**



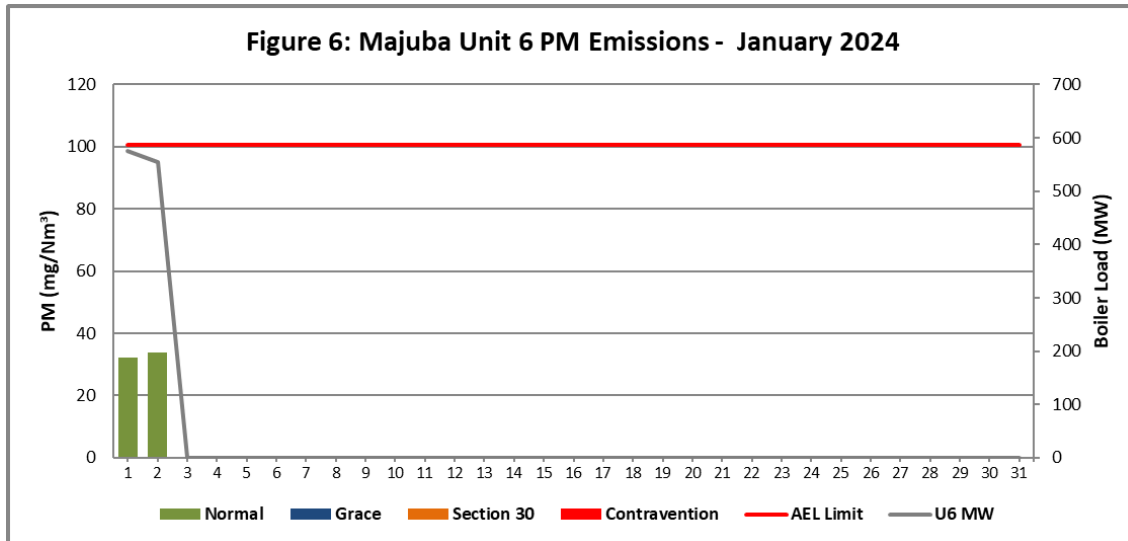
**Figure 3. Particulate Matter emissions (daily averages) for the month of January 2024 against emission limit for Unit 3.**



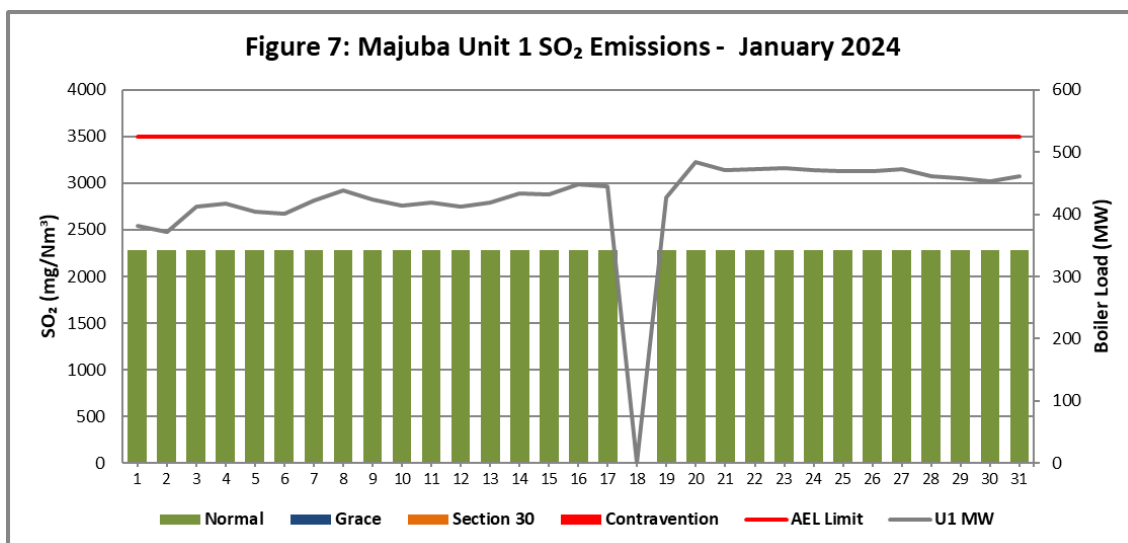
**Figure 4. Particulate Matter emissions (daily averages) for the month of January 2024 against emission limit for Unit 4.**



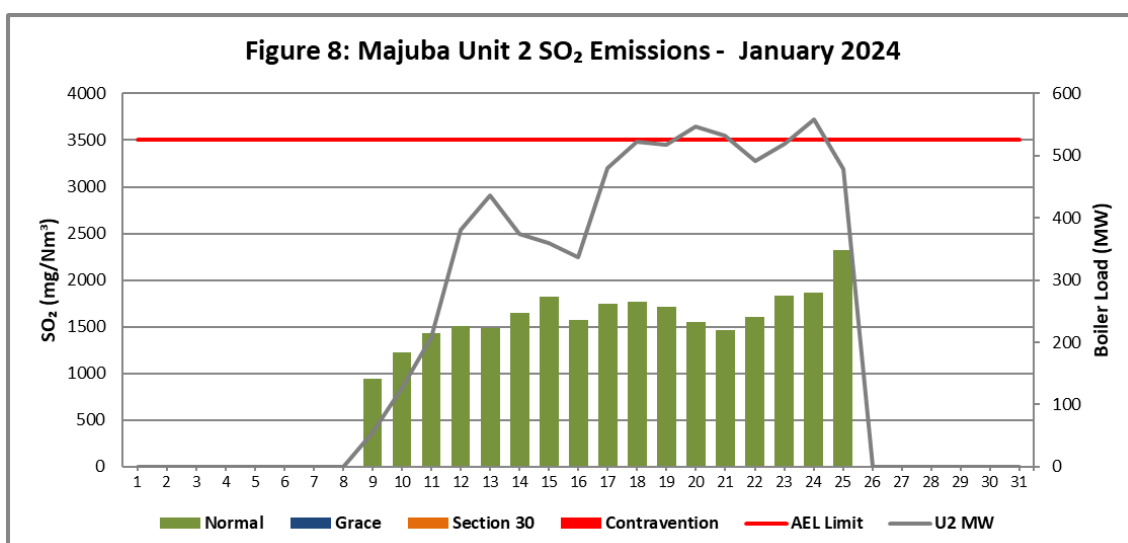
**Figure 5. Particulate Matter emissions (daily averages) for the month of January 2024 against emission limit for Unit 5.**



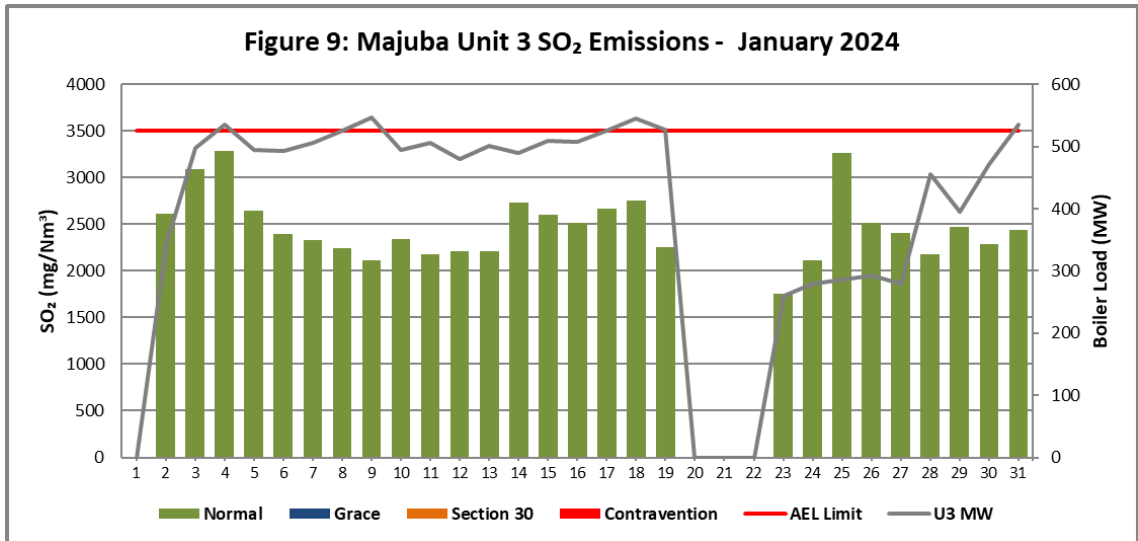
**Figure 6. Particulate Matter emissions (daily averages) for the month of January 2024 against emission limit for Unit 6.**



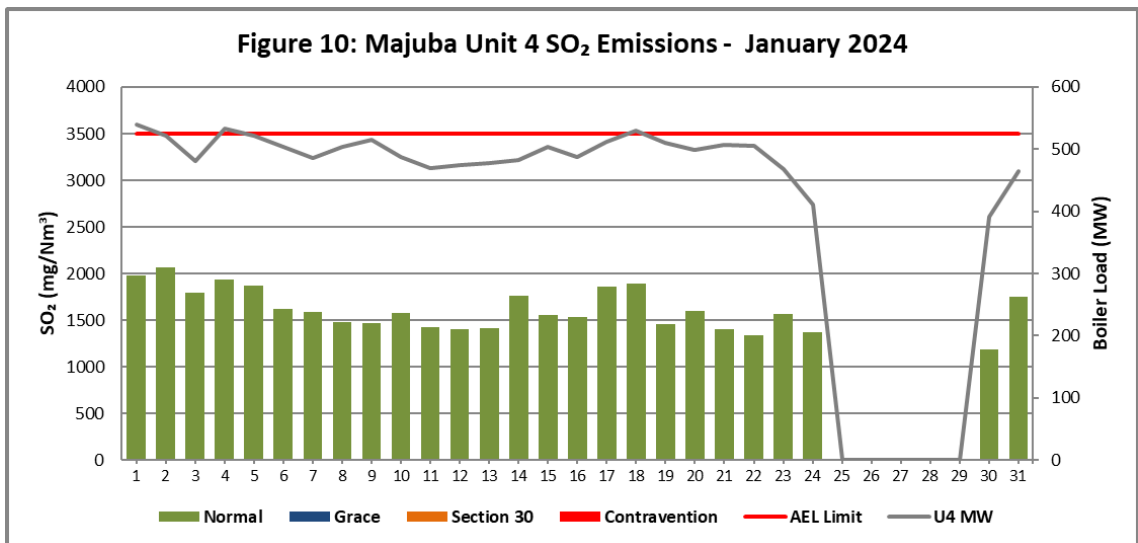
**Figure 7. SO₂ emissions (daily averages) for the month of January 2024 against emission limit for Unit 1.**



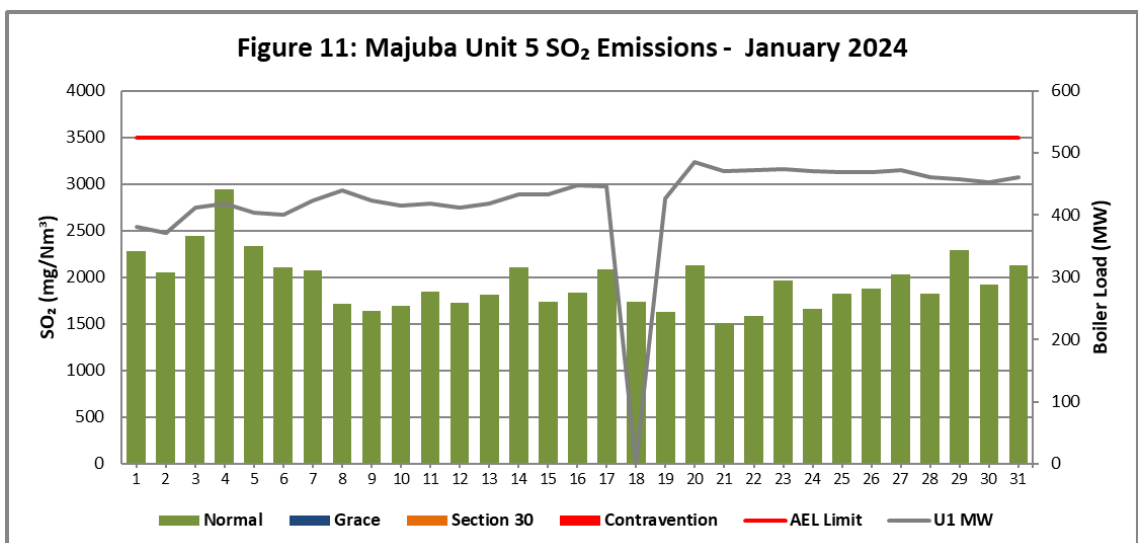
**Figure 8. SO₂ emissions (daily averages) for the month of January 2024 against emission limit for Unit 2.**



**Figure 9. SO<sub>2</sub> emissions (daily averages) for the month of January 2024 against emission limit for Unit 3.**



**Figure 10. SO<sub>2</sub> emissions (daily averages) for the month of January 2024 against emission limit for Unit 4.**



**Figure 11. SO<sub>2</sub> emissions (daily averages) for the month of January 2024 against emission limit for Unit 5**

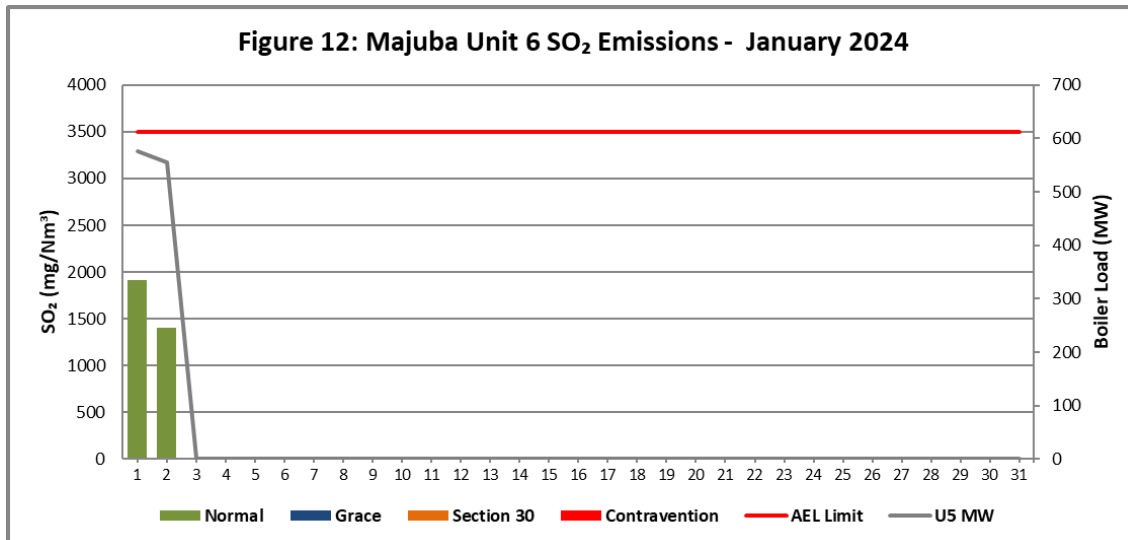


Figure 12. SO<sub>2</sub> emissions (daily averages) for the month of January 2024 against emission limit for Unit 6.

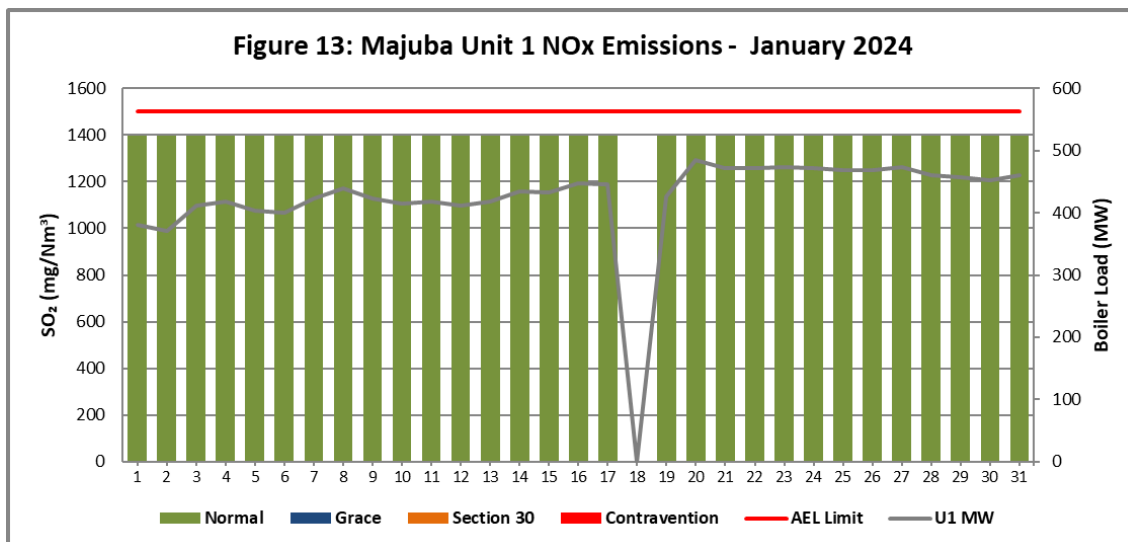


Figure 13. NO<sub>x</sub> emissions (daily averages) for the month of January 2024 against emission limit for Unit 1.

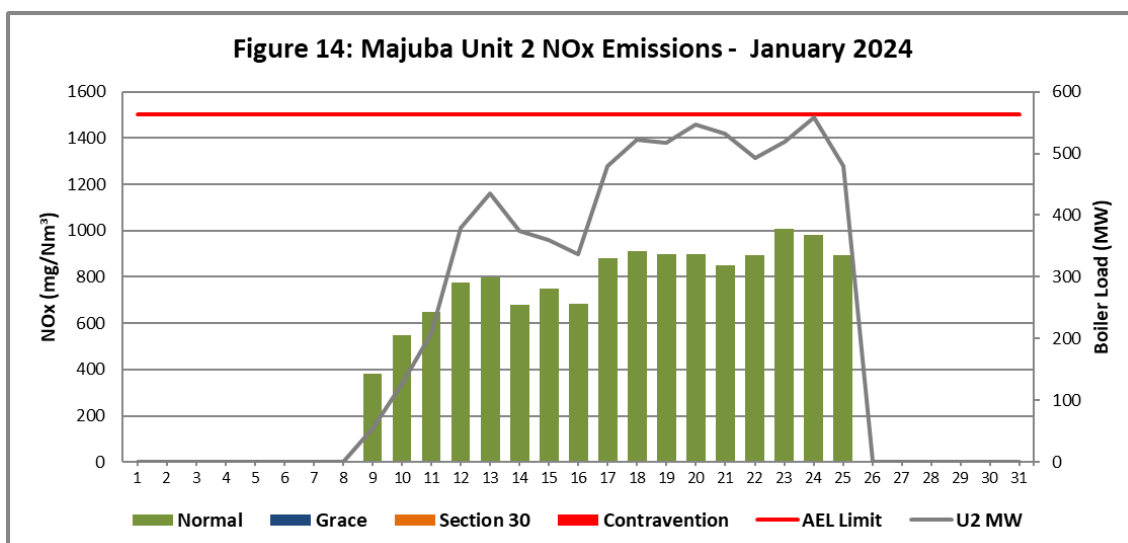


Figure 14. NO<sub>x</sub> emissions (daily averages) for the month of January 2024 against emission limit for Unit 2.

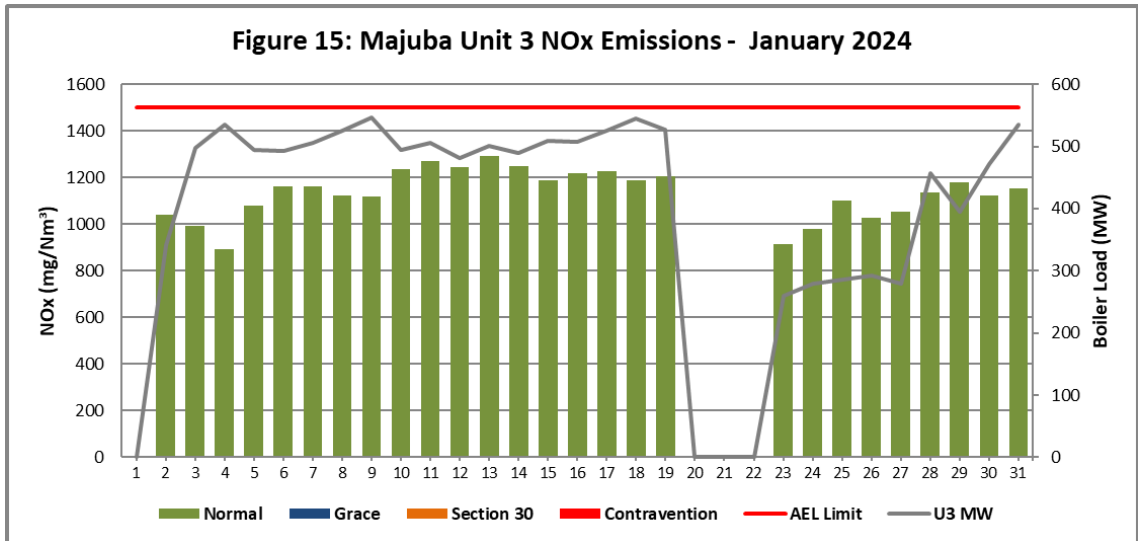


Figure 15. NOx emissions (daily averages) for the month of January 2024 against emission limit for Unit 3.

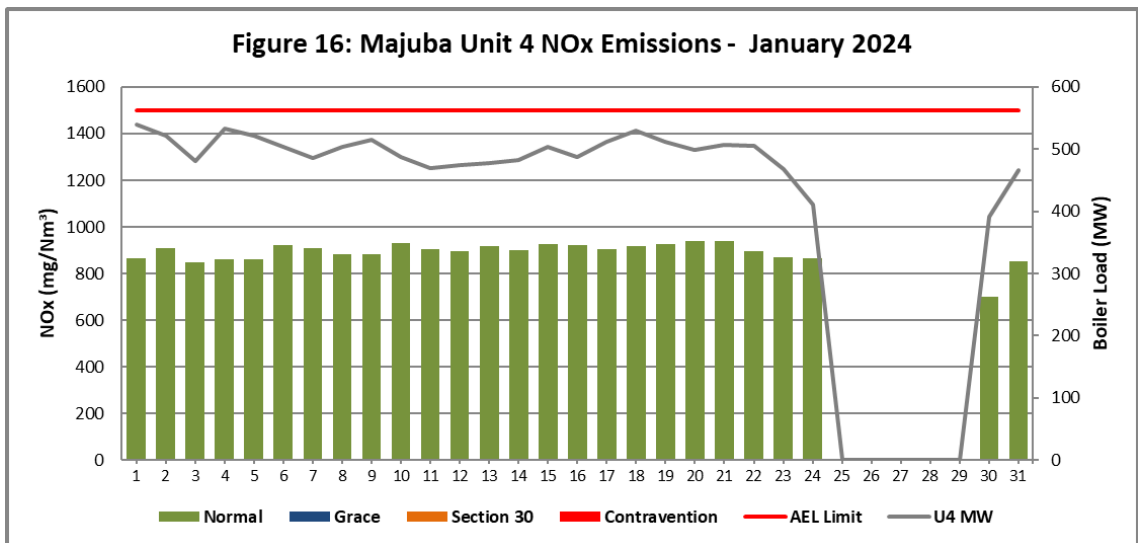


Figure 16. NOx emissions (daily averages) for the month of January 2024 against emission limit for Unit 4

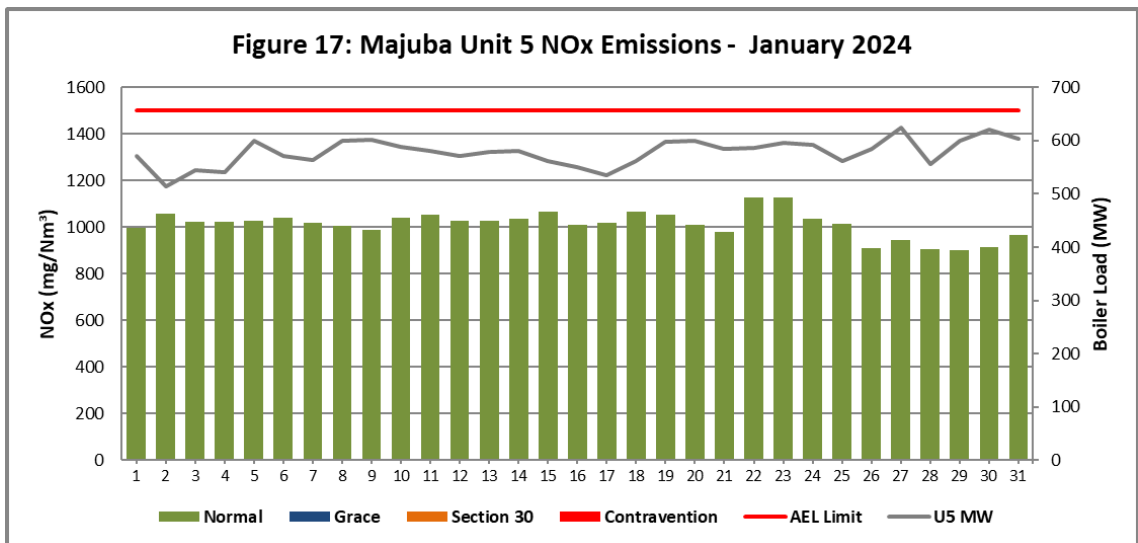


Figure 17. NOx emissions (daily averages) for the month of January 2024 against emission limit for Unit 5

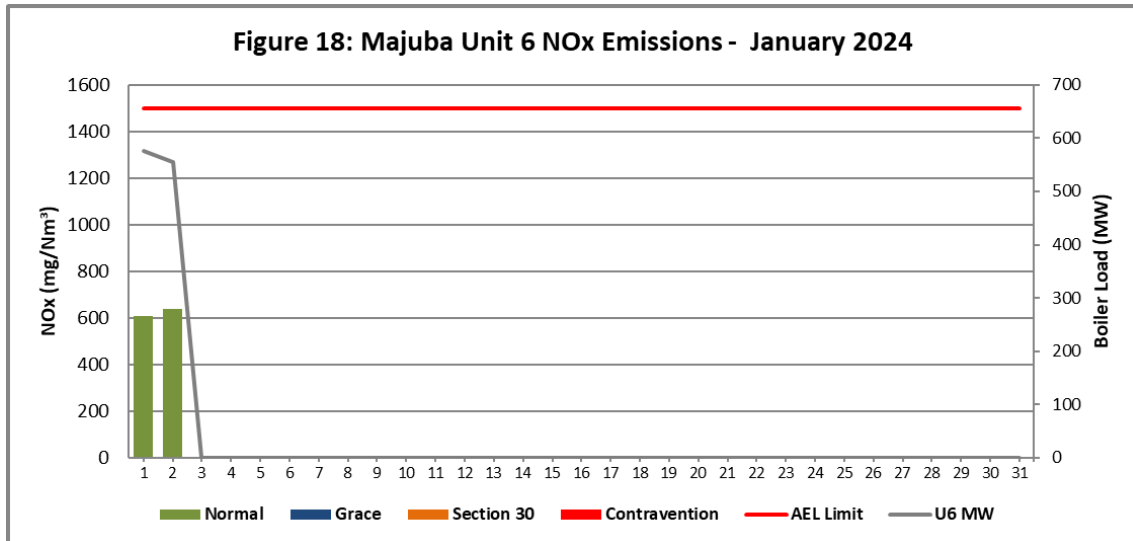


Figure 18. NOx emissions (daily averages) for the month January 2024 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of January 2024

Unit	PM (tons)	SO <sub>2</sub> (tons)	NOx (tons)
Unit 1	38.5	2 734	1 674
Unit 2	9.0	1 359	688
Unit 3	31.4	4 119	1 896
Unit 4	8.9	3 428	1 881
Unit 5	71.3	4 616	2 399
Unit 6	4.2	223	79

Table 5: Average monthly concentrations (mg/Nm<sup>3</sup>) for the month of January 2024

Unit	PM (Mg/Nm <sup>3</sup> )	SO <sub>2</sub> (Mg/Nm <sup>3</sup> )	NOx (Mg/Nm <sup>3</sup> )
1	34.9	2 281.2	1 397.0
2	16.9	1 617.6	792.5
3	20.4	2 466.9	1 132.1
4	4.7	1 612.8	890.5
5	31.9	1 951.6	1 013.5
6	33.0	1 660.5	624.4

Table 6: Each unit and respective days operating in compliance to the AEL Emission Limits (SO<sub>2</sub>, NOx, and PM)

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance
Unit 1	29	0	0	0	0
Unit 2	11	0	0	0	0
Unit 3	24	0	0	0	0
Unit 4	25	0	0	0	0
Unit 5	30	0	0	0	0
Unit 6	2	0	0	0	0



**Table 7: MONITOR RELIABILITY (%)**

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	99.9	96.0	96.4	0.0
Unit 2	99.6	96.6	94.3	15.8
Unit 3	92.3	100.0	100.0	99.7
Unit 4	53.9	100.0	100.0	92.3
Unit 5	100.0	100.0	100.0	99.9
Unit 6	100.0	100.0	100.0	100.0

**Table 8: CO<sub>2</sub> and O<sub>2</sub> deviations of the Month of January 2024**

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

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

	2024/02/06	CO <sub>2</sub> (Actual Dry %)						Final O <sub>2</sub> CEMS Data (%)						SUM CO <sub>2</sub> + O <sub>2</sub> CEMS Data (%)					
		Date	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5
TRUE	2024/01/01	7.5			9.4	10.5	12.3	12.0			9.5	9.8	9.1	19.5			18.9	20.4	21.4
TRUE	2024/01/02	7.5		7.5	9.2	9.8	12.1	12.0		12.7	10.3	10.8	9.2	19.5		20.2	19.4	20.6	21.4
TRUE	2024/01/03	7.5		9.5	9.2	10.2		12.0		10.9	10.7	10.5		19.5		20.4	19.9	20.7	
TRUE	2024/01/04	7.5		10.0	9.2	9.9		12.0		10.5	10.1	10.8		19.5		20.5	19.3	20.6	
TRUE	2024/01/05	7.5		9.6	9.2	10.8		12.0		11.1	10.2	9.6		19.5		20.7	19.4	20.4	
TRUE	2024/01/06	7.5		9.6	9.2	10.4		12.0		11.0	10.4	10.0		19.5		20.6	19.6	20.5	
TRUE	2024/01/07	7.5		9.8	9.2	10.4		12.0		10.8	10.5	10.0		19.5		20.6	19.7	20.4	
TRUE	2024/01/08	7.5		10.1	9.2	10.9		12.0		10.4	10.0	9.5		19.5		20.5	19.3	20.3	
TRUE	2024/01/09	7.5	8.6	10.2	9.2	11.2		12.0	10.9	10.3	10.2	9.2		19.5	19.4	20.5	19.4	20.4	
TRUE	2024/01/10	7.5	6.3	9.3	9.3	10.8		12.0	10.9	11.6	10.6	9.8		19.5	17.2	20.9	19.9	20.7	
TRUE	2024/01/11	7.5	7.3	9.4	9.2	10.7		12.0	10.9	11.4	10.9	9.9		19.5	18.2	20.8	20.1	20.6	
TRUE	2024/01/12	7.5	7.8	9.3	9.2	10.7		12.0	10.9	11.6	10.7	9.8		19.5	18.6	20.8	19.9	20.6	
TRUE	2024/01/13	7.5	8.2	9.5	9.2	10.7		12.0	10.9	11.2	10.7	9.8		19.5	19.1	20.7	19.9	20.5	
TRUE	2024/01/14	7.5	7.8	9.5	9.3	10.7		12.0	10.9	11.3	10.7	9.8		19.5	18.7	20.8	20.0	20.5	
TRUE	2024/01/15	7.5	8.0	9.8	9.3	10.3		12.0	10.9	11.0	10.2	10.3		19.5	18.9	20.7	19.5	20.6	
TRUE	2024/01/16	7.5	7.6	9.7	9.2	10.4		12.0	10.9	10.9	10.2	10.2		19.5	18.4	20.6	19.4	20.6	
TRUE	2024/01/17	7.5	9.1	9.9	9.2	10.2		12.0	10.8	10.8	10.2	10.6		19.5	20.0	20.7	19.4	20.8	
TRUE	2024/01/18		9.3	10.1	9.0	10.6			10.9	10.3	10.1	10.1			20.2	20.4	19.1	20.7	
TRUE	2024/01/19	7.5	9.4	9.9	9.0	10.7		12.0	10.5	10.5	10.1	9.9		19.5	19.9	20.4	19.0	20.6	
TRUE	2024/01/20	7.5	9.5		9.1	10.8		12.0	10.1		10.3	9.5		19.5	19.6		19.4	20.3	
TRUE	2024/01/21	7.5	9.5		9.2	11.0		12.0	10.4		10.4	9.2		19.5	19.9		19.6	20.2	
TRUE	2024/01/22	7.5	9.1		9.2	11.0		12.0	11.4		9.9	9.4		19.5	20.6		19.1	20.4	
TRUE	2024/01/23	7.5	9.8	7.1	9.0	11.1		12.0	11.1	12.5	10.3	9.4		19.5	20.9	19.6	19.4	20.5	
TRUE	2024/01/24	7.5	9.8	7.4	8.9	11.2		12.0	11.2	12.7	10.9	9.3		19.5	21.0	20.1	19.7	20.5	
TRUE	2024/01/25	7.5	8.5	7.7		11.0		12.0	11.4	13.0		9.7		19.5	19.9	20.7		20.7	
TRUE	2024/01/26	7.5		8.1		11.5		12.0		12.5		8.9		19.5		20.6		20.4	
TRUE	2024/01/27	7.5		7.4		11.7		12.0		13.5		8.7		19.5		20.9		20.3	
TRUE	2024/01/28	7.5		9.4		11.2		12.0		11.2		9.1		19.5		20.6		20.4	
TRUE	2024/01/29	7.5		9.0		11.5		12.0		11.6		8.8		19.5		20.6		20.3	
TRUE	2024/01/30	7.5		9.6	9.0	11.3		12.0		10.9	10.3	9.0		19.5		20.5	19.4	20.3	
TRUE	2024/01/31	7.5		9.8	9.1	11.2		12.0		10.8	10.3	9.3		19.5		20.5	19.4	20.5	

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

## Emergency Generation

**Table 9: Emergency Generation for the month of January 2024**

	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 of the days during the month and off for one day. Forty-six fabric filter bags were replaced during the month.

#### UNIT 2

The unit base loaded for 17 days and off for fourteen days. Sixteen fabric filter bags were replaced during the month.

#### UNIT 3

The unit base loaded for most of the days during the month and off for three days. One hundred and seventy-four fabric filter bags were replaced during the month.

#### UNIT 4

The unit base loaded for most of the days during the month and off for five days. Twelve fabric filter bags were replaced during the month.

#### UNIT 5

The unit base loaded for all of the days of the month. No fabric filter bags were replaced during the month.

#### UNIT 6

The unit was shut down on the 2<sup>nd</sup> of January for an outage. No fabric filter bags were replaced during the month.

### Complaints Register

**Table 10: Complaints for the month of January 2024**

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modelling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
	No complaints were received during the month of January 2024.				

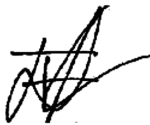
## General

The investigations for the exceedances reported in March, May, June and September has been completed and the investigation report is attached to this report.

The Station has exceeded the fuel oil consumption limit of 6000 tons. Fuel oil consumption had significantly declined in the month of December 2023 following the recovery of the milling plant, having 5 mills available per unit. The Station will thus closely monitor other contributing factors including plant redundancy and address them to ensure compliance to the AEL limit. Unit 1 & 2 O<sub>2</sub> monitors and Unit 4 PM monitor are faulty. The Original Equipment Manufacturer (OEM) has been called to site and they will be repairing the faulty monitors.

Yours sincerely

Report compiled by:



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

Date 08/02/2024

Report verified by:



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

Date 08/02/2024


Report approved by:





Johan Swanepoel  
**ENGINEERING MANAGER: (MAJUBA)**

2024/02/08

Date

	<b>Non- Conformance and Corrective Action close-out Report</b>	Identifier	MAJ/186	Rev	6
		Doc type	Form	Rev	
		Effective Date	October 2020		
		Review Date	October 2023		

<b>Parent Issue ID: 100065281</b>		<b>Activity ID: 200163271</b>		
<b>Start Date</b>	13/09/2023	<b>End Date</b>	30/11/2023	
<b>Issue Type</b>	Operational Experience <input type="checkbox"/>	Audit <input checked="" type="checkbox"/>	Non-conformance <input type="checkbox"/>	
<b>Action Type</b>	Corrective <input checked="" type="checkbox"/>	Immediate <input type="checkbox"/>	Effectiveness Review <input type="checkbox"/>	
<b>Classification / Priority</b>	High (Major) <input type="checkbox"/>	Medium (Minor) <input checked="" type="checkbox"/>	Low <input type="checkbox"/>	AFI/OFI <input type="checkbox"/>
<b>Source:</b> procedure, policy, project, supplier, requirement	Requirements	<b>Initiator/Assessor</b>		
<b>Title:</b> <i>(as reported on SAP QIM - short text)</i>				
U3 SOx and NOx limits exceeded.				
<b>Description of finding /Recommendation:</b> <i>(as loaded on SAP QIM)</i>				
High SOx and NOx monitor reading, Perform a GMR32 monitor service. Issue report (100065281) is an investigation on high SOx emissions only but it will resolve issues on high NOx emissions as well since they are monitored by a same monitor.				
<b>Root Cause(s):</b> <i>(What gave rise to the above activity to happen/ what lead to the above activity?)</i>				
Automatic Alignment Control Unit (AACU) on the GMR32 monitor was faulty.				
<b>Effect Codes</b>		<b>IBI Codes and description</b>		
ASH01 Emissions				
<b>Action Taken:</b> <i>1. steps that were taken to resolve the issue, 2. reference /documents numbers and 3. attach relevant documents/ evidence (if issue is cleared) to form)</i>				
AACU was fixed and the fault was cleared.				
<b>Action Approval by:</b>	<b>Name</b>	<b>Unique number</b>	<b>Signature</b>	<b>Date</b>
Implementation Owner	LK Mvulane	4516897		11/01/2024
Reviewer/ Verified	Xolisile Yende	4788838		01/02/2024
Close-out Manager	Faith Kagoda	4583934		

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