

Mr. Vusi Mahlangu  
 Air Quality Officer  
 Nkangala District Municipality  
 PO Box 437  
 MIDDELBURG  
 1050

Date:  
 31 May 2018

Enquiries:

Ref: DUVAEL17/18

Dear Mr. Mahlangu

### DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18

This serves as the annual report required in terms of Section 7.6 in Duvha Power Station's Atmospheric Emission Licence as well as in terms of the reporting requirements listed in the Minimum Emission Standards. The emissions are for Eskom's 2017/18 financial year, which is from 1 April 2017 to 31 March 2018. Verified emissions of particulates, as measured by installed CEMS and SO<sub>2</sub> and NO<sub>x</sub> (as NO<sub>2</sub>), as calculated, are also included.

#### Name, description and reference number of plant as specified in the AEL:

<b>Name of facility</b>	Eskom Holdings SOC Limited
<b>Description of facility</b>	Duvha Power Station
<b>Reference number of plant</b>	NDM/AEL/MP312/11/07

#### Emission Trends:

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

Table 1. General oversight of emissions at Duvha Power Station 2017/2018

<b>Power Station</b>	<b>Coal-fired emissions (tons/annum)</b>	<b>Fuel-oil emissions (tons/annum)</b>	<b>Total (tons/annum)</b>
<b>Duvha Power Station</b>	<b>N<sub>2</sub>O:</b> 224.317	<b>N<sub>2</sub>O:</b> 0	<b>N<sub>2</sub>O:</b> 224.317
	<b>PM:</b> 4118.57	<b>PM:</b> 0	<b>PM:</b> 4118.57
	<b>SO<sub>2</sub>:</b> 122 949	<b>SO<sub>2</sub>:</b> 1 367.38	<b>SO<sub>2</sub>:</b> 124 316.38
	<b>NO<sub>x</sub>:</b> 55 658	<b>NO<sub>x</sub>:</b> 0	<b>NO<sub>x</sub>:</b> 55 658

Environmental Management  
 Megawatt Park Maxwell Drive Sunninghill Sandton  
 PO Box 1091 Johannesburg SA 2000  
 Tel +27 11 800 3501 Fax +27 86 661 6092 www.eskom.co.za

# DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18

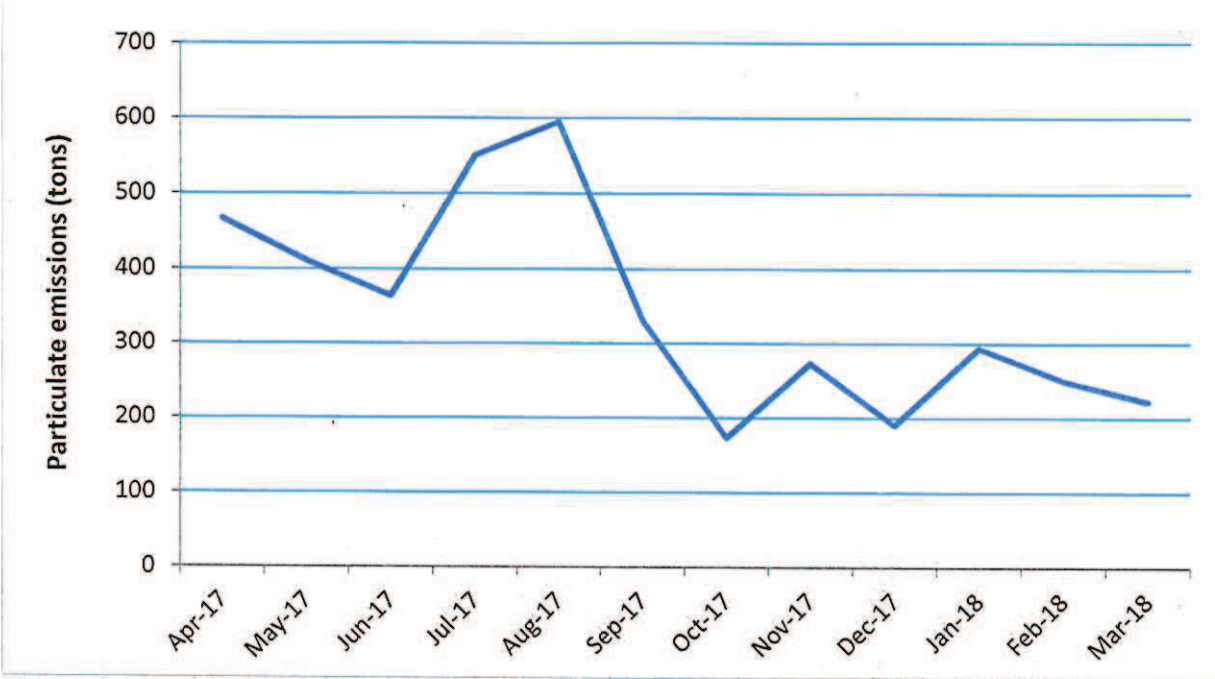


Figure 1. Monthly Particulate Emission in tons from Duvha Power Station 2017/2018.

Please note: Gaseous emissions, in particular, are largely dependent on the power generated by the power station, and thus the amount of coal burnt.

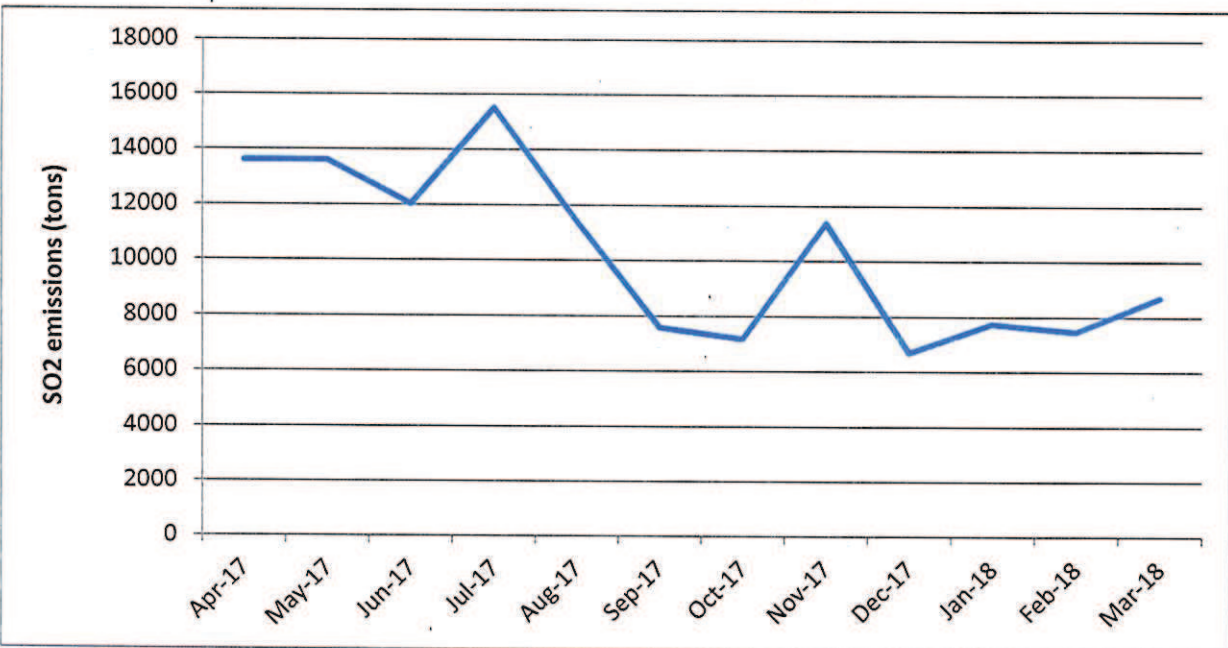


Figure 2. Monthly SO<sub>2</sub> Emissions in tons from Duvha Power Station 2017/2018.

DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18

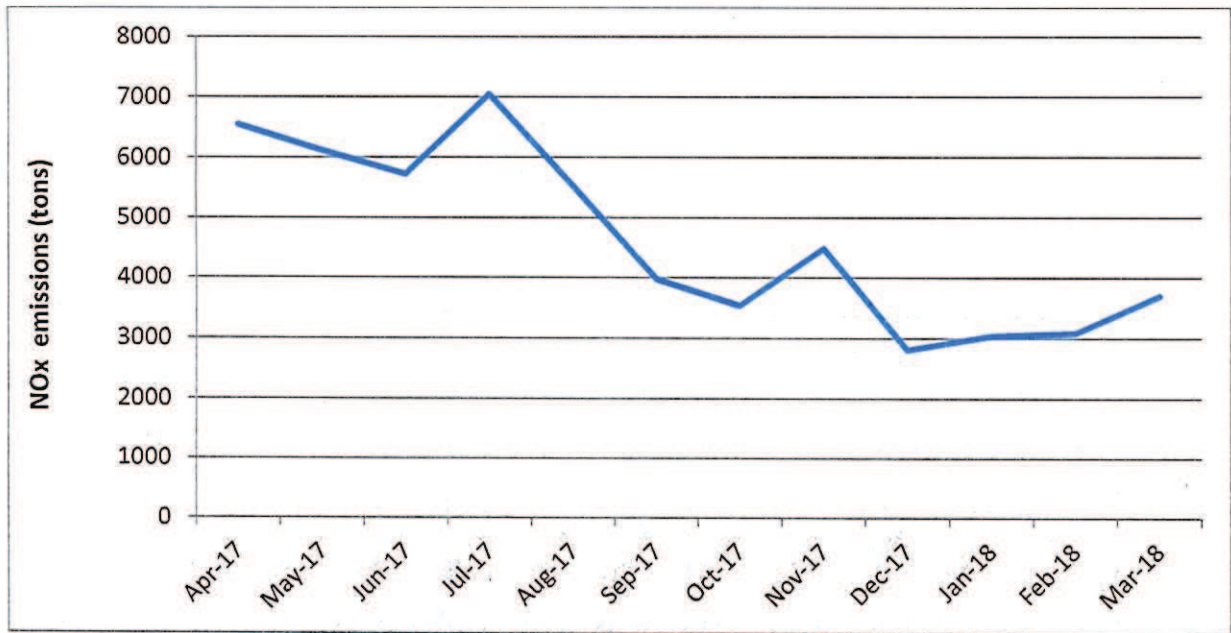


Figure 3. Monthly NO<sub>2</sub> Emissions in tons for Duvha Power Station 2017/2018.

Figure 4. Monthly CO<sub>2</sub> Emissions in tons from Duvha Power Station 2017/2018.

## DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18

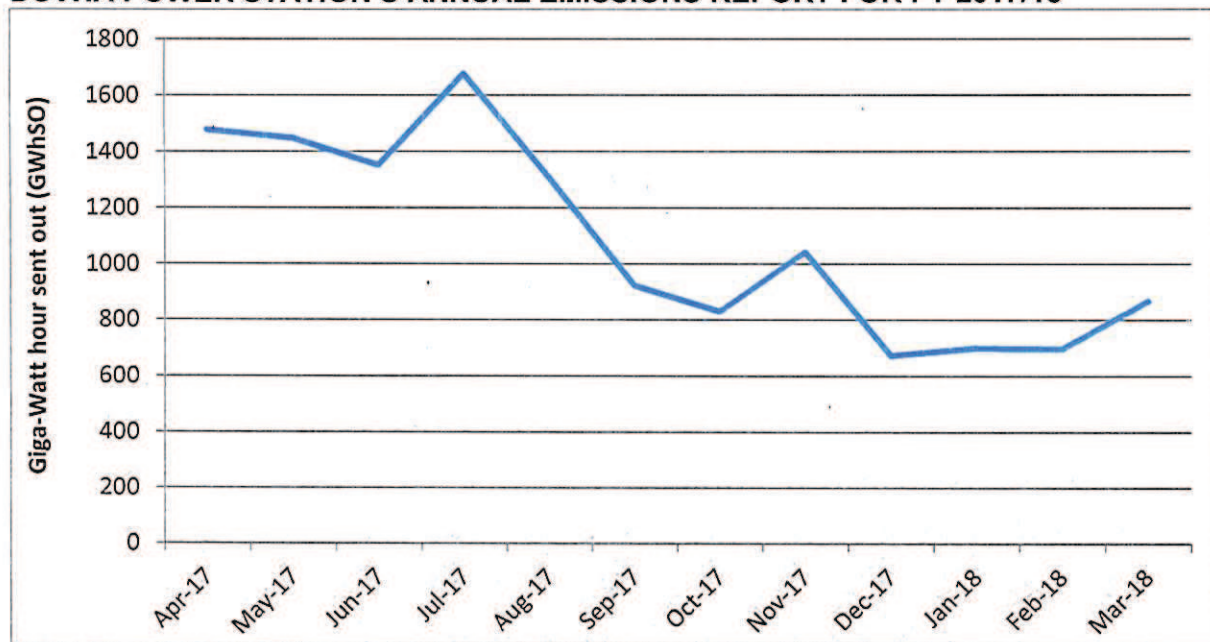


Figure 5. Monthly Energy sent out in GWh at Duvha Power Station 2017/2018.

Figures showing compliance with the daily average emission limits of the respective pollutants have been presented to you in the monthly emission reports sent to your offices.

### Monitoring data availability

Table 2. General oversight of monitoring data availability for Duvha 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	96%	97%	Unit Offload	94%	98%	99%
SO <sub>2</sub>	76%	78%	Unit Offload	89%	97%	93%
NO <sub>x</sub>	76%	79%	Unit Offload	90%	97%	93%

### Compliance Audit Report(s):

No Legal Compliance Audit was done for the 2017/18 financial year; however the compliance audit done in the 2015/16 financial year is still relevant as the legal audit cycle is every two years. The report was sent to your office with the 2015/16 annual report. A Legal Compliance Audit will be conducted during this 2018/19 financial year.

### Major upgrades projects:

A test project, involving the installation of High Frequency Transformers (HFT's) on unit 5, which is currently using Electrostatic Precipitator (ESP) abatement equipment, is currently being conducted. Transformers have been installed but not yet handed over to the station by Centre of Excellence (CoE) and optimization is in progress, full commissioning is planned at end December 2018. This is aimed at testing the effectiveness of this technology in reducing PM emissions to ensure compliance to the minimum emissions limits of 2020 (50mg/Nm<sup>3</sup> for all units). If it is found successful, these transformers will be rolled out on units 4 and 6.

A project to install a spare Sulphur tank has been approved by the Duvha Site Committee and the Engineering Change Process is underway for the design of the new system. The purpose is to increase SO<sub>3</sub> plant reliability and availability, which in turn has a positive effect on the ESP and PM reduction

# DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18

## 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 NOx

Stack/ Unit	PM (Correlation tests)	SO <sub>2</sub> (Parallel tests)	NOx (Parallel tests)
Unit 1	02-05 March 2018	26-29 January 2018	26-29 January 2018
Unit 2	22-25 August 2017	23-26 May 2018	23-26 May 2018
Unit 3			
Unit 4	07 & 12 February 2017	22-24 June 2015	22-24 June 2015
Unit 5	17 & 19 February 2017	28 November -05 December 2017	28 November -05 December 2017
Unit 6	10-14 October 2017	28 November -05 December 2017	28 November -05 December 2017

Unit 4 Gaseous monitor parallel tests will be conducted when the unit comes back on-load from an outage.

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

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

Stack/unit and pollutant	Exceedance date [from – to]	Reason for exceedance	Remediation measure and effectiveness
Unit 6 and NOx	16-18 April 2017.	The O <sub>2</sub> average concentration was too high, above the 10%, due to the O <sub>2</sub> filter was blocked.	The O <sub>2</sub> filter was cleaned and the emissions dropped to 864.4mg/Nm <sup>3</sup> on the 19 <sup>th</sup> of April 2017.
Unit 5 and PM	28-30 June 2017	Ineffective work co-ordination to ensure effective implementation of work	<b>Preventative action:</b> Production to develop/review procedures to address priority plants.
Unit 4 and PM	28 July-01 August 2017	Poor Management of resources.	<b>Preventative action:</b> 1. Develop testing and commissioning procedure for recommissioning precipitator fields and transformers. 2. Develop QCP. Train EMD personnel. 3. Train system Engineer. 4. Management to conduct disciplinary inquiries into the conduct of the key individuals involved leading to the incident.

**DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18**

Unit 5 and PM	31 July-03 August 2017.	Poor Management of operating resources	<p><b>Preventative action:</b> Operating Manager to implement the 5<sup>th</sup> Shift.</p>
Unit 5 and PM	29-30 August 2017	Assumed that Southey accidentally closed valves when building scaffold when the unit was off.	<p><b>Preventative action:</b></p> <ol style="list-style-type: none"> <li>1. Review procedure BI096 and check-sheet (BL027) to include the fault-finding period and checking of the throttle valves respectively.</li> <li>2. Compile Station emissions response procedure.</li> <li>3. Risk assessment to be conducted by Southey before erecting any scaffold in the plant with the Supervisor present.</li> <li>4. Initiate a PM to check the condition of aeroslide heaters.</li> <li>5. Immediately shut down the DHP as soon as blockages on the airlift vessel are identified.</li> </ol>
Unit 2 and PM	07-15 August 2017 02-04 September 2017.	<p>Lack of experience and understanding by the OEM Agent and Station as an assumption was made that when the unit is off there is no residual dust coming off the stack.</p> <p>The exceedance was identified during back fitting of data after the new correlation curves were implemented.</p>	<p><b>Preventative action:</b></p> <ol style="list-style-type: none"> <li>1. Create a PM to initiate an annual awareness and capacity building with regards to emissions monitoring systems and reporting, the first session should be held before the end of 2017/18 financial year.</li> <li>2. Update particulate emission monitoring &amp; control (Unit 1-3)-BI090 procedure to include weekly visual observation of the stack.</li> </ol>
Unit 5 and PM	22-27 September 2017	Project not properly closed and handed over after implementation.	<p><b>Preventative action:</b></p> <ol style="list-style-type: none"> <li>1. Define boundaries and clear role and responsibility for the Electrostatic Precipitator plant substation and the PPMS.</li> <li>2. Ensure a proper modification hand over and close out for the Electrostatic</li> </ol>

**DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18**

			<p>Precipitator plant is done as per the Engineering Change Management Process.</p> <p>3. Review the Electrostatic Precipitator Maintenance strategy to include all C&amp;I components.</p> <p>4. Review the Electrostatic Precipitator Maintenance strategy to include all Electrical components.</p> <p>5. Create stock items spares list for the Electrostatic Precipitator Plant communication network system.</p> <p>6. Include learning for the implementation of the new power plus project on other units.</p> <p>17. Develop a trip response works instruction for the electrostatic precipitator plant.</p>
<p>Unit 1 and PM</p>	<p>31 December 2017-02 January 2018.</p>	<p>1. Incorrect TEC development due to lack of awareness in the procurement process.</p> <p>2. Lack of prioritization and resources availability in Boiler Engineering and Procurement.</p> <p>3. Starting and stopping of technical project due to lack funding.</p>	<p><b>Preventative action:</b> TEC developed will be standardized for the procurement of replacement bags on site whenever the NC is not in place</p>

**DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FY 2017/18**

**NAEIS reporting:**

Duvha Power Station submitted its annual report on the NAEIS system on the 31<sup>st</sup> of March 2018.

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

Hoping the above will meet your satisfaction.

Yours sincerely

**DUVHA POWER STATION: GENERAL MANAGER**