

GreenMined Environmental (Pty) Ltd  
Postnet Suite 62,  
Private Bag X15  
Somerset West  
7129

**Name:** Gerhard Botha  
**Cell:** 084 207 3454  
**E-mail:** gabotha11@gmail.com  
**Date:** 12 August 2019  
**Ref:** FS 10541 PR

**Attention: Ms Sonette Smit**

Dear Madam,

**ECOLOGICAL COMMENTS: PROPOSED PROSPECTING AND DRILLING (8 BOREHOLES) OF A MINERAL RESOURCE NORTH OF KOPPIES, FREE STATE PROVINCE.**

To whom it may concern.

Ecological comments were requested from NKURENKURU Ecology and Biodiversity by GreenMined Environmental on behalf of MinMet Services regarding the proposed prospecting (drilling) of mineral resources north of the town of Koppies and whether an in-depth Scoping and/or Basic Impact Assessment will be necessary due to the extent (size, location and sensitivity) of the proposed development.

Subsequently the aim and terms of reference is to determine from available literature and desktop data whether:

- Any potential sensitive habitats, features and species may persist within the project site and surrounding habitat (and may utilise this open space).
- The sites connectivity and potential influence on the surrounding Provincial Critical Biodiversity Areas.
- The potential impacts associated with this and the sensitivity of these impacts.
- The potential threat these impacts pose to any ecological sensitive features and the
- On-site ecological condition.

And finally, from the above obtained results, conclude whether a Scoping and/or Basic Impact Assessment will be necessary as well as provide any additional recommendations.

## 1. LOCATION

The proposed development will comprise of eight boreholes which will be located within the following properties:

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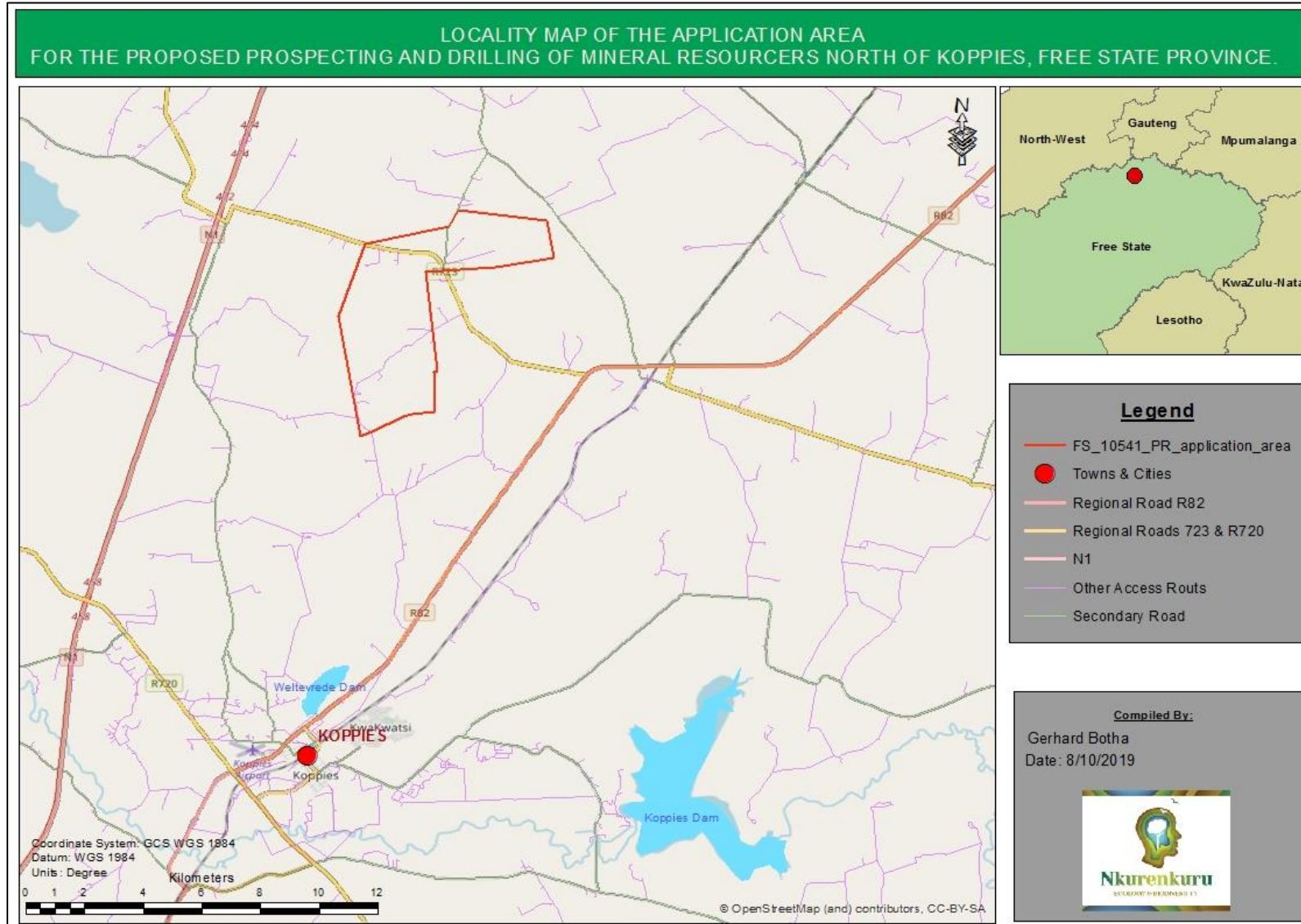
- Goedgunst 315
- Kronenbloem 51,
- Verntersbloem 163,
- Oceaan 64,
- Oceaan 99,
- Broodkop 304,
- Enkelsbosch 31,
- Hooge Bult 542,
- Geluk 237,
- Verdeel 278,
- Goudlaagte 238,
- Ongegund 507

The application area is approximately 2195ha in size and is approximately 14.8km north of the town of Koppies located within the Ngwathe Local Municipality (Fezile Dabi District Municipality), Free State Province.

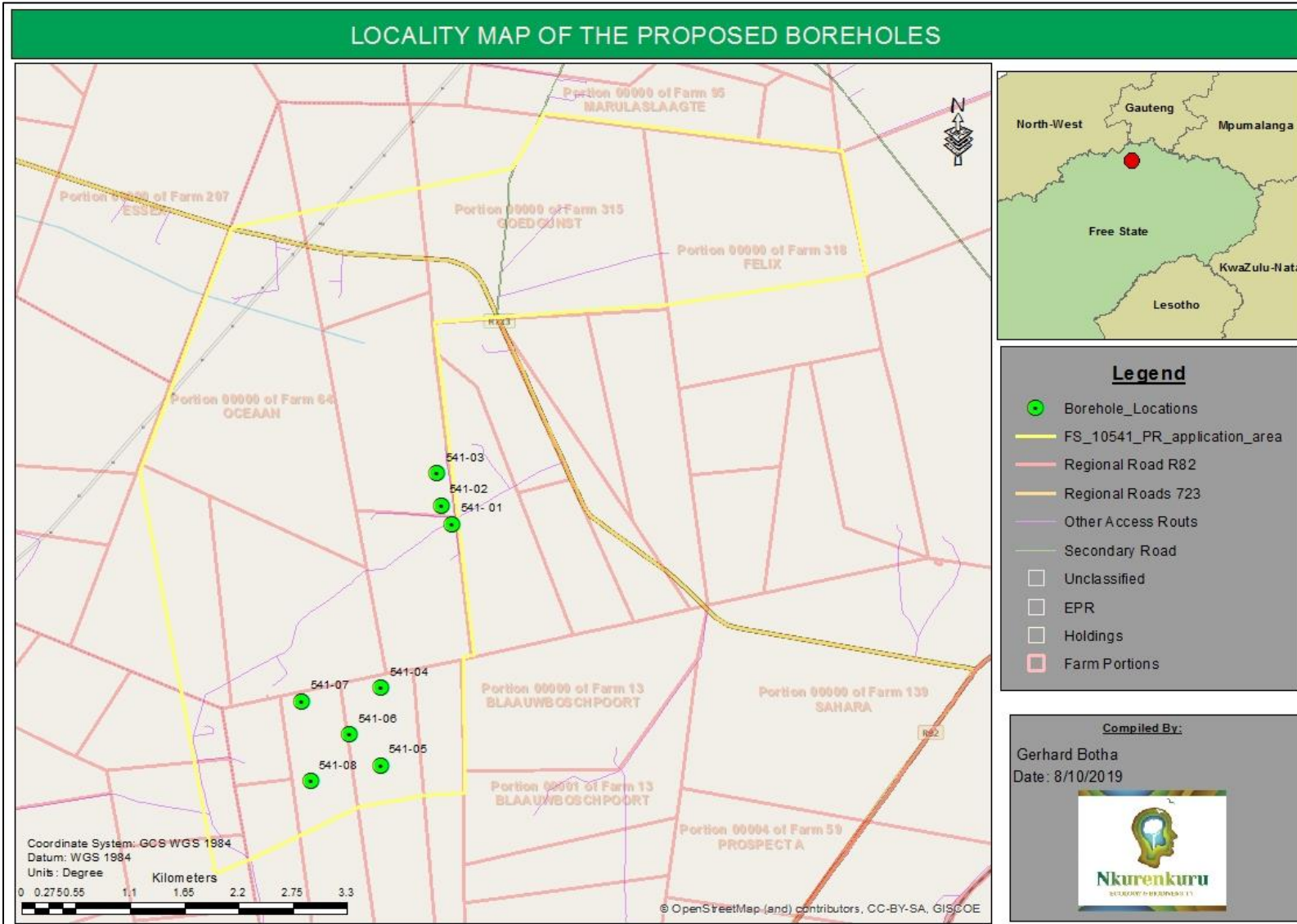
The proposed location of the Boreholes are as follows:

Borehole No	Latitude	Longitude
541-01	-27.106983°	27.609359°
541-02	-27.105281°	27.608381°
541-03	-27.102375°	27.608002°
541-04	-27.121916°	27.602891°
541-05	-27.128949°	27.602859°
541-06	-27.126153°	27.600018°
541-07	-27.123147°	27.595694°
541-08	-27.130412°	27.596459°

Access to the area is from the N1 National road turning east onto the R723 and driving for approximately 7km. The project area can be accessed from Sasolburg, Koppies or Parys. Access to most of the above-mentioned locations can be gained via existing roads and farm tracks with very limited off-road driving to locations required.



**Figure 1:** Proposed location of the application Area.



**Figure 2:** Proposed location of the boreholes

## 2. PROPOSED ACTIVITY

The prospecting or exploration of a mineral resource through the following phases:

### **Non-Invasive Phase:**

Geophysical survey (thermal raster surveys) and surface sampling techniques will be used as well as geological mapping. Data will be extracted and plotted into geological maps. Areas of invasive prospecting will be identified for resource determination

### **Invasive Prospecting Phase:**

Core drilling within areas identified during the non-invasive phase. Each exploration site will disturb a minimum area of 40m<sup>2</sup>; however, the number of boreholes required can only be finalized once the non-invasive prospecting is completed. At present eight boreholes will be drilled (refer to Figure 2 for location of boreholes). After drilling, the core will be sampled and assessed by the on-site geologist and cores logs will be maintained. As the area of prospecting is large and have an undulating topography, depth of the drilling will differ depending on the area. Drilling is expected to reach around 40m deep. Existing farm roads and track will be utilized as far as possible. The drilling crew and Lengana Health staff will bring their own water on to site which will be mostly for consumption and domestic use. No water from the farms will be used or required. The proposed timeframes associated with invasive prospecting will depend on access agreements negotiations between the applicant, Lengana Health SA and the landowners. Ideally all invasive prospecting is estimated to be a period of 3-4 months.

The Environmental Impact Assessment Regulations of 2014 promulgated in terms of Section 24(5) of the National Environmental Management Act, (Act No. 107 of 1998) as amended, requires Environmental Authorization from the competent authority (Eastern Cape Department of Mineral Resources) for activities listed in Government Notices R 983, R 984 and R 985 which pertain to mining. The activities in the Environmental Impact Assessment Regulations of 2014 that has been triggered for the proposed development are listed below.

Name of Activity	Aerial extent of activity (ha or m <sup>2</sup> )	Applicable Listing Notice
Drill Site	Drill holes will be approximately 50m apart.	Activity 20 (a)
Sample Storage	Drill cores will be left to dry for 2-3 days after that the cores will be logged and then sampled. Samples will be stored at Mystic Blue storage facilities.	Activity 20 (a)
Equipment Storage	Drilling equipment will be left on site during the course of the drilling campaign, one drilling truck with a drill rig and a bakkie will be used by the contracted drilling company.	Activity 20

### 3. RELEVANT LEGISLATION AND GUIDELINES

The following legislation was taken into account whilst compiling this report:

#### **International:**

- Convention on Biological Diversity (CBD, 1993)
- The Convention on Wetlands (RAMSAR Convention, 1971)
- The United Nations Framework Convention on Climate Change (UNFCCC, 1994)
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)

#### **National:**

- Constitution of the Republic of South Africa (Act No. 108 of 2006)
- The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
- The National Environmental Management Protected Areas Act (Act No. 57 of 2003)
- The National Environmental Management Biodiversity Act (Act No. 10 of 2004)
- The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
- The Environment Conservation Act (Act No. 73 of 1989)
- National Environmental Management Air Quality Act (No. 39 of 2004)
- National Protected Areas Expansion Strategy (NPAES)
- Natural Scientific Professions Act (Act No. 27 of 2003)
- National Biodiversity Framework (NBF, 2009)
- National Forest Act (Act No. 84 of 1998)
- National Veld and Forest Fire Act (101 of 1998)
- National Water Act, 1998 (Act 36 of 1998)
- National Freshwater Ecosystem Priority Areas (NFEPA's)
- National Spatial Biodiversity Assessment (NSBA)
- World Heritage Convention Act (Act No. 49 of 1999)
- National Heritage Resources Act, 1999 (Act 25 of 1999)
- Municipal Systems Act (Act No. 32 of 2000)
- Alien and Invasive Species Regulations, 2014
- South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
- Sustainable Utilisation of Agricultural Resources (Draft Legislation).
- White Paper on Biodiversity

#### **Provincial:**

- Free State Nature Conservation Bill (2007);
- Free State Biodiversity Plan (2015)

## 4. METHODOLOGY

### 4.1. Ecology (Terrestrial Fauna and Flora): Data scouring and review

Data sources from the literature were consulted and used where necessary in the study and include the following:

#### **Vegetation:**

- Vegetation types and their conservation status were extracted from the South African National Vegetation Map (Mucina and Rutherford 2012) as well as the National List of Threatened Ecosystems (2011), where relevant.
- Critical Biodiversity Areas for the site and surroundings were extracted (CBA Map for Free State Province obtained from <http://bgis.sanbi.org/fsp/project.asp>).
- Information on plant and animal species recorded for the surrounding area was extracted from the SABIF/SIBIS database hosted by SANBI. This is a considerably larger area than the project site, but is necessary to ensure a conservative approach as well as counter the fact that the site itself has probably not been well sampled in the past.
- The IUCN conservation status of the species in the list was also extracted from the database and is based on the Threatened Species Programme, Red List of South African Plants (2013).
- Freshwater and wetland information was extracted from the National Freshwater Ecosystem Priority Areas assessment, NFEPA (Nel et al. 2011). This includes rivers, wetlands and catchments defined under the study.

#### **Fauna**

- Lists of mammals, reptiles and amphibians which are likely to occur in the project site were derived based on distribution records from the literature and various spatial databases (SANBI's SIBIS and BGIS databases).
- Literature consulted includes Branch (1988) and Alexander and Marais (2007) for reptiles, Du Preez and Carruthers (2009) for amphibians, Friedmann and Daly (2004) and Skinner and Chimimba (2005) for mammals.
- Apart from the literature sources, additional information on reptiles was extracted from the SARCA web portal, hosted by the ADU, <http://vmus.adu.org.za>.
- The conservation status of each species is also listed, based on the IUCN Red List Categories and Criteria 2014 and where species have not been assessed under these criteria, the CITES status is reported where possible. These lists are adequate for mammals and amphibians, the majority of which have been assessed, however the majority of reptiles have not been assessed and therefore, it is not adequate to assess the potential impact of the development on reptiles, based on those with a listed conservation status alone. In order to address this shortcoming, the distribution of reptiles was also taken into account such that any narrow endemics or species with highly specialised habitat requirements occurring at the site were noted.

## Fauna

- Lists of mammals, reptiles and amphibians which are likely to occur in the project site were derived based on distribution records from the literature and various spatial databases (SANBI's SIBIS and BGIS databases).
- Literature consulted includes Branch (1988) and Alexander and Marais (2007) for reptiles, Du Preez and Carruthers (2009) for amphibians, Friedmann and Daly (2004) and Skinner and Chimimba (2005) for mammals.

## Site Visit

- The site was visited on the 10<sup>th</sup> of August 2019
- The aim of the site visit was to confirm or refute the desktop findings and results
- Permission to access private land was not provided and as such general visual observations were made of the affected areas from public land and roads. Most of the sites was visible from public roads, and for the above-mentioned purposes, these observations from such viewpoints were regarded as satisfactory and did not have an affect on the findings and results as recorded within this letter.

## 5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

### 5.1. Broad Vegetation Types

The project site is situated in the Grassland biome and Dry Highveld Grassland Bioregion. The vegetation in and surrounding the project site is Central Free State Grassland (Gh6) (refer to Figure 3). According to Mucina & Rutherford (2006), Central Free State Grassland vegetation type is classified as **Vulnerable**. The national target for conservation protection for this vegetation type is 24%, but only small portions enjoy statutory conservation (Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves) as well as some protection in private nature reserves. Almost a quarter of the area has been transformed either for cultivation or by building of dams (Allemanskraal, Erfenis, Groothoek, Koppies, Kroonstad, Lace Mine, Rustfontein and Weltevrede). This vegetation is however not included within the National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environment Management: Biodiversity Act (Act No. 10 of 2004).

A species list from BODATSA-POSA containing the species that have been recorded to date in the area was obtained. POSA generated species lists also contain updated IUCN Red Data species status. Only 2 species were recorded within the region that are listed as Red Data species namely; *Drimia elata* (Data Deficient) and *Anacampteros recurvata* (Endangered).

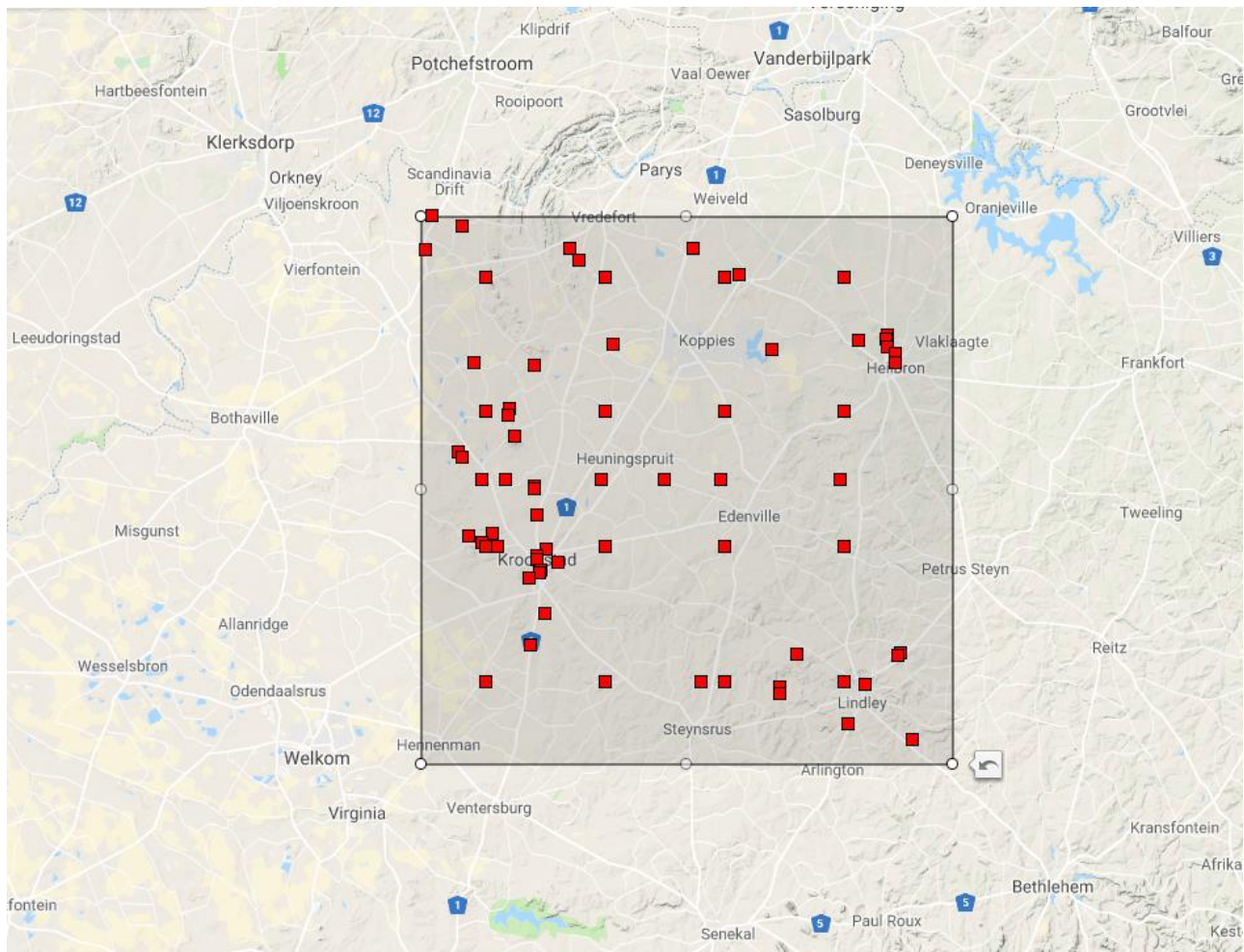
A total of 696 indigenous species have been recorded in the region according to the SANBI database.

The following floristic information was obtained through the BODATSA-POSA generated species listed



- Indigenous Species: 618
- South African Endemic Species: 45
- Alien Plants: 78 Species
- Listed Invasive Alien Plants: 16
- IUCN Red Data Plants: 2

Based on available data no threatened or protected vegetation types / terrestrial ecosystems will be impacted by the proposed development. Furthermore, the development will most likely not have a significant impact on the status and distribution of any endemic and / or Red Data plant species.



**Figure 3:** Map showing the grid drawn to compile an expected species list (BODATSA-POSA, 2019)

## 5.2. Free State Biodiversity Plan (2015) - Critical Biodiversity Areas

According to the Free State Biodiversity Plan all of the borrow pits are located within Ecological Support Areas (ESA) with most of them located with ESA1, apart from borehole number 541-03 which is located within an ESA2 (Figure 4).

ESA1 are typically those areas that are in a largely natural state and even though they do not contain critical biodiversity or high sensitive features, they are landscape features that are regarded as important for the maintenance and generation of biodiversity within sensitive areas (CBAs), and therefore require sensitive management. ESA 2 areas on the other hand are no longer intact but potentially may retain significant importance from a process perspective (e.g. maintaining landscape connectivity).

Following the site visit it was determined that only borehole 541-04 to 541-08 are located within a near natural grassland consistent within the definition of an ESA1. However due to the small size of the proposed activity footprint the proposed development will not have a significant impact on the functionality and services provided by this near-natural grassland. Furthermore, boreholes 541-01 to 541-03 are located in highly degraded and transformed habitats which do not meet the requirements of an ESA.

### **5.3. Wetland and Watercourse**

No wetlands or watercourses are present within the proposed development area as well as the immediate surrounding environment (Figure 4). The most important hydrological systems within the larger environment are the Rietspruit which is located approximately 970m north of borrow pit 541-03. Two artificial drainage lines are located in close proximity to boreholes 541-0 & 07 and a small gravel dam is located approximately 233m south of borehole 541-05.

Due to the proposed locations and extent of the boreholes, the drilling and maintenance of these boreholes will not have an impact on freshwater (surface) resources.

### **5.4. Faunal Element of the Area**

#### ***Mammals***

Although as many as 54 different terrestrial mammals are known from the broad area of the study site, a much smaller number would actually be present at the site itself. The extent of the site is low and the variety of habitats present is also low as the site consists mostly of open grassland, with the result that species associated with wooded areas, wetlands or rocky outcrops are not likely to occur within the proposed development area, although they may be present within the local area. Species observed at the site and which are also likely to be present within the proposed development area include Scrub Hare, Springhare, South African Ground Squirrel, Cape Porcupine, Bat-eared Fox and Steenbok. Listed mammals which may occur at the site include the White-tailed Mouse *Mystromys albicaudatus* (Endangered), Brown Hyaena *Hyaena brunnea* (Near Threatened) and Black-footed Cat *Felis nigripes* (Vulnerable). The Brown Hyaena is not likely to occur in the area on account of the relatively intensive agricultural land-use in the area which is not typically tolerant of large carnivores.

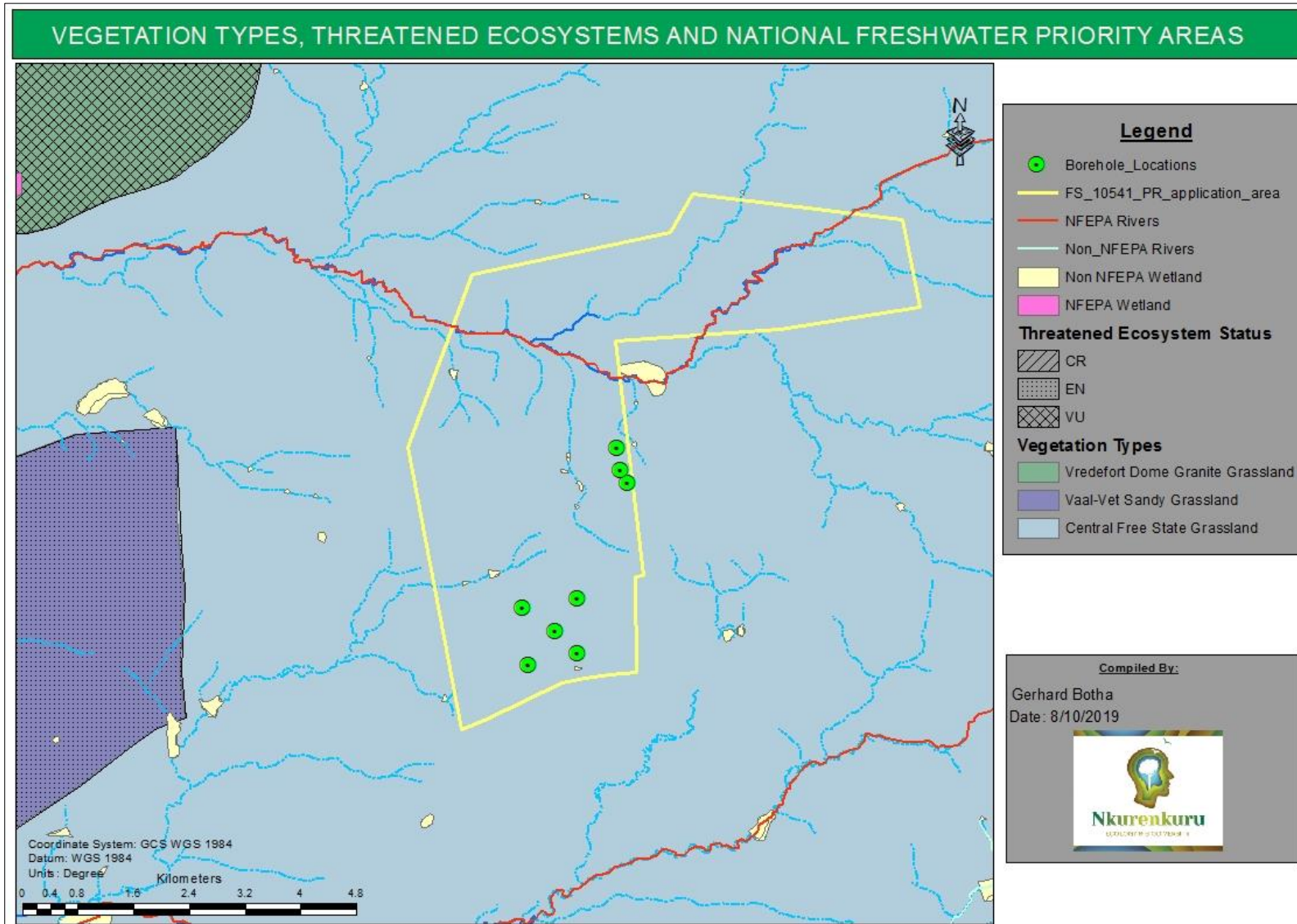
The White-tailed Mouse may however occur at the site as the habitat is broadly suitable and the species often occurs in areas with relatively low plant cover as occurs at the site. The Black-footed Cat is a secretive species which is likely to occur in the area, but would probably avoid most areas due to the proximity to roads, infrastructure, mining activities and cultivation activities. Given the extremely limited extent of the development area and the proximity of the site to human disturbance, the development would comprise a very small area relative to the extensive national ranges of the listed species and the impact of the development on habitat loss for these species would be indelible.

### **Reptiles**

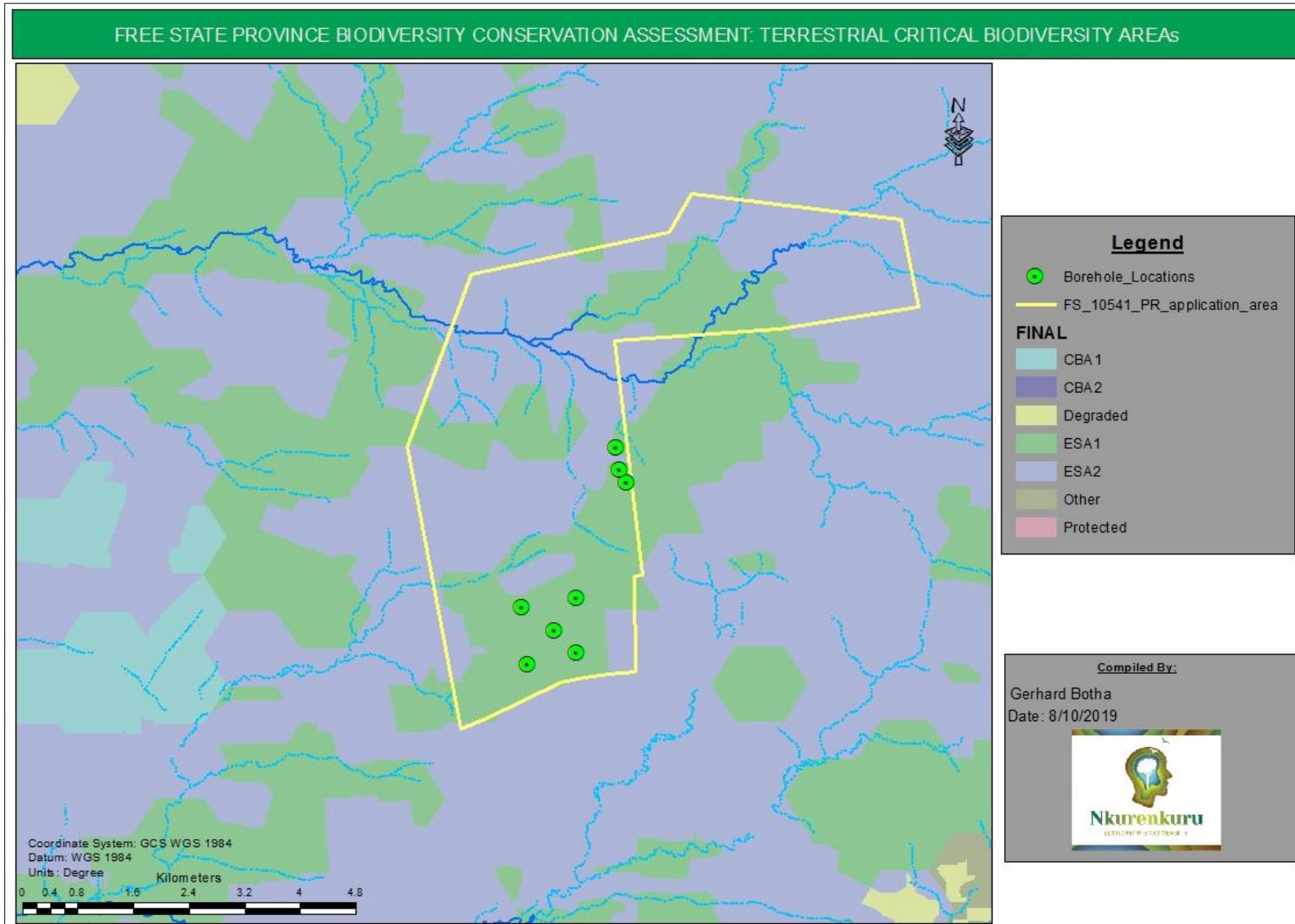
The site lies in or near the distribution range of at least 38 reptile species. This is a comparatively low total suggesting that the site has relatively low reptile species richness. Based on distribution maps and habitat requirements, the composition of the reptile fauna is likely to comprise 1 terrapin, 25 snakes, 11 lizards and skinks and 1 gecko. Listed species which may occur at the site include the Sungazer or Giant Girdled Lizard *Smaug giganteus* (Vulnerable) and Striped Harlequin Snake *Homoroselaps dorsalis* (Near Threatened). Based on their reported habitat preferences, the probability that they occur at the site is low. Given that the proposed development area is restricted to open grassland, only species associated with this habitat would be impacted by the development. Given the homogenous nature to the proposed development area, no areas of above-average significance for reptiles could be identified within the proposed development area. Within the wider area, there were some mesic areas present which would be important for many snakes and some rocky outcrops which were identified as being important for all reptile groups. However, these were not in close proximity to the proposed development area and there are not likely to be direct impacts on these habitats resulting from the development. The major impact on reptiles therefore appears to be restricted largely to the local loss of the open grassland habitat type, which is, due to the extent of the development also negligible.

### **Reptiles**

The site lies within or near the range of 11 amphibian species, indicating that the site potentially has a moderately diverse frog community. Those that require permanent water are likely to be restricted to the vicinity of the dams and watercourse, while the others are likely to occur more widely in the region. No listed species are known from the area and it is therefore highly unlikely that any listed amphibians would be affected by the development. Due to the extent of the development it is highly unlikely that the development would have a significant impact on amphibians.



**Figure 4:** Proposed sensitive features located in close proximity to the new substation location (option 2).



**Figure 5:** Proposed sensitive features located in close proximity to the new substation location (option 2).

## 5.5. The Ecological Condition of the affected sites

### ***Borehole No. 541-01***

This borehole point is located within a severely degraded and transformed grassland being encroached by shrubs (*Vachelia karroo* and *Asparagus laricinus*) and is surrounded by numerous farm tracks, gravel roads and other types of disturbances. Very little of the original Central Free State Grassland remain and this isolated patch have lost most of its functions and services.



**Figure 6:** Photo illustrating the degree of shrub encroachment within this specific area.



**Figure 7:** Highly disturbed and transformed area with numerous anthropogenic associated disturbances.

### ***Borehole No. 541-02 and 541-03***

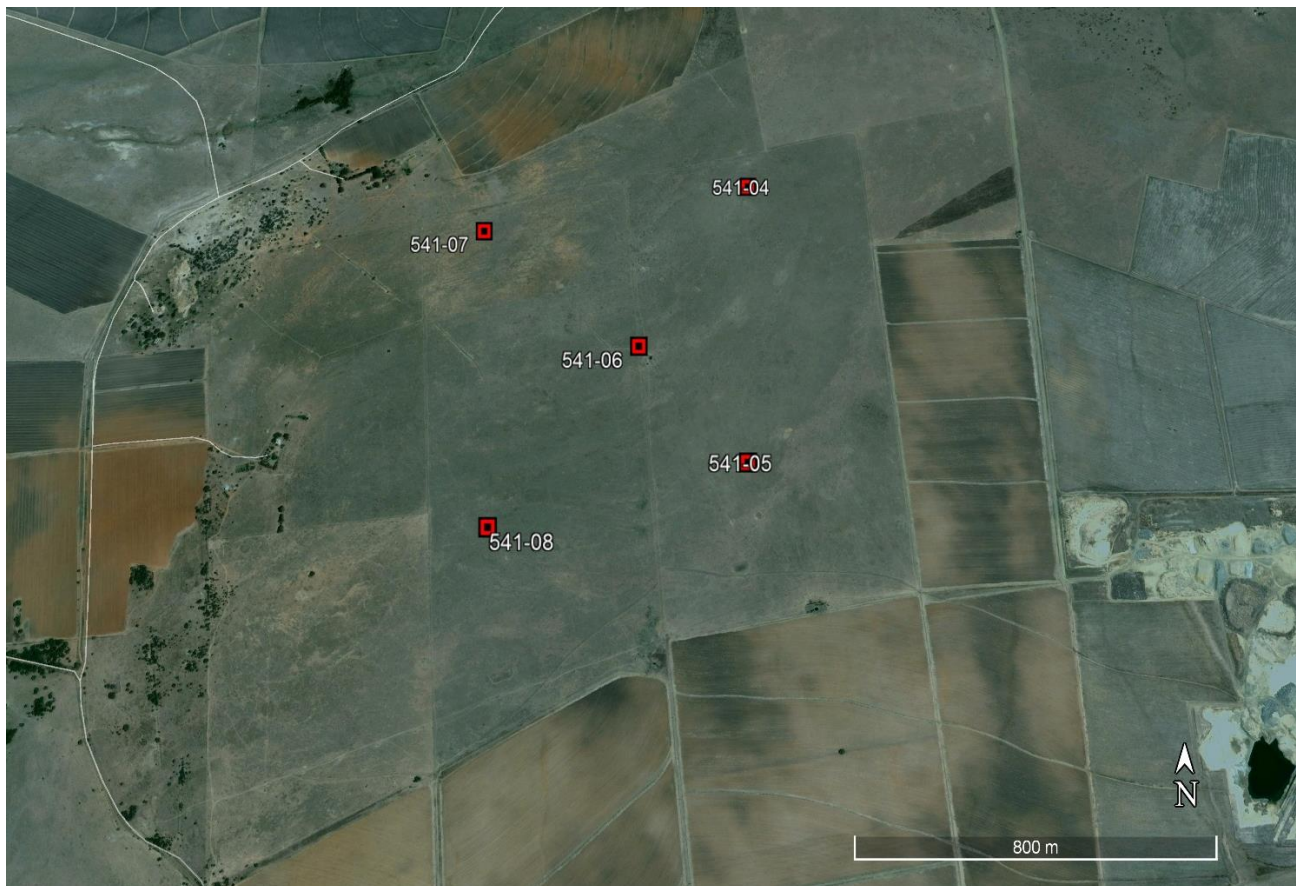
These two boreholes are located within a completely transformed landscape being ploughed for cultivation purposed subsequently providing none of its original functions and services.



**Figure 8:** Proposed location of borehole point 541-02 within a ploughed area.



**Figure 9:** Proposed location of borehole point 541-01 within a ploughed area.



**Figure 10:** Google image indicating the location of the near-natural grassland in relationship to the surrounding disturbances visible from satellite imagery.

### ***Borehole No. 541-04 to 54108***

All five proposed drilling points are located in a similar habitat type, namely a near-natural, gentle sloping grassland. The most significant on-site impact is grazing by livestock (mostly cattle) and the fracturing of habitat due to the presence of fences (for rotational grazing). Some trampling and overgrazing are visible from satellite imagery and is located around watering points and/or feeding points. The presence of Invasive Alien Plants is furthermore regarded as moderate-low within these locations. Significant surrounding land use and impacts include; cultivation, roads, mining activities. No wetlands, watercourses are located in close proximity to these proposed boreholes. However, as mentioned two artificial drainage lines are located in close proximity to boreholes 541-0 & 07 and a small gravel dam is located approximately 233m south of borehole 541-05. Due to the limited extent of disturbance and transformation, this area can be regarded as a valuable portion of grassland providing resources for the maintenance of biodiversity. However, even though valuable this area is not regarded as critical and the functions and services are somewhat limited due to the fractured nature and surrounding disturbances.





**Figure 11:** Gentle sloping grassland with minimal presence of shrubs (*Vachelia karroo*, *Asparagus lariginus*). Grassland of this grazing camp have been subjected to a slightly higher grazing pressure.



**Figure 12:** Similar grassland habitat with a slightly denser shrub layer (*Vachelia karroo* and *Searsia lancea*) and less grazing pressure.



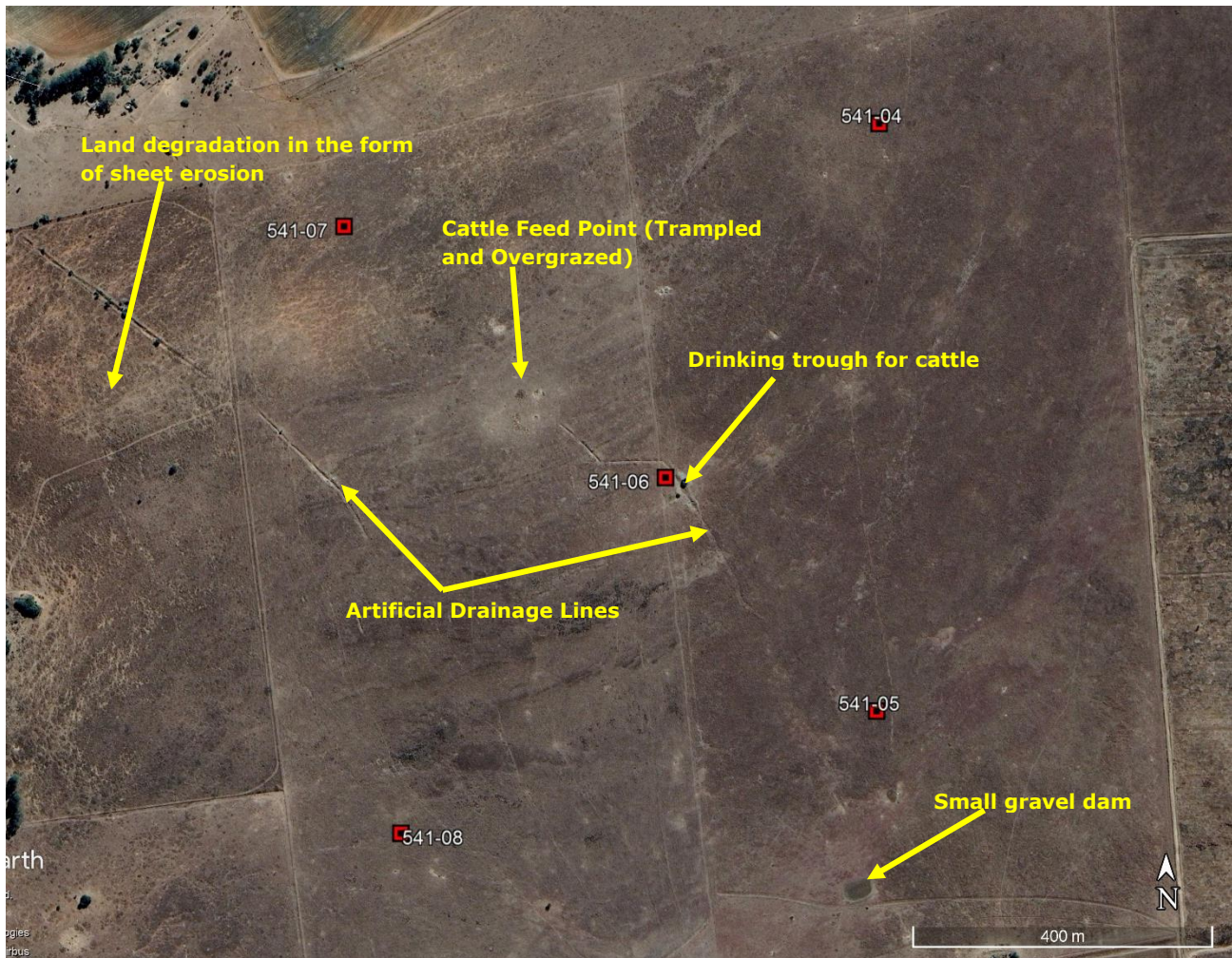
**Nkurenkuru**

ECOLOGY & BIODIVERSITY  
SACNASP REG: 400502/14

+27 (0) 84 207 3454 • 3 Jock Meiring Street, Park West, Bloemfontein, 9301 • PO Box 12500, Brandhof 9324



**Figure 13:** Google image indicating the location of the near-natural grassland in relationship to the surrounding disturbances visible from satellite imagery.



**Figure 14:** Google image indicating disturbances within the near-natural grassland.

## 6. POTENTIAL IMPACTS AND SIGNIFICANCE

The proposed impact and threats posed by this development (prospecting and drilling of boreholes), from an ecological perspective can be regarded as **minimal and not significant** due to;

- the extent of the development in terms of;
  - number of boreholes that will be drilled (only eight) and
  - the size of the footprint (less than 30m<sup>2</sup> per borehole),
- the fact that almost half of the points (541-01 to -03) are located within disturbed and transformed habitats,
- as well as the fact that existing roads and tracks will be utilized as far as possible.

The most significant impact will be associated with the disturbance of vegetation within and around the drilling point, however as mentioned this impacted area will be minimal and is still regarded as **LOW**. Furthermore, this impact on the vegetation have been sufficiently addressed within the EMPr.

The potential impact on listed and protected plant species as well as on local fauna will **not be significant and will not threaten** any conservation important individuals and / or communities.

The impact on broad-scale ecological processes can also be regarded as **negligible** and this development will **not threaten the status** of any Critical Biodiversity or Ecological Support Areas and these areas are not regarded significant for the maintenance and generation of biodiversity.

From the above mentioned it is clear that there are **no ecological significant impacts** associated with the development, as described within this letter, and the **necessity for any further ecological investigation and subsequently a full Basic Ecological Assessment are not regarded as a necessity**.

## 7. CONCLUSION AND RECOMMENDATIONS

The proposed impact and threats posed by this development (prospecting and drilling of boreholes), from an ecological perspective can be regarded as **minimal and not significant** due to;

- the extent of the development in terms of;
  - number of boreholes that will be drilled (only eight) and
  - the size of the footprint (less than 30m<sup>2</sup> per borehole),
- the fact that almost half of the points (541-01 to -03) are located within disturbed and transformed habitats,
- as well as the fact that existing roads and tracks will be utilized as far as possible.

**No ecological significant impacts** were identified and the **necessity for any further ecological investigation and subsequently a full Basic Ecological Assessment are not regarded as a necessity**.

The mitigation of potential impacts have been sufficiently addressed within the EMPr.

From an ecological perspective the most important aspects within the EMPr are;

- That all disturbances should be maintained within a minimal footprint area.
- Vegetation disturbance and destruction outside of the earmarked footprint areas should be avoided as far as possible.
- No unnecessary off-road driving must be allowed and existing roads and track should be utilized as far as possible.
- Rehabilitation of the disturbed areas, including the re-instatement of a natural vegetation cover consistent with that of Central Free State Grassland is regarded as important.
- Any rock or gravel that have been brought up to the surface during the drilling process should be spread out over the surface and not allowed to form an impenetrable layer for vegetation.



**Nkurenkuru**  
ECOLOGY & BIODIVERSITY  
SACNASP REG: 400502/14

+27 (0) 84 207 3454 • 3 Jock Meiring Street, Park West, Bloemfontein, 9301 • PO Box 12500, Brandhof 9324

A handwritten signature in black ink, appearing to read 'Gerhard Botha', with a long, sweeping flourish extending to the right.

Gerhard Botha (SACNASP Reg. No 400502/14)  
08/12/2019