December 2018

RED DATA PLANT SPECIES VERIFICATION:

Portion 62 of the farm Witpoortjie 117-IR – Brakpan, Ekurhuleni, Gauteng

A report commissioned by LEAP

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CONDITIONS RELATING TO THIS REPORT

Declaration of interest

Enviroguard Ecological Services cc and its members/co-workers:

- Have no vested interest in the property studied nor is it affiliated with any other person/body involved with the property and/or proposed development.
- Is not a subsidiary, legally or financially of the proponent.
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).
- Declare that remuneration for services provided by Enviroguard Ecological Services cc and its members/co-workers is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA.
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.
- Is committed to biodiversity conservation but concomitantly recognize the need for economic development. We reserve the right to form and hold our own opinions within the constraints of our specialities and experience, and therefore will not submit willingly to the interests of other parties or change our statements to appease them.

The study was undertaken by Prof. LR Brown (PhD UP). Prof Brown is registered as a Professional Natural Scientist with the following details:

Prof LR Brown: Reg. No. 400075/98 (Botanical Science and Ecological Science).

He has the following qualifications:

SPECIALIST	QUALIFICATION
Prof. L.R. Brown	PhD Terrestrial plant ecology MSc. Water ecology BSc Hons (Botany) BSc (Botany & Soil Science) Wetland and Riparian Delineation *(DWAF Accredited Course)* Soil Classification and Wetland Delineation Short Course – TERRASOIL Science

Factors limiting the quality of this study

Flora: A once off survey was conducted while the study was done on 18 November 2018. Due to little rainfall in the area the grasses and forbs have not all started growing (while a fire has gone through the area in the winter) resulting in the vegetation being in an early growth stage. Thus, only those flowering plants that flowered at the time of the visit could be identified with high levels of confidence. Some of the more rare and cryptic species may have been overlooked due to their inconspicuous growth forms. Many of the rare and endangered succulent species can only be distinguished (in the veld) from their very similar relatives on the basis of their reproductive parts. These plants flower during different times of the year. Multiple visits to any site during the different seasons of the year could therefore increase the chances to record a larger portion of the total species complex associated with the area.

Indemnity

Although Enviroguard Ecological Services cc exercises due care and diligence in rendering services and preparing documents, the client takes full responsibility for this report and its implementation in terms of the National Environmental Management Act of 1998, and exempt Enviroguard Ecological Services cc and its associates and their sub-contractors from any legal responsibility based on the timing of the assessment, the result and the duration thereof, which has an influence on the credibility and accuracy of this report. .Enviroguard Ecological Services cc accepts no liability, and the client, by receiving this document, indemnifies Enviroguard Ecological Services cc and its directors, managers, agents and employees against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by Enviroguard Ecological Services cc and by the use of the information contained in this report.

Prof LR Brown *Pri.SciNat*; MGSSA
Enviroguard Ecological Services cc

AIMS OF THE STUDY

This report aims to present a verification of the Red data species scan conducted on Portion 62 of the farm Witpoortjie 117-IR – Brakpan, Ekurhuleni, Gauteng (hereafter referred to as the study area) by EcoAssessments (EcoAssessments 2011).

STUDY AREA

Location

The study site is located within the Dalpark suburb within Brakpan, Gauteng. The site is an open grassland area with a slimes dam that is located between the R23 Road and the M43, which are located towards the east and west respectively. Elsburg Road is located North of the site.

The slimes dam is located in the north-eastern part of the site comprising approximately 144 ha. The open grassland section is approximately 299 ha in size and comprises the largest section of the property. A water pipeline and railway line is located along the entire southern boundary of the property.

Figure 1. Locality the study area (Red lines) (Source: Google Maps).

Existing impacts

Existing impacts on the site include:

- Various two-spoor roads traversing the area
- Dumping of rubble and litter in some areas
- Leaking of the water pipeline along the southern boundary
- An existing model airplane airfield on the site
- Cattle grazing on the site
- Land uses around the site include residential area, mining zones, a prison and open land in the south.

Elevation profile

The site is mostly level though has a slight western slope with undulating terrain. The highest point is 1610 m.a.s.l. with the lowest point 1599 m.a.s.l. This equates to an average elevation los ranging between 16.6-34.4 ma with an average slope ranging between 1.0% - 1.9%. the undulating terrain results in some depression areas where water collects during rainfall events that has led to various seasonally wet pan systems establishing on the site/

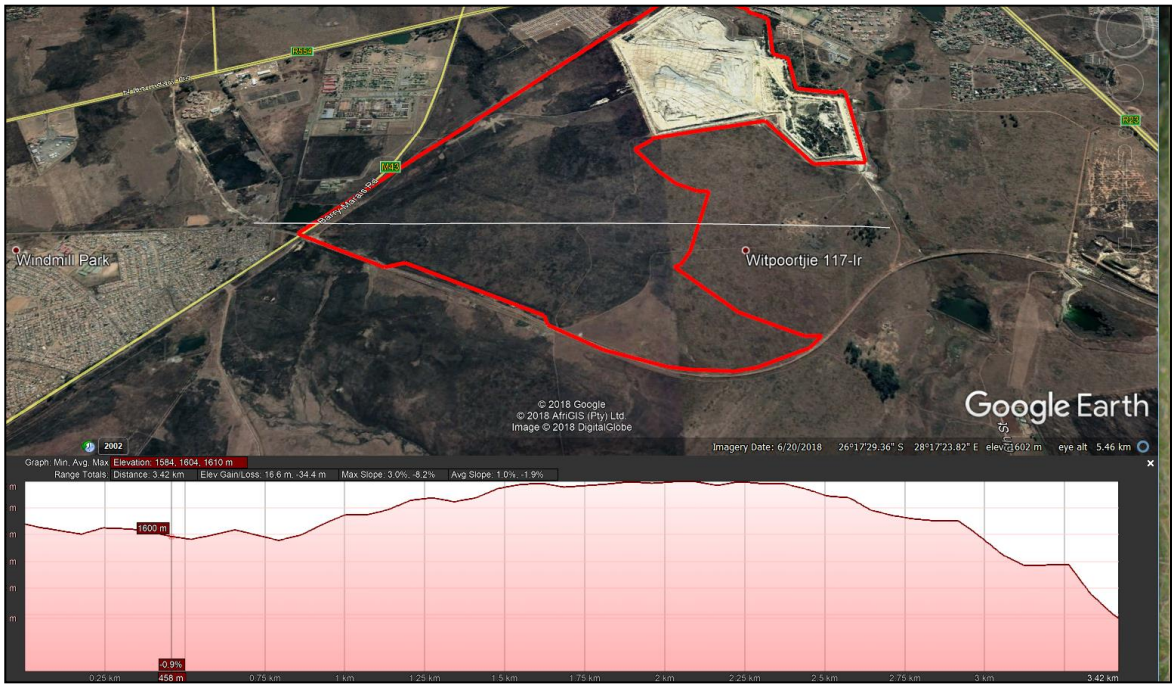

Figure 2. West-South elevation profile of the study area (Source: Google Maps).

METHODS

Prior to the site visit a desktop study was conducted on the development history as well as the topography of the study area, while literature on the area was consulted.

The site was visited on 18 November 2018. Very little rain has fallen, though some grasses have started growing. The area was traversed on foot and by vehicle and notes made on the presence or not of sensitive ecosystems and red data plants and habitat.

An investigation was also carried out on rare and protected plants that might possibly occur in the region. For this investigation the National Red List of Threatened Plants of South Africa, Lesotho & Swaziland, compiled by the Threatened Species Programme, South African National Biodiversity Institute (SANBI) was used while a list of potential Red data plants for the QDG and near the vicinity of the study site, was obtained from GDARD. Internet sources were also consulted on the distribution of these species in the area.

Other information used included:

- The IUCN conservation status categories on which the Threatened Species Programme, Red List of South African Plants (2013) is based, was also obtained.

The presence of rare and protected species or suitable habitat was recorded during the field visit.

RESULTS

The vegetation of the study site is classified as mostly natural grassland belonging to the endangered **Tsakane Clay Grassland** (Gm9) vegetation type (Mucina & Rutherford, 2006)**.** This vegetation type occurs on flat to undulating terrain and is characterized by the dominance of the grasses *Brachiaria serrata, Cynodon dactylon, Cynodon hirsutus, Eragrostis chloromelas, Eragrostis patentipilosa, Eragrostis plana, Heteropogon contortus, Setaria sphacelata, Themeda triandra, Trachypogon spicatus* and *Elionurus muticus.*

Three natural depression pan systems located towards the centre of the open grassland section was noted as well as two artificial pans (dug by humans for soil excavation purposes) that seem to be fed by water during rainfall events as well as the water pipes that leak. A larger wetland/drainage system is present in the northern parts of the site, fed by water from the slimes dam, and extends along the western boundary of the site (Figure 3).

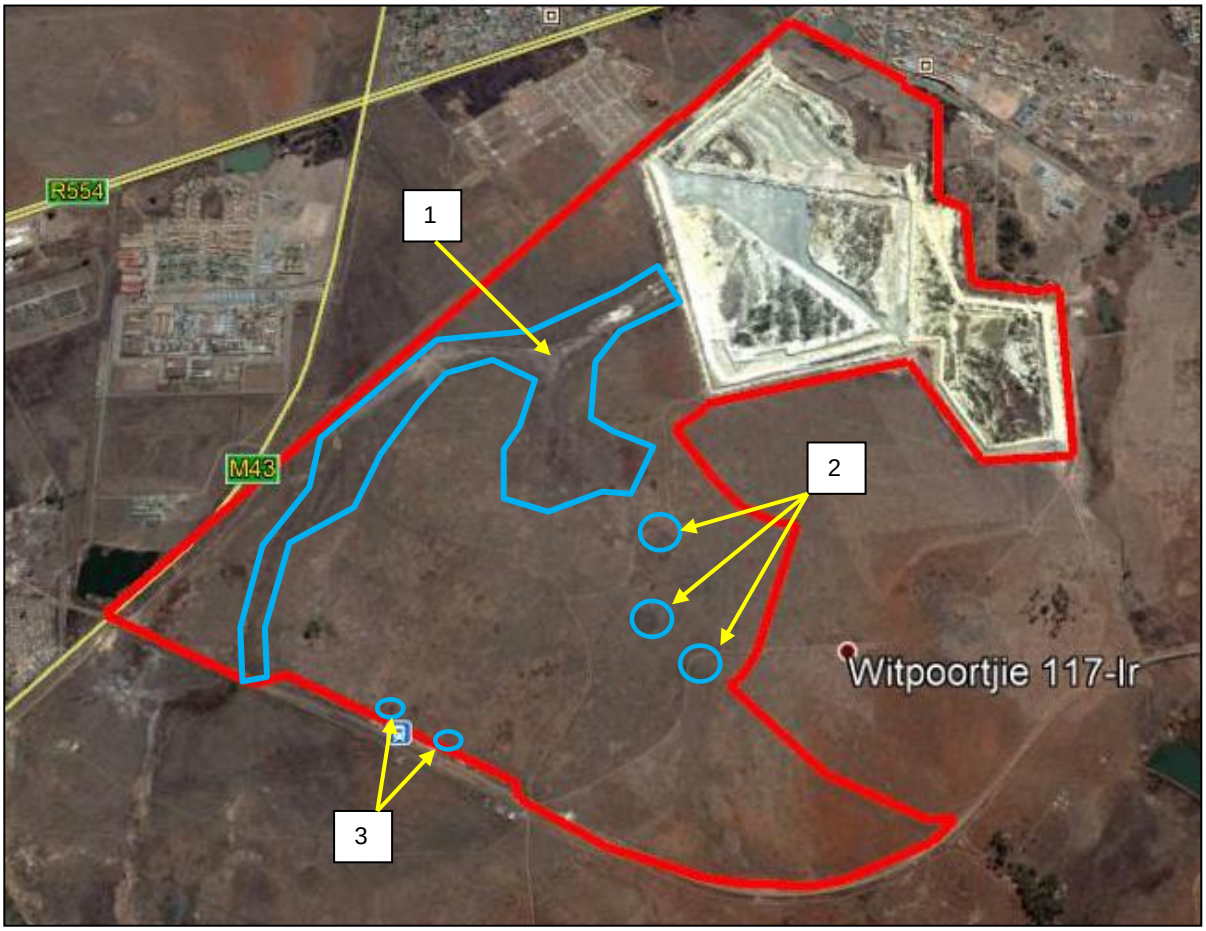

Figure 3. Approximate locations of wetland areas noted on the study area (1=large drainage/wetland system; 2=natural pans; 3=artificial pans) (Source: Google Maps).

BROAD VEGETATION UNITS

The site comprises a large terrestrial grassland section with some wetland areas.

Wetland areas

All the wetland areas (1 and 2 – Figure 3) except the artificial areas (3 – Figure 3) were dry during the site visit.

Large drainage/pan system

This large drainage/pan system is located in the northern and extends along the western boundary where it is mostly degraded. The area has a few roads traversing it, but it is assumed that during the rainfall season that the road becomes unusable. The northern are leads to a channel-like sections in the west where the reed *Phragmites australis* and the forb *Typha capensis* are present. The open, more pan-like section is characterised by short grasses such as *Cynodon dactylon* and various *Cyperus* spp.

White sandy deposit from the slimes dam is found in large parts of this system and do influence the vegetation and therefore habitat negatively by smothering vegetation and also changing the soil nutrient status.

Natural pan systems

The pan systems are characterised by short grass and forb species including the grasses *Brachiaria serrata, Imperata cylindrica* and the forbs *Monopsis decipens, Schoenoplectus* spp., *Conyza podocephala, Fuirena pubescens* and *Cyperus spp.* The vegetation is short and in some of the pans large quartzite rocks have been dumped in the past with pioneer species such as *Tagetes minuta, Bidens pilosa* and *Conyza bonariensis* establishing.

Artificial pans

The artificial pans are characterised by standing water and the vegetation include the grasses *Paspalum dilatatum, Agrostis lachnantha, Leersia hexandra, Imperata cylindrica* and the forbs *Schoenoplectus corymbosus, Juncus* spp., *Verbena bonariensis* and *Verbena brasiliensis.* The alien invasive grass *Pennisetum clandestinum* is also prominent in some areas. These systems seem to periodically receive water from the water pipeline whilst the clay soil assists in the area being permanently wet resulting in wetland vegetation establishing.

Natural grassland area

The natural grassland area comprises the largest section of the study area. The vegetation in the central parts are mostly natural, though the sections along the western and southern boundaries are somewhat degraded. Common species include the grasses *Themeda triandra, Cymbopogon caesius, Hyparrhenia hirta, Heteropogon contortus, Brachiaria serrata, Tristachya leucothrix, Eragrostis curvula, Eragrostis chloromelas, Cynodon dactylon*, and the forbs *Vernonia oligocephala, Senecio inornatus, Epaltes gariepina, Albuca cf. setosa, Felicia muricata, Conyza podocephala, Dianthus mooiensis* and *Helichrysum chionosphaerum.*

In some areas, sections dominated by the declared alien invasive tree *Eucalyptus camaldulensis* occur. The vegetation of these areas is degraded and most of the natural species have been displaced with only pioneer weedy species present.

RED DATA SPECIES

A number of the Orange listed geophyte *Hypoxis hemerocallidea* populations were found throughout the grassland. No other red data species or species of concern were noted during the field survey.

The following is a list of potential red data species that were

Species	Status	Flowering season	Recorded	Comments
Adromischus umbraticola subsp. *umbraticola*	Near Threatened	Sep-Jan	×	No suitable habitat
Argyrolobium campicola	Near Threatened	Nov-Feb	×	Marginal habitat (grassland section), but not found
Bowiea volubilis subsp. *volubilis*	Vulnerable	Sep-Apr	×	No suitable habitat
Cineraria longipes	Vulnerable	Mar-May	×	No suitable habitat
Delosperma leendertziae	Near Threatened	Aug-Mar	×	No suitable habitat
Dioscorea sylvatica	Vulnerable	Oct-Jan	×	No suitable habitat
Eucomis autumnalis	Declining	Nov-Apr	×	Grassland habitat too dry, marginal habitat near wetlands but not found
Eulophia coddii	Vulnerable	Dec	×	No suitable habitat
Gladiolus robertsoniae	Near Threatened	Oct-Dec	×	No suitable habitat
Gnaphalium nelsonii	Near Threatened	Oct-Dec	×	No suitable habitat (could occur close to pans)
Gunnera perpensa	declining	Oct-Mar	×	No suitable habitat
Habenaria barbertoni	Near Threatened	Feb-Mar	×	No suitable habitat
Habenaria bicolor	Near Threatened	Jan-Apr	×	No suitable habitat
Holothrix micrantha	Critically Endangered	Oct	×	No suitable habitat
Hypoxis hemerocallidea	Declining	Sep-Mar	✓	Grassland section has various populations
Ilex mites var mitis	Declining	Oct-Dec	×	No suitable habitat
Khadia beswickii	Vulnerable	Jul-Apr	×	No suitable habitat
Kniphofia typhoides	Near Threatened	Feb-Marc	×	No suitable habitat
Lithops lesliei subsp. *lesliei*	Near Threatened	Marc-June	×	No suitable habitat

The following Red/Orange List plant taxa have been recorded from the farm on which the study site is situated / within 5km of the study site.

- *Argyrolobium campicola*
- *Lithops lesliei* subsp. *lesliei*

The grassland area provides marginal habitat for the forb *Argyrolobium campicola,* though no suitable habitat is present for the forb *Lithops lesliei* subsp. *lesliei*

The site was also assessed for the presence of the following species obtained from literature:

Species	Status	Recorded	Comments
Trachyandra erythrorrhiza	Near Threatened	✗	No suitable habitat
Adromischus umbraticola subsp. *umbraticola*	Near Threatened	✗	No suitable habitat
Crinum bulbispermum	Declining	✗	Not present

CONCLUSION

The study area consists of various wetland sections that are mostly seasonally wet. A large slimes dam occurs in the northern part of the site with the largest part of the study area consisting of the wetland and drainage areas and the large mostly natural grassland area. The area is open and easily accessible with sections of the grassland being degraded due to various human-induced activities (grazing by cattle, frequent fires, poor conservation practices etc.).

No detailed vegetation survey was conducted, though the study area was traversed to determine the presence or not of red data species or suitable habitat to be able to verify the findings of the previous red data report conducted by EcoAssessments in 2011. The area received low rainfall prior to the visit resulting in a low growth rate of the plants. Other than the presence of a number of populations of the Orange listed geophyte *Hypoxis hemerocallidea,* no other red data plants were observed within the grassland section and close to the artificial pans. Marginal habitat exists for three other species, though it is mostly around the natural pan areas. These species have a low-medium probability to be present on the site.

Since the most sensitive habitats are located in and around the natural pans, it is important that suitable buffer zones are implemented around these wetland systems to ensure protection of the habitat close to and around the wetlands. It is also important that connectivity between the three natural pans be ensured to maintain their ecological functioning.

REFERENCES

ACOCKS, J.P.H. 1988. Veld Types of South Africa. 3rd edn. *Mem*. *Bot. Surv. S. Afr*. 57: 1–146.

BREDENKAMP, G.J. & BROWN, L.R. 2001. Vegetation – A reliable ecological basis for environmental planning. Urban Greenfile Nov-Dec 2001: 38-39.

BREDENKAMP G.J & BROWN, L.R. 2003. A reappraisal of Acocks' Bankenveld: origin and diversity of vegetation types. South African Journal of Botany 69(1): 7-26.

BROMILOW, C. 2001. *Problem plants of South Africa*. Briza Publications, Pretoria.

CHIEF DIRECTORATE SURVEYS & MAPPING. 2006. 1:50 000 Topographic Map South Africa: 2528DD Balmoral. Government Printer, Pretoria.

CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983 (Act No. 43 of 1983).

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM. 2007. National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004): Publication of Lists of Critically Endangered, Endangered, Vulnerable and Protected Species. Government Notices.

ECOASSESSMENTS, 2011. Floral Red Data species scan on Portion 62 of the farm Witpoortjie 117-IR – Brakpan, Ekurhuleni, Gauteng. Unpublished Report, 16pp.

ENVIRONMENTAL CONSERVATION ACT, 1989 (Act No. 73 of 1989).

ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2010 (Gazette No 33306 – Regulation 543).

GAUTENG STATE OF THE ENVIRONMENT REPORT. 2004. Biodiversity. [Online]. (URL http:// www.environment.gov.za/soer/reports/gauteng).

GDARD. 2011. Gauteng Conservation Plan Version 3.3 (C-Plan 3.3)

GDARD, 2014. Requirements for biodiversity assessments Version 3. Biodiversity Management Directorate, Department of Agriculture and Rural development.

GOLDING J (ED). 2002. Southern African Plant Red Data Lists. Southern African Botanical Diversity Network Report No. 14, Pretoria.

GROBLER C H, BREDENKAMP G J & BROWN L R. 2002. Natural woodland vegetation and plant species richness of the urban open spaces in Gauteng, South Africa. Koedoe. 45(1): 19-34.

GROBLER C H, BREDENKAMP G J & BROWN L.R. 2006. Primary grassland vegetation of open spaces in urban areas of Gauteng, South Africa. South African Journal of Botany 72: 367-377.

MCKINNELY, M. L. 1999. High rates of extinction and threat in poorly studied taxa. *Conservation Biology* **13**: 1273-1281.

MUCINA, L AND RUTHERFORD, M.C. (eds) 2006. The *vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. SANBI, Pretoria.

NATIONAL ENVIRONMENT MANAGEMENT ACT, 1998 (Act No. 107 of 1998).

NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (Act No. 10 0f 2004). Government Gazette RSA Vol. 467, 26436, Cape Town, June 2004.

NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (Act No. 10 of 2004). Draft List of Threatened Ecosystems. Government Gazette RSA Vol. 1477, 32689, Cape Town, 6 Nov 2009.

NATIONAL FORESTS ACT, 2006 (Act No. 84 of 1998 as amended). Government Gazette RSA Vol. 897, 29062, Cape Town, 8 Sept 2006.

NATURAL SCIENTIFIC PROFESSIONS ACT, 2003 (Act No. 27 of 2003).

PFAB, M. 2006. *Requirements for biodiversity assessments*. Department of Agriculture, Conservation and Environment, Directorate of Nature Conservation GDACE, Johannesburg.

SANBI. 2013. Grasslands Ecosystem Guidelines: landscape interpretation for planners and managers. Compiled by Cadman, M. de Villiers, C., Lechmere-Oertel, R. and D. McCulloch. South African National Biodiversity Institute, Pretoria. 139 pages.

SANBI BGIS. 2018. Land Use Decision Support (LUDS) Report, generated 7-18-2018.

VAN OUDTSHOORN, F. 1999. Guide to grasses of southern Africa. Briza Publications, Pretoria.

VAN SCHALKWYK, M. 2007. National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004); Publication of Lists of Critically Endangered, Endangered, Vulnerable and Protected Species.

VAN WYK, A. E. & MALAN, S.J. 1998. *Field guide to the wild flowers of the Highveld*. Struik Publishers (Pty) Ltd, Cape Town.