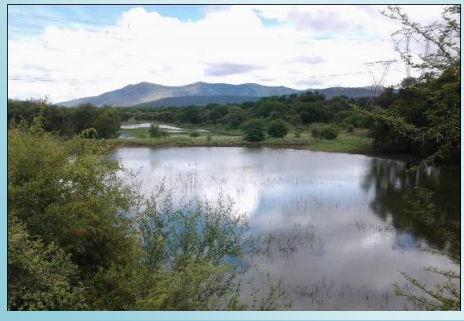
WETLAND DELINEATION STUDY

ESKOM POWERLINE FROM MASA SUB-STATION (LEPHALALE) TO NGWEDI SUB-STATION (NEAR RUSTERNBURG) – KM 82 – 116 (35kms), LIMPOPO PROVINCE

SECTION 3



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MARCH 2014

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SECTION 3

FINAL

GUDANI Project No: GC2013/013/Wetlands
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MARCH 2014

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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.

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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 3 of the Eskom powerline from km 82 to km 116 covering a distance of 35 kilometers.

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 Holdings SOC Limited

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
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1.3 Project Locality and Description of Study Area

The study area is situated in both 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. 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 the third section km 82 to 116 (35 kilometres) of the powerline undertaken between the 18th to 22nd November 2013 and 3rd and 4th March 2014.

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 proposed 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: The first section starts at Rhenosterpan to Klippan farms and is approximately 42km. Secondly, Turfpan to Paarl farms which is approximately 39km and the last section or report was from Mecklenburg to Vlakpoort which is approximately 35km. This third report will address the wetland/ riparian areas for the last 35km of the powerline route - i.e. from Mecklenburg to Vlakpoort from km 82 to 116.

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

According to the Department Water Affairs and Forestry – DWAF (2005), the four main indicators of the presence of a wetland are:

- The presence of water (hydrology)
- The presence of wetland (hydromorphic) soils
- The presence of water loving plants (hydrophytes)
- The terrain unit, which indicates the position in the landscape where wetlands are most likely to occur.

Although all four indicators are important in the identification and delineation of a wetland the soil form indicator is the most important and the most accurate due to the fact that the morphological indicators in the soil are far more permanent and will hold signs of frequent saturation long after a wetland has been drained or otherwise transformed. The other three indicators are used more in a confirmatory role (DWAF, 2005). Because of this and because it is difficult to define the minimum frequency and duration of saturation that creates a wetland, the finding of the outer edge of the wetland is dependent on four, more specific indicators:

- The Terrain Unit Indicator (as mentioned above).
- The Soil Form Indicator, which identifies soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation.

- The Soil Wetness Indicator, which identifies the morphological signatures that develop in the soil profile as a result of prolonged and frequent saturation.
- The Vegetation Indicator, which identifies hydrophilic vegetation that is associated with permanent or frequently saturated soils.

Three zones are distinguished within a wetland i.e. the permanent zone (all year round wetness), the seasonal zone (wet for at least three months of a year), and the temporary zone (wet for less than three months of a year). The object of a wetland delineation procedure is to identify the outer edge of the temporary zone. This outer edge marks the boundary between the wetland and the adjacent terrestrial areas (DWAF, 2005).

The method described by (DWAF, 2005) and followed in the delineation of the wetlands in the study area is as follows:

- First the position of the wetland is visually determined (Terrain Unit Indicator).
- Starting at the wettest parts, a transect is then followed width ways across the wetland and using a soil auger the soil profile is examined up to a depth of 50cm for the presence of soil form indicators and / or soil wetness indicators. Vegetation indicators are also recorded.
- Proceeding outwards towards the estimated edge of the wetland, sampling continues at regular intervals to check for wetness and vegetation indicators.
- The outer edge of the wetland is subsequently defined as the point where soil wetness indicators are no longer visible within the top 50cm of the soil profile.
- The outer edge is recorded with a handheld GPS and eventually the GPS waypoints are plotted and joined on a map to visually indicate the extent of the outer edge (temporary zone) of the wetland.
- Several further transects are then also followed at regular intervals and at other strategic points in the wetland paying particular attention to features that may disrupt the wetland boundary, such as seeps entering the wetland, large floodplains, etc.

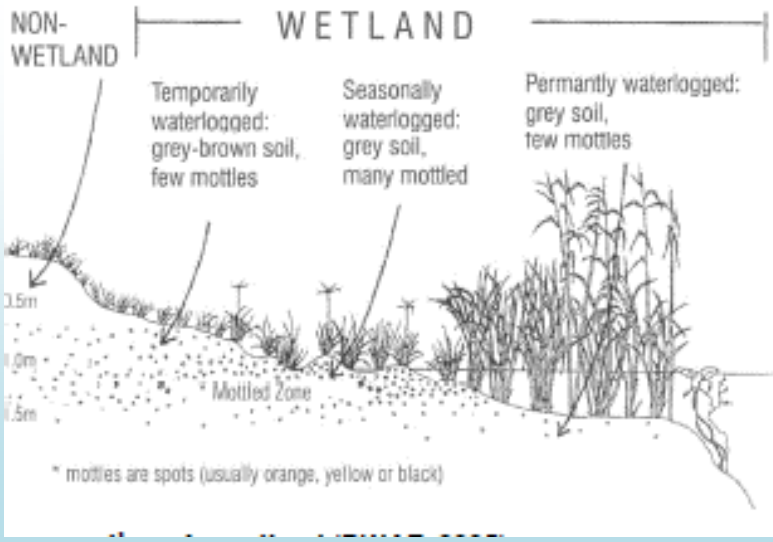

Figure 1: Typical Cross section of a Wetland

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.

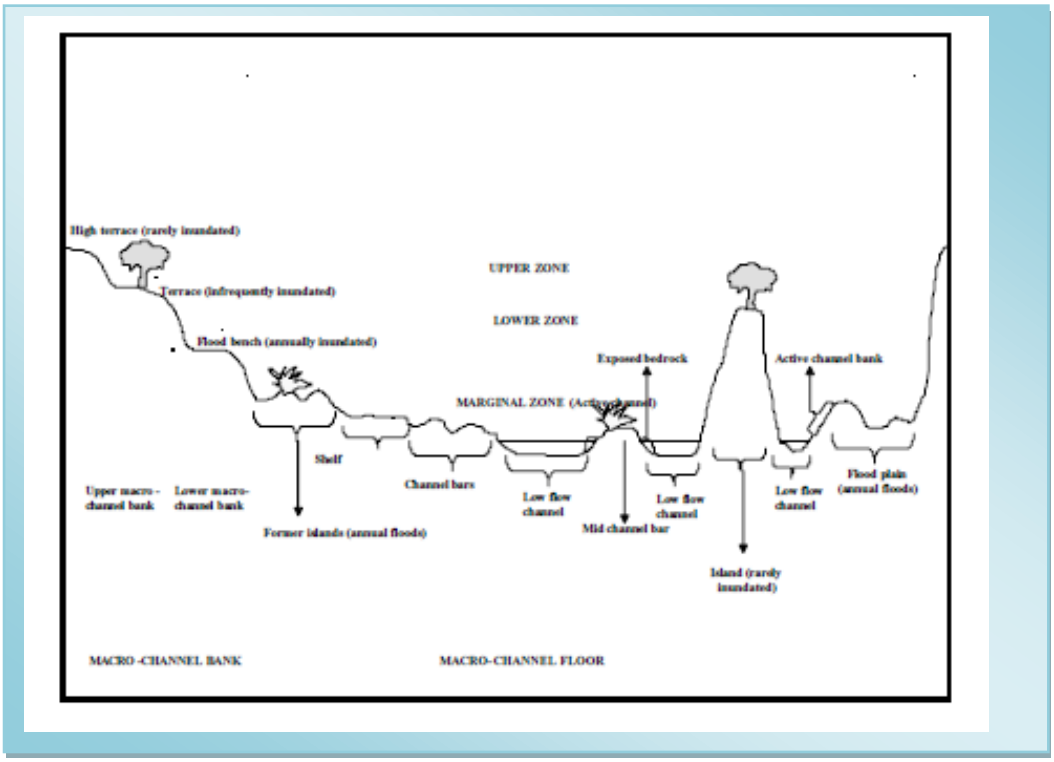

Figure 2: Schematic diagram illustrating an example of where the 3 zones would be placed relative to geomorphic diversity (Kleynhans *et al.2007*)

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).

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).

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 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	>0 and <=1	**Low**

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.

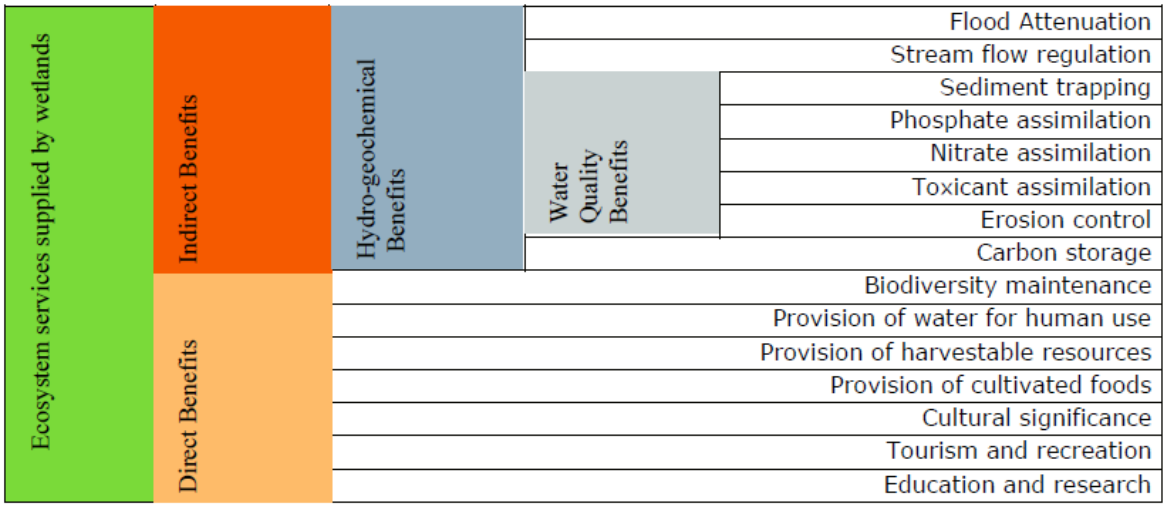

Figure 3: Wet-EcoServices Tool

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.

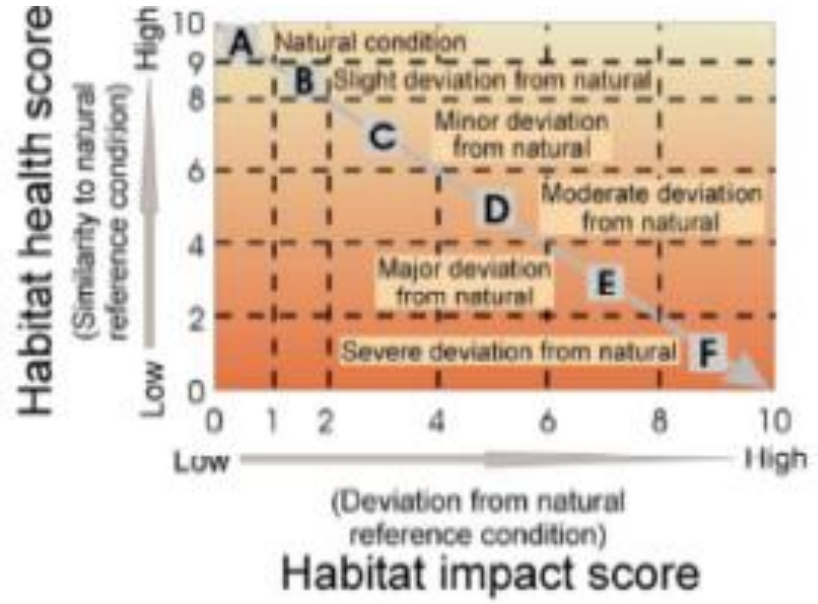

Figure 4: Wet-Health Tool

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).

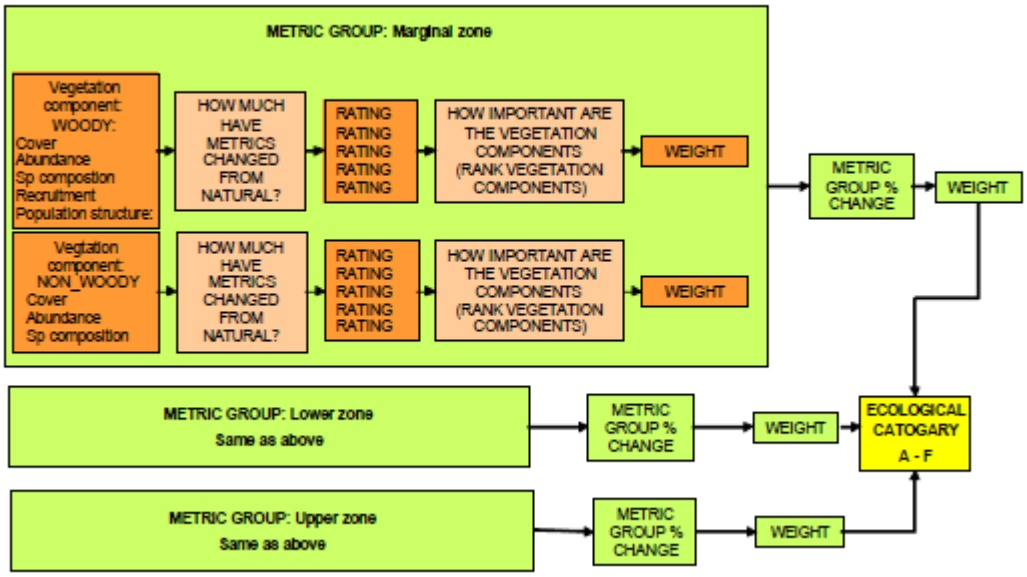

Figure 5: Generic ecological categories for Eco-Status components used in the VEGRAI index (modified from Kleynhans, 1996 and Kleynhans 1999 cited in Kleynhans & Louw 2007b)

3. WETLAND AND RIPARIAN DELINEATION FINDINGS

3.1 Wetland and Riparian Findings

Wetland Findings:
In section 3 a probable wetland was noticed on the farm Hampton 320KQ/1 on the eastern banks of the Crocodile River (Figure 6). The delineation of that wetland, however, took place on a desktop level as access to the area was denied by the land owner.

The wetland is situated approximately 70 to 100 m from the midstream of the Crocodile River and takes form as a floodplain wetland that probably formed in a linear depression of a paleo stream of the Crocodile River. Due to the fact that the area could not be accessed it is unclear if this area forms part of the Crocodile River floodplain and is therefore inundated when the river floods its banks, or if it is wet all year round due to the effects of another water source. Dominant species could not be assessed, but in all probability include water loving grasses, reeds, sedges, rushes and other hydrophilic and aquatic herbs.

Figure 6: Wetland area inundated after good rains on the farm Hampton east of the Crocodile River

Standing on the tar road just north of the wetlands, it would appear that the wetland area has been slightly transformed by the previous or current land owner, which will have had a negative ecological effect on the natural wetland system.

The wetland was delineated during a desktop action and the prescribed 32m buffer zone, as prescribed in Government Notice R.544 in Government Gazette 33306 of 18 June 2010, indicated in Figure 7. The wetland and buffer zone is to be protected as far as possible.

The buffer zone serves to protect the wetland from degradation and transformation through the effects of anthropogenic actions.

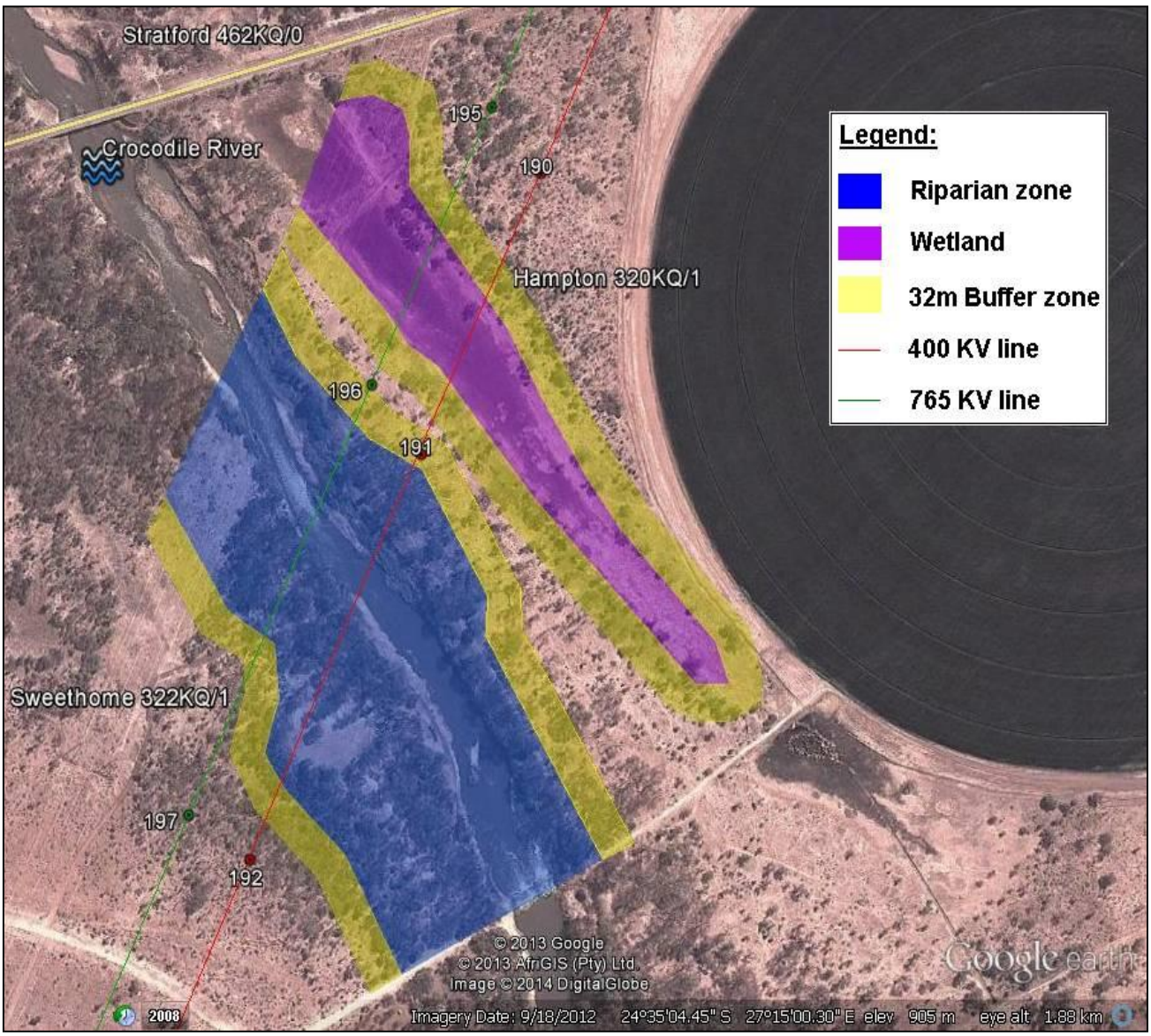

Figure 7: Google earth image illustrating the riparian zone, wetland and prescribed 32m buffer zone

Riparian Zones Findings:

At the position in section 3 where the two lines cross the Crocodile River a delineation of the riparian zone between the farms Hampton 320KQ/1 (eastern bank) and Sweethome 322KQ/1 (western bank) was conducted and the prescribed buffer zone mapped (Figure 2). 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.

The riparian zone is defined by tall trees and a well developed shrub and grass undergrowth (Figure 8). The dominant trees and woody shrubs include the protected

Combretum imberbe as well as *Acacia burkei, A. schweinfurthii, A, tortilis, Croton megalobotrys, Diospyros lycioides, Gymnosporia buxifolia* and *Ziziphus mucronata.* The dominant graminoids (grasses and grass like plants) are the grasses *Panicum maximum* and the reed *Phragmites australis.*

Figure 8: Riparian vegetation on either side of the Crocodile River

The eastern bank of the Crocodile River on the farm Hampton was not physically assessed as access to that area was denied by the land owner. A physical delineation of this area as well as the wetland on the farm Hampton will have to be conducted as soon as access can be established.

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.

Generic ecological categories for Eco-Status components

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 but some remaining natural habitat features are still recognizable.	20-39	E	Low
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. Regulations 544 and 545, 2010 promulgated under NEMA the following activities require an Environmental Impact Assessment or Basic Environmental Assessment:

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 3) 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:

<table>
<tr><td colspan="4">NATURE:
The character of the impact</td></tr>
<tr><td>EXTENT</td><td>DURATION</td><td>PROBABILITY</td><td>MAGNITUDE</td></tr>
<tr><td>Area</td><td>Time Frame</td><td>Likelihood</td><td>Intensity of impact to destroy or alter the environment.</td></tr>
<tr><td colspan="4">SIGNIFICANCE:
Implication of the impact both with or without mitigation</td></tr>
<tr><td colspan="4">TYPE:
Description as to whether the impact is negative or positive or neutral.</td></tr>
<tr><td colspan="4">MITIGATION:
Possible impact management, minimization and mitigation of the identified impacts.</td></tr>
<tr><td colspan="4">NO GO OPTION:
Evaluation of the no-go-option</td></tr>
</table>

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:

- Insignificance: 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 Crocodile River between towers 195 to 197 on the 765 kV powerline and 190 -192 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 3. There will therefore be no impacts on surface water. The towers - 190 and 192 on the 400 KV line; 195, 196 and 197 on the 765 KV line) fall within a wetland, riparian zone or delineated buffer zone.

The only possible significant impact due the proposed powerline construction on the surface water (Crocodile 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 Crocodile 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: 190 and 192 on the 400 KV line; 195, 196 and 197 on the 765 KV line) fall within a wetland, riparian zone or delineated buffer zone of the Crocodile renders potential impacts of **Low Negative Significance**.

Should a lot of sediment load end up in the surrounding water resource channel (Crocodile 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 8) 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 wetland on Hampton will/may have to be re-assessed at a later stage when an agreement with the land owner can be reached in terms of access to the area. The vegetation and all other physical characteristics of the wetland need to be protected and degradation and destruction of the wetland and the delineated buffer zone must be avoided at all costs.

Currently only one of the planned towers of the 400KV line, i.e. no. 191, falls within a delineated buffer zone. It falls approximately 20 m inside the buffer zone – just about 12 m from the edge of the desktop delineated riparian zone on the eastern side of the river on the farm Hampton. None of the other five adjacent towers (190 and 192 on the 400 KV line; 195, 196 and 197 on the 765 KV line) fall within a wetland, riparian zone or delineated buffer zone.

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 Crocodile River.

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 powerline and respective towers 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 3

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
176	28145.61	-2713221.4	No comment
177	28015.98	-2713705.4	No comment
178	27813.75	-2714159.5	No comment
179	27609.96	-2714617	No comment
180	27422.65	-2715037.5	No comment
181	27227.05	-2715476.7	No comment
182	27021.53	-2715938.1	No comment
183	26806.56	-2716420.7	No comment
184	26586.08	-2716915.7	No comment
185	26388.71	-2717358.9	No comment
186	26166.68	-2717857.3	No comment
187	25942.44	-2718360.8	No comment
188	25715.25	-2718870.9	No comment
189	25491.71	-2719372.7	No comment
190	25322.73	-2719752.1	Wetland situated approximately 125 m south-west from tower position – no imminent impact on wetland expected.
191	25209.96	-2720005.3	Wetland situated approximately 60 m north-east and riparian zone (RZ) 12 m south-west from tower position – slight impact on wetland expected. Impacts on RZ probable.
192	25053.61	-2720356.3	RZ situated approximately 65 m north-east from tower position – no imminent impact on RZ expected.

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
193	24874.52	-2720758.4	No comment
194	24671.3	-2721214.7	No comment
195	24473.33	-2721659.1	No comment
196	24299.87	-2722048.6	No comment
197	24138.67	-2722410.5	No comment
198	23919.75	-2722902	No comment
199	23921.44	-2723029.7	No comment
200	23929.57	-2723643.4	No comment
201	23935.3	-2724076.1	No comment
202	23941.36	-2724533.9	No comment
203	23947.79	-2725019.3	No comment
204	23954.54	-2725529.1	No comment
205	23961.75	-2726073.2	No comment
206	23968.73	-2726600.2	No comment
207	23974.18	-2727012.4	No comment
208	23980.63	-2727499.5	No comment
209	23987.69	-2728032.6	No comment
210	23993.29	-2728455.5	No comment
211	24000.5	-2728999.4	No comment
212	24007.84	-2729553.8	No comment
213	24012.54	-2729909	No comment
214	24019.02	-2730397.9	No comment
215	24024.68	-2730825.5	No comment
216	24028.8	-2731136.7	No comment

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
217	24030.6	-2731272.6	No comment
218	24036.31	-2731704	No comment
219	24040.2	-2731997.5	No comment
220	24001.91	-2732355.8	No comment
221	23940.87	-2732926.9	No comment
222	23893.94	-2733366.2	No comment
223	23842.12	-2733851.1	No comment
224	23801.61	-2734230.1	No comment
225	23758.7	-2734631.6	No comment
226	23878.48	-2734820.7	No comment
227	24098.01	-2735167.1	No comment
228	24179.63	-2735296	No comment
229	24202.7	-2735782.7	No comment
230	24225.41	-2736261.8	No comment
231	24252.38	-2736830.8	No comment
232	24278.26	-2737376.8	No comment
233	24303.15	-2737901.8	No comment
234	24327.32	-2738411.9	No comment
235	24352.87	-2738950.9	No comment
236	24378.18	-2739484.9	No comment
237	24403.21	-2740013	No comment
238	24428.78	-2740552.4	No comment
239	24450.66	-2741014	No comment
240	24418.11	-2741452.3	No comment

400KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
241	24384.98	-2741898.5	No comment
242	24352.35	-2742338	No comment
243	24316.24	-2742824.3	No comment
244	24280.2	-2743309.6	No comment
245	24240.16	-2743848.8	No comment
246	24200.35	-2744384.9	No comment
247	24161.37	-2744909.9	No comment
248	24121.39	-2745448.4	No comment
249	24081.4	-2745986.8	No comment
250	24047.43	-2746444.3	No comment
251	24008.83	-2746964.1	No comment
252	23970.34	-2747482.5	No comment

Appendix 2: List of Towers, Findings and Comments with Regards to Wetlands and Riparian Zones for the 765kV power line - Section 3

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 180	28080.24	-2713204.4	No comment
MASNGW 181	27952.12	-2713682.7	No comment
MASNGW 182	27773.2	-2714084.4	No comment
MASNGW 183	27571.57	-2714537.1	No comment
MASNGW 184	27379.52	-2714968.3	No comment
MASNGW 185	27198.44	-2715374.8	No comment
MASNGW 186	27010.31	-2715797.2	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 187	26820.46	-2716223.4	No comment
MASNGW 188	26625	-2716662.2	No comment
MASNGW 189	26421.66	-2717118.8	No comment
MASNGW 190	26227.08	-2717555.6	No comment
MASNGW 191	26014.25	-2718033.5	No comment
MASNGW 192	25820.84	-2718467.7	No comment
MASNGW 193	25608.91	-2718943.5	No comment
MASNGW 194	25415.83	-2719377	No comment
MASNGW 195	25275.95	-2719691	Wetland situated approximately 85 m west and 120 m south-west from tower position – no imminent impact on wetland expected.
MASNGW 196	25163.52	-2719943.5	Wetland situated approximately 50 m north-east and riparian zone (RZ) 35 m south-west from tower position – slight impact on wetland expected. Impacts on RZ possible.
MASNGW 197	24996.53	-2720318.4	RZ situated approximately 85 m north-east from tower position – no imminent impact on RZ expected.
MASNGW 198	24820.87	-2720712.8	No comment
MASNGW 199	24631.01	-2721139	No comment
MASNGW 200	24439.35	-2721569.3	No comment
MASNGW 201	24236.69	-2722024.3	No comment
MASNGW 202	24035.01	-2722477.1	No comment
MASNGW 203	23852.02	-2722887.9	No comment
MASNGW 204	23854.36	-2723064.7	No comment
MASNGW 205	23861.85	-2723630.5	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 206	23868.72	-2724149.5	No comment
MASNGW 207	23874.92	-2724617.6	No comment
MASNGW 208	23881.75	-2725133.4	No comment
MASNGW 209	23888.25	-2725623.7	No comment
MASNGW 210	23894.73	-2726113.3	No comment
MASNGW 211	23900.88	-2726577.3	No comment
MASNGW 212	23907.01	-2727040.2	No comment
MASNGW 213	23913.79	-2727552.6	No comment
MASNGW 214	23920.22	-2728038.2	No comment
MASNGW 215	23925.36	-2728425.9	No comment
MASNGW 216	23931.25	-2728871.1	No comment
MASNGW 217	23938.56	-2729423.3	No comment
MASNGW 218	23944.22	-2729850	No comment
MASNGW 219	23950.01	-2730288	No comment
MASNGW 220	23956.55	-2730781.7	No comment
MASNGW 221	23961.71	-2731171.5	No comment
MASNGW 222	23963.79	-2731328.1	No comment
MASNGW 223	23972.61	-2731994.2	No comment
MASNGW 224	23937.39	-2732323.9	No comment
MASNGW 225	23879.57	-2732864.9	No comment
MASNGW 226	23833.67	-2733294.4	No comment
MASNGW 227	23782.04	-2733777.5	No comment
MASNGW 228	23734.31	-2734224.1	No comment
MASNGW 229	23689.05	-2734647.7	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 230	23831.79	-2734873	No comment
MASNGW 231	24044.56	-2735208.8	No comment
MASNGW 232	24113.02	-2735316.9	No comment
MASNGW 233	24135.21	-2735785.2	No comment
MASNGW 234	24157.84	-2736262.6	No comment
MASNGW 235	24179.49	-2736719.3	No comment
MASNGW 236	24200.13	-2737154.8	No comment
MASNGW 237	24222.66	-2737630.1	No comment
MASNGW 238	24245.38	-2738109.5	No comment
MASNGW 239	24268.86	-2738604.9	No comment
MASNGW 240	24291.66	-2739085.9	No comment
MASNGW 241	24315.59	-2739590.7	No comment
MASNGW 242	24338.87	-2740081.9	No comment
MASNGW 243	24362.2	-2740574.2	No comment
MASNGW 244	24383	-2741013	No comment
MASNGW 245	24352.34	-2741425.9	No comment
MASNGW 246	24323.74	-2741811.1	No comment
MASNGW 247	24293.87	-2742213.2	No comment
MASNGW 248	24256.79	-2742712.7	No comment
MASNGW 249	24225.05	-2743140.1	No comment
MASNGW 250	24194.07	-2743557.3	No comment
MASNGW 251	24157.05	-2744055.8	No comment
MASNGW 252	24120.47	-2744548.4	No comment
MASNGW 253	24083.85	-2745041.7	No comment

765KV Tower Number	X Easting (m)	Y Northing (m)	Comment regarding wetlands & Riparian zones
MASNGW 254	24047.79	-2745527.2	No comment
MASNGW 255	24012.45	-2746003.2	No comment
MASNGW 256	23975.46	-2746501.3	No comment

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