Eskom

Ms Nompumelelo Simelane
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Nkangala District Municipality
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Date:
15 August 2024

Enquiries:
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Ref: NDM/AEL/MP312/11/07

Dear Ms. Simelane

DUVHA POWER STATION'S BI-ANNUAL EMISSIONS REPORT FOR FY 2023/24

This serves as the bi-annual report required in terms of Section 7.2.1. 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 from 01 April 2023 to 31 September 2023. Verified emissions of particulates as measured by installed CEMS and SO_2 and NOx (as NO_2) as calculated, are also included.

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

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

Emission Trends:

The emissions in the table below are that of April 2023 to September 2023 bi-annual period.

Table 1. General oversight of emissions at Duvha Power Station 2023/24

Power Station	**Coal-fired emissions (tons/annum)**	**Fuel-oil emissions (tons/annum)**		**Total (tons/annum)**
Duvha Power Station		**FO 150**	**Catlight**	
	PM: 2691.66	**PM:** 0	**PM: 0**	**PM:** 2691.66
	SO_2: 52 501	**SO_2:** 161.80	**SO_2:** 26.46	**SO_2:** 52 689.26
	NO_x: 31 267	**NO_x:** 0	**NO_x: 0**	**NO_x:** 31 267

Generation Division
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Eskom Holdings SOC Limited Reg No 2002/015527/30

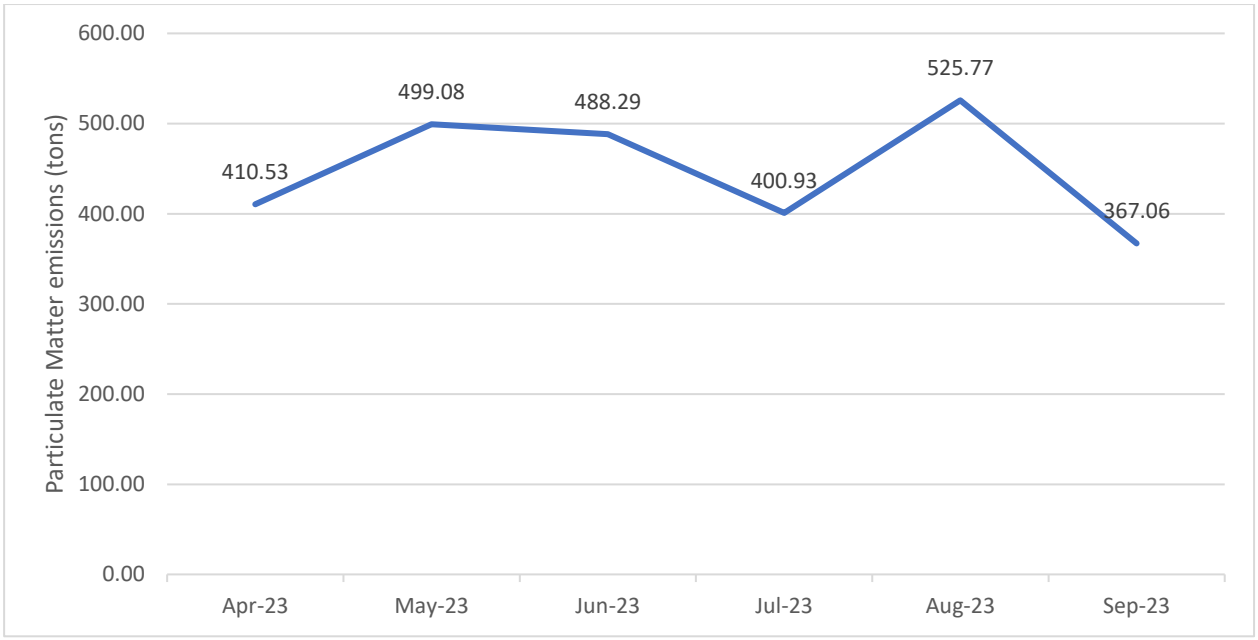

Figure 1. Monthly Particulate Emission in tons from Duvha Power Station April 2023 to September 2023.

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

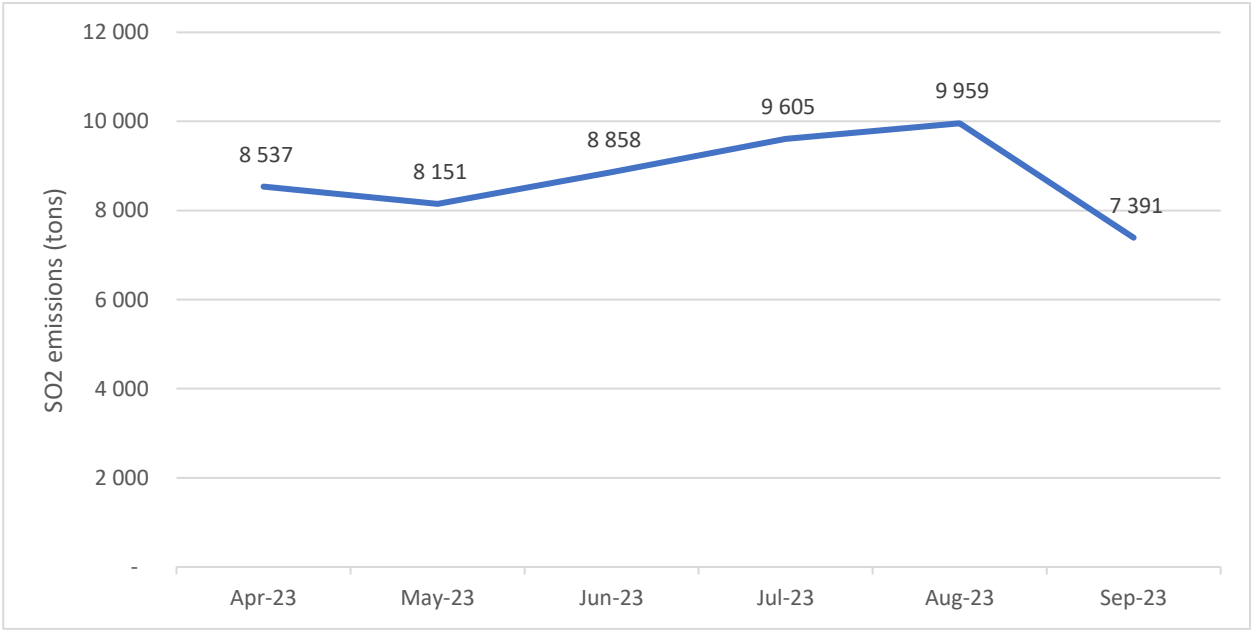

Figure 2. Monthly SO_2 Emissions in tons from Duvha Power Station April 2023 to September 2023.

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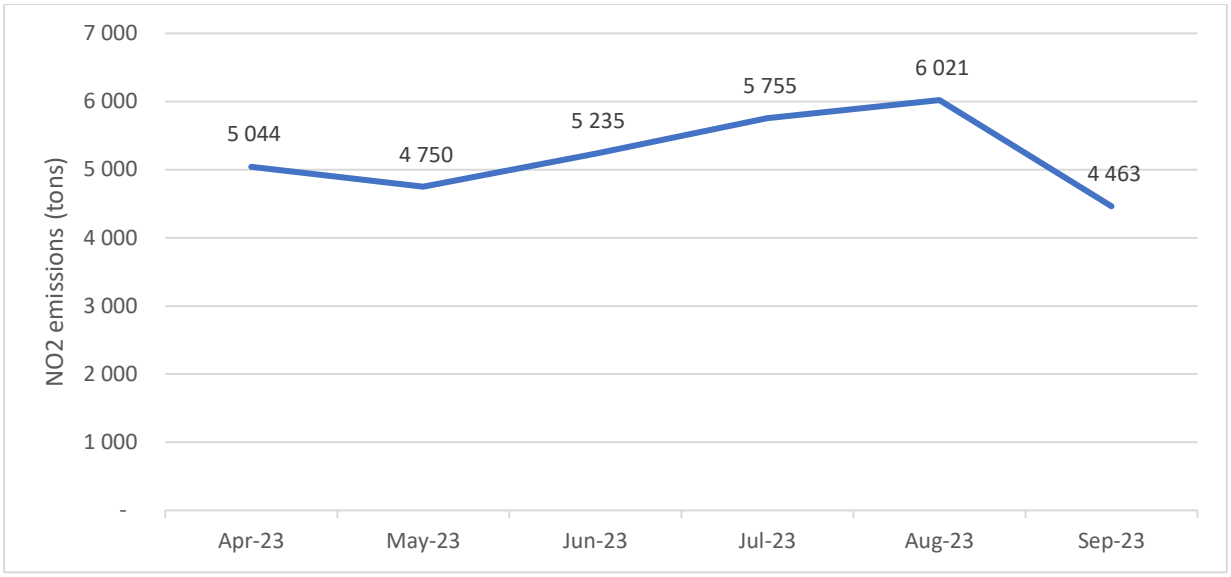

Figure 3. Monthly NO_2 Emissions in tons for Duvha Power Station April 2023 to September 2023.

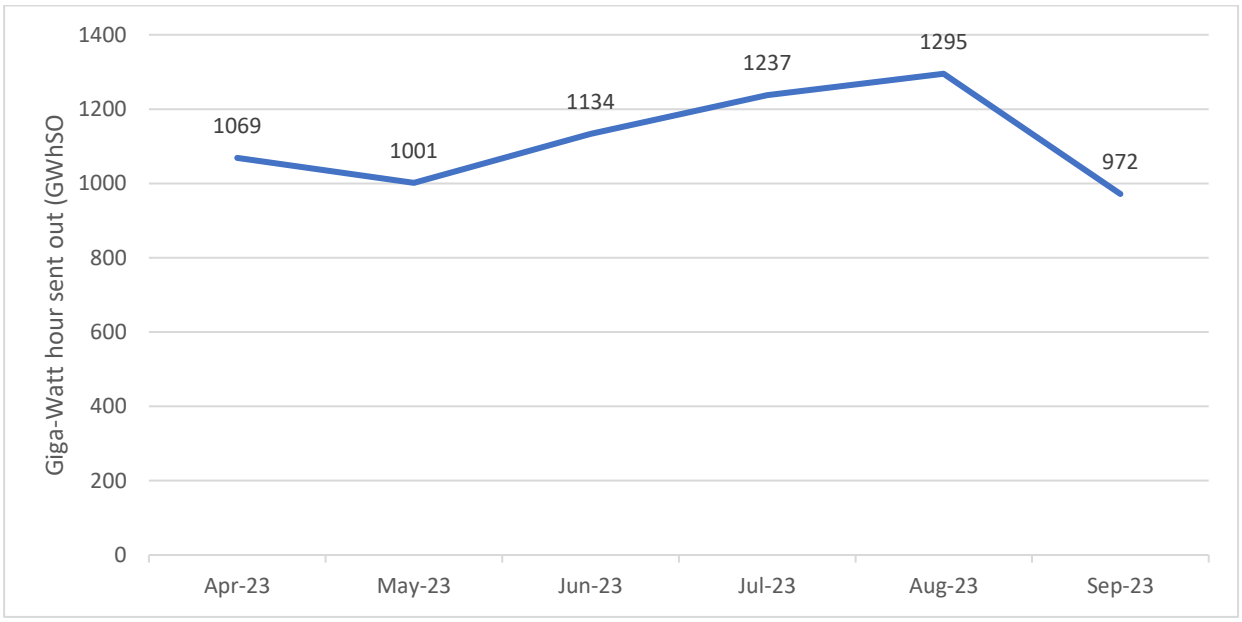

Figure 4. Monthly Energy sent out in GWh at Duvha Power Station April 2023 to September 2023.

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.

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Monitoring data availability

Table 2. General oversight of monitoring data availability for Duvha Power Station April 2023 to September 2023 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	99.90%	96.77%	Unit Offload	98.63%	100.00%	99.30%
SO_2	99.62%	99.55%	Unit Offload	89.53%	94.36%	97.34%
NOx	86.48%	90.98%	Unit Offload	94.43%	93.77%	97.37%

Compliance Audit Report(s):

An annual atmospheric emission license audit was conducted on 22 - 24 May 2023 (please refer to appendix A) to determine the power stations performance in relation to the conditions detailed in the Atmospheric emissions license (AEL).

Major upgrades projects:

A project to install High Frequency Transformers (HFT's) on unit 4 and 6 which are currently using Electrostatic Precipitator (ESP) abatement equipment is at the commercial phase whereby the Project Execution Release Approval document was revised, and the investment request was re-approved. The Squad Check will be conducted by 30 June 2024.
This is aimed at reducing PM emissions to ensure compliance to the minimum emissions limits of 2020 (50mg/Nm^3 for all units).

Greenhouse gas emissions:

Greenhouse gas emissions are reported through the greenhouse gas reporting regulation process and as such are not included in this annual emissions report.

Results of spot measurements or correlation tests:

Table 3. Overview of dates of last conducted CEMS verification tests for PM, SO_2 and NOx (Please see annexure 2 for the verification test results)

Stack/ Unit	PM (Correlation tests)	SO_2 (Parallel tests)	NOx (Parallel tests)
Unit 1	16-20 May 2022	21 – 22 July 2023	21 – 22 July 2023
Unit 2	10-14 October 2023	18-21 July 2023	18-21 July 2023
Unit 4	08-10 February 2023	13-15 July 2023	13-15 July 2023
Unit 5	03-06 October 2022	04-07 July 2023	04-07 July 2023
Unit 6	31 October-06 November 2023	10-13 July-2023	10-13 July-2023

An explanation of all instances where the license requirements were exceeded:

Table 4. Overview of emission license limit exceedances for April 2023 to September 2023.

Stack/unit and pollutant	**Exceedance date** [from – to]	**Reason for exceedance**	**Remediation measure and effectiveness**
Unit 6 (PM)	27 April 2023	Reactive approach to frequent plant failures (no monitoring and follow up plans to check the reasons for repeated failures)	**Corrective actions:** • Establish and share the expected pressure requirements for the SO3 plant control air supply to the burner air block valve. • Share operating experience from this report with C&I Maintenance personnel. • Conduct daily monitoring of the SO3 plant and present the weekly SO3 plant health status at the Emissions Task team forum. • Draw a list of previous SO3 related investigated incidents and come up with scenarios that the team can be trained on as part of on-job skills improvement for improved troubleshooting. Arrange with Training department for Duvha PS specific training.
Unit 4 (PM)	11 – 14 May 2023	Poor decision making in terms of availing 4B as standby plant.	**Corrective actions:** • Conduct an awareness session on decision making of critical components and management of standby. • Issue a scope of work to HMD ash plant team to unblock ash sump pots and inspect the functionality of the agitation nozzles. • Request for opportunity maintenance to execute scope from engineering once required. equipment and resources are obtained. • Issue an NCR to Engineering and the Contract Manager for poor management of QCP during refurbishment. **Preventative actions:** •Expedite the procurement of a bigger submersible pump/Toya pump PR 1074935004 • Compile a standard memo that can be used to formally communicate the emissions risk to the GM and TPM within 24 hours as per procedure. • Contract Manager to update ash pump repair QCP as per latest Duvha quality procedures.

Unit 5 (PM)	19 May 2023	Pressure and temperature signals not part of plant initial design.	**Corrective actions:** • Issue a memo to maintenance to address the maintenance common practice on manually adjusting the valve at 57 ML. • Update Trouble shooting guide, ref to action 12.2 from issue 100066631: Preventative actions: • Awareness training to be done for Ops personnel regarding SO3 plant, specifically including the need to manually blow down steam traps after low sulphur temperature conditions. • Develop a multi discipline team to review the SO3 plant design and implement required changes
Unit 6 (PM)	19 – 20 May 2023	Pressure and temperature signals not part of plant initial design.	**Corrective actions:** • Issue a memo to maintenance to address the maintenance common practice on manually adjusting the valve at 57 ML. • Update SO3 plant trouble shooting manual to ensure it adds all required operating parameters before and after calibration. The manual should also highlight the effects of sulphur flow conditions when calibrating. **Preventative actions:** • Awareness training to be done for Ops personnel regarding SO3 plant, specifically including the need to manually blow down steam traps after low sulphur temperature conditions. • Develop a multi discipline team to review the SO3 plant design and implement required changes.
Unit 4 (PM)	02 – 06 June 2023	Inadequate, LCI and troubleshooting guide regarding identifying correct Sulphur conditions when zeroing the flow sensor.	**Corrective actions:** • Address none adherence to ash plant philosophy and poorly managed ash plant defect. • Update the SO3 strategy to include steam-regulating valve. • Update SO3 P&ID to include steam regulating valve. Preventative actions: • Share lessons learned on this incident with C&I maintenance team. • Update SO3 plant trouble shooting manual to ensure it adds all required operating parameters before and after calibration. The manual should also highlight the effects of Sulphur flow conditions when calibrating.

			• Update LCI 6001 for C&I maintenance
Unit 6 (PM)	20 July 2023	Sudden unexpected failure of a run to failure component during section 30 timeframe territory.	**Corrective action:** • Awareness training to be done by Ops personnel regarding SO3 plant, specifically including the need to manually blow down steam traps after low sulphur temperature conditions. • Review the operating Sulphur off-loading work instruction to include the capturing of the temperature of the tanker before off loading and precaution measures to the skids before offloading. Preventative action: • Implement a routine replacement of the SOx plant control air pipes based on typical failure rate or consider alternative material selection to reduce chance of failure.
Unit 4 (PM)	20-22 august 2023	Lack of communication within Electrical Maintenance Department (EMD).	**Corrective action:** • Compile handover work instruction to be used within EMD to ensure plant issues and findings are well communicated. **Preventative action:** • Replace DB/door cover at sandblasting workshop. • Address failure to adhere to emergency switching. • Normalize SO3 plant temporary cable. • Address plant safety regulations violation and connecting temporary supplies without OON.
Unit 5 (PM)	10 August 2023	Difficulty to get suitable suppliers to repair pumps using the open market procurement.	**Corrective action:** • Implement Project SP2 recommendations for spares. • Issue NCR to maintenance execution for non-adherence to QC process. **Preventative action:** • Finalise the split casing contract. • Address all departmental technicians on the non-adherence of Quality control process.

			• Review sluice pump repair QCP to ensure that include the direction flow of the impeller is included.
Unit 6 (PM)	19-20 August 2023	Difficulties in getting suppliers who can supply these spares on open tender.	**Corrective action:** • Finalize split casing contract **Preventative action:** • Compile fault finding procedure to ensure all components are tested when doing fault finding on MV Motors. • Maintenance standby procedure MGP0042 to be communicated clearly with all EMD employees. • Shift Manager to conduct an incident recall/awareness on the response of the Unit Controller with the Team. • Review resource planning to ensure every standby team has adequate RPs' for High voltage and PSR permits • Raise Engineering change notification against Electrical Engineering to correct the bolts that gets loose overtime on 3.3kV Siemens circuit breakers. • NCR to be issued to cabling Contractor for failure to avail a jack hammer.
Unit 6 (PM)	15-16 September 2023	Inadequate sense of urgency demonstrated in addressing emission related defects.	**Corrective action:** • Maintenance manager to address the issue of spares management to be effective. • Operating manager to enforce the discipline on sump man always monitoring the sump and filling of the running check sheet at all times. • Auxiliary Engineering to conduct a risk assessment of not having emergency plant such that the action can be formally tracked and expedited on formal platforms. • Emissions manager to address negligence and prioritization of emissions abatement plant defects. **Preventative action:** C&I Engineering to review the maintenance strategy for the cleaning of the ultrasonic level indication on regular basis.

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NAEIS reporting:

Duvha Power Station submitted its annual report on the NAEIS system on the 31st of March 2023.

General

All gaseous (SO2 and Nox) emissions tonnage figures reported on this bi-annual emissions report and previous annual emissions reports are calculated figures.

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.

Supported by

M Mamoleka
ENGINEERING MANAGER: DUVHA POWER STATION

Yours sincerely

L Chauke
DUVHA POWER STATION: GENERAL MANAGER