

**Duvha Power Station**  
**Fugitive Emission Management Plan**

March 2015

## **1 INTRODUCTION**

Most releases into the atmosphere from power stations are from tall stacks. These stacks aid in the dispersion of pollutants before they reach ground-level, and 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 untarred roads. Fugitive dust tends to be generated mainly in association with strong winds, or when a surface is disturbed. Fugitive emissions are usually sporadic and emitted over a large area, and so are very difficult to quantify.

A fugitive emission management plan has been compiled for Duvha 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 a plan for implementation have been identified where required. The template and schedule for reporting to the Licensing Authorities is proposed.

This plan satisfies the requirement for a fugitive emission management plan in sections 7.5 of the Duvha Atmospheric Emissions License number 17/4/AEL/MP312/11/07.

The responsible person for the implementation of this plan is the Duvha Power Station Environmental Manager, Simthandile Mpondo.

## **2 SOURCES OF FUGITIVE DUST**

The locations of the ashing facility and coal stockyard are shown in Figure 1.



Figure 1. A map showing the location of the ash dams and coal stockyard

## 2.1 Ashing facility

At Duvha a wet ashing process is used. On Units 1 - 3 the hydrovac system is used to empty the ash hoppers. Water is used to create vacuum in order to suck the dust out of the hoppers and push it through to the sluice way, from the sluice way the ash goes to the ash sump where it is pumped out by the ash pumps through the ash lines to the Ash Dams.

On Units 4 – 6 the aeroslide system is used to transport ash from the hoppers to the silo and from the silo the hydrovac system is used to empty the ash from the silo to the sluice way and from there it goes to the ash sump and pumped out by the ash pumps through the ash lines to the Ash Dams.

At the Ash Dams the ash slurry is pumped to a central distribution point situated at a high point on the southern perimeter of the ash dam. From the distribution point the fly ash and coarse ash are channelled through various open trenches and allowed to gravitate via appropriate night and day paddocks to the penstocks.

On average there's about 3374,987 tonnes of ash disposed of to the ash dams per annum.

## **2.2 Coal stockyard**

Duvha Power Station has a contract with Middleburg Mining Services to supply the station with 10 million tons of coal per annum. An additional 2 million tons of coal is trucked in to the station from Kleinkoppie, Goedgevonden, New Clydesdale, Blesbok, MTL and Black Wattel mines. A buffalo feeder reclaims the coal from the stockpile onto the conveyor belts. The coal is then conveyed into two coal staithes and from the coal staithes into six (6) unit coal bunkers. Coal is then conveyed into the mills where it is milled to pulverized fuel which is used for combustion in the boiler.

On average there's about 1,278,634.6 tons of coal stored on the stockpiles and the distance of the coal stockyard is 3,00km.

## **2.3 Unpaved roads**

The length of the unpaved road around the Ash Dams is 27km. About 20,9km of the road is used daily by light vehicles; 5,1km used once per week by light vehicles and 1,0km is used daily by light and heavy vehicles.

There are also unpaved roads around the security and boundary fence which are about 23,55km in length. These roads are used daily by Protective Services travelling by light vehicles.

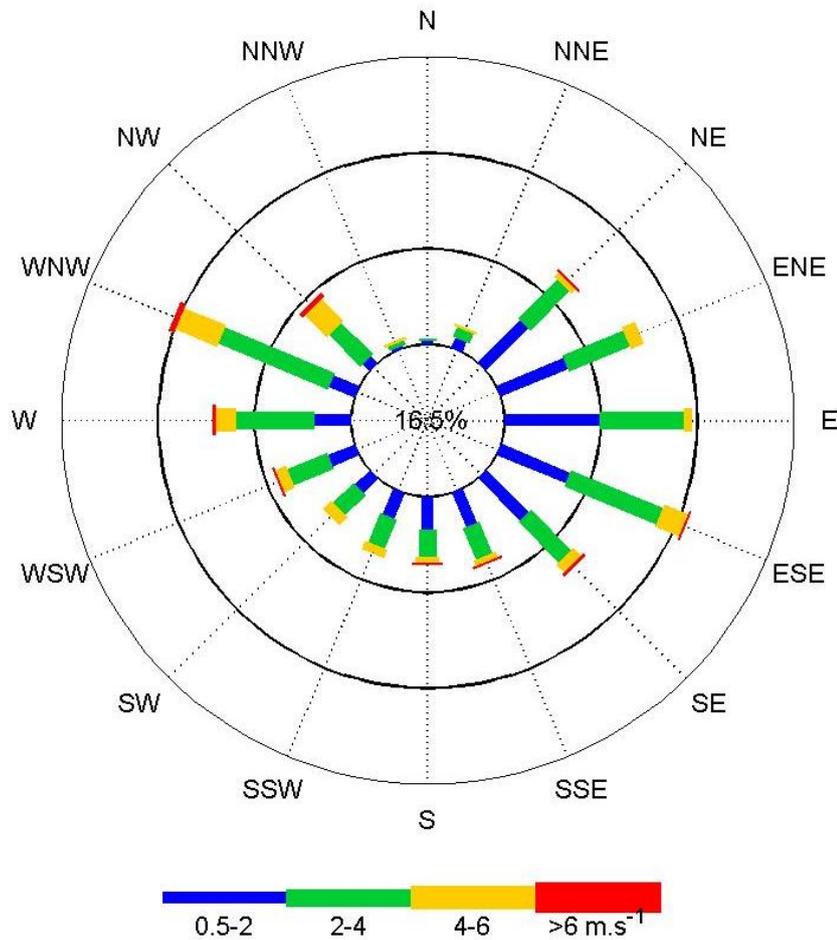
At the Eskom Village there are also unpaved roads which are about 3,65km in length and which are used daily by personnel working there travelling by normal cars.

There are roads around the sewage plant, north oil traps, married quarters, and the raw water dam, which are about 6,1km long, travelled daily by light vehicles.

## **3 METEOROLOGY**

Wind speed and direction recorded at the Department of Environmental Affairs' ambient air quality monitoring station in Witbank from October 2009 to September 2010 have been used to compile the wind rose below. Winds at Duvha may differ from those recorded at the Witbank monitoring station due to local topographical influences. Prevailing winds in Witbank are west-north-westerly and easterly to east-south-easterly. Winds exceed 4 m/s for 11.4% of the time, and winds exceed 6 m/s for 0.9% of the time. Fugitive emissions can be expected to be generated in association with higher wind speeds. Calm conditions (<0.5 m/s) persist for 16.5% of the time.

**Witbank wind rose**  
**October 2009 to September 2010**



Arcs represent 5% frequency intervals  
 Frequency below minimum shown in inner circle

## 4 CONTROL MEASURES FOR FUGITIVE DUST SOURCES

### 4.1 Ashing facility

At Duvha we are using wet ashing and ash is transported by ash line pipes and there are no significant fugitive emissions from the transportation of ash. The ash dams which are not in use are flooded with ash water to suppress dust.

The rehabilitation of the ash dam side slope is done every 8,5m of the dam height, which happens every five (5) years. The topsoil is spread evenly to a minimum thickness of 200mm over the total graded ash dam side slope. The topsoil is worked to a minimum of 200mm to ensure a smooth final surface without any slacks and hollows where ponding can take place.

The seeding of grass takes place as early as possible during the growing season. The compost is used to fertilize the prepared area. The grass species used are Chloris gayana, Eragrostis turf, Aragrostis chloromelas, Aragrostis lehmanniana and Ennerapogon cenchroides and trees species used are Acacia karroo, Soetdoring, Koorsboom, Witkoree, Swartkaree, Wildeperske Blink and blaar wag'n bietjie.

#### **4.2 Coal stockyard**

The stockpiles are compacted on monthly basis. There are two water bouzers that are used to maintain dust suppression.

A buffalo feeder reclaims the coal from the stockpile onto the conveyor belts. The coal is then conveyed into two coal staithes and from the coal staithes into six (6) unit coal bunkers. Coal is then conveyed into the mills where it is milled to pulverized fuel which is used for combustion in the boiler. Dust suppression is done in the coal staithes and bunkers.

#### **4.3 Unpaved roads**

The firebreaks are burnt next to the roads between March and April every year, or as when required. The roads are compacted by the grader. The truck water tanks will be used to suppress dust, if any, on active roads.

### **5 FUGITIVE EMISSION INSPECTION AND MONITORING**

#### **5.1 Ashing facility**

At Duvha we are using wet ashing and weekly inspections and visual monitoring are done, or as when required especially during windy season. A truck is used to spray water for dust suppression and rehabilitation is done on the ash dams side slopes.

No complaints have been received from the public.

#### **5.2 Coal stockyard**

The inspections and monitoring are done on daily basis.

No complaints have been received from the public

#### **5.3 Unpaved roads**

There is currently no heavy traffic on the unpaved roads, as it is mostly used by personnel responsible for those particular areas and Protective Services personnel when doing their patrols.

Any complaints received from the public are registered on the Initial Notification of Occurrence (INO) system and investigated and the complainant is given feedback on the actions taken.

#### **5.4 Fugitive emission monitoring and reporting**

The results of the PM10 or dust fallout monitoring will be reported to the relevant authorities as soon as monitoring commences on site. It is anticipated that monitoring will start by end of June 2015.

### **6 CONCLUSION**

Significant sources of fugitive dust emissions have been identified, and appropriate control measures identified in this fugitive emission management plan. Progress on the implementation of the plan and the monitoring results (where applicable) will be reported to the Licencing Authority annually.

This fugitive emission monitoring plan will be reviewed every 5 years. The next review date is March 2020.

Eskom is committed to continual improvement in environmental performance.