WETLAND DELINEATION STUDY

ESKOM POWERLINE FROM MASA SUB-STATION (LEPHALALE) TO NGWEDI SUB-STATION (NEAR RUSTERNBURG) – KM 1 - 42, LIMPOPO PROVINCE

Prepared By:

gudaniconsulting
ENVIRONMENTAL & SOCIAL SCIENTISTS
P.O. Box 714, Faunapark, Polokwane, 0787
37A Voortrekker Street, Polokwane, 0699
Tel: 015 - 291 3620, Fax: 015 - 291 4932
setenane@gudaniconsulting.co.za
www.gudaniconsulting.co.za

NOVEMBER 2013

WETLAND DELINEATION STUDY

ESKOM POWERLINE FROM MASA SUB-STATION (LEPHALALE) TO NGWEDI SUB-STATION (NEAR RUSTERNBURG) – KILOMETER 1 - 42, LIMPOPO PROVINCE

FINAL

GUDANI Project No: GC2013/013/Wetlands
GUDANI CONSULTING
37A Voortrekker Street
POLOKWANE
0699

NOVEMBER 2013

Compiled by:
Setenane Nkopane – *Pr.Sci.Nat*
Elijah Monyai – *BSc. Nat. Sci.*

Declaration of Independence:

I, **Setenane Nkopane**, in my capacity as a specialist consultant, hereby declare that I - Act as an independent consultant;

Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act

- 107 of 1998); Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998); As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member; and Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional judgement. I will comply with the Act, regulations and all other applicable legislation; all the particulars furnished by me in this document are true and correct; and I realize that a false declaration is an offence in terms of Regulation 71 of NEMA and is punishable in terms of section 24F of the Act.

_____

Setenane Nkopane (Pr.Sci.Nat

SACNASP Reg. No: 400022/13

Indemnity
This report is based on survey and assessment techniques which are limited by time and budgetary Constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as information available at the time of study. Although the author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of this document.

TABLE OF CONTENTS:

LIST OF ABBREVIATIONS AND DEFINITIONS:

ACRONYM	DESCRIPTION
NEMA	National Environmental Management Act
NWA	National Water Act
NEMBA	National Environmental Management Biodiversity Act
NEMPAA	National Environmental Management: Protect Area Act
NEMWA	National Environmental Management Waste Act
NEMAQA	National Environmental management Air Quality Act
ECA	Environmental Conservation Act
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency
LIHRA	Limpopo Heritage Resources Agency
DEA	Department of Environmental Affairs
PES	Present Ecological State
GIS	Geographic Information Systems
SANBI	South African National Biodiversity Institute
NEMBA	National Environmental Management Biodiversity Act
EMF	Environmental Management Framework
EIS	Ecological Importance and Sensitivity
VEGRAI	Riparian Vegetation Assessment Index
DWA	Department of Water Affairs

In a South African legal context, the term watercourse is often used rather than the terms wetland, or river. The National Water Act (NWA) (1998) includes wetlands and rivers into the definition of the term watercourse in the following definition.
Watercourse means:

a) A river or spring;
b) A natural channel in which water flows regularly or intermittently;
c) A wetland, lake or dam into which, or from which, water flows, and
d) Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Riparian habitat is the accepted indicator used to delineate the extent of a river's footprint (DWA, 2005).

The National Water Act, 1998 (Act No. 36 of 1998), defines a riparian habitat as follows:

"Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse, which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas".

The National Water Act, 1998 (Act 36 of 1998) defines a wetland as:

"land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil."

FOREWORD

This document contains the report on the wetland delineation- which forms part of the specialist studies for the compilation of the environmental management programme (EMPR) for the proposed construction of 400 and 765kV power lines from Masa to Ngwedi Substations. This wetland study was undertaken by Gudani Consulting. In order to inform the EMPR in accordance with the EIA Regulations (No. R543, Department of Environmental Affairs, 18 June 2010) emanating from Part 5 of the National Environmental Management Act 1998 (Act No. 107 of 1998), as well as the Water Use Licence application Process which specifies that activities within 500m from wetlands or riparian areas are excluded from the General Application of Authorization S21 (c) and (i) water uses (government gazette No. 389), wetland and riparian delineations and functional assessments will be conducted to inform activities associated with the Limpopo section of the power line between Rhenosterpan and Vlakpoort approximately 120km.The watercourses form the basis for identifying potential wetland and riparian areas will be investigated during field surveys or walk through.

This report outlines the finding along section 1 of the Eskom powerline from km 1 to km 42.

1.0 INTRODUCTION

Gudani Consulting was appointed by Senkosi Consulting on behalf of Eskom to conduct wetland and riparian delineations and functional assessments to inform the EMPr as well as water use license application process for the 400kV and 765kV power lines from Masa (near Medupi Power-Station in Lephalale, Limpopo Province) to Ngwedi substations near Rustenburg in North West Province. Gudani Consulting will conduct the wetland studies for the first 120km for the proposed project or development. Other specialist studies - Ecology, Avifauna, and Heritage were conducted some years back as part of the EIA process, but the wetland studies were not included, hence the purpose of this study.

1.1 Details of the Applicant

Name of the company	Eskom

1.2 Details of the Wetland Specialist

Name of the company	Gudani Consulting
Assessment done by	Elijah Monyai and Albie Gotze
Report Compiled by	Elijah Monyai
Report Reviewed by	Setenane Nkopane
Postal Address	P.O.Box 714 Faunapark 0787
Physical Address	37A Voortrekker Street, Polokwane 0699
Telephone Number	015 – 291 3620
Fax Number	015 – 291 4932
Email Address	setenane@gudaniconsulting.co.za
Website	www.gudaniconsulting.co.za

1.3 Project Locality and Description of Study Area

The study area for these particular lines is situated in the Limpopo Province. The two power lines of approximately 120km: 400kV and 765kV lines will run from Masa Substation in the north near Medupi power station in Lephalale, Limpopo Province to Ngwedi Substation that is situated in the North West Province. The study area falls to Savannah Biome and it is characterised by grass, thorn trees like Camel thorn, Acacia and shrubs, Marula, Leadwood Shepherds trees, Fig trees to mention but few. The predominant landuse is game farming where the different kinds of animals can be found including the Big Five. This report includes the findings of the wetland and riparian zone assessment along first section (1 – 40km) of the powerline undertaken between the 04th and 08th November 2013.

2.0 STUDY METHODOLOGY AND APPROACH

2.1 Study Methodology

The wetland studies was conducted to ensure that no wetland or riparian zone will be disturbed or damaged during the construction and operational phases of the power lines. The 120km distance of the wetland studies was divided into three sections of approximately 40 km and subsequently three reports: Rhenosterpan to Klippan which is approximately 42km.Turfpan to Paarl is approximately 39km and the last section or report will be from Mecklenburg to Vlakpoort which is approximately 35km. This first report will address the wetland/ riparian areas for the first 42km i.e. from Rhenosterpan to Klippan.

The protocol/methodology that Gudani Consulting followed in conducting the Riparian/Wetland Delineation was in line with the delineation method documented by the Department of Water Affairs:

"An updated manual for identification and delineation of wetlands and riparian areas" (DWA, 2008), was followed throughout the field survey. This guideline describes the use of indicators to determine the outer edge of the wetland and riparian areas such as soil and vegetation forms as well as the terrain unit indicator. A hand held GPS was used to capture GPS co-ordinates in the field. 1:50 000 cadastral maps and available GIS data will be used as reference material for the mapping of the preliminary wetland boundaries. These will be converted to digital image backdrops and delineation lines and boundaries will be imposed accordingly after the field survey.

2.2 Study Approach and Objectives

The objectives of this study were as follows:

- Identify and evaluate the existing wetland aspects along the powerlines routes;
- Give specialist input to the environmental management programme;
- Identify management options that can be implemented in order to reduce or minimise the predicted environmental impacts,
- Assess the significance of the predicted impacts in terms of nature, probability of occurrence, extent, and duration before and after implementation of mitigation measures;
- Document the findings;
- To inform and provide the information and an understanding of the project, issues and solutions;
- Identify key issues and concerns;
- identify shortcomings and gaps in existing information;
- Highlight the potential for environmental impacts, whether positive or negative.

2.3 Study Assumptions

The following assumptions are made in this document:

- Although the proposed power lines will occur within an approximate 135m corridor, wetlands within 500m of construction activities should be identified as per the DWA Water Use Licence application regulations. In order to meet the timeframes and budget constraints for the project, wetlands within the proposed corridor will be delineated on a fine scale based on detailed soil and vegetation sampling. Wetlands that fall outside of this 120m corridor, but that fall within 500m of the proposed

activities will be delineated based on desktop analysis of vegetation gradients visible from aerial imagery.

- Flood line calculation, groundwater and hydrological processes fall outside the scope of wetland and riparian delineation and functional assessments discussed in this report.

- The effect of the power lines on aquatic ecosystems, for example, the migration routes of fish, is not included in the wetland and riparian delineation.

2.4 Study Limitations and Challenges

- The accuracy of the handheld GPS unit used in the field, the delineated wetland/ riparian boundaries cannot be guaranteed beyond an accuracy of about 5m on the ground. Should greater mapping accuracy be required, the wetlands would need to be pegged in the field and surveyed using conventional survey techniques.

- This company, the consultants and/or specialist investigators do not accept any responsibility for conclusions, suggestions, limitations and recommendations made in good faith, based on the information presented to them, obtained from these strategic assessments or requests made to them for the purpose of this report.

- This report is based on survey and assessment techniques which are limited by time and budgetary Constraints relevant to the type and level of investigation undertaken.

2.5 Wetland and Riparian Delineation

Wetlands were investigated and identified based on the following characteristic attributes (DWA, 2008):

- The presence of plants adapted to or tolerant of saturated soils (hydrophytes);
- Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation; and
- A high water table that results in saturation at or near the surface, leading to anaerobic conditions developing within 50cm of the soil surface.

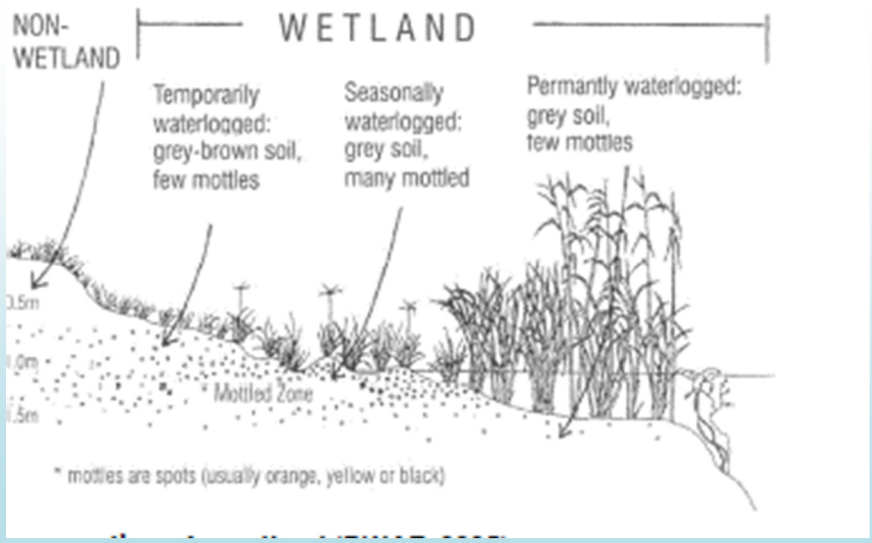

Figure 1: Typical Cross section of a Wetland

Riparian habitat is classified primarily by identifying riparian vegetation along the edge of the macro stream channel. The macro stream channel is defined as the outer bank of a compound channel and should not be confused with the active river bank. The macro channel bank often represents a dramatic change in the energy with which water passes through the system. Rich alluvial soils deposit nutrients making the riparian area a highly productive zone. This causes a very distinct change in vegetation structure and composition along the edges of the riparian area (DWAF, 2005).

The marginal zone has also been referred to as active features or wet bank (Van Niekerk and Heritage, 1993 cited in DWAF, 2008). It includes the area from the water level at low flow, if present (the greenline concept may be used in the absence of base flow, to those features that are hydrologically activated for the greater part of the year (WRC Report No TT 333/08 April, 2008 cited in DWAF, 2008). The non-marginal zone is the combination of the upper and lower zones.

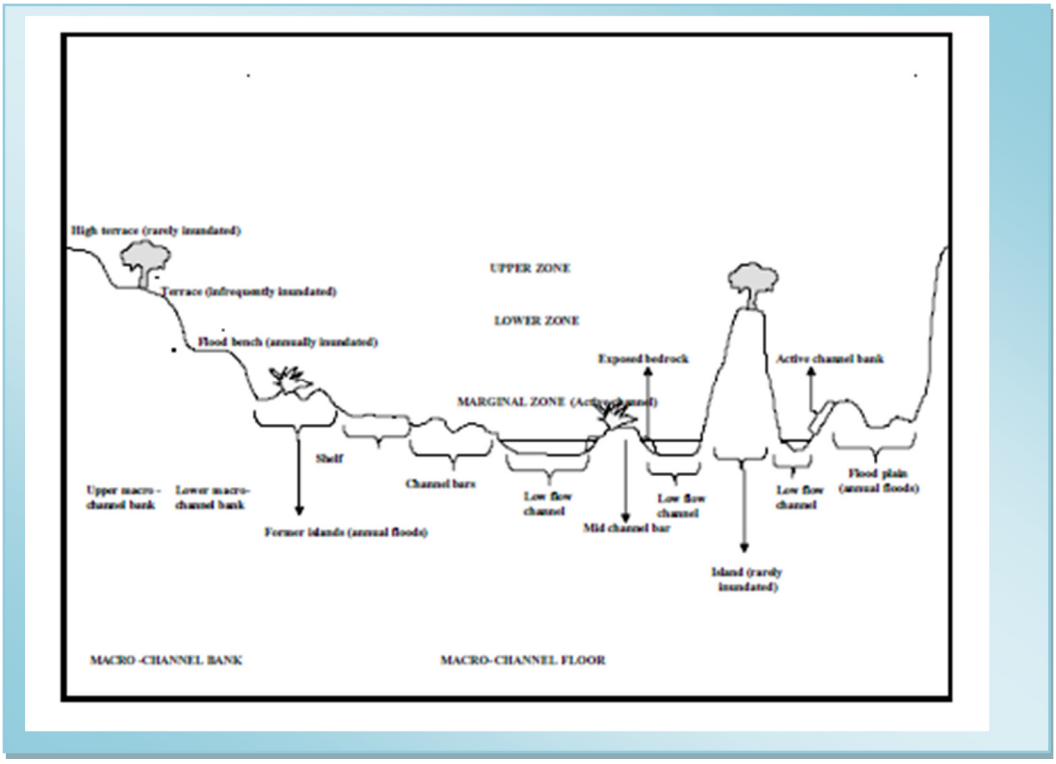

Figure 2: Schematic diagram illustrating an example of where the 3 zones would be placed relative to geomorphic diversity (Kleynhans *et al.2007*)

2.6 Wetland and Riparian Functionality and Integrity Assessments

For the purpose of activities within the 1:100 year floodline or the wetland/riparian area (whichever is the greatest), an application for a Water Use License must be made. In addition, activities close to wetlands are excluded from the General Authorization for S21 (c) and (i) water uses (government gazette No. 389) due to the complexity and potentially cumulative impact on a wetlands and rivers and the resources as a whole (DWA, 2010). Therefore all activities within 500m of wetlands or rivers should be subject to an application for authorization.

In order to inform the water use licence application process, an analysis of wetland and riparian functionality or integrity must be undertaken. Wetland functionality is defined as a measure of the deviation of wetland structure and function from its natural reference condition. In this study the hydrological, geomorphological and vegetation integrity will be assessed for the wetland units that are recorded at the time of the site visit to provide a Present Ecological Status (PES) score (Macfarlane *et al*, 2007), and an Environmental Importance and Sensitivity category (EIS) (DWAF, 1999) and in the case of riparian areas VEGRAI (Kleyhans *et al*, 2006). No wetlands were identifies for the first 42 km distance of the proposed powerline from Masa to Ngwedi.

Furthermore the ecosystem services provided by the wetland will be explored using Wet-Eco Services (Kotze *et al*, 2005). The functional assessment methodologies presented below take into consideration these recorded impacts in various ways to determine the scores attributed to each functional Hydrogeomorphic (HGM) wetland unit. It is important to note that, for the purposes of this wetland assessment, functional wetland units are approached as larger units which may combine smaller parts that could be considered as separate functional units in a more detailed study. The aspect of wetland functionality and integrity that is predominantly addressed includes hydrological and geomorphological function and the integrity of the biodiversity component (mainly based on the intactness of natural vegetation). No wetlands were identifies therefore the functional assessment was not applicable.

2.7 Ecological Importance and Sensitivity (EIS)

Ecological importance is an expression of a wetland's importance to the maintenance of ecological diversity and functioning on local and wider spatial scales. Ecological sensitivity refers to the system's ability to tolerate disturbance and its capacity to recover from disturbance once it has occurred (DWAF, 1999). This classification of water resources allows for an appropriate management class to be allocated to the water resource and includes the following:

- Ecological Importance in terms of ecosystems and biodiversity;
- Ecological functions; and
- Basic human needs.

Ecological Importance and Sensitivity Categories	Rating	Summary
Wetlands that are considered ecologically important and sensitive on a national or even international level. The biodiversity of these wetlands is usually very sensitive to flow and habitat modifications. They play a major role in moderating the quantity and quality of water in major rivers	>3 and <=4	**Very High**
Wetlands that are considered to be ecologically important and sensitive. The biodiversity of these wetlands may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers	>2 and <=3	**High**
Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these wetlands is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water in major rivers	>1 and <=2	**Moderate**
Wetlands that is not ecologically important and sensitive at any scale. The biodiversity of these wetlands is	>0 and <=1	**Low**

ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water in major rivers		

2.8 Wet-EcoServices Tool

Wet-EcoServices Kotze *et al*, (2005) was adapted and used to assess the different benefit values of a wetland. A Level 1 desktop assessment will be performed to determine the wetland's functional benefits.

Several characteristics will be verified during the field survey to produce a comprehensive initial functional analysis. This technique is not ideally suited to determine the specific level of impact of a current or proposed development and is based more on qualitative data as opposed to quantitative data, which opens it up to subjective misuse (Kotze *et al*, 2005). Figure 3 provides an example of the results for a Wet-EcoServices analysis.

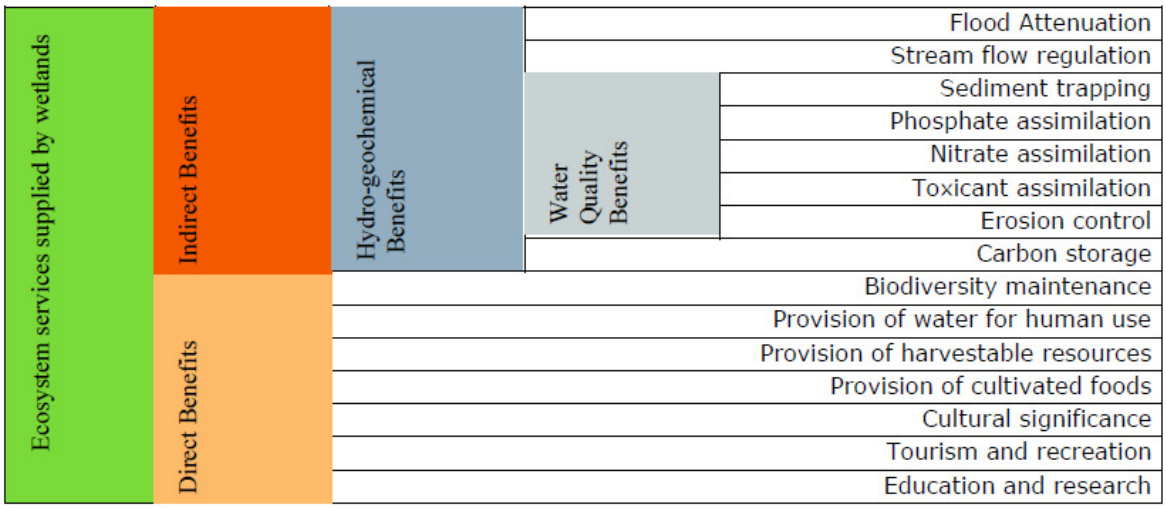

Figure 3: Wet-EcoServices Tool

2.9 Wet-Health

WET-Health is a tool designed to assess the health or integrity of a wetland. Wetland health is defined as a measure of the deviation of wetland structure and function from its natural reference condition. This technique attempts to assess hydrological, geomorphological and vegetation health and is suitable for the functional assessment of floodplain, channelled and un-channelled valley bottom, seepage wetlands and pans. It is a modular approach that uses:

- An impact-based approach for those activities that do not produce clearly visible responses in wetland structure and function. The impact of irrigation or afforestation in the catchment, for example, produces invisible impacts on water inputs. This is the main approach used in the hydrological assessment.
- An indicator-based approach for activities that produce clearly visible responses in wetland structure and function such as the presence of gullies or alien species. This approach is mainly used in the assessment of geomorphological and vegetation health.

- Each of these modules follows a broadly similar approach that examines extent, intensity and magnitude of impact. This is translated into a health score. The approach is as follows:
- The extent of impact is measured as the proportion of a wetland and/or its catchment that is affected by an activity. Extent is expressed as a percentage.
- The intensity of impact is estimated by evaluating the degree of alteration that results from a given activity.
- The magnitude of impact for individual activities is the area-weighted product of extent and intensity.
- The magnitude of individual activities is combined in a structured and transparent way to calculate the overall impact of all activities that affect hydrology, geomorphology or vegetation.
- The overall magnitude of impact is then translated into an estimate of wetland health for hydrology, geomorphology or vegetation.

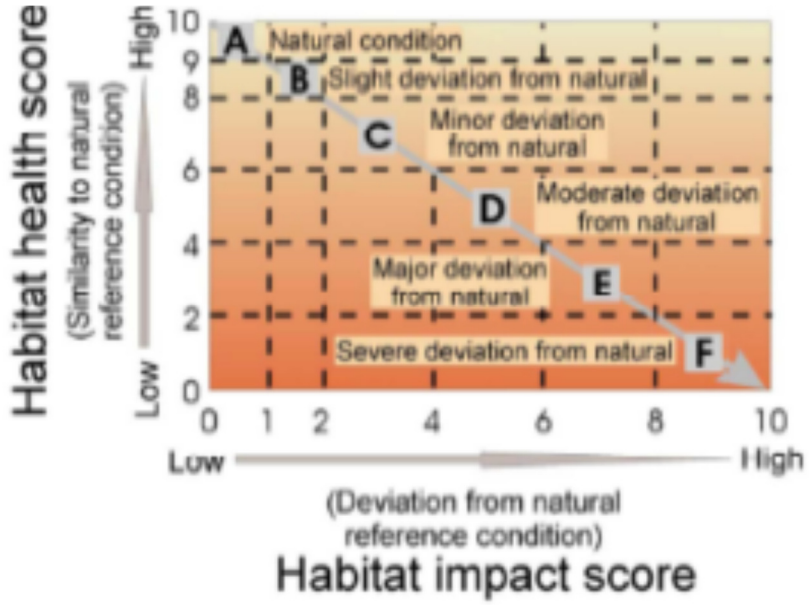

Figure 4: Wet-Health Tool

2.10 Riparian Vegetation Response Assessment (VEGRAI):

The Riparian Vegetation Response Assessment Index (VEGRAI) (Kleynhans *et al*, 2007) was used to determine the functionality of the riparian zone on the study site in terms of its Eco-Classification. Eco-Classification is the term used for the Ecological Classification process. This refers to the determination and categorization of the Present Ecological State (PES) of various biophysical attributes of rivers relative to the natural or close to the natural reference condition (Kleynhans & Louw 2007). VEGRAI has a spreadsheet model component that is composed of a series of metrics and metric groups, each of which is rated by populating spreadsheets with field data. The metrics in VEGRAI first describe the status of riparian vegetation in both its current and reference states and second, compare differences between the two states as a measure of vegetation response to an impact regime (Kleynhans *etal*, 2007).

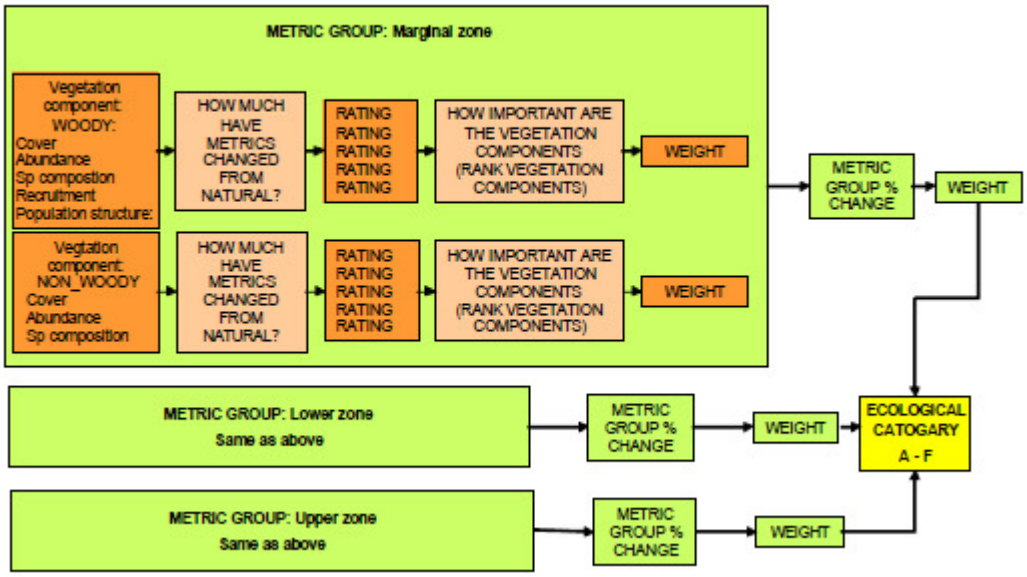

Figure 5: Generic ecological categories for Eco-Status components used in the VEGRAI index (modified from Kleynhans, 1996 and Kleynhans 1999 cited in Kleynhans & Louw 2007b)

3. WETLAND AND RIPARIAN DELINEATION FINDINGS

3.1 Wetland and Riparian Findings

Wetland Findings:
No wetlands were encountered at any of the tower positions of either the 765KV or the 400KV powerlines for the whole of Section 1, therefore the Ecological Importance and Sensitivity (EIS), Wet-EcoServices Tool, and WET-Health Tool were not applicable.

Riparian Zones Findings:
At the position where the two lines cross the Matlabas River a delineation of the riparian zone was conducted and the prescribed buffer zone mapped.

3.2 Riparian Habitats

According to DWAF (2005) the National Water Act defines a riparian habitat as follows: "Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas."

Riparian habitats, also known as riparian areas, include plant communities adjacent to and affected by surface and subsurface hydrologic features, such as rivers, streams, lakes, or drainage ways. These areas may be a few meters wide near streams or more than a kilometer in floodplains. Both perennial and non-perennial streams support riparian vegetation. Because riparian areas represent the interface between aquatic and upland ecosystems, the vegetation in the riparian area may have characteristics of both aquatic and upland habitats. Many of the plants in the riparian area require plenty of water and are adapted to shallow water table conditions. Due to water availability and rich alluvial soils, riparian areas are usually very productive. Tree growth rate is high and the vegetation under the trees is usually lush and includes a wide variety of shrubs, grasses, and wildflowers.

Riparian areas perform a variety of functions that are of value to society, especially the protection and enhancement of water resources, and provision of habitat for plant and animal species. Functions of riparian areas according to DWAF (2005) include:

- stores water and helps reduce floods
- stabilizes stream banks;
- improves water quality by trapping sediment and nutrients;
- maintains natural water temperature for aquatic species;
- provides shelter and food for birds and other animals;
- provides corridors for movement and migration of different species;
- acts as a buffer between aquatic ecosystems and adjacent land uses;
- can be used as recreational sites; and
- provides material for building, muti, crafts and curios.

Not all riparian areas develop the same way and may not perform these functions to the same extent. It is important that a riparian area's capacity to provide the benefits listed is not reduced. Many of these areas are best managed as natural areas, rather than being converted to other uses (DWAF 2005).

Like wetlands, riparian areas have their own unique set of indicators. It is possible to delineate riparian areas by checking for the presence of these indicators. Some areas may

display both wetland and riparian indicators, and can accordingly be classified as both. If you are adjacent to a watercourse, it is important to check for the presence of the riparian indicators described below, in addition to checking for wetland indicators, to detect riparian areas that do not qualify as wetlands (DWAF 2005).

The delineation process requires that the following be taken into account:

- topography associated with the watercourse;
- vegetation; and
- alluvial soils and deposited material.

3.3 Riparian Zone of the Matlabas River Crossing

The Matlabas River crosses the path of the two new powerlines on the border between the two farms Rietfontein 15KQ/0 and Colchester 17KQ/2. The riparian zone is defined by tall trees and a well developed shrub and grass undergrowth. The dominant trees and woody shrubs include *Acacia karroo, Combretum erythrophyllum, C. hereroense, Diospyros lycioides, Gymnosporia buxifolia* and *Ziziphus mucronata.* The dominant graminoids (grasses and grass like plants) are the grass *Panicum maximum* and the reed *Phragmites australis.*

Figure 7 displays the delineated position of the riparian zone together with a buffer zone of 32 m from the edge of the riparian zone, as prescribed in Government Notice R.544 in Government Gazette 33306 of 18 June 2010. This buffer zone is to be protected as far as possible. The buffer zone serves to protect the riparian zone and river habitat from degradation and transformation through the effects of development and to ensure an effective corridor beside the river along which ecosystem services can take place up and downstream from the position of the study area. For the VEGRAI of this riparian zone see the table below.

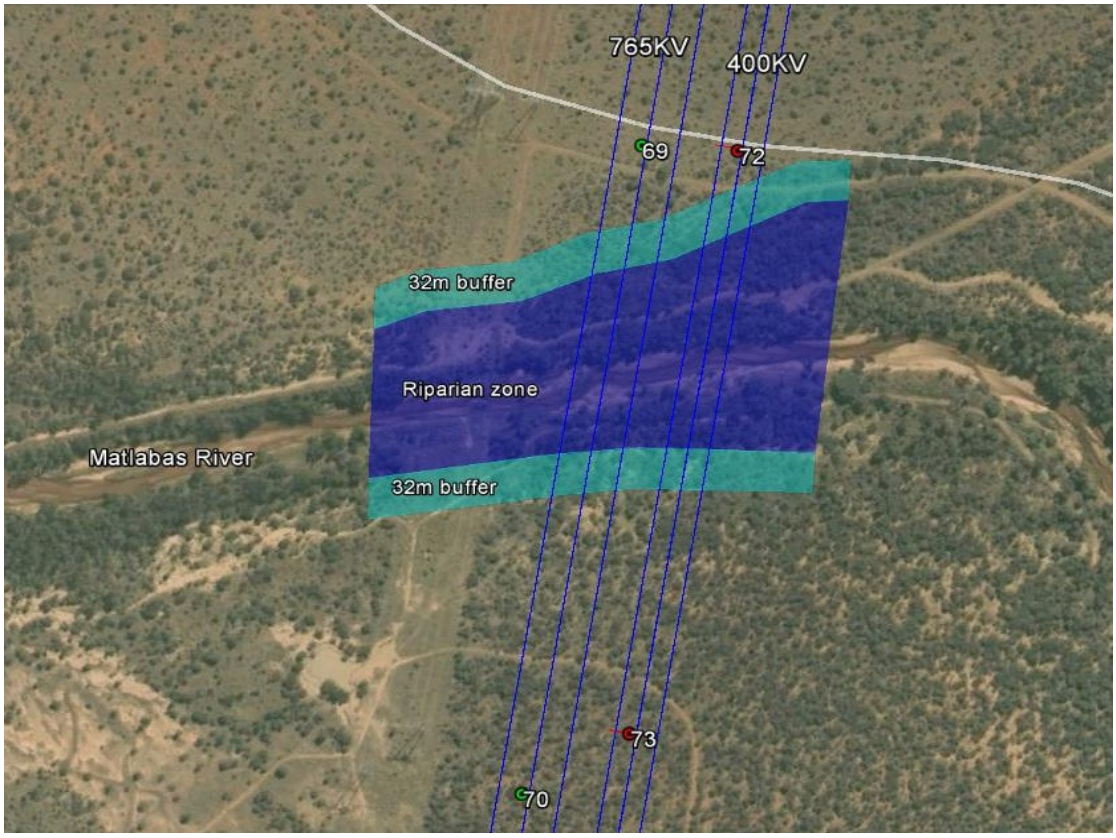

Figure 7: Google™ image illustrating the riparian zone and proposed buffer zone

Eco-Status Classification for the Matlaba's River Riparian Zone:

Description	Impact Score Range %	PES Score	Summary
Unmodified, natural.	90-100	A	Very High
Largely natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place.	80-89	B	High
Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact.	60-79	C	Moderate
Largely modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	40-59	D	Moderate
Seriously modified. The change in ecosystem processes and loss of natural habitat and biota is great	20-39	E	Low

but some remaining natural habitat features are still recognizable.			
Critically modified. Modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	0-19	F	Very Low

4.0 LEGISLATIVE FRAMEWORK

4.1 National Environmental Management Act, 1998

The National Environmental Management Act (NEMA), 1998 can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development.
- Natural and cultural resources, use and conservation.
- Pollution control and waste management.

The law is based on the concept of sustainable development. The object of NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- the procedures for state decision-making on the environment; and
- the institutions of state which make those decisions.

The NEMA principles serve as:

- a general framework for environmental planning;
- guidelines according to which the state must exercise its environmental functions; and
- a guide to the interpretation of NEMA itself and of any other law relating to the environment.

What are the NEMA principles?

Some of the most important principles contained in NEMA are that:

- environmental management must put people and their needs first;
- development must be socially, environmentally and economically sustainable;
- there should be equal access to environmental resources, benefits and services to meet basic human needs;
- government should promote public participation when making decisions about the environment;
- communities must be given environmental education;
- decisions must be taken in an open and transparent manner and there must be access to information;
- the role of youth and women in environmental management must be recognised;
- the person or company who pollutes the environment must pay to clean it up;
- the environment is held in trust by the state for the benefit of all South Africans; and
- the utmost caution should be used when permission for new developments is granted.

The NEMA is enforced by the Department of Environment Affairs. In the Limpopo Province this delegated role is fulfilled by the Limpopo Department of Economic Development, Environment and Tourism.

4.2 National Water Act, 1998

In terms of the NWA, 1998 the national government, acting through the Minister of Water Affairs ("the Minister"), is the public trustee of South Africa's water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The Minister is responsible

to ensure that water is allocated equitably and used beneficially in the public interest, while promoting environmental values. The national government, acting through the Minister, has the power to regulate the use, flow and control of all water in South Africa.

The majority of the provisions of the National Water Act came into effect as of 1 October 1998 and at the same time various provisions of the 1956 Water Act were repealed. The remaining provisions of the National Water Act commenced on 1 January 1999 and 1 October 1999 (and the remaining provisions of the 1956 Water Act repealed).

The most fundamental departure from the old legislation is the removal of the concept of water as private property. Instead, water will be made available through user licences, which may be issued for a maximum period of 40 years, subject to renewal. A priority of users has been established for the allocation of licences, with the environment near the top of the list of priorities.

Section 21 of the National Water Act indicates that "water use includes":

- taking water from a water resource;
- storing water;
- impeding or diverting the flow of water in a water course;
- engaging in a stream flow reduction activity contemplated in section 36;
- engaging in a controlled activity which has either been declared as
- such or is identified in section 37(1);
- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- disposing of waste in a manner which may detrimentally impact on a water resource;
- disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- altering the bed, banks, course or characteristics of a water course;
- removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- using water for recreational purposes.

A person may only use water:

- without a licence:
  - if that water use is permissible under Schedule I;
  - if that water use is permissible as a continuation of an existing lawful water use; or
  - if that water use is permissible in terms of a general authorisation issued under section 39;
- if the water use is authorised by a licence under the National Water Act; or
- if the responsible authority has dispensed with a licence requirement (which may be done if the responsible authority is satisfied that the purpose of the National Water Act will be met by the grant of a licence, permit or other authorisation under any other law).

A person who uses water:

- must use the water subject to any condition of the relevant authorisation;
- is subject to any limitation, restriction or prohibition in terms of the National Water Act or any other law;
- in the case of the discharge or disposal of waste or water containing waste, must comply with any applicable waste standards or management practices prescribed

by regulations, unless the conditions of the relevant authorisation provide otherwise;
- may not waste that water; and
- must return any seepage, run-off or water containing waste which emanates from that use to the water resource from which the water was taken, unless the responsible authority directs otherwise or the relevant authorisation provides otherwise.
-

4.3 National Environmental Management: Biodiversity Act

National Environmental Management: Biodiversity Act (Act 10 of 2004) identifies that all people and organizations should act with due care to conserve and avoid negative impacts on biodiversity, and to use biological resources sustainably, equitably and efficiently.

Biodiversity is defined to include "the number and variety of living organisms on earth, the millions of plants, animals, and micro organisms, the genes they contain, the evolutionary history and potential they encompass, and the ecosystems, ecological processes and landscapes of which they are integral parts. Biodiversity thus refers to the life-support systems and natural resources upon which we depend".

The National Environmental Management: Biodiversity Act provides for:

- The management and conservation of the biological diversity of South Africa;
- The sustainable use of our biological resources; and
- The fair and equitable sharing of benefits arising from the use and application of genetic resources and material.

4.4 National Environment Management: Protected Areas Act

The National Environmental Management: Protected Areas Act (Act 57 of 2003) forms part of a suite of legislation established to manage the environment. The Protected Areas Act provides for the continued existence of the South African National Parks, the declaration and management of protected areas in South Africa and cooperative governance in such declaration and management of protected areas.

Four types of protected area can be declared in terms of the Act:

- Special nature reserve
- National Park
- Nature Reserve
- Protected Environment

5 ENVIRONMENTAL IMPACT ASSESSMENT

5.1 Introduction

This section therefore provides:

- Details of the potential **environmental impacts** that were identified;

- An assessment of all the potential impacts in terms of their significance;

The assessment of impacts must also adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account.

The environmental impact assessment on the wetland aspects along the entire 120km (including section 1) powerline route from Masa (Lephalale) to Ngwedi (near Rustenburg) sub-stations was conducted taking cognizance of the provisions of section 2 and Chapter 5 of the NEMA, 1998, and the relevant EIA Regulations. The criteria followed to measure each impact is outlined below:

NATURE: The character of the impact			
EXTENT	**DURATION**	**PROBABILITY**	**MAGNITUDE**
Area	Time Frame	Likelihood	Intensity of impact to destroy or alter the environment.
SIGNIFICANCE: Implication of the impact both with or without mitigation			
TYPE: Description as to whether the impact is negative or positive or neutral.			
MITIGATION: Possible impact management, minimization and mitigation of the identified impacts.			
NO GO OPTION: Evaluation of the no-go-option			

5.2 Impact Measuring Criteria and Rating

5.2.1 Nature

Nature of impact describes the character of the impact in terms of the effect on the relevant environmental aspect.

5.2.2 Spatial Extent

Measures the area extent, physical and spatial scale over which the impact will occur. This implies the scale limited to the Specific power-line route (footprint), entire power-line development sites (Sites) or over the entire power-line project area, including adjacent residential/game farm areas (localized), or the Municipality area (regional) or the entire Province (Provincial), or the entire country (National) or beyond the borders of South Africa.

Criteria	**Footprint (F)**	**Site/Local (S-L)**	**Regional (R)**	**National (N)**	**International (I)**
Rating	**1**	**2**	**3**	**4**	**5**

5.2.3 Duration

Duration measures the timeframe of the impact in relation to the lifetime of the power-line activities under application. It gives an assessment of whether the impact will disappear with mitigation immediately (0-1) after a short time (1-5 years), medium term (5-10 years), long term (11- 30 years of the power-line construction activities), or permanent (persists beyond life) due to the power-line activities.

Criteria	Immediately (I)	Short Term (ST)	Medium Term (MT)	Long Term (LT)	Permanent (P)
Rating	1	2	3	4	5

5.2.4 Probability

Probability measures the probability or likelihood of the impact actually occurring, as either probable, possible, likely, highly likely or definite (impact will occur regardless of preventative measures).

Criteria	Probable (PR) (0-10%)	Possible (PO) (10-25%)	Likely (L) (25-50%)	Highly Likely (HL) (50-75%)	Definite (D) (100%)
Rating	1	2	3	4	5

5.2.5 Magnitude/Intensity

Magnitude or intensity of the impact measures whether the impact is destructive or benign, whether it destroys, alters the functioning of the impacted environment, or alters the environment itself. It is rated as insignificant, low, medium, high or very high.

Criteria	Insignificant (I)	Low (L)	Medium (M)	High (H)	Very High (VH)
Rating	1	2	3	4	5

5.2.6 Significance

Significance measures the foreseeable significance of the impacts of the Eskom power-line project both with and without mitigation measures. The significance on the aspects of the environment is classified as:

- Insignificant: where the impact would not have any influence on the decision to proceed with the power-line project – with or without mitigation;
- Low significance: where the impact would minimal influence on the decision to proceed with the power-line project – with or without mitigation;
- Moderate significance: where the impact should influence the decision to proceed with the power-line project – with mitigation;
- High significance: where the impact should influence the decision to proceed with the power-line project unless it is effectively managed and mitigated. This may require modification of the power-line project design or determination of strict mitigation measures;
- Very High significance: where the impact would influence the decision to proceed with the power-line project regardless of any mitigation measures. Significance rating is determined as follows:

Significance Rating (SR) =	(Extent + Intensity + Duration) x Probability

Criteria	Insignificant (I)	Low (L)	Medium (M)	Highly (H)	Very High (VH)
SR Without Mitigation	0-5	6-30	31-60	61-90	90 <
SR With Mitigation	0-5	6-30	31-60	61-90	90 <

5.2.7 Status of impact

Status of impact describes whether the impact is positive (beneficial) on the affected environment or negative (detrimental) or neutral.

5.3. Environmental Impacts Assessment

5.3.1 Surface Water (including Wetlands and Riparian Areas)

NATURE:

Construction Phase:

Except for the Matlaba's between towers 69 and 70 on the 765 kV powerline and 72 and 73 on the 400 kV line, there are no other streams/rivers or water resources bodies within the vicinity and along the proposed 120 km powerline – Section 1. There will therefore be no impacts on surface water. The mentioned towers in both lines (756 and 400 kV) are situated outside the 32m buffer zones from the outer most edge of the riparian zone.

The only possible significant impact due the proposed powerline construction on the surface water (Matlaba's River) will be sediment load due to storm water run-off – in the event of rain. During rainy seasons this sediment from the trench excavations and access roads may be washed and deposited into surrounding drainage channels which in turn may lead to some surface water resource.

Once the powerline installations area completed, the trenches must be backfilled and natural vegetation re-established. The ground will re-stabilize and sediment load reverted to natural state.

The surrounding landscape is undulating flat terrain. The powerline towers will be outside the 1:50 year flood line. The installation and operations of the powerlines will not impact on the said Matlaba's River

If, and when accidental oil and fuel spillages do occur from the construction vehicles, and water come into contact with the spillages prior to cleaning, such water is likely to be contaminated.

Operational Phase:

No impacts on surface water resources (including the riparian areas) envisaged during operations of the powerline.

STATUS OF THE IMPACT:

Construction Phase:

The proposed powerlines (400 and 765 kV) will not impede or affect any surface water resource. The impact will therefore be of **Low to Negligible Significant**, for the construction phase. Accidental oil and fuel spillages, sediment load run-off will/may cause negative impacts on surface water if not managed as recommended in this report. Any spillage – subject to volume - will render the impact of low to moderate significance, and high if no mitigation measures are implemented.

The proximity of towers: 69 and 72 to the 32m buffer zone of the Matlaba's renders potential impacts of **Low Negative Significance**.

Should a lot of sediment load end up in the surrounding water resource channel (Matlaba's River) emanating from the powerline construction activities, the impact will be **Low to Moderate Negative**, for the said water resource channels, since it will increase the sediment load of the affected channel, and likely to disturb the riverine ecology – if construction is undertaken during wet seasons.

Operational Phase:

No impacts are envisaged on surface water due to the installation of powerlines. The powerline route must be regularly inspected and maintain at all times to detect any excessive erosion. Eskom must keep an inspection and maintenance log book.

MITIGATION:

Construction Phase:

Constructions of the powerline activities will have physical disturbance to the environment. Since both powerlines will be above-surface infrastructure, the trenches must be backfilled to restore the ground surface configuration and storm water flow patterns. Any spillages (fuel, oil, chemicals) should be immediately removed and stored in sealed containers/drums – until they are properly disposed to the hazardous waste site by the appointed contractor.

All disturbed area must be re-vegetated with indigenous vegetation to encourage formation of soil structure and composition, and in turn minimize erosion and surface run-off.

All waste must collected and disposed of at the registered municipal sites. There must be no littering around the construction sites.

The proposed development should in no way disturb, damage or alter the characteristics of the wetland/riparian area on the site.

No new road or other accesses should be allowed to cross wetland/riparian areas and associated buffers, and no construction vehicles should be allowed to drive over the wetland areas.

During the operation of the proposed development, the wetland / riparian areas should be kept free from disturbance, and no vehicles should be allowed to traverse the wetland areas.

No waste disposal services or facilities should be located within the wetland areas or associated buffer, or within a distance of 150m from the boundary of the wetland

The contractor must have a spill-kit on site.

Operational Phase:

No impacts are envisaged on surface water due to the installation of powerlines. The powerline route must be regularly inspected and maintain at all times to detect any excessive erosion. Eskom must keep an inspection and maintenance log book.

EXTENT		INTENSITY		DURATION		PROBABILITY	
Powerline route footprint	1	Medium	3	Short Term	2	Possible	2
SIGNIFICANCE RATING WITHOUT MITIGATION:						**12**	

EXTENT		INTENSITY		DURATION		PROBABILITY	
Powerline route footprint	1	Low	2	Immediate	1	Possible	2
SIGNIFICANCE RATING WITH MITIGATION:						**8**	

NO GO OPTION:
If the construction of powerline (400 and 765 kV) developments does not proceed, no impacts anticipated on surface water entities.

5.3.2 Underground Water

NATURE:
Construction Phase:
The proposed powerline will not have impacts on ground water. The construction of both powerlines (400 and 765 kV) will be sub-surface and surface infrastructure of not more than 4m in depth. The surrounding water table levels is estimated to vary between 8m and 30m below surface.

The typical depth of weathered aquifers varies between 30m – 60m, and most of them can be classified as unconfined aquifers. The water quality in these aquifers is generally poor due to lack of dynamic recharge from rainfall.

Operational Phase:
No impacts envisaged.

STATUS OF THE IMPACT:
Construction and Operational Phases:
The proposed powerline will not have impacts on ground water. The construction of both powerlines (400 and 765 kV) will be sub-surface and surface infrastructure of not more than 4m in depth. The surrounding water table levels is estimated to vary between 8m and 30m below surface

The underground water bodies or the water table will not be affected. The impact will therefore of **Low to Insignificant negative** impact.

No impacts are anticipated during operational phase of both powerlines. However should there be oil/fuel spillages that are undetected during powerline construction the impact will be of **Moderate to High Negative Significance**. Regular inspections of the contractor's camp must be implemented. In the unlikely event of oil spillages from construction equipment and machinery, these will be site specific and localized, provided they are detected on time.

MITIGATION:
Construction Phase:
No ground water should be used for construction purpose. Alternative sources, such as municipal water, must be identified and used.

The contractor's camp and fuel, oil and chemical storage area must be properly constructed and maintained. The contractor must have emergency procedures in place to deal with accidental spillages to avoid underground water contamination. Oil spill kit should be available on site. The contact details of the companies that deals with oil spillages

Only chemical or mobile flush toilets will be used at the contractor's camp. No long drop pit latrine will be erected.

EXTENT		INTENSITY		DURATION		PROBABILITY	
Powerline Route and Camp Sites	**1**	High for oil spillages	**4**	Medium Term	**3**	Possible	**2**
SIGNIFICANCE RATING WITHOUT MITIGATION:						**16**	

EXTENT		INTENSITY		DURATION		PROBABILITY	
Powerline Route and Camp Sites	**1**	Low	**2**	Short Term	**2**	Possible	**2**
SIGNIFICANCE RATING WITH MITIGATION:						**10**	

NO GO OPTION:
No impacts on ground water. Current status quo remains.

6 CONCLUSION AND RECOMMENDATIONS

The vegetation of the riparian zone and the delineated buffer zone (Figure 7) is especially crucial to prevent erosion of the river banks. River bank erosion causes habitat loss on the riverbanks and silts up the riverbed and may even cause the river to divert to a new course, which may be devastating to other terrestrial habitats and human developments downstream. Therefore, the thinning out of or removal of vegetation of the riparian zone needs to be done with special care and with great caution. If all vegetation of the riverbank is summarily removed it may have a detrimental effect on the riverbank itself as well as the riparian and aquatic habitats downstream.

The loss of topsoil and fragmentation of natural habitats that is virtually unavoidable with any type of development, has a negative impact on the regional ecosystem as it disrupts the natural flow of ecosystem services and affects all fauna and flora that are dependent on those habitats. Linear ridges, water courses, drainage lines, etc. are especially sensitive to and easily fragmented. A high conservation value is attributed to the plant communities and faunal assemblages of these areas as they contribute significantly to the biodiversity of a region. Care should be taken not to unnecessarily clear or destroy natural vegetation and where possible the rehabilitation of transformed areas and restoration of degraded riparian areas should take place in order to improve the ecological health of the floristic component on the banks of the Matlabas.

Based on the data and information presented in this report as well as observations made during the survey and the comments above there are no major limitations or objections towards the proposed development.

7 LIST OF APPENDICES

Appendix 1: List of Towers, Findings and Comments with Regards to Wetlands and Riparian Zones for the 400kV power line - Section 1

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
9	41913.3	-2632890.46	No comment
10	42117.712	-2633177.715	No comment
11	42365.582	-2633526.039	No comment
12	42546.11	-2633779.73	No comment
13	42444.46	-2634197.626	No comment
14	42330.473	-2634666.239	No comment
15	42214.892	-2635141.407	No comment
16	42097.048	-2635625.879	No comment
17	41963.552	-2636174.695	No comment
18	41838.034	-2636690.713	No comment
19	41707.867	-2637225.848	No comment
20	41577.048	-2637763.659	No comment
21	41458.698	-2638250.209	No comment
22	41331.058	-2638774.951	No comment

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
23	41203.588	-2639298.997	No comment
24	41073.162	-2639835.195	No comment
25	40944.05	-2640365.988	No comment
26	40834.301	-2640817.18	No comment
27	40736.214	-2641220.429	No comment
28	40622.623	-2641687.414	No comment
29	40493.319	-2642218.998	No comment
30	40365.933	-2642742.698	No comment
31	40246.735	-2643232.733	No comment
32	40116.761	-2643767.071	No comment
33	39989.46	-2644290.423	No comment
34	39862.641	-2644811.79	No comment
35	39733.735	-2645341.739	No comment
36	39607.395	-2645861.136	No comment
37	39480.635	-2646382.264	No comment
38	39353.817	-2646903.624	No comment
39	39250.54	-2647328.21	No comment

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
40	39314.784	-2647772.461	No comment
41	39380.594	-2648227.546	No comment
42	39445.154	-2648673.982	No comment
43	39521.33	-2649200.742	No comment
44	39598.873	-2649736.958	No comment
45	39675.294	-2650265.416	No comment
46	39751.74	-2650794.046	No comment
47	39827.364	-2651316.991	No comment
48	39903.533	-2651843.702	No comment
49	39980.742	-2652377.613	No comment
50	40057.152	-2652905.994	No comment
51	40134.432	-2653440.386	No comment
52	40211.106	-2653970.594	No comment
53	40286.3	-2654490.567	No comment
54	40354.611	-2654962.944	No comment
55	40422.267	-2655430.788	No comment

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
56	40500.464	-2655971.527	No comment
57	40569.751	-2656450.653	No comment
58	40641.655	-2656947.871	No comment
59	40684.547	-2657244.476	No comment
60	40738.115	-2657614.899	No comment
61	40775.5	-2657873.42	No comment
62	40586.533	-2658152.27	No comment
63	40443.2	-2658363.78	No comment
64	40371.311	-2658779.359	No comment
65	40280.849	-2659302.301	No comment
66	40192.592	-2659812.499	No comment
67	40101.85	-2660337.061	No comment
68	40018.872	-2660816.744	No comment
69	39934.058	-2661307.04	No comment
70	39842.905	-2661833.974	No comment
71	39754.47	-2662345.202	No comment
72	39666.496	-2662853.764	Matlabas riparian zone (delineated) 57m S of tower position - therefore, the thinning out of or removal

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
			of vegetation of the riparian zone needs to be done with special care and with great caution.
73	39586.384	-2663316.878	Matlabas riparian zone (delineated) 196m N of tower position Therefore, the thinning out of or removal of vegetation of the riparian zone needs to be done with special care and with great caution.
74	39493.191	-2663855.606	No comment
75	39400.662	-2664390.504	No comment
76	39309.246	-2664918.961	No comment
77	39233.395	-2665357.443	No comment
78	39161.443	-2665773.384	No comment
79	39069.259	-2666306.284	No comment
80	38985.403	-2666791.042	No comment
81	38907.055	-2667243.953	Dry stream bed 110m S of tower position - no delineation necessary -
82	38818.514	-2667755.795	No comment
83	38725.548	-2668293.215	No comment
84	38633.442	-2668825.661	No comment
85	38541.739	-2669355.783	No comment
86	38469.709	-2669772.171	No comment

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
87	38405.34	-2670144.275	No comment
88	38325.543	-2670605.57	No comment
89	38239.879	-2671100.779	No comment
90	38149.81	-2671621.452	No comment
91	38058.128	-2672151.445	No comment
92	37965.531	-2672686.733	No comment
93	37874.73	-2673211.639	No comment
94	37781.696	-2673749.452	No comment
95	37690.246	-2674278.109	No comment
96	37607.4	-2674757.022	No comment

Appendix 2: List of Towers, Findings and Comments with Regards to Wetlands and Riparian Zones for the 765kV power line - Section 1

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 1	41857.002	-2632929.331	No comment
MASNGW 2	42099.814	-2633270.544	No comment
MASNGW 3	42344.61	-2633614.546	No comment
MASNGW 4	42471.936	-2633793.472	No comment
MASNGW 5	42359.339	-2634256.369	No comment
MASNGW 6	42246.451	-2634720.468	No comment
MASNGW 7	42138.562	-2635164.01	No comment
MASNGW 8	42028.877	-2635614.938	No comment
MASNGW 9	41909.579	-2636105.387	No comment
MASNGW 10	41794.224	-2636579.627	No comment
MASNGW 11	41682.396	-2637039.365	No comment
MASNGW 12	41568.02	-2637509.576	No comment
MASNGW 13	41452.874	-2637982.954	No comment
MASNGW 14	41341.555	-2638440.602	No comment
MASNGW 15	41225.494	-2638917.741	No comment
MASNGW 16	41117.767	-2639360.619	No comment
MASNGW 17	41005.03	-2639824.091	No comment
MASNGW 18	40897.507	-2640266.134	No comment
MASNGW 19	40785.928	-2640724.846	No comment
MASNGW 20	40670.846	-2641197.963	No comment
MASNGW 21	40550.779	-2641691.57	No comment
MASNGW 22	40437.803	-2642156.028	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 23	40328.606	-2642604.95	No comment
MASNGW 24	40217.195	-2643062.976	No comment
MASNGW 25	40100.003	-2643544.764	No comment
MASNGW 26	39992.99	-2643984.706	No comment
MASNGW 27	39878.197	-2644456.634	No comment
MASNGW 28	39762.266	-2644933.239	No comment
MASNGW 29	39645.554	-2645413.058	No comment
MASNGW 30	39526.837	-2645901.117	No comment
MASNGW 31	39412.61	-2646370.718	No comment
MASNGW 32	39293.552	-2646860.177	No comment
MASNGW 33	39180.565	-2647324.681	No comment
MASNGW 34	39249.775	-2647803.27	No comment
MASNGW 35	39316.833	-2648266.983	No comment
MASNGW 36	39385.636	-2648742.758	No comment
MASNGW 37	39457.746	-2649241.403	No comment
MASNGW 38	39527.663	-2649724.889	No comment
MASNGW 39	39596.888	-2650203.579	No comment
MASNGW 40	39667.312	-2650690.569	No comment
MASNGW 41	39736.837	-2651171.339	No comment
MASNGW 42	39804.916	-2651642.107	No comment
MASNGW 43	39870.185	-2652093.448	No comment
MASNGW 44	39938.503	-2652565.874	No comment
MASNGW 45	40008.336	-2653048.775	No comment
MASNGW 46	40076.177	-2653517.895	No comment
MASNGW 47	40139.184	-2653953.592	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 48	40205.133	-2654409.638	No comment
MASNGW 49	40277.128	-2654907.489	No comment
MASNGW 50	40344.743	-2655375.046	No comment
MASNGW 51	40415.072	-2655861.376	No comment
MASNGW 52	40484.875	-2656344.073	No comment
MASNGW 53	40547.39	-2656776.365	No comment
MASNGW 54	40606.99	-2657188.502	No comment
MASNGW 55	40650.218	-2657487.429	No comment
MASNGW 56	40675.404	-2657661.588	No comment
MASNGW 57	40703.666	-2657857.024	No comment
MASNGW 58	40574.339	-2658048.646	No comment
MASNGW 59	40379.111	-2658337.912	No comment
MASNGW 60	40302.817	-2658778.955	No comment
MASNGW 61	40233.958	-2659177.015	No comment
MASNGW 62	40156.514	-2659624.705	No comment
MASNGW 63	40069.137	-2660129.813	No comment
MASNGW 64	39986.59	-2660607.005	No comment
MASNGW 65	39907.196	-2661065.967	No comment
MASNGW 66	39829.652	-2661514.238	No comment
MASNGW 67	39750.71	-2661970.588	No comment
MASNGW 68	39676.411	-2662400.096	No comment
MASNGW 69	39598.73	-2662849.156	Matlabas riparian zone (delineated) 62m S of tower position - Therefore, the thinning out of or removal of vegetation of the riparian zone needs to be done with special care and with great caution.

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 70	39509.95	-2663362.374	Matlabas riparian zone (delineated) 238m N of tower position - Therefore, the thinning out of or removal of vegetation of the riparian zone needs to be done with special care and with great caution.
MASNGW 71	39423.993	-2663859.279	No comment
MASNGW 72	39339.665	-2664346.76	No comment
MASNGW 73	39252.734	-2664849.296	No comment
MASNGW 74	39168.121	-2665338.429	No comment
MASNGW 75	39093.846	-2665767.797	No comment
MASNGW 76	39011.854	-2666241.778	No comment
MASNGW 77	38931.89	-2666704.032	No comment
MASNGW 78	38848.498	-2667186.107	Dry stream bed 145m S of tower position - no delineation necessary -
MASNGW 79	38768.431	-2667648.963	No comment
MASNGW 80	38686.242	-2668124.084	No comment
MASNGW 81	38598.489	-2668631.366	No comment
MASNGW 82	38518.783	-2669092.134	No comment
MASNGW 83	38441.8	-2669537.155	No comment
MASNGW 84	38361.261	-2670002.737	No comment
MASNGW 85	38276.801	-2670490.989	No comment
MASNGW 86	38199.194	-2670939.617	No comment
MASNGW 87	38118.112	-2671408.339	No comment
MASNGW 88	38031.471	-2671909.198	No comment
MASNGW 89	37950.21	-2672378.949	No comment
MASNGW 90	37870.606	-2672839.125	No comment
MASNGW 91	37789.983	-2673305.193	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 92	37705.789	-2673791.902	No comment
MASNGW 93	37620.435	-2674285.321	No comment
MASNGW 94	37550.528	-2674689.437	No comment

8.0 REFERENCES

1. Department of Water Affairs (2010). National Water Act, 1998 (Act No 36 of 1998) S21(c) & (i) Water Uses. Version: February 2010. Training Manual.

2. Department of Water Affairs and Forestry (1999). Resource Directed Measures for Protection of WaterResources. Volume 4. Wetland Ecosystems Version 1.0. Pretoria

3. Department of Water Affairs and Forestry (2008). Updated Manual for the identification and delineation ofwetlands and riparian areas. Department of Water affairs and Forestry. Pretoria. South AfricaSecond Edition. September 2008.

4. Macfarlane D.M., Teixeira-Leite A., Goodman P., Bate G and Colvin C. (2010) Draft Report on theDevelopment of a Method and Model for Buffer Zone Determination. Water Research Commission project K5/1789. The Institute of Natural Resources and its Associates

5. Mucina L., and Rutherford M. C. (2006). Vegetation Map of South Africa, Lesotho and Swaziland, 1:1 000 000 scale sheet maps.

6. South African National Biodiversity Institute, Pretoria SANBI 2010. National Freshwater Ecosystem Priority Areas. South African National Biodiversity Institute

7. Waterberg Environmental Management Framework , 2010