

Ecological Desktop Study

The proposed Diamonds Alluvial & Diamonds General Prospecting Right near Hopetown on the Remaining extent of the farm Slypsteen 42, Registration Division Hopetown, Northern Cape Province.

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Prepared by

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189 CC

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Introduction

Milnex 189 CC was contracted by Mr. Jacobus Smit 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 located approximately 41km South West of Hopetown towards Douglas in the Northern Cape Province on the Remaining extent of the farm Slypsteen 42, Registration Division Hopetown. 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.

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.

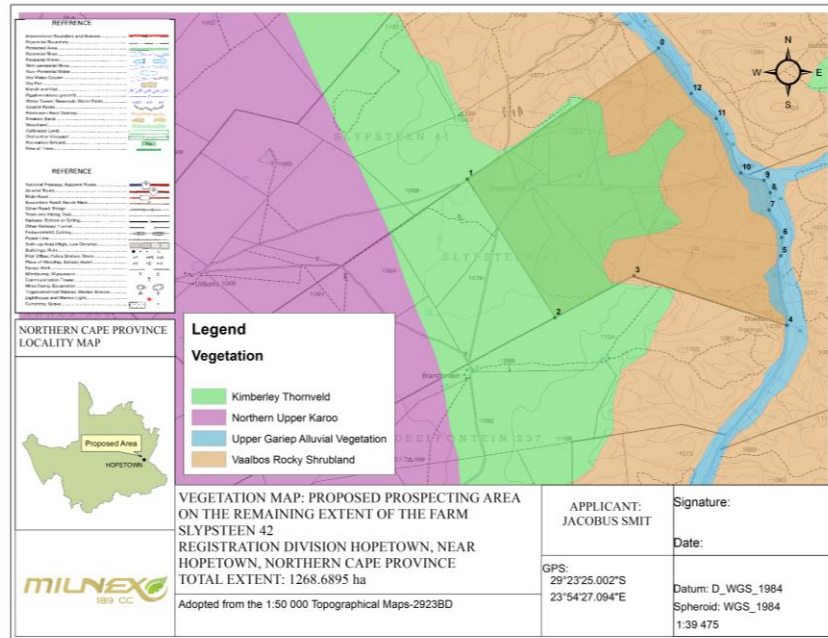


Figure 1: Vegetation Unit Map

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation units SVk 4, SVk5 and AZa 4, which is known as the Kimberley Thornveld, Vaalbos Rocky Shrubland and Upper Gariep Alluvial Vegetation.

The Kimberly Thornveld and Vaalbos Rocky Shrubland are part of the Eastern Kalahari Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome. While the Upper Gariep Alluvial Vegetation is part of the Alluvial Vegetation Bioregion which is a sub-bioregion for the Inland Azonal Vegetation.

Kimberley Thornveld

According to Mucina and Rutherford (2006:516), the Kimberley Thornveld vegetation covers the North West, Free State and Northern Cape Provinces: Most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkley West District. This thornveld is situated on an altitude of 1050m – 1400m.

The area often has slightly irregular plains with a well-developed tree layer with *Acacia Erioloba*, *A. tortillis*, *A. karoo* and *Boscia albitrunca* and a well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *A. mellifera*. Grass layer open with much uncovered soil.

Some other important Taxa found on in the area:

Tall Tree: *Acacia erioloba* (d).

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

Tall Shrubs: *Tarchonanthus camphoratus* (d), *Diospyros pallens*, *Ehretia rigida* subsp. *rigida*, *Euclea crispa* subsp. *ovato* *Grewia flava*, *Lycium arenicola*, *L. hirsutum*, *Rhus tridactyla*.

Low Shrubs: *Acacia hebeclada*, subsp. *hebeclada* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum zeyheri*, *Hermannia comosa*, *Lycium pilifolium*, *Melolobium microphyllum*, *Pavonia burchelli*, *Peliostomum leucorrhizum*, *Plinthus sericeus*, *Wahlenbergia nodosa*.

Succulent Shrubs: *Aloe hereroensis* var. *hereroensis*, *Lycium cinereum*

Graminoids: *Eragrotis lehmanniana* (d), *Aristida canescens*, *A. congesta*, *A. mollissima* subsp. *argentea*, *Cymbopogon pospischilli*, *Digitaria argyrograpta*, *D. eriantha* subsp. *eriantha*, *Enneapogon cenchroides*, *E. scoparius*, *Eragrostis rigidior*, *Heteropogon contortus*, *Themeda triandra*.

Herbs: *Barleria macrotegia*, *Dicoma schinzii*, *Harpagophytum procumbens* subsp. *procumbens*, *Helichrysum cerastioides*, *Hermbstaedtia odorata*, *Hibiscus marlothianus*, *Jamesbrittenia aurantiaca*, *Lippia scaberrima*, *Osteospermum muricatum*, *Vahlia capensis* subsp. *vulgaris*.

Succulent Herbs: *Aloe grandidentata*, *Piранthus decipiens*.

Mucina and Rutherford (2006:517) also states that the conservation of this thornveld type, is Least Threatened with a target of 16%. Only 2% of this thornveld is statutorily conserved in Vaalbos National Park and in Sanveld, Bloemhof Dam and S.A. Lombard Nature Reserve. As much as 18% is already transformed, mostly by cultivation. Low erosion is associated with this type of thornveld. The area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of *Acacia mellifera* subsp. *detinens*.

The EAP that compiled the report is also aware that the presence of *Acacia erioloba* dominates these areas, but during the desktop study no such tall tree was identified on site.

Vaalbos Rocky Shrubland

According to Mucina and Rutherford (2006:516), the Vaalbos Rocky Shrubland covers the Northern Cape and Free State Provinces. It extends along solitary hills and scattered ridges east of the confluence of the Orange and Vaal Rivers, mainly in the Kimberley and Herbert Districts and west of a line bounded by the western Free State towns of Luckhoff, Petrusburg, Dealesville, Bultfontein and Hertzogville. This shrubland is situated on an altitude of 1000-1400m.

The vegetation and landscape features can be described as slopes and elevated hills and ridges within plains of mainly SVk 4 (Kimberley Thornveld), also in the vicinity of NKu 3 (Northern Upper Karoo). Evergreen shrub communities dominated by *Tarchonanthus camphoratus*, *Olea europaea* subsp. *Africana*, *Euclea crispa*, *Diospyros lycioides*, *Rhus burchellii* and *Buddleja saligna*. Sheltered, cool sites include trees such as *R. lancea*, *Celtis Africana* and *Ziziphus mucronata*. On the footslopes of the dolerite hills, where calcrete-rich soils occur, shrubs and small trees of *Acacia tortilis* and *Z. mucronata* can be dominant.

Some other important Taxa found on in the area:

Small trees: *Boscia albitrunca*, *Cussonia paniculata*, *Rhus lancea*.

Tall Shrubs: *Euclea crispa* subsp. *Crispa* (d), *Olea europaea* subsp. *Africana* (d), *Tarchonanthus camphoratus* (d), *Ziziphus mucronata* (d), *Buddleja saligna*, *Cadaba aphylla*, *Diospyros austro-africana*, *D. lycioides* subsp. *Lycioides*, *Ehretia rigida* subsp. *Rigida*, *Gymnosporia polyacantha*, *Rhigozum obovatum*, *Rhus burchellii*

Low Shrubs: *Asparagus suaveolens*, *Hermannia comosa*, *Lantana rugose*, *Lycium pilifolium*, *Pentzia globose*, *Rhus ciliate*.

Succulent Shrubs: *Cotyledon orbiculata* var. *orbiculata*, *Crassula nudicaulis*, *Kalanchoe paniculata*, *Lycium cinereum*.

Graminoids: *Aristida adscensionis*, *A. congesta*, *Digitaria eriantha* subsp. *Eriantha*, *Elionurus muticus*, *Enneapogon scoparius*, *Eragrostis lehmanniana*, *E. obtuse*, *Eustachys paspaloides*, *Fingerhuthia Africana*, *Heteropogon contortus*, *Hyparrhenia hirta*, *Stipagrotis uniplumis*, *Themeda triandra*.

Herb: *Chascanum pinnatifidum*, *Harpagophytum procumbens* subsp. *Procumbens*, *Hibiscus pusillus*.

Geophytic Herbs: *Albuca setosa*, *Cheilanthes eckloniana*, *Haemanthus humilis* subsp. *Humilis*, *Pellaea calomelanos*.

Succulent Herbs: *Aloe grandidentata*, *Stapelia grandiflora*.

Mucina and Rutherford (2006:518) also states that the conservation of this vegetation type is least threatened with a target 16%. Less than 2% is statutorily conserved in the Vaalbos National Park and only about 2% already transformed.

Upper Gariep Alluvial Vegetation

According to Mucina and Rutherford (2006:639), the Upper Gariep Alluvial Vegetation covers the Free State and Northern Cape Province: Broad alluvia of the Orange River, lower Caledon as well as lower

stretches of the Vaal, Riet and Modder rivers as far as Groblershoop. These river stretches are surrounded by vegetation units of broad transitional regions between the dry facies of the Savanna and Grassland and northern regions of the Nama-Karoo Biome. Altitude ranging from 1000 – 1500m.

The area has flat alluvial terraces supporting complex of riparian thickets (gallery forests) dominated by native *Acacia karoo* and *Diospyros lycioides*, flooded grasslands, reed beds and ephemeral herblands populating mainly sand banks within the river and on its banks

Some other important Taxa found on in the area:

Riparian thickets

Small trees: *Acacia karoo* (d), *Celtis Africana* (d), *Salix mucronata* subsp. *mucronata* (d)

Tall shrubs: *Diospyros lycioides* (d), *Melianthus comosus* (d), *Rhus pyroides*

Low Shrubs: *Asparagus setaceus*, *A. suaveolens*.

Woody Climber: *Clematis brachiate*.

Succulent Shrub: *Lycium arenicola*, *L. hirsutum*.

Herb: *Rubia cordifolia*

Flooded grasslands & herblands

Graminoids: *Melica decumbens* (d)

Herbs: *Cineraria dregeana*, *C. lobate*.

Upper Gariep Alluvial Vegetation has a conservation which is vulnerable with a target of 31%. Only about 3% statutorily conserved in Tussen Die Riviere, Gariep Dam and Oviston Nature Reserve. More than 20% transformation for cultivation (vegetable grapes) and building of dams. Exotic woody species such as *Salix babylonica*, *Eucalyptus camaldulensis*, *E. sideroxylon*, *Prosopis* and *Populus* species have become common dominants in patches of heavily disturbed alluvial vegetation (Mucina and Rutherford, 2006:639-640).

Protected Areas

According to the data for the protected areas, the portion does not fall within the national protected area nor threatened ecosystems.

Recommendations

- The EAP shall be notified should the occurrence of the tree, *Acacia erioloba*, or any other valuable Flora specie be identified. If the EAP finds that the mining activities will have an impact on such a tree(s)/flora specie or that the tree/flora specie needs to be removed, the needed permit will be applied for.
- 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.

A handwritten signature in black ink, appearing to read 'Danie Labuschagne', written over a faint horizontal line.

Signature of the EAP: Danie Labuschagne

Date: 14/06/2016