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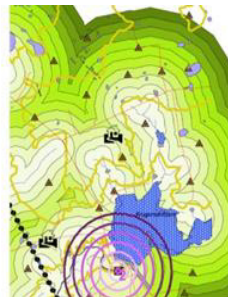
SITE SENSITIVITY VERIFICATION AND TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT REPORT ASSOCIATED WITH THE SARAO KLEREFONTEIN SUPPORT BASE IN THE NORTHERN CAPE

Version – final

May 2023

GCS Project Number: 22-1156

Client Reference:





**SITE SENSITIVITY VERIFICATION AND TERRESTRIAL BIODIVERSITY COMPLIANCE
STATEMENT REPORT ASSOCIATED WITH THE SARAO KLEREFONTEIN SUPPORT
BASE IN THE NORTHERN CAPE**

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Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and

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.



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May 2023
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SITE SENSITIVITY VERIFICATION AND TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT REPORT ASSOCIATED WITH THE SARAO KLEREFONTEIN SUPPORT BASE IN THE NORTHERN CAPE

1 INTRODUCTION

GCS Water and Environment (Pty) Ltd has been appointed by Delta Build Environment Consultants (Pty) Ltd DeltaBec, on behalf of the South African Radio Astronomy Observatory (SARAO), as national facility of the National Research Foundation (NRF), to undertake a Terrestrial Biodiversity Assessment of the Klerefontein Karoo Support Base site near Carnarvon in the Northern Cape Province.

2 PROJECT BACKGROUND

2.1 Location and extent

The Klerefontein Support Base is located approximately 14km to the west of the town of Carnarvon in the Kareeberg Municipality in the Northern Cape Province. The location of the support base is provided in Figure 2-2. The extent of the Klerefontein Support Base is approximately 8.5ha and is indicated in Figure 2-3.

2.2 Project description

The SKA1-MID Engineering Operations Centre (EOC) will be an expansion of the current infrastructure on site where the current workshops will be expanded as a singular building to incorporate:

- New office space
- Additional workshops
- Expansion of generator facilities and diesel storage

There is also a second building on site which is the old farmhouse which will remain unaltered as it is more than 60 years old and is therefore protected by the National Heritage Resources Act (Act 25 of 1995).

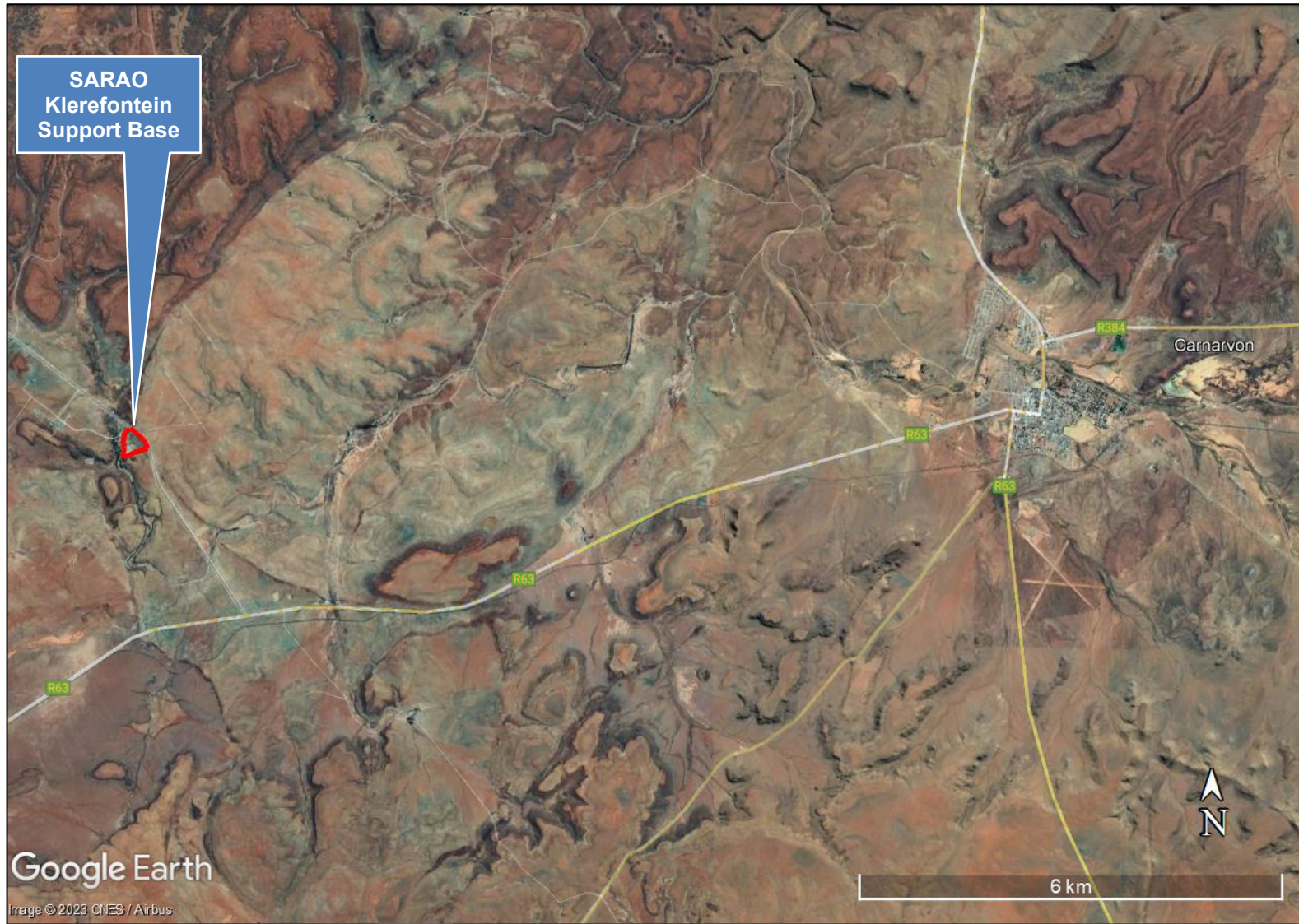


Figure 2-2: Location of the SARAO Klerefontein Support Base



Figure 2-3: Extent of the site associated with the SARAO Klerefontein Support Base

3 ASSUMPTIONS AND KNOWLEDGE GAPS

The following are assumptions made in the completion of the report:

- The assessment of the potential terrestrial biodiversity on the study site is based on several site visits, the last of which was conducted on 8 October 2021. Further site photographs and updates were provided by the client's representative on site.
- The following standardised and accepted methods to determine the various aspects of the study were used:
 - Electronic biodiversity databases managed by the South African National Biodiversity Institute (SANBI);
 - Virtual aquatic feature databases;
 - Available provincial electronic biodiversity databases;
 - South African Bird Atlas 2; and
 - Information from the Virtual Museum managed by the Percy Fitzpatrick Institute.

4 SCOPE OF WORK

This report will be submitted in support of the Application for Environmental Authorisation in accordance with the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended and the Water Use Licence Application in accordance with the National Water Act (Act No. 36 of 1998). The report will make provision for the requirements of these to regulatory processes.

The results from the Department of Forestry, Fisheries and Environment's (DFFE) online Screening Tool as it relates to the terrestrial biodiversity on the study site are provided in the table below.

Table 4-1: Result of the DFFE online Screening Tool

Theme	Very high sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Animal species theme		X		
Plant species theme				X
Terrestrial biodiversity theme	X			

The full screening assessment is attached in Appendix C.

From the above, it is clear that the Terrestrial Biodiversity Theme is classified as “very high” with the Animal Species Theme being “high” and Plant Species Theme being “low”.

As such, the protocol requires the completion of a Site Sensitivity Verification before conducting a specialist assessment. The minimum requirements associated with the Site Sensitivity Verification is as follows:

1. The Site Sensitivity Verification must be undertaken by a specialist.
2. The site sensitivity verification must be undertaken through the use of:
 - a) A desktop analysis, using satellite imagery;
 - b) A preliminary on-site inspection; and
 - c) Any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
 - a) confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool;
 - b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
 - c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

To this end, the first step in the Scope of Works is to complete the Site Sensitivity Verification.

- The outcome of this verification will guide the next step in the assessment process. If the outcome of the verification is that the sensitivities identified in the screening tool are relevant provision will be made to conduct an assessment in accordance with the requirements of the specified protocol, which makes provision for the following:
- The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:
 - A description of the ecological drivers or processes of the system and how the proposed development will impact these;

-
- Ecological functioning and ecological processes (e.g. fire, migration, pollination, etc. that operate within the preferred site;
 - The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;
 - The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA) sub catchments;
 - A description of terrestrial biodiversity and ecosystem on the preferred site, including: (a) main vegetation types; (b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified; (c) ecological connectivity, habitat fragmentation, ecological processes and fine scale habitats; and (d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified;
 - The assessment must identify any alternative development footprints within the preferred site which would be of a “low” sensitivity as identified in the screening tool and verified through the site sensitivity verification; and
 - The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:
 - ✓ Terrestrial critical biodiversity areas (CBAs),
 - ✓ Terrestrial ecological support areas (ESAs),
 - ✓ Protected areas as defined by the National Environmental Management: Protected Areas Act (Act No. 57 of 2003),
 - ✓ Priority areas for protected area expansion,
 - ✓ Strategic Water Source Areas (SWSAs),
 - ✓ Indigenous forests.

5 SITE SENSITIVITY VERIFICATION

The Site Sensitivity Verification was initiated by conducting a desktop assessment of the proposed development site. The desktop assessment made use of the following available information:

- Information contained in the DFFE Screening Tool Report;
- Current and historical aerial imagery of the area;
- Biodiversity databases available on the SANBI Website;
- Aquatic Assessment compiled for the site;
- 1 in 50 000 topographical map sheet for the area;
- Recent aerial imagery for the site;
- South African Bird Atlas 2; and
- Information from the Virtual Museum managed by the Percy Fitzpatrick Institute.

Various site assessments associated with the development of the study site was conducted by Mr Magnus van Rooyen of GCS Water and Environment (Pty) Ltd. The seasonality of these site visits is not considered to be a limitation of the findings of the site verification assessment. The site assessment consisted of a site walkover to identify any possible terrestrial biodiversity features that require investigation and assessment. The assessment also had as a goal to verify the information findings of the desktop assessment.

The following findings were made during the Site Sensitivity Verification.

6 DESKTOP FINDINGS

6.1 Department of Forestry, Fisheries and Environment online Screening Tool

The **DFFE online Screening Tool** has indicated that the animal species theme is considered to be of “high sensitivity” with the vegetation species theme, being of “low sensitivity” and the Terrestrial Biodiversity Theme of “very high sensitivity”. The protocol requires the completion of a Site Sensitivity Verification before conducting a specialist assessment. The information from the screening tool for each of these themes are provided in the table below.

Table 6-1: Sensitivity features identified for the animal and vegetation themes

Sensitivity theme	Feature	Sensitivity
Terrestrial biodiversity theme	Presence of a Critical Biodiversity Area 1	Very high
Animal species theme	Aves – <i>Neotis ludwigii</i> Reptilia – <i>Chersobius boulengeri</i>	High Medium
Plant species theme	No sensitive features	Low

It must be noted that the assessment of these species in the context of the project will be limited to the species' presence as well as suitable habitat for the species within boundaries of the project site.

6.2 Northern Cape Biodiversity Area Map (2016)

The development of provincial biodiversity plans is a key component of the systematic biodiversity planning in South Africa and therefore a strong focus of the Biodiversity Planning Forum. To this end the Northern Cape Biodiversity Area Map was developed in 2016 to highlight the potential key biodiversity areas in the province. These areas are identified as Critical Biodiversity Areas (CBAs).

CBAs are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

The Northern Cape Biodiversity Area Map has indicated that the entire study site is located in a CBA, which has been reflected in the “very high” sensitivity theme in the DFFE Screening Tool output.

6.3 Threatened and endangered ecosystems as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)

No threatened or endangered ecosystems as per the Act were identified on the Klerefontein Support Base site.

6.4 National Protected Areas Expansion Strategy (NPAES) (2018)

The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection. No part of the Klerefontein Support Base site is included in any NPAES area.

6.5 South African Protected and Conservation Areas Database (2022)

The South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) are GIS inventories of all Protected (PA) and Conservation (CA) areas in South Africa. The database also includes data on privately owned protected areas. The SAPAD and SACAD is maintained and updated on a regular basis and the latest data is released on a quarterly basis. The SAPAD database identified the presence of the Dr Appie van Heerden Nature Reserve approximately 9.5km to the southeast of the study site. Figure 6-1 provides the location and extent of this protected area.



Figure 6-1: Location and extent of the Dr Appie van Heerden Nature Reserve in relation to the study site (shown in red)

6.6 Important Bird and Biodiversity Area (IBAs)

IBAs constitute a global network of over 13 500 sites of which 112 are found in South Africa. IBAs are sites using globally standardised, quantitative and scientifically agreed criteria; and observations.

No IBAs intersect the site or is within a 5km radius of the study site.

6.7 Historical aerial imagery from the Surveyor General's Office

Dated aerial imagery of the site (1967 to 2021) shows the presence of disturbances on the site. These disturbances are directly associated with the presence of a farmstead on the property. The farmstead makes provision for a farmhouse, storage areas, workshops, parking areas, livestock pens, access road, pasture, etc.



Figure 6-2: Dated aerial image, 1967, showing the presence of a farmstead on the study site



Figure 6-3: Dated aerial image, 2021, showing the presence of a farmstead on the study site

The disturbance of the area has continued from before 1967 all the way to the present date. The most recent aerial image of the site taken in 2021, see Figure 6-4, shows the location and extent of the disturbances on the study site. The total extent of the disturbed areas is approximately 5.8ha and is made up of the following, Prickly Pear stand (3.3ha), access road (.01ha), farmstead and associated infrastructure (2ha), material stockpile (0.25ha) and irrigated pasture (0.15ha).

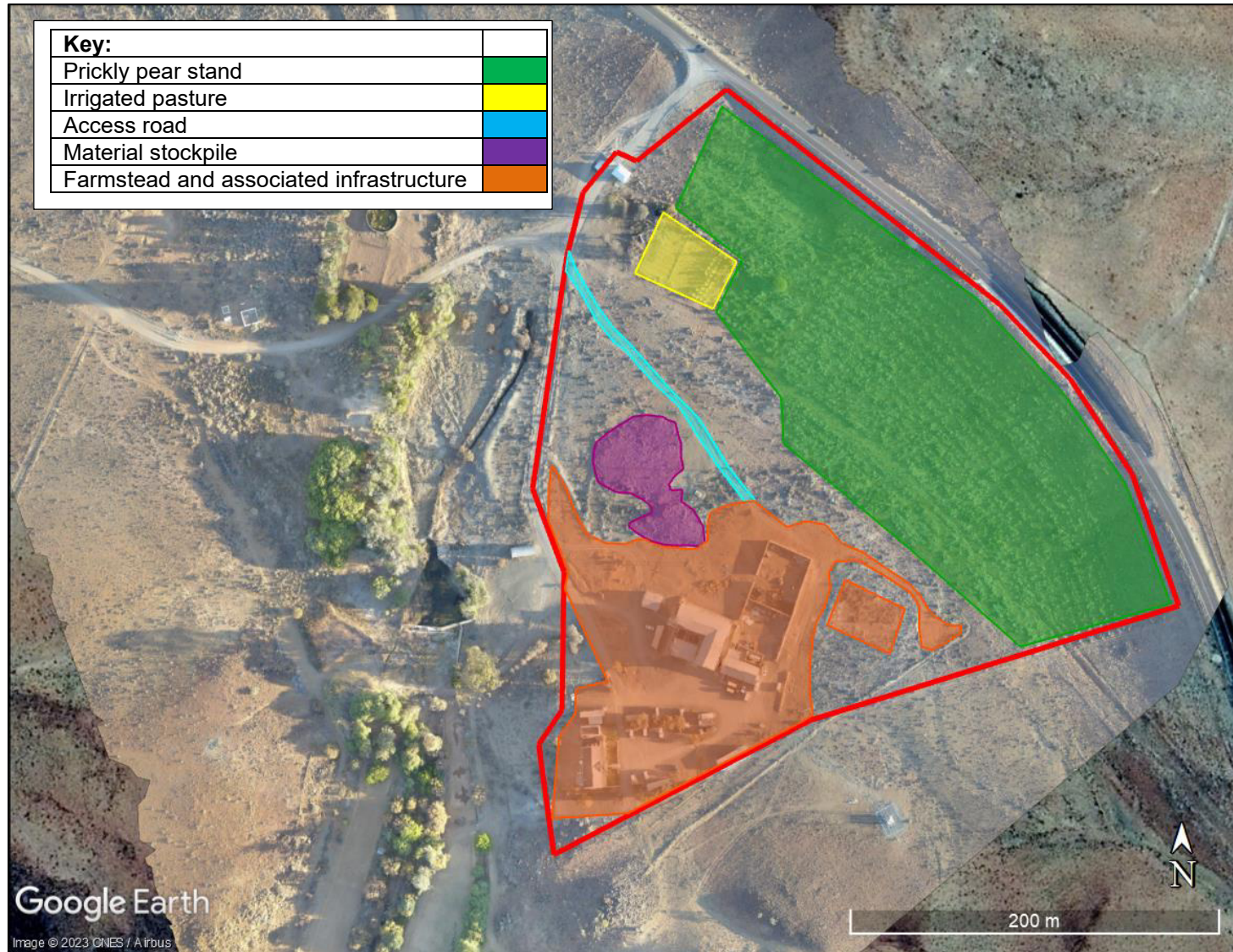


Figure 6-4: Location and extent of the current disturbed areas within the study site

6.8 Species data from the Virtual Museum (www.vmus.adu.org.za)

The following species data was generated through the interrogation of the various species lists for the map reference of the study site.

Mammals

The data from the Virtual Museum has indicated that 9 mammal species occur in the pentad in which the study site is located. The table below contains all the species identified with the “vulnerable” species as identified in the IUCN classification or the South African Red Data List, highlighted.

Table 6-2: Mammal species identified by the Virtual Museum to be potentially present within the study site

Scientific name	Common name	Red list category
<i>Cryptomys hottentotus</i>	Southern African Mole-rat	Least Concern (2016)
<i>Ammotragus lervia</i>	Barbary Sheep	No information
<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern (2016)
<i>Otocyon megalotis</i>	Bat-eared Fox	Least Concern (2016)
<i>Caracal caracal</i>	Caracal	Least Concern (2016)
<i>Felis nigripes</i>	Black-footed Cat	Vulnerable (2016)
<i>Herpestes pulverulentus</i>	Cape Gray Mongoose	Least Concern (2016)
<i>Procavia capensis capensis</i>	Cape Rock Hyrax	Least Concern (2015)
<i>Xerus inauris</i>	South African Ground Squirrel	Least Concern

The only species that is not classified as “least concern” is the *Felis nigripes* (Black-footed Cat), which is classified as “vulnerable”.

Reptiles

The data from the Virtual Museum has indicated the possible presence of 7 reptile species within the pentad in which the property is located. The table below contains the species all the species identified with the “near threatened” species as per the South African Reptile Conservation Assessment (SARCA), highlighted.

Table 6-3: Reptile species identified by the Virtual Museum to be potentially present within the study site

Scientific name	Common name	Red list category
<i>Agama aculeata aculeata</i>	Common Ground Agama	Least Concern (SARCA 2014)
<i>Agama atra</i>	Southern Rock Agama	Least Concern (SARCA 2014)
<i>Pedioplanis namaquensis</i>	Namaqua Sand Lizard	Least Concern (SARCA 2014)
<i>Chersobius boulengeri</i>	Karoo Padloper	Near Threatened (SARCA 2014)
<i>Psammobates tentorius</i> subsp.	Tent Tortoise (subsp. ?)	Least Concern (SARCA 2014)
<i>Psammobates tentorius verroxii</i>	Verrox's Tent Tortoise	No information
<i>Varanus albigularis</i>	Rock Monitor	Least Concern (SARCA 2014)

The only reptile species that is classified as “near threatened” is *Chersobius boulengeri* (Karoo Padloper). This is the species that is highlighted in the results of the DFFE Online Screening Tool.

Frogs

The data from the Virtual Museum has indicated the possible presence of 5 frog species within the pentad in which the property is located. All the species are classified as “least concern” by the IUCN classification or the South African Red Data List are provided in the table below.

Table 6-4: Frog species identified by the Virtual Museum to be potentially present within the study site

Scientific name	Common name	Red list category
<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad	Least Concern
<i>Xenopus laevis</i>	Common Platanna	Least Concern (IUCN 2020)
<i>Amietia fuscigula</i>	Cape River Frog	Least Concern (2017)
<i>Cacosternum boettgeri</i>	Common Caco	Least Concern (2013)
<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	Least Concern

Avifauna

The avifauna list generated for pentab 3055_2155 indicates the possible presence of 78 bird species in the pentab in which the study site is located. One of the species is highlighted in the DFFE Screening Tool output report, these species are provided in the table below.

Table 6-5: Bird species identified by the Virtual Museum to be potentially present within the study site

No.	Scientific name	Common name	Red list category
1	<i>Neotis ludwigii</i>	Ludwig's Bustard	Endangered

The *Neotis ludwigii* (Ludwig's Bustard) is classified as "endangered" by the IUCN. The threats to the species is habitat loss due to mining and renewable energy production and associated infrastructure (powerlines, wind turbines, etc.) and other anthropogenic impacts such as hunting, collection and poisoning.

6.9 Vegetation and Ecoregion

The study site is located in the Nama Karoo Biome that forms a large part of the Northern Cape Province, the western part of the Free State Province, parts of the northern Eastern Cape Province and extends southwards to the eastern parts of the Western Cape Province. The ecoregion associated with the study site is identified as the Nama Karoo Ecoregion that has a similar distribution as the biome in which it is located. The location and extent of the biome and ecoregion is provided in Figure 6-5 and Figure 6-6.

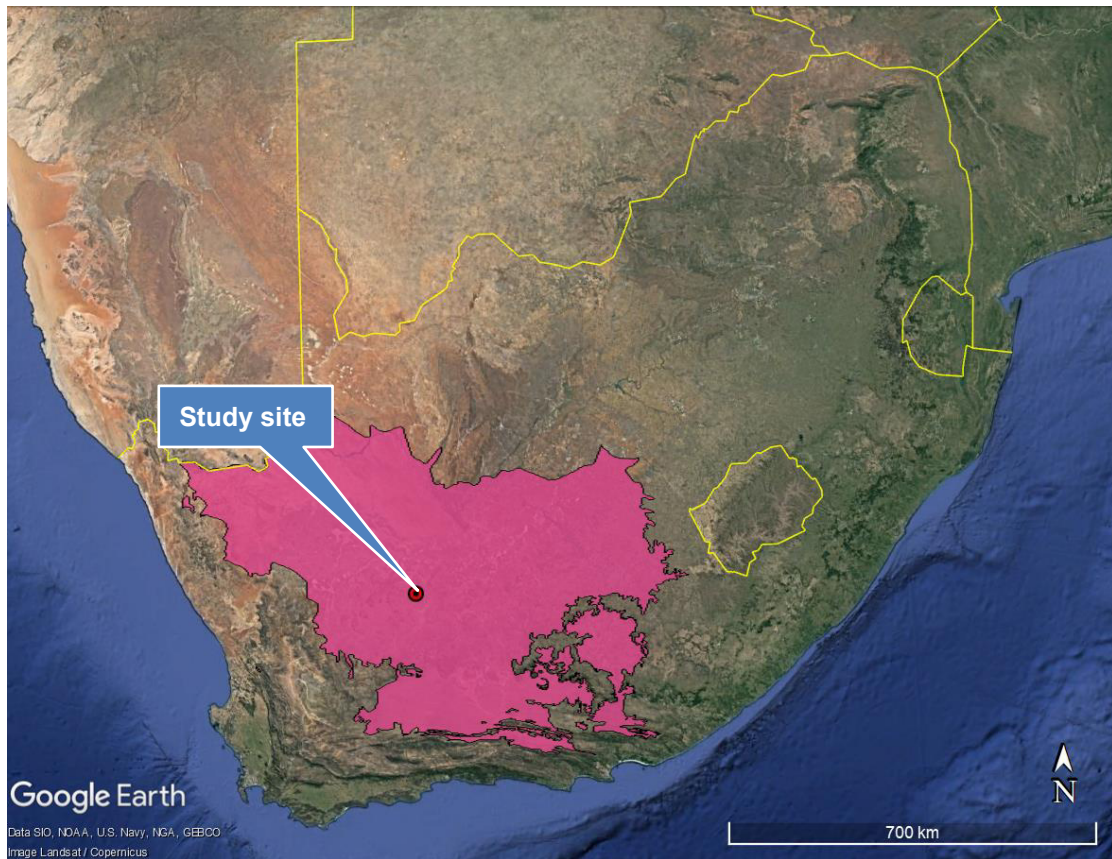


Figure 6-5: Location and extent of the Savanna Biome in which the study site is located

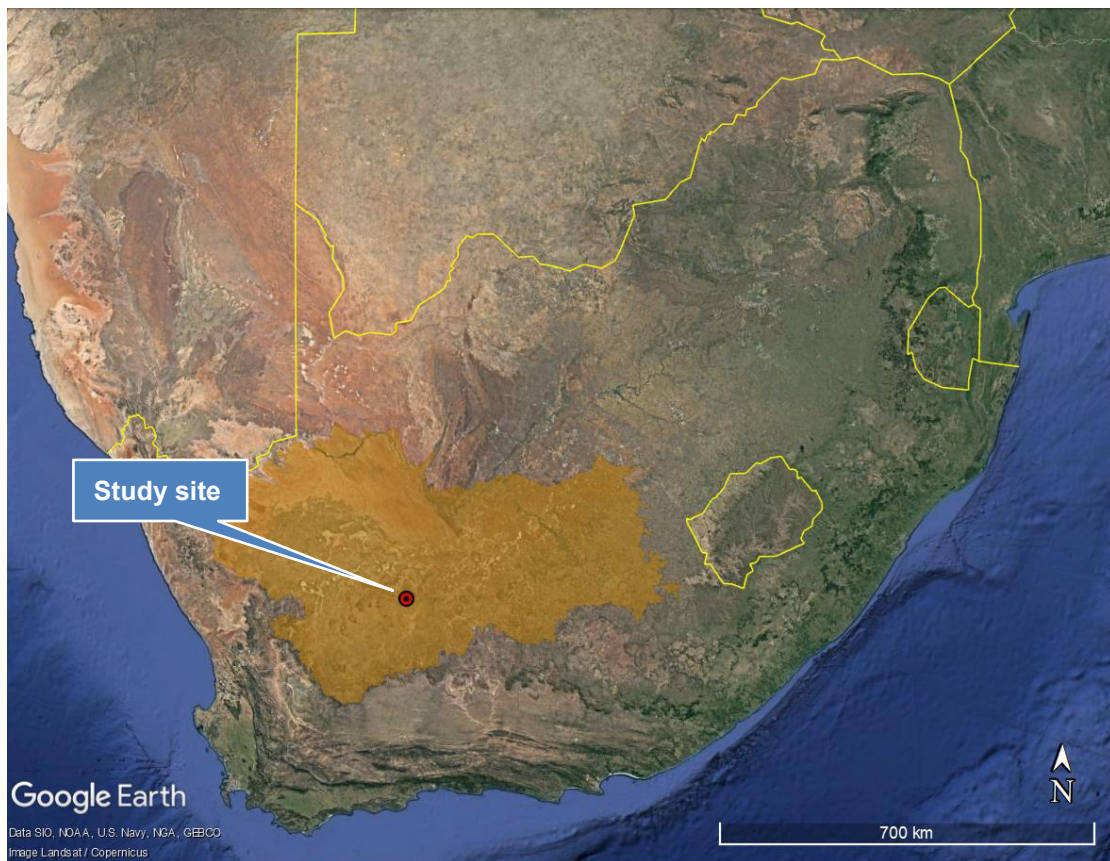


Figure 6-6: Location of the study site in the Nama Karoo Belt Ecoregion

Louw and Robelo have classified the vegetation on the study site as Bushmanland Nama Karoo while the assessment conducted by the South African National Biodiversity Institute (SANBI) classified the vegetation as Western Upper Karoo vegetation type (NKu1) (see Figure 5-8) and attributed a “least threatened” conservation status to the vegetation type.

The distribution of the vegetation type is confined to the Northern Cape Province with a small part that reaches into the Western Cape Province. The vegetation type is mostly located at altitudes between 1 000m to 1 500m and extends from the plains of the Fish River and upper reaches of the Renoster River in the west and as far as Fraserburg and Carnarvon in the east. The Bushmanland Basin bounds the vegetation to the north and by the Roggeveld Karoo and the Great Escarpment to the south.

The landscape is very dissected in the southwest by the tributaries of the upper catchment of the Sak River (e.g. Renoster River, Riet River and Klein Sak River) and often rocky. The vegetation is dominated by a mixture of small-leaved shrubs and shrubby succulents (*Brownanthus*, *Drosanthemum*, *Ruschia* etc.) with drought-resistant (mostly “white”) grasses.

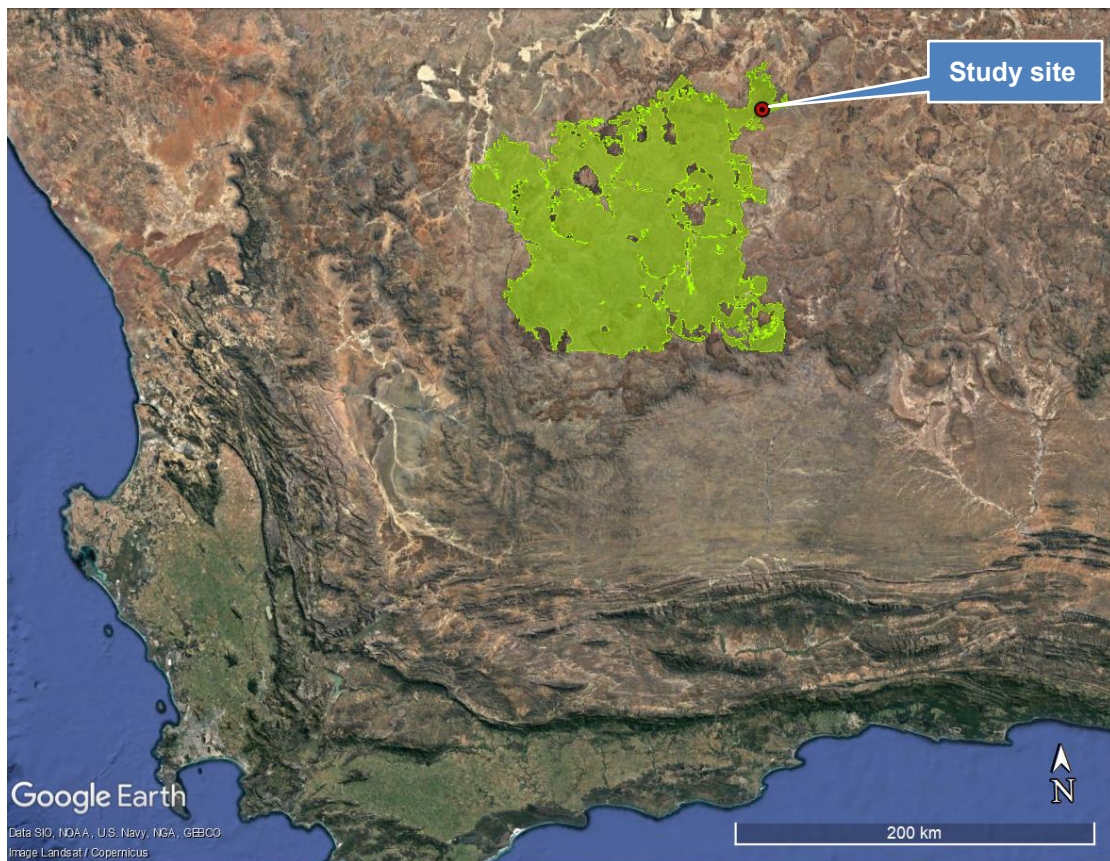


Figure 6-7: Location of the study site within the Western Upper Karoo (NKu1) vegetation type

7 SITE ASSESSMENT FINDINGS

The site assessment has as a goal to verify the findings of the desktop assessment discussed above. The site assessment was conducted on 14 January 2021 and 7 and 8 October 2021. The site visits were therefore conducted in mid- and early summer. The seasonality of the assessment is not considered to compromise the findings of the assessment.

7.1 Vegetation

The vegetation within the study site has been severely altered by historic and current anthropogenic impacts. In the past these impacts related to agricultural activities, associated with the Klerefontein farmstead and associated infrastructure. As shown in Figure 6-4, large parts of the study site have already been physically transformed by historic activities (approximately 70% of the study site).

As such, vegetation on the remaining 30% of the site has not been physically disturbed but is considered to be secondary in nature and of poor biodiversity value. No areas within the study site are considered to contain pristine vegetation.



Plate 7-1: View of the Prickly Pear “orchard” on site



Plate 7-2: View of the material stockpile area on site



Plate 7-3: Aerial view of the Klerefontein Support Base site, looking in a north-westerly direction, note the extent of the Prickly Pear “orchard” to the right of the image

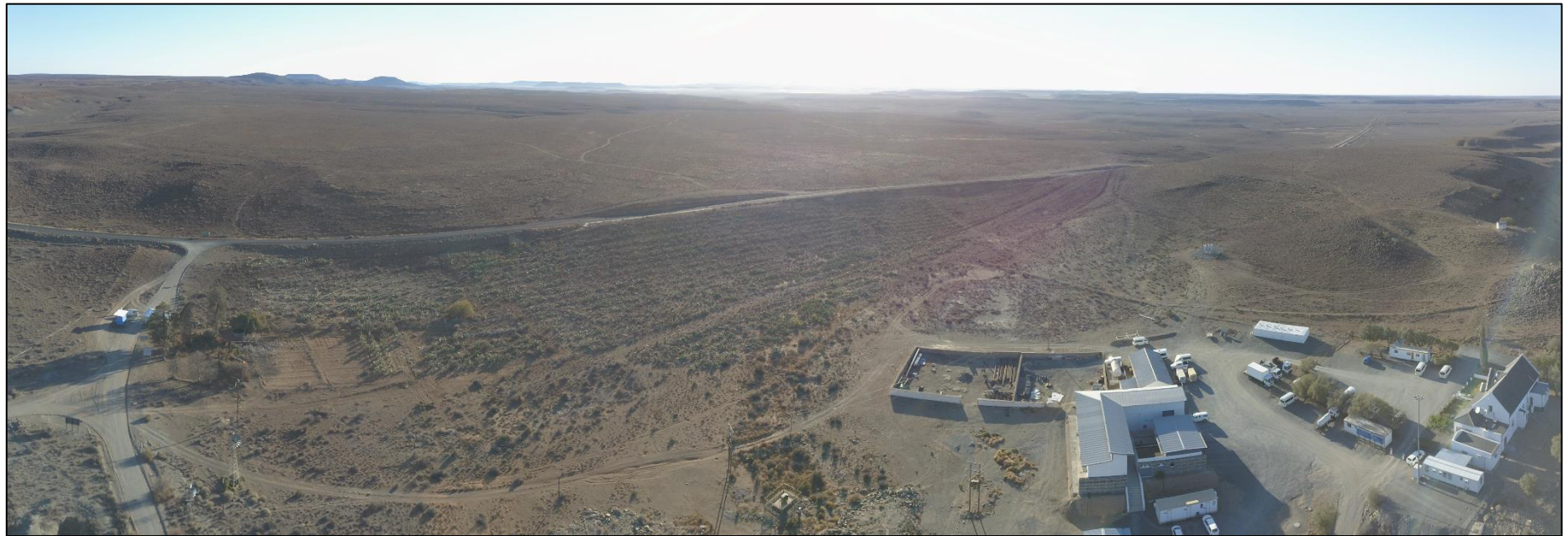


Plate 7-4: Aerial view of the Klerefontein Support Base site, looking in a south-easterly direction

The most prominent vegetative feature within the study site is the relatively extensive *Opuntia robusta* (Blue-leaf Prickly Pear) “orchard” that has been planted on the site. This stand is approximately 3.3ha in extent. The species is alien in nature and can be invasive if not sufficiently controlled. The “orchard” was likely planted to harvest the green “leaves” to use for fodder for livestock during extreme droughts. The fruit are also edible and was likely harvested for use.

The other large area of disturbance is associated with the existing farmstead and associated infrastructure. These areas are devoid of any indigenous vegetation.

The layout provided is largely situated on these two disturbed areas, see Figure 7-1 and as such will not impact on the vegetative biodiversity value of the development footprints.

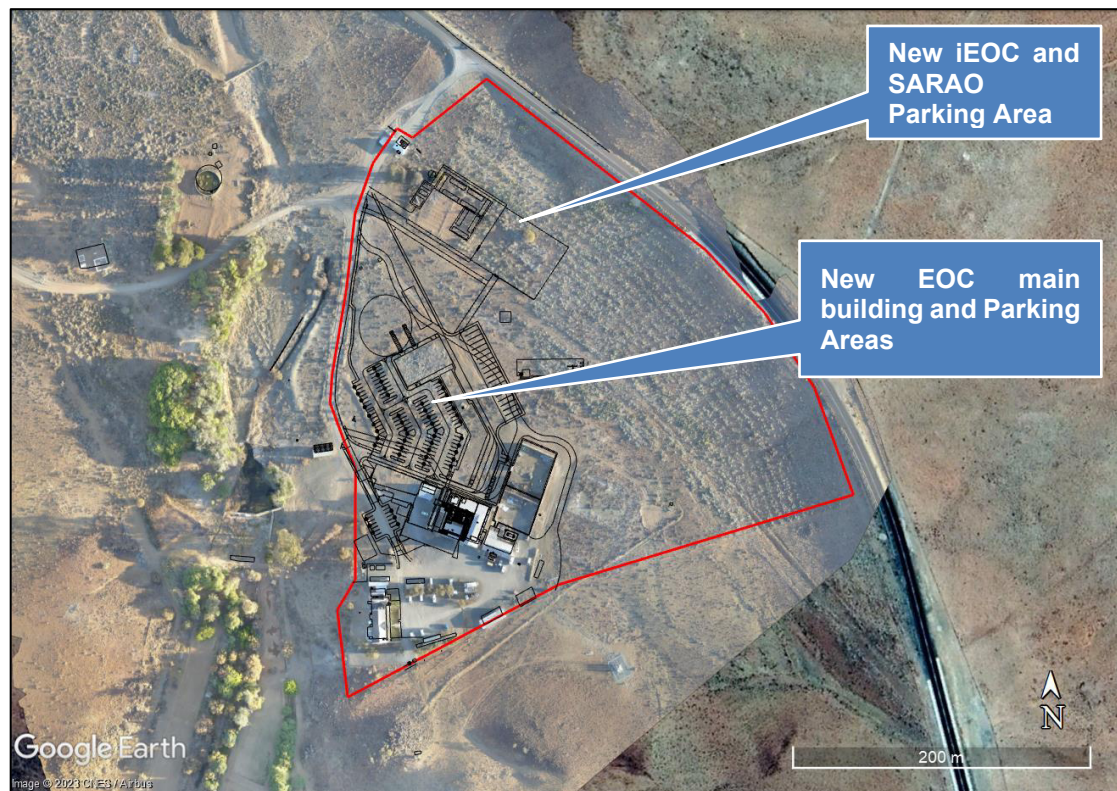


Figure 7-1: Outline of the layout of the proposed Klerefontein Support Base and associated infrastructure

7.2 Mammals

No wild mammals were observed during the site assessment. This is possibly due to the lack of suitable habitat on the study site as a result of the severe alteration of the habitat from its pristine nature. The presence of constant human movement on the study site will also dissuade any large mammals from visiting the site.

The desktop study has indicated that the vulnerable *Felis nigripes* (Black-footed Cat) may occur on the study site. The presence of this species is highly unlikely due to the absence of any suitable habitat.

7.3 Reptiles

No reptiles were observed during the site assessment. However, it must be pointed out that the presence of common reptiles is likely in the areas to the south of the study site as the rocky habitat will be suitable for some species.

The DFFE Online Screening Assessment has identified the possible presence of *Chersobius boulengeri* (Karoo Padloper) which is classified as “near threatened” by the ICUN. This species was not present on site, likely as a result of the lack of suitable habitat due to the significant transformation of the site.



Plate 7-5: View of the near threatened *Chersobius boulengeri* (Karoo Padloper) (reference photograph)

7.4 Frogs

No frogs were identified during the site assessment. If present, these species will be associated with the watercourse that passes to the west of the study site. No suitable habitat is located within the study site.

7.5 Birds

The DFFE Online Screening Tool output identified the presence of *Neotis ludwigii* (Ludwig's Bustard) on the study site. The IUCN classifies this bird species as endangered as a result of habitat loss due to mining and the development of renewable energy projects and physical impacts due to hunting and bird-strikes (wind turbines and powerlines) This species was not viewed during the site assessment and is also unlikely to frequent the site due to the disturbed habitat and the presence of human activity.



Plate 7-6: View of the *Neotis ludwigii* (Ludwig's Bustard) (reference photograph)

8 OUTCOME OF THE SITE SENSITIVITY VERIFICATION

The outcome of the Site Sensitivity Verification based on the information generated is summarised in the table below.

Table 8-1: Outcome of the Site Sensitivity Verification

DFFE Screening Tool Theme	DFFE Screening Tool sensitivity rating	Site Sensitivity Verification findings	Discussion
Terrestrial Biodiversity Theme	Very high sensitivity	Low sensitivity	<p>The screening tool indicates that the property is located within a CBA as identified in the Northern Cape Biodiversity Area Map (2016). The map does not provide any details as to the reasons for the classification, but one can only assume that the classification is based on the pristine nature of the vegetation in the area.</p> <p>The vegetation on the Klerefontein Support Base study site is not pristine as it has undergone historic transformation as outline in the sections above. Approximately 70% of the study area has been physically transformed with the remaining 30% being considered secondary in nature.</p> <p>Based on the above findings, the sensitivity of the Terrestrial Biodiversity Theme is considered to be of Low Sensitivity.</p>
Animal Theme	High sensitivity	Low sensitivity	<p>The High Sensitivity rating of this theme is based on the possible presence of a single bird species, <i>Neotis ludwigii</i> (Ludwig's Bustard) and a single reptile species, <i>Chersobius boulengeri</i> (Karoo Pad-looper).</p> <p>Neither of these species are present on the site and no suitable habitat for these species is present on the site as a result of the high levels of historic and current disturbances.</p> <p>As such, the sensitivity of the Animal Theme within the property, is considered to be of Low Sensitivity.</p>
Plant Theme	Low sensitivity	Low sensitivity	<p>Due to the high levels of historic and current disturbances to the vegetation on the study site, the low sensitivity rating of the screening tool can be confirmed.</p>

9 COMPLIANCE STATEMENT

As the Site Sensitivity Verification completed in Section 5, above, has indicated that the Terrestrial Biodiversity, Plant and Animal Themes (key components of Terrestrial Biodiversity) is considered to be “LOW”, the following Compliance Statement has been prepared for the project in relation to the Terrestrial Biodiversity. The contents of the Compliance Statement are provided in the table below.

Table 9-1: Minimum contents requirements of the Compliance Statement

Compliance statement requirement	Section of this report
Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement, including the curriculum vitae	Appendix A
A signed statement of independence by the specialist	Page (i)
A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	Section 3
A description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant	Section 3 and 4
The mean density of observations / number of sample sites per unite area	NA
Where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion into the EMPr	Section 9
A description of the assumptions made and any uncertainties or gaps in knowledge or data	Section 3
Any conditions to which the compliance statement is subjected.	Section 9

9.1 Impact identification and assessment

The likely impacts associated with the proposed development on the identified terrestrial biodiversity baseline have been identified through the undertaking of desktop assessment, site visit, consultation with published information and comments from relevant stakeholders (where applicable).

The impact assessment will make provision for the assessment of the following impacts:

- No-go impacts;
- Planning and design phase impacts;
- Construction phase impacts;
- Operational phase impacts;
- Decommissioning phase impacts; and
- Cumulative impacts.

Impacts identified were assessed according to the criteria outlined in Appendix B. Each impact was ranked according to extent, duration, magnitude and probability. These criteria are based on the Department of Environmental Affairs and Tourism (DEAT) (now the Department of Forestry, Fisheries and Environmental Affairs) Guideline Document to the EIA Regulations(1998). Where possible, mitigatory measures were recommended for the impacts identified.

9.1.1 No-go impacts

To contextualise the potential impacts of the project's activities and associated infrastructure, the existing impacts (or *status quo*) associated with current terrestrial biodiversity conditions need to be described in terms of the presence of the terrestrial features and vegetation patterns, structure and composition. This *status quo* should be used as the comparison against which the other project impacts are assessed. The main issues identified with the existing impacts are:

- The present impacts associated with the high levels historic and current disturbances will persist, which will result in the current impacts on the terrestrial biodiversity to continue, resulting in degradation of the ecological importance of the study site.

Since these existing impacts will continue even if the project is not implemented, they are considered to be “no-go” impacts.

9.1.2 Planning and design phase impacts

Activities associated with the design and pre-construction phase pertain mostly to a feasibility assessment which is done mostly at a desktop level. In some cases, further site visits need to take place, but the impacts of these visits are negligible, if any, e.g. photographs and field surveys, etc.

For the purposes of this assessment, no impacts have been identified that are directly associated with the project.

9.1.3 Construction phase impacts

This section will assess the impacts associated with the implementation of the proposed *in situ* upgrades on the terrestrial biodiversity on the study site. During the construction phase the of the proposed project the following impacts have been identified:

- Loss of indigenous vegetation.
- Spreading of alien invasive plant species.
- Contamination of the area by petrochemical spillages.
- Contamination of the area by construction waste.
- Contamination of the area by domestic waste.
- Contamination of the area as a result of leaking portable toilet facilities.

9.1.4 Operational phase impacts

This phase assesses the impacts associated with the operational phase of the new development. The following impacts have been identified:

- Spreading of alien invasive vegetation.
- Contamination by domestic waste generated by the operations.

9.1.5 Decommissioning phase impacts

As the development will not be decommissioned, no provision is made for the any decommissioning impacts.

9.1.6 Cumulative impacts

The following cumulative impacts associated with the development on the study site have been identified:

- Loss of indigenous vegetation.
- Spread of alien invasive plant species.

Table 9-2: No-go impacts associated with the development

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; P = Probability; M = Magnitude							S = Status; E = Spatial extent; D = Duration; P = Probability; M = Magnitude					
		S*	E	D	M	P			S	E	D	M	P	
Vegetation	The current impacts on the terrestrial biodiversity as a result of the historic and current disturbances will persist	-	1	5	0	5	30 Low neutral	None, as the no-go option reflects the <i>status quo</i> .	-	1	5	0	5	30 Low neutral

Table 9-3: Construction phase related impacts associated with the development

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude; P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude; P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
Loss of indigenous vegetation	Even though the vegetation on the study site is considered to be severely degraded, the vegetation meets the definition of "indigenous vegetation" as per the NEMA EIA Regulations (2014), as amended.	-	1	2	4	5	35 Medium negative	<p>The areas that will require the clearance of vegetation must be limited to as small a footprint within the construction site as possible.</p> <p>The footprint must be surveyed and clearly demarcated to ensure that the area to be cleared will be limited to the area required. No operations must be allowed outside of the demarcated areas.</p> <p>The areas that have been cleared of vegetation during the implementation of the project must be revegetated with grasses that occur naturally in the area.</p>	+	1	2	6	2	18 Low negative

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
Spreading of alien invasive plant species.	Alien invasive plant species are already present in the study area. As such, the clearance of areas for construction will result in bare areas into which these species can spread.	-	1	2	4	3	21 Low negative	<p>The disturbance of the vegetative cover during the construction phase of the development will provide an opportunity for the establishment of alien invasive species on these areas.</p> <p>To prevent this from happening, an Alien Invasive Management Plan must be implemented for the duration of the construction phase of the development. This plan must make provision for the following:</p> <ul style="list-style-type: none"> • The construction footprint must be clearly surveyed and demarcated before any construction of the components of the development is to commence. • This must be done to ensure that areas to be cleared are limited to only the areas that are necessary. • The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear. • Identification and eradication methodologies of any alien plant species that establish on the site. • The rehabilitation of these cleared areas must commence as soon as practically possible after construction activities have ceased. 	-	1	2	4	1	7 Low negative

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
Contamination of the area by petrochemical spillages.	The presence of plant and equipment on the construction site that make use of petrochemical substances to operation pose a risk of contamination to the terrestrial biodiversity on the study site.	-	1	2	8	3	33 Medium negative	<ul style="list-style-type: none"> All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis before operations commence. All plants and equipment that are found to be leaking must be removed from the site and only returned once the leakages have been addressed. If any petrochemical substances are stored on the site, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. All refuelling of plant and equipment must be conducted over a drip-tray. If any plant or equipment is to be parked on the site, these must be parked within the demarcated construction footprint that has been cleared. If any spillages from plant or equipment occur, the spill must be contained immediately, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider. 	-	1	2	8	1	11 Low negative

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
Contamination of the area by construction waste.	The construction activities will generate an amount of construction waste (wood off-cuts, waste concrete, waste cement, etc.) on the site.	-	1	2	8	3	33 Medium negative	<ul style="list-style-type: none"> Skips must be made available on-site into which all construction waste can be discarded. All construction waste must be cleared from the site on a daily basis and placed in these skips. The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed. The disposal of the content of these skips must be done at a municipal landfill site. No dumping of construction waste on open areas on the property will be allowed. The burying of construction waste on the development site will not be allowed. 	-	1	1	8	1	10 Low negative

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
Contamination of the area by domestic waste.	The presence of a labour force associated with the construction will generate an amount of domestic waste (food wrapping, plastic bottles, etc.) on the site.	-	1	1	6	3	24 Low negative	<ul style="list-style-type: none"> A designated eating area must be established within the construction site. Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the labour. The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously. The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker. The burying and burning of domestic waste on site will not be allowed. 	-	1	1	6	1	8 Low negative
Contamination of the area as a result of leaking portable toilet facilities.	Portable toilet facilities will be present to service the labour associated with the construction. These toilets will pose a risk of leakages and spillages which may impact on the terrestrial biodiversity on the site.	-	1	2	8	3	33 Medium negative	<ul style="list-style-type: none"> Only portable chemical toilets with a sealed reservoir will be allowed on site. All portable chemical toilets must be located further than 30m away from the delineated edges of the buffers around the riparian and wetland edges. The capacity of the reservoirs in the portable chemical toilets must be 	-	1	2	8	1	11 Low negative

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
								monitored on a daily basis to ensure that they can be serviced timeously. <ul style="list-style-type: none"> All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal wastewater treatment facility. No onsite disposal of sewage will be allowed. 						

Table 9-4: Operational phase impacts associated with the development

Nature of impact	Impact summary	Without mitigation					Significance rating (pre-mitigation)	Proposed mitigation and management measures	With mitigation					Significance rating (post-mitigation)
		S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability							S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability					
		S*	E	D	M	P			S	E	D	M	P	
Spreading of alien invasive vegetation.	Due to the presence of the alien invasive <i>Opuntia robusta</i> (Blue-leave Prickly Pear) "orchard" on the site, this and other alien invasive species can proliferate into any disturbed as a result of construction activities.	-	1	3	6	4	40 Medium negative	Provision must be made for the compilation and implementation of an Alien Invasive Management Plan for the operational phase of the development. This plan must make provision for the following: <ul style="list-style-type: none"> Regular monitoring of the areas surrounding the construction facilities for the presence of any alien invasive plant species. If these species are found near the facilities, these must be eradicated in 	-	1	1	2	1	4 Low negative

10 CONCLUSIONS AND REASONED OPINION BY THE SPECIALIST

The findings of this report have indicated that the terrestrial biodiversity (fauna and flora) on the study site has been historically degraded and is currently still being impacted on site activities. As such, the animal and the terrestrial biodiversity theme on the site is considered to be LOW which is in contradiction with the findings of the DFFE Screening Tool. In addition, the vegetation theme was found to be LOW which is in agreement with the findings of the DFFE Screening Tool.

It is therefore the opinion of the specialist that there are no fatal flaws in terms of the terrestrial biodiversity, associated with the implementation of SARAO Klerefontein Support Base and that the project should be authorised.

11 REFERENCES

BOON, R., 2010. Pooley's Trees of Eastern South Africa – A Complete Guide. Flora and Fauna Publication Trust.

MINTER, L.R., BURGER, M., HARRISON, J.A., BRAACK, H.H., BISHOP, P.J., and KLOEPFER, D. eds. 2004. Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland. SI/MAB Series # 9. Smithsonian Institution. Washington DC.

MUCINA, L. and RUTHERFORD, M.C. (eds.), 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia Publishers.

POOLEY, E., 2005. A Field Guide to Wild Flowers of KwaZulu-Natal and the Eastern Region. Natal Flora Publication Trust.

VAN OUDTSHOORN, F., 2006. Guide to grasses of Southern Africa. Briza Publications.

APPENDIX A
SPECIALIST CURRICULUM VITAE



Magnus van Rooyen

Technical Director - Environment

CORE SKILLS

- Environmental Impact Assessment
- Specialist Ecological (Terrestrial and Aquatic) Assessment
- Environmental Screening Assessment
- Due Diligence Assessment and Feasibility Studies
- Mining Applications
- Environmental Management Programmes and Plans
- Strategic Environmental Assessments
- Wildlife Management Plans

DETAILS

Qualifications

- MPil. Environmental Management
- BSc (Hon) Botany
- BSc (Botany and Zoology)
- Post Graduate Certificate in Education (Science and Biology)

Memberships

- South African Council for Natural Scientific Professions (Pr. Sci. Nat. 400335/11)
- International Association of Impact Assessors (Ref No. 1839)

Languages

- Afrikaans - fluent
- English - fluent
- German - fair
- Zulu - communication

Countries worked in:

South Africa, Namibia, Lesotho, Mozambique, Botswana, Guinea, Liberia, United States, United Kingdom

PROFILE

Mr van Rooyen is currently a Technical Director – Environment and the Branch Manager of the KwaZulu-Natal Office of GCS in Durban.

In addition to holding a Masters degree in Environmental Management, he also holds a BSc degree in Botany and Zoology, an Honors degree in Botany and a Post Graduate Certificate in Education. He has in excess of 18 years' experience in the environmental consulting field through conducting and managing Environmental Impact Assessments, Specialist Terrestrial and Aquatic Ecology Assessments and Strategic Environmental Management inputs into various project feasibility studies.

Through these services, he has been exposed to projects in a range of sectors which include the general public infrastructure sector (national and provincial roads, harbour and rail developments, water (dams and supply) and wastewater (treatment works and reticulation), private infrastructure sector (small and large scale housing developments, lodges, private dams, etc.), agricultural sector (dams, establishment of orchards, plantations and feedlots), mining sector (coal mines, gold mine, manganese mines, aggregates and associated mining infrastructure) and the industrial sector (light and heavy industrial infrastructure development).

In addition, Mr van Rooyen has extensive experience in conducting specialist terrestrial and aquatic ecological assessments for various infrastructure (roads, dams, ports) and industrial (smelters, power plants) development projects in a number of diverse ecosystems across Africa. He has experience in the compilation of Resettlement Policy Framework Plans, Due Diligence Assessments and Feasibility Studies associated with infrastructure development projects. Mr van Rooyen has experience in working on various private and public sectors as well as rural and urban environments in various countries

Previous Experience

Client	Project Description	Role/ Responsibility
Private client	Wetland Assessment for the farm dam on the Farm Compentation near Matatiele Undertaking of the wetland assessment for the development of an irrigation dam on the Farm Compensation near Matatiele in KwaZulu-Natal.	Wetland Specialist
Senekal Boerdery	Wetland and Biodiversity Assessment for the Mkuze Township Establsishment Undertaking of the wetland and biodiversity assessment associated with the township establishment in the town of Mkuze, KwaZulu-Natal.	Wetland and Biodiversity Specialist
WSP Consulting	Wetland Assessment associated with the establishment of a flood protection berm at the SAPPI Saiccor Mill Undertaking of the wetland assessment for the construcion of a flood protection berm between the uMkomaas River and the SAPPI Saiccor Mill in KwaZulu-Natal.	Wetland Specialist
Transnet National Ports Authority	Forest mapping within the Port of Richards Bay Undertaking of the mapping and classification of all the indigenous forest areas within the Port of Richards Bay, KwaZulu-Natal.	Biodiverstiy Specialist
RHDHV	KwaMathanya Water Supply Scheme Wetland Assessment Undertaking of the wetland assessment of the KwaMathanya water supply scheme near town of Ixopo in KwaZulu-Natal.	Wetland Specialist
Private client	Brownsdrift Hydropedological Assessment Undertaking of the wetland and hydropedological assessment associated with the proposed residential developmnet on the site in Brownsdrift, eThekwini Municipality, KwaZulu-Natal.	Wetland Specialist
GreenScene Environmental	Wetland and Biodiversity Assessment for a residential property in Pumula Undertaking of the wetland and biodiversity assessment for the residential development on Lot 967 Pumula, KwaZulu-Natal.	Wetland and Biodiversity Specialist
GreenScene Environmental	Wetland and Biodiversity Assessment for Lot 962 and 965 Port Edward Undertaking of the wetland and biodiversity assessment for the residential development on Lot 962 and 965 Port Edward, KwaZulu-Natal.	Wetland and Biodiversity Specialist
Msunduzi Municipality	Wetland and Biodiversity Assessment for various Military Veterans Housing sites within the Msduzi Municipality Undertaking of the wetland and biodiversity assessment for the various sites earmarked for the establishment of residential houses for the Military Veterans in the Msunduzi Municipality, KwaZulu-Natal.	Wetland and Biodiversity Specialist
Private client	Forest delineation of a private property in Munster Undertaking of the delineation of the forest margins on the residential property in Munster, KwaZulu-Natal.	Biodiverstiy Specialist

Previous Experience

JG Afrika (Pty) Ltd	Gunyana Water Supply Scheme Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity assessment of the Gunyana community water supply scheme near town of Pomeroy in KwaZulu-Natal.	Wetland and Biodiversity Specialist
GreenScene Environmental	Wetland and Vegetation Assessment associated with the construction of the Ingwebaba Pedestrian Bridge near Shelly Beach Undertaking of the wetland and vegetation assessment for the construction of the Ingwebaba Pedestrian Bridge near Shelly Beach in KwaZulu-Natal.	Wetland and Biodiversity Specialist
Terratest (Pty) Ltd	Wetland and Vegetation Assessment associated with the construction of the KwaHlokohe Rural Water Supply Scheme near Eshowe Undertaking of the wetland and biodiversity assessment of the KwaHlokohe community water supply scheme near town of Eshowe in KwaZulu-Natal.	Wetland and Biodiversity Specialist
Coastal Macadamias	Wetland Assessment associated with the development of an irrigation dam for Coastal Macadamias near Ramsgate Undertaking of the wetland assessment for the development of an irrigation dam for the Coastal Macadamias property near Ramsgate, KwaZulu-Natal.	Wetland Specialist
South African National Roads Agency Limited	Ballito to Tinley Manor Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity study to support the preliminary design for the upgrade of the N3 between Ballito and Tinley Manor.	Wetland and Biodiversity Specialist
Vale Limitada	Biodiversity Assessment for the alternative water supply pipeline Undertaking of the biodiversity assessment to support the preliminary design of the proposed alternative water supply pipeline at the Moatize Mine in Tete, Mozambique.	Biodiversity Specialist
GIB Consulting Engineers	Aquadene Wetland Assessment Undertaking of the wetland assessment for the Aquadene housing development in Richards Bay.	Wetland Specialist
JG Afrika (Pty) Ltd	Wetland Assessment for the pipeline route for the drought relief pipeline in Laingsburg Undertaking of the wetland assessment associated with the 25km pipeline route from the water source to the town of Laingsburg in the Western Cape.	Wetland Specialist
Seche International	Wetland and Biodiversity Assessment for the proposed new uMgungundlovu Landfill Site Preliminary wetland and biodiversity assessment for the proposed new uMgungundlovu Landfill site outside of Pietermaritzburg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	Wetland and Vegetation Assessment associated with the upgrading of the N1 between Heuningspruit and Koppies Undertaking of the wetland and biodiversity assessment for the upgrading of the N1 between Heuningspruit and Koppies in the Free State Province.	Wetland and Biodiversity Specialist
Terratest (Pty) Ltd	Wetland and Vegetation Assessment associated with the upgrading of the Nelson Mandela Museum at Qunun	Wetland and Biodiversity Specialist

Previous Experience

	Undertaking of the wetland and vegetation assessment associated with the upgrading of the Nelson Mandela Museum in Qunu in the Eastern Cape Province.	
GreenScene Environmental	Wetland and Vegetation Assessment associated with the construction of the Ulundi Water Supply Scheme Undertaking of the wetland and biodiversity assessment of the Ulundi water supply scheme near town of Eshowe in KwaZulu-Natal.	Wetland and Biodiversity Specialist
MOZAL	Biodiversity Assessment for the raw water supply pipeline for the Mozal Aluminium Smelter in Mozambique Undertaking of the biodiversity assessment for the raw water supply pipeline from the desalination plant in the Port of Matola to the MOZAL smelter in Boane, Maputo, Mozambique.	Biodiversity Specialist
JG Afrika (Pty) Ltd	Wetland and Biodiversity Assessment for various water supply schemes in the Cedarberg Municipality Undertaking of the wetland and biodiversity assessments for the water supply schemes for the town of Whupperthal, Clanwilliam and Citrusdal in the Western Cape.	Biodiversity Specialist
uKhozi Environmentalists	Phalanndwa Coal Mine Biodiversity and Wetland Assessment Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Phalanndwa Coal Mine Expansion near Delmas.	Wetland and Biodiversity Specialist
Kongiwe Environmental Consultants	Lephalale Coal Mine Biodiversity and Wetland Assessment Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Lephalale Coal Mine near Lephalale.	Wetland and Biodiversity Specialist
Nzingwe Consultancy	Riversdale Coal Mine Wetland Assessment Undertaking the wetland specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the Riversdale Coal Mine near Vryheid.	Wetland Specialist
WSP Environmental	SAPPI Saiccor Wetland Assessment Undertaking the wetland specialist study in support of the Application for Environmental Authorisation for the construction of flood protection measures associated with the SAPPI Saiccor Mill, uMkomaas.	Wetland Specialist
WSP Environmental	11th Avenue Interchange Wetland Assessment Undertaking the wetland specialist study in support of the Application for Environmental Authorisation for the construction of the 11 th Avenue Interchange, Durban	Wetland Specialist
WSP Environmental	SAPPI Saiccor Alien Invasive Plant – Risk Assessment	Vegetation Specialist

Previous Experience

	Undertaking of the risk assessment of the presence of various listed category I and II alien invasive plant species on the SAPPI Saiccor Mill site, uMkomaas.	
Environmental Resources Management	Bhangazi Community Tented Camp Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the establishment of the Bhangazi Community Tented Camp in the isiMangoliso Wetland Park, St. Lucia.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	N3 – Market Road Interchange Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Market Road Interchange, Pietermaritzburg.	Wetland and Biodiversity Specialist
ESKOM SOC	ESKOM 22 kVA Lines Vegetation Assessments Undertaking of vegetation assessments for the establishment of various 22kVA electrification lines in KwaZulu-Natal.	Vegetation Specialist
ESKOM SOC	Tombo to Mafini 300kVA Line Vegetation Assessments Undertaking of vegetation assessment for the route alignment of the 300kVA high voltage electricity line from the Tombo Substation to Mafini, Port St. Johns.	Vegetation Specialist
Element Consulting Engineers	Port St. Johns Water Treatment Works Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the establishment of the Port St. Johns Water Treatment Works, Port St. Johns.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	N2 – uMgeni Road Interchange Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N2 – uMgeni Road Interchange, Durban.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	N2 – Mt Edgecombe Interchange Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N2 – Mt Edgecombe Interchange, Durban.	Wetland and Biodiversity Specialist
Afrimat	Ladysmith Quarry Wetland and Biodiversity Assessment Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Afrimat Quarry, Ladysmith.	Wetland and Biodiversity Specialist

Previous Experience

South African National Roads Agency Limited	N3 – Epworth Road Interchange Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Epworth Road Interchange, Pietermaritzburg	Wetland and Biodiversity Specialist
Millennium Challenge Account - Mozambique	Nacala Dam rehabilitation Biodiversity Assessment Undertaking of the biodiversity specialist study in support of the Application for an Environmental Permit for the rehabilitation and raising of the Nacala Dam, Mozambique.	Biodiversity Specialist
WSP Environmental	SAPPI Ngodwana Mill Expansion Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the expansion of the Ngodwana Mill, Waterval Boven.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	N3 – Chota Motala Road Interchange Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the N3 – Chota Motala Road Interchange, Pietermaritzburg.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	R30 Glen Lyon to Brandfort Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the R30 between Glen Lyon and Brandfort.	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	R30 Virginia to Beatrix Mine Wetland and Biodiversity Assessment Undertaking of the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the upgrading of the R30 between Virginia and Beatrix Mine.	Wetland and Biodiversity Specialist
Miranda Minerals	Sesikhona Colliery Wetland and Biodiversity Assessment Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Sesikhona Colliery, Dannhauser.	Wetland and Biodiversity Specialist
Miranda Minerals	Uithoek Colliery Wetland and Biodiversity Assessment Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Uithoek Colliery, Dundee.	Wetland and Biodiversity Specialist
Miranda Minerals	Burnside Colliery Wetland and Biodiversity Assessment Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Burnside Colliery, Dundee.	Wetland and Biodiversity Specialist



Previous Experience

Ultimate Goal	<p>Ultimate Goal Colliery Biodiversity Assessment Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Ultimate Goal Colliery, Dundee.</p>	Biodiversity Specialist
Canton Trading	<p>Taylor's Halt Quarry Wetland and Biodiversity Assessment Undertaking the wetland and biodiversity specialist study in support of the Mining Right Application for the establishment of the Taylor Halt Quarry, Pietermaritzburg.</p>	Wetland and Biodiversity Specialist
South African National Roads Agency Limited	<p>uMtamvuna Quarry Biodiversity Assessment Undertaking the biodiversity specialist study in support of the Mining Right Application for the establishment of the SANRAL Quarry, Kokstad.</p>	Biodiversity Specialist

APPENDIX B
DFFE SCREENING ASSESSMENT REPORT

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number: NA

Project name: SARAO Klerefontein Support Base

Project title: SARAO Klerefontein Support Base

Date screening report generated: 31/05/2023 06:26:05

Applicant: NRF

Compiler: M van Rooyen

Compiler signature:
.....

Application Category: Transformation of land | Indigenous vegetation

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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	KLEDERENFONTEIN	527	0	30°59'16.64S	22°0'52.97E	Farm
2	KLEDERENFONTEIN	527	0	30°58'33.62S	21°59'44.36E	Farm Portion

Development footprint¹ vertices:

No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

¹ "development footprint", means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:

Transformation of land | Indigenous vegetation.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme				X
Animal Species Theme		X		
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme			X	
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the known impacts associated with the proposed development, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

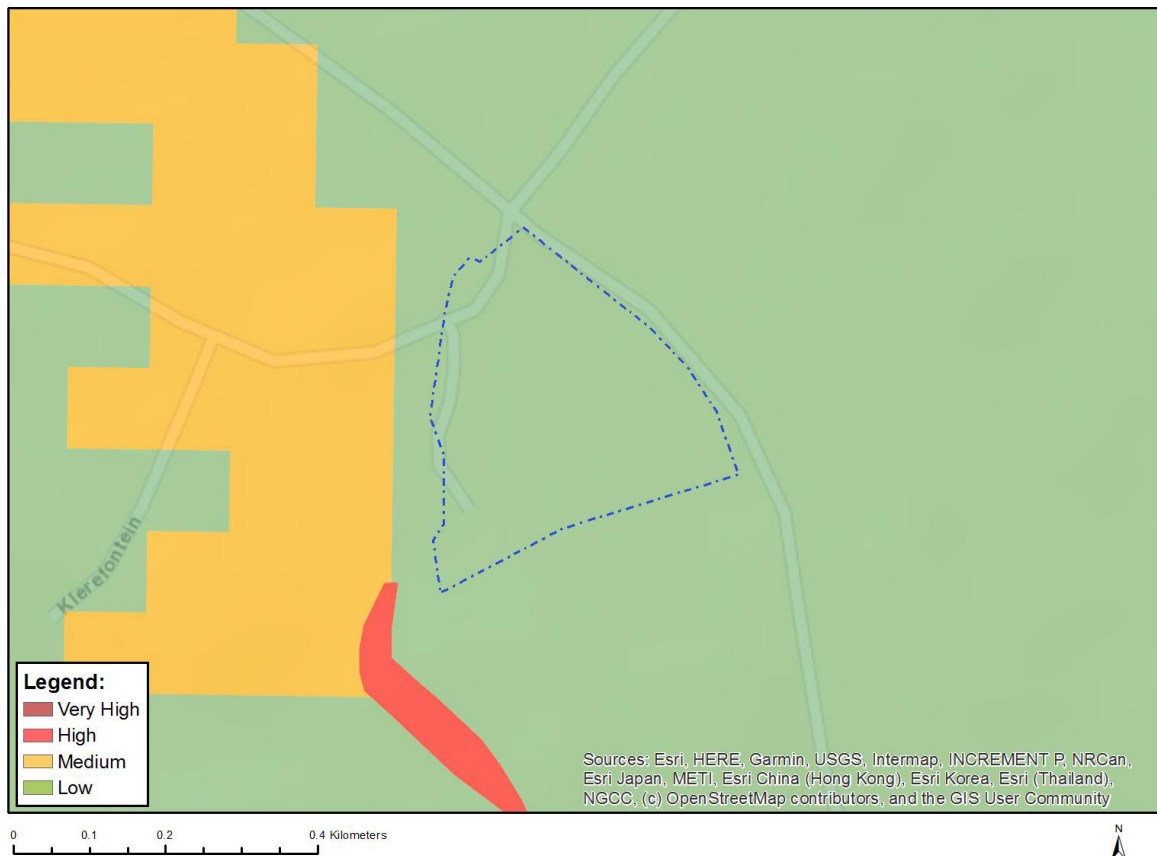
No	Specialist assessment	Assessment Protocol
1	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf

	Assessment	rotocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf
6	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
7	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf
8	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

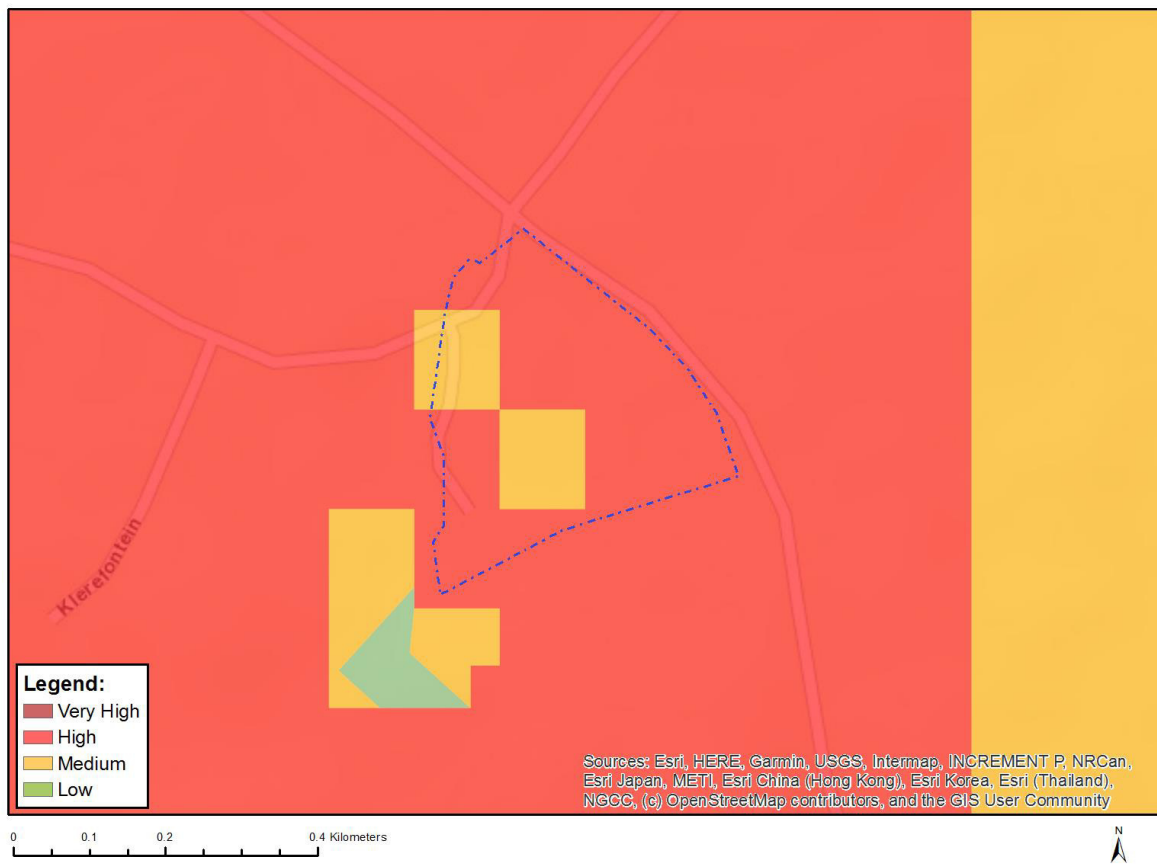


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



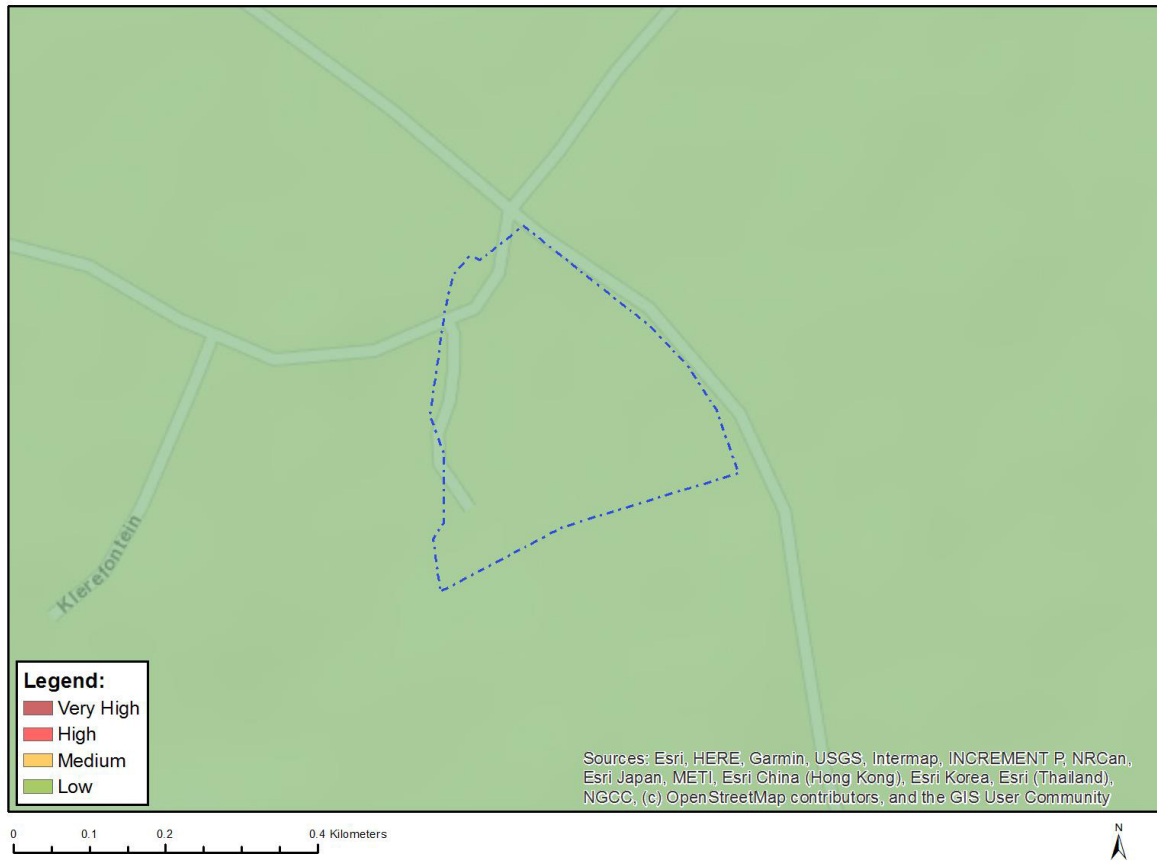
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
Medium	Reptilia-Chersobius boulengeri

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

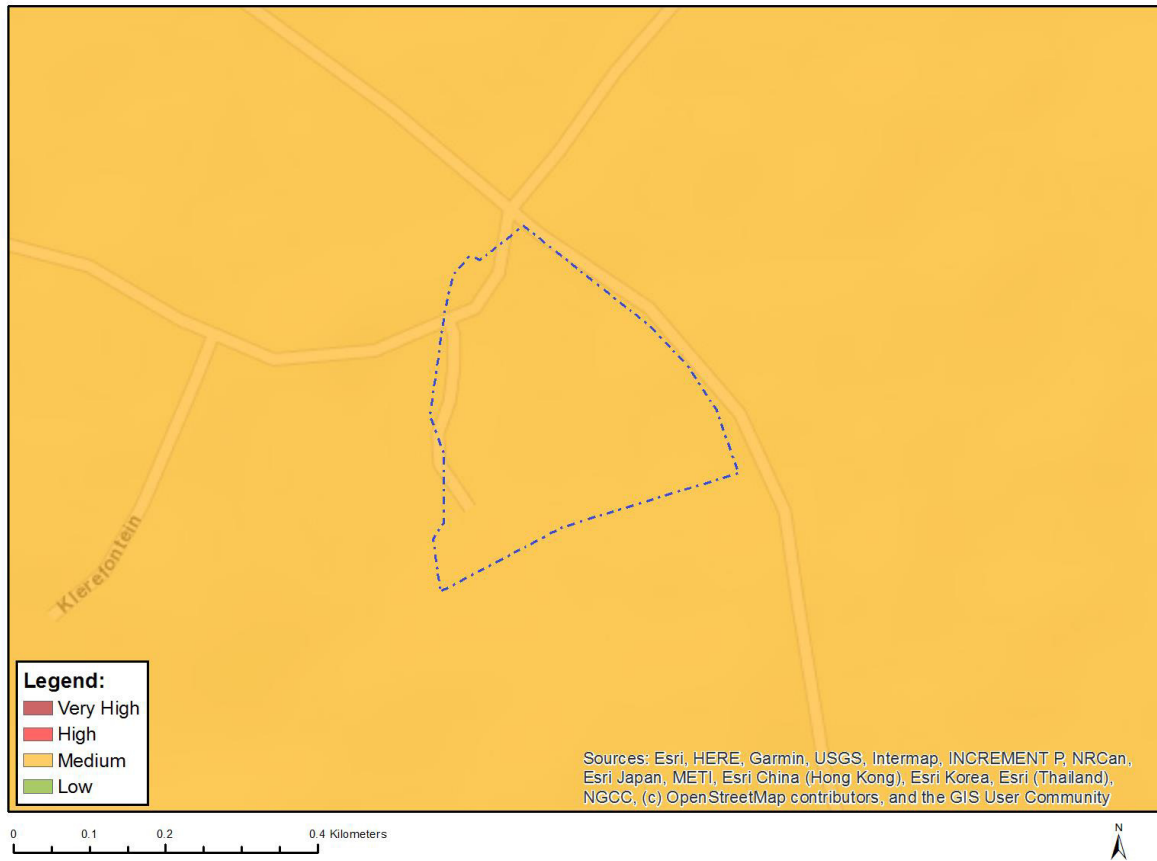


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Between 8 and 15 km of other civil aviation aerodrome

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

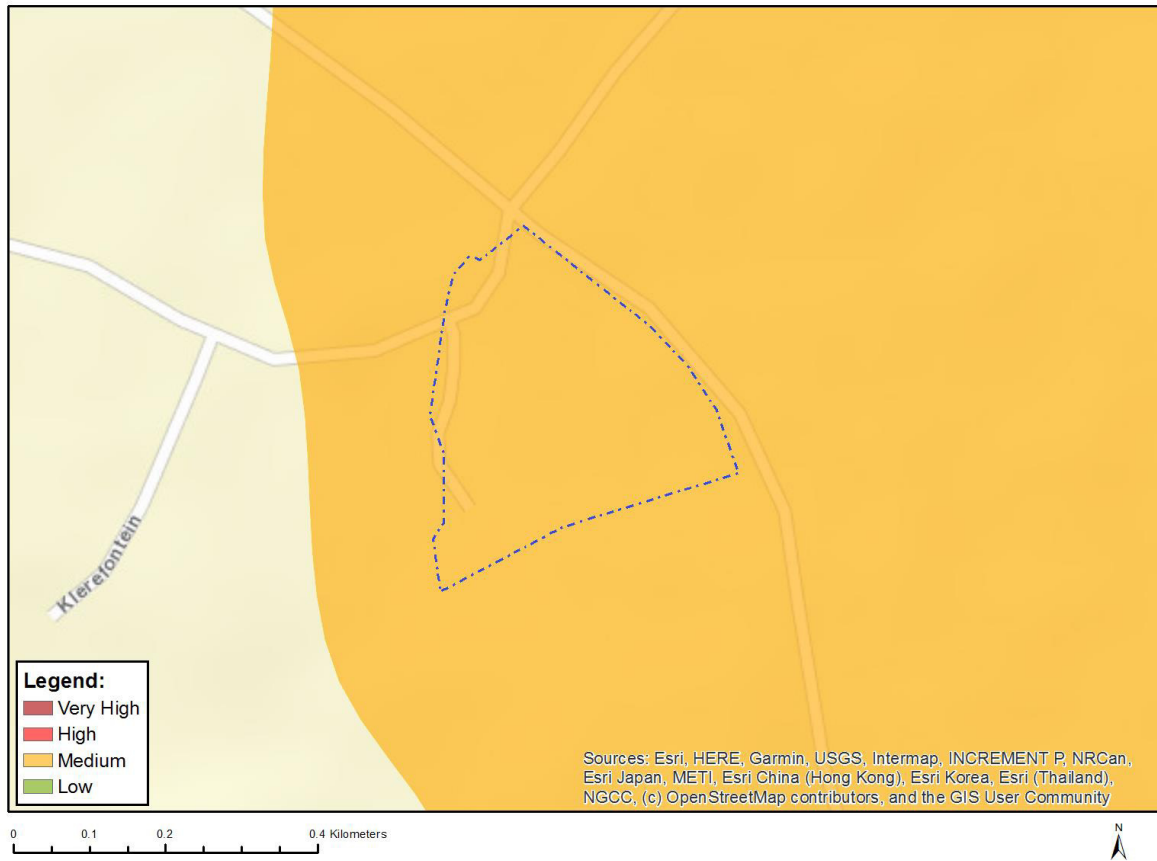


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

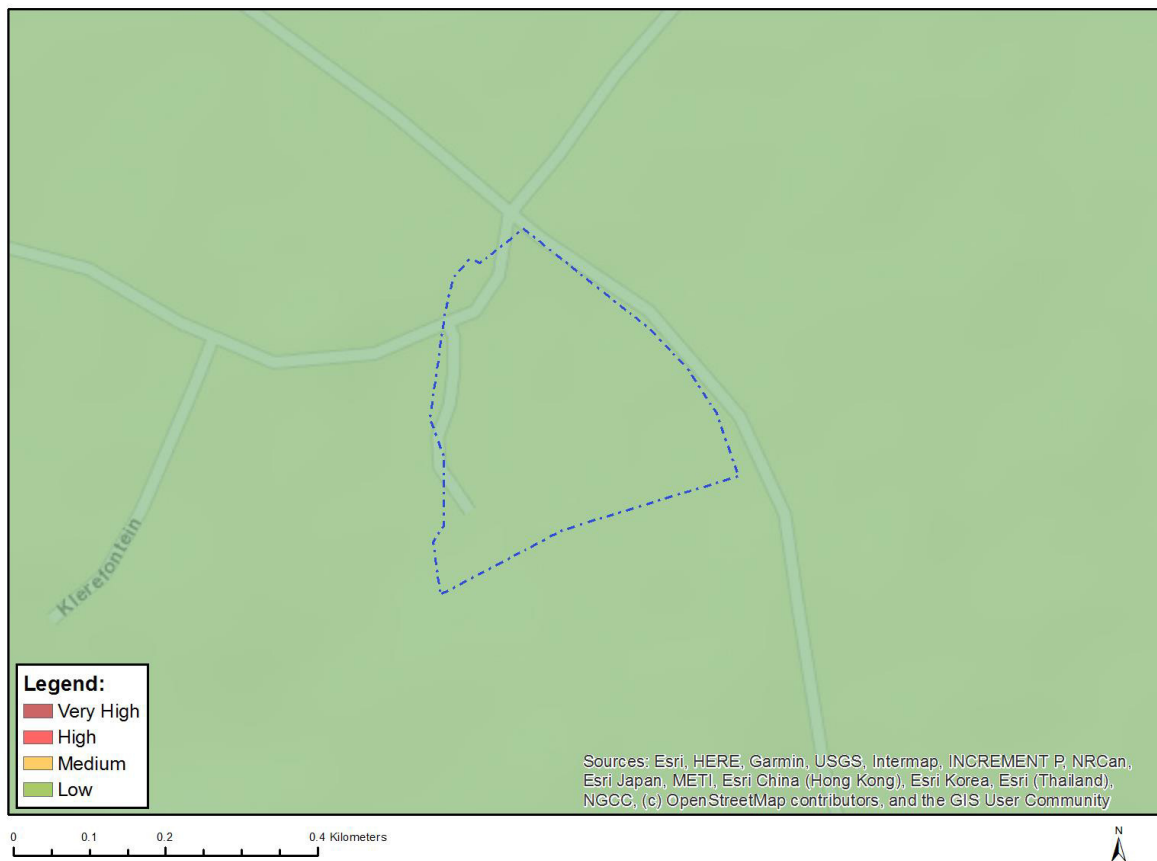


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



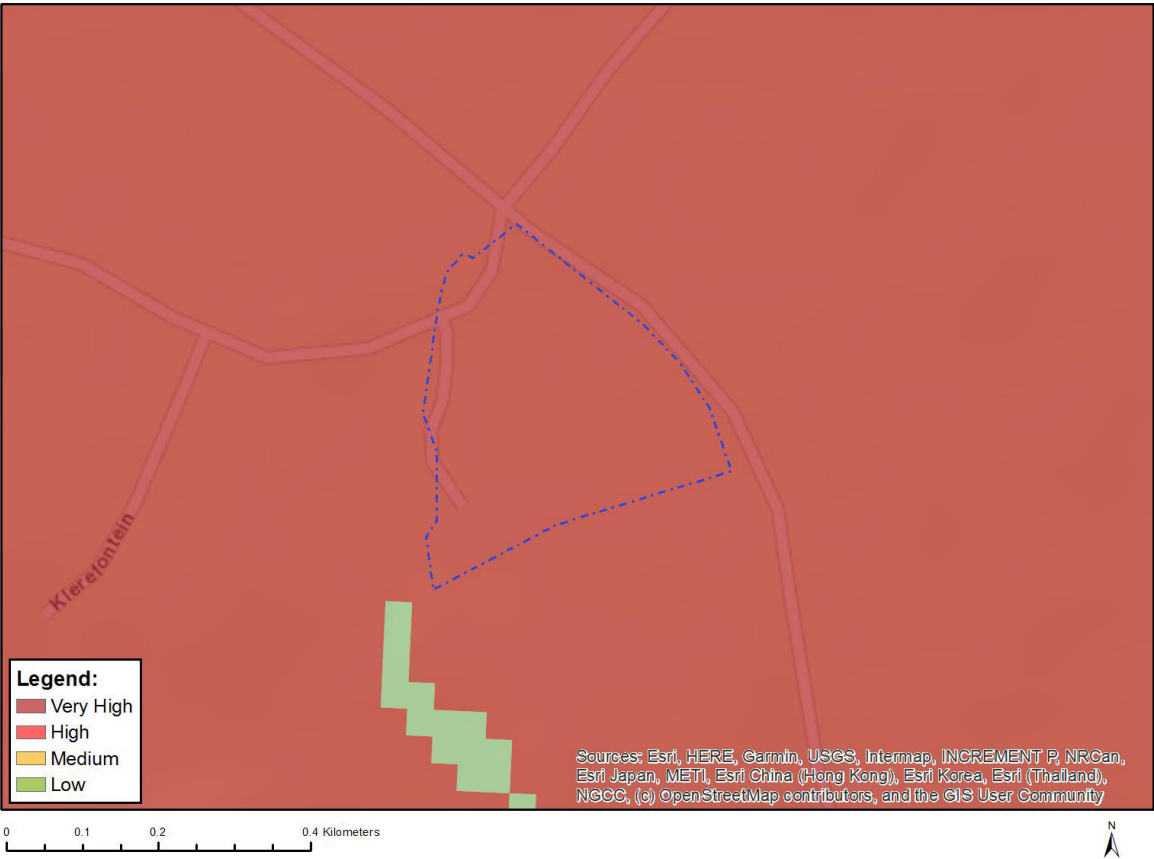
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	CBA 1

APPENDIX C
IMPACT ASSESSMENT METHODOLOGY

IMPACT ASSESSMENT METHODOLOGY

Likely impacts associated with the proposed development on the identified aquatic and terrestrial biodiversity baseline have been identified through the undertaking of site visits, consultation of published information, comments from Interested and Affected Parties, comments from the relevant authority and independent assessment by the Environmental Project Team. Impacts have also been identified by the specialist assessments undertaken.

The impact assessment will make provision for the assessment of the following impacts:

- No-go impacts;
- Planning and design phase impacts;
- Construction phase impacts;
- Operational phase impacts;
- Decommissioning phase impacts; and
- Cumulative impacts.

Impacts identified were assessed according to the criteria outlined below. Each impact was ranked according to extent, duration, magnitude and probability. These criteria are based on the Department of Environmental Affairs and Tourism (DEAT) (now the Department of Environmental Affairs, Forestry and Fisheries) Guideline Document to the EIA Regulations(1998). A significance rating was calculated as per the methodology outlined below. Where possible, mitigatory measures were recommended for the impacts identified.

Status of the Impact

The impacts were assessed as having either of the following:

Table 1: Impact status classification

Classification	Definition
Negative effect	at a cost to the environment
Positive effect	a benefit to the environment
Neutral	Neutral effect on the environment

Extent of the Impact

The extent of each impact was rated as being one of the following:

Table 2: Impact extent classification

Classification	Definition
1	Site - within the boundaries of the development site
2	Local - the area within 5 km of the site
3	Municipal - the Local Municipality
4	Regional - The Province
5	National – South Africa
6	International – Southern Africa

Duration of the Impact

The duration of each impact was rated as being one of the following:

Table 3: Impact duration classification

Classification	Definition
1	Immediate - > 1 year
2	Short term – 1 to 5 years
3	Medium term – 6 to 15 years
4	Long Term – the impact will cease when the operation stops
5	Permanent – no mitigation measure will reduce the impact after construction

Magnitude of the Impact

The intensity or severity of each impact was rated as being one of the following:

Table 4: Impact severity classification

Classification	Definition
0	None – where the aspect will have no impact on the environment
2	Minor – where the impact affects the environment in such a way that natural, cultural and social functions / processes are not affected

Classification	Definition
4	Low – where the impact affects the environment in such a way that the natural, cultural and social functions / processes are slightly affected
6	Moderate – where the affected environment is altered but natural, cultural and social functions / processes continue, albeit in a modified way
8	High – natural, cultural or social functions / processes are altered to the extent that they will temporarily cease
10	Very high / unknown – natural, cultural or social functions / processes are altered to the extent that they will permanently cease

Probability of Occurrence

The likelihood of the impact actually occurring is indicated as either:

Table 5: Impact probability classification

Classification	Definition
0	None – the impact will not occur
1	Improbable – the possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate corrective actions
2	Low – there is a probability that the impact will occur
3	Medium – the impact may occur
4	High – it is most likely that the impact will occur
5	Definite / unknown – the impact will occur regardless of the implementation of any prevention or corrective actions, or it is not known what the probability will be, based on a lack of published information