Ecological Desktop Study

The proposed Prospecting Right application of Diamonds Alluvial & Diamonds General near Schweizer-Reneke on the Remaining Extent of Portion 2 (Cypherfontein) and Portion 15 (On Avon – a Portion of Portion 2) of the farm Maraetchesfontein 54, Registration Division: HO, North West Province.

Reference No. : NW30/5/1/1/2/12057PR

Prepared by

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Introduction

Milnex 189 CC was contracted by Brakpan Trust as the independent environmental consultant to undertake the Ecological Desktop Study for the Environmental Impact Assessment process for a Prospecting Right of diamonds alluvial and diamonds general on the Remaining Extent of Portion 2 (Cypherfontein) and Portion 15 (On Avon – a Portion of Portion 2) of the Farm Maraetchesfontein 54, Registration Division: HO, North West Province. Situated within the Mamusa Local Municipality area of jurisdiction. The property is located approximately 11.5km North East of Schweizer-Reneke adjacent to the R504 towards Migdol. The property is located approximately 23km North East of Delareyville in the North West Province. Milnex 189 CC is a specialist environmental consultancy with extensive experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex 189 CC benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety of mining related projects throughout South Africa. The Milnex 189 CC team has considerable experience in environmental impact assessment and environmental management, especially in the mining industry.

The EAP, Danie Labuschagne, which conducted the desktop study has experience in consulting in the environmental field. His key focuses are on environmental assessment, advice and management and ensuring compliance to legislation and guidelines, GIS and Water Use Licenses. He is currently involved in undertaking EIAs for several projects across the country. He's key qualifications include:

- Masters Degree in Environmental Management and Geography, North West University, SA.
- Honors in Environmental Management (Hons.Env.Man) (Cum Laude), North West University (NWU), SA.
- B. Sc in Geology and Geography, North West University (NWU), SA.
- Implementing Environmental Management Systems (ISO 14001) course from the CEM (Centre for Environmental Management).
- Environmental Law for Environmental Managers course from the CEM (Centre for Environmental Management).
- Environmental Management Systems ISO 14001 Audit: A Lead Auditor Course based on ISO 19011 and ISO 17021(SAATCA Registered) course at the CEM (Centre for Environmental Management).

It should just be noted that Danie Labuschagne ***is not*** a qualified Ecologist.

The Ecological habitat status of the proposed mining right area, was determined by means of a site visit and a desktop study. In this document a brief description of the ecology, as stated by Mucina and Rutherford (2006), will be given. This information will be supported with a map and site specific photographs.

It should be noted that the status of these vegetation may have changed as the data used from Mucina and Rutherford (2006) is 10 years old.

Vegetation Map

The exact coordinates of the proposed mining right area are plotted to determine the vegetation unit(s), in which the proposed mining activities will take place. The data used, is that provided by Mucina and

Rutherford (2006). A vegetation unit is defined by Mucina and Rutherford (2006) as a complex of plant communities ecologically and historically occupying habitat complexes at the landscape scale. According to Mucina and Rutherford (2006) their vegetation units are the obvious vegetation complexes that share some general ecological properties such as position on major ecological gradients and nutrient levels, and appear similar in vegetation structure and especially in floristic composition.

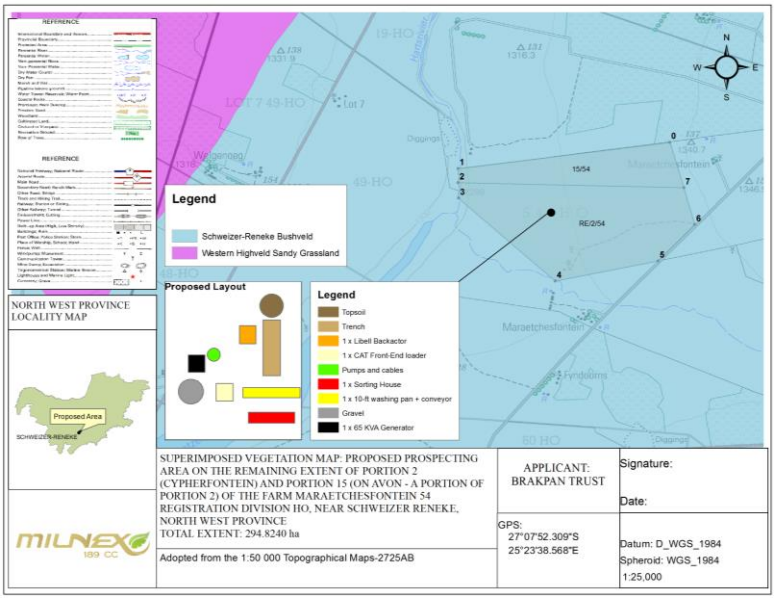

Figure 1: Vegetation Unit Map

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation unit SVk 3, which is known as the Schweizer-Reneke Bushveld. Schweizer-Reneke Bushveld is part of the Eastern Kalahari Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome.

<u>Schweizer-Reneke Bushveld</u>

According to Mucina and Rutherford (2006:516), the Schweizer-Reneke Bushveld vegetation covers the North West Province. Schweizer-Reneke area in the east to Amalia in the west and from the farming areas of around Broedersput in the north to Never Mind (Christiana District) in the south. This Bushveld is situated on an altitude of 1250m – 1400m.

The region is characterised by plains, slightly undulating plains and some hills, supporting open woodland with a fairly dense shrub layer, with *Acacia erioloba, A. karroo, A. tortilis, Rhus lancea* trees and *A. hebeclada, Diospyros lycioides, Grewia flava, Tarchonanthus camphoratus* shrubs.

Some other important Taxa found on in the area:

Tall Trees: *Acacia erioloba* (d)

Small Trees*:* *Acacia karroo* (d), *A. tortilis subsp. Heteracantha* (d), *Rhus lancea* (d).

Tall Shrubs: *Asparagus Laricinus* (d), *Diospyros lycioides* subsp. *lycioides* (d), *Grewia Flava* (d), *Tarchonanthus camphoratus* (d), *Diospyros pallens, Ehretia rigida subsp. rigida, Gymnosporia buxifolia, Rhus tridactyla.*

Low Shrubs: Acacia *hebeclada subsp. hebeclada* (d), *Aptosimum decumbens, Chrysocoma ciliate, Gnidia polycephala, Pentzia viridis*

Woody climber: *Asparagus africanus.*

Graminoids: *Anthepora pubescens* (d), *Digitaria eriantha subsp. eriantha* (d), *Heteropogon contortus* (d), *stipagrotis uniplumis* (d), *Themeda triandra* (d), *Aristida congesta, A. stipitata* subsp. *spicata, Chloris virgate, Cynodon dactylon, Eragrostis biflora, E. rigidior, E superba, E trichophora, Sporobolus fimbriatus.*

Herbs: *Barleria macrostegia, Hermannia tomentosa, Hibiscus pusillus, Indigofera daleoides, Lippia scaberrima, Osteospermum muricatum, Pollichia campestris, Rhynchosia adenodes*

Geophytic Herbs: *Dipcadi papillatum, Nerine laticoma*

Mucina and Rutherford (2006:516) also states that the conservation of this Bushveld type, is endangered with a target of 16%. None conserved in statutory conservation areas. Largely (42%) transformed almost all by cultivation. Erosion is very low.

Protected Areas

According to the data for protected areas the proposed portions does not fall within a formally protected area. However, it does fall within Schweizer-Reneke Bushveld threatened ecosystems.

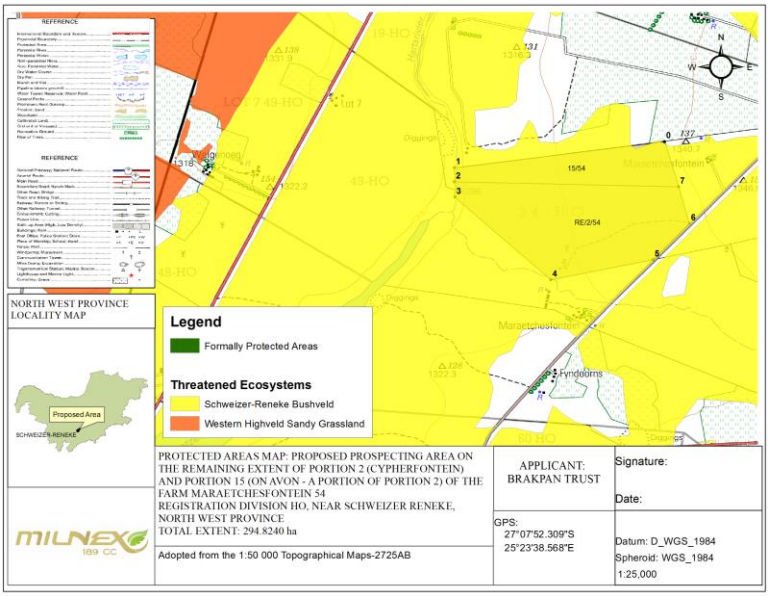

Figure 2: Protected Areas Map

Critical Biodiversity Area

According to READ (2015) "Critical biodiversity areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met.

Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses and can include one or more of the following: threatened ecosystems, special and important habitats, areas of high irreplaceability, ecological/biodiversity corridors, and existing or proposed protected areas and protected area development nodes. CBAs can be divided into two categories, namely: CBA 1 and CBA 2. READ (2015) also states that according to the extent of the CBA Map categories in the North-West Province, only 8% are CBA 1 and 20% are CBA 2.

According to the data for Critical Biodiversity Areas, areas of the proposed portions fall within CBA type 1 and type 2. The North West Biodiversity Sector Plan (2015) defined the management of the different CBA areas as follows:

Critical Biodiversity Area type 1

Maintain in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process:

- Ecosystems and species fully or largely intact and undisturbed.
- These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost, then targets will not be met.
- These are biodiversity features that are at, or beyond, their limits of acceptable change.

Critical Biodiversity Area type 2

Maintain in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process:

- Ecosystems and species fully or largely intact and undisturbed.
- Areas with intermediate irreplaceability or some flexibility in terms of meeting biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising the ability to achieve biodiversity targets, although loss of these sites would require alternative sites to be added to the portfolio of CBAs.
- These are biodiversity features that are approaching but have not passed their limits of acceptable change

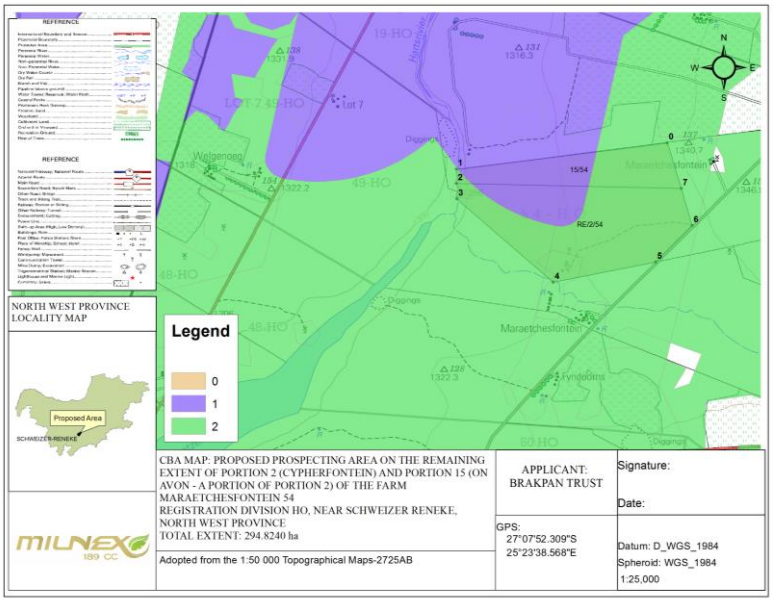

Figure 3: Critical Biodiversity Areas Map.

According to a matrix of recommended land use zones and associated activities in relation to the CBA map categories), prospecting is not permitted or it is discouraged in CBA type 1 areas. In CBA type 2 areas it is restricted to compulsory, site specific conditions and controls when unavoidable, not usually permitted.

NO	LAND USE ZONE	ASSOCIATED LAND USE ACTIVITIES	PA/CA	CBA1	CBA2	ESA1	ESA2	ONA
15	Quarrying and Mining	Prospecting and Underground Mining	N	N	R	R	R	R
		Quarrying and open-cast mining (includes surface mining, dumping & dredging).	N	N	N	N	N	R
		Hydraulic Fracturing (fracking)	N	N	N	R	R	R

Notes:

1. Guidelines apply only to natural or near-natural land with natural vegetation cover within each category (on site).
2. Y = YES, permitted and actively encouraged activity;
3. N = NO, not permitted, actively discouraged activity; and,
4. R = RESTRICTED to compulsory, site-specific conditions & controls when unavoidable, not usually permitted.

(North West Biodiversity Sector Plan, 2015:57

Sensitive area for Mine

According to the Mining of Biodiversity Guidelines, biodiversity priority areas sensitive to the impacts of mining are categorized into four categories (please see the table below).

Category	Description
A	Legally protected
B	Highest biodiversity importance
C	High biodiversity importance
D	Moderate biodiversity importance

The purpose is to identify and categorize biodiversity priority areas sensitive to the impacts of mining in order to support mainstreaming of biodiversity issues in decision making in the mining sector.

According to the mine guide map, certain areas of the proposed portions fall within category B and C, which states the biodiversity priority areas for the different categories is as follows:

Category B (Highest risk for mining)

These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.

Biodiversity priority areas:

- Critically endangered and endangered ecosystems
- Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans

- River and wetland Freshwater Ecosystem Priority Areas (FEPAs), and a 1km buffer around these FEPAs
- Ramsar Sites

Category C (High risk for mining)

These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, for maintaining important ecosystem services for particular communities or the country as a whole.

Biodiversity priority areas:

- Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves).
- Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas).
- Other identified priorities from provincial spatial biodiversity plans.
- High water yield areas
- Coastal Protection Zone
- Estuarine functional zone

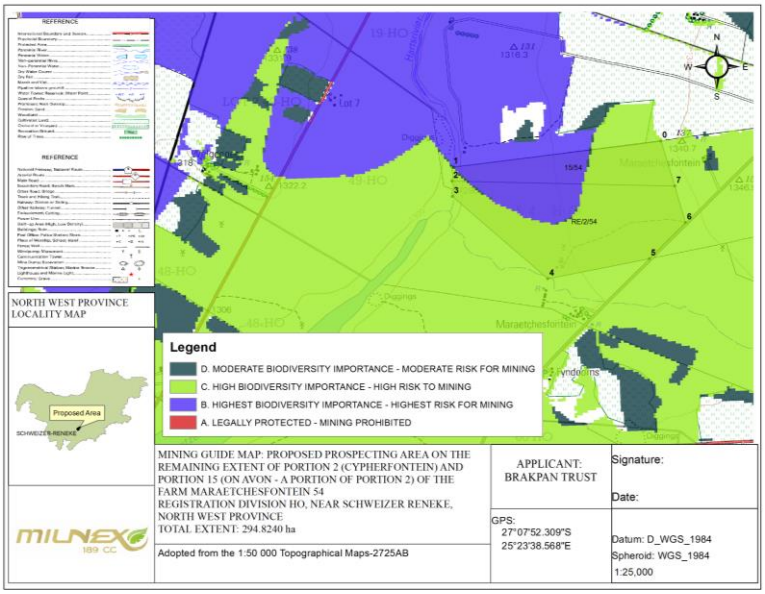

Figure 4: Sensitive area for mine

Wetland Areas

Wetland is defined 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 (from the South African National Water Act; Act No. 36 of 1998).

Map below depicts all wetland areas on the proposed area. The proposed area consists of an channelled valley-bottom wetland and the wetland vegetation type falls within the Eastern Kalahari Bushveld Group 2.

According to the 2013 SANBI Biodiversity Series 22 a:

Channelled valley-bottom wetland is a valley-bottom wetland with a river channel running through it. It is characterised by their position on valley floors and the absence of characteristic floodplain features and the presence of a river channel flowing through the wetland. Dominant water inputs to these wetlands are from the river channel flowing through the wetland, either as surface flow resulting from flooding or as subsurface flow, and/or from adjacent valley-side slopes (as overland flow or interflow).

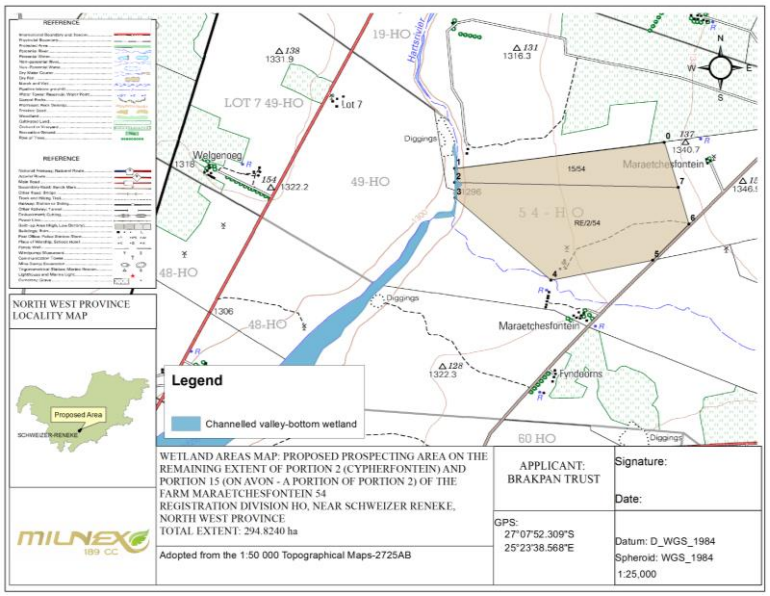

Figure 5: Wetland types present on site

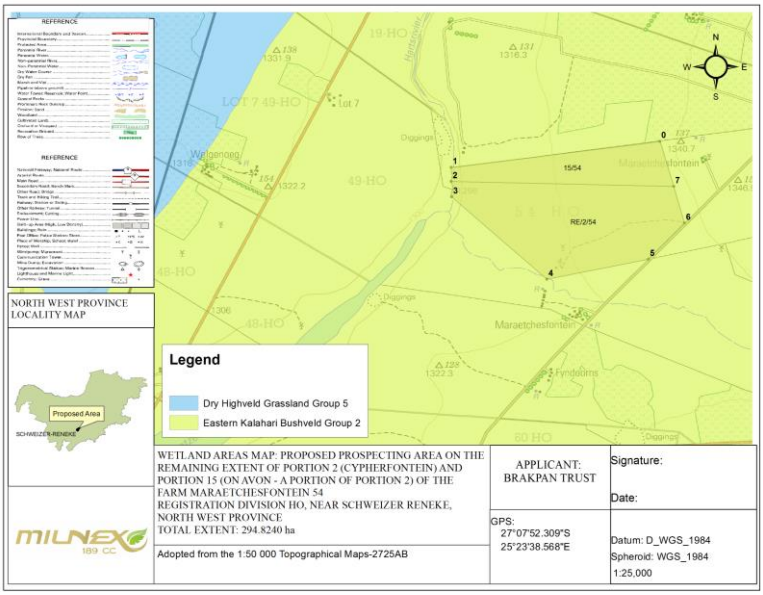

Figure 6: Wetland types present on site

River Ecosystem Status

There is a watercourse running adjacent to the proposed site, which is classified as being Class C: Moderately Modified. The figure below depicts the river ecosystem status.

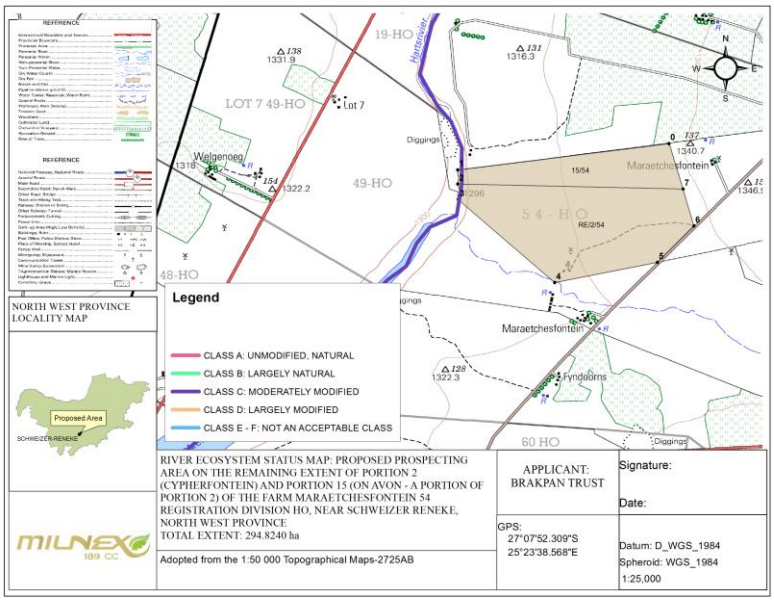

Figure 7: River Ecosystem Status

Recommendations

- Protected trees and plants shall not be removed or damaged without prior approval and permits or licenses from the relevant authority.
- Vegetation clearance, if any, should be kept to the minimum required for the operation.

The EAP herewith confirms the correctness of the information provided in this report.

Signature of the EAP: Danie Labuschagne

Date: 28/03/2017