

Mr TD Hlanyane
 Air Quality Officer
 Gert Sibande District Municipality
 C/o Joubert and Oosthuise Streets
ERMELO
 2430

Date: 31 May 2017

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Dear Mr Hlanyane:

TUTUKA POWER STATION ANNUAL EMISSIONS REPORT – 2016/17 FY

Herewith the Annual Emissions Report required in terms of Section 7.6 in Tutuka Power Station's Atmospheric Emission License (Ref no: Lekwa/Eskom H SOC Ltd/TPS/0013/2015F0231March 2015), for the period 1 April 2016 to 31 March 2017. Verified emissions of particulates, and emissions for SO₂ and NO_x (as NO₂) are also included.

1. Pollutant Emissions Trends and Greenhouse Gas Emissions

Table1: General Oversight of Emissions

Pollutant	Tons per annum	
	Tons per annum	(greenhouse gases)
PM	16 077.34	
NO _x	88 247.00	
SO ₂	145 855.00	
N ₂ O	318.04	
CO ₂	178 159.11	203 785.00

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MONTH	PM (T)	SO ₂ (T)	NO _x (T)	CO ₂ (T)	N ₂ O (T)
April 2016	1 578.07	11 257	7 912	1 656 349	28.68
May 2016	1 479.40	12 211	7 936	1 660 885	28.75
June 2016	1 380.50	9 280	7 739	1 595 286	27.85
July 2016	1 507.80	8 330	7 920	1 628 015	29.04
August 2016	1 489.03	13 056	7 924	1 618 154	28.95
September 2016	1 313.29	12 173	6 755	1 385 435	24.66
October 2016	1 301.83	13 158	7 394	1 515 774	26.88
November 2016	986.30	11 060	6 204	1 220 992	22.18
December 2016	1 184.42	13 825	7 254	1 415 930	25.62
January 2017	1 326.90	13 674	7 377	1 433 608	25.96
February 2017	1 120.40	12 883	6 090	1 180 939	21.78
March 2017	1 409.40	14 950	7 741	1 504 544	27.63

Table 2: Pollutant Emission Trends for 2016/2017

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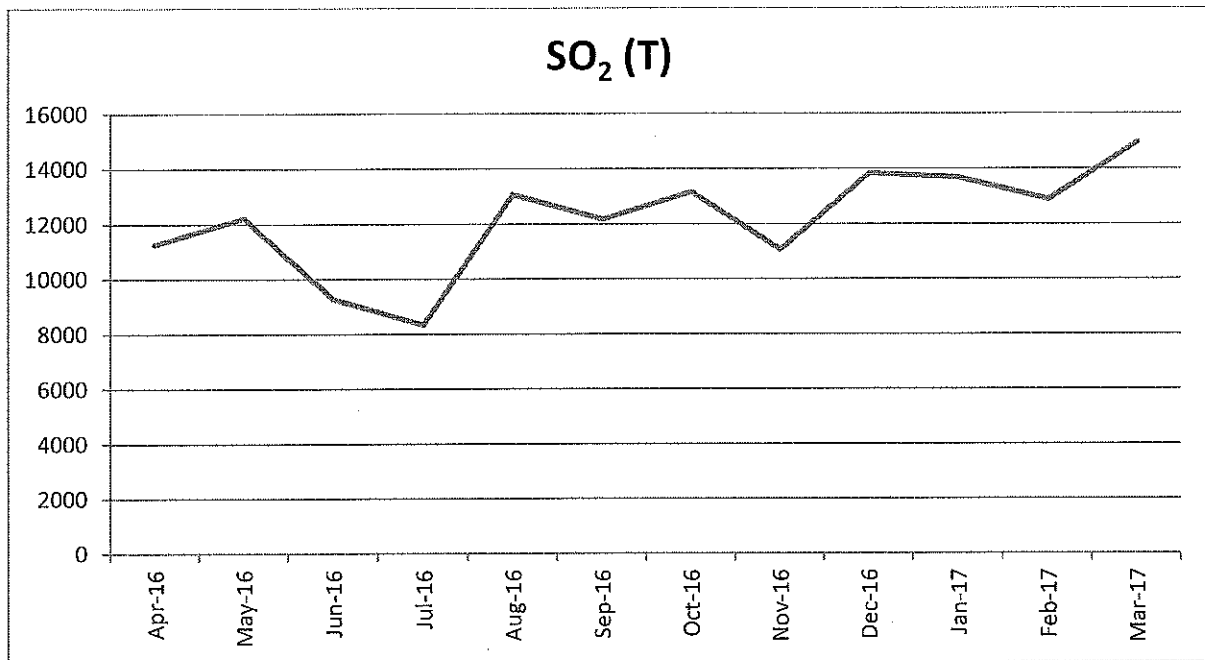


Figure 1: Monthly SO₂ Emissions for Tutuka Power Station 2016/2017

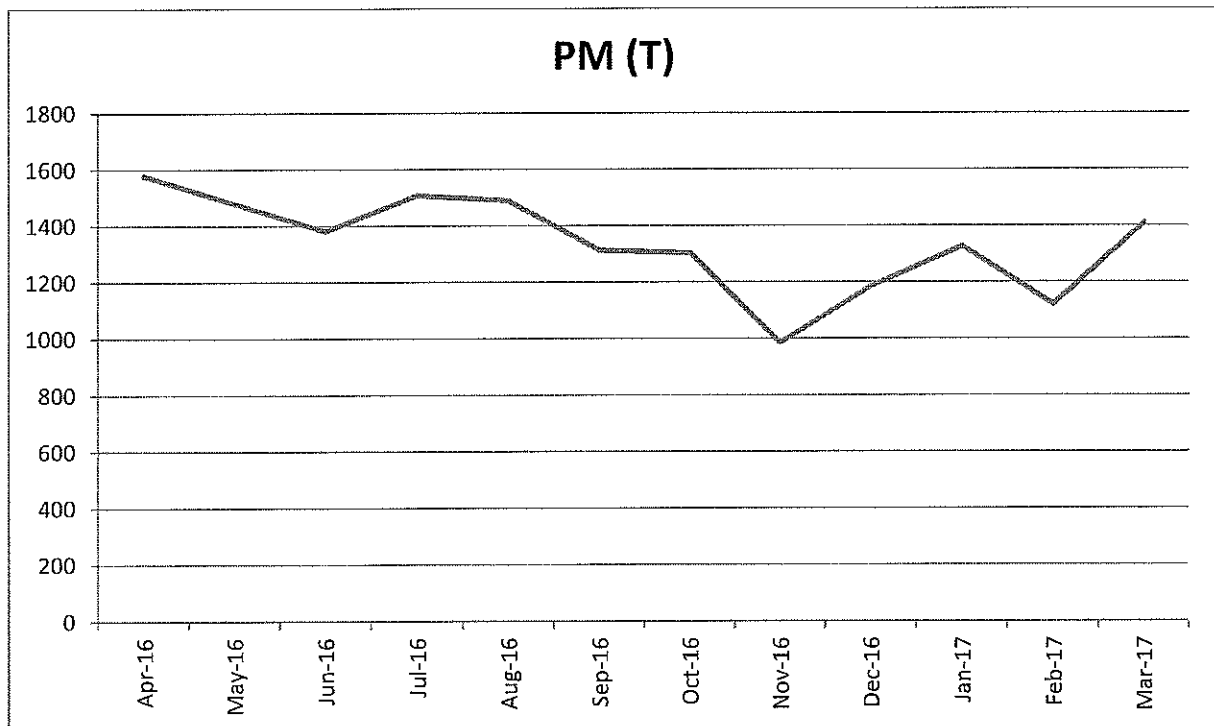


Figure 2: Monthly Particulate Emissions for Tutuka Power Station 2016/2017

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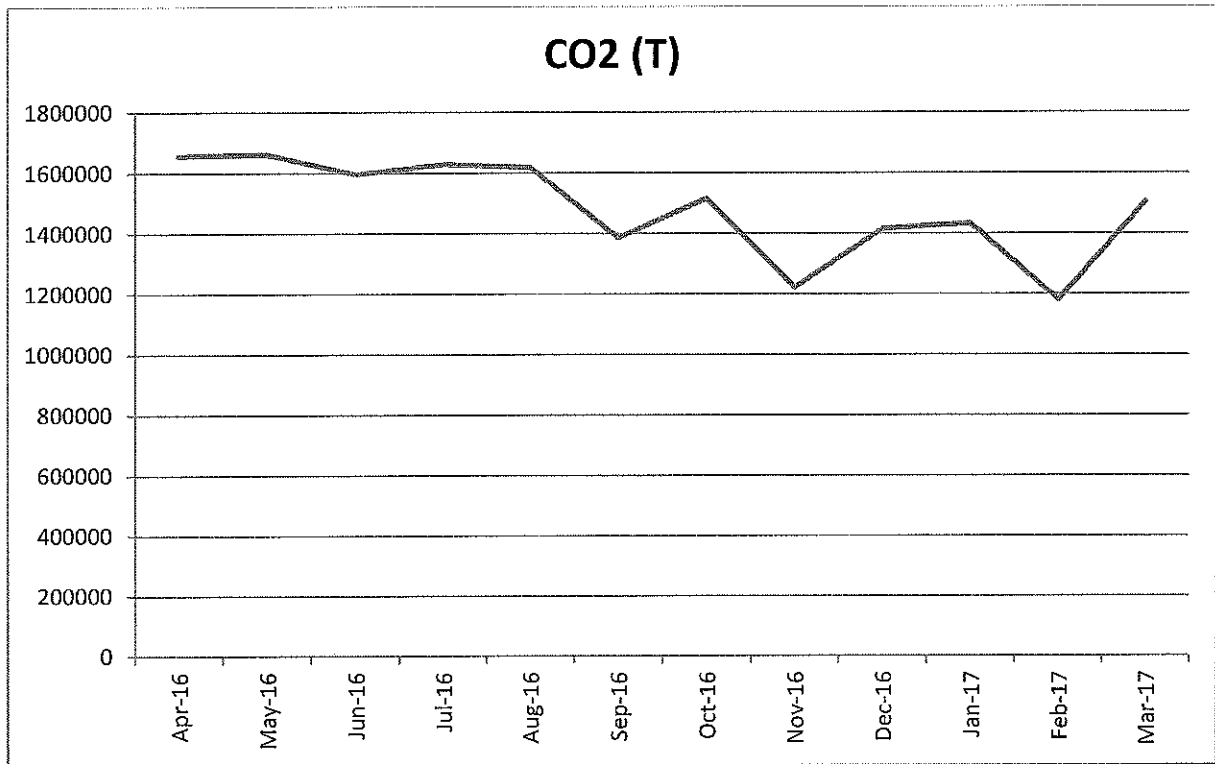


Figure 3: Monthly CO₂ Emissions for Tutuka Power Station 2016/2017

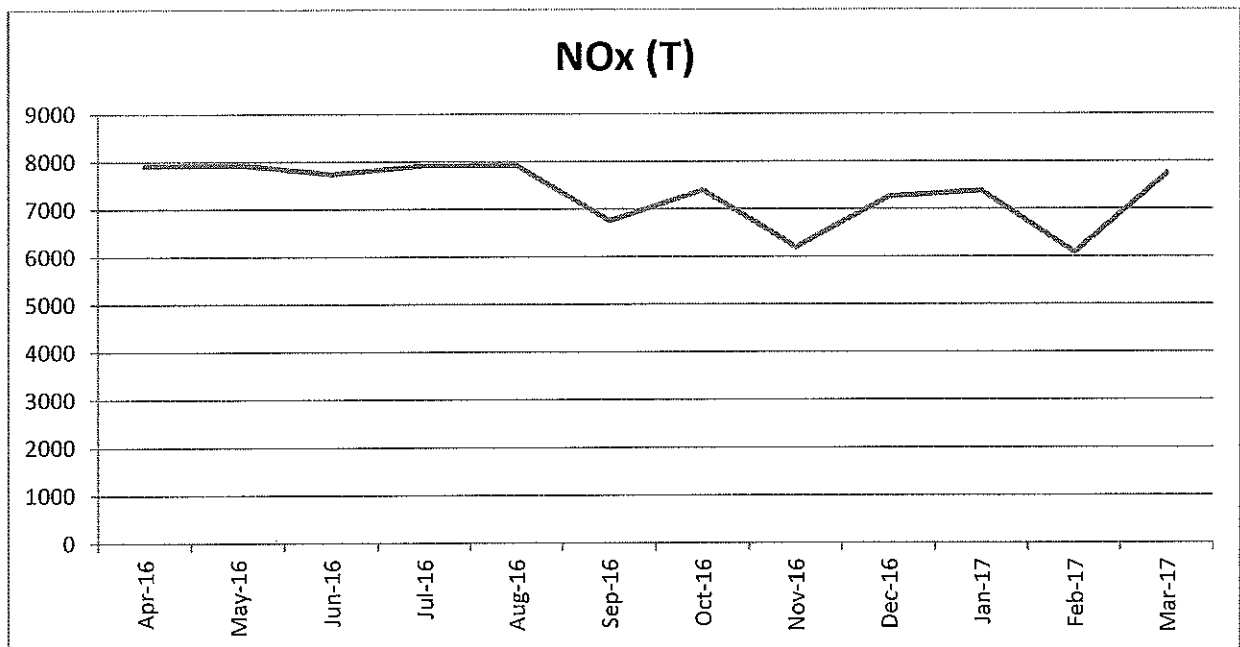


Figure 4: Monthly NO₂ Emissions for Tutuka Power Station 2016/2017

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On 29 June 2016 to 01 July, Tutuka Unit 4 recorded high NOx and the limit was exceeded for three (3) days. This exceedance resulted in a Section 30 reportable incident see graph below:

The incident was reported as a Section 30 on 24 November 2016. The reason for the late reporting was that the incident was only discovered during an Eskom Internal audit which took place in November 2016. Immediately after the internal emissions review flagged the incident as a Section 30, the incident was then reported to all relevant authorities including Gert Sibande District Municipality.

Prior to Unit 4 exceeding the emissions limit, the Unit was shut down for maintenance activities for two days. The maintenance activities were executed successfully and the Unit was brought back to service. The NOx exceedance occurred after the unit was on load and synchronized. The investigation into the incident as required by legislation revealed that when a Unit is shut down, monitor coolers either trip or are switched off. This causes moisture to build up in the monitors which in turn causes the monitor to read erroneous high NOx figures. The investigation had several recommendations including keeping the monitor coolers in service while the Unit is off load.

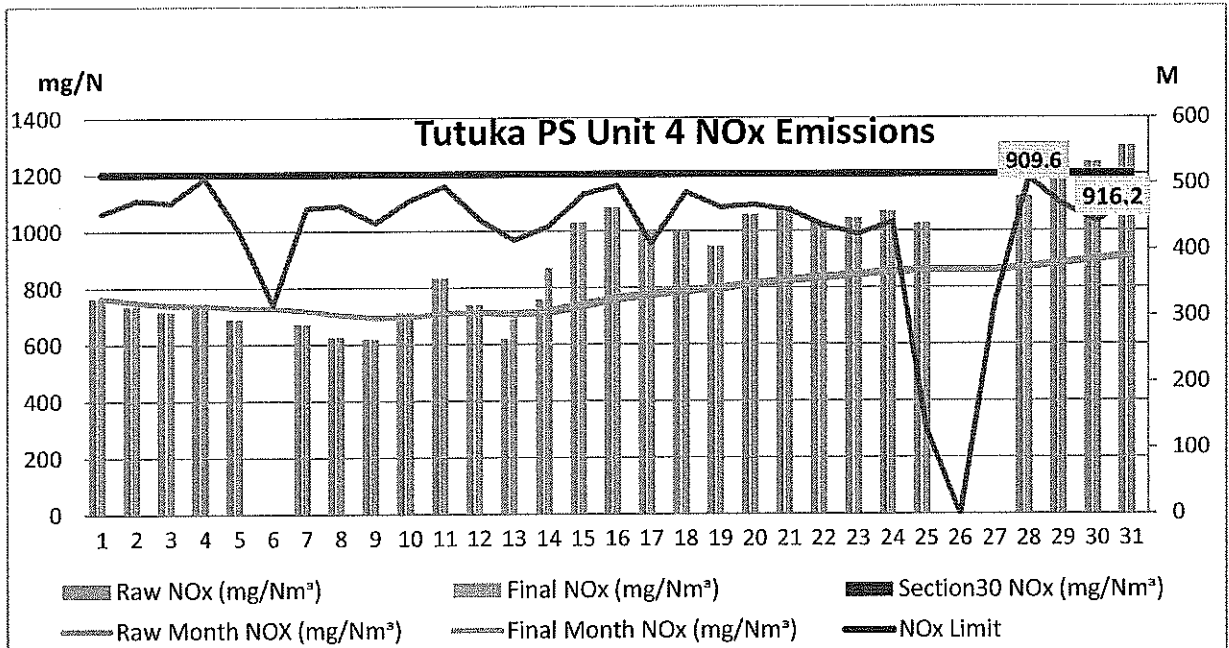


Figure 5: Unit 4 NOx Emissions for the month of June 2016

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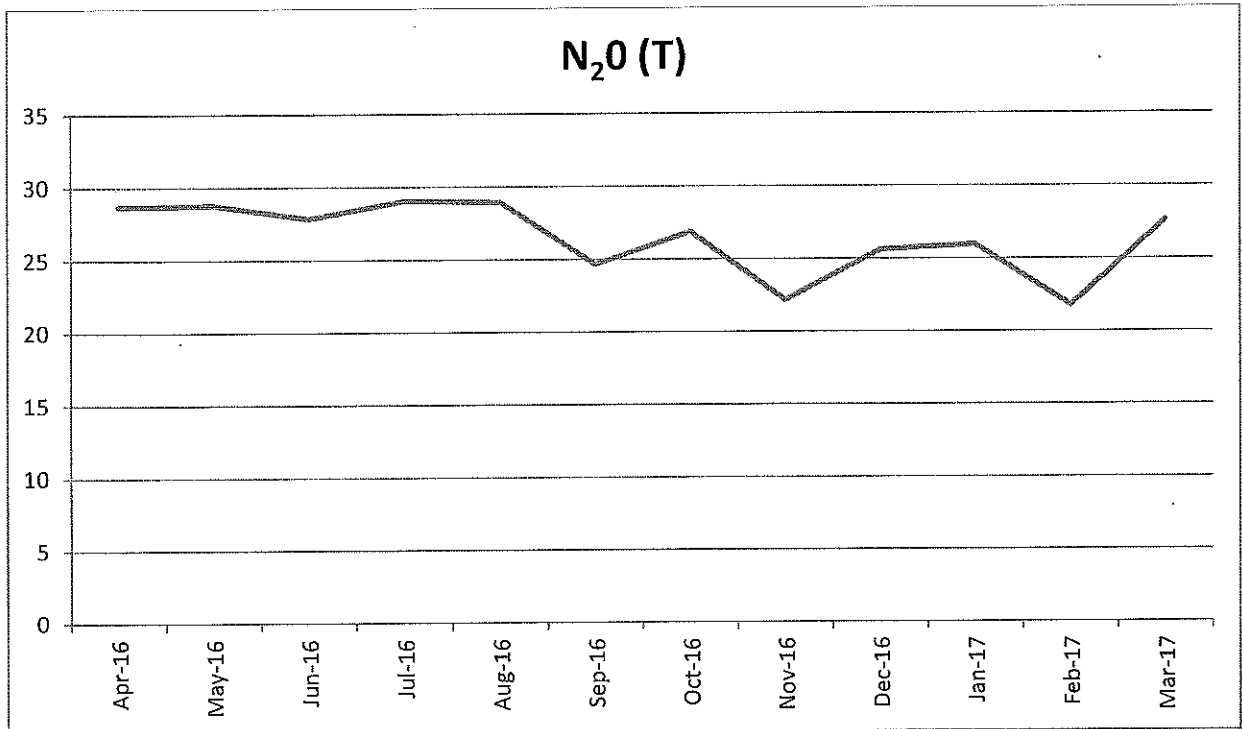


Figure 6: Monthly N₂O Emissions for Tutuka Power Station 2016/2017

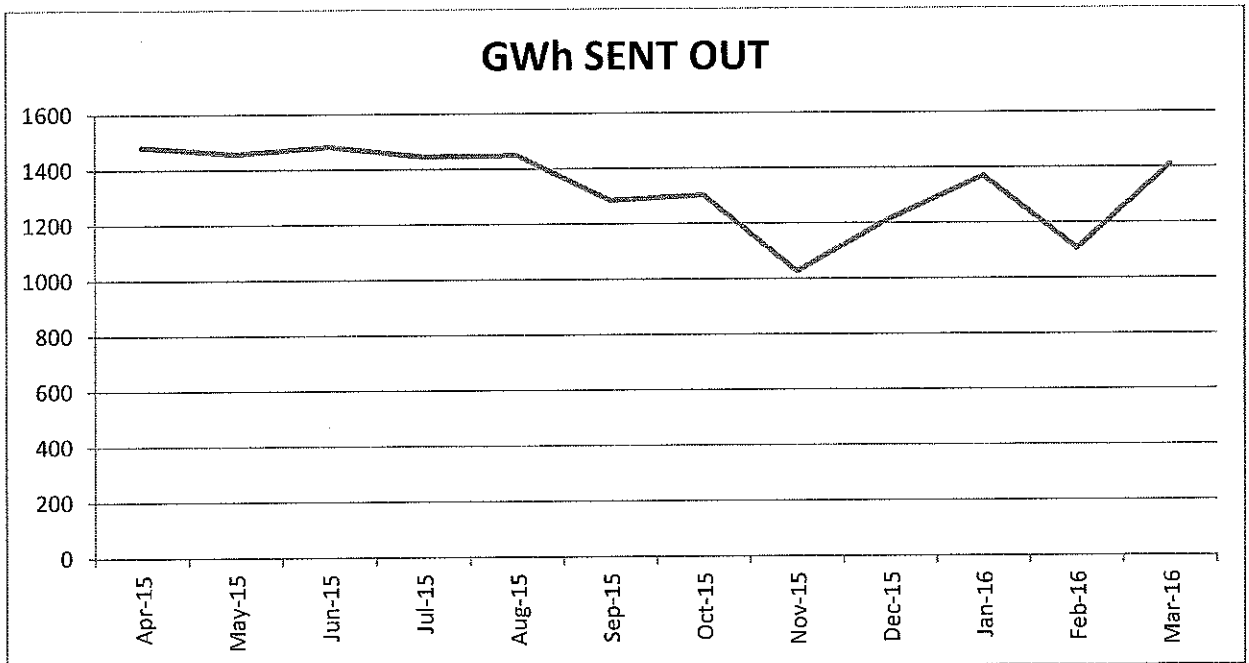


Figure 7: Monthly Energy per GWh sent out for Tutuka Power Station 2016/2017

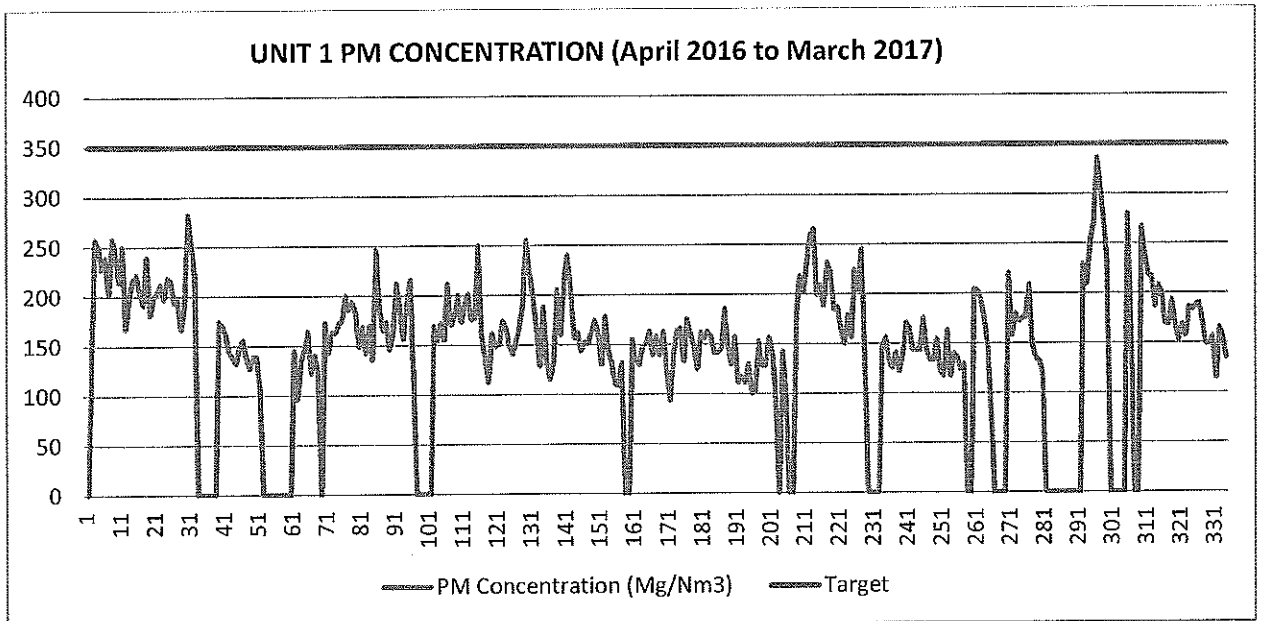


Figure 8: Unit 1 PM Concentration in mg/Nm³ (April 2016 to March 2017)

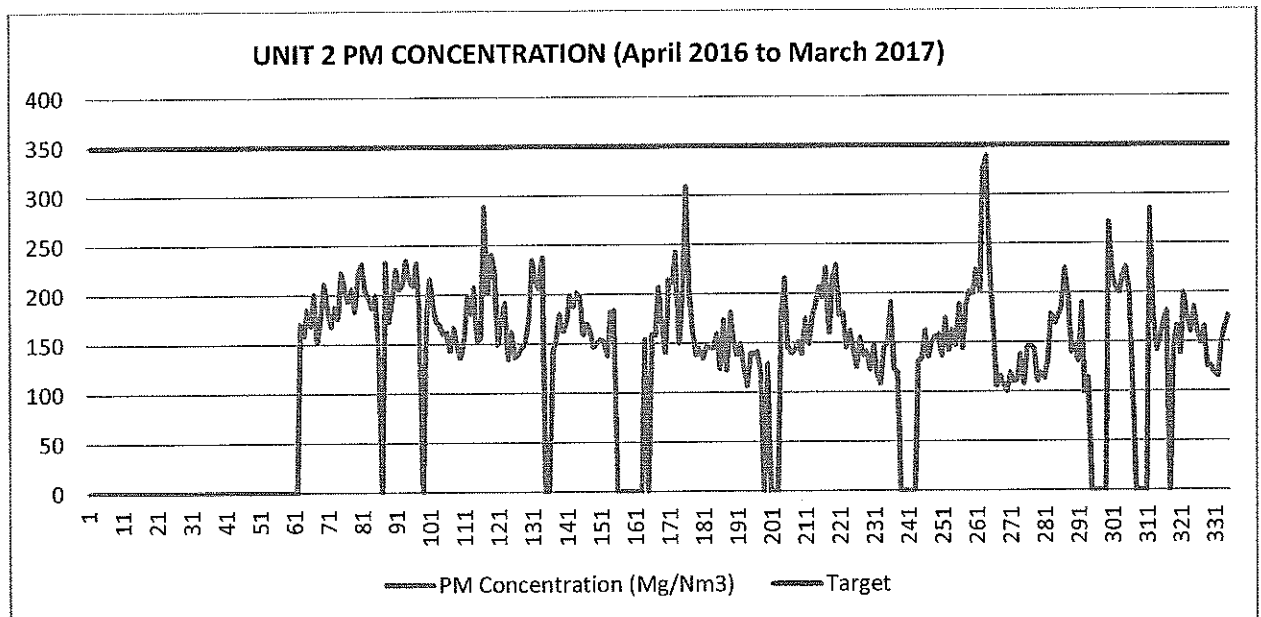


Figure 9: Unit 2 PM Concentration in mg/Nm³ (April 2016 to March 2017)

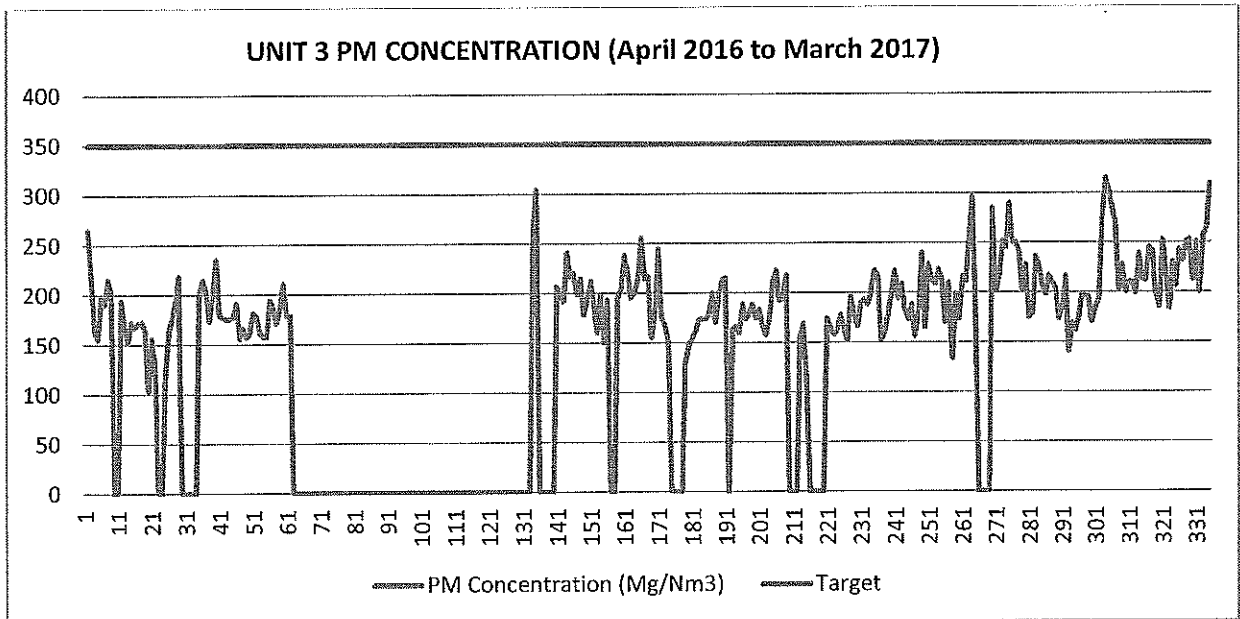


Figure 10: Unit 3 PM Concentration in mg/Nm³ (April 2016 to March 2017)

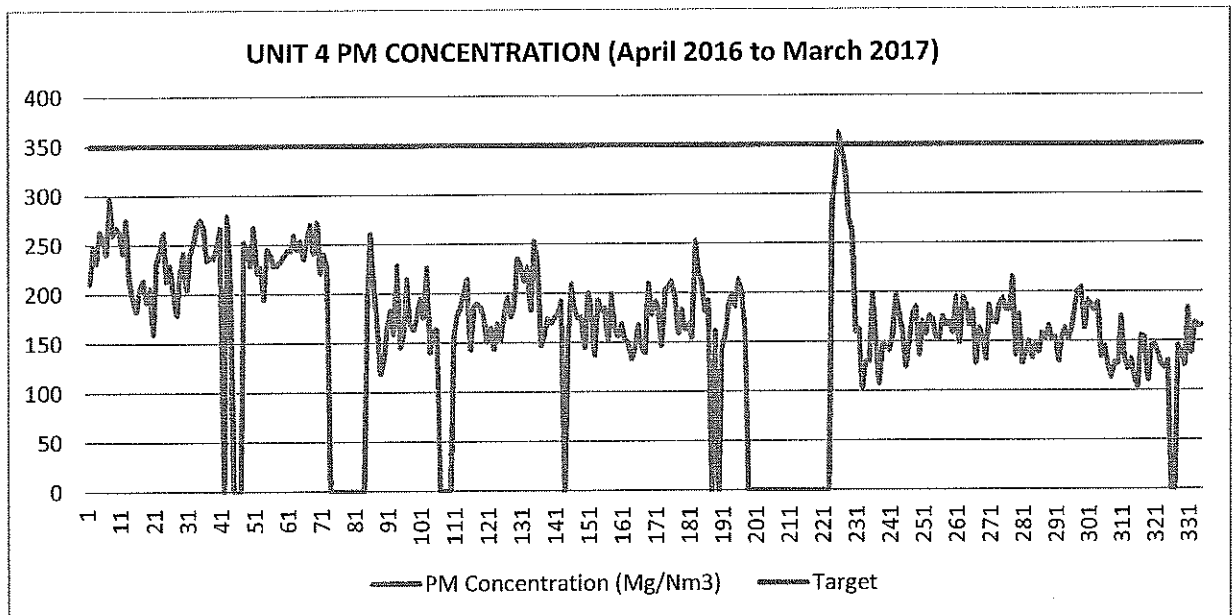


Figure 11: Unit 4 PM Concentration in mg/Nm³ (April 2016 to March 2017)

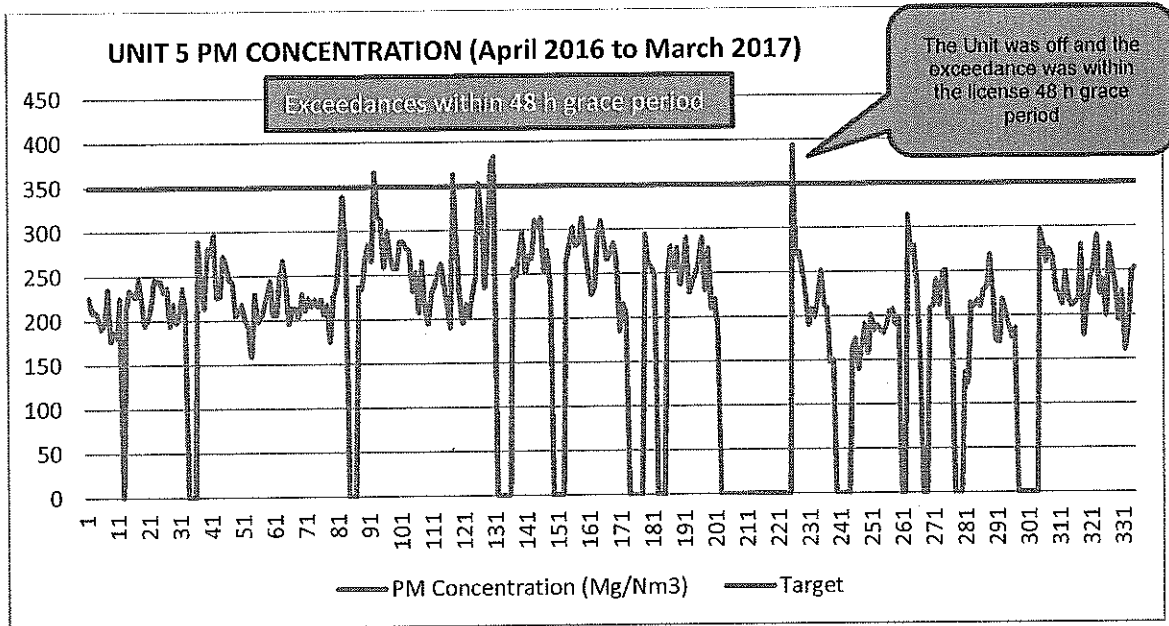


Figure 12: Unit 5 PM Concentration in mg/Nm³ (April 2016 to March 2017)

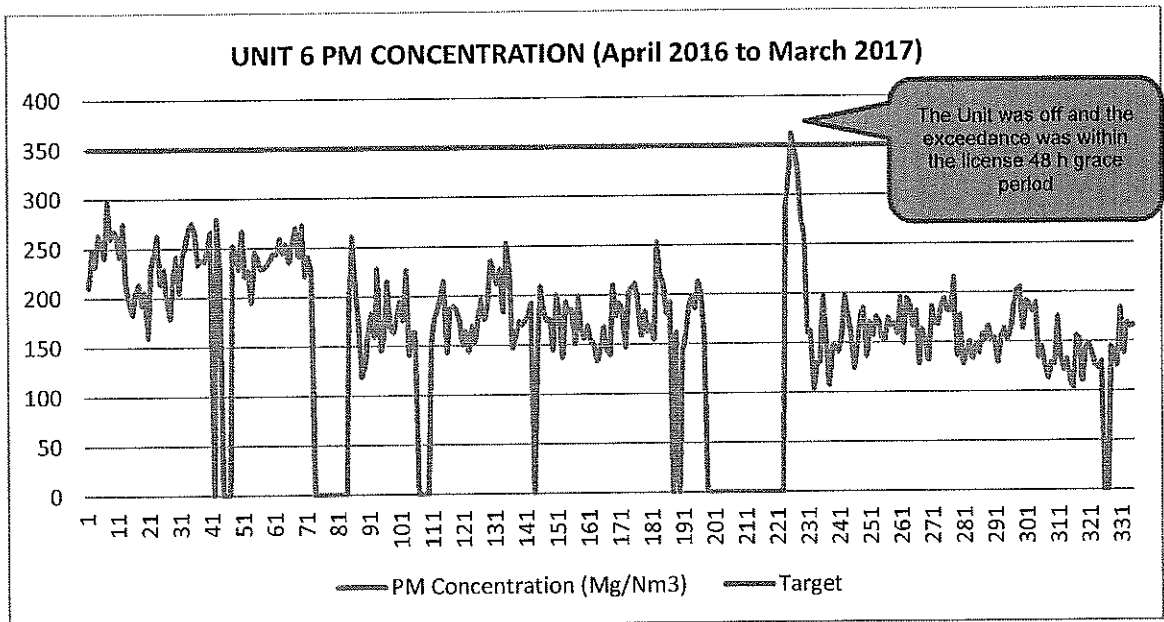


Figure 13: Unit 6 PM Concentration in mg/Nm³ (April 2016 to March 2017)

2. Annual Average Monitoring Data Availability Per Unit*Table 3: Monitoring Data Availability for 2016/2017*

	U1	U2	U3	U4	U5	U6
PM	99.84%	99.70%	99.5%	99.7%	99.08%	99.70%
SO ₂	88.29%	86.96%	81.99%	99.46%	86.88%	88.40%
NOx	91.51%	97.30%	86.151%	97.61%	87.02%	93.55%

3. Compliance Audit Report(s):

On 17 September 2015, DEA Environmental Management Inspectorate (EMI) conducted a compliance inspection at Tutuka Power Station. The compliance inspection team included various government spheres including Gert Sibande District Municipality. The scope of the compliance inspection included various elements including air quality. On 1 September 2016, the station received a Pre-Compliance Notice from the EMI; the Pre-Compliance Notice was issued in terms of Section 31 L of the National Environmental Management Act of 1998.

There were various issues raised under air quality management, including Leak Detection and Repair Program (LDAR) which was not submitted to Gert Sibande District Municipality. Subsequent to the EMI inspection, an LDAR was submitted to Gert Sibande District Municipality. Tutuka submitted the responses to the Pre-Compliance Inspection on 28 October 2016, and no response received from the DEA thus far.

4. Major Upgrade Projects:

- Tutuka Power Station received Environmental Authorisation for the following upgrade projects which are currently in the planning phase for execution: see all the impact studies on this link: http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Environment_Impact_Assessments.aspx
 - Fabric Filter Plant (FFP) Retrofit and Dust Handling Plant (DHP)
 - Expansion of the Ash Disposal Facility

5. Complaints

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
Neighboring Farmers claiming that excessive dust from the Ash Disposal Facility (ADF) is impacting negatively on crop yields	Independent third party contractor appointed to conduct soil studies to determine if the alleged negative impact can be attributed to Tutuka ADF operations	The soil studies conducted indicated that there were no negative impacts on the soil.	N/A	Weather monitoring station commissioned to pre-empt extreme windy conditions Additional dust suppression during extreme windy conditions	Ongoing
Windblown dust from coal stock yard and service roads has a negative impact on farming activities. This was verbally reported	It was suspected that coal dust resulted in air pollution	Inspection done on Farm Monthly fugitive dust monitoring results does not indicate exceedances	N/A	Weather monitoring station commissioned to pre-empt extreme windy conditions. Additional dust suppression during extreme windy conditions. Monthly fugitive dust monitoring ongoing.	Ongoing
Water leaving site observed beyond southern bypass road. This was a verbally reported	It was suspected that the dam was overflow due to heavy rainfall	Inspection done in the area - water samples taken for bacteriological and chemical analysis	N/A	Investigation completed	Closed

Table 4: Complaints received

6. Annual Report on the Implementation of the Highveld Air Quality Plan and Off-sets program

- Tutuka Power Station falls within Gert Sibande District Municipality (GSDM), and GSDM Air Quality Control Officer indicated that they are currently busy generating an annual report with regard to the implementation of the Highveld Priority Air Quality Management Plan for all the stakeholders which falls within the GSDM Highveld priority area.
- Eskom head-office has submitted the off-sets program for all the power stations including Tutuka Power Station.

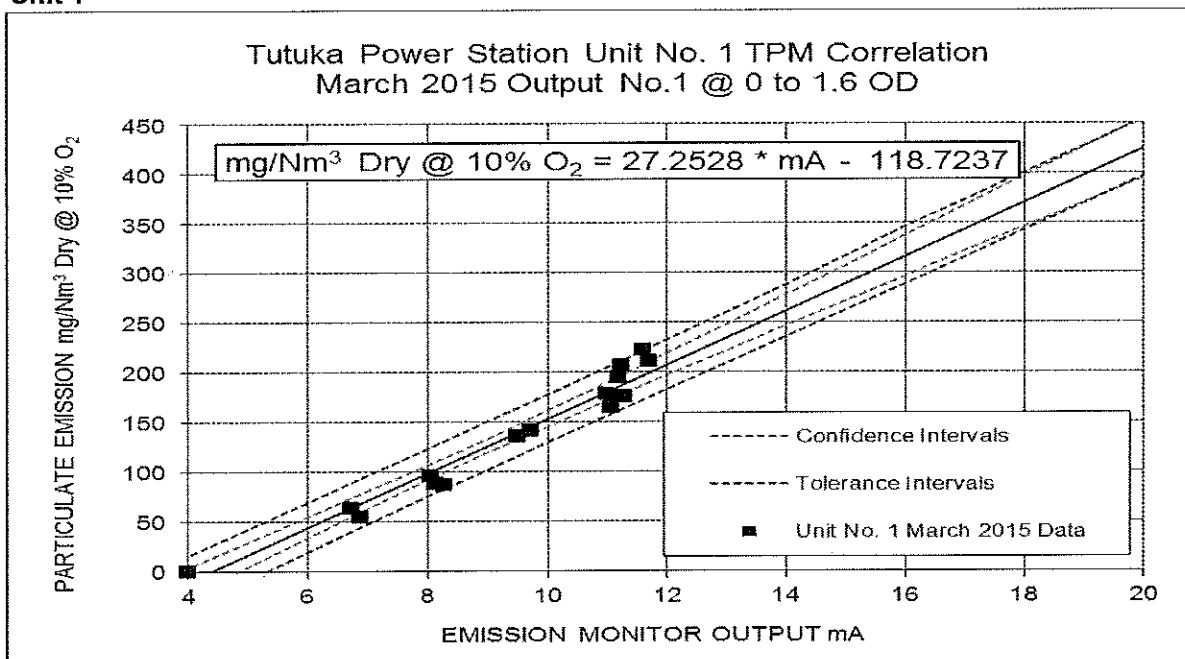
7. NAIES Reporting

Eskom Head-office Air Quality Center of Excellence submitted the NAIES report on behalf of Tutuka Power Station on the 31st of March 2017.

8. Correlation Tests:

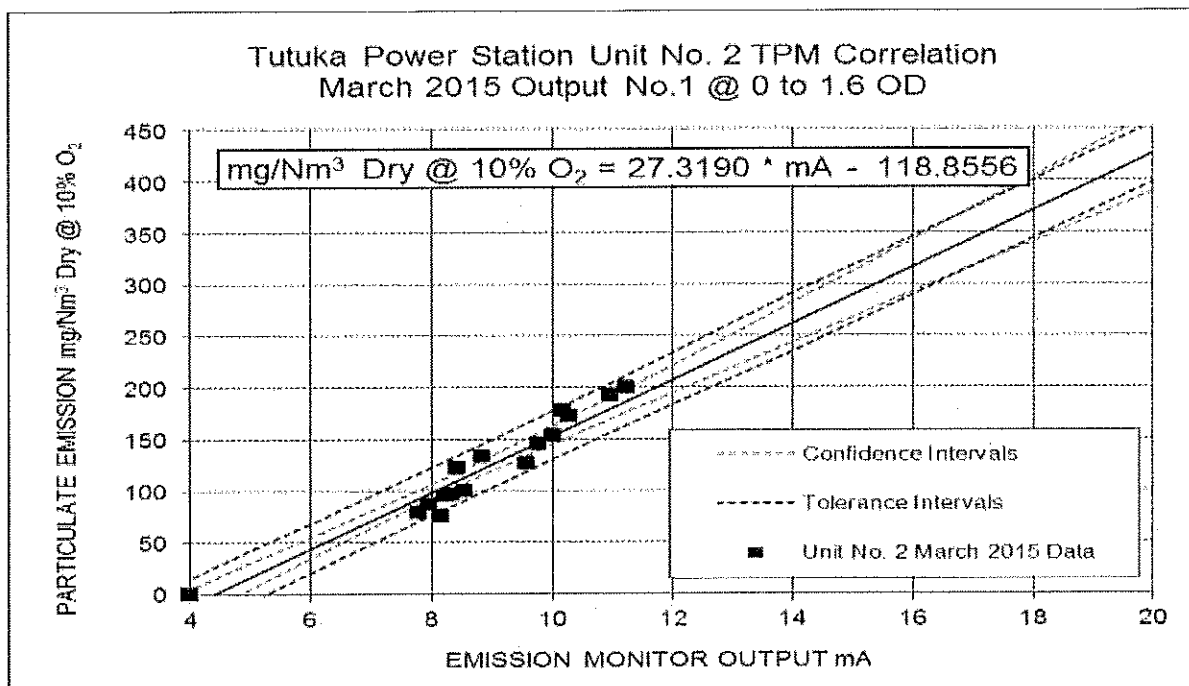
The primary objectives of the particulate emission monitor correlations graphs depicted below is to quantify the concentrations of all particulate matter released into the atmosphere during the operation of Units 1-6 at Tutuka Power Station. The requirement for conducting the particulate emission monitor correlations is to demonstrate compliance with the requirements of the National Environmental Management: Air Quality Act (39/2004), Listed Activities and Associated Minimum Emission Standards in terms of Section 21, Category 1.1. The substance applicable under Category 1.1 is Particulate Matter which is capped at 100mg/Nm³ dry @ 10% O₂. This cap limit however, in the case of Tutuka Power Station, was negotiated to 350mg/Nm³ dry @ 10% O₂. All the correlations tests conducted on Tutuka Power Station's Unit 1 - 6 were all within the norm.

Unit 1



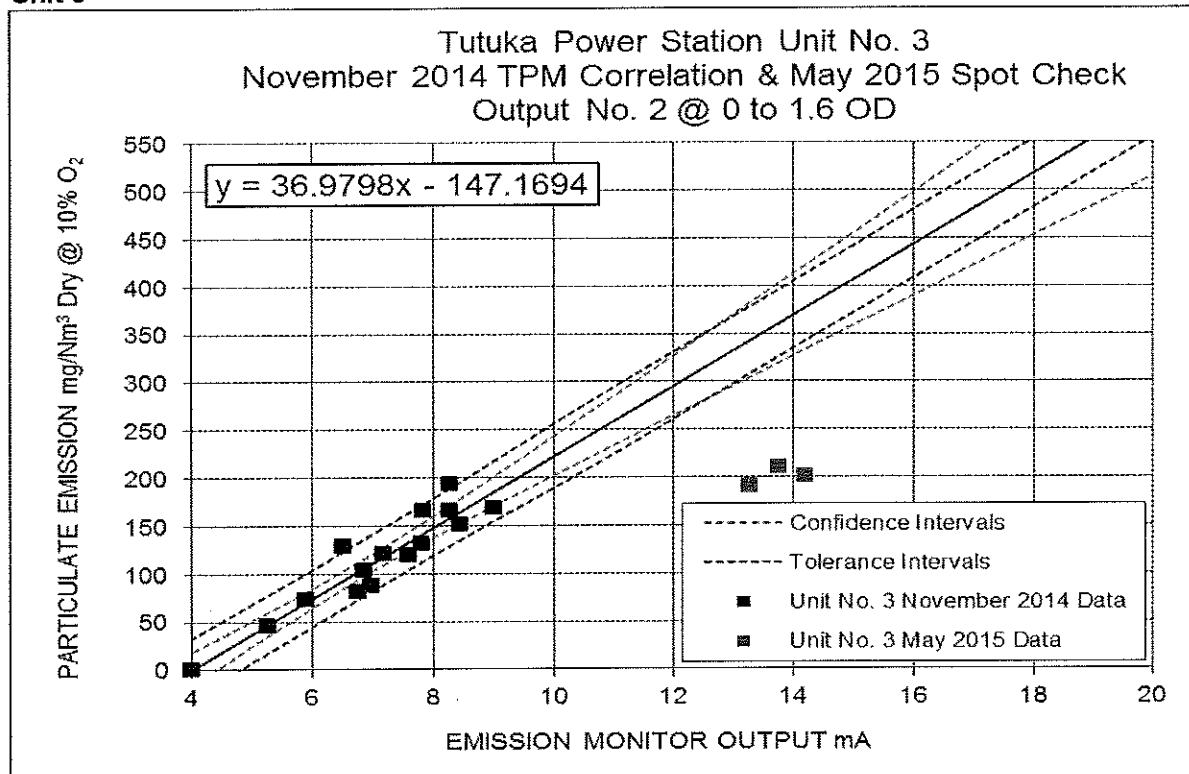
U 1 Correlation Results – March 2015

Unit 2



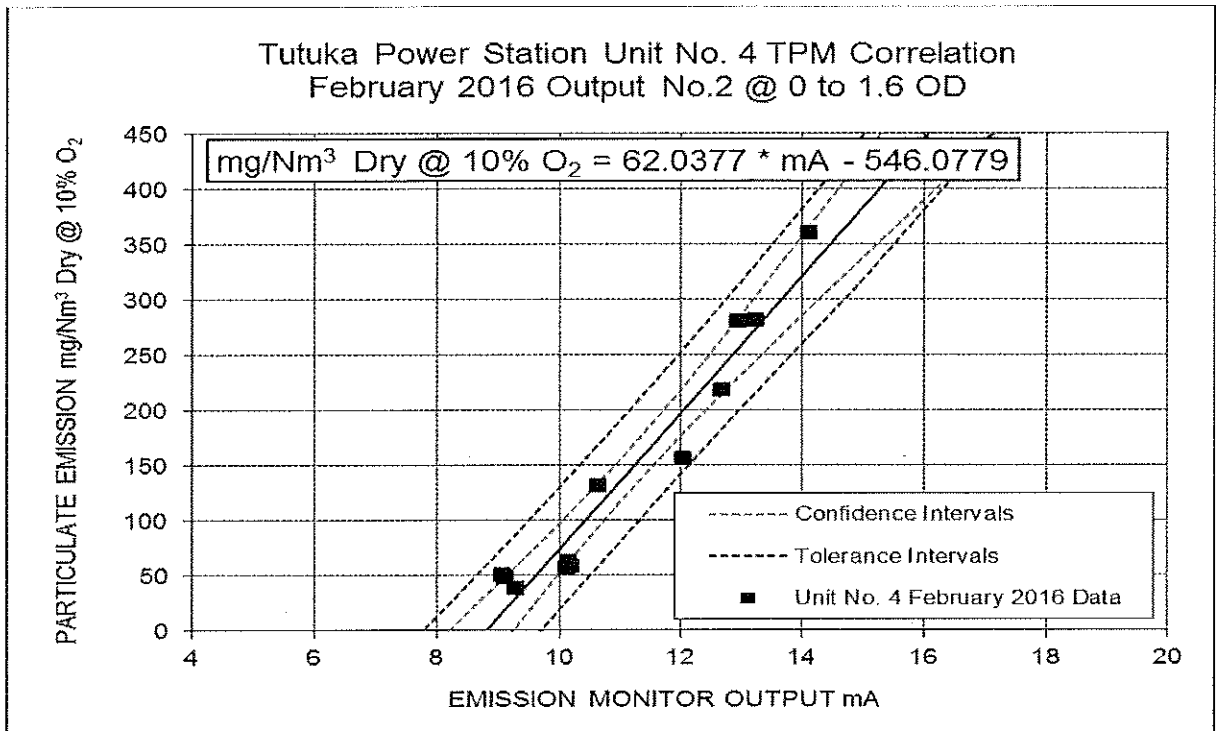
U 2 Correlation Results – March 2015

Unit 3



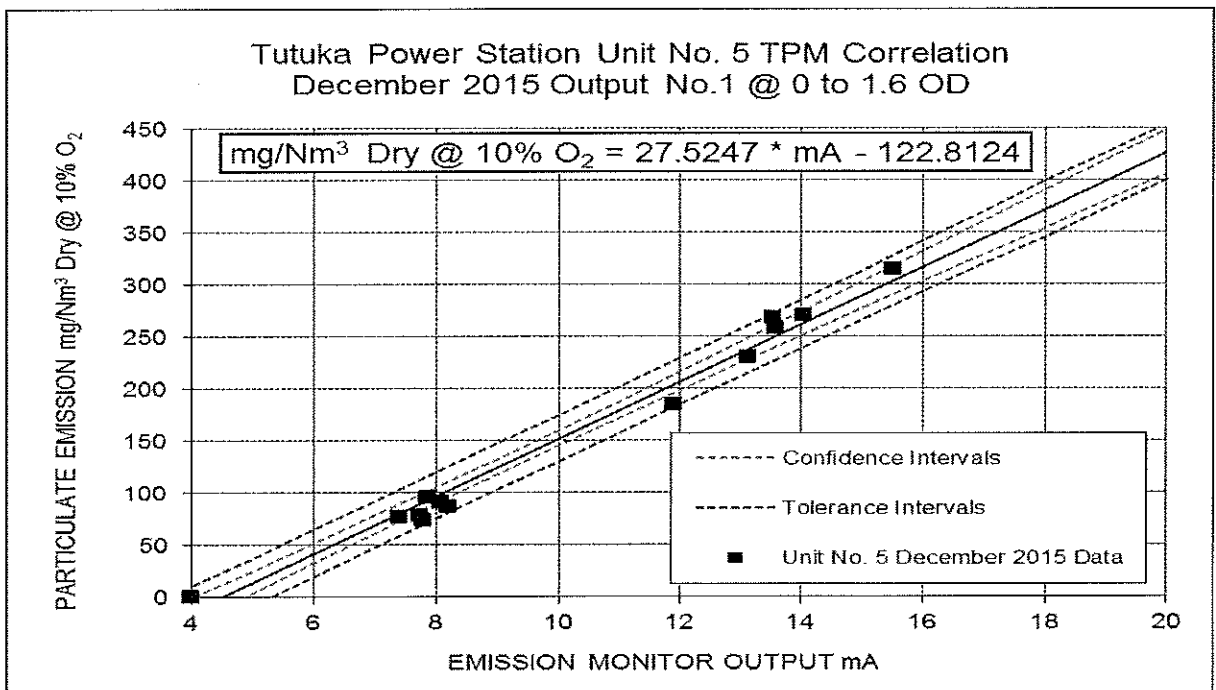
U 3 Correlation Results – May 2015

Unit 4



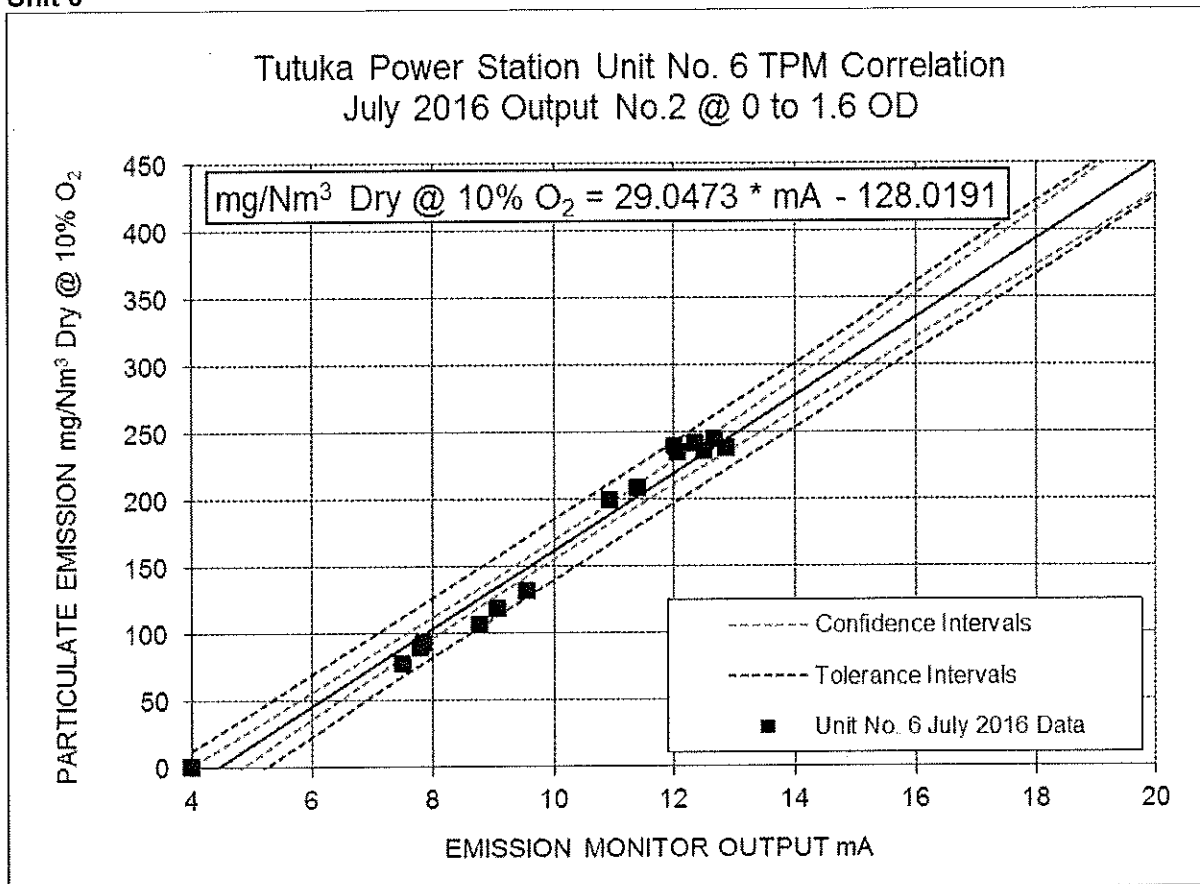
U 4 Correlation Results – February 2016

Unit 5



U 5 Correlation Results – December 2015

Unit 6



U 6 Correlation Results – July 2016

9. Greenhouse Gas Emissions:

- Figures for Greenhouse Gases (CO₂ and N₂O) are depicted in Tables 1 & 2 above in pages 1 & 2 respectively.

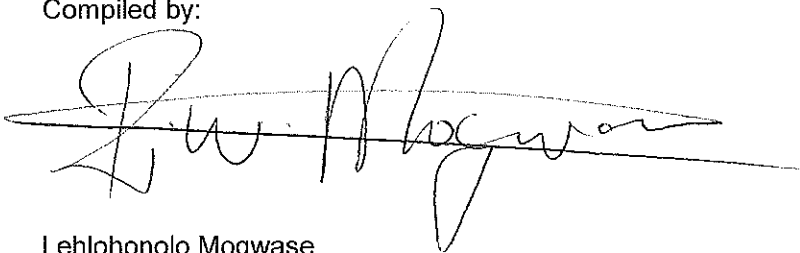
10. General

Additional information regarding compliance with the emission license conditions is included in the Monthly Emission Reports.

For any inquiries please contact Mr Lehlohonolo Mogwase, Environmental Practitioner (Tutuka PS Emissions Control Officer), Tel: 017 749 5536 / Cell: 076 334 0449 / E-mail:

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