

Mr Dan Hlanyane
 Director Planning and Services
 Gert Sibande District Municipality
 PO BOX 3016
 ERMELO
 2350

Date:
 29 March 2018

Enquiries:

Dear Mr. Hlanyane

MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF JANUARY 2018

This serves as the monthly report required in terms of Majuba Power Station's Atmospheric Emission License (MPS/0014/2014/F01) under section 7 routine reporting and record keeping. The emissions are for the month of January 2018. Verified emissions of particulates are included. SO₂ and NO_x (as NO₂) emissions are included for all units.

Raw Materials and Products

Table 1. Quantity of Raw Materials and Products used/produced for the month of January 2018

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of January 2018
	Coal	Tons/month	1.800.000	1 111 559
	Fuel Oil	Tons/month	6000	4 545.8
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of January 2018
	Energy	GWh	4110	2 175.89
	Ash	Tons/month	Not stated in the license	316 794.4

Abatement Technology

Table 2. Abatement Equipment Control Technology for the month of January 2018

Associated Unit	Technology Type	*Minimum Control Efficiency (%)	Actual Utilisation (%) for the month of January 2018
Unit 1	Fabric Filter Plant	99.96	100%
Unit 2	Fabric Filter Plant	99.90	100%
Unit 3	Fabric Filter Plant	99.78	100%
Unit 4	Fabric Filter Plant	99.94	100%
Unit 5	Fabric Filter Plant	99.91	100%
Unit 6	Fabric Filter Plant	99.95	100%

*Calculated from the assumption of 90% fly ash to 10% bottom ash and percentage ash as measured in coal

Generation Division (Operating Unit Coal 2)

Majuba Power Station

Between Amersfoort and Volksrust

Private Bag x9001 Volksrust 2470 SA

Tel +27 17 799 2100 Fax +27 17 799 3615 www.eskom.co.za

Eskom Holdings SOC Ltd Reg No 2002/015527/30

Energy Source Characteristics

Table 3. Energy Source Material Characteristics for the month of January 2018

Characteristic	Stipulated Range (Unit)	Monthly Average Content
CV Content	<i>Not stipulated</i>	
Sulphur Content	0.6 to >0.94%	0.99
Ash Content	28 to >30%	28.5

Emissions Reporting

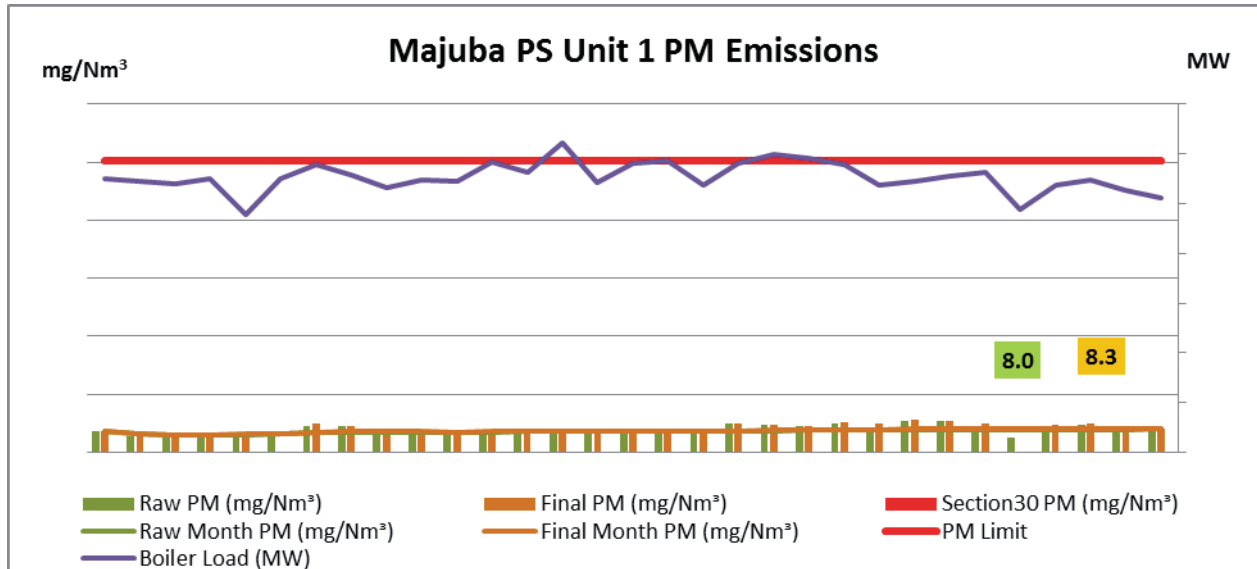


Figure 1. Particulate Matter emissions (daily averages) for the month of January 2018 against emission limit for Unit 1

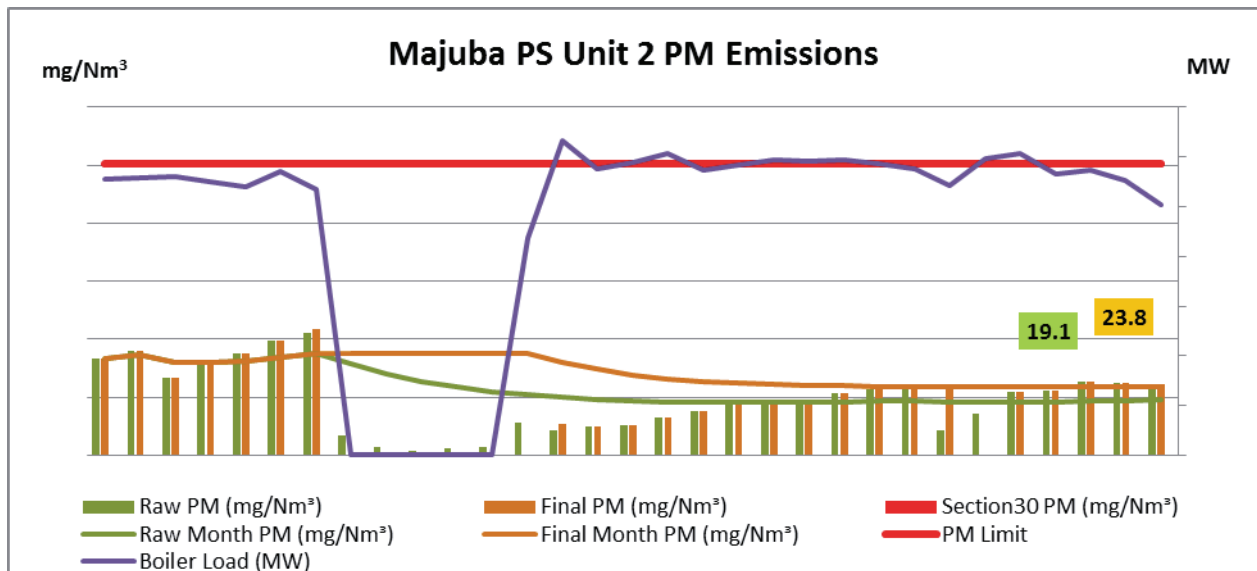


Figure 2. Particulate Matter emissions (daily averages) for the month of January 2018 against emission limit for Unit 2

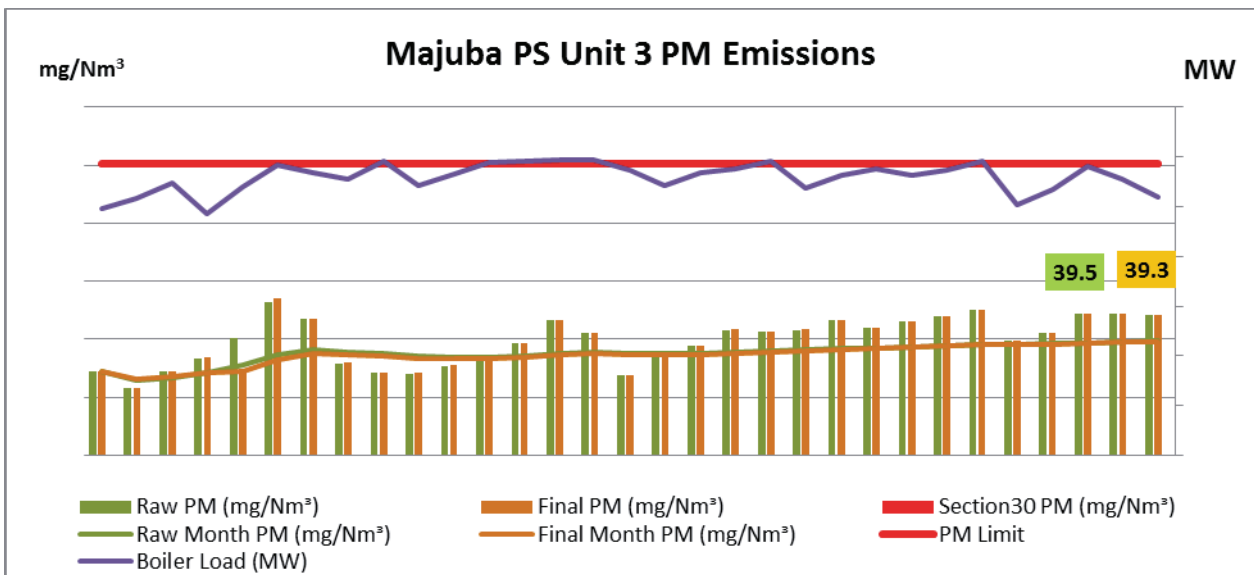


Figure 3. Particulate Matter emissions (daily averages) for the month of January 2018 against emission limit for Unit 3

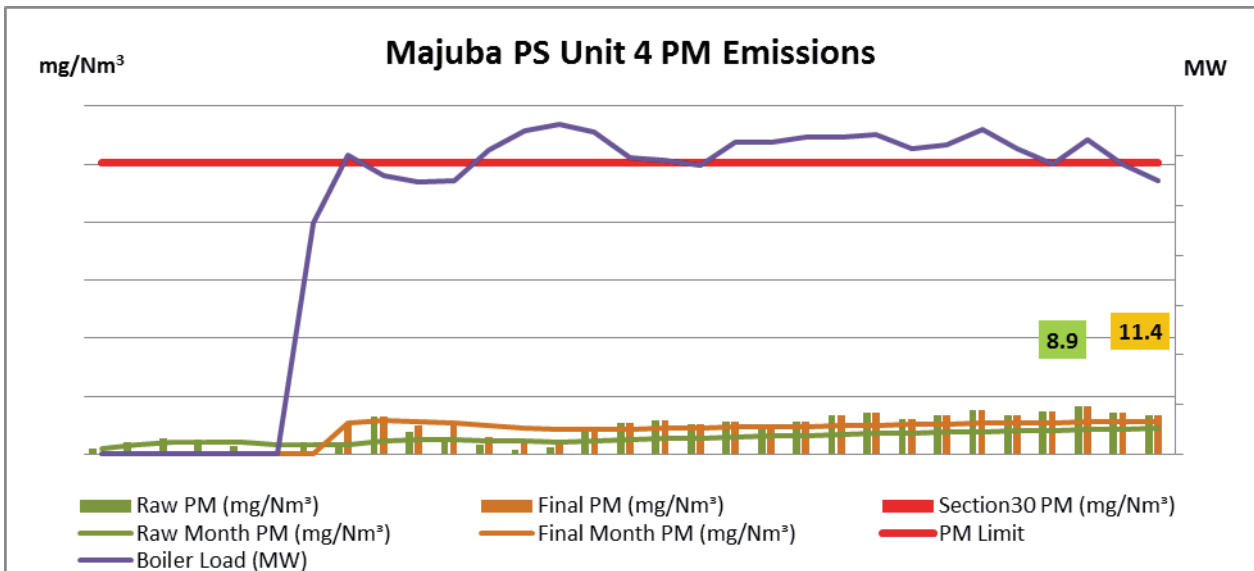


Figure 4. Particulate Matter emissions (daily averages) for the month of January 2018 against emission limit for Unit 4

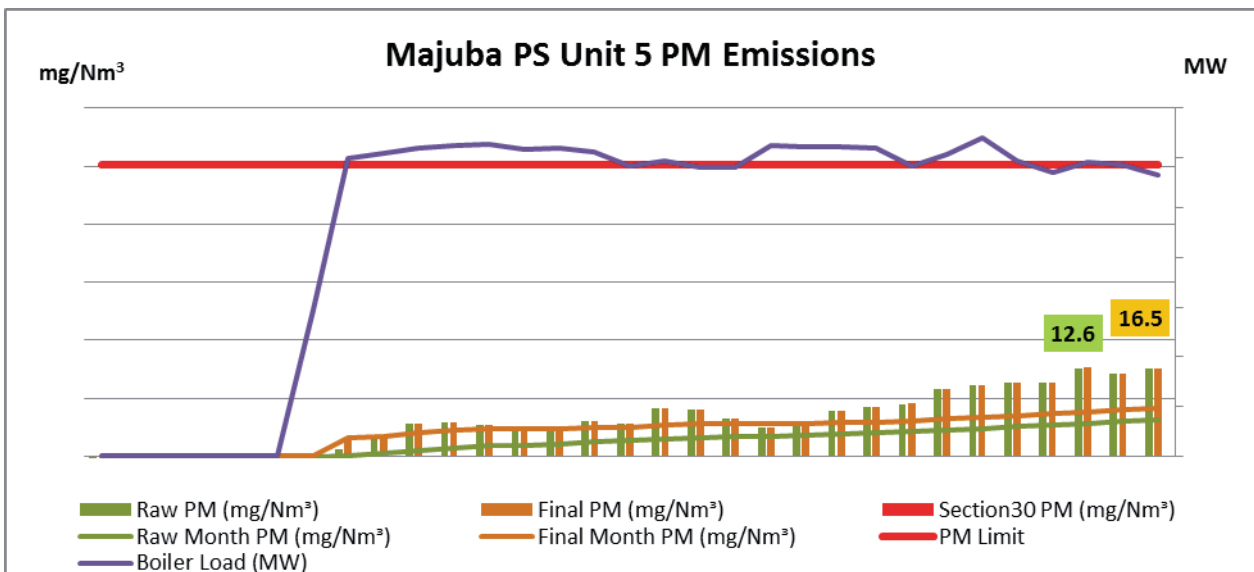


Figure 5. Particulate Matter emissions (daily averages) for the month of January 2018 against emission limit for Unit 5

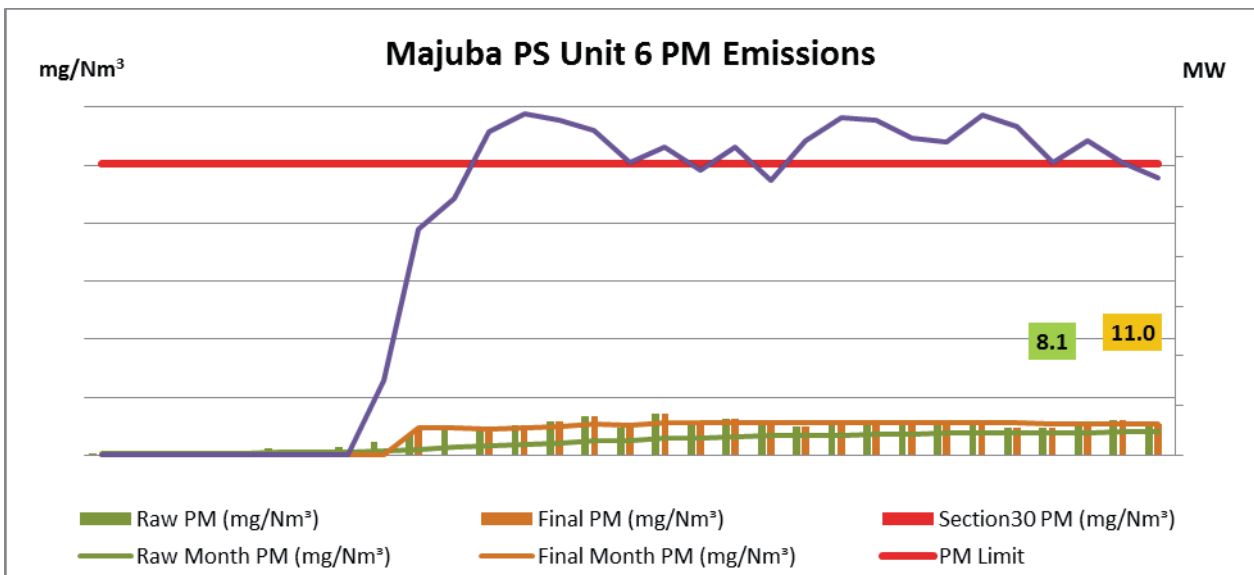


Figure 6. Particulate Matter emissions (daily averages) for the month of January 2018 against emission limit for Unit 6

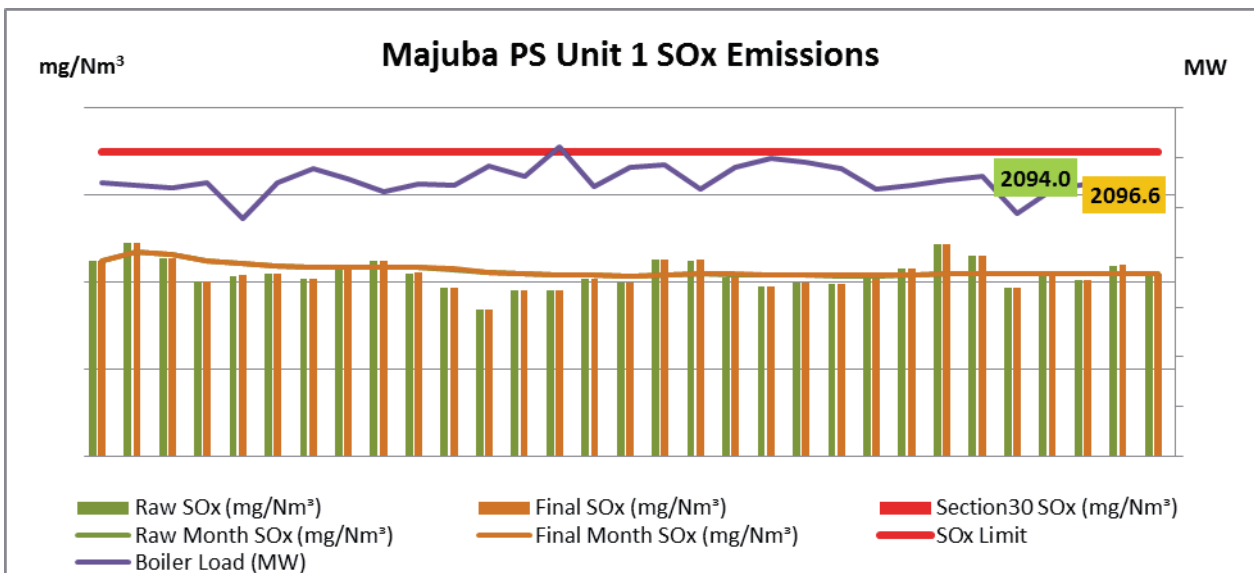


Figure 7. SOx emissions (daily averages) for the month of January 2018 against emission limit for Unit 1

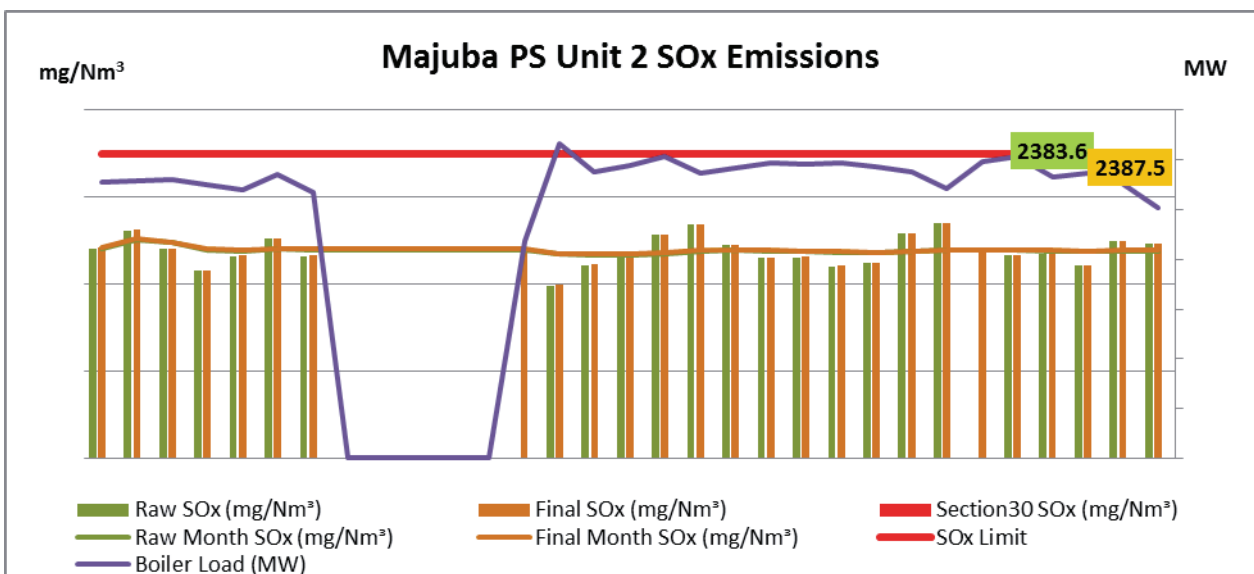


Figure 8. Sox emissions (daily averages) for the month of January 2018 against emission limit for Unit 2

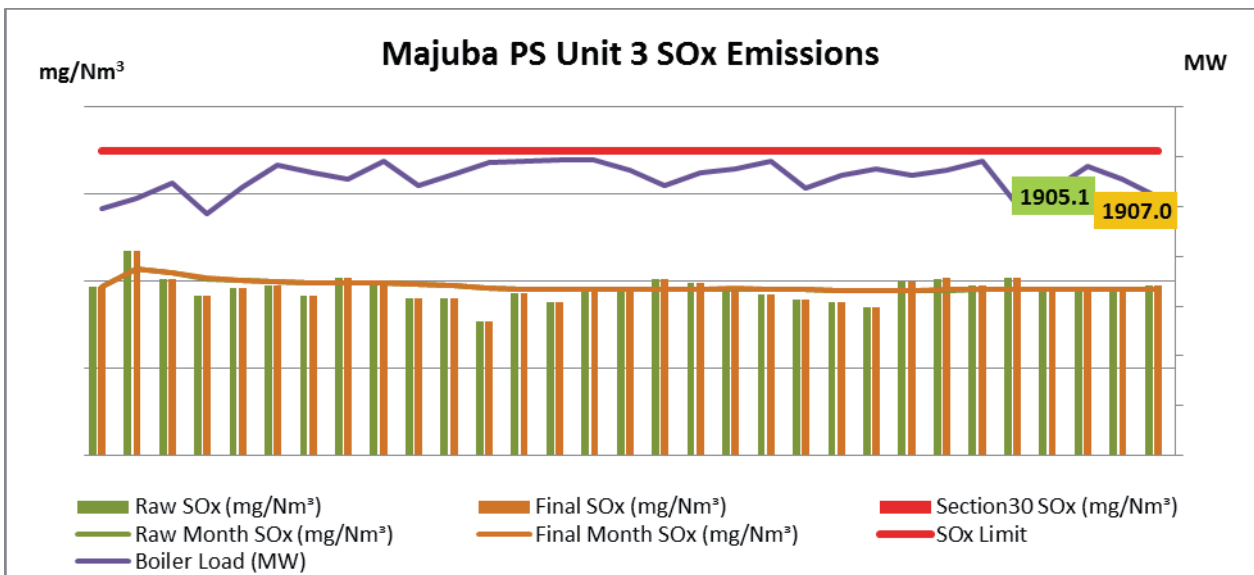


Figure 9. Sox emissions (daily averages) for the month of January 2018 against emission limit for Unit 3

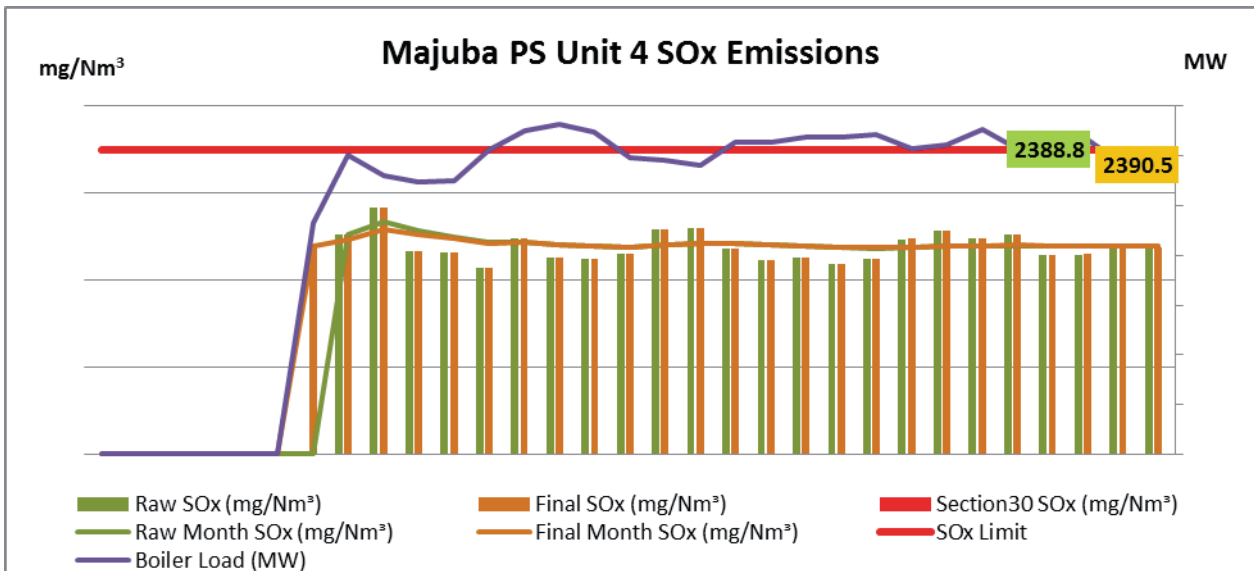


Figure 10. Sox emissions (daily averages) for the month of January 2018 against emission limit for Unit 4

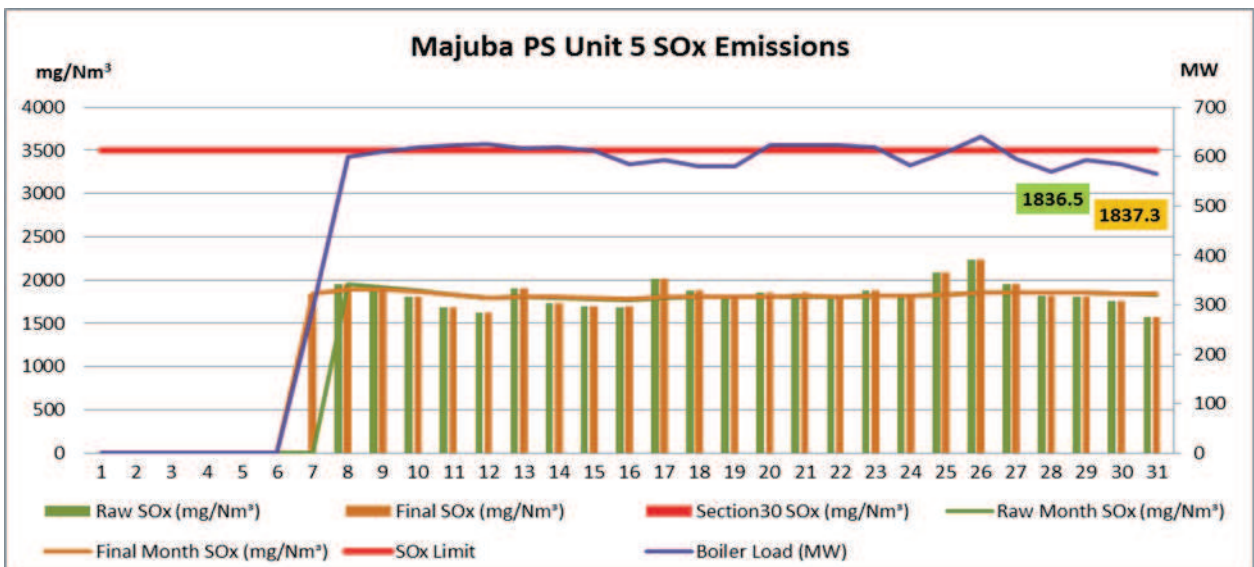


Figure 11. Sox emissions (daily averages) for the month of January 2018 against emission limit for Unit 5

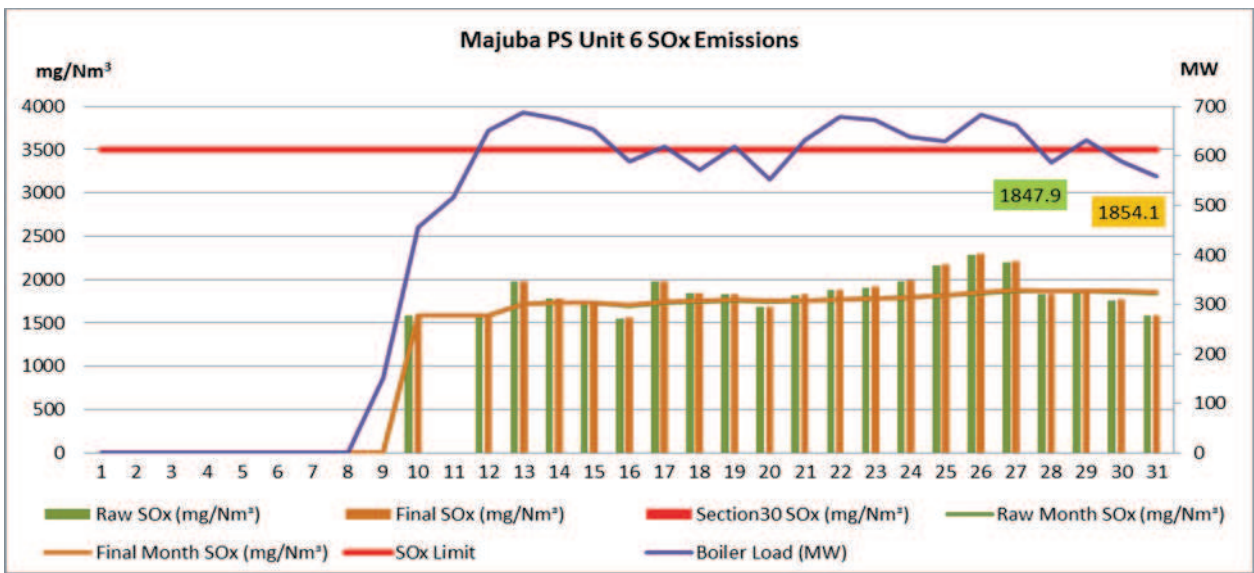


Figure 12. Sox emissions (daily averages) for the month of January 2018 against emission limit for Unit 6

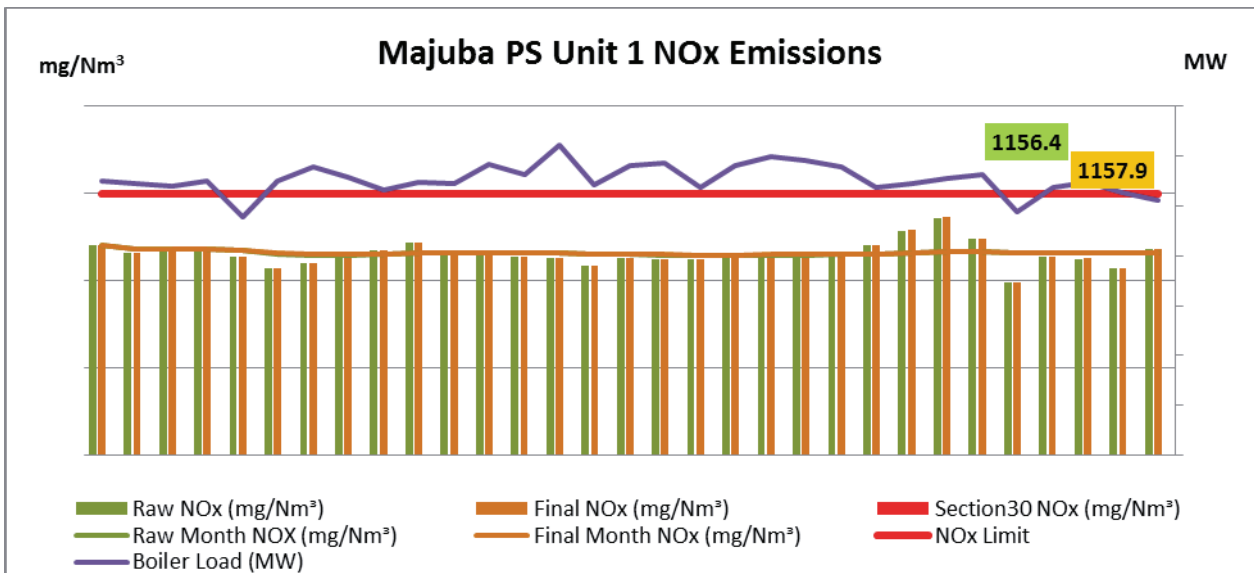


Figure 13. Nox emissions (daily averages) for the month of January 2018 against emission limit for Unit 1

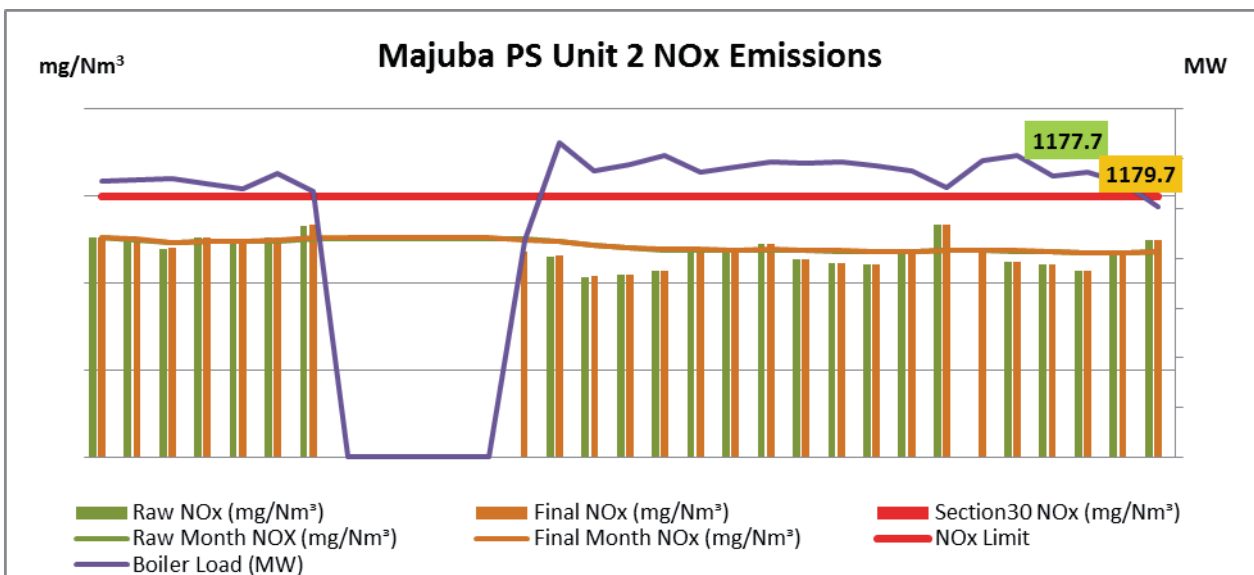


Figure 14. Nox emissions (daily averages) for the month of January 2018 against emission limit for Unit 2

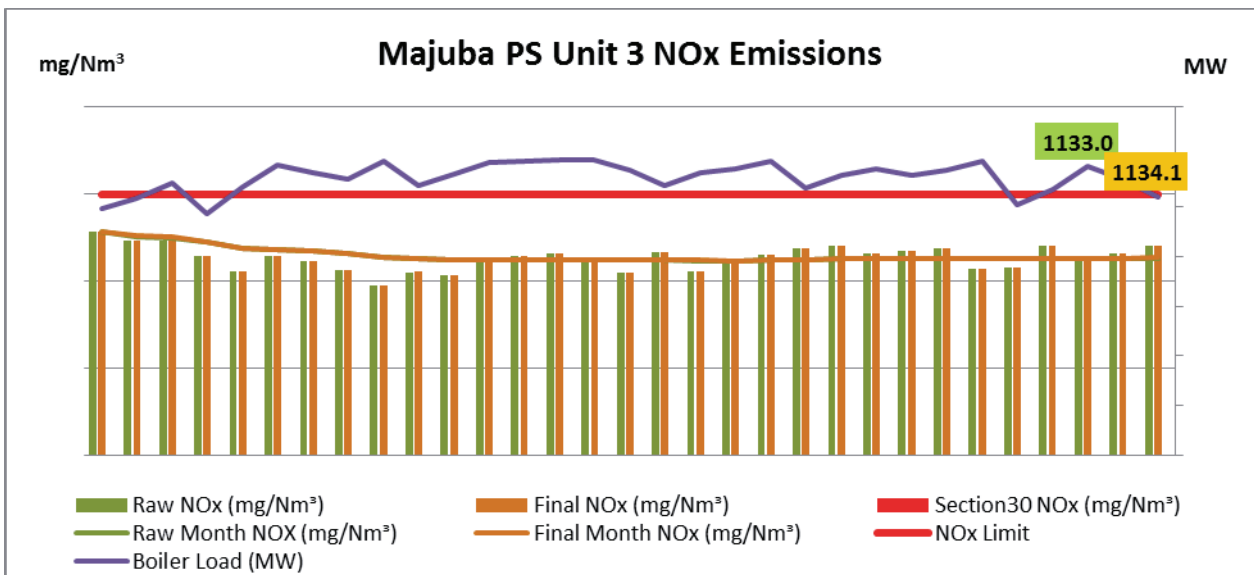


Figure 15. Nox emissions (daily averages) for the month of January 2018 against emission limit for Unit 3

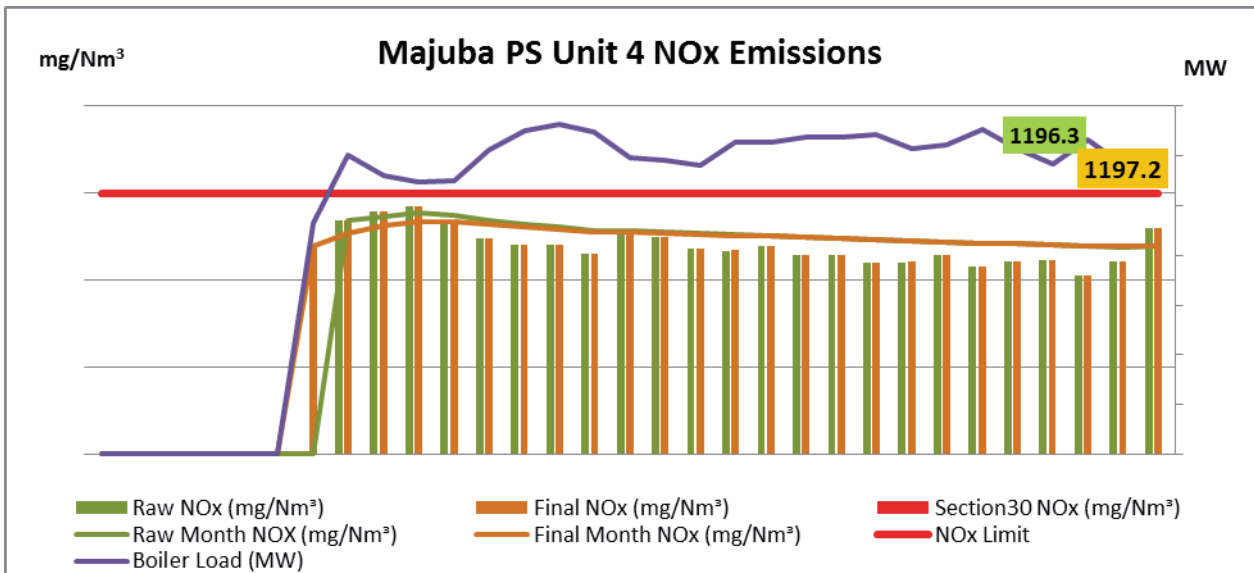


Figure 16. Nox emissions (daily averages) for the month of January 2018 against emission limit for Unit 4

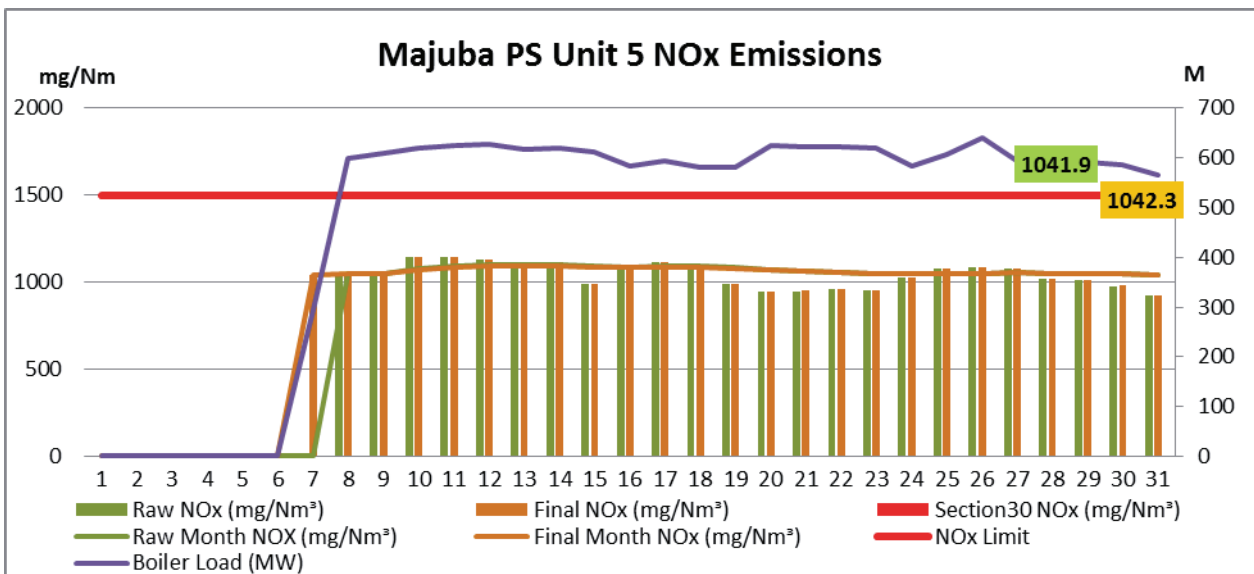


Figure 17. Nox emissions (daily averages) for the month of January 2018 against emission limit for Unit 5

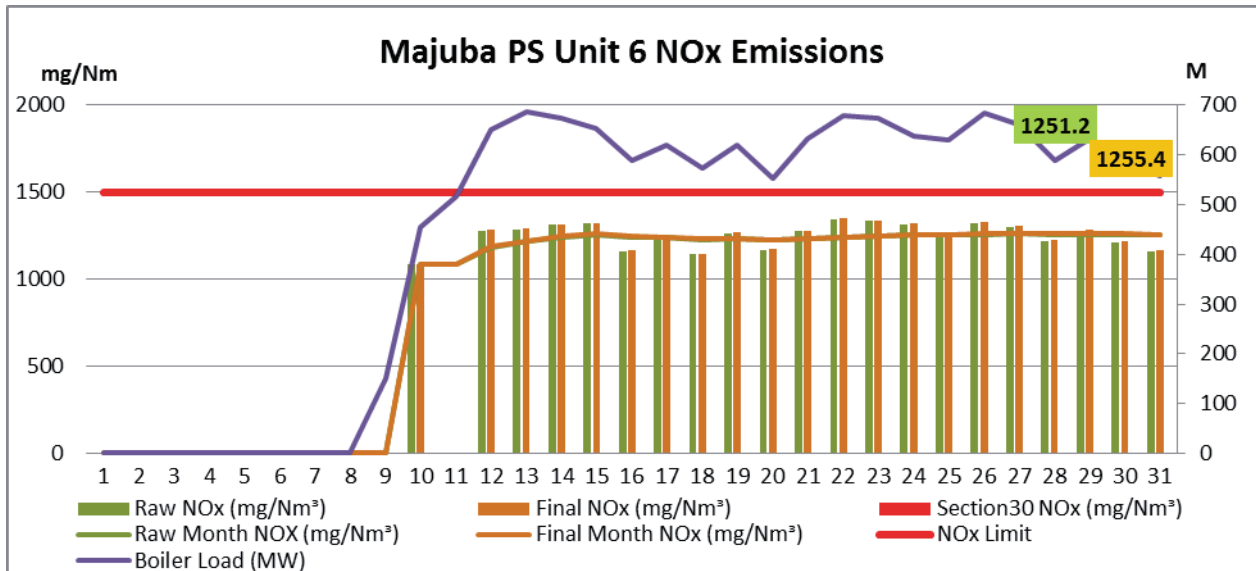


Figure 18. Nox emissions (daily averages) for the month January 2018 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of January 2018

Unit	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO ₂ (tons)
1	14.2	4 052	2 246	
2	30.8	3 333	1 645	
3	87.8	4 346	2 586	
4	19.4	4 216	2 104	
5	29.0	3 311	1 879	
6	16.8	2 945	1 994	
Sum	198.0	22 203	12 453	

Table 5: Average monthly concentrations (mg/Nm³) for the month of January 2018

Unit	PM (Mg/Nm ³)	SO ₂ (Mg/Nm ³)	NO ₂ (Mg/Nm ³)	CO ₂ (Mg/Nm ³)
1	8.3	2097	1158	
2	23.8	2387	1180	
3	39.3	1907	1134	
4	11.4	2391	1197	
5	16.5	1837	1042	
6	11.0	1854	1255	

Table 6: Each unit and respective days operating under normal operation, days in grace period, and section 30 days respectively

Unit	Operating Days (DD:HH:MM)			
	Normal operation	In grace period	Under S 30	Unit off load
1	29:15:10	00:00:00	00:00:00	01:08:50
2	24:11:45	00:00:00	00:00:00	06:12:15
3	30:22:45	00:00:00	00:00:00	00:01:15
4	24:14:00	00:00:00	00:00:00	06:10:00
5	24:07:25	00:00:00	00:00:00	06:16:35
6	21:23:05	00:00:00	00:00:00	09:00:55

*Grace period referring to 48 hours after a start-up as per AEL

CO₂ and O₂ Relationship

Calculation: CO₂% + O₂% = 19.5-21.5%

Table 7: CO₂ and O₂ deviations of the Month of January 2018

Date	Final Average CO ₂ (%)						Final Average O ₂ (%)						Final Average CO ₂ + O ₂ (%)					
	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6
01-Jan							9.59	9.64	9.35									
02-Jan							9.68	9.54	9.16									
03-Jan							10.1	9.7	8.17									
04-Jan							10.1	10	9.03									
05-Jan							10.5	10.2	8.21									
06-Jan							9.22	9.67	7.34									
07-Jan							9.01	10.4	7.39	9.79	7.52							
08-Jan							9.56		7.95	10.3	8.27							
09-Jan							10.4		7.18	11.7	8.32							
10-Jan							10.2		8.04	11.4	8.2	7.6						
11-Jan							10.2		7.69	11.4	8.15							
12-Jan							9.4		7.17	10.1	8.16	7.61						
13-Jan							9.44	9.88	7.24	9.35	8.13	7.59						
14-Jan							8.73	9.45	7.29	9.14	8.1	7.57						
15-Jan							9.47	9.89	7.4	9.21	8.13	7.59						
16-Jan							9.26	9.81	7.58	9.86	8.25	7.58						
17-Jan							9.03	9.4	8.1	9.7	8.29	7.59						
18-Jan							10.1	10.3	7.75	10.2	8.26	7.54						
19-Jan							8.99	10	7.72	9.25	8.1	7.51						
20-Jan							8.96	10	7.4	9.27	8.13	7.52						
21-Jan							8.97	9.62	8.02	9.16	8.18	7.62						
22-Jan							9.13	9.31	7.66	9.32	8.18	7.65						
23-Jan							9.44	9.13	7.21	9.18	8.21	7.66						
24-Jan							9.38	9.93	7.32	9.32	8.17	7.64						
25-Jan							10	10.8	7.43	9.42	8.27	7.64						
26-Jan							9.8	9.88	7.04	8.96	8.32	7.63						
27-Jan							8.98	9.12	9.16	9.47	8.31	7.64						
28-Jan							9.36	9.7	8.27	9.72	8.17	7.61						
29-Jan							9.52	9.52	7.49	9.17	8.17	7.62						
30-Jan							10.5	10.4	8	9.83	8.15	7.61						
31-Jan							11.4	11.4	9.19	10.5	8.13	7.58						

Comments on the performance and availability of each unit

UNIT 1

The unit base loaded for most of the days during the month and offline for one day. Two fabric filter bags were replaced during the month.

UNIT 2

The unit base loaded for most of the days during the month and off for six days. Twenty-seven fabric filter bags were replaced during the month.

UNIT 3

The unit base loaded for all of the days during the month. Ninety filter bags were replaced during the month.

UNIT 4

The unit base loaded for most of the days during the month and off for six days. No fabric filter bags were replaced during the month.

UNIT 5

The unit base loaded for most of the days during the month and off for six days. No fabric filter bags were replaced during the month.

UNIT 6

The unit base loaded for most of days during the month and was shut down for an outage. No fabric filter bags were replaced during the month.

Emergency Generation

Table 8: Emergency Generation for the month of January 2018

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Emergency Generation hours declared by national Control	0	0	0	0	0	0
Emergency Hours declared including hours after stand down	0	0	0	0	0	0
Hours over the Limit during Emergency Generation	0	0	0	0	0	0

Complaints Register

Table 9: Complaints for the month of January 2018

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 by which measure will be implemented
	No Complaints were received for the month of January 2018				

General

UNIT 5 O₂ Analyser

For January 2018 it was found that the O₂ analyser reliability was below the required 80% threshold, though the monitor was still providing readings. For accurate reporting purposes, the averages O₂ values from November were used for the normalization calculations of the SOx and NOx emissions for January 2018.

Unit 6 O₂

On 31 December the O₂ analyser ceased functioning due to a capillary blockage which resulted in low differential pressure fault. The analyser had to be brought back to the supplier's workshop for a replacement of the capillary, and a full service on the unit. The monitor was replaced on the 8th of March. As a result of the faulty O₂ analyser, the accurately measured November O₂ values were used for normalization calculations in the January 2018 SO₂ and NOx emission reporting.

Additional information demonstrating compliance with the emission license conditions is supplied in the annual emission reports sent to your office.

Report compiled by

ENVIRONMENT MANAGER: (MAJUBA)

Date 2018/04/04

Report verified by:

BOILER ENGINEERING MANAGER: (MAJUBA)

Date 2018/04/04

Hoping the above will meet your satisfaction.

Yours sincerely

SENIOR ENGINEERING MANAGER: (MAJUBA)

2018/04/12.
Date