Eskom

Generation

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AND

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DUVHA POWER STATION

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

GENERAL MANAGER

2024/05/22

DATE

Eskom

JANUARY 2024

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-2024
	Coal	Tons	*1 400 000*	*472637.53*
	Fuel Oil	Tons	*5 000*	*6296.55*
Production Rates	**Product / By-Product Name**	**Units**	**Maximum Production Capacity Permitted**	**Indicative Production Rate Jan-2024**
	Energy	GWh	*2 505.600*	*795.12*
	Ash	Tons	*not specified*	*119530.03*

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	%	*0.6 TO >1.2*	*0.68*
Ash Content	%	*27 TO 30*	*25.29*

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO_2	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 Jan-2024	Technology Type	SO_3 Utlization Jan-2024
Unit 1	*FFP*	*Off*	*SO_3*	*n/a*
Unit 2	*FFP*	*100.0%*	*SO_3*	*n/a*
Unit 4	*ESP + SO_3*	*99.8%*	*SO_3*	*99.6%*
Unit 5	*ESP + SO_3*	*99.6%*	*SO_3*	*100.0%*
Unit 6	*ESP + SO_3*	*99.7%*	*SO_3*	*100.0%*
***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	*Unit Off*	*Unit Off*	*Unit Off*	*Unit Off*
Unit 2	*92.9*	*99.8*	*99.8*	*100.0*
Unit 4	*100.0*	*82.1*	*82.1*	*85.6*
Unit 5	*100.0*	*84.1*	*81.4*	*100.0*
Unit 6	*100.0*	*98.8*	*98.8*	*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 2024

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	Unit off	Unit off	Unit off
Unit 2	8.2	2 024	714
Unit 4	49.6	1 386	635
Unit 5	114.4	2 016	759
Unit 6	86.2	2 067	1 177
SUM	258.43	7 494	3 285

Table 6 2 Operating days in compliance to PM AEL Limit - January 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1		0	0	0	0	
Unit 2	21	0	0	0	0	8 3
Unit 4	19	3	0	0	3	53 3
Unit 5	25	2	0	0	3	84 3
Unit 6	20	3	0	0	3	66 3
SUM	**85**	**8**	**0**	**0**	**9**	

Table 6 3 Operating days in compliance to SO_2 AEL Limit - January 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO_2 (mg/Nm³)
Unit 1	Unit off	Unit off	Unit off	Unit off	Unit off	
Unit 2	23	0	0	0	0	1 736 4
Unit 4	24	0	0	0	0	1 296 2
Unit 5	28	0	0	0	0	1 443 7
Unit 6	24	0	0	0	0	1 431 6
SUM	**99**	**0**	**0**	**0**	**0**	

Table 6.4: Operating days in compliance to NOx AEL Limit - January 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	Unit off	Unit off	Unit off	Unit off	Unit off	
Unit 2	23	0	0	0	0	604.8
Unit 4	24	0	0	0	0	584.2
Unit 5	28	0	0	0	0	536.0
Unit 6	24	0	0	0	0	807.6
SUM	**99**	**0**	**0**	**0**	**0**	

Note: NO_x emissions is measured as NO in PPM. Final NO_x 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 2024

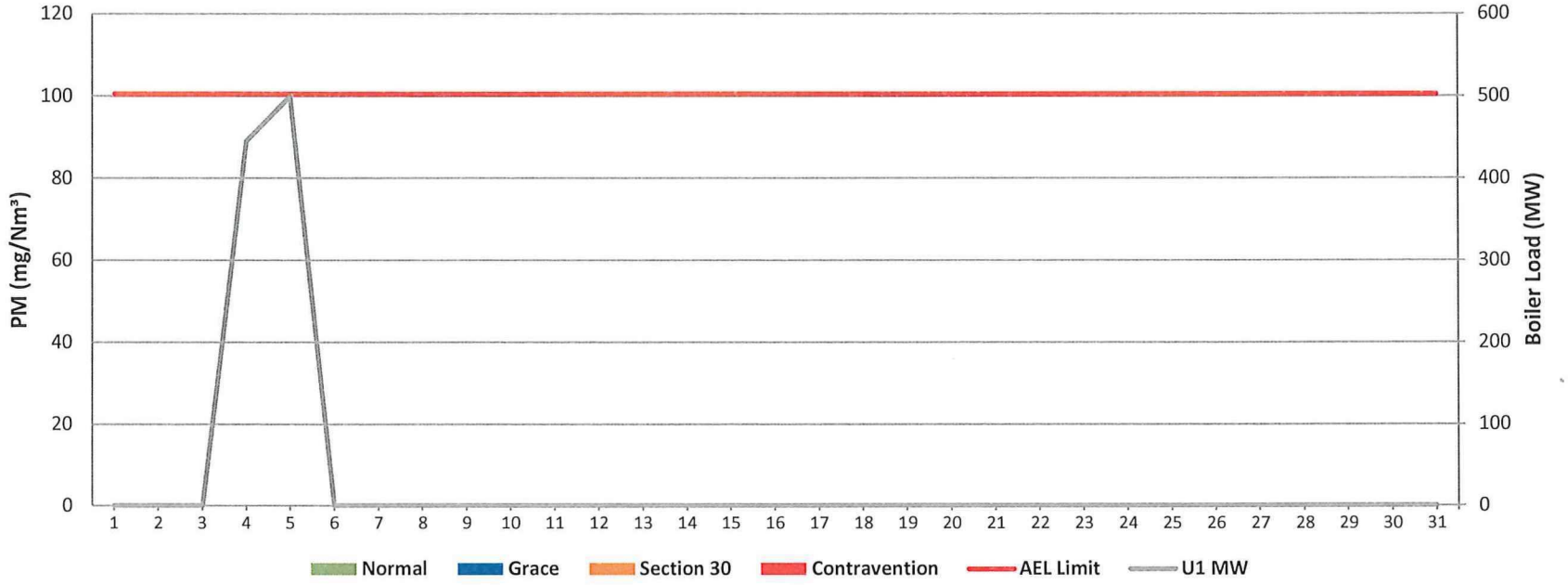


Figure 2: Duvha Unit 2 PM Emissions - January 2024

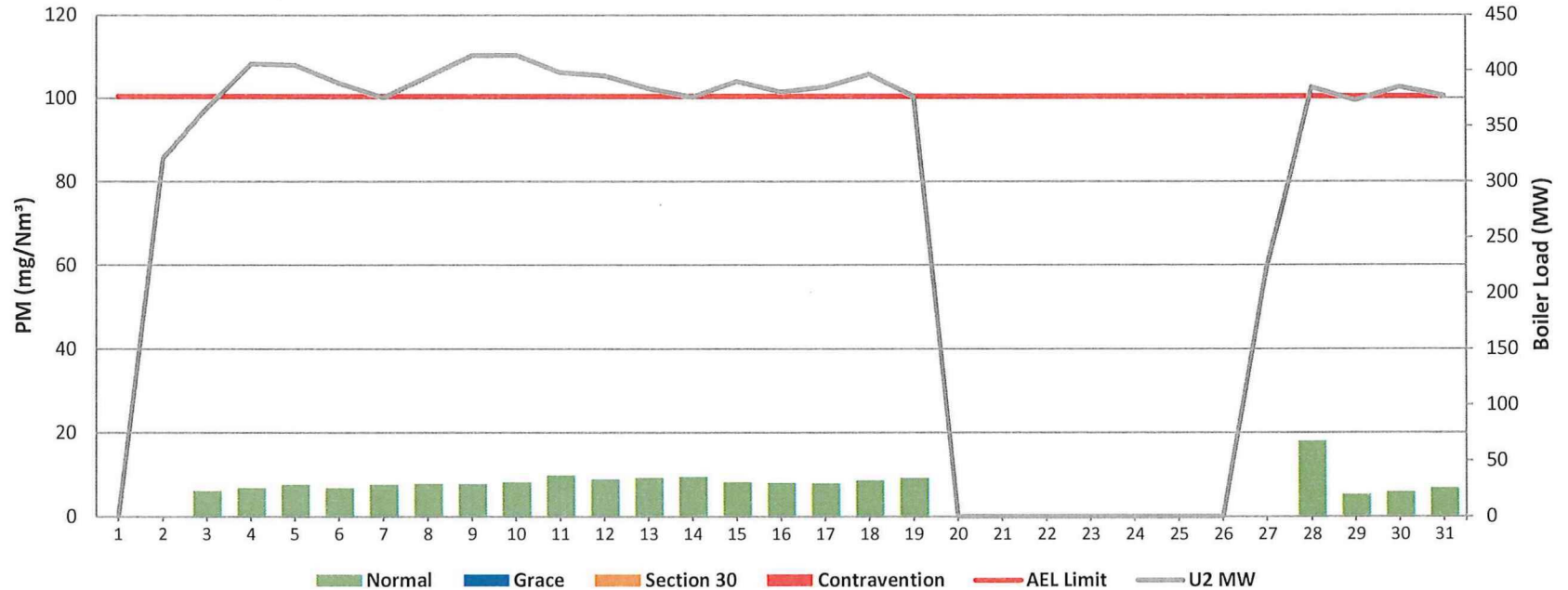


Figure 3: Duvha Unit 4 PM Emissions - January 2024

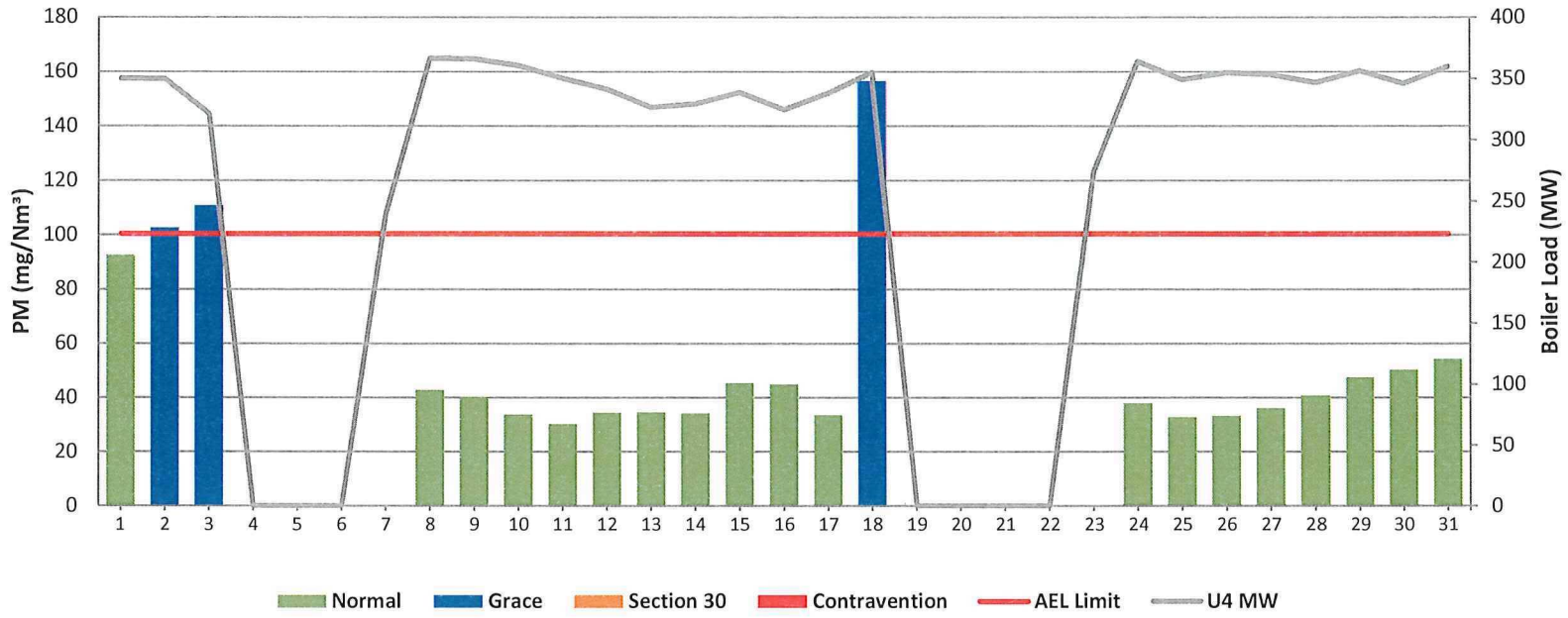


Figure 4: Duvha Unit 5 PM Emissions - January 2024

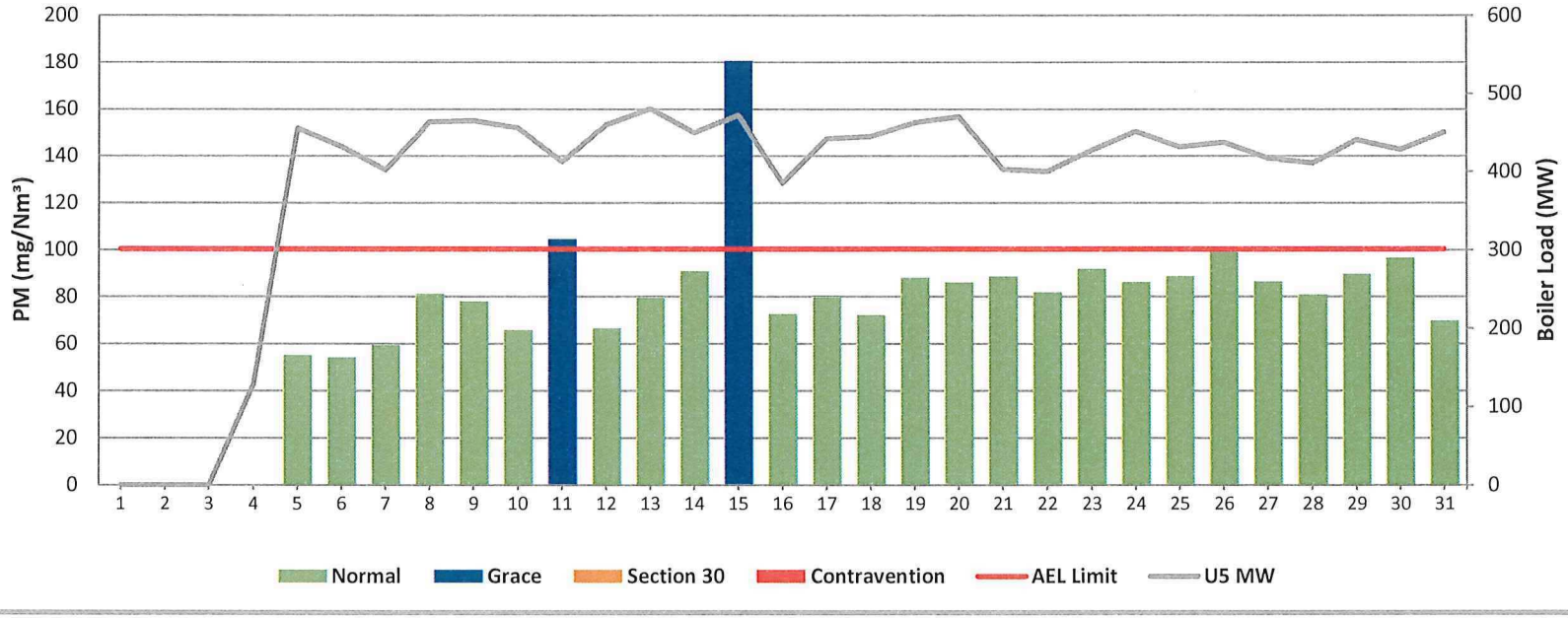


Figure 5: Duvha Unit 6 PM Emissions - January 2024

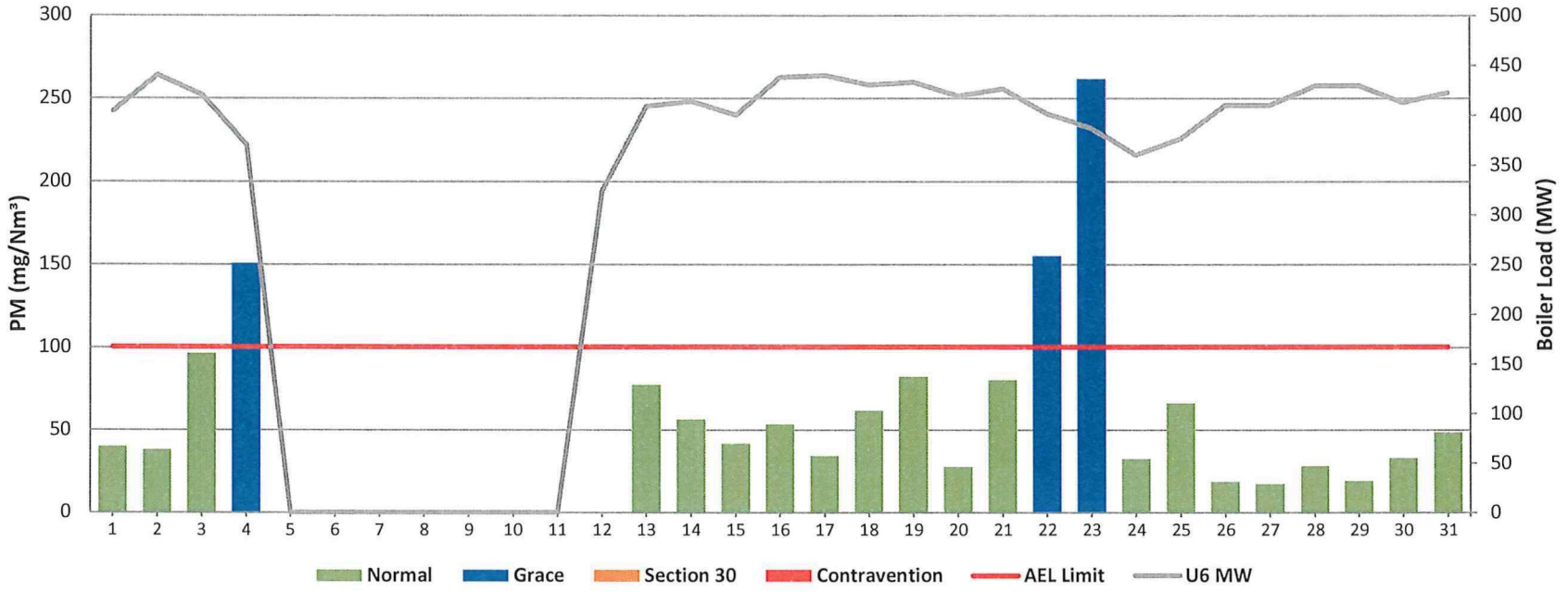


Figure 6: Duvha Unit 1 SO_2 Emissions - January 2024

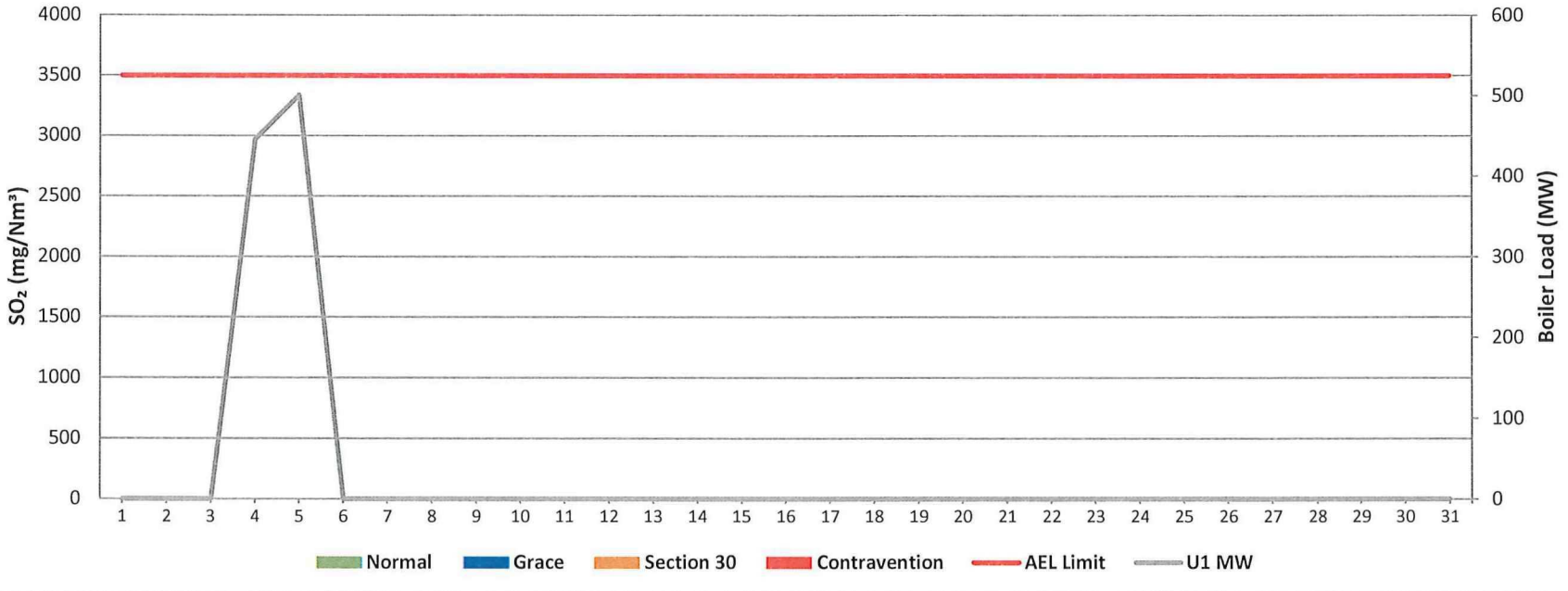


Figure 7: Duvha Unit 2 SO_2 Emissions - January 2024

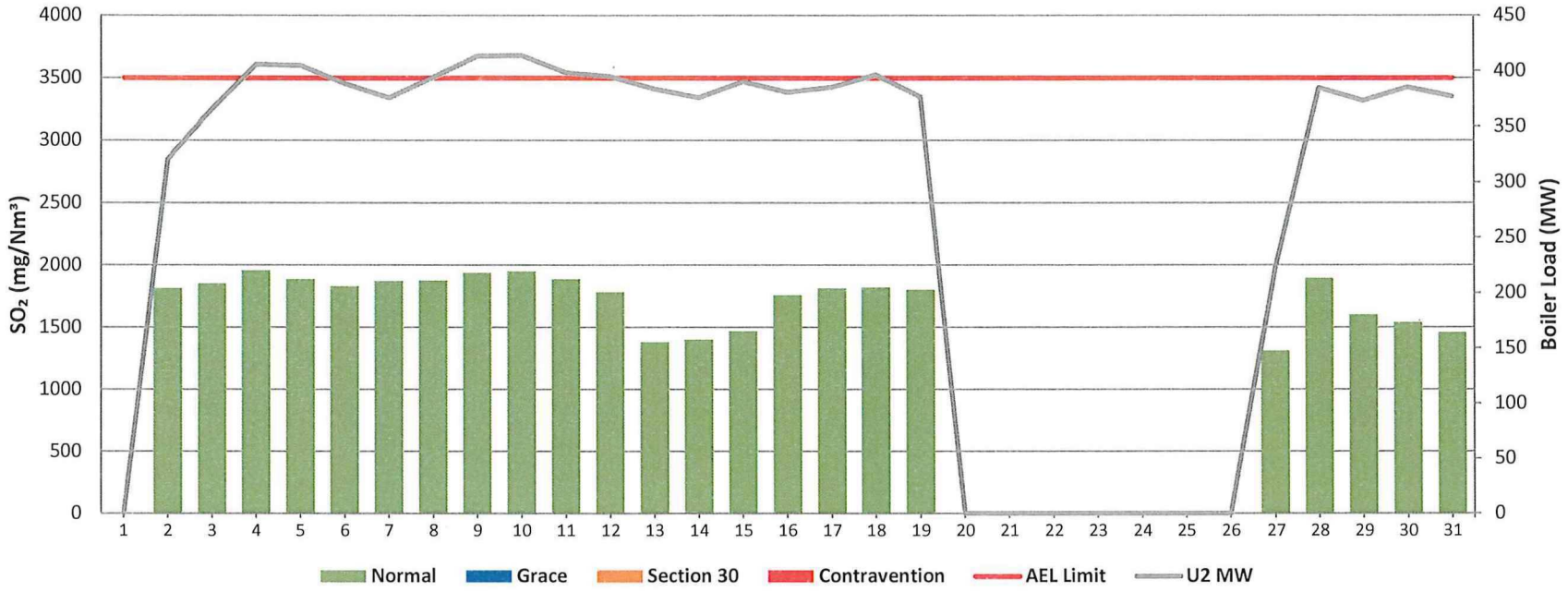


Figure 8: Duvha Unit 4 SO_2 Emissions - January 2024

Figure 9: Duvha Unit 5 SO_2 Emissions - January 2024

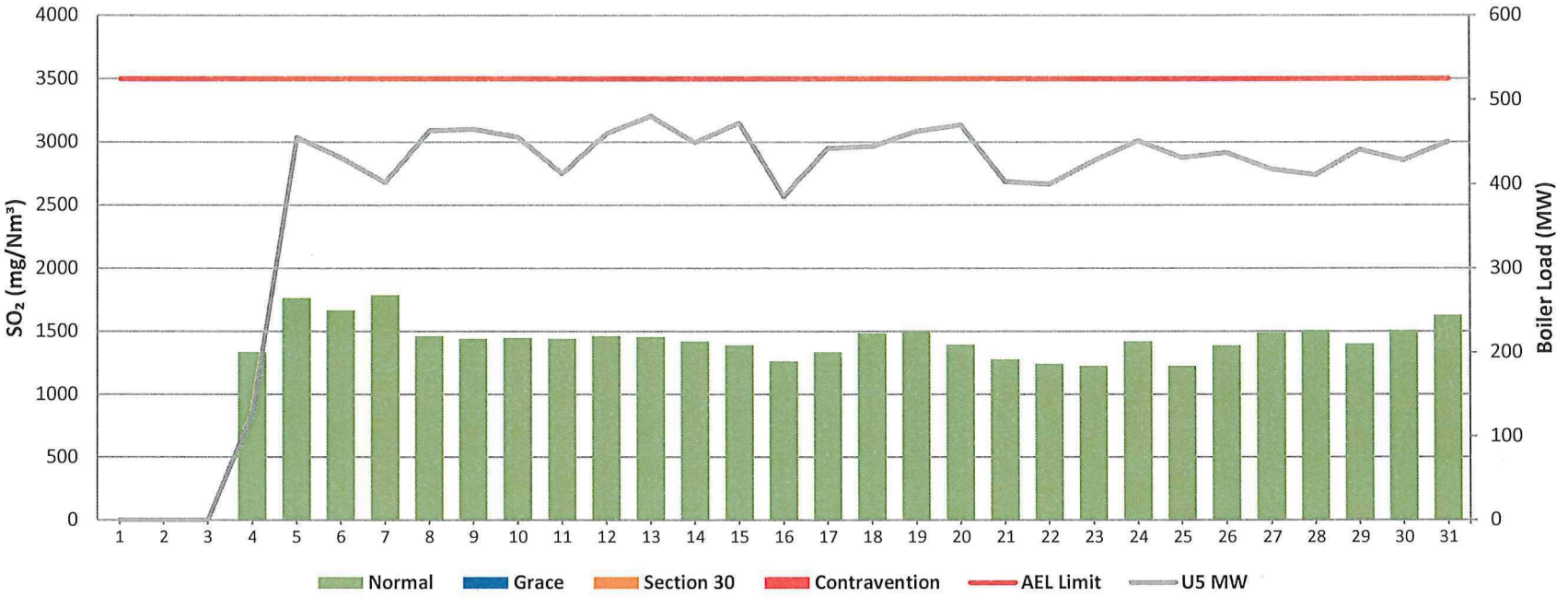


Figure 10: Duvha Unit 6 SO_2 Emissions - January 2024

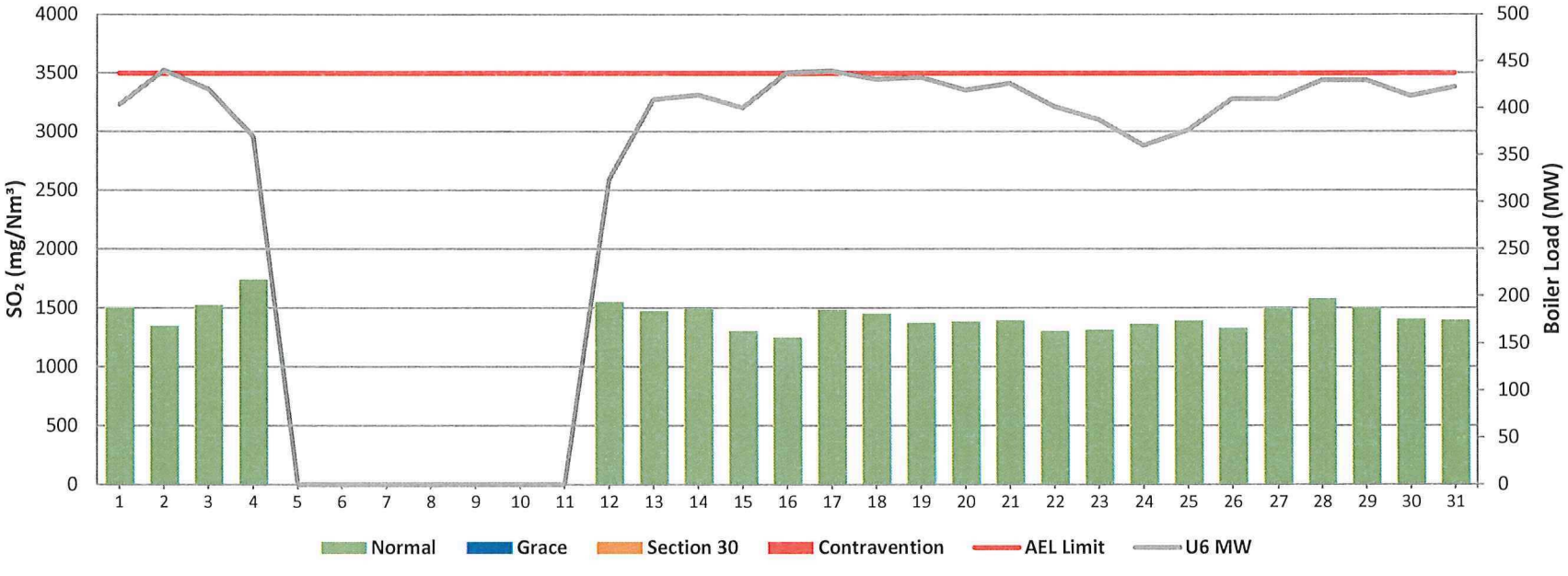


Figure 11: Duvha Unit 1 NOx Emissions - January 2024

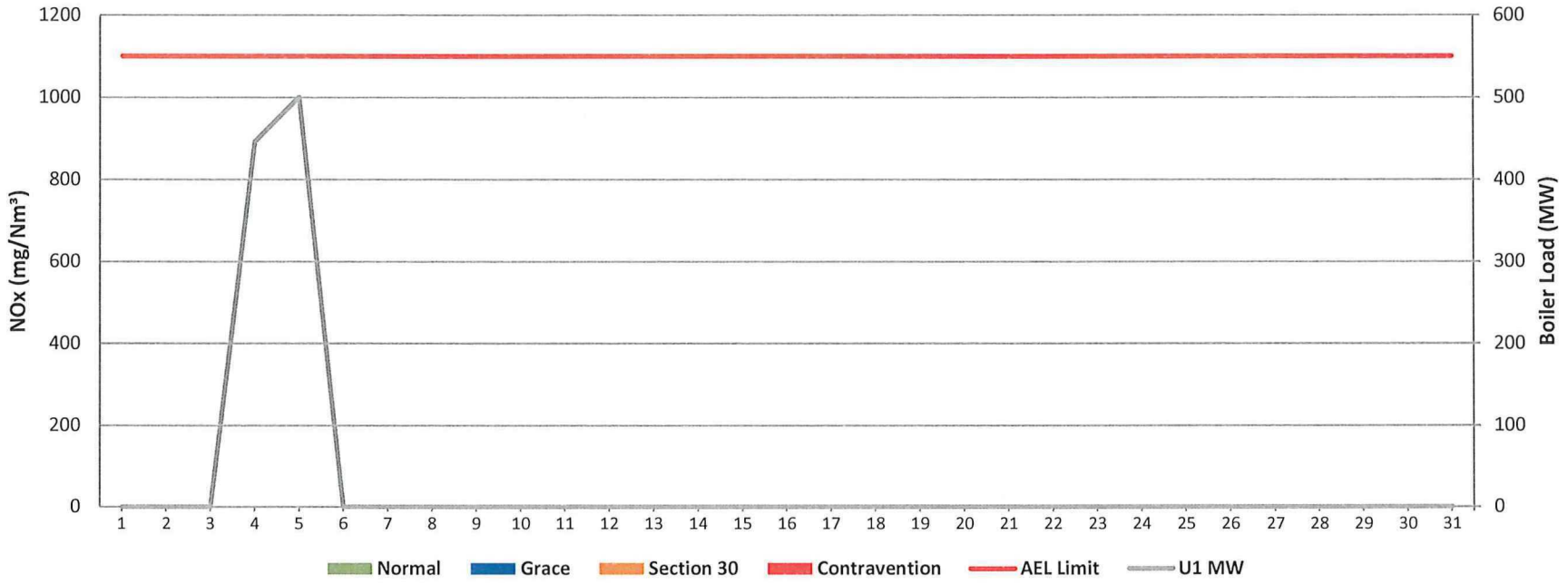


Figure 12: Duvha Unit 2 NOx Emissions - January 2024

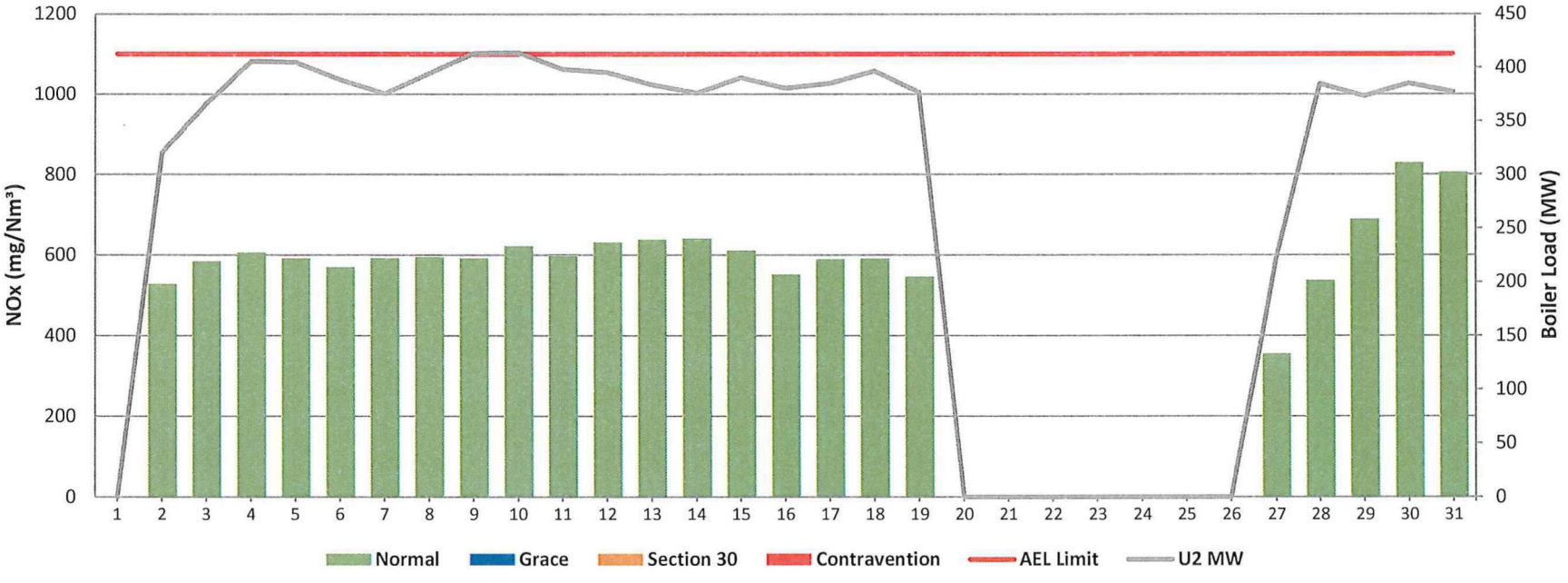


Figure 13: Duvha Unit 4 NOx Emissions - January 2024

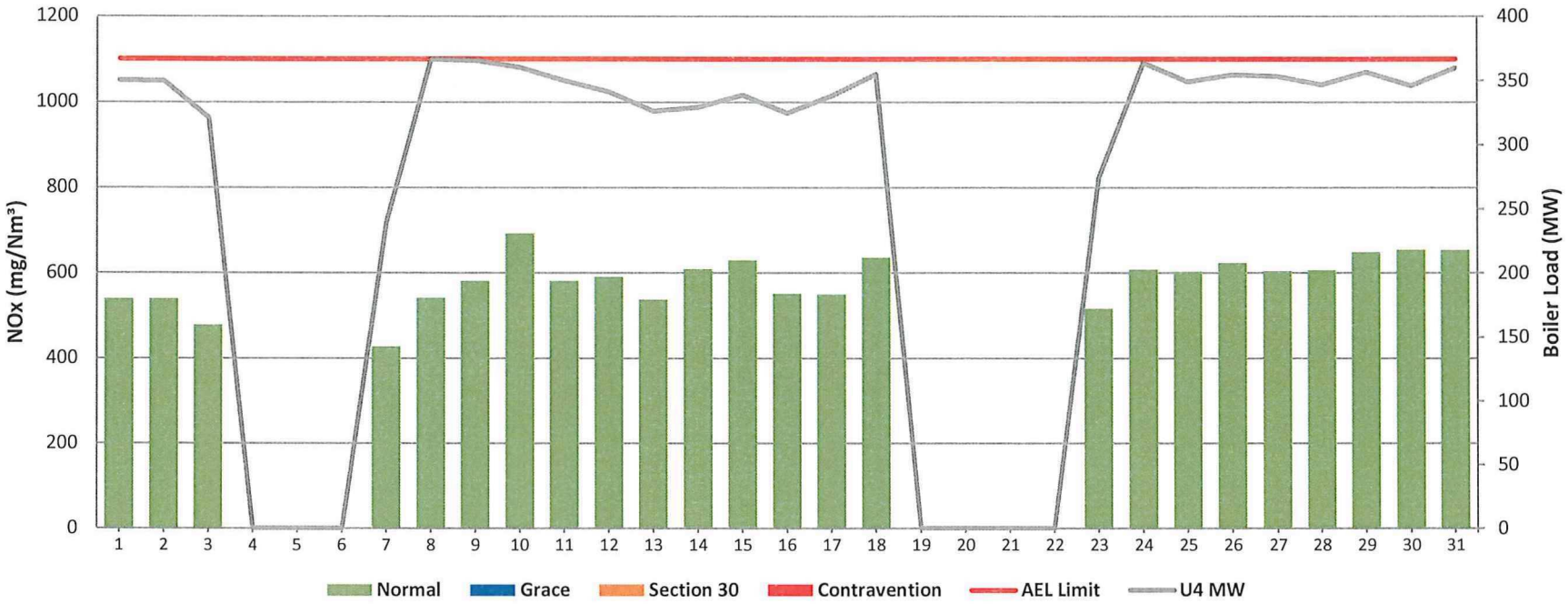


Figure 14: Duvha Unit 5 NOx Emissions - January 2024

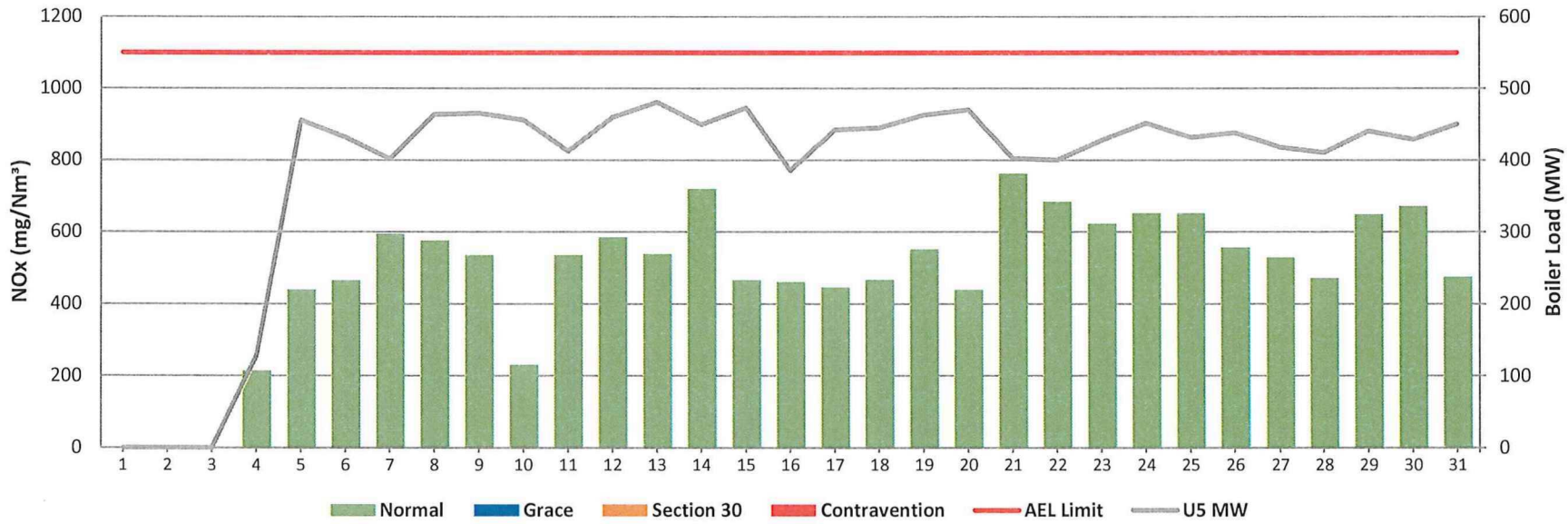
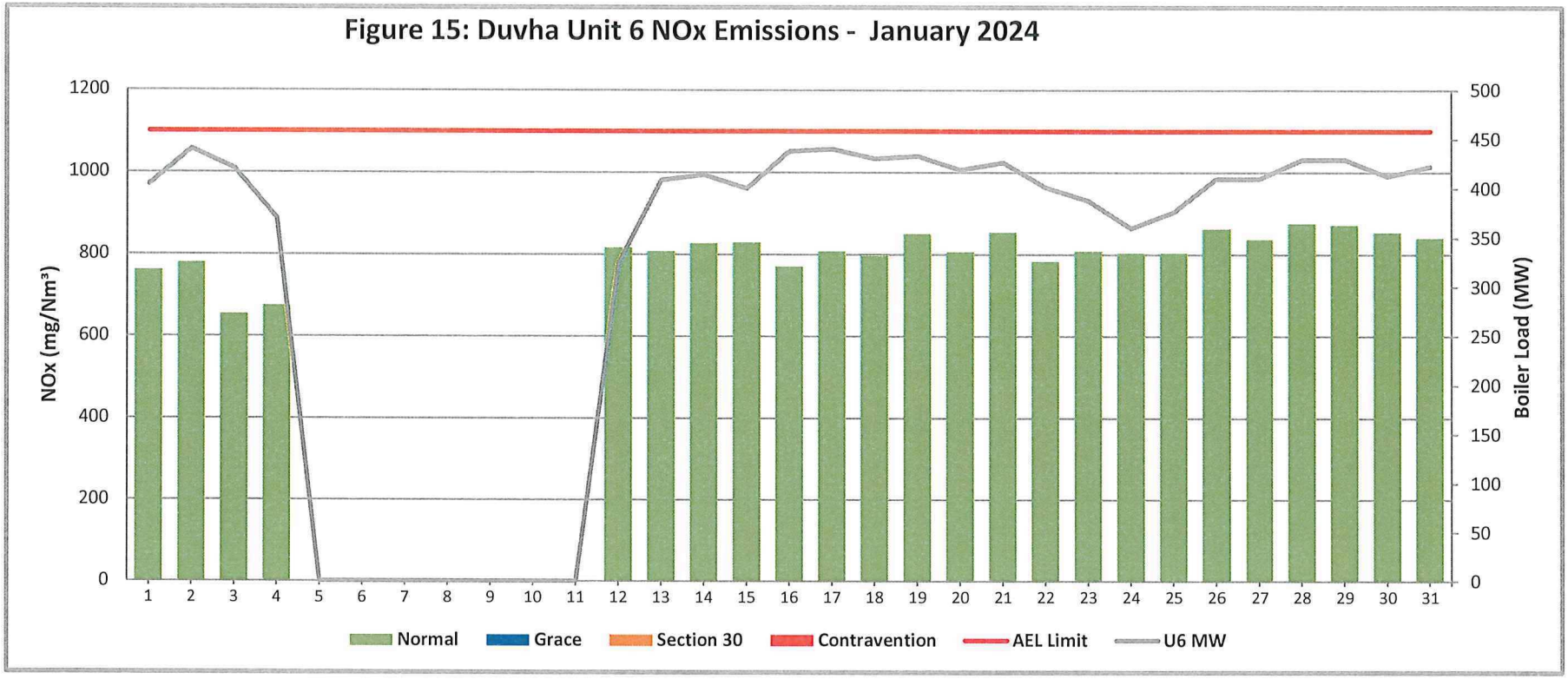


Figure 15: Duvha Unit 6 NOx Emissions - January 2024



7 SHUT DOWN AND LIGHT UP INFORMATION

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

Unit No.2	Event 1	Event 2		
Breaker Open (BO)	BO previously	BO previously	7:10 am	2024/01/19
Draught Group (DG) Shut Down (SD)	n/a	n/a	2:15 am	2024/01/20
BO to DG SD (duration)	n/a	DD:HH:MM	00:19:05	DD:HH:MM
Fires in time	12:45 am	2024/01/02	5:05 am	2024/01/27
Synch. to Grid (or BC)	9:20 am	2024/01/02	8:05 pm	2024/01/27
Fires in to BC (duration)	00:08:35	DD:HH:MM	00:15:00	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

Unit No.4	Event 1	Event 2		
Breaker Open (BO)	9:55 pm	2024/01/03	9:15 am	2024/01/18
Draught Group (DG) Shut Down (SD)	5:55 am	2024/01/04	12:10 pm	2024/01/18
BO to DG SD (duration)	00:08:00	DD:HH:MM	00:02:55	DD:HH:MM
Fires in time	11:05 am	2024/01/07	1:20 am	2024/01/23
Synch. to Grid (or BC)				
Fires in to BC (duration)	00:08:35	DD:HH:MM	00:09:35	DD:HH:MM
Emissions below limit from BC (end date)	8:00 pm	2024/01/08	6:00 am	2024/01/24
Emissions below limit from BC (duration)		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	2:55 pm	2024/01/04
Synch. to Grid (or BC)	10:50 pm	2024/01/04
Fires in to BC (duration)	00:07:55	DD:HH:MM
Emissions below limit from BC (end date)	12:00 am	2024/01/06
Emissions below limit from BC (duration)	01:01:10	DD:HH:MM

Unit No.6	Event 1	Event 2		
Breaker Open (BO)	4:15 am	2024/01/01	11:20 am	2024/01/04
Draught Group (DG) Shut Down (SD)	DG did not trip or SD	DG did not trip or SD	12:40 pm	2024/01/04
BO to DG SD (duration)	n/a	DD:HH:MM	00:01:20	DD:HH:MM
Fires in time			12:00 am	2024/01/12
Synch. to Grid (or BC)			8:30 am	2024/01/12
Fires in to BC (duration)		DD:HH:MM	00:08:30	DD:HH:MM
Emissions below limit from BC (end date)			12:00 am	2024/01/13
Emissions below limit from BC (duration)		DD:HH:MM	00:15:30	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

Exceedances:

Units 4

02/01/2024 and 03/01/2024

- Unit exceeded on the 2nd and 3rd Jan The issue was Field 1 1, 1 2, 2 4, 3.1 were off due to an under-voltage fault. Field 1.5 & 3 5 were off due to a faulty transformer that need to be replaced Fields 1 3, 2 1, 2 2, 3.2, 3 3, 4 1, 4 2, 4 4, and 4 5 High backend temperatures The unit was then shut down for Boiler Tube leaks repair and inspection and repairs on the precipitator fields

18/01/2024

- Dust handling plant out of service, all slide gates closed and not conveying any dust to the silo

Unit 5

11/01/2024

- Electrostatic precipitator Fields kept tripping due to suspected communication problems experienced between the DCS and PPMS.

15/01/2024

- Poor Electrostatic precipitator Performance affected by the high back end temperatures.

Unit 6

04/01/2024

- High Dust Silo level at 73% - Dusting not conducted due sluice pump A tripping Sluice pump B was not to be available due to high vibrations

22/01/2024 and 23/01/2024

- The Dust Handling Plant was not in service due to maintenance that was in progress, and this resulted in high hoppers Work on the Dust handling plant was completed, and dusting commenced

The Fuel oil usage for the month of January 2024 exceeded the permitted consumption rate due to the following reasons

Unit 1

- Attempted unit return to service from outage
- Unit shutdown to repair turbine bearing No 03

Unit 2

- Oil burner testing and oil burner support during soot blowing
- Mills challenges
- Cold return to service from boiler tube leaks repairs
- Soot blowing boiler manually (soot blowing testing)
- Continuously on oil burner support due to unstable bottom pyros
- Return to service of boiler feed pump turbine

Unit 4

- Continuously supporting combustion due to unstable bottom pyros
- Cold return to service
- Supporting combustion while soot blowing the boiler and testing of soot blowing
- lances
- Milling plant challenges
- return to service of boiler feed pump turbine

Unit 5

- Support unstable combustion due to milling plant challenges (mills rejecting
- excessively)
- Cold return to service from boiler tube leaks repairs
- Supporting combustion while soot blowing the boiler and testing of soot blowing
- lances

Unit 6

- Support unstable combustion due to milling plant challenges
- Continuously supporting combustion due to unstable bottom pyros and mills
- unavailable
- Oil burner testing and oil burner support during soot blowing
- Cold return to service
- Hot return to service

Lastly the averages Oxygen (O2) and Carbon Dioxide (CO2) data from the QAL2 tests report 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 faulty O2 analysers The station is in the process to replace all the faulty analysers by 31 March 2024

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 the month of January.

Boiler Plant Engineering Manager

22/05/2024.
Date

Environmental Manager

2024/05/22
Date

Engineering Manager

2024-05-22
Date

Compiled by	Environmental Officer	
For	Nkangala District Municipality	Air Quality Officer
Copies	Generation Environmental Management	D Herbst B Mccourt
	Generation Complaince 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