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Environmental Feasibility study

Of

**Kutalo Station on portion 103 of the
farm Driefontein 87-IR**

June 2013

**Compiled by:
Mr Bertus Fourie (B. Tech Nature Conservation)
& Mrs. P. Lemmer (Cert. Sci. Nat: B.Sc.)**

i. DECLARATION OF INDEPENDENCE

I, **Bertus Fourie**, declare that -

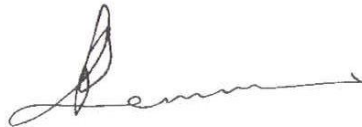
- I am subcontracted as specialist consultant by Galago Environmental CC for the Kutalo Station wetland ecosystem Delineation.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in Regulation 8;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.



Bertus Fourie

I, **Petro Lemmer** (440129 0025 085) declare that I:

- am committed to biodiversity conservation but concomitantly recognize the need for economic development. Whereas I appreciate the opportunity to also learn through the processes of constructive criticism and debate, I reserve the right to form and hold my own opinions and therefore will not willingly submit to the interests of other parties or change my statements to appease them
- abide by the Code of Ethics of the S.A. Council for Natural Scientific Professions
- act as an independent specialist consultant in the field of botany
- am subcontracted as specialist consultant by Galago Environmental CC for the proposed Kutalo Station development project described in this report
- have no financial interest in the proposed development other than remuneration for work performed
- have or will not have any vested or conflicting interests in the proposed development
- undertake to disclose to the Galago Environmental CC and its client as well as the competent authority any material information that have or may have the potential to influence the decision of the competent authority required in terms of the Environmental Impact Assessment Regulations, 2006.



Petro Lemmer

TABLE OF CONTENTS

I. DECLARATION OF INDEPENDENCE	2
1. INTRODUCTION	5
2. ASSUMPTIONS AND LIMITATIONS.....	5
3. SITE LOCATION AND DESCRIPTION.....	6
3.1. REGIONAL VEGETATION.....	6
3.2. PROPOSED ACTIVITIES.....	7
3.3. AQUATIC DESCRIPTION.....	7
3.4. CLIMATIC CONDITIONS ON THE SITE.....	8
3.5. HISTORICAL AND CURRENT USE OF THE PROPERTY.....	8
4. METHODS.....	10
4.1. FLORA ASSESSMENT.....	10
4.2. WETLAND DELINEATION METHODS.....	10
5. RESULTS.....	12
5.1. CONNECTIVITY.....	12
5.2. FAUNAL ASSESSMENT.....	13
6. CONCLUSION AND MITIGATING RECOMMENDATIONS.....	13
7. REFERENCES.....	14
8. ANNEXURE A: RED- AND ORANGE LIST* PLANTS .	16
9. ANNEXURE B: GDARD BIODIVERSITY REQUIREMENTS.....	17

FIGURES:

FIGURE 1: LOCALITY MAP OF THE STUDY AREA	6
FIGURE 2: THE CATCHMENT AND HYDROLOGICAL DATA FOR THE STUDY SITE.....	7
FIGURE 3: THE MOST RECENT GOOGLE EARTH AERIAL IMAGE OF THE SITE FROM 2012	8
FIGURE 4: THE OLDEST GOOGLE EARTH IMAGE OF THE SITE, TAKEN IN 2001.....	9
FIGURE 5: THE 1952 AERIAL PHOTOGRAPH OF THE STUDY SITE (YELLOW POLYGON).	9
FIGURE 6: THE TOPOGRAPHICAL LOCATION OF WETLANDS IN THE LANDSCAPE	11
FIGURE 7: CROSS SECTION THROUGH A WETLAND	11
FIGURE 8: CULTIVATION OF THE STUDY SITE.....	12

TABLES:

TABLE 1: THE IMPACT OF CONNECTIVITY INTERRUPTERS ON THE STUDY SITE'S RIDGE.....	13
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1. Introduction

Galago Environmental CC was appointed to determine the environmental feasibility of the proposed Kutalo station on Portion 103 of the farm Driefontein 87-IR, Germiston South (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 (2006)
- Red and orange data lists of flora (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 to determine whether there are potential wetlands or sensitive flora on site and to assess the potential impacts associated with the proposed development. The objective was to determine the sensitivity of the site in relation to the possible occurrences of Red List or Orange List species (fauna and flora) and 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 June 2013, 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 the Gauteng Department of Rural Development (GDARD) Minimum Requirements for Biodiversity Assessments (GDARD, 2012), should the Environmental Impact Assessment Process be undertaken for the study site in the future.

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 7,6894 ha study site lies northeast of, and parallel to the railway line of Kutalo Station and between Kutalo Road in the north and Henderson Road in the south, Germiston.

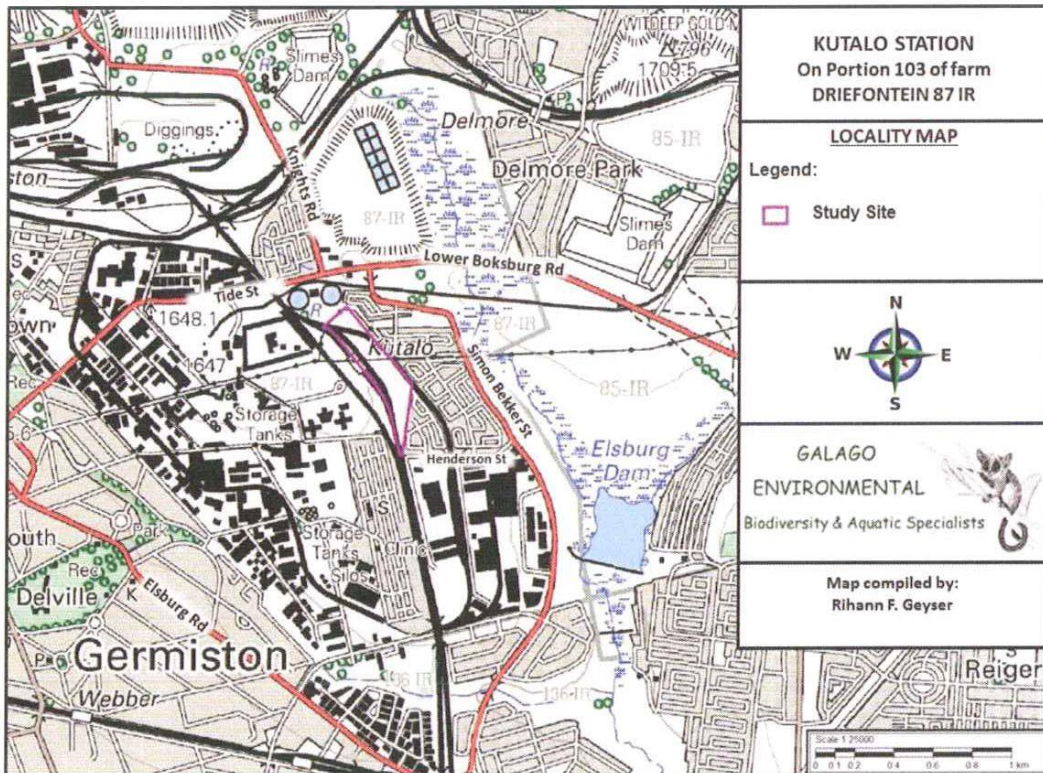


Figure 1: Locality map of the study area

3.1. Regional vegetation

The study site lies in the quarter degree square 2628AA (Johannesburg). Mucina & Rutherford (2006) classified the area as Soweto Highveld Grassland, a gently to moderately undulating landscape 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 *Elyonurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. It is in places undisturbed, with scattered small wetlands, narrow stream alluvia and pans. Occasional ridges or rocky outcrops interrupt the continuous grassland cover. This vegetation unit comprises shale, sandstone or mudstone, or the intrusive Karoo Suite dolerites which feature prominently. The soil is deep and red on the flat plains.

It has summer rainfall and cool-temperate climate with high extremes between maximum summer and minimum winter temperatures, frequent frosts and large thermic diurnal differences, especially in autumn and spring.

This vegetation unit is considered endangered. Its conservation target is 24%. Only few patches are conserved in statutory reserves and a few private nature reserves. Almost 50% of the unit is already transformed by cultivation, urbanization, mining and road infrastructure and some areas have been flooded by dams.

3.2. Proposed Activities

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

3.3. Aquatic description

The study site lies near Elsburgspruit, a major tributary to the Natsalspruit in the Upper Vaal Water management area. See **FIGURE 2** below for the Department of Water Affairs's Google Earth layer information of the site.

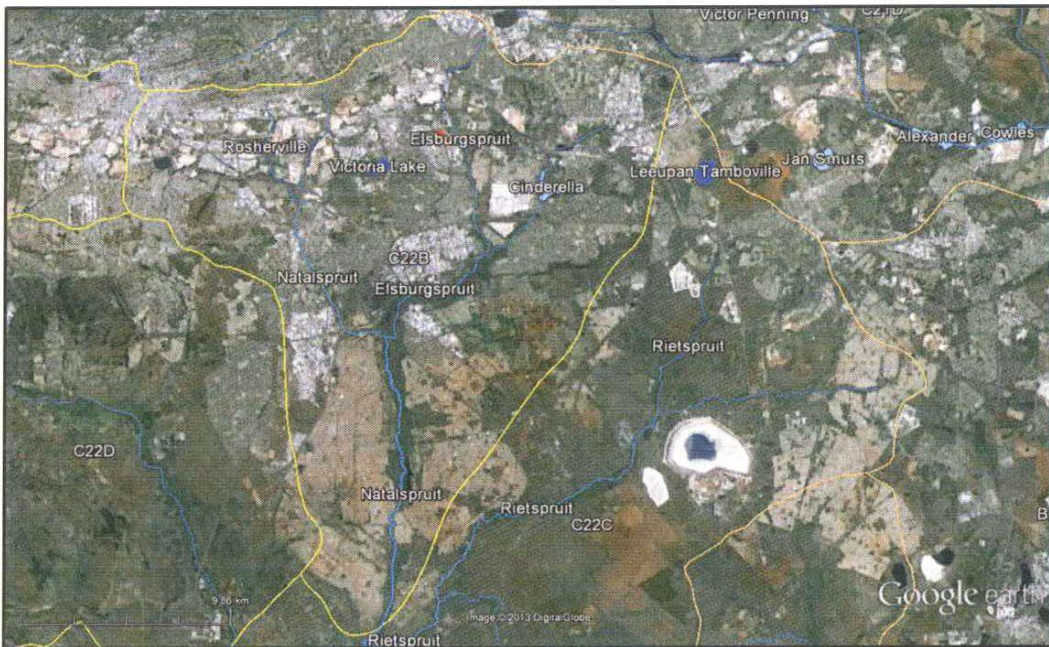


FIGURE 2: THE CATCHMENT AND HYDROLOGICAL DATA FOR THE STUDY SITE, AS AVAILABLE FROM DWA RQS SERVICES.

The site falls within quaternary catchment C22B. The study site forms part of Ecoregion 11 and is classified by the following characteristics (DWAf 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.

3.4. Climatic conditions on the Site

The climate of the site is typical of the Highveld region. Precipitation is usually in the form of thundershowers, often accompanied by hail in the summer months followed by dry winters. The mean annual precipitation for the area is between 600 and 700 mm, with the dominant precipitation received during the months of October to March.

The area generally receives little rainfall during the months from April to September. The highest monthly temperature of 35.3°C is recorded in January and the lowest monthly temperature of -3.3°C is recorded in July. The area is significantly colder than Pretoria itself, with winter temperatures easily dropping to 4 degrees below freezing point with extensive frost during winter months (Mucina and Rutherford, 2006).

3.5. Historical and Current use of the property

Prior to assessing the historical land use of the study site, the most current aerial image is accessed (Figure 3). To assess the recent historical land use, Google Earth's Timeline function is used ("Kutalo Station" 26°13'5.15"S 28°11'24.10"E Accessed June 2013) (Figure 5).



FIGURE 3: THE MOST RECENT GOOGLE EARTH AERIAL IMAGE OF THE SITE FROM 2012



FIGURE 4: THE OLDEST GOOGLE EARTH IMAGE OF THE SITE, TAKEN IN 2001.

To assess the older land use, aerial photography from the 1940 to 1970's is used (Figure 5). This provides a clearer indication if in the past, the site was extensively altered or to detect large changes in the land use of the catchment. This is also useful when determining the current state of the site, to explain observed objects of concern.

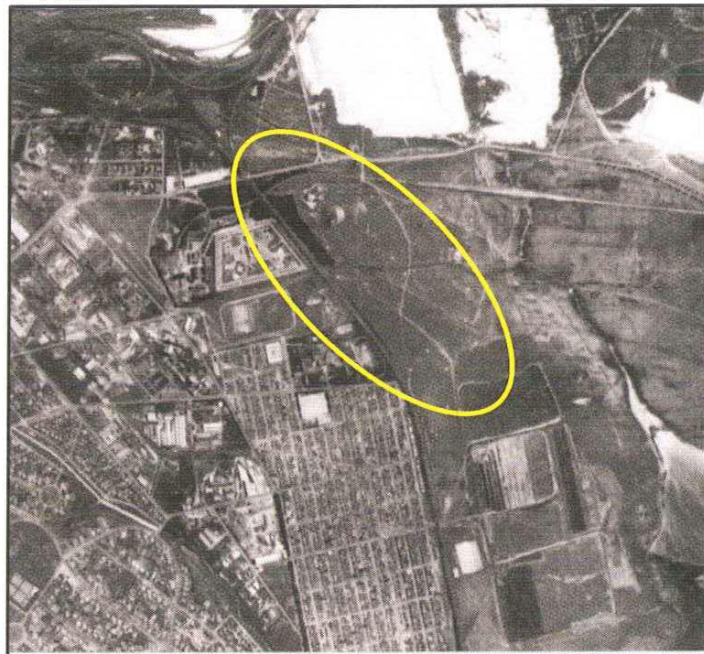


FIGURE 5: THE 1952 AERIAL PHOTOGRAPH OF THE STUDY SITE (YELLOW POLYGON).

From the 1952 image it can be seen that the site is still open to the east but development is already present to the other sides. The railway is already constructed and the mine tailings are where it is today.

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 Soweto Highveld Grassland.

The study site was visited on 3 June 2013. 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**).

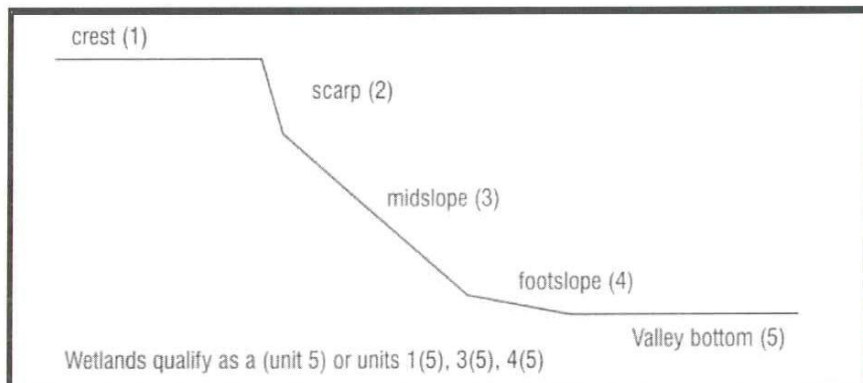


FIGURE 6: THE TOPOGRAPHICAL LOCATION OF WETLANDS IN THE LANDSCAPE (FROM DWAF, 2005).

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).

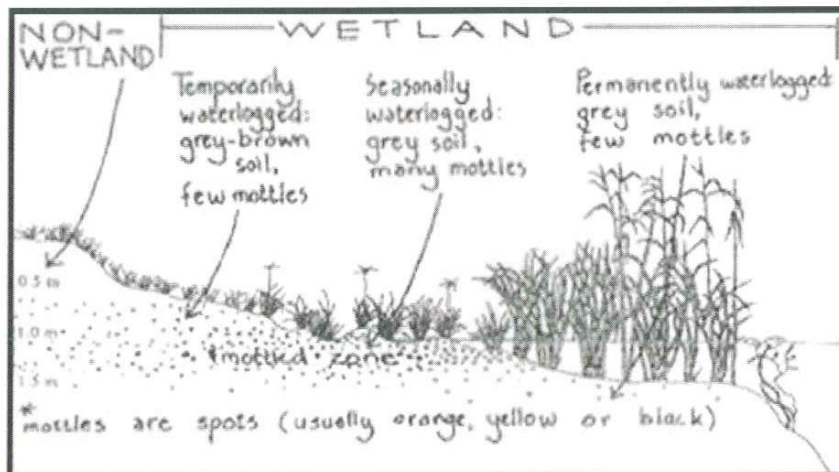


FIGURE 7: CROSS SECTION THROUGH A WETLAND WITH SOIL WETNESS AND VEGETATION INDICATORS. SOURCE: DONOVAN KOTZE, UNIVERSITY OF KWAZULU NATAL (FROM WWW.WATERWISE.CO.ZA)

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

The study site is highly degraded with builders' rubble and general refuse dumped in many places and is generally overgrown by weeds. The southern part of the site was already transformed by subsistence cultivation (Figure 8). The power line servitude runs from west to east through the centre of the site. A drainage line runs parallel to the power line and continues south of, and parallel to, Sesela Street towards the wetland that flows into the Elsburg wetland, and subsequent river system. This drainage line is not considered a wetland due to a lack of wetland requirements as outlined above. This area should not be destroyed but rather incorporated into the layouts as part of the stormwater infrastructure.

The habitat of the site was not suitable for any of the Red List or Orange List flora species known to occur in the quarter degree square (see Annexure A).



FIGURE 8: CULTIVATION OF THE STUDY SITE

From the feasibility study it seems that the study site is deemed as suitable for development, with no environmental constraints that could be determined through this limited study.

5.1. Connectivity

The connectivity of the site in relation to other areas is important especially in light of endemism and especially paleo-endemism (an endemic species that used to occur throughout a site, but is now limited to islands of populations).

The study site is however highly isolated and the movement of non-aerial fauna will be limited. Except for the drainage channel, the movement of flora through seed dispersal is

limited to highly mobile seeding systems as found in alien vegetation. This seed dispersal is mainly based on (aerial) movement of edible seeds.

The lateral connectivity between the study site and the other surrounding areas is very limited due to the presence of obstacles (Table 1) reducing the connectivity (increased presence of homesteads, higher utilization of roads and erection of fences).

Table 1: The impact of connectivity interrupters on the study site's ridge

Connectivity interrupter	Description of impact	Impact rating (0 no impact- 5 highest)
Roads/ Railways	Roads create dangerous areas for mammals and herpetofauna to cross. The frequency of traffic on the road and railway also determines the impact rating. The distribution of alien species of flora is also of concern	5
Homesteads/ Developments	Localized alteration of biotic and abiotic factors. Presence of domestic animals (cats and dogs) also impacts on the small rodent populations. The distribution of alien species of flora is also of concern.	5
Fencing	The precast concrete walls will limit the movement of small and large fauna species from and onto the ridge.	5

5.2. Faunal assessment

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

6. Conclusion and mitigating recommendations

The site was completely degraded and the habitat not suitable for any of the Red List or Orange List plant species known to occur in the 2628AA q.d.s. The drainage line should be incorporated into the stormwater management system of the site. No other exclusion of land is proposed and the site is deemed suitable for development through this limited investigation. Further investigation into the biodiversity of the site should not reveal new sensitivities and no extra biodiversity studies should be required by GDARD as seen in Appendix B.

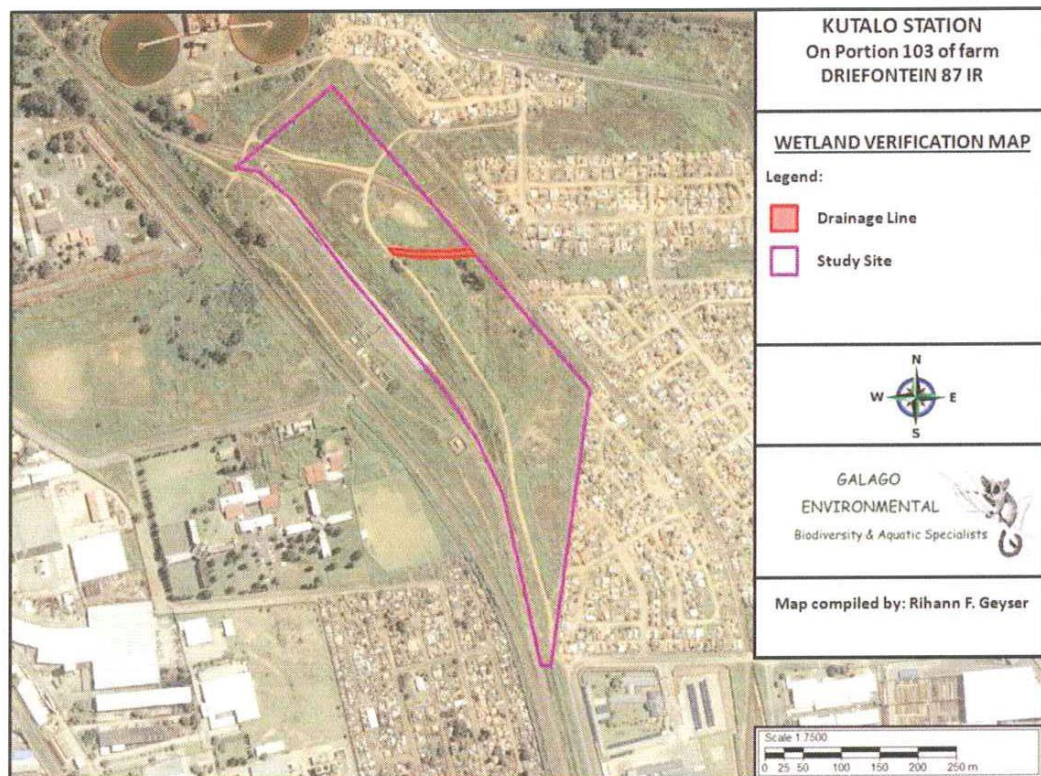


Figure 4: Feasibility map of the study site showing the sensitive drainage line

Sensitive areas: Only the drainage line. This area should be incorporated into the stormwater management planning.

Red and orange listed species: No threatened species of fauna and flora was found on and around the extended study area.

Habitat(s) quality and extent: Very poor quality of habitat due to the degraded nature of the site.

Impact on species richness and conservation: It is predicted that the proposed development will not have an impact on species richness and conservation. This is due to the *in situ* conditions of the site and the connectivity already being degraded and reduced for non-aerial species.

7. 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.
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- Mucina, L. & Rutherford, M.C. (eds). 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. 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

8. ANNEXURE A: Red- and Orange List* plants of the 2628AA q.d.s.

Species	Flower season	Suitable habitat	Priority group	Conserv status	PRESENT ON SITE
<i>Adromischus umbraticola</i> subsp <i>umbraticola</i>	Sep-Jan	Rock crevices on rocky ridges, usually south-facing, or in shallow gravel on top of rocks, but often in shade of other vegetation.	A2	Near threatened ¹	Habitat not suitable
<i>Callilepis leptophylla</i>	Aug-Jan & May	Grassland or open woodland, often on rocky outcrops or rocky hillslopes.	N/A	Declining ²	Habitat not suitable
<i>Cineraria austrotransvaalensis</i>	Mar-Jun	Among rocks on steep slopes of hills and ridges as well as at the edge of thick bush or under trees, on all aspects and on a range of rock types quartzite, dolomite & shale. 1400 – 1700m	A3	Near threatened ¹	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 coglamoratte type in open or broken shade rarely in shade, in grassland with some trees. .	A1	Endangered ¹	Habitat not suitable
<i>Eucomis autumnalis</i>	Nov-Apr	Damp open grassland and sheltered places.	N/A	Declining ²	Habitat not suitable
<i>Gunnera perpensa</i>	Oct-Mar	In cold or cool continually moist localities, mainly along upland streambanks.	N/A	Declining ²	Habitat not suitable
<i>Habenaria bicolor</i>	Jan-Apr	Well-drained grassland, at about 1600m.	B	Near Threatened ²	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. From sandy hills on margins of dune forests to open rocky grassland. Also on dry, stony grassy slopes, mountain slopes and plateaux. Appears to be drought and fire tolerant. 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>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
<i>Trachyandra erythrorhiza</i>	Sep-Nov	Marshy areas, grassland, usually in black turf marshes.	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'

9. Annexure B: GDARD BIODIVERSITY REQUIREMENTS

Dear Rihann

With regard to the above project, no specialist biodiversity studies are required to be investigated.

The absence of wetlands on site should be verified. Should a wetland be located, a wetland specialist study will be required.

Please note that this information is relevant solely for the study site specified in your request. Red/Orange Listed plant species information relevant to a wider geographic area can be obtained from Lorraine Mills (Lorraine.Mills@gauteng.gov.za).

All specialist studies must comply with GDARD Requirements for Biodiversity Assessments. The most recent version of this document (currently version 2) can be obtained by e-mailing [GDARD BiodiversityInfo@gauteng.gov.za](mailto:GDARD_BiodiversityInfo@gauteng.gov.za).

Should the environmental assessment practitioner be of the opinion that any of the above specialist studies are unnecessary for the site/activity in question, then an ecologically-based motivation justifying why the studies are deemed unnecessary must be submitted to GDARD as part of the application. This submission will be evaluated and either accepted or returned to the applicant for the completion of the necessary studies.

Please do not send follow up inquiries to this message as they will not be processed. For further queries please contact Phuti Matlamela (Phuti.matlamela@gauteng.gov.za).

Regards

EIA Unit