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Date:
01 March 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 12th every month. The report shall indicate the emission performance for the previous month. This report contains the emission performance for the month of January 2021.

Tutuka Power station would like to apologise for late submission

**1. RAW MATERIALS AND PRODUCTS**

| Raw Materials and Products | Raw Material Type | Units | Max. Permitted | Actual Consumption Jan-2021 |
|---|---|---|---|---|
| | Coal | Tons | *1 200 000* | *622 587.00* |
| | Fuel Oil | Tons | *10 000* | *15 084.43* |
| | | | | |
| **Production Rates** | **Product / By-Product Name** | **Units** | **Max. Production Capacity Permitted** | **Production Rate Jan-2021** |
| | Energy | MW | *30748* | *42008* |
| | Ash | Tons | *1 200 000* | *148 425.00* |
| | RE Ash | kg/MWh | *not specified* | *1.53* |

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

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## 2. ENERGY SOURCE CHARACTERISTICS

| Coal Characteristics | Units | Stipulated Range | Monthly Average Content |
|---|---|---|---|
| CV Content | MJ/kg | *16-24* | 22.07 |
| Sulphur Content | % | *0.6 TO >2.6* | *0.80* |
| Ash Content | % | *21 TO >33* | *23.84* |

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

## 3. ABATEMET TECHNOLOGY (%)

| Associated Unit/Stack | Technology Type | Minimum Control Efficiency (%) | Actual Utilisation (%) |
|---|---|---|---|
| Unit 1 | *Electro Static Precipitators (ESP)* | *95.00* | 99.4 |
| Unit 2 | *Electro Static Precipitators (ESP)* | *95.00* | 99.6 |
| Unit 3 | *Electro Static Precipitators (ESP)* | *98.00* | 100.0 |
| Unit 4 | *Electro Static Precipitators (ESP)* | *95.00* | 99.3 |
| Unit 5 | *Electro Static Precipitators (ESP)* | *95.00* | 99.3 |
| Unit 6 | *Electro Static Precipitators (ESP)* | *95.00* | 99.2 |

**Table 3.1:** Abatement Equipment Control Technology for month of January 2021

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

### 3.2. MONITOR RELIABILITY (%)

| Associated Unit/Stack | PM | $SO_2$ | NO |
|---|---|---|---|
| Unit 1 | *100.0* | *100.0* | *100.0* |
| Unit 2 | *99.9* | *100.0* | *100.0* |
| Unit 3 | *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 January 2021

Unit 3 was off during the month of January 2021.

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## 4. EMISSION PERFORMANCE

| Associated Unit/Stack | PM (tons) | $SO_2$ (tons) | $NO_x$ (tons) |
|---|---|---|---|
| Unit 1 | 261.0 | 1845 | 524 |
| Unit 2 | 172.2 | 1 352 | 393 |
| Unit 3 | 0.0 | 0 | 0 |
| Unit 4 | 321.9 | 3 778 | 957 |
| Unit 5 | 316.5 | 3 236 | 936 |
| Unit 6 | 325.6 | 3 229 | 918 |
| **SUM** | 1 397.3 | 13440.2 | 3727.9 |

Table 4.1: Monthly tonnages for the month of January 2021

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

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

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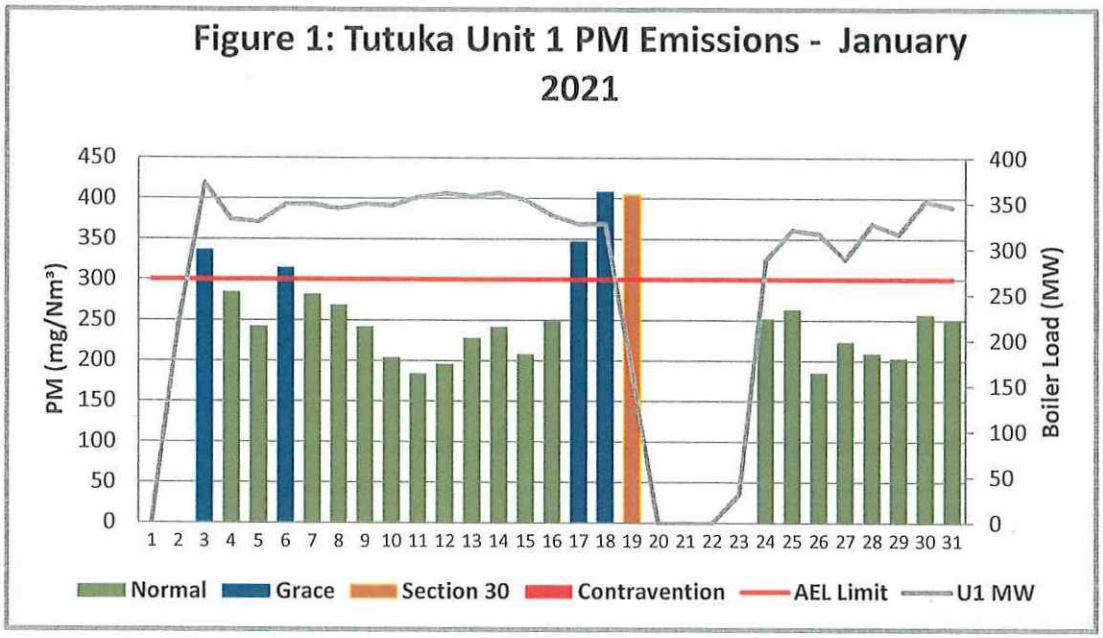


**Figure 1:** Unit 1 Daily Average PM emissions for the month of January 2021(against the emission limits and load Generated)

**Note:** Unit 1 was shut down after 11.8 hours on the 19 Jan 2021.Fields 21, 41, 31 and 32 tripped on under voltage(UV) due to full hoppers.

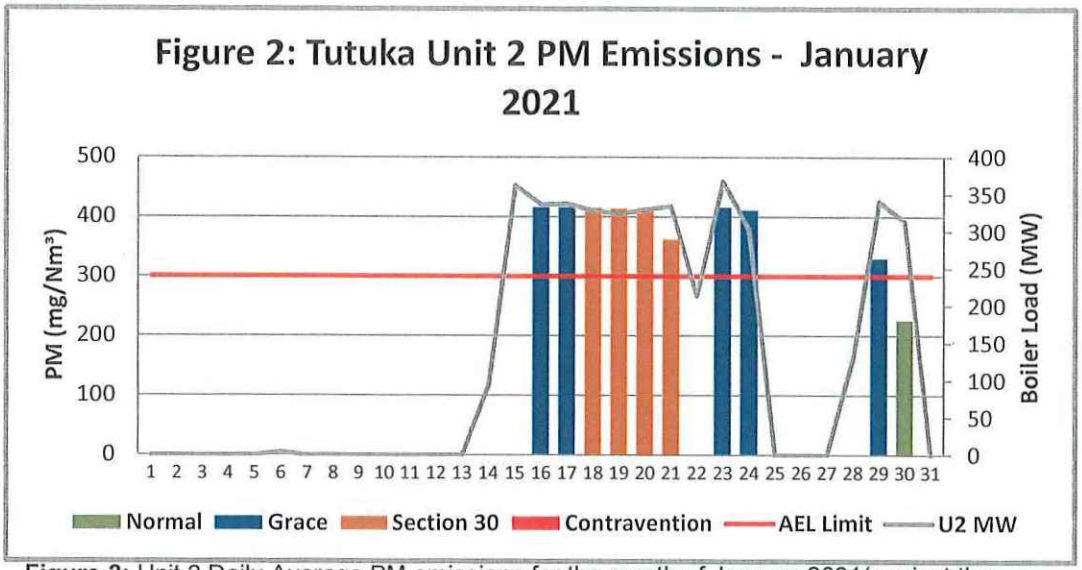


**Figure 2:** Unit 2 Daily Average PM emissions for the month of January 2021(against the emission limits and load Generated)

Unit 2 had incurred section 30 on the 18 January 2021.See details on section 7 below.

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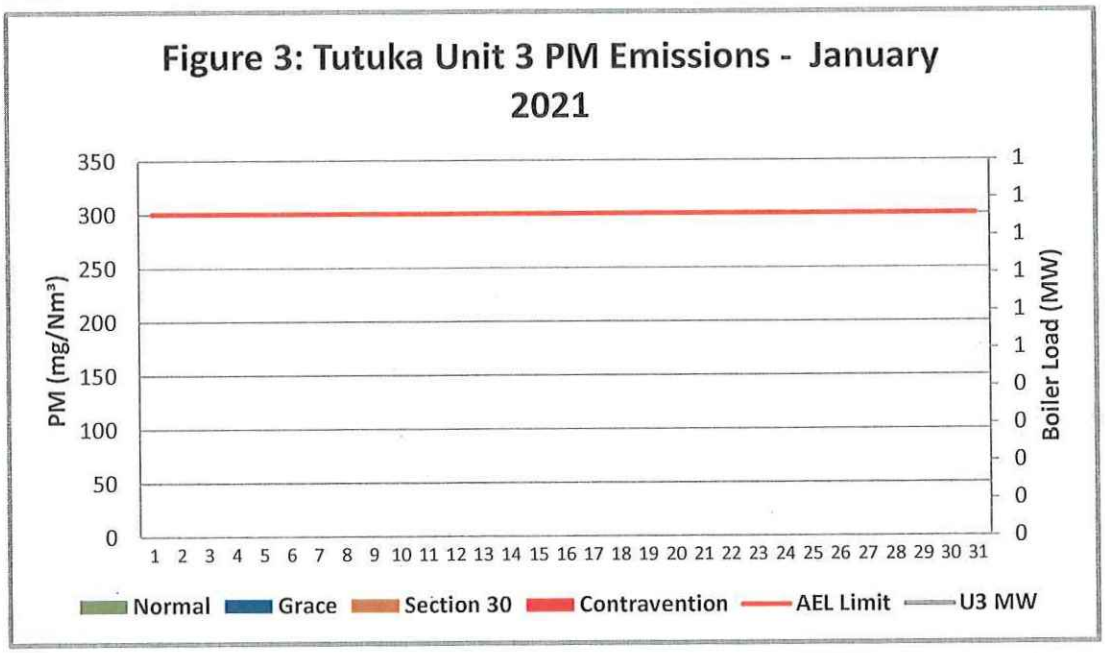


**Figure 3:** Unit 3 Daily Average PM emissions for the month of January 2021(against the emission limits and load Generated)

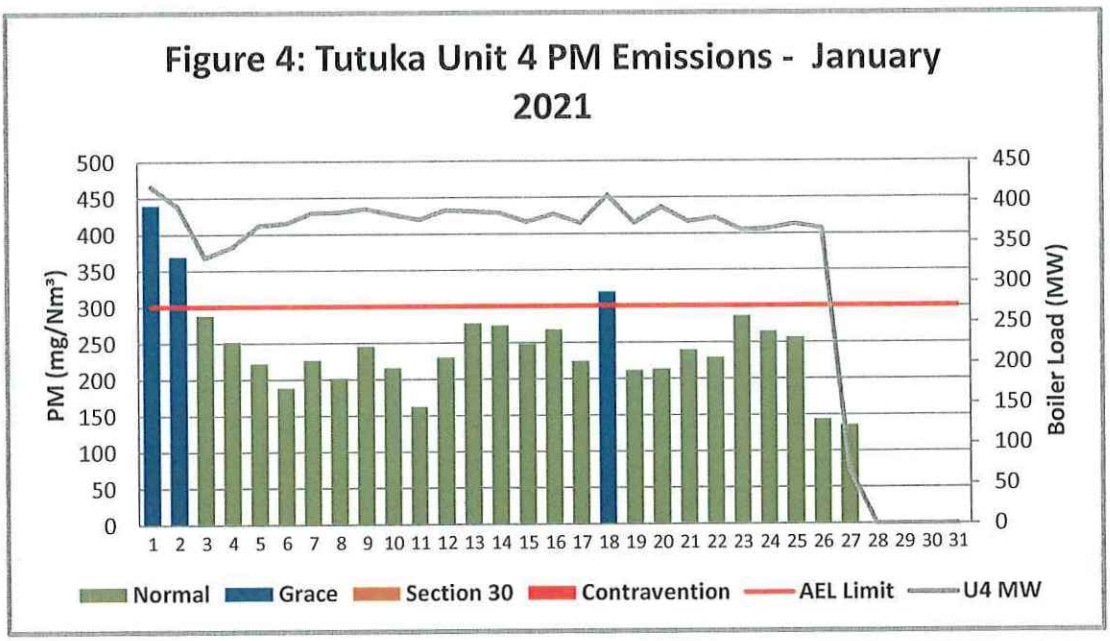


**Figure 4:** Unit 4 Daily Average PM emissions for the month of January 2021(against the emission limits and load Generated)

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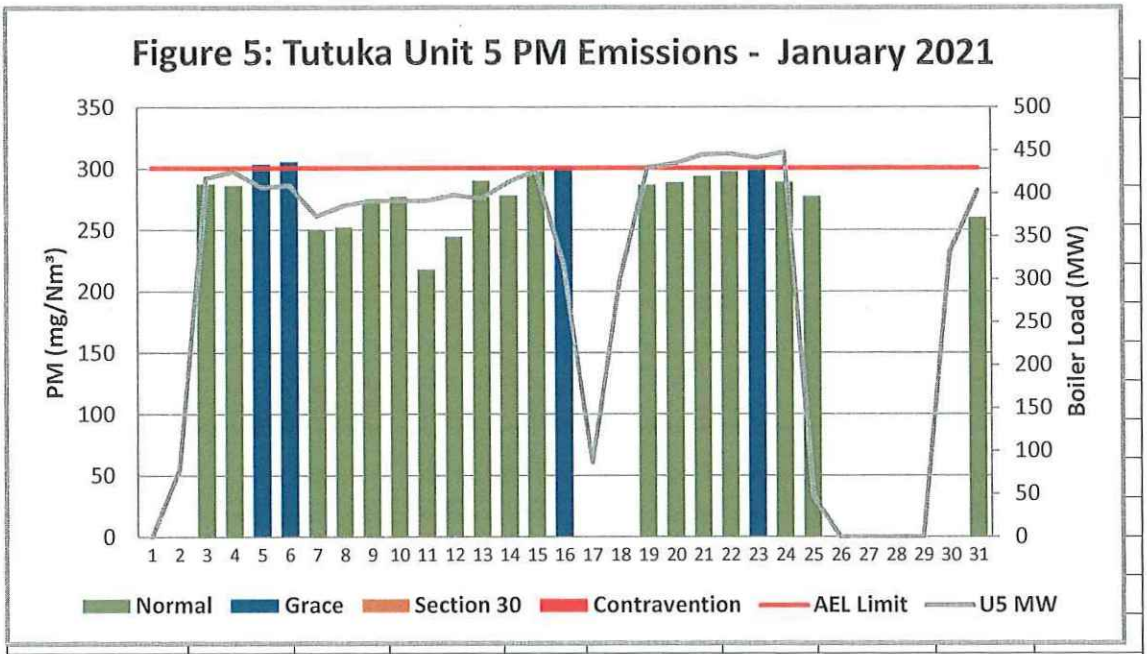


**Figure 5:** Unit 5 Daily Average PM emissions for the month of January 2021(against the emission limits and load Generated)

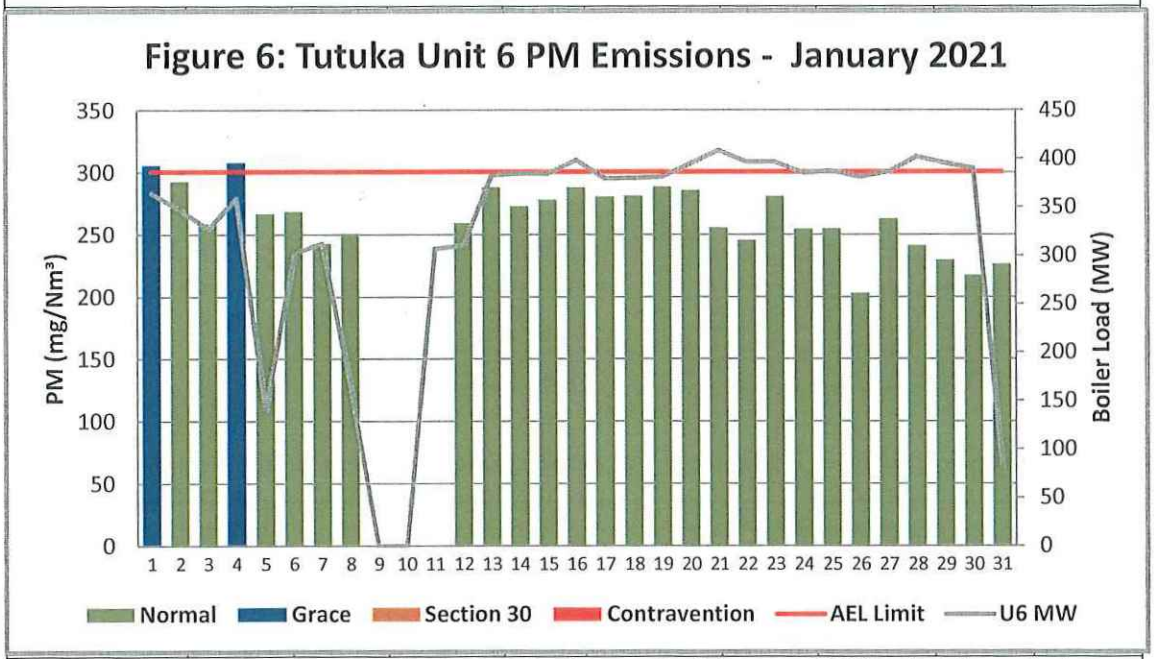


**Figure 6:** Unit 6 Daily Average PM emissions for the month of January 2021(against the emission limits and load Generated)

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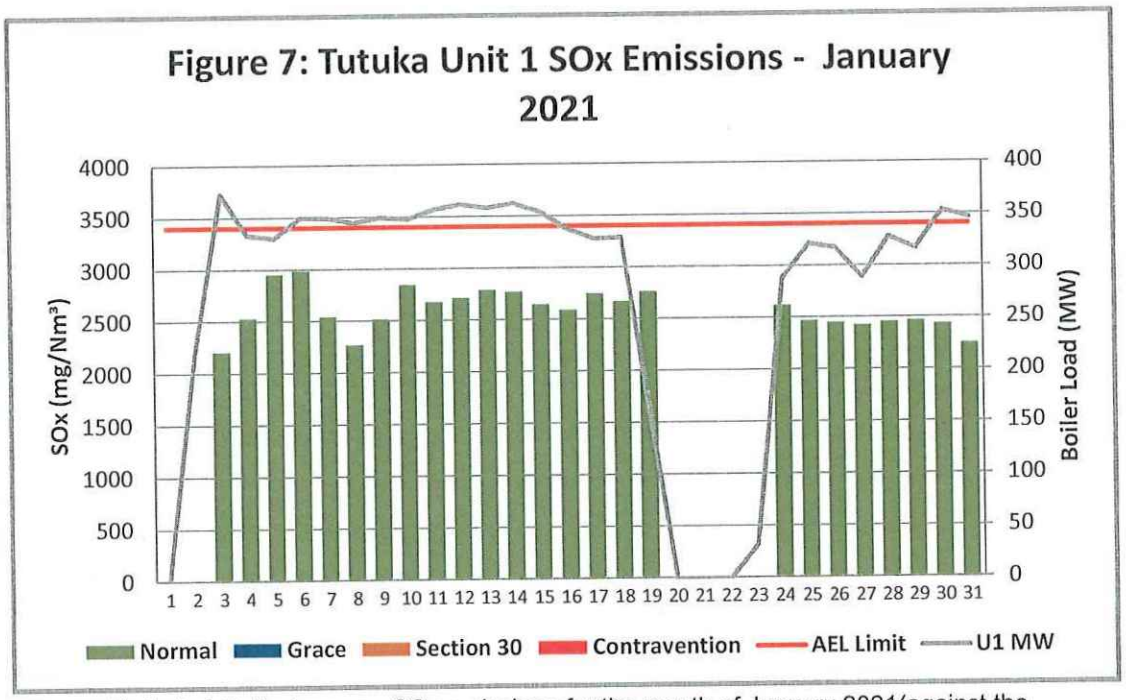


**Figure 7:** Unit 1 Daily Average SOx emissions for the month of January 2021(against the emission limits and load Generated)

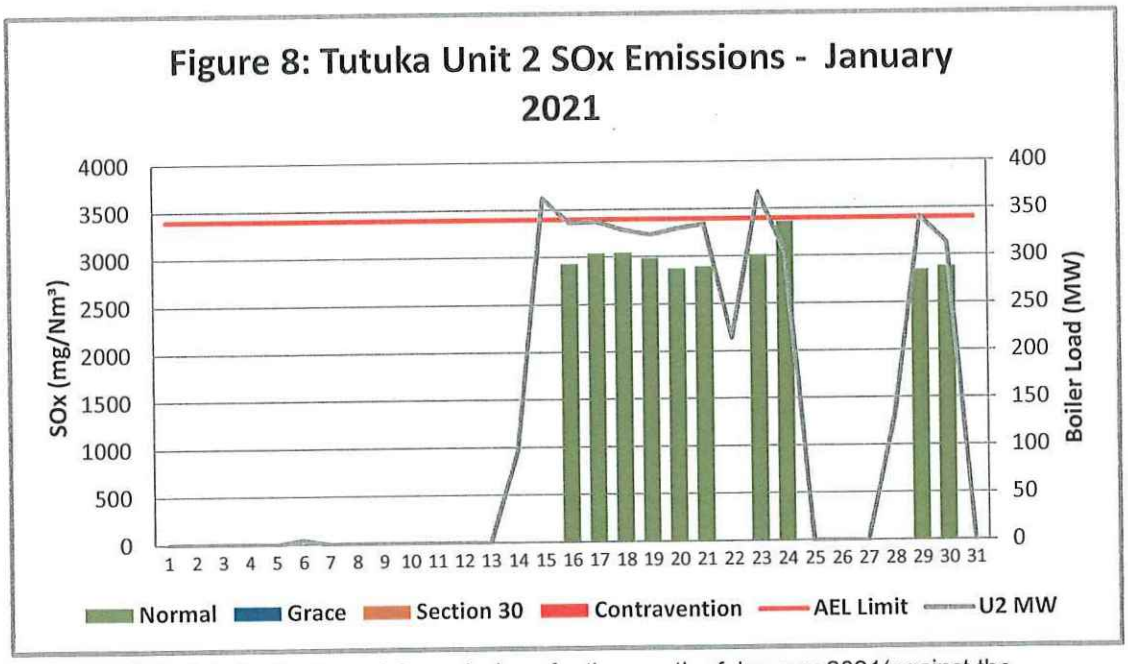


**Figure 8:** Unit 2 Daily Average SOx emissions for the month of January 2021(against the emission limits and load Generated)

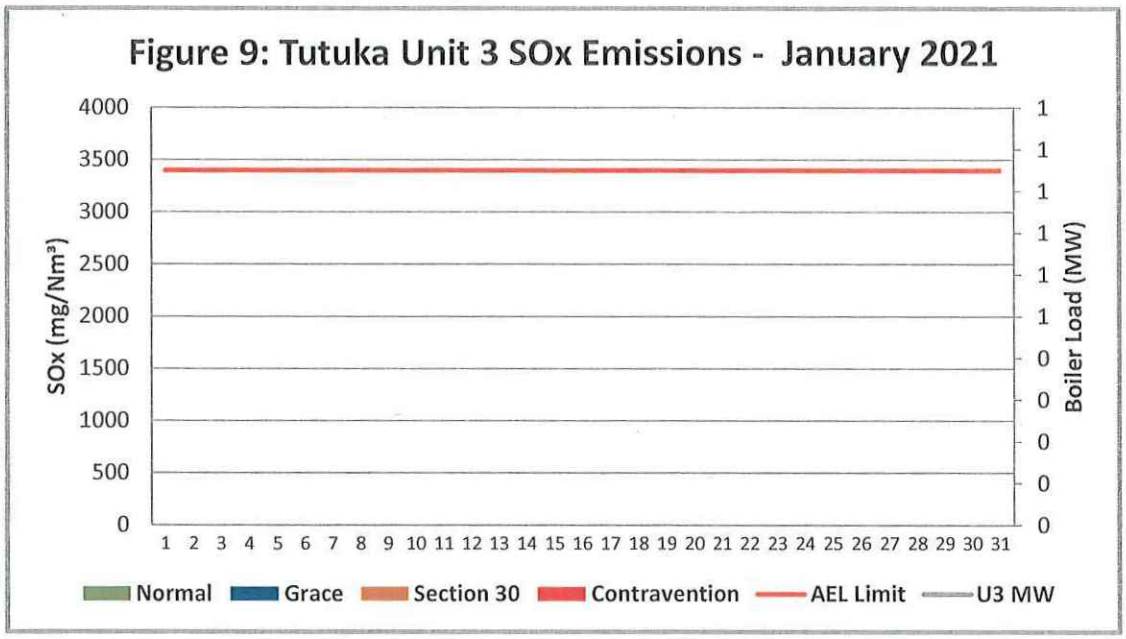


**Figure 9:** Unit 3 Daily Average SOx emissions for the month of January 2021(against the emission limits and load Generated)

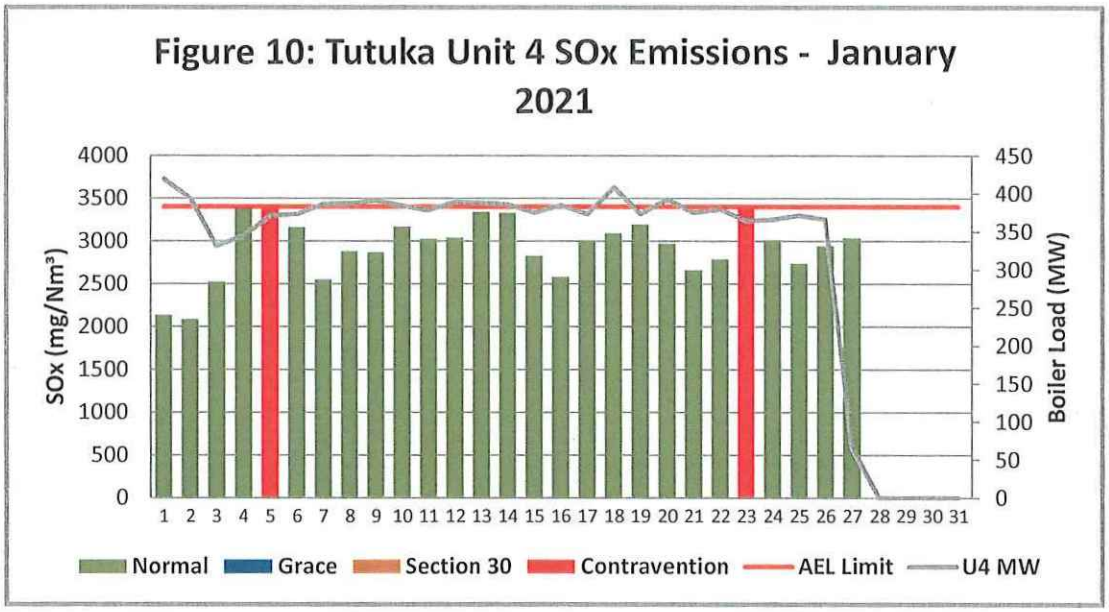


**Figure 10:** Unit 4 Daily Average SOx emissions for the month of January 2021(against the emission limits and load Generated)

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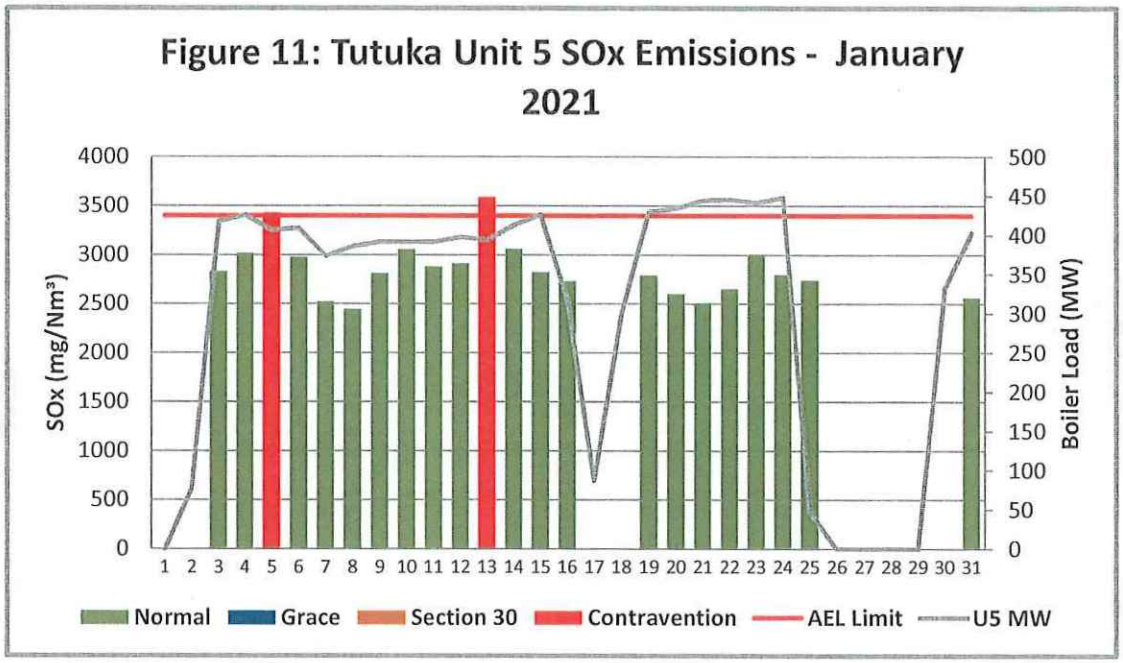


**Figure 11:** Unit 5 Daily Average SOx emissions for the month of January 2021(against the emission limits and load Generated)

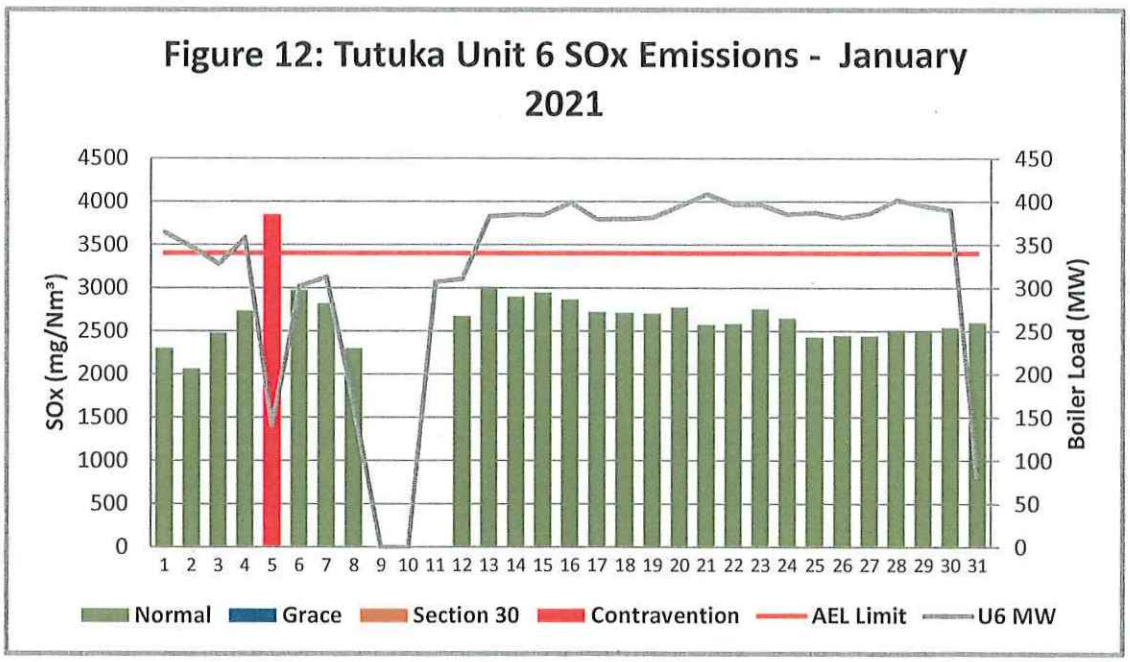


**Figure 12:** Unit 6 Daily Average SOx emissions for the month of January 2021(against the emission limits and load Generated)

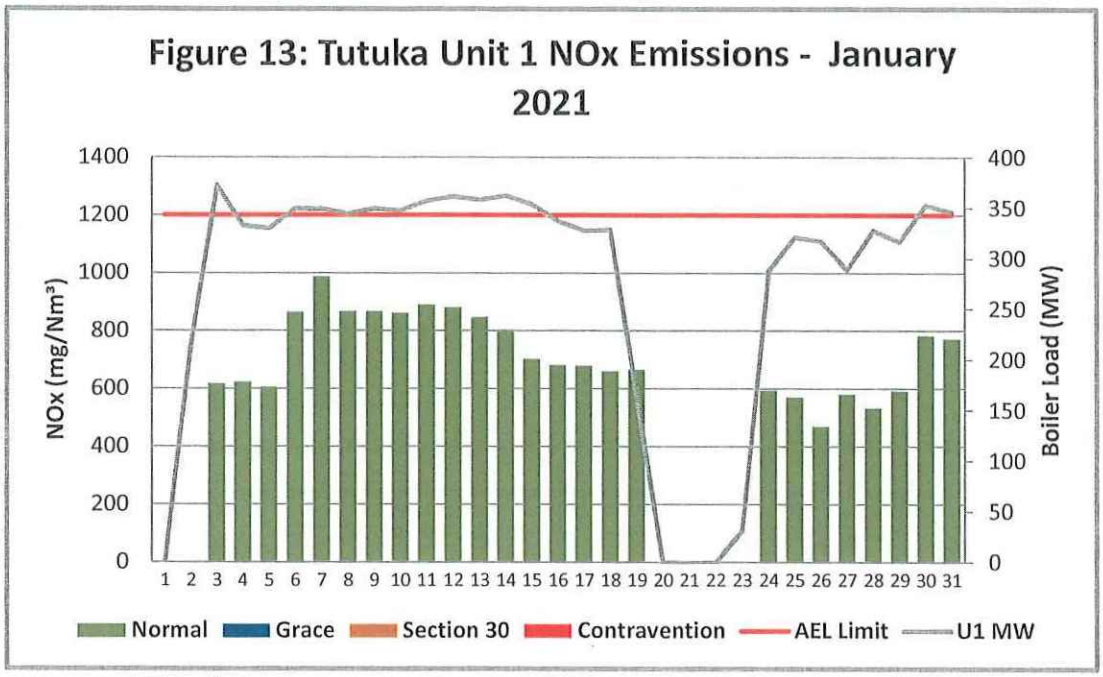


**Figure 13:** Unit 1 Daily Average NOx emissions for the month of January 2021(against the emission limits and load Generated)

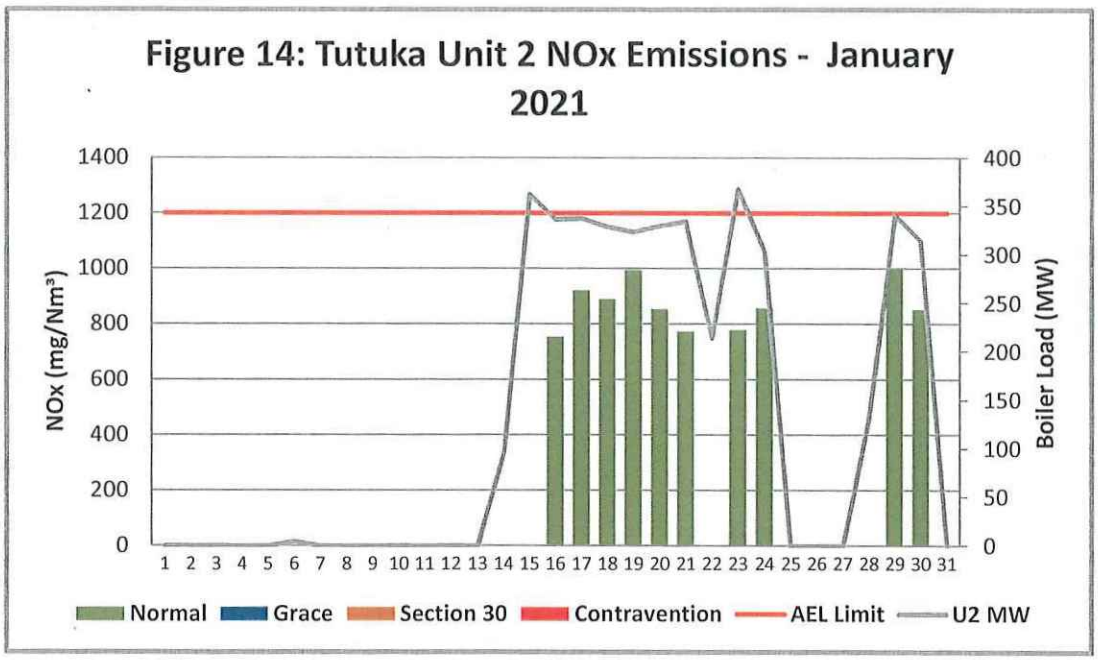


**Figure 14:** Unit 2 Daily Average NOx emissions for the month of January 2021(against the emission limits and load Generated)

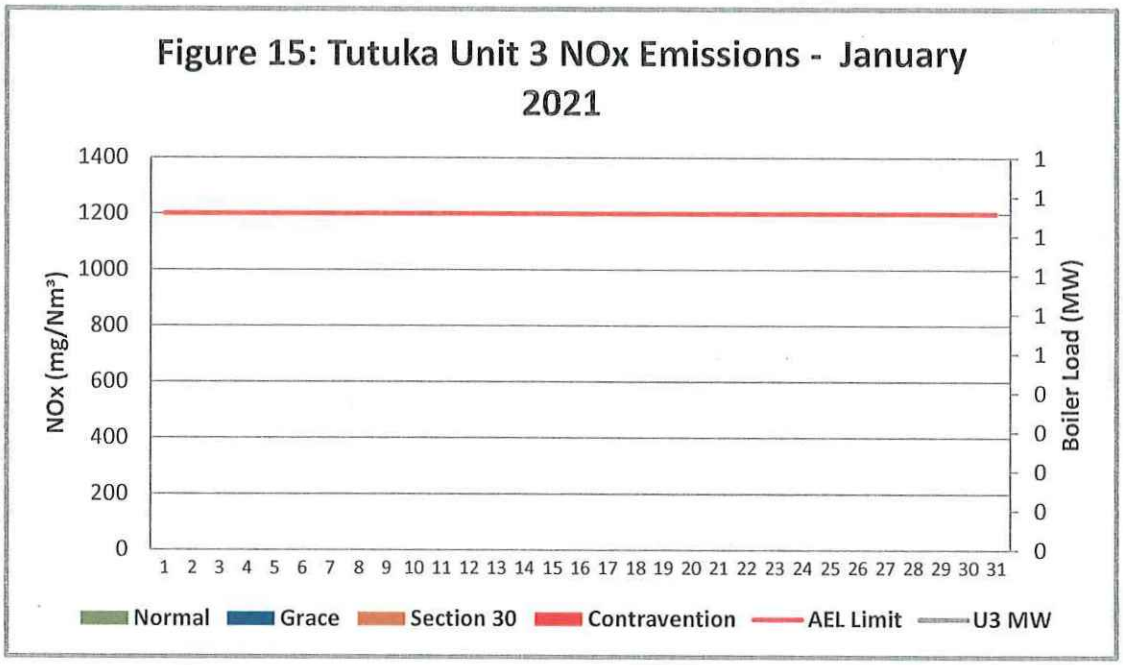


**Figure 15:** Unit 3 Daily Average NOx emissions for the month of January 2021(against the emission limits and load Generated)

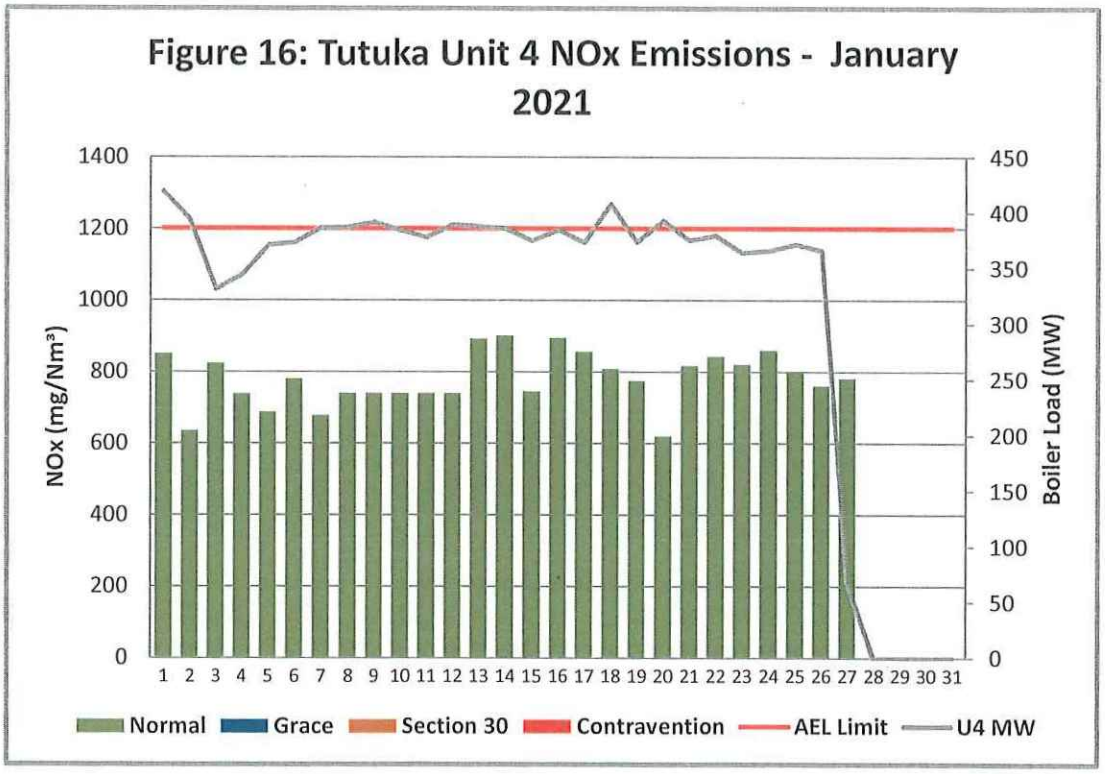


**Figure 16:** Unit 4 Daily Average NOx emissions for the month of January 2021(against the emission limits and load Generated)

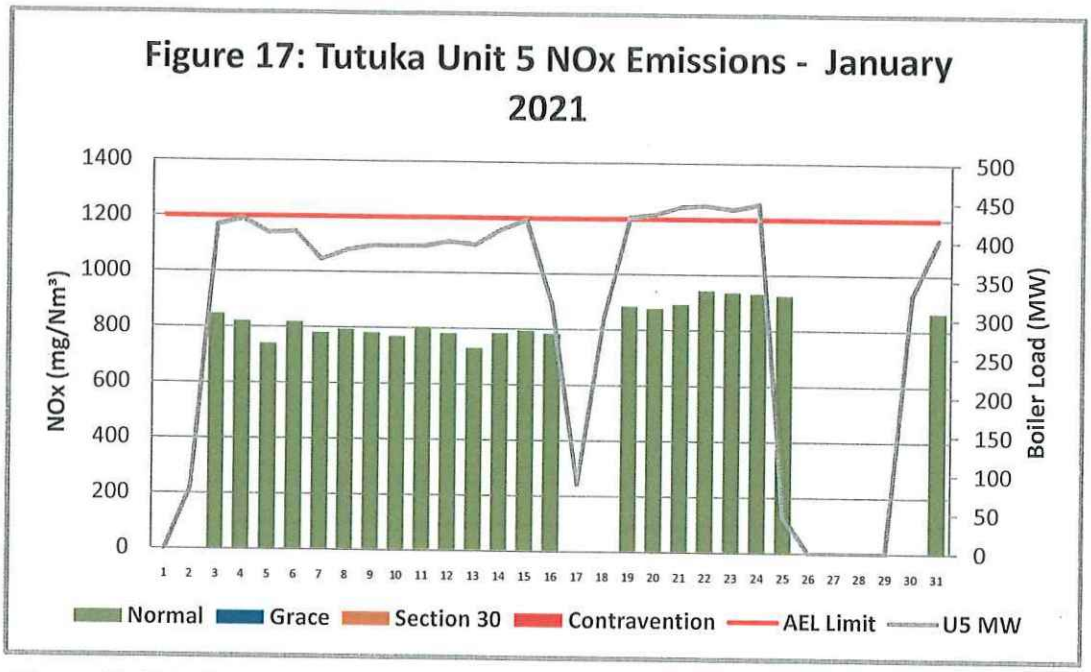


**Figure 17:** Unit 5 Daily Average NOx emissions for the month of January 2021(against the emission limits and load Generated)

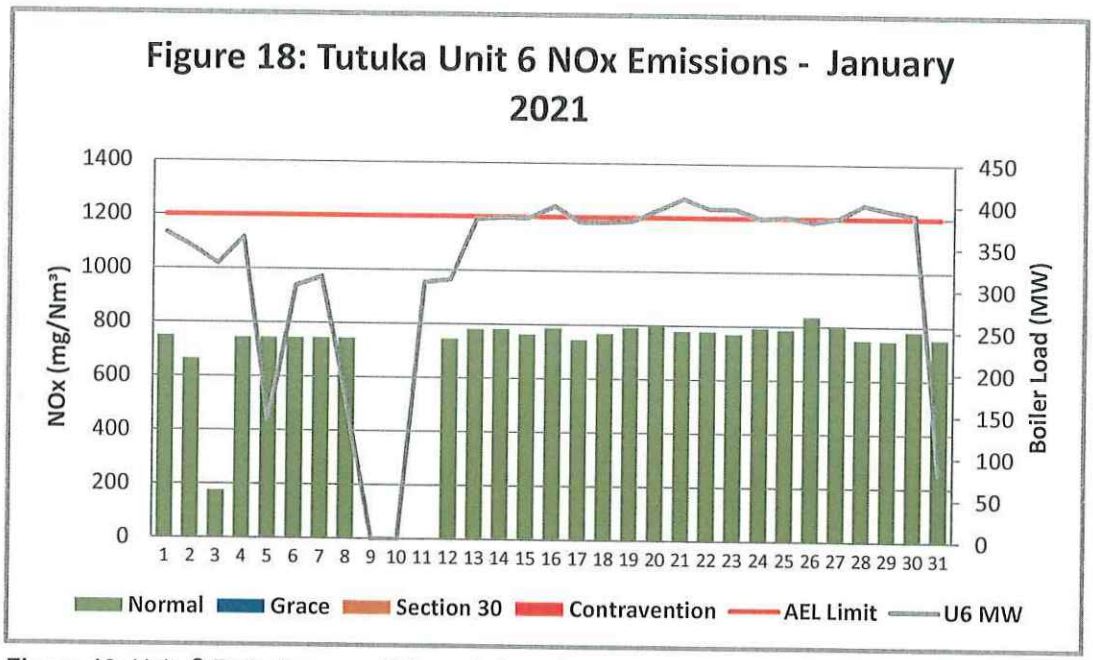


**Figure 18:** Unit 6 Daily Average NOx emissions for the month of January 2021(against the emission limits and load Generated)

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**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) | 2 | 2 | 0 | 0 | 2 | 1 |
| Number Of Cold Starts (Off-Load > 30 hrs) | 2 | 3 | 0 | 0 | 2 | 2 |

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

**6. Complaints**

No complaints were received from the stakeholders in the month of January 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 |
|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A | N/A |

*Table 6: Complaints for the month of January 2021*

**7. General**

2 Section 30(Unit 1 & 2) incidents was recorded in the month of January 2021.Unit 1 incidents happened on the 19 January 2021.The incident was caused by the fields that were tripping on UV due to full hoppers. Unit 2 incident occurred on the 18 January 2021.The incidents for both unit 1 and 2 were due to cable theft along the ash conveyer belts leading to accumulation of more ash at the temporary ashing area TT02 and consequently full hoppers and Dust Handling Plant (DHP) motor failures (See table 67.1 below).

There were SOx exceedances that on unit 4, 5 and 6 due to motor issues. No NOx exceedances were incurred in the month of January 2021(See tables 7.2 -7.3 below)

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

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average PM (mg/Nm³) |
|---|---|---|---|---|---|---|
| Unit 1 | 20 | 4 | 1 | 0 | 5 | 259.5 |
| Unit 2 | 1 | 5 | 4 | 0 | 9 | 382.3 |
| Unit 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unit 4 | 24 | 3 | 0 | 0 | 3 | 245.8 |
| Unit 5 | 18 | 4 | 0 | 0 | 4 | 280.1 |
| Unit 6 | 26 | 2 | 0 | 0 | 2 | 263.9 |
| **SUM** | **89** | **18** | **5** | **0** | **23** | |

Table 7.2. Operating days in compliance to SOx AEL Limit - January 2021

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average SOx (mg/Nm³) |
|---|---|---|---|---|---|---|
| Unit 1 | 25 | 0 | 0 | 0 | 0 | 2 591.0 |
| Unit 2 | 10 | 0 | 0 | 0 | 0 | 2 985.6 |
| Unit 3 | 0 | 0 | 0 | 0 | 0 | |
| Unit 4 | 25 | 0 | 0 | 2 | 2 | 2 935.0 |
| Unit 5 | 20 | 0 | 0 | 2 | 2 | 2 853.0 |
| Unit 6 | 27 | 0 | 0 | 1 | 1 | 2 673.0 |
| **SUM** | **107** | **0** | **0** | **5** | **5** | |

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

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average NOx (mg/Nm³) |
|---|---|---|---|---|---|---|
| Unit 1 | 25 | 0 | 0 | 0 | 0 | 720.1 |
| Unit 2 | 10 | 0 | 0 | 0 | 0 | 867.5 |
| Unit 3 | 0 | 0 | 0 | 0 | 0 | |
| Unit 4 | 27 | 0 | 0 | 0 | 0 | 780.5 |
| Unit 5 | 22 | 0 | 0 | 0 | 0 | 831.4 |
| Unit 6 | 28 | 0 | 0 | 0 | 0 | 745.0 |
| **SUM** | **62** | **0** | **0** | **0** | **0** | |

## 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.

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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...** 23 March 2021

**Verified By:**
**Mike Molepo**
**SENIOR CHEMIST CHEMISTRY: TUTUKA POWER STATION**
24/03/2021
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**Approved by:**
**Sello Mametja**
**GENERAL MANAGER: TUTUKA POWER STATION**
.....

**Date:** 2021/03/24