

**Mr. TD Hlanyane**

Air Quality Officer

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C/o Joubert and Oosthuise Streets

**ERMELO**

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Date: 2 June 2016

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Dear Mr Hlanyane:

## **TUTUKA POWER STATION REVISED FUGITIVE EMISSIONS MANAGEMENT PLAN – JUNE 2016**

### **1. INTRODUCTION**

Most emissions released into the atmosphere from power stations are from smoke stacks, which disperse the pollutants before they reach ground-level. The emissions can be well quantified either by direct measurements or by calculations based on the amount and characteristics of the coal burnt.

Fugitive dust may be emitted from a number of sources at a power station, most notably from the ashing facility and the coal stockyards. Fugitive dust may also originate from a number of other sources, including un-tarred roads. Fugitive dust tends to be generated mainly in association with strong winds or when a surface is disturbed. Fugitive emissions are usually sporadic, emitted over a large area and not easily quantified.

A fugitive emission management plan has been compiled for Tutuka Power Station, based on the identification of sources of fugitive dust an assessment of the significance of emissions from these sources and the control measures which are already implemented to control emissions. Additional control measures and plans for implementation have been identified where required.

The responsible person for the implementation of this plan is Ilse Coop (Environmental Manager / Emissions Control Officer).

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## **2. SOURCES OF FUGITIVE DUST**

The locations of the ashing facility and coal stockyard are shown under Fugitive Dust Monitoring Network (point 5 on pages 3 & 4)

### **2.1. ASHING FACILITY**

Tutuka is a coal-fired power station, and it uses a dry ashing methodology. An average of approximately 3 000 kilotons of ash is disposed at the Ash Disposal Facility (ADF) annually.

Inside the power plant, ash is transported via conveyers to two the overland conveyors which in turn transport the ash, which has been conditioned with water to avoid dust displacement, to the ADF. If the main conveyor (A) becomes unavailable, the standby system (B) is put in service and when ash spillages occur inside the plant, the areas are cleaned using small front end loaders (Bobcats) and the ash is taken to the emergency ashing area next to the conveyor house on the northern side of the power station.

### **2.2. COAL STOCKYARD**

The Coal Stockyard (CSY) is situated on the southern side of Tutuka Power Station. Fifty percent (50%) of the coal utilised is brought in via conveyor belts from New Denmark Colliery and the remainder is brought in via road & rail from various sources. There are two stockpiles (live & strategic) situated at the CSY, which carries a reserve to generate power for a period of fifty-five (55) days.  
Tutuka Power

### **2.3. OTHER SOURCES OF FUGITIVE RELEASES**

Station has three unpaved access roads that are used on a daily basis, as follows:

- Domestic Waste Site (700 m) - Mini trucks, tractors and LDV's
- Ash Disposal Facility (1.2 km) – SUV's as well as light-and heavy duty trucks
- Coal Stockyard (1.3 km) - SUV's as well as light-and heavy duty trucks

When less water is applied on ash conditioning, fugitive dust may be released from the ash conveyer.

## **3. METEOROLOGY**

Tutuka Power Station has an in-house Weather Monitoring Station that records weather data 24/7. Additional information on weather conditions of the surrounding areas is obtained from Eskom's Ambient Air Quality Monitoring Station situated at the Grootdraai Dam, 13.5 km south-west of the power station. Weather data is assessed on a daily basis and should excessive windy conditions be predicted additional mitigation measures are put in place to minimise fugitive dust.

#### 4. FUGITIVE DUST MONITORING METHODOLOGY

Windblown settleable dust fall-out is monitored based on the ASTM International Standard Method for Collection and Analysis of Dustfall (ASTM D1739 – 1970), with certain modifications.

The method employs a simple device consisting of a cylindrical 5l container half-filled with deionised water exposed for one calendar month ( $30 \pm 3$  days). The water is treated with algacide to prevent algal growth in the buckets (reagent - 5% copper sulphate solution).

The bucket stand comprises of a ring that is raised above the rim of the bucket to prevent contamination from perching birds. The bucket holder is connected to a 2.1m galvanised steel pole, which is either directly attached to a fence post or attached to a galvanised steel base plate and planted half a meter deep in the ground.

Exposed buckets, when returned to the laboratory, are rinsed with deionised water to remove residue from the sides of the bucket, and the bucket contents filtered through a 1mm sieve to remove insects and other coarse organic debris. The sample is then filtered through a pre-weighed paper filter to remove the insoluble fraction, or dust fall-out. The residue and filter is then dried and gravimetrically analysed to determine the insoluble fraction (dust fall-out).

#### 5. FUGITIVE DUST MONITORING NETWORK

##### 5.1.COAL STOCK YARD

The Coal Stockyard (CSY) fugitive dust monitoring network was re-evaluated and found to be sufficient for current operations and possible impacts.

1 STOCKYARD DAM	2 UITKYK 1	3 WILDEALSKOP	4 CENTRAL SHAFT	6 STD HOOP NORTH	7 TUTUKA LAB	8 ROSHCON OFFICES	9 STOCKPILE	* 12 FARM HOUSE	* 27 DU TOIT FARM HOUSE
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Figure 1 – Tutuka PS CSY Dust Monitoring Network – June 2016

## 5.2. ASH DISPOSAL FACILITY

The Ash Disposal Facility (ADF) fugitive dust monitoring network was re-evaluated and expanded. Nine (9) additional ash monitoring stations were commissioned of which seven (7) are at farm residences and two (2) are in crop fields.

*13 ASH DISPOSAL OFFICES	*16 BEN STEYN FARM HOUSE	*18 SOUTH OF ASH HEAP (CONTROL)	*19 FANIE VD MERWE FARM HOUSE	*20 SPIOENKOP W OF ADF (CONTROL)	*21 STEYN VD MERWE FARM HOUSE	*22 SIMON RIEKERT FARM HOUSE	*23 SPIOENKOP SW OF ASH HEAP (CONTROL)	*24 JAN SCHOONRAAD FARM HOUSE	*25 HENNIE DU PREEZ FARM HOUSE	*26 FIELD NW OF ASH HEAP (CONTROL)	*28 WOUTER THERON FARM HOUSE	*29 WOUTER THERON FIELD	*30 WOUTER THERON FIELD W/TANK
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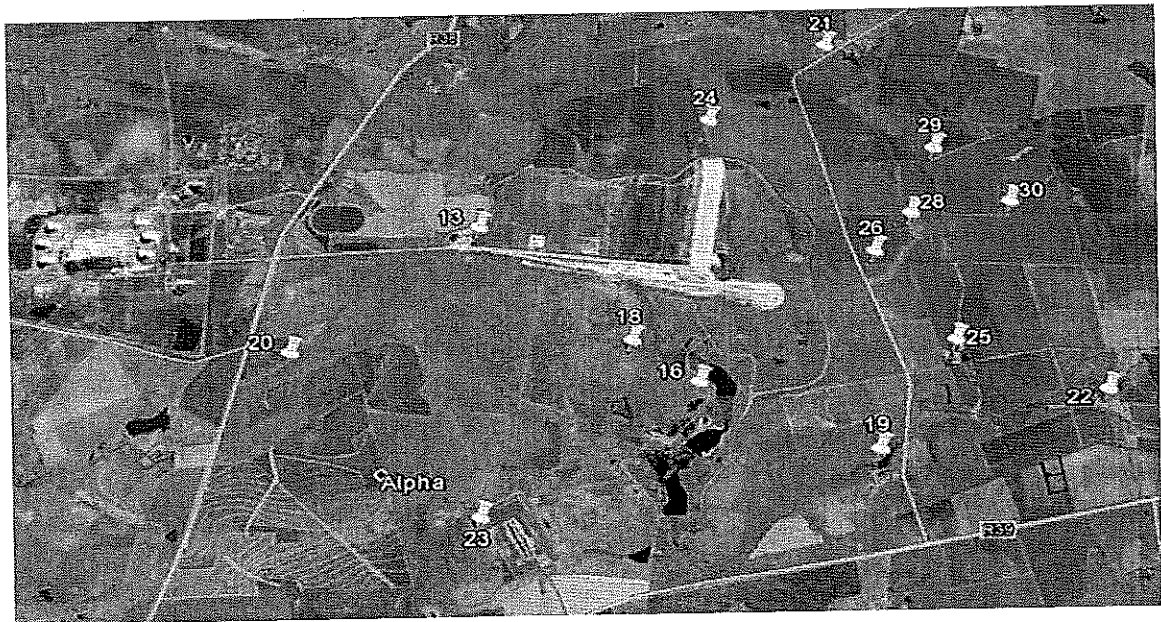


Figure 2 – Tutuka PS ADF Dust Monitoring Network – June 2016

## 6. CONTROL MEASURES FOR FUGITIVE DUST SOURCES

### 6.1. ASH DISPOSAL FACILITY (ADF)

The following control measures are in place to mitigate the risk of fugitive dust fall-out:

- Ash that is transported to the ADF is conditioned with water (procedure available).
- Dust suppression on the ash stack is done via a sprinkler system which is currently in the process of being upgraded to be more efficient.
- Dust suppression with treated effluent water is done on a daily basis and the frequency is increased if excessive windy conditions are predicted / encountered.
- A 300mm layer of top soil is placed on areas that are rehabilitated, to allow for the re-establishment of natural vegetation.

### 6.2. COAL STOCKYARD (CSY)

The stockpiles at the CSY are compacted and dust suppression with treated effluent water is done on a daily basis - the frequency is increased if excessive windy conditions are predicted / encountered.

### 6.3. OTHER AREAS

Dust suppression with treated effluent water is done on a daily basis on all unpaved roads and other areas on site where fugitive dust have been observed (e.g. excavations for construction activities).

## 7. REPORTING

The following reports, which contain information pertaining to fugitive emissions, are submitted to the Gert Sibande District Municipality:

- Monthly Fugitive Dust Emissions Reports as received from the Service Provider
- Monthly Emissions Reports (including complaints pertaining to fugitive dust)
- Annual Emissions Report as per the Tutuka Air Emissions License Requirements.

## 8. CONCLUSION

The Tutuka Power Station Fugitive Emission Management Plan will be reviewed every five (5) years as well as when significant new areas of impact have been identified. The next official review date is June 2021.

Please forward all enquiries to myself, should there be a need for additional information.

Compiled & Submitted by:



Ilse Coop

**EMISSIONS CONTROL OFFICER**