



Generation

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Mr V Mahlangu

AND

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DUVHA POWER STATION

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

GENERAL MANAGER

2024/01/30

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 Jul-2023
	Coal	Tons	1 400 000.00	711 590.80
	Fuel Oil	Tons	5 000.00	7238.36

Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Indicative Production Rate Jul-2023
	Energy	GWh	2678.40	1 237.26
	Ash	Tons	not specified	188 429.24

Note: Maximum energy rate is as per the maximum capacity stated in the AEL: [3 600 MW] x 24 hrs x days in Month/1000 to convert to GWh

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	0.60 TO >1.20	0.75
Ash Content	%	27.00 TO 30.00	26.48

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO ₂	NO _x
Unit 1	100	3500	1100
Unit 2	100	3500	1100
Unit 3	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 Jul-2023	Technology Type	SO ₃ Utilization Jul-2023
Unit 1	FFP	99.80%		
Unit 2	FFP	99.90%		
Unit 4	ESP + SO ₃	99.60%	SO ₃	99.90%
Unit 5	ESP + SO ₃	99.70%	SO ₃	99.40%
Unit 6	ESP + SO ₃	99.70%	SO ₃	97.90%

Note: ESP and FFP plants do not have a bypass mode operation, hence plants 100% Utilised.

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO
Unit 1	100.00	100.00	100.00
Unit 2	100.00	100.00	100.00
Unit 4	100.00	94.00	94.00
Unit 5	100.00	93.10	93.00
Unit 6	96.80	94.00	94.00

Note: NO_x emissions is measured as NO in PPM. Final NO_x value is expressed as total NO₂

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of July 2023

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	30.50	2 506	954
Unit 2	34.80	3 724	1 762
Unit 4	134.90	2 880	1 161
Unit 5	112.90	2 201	867
Unit 6	87.80	2 231	1 053
SUM	400.93	13 542	5 798

Table 6.2: Operating days in compliance to PM AEL Limit - July 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	15	0	0	0	0	27.50
Unit 2	31	0	0	0	0	18.10
Unit 4	23	6	0	0	6	87.80
Unit 5	20	6	0	0	6	92.00
Unit 6	25	5	0	0	5	67.70
SUM	114	17	0	0	17	

Table 6.3: Operating days in compliance to SO₂ AEL Limit - July 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO ₂ (mg/Nm ³)
Unit 1	17	0	0	0	0	2 061.80
Unit 2	31	0	0	0	0	1 849.90
Unit 4	31	0	0	0	0	1 770.30
Unit 5	27	0	0	0	0	1 692.90
Unit 6	31	0	0	0	0	1 570.00
SUM	137	0	0	0	0	

Table 6.4: Operating days in compliance to NO_x AEL Limit - July 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO _x (mg/Nm ³)
Unit 1	17	0	0	0	0	770.50
Unit 2	31	0	0	0	0	871.80
Unit 4	31	0	0	0	0	708.20
Unit 5	27	0	0	0	0	660.60
Unit 6	31	0	0	0	0	739.70
SUM	137	0	0	0	0	

Note: NO_x emissions is measured as NO in PPM. Final NO_x value is expressed as total NO₂

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 - July 2023

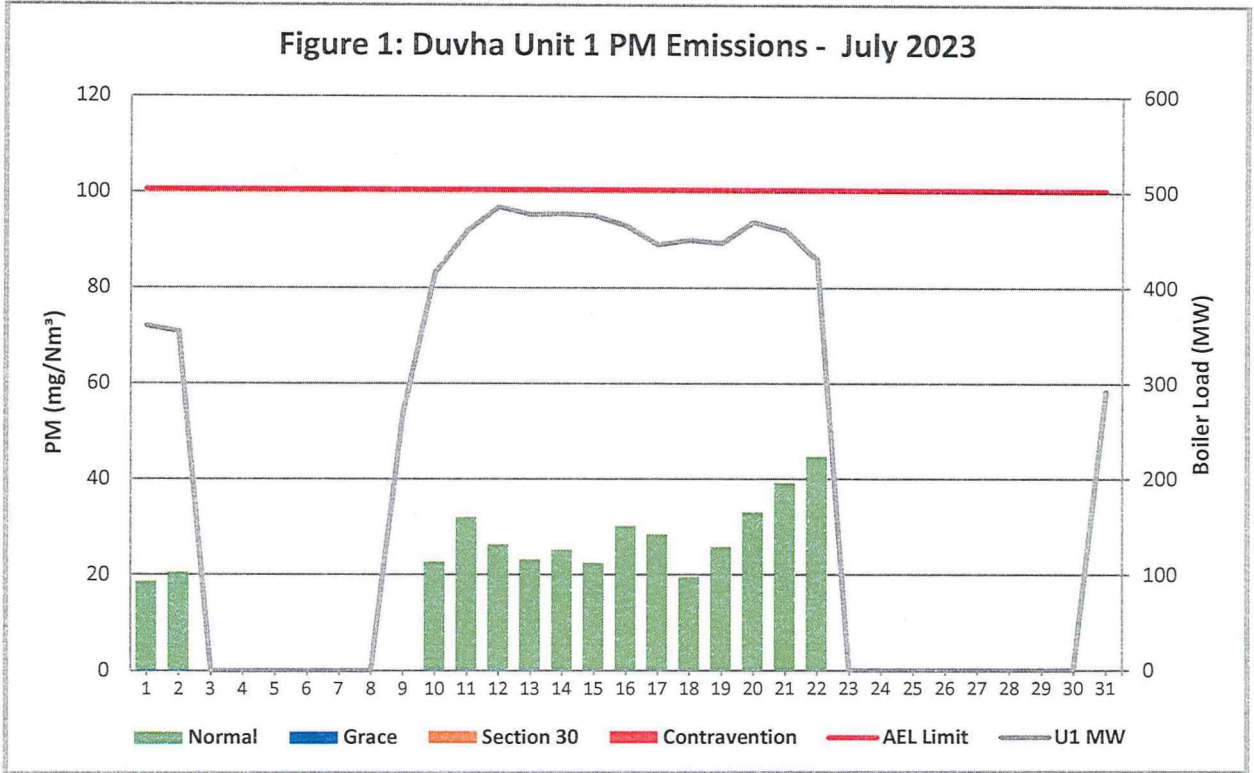


Figure 2: Duvha Unit 2 PM Emissions - July 2023

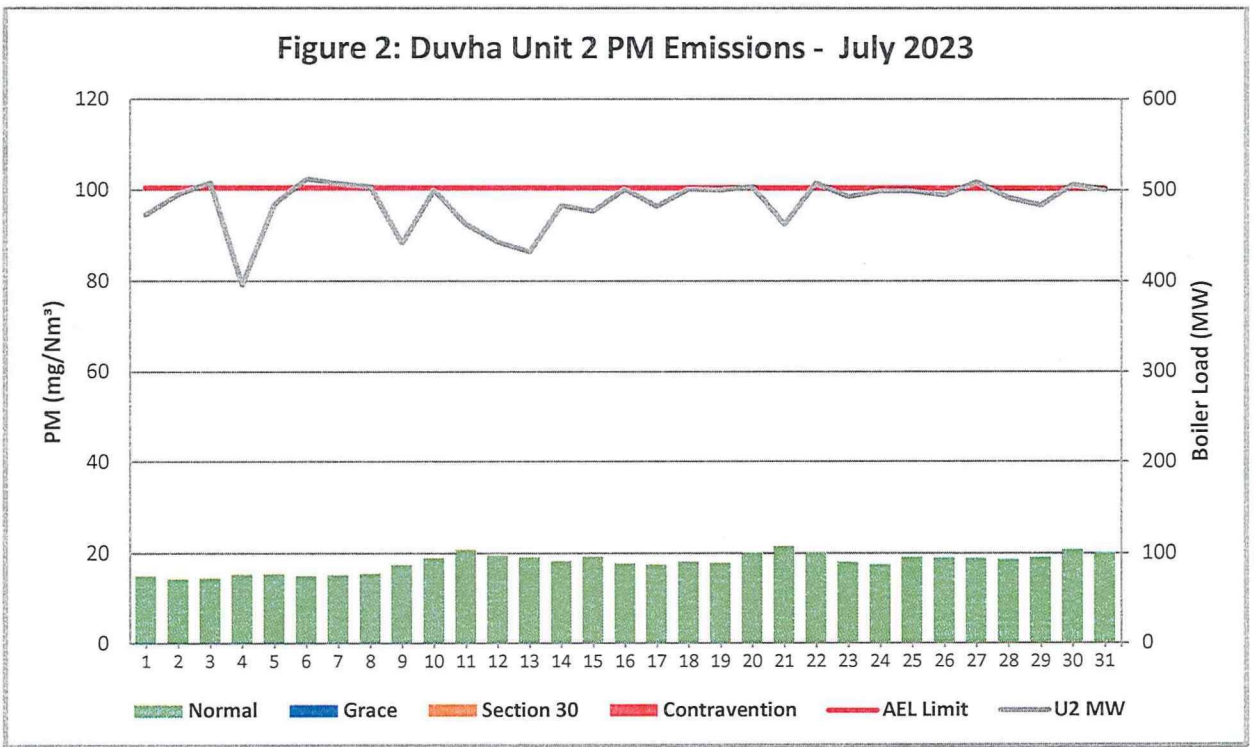


Figure 3: Duvha Unit 4 PM Emissions - July 2023

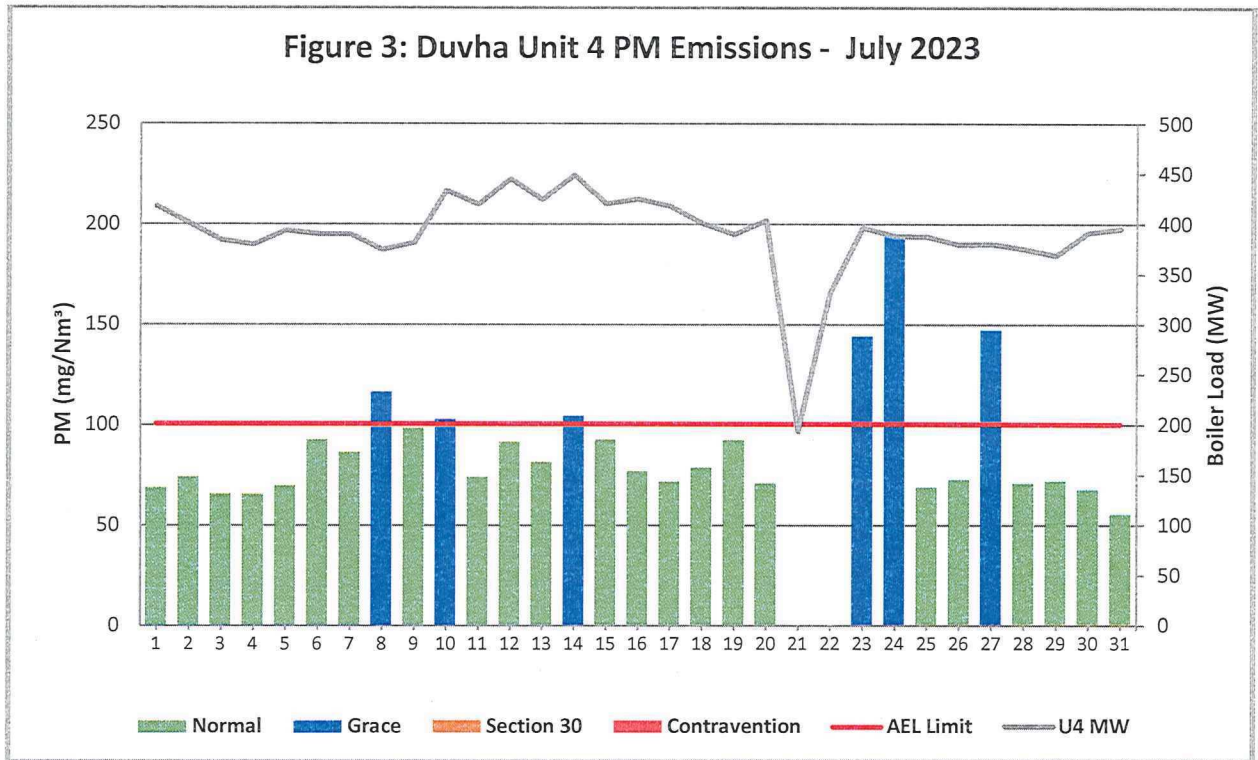


Figure 4: Duvha Unit 5 PM Emissions - July 2023

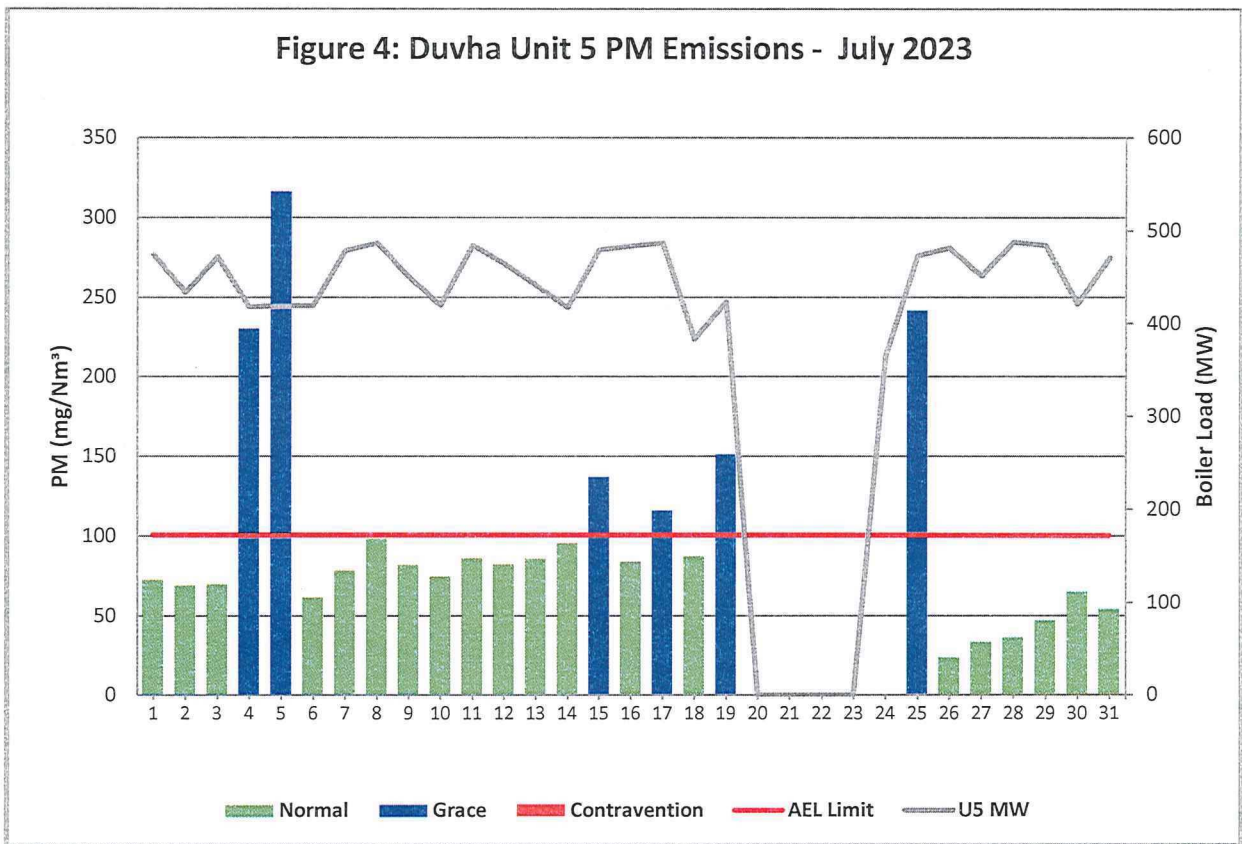


Figure 5: Duvha Unit 6 PM Emissions - July 2023

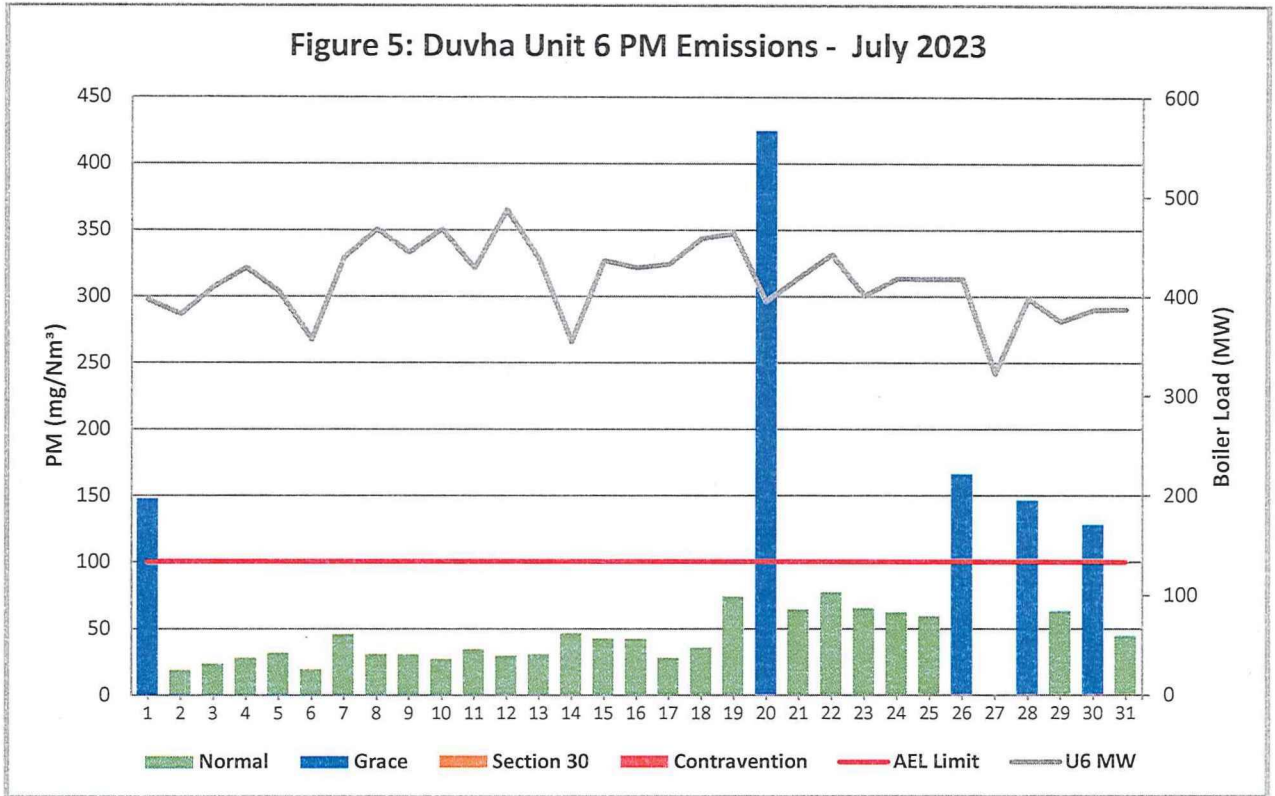


Figure 6: Duvha Unit 1 SO₂ Emissions - July 2023

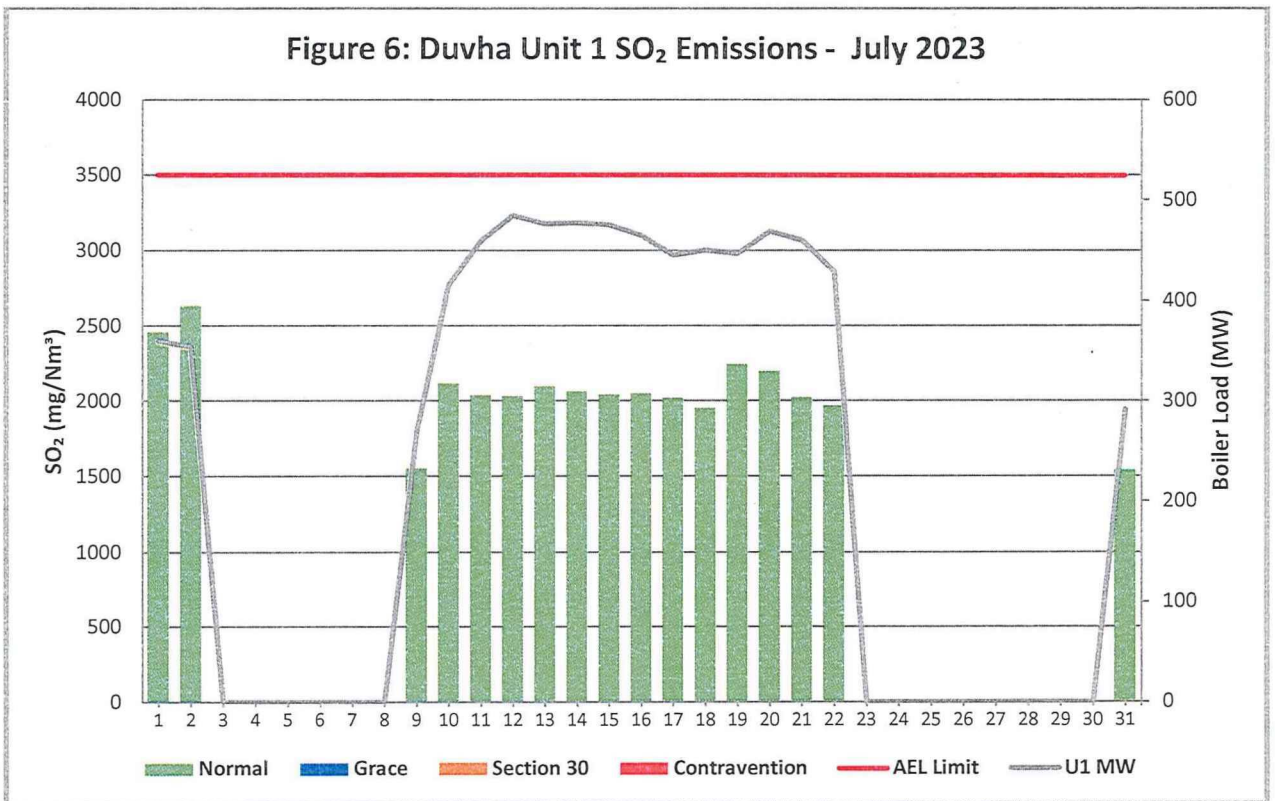


Figure 7: Duvha Unit 2 SO₂ Emissions - July 2023

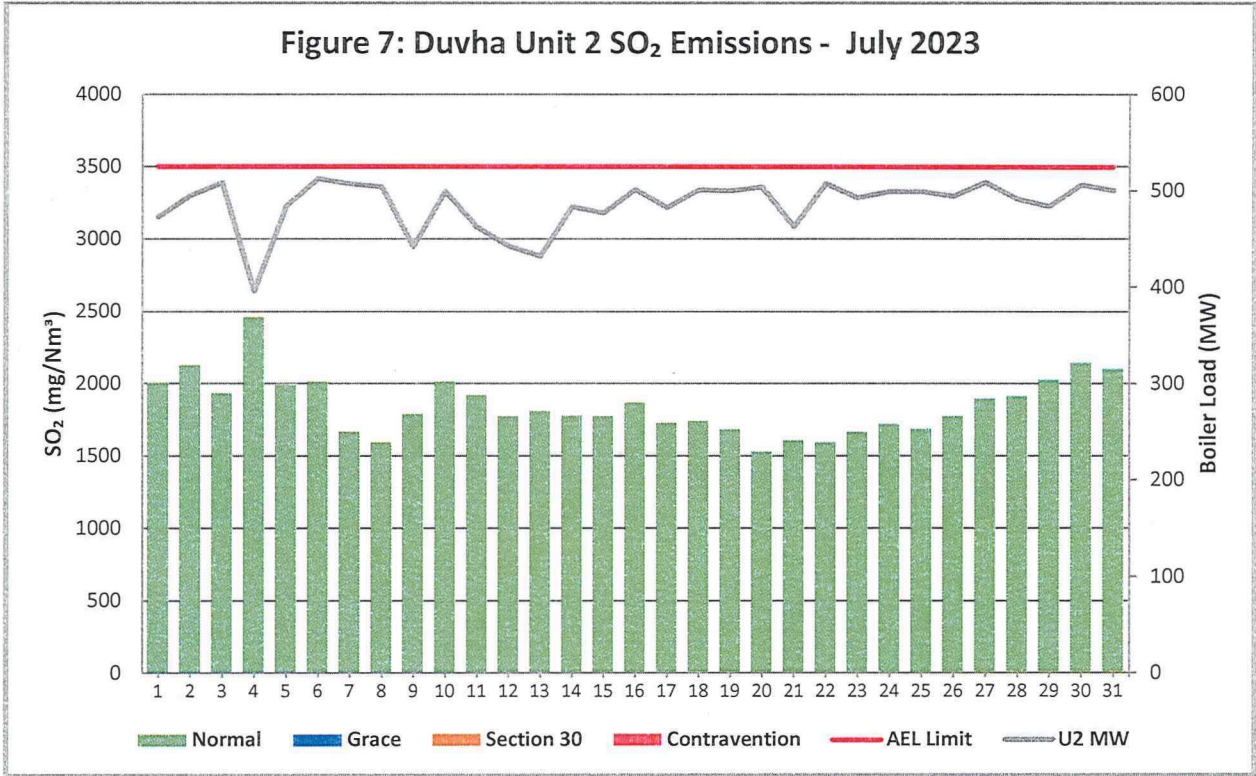


Figure 8: Duvha Unit 4 SO₂ Emissions - July 2023

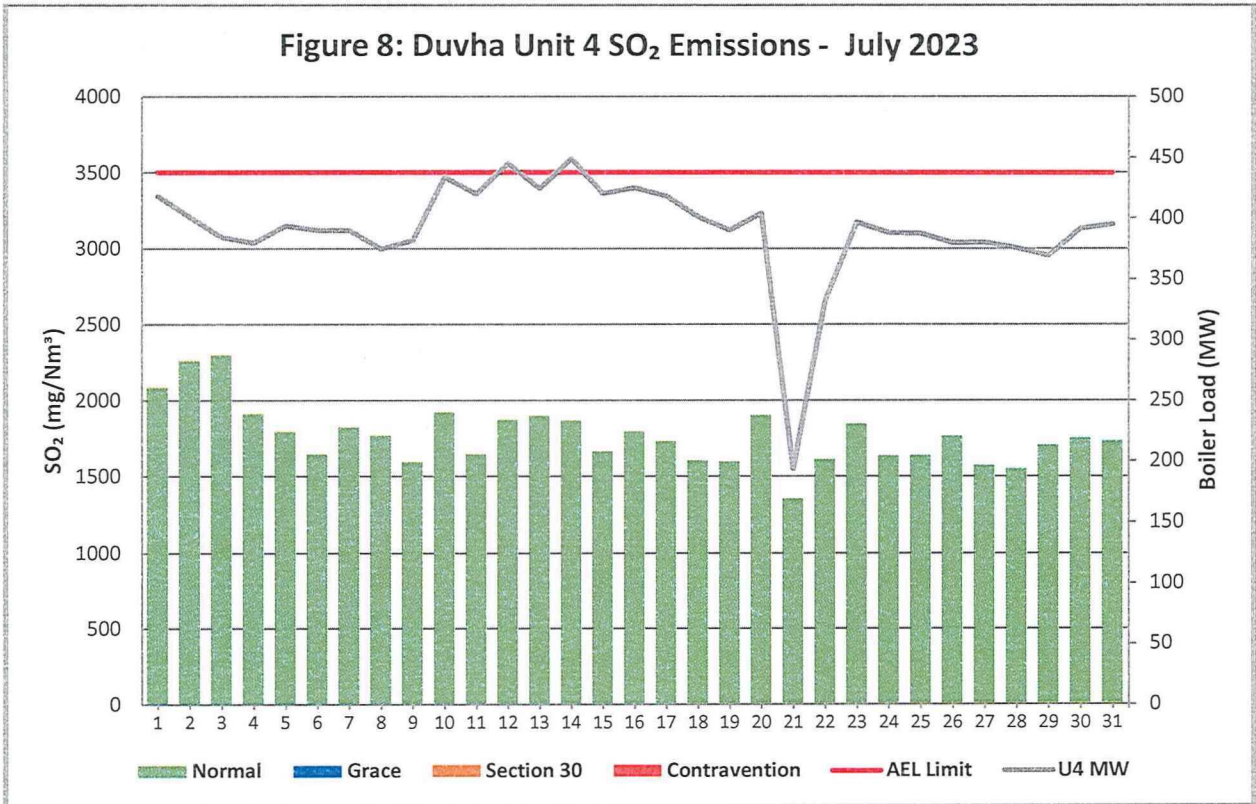


Figure 9: Duvha Unit 5 SO₂ Emissions - July 2023

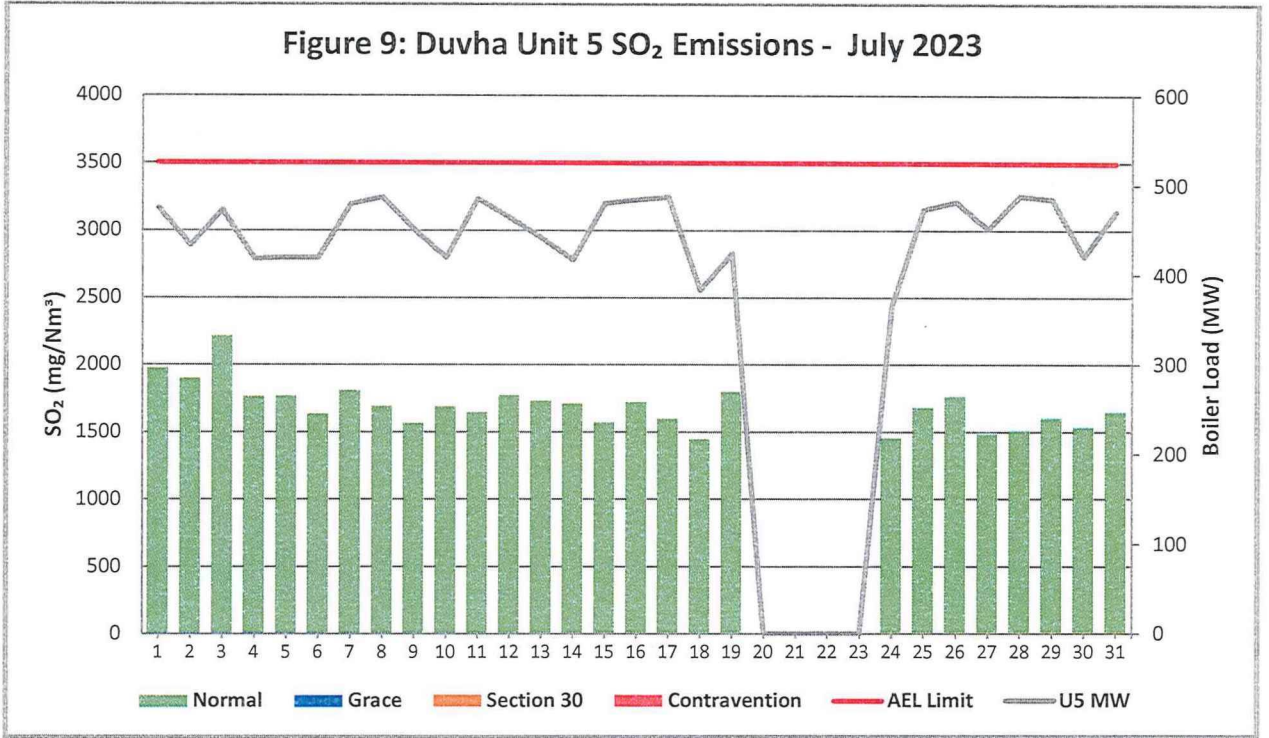


Figure 10: Duvha Unit 6 SO₂ Emissions - July 2023

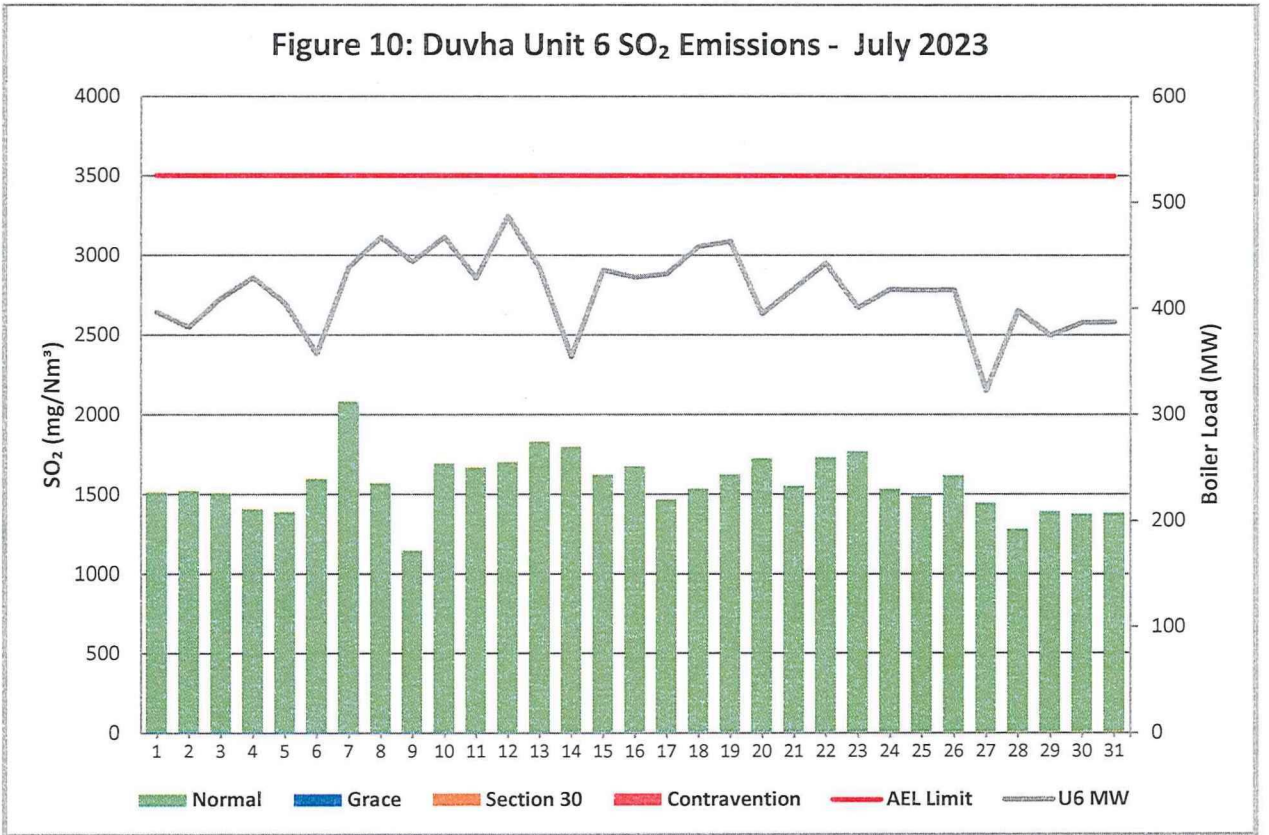


Figure 11: Duvha Unit 1 NOx Emissions - July 2023

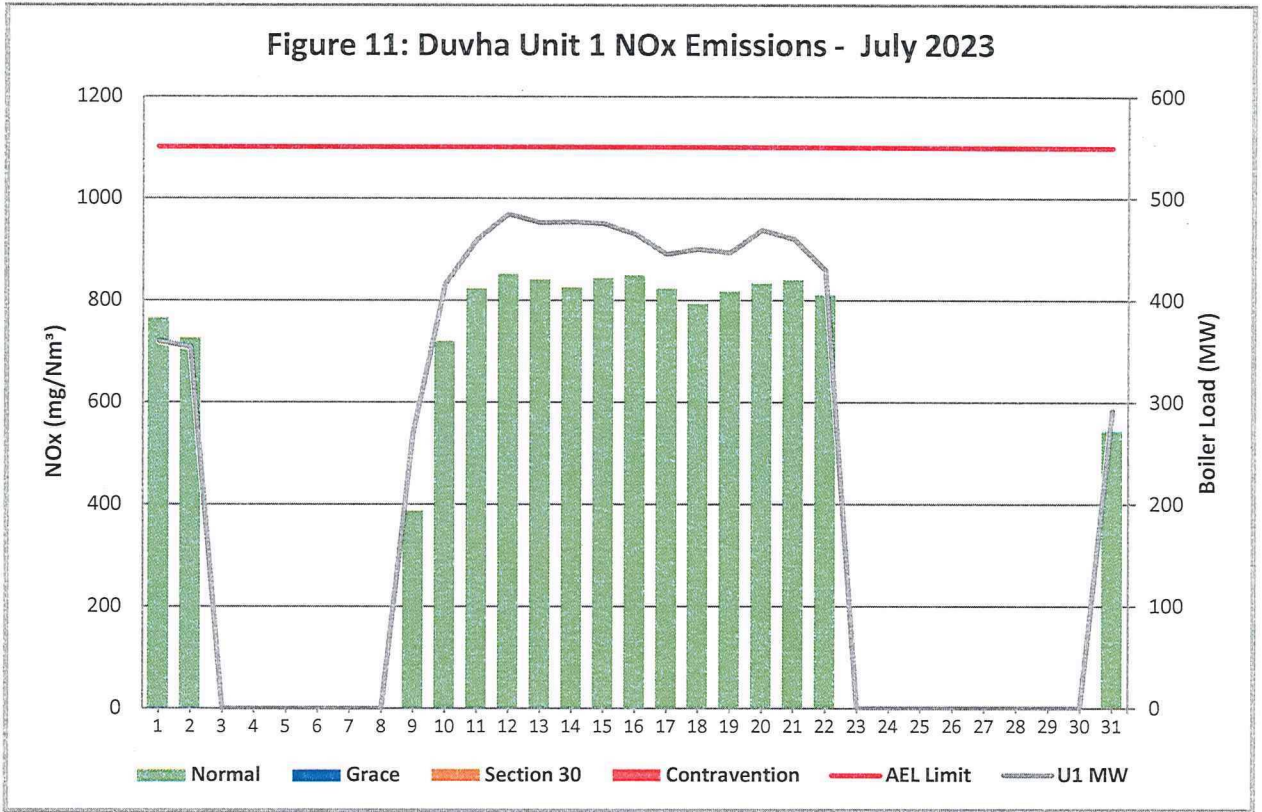


Figure 12: Duvha Unit 2 NOx Emissions - July 2023

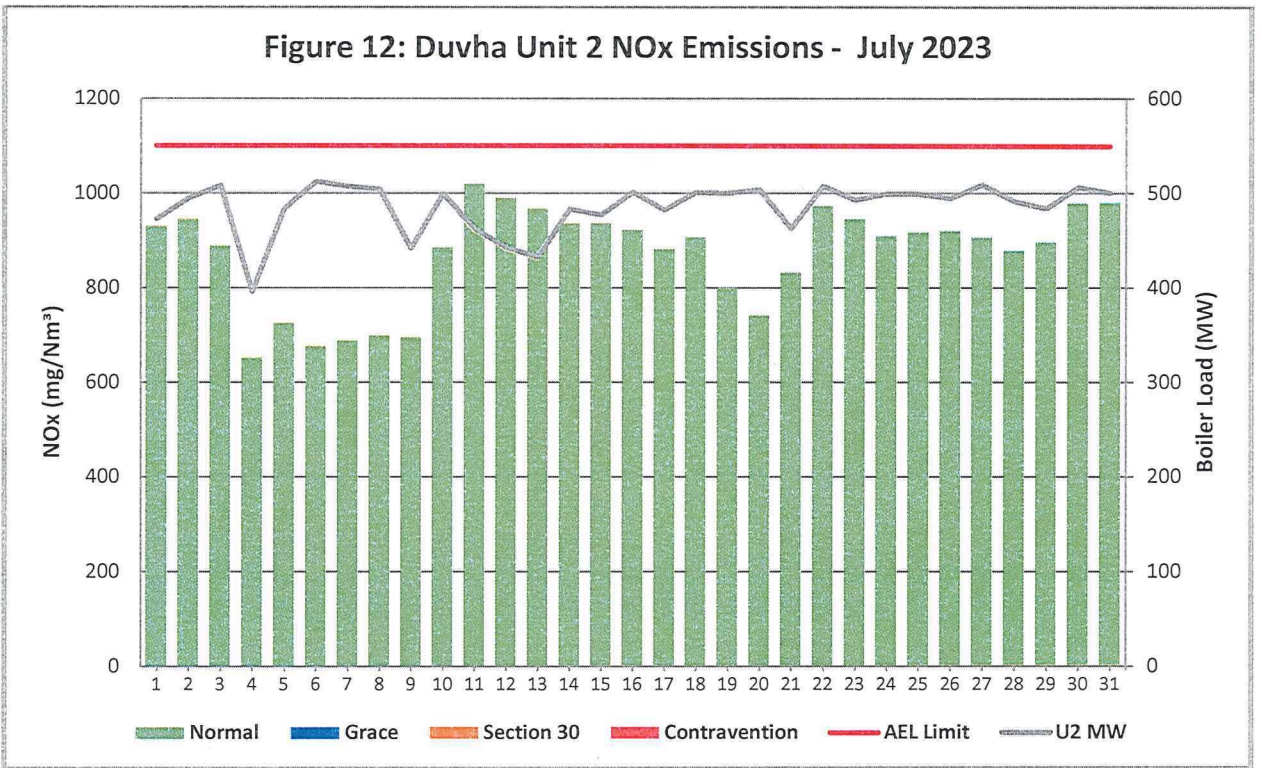


Figure 13: Duvha Unit 4 NOx Emissions - July 2023

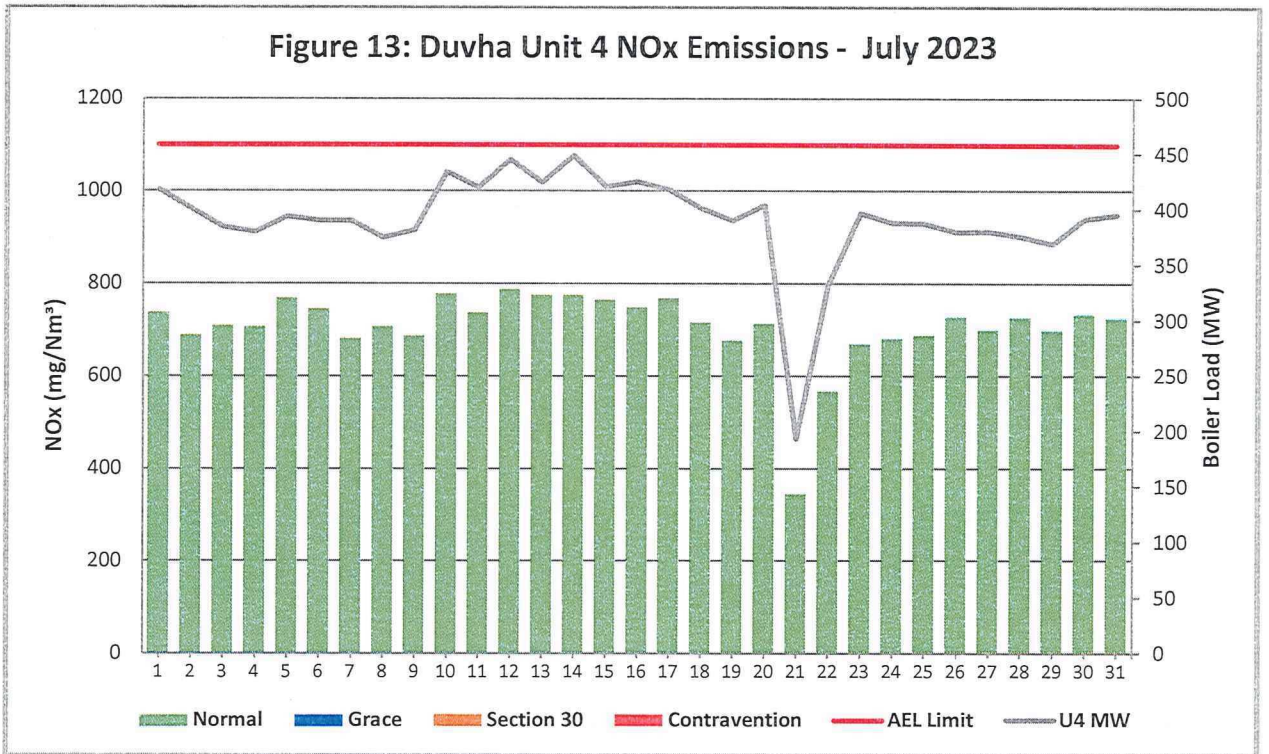
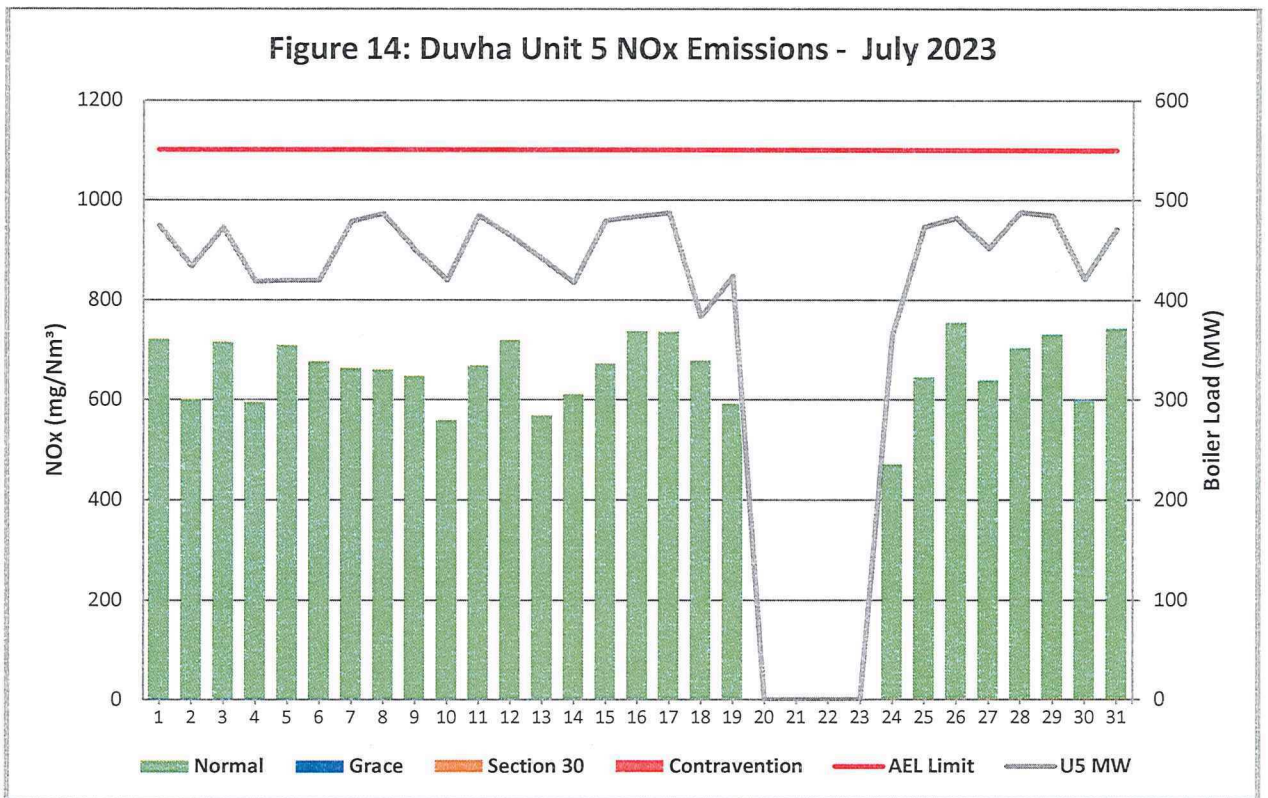
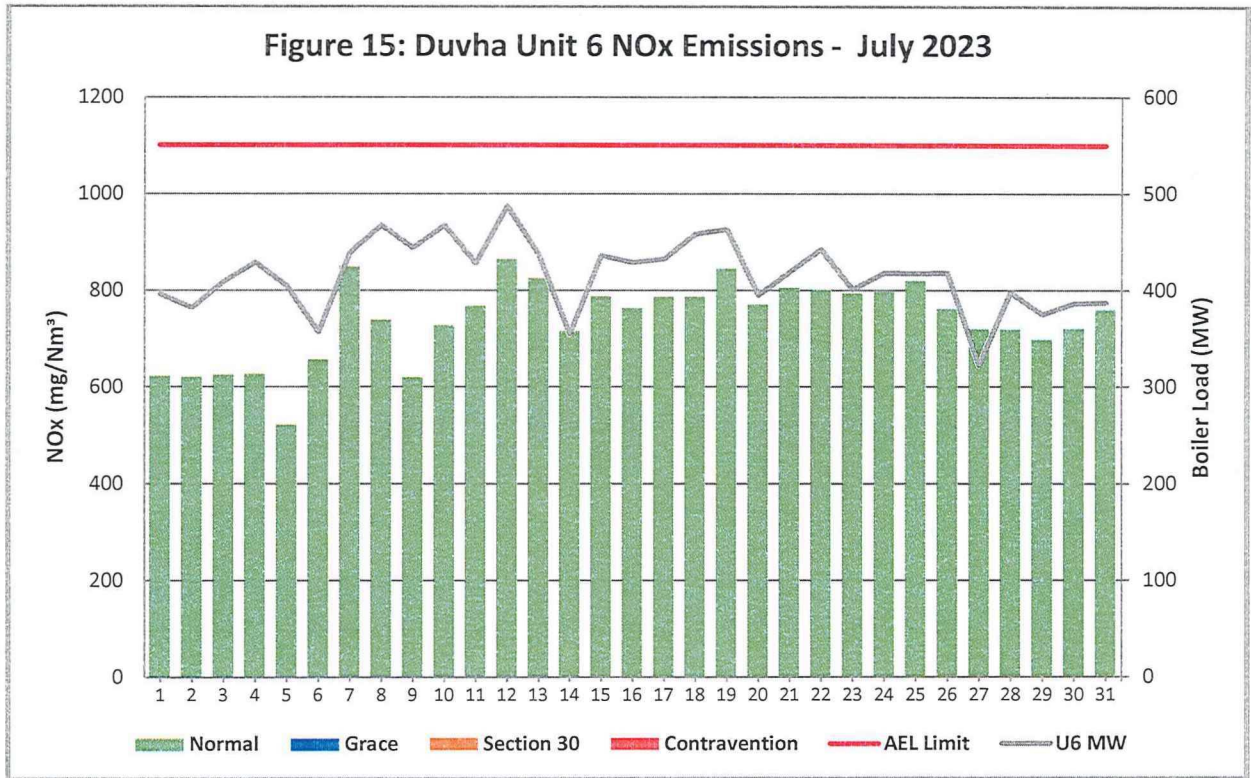


Figure 14: Duvha Unit 5 NOx Emissions - July 2023





7 SHUT DOWN AND LIGHT UP INFORMATION

Tables 7.1: Shut-down and light-up information for the month of July 2023

Unit No.1	Event 1		Event 2	
Breaker Open (BO)	5:25 pm	2023/07/02	10:20 pm	2023/07/22
Draught Group (DG) Shut Down (SD)	8:05 am	2023/07/03	9:35 am	2023/07/23
BO to DG SD (duration)	00:14:40	DD:HH:MM	00:11:15	DD:HH:MM
Fires in time	4:05 am	2023/07/09		
Synch. to Grid (or BC)	3:20 pm	2023/07/09		
Fires in to BC (duration)	00:11:15	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit		
Emissions below limit from BC (duration)	n/a	DD:HH:MM		DD:HH:MM

Unit No.2	Event 1		Event 2	
Breaker Open (BO)	2:45 pm	2023/07/01	5:35 am	2023/07/04
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

BO to DG SD (duration)	<i>n/a</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM
Fires in time				
Synch. to Grid (or BC)				
Fires in to BC (duration)		DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)				
Emissions below limit from BC (duration)		DD:HH:MM		DD:HH:MM

Unit No.4	<i>Event 1</i>		
Breaker Open (BO)	<i>8:00 pm</i>		<i>2023/07/20</i>
Draught Group (DG) Shut Down (SD)	<i>3:25 am</i>		<i>2023/07/22</i>
BO to DG SD (duration)	<i>01:07:25</i>		DD:HH:MM
Fires in time	<i>8:00 am</i>		<i>2023/07/22</i>
Synch. to Grid (or BC)	<i>2:45 pm</i>		<i>2023/07/24</i>
Fires in to BC (duration)	<i>00:04:20</i>		DD:HH:MM
Emissions below limit from BC (end date)	<i>12:00 am</i>		<i>2023/07/25</i>
Emissions below limit from BC (duration)	<i>00:09:15</i>		DD:HH:MM

Unit No.5	<i>Event 1</i>		
Breaker Open (BO)	<i>12:00 pm</i>		<i>2023/07/19</i>
Draught Group (DG) Shut Down (SD)	<i>1:05 am</i>		<i>2023/07/20</i>
BO to DG SD (duration)	<i>00:13:05</i>		DD:HH:MM
Fires in time	<i>10:20 am</i>		<i>2023/07/24</i>
Synch. to Grid (or BC)	<i>2:45 pm</i>		<i>2023/07/24</i>
Fires in to BC (duration)	<i>00:04:25</i>		DD:HH:MM
Emissions below limit from BC (end date)	<i>12:00 am</i>		<i>2023/07/26</i>
Emissions below limit from BC (duration)	<i>01:09:15</i>		DD:HH:MM

Unit No.6	<i>Event 1</i>		
Breaker Open (BO)	<i>9:15 am</i>		<i>2023/07/26</i>
Draught Group (DG) Shut Down (SD)	<i>11:55 am</i>		<i>2023/07/26</i>
BO to DG SD (duration)	<i>00:02:40</i>		DD:HH:MM
Fires in time	<i>12:10 am</i>		<i>2023/07/27</i>
Synch. to Grid (or BC)	<i>2:00 pm</i>		<i>2023/07/27</i>
Fires in to BC (duration)	<i>00:13:50</i>		DD:HH:MM
Emissions below limit from BC (end date)	<i>2:00 am</i>		<i>2023/07/29</i>
Emissions below limit from BC (duration)	<i>01:12:00</i>		DD:HH:MM

8 GENERAL

Exceedances:

Unit 4:

08/07/2023

- SO3 plant kept tripping and going into Hold Mode when the unit load dropped to below 380MW.

10/07/2023

- SO3 plant kept tripping and going into Hold Mode when the unit load dropped to below 380MW.

14/07/2023

- Electrostatic Precipitators (ESP) fields 1.5, 3.2, 3.3, 3.5 were not in service.

23-24/07/2023

- Cold unit light up.

27/07/2023

- Dust Handling plant (DHP) left hand Aeroslide heater temperatures were low.

Unit 5:

04-05/07/2023

- Cold unit light up.

15/07/2023

- The first row ESPs on both right and left hands were switched off due to high Silo level. As a result of sluice pump unavailability. This was done to protect the ESP fields from damage.

19/07/2023

- The SO3 common plant was switched off for the replacement of common plant Sulphur supply pump.

25/07/2023

- The 1st and 2nd row of Electrostatic Precipitators (ESP) fields were switched off due to the Dust Handling plant (DHP) backlog. This was done to protect the ESP fields from damage.

Unit 6:

28/06/2023 - 01/07/2023

Contravention Incident: The 72 Hours allowable for a cold unit light up were exceeded on Duvha's unit 6 on the 02nd of July 2023. A detailed investigation report with the root cause and corrective and preventative actions will be submitted to your office once the investigation is completed.

20/07/2023

- Due to sootblowing an abnormally dirty boiler which resulted in the exceedance.

26/07/2023

- Due to sootblowing an abnormally dirty boiler which resulted in the exceedance.

28/07/2023

- Cold unit light up.

30/07/2023

- SO3 plant stopped injecting sulphur when the load dropped to below 350MW.

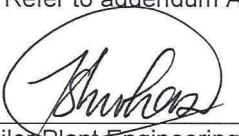
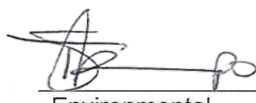

Lastly the averages Oxygen (O2) and Carbon Dioxide (CO2) data from the QAL 2 tests reports were used for reporting for gaseous emissions for Units 2, 4, 5, and 6 due to poor performance of the O2 and CO2 gaseous monitors. These poor performances of the gaseous monitors are due to faulty O2 analysers. The Station is in the process to replace all the faulty analysers by 31 March 2024.

The fuel oil usage for the month of July 2023 exceeded the permitted consumption rate. A detailed investigation report with root cause and preventative actions will be submitted is attached as an annexure to this report.

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 Complaints and S30 Incidents Register

Refer to addendum A

 Boiler Plant Engineering Manager	<u>25/01/2024</u> Date	 Environmental Manager	<u>2024/01/29</u> Date
 Engineering Manager	<u>2024-01-25</u> 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:

Engineering
Manager
Operating
Manager
Maintenance
Manager
Production
Manager

Boiler Engineering Manager

System Engineer

Environmental Manager

9 COMPLAINTS REGISTER

Table 9. Complaints for the month of July 2023

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 measure will be implemented
No complaints were received during the month of July 2023.					

10 S30 INCIDENT OR LEGAL CONTRAVENTION REGISTER

To be completed in the case of a S30 incident or a legal contravention:

Unit no	Incident Start Date	Incident End Date	Incident Cause	Remedial action	S30 initial notification sent	Date S30 investigation report sent	Date DEA Acknowledgment	Date DEA Acceptable	Comments / Reference No.
Unit 6	02/07/2023	02/07/2023	Incident still under investigation	Contravention incident not reported as a Section 30. Final investigation report will be submitted once investigation completed			N/A	N/A	Contravention Incident: The 72 Hours allowable for a cold unit light up were exceeded on Duvha's unit 6 on the 02 nd of July 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office once by 29/02/2024.