

Mr. Dan Hlanyane  
 Air Quality Officer  
 Gert Sibande District Municipality  
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Date:  
 09 April 2021

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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 12<sup>th</sup> every month. The report shall indicate the emission performance for the previous month. This report contains the emission performance for the month of February 2021.

**1. RAW MATERIALS AND PRODUCTS**

Raw Materials and Products	Raw Material Type	Units	Max. Permitted	Actual Consumption February-2021
	Coal	Tons	1 200 000	621 608
	Fuel Oil	Tons	10 000	16285.52
Production Rates	Product / By-Product Name	Units	Max. Production Capacity Permitted	Production Rate February-2021
	Energy	MW	30748	32 930.00
	Ash	Tons	1 200 000	131 035
	RE Ash	kg/MWh	<i>not specified</i>	1.63

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

## 2. ENERGY SOURCE CHARACTERISTICS

Coal Characteristics	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	16-24	21.080
Sulphur Content	%	0.6 TO >2.6	0.840
Ash Content	%	21 TO >33	21.080

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

## 3. ABATEMET TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Minimum Control Efficiency (%)	Actual Utilisation (%)
Unit 1	Electro Static Precipitators (ESP)	95.00	98.9%
Unit 2	Electro Static Precipitators (ESP)	95.00	98.3%
Unit 3	Electro Static Precipitators (ESP)	98.00	0
Unit 4	Electro Static Precipitators (ESP)	95.00	98.7%
Unit 5	Electro Static Precipitators (ESP)	95.00	98.7%
Unit 6	Electro Static Precipitators (ESP)	95.00	98.7%

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

**Note:** The ESP does not have bypass mode operation, hence plant considered 100% Utilised.

### 3.2. MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SOx	NOx
Unit 1	100.0	100.0	100.0
Unit 2	100.0	100.0	100.0
Unit 3	0.0	0.0	0.0
Unit 4	100.0	100.0	100.0
Unit 5	100.0	100.0	100.0
Unit 6	100.0	100.0	100.0

Table 3.2: Monitor reliability for month of February 2021

Unit 3 was off during the month of February 2021.

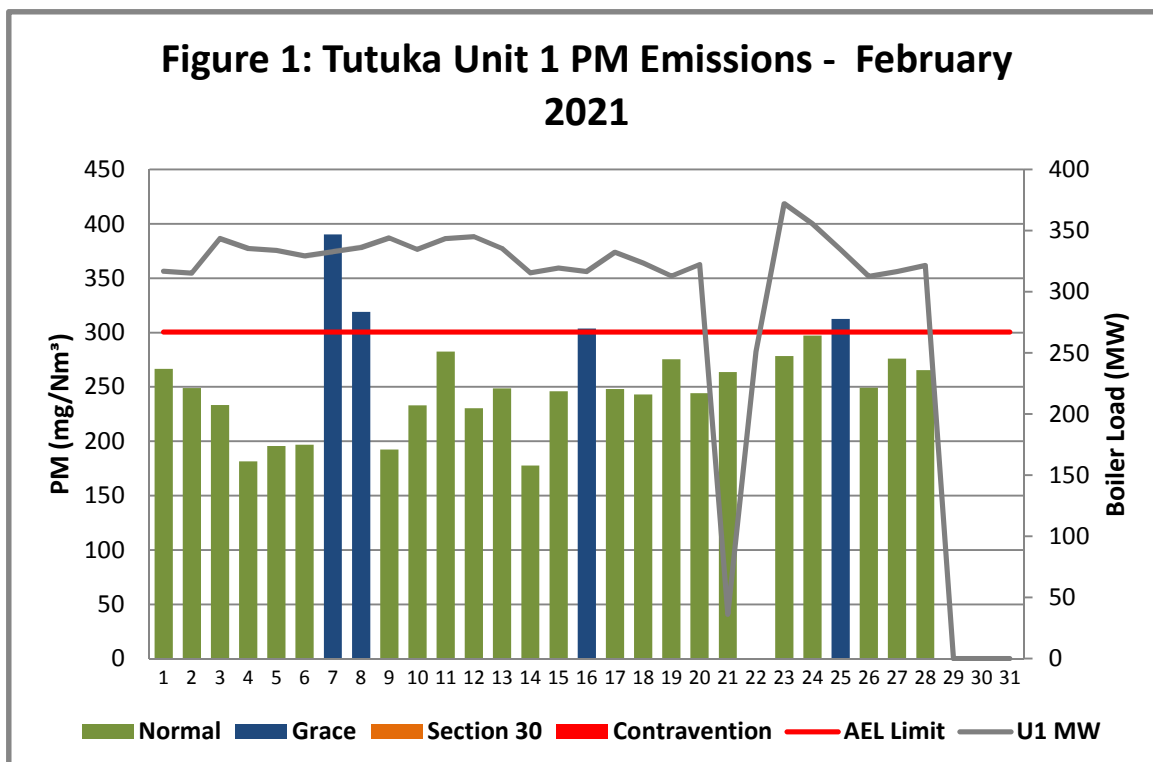
#### 4. EMISSION PERFORMANCE

Associated Unit/Stack	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
Unit 1	302.0	1 693	512
Unit 2	340.6	3 182	996
Unit 3	0.0	0	0
Unit 4	239.7	2 186	681
Unit 5	312.9	2 854	936
Unit 6	329.1	2 982	887
<b>SUM</b>	<b>1 554.23</b>	<b>13152.7</b>	<b>4098.5</b>

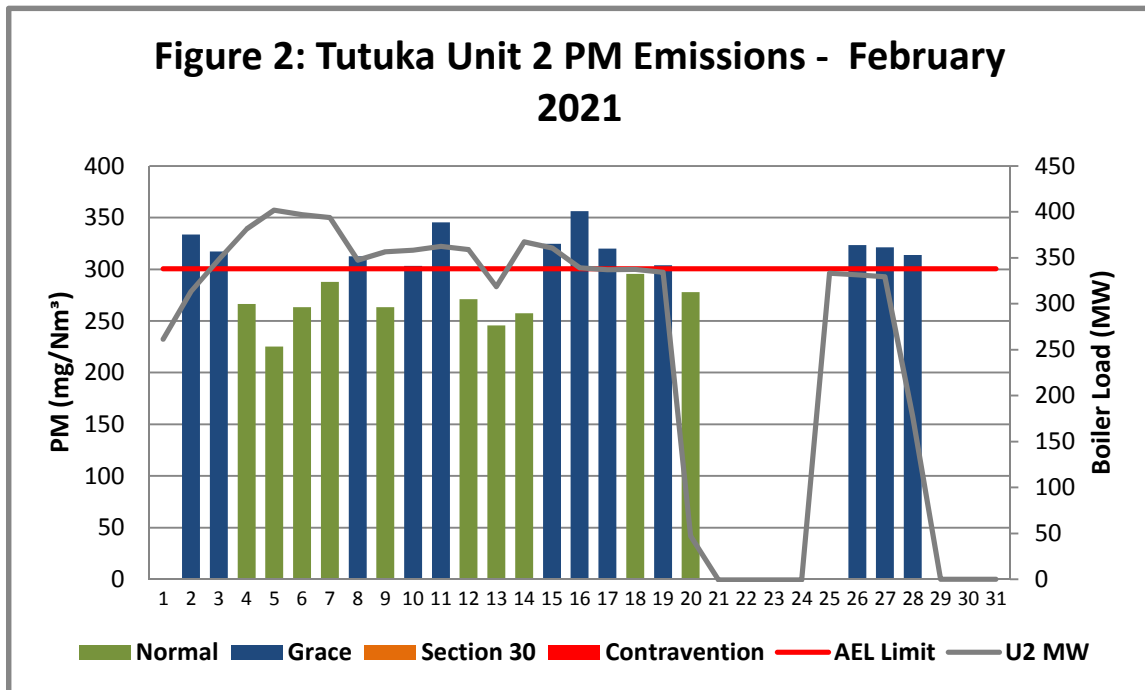
**Table 4.1:** Monthly tonnages for the month of February 2021

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

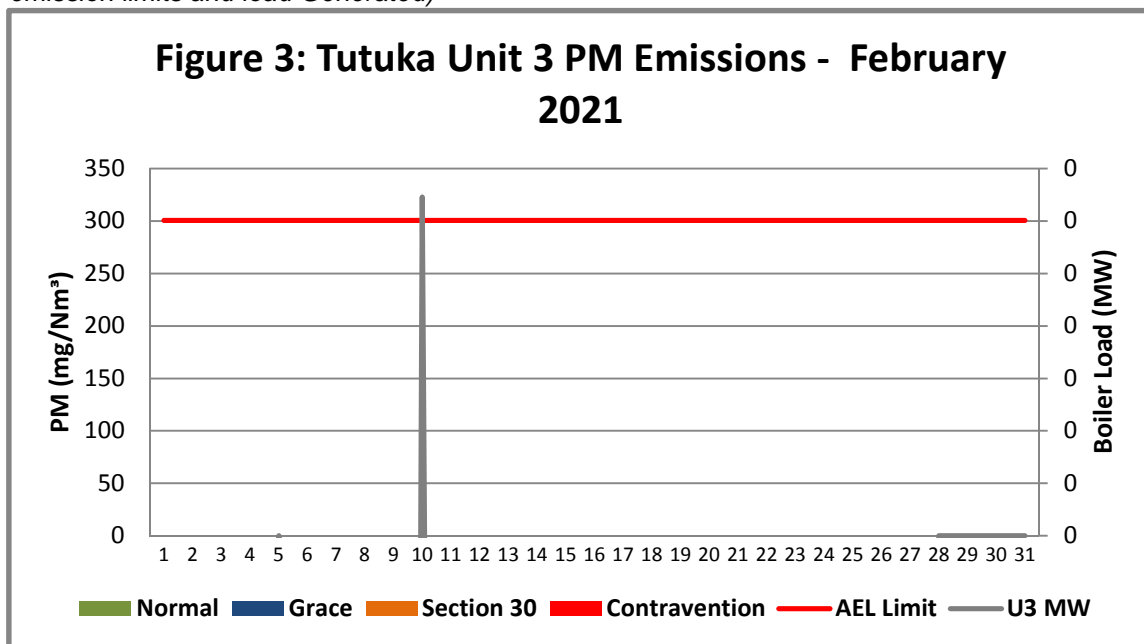
Condition	Colour	Description
Normal	Green	Emissions below Emission Limit Value (ELV)
Grace	Blue	Emissions above the ELV during grace period
Section 30	Orange	Emissions above ELV during a NEMA S30 incident
Contravention	Red	Emissions above ELV but outside grace or S30 incident conditions



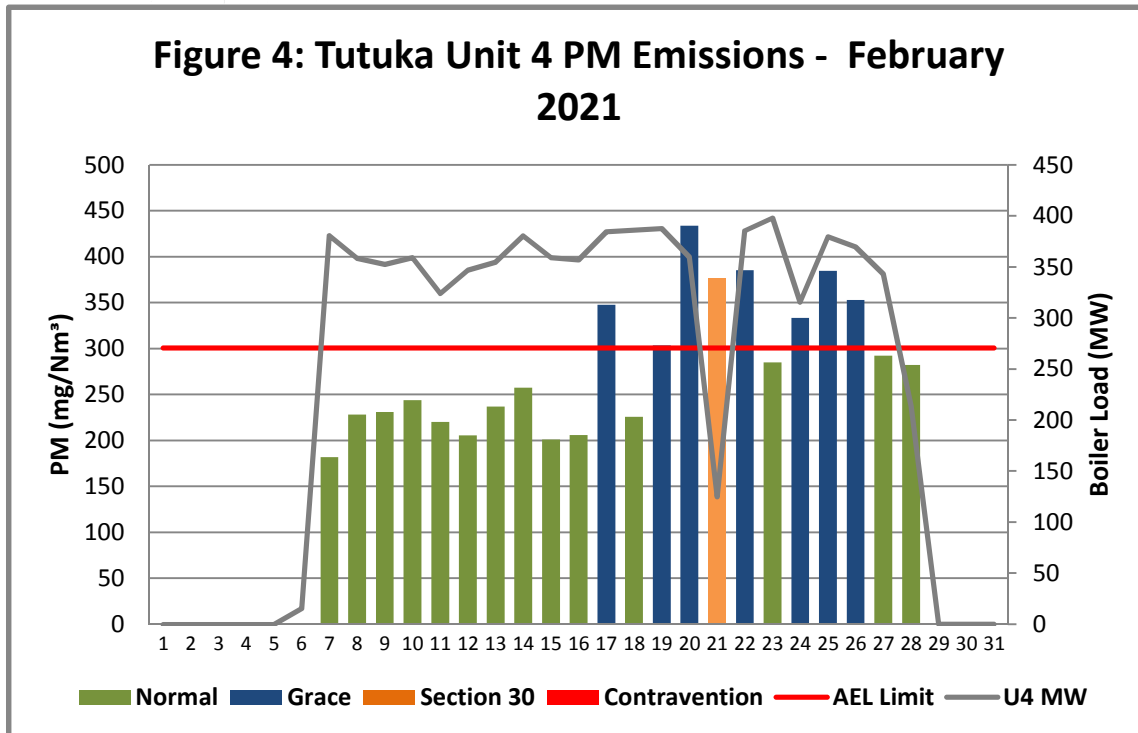
**Figure 1:** Unit 1 Daily Average PM emissions for the month of February 2021 (against the emission limits and load Generated)



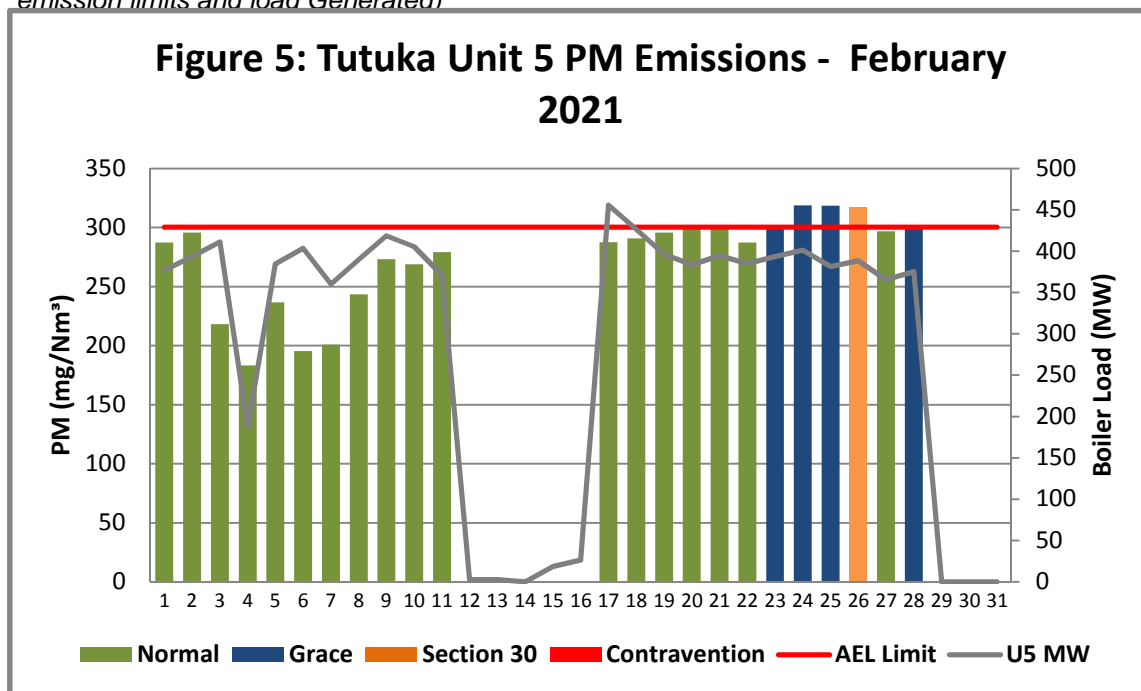
**Figure 2:** Unit 2 Daily Average PM emissions for the month of February 2021 (against the emission limits and load Generated)



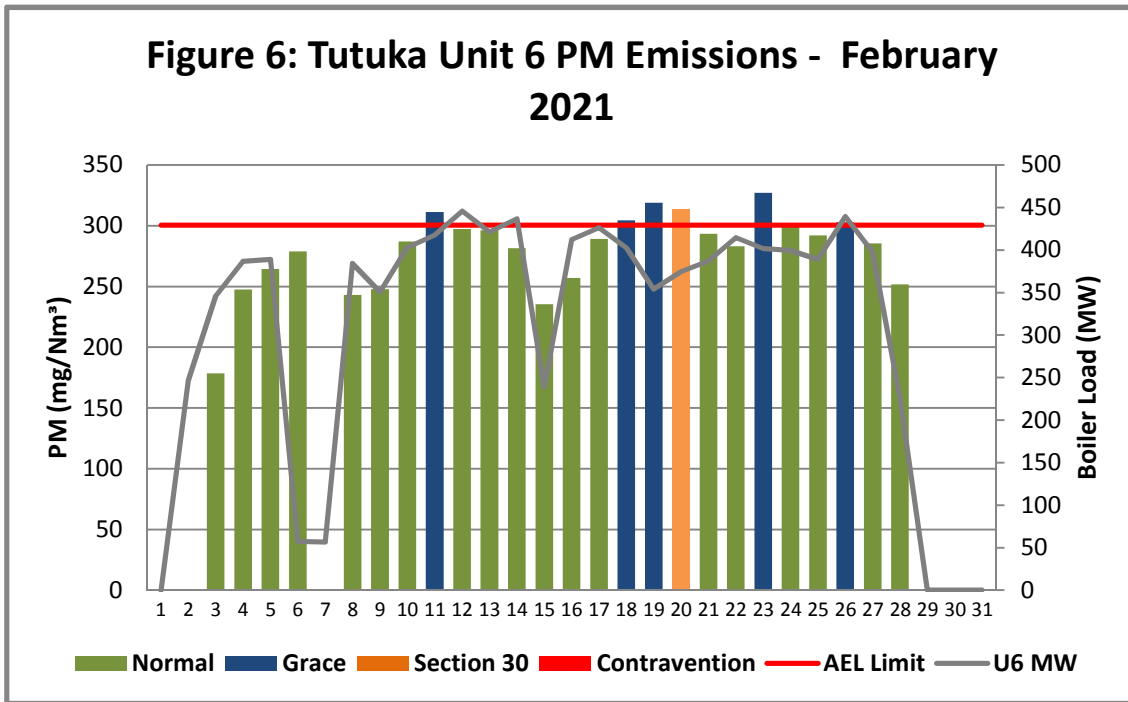
**Figure 3:** Unit 3 Daily Average PM emissions for the month of February 2021 (against the emission limits and load Generated)



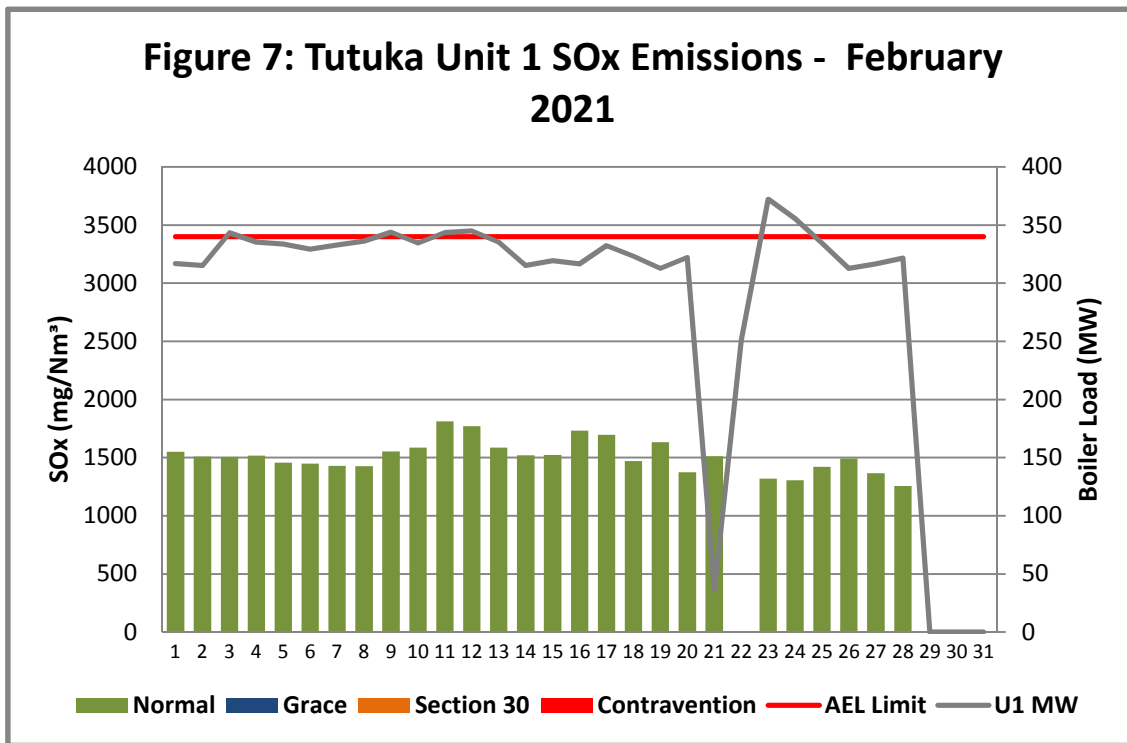
**Figure 4:** Unit 4 Daily Average PM emissions for the month of February 2021 (against the emission limits and load Generated)



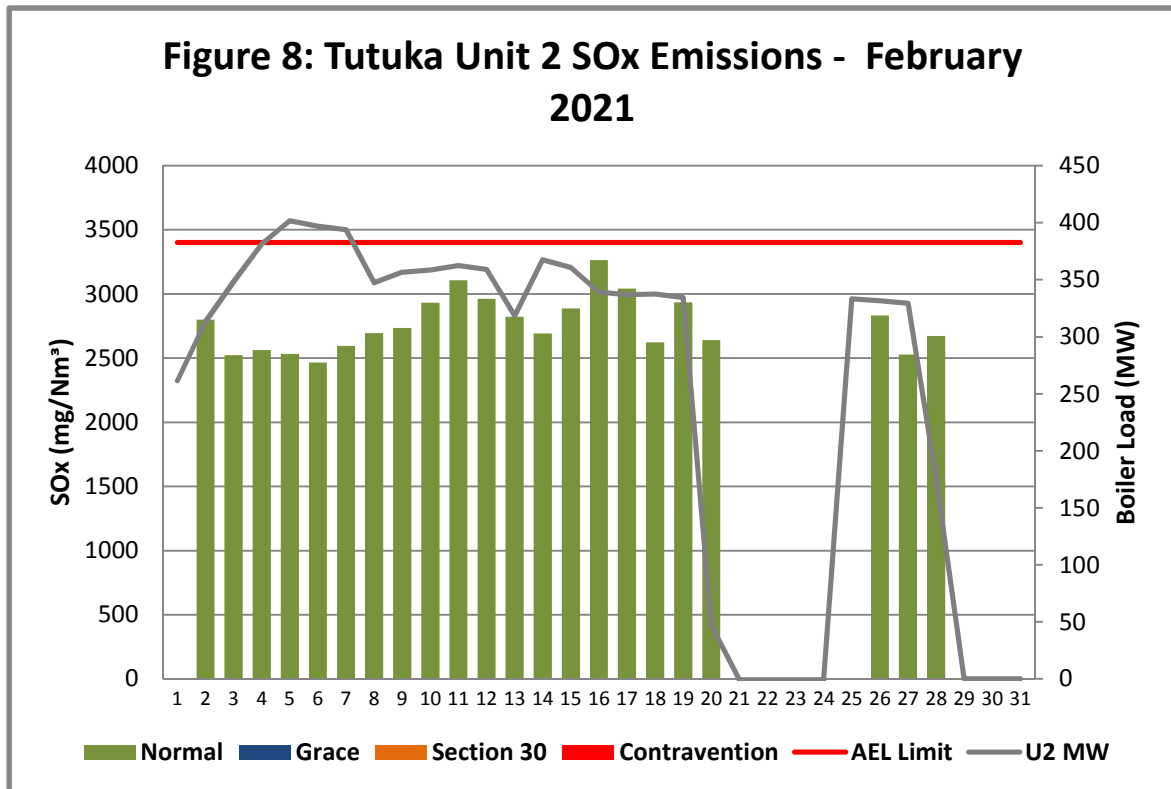
**Figure 5:** Unit 5 Daily Average PM emissions for the month of February 2021 (against the emission limits and load Generated)



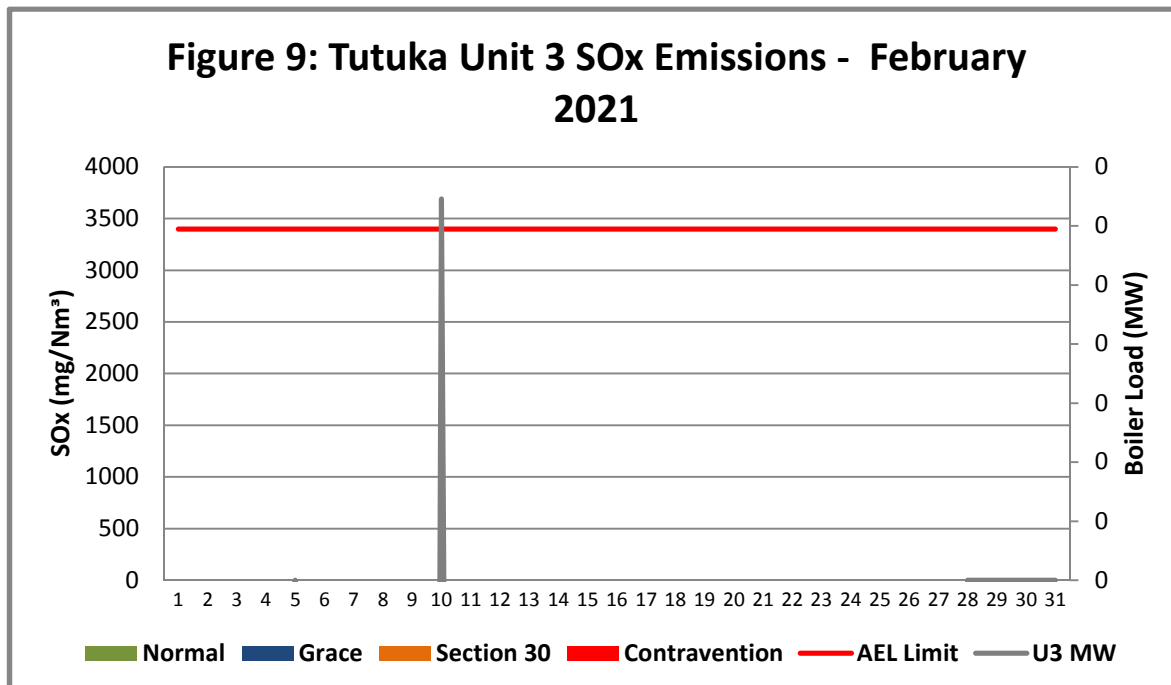
**Figure 6:** Unit 6 Daily Average PM emissions for the month of February 2021 (against the emission limits and load Generated)



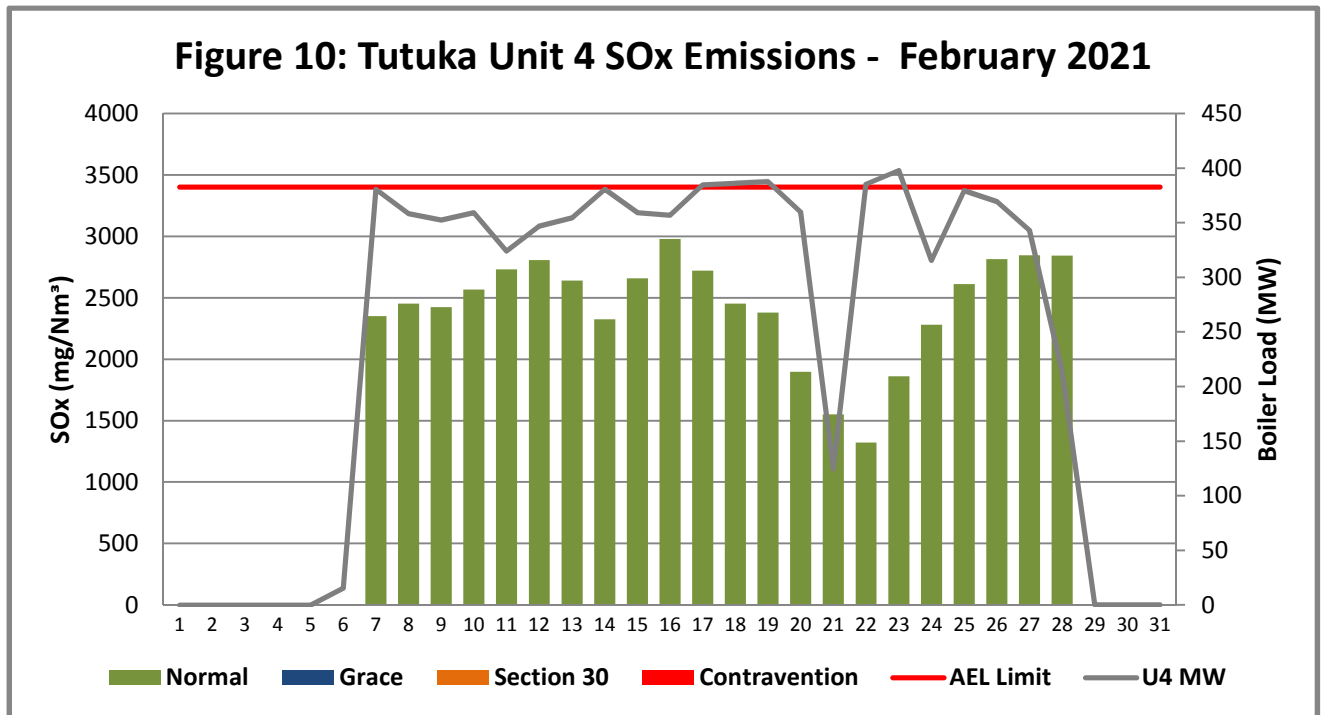
**Figure 7:** Unit 7 Daily Average SOx emissions for the month of February 2021 (against the emission limits and load Generated)



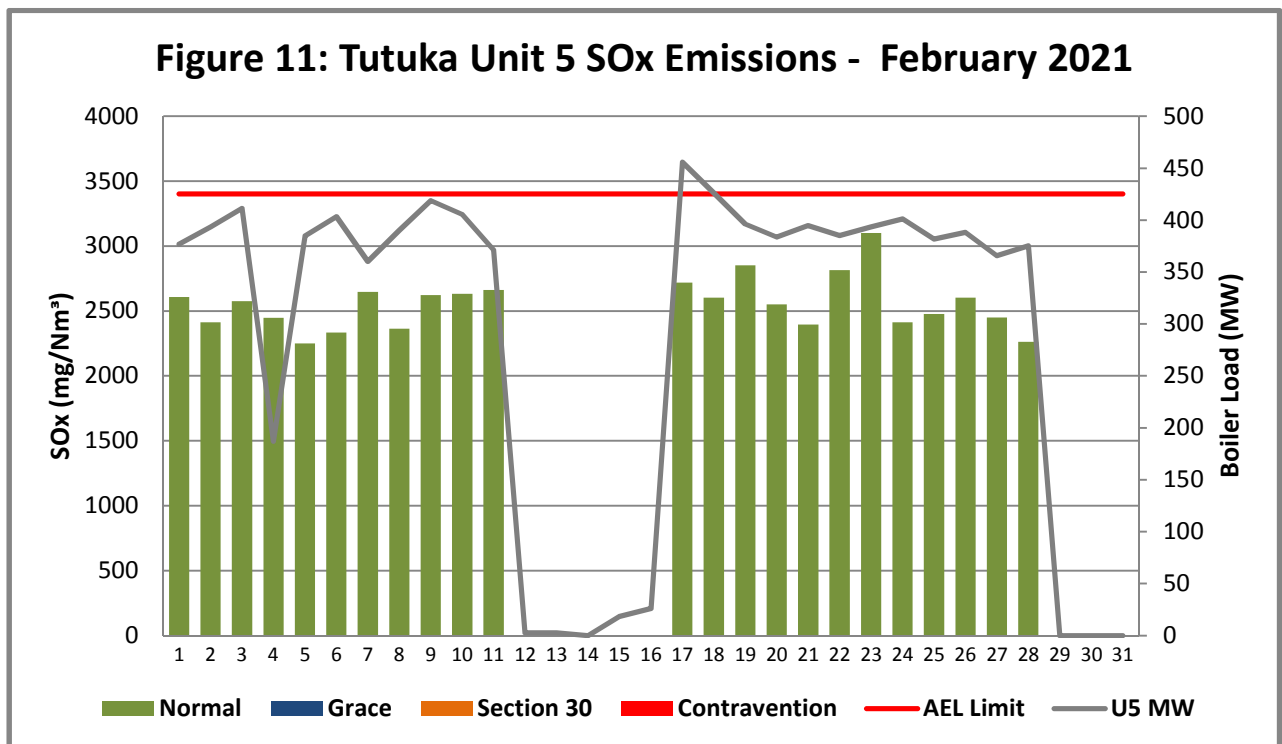
**Figure 8:** Unit 2 Daily Average SOx emissions for the month of February 2021 (against the emission limits and load Generated)



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

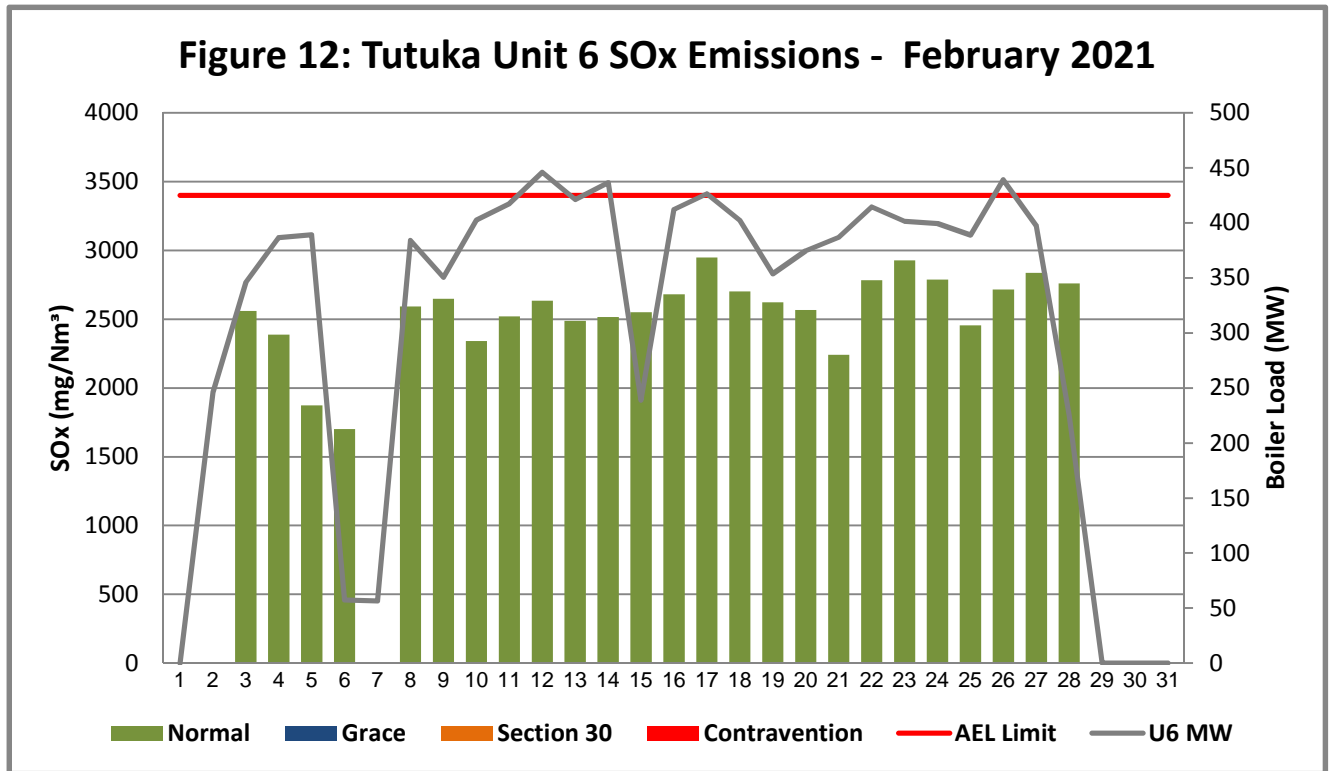


**Figure 10: Unit 4 Daily Average SOx emissions for the month of February 2021 (against the emission limits and load Generated)**

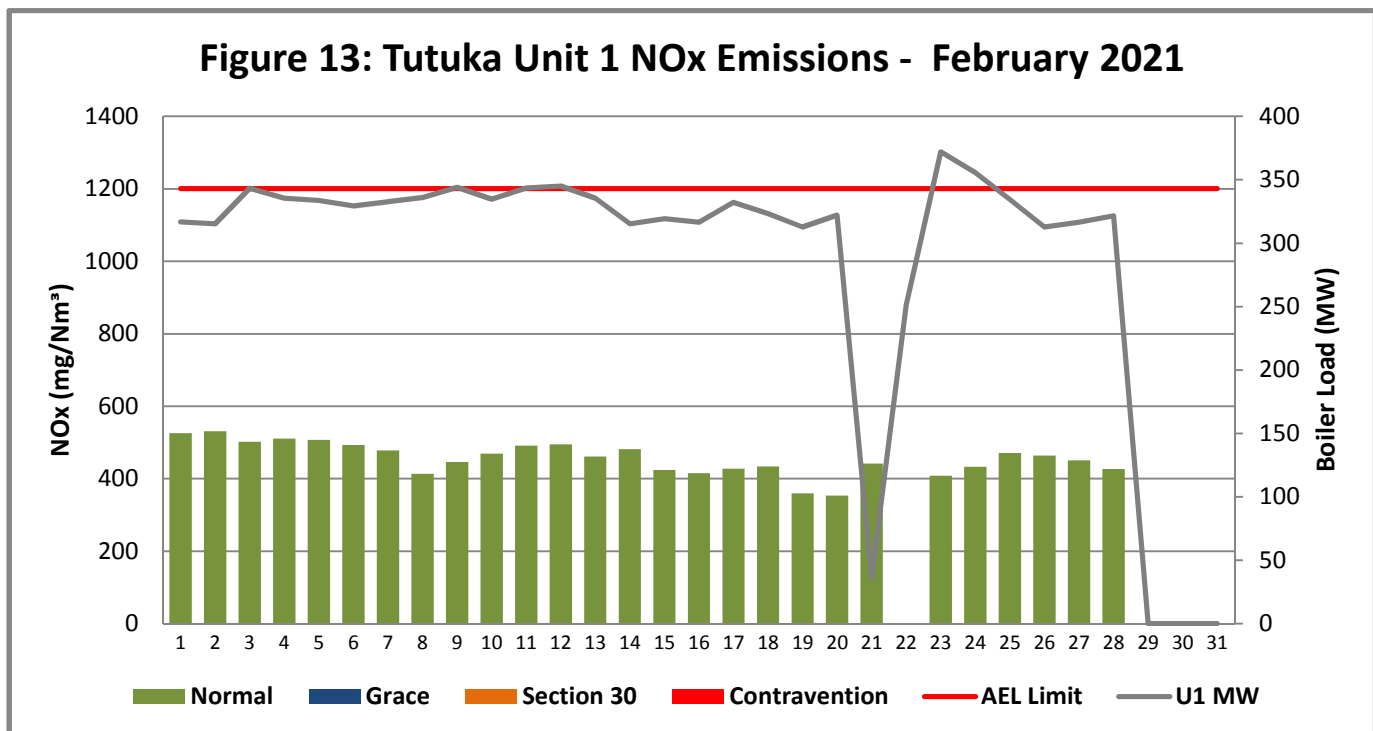


**Figure 11: Unit 5 Daily Average SOx emissions for the month of February 2021 (against the emission limits and load Generated)**

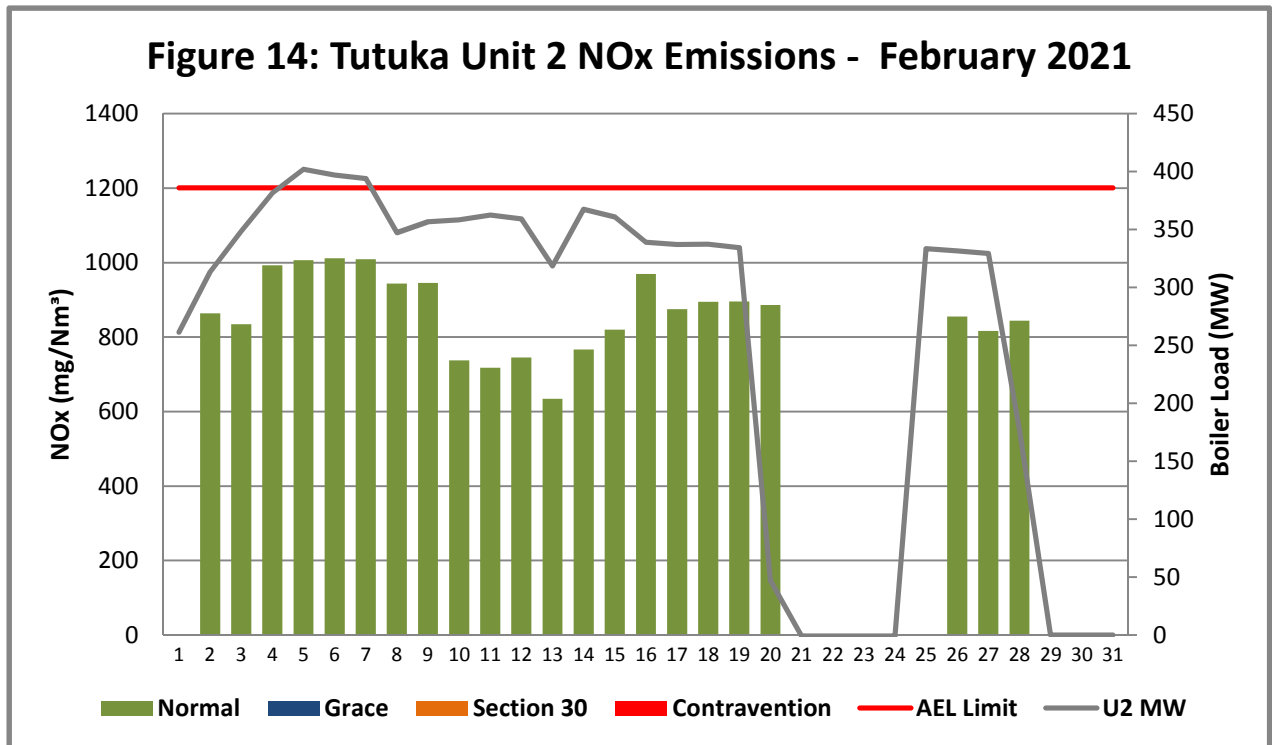




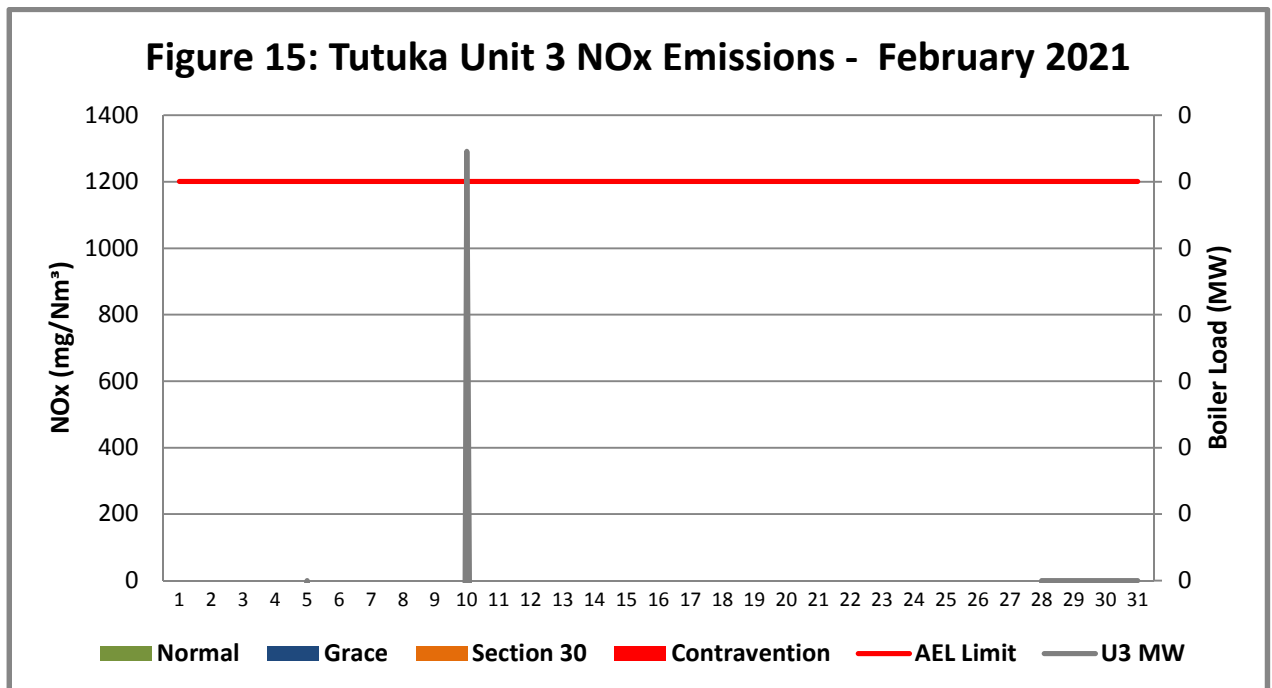
**Figure 12:** Unit 6 Daily Average SOx emissions for the month of February 2021 (against the emission limits and load Generated)



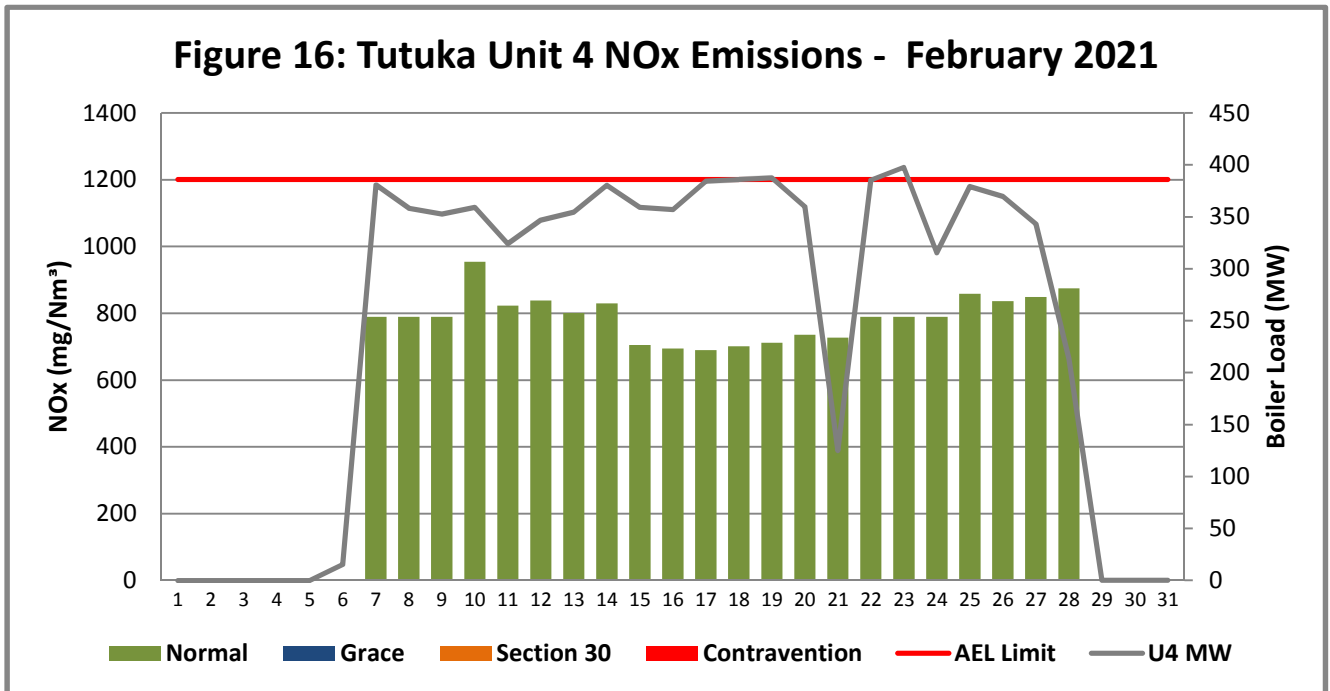
**Figure 13:** Unit 1 Daily Average NOx emissions for the month of February 2021 (against the emission limits and load Generated)



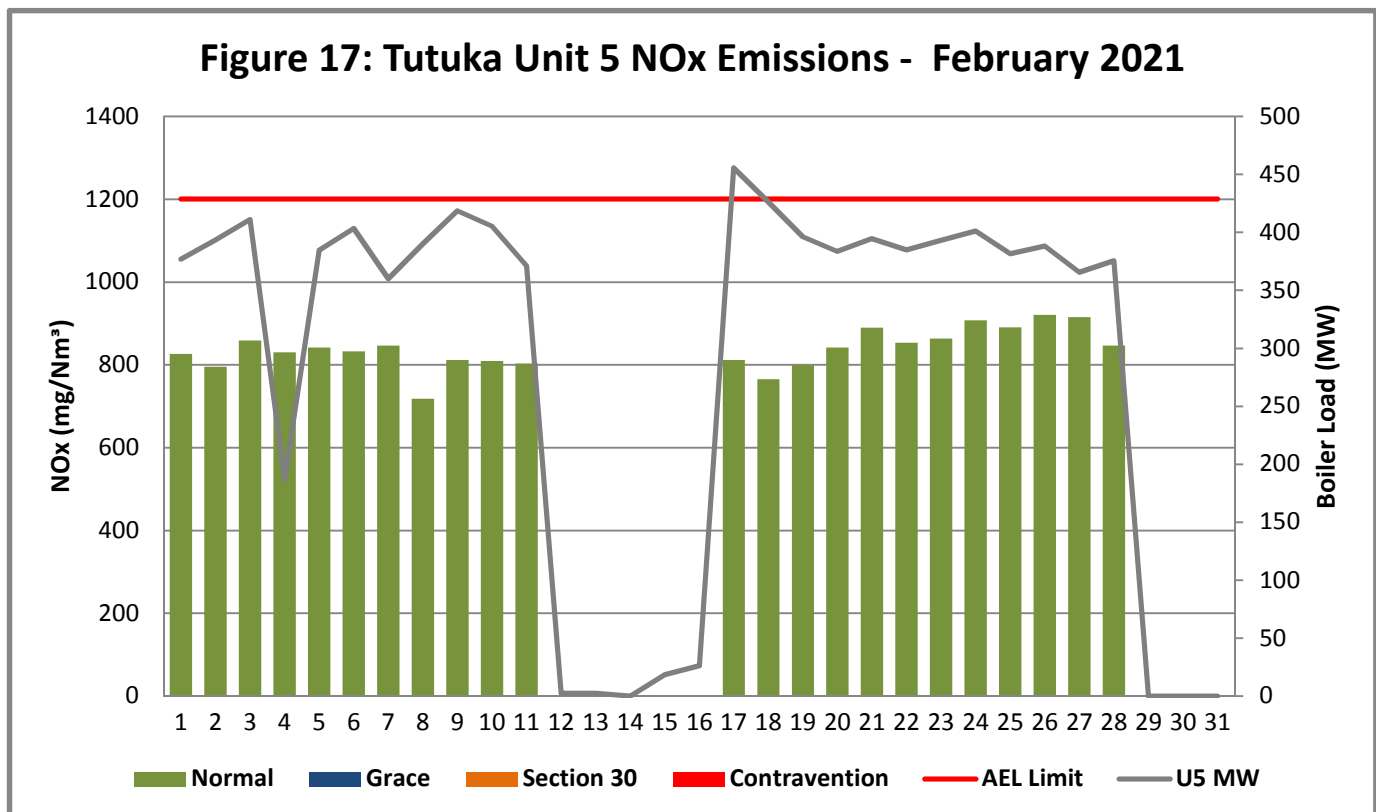
**Figure 14:** Unit 2 Daily Average NOx emissions for the month of February 2021 (against the emission limits and load Generated)



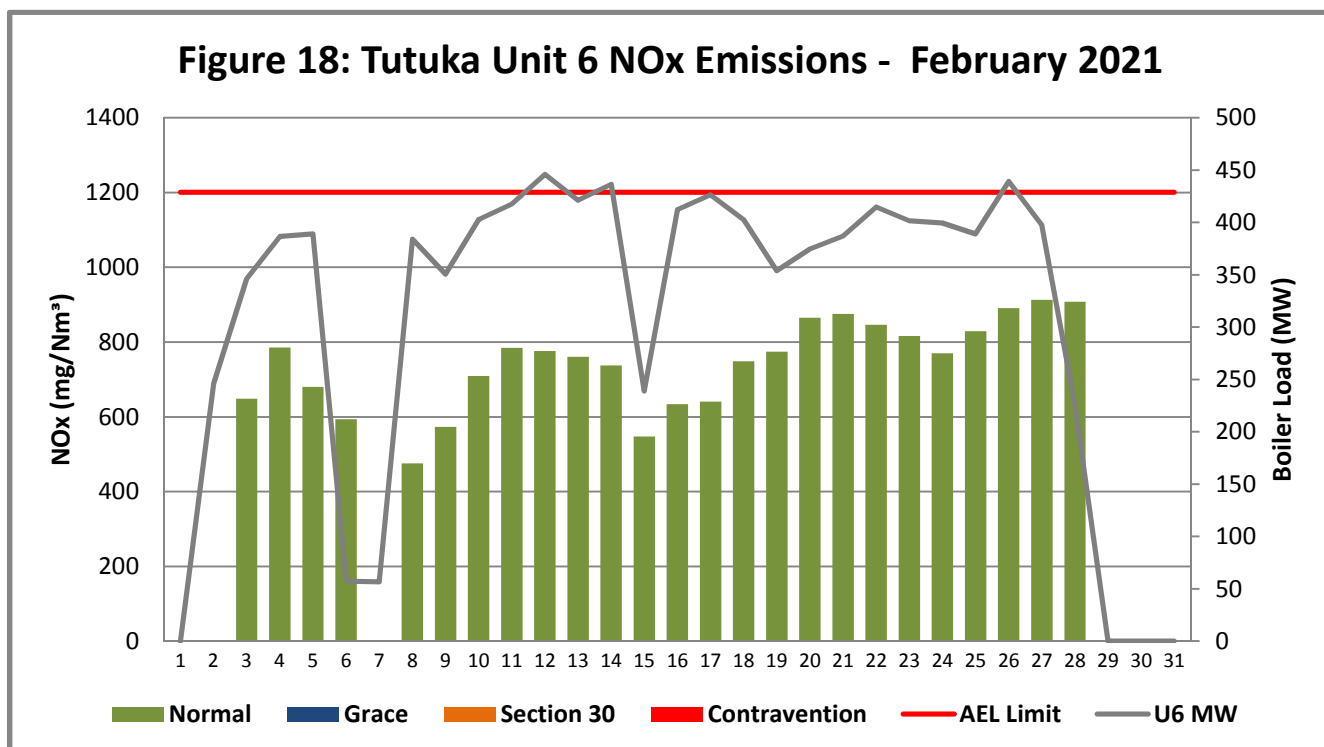
**Figure 15:** Unit 3 Daily Average NOx emissions for the month of February 2021 (against the emission limits and load Generated)



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



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



**Figure 18:** Unit 6 Daily Average NOx emissions for the month of February 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	0	0	2	2	1
Number Of Cold Starts (Off-Load > 30 hrs)	0	2	0	1	2	2

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

### 6. Complaints

1 complains was received from Gert Sibande Municipality in the month of February regarding the elevated SO<sub>2</sub> and H<sub>2</sub>S in Gauteng Province. The source of the incident was unknown at the time of the complaint. However, Tutuka Power station did not have any activity that could trigger the release of SO gases. The station has submitted all the required document to Gert Sibande District Municipality.

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
001		N/A	N/A	N/A	N/A

Table 6: Complaints for the month of February 2021

## 7. General

Section 30 incidents was incurred on unit 2,4 5 and 6 in the month of February 2021(See table 7.4 below).

**Unit 2** was operating on section 30 from the 15 February to the 04<sup>th</sup> of March. The unit experience multiple trips and multiple plant component failures including the controllers and transformer failures. Many fields including fields 11,13, 21,23,25 & 43 were also faulty impacting the plate rappers

**Unit 4:** Challenges with HFPS defects, Dust handling plant (DHP) defects as well as suspected internal fault on the precip. Multiple failures of the fields as a result of full hoppers

**Unit 5:-**Unavailability of the ash conditioners 5 and 6, which caused the high ash bunker 3A/B levels.

-Conveyor Chain flight bent and motor burned

-Hopper conveyor E motor was replaced three times

**Unit 6:** Precip route A & B tripped due to high Ash Bunkers and unavailability of plate rapper motor spares. The left hand plate rapper motor was burnt

There were no NOx exceedances were incurred in the month of February 2021(See tables 7.2 -7.3 below)

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm <sup>3</sup> )
Unit 1	23	4	0	0	4	255.5
Unit 2	10	12	0	0	12	296.8
Unit 3	0	0	0	0	0	
Unit 4	14	8	0	0	8	282.5
Unit 5	18	5	0	0	5	273.8
Unit 6	19	6	0	0	6	279.5
<b>SUM</b>	<b>47</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>24</b>	

Table 7.4: Section 30 exceedances for February 2021.

<b>Date</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>U3</b>	<b>Unit 4</b>	<b>Unit 5</b>	<b>Unit 6</b>
01-Feb	266.5				287.4	
02-Feb	248.8	333.6			295.7	
03-Feb	233.3	317.2			218.2	178.6
04-Feb	181.5	266.4			183.4	247.5
05-Feb	195.7	225.3			236.6	264.3
06-Feb	196.9	263.3			195.6	278.9
07-Feb	390.3	288.0		181.9	201.0	
08-Feb	318.9	312.7		228.2	243.5	243.0
09-Feb	192.4	263.4		230.9	273.2	247.8
10-Feb	233.1	303.2		243.9	269.0	286.9
11-Feb	282.5	345.4		220.1	279.4	311.4
12-Feb	230.4	271.2		205.5		297.2
13-Feb	248.7	245.7		236.8		296.4
14-Feb	177.5	257.4		257.4		281.5
15-Feb	245.8	324.8		201.0		235.4
16-Feb	303.7	356.4		205.8		256.9
17-Feb	248.0	320.1		347.7	287.7	289.2
18-Feb	243.2	295.5		225.8	291.0	304.5
19-Feb	275.4	304.0		303.6	295.7	319.0
20-Feb	244.3	278.1		433.9	299.6	313.5
21-Feb	263.7	-		377.1	299.2	293.3
22-Feb		-		385.2	287.4	283.1
23-Feb	278.5	-		285.0	301.1	327.0
24-Feb	297.3	-		333.5	318.9	300.1
25-Feb	312.6	-		384.5	318.4	292.1
26-Feb	249.2	323.4		352.8	317.5	302.7
27-Feb	276.1	321.2		292.4	296.8	285.4
28-Feb	265.3	314.0		282.2	301.4	251.8

**Table 7.2: Operating days in compliance to SO<sub>x</sub> AEL Limit - February 2021**

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO <sub>x</sub> (mg/Nm <sup>3</sup> )
Unit 1	27	0	0	0	0	1 510.2
Unit 2	22	0	0	0	0	2 766.3
Unit 3	0	0	0	0	0	
Unit 4	22	0	0	0	0	2 432.9
Unit 5	23	0	0	0	0	2 556.4
Unit 6	25	0	0	0	0	2 553.9
<b>SUM</b>	<b>71</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

**Table 7.3: Operating days in compliance to NO<sub>x</sub> AEL Limit - February 2021**

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO <sub>x</sub> (mg/Nm <sup>3</sup> )
Unit 1	27	0	0	0	0	456.1
Unit 2	22	0	0	0	0	866.7
Unit 3	0	0	0	0	0	
Unit 4	22	0	0	0	0	789.4
Unit 5	23	0	0	0	0	838.4
Unit 6	25	0	0	0	0	743.3
<b>SUM</b>	<b>71</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

## 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/Nm<sup>3</sup> was requested (24 hour moving average). Tutuka PS's new PM emissions limit of 100 mg/Nm<sup>3</sup> (previously- 350 mg/Nm<sup>3</sup>), 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/Nm<sup>3</sup> 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

**Compiled by:**

**Monica Mokgawa**

**ENVIRONMENTAL MANAGER: TUTUKA POWER STATION**



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**Date...** 20 April 2021

**Verified By:**

**Mike Molepo**



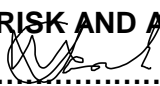
**SENIOR CHEMIST CHEMISTRY: TUTUKA POWER STATION**

20/04/2021  
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**Supported By:**

**Thokozani Maseko**

**RISK AND ASSURANCE MANAGER (ACTING)**



21/04/2021  
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**Approved by:**

**Sello Mametja**

**GENERAL MANAGER: TUTUKA POWER STATION**

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**Date:** 21/04/2021