

Mr. Dan Hlanyane
 Air Quality Officer
 Gert Sibande District Municipality
 c/o Joubert & Oosthuise Street
 ERMELO
 2350

Date:
 29 April 2021

Enquiries: Monica Mokgawa
 (017) 749 9399

E-mail: Dan.Hlanyane@gsibande.gov.za

E-mail: records@sibande.gov.za

Dear Mr. Hlanyane

TUTUKA POWER STATION SUBMISSION MONTHLY EMISSIONS PERFORMANCE MONITORING REPORT AS STIPULATED ON CONDITION 7.5 OF TUTUKA POWER STATION ATMOSPHERIC EMISSION LICENCE NO: Lekwa/Eskom H SOC Ltd TPS/0013/2019/F03 Dated 25 APRIL 2019

In terms of Tutuka PS AEL, the station is required to submit the monthly emissions monitoring report on/before the 12th every month. The report shall indicate the emission performance for the previous month. This report contains the emission performance for the month of March 2021.

1. RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Max. Permitted	Actual Consumption March-2021
	Coal	Tons	1 200 000	681 994
	Fuel Oil	Tons	10 000	16009.86
Production Rates	Product / By-Product Name	Units (per month)	Max. Production Capacity Permitted	Production Rate March-2021
	Energy	GWh	2611.44	1 030.7
	Ash	Tons	Not specified	169 271
	RE Ash	kg/MWh	not specified	1.89

Table 1:Quantity of raw materials and products used/produces for the month of March 2021

2. ENERGY SOURCE CHARACTERISTICS

Coal Characteristics	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	<i>Not specified</i>	21.580
Sulphur Content	%	0.6 -.6	0.83
Ash Content	%	21 -3	24.82

Table 2: Energy sources material characteristics for the month of March 2021

3. ABATEMET TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Minimum Control Efficiency (%)	Calculated Efficiency (%)
Unit 1	<i>Electro Static Precipitators (ESP)</i>	95.00	98.9%
Unit 2	<i>Electro Static Precipitators (ESP)</i>	95.00	98.7%
Unit 3	<i>Electro Static Precipitators (ESP)</i>	98.00	99.2%
Unit 4	<i>Electro Static Precipitators (ESP)</i>	95.00	98.2%
Unit 5	<i>Electro Static Precipitators (ESP)</i>	95.00	98.6%
Unit 6	<i>Electro Static Precipitators (ESP)</i>	95.00	99.0%

Table 3.1: Abatement Equipment Control Technology for month of March 2021

Note: The ESP does not have a bypass mode operation, hence the plant is 100% utilised.

3.2. MONITOR DATA RELIABILITY (%)

Associated Unit/Stack	PM	SO _x	NO _x
Unit 1	100.0	100.0	100.0
Unit 2	99.6	99.7	99.7
Unit 3	100.0	100.0	100.0
Unit 4	99.9	99.9	99.9
Unit 5	100.0	100.0	100.0
Unit 6	100.0	100.0	100.0

Table 3.2: Monitor reliability for month of March 2021

4. EMISSION PERFORMANCE

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	430.5	3 297	1 027
Unit 2	61.7	582	170
Unit 3	89.2	1 037	353
Unit 4	567.9	2 679	1 049
Unit 5	519.3	4 827	1 430
Unit 6	279.6	3 083	819
SUM	1 948.2	15 506	4 847

Table 4.1: Monthly tonnages for the month of March 2021

Table 4.2: Legend Description for figure 1-18(below)

Condition	Colour	Description
Normal	Green	Emissions below Emission Limit Value (ELV)
Grace	Blue	Emissions above the ELV during grace period
Section 30	Orange	Emissions above ELV during a NEMA S30 incident
Contravention	Red	Emissions above ELV but outside grace or S30 incident conditions

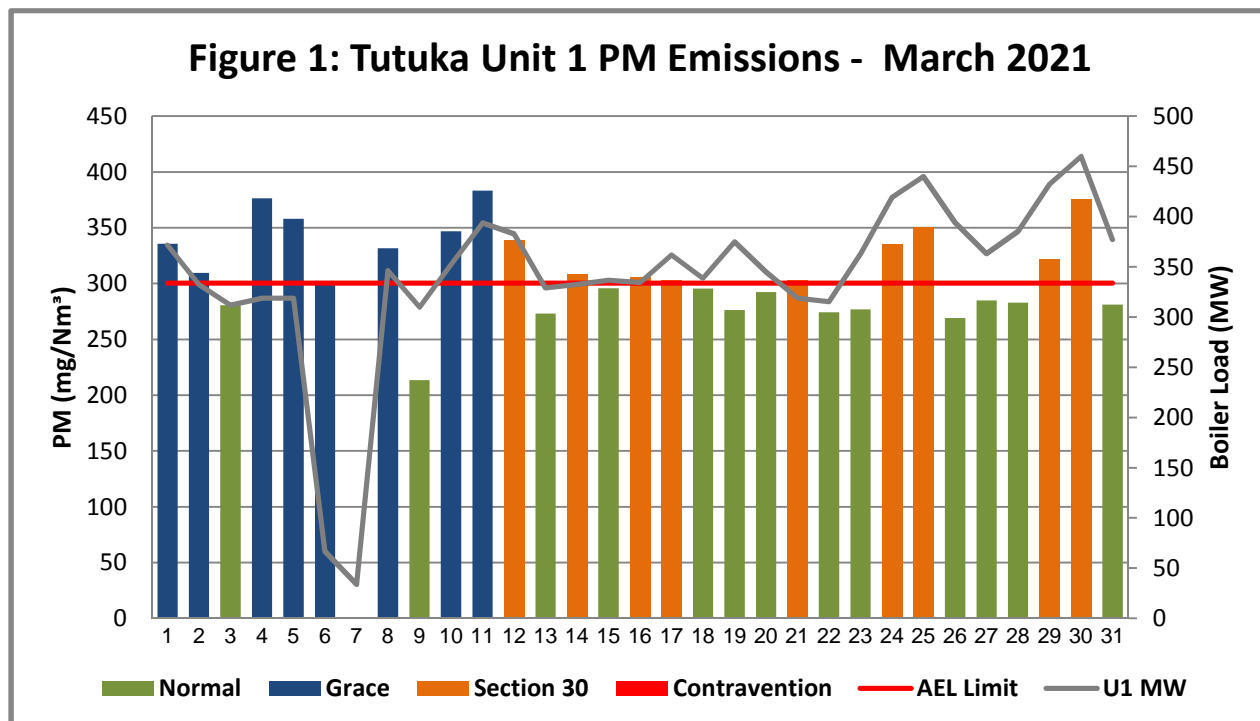


Figure 1: Unit 1 Daily Average PM emissions for the month of March 2021 (against the emission limits and load Generated)

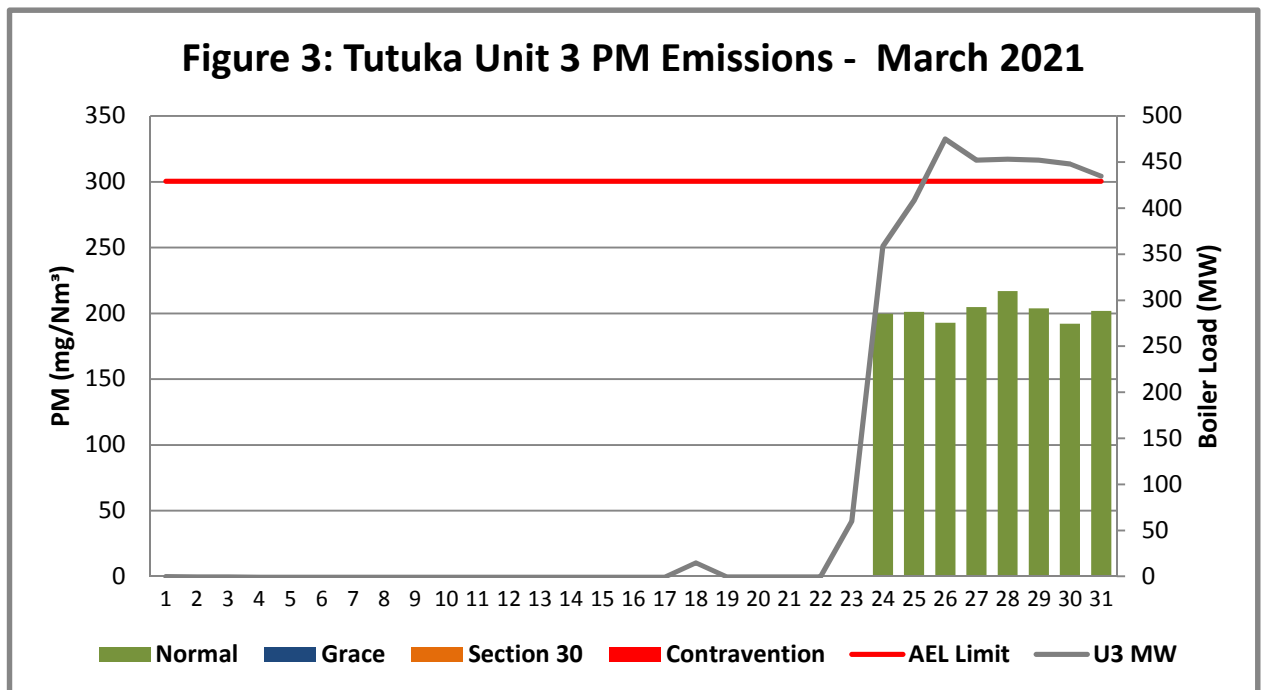
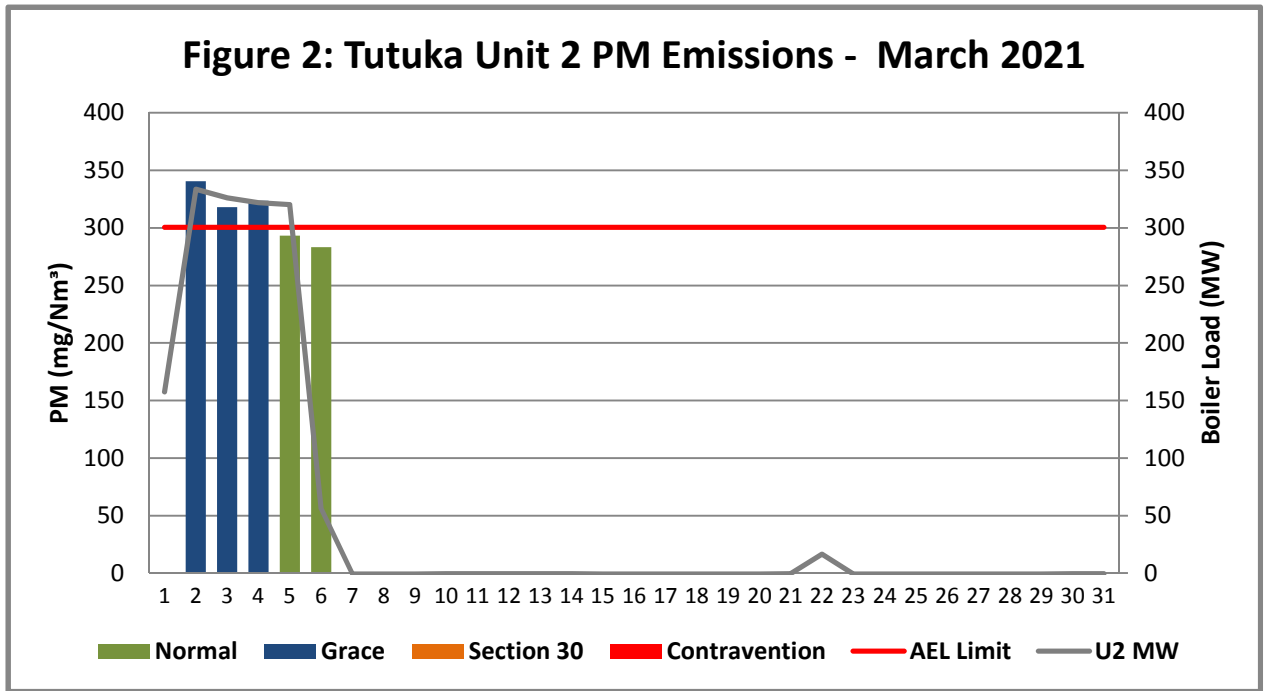
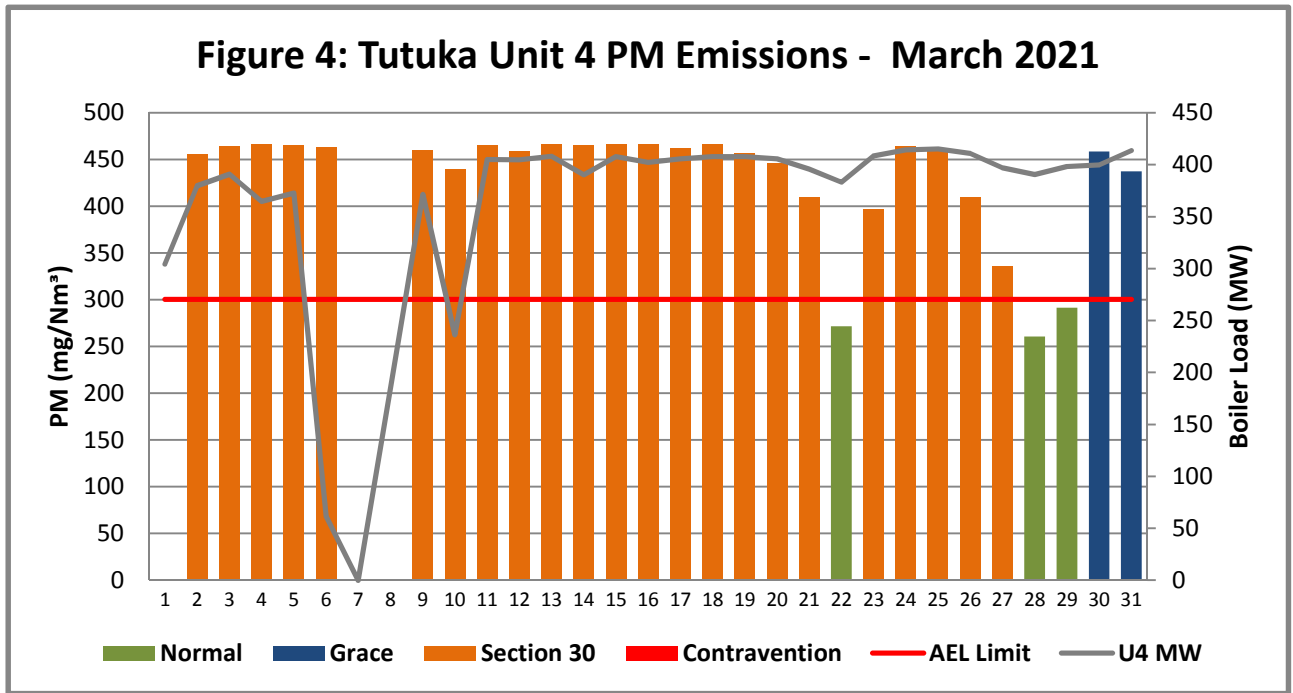


Figure 3: Unit 3 Daily Average PM emissions for the month of March 2021 (against the emission limits and load Generated)



and load Generated)

Note: Unit 4 is on a continuous section 30 from the 19 February 2021. The unit went off on the 01 March 2021 and again on the 7 & 8 March as the station was attempting to resolve the high emissions issue.

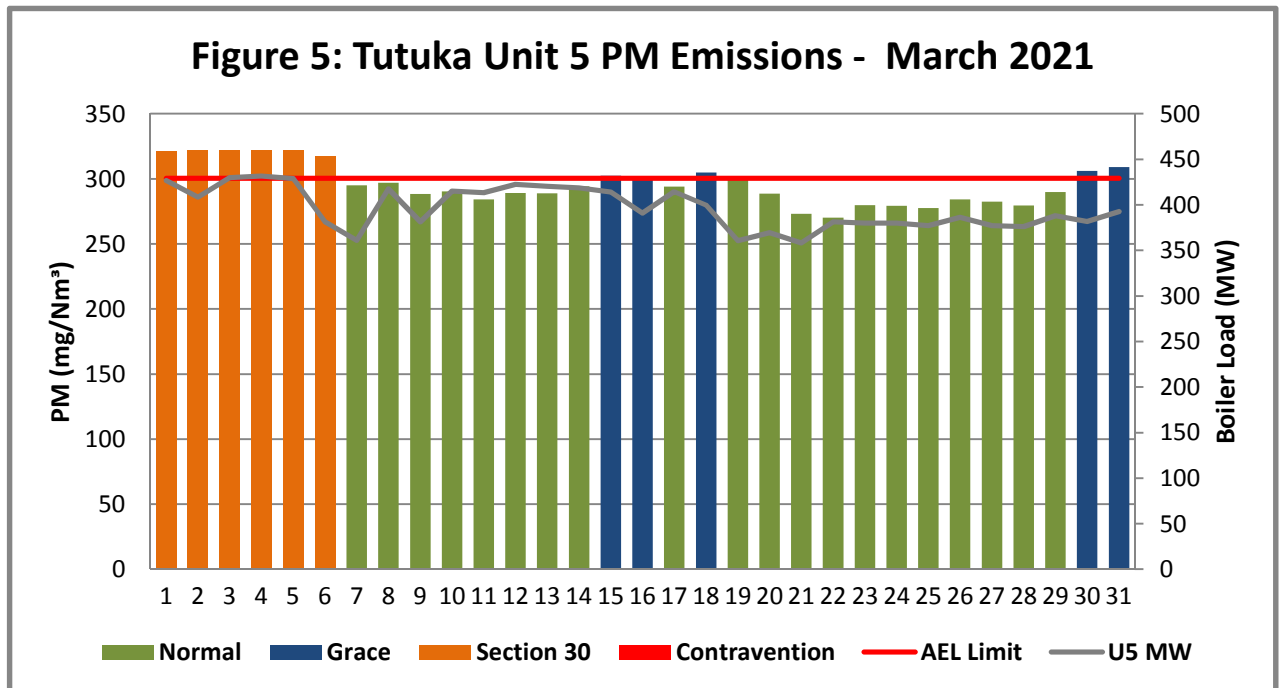


Figure 5: Unit 5 Daily Average PM emissions for the month of March 2021 (against the emission limits and load Generated)

Note: Unit 5 had a continuous section 30 from the 26 February 2021 to the 6 March 2021.

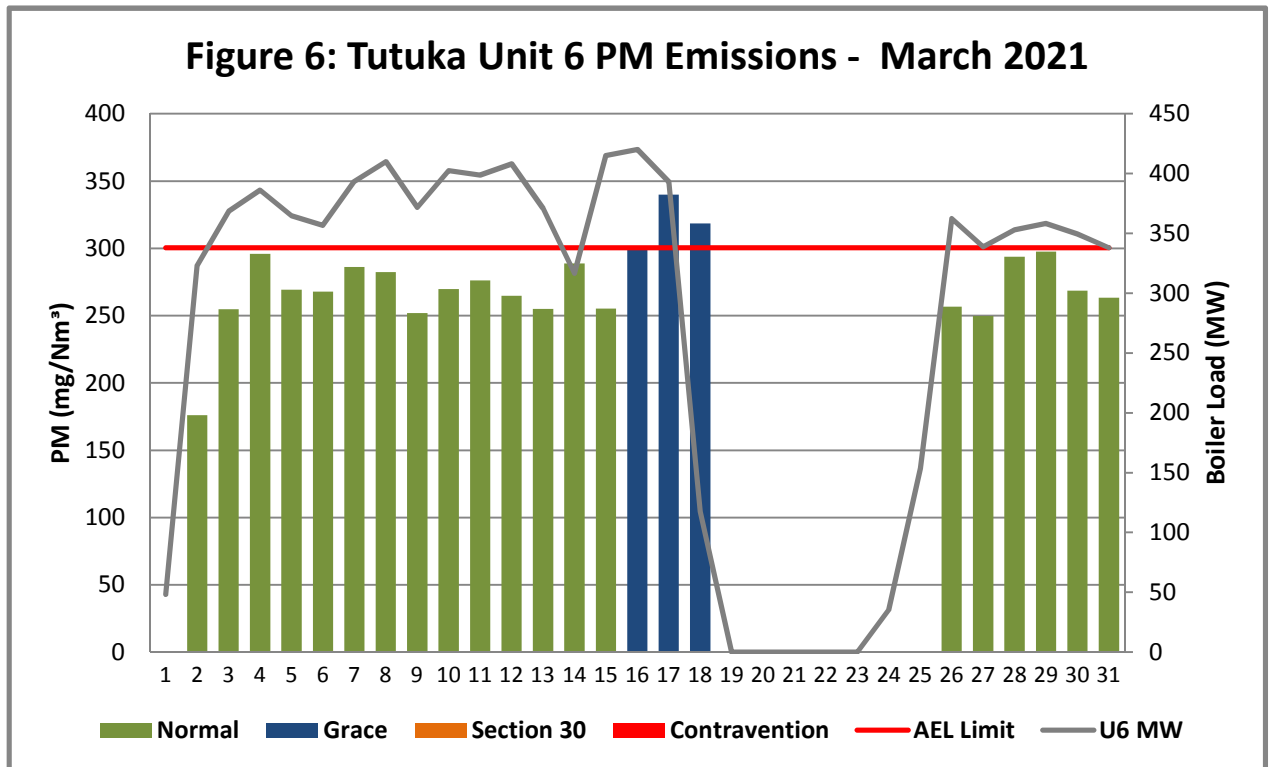


Figure 6: Unit 6 Daily Average PM emissions for the month of March 2021 (against the emission limits and load Generated)

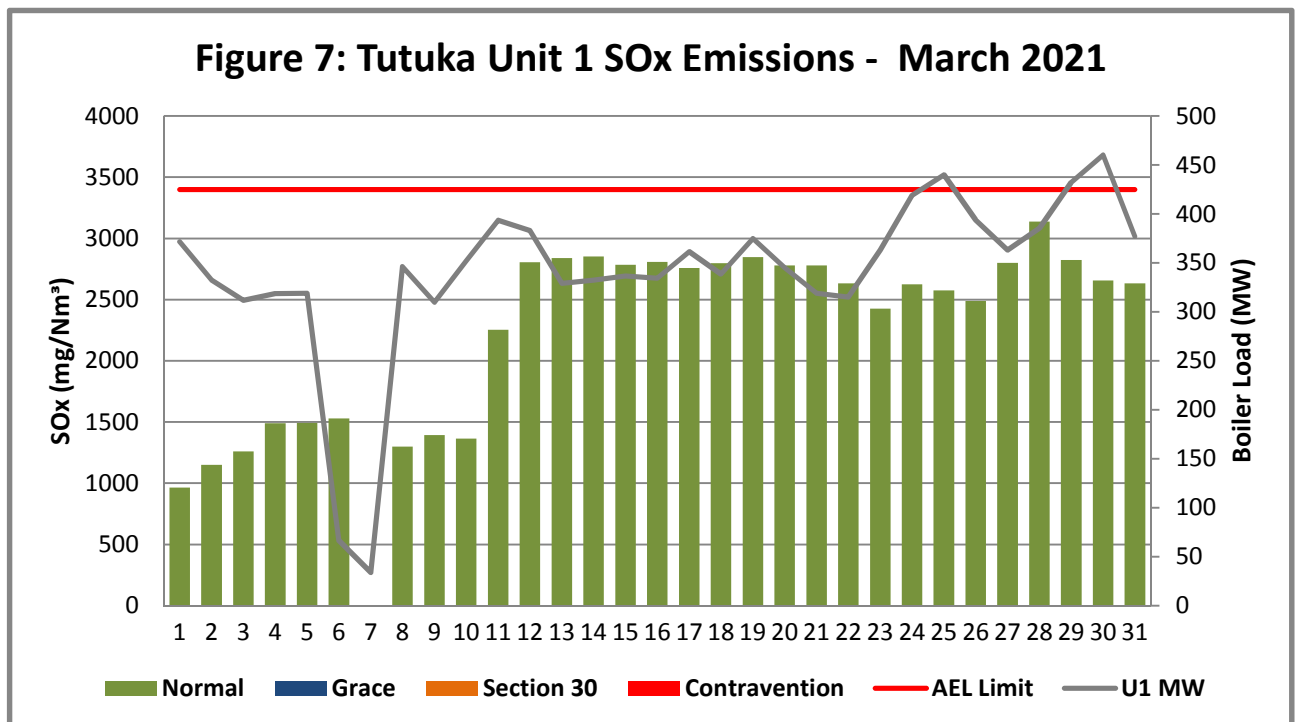


Figure 7: Unit 1 Daily Average SOx emissions for the month of March 2021 (against the emission limits and load Generated)

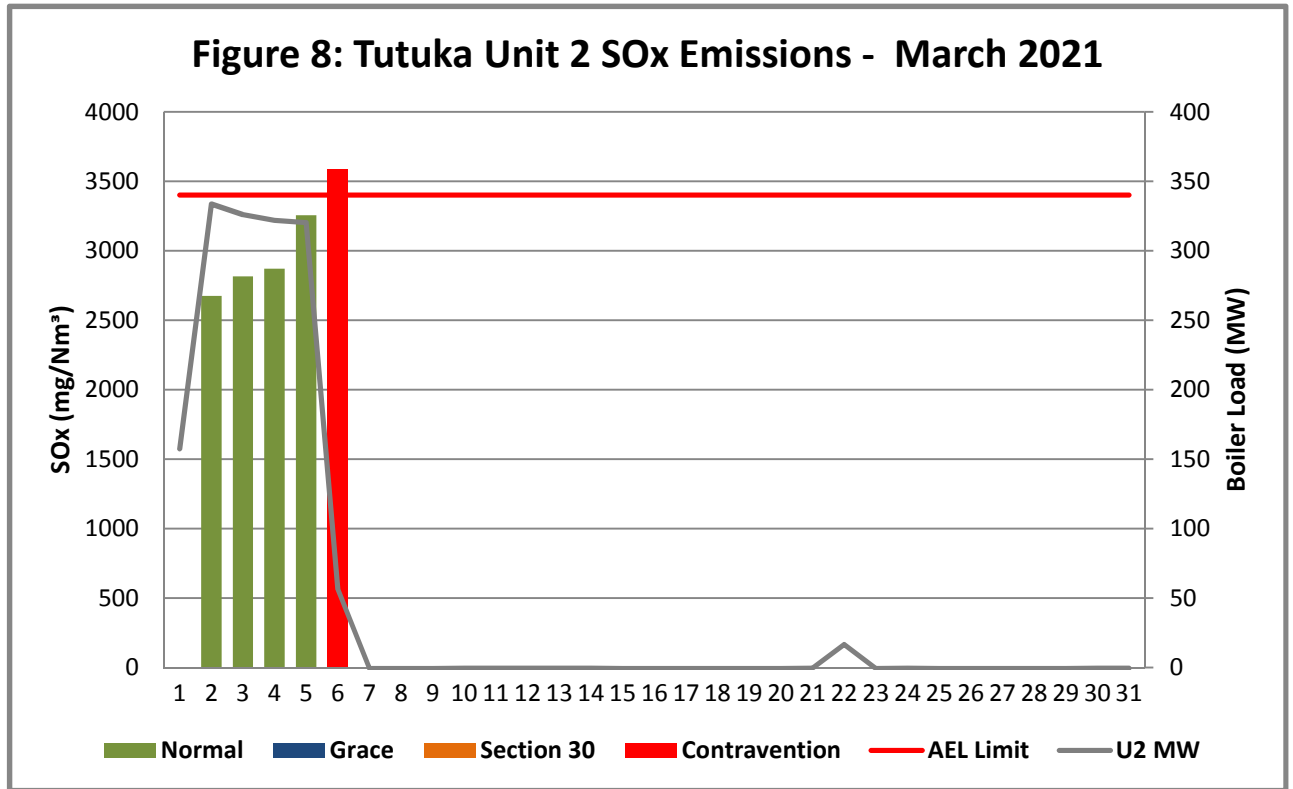


Figure 8: Unit 2 Daily Average SOx emissions for the month of March 2021 (against the emission limits and load Generated)

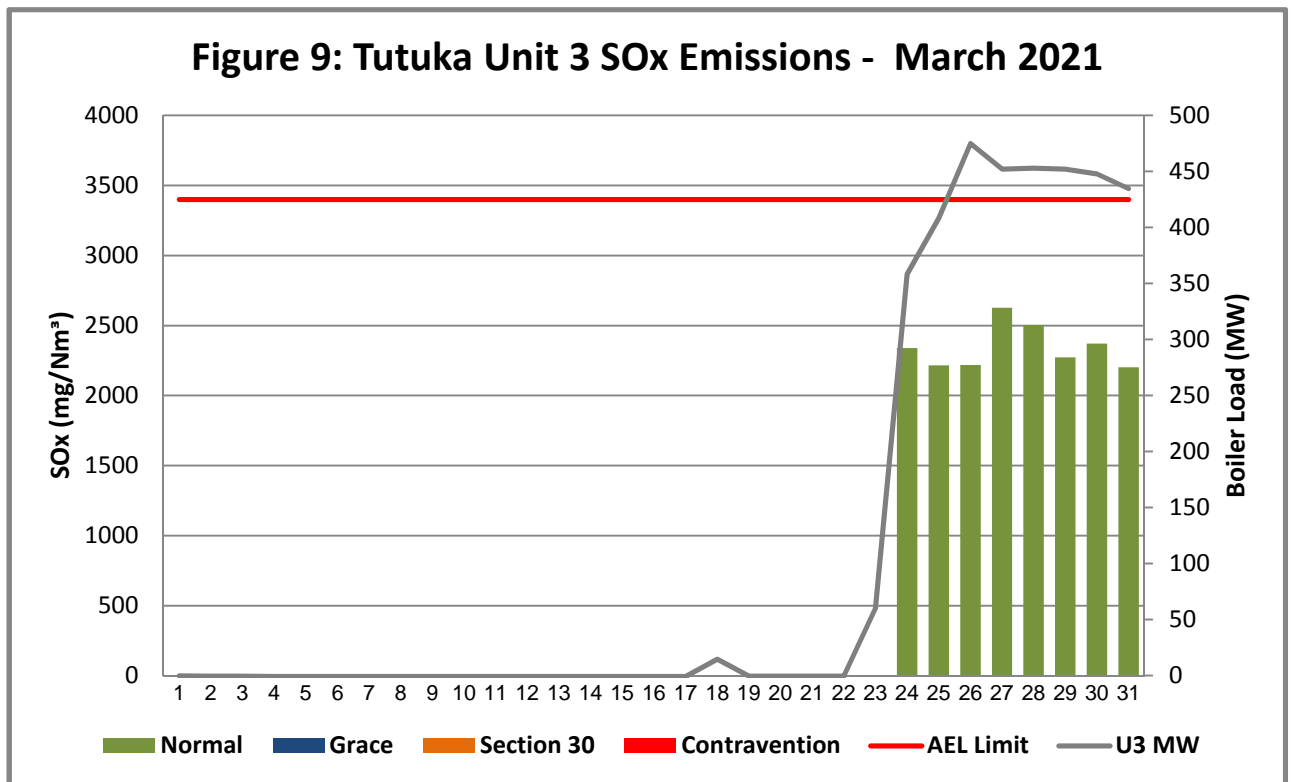


Figure 9: Unit 3 Daily Average SOx emissions for the month of March 2021 (against the emission limits and load Generated)

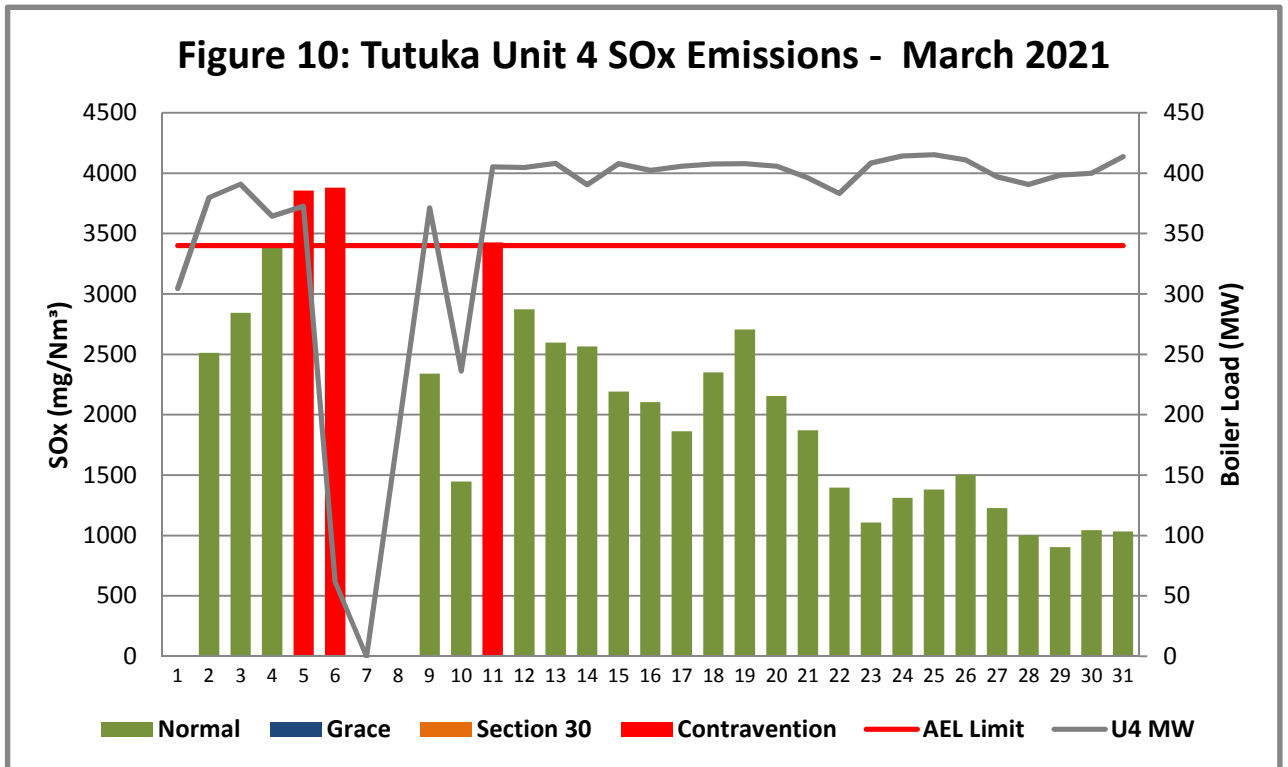


Figure 10: Unit 4 Daily Average SOx emissions for the month of March 2021 (against the emission limits and load Generated)

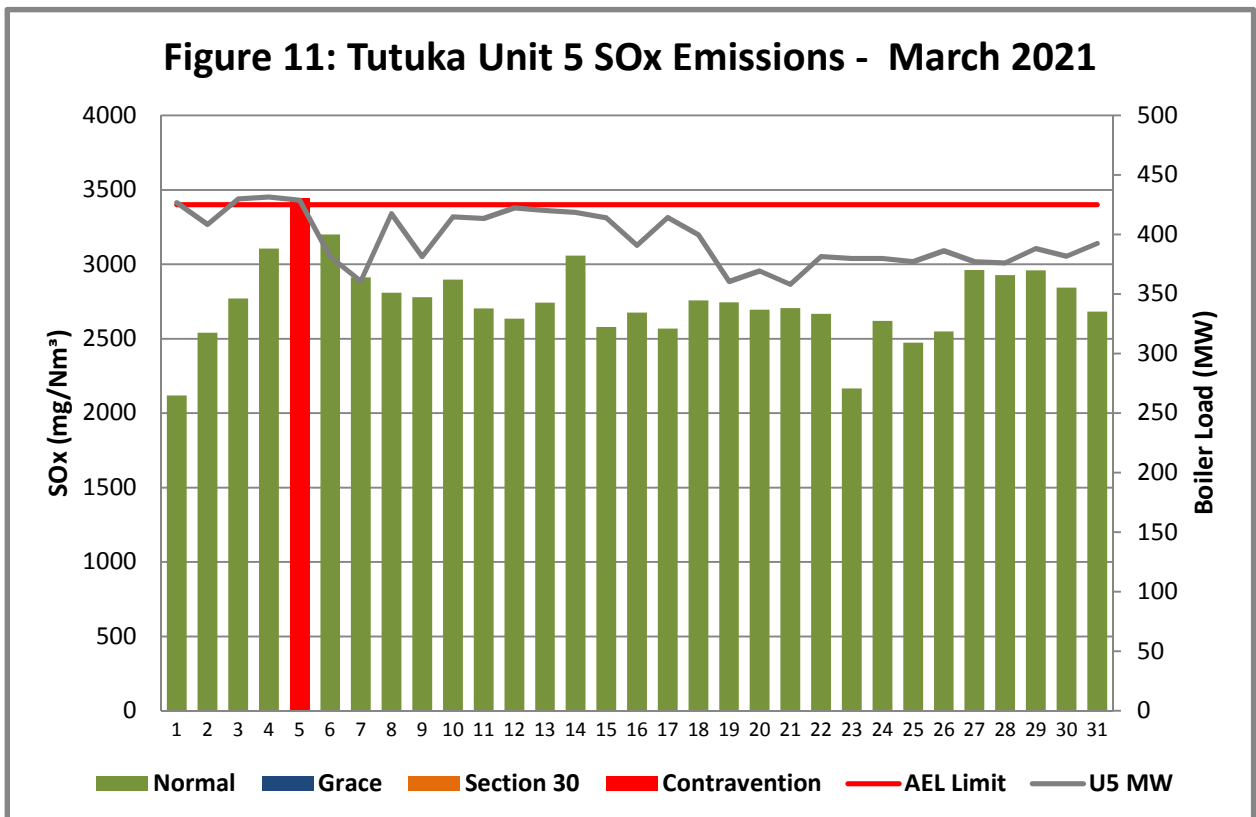


Figure 11: Unit 5 Daily Average SOx emissions for the month of March 2021 (against the emission limits and load Generated)

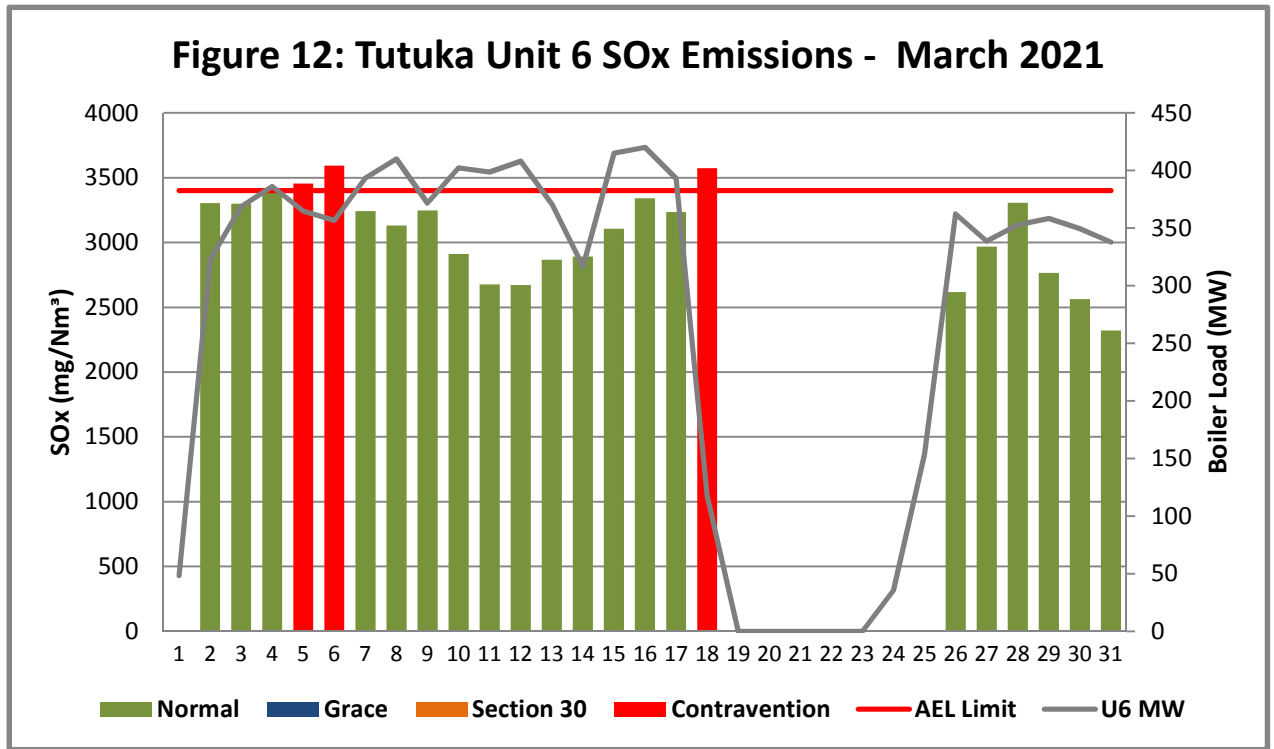


Figure 12: Unit 6 Daily Average SOx emissions for the month of March 2021 (against the emission limits and load Generated)

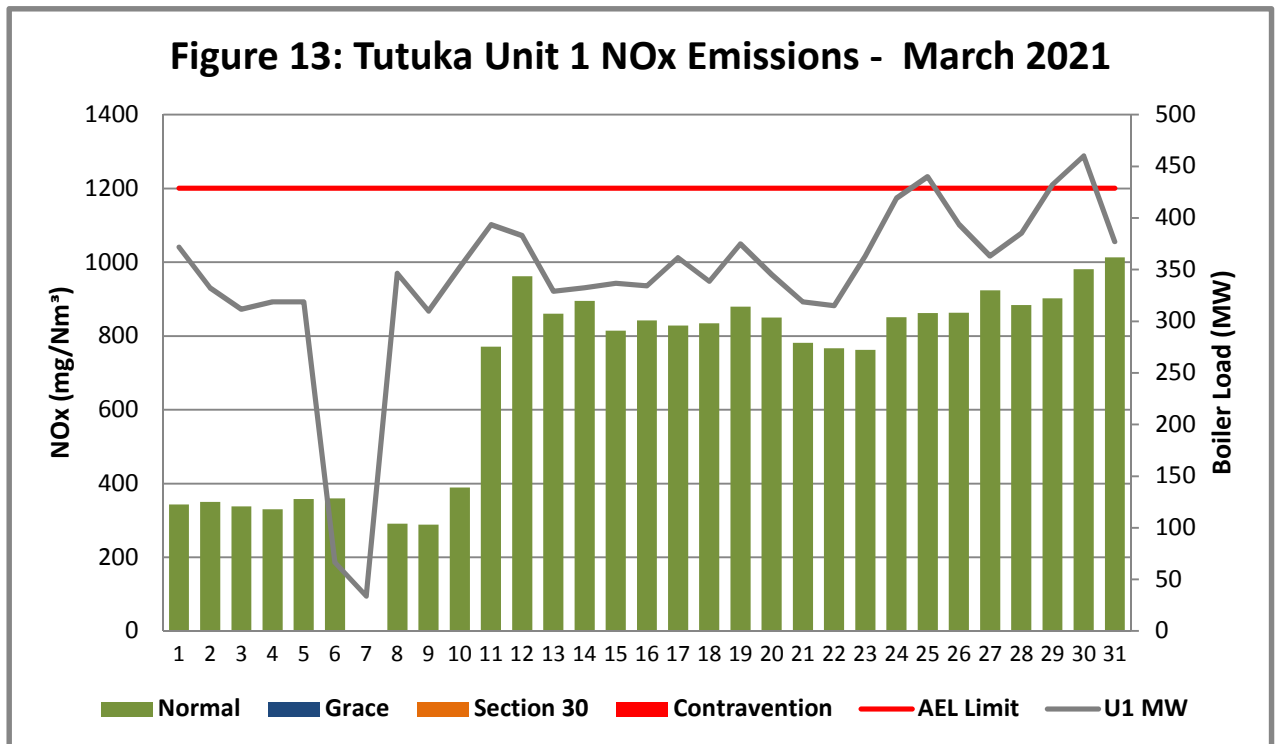


Figure 13: Unit 1 Daily Average NOx emissions for the month of March 2021 (against the emission limits and load Generated)

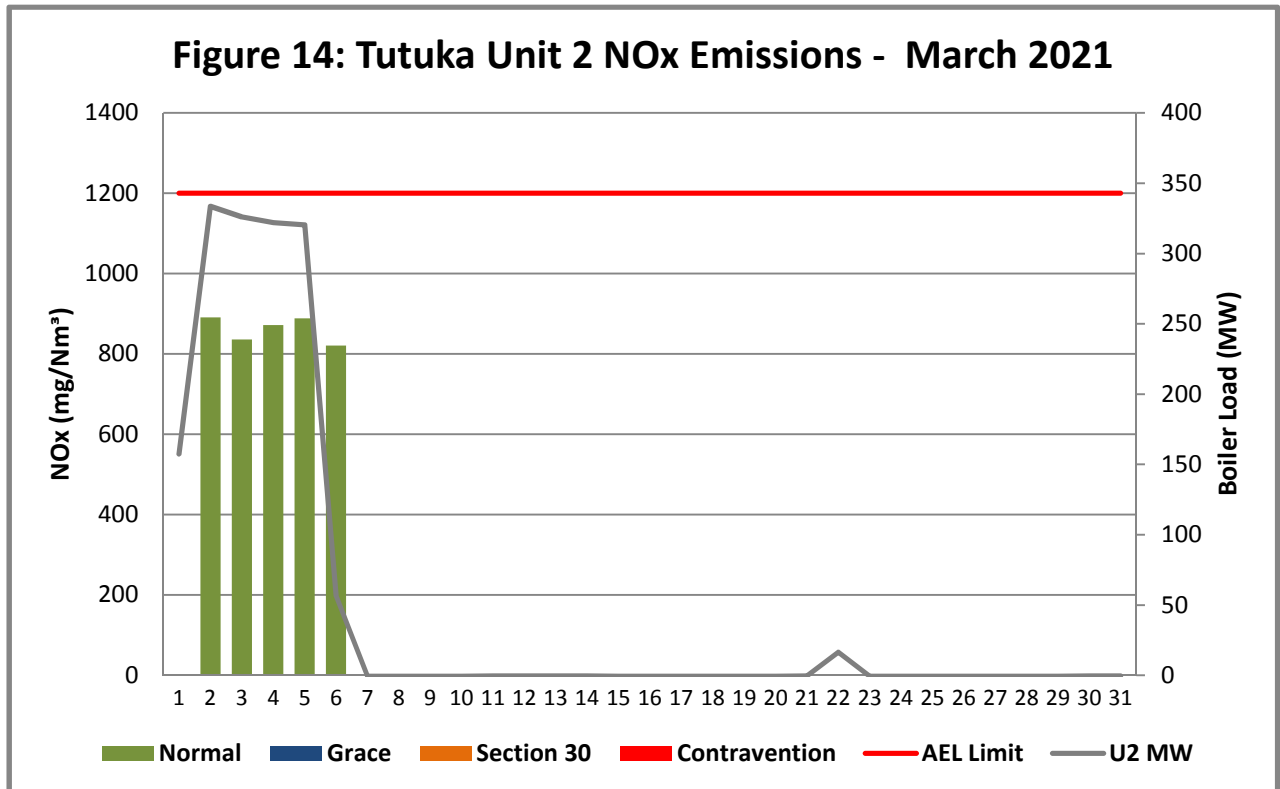


Figure 14: Unit 2 Daily Average NOx emissions for the month of March 2021 (against the emission limits and load Generated)

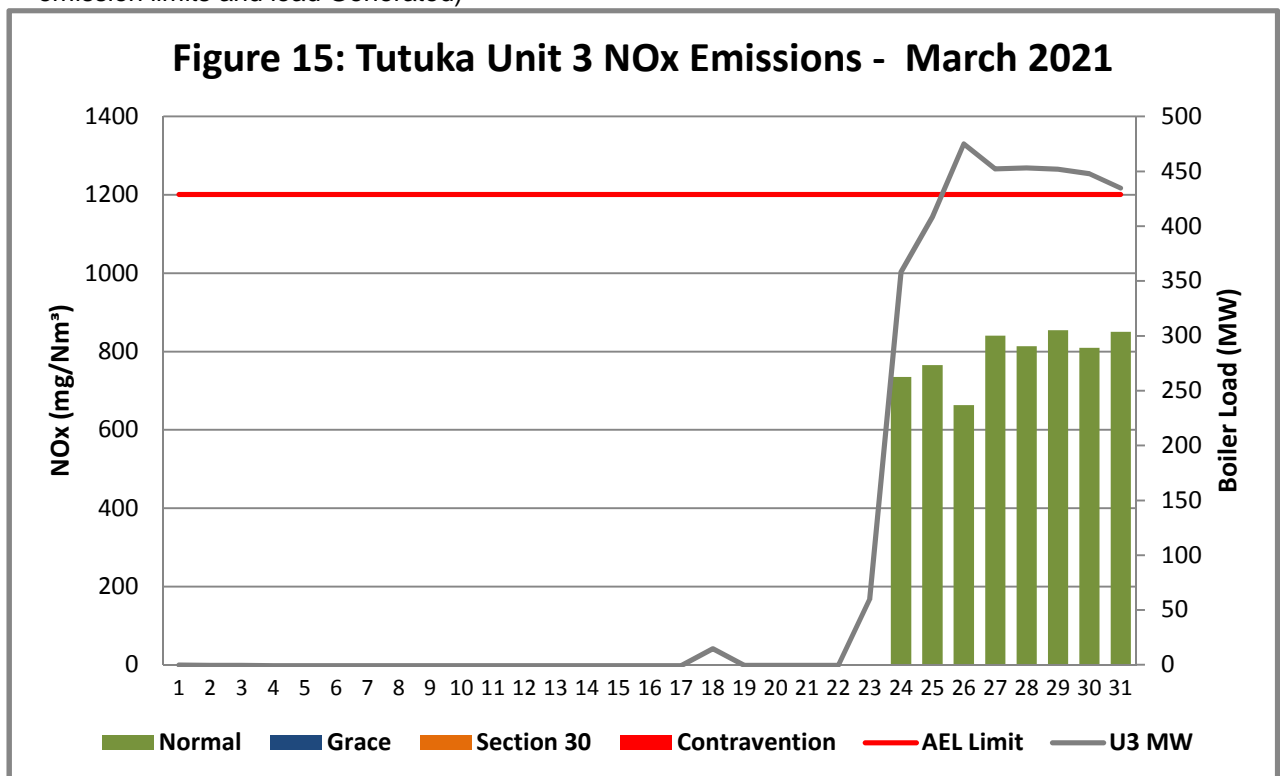


Figure 15: Unit 3 Daily Average NOx emissions for the month of March 2021 (against the emission limits and load Generated)

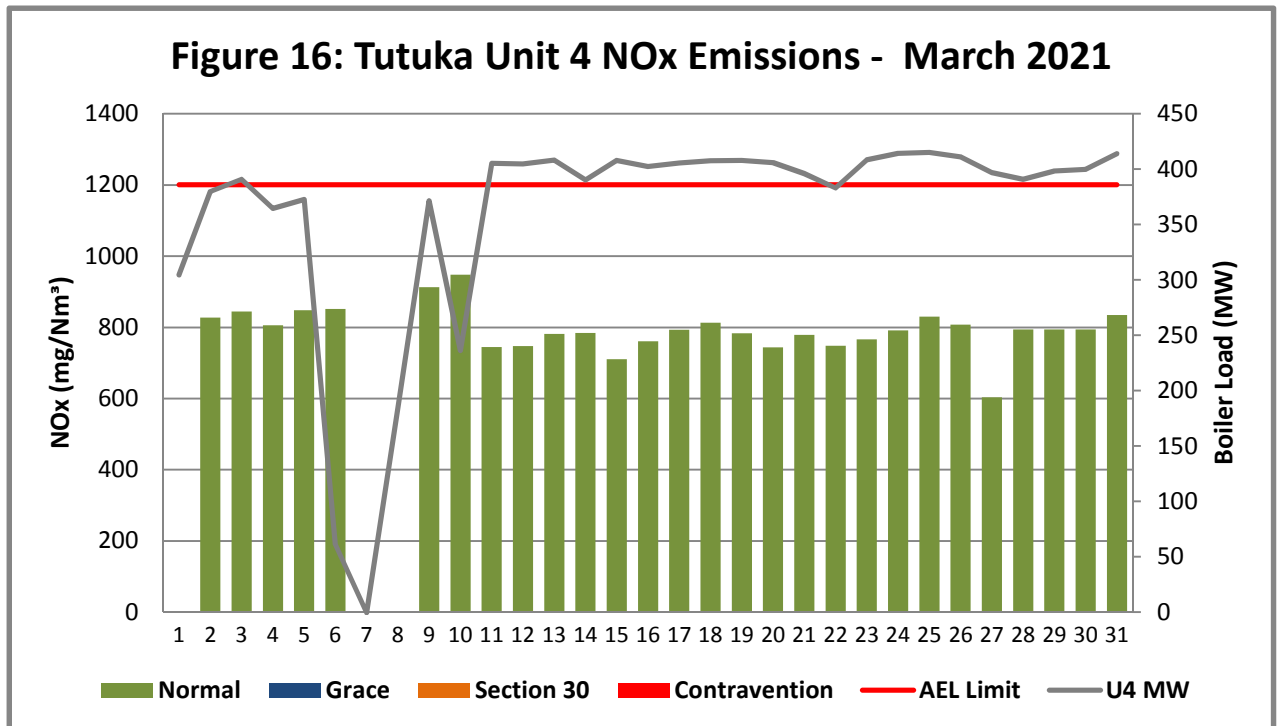


Figure 16: Unit 4 Daily Average NOx emissions for the month of March 2021 (against the emission limits and load Generated)

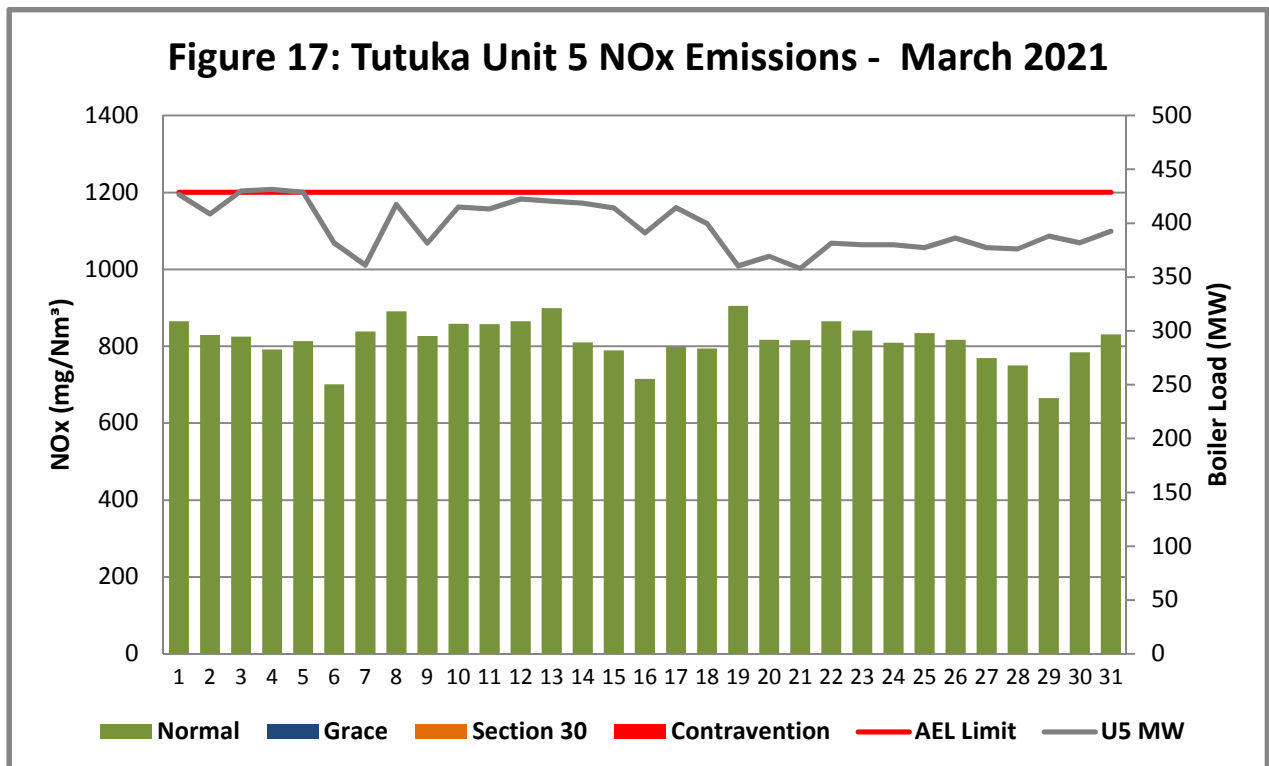


Figure 17: Unit 5 Daily Average NOx emissions for the month of March 2021 (against the emission limits and load Generated)

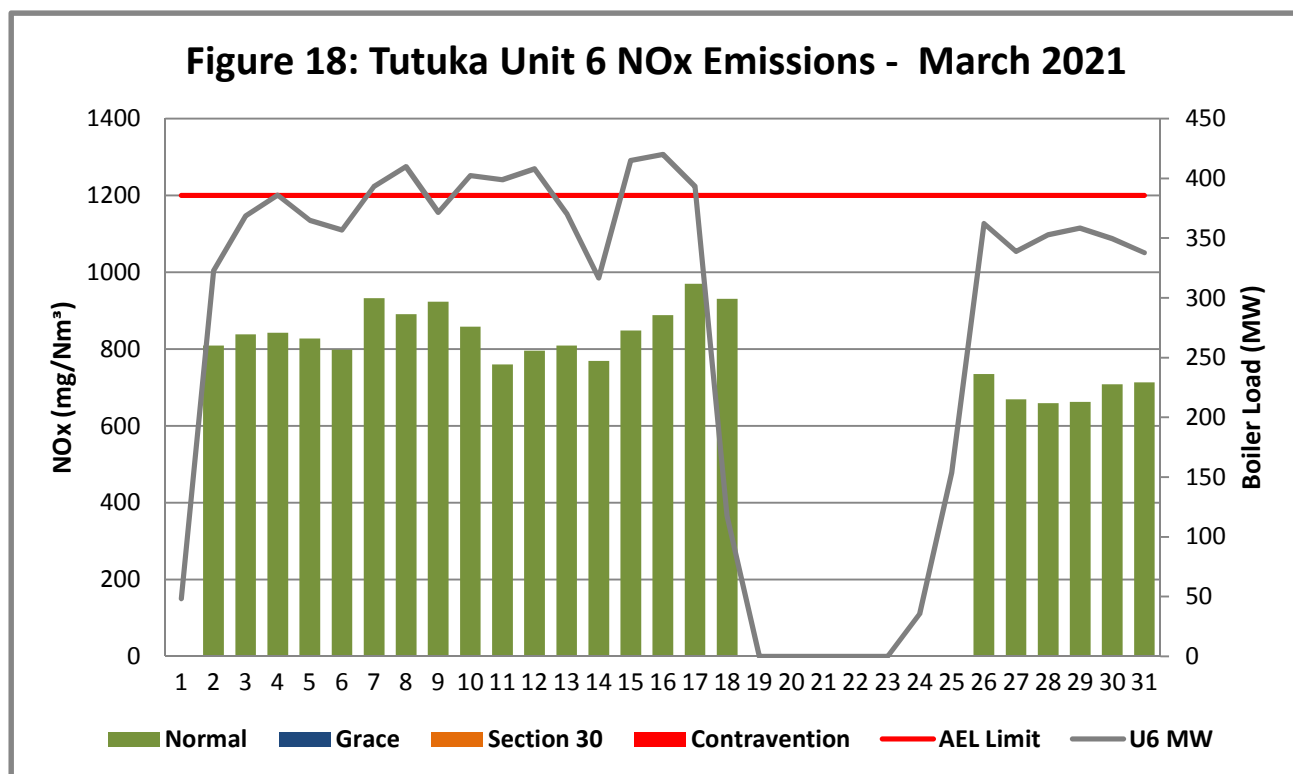


Figure 18: Unit 6 Daily Average NOx emissions for the month of March 2021 (against the emission limits and load Generated)

5. Number and Types of unit’s start-ups

Number & Type of Starts	U1	U2	U3	U4	U5	U6
Number Of Hot Starts (Off-Load < 30 Hrs)	1	4	1	2	0	3
Number Of Cold Starts (Off-Load > 30 hrs)	1	1	2	1	0	1

Table 5: Number and type of Unit start-ups for each unit respectively for the month of March 2021

6. Complaints

No public complaints received for the month of March 2021

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		N/A	N/A	N/A	N/A

Table 6: Complaints for the month of March 2021

7. General

Section 30 incidents were incurred on unit 1, 4 and 5 in the month of March 2021(See table 7.4 below).

Unit 1: incurred a section 30 on the 12th March 2021 due to high hoppers and Fields Out of commission. Fields 1.3, 3.4, 4.2 and 4.3 were O/C.

Unit 4: Had a continuous section 30 from the 21 February 2021 to the 21 March 2021.The initial notification to authorities was sent on the 04 March 2021.The unit had challenges with HFPS defects, Dust handling plant (DHP) defects as well as internal faults on the precipis.

Unit 5:-Had a continuous section 30 from the 26th February 2021 to the 06 March 2021.The initial notification was sent to authorities on the 01.March 2021.The incident was due to unavailability of the ash conditioners 5 and 6, which caused the high ash bunker 3A/B levels.

There were no NOx exceedances were incurred in the month of March 2021(See tables 7.1 - 7.3 below) and 8 SOx exceedances were recorded. High SOx levels were reported to boiler engineering for further investigations

Gas monitors calibration contractors have cleaned and adjusted monitors to the Zero's every week and it was found that there seems like slight blockages in the sample lines which affected the sample .The blockages resulted with the NOx giving same reading on unit 4 for more than 3 days. The team also replaced some of the cooler peristaltic pumps.

Table 7.1: Operating days in compliance to PM AEL Limit - March 2021

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	13	8	9	0	17	309.4
Unit 2	2	3	0	0	3	311.8
Unit 3	8	0	0	0	0	201.7
Unit 4	3	5	20	0	25	429.7
Unit 5	20	5	6	0	11	295.9
Unit 6	20	3	0	0	3	273.2
SUM	66	24	35	0	59	

Table 7.2: Operating days in compliance to SOx AEL Limit - March 2021

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SOx (mg/Nm ³)
Unit 1	30	0	0	0	0	2 301.7
Unit 2	4	0	0	1	1	3 041.1
Unit 3	8	0	0	0	0	2 343.8
Unit 4	25	0	0	3	3	2 102.7
Unit 5	30	0	0	1	1	2 751.5
Unit 6	20	0	0	3	3	3 064.7
SUM	117	0	0	8	8	

Table 7.3: Operating days in compliance to NOx AEL Limit - March 2021

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm ³)
Unit 1	30	0	0	0	0	705.9
Unit 2	5	0	0	0	0	861.8
Unit 3	8	0	0	0	0	791.4
Unit 4	28	0	0	0	0	794.5
Unit 5	31	0	0	0	0	815.3
Unit 6	23	0	0	0	0	810.5
SUM	125	0	0	0	0	

Table 7.4: Section 30 & PM exceedances for the month of March 2021

Units	No.of exceedance days	Date of Initial Notification	Mitigation
Unit1	17	15 March 2021	-Replaced Hopper conveyor G motors and empty hoppers G1 and G2. -Replace B-route transfer conveyor chain
Unit 4	28	04 March 2021	-Install damping resistors in all fields Unblock Hopper conveyor D -Book 17 days outage to inspect and repair the precip internals and rectify defects on the isolator
Unit 5	11	01 March 2021	-Replace hopper conveyor E motor and conditioner conveyor belt -Undertake a project to install new drives on the DHP chain conveyors for unit 4,5 & 6 during 2024-2026 financial years


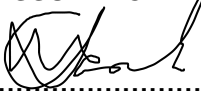

8. Conclusion

Eskom Centre of Excellence (CoE): Air Quality submitted an application on behalf of Tutuka PS for the postponement for the implementation of the Minimum Emissions Standard (MES) limits to the Department of Environment Fisheries and Forestry (DEFF) and Gert Sibande District Municipality on the 09th of November 2018. In the application, a postponement of 300 mg/Nm³ was requested (24 hour moving average). Tutuka PS's new PM emissions limit of 100 mg/Nm³ (previously- 350 mg/Nm³), came into effect on the 1st January 2020. The Station is unable to meet the limits with the current abatement technology.

All documentation in respect of the stations MES postponement application was submitted and DEFF has confirmed that while the application is being assessed the previous emission limits apply i.e. 300 mg/Nm³ for PM. In addition to that, the station has also submitted an AEL variation request.

For more information or enquiries contact the Tutuka environmental team.

Yours Sincerely

<p>Compiled by: Monica Mokgawa</p> <p>ENVIRONMENTAL MANAGER: TUTUKA POWER STATION</p> <p>Signature:.....</p>	<p>Supported By: Thokozani Maseko</p> <p>RISK AND ASSURANCE MANAGER (ACTING)</p> <p>Signature:.....</p>
<p>Approved by: Sello Mametja</p> <p>GENERAL MANAGER: TUTUKA POWER STATION</p> <p>Signature:.....</p> <p>Date:..2021/06/09.....</p>	