# Ecological Desktop Study

THE PROPOSED DIAMONDS ALLUVIAL & DIAMONDS GENERAL PROSPECTING RIGHT, NEAR WOLMARANSSTAD ON THE REMAINING EXTENT OF PORTION 15 (PORTION OF PORTION 1) OF THE FARM RIETKUIL 155, REGISTRATION DIVISION: HO, REMAINING EXTENT OF PORTION 12 (PORTION OF PORTION 4), THE REMAINING EXTENT OF PORTION 15 (PORTION OF PORTION 2), PORTION 36 (PORTION OF PORTION 12) OF THE FARM SYFERFONTEIN 2 AND PORTION 3 OF THE FARM KATDOORNPLAAT 1, REGISTRATION DIVISION: HP, NORTH WEST PROVINCE.

Reference No. : NW30/5/1/1/2/11930PR

Prepared by

MILNEX 189 CC

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## Introduction

Milnex 189 CC was contracted by Mr. DMJ van der Merwe 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. The farm Rietkuil is approximately 21km North of Wolmaransstad adjacent to the R505 on route to Ottosdal, the farm Katdoornplaat is approximately 29km North East of Wolmaransstad adjacent to the R505 on route to Ottosdal. The farm Syferfontein is located approximately 15 km North East of Wolmaranstad adjacent to the N12 on the Remaining Extent of Portion 15 (portion of Portion 1) of the farm Rietkuil 155, Registration Division: HO, Remaining Extent of Portion 12 (portion of Portion 4), the Remaining Extent of Portion 15 (portion of Portion 2), Portion 36 (Portion of Portion 12) of the farm Syferfontein 2 and Portion 3 of the farm Katdoornplaat 1, Registration Division: HP, 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.

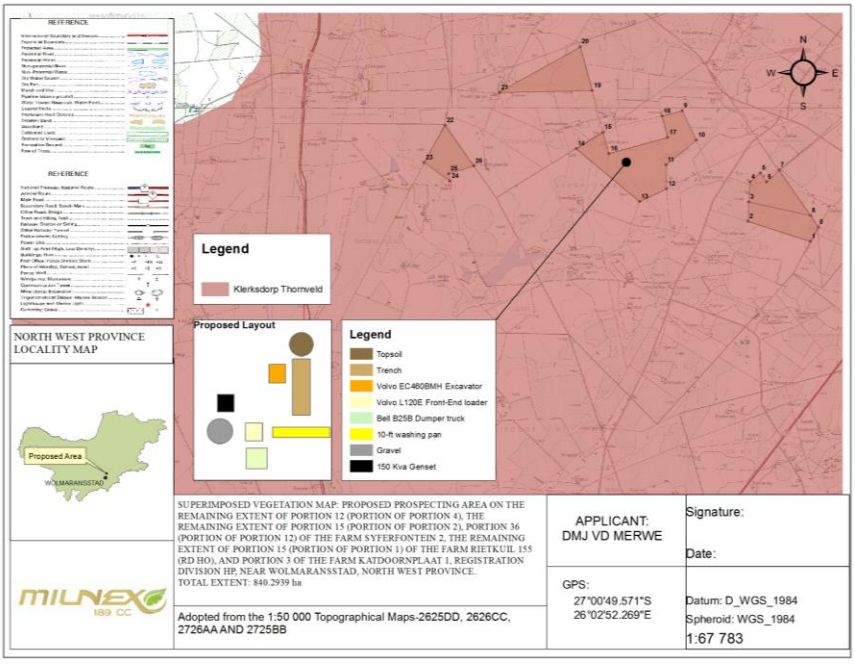


**Figure 1**: Vegetation Unit Map

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation unit Gh 13, which is known as the Klerksdorp Thornveld. The Klerksdorp Thornveld is part of the Dry Highveld Grassland Bioregion, which is a sub-bioregion for the Grassland Biome.

According to Mucina and Rutherford (2006:386), the Klerksdorp Thornveld vegetation covers the North West Province: In two sets of patches, one in the Wolmaransstad, Ottosdal and Hartbeesfontein region and the other from the Botsolano Game Park north of Mafikeng to the vicinity of Madibogo in the south. This Thornveld is situated on an altitude of 1260-1580m.

The area often has plains or slightly irregular undulating plains with open to dense *Acacia karroo* bush clumps in dry grassland.

**Some other important Taxa found on in the area:**

Small Trees: *Acacia karroo* (d), *A. caffra, Celtis africana, Rhus lancea, Ziziphus mucronata.*

Tall Shrubs: *Acacia hebeclada, Diospyros lycioides* subsp. *lycioides, Ehretia rigida, Grewia flava, Gymnosporia buxifolia, Rhus pyroides, Tarchonanthus camphoratus.*

Woody climber: *Asparagus africanus.*

Low Shrubs: *Asparagus laricinus* (d)*, A. suaveolens* (d)*, Felicia muricata* (d), *Anthospermum hispidulum, A. rigidum* subsp. *pumilum, Aptosimum elongatum, Gnidia capitate, Gomphocarpus fruticosus* subsp*. fruticosus, Helichrysum dregeanum, Leucas capensis, Pavonia burchellii, Pentzia globose, Solanum supinum* var. *supinum, Triumfetta sonderi, Ziziphus zeyheriana.*

Graminoids: *Aristida congesta* (d), *Cynodon dactylon* (d), *Eragrostis lehmanniana* (d), *E. trichophora* (d), *Microchloa caffra* (d), *Panicum coloratum* (d), *Sporobolus fimbriatus* (d), *Themeda triandra* (d), *Andropogon schirensis, Aristida junciformis* subsp*. galpinii, A. stipitata* subsp*. graciliflora, Brachiaria nigropedata, B. serrata, Bulbostylis burchellii, Cymbopogon pospischilii, Digitaria eriantha, Diheteropogon amplectens, Elionurus muticus, Eragrostis curvula, E. obtuse, E. racemose, E. superba, Eustachys paspaloides, Heteropogon contortus, Setaria sphacelata, Sporobolus africanus, Tragus berteronianus, Trichoneura grandiglumis, Triraphis andropogonoides.*

Herbs- *Acalypha angustata, Acanthospermum austral, Berkheya onopordifolia* var*. onopordifolia, B. setifera, Blepharis integrifolia* var*. clarkei, Chamaesyce inaequilatera, Chascanum adenostachyum, Dicoma macrocephala, Helichrysum nudifolium* var*. nudifolium, Hermannia lancifolia, Hibiscus pusillus, Justicia anagalloides, lippie scaberrima, Nidorella microcephala, Nolletia ciliaris, Pollichia campestris, Rhynchosia adenodes, Salvia radula, Selago densiflora, Teucrium trifidum, Tolpis capensis.*

Geophytic Herbs: *Bulbine narcissifolia, Ledebouria marginata, Ornithogalum tenuifolium* subsp. *tenuifolium, Raphionacme hirsute.*

Herbaceous Climber: *Rhynchosia venulosa*

Mucina and Rutherford (2006:387) also states that the conservation of this thornveld type, is vulnerable with a target of 24%. Only 2.5% is statutorily conserved in the Mafikeng Game Reserve, private Botsolano Game Park and Faan Meintjies Nature Reserve. Almost a third already transformed for cultivation and by urban sprawl. This vegetation unit has a high grazing capacity and this leads to overutilisation and degradation, and subsequent invasion of *Acacia Karroo* into adjacent dry grassland. Due to the great habitat and floristic diversity and for aesthetical reasons, the landscape deserves to be conserved.

**Protected Areas**

According to the data for protected areas, the proposed portions do not fall within a formally protected area, nor threatened ecosystem.

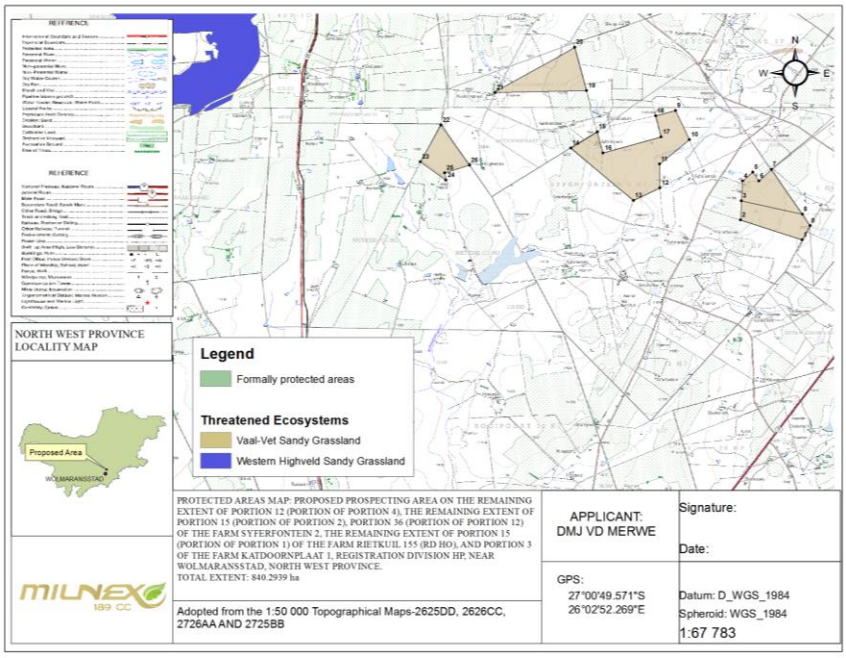


**Figure 2**: Protected Areas Map

## Critical Biodiversity Area

According to B-GIS "Critical biodiversity areas (CBAs) are 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", therefore the purpose of CBA's is simply to indicate spatially the location of critical or important areas for biodiversity in the landscape.

According to the data for Critical Biodiversity Areas, some areas of the proposed portions fall within Critical Biodiversity Area type 2.

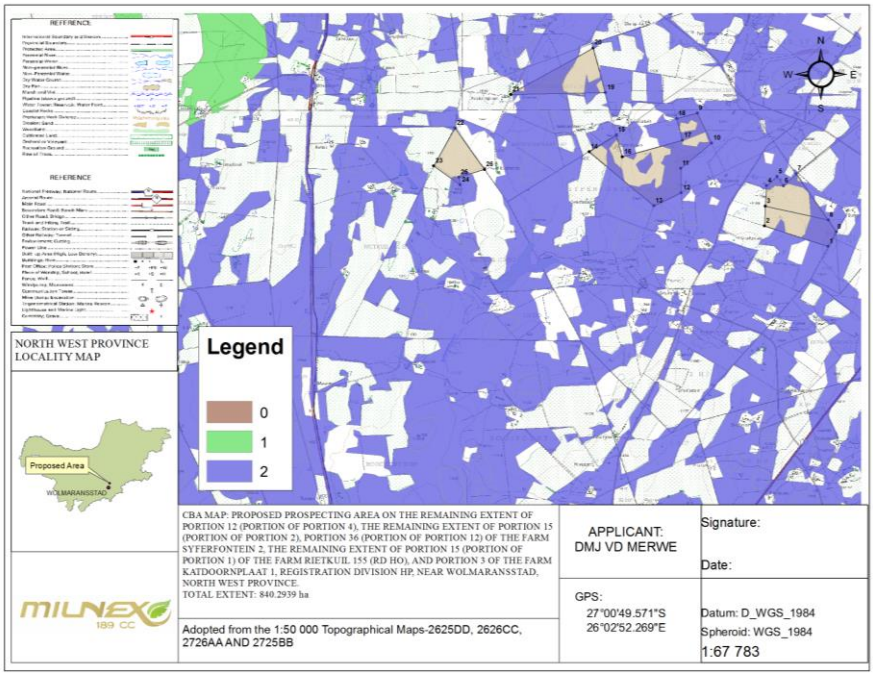


**Figure 3:** Critical Biodiversity Areas Map.

**Sensitive area for Mine**

Certain areas of the proposed portions fall within Highest (B) and High (C) biodiversity importance which means it is a highest and high risk area for mining.

Highest biodiversity importance (B)

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

According to SANBI (data from online SANBI:2012) an environmental impact assessment should include the strategic assessment of optimum, sustainable land use for a particular area will determine the significance of the impact on biodiversity.

High biodiversity importance (C)

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.

According to SANBI (data from online SANBI:2012) an environmental impact assessment / basic assessment should be conducted to determine the significance of the impact on the biodiversity by an assessment of optimum, sustainable land use for a particular area.

Below is figure 4 representing the sensitive area for mining (data from online SANBI)

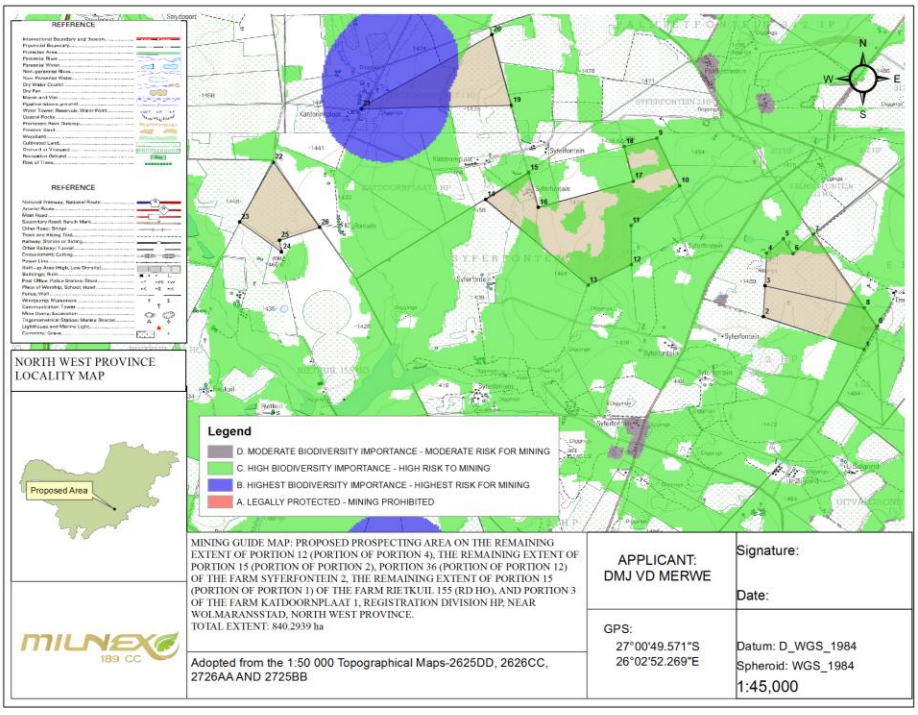


**Figure 4:** Sensitive area for mine

## 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 Depression, Seep and Unchannelled valley-bottom wetlands. The wetland vegetation type falls within the Dry Highveld Grassland Group 5.

According to the 2013 SANBI Biodiversity Series 22, a depression is a wetland or aquatic ecosystem with closed (or near-closed1) elevation contours, which increases in depth from the perimeter to a central area of greatest depth and within which water typically accumulates. Most depressions occur either where the water table intercepts the land surface (such as on coastal plains along the South African coastline), or in semi-arid settings where a lack of sufficient water inputs prevents areas where water accumulates from forming a connection with the open drainage network.

A seep is a wetland area located on gently to steeply sloping land and dominated by colluvial (i.e. gravity-driven), unidirectional movement of water and material down-slope. Seeps are characterised by their association with geological formations (lithologies) and topographic positions that either cause groundwater to discharge to the land surface or rain-derived water to 'seep' down-slope as subsurface interflow.

Unchannelled valley-bottom wetlands are characterised by their location on valley floors, an absence of distinct channel banks, and the prevalence of diffuse flows. These wetlands are generally formed when a river channel loses confinement and spreads out over a wider area, causing the concentrated flow associated with the river channel to change to diffuse flow (i.e. the river becomes an unchannelled valley-bottom wetland).

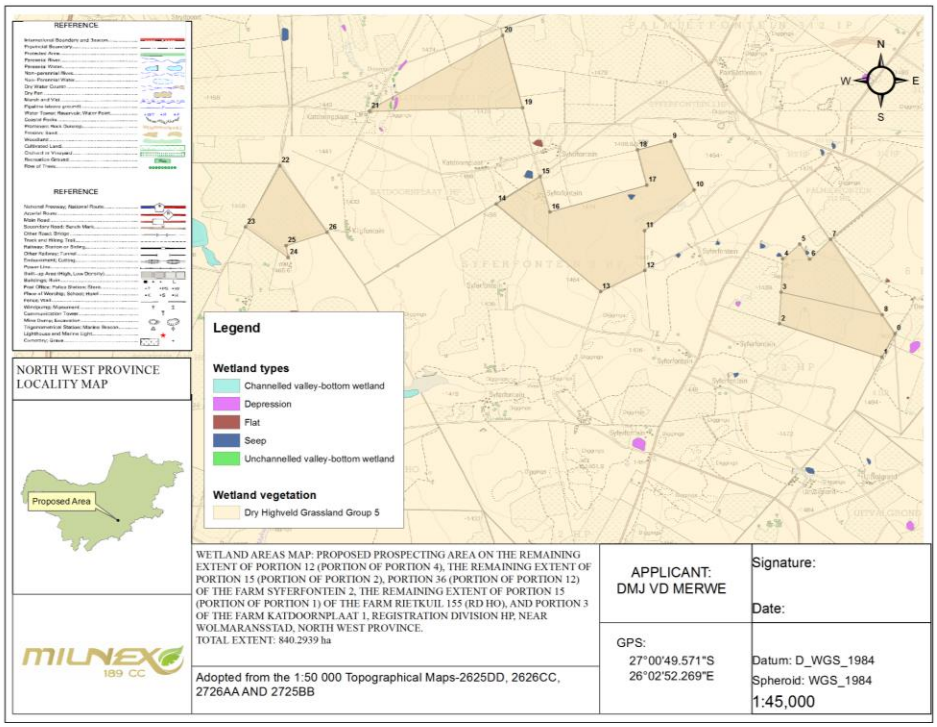


**Figure 5:** Wetland types present on site

**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: 05/10/2016