

Department of Agriculture, Rural Development, Land and Environmental  
Affairs

The Director: Pollution and Waste Management  
Private Bag X11219  
Nelspruit 1200

Date:  
15<sup>th</sup> August 2018  
Enquiries:

Attention:  
Mr. M Mahlalela

**Nkangala District Municipality**  
PO Box 437  
Middelburg 1050

Attention:  
Mr. V Mahlangu

## MATLA POWER STATION AIR QUALITY REPORT FOR JULY 2018

The figures reported in this report are preliminary, and are to be considered for information purposes only. Final annual figures are those reported within 60 days of the independent audit conducted at the end of the financial year (March).

### 1. PARTICULATE EMISSIONS: MONTHLY TONNAGES.

	BLR	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
		2017	2017	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018
Monthly Tonnage	1	61.36	65.19	71.68	108.77	90.10	46.69	Off	Off	Off	Off	Off	Off
	2	47.40	56.79	51.66	99.27	84.35	165.43	57.98	60.80	28.57	44.25	74.24	74.20
	3	48.85	61.23	47.64	97.34	82.94	172.35	55.05	62.50	29.56	35.97	86.14	79.36
	4	165.94	148.80	183.23	165.67	173.61	188.43	166.34	132.22	87.07	123.63	67.06	56.07
	5	30.95	45.36	147.51	74.42	49.59	82.97	68.06	97.63	61.14	83.25	90.26	45.00
	6	Off	Off	Off	5.37	22.74	53.43	62.15	50.91	52.66	44.17	47.93	46.24
	Station	354.51	377.37	501.73	550.84	503.33	709.30	409.57	404.02	258.99	331.28	365.62	300.89
GWhSO		1557.1	1703.4	1580.5	1802.7	1998.5	1783.6	1562.9	1733.7	1594.2	1627.7	1491.5	1398.1

**2. COAL AND LOAD FACTOR:**

STATION		AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Load Factor		75.25	78.05	80.55	83.88	85.33	82.96	88.34	86.45	78.39	89.58	76.24	72.31
Ash Content	%	28.42	28.70	24.34	24.11	29.57	27.15	23.3	26.41	25.3	27.70	27.92	27.6
Sulphur Content	%	1.00	1.00	1.00	1.0	1.0	1.0	0.95	0.90	1.00	1.2	1.00	1.00
Total Moisture	%	9.54	7.10	8.11	10.69	9.64	9.43	9.60	9.57	9.21	9.7	9.47	9.43

**3. GASEOUS EMISSIONS:**

**CO<sub>2</sub> emissions: kilotons emitted per month, calculated from coal analysis and emission factors.**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3												
Unit 4												
Unit 5												
Unit 6												
All Units												

**SO<sub>2</sub> emissions: kilotons emitted per month, calculated from coal analysis and emission factors.**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3	9.64	8.66	9.40	10.46	10.31	8.25	6.95	7.84	6.62	7.68	6.18	6.34
Unit 4	3.52	3.15	3.62	3.38	3.71	2.89	2.85	3.16	3.29	3.94	3.18	3.22
Unit 5	2.99	3.02	3.25	3.15	3.50	3.31	3.02	3.51	3.07	3.95	2.77	1.67
Unit 6	Off	Off	Off	0.44	2.80	3.70	2.46	3.13	3.15	3.93	2.99	2.89
All Units	16.15	14.83	16.27	17.43	20.32	18.15	15.28	17.64	16.12	19.50	15.12	14.13

**NO<sub>x</sub> emissions: kilotons emitted per month, calculated from coal analysis and emission factors.**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3	3.02	2.71	2.95	3.28	3.23	2.59	2.18	2.46	2.07	2.01	1.94	1.99
Unit 4	1.10	0.99	1.13	1.06	1.16	0.91	0.89	0.99	1.03	1.03	1.00	1.01
Unit 5	0.94	0.95	1.02	0.99	1.10	1.04	0.95	1.10	0.96	1.03	0.87	0.52
Unit 6	Off	Off	Off	0.14	0.88	1.16	0.77	0.98	0.99	10.3	0.94	0.91
All Units	5.06	4.65	5.10	5.46	6.37	5.69	4.79	5.53	5.05	5.09	4.74	4.43

**CO<sub>2</sub> emissions: kilotons emitted per month, measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3												
Unit 4												
Unit 5												
Unit 6												
All Units												

**SO<sub>2</sub> emissions: kilotons emitted per month, measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3	7.60	7.82	7.59	12.65	9.94	7.15	5.55	8.31	6.73	6.64	6.72	6.43
Unit 4	2.89	1.54	2.91	2.51	2.43	1.61	1.81	2.28	2.18	1.96	1.86	1.84
Unit 5	4.66	1.55	2.84	3.05	2.89	2.54	2.57	2.74	2.61	2.58	2.12	0.96
Unit 6	Off	Off	Off	0.14	1.06	1.44	1.03	1.22	2.73	2.65	2.40	2.38
All Units	15.15	10.91	13.35	18.36	16.33	12.74	10.96	14.55	14.26	13.83	13.10	11.62

**NO<sub>x</sub> emissions: kilotons emitted per month, measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3	3.78	3.57	3.48	5.98	5.03	3.26	2.98	3.78	2.82	2.47	2.61	2.48
Unit 4	1.81	0.87	1.84	1.53	1.52	0.98	1.30	1.26	1.01	0.84	0.87	0.81
Unit 5	2.41	0.68	1.35	1.41	1.35	1.43	1.32	1.28	1.06	1.02	0.90	0.31
Unit 6	Off	Off	Off	0.07	0.54	0.79	0.55	0.63	1.25	1.10	1.19	1.11
All Units	8.01	5.12	6.66	8.99	8.44	6.46	6.15	6.95	6.15	5.43	5.57	4.72

**CO<sub>2</sub> emissions (mg/Nm<sup>3</sup>): Average concentration per month (at 273 K, 101.3 kPa and 10% O<sub>2</sub>), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only**

	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
Units 1-3												
Unit 4												
Unit 5												
Unit 6												

**SO<sub>2</sub> emissions (mg/Nm<sup>3</sup>): Average concentration per month (at 273 K, 101.3 kPa and 10% O<sub>2</sub>), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only**

Limit	AUG 2017	SEP 2017	OCT 2017	NOV 2017	DEC 2017	JAN 2018	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018
4000												
Units 1-3	1875	2094	1831	2390	2127	1883	1587	2246	2036	2153	2203	2116
Unit 4	2112	1627	2023	1513	1447	1476	1350	1626	1628	1685	1590	1761
Unit 5	2562	1731	1966	2046	1906	1751	1827	1856	1850	1797	1656	1533
Unit 6	Off	Off	Off	1421	1385	1353	1406	1425	1540	1620	1529	1554

**SO<sub>2</sub> daily average emissions: AEL limit exceedances**

Limit	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
3500	2017	2017	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018
Units 1-3	0	0	0	0	0	0	0	0	0	0	0	0
Unit 4	0	0	0	0	0	0	0	0	0	0	0	0
Unit 5	0	0	0	0	0	0	0	0	0	0	0	0
Unit 6	0	0	0	0	0	0	0	0	0	0	0	0

**NO<sub>x</sub> emissions (mg/Nm<sup>3</sup>): Average concentration per month (at 273 K, 101.3 kPa and 10% O<sub>2</sub>), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only**

Limit	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
1700	2017	2017	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018
Units 1-3	932	956	838	1128	1074	858	851	1017	852	797	853	806
Unit 4	1313	914	1269	914	894	896	970	872	752	713	735	773
Unit 5	1291	759	938	949	892	982	936	859	753	708	703	493
Unit 6	Off	Off	Off	682	705	751	751	740	711	674	757	717

**NO<sub>x</sub> daily average emissions: AEL limit exceedances**

Limit	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
1200	2017	2017	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018
Units 1-3	0	0	0	2	0	0	0	0	0	0	0	0
Unit 4	17	0	20	0	0	0	0	0	0	0	0	0
Unit 5	21	0	0	0	0	0	0	0	0	0	0	0
Unit 6	0	0	0	0	0	0	0	0	0	0	0	0

**4. PARTICULATE EMISSION PERFORMANCE**

	MONTH AVERAGE EMISSIONS	AEL LIMIT(DAILY AVERAGE)	HIGHEST DAILY AVERAGE
UNIT	mg/Nm3	mg/Nm3	mg/Nm3
1, 2 & 3	49.83	200	70.99
4	52.79	200	226.80
5	69.92	100	198.4
6	30.40	100	109.8
Station	50.73		
YTD	47.74		

**ABATEMENT APPARATUS AVAILABILITY**

Unit		1	2	3	4	5	6	Station
Precipitator efficiency	%	Off	99.81	99.79	99.86	99.74	99.86	99.81
Precipitator availability	%	Off	99.27	100.00	98.07	96.99	98.61	95.58
SO <sub>3</sub> plant utilisation	%	Off	99.92	99.36	99.80	100.00	99.92	99.81

## ATMOSPHERIC EMISSION LICENSE LIMIT EXCEEDED

	AEL LIMIT EXCEEDED (TOTAL)	AEL LIMIT EXCEEDED (LIGHT-UP/SHUT DOWN)	AEL LIMIT EXCEEDED (UPSET CONDITIONS)	AEL LIMIT EXCEEDED (MAINTENANCE)	AEL LIMIT EXCEEDED (SECTION 30 / CONTRAVENTION)
UNIT	Days	Days	Days	Days	Days
1, 2 & 3	0	0	0	0	0
4	1	0	1	0	0
5	5	0	2	0	3
6	1	0	0	1	0
Station	7	0	3	1	3
YTD	14	0	9	2	3

### 5. DISCUSSION

#### Unit 1:

The unit was taken off load on the 10<sup>th</sup> January 2018 for a major refurbishment outage. Re-commissioning of the unit commenced as from the 15<sup>th</sup> July 2018 with fan balancing. The first ignition was established on the 27<sup>th</sup> July 2018 at 15:00. The boiler tripped at 21:55 when the low drum level protection operated. Ignition was established at 22:30 on 27 July 2018. Fires was taken out at 02:31 on 28 July 2018, ignition established again at 15:32 on the 28<sup>th</sup> July 2018. The first mill was introduced at 22:44 on the 28<sup>th</sup> July 2018. The boiler tripped at 01:42 on the 29<sup>th</sup> July 2018. Ignition was established 02:06 on the 29<sup>th</sup> July 2018, mill placed in service at 09:22 and boiler pressure raising commenced for safety valve floating. The fires was taken out at 09:48 on the 30<sup>th</sup> July 2018 and the boiler force cooled.

#### Unit 2:

The unit tripped on the 30<sup>th</sup> July 2018 at 09:57 when the boiler drum low level protection operated. The unit returned to service on the 30<sup>th</sup> July 2018 at 17:57. The unit experience a few precipitator field failures due to various reasons. The impact on the particulate emissions was limited due to the short duration of the failures. A few SO<sub>3</sub> flue gas conditioning plant failures were experienced during the month. The flue gas cleaning plant performed well during the month and emissions well below the AEL limit was recorded for the month.

#### Unit 3:

The unit experience a few precipitator field failures due to various reasons. The impact on the particulate emissions was limited due to the short duration of the failures. A few SO<sub>3</sub> flue gas conditioning plant failures were experienced during the month. The flue gas cleaning plant performed well during the month and emissions well below the AEL limit was recorded for the month.

#### **Unit 4:**

The unit experienced a substantial number of precipitator field failure due to full dust hopper during the first part of the month which gave rise to the particulate emissions. The coal quality deteriorated which is deemed to be the cause for the hopper levels.

The SO<sub>3</sub> flue gas conditioning plant tripped several times during the month but in general was back in service within the hour and the impact on the particulate emissions was thus limited. The unit exceeded the AEL limit on the 25<sup>th</sup> July due to precipitator field failures due to extreme poor coal quality.

#### **Unit 5:**

The unit was taken off load on the 29<sup>th</sup> June 2018 at 00:30 for HP piping inspection.

The unit returned to service on the 10<sup>th</sup> July 2018 at 03:53. The opportunity was utilised to carry out precipitator repairs.

The unit tripped on the 11<sup>th</sup> July 2018 at 16:05 when a turbine control module failed. The unit returned to service on the 11<sup>th</sup> July 2018 at 23:59.

The dust handling plant experienced numerous conveying line blockages as from the 16<sup>th</sup> July 2018 due to instrument air pressure failures. The coal supplied to the station at this point in time was of a poor quality which proved to be problematic in conveying due to elevated levels of density. As a result left hand precipitator field 2 tripped on the 16<sup>th</sup> July 2018 at 08:09 on under-voltage protection due to full hoppers. The field was placed back in service on the 17<sup>th</sup> July 2018 at 16:54 but performed poorly due to the full hoppers. Left hand field 3 tripped on the 17<sup>th</sup> July 2018 followed by left hand field 1 on the 18<sup>th</sup> July 2018 at 01:54. Left hand field 4 tripped on the 16<sup>th</sup> July 2018. The combination of these field failure resulted in the particulate emission to exceed the AEL limit as from 02:02 on the 18<sup>th</sup> July 2018. Contributory to the high emissions was right hand precipitator field 7 rapping insulator which failed on the 11<sup>th</sup> July 2018 causing a dead short in the HT room. The rapping shaft was repositioned on the 19<sup>th</sup> July which assisted in limiting the particulate emissions. Left hand fields 2 and 4 returned to service on the 22<sup>nd</sup> July 2018 at 09:00 and the particulate emissions reduced to below the AEL limit. A section 30 notification has been submitted.

The unit was taken off load on the 27<sup>th</sup> July 2018 at 22:47 for the weekend to carry out precipitator repairs. The unit returned to service on the 30<sup>th</sup> July 2018 at 14:05.

#### **Unit 6:**

The unit tripped on the 19<sup>th</sup> July 2018 at 16:35. The unit returned to service on the 20<sup>th</sup> July 2018 at 07:00.

The unit also experienced precipitator field failures due to full dust hoppers during the first days of the month.

The AEL limit was exceeded on the 31<sup>st</sup> July 2018 for maintenance to attend to the SO<sub>3</sub> flue gas conditioning plant.

#### **SO<sub>3</sub> common Plant:**

The SO<sub>3</sub> flue gas conditioning common plant availability was high for the month.

### Gas Emissions:

The south stack O<sub>2</sub> analyser reading remained high. The OEM established that the sensor is faulty. The procurement process to replace the sensor has commenced. The O<sub>2</sub> reading is thus calculated based on the O<sub>2</sub>/CO<sub>2</sub> balance.

The availability of the CEMS was good for the month of July 2018.

The gas emissions measured by the CEMS was well below the AEL limit for the duration of the month.

### General:

The coal quality supplied to boilers 5 and 6 remained poor during the month, impacting negatively on the particulate emissions.

## 6. LIGHT UP:

Unit:	5	
Fires in:	21:45	9 July 2018
Synchronisation:	03:53	10 July 2018
Emissions below Limit:	22:47	10 July 2018
Fires in to synchronisation:	6:08	Hours
Synchronisation to < Limit:	18:54	Hours

Unit:	6	
Fires in:	03:10	20 July 2018
Synchronisation:	07:00	20 July 2018
Emissions below Limit:	11:08	20 July 2018
Fires in to synchronisation:	3:50	Hours
Synchronisation to < Limit:	4:08	Hours

Unit:	5	
Fires in:	0:07	30 July 2018
Synchronisation:	14:05	30 July 2018
Emissions below Limit:	19:22	30 July 2018
Fires in to synchronisation:	13:58	Hours
Synchronisation to < Limit:	5:17	Hours

Unit:	2	
Fires in:	12:30	30 July 2018
Synchronisation:	17:57	30 July 2018
Emissions below Limit:	21:41	30 July 2018
Fires in to synchronisation:	5:27	Hours
Synchronisation to < Limit:	3:44	Hours

**7. GRAPHS:**

See attached graphs

**8. COMPLAINTS**

Name of complainant	Date	Description of complaint	Action taken
No Complaints			



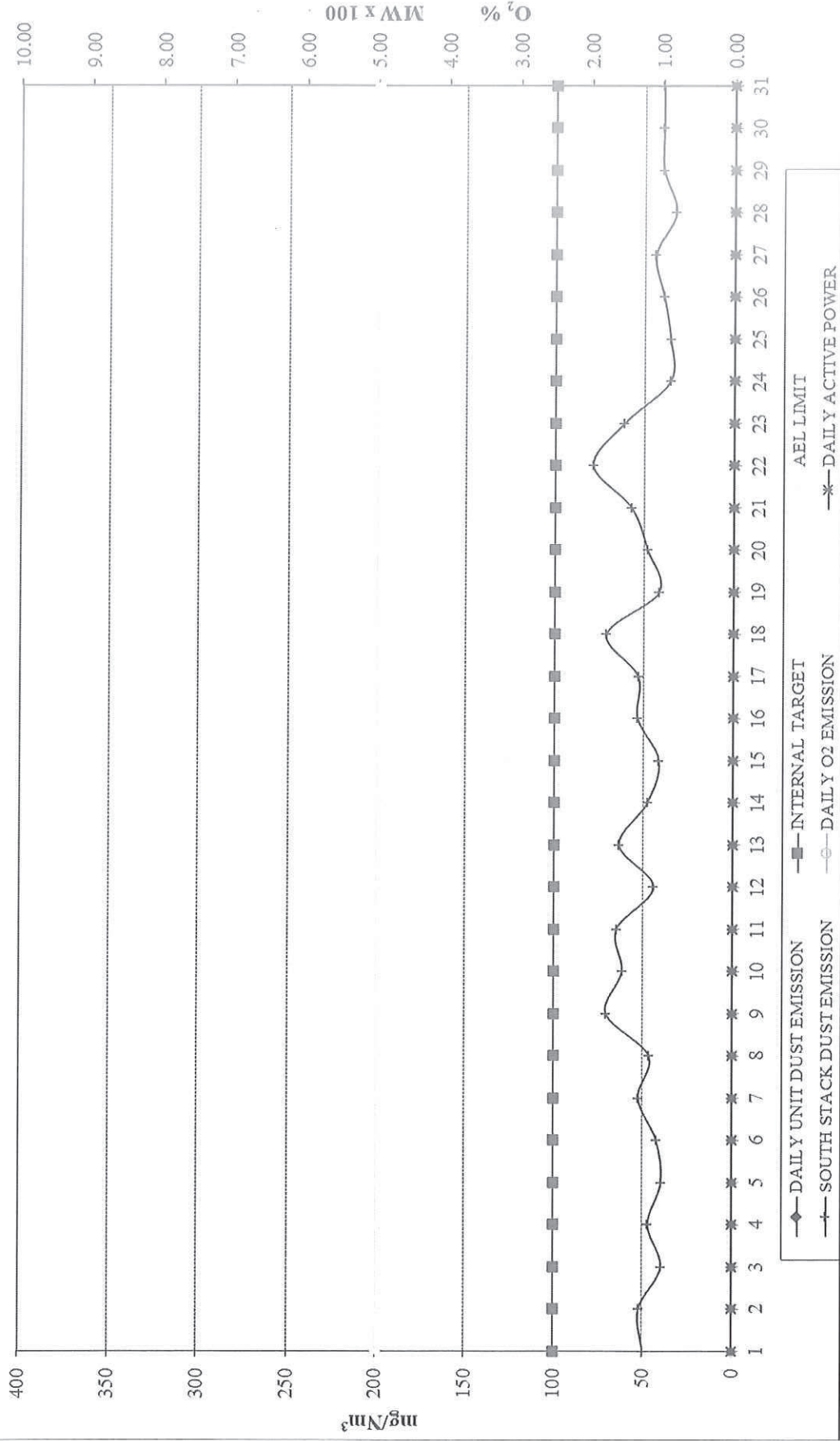
9. NOTIFICATION OF CONTRAVENTION OF EMISSION LICENCE CONDITIONS

<i>Date</i>	
<i>Power Station Unit(s)</i>	Matla Power Station –
<i>Date of incident Time of incident</i>	Start date and time:  End date:
<i>Nature of incident</i>	Extended start-up <input type="checkbox"/>  On-line maintenance <input type="checkbox"/>  Extended shut-down <input type="checkbox"/>
<i>Emission limit exceedance</i>	Boiler 5 particulate emission limit of 100 mg/Nm <sup>3</sup>
<i>Details of incident</i>	
<i>Risks posed by the incident to public health, safety and property</i>	The main area affected by the high emissions from Matla Power Station is within a 15km radius of the power station. The area does extend to Kriel town and Rietspruit, but the impact in these areas is lower. The towns of Kriel and Rietspruit are more densely populated than the village and farming communities in the immediate vicinity of the power station. The emissions have a negligible effect on livestock and crops on the nearby farms. Highveld priority area.
<i>Toxicity of substance or by-products released by the incident</i>	Non toxic
<i>Mitigation to avoid or minimize the incident effects on public health and the environment</i>	The unit load has been reduced to approximately 360MW during the incident
<i>Compiler and contact details</i>	Name: Tel no: Email:
<i>Responsible manager and contact details</i>	Name: Tel no: Email:

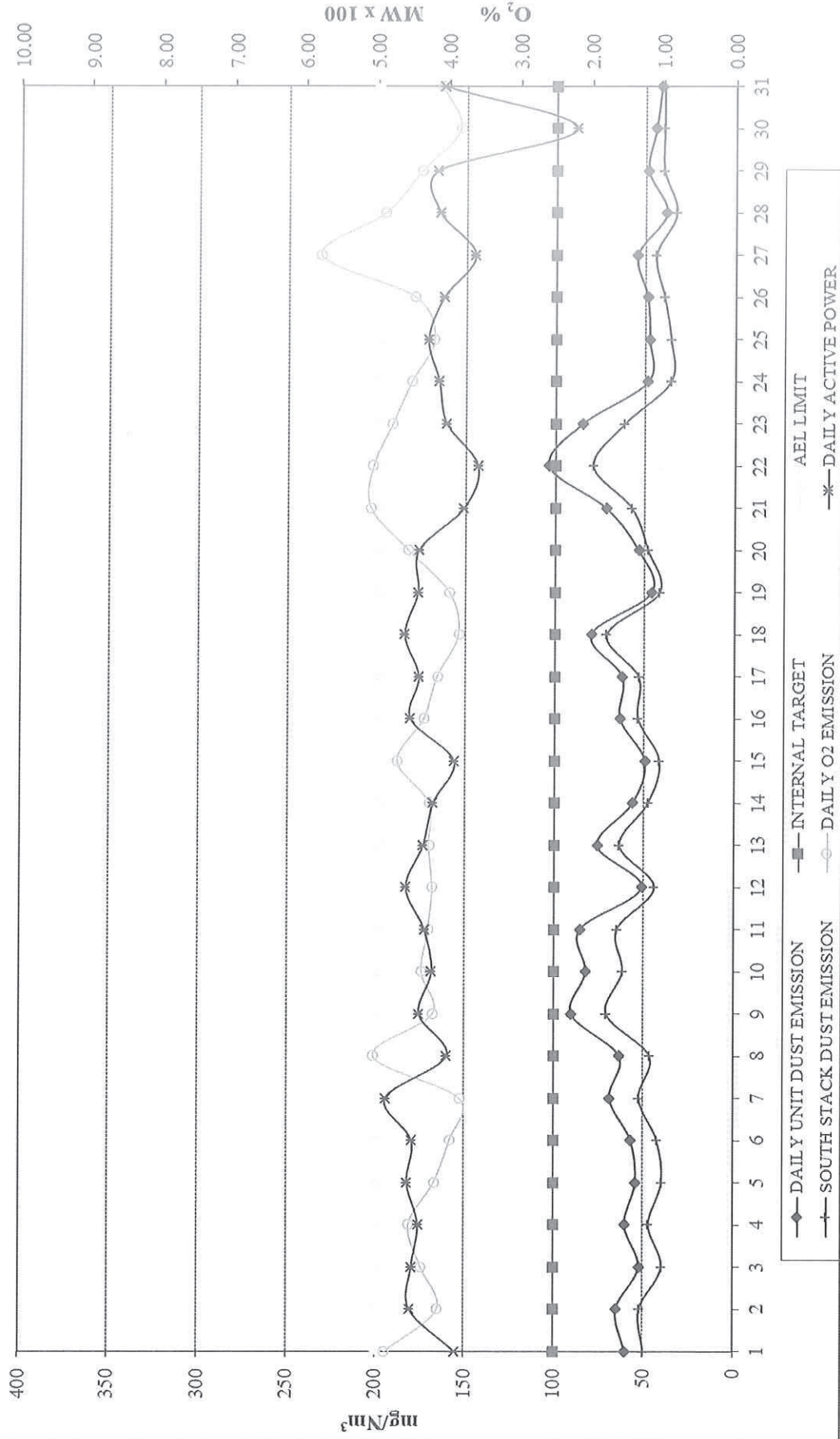
## **BOILER PLANT ENGINEERING**

Copies to:     Licensing Authority  
                  Power Station Manager (Acting)  
                  Environmental Practitioner  
                  Engineering Manager  
                  Boiler Plant Engineering Manager  
                  Maintenance Manager (Acting)  
                  Unit Electrical Maintenance Manager  
                  Operating Manager  
                  Production Manager  
                  Outside Plant Maintenance Manager  
                  Coal Manager  
                  Megawatt Park, Corporate Consultant Air Pollution  
                  Plant Performance Units 1 to 6

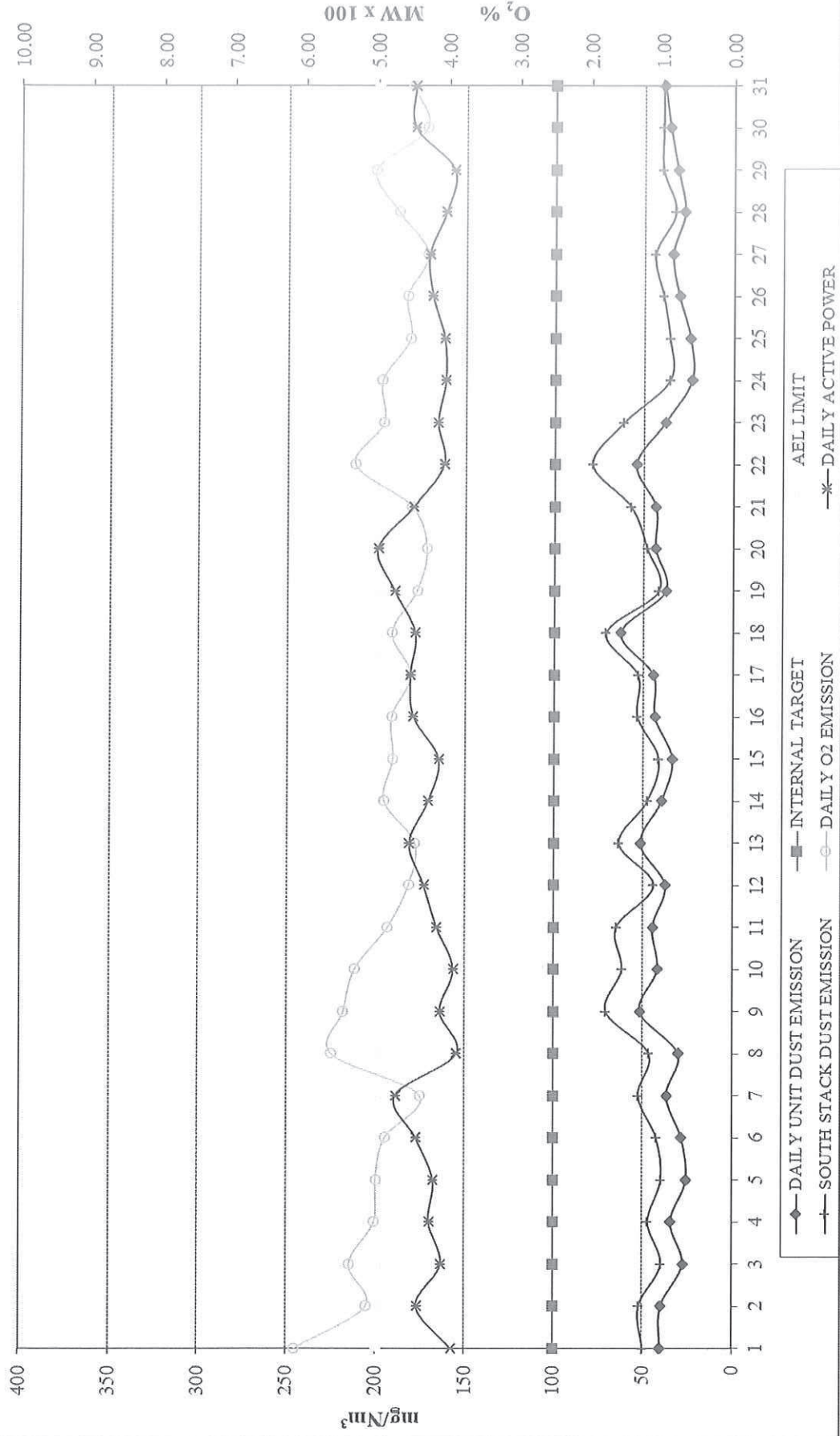
**MATLA POWER STATION  
UNIT 1 DUST EMISSION REPORT  
JULY 2018**



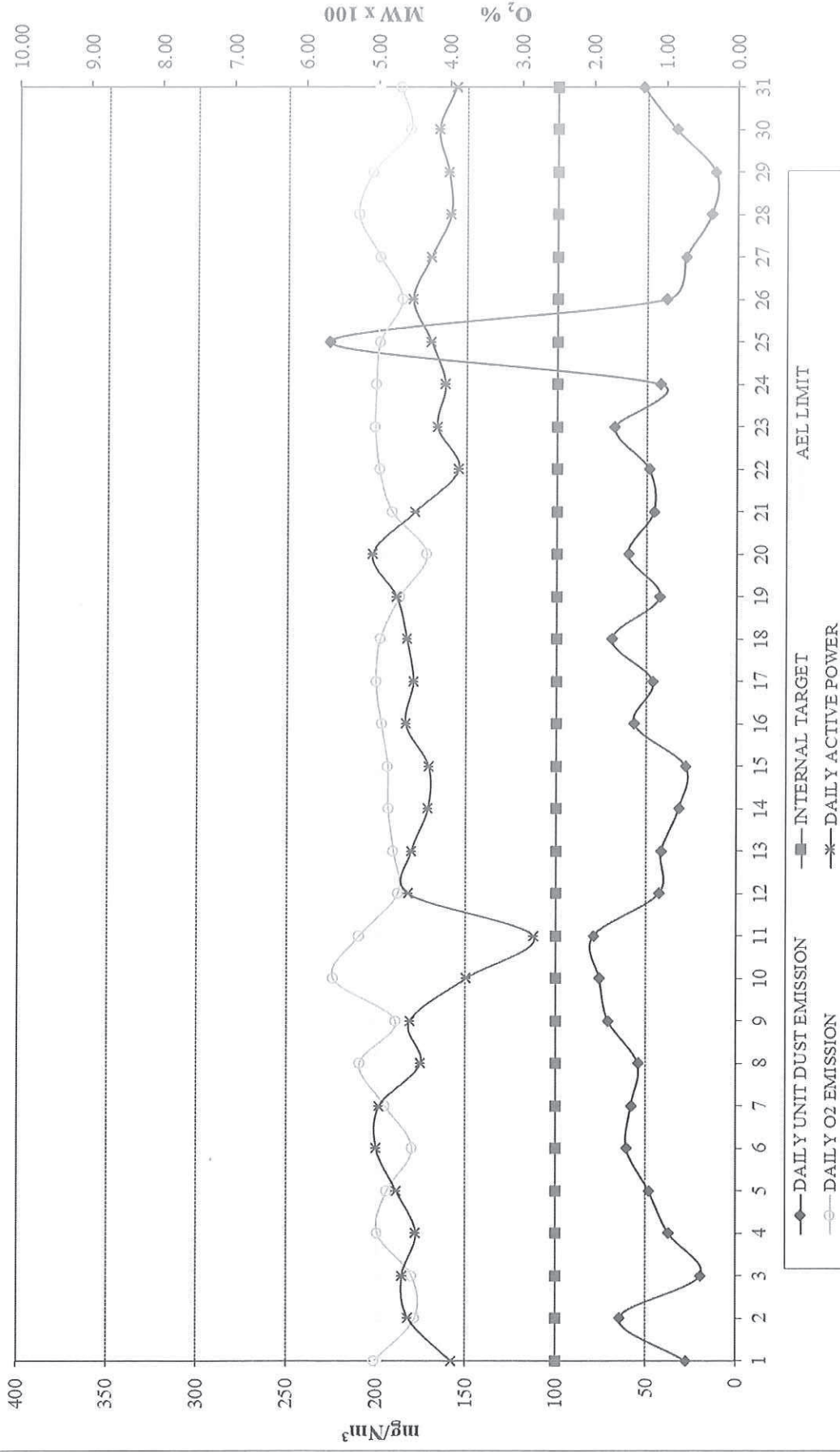
**MATLA POWER STATION  
UNIT 2 DUST EMISSION REPORT  
JULY 2018**



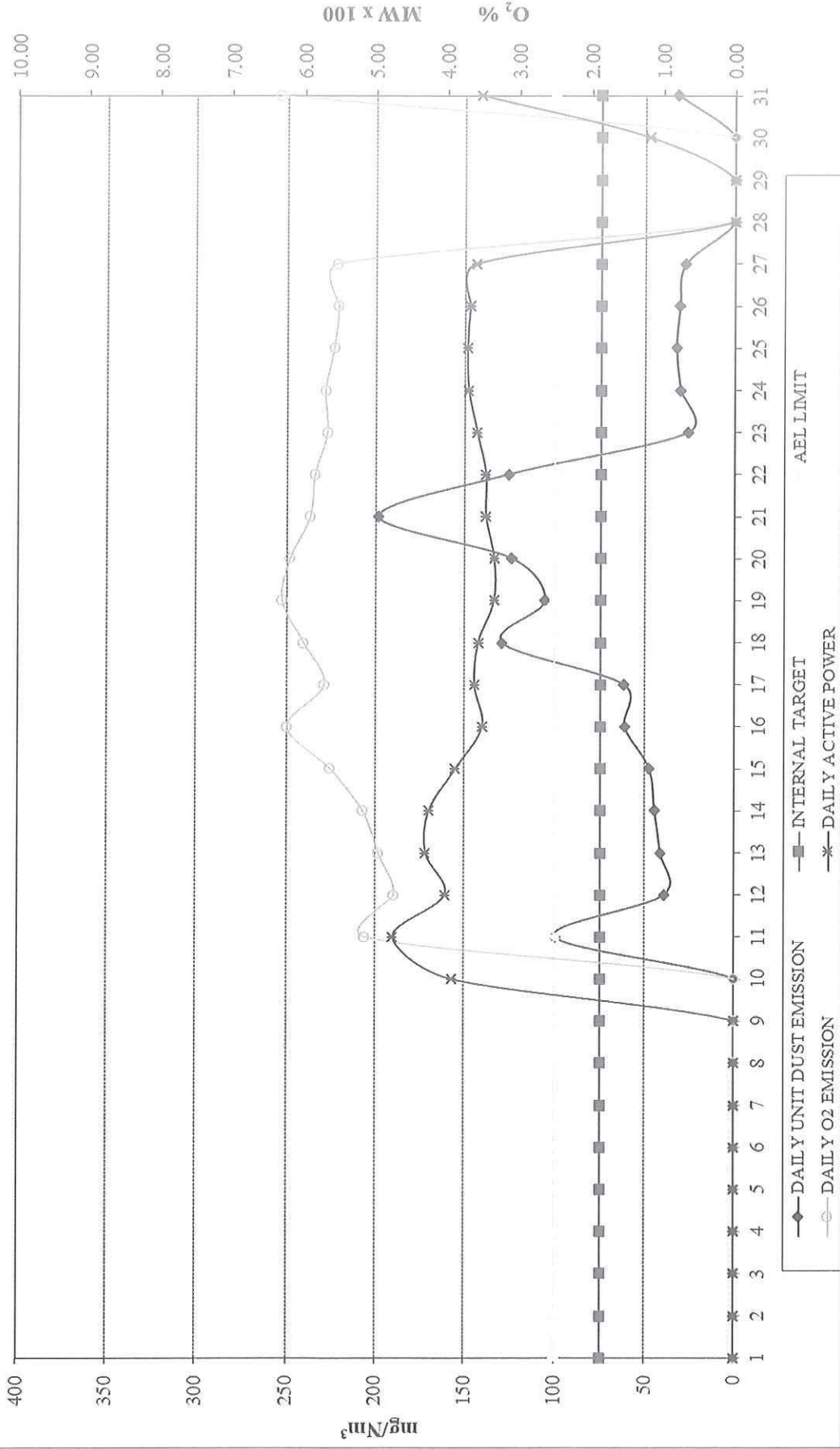
**MATLA POWER STATION  
UNIT 3 DUST EMISSION REPORT  
JULY 2018**



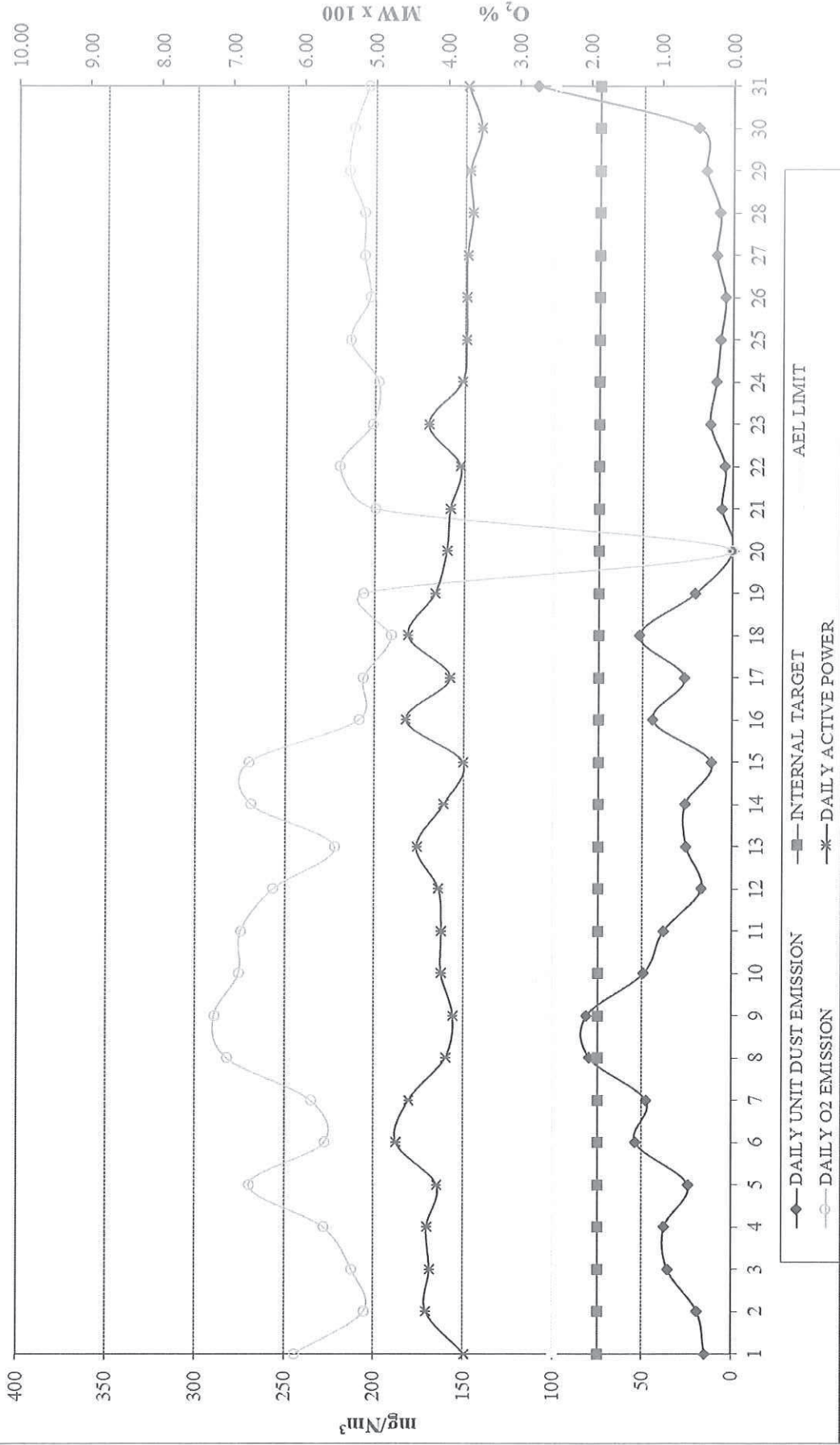
**MATLA POWER STATION  
UNIT 4 DUST EMISSION REPORT  
JULY 2018**



**MATLA POWER STATION  
UNIT 5 DUST EMISSION REPORT  
JULY 2018**

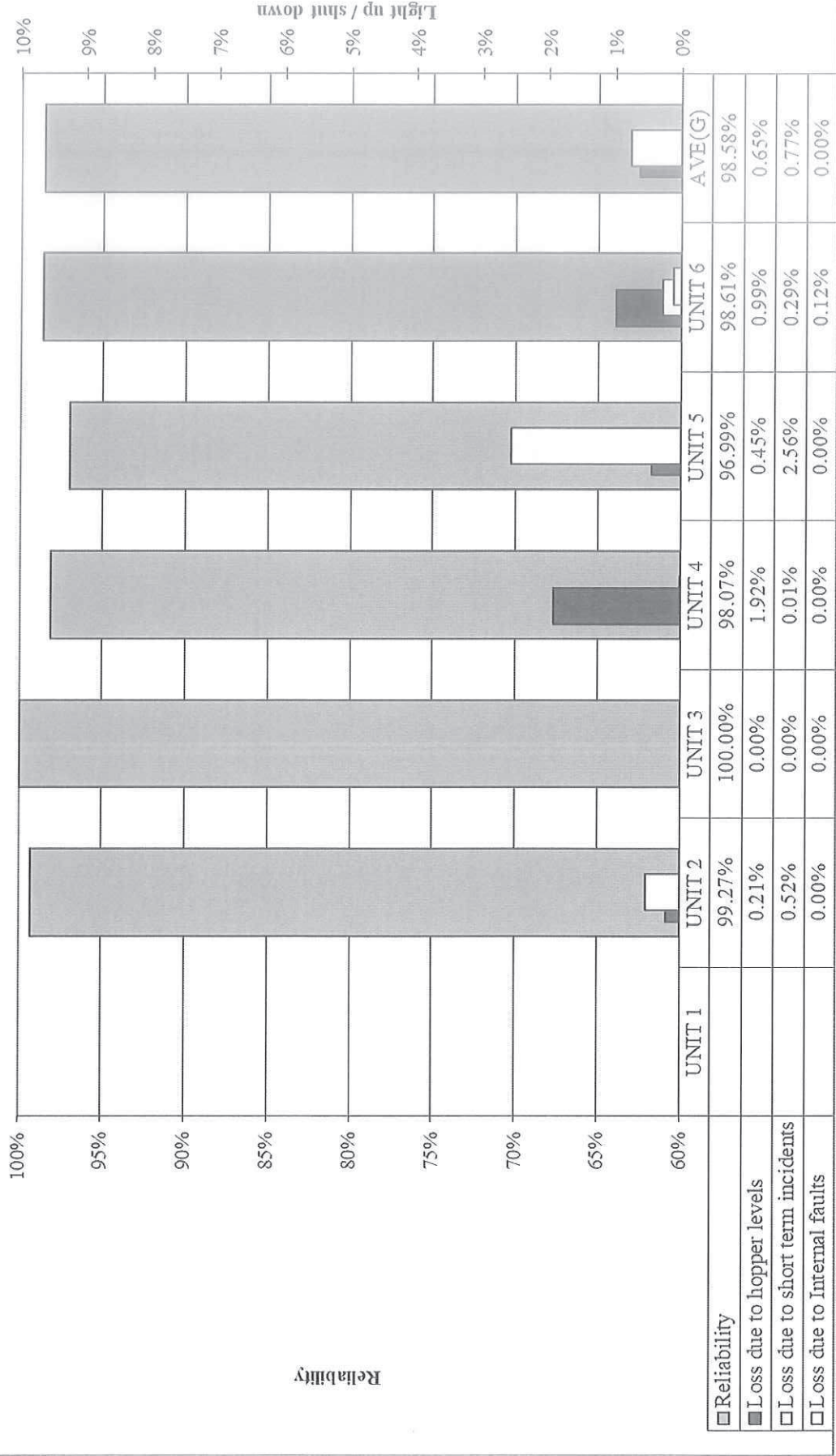


**MATLA POWER STATION  
UNIT 6 DUST EMISSION REPORT  
JULY 2018**

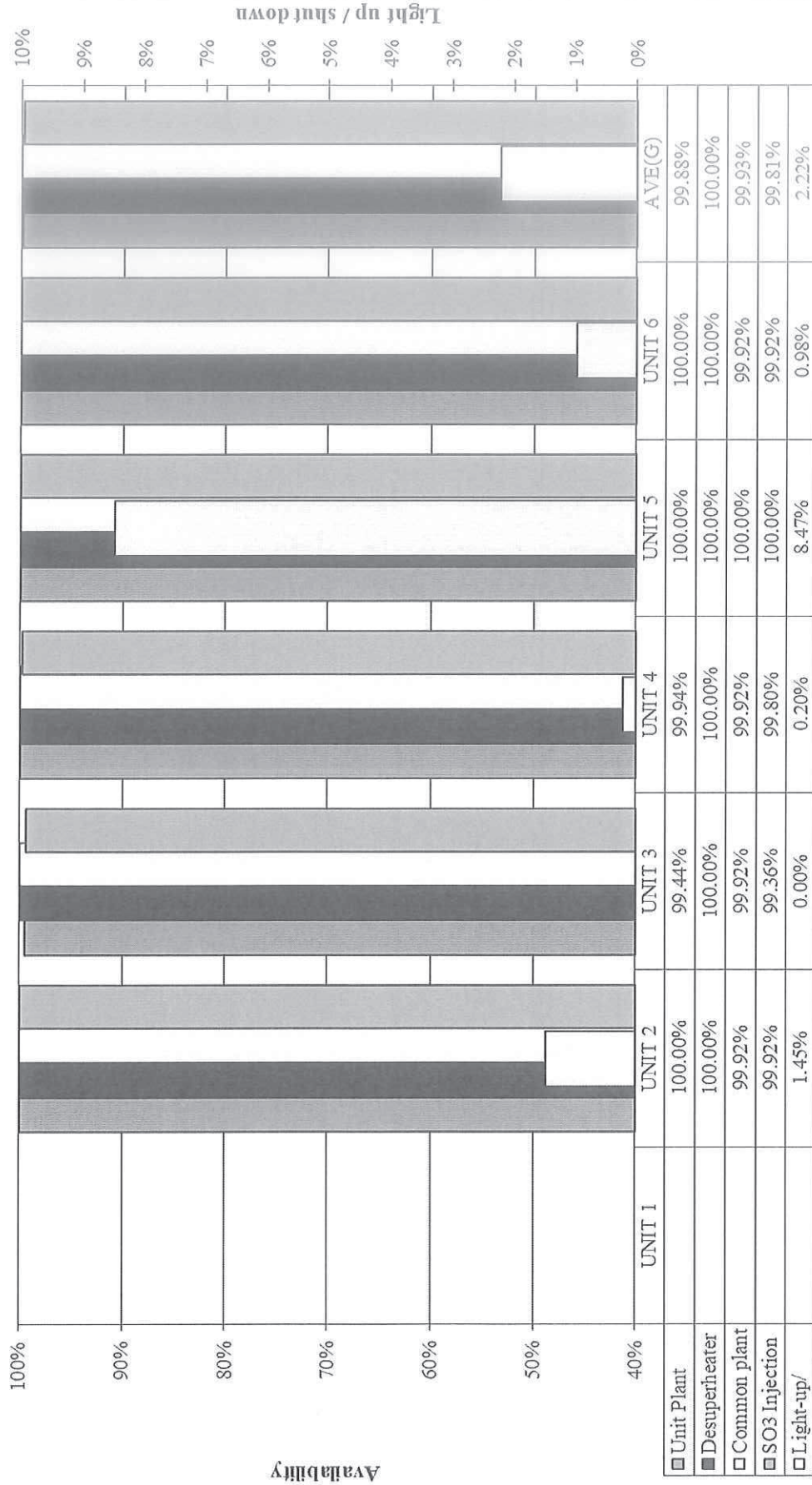




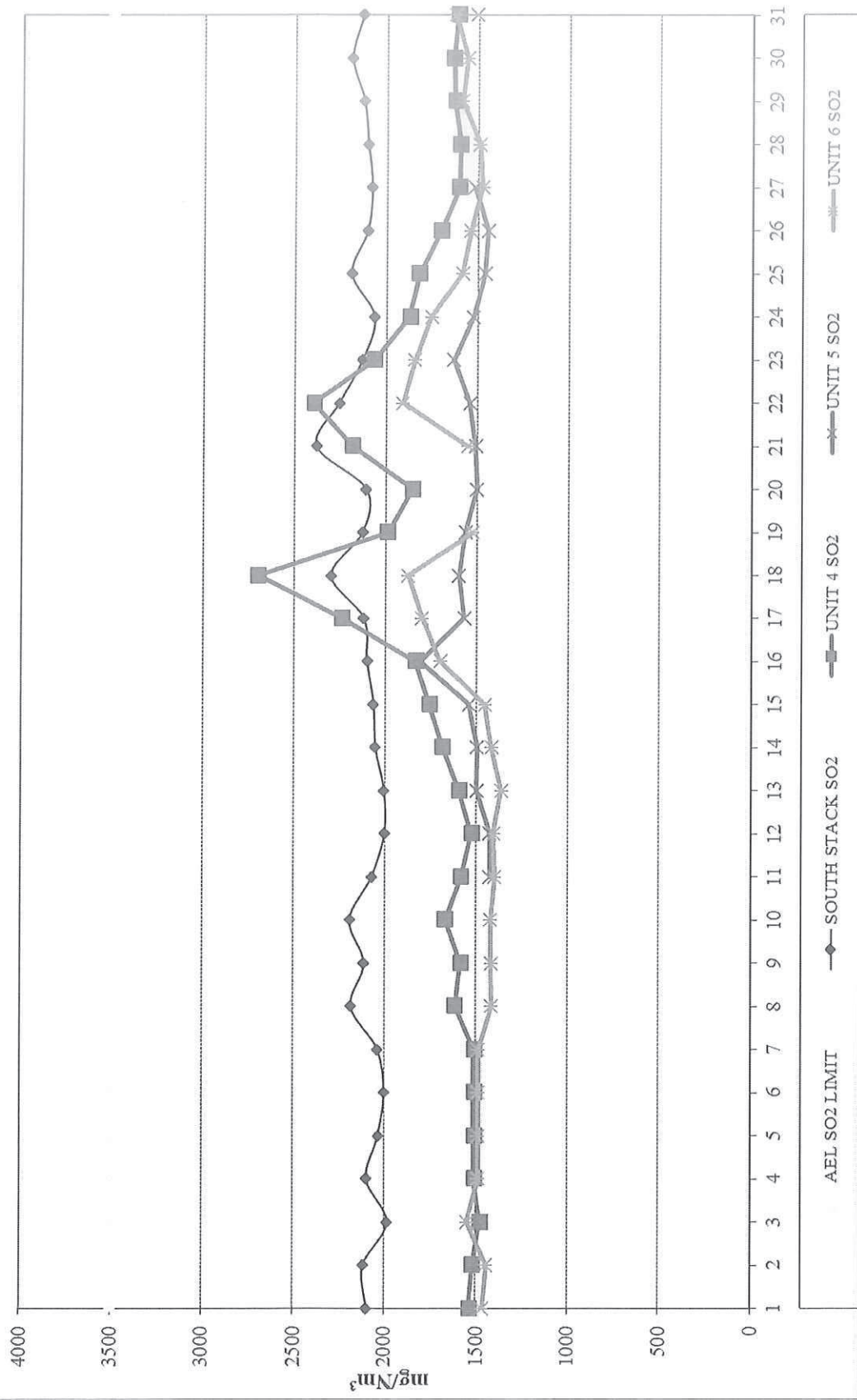
**MATLA POWER STATION  
PRECIPITATOR RELIABILITY  
JULY 2018**



**MATLA POWER STATION  
SO<sub>3</sub> PLANT AVAILABILITY  
JULY 2018**



**MATLA POWER STATION  
SMOKE STACK SO2 EMISSION REPORT  
JULY 2018**



**MATLA POWER STATION**  
**SMOKE STACK NO2 EMISSION REPORT**  
**JULY 2018**

