Eskom

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DUVHA POWER STATION

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

GENERAL MANAGER

2023/03/02
DATE

Eskom

JANUARY 2023

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 Jan-2023
	Coal	Tons	*1 400 000*	*355 806.63*
	Fuel Oil	Tons	*5 000*	*3728.68*
Production Rates	**Product / By-Product Name**	**Units**	**Maximum Production Capacity Permitted**	**Production Rate Jan-2023**
	Energy	GWh	*3600*	*597.50*
	Ash	Tons	*not specified*	*95 676.40*

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	*0.6 TO >1.2*	*0.85*
Ash Content	%	*27 TO 30*	*26.89*

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO_2	NOx
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 Jan-2023	Technology Type	SO_3 Utilization Jan-2023
Unit 1	*FFP*	*99.9%*	*n/a*	*n/a*
Unit 4	*ESP + SO_3*	*97.1%*	*SO_3*	*99.7%*
Unit 5	*ESP + SO_3*	*99.6%*	*SO_3*	*100.0%*
Unit 6	*ESP + SO_3*	*99.5%*	*SO_3*	*99.8%*

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

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO_2	NO	O_2
Unit 1	*100.0*	*99.7*	*99.7*	*100.0*
Unit 4	*74.6*	*52.9*	*51.9*	*100.0*
Unit 5	*100.0*	*100.0*	*100.0*	*100.0*
Unit 6	*99.0*	*58.2*	*58.4*	*100.0*

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of January 2023

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	19.2	1 790	908
Unit 4	805.5	2 675	1 418
Unit 5	19.8	335	154
Unit 6	140.2	2 119	1 037
SUM	984.64	6 919	3 516

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	15	0	0	0	0	19.1
Unit 4	9	2	13	0	15	530.9
Unit 5	1	3	0	0	3	122.8
Unit 6	19	6	0	0	6	103.9
SUM	**44**	**11**	**13**	**0**	**24**	

Table 6.3: Operating days in compliance to SO_2 AEL Limit - January 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO_2 (mg/Nm³)
Unit 1	16	0	0	0	0	1 562.9
Unit 4	26	0	0	0	0	1 870.5
Unit 5	6	0	0	0	0	1 421.6
Unit 6	28	0	0	0	0	1 585.4
SUM	**76**	**0**	**0**	**0**	**0**	

Table 6.4: Operating days in compliance to NOx AEL Limit - January 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	16	0	0	0	0	795.7
Unit 4	26	0	0	0	0	998.7
Unit 5	6	0	0	0	0	635.8
Unit 6	28	0	0	0	0	769.3
SUM	**76**	**0**	**0**	**0**	**0**	

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

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 - January 2023

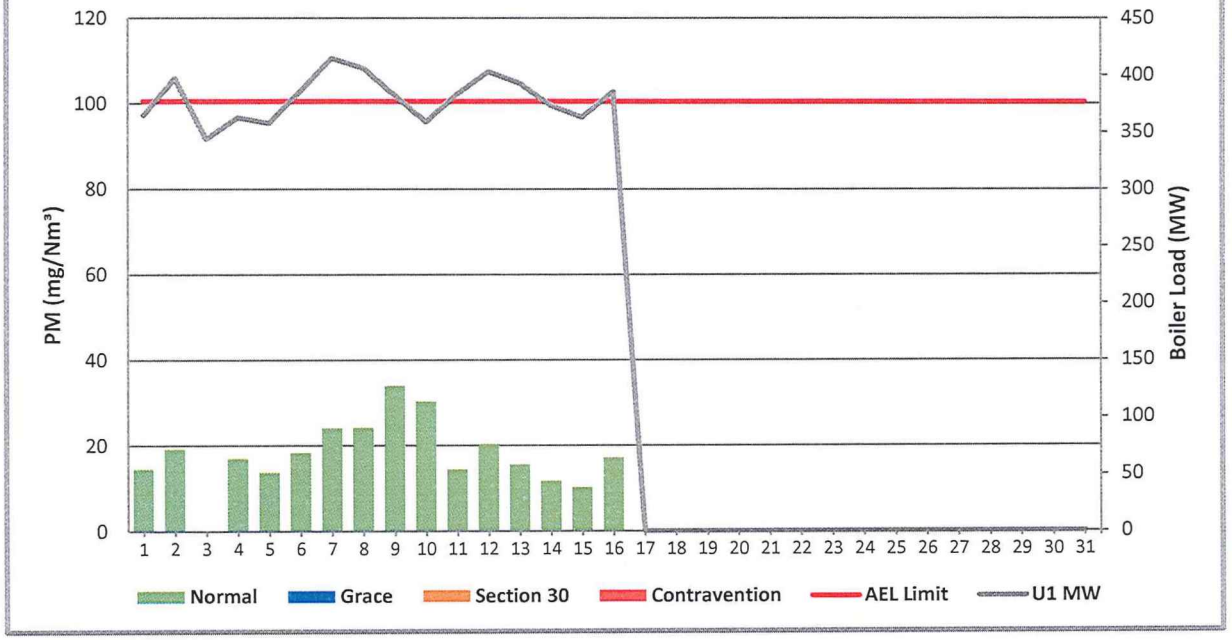


Figure 2: Duvha Unit 4 PM Emissions - January 2023

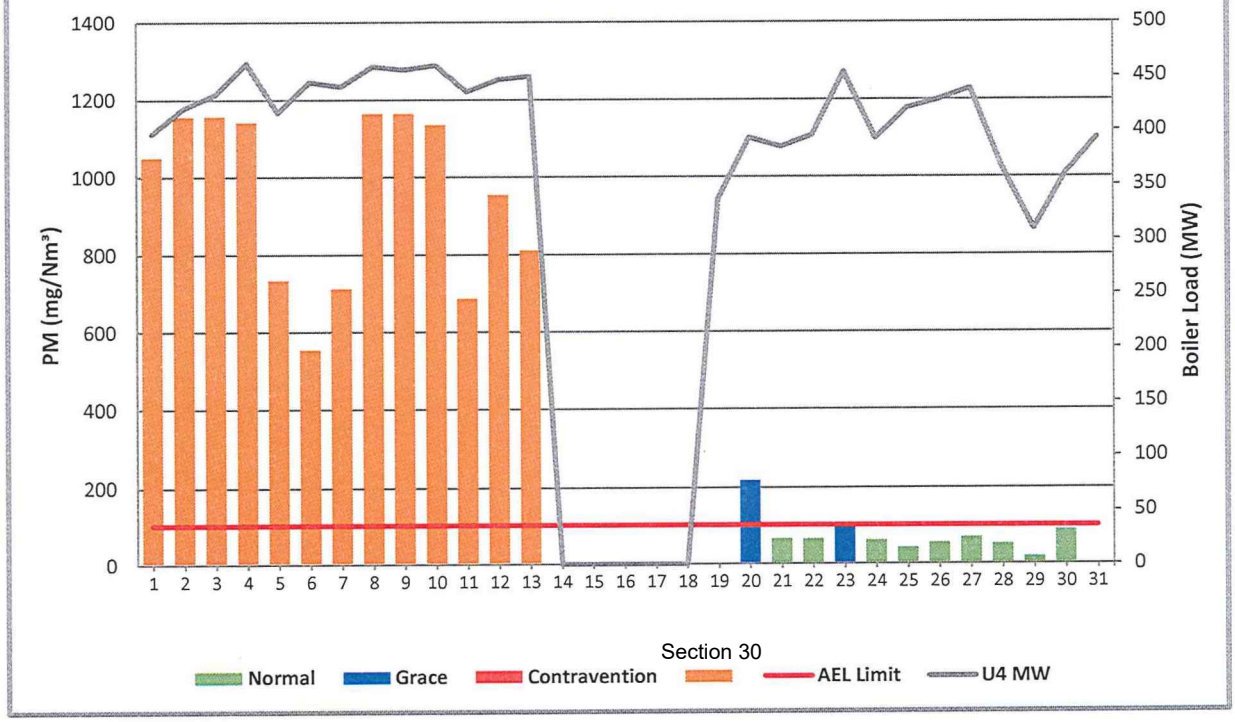


Figure 3: Duvha Unit 5 PM Emissions - January 2023

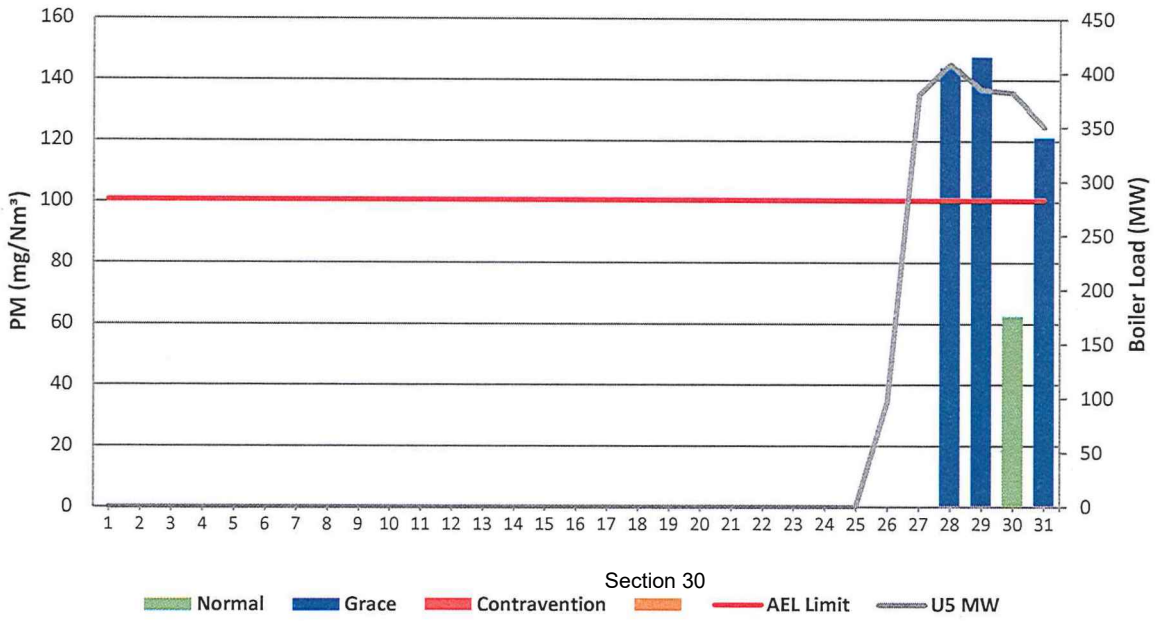


Figure 4: Duvha Unit 6 PM Emissions - January 2023

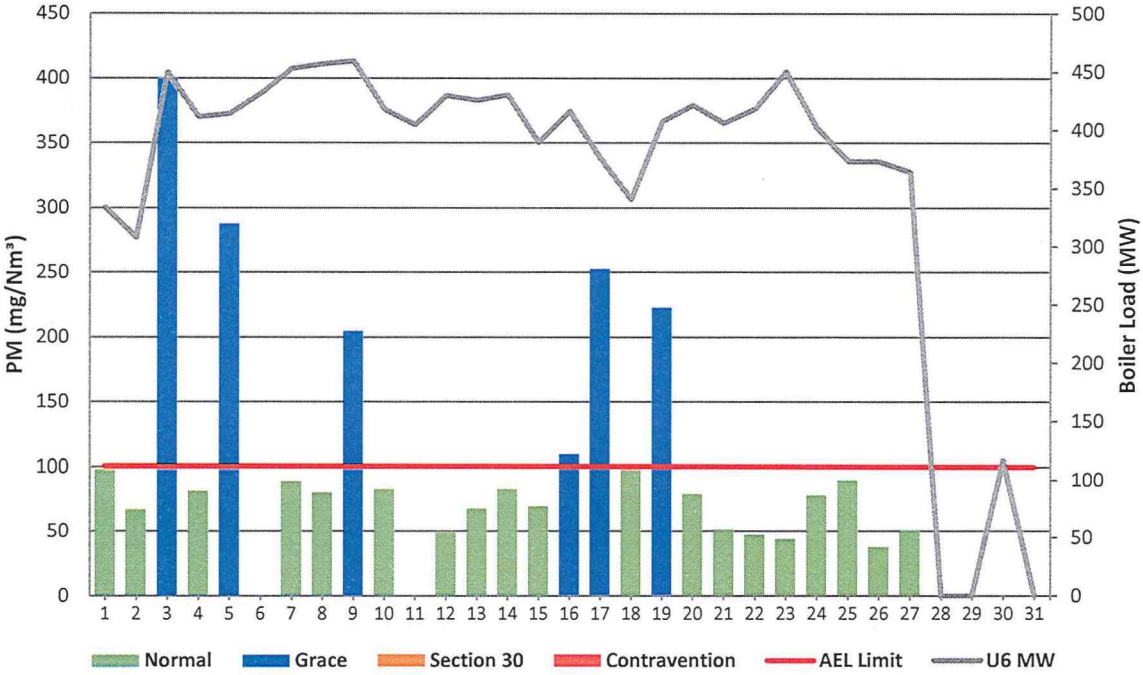


Figure 5: Duvha Unit 1 SO_2 Emissions - January 2023

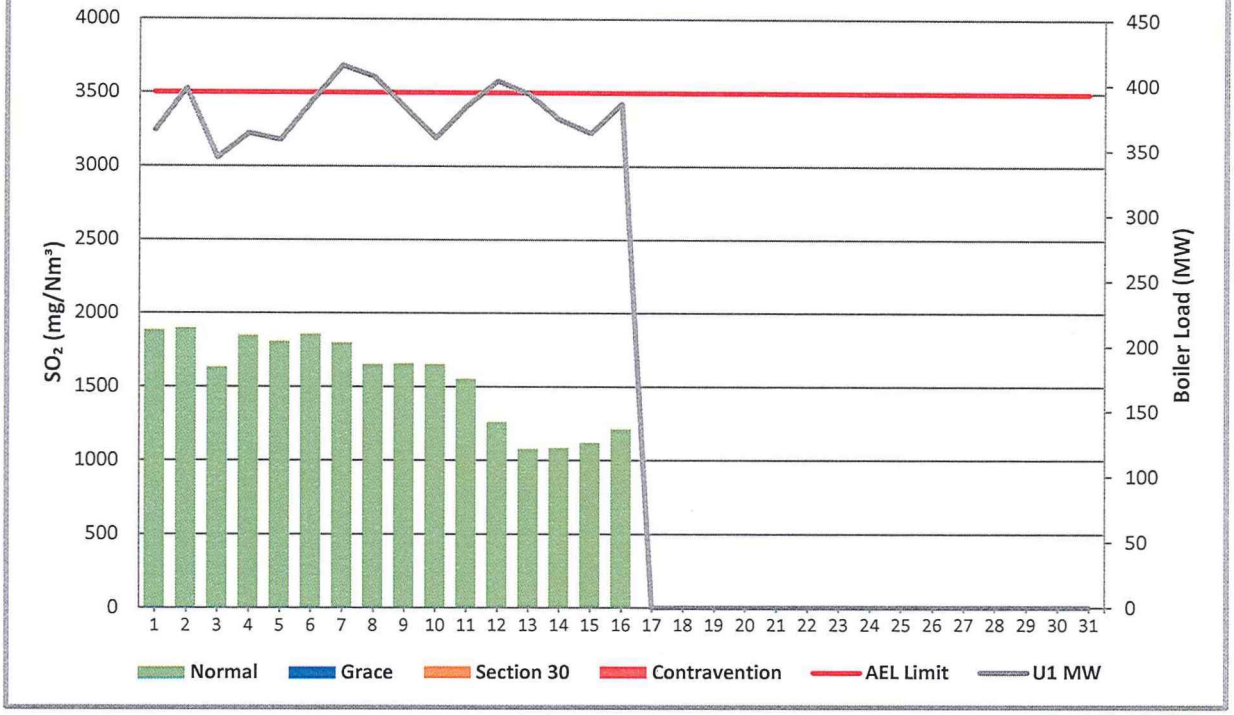


Figure 6: Duvha Unit 4 SO_2 Emissions - January 2023

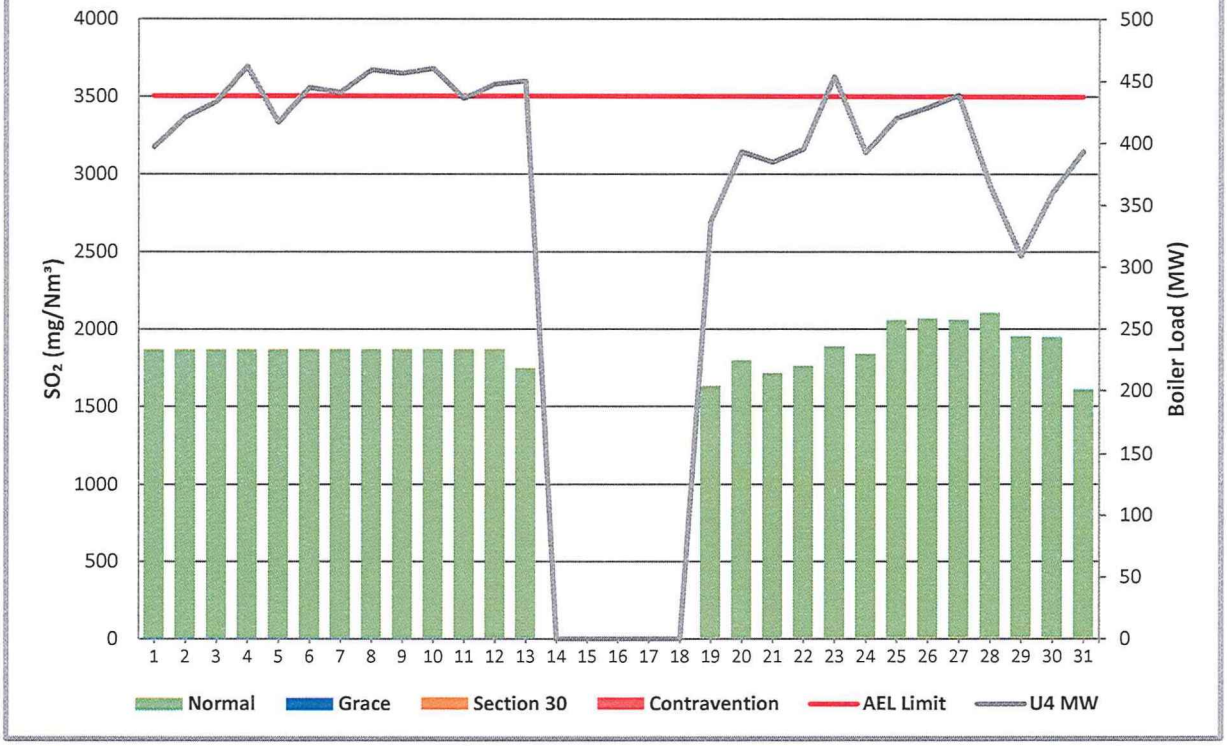


Figure 7: Duvha Unit 5 SO_2 Emissions - January 2023

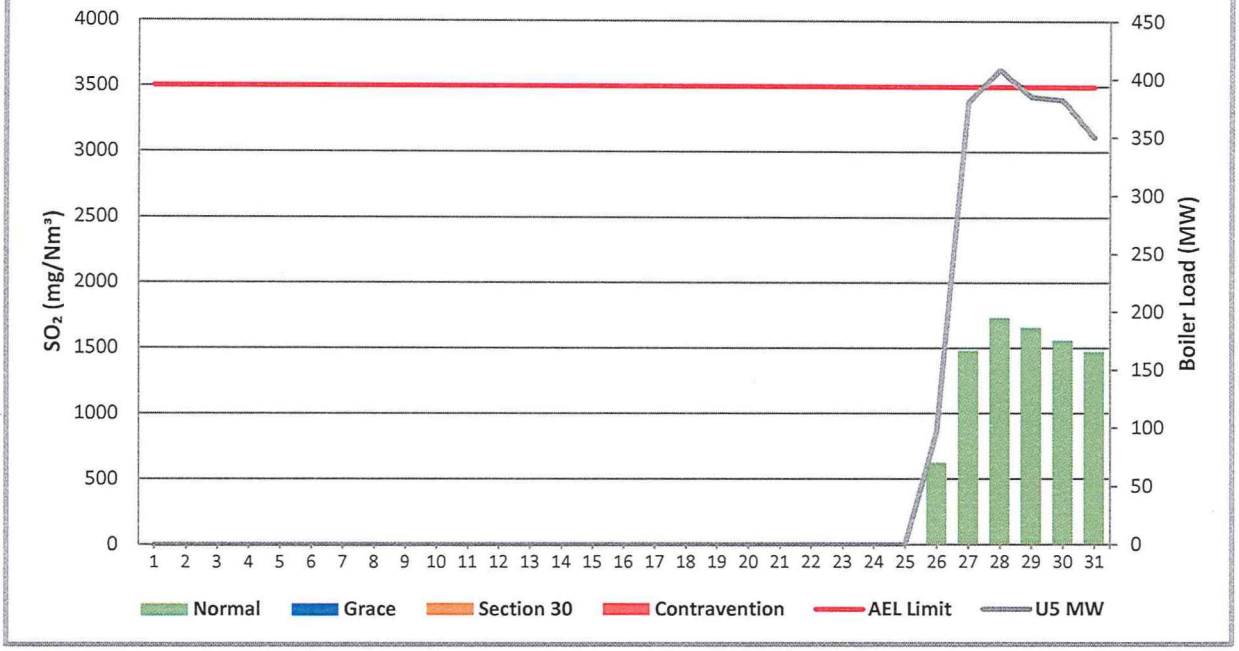


Figure 8: Duvha Unit 6 SO_2 Emissions - January 2023

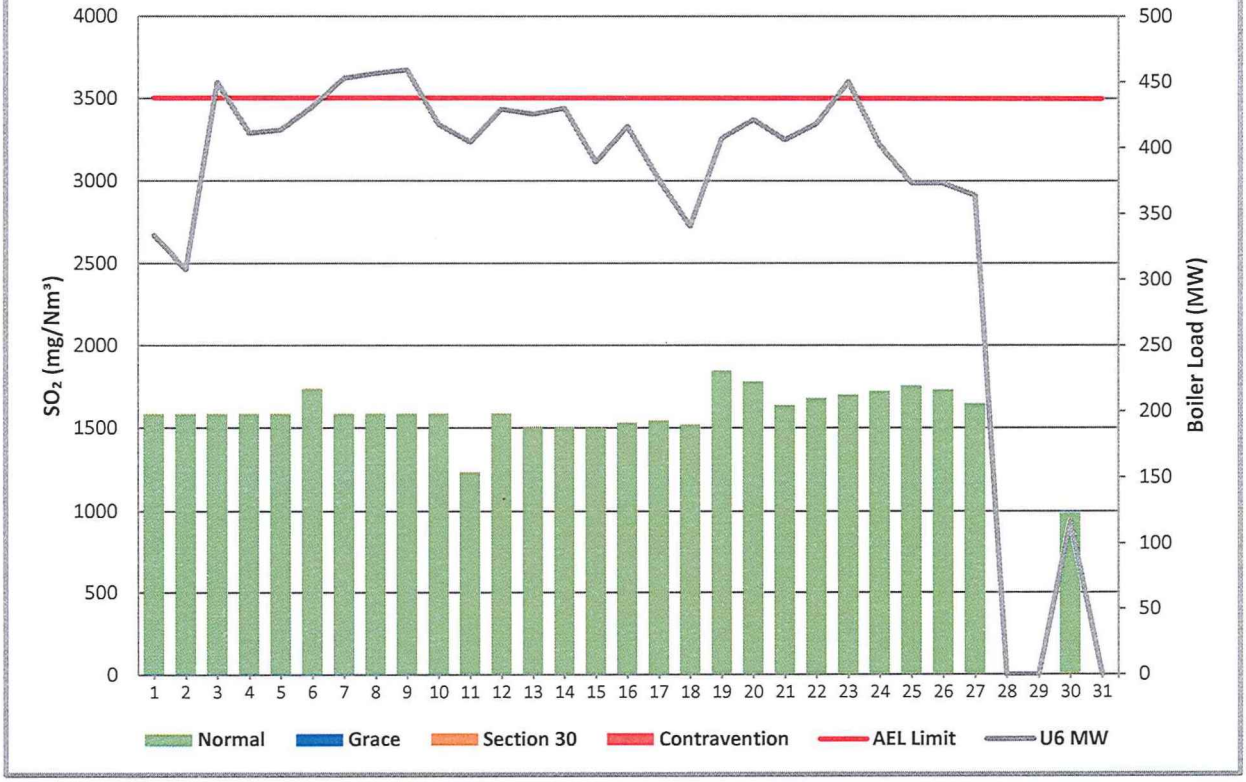


Figure 9: Duvha Unit 1 NOx Emissions - January 2023

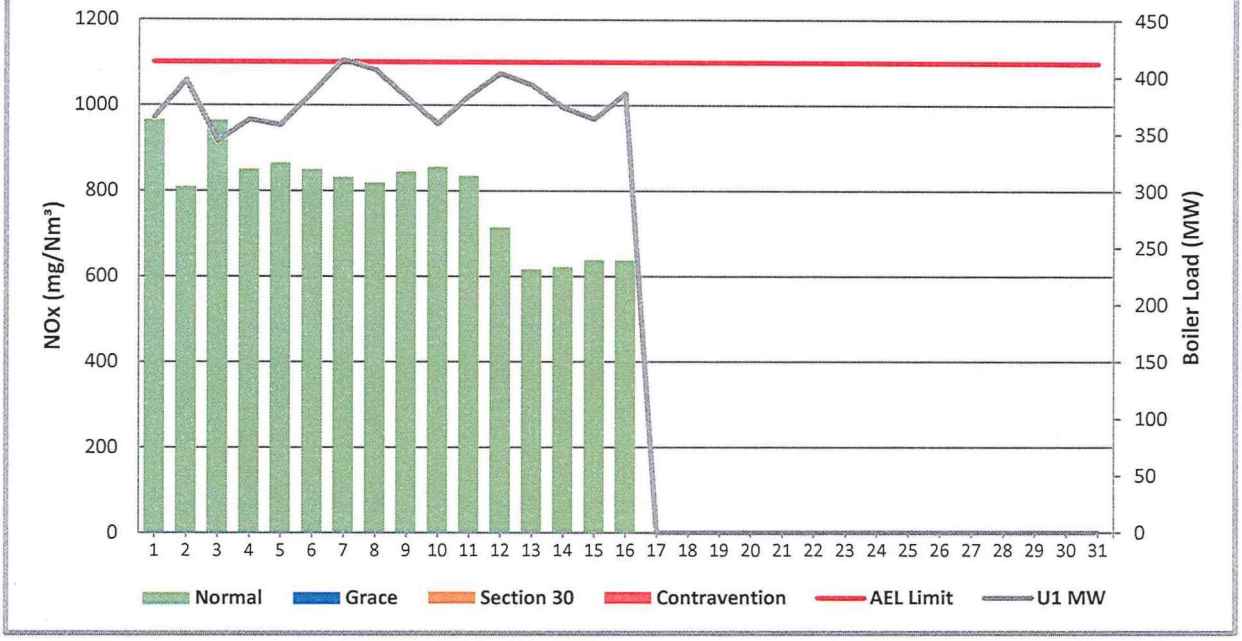


Figure 10: Duvha Unit 4 NOx Emissions - January 2023

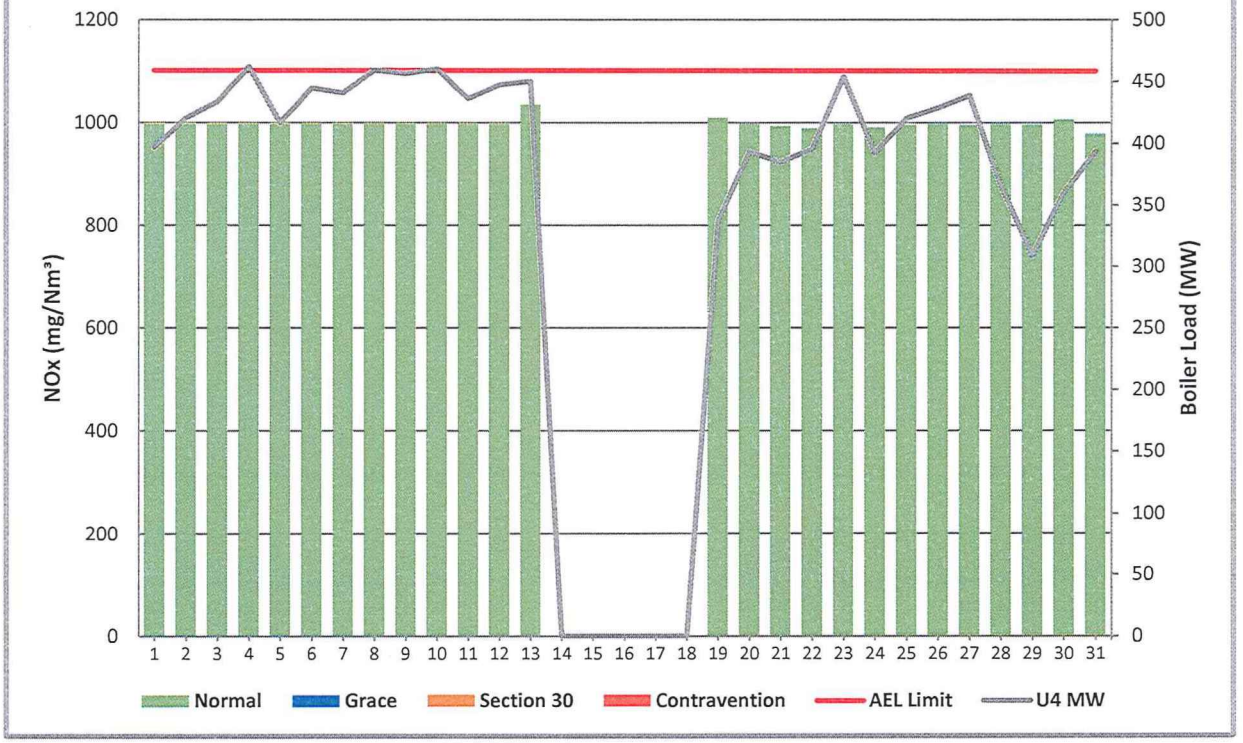


Figure 11: Duvha Unit 5 NOx Emissions - January 2023

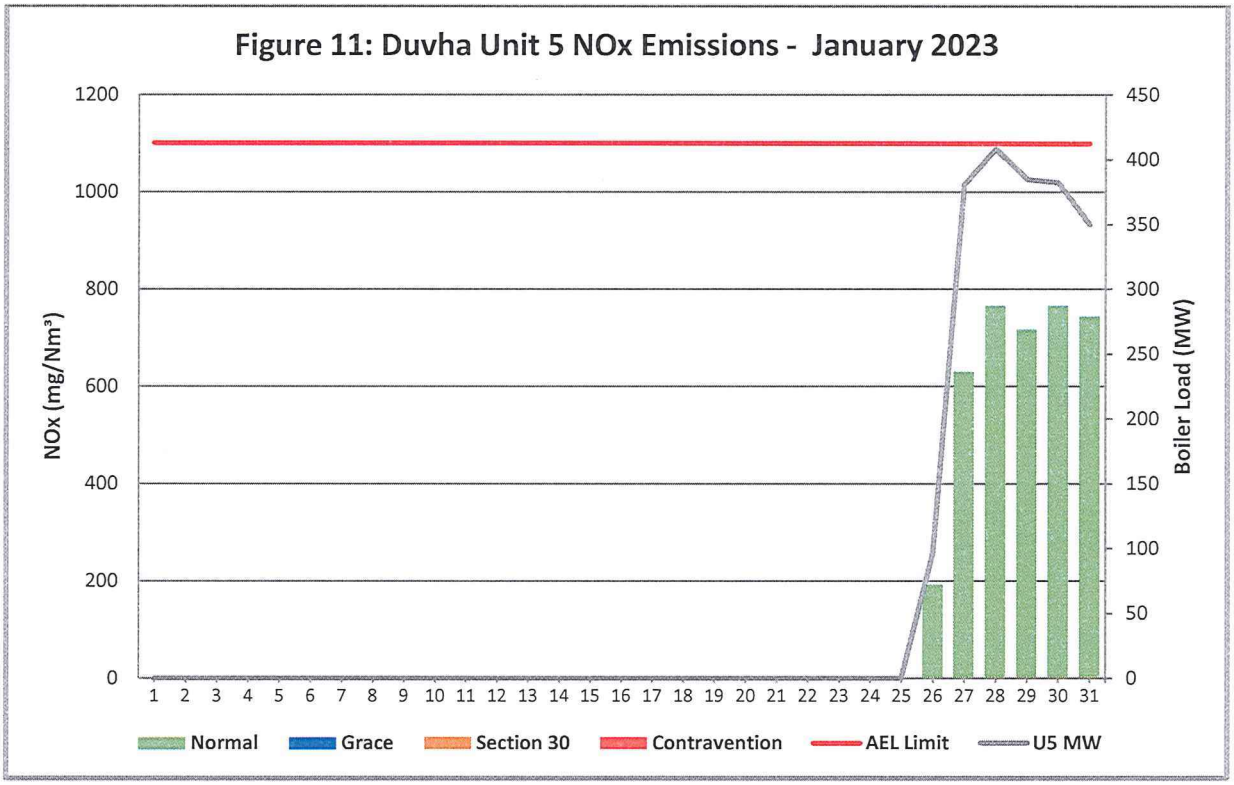
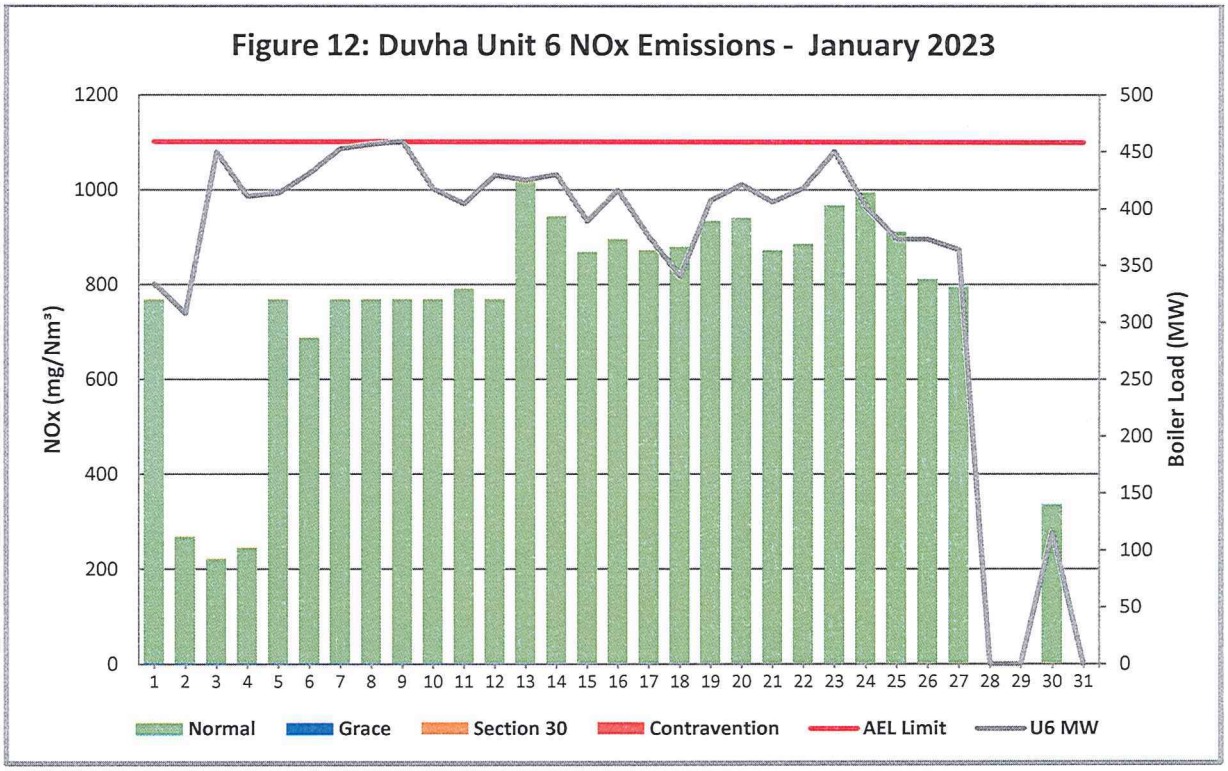


Figure 12: Duvha Unit 6 NOx Emissions - January 2023



7 SHUT DOWN AND LIGHT UP INFORMATION

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

Unit No.1	Event 1		Event 2		Event 3	
Breaker Open (BO)	11:10 am	2023/01/01	11:40 pm	2023/01/02	4:15 pm	2023/01/16
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	9:30 pm	2023/01/16
BO to DG SD (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM	00:05:15	DD:HH:MM
Fires in time						
Synch. to Grid (or BC)	4:50 pm	2023/01/01				
Fires in to BC (duration)		DD:HH:MM		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		DD:HH:MM

Unit No.4	Event 1		Event 2	
Breaker Open (BO)	7:00 pm	2023/01/13	10:10 am	2023/01/30
Draught Group (DG) Shut Down (SD)	2:10 pm	2023/01/14	10:25 am	2023/01/31
BO to DG SD (duration)	00:19:10	DD:HH:MM	01:00:15	DD:HH:MM
Fires in time	1:25 am	2023/01/19		
Synch. to Grid (or BC)	4:20 am	2023/01/06		
Fires in to BC (duration)	00:10:35	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	12:00 am	2023/01/21		
Emissions below limit from BC (duration)	14:19:40	DD:HH:MM		DD:HH:MM

Unit No.5	Event 1	
Breaker Open (BO)	BO previously	BO previously
Draught Group (DG) Shut Down (SD)	n/a	n/a
BO to DG SD (duration)	n/a	DD:HH:MM
Fires in time	2:20 am	2023/01/26
Synch. to Grid (or BC)	5:35 am	2023/01/27
Fires in to BC (duration)	01:03:15	DD:HH:MM
Emissions below limit from BC (end date)	12:00 am	2023/01/30
Emissions below limit from BC (duration)	02:18:25	DD:HH:MM

Unit No.6	Event 1		Event 2		Event 3	
Breaker Open (BO)	*10:55 pm*	*2023/01/05*	*10:05 pm*	*2023/01/10*	*9:50 am*	*2023/01/27*
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*	*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	*n/a*	DD:HH:MM
Fires in time						
Synch. to Grid (or BC)						
Fires in to BC (duration)		DD:HH:MM		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		DD:HH:MM

8 GENERAL

Unit 2 was offload during the month of January 2023.

Exceedances:

Unit 4:

27-31/12/2022-13/01/2023

- The 72 hours allowable for a cold unit light-up were exceeded from the 29th of December 2022 on unit 4. The final investigation report will be submitted to your office once the investigation is completed.

20/01/2023

- Cold unit light up.

23/01/2023

- High backend temperatures after sootblowing conducted.

30/01/2023

- Hot unit light up.

Unit 5:

28-29/01/2023

- Cold unit light up.

31/01/2023

- Cold unit light up.

Unit 6:

03/01/2023

- The SO3 plant kept on tripping on process air flow deviation alarm.

05/01/2023

- The SO3 plant kept on tripping on process air flow deviation alarm.
- The Electrostatic precipitator fields computer screen was not working.

09/01/2023

- Hot unit light up.

16-17/01/2023

- Underperforming ESPs and a total of 4 ESPs tripped on undervoltage,
- High backend temperatures after sootblowing conducted due to low availability of sootblowers,
- Blocked DHP dust hoppers

19/01/2023

- Underperforming ESPs and a total of 4 ESPs tripped on undervoltage,
- High backend temperatures after sootblowing conducted due to low availability of sootblowers

Unit 4 PM emissions monitors reliability for the month of January 2023 were less than 80% due to the monitor maxing out. The correlation spot check surrogate values were used during the period the monitors maxed out.

Units 4, 5 and 6 gaseous emissions monitors reliabilities were below the 80% threshold due to the control air that was isolated for statutory work on unit 5 during the outage. The control air was bypassed, and the monitors started reading.

The averages Oxygen(O2) and Carbon Dioxide (CO2) data from the QAL 2 tests reports were used for reporting for Units 1, 4, 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. The monitors have been relocated successfully and are being verified.

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 Complaints and 10 S30 Incidents Register

Refer to ~~addendum A~~

Boiler Plant Engineering ~~Manager~~	01/03/2023	Environmental Manager	01/03/2023
	Date		Date

Engineering Manager

01/03/2023
Date

Compiled by:	Environmental Officer	
For:	Nkangala District Municipality	Air Quality Officer
Copies:	Generation Environmental Management	D Herbst
		B Mccourt
	Generation Compliance Management	R Rampiar
	Generation Asset Management	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 January 2023

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 January 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 4	29/12/2022	13/01/2023	Incident still under investigation		03/01/2023	Incident still under investigation	Not yet received	N/A	The 72 hours allowable for a cold unit light-up were exceeded from the 29th of December 2022 on unit 4. The final investigation report will be submitted to your office once the investigation is completed.