

**Phase 1 Heritage Impact Assessment for the proposed
construction of a 800m section of gravel road and
associated infrastructure at the Black Mountain Decline
on the Farm Zuurwater 62 , Khai-Ma Local Municipality,
NC Province.**

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Executive Summary

A Phase 1 Heritage Impact Assessment was carried out for the proposed new linear development on the Farm Zuurwater 62, situated near the town of Aggeneys between Pofadder and Springbok in the Northern Cape Province, where the Black Mountain mining company plans to construct a 800m section of gravel road and associated infrastructure at the Black Mountain Decline area (Swartberg). The field assessment provided no above-ground evidence of prehistoric structures, buildings older than 60 years, or material of cultural significance or *in situ* archaeological sites within the study areas. The development footprint is not considered palaeontologically significant. No further palaeontological or archaeological mitigation is required, as long as all the planned activities are restricted to within the boundaries of proposed development footprint.

Table of Contents

Executive Summary.....	2
Introduction.....	4
Locality data.....	5
Background.....	6
Impact Assessment.....	8
Field Assessment.....	8
Impact Statement and Recommendation.....	9
References.....	9
Figures.....	12

Introduction

A Phase 1 Heritage Impact Assessment was carried out for the proposed new linear development on the Farm Zuurwater 62, situated near the town of Aggeneys between Pofadder and Springbok in the Northern Cape Province, where the Black Mountain mining company plans to construct a 800m section of gravel road and associated infrastructure at the Black Mountain Decline area (Swartberg). (**Fig. 1 & 2**). The region's unique and non-renewable archaeological and palaeontological heritage sites are 'Generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. As many such heritage sites are threatened daily by development, both the environmental and heritage legislation require impact assessment reports that identify all heritage resources including archaeological and palaeontological sites in the area to be developed, and that make recommendations for protection or mitigation of the impact of the sites.

The National Heritage Resources Act (NHRA) (No 25 of 1999) identifies what is defined as a heritage resource, the criteria for establishing its significance and lists specific activities for which a heritage specialist study may be required. In this regard, categories of development listed in Section 38 of the NHRA are:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site;
- Exceeding 5000 m² in extent;
- Involving three or more existing erven or subdivisions thereof;
- Involving three or more subdivisions thereof which have been consolidated within the past five years;
- Costs of which will exceed a sum set in terms of regulations by the South African Heritage Resources Agency (SAHRA).
- The rezoning of a site exceeding 10 000 m².
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

In many cases, the nature and degree of heritage significance is largely unknown pending further investigation (e.g. capped sites, assemblages or subsurface fossil remains). On the other hand, it is also possible that a site may contain heritage resources (e.g. structures older than 60 years), with little or no conservation value. In most cases it will be necessary to engage the professional opinion of a heritage specialist in determining whether or not further heritage specialist input in an EIA process is required.

Terms of Reference

- Identify and map possible heritage sites and occurrences using available resources.
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

Methodology

The heritage significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant archaeological and palaeontological information, aerial photographs and site records were consulted and integrated with data acquired during the on-site inspection.

Locality data

1 : 50 000 scale topographic map 2918 BA Haramoep

1 : 250 000 scale geological map 2918 Pofadder

The study areas consists of a more or less linear footprint totalling 0.7765 ha of mostly rocky terrain covered by red-brown residual soils, calcretes and wind-blown sands along the lower slope of Swartberg (Black Mountain Decline) (**Fig. 3**). Proposed development will include the upgrading and extension of a 800 m long gravel road (5600 m²) and three separate infrastructure areas covering 765m², 400m² and 1000m² respectively (**Table 1**). The area is underlain by sediments of the Namaqua-Natal Metamorphic Complex, where rocks of the Bushmanland Group and

Precambrian granites outcrop in places (**Fig. 4**). The prominent inselbergs and ranges of hills which characterise the arid landscape of the area are formed by the metavolcanic-metasedimentary units of the Bushmanland Group that usually occur as major, often overturned, synformal infolds in the associated granitic gneisses (Baillie *et al.* 2007). Geologically recent superficial deposits along the valley floors are largely made up of by gritty to gravelly, brown top soils composed of an admixture of weathered bedrock, calcretes and Quaternary wind-blown sands.

Table 1. GPS coordinates of the proposed development (see Fig. 3).

#	GPS Coordinates	
A	29°14'23.80"S	18°45'7.42"E
B	29°14'31.14"S	18°45'20.97"E
C	29°14'37.55"S	18°45'35.37"E

Background

Geologically recent superficial deposits along the valley floors are largely made up of Quaternary calcretes and sands. Cenozoic river terrace deposits between Upington and Pella consists of thin remnants preserved as bedrock lags and small sediment accumulations concentrated at local bedrock knickpoints (De Wit 2006). There are currently no records of vertebrate fossil remains from alluvial contexts associated with the Orange River in the region. Paleogene fossil assemblages are known from a crater-lake deposit within a volcanic pipe at Stompoor, located about 160 km due south of Upington, and include a diversity of fish, frogs, reptiles, insects, and palynological remains (Smith 1988). Fluvial deposits from the ancient Koa Valley have yielded fossil vertebrate bone as well as fossil wood (Maglio 1978; De Wit 1996; De Wit and Bamford 1993) while a rich, Middle Miocene vertebrate site is located further downstream in proto-Orange River gravel deposits on the Namibian side of the Orange River at Arrisdrift, about 40 km northeast of Oranjemund.

Archaeological and historical evidence show that the Middle Orange River and Bushmanland regions have been populated more or less continuously during prehistoric times and that the region was extensively occupied by Khoi herders and

San hunter-gatherers during the last 2000 years (Morris & Beaumont 1991; Beaumont *et al.* 1995; Smith 1995). According to Beaumont (1986) archaeological visibility in the region was high during the Last Glacial Maximum, a viewpoint that is in contrast to that indicated for southern Africa as a whole (Deacon and Thackeray 1984). Beaumont *et al.* 1995 also noted that MSA artifact occurrences are widespread in the Bushmanland area, but are mainly preserved as low density surface scatters on the landscape. Morris (2010, 2013a, 2013b) noted very sparse localized scatters of MSA stone tools at the top of Gamsberg, including a MSA knapping site, and ESA material, including a Victoria West core on quartzite within the Gamsberg basin. The importance of Gamsberg as an archaeological/historical focal point is further alluded to in early 19th century records (Penn 2005) as a place of refuge and conflict during the colonial frontier period and by the meaning of its name, which is derived from the Khoikhoi word Gaams, meaning 'grassy spring'. The principal Khoikhoi inhabitants of the Middle Orange River were the Einiqua who belonged to the same language group as the Namaqua and Korana, namely the Orange River Khoikhoi (Penn 2005). The Einiqua occupied the area around and east of the Augrabies Falls while the Korana occupied the Middle-Upper Orange River further to the east. A large number of burial cairns were excavated near the Orange River in the Kakamas area and appear to be related to Korana herders (Morris 1995). It is pointed out that while Bushmanland sites in the surrounding area appear to be ephemeral occupations by small hunter-gatherer groups, substantial herder encampments found along the Orange River itself indicate that the banks and floodplains of the river were more intensely exploited (Morris & Beaumont 1991; Beaumont 1995). Hinterland sites are mainly restricted rock shelters near mountainous terrain sand dune deposits, or around seasonal pans and springs (Beaumont 1995). Herder sites with ample pottery have been recorded near Aggeneys and, east of Pofadder, at Schuitdrift South (Morris 1999) and historical records show that herder groups settled at the stronger springs such as Pella (Thompson 1827). Pella originated as Roman Catholic mission station, about 28 km northwest of Pofadder. It was established as a station of the London Missionary Society about 1806, was taken over by the Rhenish Missionary Society until 1869, and then by the Roman Catholics in 1874. The town of Pofadder developed from a station of the Inland Mission founded in 1875, and named after Klaas Pofadder, a Korana chief. The town was laid out in 1917 and a village management board was instituted in 1937. Originally named *Theronsville*, the name

Pofadder was restored in 1936. Grinding grooves have been found on rock outcrops in the Gamsberg area (Morris 2011) and rock paintings, grinding surfaces and cupules sites are known from the Black Mountain Mining property at Aggeneys and at the foot of the mountain on Zuurwater 62 (Morris 2013a). No Iron Age sites are expected to be found in this area as it falls outside the southwestern periphery of distribution of Iron Age settlement in the region (Humphreys 1976).

Impact Assessment

Nature of Impacts

It is expected that the proposed construction activities will be localized, and that potential palaeontological and archaeological impacts, if any, will be confined to the development footprint during the construction phase. Bedrock underlying the study area is not considered to be palaeontologically significant, because of the metavolcanic-metasedimentary nature of the strata. There is a low probability that well-developed Quaternary alluvial surface deposits may contain large vertebrate fossil remains or capped Stone Age occurrences. It is also likely that outcrop may yield rock art rock shelters with evidence of prehistoric human occupation.

Extent of Impact

Possible extent of impact following the construction activities will be locally restricted to potential damage or destruction as a result of excavations into Bushmanland Group strata and Quaternary overburden.

Duration of Impact

The proposed developments are considered long term with the consequence that any damage or destruction to geological strata and archaeological heritage within the affected area will be permanent.

Cumulative Impact

There currently exists a well-established mining footprint within a 50 km radius of the proposed developments. The proposed developments will be carried out on a landscape where mining activities is a common feature.

Field Assessment

The proposed footprint is primarily located on flat, open terrain covered by red-brown residual soils, calcretes and wind-blown sands. A foot survey along nearby drainage

lines (alluvium) indicate that impact on potential palaeontological heritage resources within the superficial sediments (overlying Quaternary sediments) is unlikely. No above-ground evidence was found of intact Stone Age archaeological assemblages or sites. The pedestrian survey also revealed no evidence of prehistoric structures, marked graves or rock art sites within the confines of the proposed development footprint.

Impact Statement and Recommendation

The field assessment provided no above-ground evidence of prehistoric structures, buildings older than 60 years, or material of cultural significance or *in situ* archaeological sites within the proposed development footprint. It is also considered unlikely that significant artefact occurrences will be found below the surface within the boundaries of the proposed development footprint. No further palaeontological or archaeological mitigation is required, as long as all the planned activities are restricted to within the boundaries of proposed development footprint.

References

- Bailie, R., Armstrong, R. And Reid, D. 2007. The Bushmanland Group supracrustal succession, Aggeneys, Bushmanland, South Africa: Provenance, age of deposition and metamorphism. *South African Journal of Geology* 110: 59-86.
- Beaumont P.B. 1986. Where did all the young men go during 0-18 Stage 2? *Palaeoecology of Africa and the surrounding islands* 17: 79 – 88.
- Beaumont, P.B., Smith, A.B. & Vogel, J.C. 1995. Before the Einiqua: the archaeology of the frontier zone. In: Smith, A.B. (ed.) Einiqualand: studies of the Orange River frontier. pp. 236-264. Cape Town: University of Cape Town Press.
- Deacon, H.J. and Thackeray, J.F 1984. *Late Quaternary environmental changes and implications from the archaeological record in southern Africa*. In: J.C. Vogel (ed). Late Cainozoic Palaeoclimates of the Southern Hemisphere Balkema, Rotterdam. pp. 375 – 390.
- De Wit, M.C.J. 1996. The distribution and stratigraphy of inland alluvial deposits in South Africa. *African Geoscience Review* 3(2): 175 – 189.

- De Wit, M.C.J. and Bamford, M. 1993. Fossil wood from the Brandvlei area, bushmanland as an indication of palaeoenvironmental changes during the Cainozoic. *Palaeont. africana* 30: 81 – 89.
- De Wit, M.C.J., Marshall, T.R. and Partridge, T.C. 2000. Fluvial deposits and fluvial evolution. In: T.C.Partridge and R.R. Maud (eds). *The Cenozoic of Southern Africa*. Oxford Monographs on Geology and Geophysics No. 40.
- Hendey, Q.B. 1976. Preliminary report on the Miocene vertebrates from Arrisdraft, South West Africa. *Annals of The South African Museum* 78 : 1 – 41.
- Humphreys, A.J.B. 1976 Note on the Southern Limits of Iron Age Settlement in the Northern Cape. *South African Archaeological Bulletin*, Vol. 31 (121/122): 54-57.
- Morris, A.G. 1995. The Einiqua: an analysis of the Kakemas skeletons. In: Smith, A.B. (ed.) *Einiqualand: studies of the Orange River frontier*. pp. 110 - 164. Cape Town: University of Cape Town Press.
- Morris, D. 1999. Archaeological impact assessment, ‘Southern Option’, powerline ‘Schuitdrift’ to ‘Paulputs’, Pofadder District, Northern Cape. Unpublished Report to Eskom.
- Morris, D. 2010. Cultural Heritage Assessment: Gamsberg. Supplementary observations to a previous specialist report on archaeological resources. Unpublished report to SRK Consulting.
- Morris, D. 2011. Black Mountain Concentrated Solar Power Facility development at Aggeneys, Northern Cape. Unpublished Heritage Impact Assessment.
- Morris, D. 2013a. Environmental Management Plan Report for Black Mountain Mine, Aggeneys, Northern Cape: Input with respect to Heritage Resources. Unpublished Heritage Report.
- Morris, D. 2013b. Archaeological and Cultural Heritage Investigation for the Environmental and Social Impact Assessment (ESIA) for the Gamsberg Zinc Mine and Associated Infrastructure in Northern Cape, South Africa. Unpublished Heritage Impact Assessment.
- Morris, D. & Beaumont, P.B. 1991. !Nawabdanas: archaeological sites at Renosterkop, Kakamas District, Northern Cape. *South African Archaeological Bulletin* 46:115-124.

Beaumont P.B. and Morris D. 1990. *Guide to archaeological sites in the Northern Cape*. SA Association of Archaeologists Post Conference Excursion 1th – 13th Sept 1990. McGregor Museum Kimberley.

Penn, N. 2005. *The Forgotten Frontier: Colonist and Khoisan on the Cape's Northern Frontier in the 18th Century*. Athens, Ohio and Cape Town: Ohio University Press and Double Storey Books.

SAHRA, 2005. Minimum Standards for the Archaeological and the Palaeontological Components of Impact Assessment Reports.

Smith, A.B. 1995. Archaeological observations along the Orange River and its hinterland. In A. B. Smith (ed.). *Einiqualand: studies of the Orange River frontier*, Cape Town: UCT Press.

Thompson, G. 1827. *Travels and adventures in Southern Africa*. Reprint 2013. Forgotten Books. www.ForgottonBooks.org.

Figures

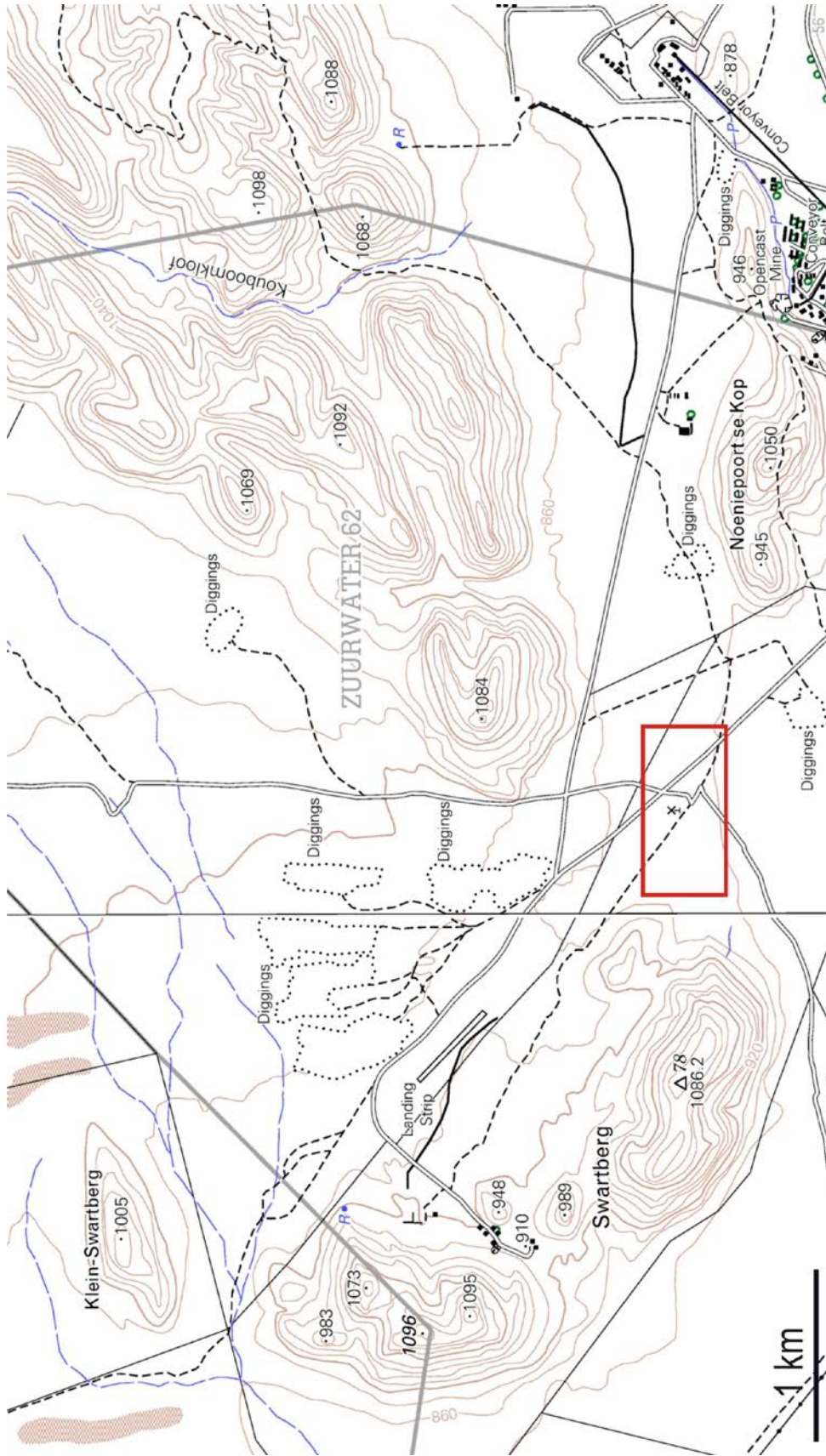


Figure 1. Locality map of the proposed Black Mountain Decline development (portion of 1:50 000 scale topographic map 2918BA Haramoep).

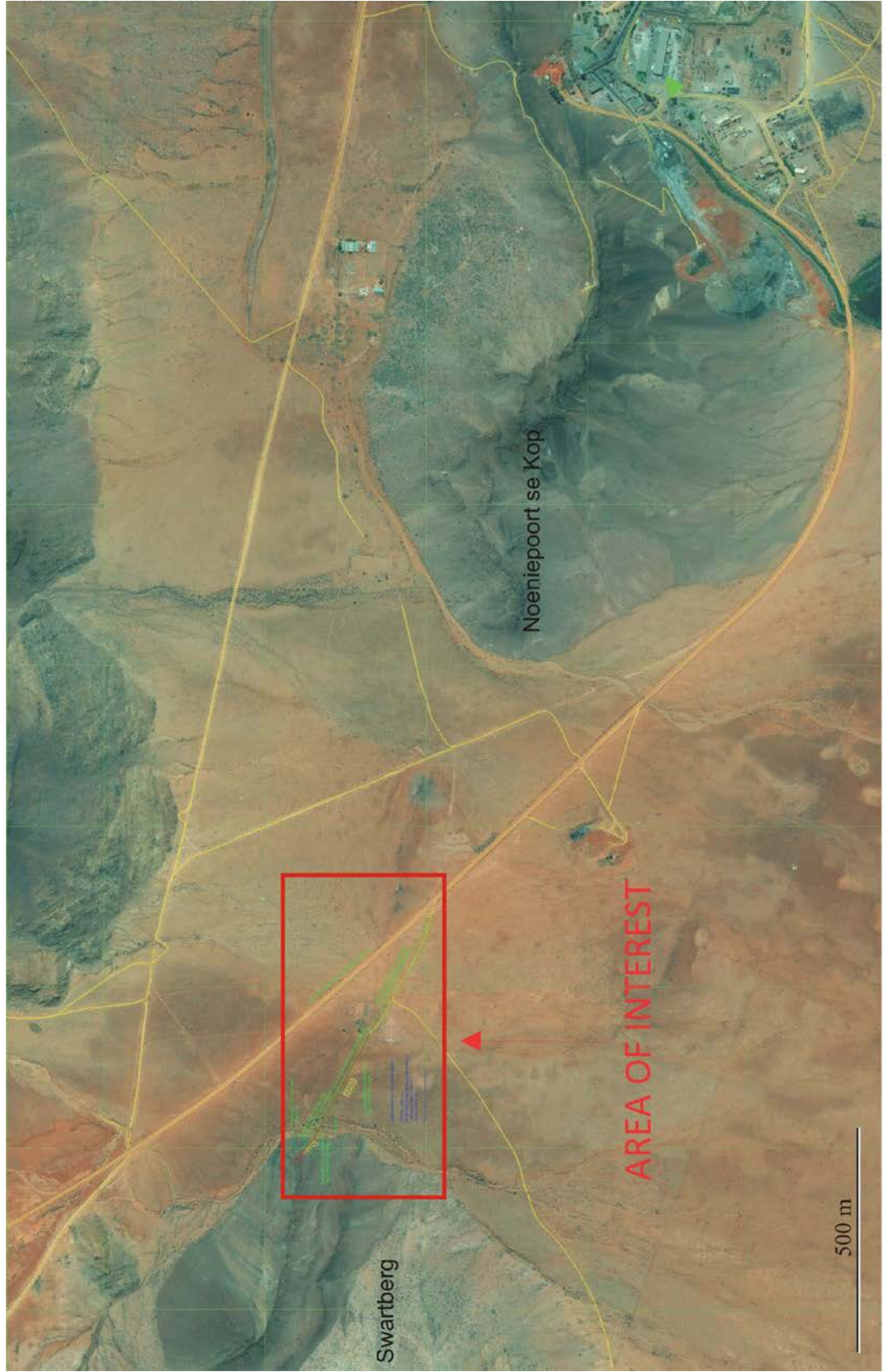


Figure 2. Aerial view of the proposed development footprint.

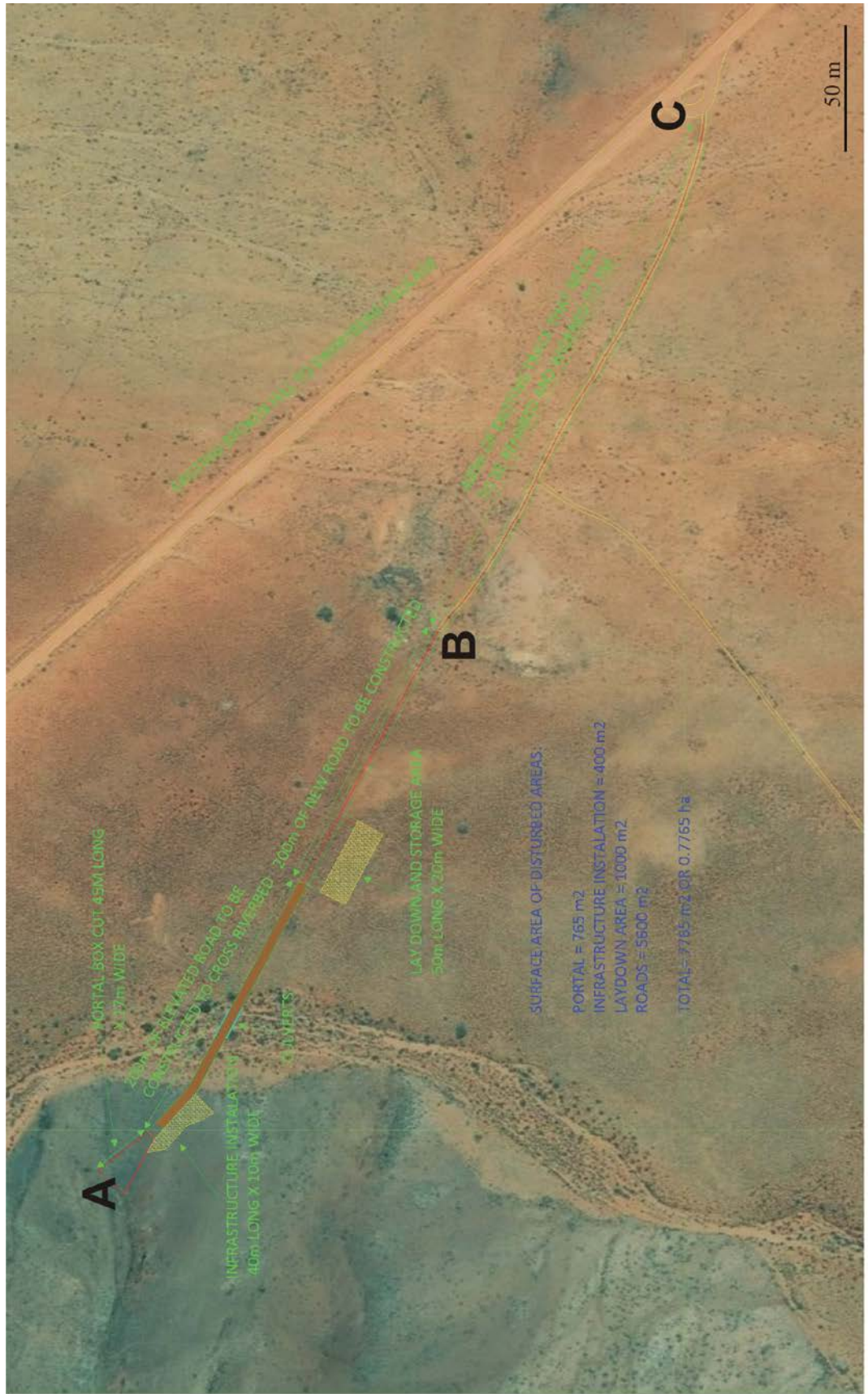


Figure 3. Layout of the proposed development footprint.

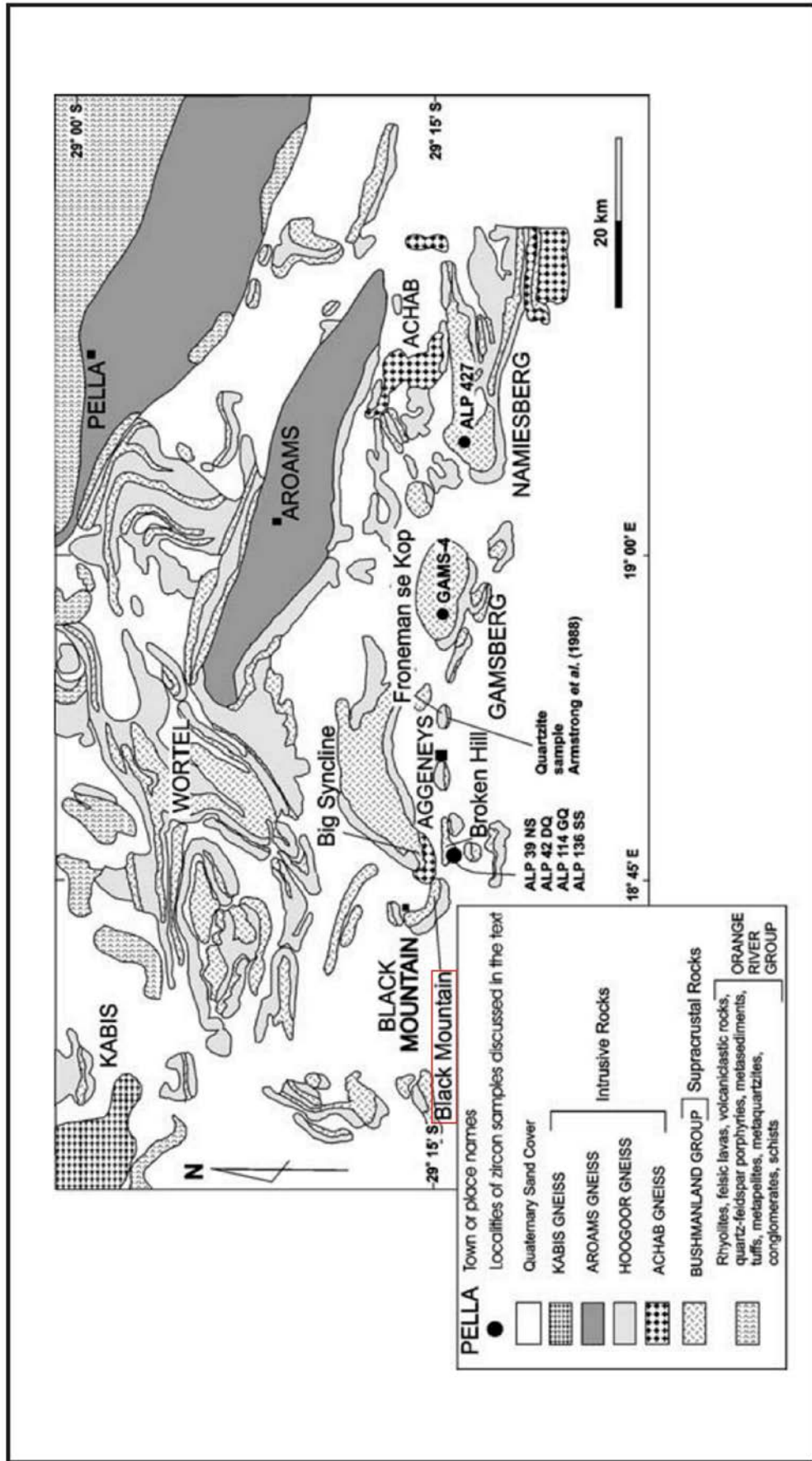


Figure 4. Simplified geological map of the area around Aggeneys and Gamsberg showing the various inselbergs and the distribution of the various granitic gneisses and the Bushmanland Group supracrustal succession (from Baillie *et al.* 2007).