



Generation

Nkangala District Municipality
P O Box 437
Middleburg
1050

Attention:

Mr V Mahlangu

AND

Directorate: Air Quality Management
Services
The Chief Director:
Mr S S Maluleka
Department of Environmental Services
Private Bag X447
PRETORIA
0001
Tel: (012) 310 3263
Fax: (012) 320 0488

Date: 2023/01/17

Enquiries: Duvha Environmental Management

+27 13 690 0445

+27 66 212 2105

Enquiries: Ms Simthandile Nhlapo

+27 13 690 0445

+27 66 212 2105

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DUVHA POWER STATION

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

GENERAL MANAGER

25 January 2023

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 Nov-2022
	Coal	Tons	1 400 000	435 884.63
	Fuel Oil	Tons	5 000	4073.76
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Nov-2022
	Energy	GWh	3600	813.63
	Ash	Tons	not specified	116 773.49

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	0.6 TO >1.2	0.91
Ash Content	%	27 TO 30	26.79

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 Nov-2022	Technology Type	SO ₃ Utilization Nov-2022
Unit 1	FFP	99.8%	n/a	n/a
Unit 4	ESP + SO ₃	98.5%	SO ₃	98.8%
Unit 5	ESP + SO ₃	99.1%	SO ₃	97.6%
Unit 6	ESP + SO ₃	98.1%	SO ₃	93.2%

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

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO
Unit 1	99.3	99.7	99.9
Unit 4	72.7	70.6	72.4
Unit 5	100.0	81.4	81.4
Unit 6	88.4	80.1	80.1

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 November 2022

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	42.0	3 165	1 664
Unit 4	215.1	1 630	893
Unit 5	249.4	2 009	887
Unit 6	490.9	2 223	1 041

SUM | 997.44 | 9 027 | 4 485 |

Table 6.2: Operating days in compliance to PM AEL Limit - November 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	25	0	0	0	0	22.7
Unit 4	3	13	0	0	13	491.9
Unit 5	11	10	8	0	18	186.3
Unit 6	6	7	7	9	23	336.0
SUM	45	30	15	9	54	

Table 6.3: Operating days in compliance to SO₂ AEL Limit - November 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO ₂ (mg/Nm ³)
Unit 1	26	0	0	0	0	1 653.7
Unit 4	21	0	0	0	0	1 644.7
Unit 5	30	0	0	0	0	1 449.9
Unit 6	30	0	0	0	0	1 569.0
SUM	107	0	0	0	0	

Table 6.4: Operating days in compliance to NO_x AEL Limit - November 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO _x (mg/Nm ³)
Unit 1	26	0	0	0	0	865.4
Unit 4	21	0	0	0	0	908.4
Unit 5	30	0	0	0	0	635.6
Unit 6	30	0	0	0	0	733.1
SUM	107	0	0	0	0	

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 - November 2022

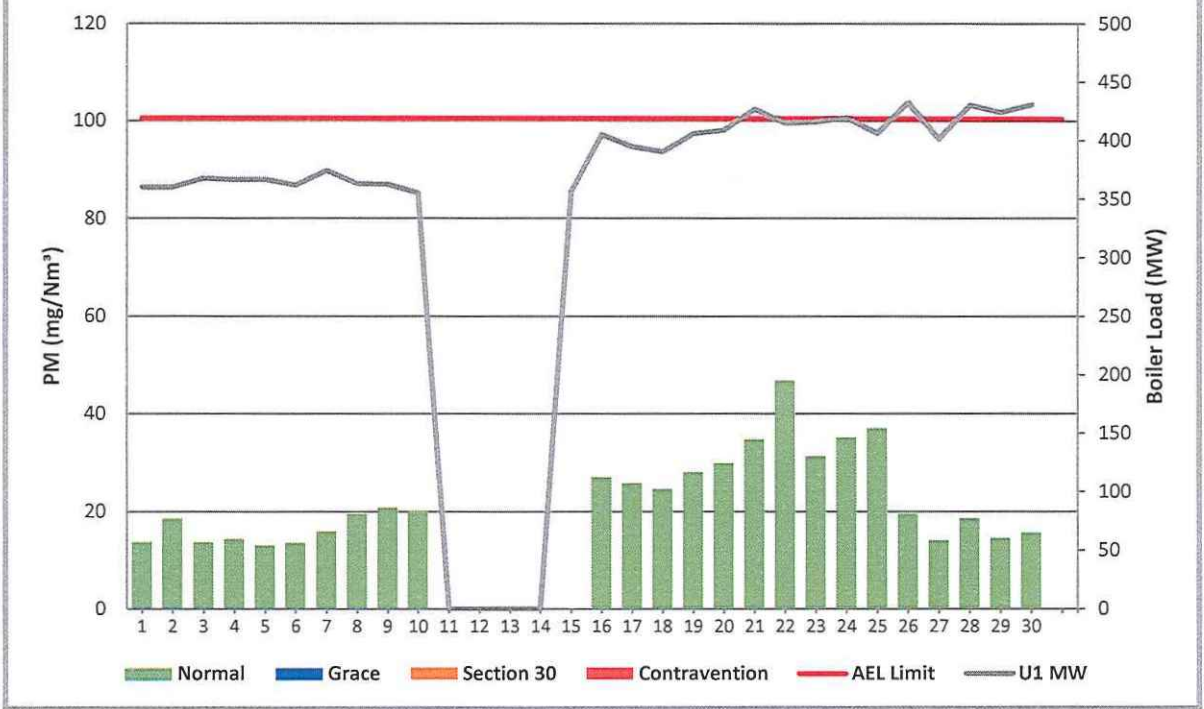


Figure 2: Duvha Unit 4 PM Emissions - November 2022

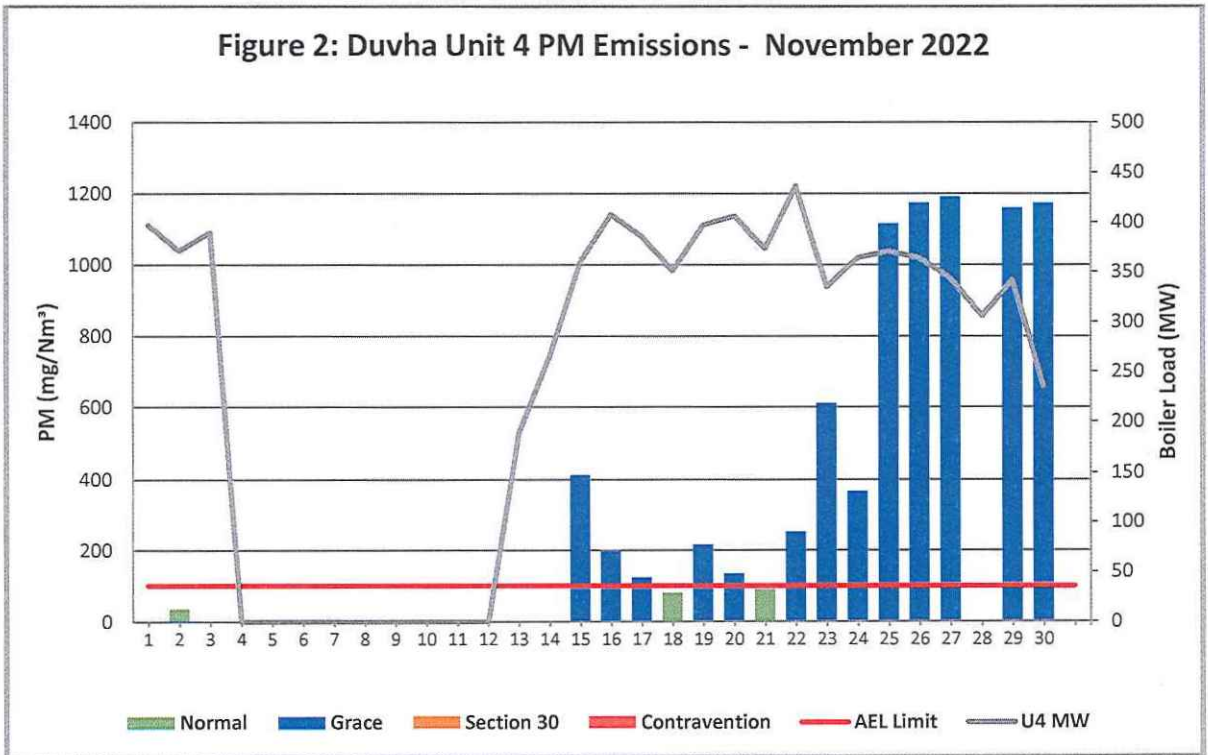


Figure 3: Duvha Unit 5 PM Emissions - November 2022

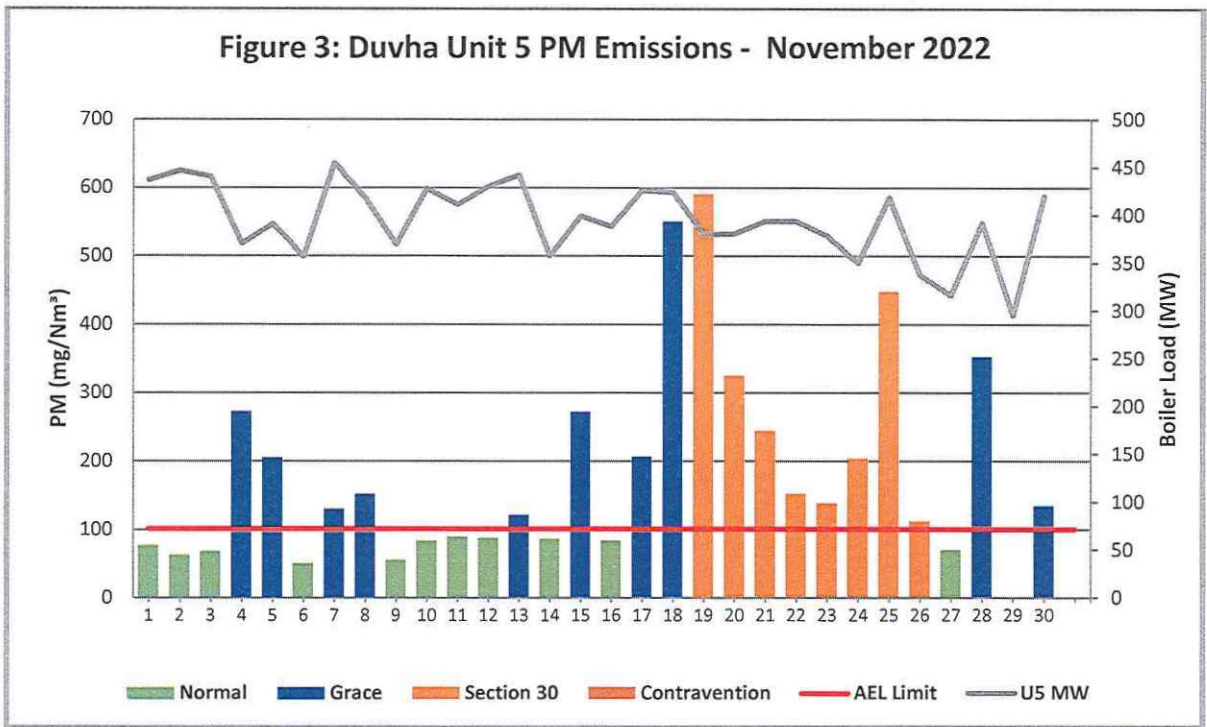


Figure 4: Duvha Unit 6 PM Emissions - November 2022

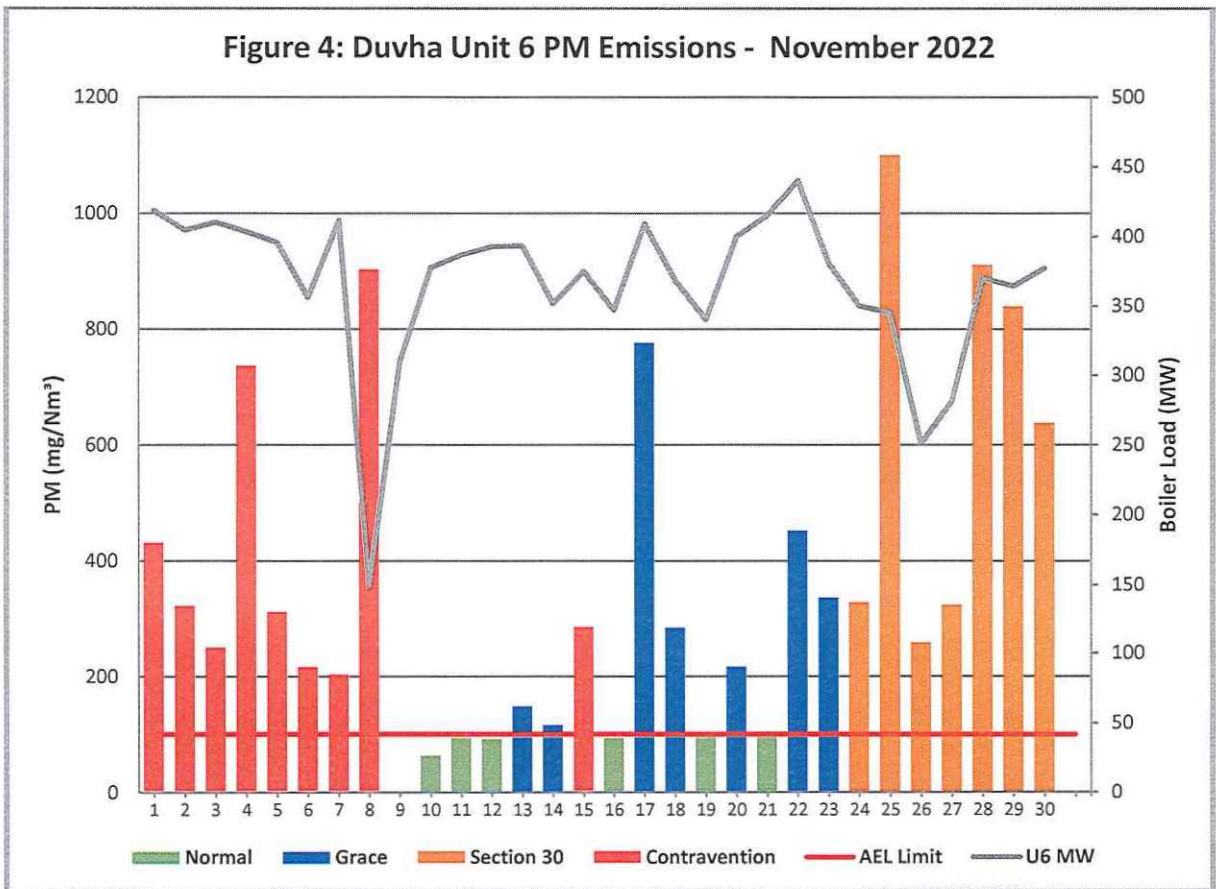


Figure 5: Duvha Unit 1 SO₂ Emissions - November 2022

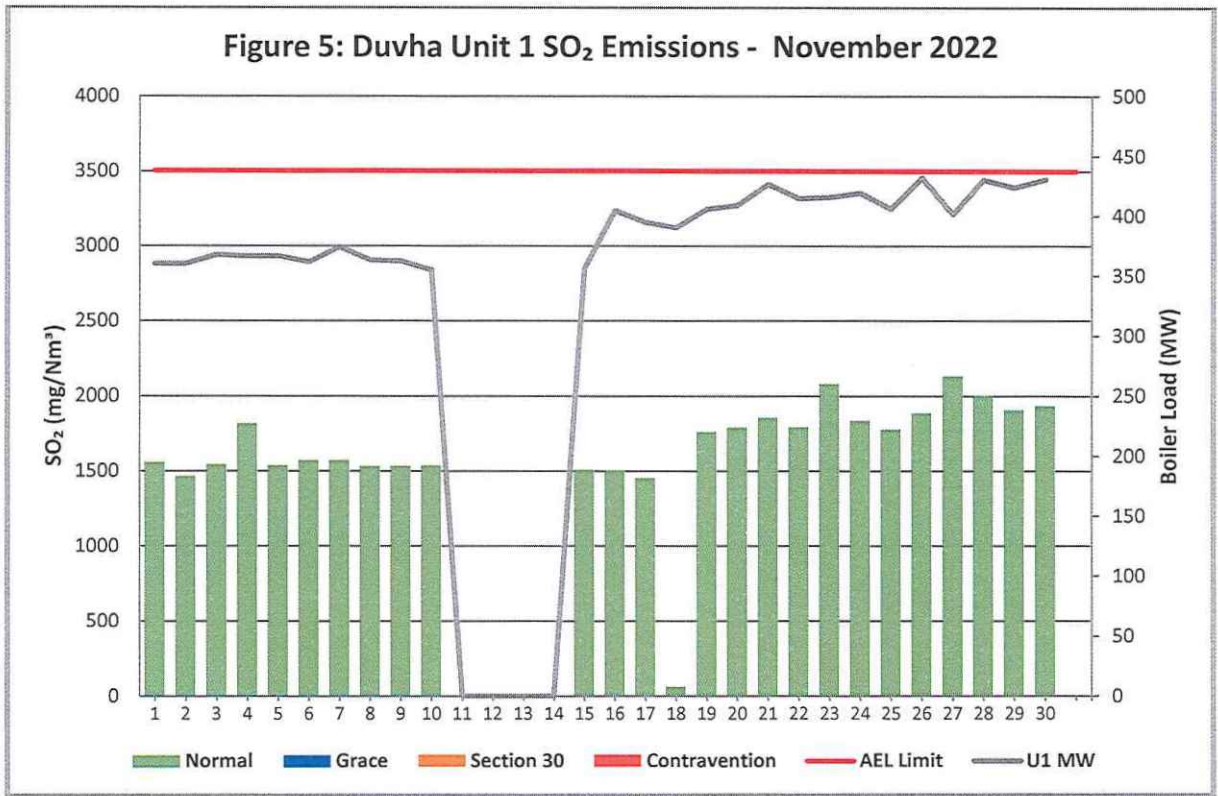


Figure 6: Duvha Unit 4 SO₂ Emissions - November 2022

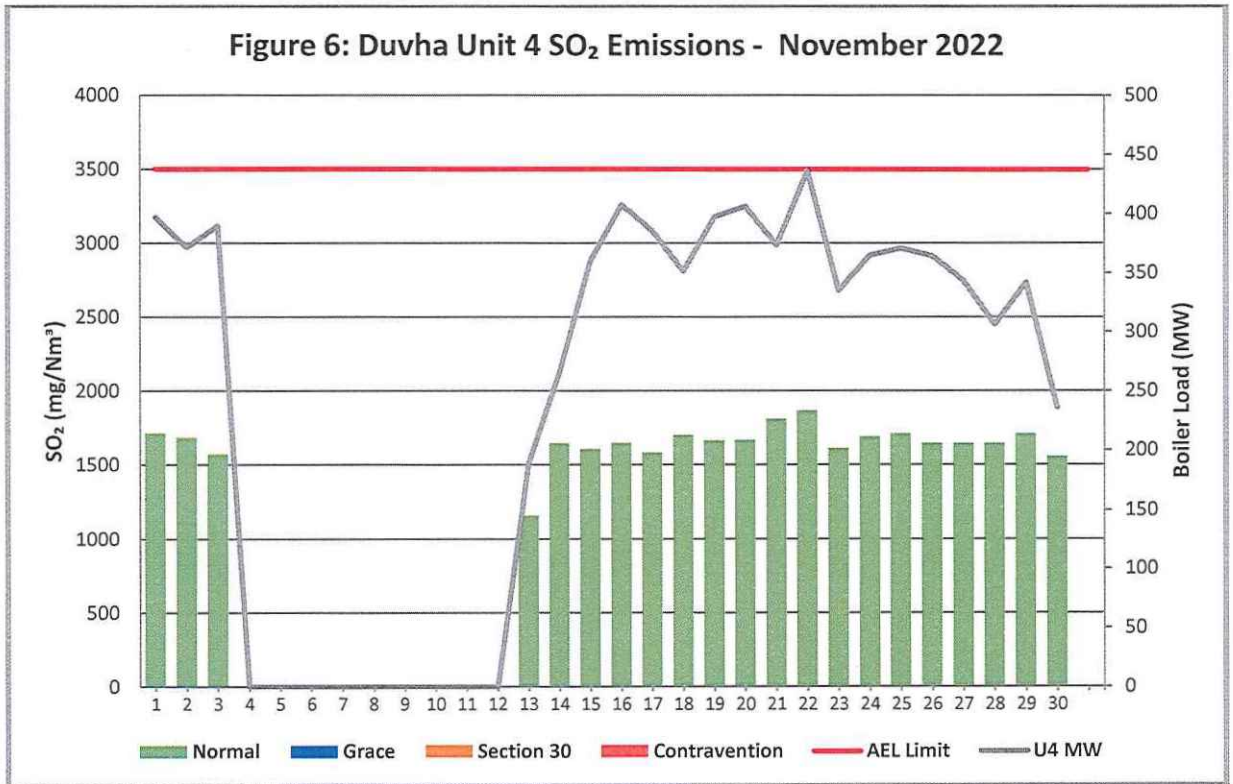


Figure 7: Duvha Unit 5 SO₂ Emissions - November 2022

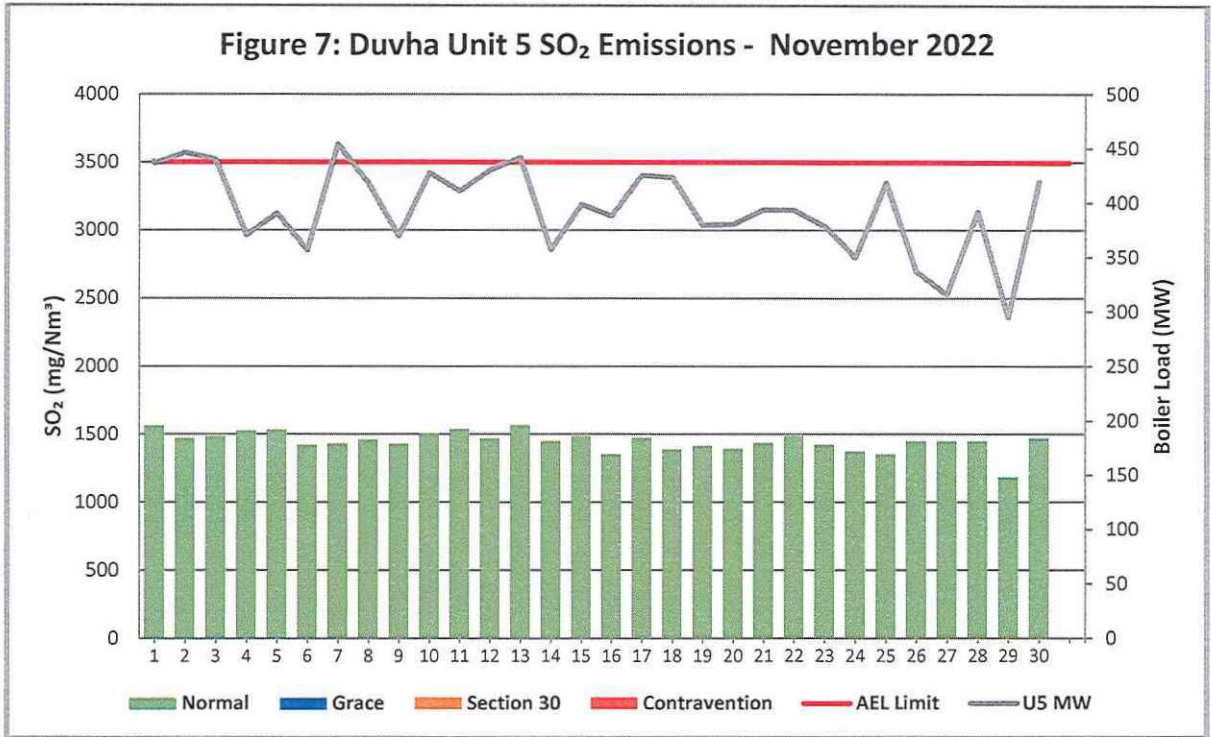


Figure 8: Duvha Unit 6 SO₂ Emissions - November 2022

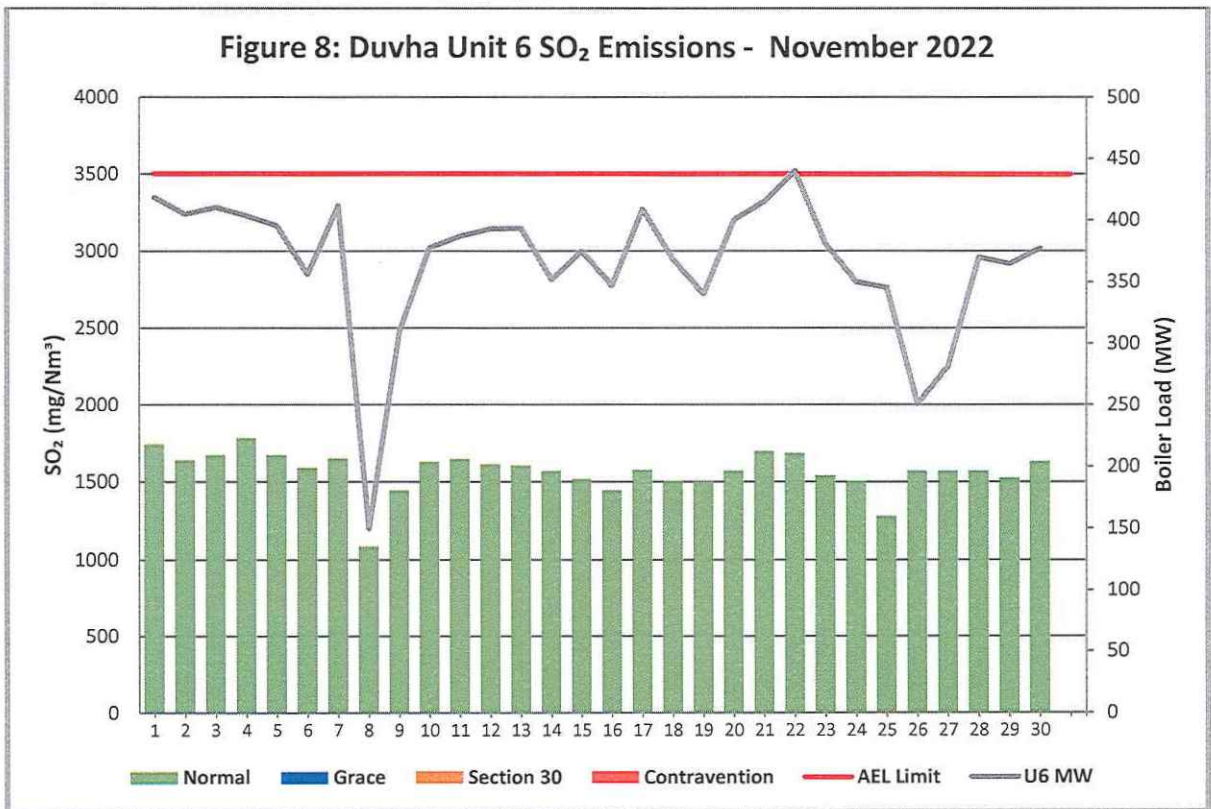


Figure 9: Duvha Unit 1 NOx Emissions - November 2022

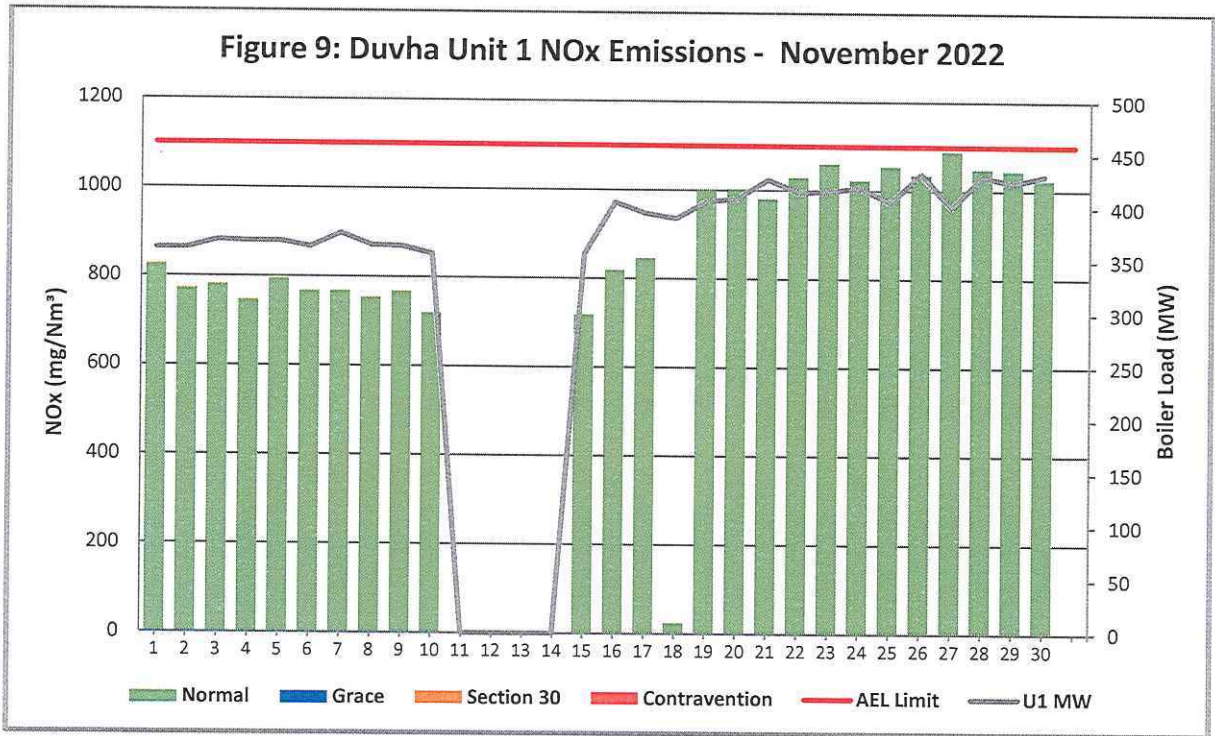


Figure 10: Duvha Unit 4 NOx Emissions - November 2022

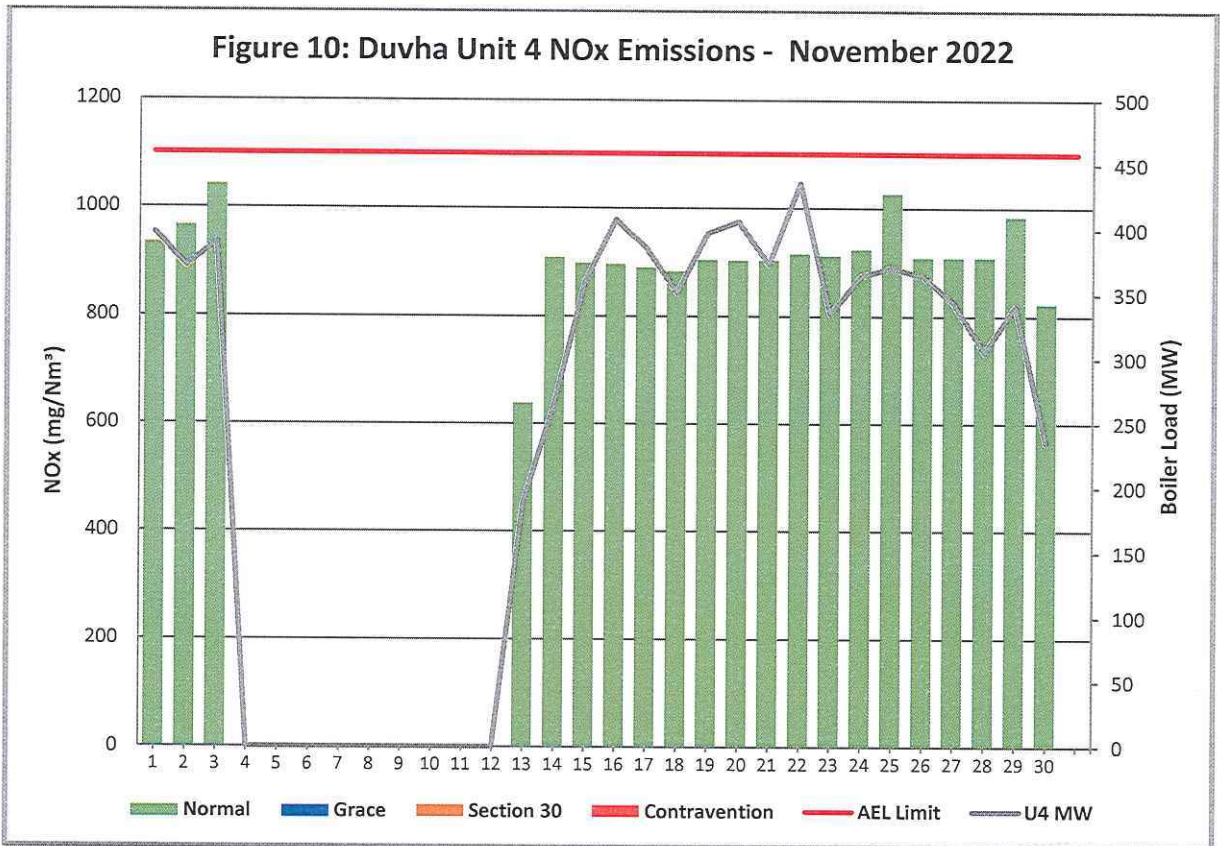


Figure 11: Duvha Unit 5 NOx Emissions - November 2022

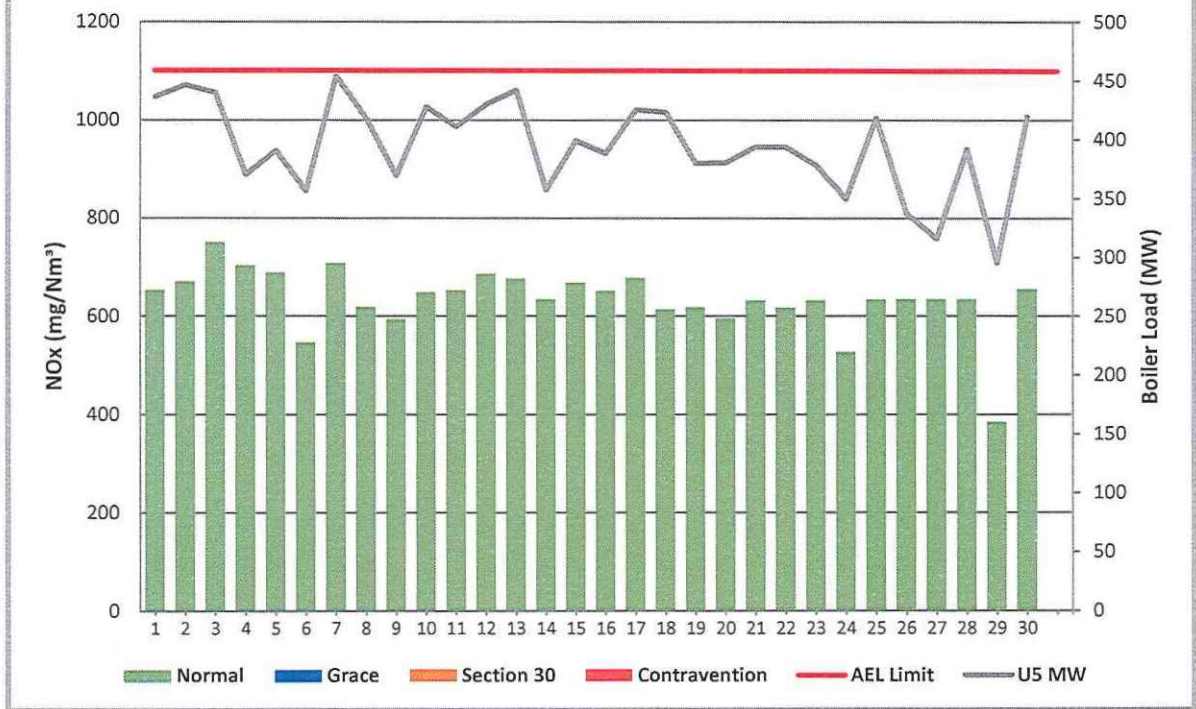
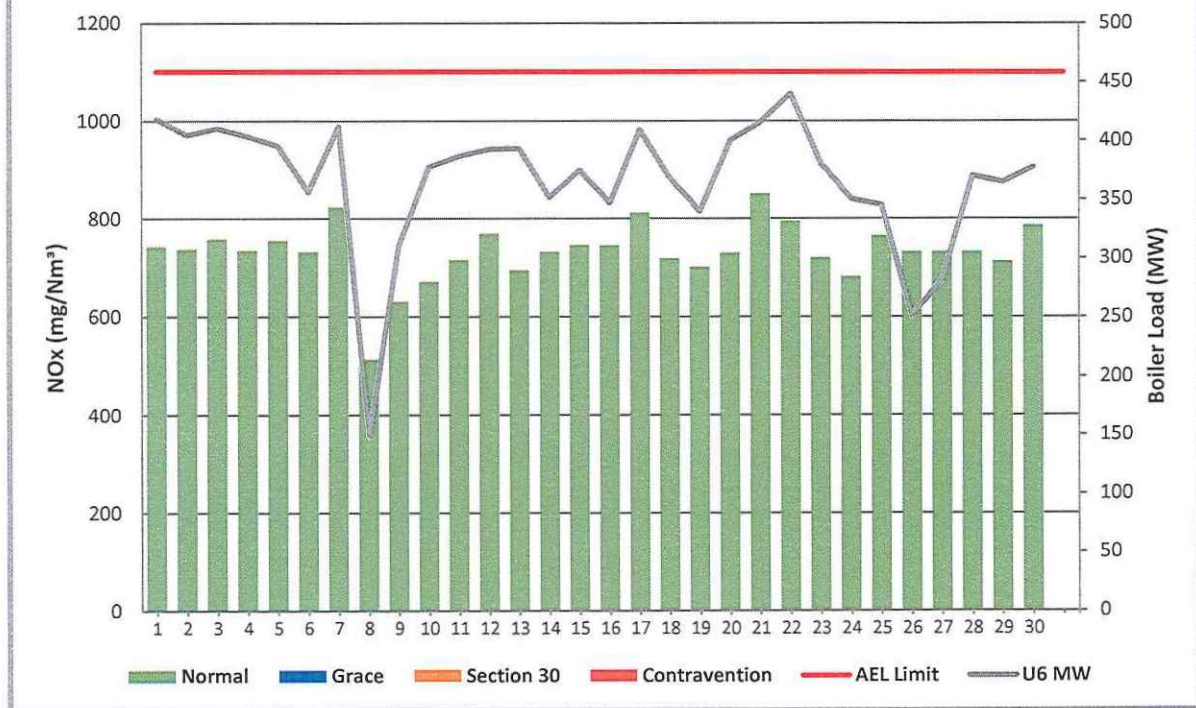


Figure 12: Duvha Unit 6 NOx Emissions - November 2022



7 SHUT DOWN AND LIGHT UP INFORMATION

Tables 7.1: Shut-down and light-up information for the month of November 2022

Unit No.1	<i>Event 1</i>	
Breaker Open (BO)	<i>8:10 am</i>	<i>2022/11/10</i>
Draught Group (DG) Shut Down (SD)	<i>11:50 am</i>	<i>2022/11/10</i>
BO to DG SD (duration)	<i>00:03:40</i>	DD:HH:MM
Fires in time	<i>8:05 pm</i>	<i>2022/11/14</i>
Synch. to Grid (or BC)	<i>2:15 am</i>	<i>2022/11/15</i>
Fires in to BC (duration)	<i>00:06:10</i>	DD:HH:MM
Emissions below limit from BC (end date)	<i>not > limit</i>	<i>not > limit</i>
Emissions below limit from BC (duration)	<i>n/a</i>	DD:HH:MM

Unit No.4	<i>Event 1</i>		<i>Event 2</i>		<i>Event 3</i>		<i>Event 4</i>	
Breaker Open (BO)	<i>5:50 pm</i>	<i>2022/11/02</i>	<i>BO previously</i>	<i>BO previously</i>	<i>8:55 am</i>	<i>2022/11/23</i>	<i>12:20 pm</i>	<i>2022/11/25</i>
Draught Group (DG) Shut Down (SD)	<i>4:20 am</i>	<i>2022/11/03</i>	<i>n/a</i>	<i>n/a</i>	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>
BO to DG SD (duration)	<i>00:10:30</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM
Fires in time			<i>6:35 am</i>	<i>2022/11/14</i>				
Synch. to Grid (or BC)								
Fires in to BC (duration)		DD:HH:MM	<i>00:09:20</i>	DD:HH:MM		DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)			<i>12:00 am</i>	<i>2022/11/18</i>				
Emissions below limit from BC (duration)		DD:HH:MM		DD:HH:MM		DD:HH:MM		DD:HH:MM

Unit No.5	<i>Event 1</i>	
Breaker Open (BO)	<i>4:20 pm</i>	<i>2022/11/28</i>
Draught Group (DG) Shut Down (SD)	<i>7:55 pm</i>	<i>2022/11/28</i>
BO to DG SD (duration)	<i>00:03:35</i>	DD:HH:MM
Fires in time	<i>12:10 pm</i>	<i>2022/11/29</i>
Synch. to Grid (or BC)	<i>6:00 pm</i>	<i>2022/11/29</i>
Fires in to BC (duration)	<i>00:05:50</i>	DD:HH:MM
Emissions below limit from BC (end date)	<i>1:00 am</i>	<i>2022/12/03</i>
Emissions below limit from BC (duration)	<i>03:07:00</i>	DD:HH:MM

Unit No.6	Event 1		Event 2	
Breaker Open (BO)	12:35 am	2022/11/08	12:15 am	2022/11/27
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)	n/a	DD:HH:MM	n/a	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

8 GENERAL

Units 3 and 4 were offload during the month of November 2022.

Exceedances:

Unit 4:

15-17/11/2022

- Unit cold light up.

19-20/11/2022

- SO3 plant kept fluctuating.

22-23/11/2022

- High back end temperatures after sootblowing conducted due to low sootblower availability.

24-25/11/2022

- Unit hot light up.

26-27/11/2022

- Hot unit light up.

29-30/2022

- Unit cold light up.

Unit 5

13/11/2022

- High back end temperatures after sootblowing conducted due to low sootblower availability.

15/11/2022

- High back end temperatures after sootblowing conducted due to low sootblower availability.

19-26/11/2022

- The 48 hours allowable for upset conditions were exceeded from the 19th to the 26th of November 2022 in unit 5. The final investigation reports will be submitted to your office once the investigation is completed.

28/11/2022

- High back end temperatures after sootblowing conducted due to low sootblower availability.

30/11/2022

- Cold unit light up.

Unit 6

27/10/2022 – 08/11/2022

- Contravention Incident: The 72 hours allowable for a cold unit light up were exceeded at Duvha unit 6 from the 27th of October 2022 to the 08th of November 2022. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

13-15/11/2022

- Contravention Incident: The 48 Hours allowable have been exceeded on Duvha's unit 6 on the 15th of November 2022. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

17-18/11/2022

- High back end temperatures after sootblowing conducted due to low sootblower availability.

20/11/2022

- High back end temperatures after sootblowing conducted due to low sootblower availability.

24-27/11/2022

- The 48 hours allowable for upset conditions were exceeded from the 24th to the 27th of November 2022 in unit 6. The final investigation reports will be submitted to your office once the investigation is completed.

28-30/11/2022

- The 48 hours allowable for a hot unit light were exceeded from the 30th of November 2022 in unit 6. The final investigation reports will be submitted to your office once the investigation is completed.

Unit 4 NOx monitor reliability for the month of November 2022 was less than 80 % due to power supply failure resulting from heavy rainfall on 13 -15/11/2022. The power supply was restored.

The averages Oxygen(O₂) and Carbon Dioxide (CO₂) data from the QAL 2 tests reports were used for reporting for Units 1, 5 and 6 due to poor performance of the O₂ and CO₂ gaseous monitors. These poor performances of the gaseous monitors were identified to be caused by the incorrect

installation of O2 analyser. An action is being implemented to relocate all the units' O2 monitors to their own measurement port. This action will be completed no later than 31 December 2022.

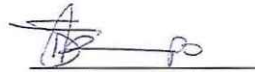
The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission report which will be sent to your office

9 and 10 Complaints and S30 Incidents Register


Refer to addendum A


 Ndwelezi
 Boiler Plant Engineering
 Manager

19 Jan 2023
 Date


 Environmental
 Manager

2023/01/24
 Date


 Engineering Manager

24/01/2023
 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
	Duvha Power Station:	E Patel
		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 November 2022

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 measure will be implemented
No complaints were received during the month of November 2022.					

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	30/10/2022	08/11/2022	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 at Duvha unit 6 from the 27 th of October 2022 to the 08 th of November 2022. A detailed investigation report with root cause and preventative actions will be submitted to your

							office once investigation completed.
Unit 6	15/11/2022	15/11/2022	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 48 Hours allowable have been exceeded on Duvha's unit 6 on the 15th of November 2022. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

Unit 5	19/11/2022	26/11/2022	Incident still under investigation	21/11/2022	Incident still under investigation	Not yet received	N/A	The 48 hours allowable for upset conditions were exceeded from the 19 th to the 26 th of November 2022 in unit 5. The final investigation report will be submitted to your office once the investigation is completed.
Unit 6	24/11/2022	27/11/2022	Incident still under investigation	28/11/2022	Incident still under investigation	Not yet received.	N/A	The 48 hours allowable for upset conditions were exceeded from the 24 th to the 27 th of November 2022 in unit 6. The final investigation report will be submitted to your office once the investigation is completed.

