

UNIVERSITY OF THE  
WITWATERSRAND,  
JOHANNESBURG



Palaeosciences Centre, East Campus, 1 Jan Smuts Avenue, Braamfontein, Johannesburg  
Private Bag 3, WITS 2050, Johannesburg, SOUTH AFRICA Tel: 011 717 6682

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[Marion.bamford@wits.ac.za](mailto:Marion.bamford@wits.ac.za)

23 June 2026

Heritage Western Cape  
CEO: Mr Michael Janse van Rensburg  
Private Bag X9067, Cape Town, 8000  
3rd Floor, Protea Assurance Building,  
Greenmarket Square, Cape Town, 8001

Dear Sir

**RE: Request for Exemption of any Palaeontological Impact Assessment for the proposed upgrade of the raw water abstraction works and pump station, Moordkuil River, Portion 15, 24 and 25 of the Farm Klipheuvel, and Camp Sites, Mossel Bay, Western Cape Province**

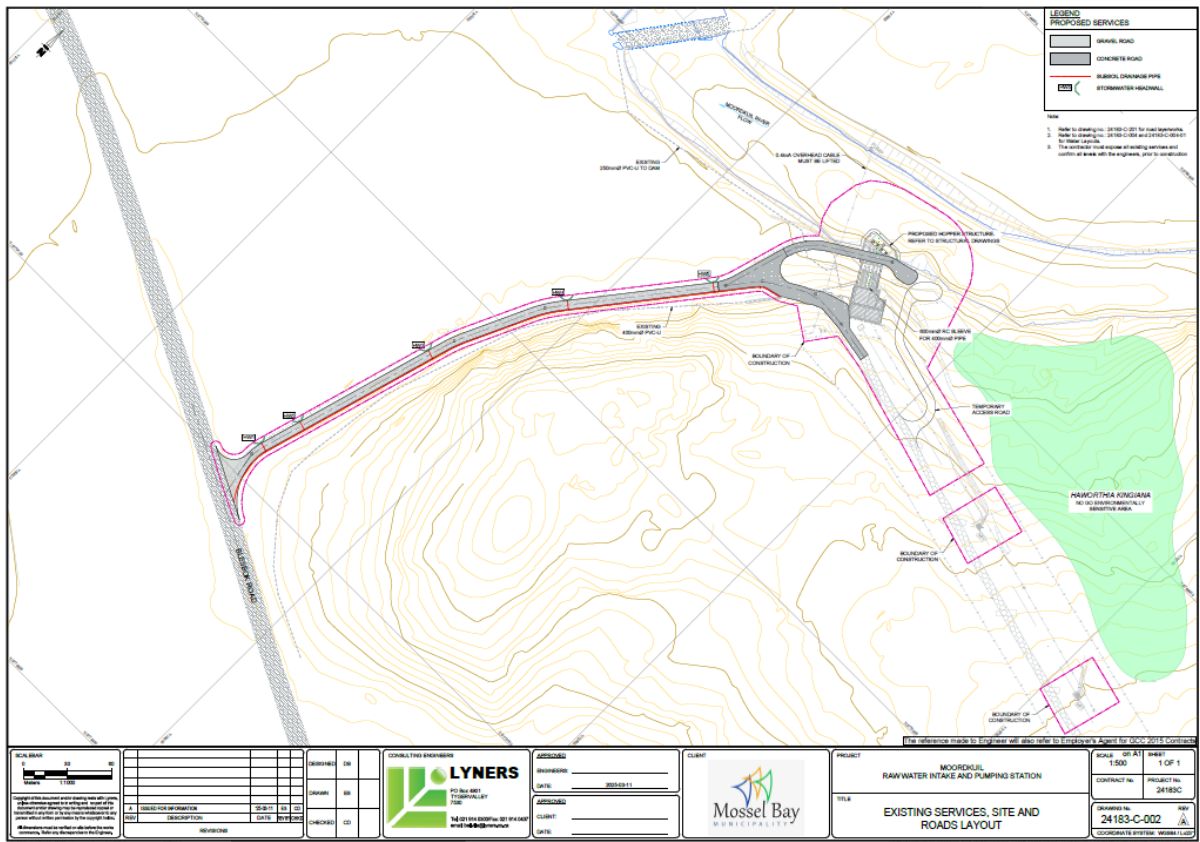
In my capacity as a professional palaeontologist, I am requesting exemption for palaeontological impact assessment in terms of the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998) which requires that the proposed development must be preceded by the relevant impact assessment, in this case for palaeontology.

**Project Description:**

Sharples Environmental Services cc (SES) has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment process for the proposed upgrade of the raw water abstraction works and pump station, Moordkuil River, Portion 15, 24 and 25 of the farm Klipheuvel, Mossel Bay. The proposed development site is at the existing raw water abstraction works and pump station (been in operation since 1980), on the Moordkuil River bank located in Mossel Bay in the Western Cape Province. Currently access to the site can be obtained from the N2 National Road, onto Blesbok Road and then via an existing gravel road to the site (Figs 1-2).



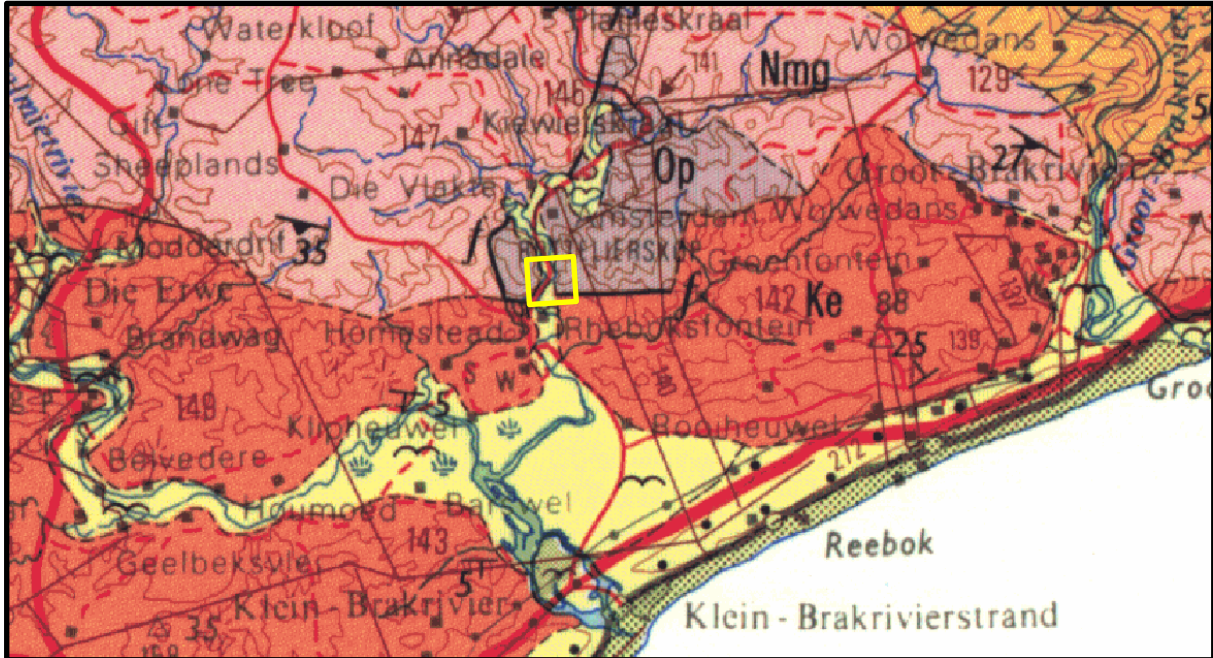
**Figure 1: Google Earth site map for the Moordkuil River pump station upgrade and two sites for the proposed camp site.**



**Figure 2: Existing service site and roads.**

## Geology and Palaeontology

The project lies in the southwestern coastal margin of South Africa where the basal Kaaimans Group granites are unconformably overlain by the Cape Supergroup, Uitenhage Group and Quaternary sands (Fig. 3; Gesse et al., 2006; Shone, 2006; Roberts et al., 2006; respectively).



**Figure 3: Geological map of the area around the Moordkuil River Pump Station. The location of the proposed project is indicated within the yellow polygon. Abbreviations of the rock types are in Table 1 below. Map enlarged from the Geological Survey 1: 250 000 map 3322 Oudtshoorn.**

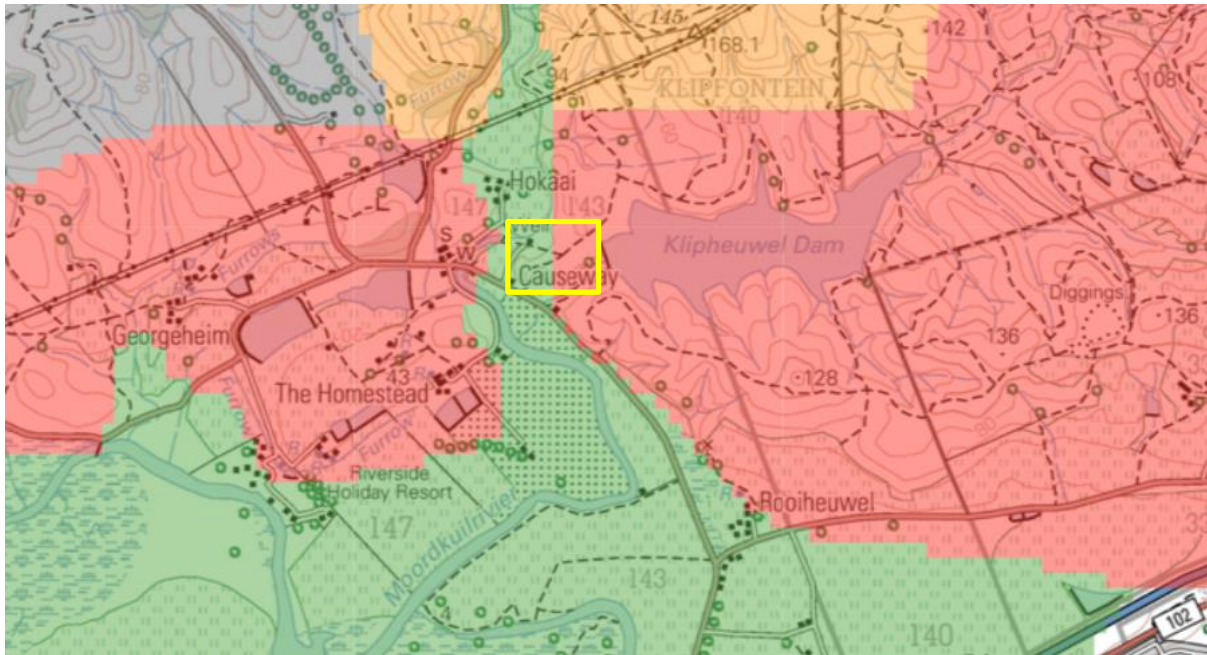
Table 1: List of abbreviations used on the geology map

Symbol	Group/Formation	Lithology	Approximate Age
Q	Quaternary	Alluvium, sand, calcrete	Quaternary Ca 1.0 Ma to present
Ke	Enon Formation, Uitenhage Group	Conglomerate, sand, sandstone	Early Cretaceous and younger
Op	Peninsular Fm, Table Mountain Group, Cape SG	Quartzite,	Ordovician
Nmg	Kaaimans Group	Gneissic granite, granodiorite	Neoproterozoic to Early Cambrian
Nk	Homtini Fm, Kaaimans Group	Phyllite, feldspathic grit, quartzite	Neoproterozoic to Early Cambrian

## Palaeosensitivity and Recommendation

The **Moordkuil River Pumpstation** project lies entirely on the Quaternary sands and alluvium along the river valley that is indicated as moderately sensitive (yellow in Fig 4; green in Fig 6). The area is highly disturbed from agriculture and present thick vegetation so it is very unlikely that any transported Quaternary fossils occur there. In addition, any fossil material would be fragmented and unidentifiable, plus it would be out of primary context. The true palaeosensitivity should be low.





**Figure 6: SAHRIS palaeosensitivity map for the site for the proposed ..... within the yellow rectangle. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.**

Both proposed sites for the **camp site** are on the Enon Formation and indicated as very highly sensitive (red; Figs 5-6). This palaeosensitivity is also contested because the Enon Formation is a conglomerate with boulders, pebbles and sands and is a “dump” for such sediments that were deposited from the Cretaceous to the Tertiary which means there are no fossils that could assist with the dating. Furthermore, both sites are also highly disturbed from previous agriculture and clearing.

Since there is no chance of fossils of any importance occurring in the project footprint, we request exemption from any further palaeontological impact assessment. As far as the palaeontology is concerned there is no preferred site for the camp site.

Yours faithfully

Prof Marion Bamford  
Palaeobotanist; PhD (Wits 1990)

**References cited:**

Gresse, P.G., von Veh, M.W., Frimmel, H.E., 2006. Namibian (Neoproterozoic) to Early Cambrian Successions. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. Pp 395-420.

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Palaeosensitivity map:

<https://sahris.sahra.org.za/map/palaeo>

## 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 can be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. 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 HWC permit must be obtained. Annual reports must be submitted to HWC 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 HWC 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.

### **Declaration of Independence**

This letter has been compiled by Professor Marion Bamford, of the University of the Witwatersrand, sub-contracted by ACRM, 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

A handwritten signature in blue ink, appearing to read 'M Bamford', with a horizontal line underneath.

Signature:

# Curriculum vitae (short) - Marion Bamford PhD

## May 2026

Present employment: Professor; Director of the Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg, South Africa. Co-Director Wits-CNRS International Research Centre

Telephone : +27 11 717 6690  
Cell : 082 555 6937  
E-mail : [marion.bamford@wits.ac.za](mailto:marion.bamford@wits.ac.za) ; [marionbamford12@gmail.com](mailto:marionbamford12@gmail.com)

### ii) Academic qualifications

Tertiary Education: All at the University of the Witwatersrand:

1980-1982: BSc, majors in Botany and Microbiology. Graduated April 1983.

1983: BSc Honours, Botany and Palaeobotany. Graduated April 1984.

1984-1986: MSc in Palaeobotany. Graduated with Distinction, November 1986.

1986-1989: PhD in Palaeobotany. Graduated in June 1990.

### iii) Professional qualifications

*Wood Anatomy Training (overseas as nothing was available in South Africa):*

1994 - Service d'Anatomie des Bois, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, by Roger Dechamps

1997 - Université Pierre et Marie Curie, Paris, France, by Dr Jean-Claude Koeniguer

1997 - Université Claude Bernard, Lyon, France by Prof Georges Barale, Dr Jean-Pierre Gros, and Dr Marc Philippe

### iv) Membership of professional bodies/associations

Palaeontological Society of Southern Africa

Royal Society of Southern Africa - Fellow: 2006 onwards

Academy of Sciences of South Africa - Member: Oct 2014 onwards

International Association of Wood Anatomists - First enrolled: January 1991

International Organization of Palaeobotany - 1993+

Botanical Society of South Africa

South African Committee on Stratigraphy - Biostratigraphy - 1997 - 2016

SASQUA (South African Society for Quaternary Research) - 1997+

PAGES - 2008 -onwards: South African representative

ROCEEH / WAVE - 2008+

INQUA - PALCOMM - 2011+onwards

### v) Supervision of Higher Degrees

All at Wits University

Degree	Graduated/completed	Current
Honours	13	1
Masters	16	0
PhD	19	2

Postdoctoral fellows	15	3
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#### vi) **Undergraduate teaching**

Geology II – Palaeobotany GEOL2008 – average 65 students per year

Biology III – Palaeobotany APES3029 – average 25 students per year

Honours – Evolution of Terrestrial Ecosystems; African Plio-Pleistocene Palaeoecology;

Micropalaeontology – average 12 - 20 students per year.

#### vii) **Editing and reviewing**

Editor: *Palaeontologia africana*: 2003 to 2013; 2014 – Assistant editor

Guest Editor: *Quaternary International*: 2005 volume

Member of Board of Review: *Review of Palaeobotany and Palynology*: 2010 –

Associate Editor: *Cretaceous Research*: 2018-2020

Review of manuscripts for ISI-listed journals: 30 local and international journals

#### viii) **Palaeontological Impact Assessments**

28 years' experience in PIA site and desktop projects with over 450 projects completed.

Selected from recent projects only – list not complete:

- Buffalo & Lyra SEFs 2023 for Nextec
- Camel Thorn Group Prospecting Rights 2023 for AHSA
- Dalmanutha SEFs 2023 for Beyond Heritage
- Elandsfontein Residential 2023 for Beyond Heritage
- Waterkloof Samancor 2023 for Elemental Sustainability
- Zonnebloem WTP 2023 for WSP
- Elders Irrigation 2023 for SRK
- Leghoya WEFS 2023 for Red Cap & SLR
- Aberdeen Solar 1,2,3 2024 for Beyond Heritage
- BeauNero Mining 2024 for Lwethuma
- Brakfontein 264 IR Mining 2024 for Eco-elementum
- Hugo & Khoa SEFs 2024 for TerraMare
- Pakamani Senior Sec. School 2025 for Afroteam
- Ufudu SEF and Grid 2025 for CES
- Bloemhoek SEF 2025 for Beyond Heritage
- Carolina township 2026 for AEB
- Exxarro Grootgeluk Dam 2026 for Shangoni
- Gromis-Nama-Groeipunt PL 2026 for Nsovo
- Kangra Coal SEFs 2026 for Envass

#### ix) **Research Output**

Publications by M K Bamford up to May 2026 peer-reviewed journals or scholarly books: over 210 articles published; 5 submitted/in press; 18 book chapters.

Scopus h-index = 35; Google Scholar h-index = 48; -i10-index = 149 based on 9145 citations.

Conferences: numerous presentations at local and international conferences.



17 February 2026

To whom it may concern,

Prof. Marion Bamford of the Evolutionary Studies Institute at the University of the Witwatersrand, Johannesburg, is a full member of the Palaeontological Society of South Africa (PSSA) since 1984. Her membership to the PSSA is in good standing as she has served on our executive committee in the past.

Signed,

A handwritten signature in black ink, appearing to read 'Cameron Penn-Clarke', written in a cursive style.

Cameron Penn-Clarke, *B.Sc. (Hons.), Ph.D., FGSSA*

Executive Secretary of the PSSA

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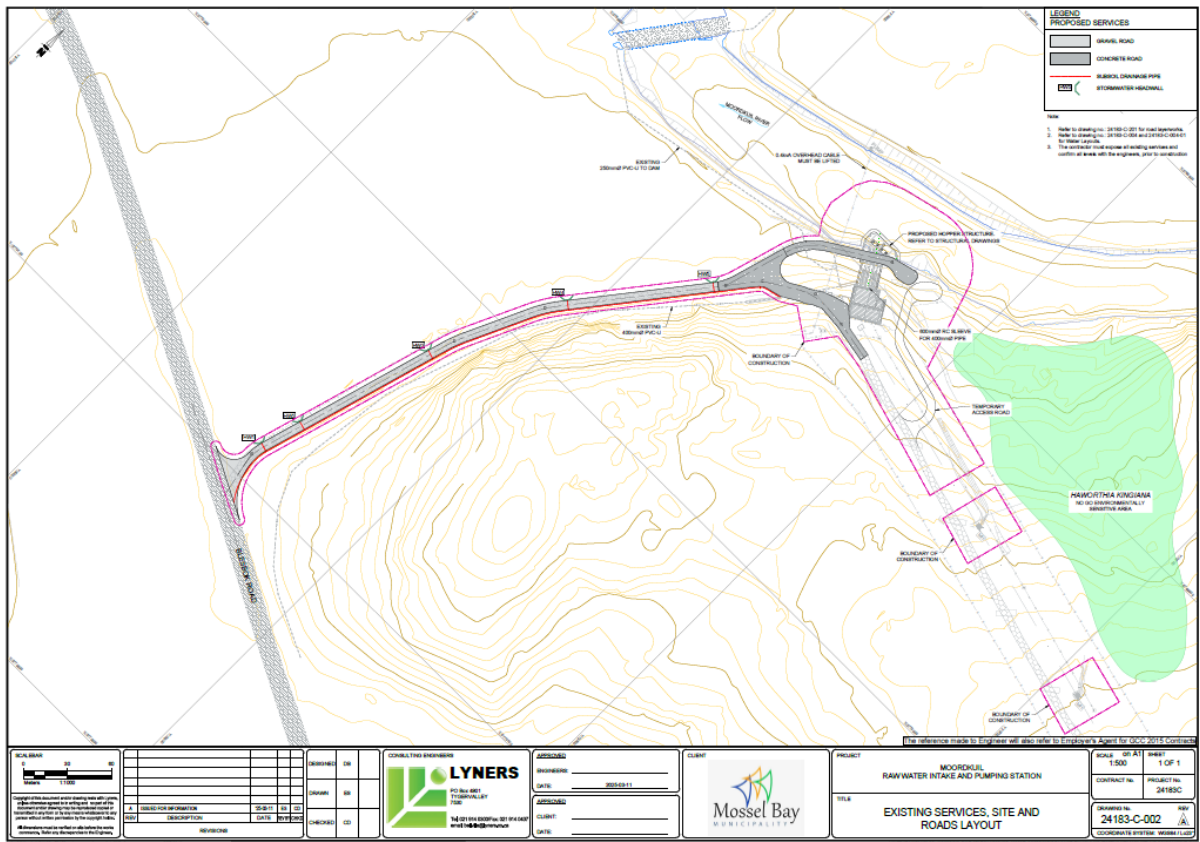
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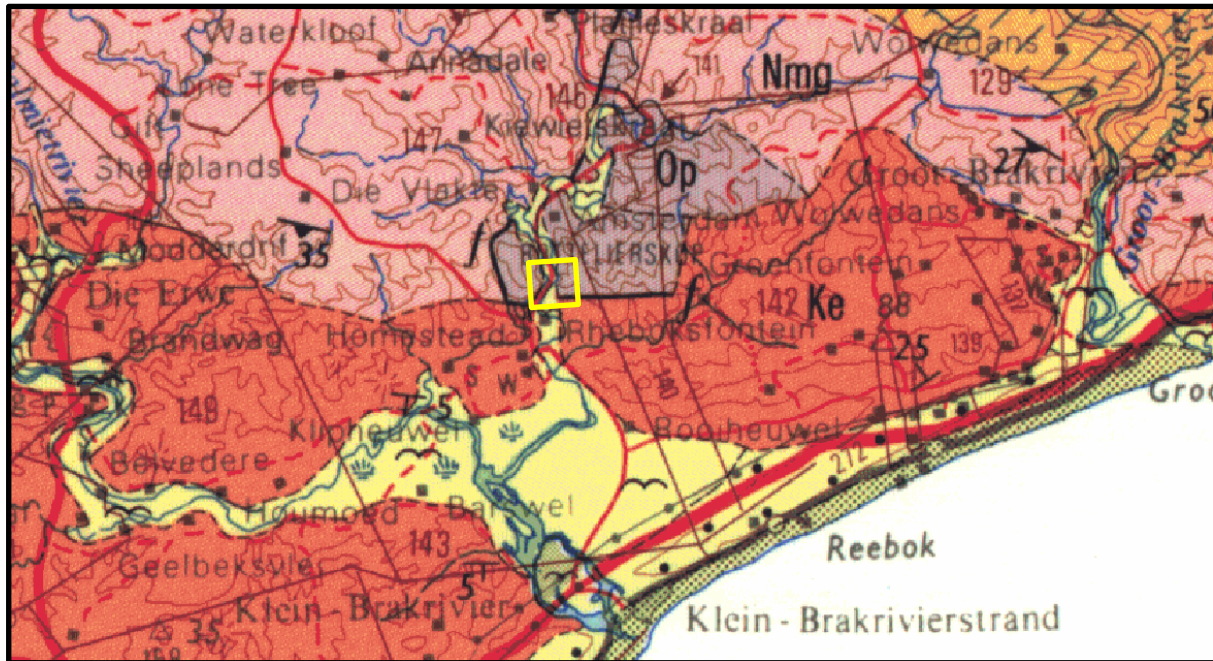
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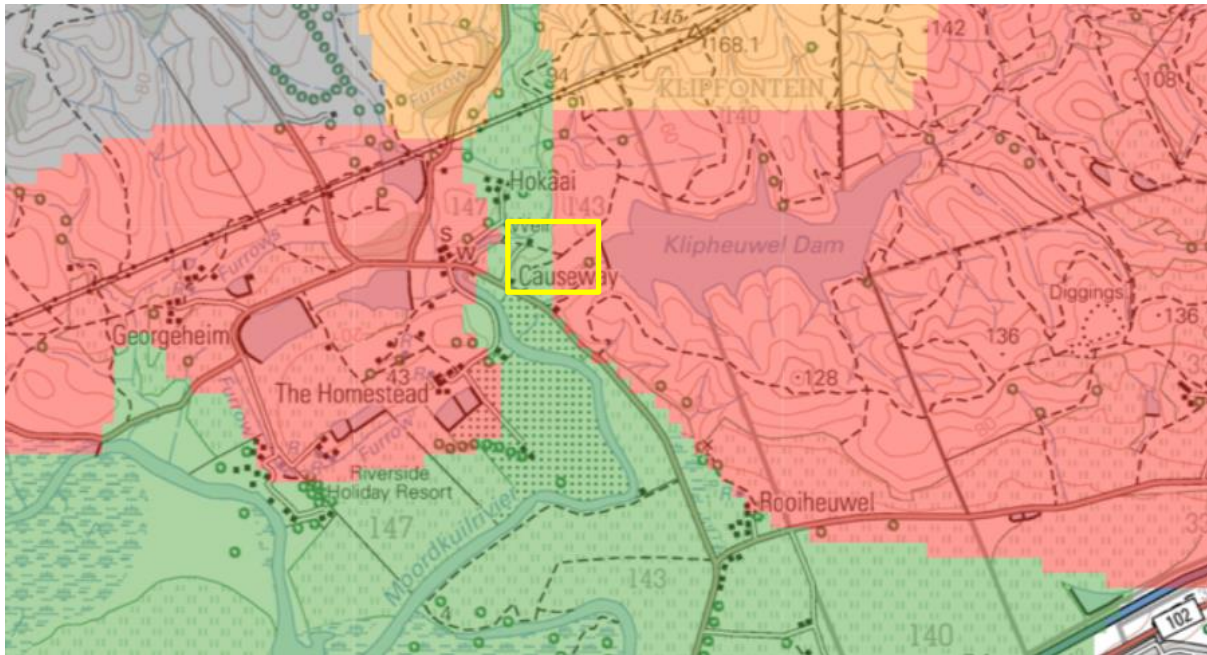
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