BACKGROUND INFORMATION DOCUMENT (BID)

APPLICATION FOR ALTERNATIVE LIMITS OF THE MINIMUM EMISSIONS STANDARDS (MES) FOR THE MEDUPI AND MATIMBA POWER STATIONS

EIMS ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

November 2019

PURPOSE OF THIS DOCUMENT:

- This Background Information Document (BID) provides you, as an Interested and Affected Party (I&AP), an overview of Eskom's reasoning for the applications.
- The BID invites you, as an I&AP, to participate in the required Public Participation Process.
- The BID provides you, as an I&AP with an opportunity to contribute and participate in these applications.
- The BID also provides you, as an I&AP an opportunity to provide the project team with your comments and queries.

INTRODUCTION:

In 2004 the National Environmental Management: Air Quality Act (NEM:AQA) (Act No 39 of 2004) was promulgated. Following the promulgation of the Act, national ambient (ground-level) air quality standards were published in December 2009 and Minimum Emission Standards (MES) in April 2010. The MES have two broad requirements which are emission limits for 'existing plants' (which came into effect on the 1st April 2015) and more stringent 'new plant' limits which must be complied with by the 1st April 2020.

Eskom applied for a five-year postponement of the existing and new plant Sulphur Dioxide (SO_2) limits for Matimba and Medupi Power Stations in March 2014. Both power stations are located in the Limpopo Province in the vicinity of Lephalale.

The Department of Environmental Affairs (DEA) (now referred to as the Department of Environment, Forestry and Fisheries, DEFF) rejected Eskom's application for postponement of the 2015 existing plant SO_2 limit but approved the request for postponement of the new plant SO_2 limit to alternative 3500mg/Nm^3 **daily** from 2020 to 2025 for both power stations.

Subsequent to the 2014 application for postponement of the MES, Matimba and Medupi have started continuous measurements of SO_2 emissions. In 2017 Medupi and Matimba applied for SO_2 emissions to be measured against a **monthly** rather than a daily limit of 3500mg/Nm^3. This was approved by DEA in September 2018.

Eskom now intends to apply for an alternative monthly limit of SO_2 emissions for Medupi, given delays in the implementation of the planned Fluid Gas Desulphurisation (FGD) plant. For Matimba power station, Eskom intends to apply for alternative monthly limits of the SO_2, Nitrogen Oxide (NOx) and Particulate Matter (PM) emission limits because of a need for operational flexibility, resource (particularly water and funding) and technically related design constraints.

Eskom has already applied for postponement from compliance to the MES for 11 of its Mpumalanga power stations in separate applications submitted in March 2019.

LOCATION OF POWER STATIONS:

LOCATION: MATIMBA

- Property Description: **Farm Grootestryd 465**
- Central Co-ordinates: **23°40'03.44 " S; 27°37'00.08" E**
- Regional Description:
  - Local Municipality: **Lephalale Local Municipality**
  - Province: **Waterberg District Municipality**
- Closest town or point of interest: **Approximately 13km West of Lephalale Town**

LOCATION: MEDUPI

- Property Description: **Farm Naauw Ontkomen 509 and Farm Eenzaamheid 687**
- Central Co-ordinates: **23°42'14.48 " S; 27°33'39.77" E**
- Regional Description:
  - Local Municipality: **Lephalale Local Municipality**
  - Province: **Waterberg District Municipality**
- Closest town or point of interest: **Approximately 19km west of Lephalale Town**

Please refer to locality map at the end of this BID.

WHAT ARE EMISSION STANDARDS?

In managing air quality, the authorities must ensure that the air breathed by people (ambient air) does not contain more than a certain quantity of pollution in every unit of air that is inhaled. The quantity of pollution per unit is expressed as the weight of the pollutant (typically in micrograms) per cubic meter of air, or µg/m^3 (see Box 1). Expressed in this manner, air pollution is referred to as a *concentration.* Authorities then use defined standards typically sourced from the World Health Organisation (WHO) to define concentrations below which human health would not be adversely affected. These concentrations are called ambient air quality standards and apply to the air to which people are exposed (in contact with or breathed).

In order to manage ambient air quality, the authorities must control the pollution that is emitted into the atmosphere (Atmospheric Emissions). To do so, maximum allowable emissions are typically prescribed and in South Africa these have been translated into law as Minimum Emission Standards (MES). The MES are also expressed as concentrations but because concentrations are greater where they are emitted (before they are diffused and dispersed through the atmosphere), the standards are expressed in mg/Nm^3 (see Box 2). These concepts are expressed in Box 3 and illustrated schematically below:

Box 1

Ambient Air Quality Standards

µg/m^3 measures microgram of pollutant per cubic metre of air

=

concentration below which human health is not adversely affected

measured in micrograms, here law accepts the pollutant as already being diffused/diluted at receptor (receptor based impact).

Box 2

Emission Standards

mg/Nm^3 measures milligrams of pollutant per cubic metre of air

=

concentration below which human health is not adversely affected

measured in milligrams, as concentrations are greater at the pollution source and law accepts the pollutant has not been diffused yet (point source).

Box 3

Understanding the expression for ambient air standards and MES

Grams are a measure of mass of which kilograms is the most commonly used measure of mass. 1kg is equal to 1000 grams. 1 gram (g) is equal to 1000 milligrams (mg). 1mg is equal to 1000 micrograms (µg) in a mg. The 'N' in the expression of MES stands for 'normal and refers to the m^3 of air at sea level at 0°C.

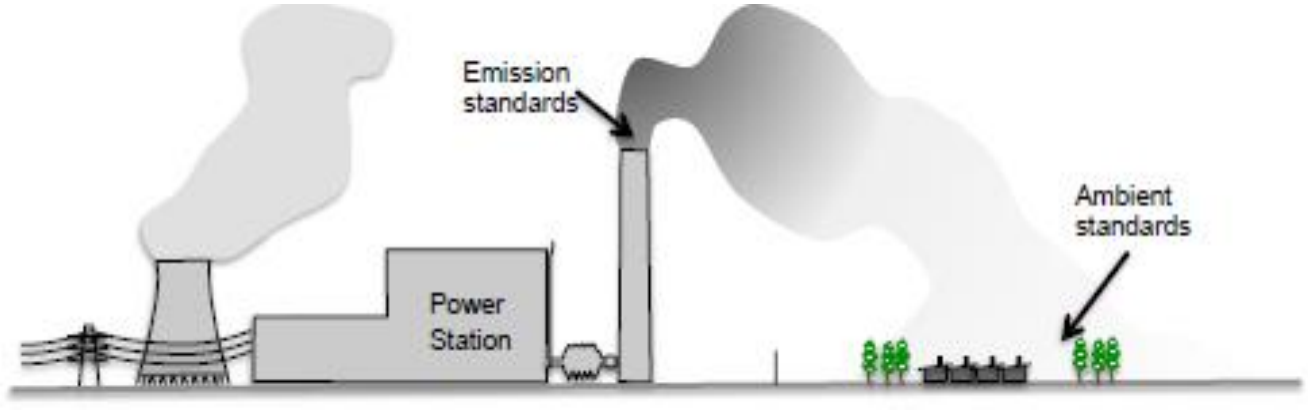


Figure 1: Schematic illustration of emission and ambient standards [1]

[1] (Rycroft , Mike; 2018, Poor air quality and hazardous emissions enddanger human life, EE Publishers, November 2018)

MES COMPLIANCE TIMEFRAMES

Eskom's power stations are required to comply with the Minimum Emission Standards (MES), which came into effect under the National Environmental Management: Air Quality Act on 1 April 2010. These standards required power stations to comply with more lenient 'existing plant' limits from 2015, and stringent 'new plant' limits in 2020.

Table 1: MES Existing and New Plant Limits

Pollutant Name	Maximum release rate for coal-fired plants		
	Limit value (mg/Nm^3)	Date to be achieved by	Average period
Particulate Matter - PM	100	1 April 2015	Daily
	50	1 April 2020	Daily
Sulphur Dioxide - SO_2	3500	1 April 2015	Daily
	500	1 April 2020	Daily
Nitrogen Oxide - NOx	1100	1 April 2015	Daily
	750	1 April 2020	Daily

Due to the need for operational flexibility, resources (particularly water and funding) and technically related design constraints, it is not possible for all power stations to comply with the limits in the stipulated timeframes on a daily basis. For this reason, Eskom Holdings submitted postponement applications from specific compliance timeframes for 16 of its power stations in 2014 of which most were granted by DEFF (then DEA). In terms of the law the postponements could only be granted for a five (5) year period and Eskom was expected to apply for further postponements when these lapsed. As such in 2018/9 Eskom applied again for postponements for eleven of its Highveld coal-fired power stations. For Medupi and Matimba the postponements were valid until 1 April 2025.

In October 2018, amendments to the MES regulations were published (GN 1207 dated 31 October 2018) indicating the following:

- An existing plant may apply to the National Air Quality Officer (NAQO) for a once-off postponement with the compliance timeframes for MES for new plant. A once-off postponement with the compliance timeframes for the MES for new plant may not exceed a period of 5 years from the date of issue. No once off postponement will be valid beyond 31 March 2025;
- An existing plant to be decommissioned by **31 March 2030** may apply to the NAQO before **31 March 2019** for a once-off suspension of compliance timeframes with MES for new plant. Such an application must be accompanied by a detailed decommissioning schedule. No such application shall be accepted by the NAQO after 31 March 2019;
- An existing plant that has been granted a once off suspension with the compliance timeframes must comply with MES for existing plant from the date of granting the application and during the period of suspension until decommissioning.
- An alternative emission limit may be granted by the NAQO, if there is assurance of compliance to the national ambient air quality standards in the area or demonstration of no increased health risk where there is no increase in the ambient air quality standards.
- No postponement of compliance timeframes or a suspension of compliance timeframes shall be granted for compliance with the MES for existing plant.

With the changes to the regulations, Eskom was required to apply for further alternative limits for Medupi and Matimba Power Stations by 31 March 2019. Due to the relatively late publication of the change in the law Eskom was unable to submit applications by 31 March 2019 and requested approval by the Minister of DEFF to submit late applications. The Minister responded and has required Eskom to submit its outstanding applications by November 2019.

Eskom intends to submit applications for Medupi and Matimba using existing information by the end of November 2019. Eskom will however also complete the full studies for the application as detailed in this document and submit these to the authorities during 2020.

PROPOSED APPLICATIONS:

Medupi status and application:
Medupi already meets the new plant limit for Particulate Matter and Nitrogen Oxide as such no application in terms of either of these pollutants is requested. In terms of Sulphur Dioxide (SO_2) Eskom has a present postponement decision granting a monthly limit of 3500 mg/Nm3 until 31 May 2025. From 1 April 2025 Eskom is required to comply with a limit of 500 mg/Nm^3. Eskom will be unable to meet the 500 mg/Nm^3 SO_2 limit. However, the installation of Fluid Gas Desulphurisation (FGD) technology would support compliance to the new plant limit. Eskom has committed to installing FGD at Medupi and previous planning indicated that FGD would be installed at Medupi 6 years after completion of each unit thus between 2021 and 2026. Unfortunately, there have been significant delays in implementation of the project and it is now anticipated that FGD will be installed between 2028 and 2030. Eskom thus requests an alternative monthly limit of 4000 mg/Nm^3 for SO_2 from 2020 until 2030, when installation of the FGD is complete. Thereafter Eskom is requesting an alternative monthly limit for SO_2 of 1000 mg/Nm^3 until decommissioning.

Matimba status and application:
Matimba meets the "existing "plant limit for Particulate Matter (PM), Nitrogen Oxide (NOx) And Sulphur Dioxide (SO_2). However, Matimba Power Station will not be able to comply with the 'new plant' daily MES limit for PM, NOx and SO_2. An alternative **monthly** limit of 750 mg/Nm^3 for NOx, 4000 mg/Nm^3 for SO_2 and 50 mg/Nm^3 for PM is requested.

In terms of SO_2 Eskom has a present postponement decision granting Matimba a monthly limit of 3500 mg/Nm3 until 31 May 2025. The installation of Fluid Gas Desulphurisation (FGD) technology would help support compliance to the new plant limit, however Eskom argues FGD at Matimba is not warranted given the limited impact on air quality, its high cost and time to decommissioning. Eskom thus requests an alternative **monthly** limit of 4000 mg/Nm^3 from 2020 until decommissioning.

In terms of PM and NOx, Eskom is not able to meet the new plant limits **on a daily basis because of the** need for operational flexibility, resources (particularly water and funding) and technically related design constraints, and as such is requesting alternative monthly limits of 50 mg/Nm3 for PM and 750 mg/Nm3 for NOx from 2020 until decommissioning.

In order to motivate for the alternative limits Eskom will need to provide and or submit details on the constraints that prevent both power stations from meeting the legislated emission standards. In addition, the NEM:AQA requires that an Atmospheric Impact Report (AIR) must be prepared in support of the applications and that a public participation process must be conducted as specified as per the National Environmental Management Act (NEMA) requirements. The DEFF also requires that the modelling be done strictly in accordance to the modelling code of practice.

ATMOSPHERIC IMPACT REPORT AND DISPERSION MODELLING

The Atmospheric Impact Report will be required to include adequate information on impact of the alternative limits on the ambient air quality. Atmospheric dispersion modelling will be used to predict the ambient air quality implications of not complying with the applicable limit values prescribed in the MES until/if abatement technology is installed/upgraded. Atmospheric Dispersion modelling considers the atmospheric processes, such as emissions released into the atmosphere that are diffused and transported as a result of turbulence and wind velocity, in order to predict the ambient concentrations of SO_2. The predicted ambient concentrations will be assessed in combination with reviews of ambient air quality monitoring data to ascertain how emissions (including fugitive emissions) from the power stations influence ambient air quality.

Dispersion models compute ambient concentrations and fallout rates as a function of source configurations, emission strengths and meteorological characteristics, thus providing a useful tool to ascertain the spatial and temporal patterns in the ground level concentrations arising from the emissions of various sources. Increasing reliance has been placed on concentration estimates from models as the primary basis for environmental and health impact assessments, risk assessments and emission control requirements.

The dispersion modelling will only include Medupi and Matimba power stations and the cumulative impact of Eskom power stations in the same air shed. However, the ambient data will be compared to the model output when model verification takes place. In this exercise it will be possible to see whether there are other source contributors to specific ambient air pollution. Depending on the signature trend of the diurnal variation plots, it can then be ascertained what type of other sources contribute to the ambient air pollution considered. This will be highlighted in the Atmospheric Impact Reports.

PUBLIC PARTICIPATION PROCESS

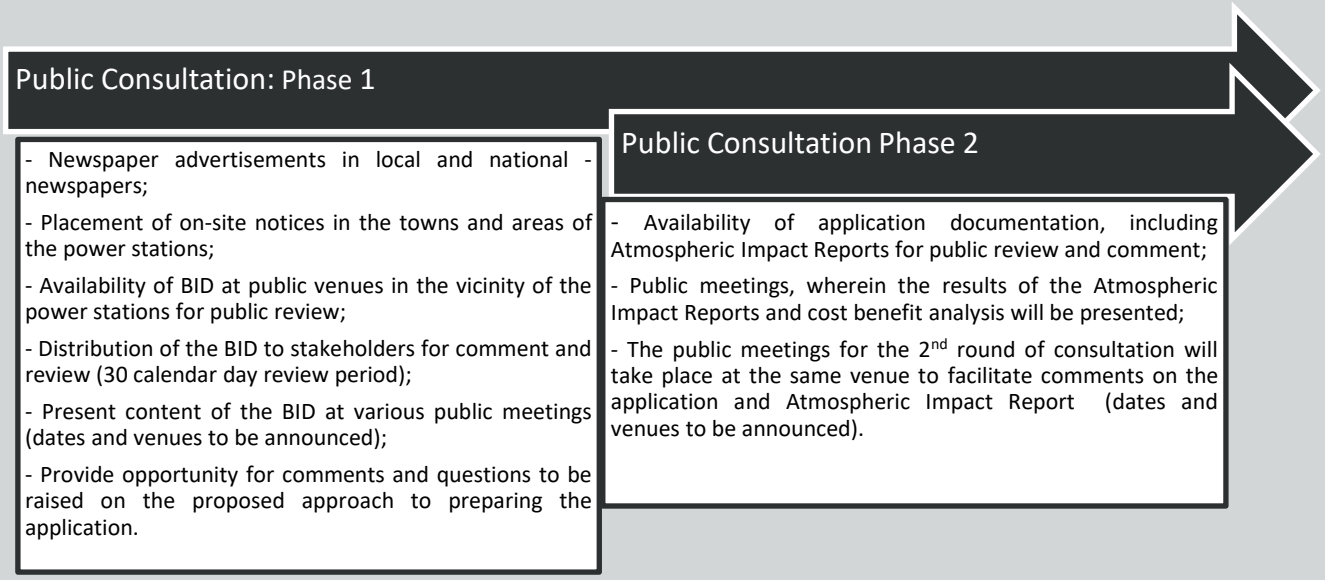
In environmental legislation, the idea of public participation (or stakeholder engagement) features strongly in the National Environmental Management Act (NEMA) and the regulations passed under the auspices of this Act makes very strict provisions for public participation in environmental decision-making.

Public participation can be defined as "a process leading to a joint effort by stakeholders, technical specialists, the authorities and the proponent who work together to produce better decisions than if they had acted independently" (Greyling, 1999, p. 2). From this definition, it can be seen that the input of the public is regarded as very important indeed.

The Public Participation Process (PPP) is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner to assist them to:

- Comment on the findings of the Atmospheric Impact Report;
- Provide relevant local information and knowledge to the assessment; and
- Verify that their comments have been recorded.

Two rounds of public consultation are planned as part of the postponement application. The first round of public consultation will be undertaken from **late November 2019 to the end of January 2020**. The second round of public consultation will be conducted in 2020.



Stakeholders can comment on individual applications (per power station) or on the overall application process.

In parallel to the MES applications Eskom is also required to submit variation request to changes the stations Atmospheric Emission Licences to match the MES application. The public participation process undertaken will be used for both the MES application and the variation request.

HOW TO GET INVOLVED

Should you feel that you may be interested in, or affected by, this project, it is essential that you register as an Interested and Affected Party (I&AP) in which case you will be kept informed regarding the project and afforded an opportunity to participate in the process. Please note that only registered I&APs will be included in future correspondence regarding the project and associated updates. You may register and/or comment as an I&AP in any of the following ways:

- Complete the I&AP registration form and questionnaire and return it to EIMS via email, fax or post;
- Submit written comments, registrations, or requests to EIMS via email, fax or post; and/or

- Via telephone call.

We request that your registration requests and any preliminary comments are submitted to EIMS (contact details provided below) by no later **29 January 2019.**

Please note that further to the above, all registered I&APs will also be notified in due course of further participation opportunities, as well as the availability of the Atmospheric Impact Report upon which comments will be solicited.

Environmental Impact Management Services (Pty) Ltd (EIMS) Contact Person: Cheyenne Muthukarapan

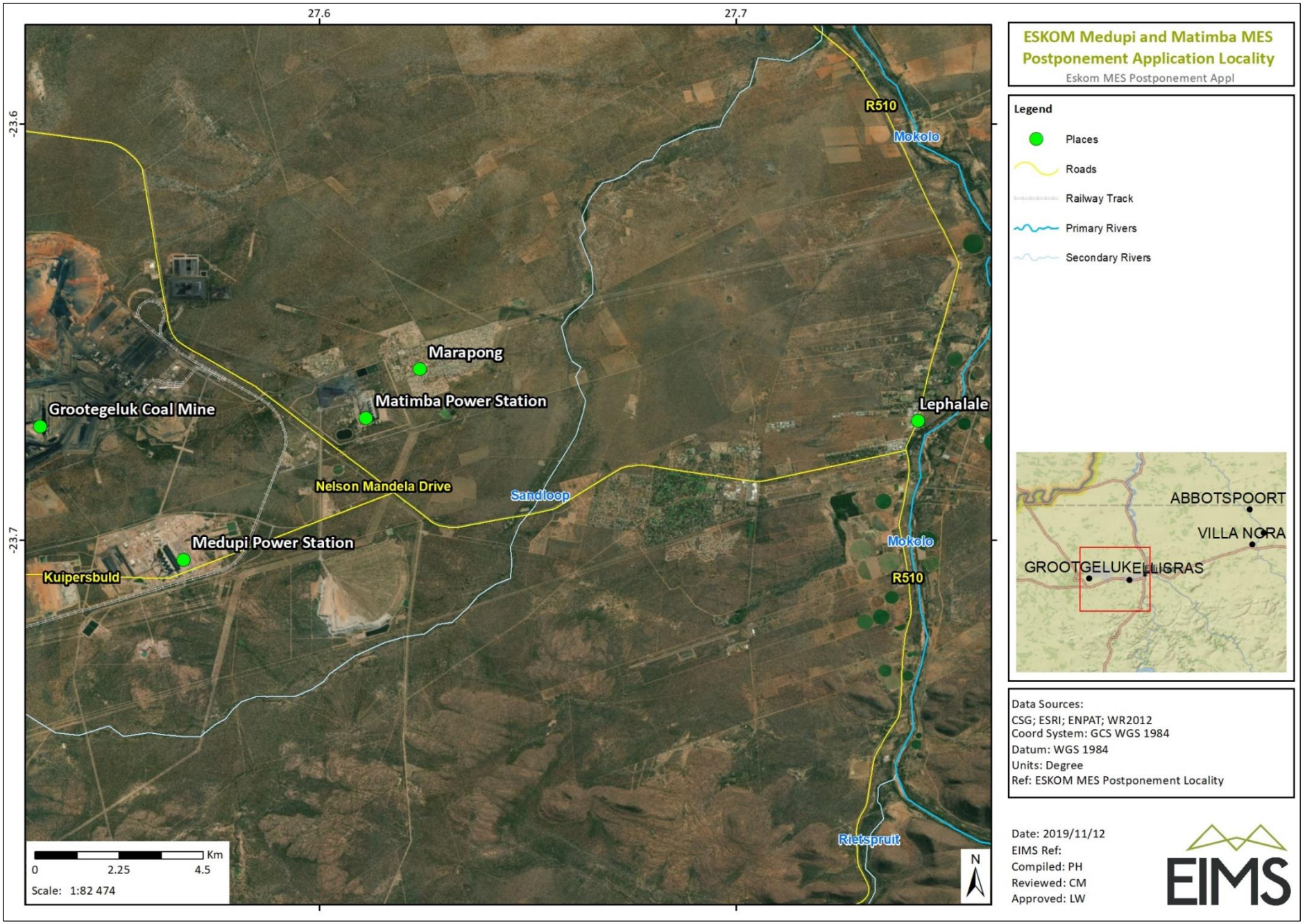
EIMS Reference Number: **1344**

Postal Address: P.O. Box 2083; Pinegowrie; 2123

Telephone: (011) 789 7170/ Fax: (011) 787 3059

For comments relating to these applications please use email address: **postponment@eims.co.za**

Please include the EIMS reference number in all correspondence.


27.6
27.7
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R510
Mokolo
Marapong
Matimba Power Station
Grootegeluk Coal Mine
Lephalale
Nelson Mandela Drive
Sandloop
Medupi Power Station
Kuipersbuld
Mokolo
R510
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N
ESKOM Medupi and Matimba MES Postponement Application Locality
Eskom MES Postponement Appl
Legend
Places
Roads
Railway Track
Primary Rivers
Secondary Rivers
ABBOTSPOORT
VILLA NORA
GROOTGELUKELLISRAS
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Date: 2019/11/12
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Compiled: PH
Reviewed: CM
Approved: LW
EIMS