

Ecological Desktop Study

The Mining Right of Diamonds, Diamonds General, Diamonds Alluvial and Kimberlite near Prieska on
Remainder of Portion 1 of the farm Uitdraai 33, Registration Division Prieska RD, Northern Cape Province.

Reference No. : NC30/5/1/2/2/10099MR

Prepared by



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Introduction

Milnex 189 CC was contracted by Prieska Diamond Mining (Pty) Ltd as the independent environmental consultant to undertake the Ecological Desktop Study for the Scoping Environmental Assessment process for Mining Right for the removal of Diamonds, Diamonds General, Diamonds Alluvial and Kimberlite near Prieska on Remainder of Portion 1 of the farm Uitdraai 33, Registration Division Prieska RD, Northern Cape 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.

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.

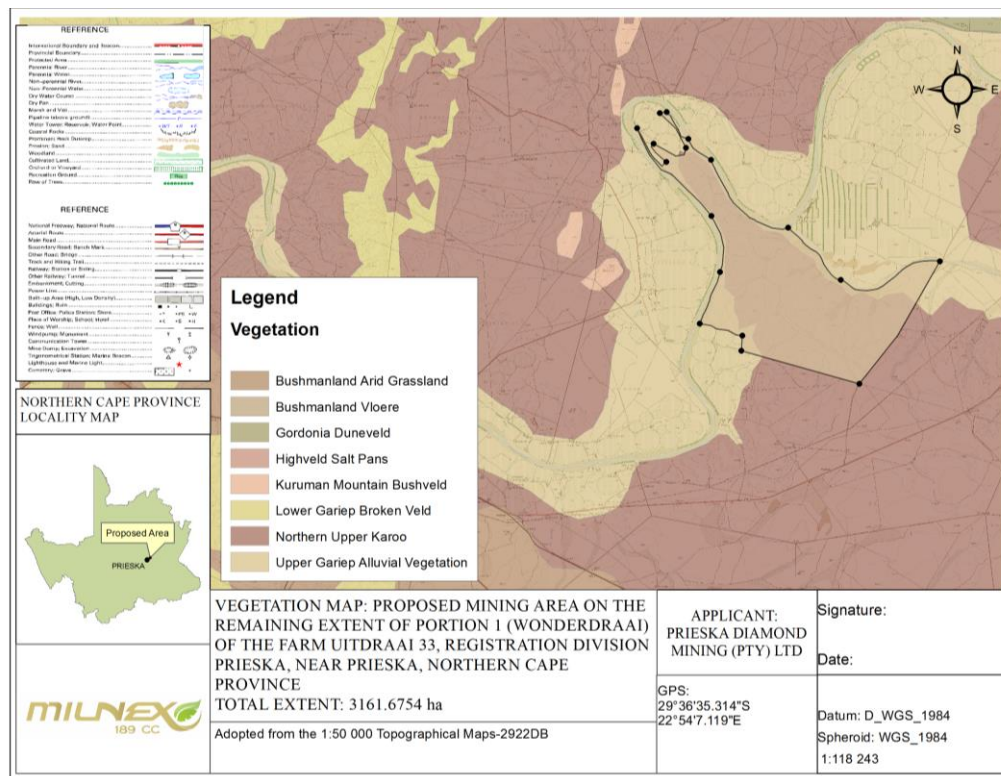


Figure 1: Vegetation Unit Map

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation unit NKu 3 and AZa 4, which is known as the Northern Upper Karoo and Upper Gariep Alluvial Vegetation. The Northern Upper Karoo is part of the Upper Karoo Bioregion, which is a sub-bioregion for the Nama-Karoo Biome. The Upper Gariep Alluvial Vegetation is part of the Alluvial Vegetation Bioregion which is a sub-bioregion for the Inland Azonal Vegetation.

Northern Upper Karoo

According to Mucina and Rutherford (2006:340), the Northern Upper Karoo vegetation covers the Northern Cape and Free State Provinces which include the Northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Philipstown, Petrusville and Petrusburg in the east. Bordered in the north by Niekerkshoop, Douglas and Petrusburg and in the south by Carnarvon, Pampoenpoort and De Aar. A few Patches occur in Griqualand West. It is situated on an altitude of 1000m – 1500m.

The shrubland area is dominated by dwarf karoo shrubs, grasses and *Anacia mellifera* subsp. *detinens* and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River). Flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans.

However, this site has little to none vegetation cover due to historical mining practices.

Some other important Taxa found on in the area:

Small Trees: *Acacia mellifera* subsp. *detinens*, *Boscia albitrunca*.

Tall Shrubs: *Lycium cinereum* (d) *L. horridum*, *L. oxycarpum*, *L. schizocalyx*, *Rhigozum trichotomum*.

Low Shrubs: *Shrysocoma ciliata* (d), *Gnidia polycephala* (d), *Pentzia calcarea* (d), *P. globose* (d), *P. incana* (d), *P. spinescens* (d), *Rosenia humilis* (d), *Amphiglossa triflora*, *Aptosimum marlothii*, *A. spinescens*, *Asparagus glauca*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides* subsp. *ericoides*, *E. gladulosus*, *E. spinescens*, *Euryops asparagoides*, *Felicia muricata*, *Helichrysum lucilioides*, *Hermannia spinose*, *Leucas capensis*, *Limeum aethiopicum*, *Melolobuim candicans*, *Microlooma armatum*, *Osteospermum leptolobum*, *O. spinescens*, *Pegolettia retrofracta*, *Pentzia lanata*, *Phyllanthus maderaspatensis*, *Plinthus karoocicus*, *Pteronia glauca*, *P. sordida*, *Selago geniculate*, *S. saxatilis*, *Tetragonia arbuscular*, *Zygophyllum lichtensteinianum*.

Herbs: *Chamaesyce inaequilatera*, *Convolvulus sagittatus*, *Dicoma capensis*, *Gazania krebsiana*, *Hermannia comosa*, *Indigofera alternans*, *Lessertia pauciflora*, *Radyera urens*, *Sesamum capense*, *Sutera pinnatifida*, *Tribulus terrestris*, *Vahlia capensis*.

Graminioids: *Aristida adscensoinis* (d), *A. congesta* (d), *A. diffusa* (d), *Enneapogon desvauxii* (d), *Eragrostis lehmanniana* (d), *E. obtusa* (d), *E. truncate* (d), *Sporobolus fimbriatus* (d), *Stipagrostis obtuse* (d), *Eragrostis bicolor*, *E. porosa*, *Fingerhuthia Africana*, *Heteropogon contortus*, *Stipagrostis ciliata*, *Themeda triandra*, *Tragus berteronianus*, *T. koelerioides*, *T. racemosus*.

Succulent Shrubs: *Hertia pallens*, *Salsola calluna*, *S. glabrescens*, *S. rabieana*, *S. tuberculata*, *Zygophyllum flexuosum*.

Semiparasitic Shrubs: *Thesium hystrix* (d)

Succulent Herb: *Psilocaulon coriarium*.

Geophytic Herb: *Moraea pallida*.

Mucina and Rutherford (2006:340) also states that the conservation of the Northern Upper Karoo, is Least Threatened with a target of 21%. About 4% has been cleared for cultivation (the highest proportion of any type in the Nama-Karoo) or irreversibly transformed by building of dams (Houwater, Kalkfontein and Smart Syndicate Dams). Areas of human settlements are increasing in the north-eastern part of this vegetation types.

Gariep Alluvial Vegetation

According to Mucina and Rutherford (2006:639), the 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 1 000 – 1 500 m.

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 brachiata*.

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

Herb: *Rubia cordifolia*

Flooded grasslands & herblands

Graminoids: *Melica decumbens* (d)

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

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).

The EAP that compiled the report is also aware that the presence of *Acacia erioloba* dominates these areas.

Protected Areas

According to the protected areas map, the proposed mining right area does not fall within any protected areas neither does it fall under the threatened ecosystem. Below is a map that depicts areas which are protected in the vicinity of the proposed farm

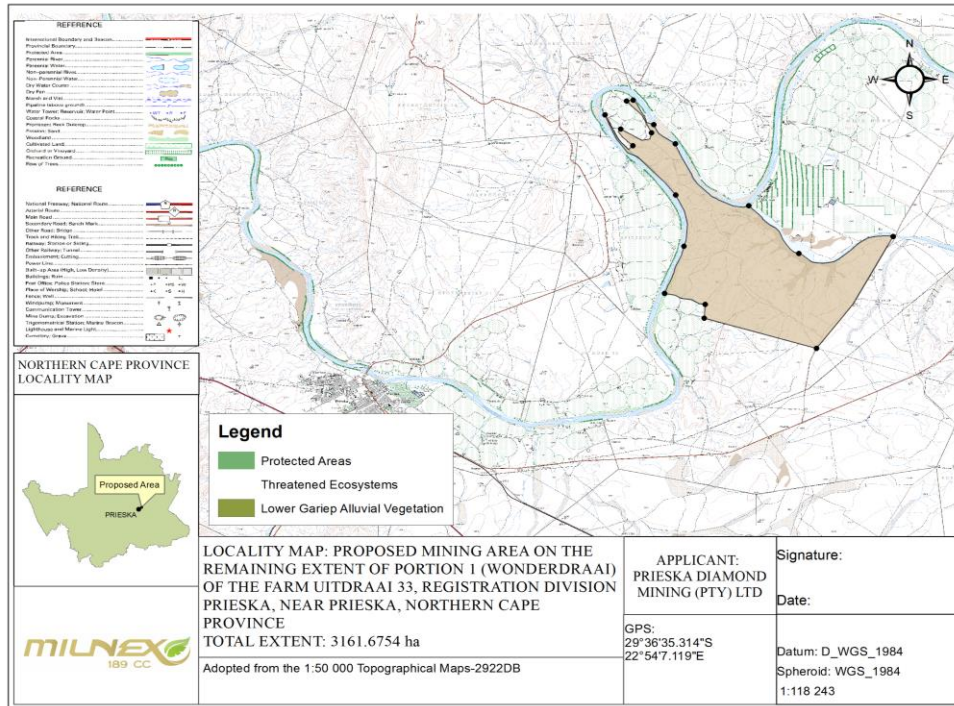


Figure 2: Protected Areas Map

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 figure below, these are the only local municipalities which have CBA maps, thus Siyathemba Local Municipality does not fall within these municipalities.

local municipality CBA maps
 Namakwa District Municipality
 Hantam Local Municipality
 Kamiesberg Local Municipality
 Karoo Hoogland Local Municipality
 Khai Ma Local Municipality
 Nama Khoi Local Municipality
 Richtersveld Local Municipality

Figure 3: Municipalities which have CBA maps.

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.



Signature of the EAP: Danie Labuschagne

Date: 25/02/2016