

Department of Agriculture, Rural Development, Land and Environmental

Affairs

The Director: Pollution and Waste Management

Private Bag X11219 Nelspruit 1200

Attention:

Mr. M Mahlalela

Nkangala District Municipality PO Box 437 Middelburg 1050

Attention:

Mr. V Mahlangu

MATLA POWER STATION AIR QUALITY REPORT FOR SEPTEMBER 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).

15th October 2018

Enquiries:

1. PARTICULATE EMISSIONS: MONTHLY TONNAGES.

	BLR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
		2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
	1	71.68	108.77	90.10	46.69	Off	Off	Off	Off	Off	Off	95.56	41.79
	2	51.66	99.27	84.35	165.43	57.98	60.80	28.57	44.25	74.24	74.20	69.81	61.67
	3	47.64	97.34	82.94	172.35	55.05	62.50	29.56	35.97	86.14	79.36	173.07	71.28
5.4 41-1	4	183.23	165.67	173.61	188.43	166.34	132.22	87.07	123.63	67.06	56.07	45.66	106.44
Monthly	5	147.51	74.42	49.59	82.97	68.06	97.63	61.14	83.25	90.26	45.00	73.61	43.41
Tonnage	6	Off	5.37	22.74	53.43	62.15	50.91	52.66	44.17	47.93	46.24	74.64	15.76
	Station	501.73	550.84	503.33	709.30	409.57	404.02	258.99	331.28	365.62	300.89	532.34	340.36
GWhSO		1580.5	1802.7	1998.5	1783.6	1562.9	1733.7	1594.2	1627.7	1491.5	1398.1	1368.0	1550.7

Generation Division (Operating Unit Coal 2)
Matla Power Station SA
Delmas Road
Private Bag X 5012, Kriel, 2271 SA
Tel +27 17 612 9111 Fax +27 17 612 6651 www.eskom.co.za

2. COAL AND LOAD FACTOR:

STATION		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
		2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Load Factor		80.55	83.88	85,33	82.96	88,34	86.45	78.39	89.58	76.24	72.31	71.04	78.96
Ash Content	%	24.34	24.11	29.57	27.15	23.3	26.41	25.3	27.70	27.92	27.6	30.93	31.33
Sulphur Content	%	1.00	1.0	1.0	1.0	0.95	0.90	0.99	1.2	1.00	1.00	1.00	1.00
Total Moisture	%	8.11	10.69	9.64	9.43	9.60	9.57	9.21	9.7	9.47	9.43	7.91	8.03

GASEOUS EMISSIONS:

CO₂ emissions: kilotons emitted per month, calculated from coal analysis and emission factors.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3	327-24-24-24-14-14-14-14-14-14-14-14-14-14-14-14-14	200000000000000000000000000000000000000			To hard your Proceedings (17)	- Water to his appear	A				730000000000	
Unit 4												
Unit 4 Unit 5												

SO₂ emissions: kilotons emitted per month, calculated from coal analysis and emission factors.

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
9.40	10.46	10.31	8.25	6.95	7.84	6.62	7.68	6.18	6.34	6.02	8.74
3.62	3.38	3.71	2.89	2.85	3.16	3,29	3.94	3.18	3.22	2.07	2.81
3.25	3.15	3.50	3.31	3.02	3.51	3.07	3.95	2.77	1.67	2.77	2.82
Off	0.44	2.80	3.70	2.46	3.13	3.15	3.93	2.99	2.89	2.75	1.03
16.27	17.43	20.32	18.15	15.28	17.64	16.12	19.50	15.12	14.13	13.61	15.40
	2017 9.40 3.62 3.25 Off	2017 2017 9.40 10.46 3.62 3.38 3.25 3.15 Off 0.44	2017 2017 2017 9.40 10.46 10.31 3.62 3.38 3.71 3.25 3.15 3.50 Off 0.44 2.80	2017 2017 2018 9.40 10.46 10.31 8.25 3.62 3.38 3.71 2.89 3.25 3.15 3.50 3.31 Off 0.44 2.80 3.70	2017 2017 2018 2018 9.40 10.46 10.31 8.25 6.95 3.62 3.38 3.71 2.89 2.85 3.25 3.15 3.50 3.31 3.02 Off 0.44 2.80 3.70 2.46	2017 2017 2018 2018 2018 9.40 10.46 10.31 8.25 6.95 7.84 3.62 3.38 3.71 2.89 2.85 3.16 3.25 3.15 3.50 3.31 3.02 3.51 Off 0.44 2.80 3.70 2.46 3.13	2017 2017 2017 2018 2018 2018 2018 2018 9.40 10.46 10.31 8.25 6.95 7.84 6.62 3.62 3.38 3.71 2.89 2.85 3.16 3.29 3.25 3.15 3.50 3.31 3.02 3.51 3.07 Off 0.44 2.80 3.70 2.46 3.13 3.15	2017 2017 2018 2018 2018 2018 2018 2018 9.40 10.46 10.31 8.25 6.95 7.84 6.62 7.68 3.62 3.38 3.71 2.89 2.85 3.16 3.29 3.94 3.25 3.15 3.50 3.31 3.02 3.51 3.07 3.95 Off 0.44 2.80 3.70 2.46 3.13 3.15 3.93	2017 2017 2018 2019 2019 2019 <th< td=""><td>2017 2017 2018 <th< td=""><td>2017 2017 2018 2019 2019 2019 2019 <th< td=""></th<></td></th<></td></th<>	2017 2017 2018 <th< td=""><td>2017 2017 2018 2019 2019 2019 2019 <th< td=""></th<></td></th<>	2017 2017 2018 2019 2019 2019 2019 <th< td=""></th<>

NO_x emissions: kilotons emitted per month, calculated from coal analysis and emission factors.

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	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3	2.95	3.28	3.23	2.59	2.18	2.46	2.07	2.01	1.94	1.99	1.88	2.74
Unit 4	1.13	1.06	1.16	0.91	0.89	0.99	1.03	1.03	1.00	1.01	0.65	0.88
Unit 5	1.02	0.99	1.10	1.04	0.95	1.10	0.96	1.03	0.87	0.52	0.87	0.88
Unit 6	Off	0.14	0.88	1.16	0.77	0.98	0.99	10.3	0.94	0.91	0.86	0.32
All Units	5.10	5.46	6.37	5.69	4.79	5.53	5.05	5.09	4.74	4.43	4.26	4.82

CO₂ emissions: kilotons emitted per month, <u>measured</u> with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.

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

SO₂ emissions: kilotons emitted per month, <u>measured</u> with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3	7.59	12.65	9.94	7.15	5.55	8.31	6.73	6.64	6.72	6.43	6.26	8.84
Unit 4	2.91	2.51	2.43	1.61	1.81	2.28	2.18	1.96	1.86	1.84	1.15	1.83
Unit 5	2.84	3.05	2.89	2.54	2.57	2.74	2.61	2.58	2.12	1.13	2.26	2.58
Unit 6	Off	0.14	1.06	1.44	1.03	1.22	2.73	2.65	2.40	2.38	2.18	0.80
All Units	13.35	18.36	16.33	12.74	10.96	14.55	14.26	13.83	13,10	11.79	11.85	14.06

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

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	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3	3.48	5.98	5.03	3.26	2.98	3.78	2.82	2.47	2.61	2.48	2.27	3.48
Unit 4	1.84	1.53	1.52	0.98	1.30	1.26	1.01	0.84	0.87	0.81	0.53	0.79
Unit 5	1.35	1.41	1.35	1.43	1.32	1.28	1.06	1.02	0.90	0.37	0.70	0.91
Unit 6	Off	0.07	0.54	0.79	0.55	0.63	1.25	1.10	1.19	1.11	0.89	0.33
All Units	6.66	8.99	8.44	6.46	6.15	6.95	6.15	5.43	5.57	4.77	4.40	5.52
				1			1	1			I .	

CO₂ emissions (mg/Nm³): Average concentration per month (at 273 K, 101.3 kPa and 10% O₂), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3										-272223		2
Unit 4												
Unit 5												
Unit 6												

 SO_2 emissions (mg/Nm³): Average concentration per month (at 273 K, 101.3 kPa and 10% O_2), measured with the continuous emission monitoring system. NOTE: These are

unverified values for information purposes only

Limit	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
4000	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3	1831	2390	2127	1883	1587	2246	2036	2153	2203	2116	2129	2096
Unit 4	2023	1513	1447	1476	1350	1626	1628	1685	1590	1761	1614	1791
Unit 5	1966	2046	1906	1751	1827	1856	1850	1797	1656	1533	1658	2033
Unit 6	Off	1421	1385	1353	1406	1425	1540	1620	1529	1554	1572	1361

SO₂ daily average emissions: AEL limit exceedances

Limit	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
3500	2017	2017	2017	2018	2018	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_x emissions (mg/Nm³): Average concentration per month (at 273 K, 101.3 kPa and 10% O_2), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only

Limit	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1700	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
Units 1-3	838	1128	1074	858	851	1017	852	797	853	806	770	823
Unit 4	1269	914	894	896	970	872	752	713	735	773	745	772
Unit 5	938	949	892	982	936	859	753	708	703	493	519	719
Unit 6	Off	682	705	751	751	740	711	674	757	717	646	564

NO_v daily average emissions: AEL limit exceedances

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

4. PARTICULATE EMISSION PERFORMANCE

	MONTH AVERAGE EMISSIONS	AEL LIMIT(DAILY AVERAGE)	HIGHEST DAILY AVERAGE
UNIT	mg/Nm3	mg/Nm3	mg/Nm3
1, 2 & 3	40.60	200	68.24
4	105.68	200	305.80
5	32.88	100	56.80
6	26.97	100	58.70
Station	51.53		
YTD	51.68		

ABATEMENT APPARATUS AVAILABILITY

Unit		1	2	3	4	5	6	Station
Precipitator efficiency	%	99.89	99.85	99.83	99.68	99.88	99.98	99.85
Precipitator availability	%	96.53	100.00	99.43	96.79	99.80	100.00	98.51
SO ₃ plant utilisation	%	98.06	95.52	99.04	98.90	98.68	99.87	98.40

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	2	0	2	0	0
5	0	0	0	0	0
6	0	0	0	0	0
Station	2	0	2	0	0
YTD	23	4	12	4	3

DISCUSSION

Unit 1:

The unit tripped on the 2nd September 2018 at 21:24 when the turbine differential expansion protection operated. The unit remained off load for repairs. The unit returned to service on the 4th September 2018 at 13:35.

The unit tripped on the 13th September 2018 at 00:59 when the generator exciter transformer failed. The unit returned to service on the 15th September 2018 at 16:27

The unit was taken off load on the 19th September 2018 at 21:31 for maintenance to repair the turbine condensate extraction pump. The unit returned to service on the 20th September 2018 at 19:39. The unit was shut down again for repairs to the condensate extraction pump on the 21st September 2018 at 01:22. The unit returned to service on the 21st September 2018 at 09:41.

The unit tripped on the 22nd September 2018 at 10:36 on turbine vacuum protection. The unit returned to service at 14:09 on the same day.

The unit experienced a few SO₃ flue gas conditioning plant failures during the month. These were of a short duration and the impact on the particulate emissions was limited.

Unit 2:

The unit tripped on the 24th September 2018 at 16:50 on boiler flame failure protection. The unit returned to service at 23:23 on the same day.

The unit was taken off load on the 27th September 2018 at 12:14 for boiler tube leak repairs.

The opportunity was utilised to carry out precipitator inspection and repairs.

The unit experienced a SO₃ flue gas conditioning plant failures during the month. These were of a short duration and the impact on the particulate emissions was limited.

Unit 3:

The unit experienced a substantial number of SO₃ flue gas conditioning plant failures during the month and as a result, higher than normal particulate emissions were recorded for the month.

Unit 4:

The unit was taken off load on the 30th August 2018 at 21:34 for boiler tube leak repairs. The unit returned to service on the 5th September 2018 at 01:28.

The unit experienced a large number of precipitator field trip due to full dust hoppers. The full hoppers were mainly as a result of extreme poor coal quality delivered to the station. In addition, the unit also experienced a fair number of SO₃ flue gas conditioning plant failures due to sulphur flow problems caused by contaminated sulphur delivered to the station. The combination of these resulted in elevated emissions for the month. As a result of the above mentioned failures the AEL limit was exceeded on the 10th and 12th September 2018.

Unit 5:

The unit tripped on the 5th September 2018 at 14:46 when a turbine control module failed. The unit returned to service on the 5th September 2018 at 22:32.

The unit experienced a limited number of precipitator field failures and SO₃ flue gas conditioning plant failures.

The particulate emissions recorded were well below the AEL limit for the month.

Unit 6:

The unit was taken off load on the 10th September 2018 at 21:34 for boiler tube leak repairs. Particulate emissions well below the AEL limit was recorded for the period that the unit was on load.

SO₃ common Plant:

The SO₃ common plant tripped on the 7th September when a tanker was off loaded. The sulphur delivered to the station is still contaminated and causes sulphur flow problems at the units.

Gas Emissions:

The south stack O_2 analyser reading remained high. The OEM established that the sensor is faulty. The procurement process to replace the sensor has commenced. The O_2 reading is thus calculated based on the O_2/CO_2 balance.

The availability of the CEMS was good for the month of September 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 the station remained poor during the month, impacting negatively on the particulate emissions.

The change in coal quality negatively impacted on the dust handling plant due to the change in dust particle size and density.

6. LIGHT UP:

o. LIGITI OF.		
Unit:	1	
Fires in:	08:00	4 September 2018
Synchronisation:	13:35	4 September 2018
Emissions below Limit:	16:19	4 September 2018
Fires in to synchronisation:	5:35	Hours
Synchronisation to < Limit:	2:44	Hours
•		
Unit:	4	
Fires in:	18:25	4 September 2018
Synchronisation:	01:28	5 September 2018
Emissions below Limit:	04:48	5 September 2018
Fires in to synchronisation:	7:03	Hours
Synchronisation to < Limit:	3:20	Hours
Unit:	5	
Fires in:	15:30	5 September 2018
Synchronisation:	22:56	5 September 2018
Emissions below Limit:	01:56	6 September 2018
Fires in to synchronisation:	7:26	Hours
Synchronisation to < Limit:	3:06	Hours
Fix b	1 2	
Unit:	1	1.50
Fires in:	07:20	15 September 2018
Synchronisation:	16:27	15 September 2018
Emissions below Limit:	19:44	15 September 2018
Fires in to synchronisation:	9:07	Hours
Synchronisation to < Limit:	3:17	Hours
Unit:	1	
Fires in:	14:37	20 September 2018
Synchronisation:	19:39	20 September 2018
Emissions below Limit:	21:36	20 September 2018
Fires in to synchronisation:	5:02	
Synchronisation to < Limit:	1:57	Hours
Cyricinomation to 4 Limit.	1.07	Tiodio
Unit:	1	
Fires in:	05:45	21 September 2018
Synchronisation:	09:41	21 September 2018
Emissions below Limit:	12:11	21 September 2018
Fires in to synchronisation:	3:56	Hours
Synchronisation to < Limit:	2:30	Hours
Unit:	1	
Fires in:	10:36	22 September 2018
Synchronisation:	14:09	22 September 2018
Emissions below Limit:	14:09	22 September 2018
Fires in to synchronisation:	3:33	Hours
Synchronisation to < Limit:	0	Hours (OPS failed to SD ESP after trip)

Unit:	2	
Fires in:	19:52	24 September 2018
Synchronisation:	23:23	24 September 2018
Emissions below Limit:	11:28	25 September 2018
Fires in to synchronisation:	3:31	Hours
Synchronisation to < Limit:	12:05	Hours

7. GRAPHS:

See attached graphs

8. COMPLAINTS

Name of complainant	Date	Description of complaint	Action taken
No Complaints	34		

9. NOTIFICATION OF CONTRAVENTION OF EMISSION LICENCE CONDITIONS

Date	
Power Station Unit(s)	Matla Power Station –
Date of incident	Start date and time:
Time of incident	End date:
Nature of incident	Extended start-up
	On-line maintenance
	Extended shut-down
Emission limit exceedance	
Details of incident	
Risks posed by the incident to public health, safety and property	
Toxicity of substance or by-products released by the incident	
Mitigation to avoid or minimize the incident effects on public health and the environment	
Compiler and contact	Name:
details	Tel no:
	Email:
Responsible manager and contact details	Name:
and comact details	Tel no: Email:
	Elliali.

BOILER PLANT ENGINEERING

Copies to: Licensing Authority

Power Station Manager (Acting) Environmental Practitione

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



















