Palaeontological Impact Assessment for four prospecting right applications near Steinkopf, Namaqualand, Northern Cape Province

Desktop Study (Phase 1)

Subcontracted by

Beyond Heritage (Pty) Ltd

12 April 2025

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1. Executive Summary

A Palaeontological Impact Assessment was requested for four prospecting right applications in the Steinkopf area of Namaqualand, northern Cape Province. The applications are for Farm Aardvark 164, Farm Gifkop 166, Farm Steenbok 165 and Farm Tusschen-In 143. The minerals being prospected far include copper, zinc, lead, silver, lithium amongst others and the applicant is Strat Energy Minerals and Resources (Pty) Ltd.

To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The prospecting sites lie on the non-fossiliferous metamorphosed igneous rocks of the Namaqualand-Natal Metamorphic Suite and Quaternary sands and alluvium. No fossils are known from this region. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations or drilling activities have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

ASPECT	SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/ PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
Palaeontology	Low to Zero	Very Low to Zero	Palaeontological Impact Assessment	Section 7.2. SAHRA Requirements

2. **Declaration of independence and summary of expertise**.

a. Declaration

This report has been compiled by Professor Marion Bamford, of the University of the Witwatersrand, sub-contracted by Beyond Heritage (Pty) Ltd, Modimolle, South Africa. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision-making process for the Project.

Specialist: Prof Marion Bamford

Signature: 

b. Expertise

The Palaeontologist Consultant: Prof Marion Bamford
Qualifications: PhD (Wits Univ, 1990); FRSSAf, mASSAf, PSSA
Experience: 36 years research and lecturing in Palaeontology; over 28 years PIA studies and over 450 projects completed.

c. Specialist declaration of independence and statement of objectivity for the assessment.

Declaration of Independence

I, Marion Bamford, declare that –
General declaration:

- I act as the independent palaeontology practitioner in this application,
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant,
- I declare that there are no circumstances that may compromise my objectivity in performing such work,
- I have expertise in conducting palaeontological impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation,
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application,
- I have no, and will not engage in, conflicting interests in the undertaking of the activity,
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority,
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties

and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application,
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct,
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations.

d. **Summary of the specialist's expertise**

I, Marion Bamford, am a professional Palaeontologist with a PhD in Palaeontology (Wits University, 1990). I have more than 35 years of experience in palaeontological research and have published over 190 papers in peer-reviewed journals and published more than 14 scholarly book chapters. I review manuscripts for international and local journals and also review funding proposals for international funding bodies. Currently I am the Director of the Evolutionary Studies Institute, the only palaeontological institute in Southern Africa.

I have completed more than 450 palaeontological impact assessments (desktop and site visit studies) in the last 28 years for a variety of projects (solar energy projects, wind energy projects, powerlines, roads, infrastructure, housing and retail projects and from all over South Africa. I have been subcontracted by over 30 different companies. From my own projects and training provided by me and other staff in the ESI for Palaeontological Impact Assessments, I am familiar with the legislation.

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3. Project Background

Greenmined Environmental (Pty) Ltd has been appointed by the applicant, Strata Energy Minerals and resources (Pty) Ltd for environmental authorisation for the proposed prospecting applications for five land parcels in the northern Cape Province in the Namaqua Magisterial District. These land parcels shown in Figure 1 and are:

1. Tusschen-In No 143
2. Portion 1 of the farm Aardvark No 164
3. Remaining Extent of the farm Aardvark No 164
4. Steenbok No 165
5. Farm No 166 (Gifkop)

The total application area is 21 217.1756 ha

The farm Tusschen-In No 143 is ±46 km north-west of Steinkopf. When travelling west along the R382, turn right (north) from the main road after ±34 km. Farms Aardvark No 164, Steenbok No 165, and Gifkop No 166 are ±40 km west to south-west of Steinkopf, and ±47 km east to south-east from Port Nolloth when travelling along the R382.

Strata Energy Minerals & Resources (Pty) Ltd (the "Applicant") applies for environmental authorisation and a prospecting right (without bulk sampling) for Copper (Cu), Zinc (Zn), Lead (Pb), Silver (Ag), Lithium (Li), Baryte ($BaSO_4$), Sillimanite-corundum (Al_2SiO_5), Wolframite (W) / Tungsten, and Feldspar (Fsp).

Should the relevant authorisations be granted, and the project commence the principal prospecting activities will entail the following:

Non-Invasive Prospecting:

- Desktop geological studies (Phase 1),
- Geological field mapping (Phase 2),
- Ground geophysical survey and ground magnetic survey (Phase 3),
- Feasibility studies and target selection (Phase 5),
- Metallurgical testing and analysis (Phase 5),
- Analytical desktop pre-feasibility study (Phase 7).

Invasive Prospecting:

- Exploration boreholes (Phase 4 & 6),
- Sloping, landscaping, and rehabilitation the affected areas (Phase 4 & 6).

Once the target areas have been identified (during non-invasive prospecting) and the invasive prospecting commences (phase 4 & 6), site establishment will entail discussions with the landowners regarding access to the properties, the clearance of vegetation (where necessary) from the areas to be prospected, the stripping and stockpiling of the topsoil, and the introduction of the prospecting equipment.
The prospecting activities will not entail bulk sampling and do not require the use of any permanent equipment/infrastructure. A central site camp will be established at an area agreed to by the landowner where mobile containers will be used as office space and for storage. Chemical ablutions will be established, and the site camp will be fenced to control

access. All chemicals/hydrocarbons will be kept in the storage containers or bunded areas with impermeable surfaces.

Drilling:
The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalized surface plan showing the intended location, extent, and depth of boreholes to be completed.
Diamond drilling will be of the standard BQ (60 mm outside diameter) or NQ (75.7 mm outside diameter) size. Down hole surveys will be done every 50 m in each hole. Core will be marked, logged, photographed, and sampled according to the standard of the applicant's logging and sampling procedures. Down the hole geophysical surveying will take place upon completion of the exploratory boreholes along with Ground EM surveys to determine positions of conductors.
Rehabilitation of drill sites will be done according to an approved Environmental Management Plan.
Percussion Rotary Air Blast (RAB) or Reverse Circulation (RC) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.
Water Use:
Water will also be used for drilling, and dust suppression at the prospecting sites and access roads. Potable water will daily be transported to site, while the process water will be bought from a local
registered sources (to be identified) in the vicinity of the prospecting activities.
Waste Handling;
The general waste generated at the prospecting sites will be transported to the site camp where it will be contained in refuse bins. Once full the refuse bins will be emptied, and the waste will be disposed of at a registered landfill site in the vicinity of the project.
Hazardous waste will be contained in designated hazardous waste containers to be removed daily to the hazardous waste storage area at the site camp. A registered contractor will be appointed to collect and dispose of the hazardous waste at a registered hazardous waste handling facility and the site will file the proof of safe disposal for auditing purposes.
The chemical toilets will weekly be serviced by an appropriately qualified sewerage handling contractor who will furnish the site with proof of safe disposal.

A Palaeontological Impact Assessment was requested for the Steinkopf prospecting application process. To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development and is reported herein.

Table 1: National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) - Requirements for Specialist Reports (Appendix 6). Includes the requirements from GNR Appendix 6 of GN 326 EIA Regulation 2017.

	A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:	**Relevant section in report**
ai	Details of the specialist who prepared the report,	Section 2
aii	The expertise of that person to compile a specialist report including a curriculum vitae	Section 2
b	A declaration that the person is independent in a form as may be specified by the competent authority	Section 2
c	An indication of the scope of, and the purpose for which, the report was prepared	Section 3
ci	An indication of the quality and age of the base data used for the specialist report: SAHRIS palaeosensitivity map accessed – date of this report	Yes
cii	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 6
d	The date and season of the site investigation and the relevance of the season to the outcome of the assessment	N/A
e	A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 4
f	The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 6
g	An identification of any areas to be avoided, including buffers	N/A
h	A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
i	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 7
j	A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 8
k	Any mitigation measures for inclusion in the EMPr	Section 10, Appendix A
l	Any conditions for inclusion in the environmental authorisation	N/A
m	Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10, Appendix A
ni	A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	Section 8
nii	If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Sections 8, 10
o	A description of any consultation process that was undertaken during the course of carrying out the study	N/A

	A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:	Relevant section in report
p	A summary and copies of any comments that were received during any consultation process	N/A
q	Any other information requested by the competent authority.	N/A
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

Figure 1: Google Earth map of the general area to the four prospecting areas (white outlines) west of Steinkopf, North West Province.

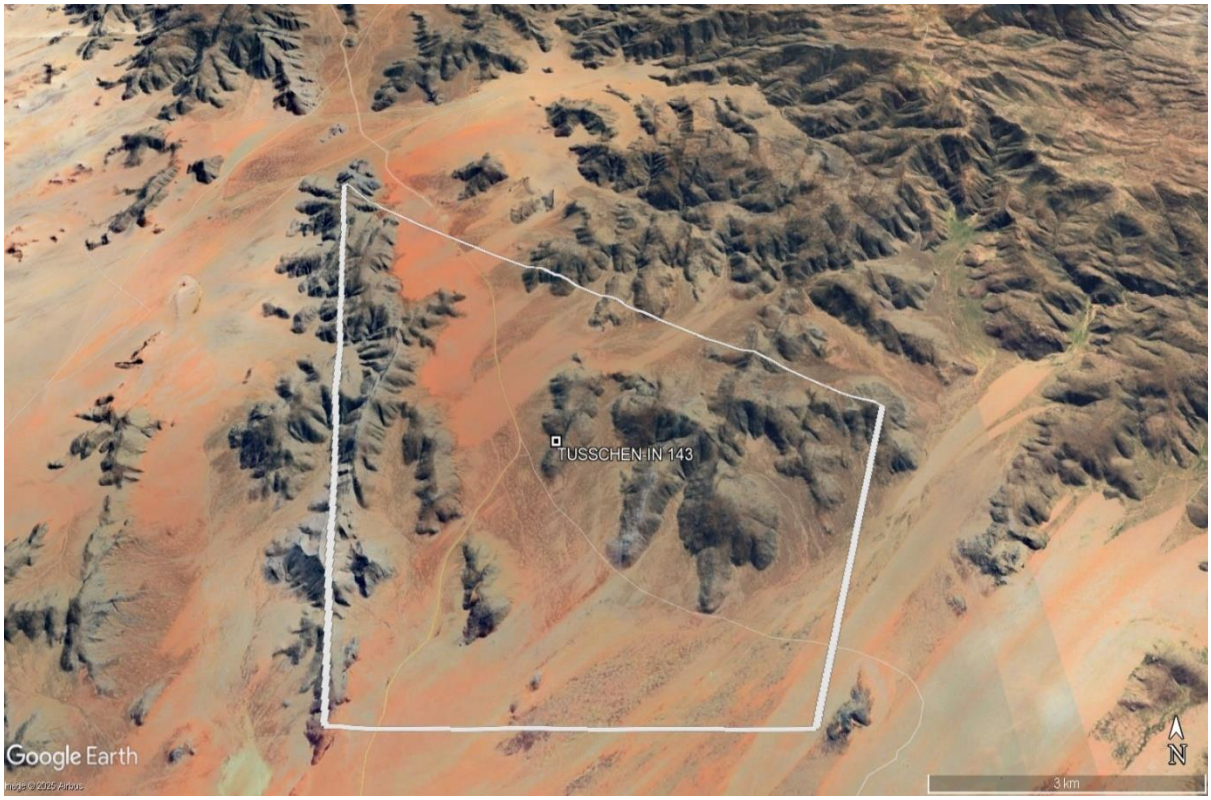

Figure 2: Google Earth Map of the Farm Tusschen-In 143 prospecting area.

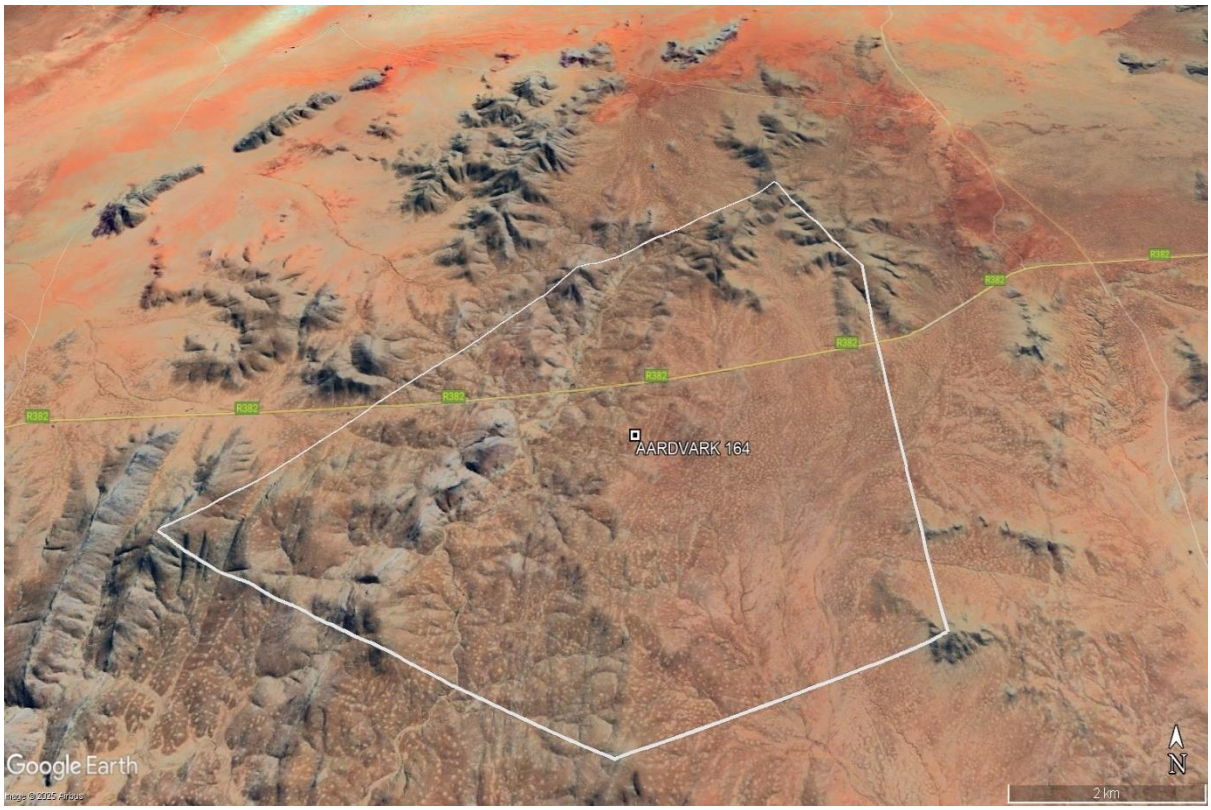

Figure 3: Google Earth map of the Aardvark 164 prospecting area.

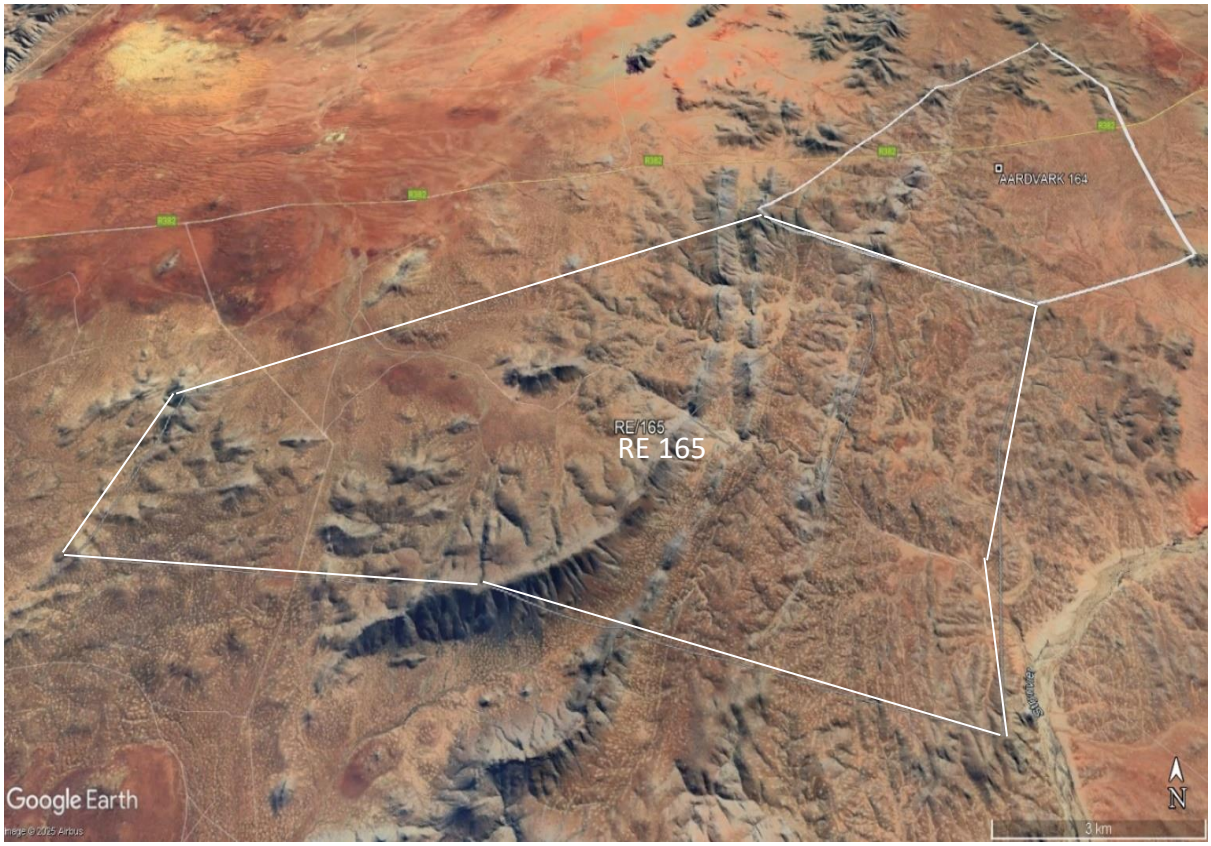

Figure 4: Google Earth map of the Steenbok 165 RE prospecting areas.

Figure 5: Google Earth map of the Gifkop 166 prospecting area.

4. Methods and Terms of Reference

The Terms of Reference (ToR) for this study were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA.
The methods employed to address the ToR included:

1. Consultation of geological maps, literature, palaeontological databases, published and unpublished records to determine the likelihood of fossils occurring in the affected areas. Sources include records housed at the Evolutionary Studies Institute at the University of the Witwatersrand and SAHRA databases; eg https://sahris.sahra.org.za/map/palaeo
2. Where necessary, site visits by a qualified palaeontologist to locate any fossils and assess their importance (*not applicable to this assessment*);
3. Where appropriate, collection of unique or rare fossils with the necessary permits for storage and curation at an appropriate facility (*not applicable to this assessment*); and
4. Determination of fossils' representativity or scientific importance to decide if the fossils can be destroyed or a representative sample collected (*not applicable to this assessment*).

5. Geology and Palaeontology

i. Project location and geological context

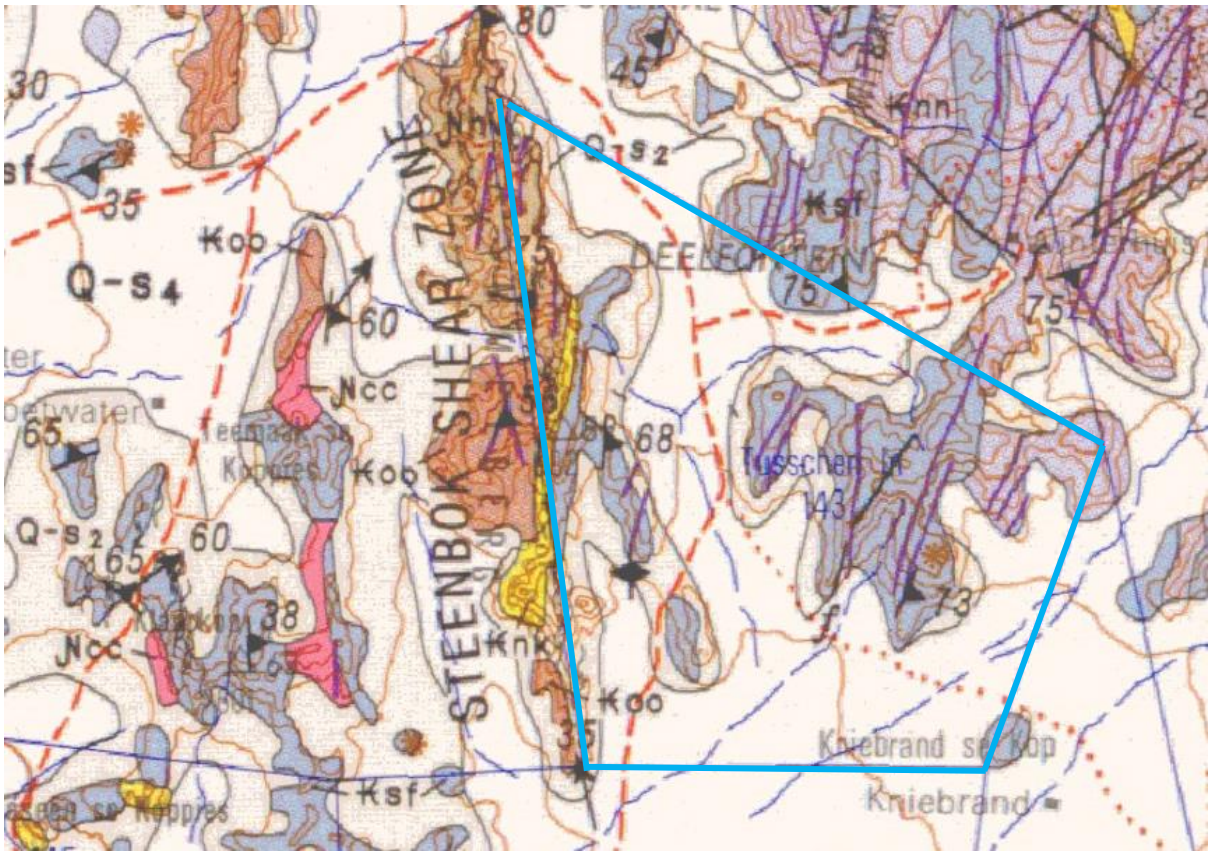

Figure 6: Geological map of the area around the Tusschen-In 143 Farm. The location of the proposed project is indicated within the blue polygon. Abbreviations of the rock

types are explained in Table 2. Map enlarged from the Geological Survey 1: 250 000 map 2916 Springbok.

Table 2: Explanation of symbols for the geological map and approximate ages (Eriksson et al., 2006. Johnson et al., 2006; McCarthy et al., 2006; Robb et al., 2006; van der Westhuizen et al., 2006). SG = Supergroup; Fm = Formation; Ma = million years; grey shading = formations impacted by the project.

Symbol	Group/Formation	Lithology	Approximate Age
Qs-2	Quaternary	Red aeolian sand	Quaternary ca 1.0 Ma to Present
Qs-4	Quaternary	Semi-consolidated piedmont deposits, red sand	Quaternary ca 1.0 Ma to Present
Nnf	Nuwefontein Granite, Spektakel Suite, Namaqua-Natal Province	Granite	Mesoproterozoic Ca 1200-1000 Ma
Ncc	Concordia Granite, Spektakel Suite, Namaqua-Natal Province	Granite	Mesoproterozoic Ca 1200-1000 Ma
Nmd	Modderfontein Gneiss, Little Namaqualand Suite, Namaqua-Natal Province	Gneiss	Mesoproterozoic Ca 1200-1000 Ma
Koo	Oograbies West Gneiss, Khuriesberg Subgroup, Bushmanland Terrane, Namaqua-Natal Province	Gneiss	Mesoproterozoic Ca 1200-1000 Ma
Knk	Nakanas Fm, Khuriesberg Subgroup, Bushmanland Terrane, Namaqua-Natal Province	Garnet staurolite-kyanite schist	Mesoproterozoic Ca 1200-1000 Ma
Ksg	Springbok Fm, Khuriesberg Subgroup, Bushmanland Terrane, Namaqua-Natal Province	Garnet sillimanite schist	Mesoproterozoic Ca 1200-1000 Ma
Knn	Noenoemaasberg Gneiss, Gladkop Suite, Namaqua-Natal Province	Gneiss	Mesoproterozoic Ca 1200-1000 Ma
Ksf	Steinkopf Gneiss, Gladkop Suite, Namaqua-Natal Province	Biotite hornblende gneiss	Mesoproterozoic Ca 1200-1000 Ma

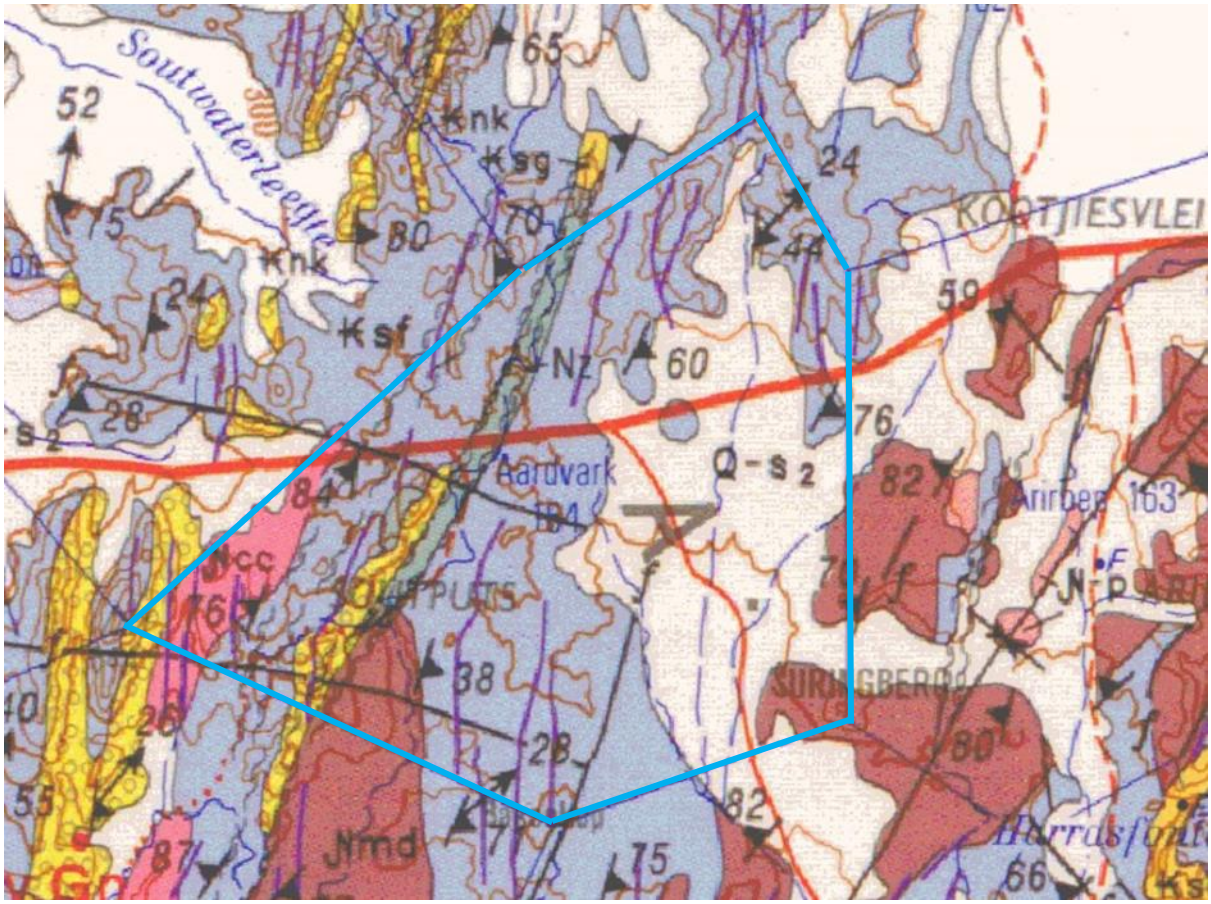

Figure 7: Geological map for the Farm Aardvark 164 (blue outline). Symbols shown in Table 2.

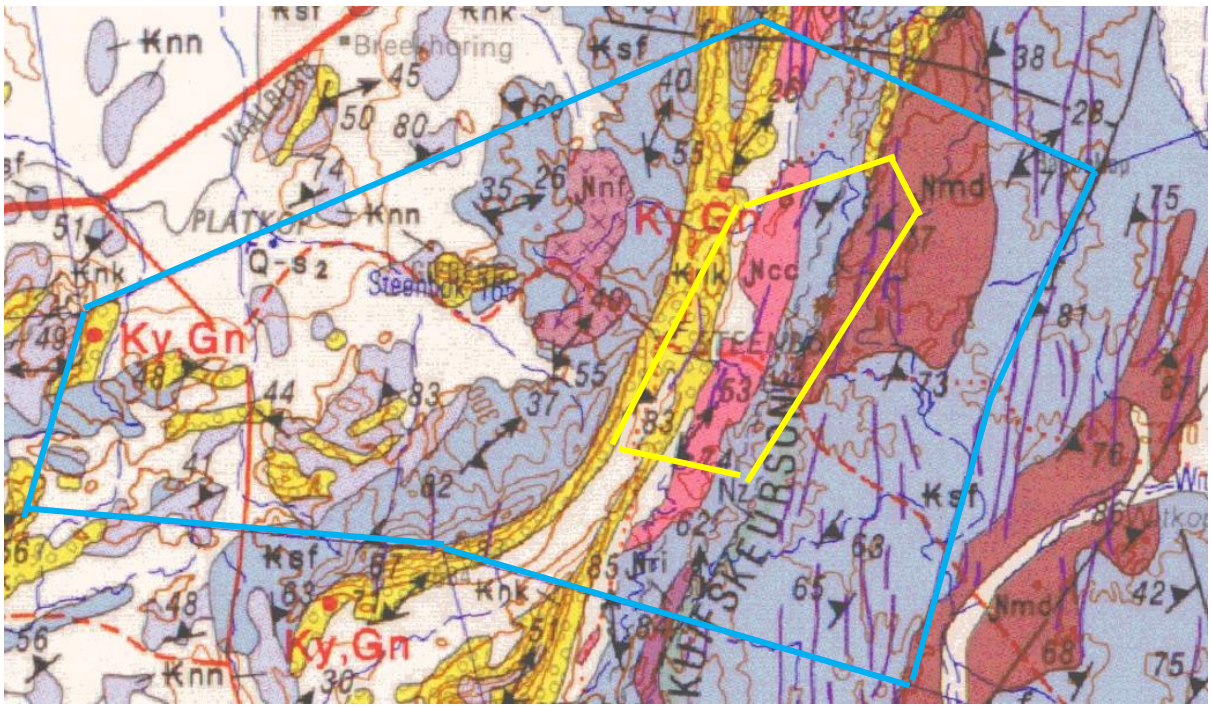

Figure 8: Geological map for Farms Steenbok 165 (blue outline) and Gifkop 166 (yellow outline. Symbols in Table 2.

The project lies in the northwest part of South Africa in the Namaqua-Natal Province in the Namaqua section (Figures 6-8, Table 2). The Namaqua-Natal Province is a tectono-stratigraphic province and forms the southern and western boundary of the ancient Kaapvaal Craton, and extends below the Karoo Basin sediments to the south (Cornell et al., 2006). It comprises rocks that were formed during the Namaqua Orogeny (mountain-building) some 1200 – 1000 million years ago. It has been divided by geologists into a number of terranes (similar lithology and bounded by shear zones). There are three main lithologic units used to separate the terranes as well as the shear zones but still there is some debate about the terranes (ibid).

The three lithostratigraphic components are:
1 – reworked, approximately 2000 year old Kheisian (late Palaeoproterozoic) rocks
2 – juvenile supracrustal and plutonic rocks formed during the rifting, ocean spreading and subduction phases of the Namaquan (Mesoproterozoic) Wilson Cycle (ca 1600 – 1200 Ma) and assembled during collision events by intense deformation and metamorphism, and
3 – voluminous syn- and post-tectonic granitoids formed between 1200 and 1000 Ma (Cornell et al., 2006). Very simply, the lithologic units are older reworked rocks, juvenile rocks formed during tectonic activities and metamorphosed, and intrusive granitoids.

According to Cornell et al. (2006) the five terranes are:
A - Richtersveld Subprovince (undifferentiated terranes)
B – Bushmanland Terrane (granites)
C – Kakamas Terrane (supracrustal metapelite ca 2000 Ma
D – Areachap Terrane (supracrustal rocks and granitoids)
E – Kaaien Terrane (Keisian aged metaquartzites and deformed volcanic rocks).

The project lies in the Bushmanland Terrane with its northern boundary against the Richtersveld Subprovince and the eastern boundary against the Kakamas Terrance (ibid). According to Moore et al. (1990, in Cornell et al., 2006), the Bushmanland Terrane rocks can be divided into three distinct age groups:
1. A basement complex (Achab Gneiss, Gladkop Suite) that is mainly composed of granitic rocks of Kheisian age (2050 - 1700 Ma).
2. A variety of supracrustal sequences of mixed sedimentary and volcanic origin and probably fitting into three broad age groups (ca 1900, 1600 and 1200 Ma).
3. Suites of syn- and late-tectonic Namaquan intrusive rocks, generally of granitic to charnockitic composition. This group includes the Little Namaqualand Suite (ca 1200 Ma), the Spektakel Suite (ca 1060 Ma) and the basic rocks of the Koperberg and Wortel Suites and Nouzees Complex (1060 – 1030 Ma), as well as the ca 950 Ma pegmatites.

The project lies in the Areachap Terrane that comprises a north-northwest trending belt of amphibolite-grade metabasic and supracrustal gneisses known as the Areachap Group and dated to about 1 300 Ma (Cornell et al., 2006). The Areachap Group is intruded by granitoids of the Keimos Suite. In the Upington and Kleinbegin areas, the Sprigg Formation forms the base and is overlain by the Jannelsepan, Bethesda and Rateldraai Formations that are made up of various schists, amphibolites and biotites gneisses (ibid). Kleinbegin is a volcanic centre with a variety of foliated metamorphosed granites.

The Namaqua-Natal Province rocks are volcanic in origin and frequently metamorphosed. Several outcrops occur on the farms in the prospecting area and probably underlie the aeolian sands and Tertiary Calcretes.

ii. Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figures 9-12. The sites for prospecting are in the mineral-rich but fossil-poor Namaqua-Natal Sequence (grey and white in the SAHRIS map) or yellow and white in the DFFE screening maps.

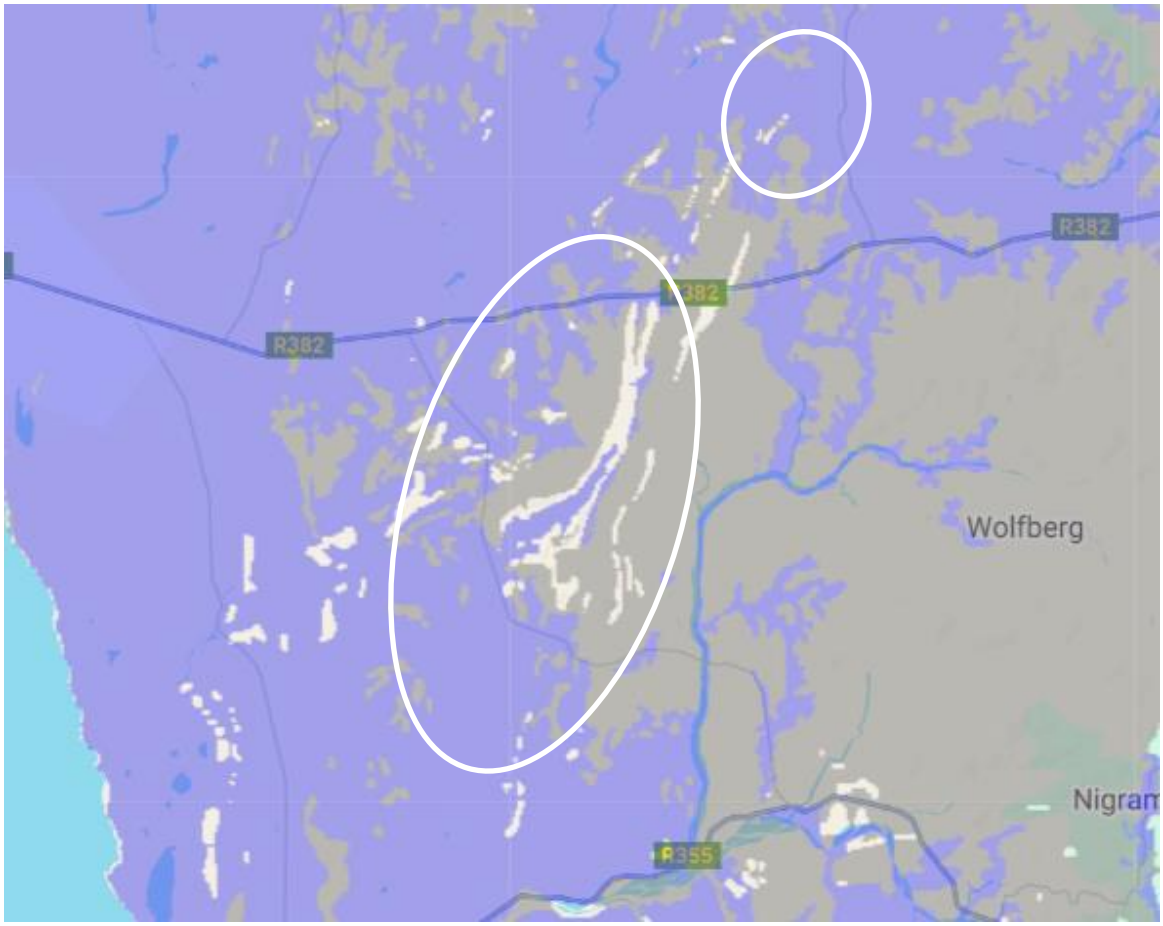

Figure 9: SAHRIS palaeosensitivity map for the site for the proposed four prospecting right areas west of Steinkopf shown within the white polygons. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

Sands do not preserve fossils because they are friable and oxidized; fossils require burial in anoxic conditions to prevent the degradation of organic matter by bacteria, fungi and insects. Sands might obscure features such as pans or springs where fossils can occur but no such feature is visible in the satellite imagery. It is unlikely that any fossils occur in the aeolian or fluvial sands.

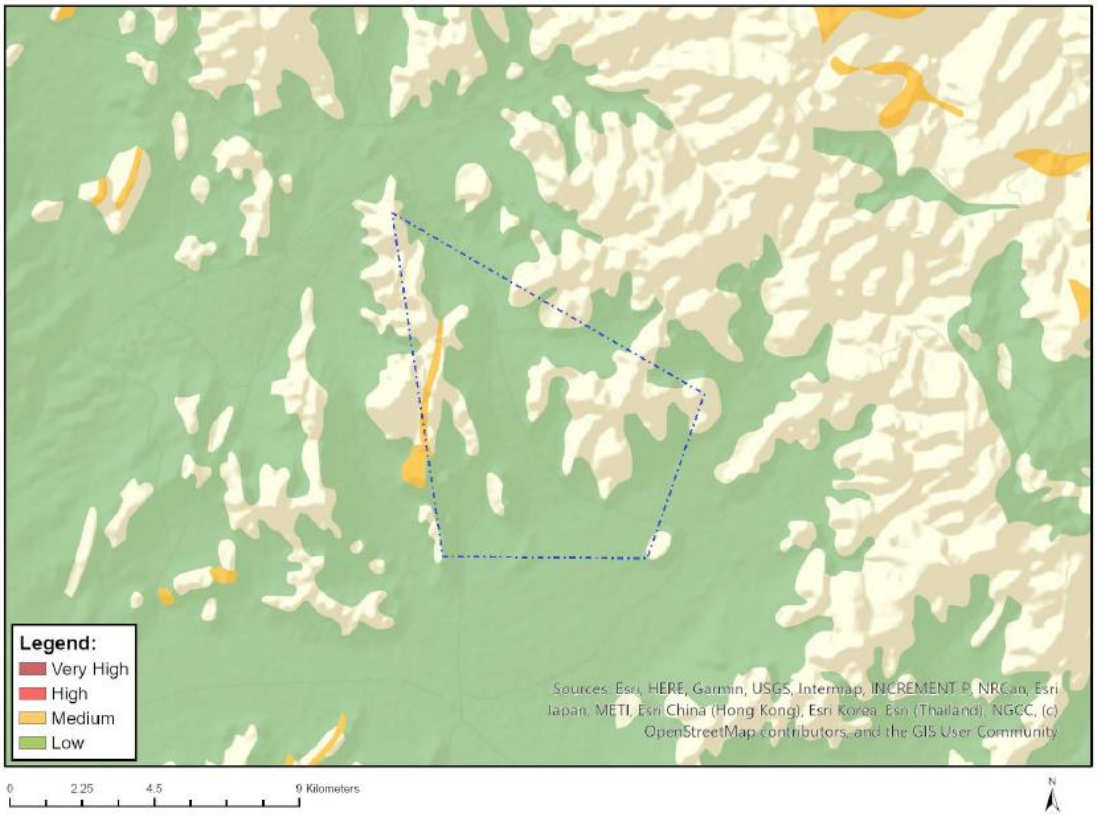

Figure 10: DFFE screening map for palaeosensitivity for Farm Tusschen-In 132.

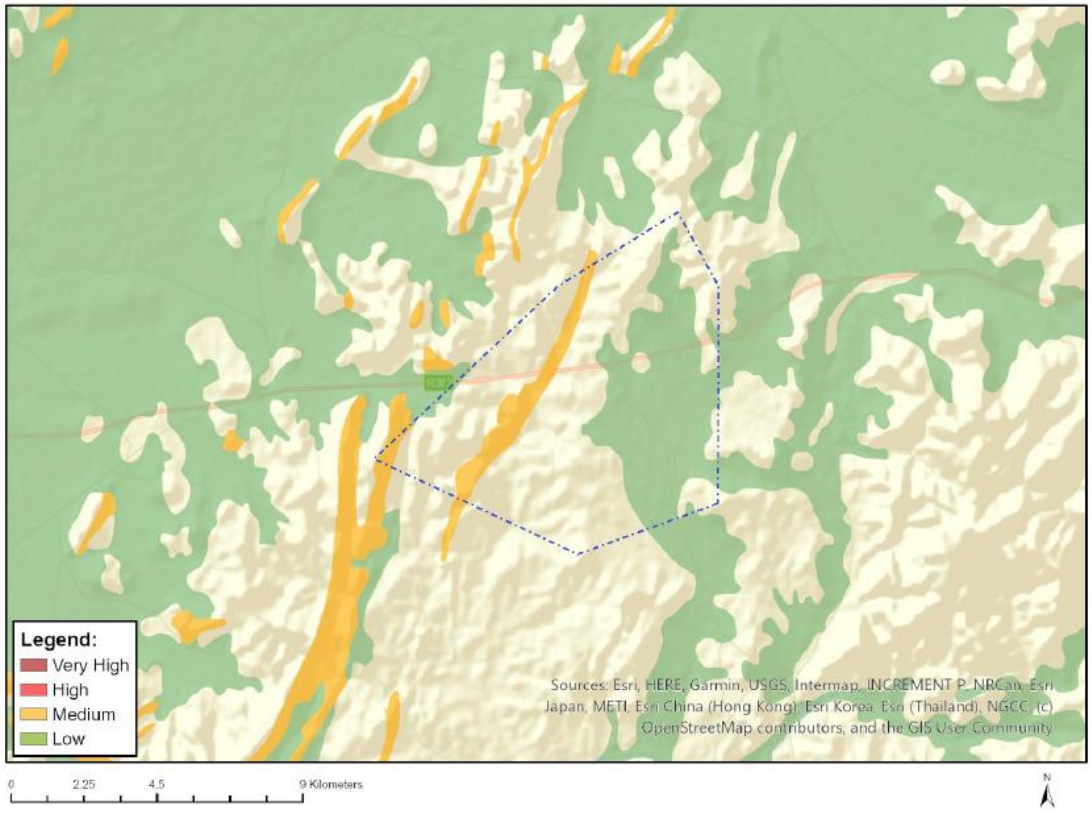

Figure 11: DFFE screening map for palaeosensitivity for Farm Aardvark 164

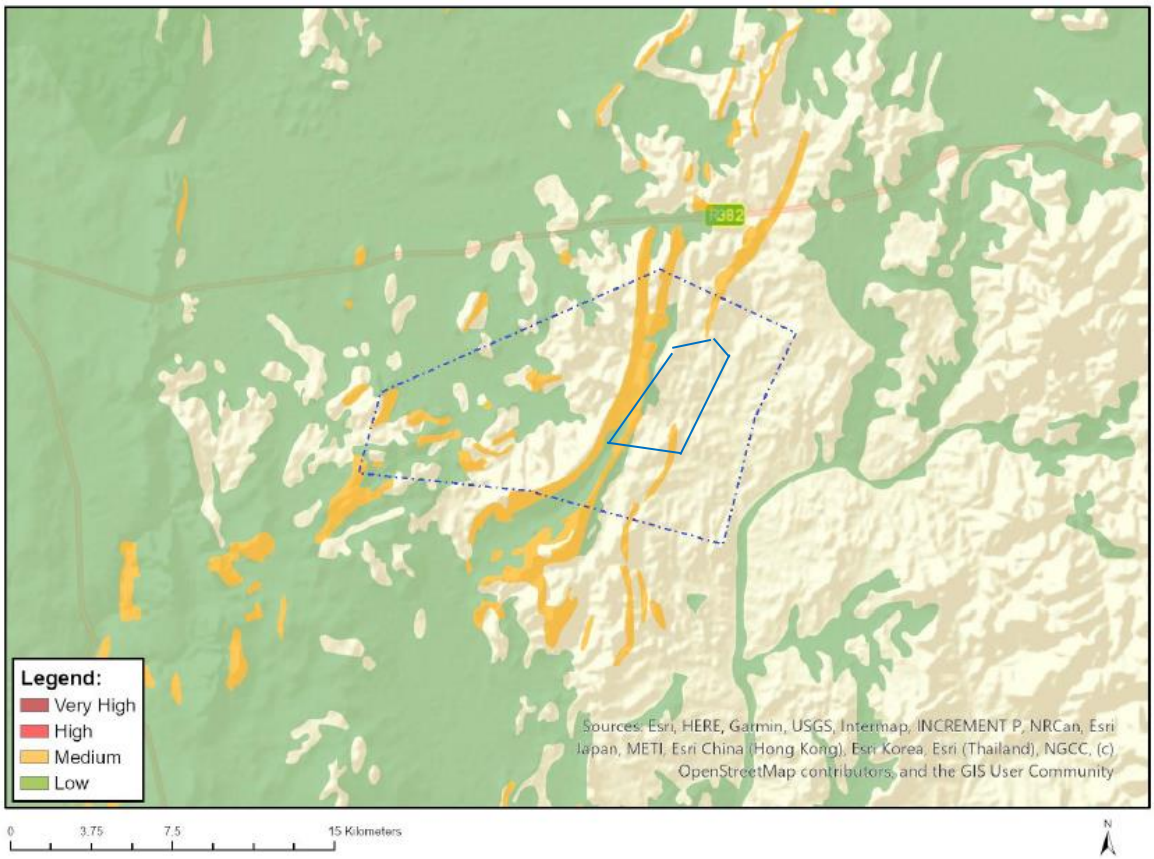

Figure 12: DFFE screening map for palaeosensitivity for Farm Steenbok 165 RE and Gifkop 166 (solid line).

6. Impact assessment

An assessment of the potential impacts to possible palaeontological resources considers the criteria encapsulated in Table 3:

Table 3a: Criteria for assessing impacts

PART A: DEFINITION AND CRITERIA		
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.

	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	**L**	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national
PROBABILITY (of exposure to impacts)	**H**	Definite/ Continuous
	M	Possible/ frequent
	L	Unlikely/ seldom

Table 3b: Impact Assessment

PART B: Assessment		
SEVERITY/NATURE	**H**	-
	M	-
	L	Soils and metamorphosed igneous rocks do not preserve fossils; so far there are no records from the Quaternary sands of plant or animal fossils in this region so it is very unlikely that fossils occur on the site. The impact would be negligible
	L+	-
	M+	-
	H+	-
DURATION	**L**	-
	M	-
	H	Where manifest, the impact will be permanent.
SPATIAL SCALE	**L**	Since the only possible fossils within the area would be transported fragmentary fossil in the sands, the spatial scale will be localised within the site boundary.
	M	-
	H	-
PROBABILITY	**H**	**-**
	M	**-**
	L	It is extremely unlikely that any fossils would be found in the loose soils and sands that cover the area or in the metamorphosed igneous rocks that will be targeted. Nonetheless, a Fossil Chance Find Protocol should be added to the eventual EMPr.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the

rocks are the wrong type to preserve fossils (metamorphosed igneous rocks) or transported sands. Since there is a very small chance that transported fragmentary fossils from the sands may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is very low.

7. Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some might contain fossil plant, insect, invertebrate and vertebrate material. The sands of the metamorphosed igneous rocks and the Quaternary period would not preserve fossils.

8. Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils or sands of the Quaternary. The target rocks for exploration are metamorphosed igneous rocks of the Namaqua-Natal Sequence and they do not preserve fossils. There is a very small chance that fragments of transported fossils may occur in the sands and alluvium so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the environmental officer, or other responsible person once drilling has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be very low, as far as the palaeontology is concerned, so the project should be authorised.

ASPECT	SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/ PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
Palaeontology	Low to Zero	Very Low to Zero	Palaeontological Impact Assessment	Section 7.2. SAHRA Requirements

9. References

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10. Fossil Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figure 13). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

11. **Appendix A** – Examples of fossils from the Quaternary sands in pans or springs.

Figure 13: Photographs of fossil fragments that have been transported in fluvial sands – not in aeolian sands – to assist the on-site responsible person.