



## Generation

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1050

### Attention:

Mr V Mahlangu

AND

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## DUVHA POWER STATION

Atmospheric Emission License 17/4/AEL/MP312/11/07

GENERAL MANAGER

2024/11/27

DATE

**DUVHA POWER STATION MONTHLY EMISSIONS REPORT**

Atmospheric Emission License 17/4/AEL/MP312/11/07



## 1 RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Maximum Permitted Consumption Rate	Consumption Rate Oct-2024
	Coal	Tons	1 400 000	638 819.1
	Fuel Oil	Tons	5 000	4329.3
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Indicative Production Rate Oct-2024
	Energy	GWh	2 678.400	1182.9
	Ash	Tons	not specified	162 515.6

## 2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	18-24	21.7
Sulphur Content	%	0.6 TO >1.2	0.6
Ash Content	%	27 TO 30	25.4

## 3 EMISSION LIMITS (mg/Nm<sup>3</sup>)

Associated Unit/Stack	PM	SO <sub>2</sub>	NOx
Unit 1	100	3500	1100
Unit 2	100	3500	1100
Unit 4	100	3500	1100
Unit 5	100	3500	1100
Unit 6	100	3500	1100

#### 4 ABATEMENT TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Oct-2024	Technology Type	SO <sub>3</sub> Utilization Oct-2024
Unit 1	FFP	99.9%	SO <sub>3</sub>	n/a
Unit 2	FFP	100.0%	SO <sub>3</sub>	n/a
Unit 4	ESP + SO <sub>3</sub>	99.8%	SO <sub>3</sub>	98.2%
Unit 5	ESP + SO <sub>3</sub>	99.8%	SO <sub>3</sub>	99.8%
Unit 6	ESP + SO <sub>3</sub>	99.6%	SO <sub>3</sub>	95.0%
<b>Note:</b> ESP plant does not have bypass mode operation, hence plant 100% Utilised.				

#### 5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	100.0	92.5	73.8	92.7
Unit 2	100.0	88.7	70.1	88.4
Unit 4	98.2	96.3	84.7	100.0
Unit 5	100.0	98.8	89.2	97.4
Unit 6	98.4	68.0	97.8	96.2

Note: NO<sub>x</sub> emissions is measured as NO in PPM. Final NO<sub>x</sub> value is expressed as total NO<sub>2</sub>

#### 6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of October 2024

Associated Unit/Stack	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
Unit 1	41.1	3 792	3 129
Unit 2	7.4	1 730	2 025
Unit 4	50.1	1 678	1 646
Unit 5	49.5	1 090	1 309
Unit 6	102.2	2 660	1 641
<b>SUM</b>	250.28	10 950	9 749

Table 6.2: Operating days in compliance to PM AEL Limit October 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm <sup>3</sup> )
Unit 1	31	0	0	0	0	22.1
Unit 2	22	0	0	0	0	6.4
Unit 4	26	0	0	0	0	38.4
Unit 5	20	1	0	0	1	63.4
Unit 6	26	3	0	0	3	62.3
<b>SUM</b>	<b>125</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	

Table 6.3: Operating days in compliance to SO<sub>2</sub> AEL Limit - October 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO <sub>2</sub> (mg/Nm <sup>3</sup> )
Unit 1	31	0	0	0	0	2 097.2
Unit 2	24	0	0	0	0	1 382.1
Unit 4	28	0	0	0	0	1 235.0
Unit 5	23	0	0	0	0	1 146.2
Unit 6	31	0	0	0	0	1 493.4
<b>SUM</b>	<b>136</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

Table 6.4: Operating days in compliance to NO<sub>x</sub> AEL Limit - October 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO <sub>x</sub> (mg/Nm <sup>3</sup> )
Unit 1	31	0	0	8	8	1 715.1
Unit 2	16	0	0	8	8	1 557.2
Unit 4	24	0	0	4	4	1 143.5
Unit 5	18	0	0	5	5	1 288.4
Unit 6	28	0	0	3	3	919.3
<b>SUM</b>	<b>108</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	

Note: NO<sub>x</sub> emissions is measured as NO in PPM. Final NO<sub>x</sub> value is expressed as total NO<sub>2</sub>

Table 6.5: Legend Description

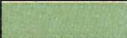



Condition	Colour	Description
Normal		Emissions below Emission Limit Value (ELV)
Grace		Emissions above the ELV during grace period
Section 30		Emissions above ELV during a NEMA S30 incident
Contravention		Emissions above ELV but outside grace or S30 incident conditions



Figure 1: Duvha Unit 1 PM Emissions - October 2024

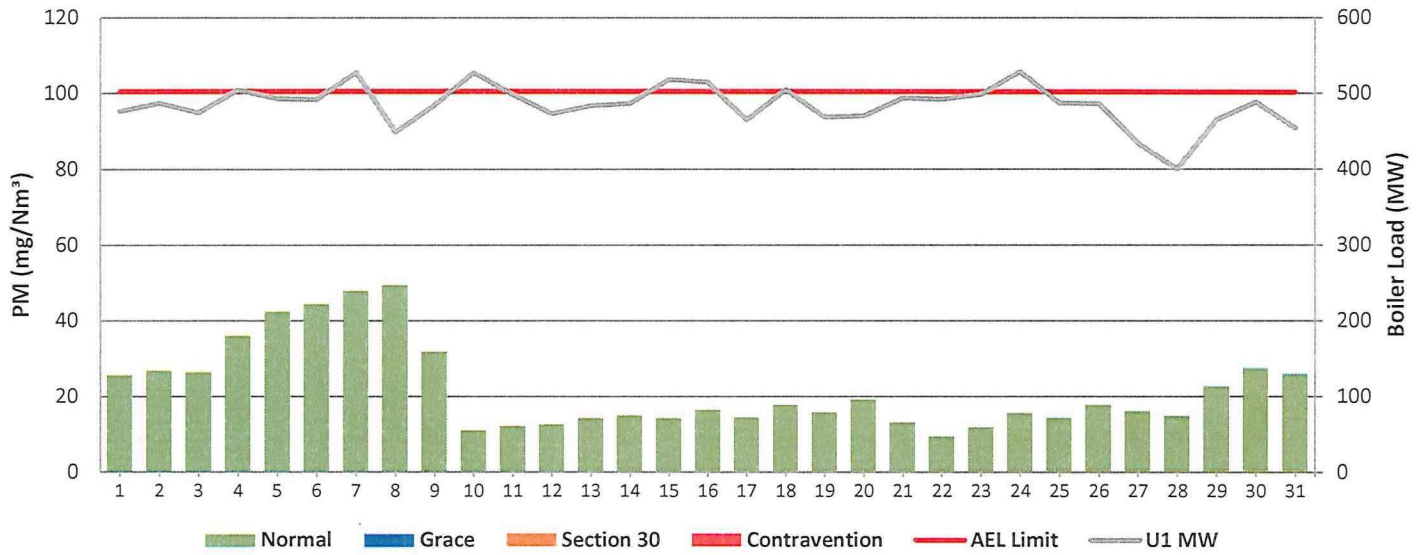


Figure 2: Duvha Unit 2 PM Emissions - October 2024

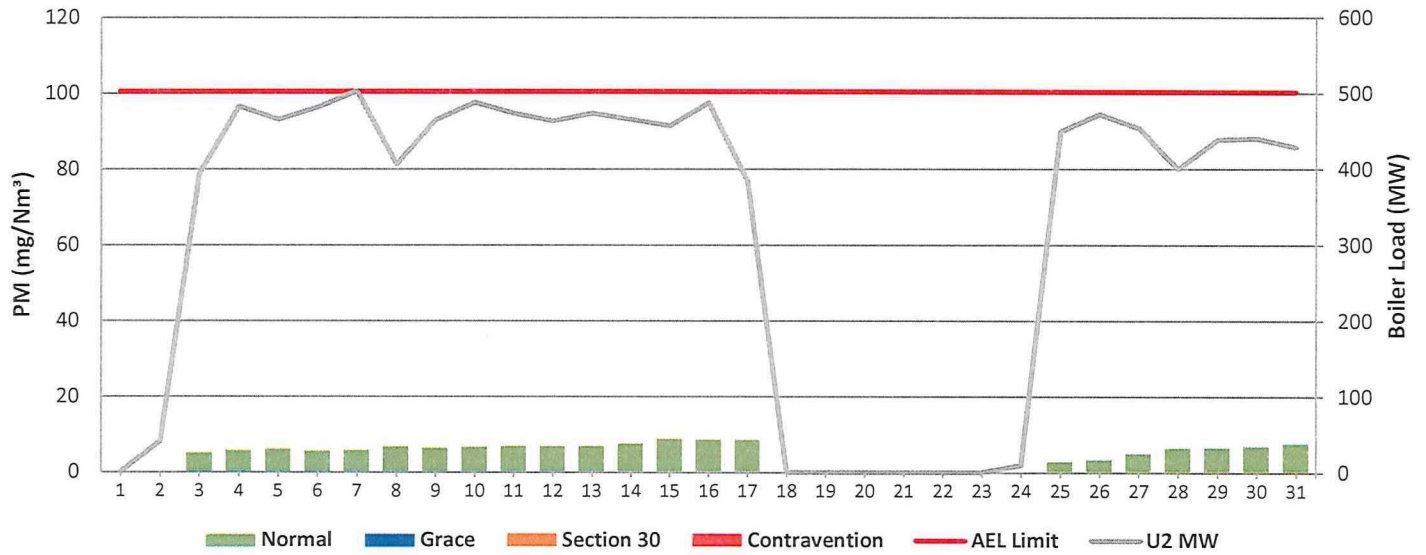


Figure 3: Duvha Unit 4 PM Emissions - October 2024

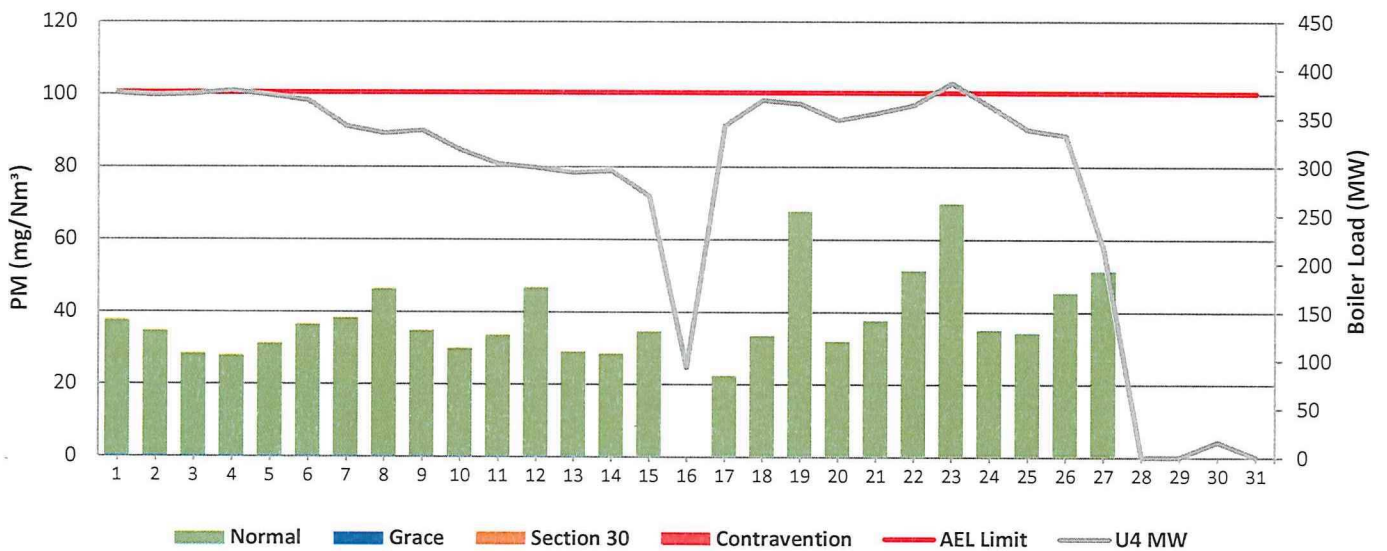


Figure 4: Duvha Unit 5 PM Emissions - October 2024

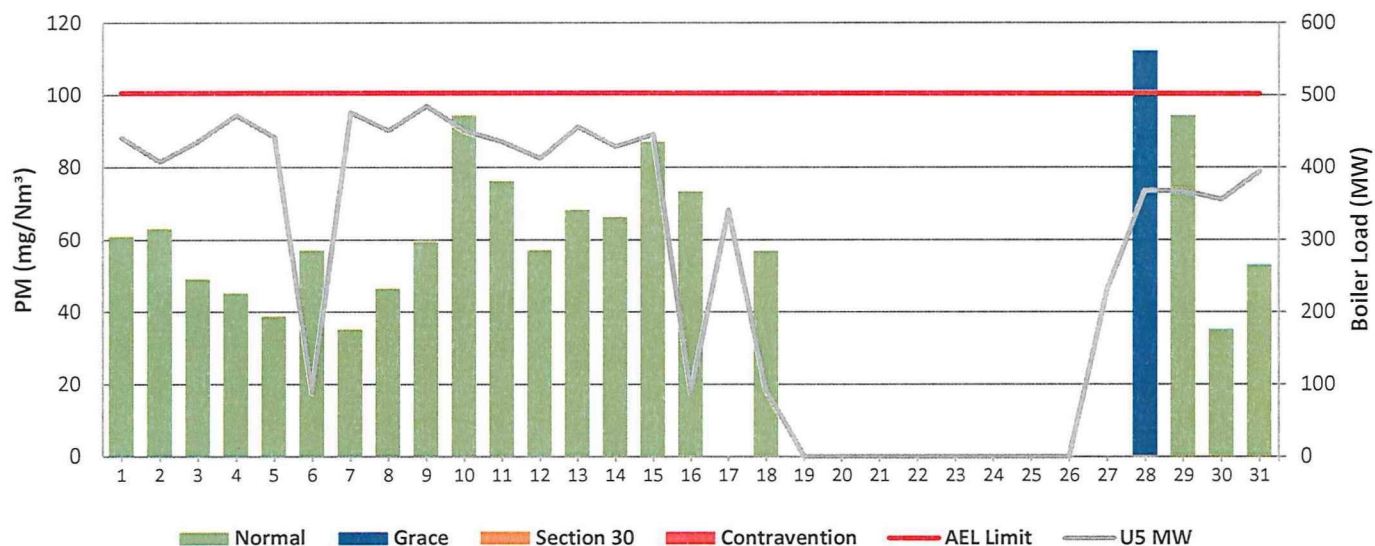


Figure 5: Duvha Unit 6 PM Emissions - October 2024

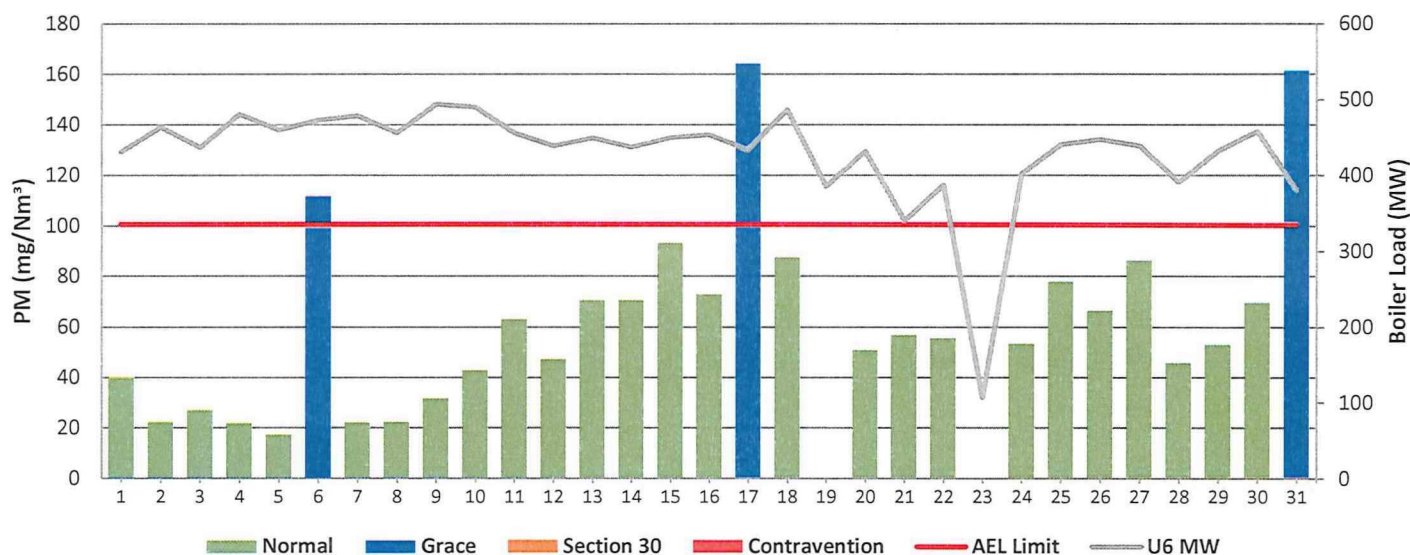


Figure 6: Duvha Unit 1 SO<sub>2</sub> Emissions - October 2024

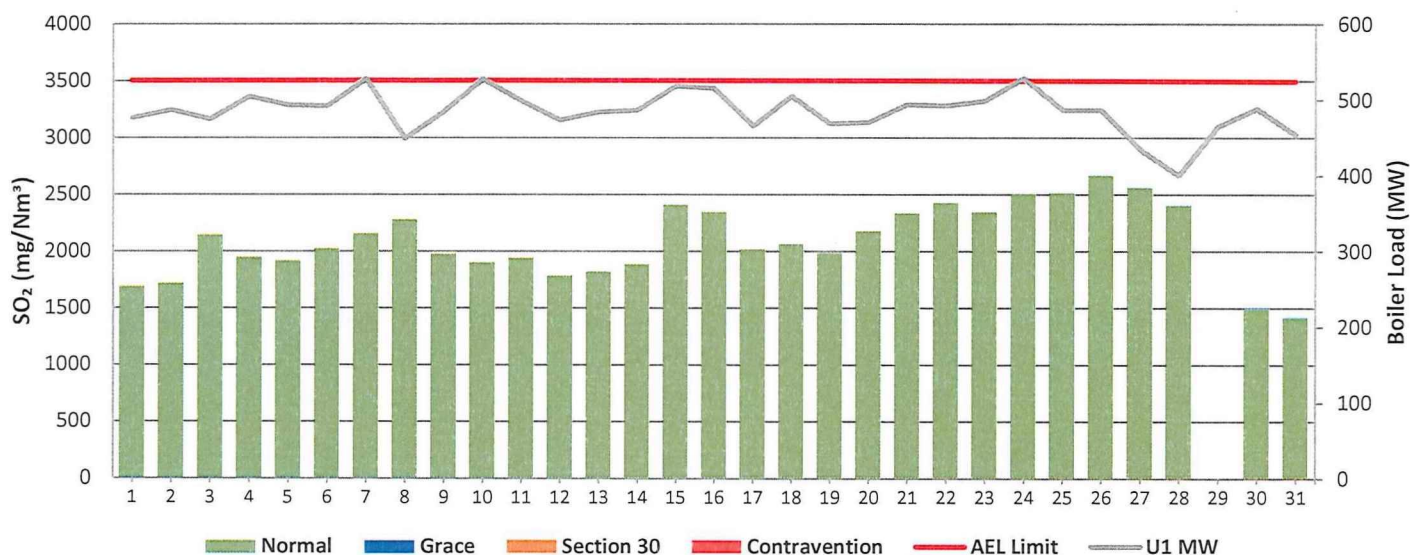




Figure 7: Duvha Unit 2 SO<sub>2</sub> Emissions - October 2024

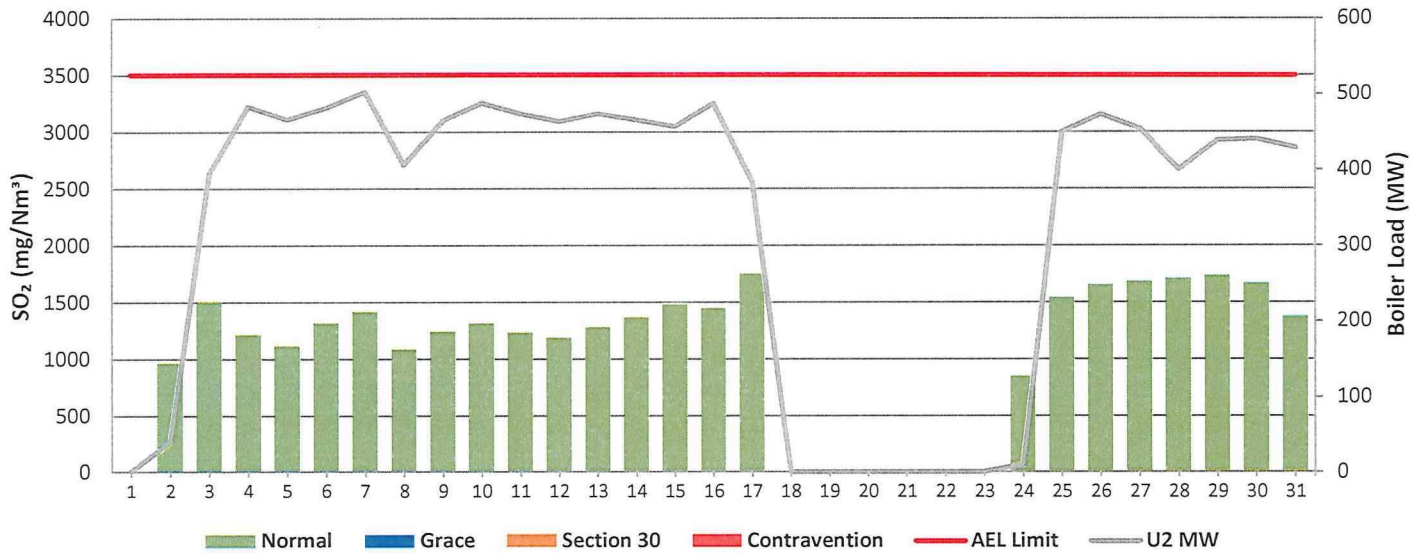


Figure 8: Duvha Unit 4 SO<sub>2</sub> Emissions - October 2024

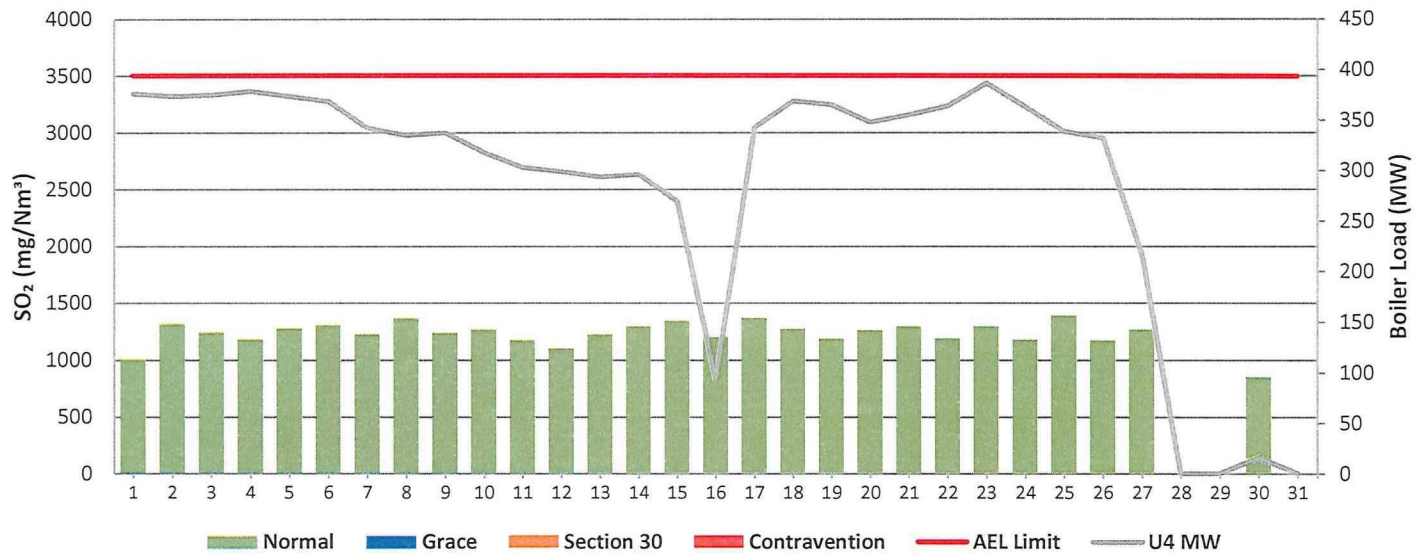


Figure 9: Duvha Unit 5 SO<sub>2</sub> Emissions - October 2024

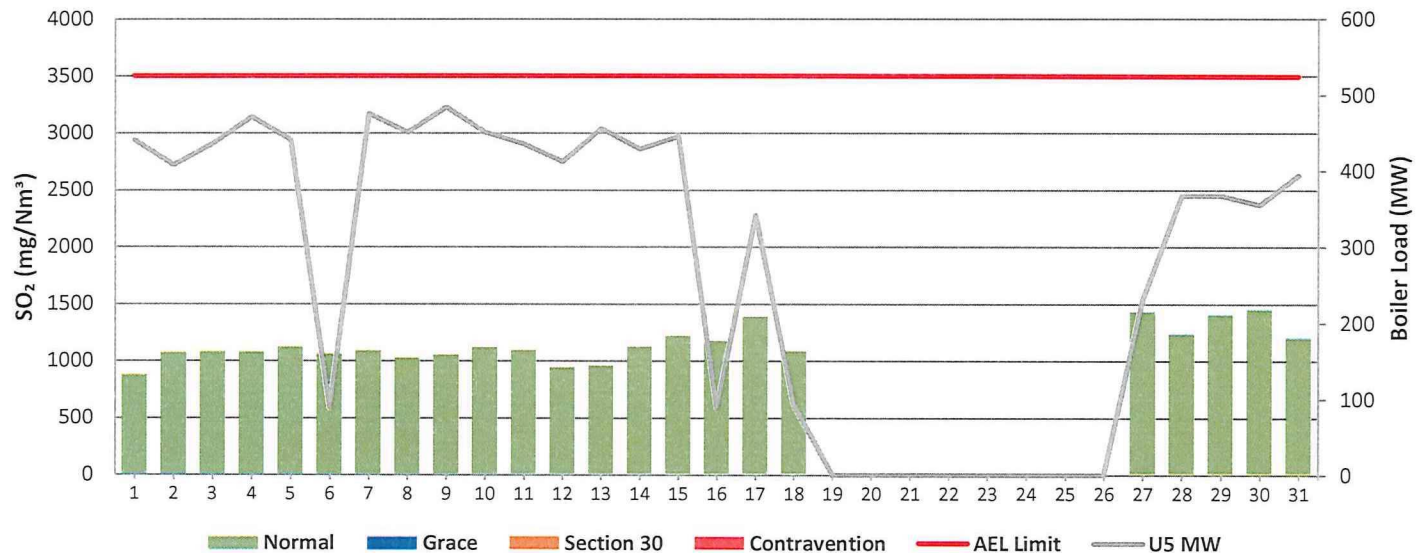




Figure 10: Duvha Unit 6 SO<sub>2</sub> Emissions - October 2024

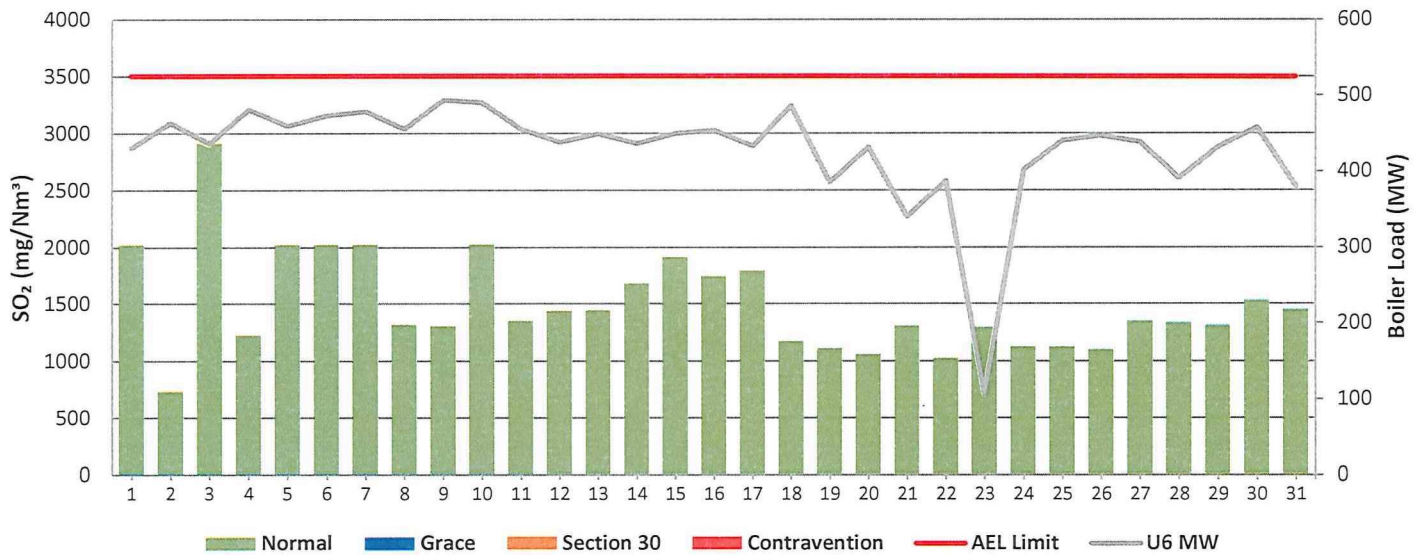


Figure 11: Duvha Unit 1 NO<sub>x</sub> Emissions - October 2024

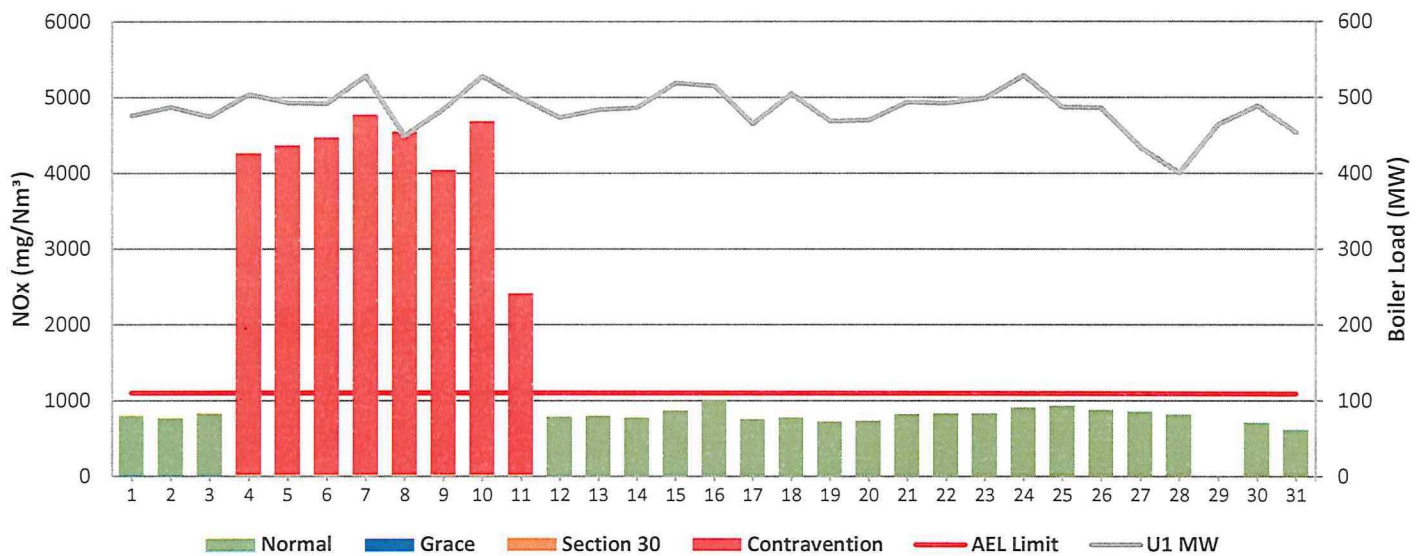


Figure 12: Duvha Unit 2 NO<sub>x</sub> Emissions - October 2024

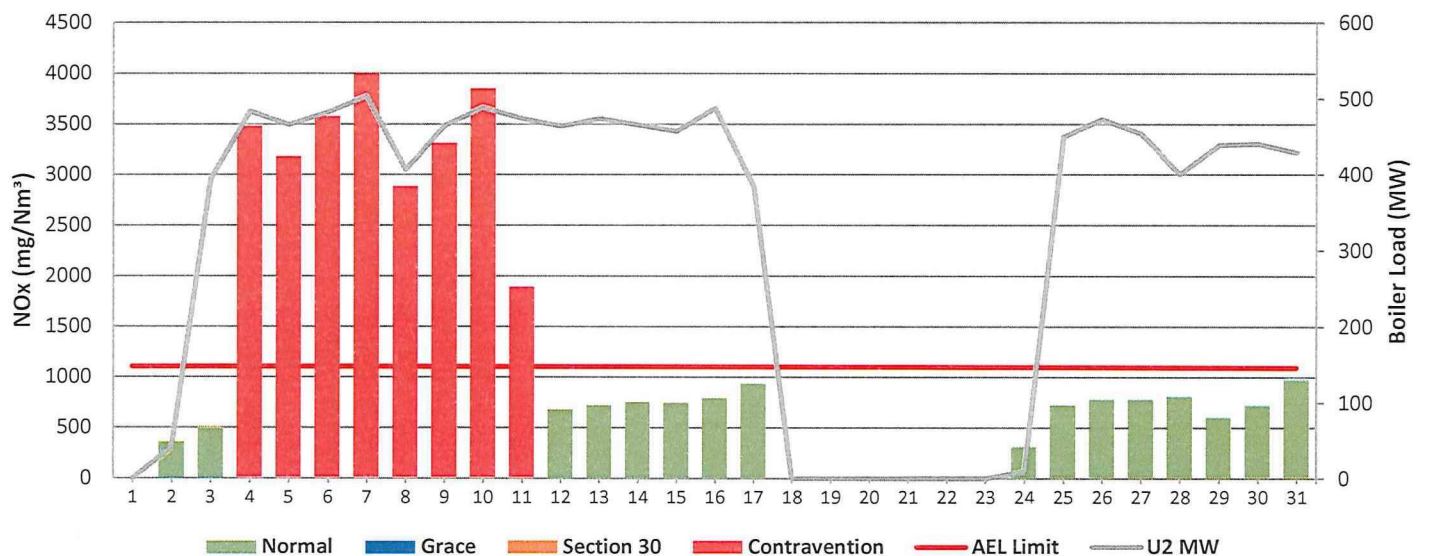


Figure 13: Duvha Unit 4 NOx Emissions - October 2024

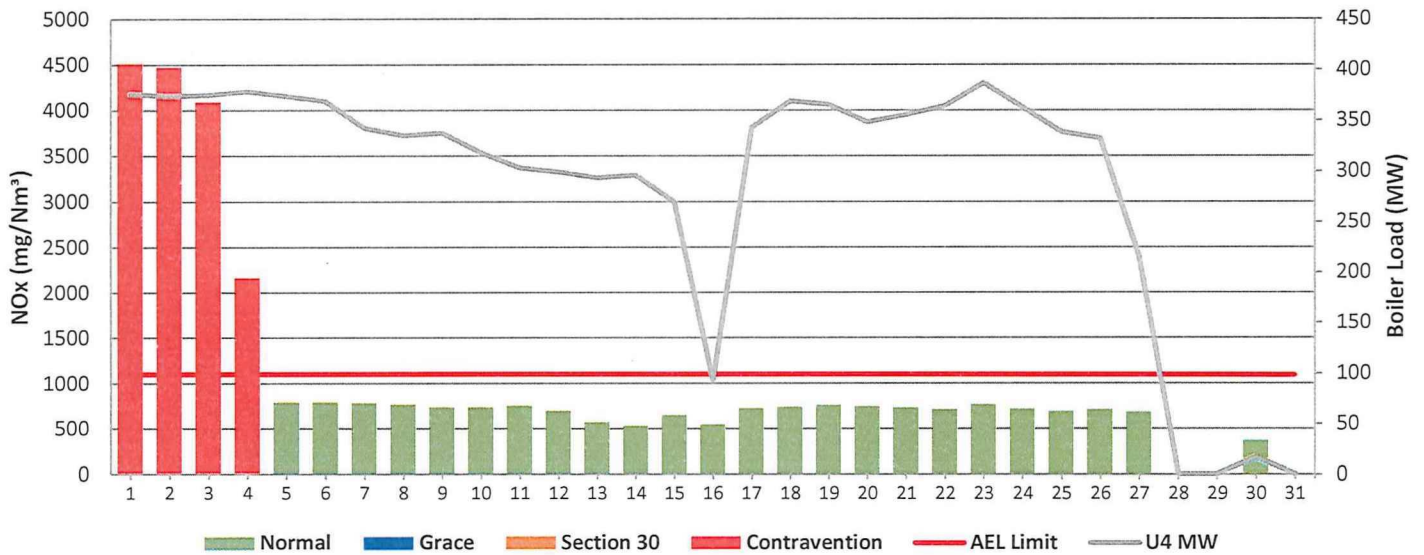


Figure 14: Duvha Unit 5 NOx Emissions - October 2024

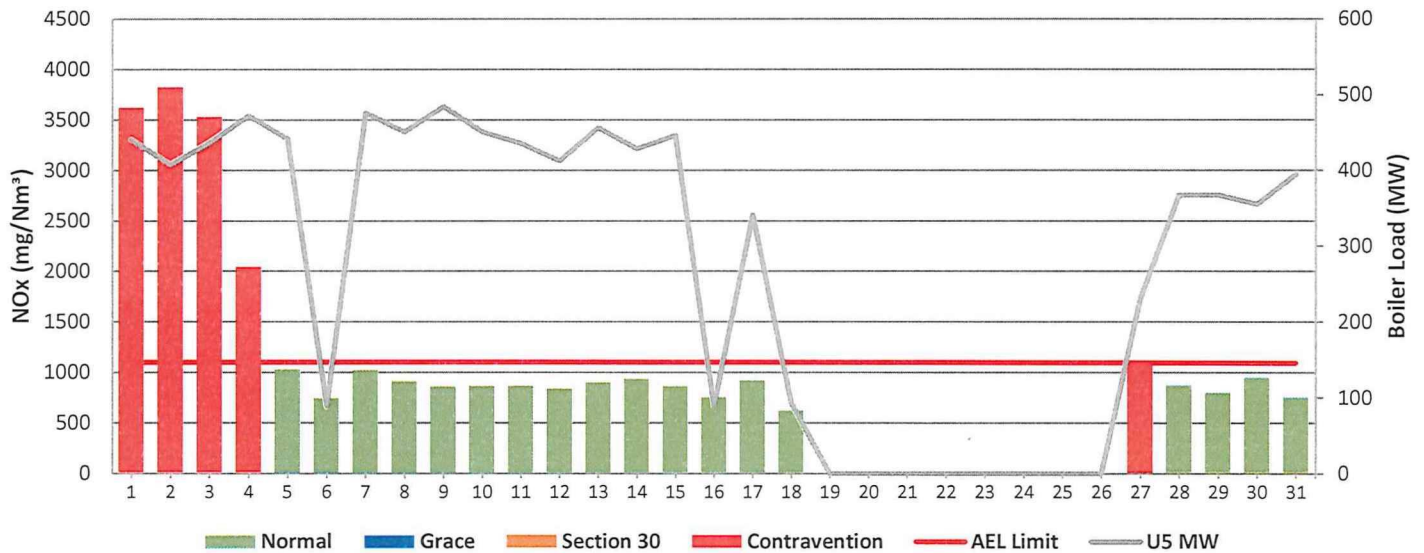
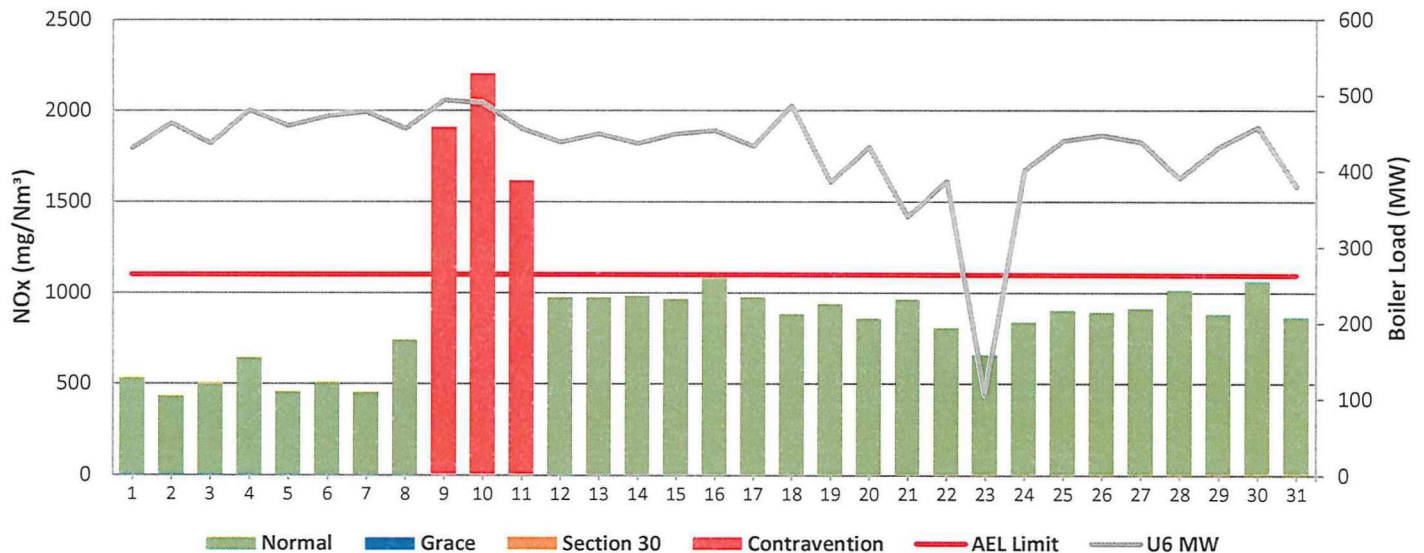


Figure 15: Duvha Unit 6 NOx Emissions - October 2024





## 7 SHUT DOWN AND LIGHT UP INFORMATION

Tables 7.1: Shut-down and light-up information for the month of October 2024

Unit No.2	<i>Event 1</i>		<i>Event 2</i>	
Breaker Open (BO)	<i>BO previously</i>	<i>BO previously</i>	<i>8:45 pm</i>	<i>2024/10/17</i>
Draught Group (DG) Shut Down (SD)	<i>n/a</i>	<i>n/a</i>	<i>8:45 pm</i>	<i>2024/10/18</i>
BO to DG SD (duration)	<i>n/a</i>	DD:HH:MM	<i>01:00:00</i>	DD:HH:MM
Fires in time	<i>12:40 pm</i>	<i>2024/10/02</i>	<i>1:25 pm</i>	<i>2024/10/24</i>
Synch. to Grid (or BC)	<i>8:10 pm</i>	<i>2024/10/02</i>	<i>10:10 pm</i>	<i>2024/10/24</i>
Fires in to BC (duration)	<i>00:07:30</i>	DD:HH:MM	<i>00:08:45</i>	DD:HH:MM
Emissions below limit from BC (end date)	<i>not &gt; limit</i>	<i>not &gt; limit</i>	<i>not &gt; limit</i>	<i>not &gt; limit</i>
Emissions below limit from BC (duration)	<i>n/a</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM

Unit No.4	<i>Event 1</i>		<i>Event 2</i>	
Breaker Open (BO)	<i>8:35 pm</i>	<i>2024/10/15</i>	<i>4:55 pm</i>	<i>2024/10/27</i>
Draught Group (DG) Shut Down (SD)	<i>10:35 pm</i>	<i>2024/10/15</i>	<i>8:15 pm</i>	<i>2024/10/27</i>
BO to DG SD (duration)	<i>00:02:00</i>	DD:HH:MM	<i>00:03:20</i>	DD:HH:MM
Fires in time	<i>10:55 am</i>	<i>2024/10/16</i>	<i>11:40 am</i>	<i>2024/10/30</i>
Synch. to Grid (or BC)				
Fires in to BC (duration)	<i>00:05:40</i>	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	<i>not &gt; limit</i>	<i>not &gt; limit</i>	<i>not &gt; limit</i>	<i>not &gt; limit</i>
Emissions below limit from BC (duration)		DD:HH:MM		DD:HH:MM



Unit No.5	Event 1		Event 2		Event 3	
Breaker Open (BO)	5:20 pm	2024/10/02	1:20 am	2024/10/06	6:15 am	2024/10/18
Draught Group (DG) Shut Down (SD)	DG did not trip or SD	DG did not trip or SD	DG did not trip or SD	DG did not trip or SD	11:25 am	2024/10/19
BO to DG SD (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM	01:05:10	DD:HH:MM
Fires in time			4:15 pm	2024/10/06	3:30 am	2024/10/27
Synch. to Grid (or BC)			8:00 pm	2024/10/06	9:10 am	2024/10/27
Fires in to BC (duration)		DD:HH:MM	00:03:45	DD:HH:MM	00:05:40	DD:HH:MM
Emissions below limit from BC (end date)			not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)		DD:HH:MM	n/a	DD:HH:MM	n/a	DD:HH:MM

Unit No.6	Event 1		Event 2	
Breaker Open (BO)	8:30 am	2024/10/18	11:00 pm	2024/10/22
Draught Group (DG) Shut Down (SD)	10:10 am	2024/10/18	DG did not trip or SD	DG did not trip or SD
BO to DG SD (duration)	00:01:40	DD:HH:MM	n/a	DD:HH:MM
Fires in time	9:20 am	2024/10/19	5:25 pm	2024/10/23
Synch. to Grid (or BC)	2:50 pm	2024/10/19	10:15 pm	2024/10/23
Fires in to BC (duration)		DD:HH:MM	00:04:50	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM

## 8 COMPLAINTS

There were no complaints for this month.

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

## 9 GENERAL

Exceedance Particulate Matter

Unit 5

28/10/2024

There was a cold unit light up

Unit 6

06/10/2024

There were issues with the SO3 plant that was constantly tripping to hold mode. This tripping was caused by the dilution valve which was not properly adjusted manually in the correct position.

17/10/2024

The Precip field 3 2 tripped on undervoltage protection. Precip field 4 1, 4 3 & 4 4 performance was heavily affected and still not recovered to its previous operating capacity. Precip field 3 2 tripped on undervoltage.

31/10/2024

The Right-hand side Precipitator fields were under performing. The Dust handling plant right hand row number 2 was blocked.

Additionally, the reasons for the NOx gas exceedances for the month of October 2024 are attached in an investigation report as appendix A. Also covered in the investigation report are the reasons for the poor gas monitor reliability.

The SO3 utilisation was 95.0% for the month of October 2024. Below are the reasons for the poor SO3 plant utilisation.

- On the 6<sup>th</sup> of October the SO3 plant kept tripping on process air flow high or process air flow deviation. This problem was eventually resolved by C&I Engineering by making a correction on the PLC program.
- On the 21<sup>st</sup> of October Unit 6 experienced a unit trip risk caused by turbine governor valve fluctuating. This caused the unit load to also fluctuate and drop below the SO3 plant load set point and correctly trip the SO3 plant during this severe load fluctuation.

Lastly the averages for Oxygen (O2) and Carbon Dioxide (CO2) data from the QAL2 tests reports were used for reporting gaseous emissions for units 2, 4, 5 and 6 due to poor performance of the O2 and CO2 gaseous monitors. These poor performances of the monitors are due to the inability to conduct bi-weekly calibrations and preventative maintenance of the O2 analysers due to the unavailability of a maintenance contract with a service provider. The maintenance contract was eventually placed on the 1st of October 2024. Since the maintenance contractor (SI analytics Pty Ltd) has been placed, a lot of issues have been identified with the monitors. These issues occurred because there was no maintenance contractor in place. SI analytics Pty Ltd has been given time to resolve these issues with the monitors and the monitors are expected to perform at 80% reliability by 31 January 2025.

The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission report which will be sent to your office.

## 10 S30 Incidents Register


There were no Section 30 incidents for this month.

  
Boiler Plant Engineering Manager

27/11/2024  
Date

  
Environmental Manager

2024/11/27  
Date

  
Engineering Manager

27/11/2024  
Date

Compiled by Environmental Officer

For Nkangala District Municipality

Air Quality Officer

Copies Generation Environmental Management

D Herbst  
B Mccourt

Generation Compliance Management  
Generation Asset Management

R Rampiar  
E Patel

Duvha Power Station

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System Engineer  
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Manager