

ANNEXURE "D"

ENVIRONMENTAL SCAN

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Environmental Feasibility study

of

**Erven 862, 863, 865 & 866 Mapleton;
On a Portion of the farm
VLAKPLAATS 138 IR**

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1. Introduction

Galago Environmental CC was appointed to determine the environmental feasibility of the proposed **Mapleton** site development (henceforth known as the “study site”).

Environmental feasibility studies are aimed at determining if there are any environmental concerns to the development of the site. An environmental feasibility is mostly driven by a desktop review of the site, as well as a short site visit to confirm desktop identified objects and concerns. This document should in no way or manner be seen as a complete ecological investigation of a site, but rather as decision support document to develop the site or not.

Feasibility Studies are defined as: *“the process of determining whether or not an individual proposal requires detailed environmental assessment and the level of assessment that should occur”* (DEAT, 2002).

Environmental feasibility is divided into three main tasks namely:

Task 1: Desktop investigation

All relevant information is compiled prior to the site visit in a desktop review of the study site. This information includes:

- Vegetation maps from sources such as Mucina and Rutherford (2007)
- Red and orange data lists (as available from GDARD)
- Hydrological Data (as available from DWA)
- Aerial imagery assessment (including Google Earth, GIS and historical aerial images)

Task 2: Site Visit

The site visits are aimed to confirm or reject the desktop investigation findings. This is especially relevant with wetland and the assessment of impacts on site. The objective was to determine the sensitivity of the site including the possible occurrence of Red List or Orange List species (fauna and flora), the presence of wetlands

Task 3: Report compilation

A short report is compiled.

2. Assumptions and limitations

This document is in no way or manner a complete environmental assessment of the site and is purely driven as a desktop investigation of the site. This document remains the property of Galago Environmental cc. and may in no way or shape be reproduced, quoted or copied without the consent from Galago Environmental cc.

The site visit was done in May 2016, and is in no way or manner the appropriate season for vegetation assessments. Follow up fauna and flora investigations of the site is required during the summer months (November to March) as required by GDARD minimum requirements (GDARD, 2014).

Galago Environmental can thus not accept responsibility for conclusions and mitigation measures made in good faith based on own databases or on the information provided at the time of the directive. This report should therefore be viewed and acted upon with these limitations in mind.

3. Site location and description

The ±4 ha study site lies within Mapleton x 10, north of Vosloorus. The study site is bordered by the N3 on the southern side and Luvuyo Street on the northern side. The study site lies on a portion of the farm Vlakplaats 138 IR.

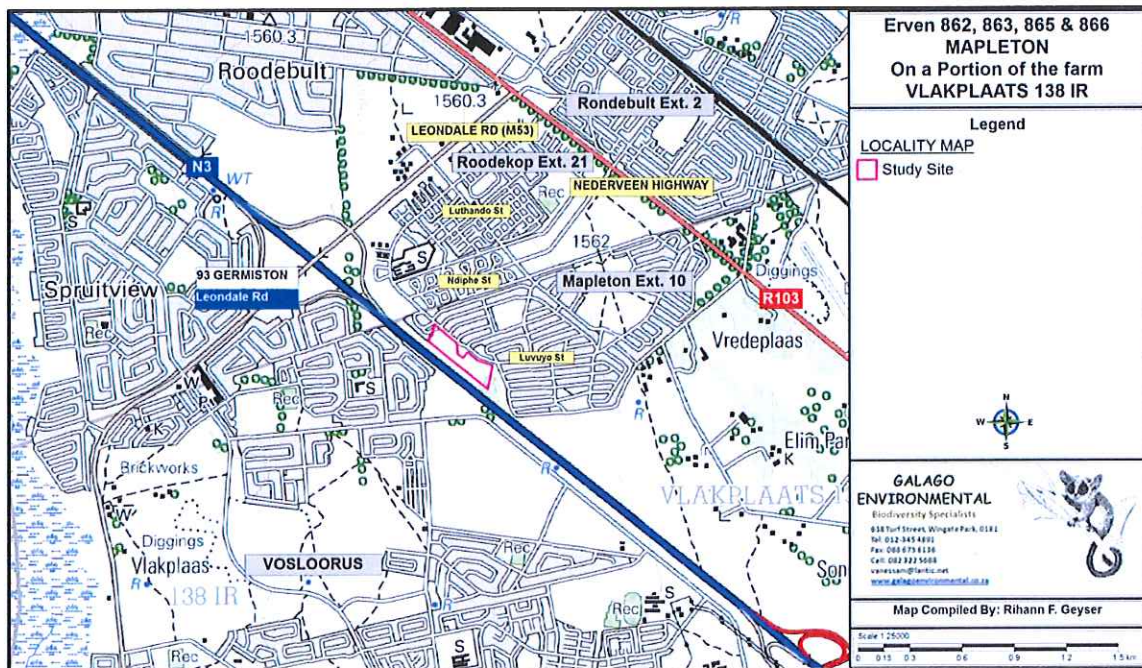


FIGURE 1: LOCALITY MAP OF THE STUDY AREA

3.1. Regional vegetation

The study site lies in the quarter degree square 2628AB (Springs). Mucina & Rutherford (2006) classified the area as **Soweto Highveld Grassland** (Gm 10) and **Tsakane Clay Grassland** (Gm 9) vegetation

The landscape of the Soweto Highveld Grassland vegetation type consists of gentle to moderately undulating plains on the Highveld plateau supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. In places where the natural vegetation is not disturbed only scattered small wetlands, narrow steams alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover (Mucina and Rutherford, 2006).

The landscape of the **Tsakane Clay Grassland** vegetation type consists of flat to slightly undulating plains and low hills. Vegetation is short, dense grassland dominated by a mixture of common highveld grasses such as *Themeda triandra*, *Heteropogon contortus*, *Elionurus muticus* and a number of *Eragrostis* species. Most prominent forbs are of the families Asteraceae, Rubiaceae, Malvaceae, Lamiaceae and Fabaceae. Disturbance leads to an increase in the abundance of the grasses *Hyparrhenia hirta* and *Eragrostis chloromelas*.

3.1.1 Conservation status of habitat

Both vegetation types are considered endangered. With regards to the **Soweto Highveld Grassland** vegetation type only a handful of patches are statutorily conserved or privately conserved. Almost half of the area has already been transformed by cultivation, urban sprawl, mining and building of road infrastructure. Some areas have been flooded by dams.

Erosion is generally very low (93%). With regards to the **Tsakane Clay Grassland** vegetation type, only 1.5% is conserved in statutory reserves. More than 60% of this vegetation type has undergone transformation mostly by urbanisation, cultivation, mining, dam-building and roads. Urbanisation is increasing and further expansion of especially the southern suburbs of Johannesburg and towns of the East Rand will bring further pressure on the remaining vegetation. Erosion is very low (87%) and low (11%) across the entire unit (Mucina and Rutherford, 2006).

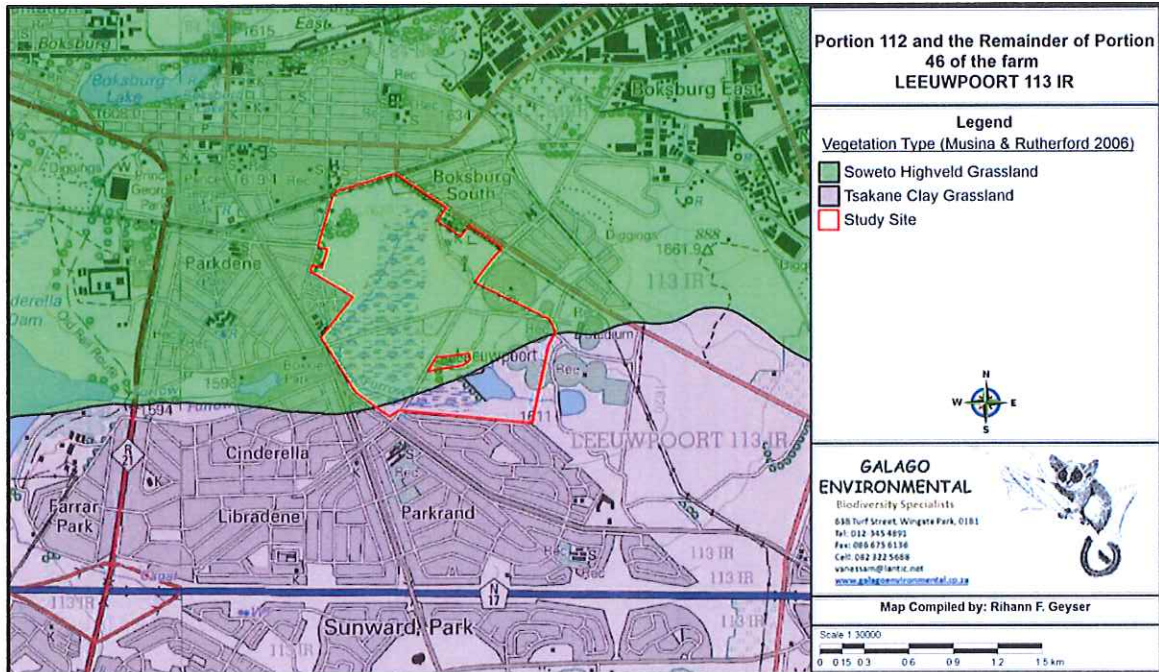


FIGURE 2: VEGETATION TYPE OF THE STUDY SITE.

3.2. Critical Biodiversity Areas and Ecological Support areas

According to C-plan 3.3 there are no Critical Biodiversity areas and Ecological Support Areas within the study area.

3.3. Proposed Activities

Ekurhuleni Local Municipality proposes the construction of high density, low cost residential properties.

3.4. Aquatic description

The study site lies near the Natalspruit, and is located in the Upper Vaal Water management area. See **FIGURE 3** below for the Department of Water Affairs's Google Earth layer information of the site.



FIGURE 3: THE CATCHMENT AND HYDROLOGICAL DATA FOR THE STUDY SITE, AS AVAILABLE FROM DWA RQS SERVICES.

The site falls within quaternary catchment C22B. The study site forms part of Ecoregion 11 and is classified by the following characteristics (DWA, 2005):

- Mean annual precipitation: Rainfall varies from low to moderately high, with an increase from west to east.
- Coefficient of variation of annual precipitation: Moderately high in the west, decreasing to low in the east.
- Drainage density: Mostly low, but medium in some areas.
- Stream frequency: Low to medium.
- Slopes <5%: >80%, but 20-50% in a few hilly areas.
- Median annual simulated runoff: Moderately low to moderate.
- Mean annual temperature: Hot in the west and moderate in the east.

3.5. Climatic conditions on the Site

Summer-rainfall ranging between 570 mm to 730 mm per annum with warm summers and very cold winter temperatures (Mucina and Rutherford, 2006).

3.6. Historical and Current use of the property

Google Earth's Timeline function was used as reference imagery (Accessed May 2016). Google Earth imagery from 2003 (Figure 4) to early 2015 (Figure 5) is available and was used to determine the historical land use and whether the site was extensively altered in the past or to detect large changes in the land use of the catchment. The maps are also used to identify areas where possible aquatic ecosystems occur). From these images, it is clear to see the study site has had increased development on the neighbouring properties.



FIGURE 4: THE OLDEST USABLE GOOGLE EARTH IMAGE OF THE SITE FROM 2003



FIGURE 5: GOOGLE EARTH IMAGE FROM 2015

4. Methods

4.1. Flora assessment

A desktop study of the habitats of the Red List and Orange List species known to occur in the area was done before the site visit. Information about the Red List and Orange List plant species that occur in the area was obtained from GDARD. The Guidelines issued by GDARD to plant specialists were consulted to ascertain the habitat of the Red- and Orange List species concerned. The vegetation map published in Mucina and Rutherford (2006) was consulted about the composition of Tsakane Clay Grassland and Soweto Highveld grassland.

The study site was visited on 23 May 2016. The sensitivity of the site was evaluated visually and the habitat examined to determine whether Red List or Orange List species were likely to occur.

4.2. Wetland Delineation methods

To delineate *any* wetland the following criteria are used as in line with Department of Water Affairs (DWA): A practical field procedure for identification and delineation of wetlands and riparian areas, Edition 1 September 2005. These criteria are:

- Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation such as grey horizons, mottling streaks, hard pans, organic matter depositions, iron and manganese concretion resulting from prolonged saturation;
- The presence, at least occasionally, of water loving plants (hydrophytes);
- A high water table that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50cm of the soil.
- Topographical location of the wetland in relation to the landscape

Also read with the guide is a draft updated report of the abovementioned guideline. The draft is used, as it provides a guideline to delineation of wetland areas:

Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare.
DWA (2008) Draft report

These criteria will mainly indicate a system as well as individual change in the wetland and riparian area. Wetlands occur throughout most topographical locations, with even the small depression wetland occurring on the crest of the landscape. The topographical location of possible wetlands is purely as an indication of the actions and movement of water in the landscape and is not a definitive delineator (**FIGURE 6**).

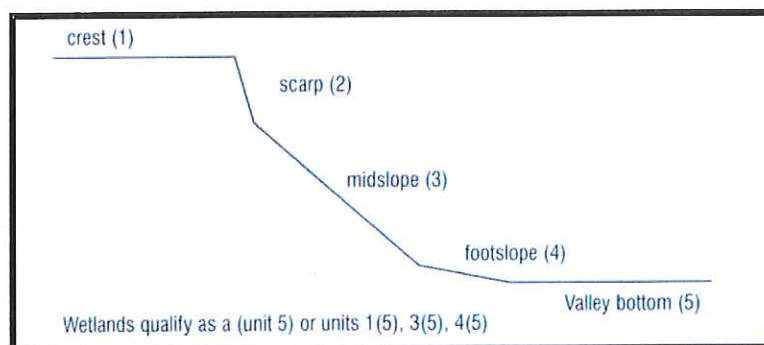


FIGURE 6: THE TOPOGRAPHICAL LOCATION OF WETLANDS IN THE LANDSCAPE (FROM DWA, 2005).

Changes in the presence and frequency of mottling in the soils are the main methods of delineation. This is as mottles are usually not influenced by short term changes in the hydrology and vegetation of the wetland (FIGURE 7).

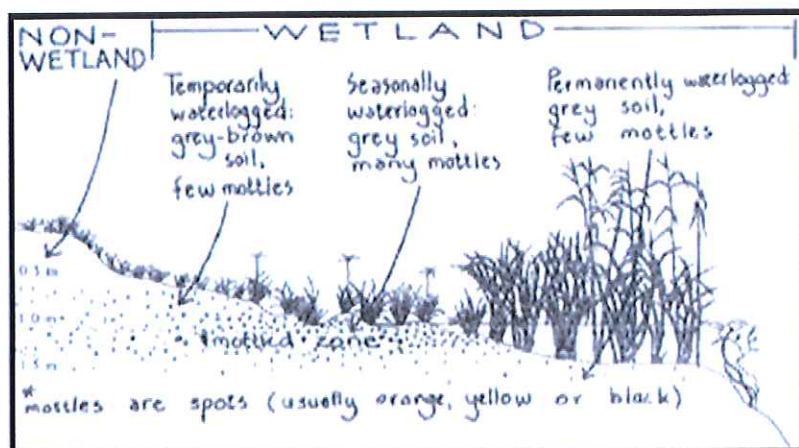


FIGURE 7: CROSS SECTION THROUGH A WETLAND WITH SOIL WETNESS AND VEGETATION INDICATORS. SOURCE: DONOVANKOTZE, UNIVERSITY OF KWAZULU NATAL (FROM WWW.WATERWISE.CO.ZA)

The outer boundary of the wetland is defined as: "the point where the indicators are no longer visible" (DWA, 2005). Using the desktop delineation GPS points, sampling took place firstly to truth if the desktop GPS points did in fact represent a wetland area. Secondly using soil sampling and moving away from the already proven wetland, further soil samples were taken until no wetland indicators were found. These points with no wetland indicators are marked and the middle between the sites with wetland indicators and non-wetland indicator sites are marked as the wetland outside boundary. The GPS coordinates are taken of these chosen boundary sites.

5. Results

A highly disturbed and impacted study site was observed during the site visit. Most of the natural vegetation has been encroached by alien vegetation. A small section of wetland was observed in the western corner.

5.1. Flora

The vegetation of the study site comprises very disturbed grassland with old excavations evident over the entire site. A drainage ditch that seems to overflow at times runs through the site from Mapleton Extension 10. An old orchard occurs in the south-eastern corner of the site (**Error! Reference source not found. 8: Very disturbed grassland**). Connectivity with natural grassland does not exist. The study site does not have suitable habitat for any Red List or Orange List species (see Annexure A).



FIGURE 8: VERY DISTURBED GRASSLAND

5.2. Wetlands

A potential depression wetland area was found on site. See Figure 9 for a basic desktop delineation of the wetlands on site.



FIGURE 9: DESKTOP INVESTIGATION OF THE WETLANDS FOUND ON SITE

5.3. Faunal assessment

No formal faunal assessment was done on site, but the anthropogenic impacts on the site will limit the species encountered to rodents as well as some domestic animals (mostly cattle, cats and dogs).

6. Conclusion and mitigating recommendations

The vegetation of the study site comprises very disturbed grassland with old excavations evident over the entire site. The study site does not have suitable habitat for any Red List or Orange List species. The delineation of the wetland indicators found on site must be done to determine the extent of the wetland.

7. Environmental requirements

The proposed development site is smaller than 20ha and a Basic Assessment process will have to be followed in terms of the NEMA EIA regulations, 2014. It is recommended that the following specialist studies be undertaken during the EIA process:

- Flora and fauna study
- Wetland delineation study
- Cultural Heritage study

8. References

Publications:

- Department of Environmental Affairs and Tourism (DEAT) (2002). Screening, Information Series 1, Pretoria.
- DWA (Department of Water Affairs) (2008). Draft Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare.
- DWAF (Department of Water Affairs) (2005) A practical field procedure for identification and delineation of wetlands and riparian areas, Edition 1 September 2005
- GDARD (Gauteng Department of Agriculture and Rural Development). Gauteng Conservation Plan: Version 3.1.0.12.
- GDARD, 2012. *Requirements for biodiversity assessments Version 2*. Directorate of Nature Conservation, Department of Agriculture and Rural development.
- GDARD, 2012. *Red List Plant Species Guidelines*. Compiled 26 June 2006 with minor edits in January 2012. Directorate of Nature Conservation, Department of Agriculture and Rural development.
- Macfarlane DM, Kotze DC, Ellery WN, Walters D, Koopman V, Goodman P and Goge C. 2007. WET-Health: A technique for rapidly assessing wetland health. WRC Report No TT 340/08, Water Research Commission, Pretoria
- Mucina, L. & Rutherford, M.C. (eds). 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.
- Pfab, M.F. & Victor, J.E. 2002. Threatened plants of Gauteng, South Africa. *South African Journal of Botany*, Vol 68: 370 – 375.
- Raimondo, D., Von Staden. L., Foden, W., Victor, J.E., Helme, N.A., Turner R.C., Kamundi, D.A. & Manyama, P.A. (eds) 2009. *Red list of South African Plants 2009*. Strelitzia 25. South African National Biodiversity Institute, Pretoria.
- Wagner RG & Hagan JM (Editors). 2000. Forestry and the riparian zone. Conference Proceedings. Wells Conference Centre, University of Maine Orono, Maine October 2000.

Websites:

www.waterwise.co.za

9. ANNEXURE A: Red List and Orange List* plants of the 2628AC q.d.s.

Species	Flower season	Suitable habitat	Priority group	Conserv. status	PRESENT ON SITE
<i>Argyrobium campicola</i>	Nov-Feb	Highveld grassland	A3	Near threatened ¹	Habitat not suitable
<i>Bowiea volubilis</i> subsp. <i>volubilis</i>	Sep-Apr	Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest.	B	Vulnerable ²	Habitat not suitable
<i>Cineraria longipes</i>	Mar-May	Grassland, on koppies, amongst rocks and along seep lines exclusively on basalt on south-facing slopes.	A1	Vulnerable ¹	Habitat not suitable
<i>Delosperma purpureum</i>	Nov-Apr	South-facing slopes, grows in shallow soils among quartzitic rocks of crystalline or conglomerate type in open or broken shade rarely in shade, in grassland with some trees. .	A1	Endangered ¹	Habitat not suitable
<i>Dioscorea sylvatica</i>	Oct-Jan	Wooded places with fair to reasonably good rainfall, such as the moister bushveld areas, coastal bush and wooded mountain kloofs.	B	Vulnerable ²	Habitat not suitable
<i>Eucomis autumnalis</i>	Nov-Apr	Damp open grassland and sheltered places.	N/A	Declining ²	Habitat not suitable
<i>Eulophia coddii</i>	Early Dec	Steep hillsides on soil derived from sandstone, grassland or mixed bush.	A2	Vulnerable ¹	Habitat not suitable
<i>Habenaria mossii</i>	Mar-Apr	Open grassland on dolomite or in black sandy soil.	A1	Endangered ¹	Habitat not suitable
<i>Holothrix micrantha</i>	Oct	Terrestrial on grassy cliffs, recorded from 1500 to 1800m.	A1	Endangered ¹	Habitat not suitable
<i>Holothrix randii</i>	Sep-Jan	Grassy slopes & rock ledges, usually southern aspects.	B	Near Threatened ²	Habitat not suitable
<i>Hypoxis hemerocallidea</i>	Sep-Mar	Occurs in a wide range of habitats. Grassland and mixed woodland.	N/A	Declining ²	Habitat not suitable
<i>Khadia beswickii</i>	Jul-Apr	Open areas on shallow surfaces over rocks in grassland.	A1	Vulnerable ¹	Habitat not suitable
<i>Lithops lesliei</i> subsp. <i>lesliei</i>	Mar-Jun	Arid grasslands where it usually occurs in rocky places.	B	Near threatened ²	Habitat not suitable
<i>Stenostelma umbelluliferum</i>	Sep-Mar	Deep black turf in open woodland mainly in the vicinity of drainage lines.	A3	Near threatened ¹	Habitat not suitable

¹⁾ global status

²⁾ national status

* Orange listed plants have no priority grouping and are designated 'N/A'