

**AIR QUALITY OFFICER  
FEZILE DABI DISTRICT MUNICIPALITY  
Mr Chakane Sibaya**

Date:  
12 December 2018

Enquiries:

Ref: LRP07PLA000 \_0094/20180516 rev 1  
Dear Mr. Sibaya

**SUBJECT: RESUBMISSION OF THE LETHABO POWER STATION'S ANNUAL EMISSION REPORT FOR THE 2017/2018 FINANCIAL YEAR**

This serves as Lethabo Power Station's Annual Emission Report as required in terms of section 7.7 in the Atmospheric Emission License issued to Lethabo Power Station. The emissions reported are for Eskom's 2017/2018 financial year which is from 01 April 2017 to 31 March 2018.

QAL2 tests were conducted on all the Units from July 2017 to November 2017. Due to challenges experienced with drift on the Oxygen readings and the substantially high correction factors on both the NO<sub>x</sub> and Oxygen parameters, which in itself casts doubt on the accuracy of the results, it was recommended that new tests be carried out. We are currently in the process of performing such tests, the same supplier was used as the previous round of test.

All units QAL 2 test were completed and back fitting of data was conducted from January 2018 onwards. This report is a resubmission of the annual report that was submitted by the end of May 2018.

Included in the report are verified emissions for Particulate Matter (PM), SO<sub>2</sub>, NO<sub>x</sub> (as NO<sub>2</sub>) and N<sub>2</sub>O.

.../2

The emissions in the table below are for the 2017/2018 financial year.

Power Station	Coal-fired emissions (tons/annum)	Fuel-oil emissions (tons/annum)	Total (tons/annum)
Lethabo Power Station	N <sub>2</sub> O: 283	N <sub>2</sub> O: Not Calculated	N <sub>2</sub> O: 283
	PM: 6 173	PM: Not Calculated	PM: 6 173
	SO <sub>2</sub> : 163 783	SO <sub>2</sub> : 478	SO <sub>2</sub> : 164 261
	NO <sub>x</sub> : 70 315	NO <sub>x</sub> : Not Calculated	NO <sub>x</sub> : 70 315

Table 1: Total Emissions for 2017/2018 Financial year

### Pollutant Emission Trends:

Month	CO <sub>2</sub> (tons)	N <sub>2</sub> O (tons)	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
April 2017		25	462	14685	6221
May 2017		32	524	18346	7472
June 2017		31	521	16579	7316
July 2017		29	593	15620	6735
August 2017		32	583	17795	7364
September 2017		28	640	15788	6371
October 2017		34	846	20484	8397
November 2017		12	376	7897	3597
December 2017		12	379	7337	3298
January 2018		16	404	9875	4571
February 2018		16	428	9605	4456
March 2018		16	417	9772	4517

Table 2: Monthly Emissions Trends 2017/2018 financial year

Figure 1: Graphical representation of CO<sub>2</sub> monthly data

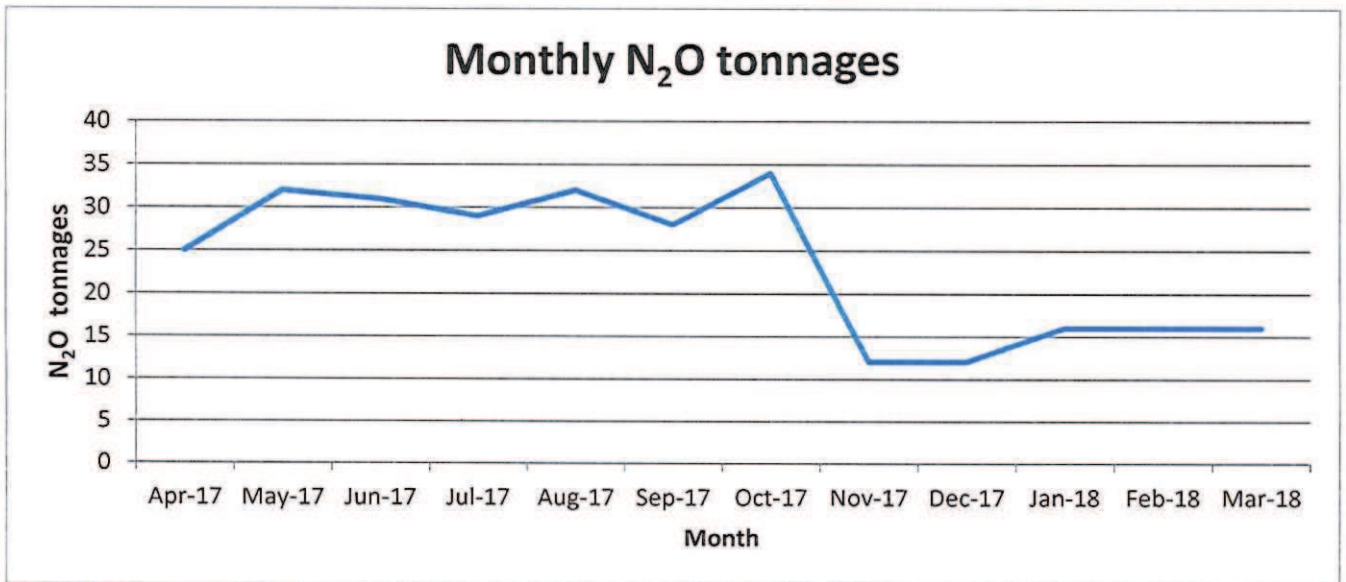


Figure 2: Graphical representation of N<sub>2</sub>O monthly data

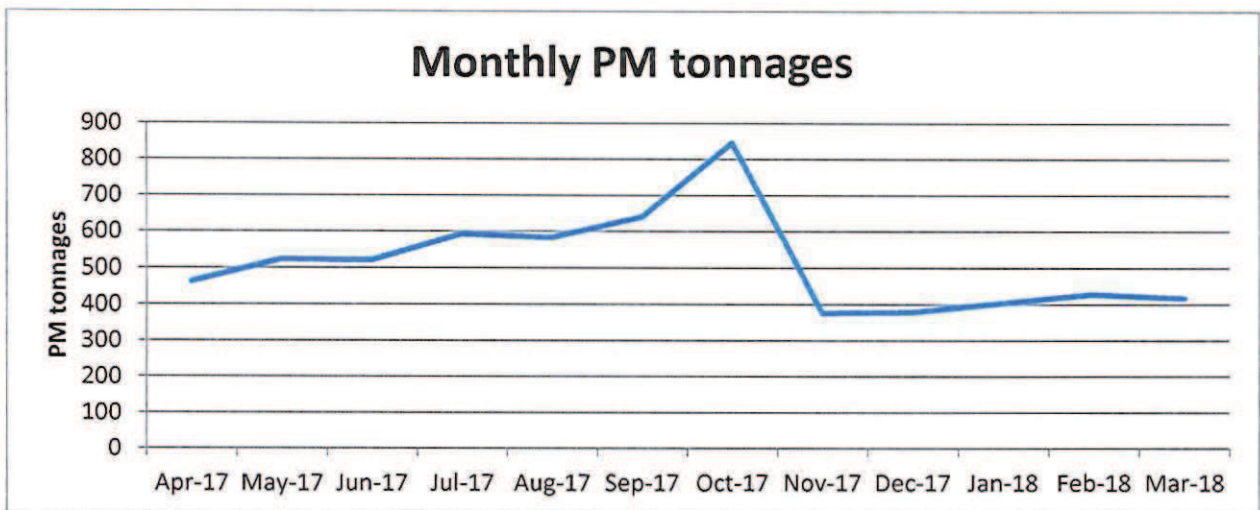


Figure 3: Graphical representation of PM monthly data

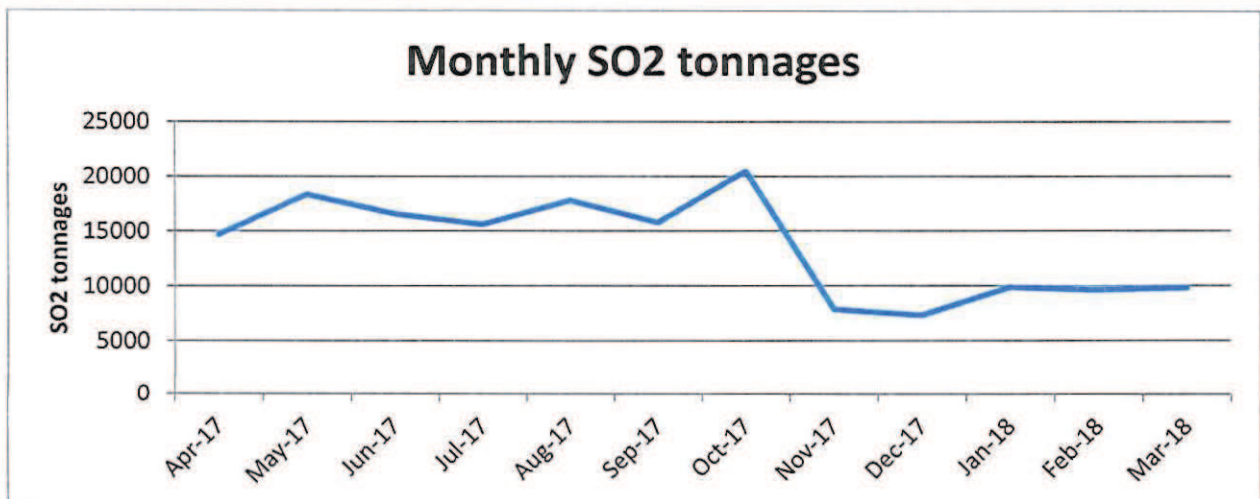


Figure 4: Graphical representation of SO<sub>2</sub> monthly data



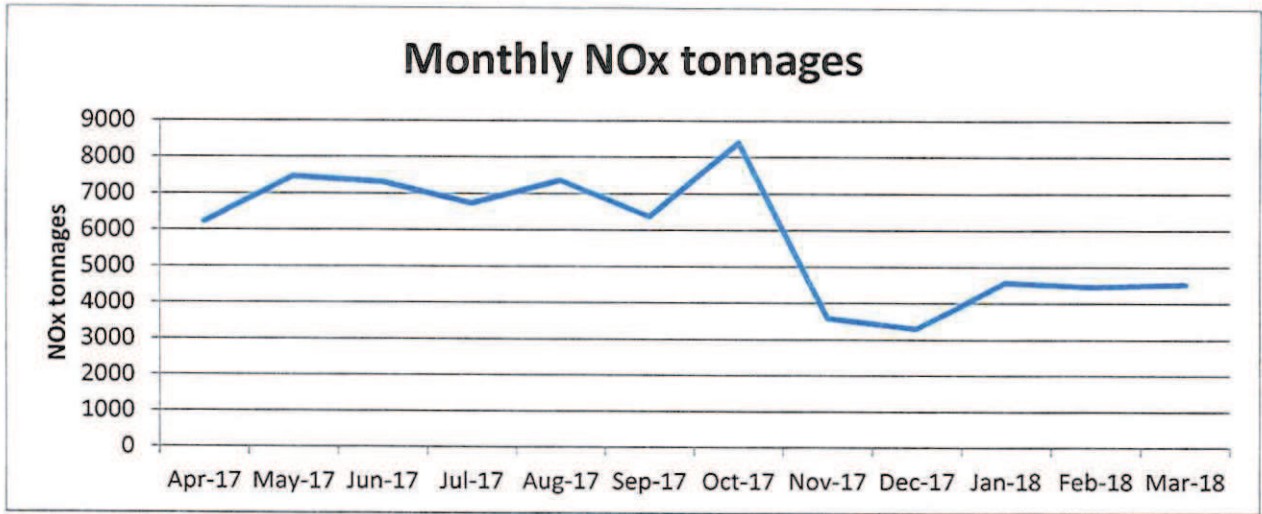


Figure 5: Graphical representation of NOx monthly data

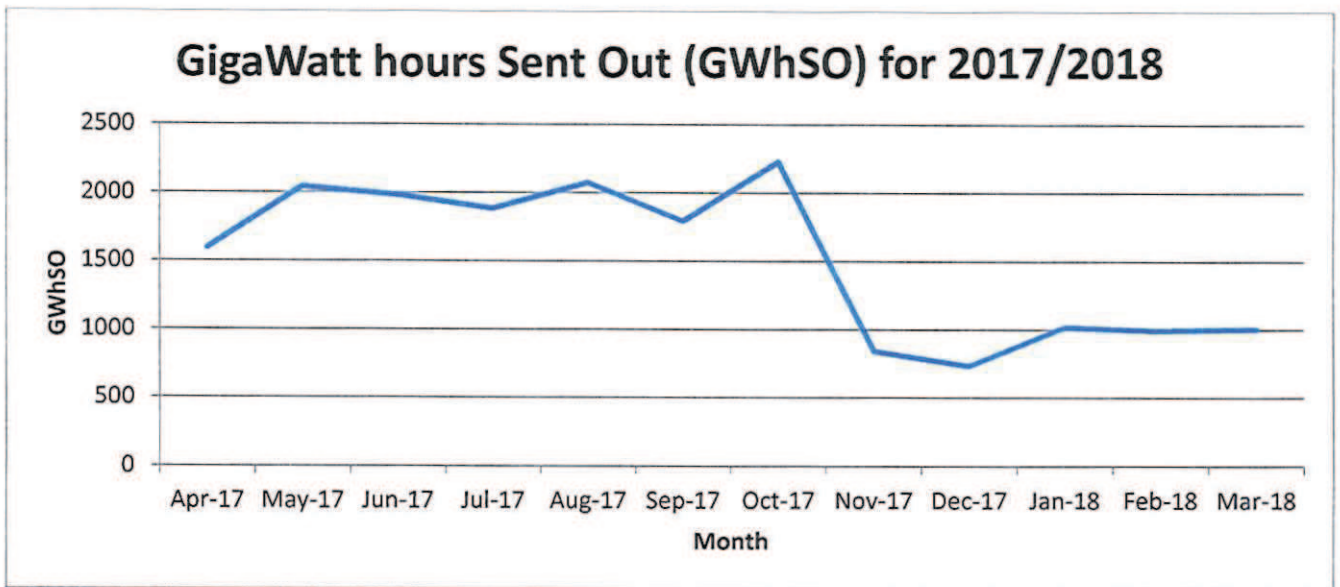


Figure 6: Graphical representation of GigaWatt hours sent out

The emission trends shown in the above table and graphs largely reflect the load of the power station as can be seen in the last graph.

**Monitoring data availability**

Table 2: General oversight of monitoring data availability for Lethabo Power Station 2017/2018 in terms of the number of full hours per annum that valid results were obtained for the CEMS in question.

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
PM	4759.7	4703	3828.7	6486.7	8113.9	7926.2
SO <sub>2</sub>	4751.9	4698.8	3902	6507.8	8172	7959.2
NOx	4751.9	4702.2	3904	6520.8	8175	7961.2



**Compliance (Audit) Report/s:**

A pre-compliance notice was issued to Lethabo Power Station on the 19<sup>th</sup> of February 2018 in terms of Section 31L of the National Environmental Management Act, 1998 (act 107 of 1998) for non-compliances related to air quality management. A response was submitted on the 20<sup>th</sup> of April 2018 to the Department of Environmental Affairs.

**Major upgrades or projects:**

Units 1, 2 and 3 had their outages from November 2017 to April 2018, resulting in the station undergoing a half station shut down.

**Greenhouse gas emissions:**

Greenhouse gas emissions as CO<sub>2</sub> and N<sub>2</sub>O have been reported on in the above sections. These have been calculated.

**Results of spot measurements or correlation tests:**

Table 3: Overview of dates of last conducted CEMS verification tests for PM, SO<sub>2</sub> and NO<sub>x</sub>. Please see annexure 1 for the results of these tests.

Stack/ Unit	PM	SO <sub>2</sub>	NO <sub>x</sub>
1	August 2017	June 2018	June 2018
2	September 2017	August 2018	August 2018
3	November 2017	August 2018	August 2018
4	August 2017	April 2018	April 2018
5	August 2017	May 2018	May 2018
6	July 2017	June 2018	June 2018

NB: QAL 2 tests were performed on all units in 2017. However, due to issues with the monitor, the results received were questionable. Lethabo has conducted new tests in 2018 as per the above table.

**An explanation of all instances where minimum emission standards were exceeded:**

Table 4: Overview of daily average limit exceedances for 2017/18 financial year

Exceedance	Stack/unit and pollutant	Exceedance date	Reason for exceedance
1	1	2017/06/17	ESP casing outage 103278
2	1	2017/07/03	ESP casing outage 103941,103942
3	1	2017/07/04	ESP casing outage 103941,103942
4	1	2017/07/11	Light up (GPSS)
5	1	2017/07/24	Sulphur common plant challenge log entries
6	1	2017/07/25	Sulphur common plant challenge log entries
7	1	2017/07/26	Sulphur common plant challenge 104828
8	1	2017/07/28	Sulphur common plant challenge 104696,104851, 104861
9	1	2017/07/29	Sulphur common plant challenge, 104902
10	1	2017/08/01	SO3 plant on PTW, cooling for PTW104996, 105119, 105104
11	1	2017/08/02	SO3 plant on PTW, cooling for PTW 104996, 105119, 105104
12	1	2017/08/03	SO3 plant on PTW, 104996, 105119, 105104
13	1	2017/08/09	SO3 plant on PTW, 105282
14	1	2017/08/11	Sulphur line blocked, flow only obtained between 17:00 and 18:00 Notification 409920
15	1	2017/08/18	ESP casing outage, 105608, 105617
16	1	2017/09/26	Light up
17	1	2017/11/02	Unit tripped due to low drum level and was put back in service
18	1	2017/11/03	Unit shut down
19	2	2017/04/01	RHI precip casing repairs
20	2	2017/04/15	Light up
21	2	2017/04/20	Light up
22	2	2017/04/21	Light up
23	2	2017/05/16	Light up SO3 plant heaters defective,102036, 102081
24	2	2017/05/17	Light up SO3 plant heaters defective,102036, 102081



25	2	2017/05/18	Light up SO3 plant heaters defective,102036, 102081
26	2	2017/05/19	Light up SO3 plant heaters defective,102036, 102081
27	2	2017/05/20	Light up SO3 plant heaters defective,102036, 102081
28	2	2017/06/15	Unit shut down
29	2	2017/06/20	Light up
30	2	2017/06/26	Light up, ESP plate rappers defective
31	2	2017/06/27	Light up, ESP plate rappers defective
32	2	2017/07/18	Light up
33	2	2017/07/24	Sulphur common plant challenges, 104696,104851,104861,104902
34	2	2017/07/25	Sulphur common plant challenges, 104696,104851,104861,104902
35	2	2017/07/26	Sulphur common plant challenges, 104696,104851,104861,104902
36	2	2017/07/28	Sulphur common plant challenges, 104696,104851,104861,104902
37	2	2017/07/29	Sulphur common plant challenges, 104696,104851,104861,104902
38	2	2017/09/15	SO3 plant on PTW for gas leak,106663,106702,106719
39	2	2017/09/16	SO3 plant on PTW for gas leak,106663,106702,106719
40	2	2017/09/17	SO3 plant on PTW for gas leak,106663,106702,106719
41	2	2017/10/05	Opacity meter power supply defective, 107411
42	2	2017/10/14	RH casings comms fault,107733
43	2	2017/10/26	RHO precip casing power outputs low
44	2	2017/10/31	RHO precip casing power outputs low
45	3	2017/04/07	LHI Esp casing outage, 100637
46	3	2017/08/01	Sulphur line blocked, 104696,104851,104861,104902. Opacity Meter lenses dirty, 105021
47	3	2017/10/04	ESP fields LHO 4, LHI 1, RHI 2, and RHI 3 & RHO 1 tripped due to communication faults. Notification no 416536, 416520



			ID fans running into saturation at full load and Several ESP fields out of service (RHI 4, RHI 6, and RHO 7.) LHO Field 2 experienced a trip during full load conditions in the late afternoon. LHI ESP casing power output below optimal for the entire day, however especially during full load conditions.
48	3	2017/11/02	
49	3	2017/11/05	Unit Shut Down
50	3	2018/03/31	Unit Light up
51	4	2017/04/19	Light up. Unit running with one draught group.
52	4	2017/05/22	SO3 plant air blower earth fault
53	4	2017/06/22	Unit shut down. Precip fields switch off
54	4	2017/06/24	Sulphur supply pipe blocked
55	4	2017/06/26	Sulphur supply problems and two casings underperforming
56	4	2017/07/03	Insufficient sulphur flow for load conditions and two casings underperforming
57	4	2017/07/12	SO3 plant challenges and opacity meter calibration
58	4	2017/07/16	ESP casing outage
59	4	2017/07/21	RHO ESP casing outage
60	4	2017/07/24	Sulphur common plant challenges
61	4	2017/07/25	Sulphur common plant challenges
62	4	2017/07/26	Sulphur common plant challenges
63	4	2017/07/28	Sulphur common plant challenges
64	4	2017/08/11	ESP casing outage
65	4	2017/08/12	ESP casing outage
66	4	2017/08/29	Two casings underperforming
67	4	2017/09/08	ESP casing outage
68	4	2017/09/16	Two casings underperforming with high and unbalanced gas flows at high loads due to ID fan links problematic
69	4	2017/09/18	Two casings not performing on spec and ID fan control erratic
70	4	2017/09/22	RHI casing on outage and RHO underperforming
71	4	2017/09/23	Sulphur flow very erratic
72	4	2017/09/27	Unit shut down
73	4	2017/10/04	SO3 plant for C&I module repairs
74	4	2017/10/07	Unit shut down
75	4	2017/10/11	Light up
76	4	2017/10/23	Communication fault on LHO ESP
77	4	2017/10/27	LHI ESP casing outage
78	4	2017/10/30	RHO ESP Power outputs below optimal.

79	4	2017/11/07	Unit start up and shut down again for generator earth fault.
80	4	2017/12/16	Unit start up and shut down for super heater safety valve repairs
81	4	2018/01/02	Light up
82	4	2018/01/03	Light up
83	4	2018/01/04	SO3 plant O/C for most of the day
84	4	2018/02/01	<ul style="list-style-type: none"> <li>- RHI 3 field performance insufficient between 00:00 to 03:00</li> <li>- RHI 4 field performance insufficient 87% of the day</li> <li>- RHI 7 Performance insufficient 54% of the day</li> <li>- RHO 3, 4 and 6 performances insufficient for the whole day.</li> <li>- ID fans running into saturation at full load.</li> </ul>
85	4	2018/02/02	<ul style="list-style-type: none"> <li>- RHI 3 field performance insufficient between 00:00 to 03:00</li> <li>- RHI 4 field performance insufficient 70% of the day</li> <li>- RHI 7 Performance insufficient 75% of the day</li> <li>- RHO 3, 4 and 6 performances insufficient for the whole day.</li> <li>- ID fans running into saturation at full load.</li> </ul>
86	4	2018/02/08	<ul style="list-style-type: none"> <li>- RHI 4 field performance insufficient 100% of the day</li> <li>- RHI 7 Performance insufficient 91% of the day</li> <li>- RHO 4 and 6 performance insufficient for the whole day.</li> <li>- ID fans running into saturation at full load.</li> </ul>
87	4	2018/02/10	<ul style="list-style-type: none"> <li>Unit tripped on 2018/02/09 @ 00:59 SOL @ 04:15.</li> <li>-LHI 2 (11kW) field performance insufficient 06:00 to 19:00 @ higher loads</li> <li>- RHI 4 (2.4kW)field performance insufficient 100% of the day</li> <li>- RHI 7 (5.4kW) Performance insufficient 91% of the day</li> <li>- RHO 3 O/C whole day</li> <li>- RHO 4 (1.8kW), 5 (30.39kW) and 6 (25.6kW) performance insufficient for the whole day.</li> <li>- ID fans running into saturation at full load.</li> </ul>



88	4	2018/02/20	-LHO 6 O/C entire day -LHO 7 performing insufficiently 66% of the day - LHI 7 O/C 17:00 to 23:59 - RHI 1,3,7 performing insufficiently - RHO 4 performing insufficiently SO3 plant tripped
89	4	2018/02/26	- LHO 6 O/C entire day - LHI 7 O/C entire day - RHI 7 performing insufficiently - RHO 4 performing insufficiently
90	4	2018/03/03	ESP LHI casing underperforming
91	4	2018/03/05	Unit high load limit decreases to 610 mw as id fans and pa fans not coping. (Furnace pressure high).
92	4	2018/03/06	FAILURE   SO3 Plant   air blower fails to start   08-04NQ01D002 - AIR BLOWER; SO 3 plant trips due to air blower fault.
93	4	2018/03/27	P&O and process engineering informed of id and pa fans that is not coping and attended. Note: mills pa flows full scale pa rating dampers 95 %.
94	4	2018/03/28	Unit Shut Down for Boiler Tube Leak
95	5	2017/04/06	LHI casing on outage and RHO performing poorly for most of the day
96	5	2017/04/25	SO 3 plant blower alignment rectified, 101319
97	5	2017/04/28	RHO casing outage
98	5	2017/05/07	LHI Casing repairs
99	5	2017/05/20	RHI casing repairs
100	5	2017/07/25	Sulphur common plant challenges
101	5	2017/08/19	ESP casing outage
102	5	2017/08/20	ESP casing outage
103	5	2017/09/11	RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
104	5	2017/09/14	ESP casing outage
105	5	2017/09/15	ESP casing outage, HP bypass spray water repairs
106	5	2017/10/01	SO3 plant air blower defective
107	5	2017/10/02	Poor ESP performance
108	5	2017/10/04	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
109	5	2017/10/06	RHI ESP casing outage
110	5	2017/10/07	LHI ESP casing outage



111	5	2017/11/06	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
112	5	2017/11/07	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
113	5	2017/11/09	LHO, LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
114	5	2017/11/10	RHO ESP casing outage, 108831, 108818
115	5	2017/11/12	RHI ESP casing outage, 108869, 108819
116	5	2017/11/13	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
117	5	2017/11/14	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
118	5	2017/11/18	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
119	5	2017/11/19	LHI Casing Outage, 109122, 109115
120	5	2017/11/20	Light up
121	5	2017/11/28	Unit shut down for boiler tube leak
122	5	2017/12/03	Light up
123	5	2017/12/04	Light up
124	5	2017/12/05	Light up
125	5	2017/12/07	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
126	5	2017/12/08	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load. Opacity meter calibrated PTW 109757
127	5	2017/12/11	LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
128	5	2017/12/12	LHO, LHI, RHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
129	5	2017/12/13	LHO, LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
130	5	2017/12/15	LHI ESP casing repairs, 109925, 109919
131	5	2017/12/16	RHO ESP casing repairs, 109926, 109920

132	5	2017/12/17	LHO ESP Power outputs below optimal and High PA flows, ID fans running into saturation at full load.
133	5	2017/12/19	Insufficient sulphur dosing, LHO, LHI, RHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load
134	5	2017/12/23	SO3 plant O/C, Notification 422291
135	5	2017/12/24	SO3 plant O/C RTS @09:30 Notification 422325
136	5	2017/12/31	LHO, LHI, RHO ESP Power outputs below optimal, High PA flows and ID fans running into saturation at full load.
137	5	2018/01/03	SO3 O/C, lost sulphur flow for no apparent reason also repairs, Notification 422832
138	5	2018/01/04	SO3 plant O/C, same reason as previous day, sulphur flow obtained at 14:05
139	5	2018/01/05	SO3 plant tripped, Notification: 422982, 422983
140	5	2018/01/07	LHO, LHI, RHO and RHI ESP Power outputs below optimal and ID fans running into saturation at full load.
141	5	2018/01/08	LHO, LHI, RHO and RHI ESP Power outputs below optimal and ID fans running into saturation at full load.
142	5	2018/01/13	LHO Casing outage, PTW: 110578, 110557
143	5	2018/01/18	SO3 plant shut down to cool for opportunity maintenance where the plants converter catalyst was replaced and the blower and it's pedestal is replaced, PTW 110769
144	5	2018/01/19	SO3 plant shut down to cool for opportunity maintenance where the plants converter catalyst was replaced and the blower and it's pedestal is replaced, PTW 110769 and unit shutdown
145	5	2018/01/23	Unit light up, RHO ESP Power outputs below optimal and ID fans running into saturation at full load
146	5	2018/01/24	Unit light up, ID fans running into saturation at full load
147	5	2018/01/28	RHI ESP Power outputs below optimal and ID fans running into saturation at full load.
148	5	2018/02/11	RHI casing outage, PTW 111418, 111423



149	5	2018/02/22	SO3 plant tripped due to air blower, failure, suspect faulty VSD. Notification 426324. Air blower outlet pipe broke off. Notification 426327, Notification 426333. PTWs: 111923, 111922
150	5	2018/02/23	SO3 plant RTS dosing started at 07h11, Notification 426408.
151	5	2018/03/09	Poor combustion, MILL D:- PA reg damper fails to open more than 50% - fault indication - check / repair / replace actuator. Bottom of Form
152	5	2018/03/10	Following precip fields underperforming:- LHO1,2; LHI2,3; RHI 2,3; RHO 2
153	5	2018/03/12	Poor performing precipitators are a contributing factor to the uncontrollable emissions Bottom of Form
154	5	2018/03/13	Notification 428698 LHO precip field no 2 tripped on under voltage check and reset field Bottom of Form
155	5	2018/03/16	SO3 plant flow lost due to outside plant SO3 tank problems Bottom of Form
156	6	2017/04/18	Light up
157	6	2017/04/19	Light up
158	6	2017/04/25	Light up
159	6	2017/04/26	Light up
160	6	2017/04/27	Light up
161	6	2017/06/22	SO3 plant shut down for lance repairs
162	6	2017/09/08	Unit shut down
163	6	2017/09/12	Light up
164	6	2017/09/14	SO3 plant O/C due to flow meter challenges 106614, 106626.
165	6	2017/10/04	SO3 plant temperatures high dosing reduced
166	6	2017/10/05	SO3 plant temperatures high dosing reduced
167	6	2017/10/06	SO3 plant temperatures high dosing reduced
168	6	2017/11/18	LHI ESP casing repairs, 109121, 109114 and SO3 plant blower repairs PTW 109116, 109146
169	6	2017/11/19	SO3 plant RTS after PTW 109116, 109146



170	6	2017/11/21	LHO, LHI, RHI and RHO ESP Power outputs below optimal.
171	6	2017/11/30	SO3 plant O/C, due to loss of sulphur flow, struggling to get the flow back and challenges with sulphur flow control valve.
172	6	2017/12/10	RHI ESP casing outage, PTW 109744, 109754
173	6	2017/12/11	LHO & LHI ESP Power outputs below optimal.
174	6	2017/12/16	LHO, LHI and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
175	6	2017/12/18	LHO, LHI, RHO and RHO ESP Power outputs below optimal and ID fans running into saturation at full load.
176	6	2017/12/19	Insufficient sulphur flow to SO3 plant, 110036
177	6	2017/12/21	Insufficient sulphur flow to SO3 plant
178	6	2017/12/23	SO3 plant sulphur flow control valve replacement, PTW 110166
179	6	2017/12/31	Insufficient sulphur flow to SO3 plant, ID fans running into saturation and LHO, LHI, RHO casings performing below optimal.
180	6	2018/01/13	Insufficient sulphur flow due to partial blockage in SO3 plant valve station piping, PTW 111027
181	6	2018/01/20	Insufficient sulphur flow due to partial blockage in SO3 plant valve station piping PTW 111027
182	6	2018/01/29	Challenges with returning SO3 plant to service after repairs and Unit shut down due to boiler tube leak PTW 111027
183	6	2018/02/06	LHI casings power outputs below optimal and ID fans running into saturation at full load.
184	6	2018/02/08	LHI casings power outputs below optimal and ID fans running into saturation at full load.
185	6	2018/02/09	LHI and RHO casings power outputs below optimal and ID fans running into saturation at full load.
186	6	2018/02/10	LHI casing outage, PTW: 111439, 111422
187	6	2018/02/16	LHO and RHO casings power outputs below optimal.
188	6	2018/02/17	SO3 plant tripped, LHO and RHO casings power outputs below optimal.

189	6	2018/02/18	RHO casing outage, PTW: 111701, 111717
190	6	2018/02/28	SO3 tripped due to a crash stop (control issue) Notification 426810.
191	6	2018/03/03	LHO ESP casing underperforming
192	6	2018/03/04	LHO casing outage
193	6	2018/03/10	High PA flows
194	6	2018/03/13	LHO 3 high hopper level and RHI poor performance
195	6	2018/03/14	Sulphur common plant resulted in loss of sulphur flow to SKID
196	6	2018/03/16	Sulphur flow stopped by outside plant due to fire at sulphur tank. Heaters started in order to retain system heat.
197	6	2018/03/17	RHO ESP casing outage
198	6	2018/03/20	High PA flows
199	6	2018/03/27	ESP RHO casing underperforming
200	6	2018/03/29	ESP LHI and RHO underperforming

NB: Remediation measure and effectiveness – Load losses and Plant repairs were carried out where taken where possible.



**NAEIS reporting:**

Lethabo Power Station submitted its annual report on the NAEIS system by the 31 March 2018.

The rest of the information demonstrating compliance with the emission license conditions is supplied in the monthly emission reports sent to your office.

Hoping the above will meet your satisfaction.

If you require any additional information or have any queries, please feel free to contact us.

Yours sincerely

**POWER STATION MANAGER**