

APPENDIX D: HERITAGE IMPACT ASSESSMENT

**DESKTOP HERITAGE SURVEY OF N1 SECTION:
KOPPIES TO HEUNINGSPRUIT**

FOR

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Abbreviations

HP	Historical Period
IIA	Indeterminate Iron Age
LIA	Late Iron Age
EIA	Early Iron Age
ISA	Indeterminate Stone Age
ESA	Early Stone Age
MSA	Middle Stone Age
LSA	Late Stone Age
HIA	Heritage Impact Assessment
PIA	Palaeontological Impact Assessment

INTRODUCTION

SANRAL intends to upgrade the N1 Section 18, between Heuningspruit and Koppies, Free State. The start point is ~27km northeast of Kroonstad and the upgrade is ~25km long.

The Preliminary Design Phase is to further develop the recommended Conceptual Design alternatives in order for the Employer to select the most appropriate alternative based on technical functionality and economic benefit. The selected option will then be further developed in the Detailed Design phase.

During the Conceptual Design stage 5 alternatives were identified as listed below:

1. Alternative 1 – 4 lane cross section reconstructed on the existing alignment.
2. Alternative 2 – 4 lane cross section reconstructed on the existing alignment including a median barrier.
3. Alternative 3 – 4 lane cross section reconstructed on the centreline alignment.
4. Alternative 4 – 4 lane cross section reconstructed on the centreline alignment including a median barrier.
5. Alternative 5 – 4 lane divided dual carriageway.

The Conceptual Design report recommended that alternatives 3, 4 and 5 be further developed during the Preliminary Design Stage. For the purpose of this report, the recommended Conceptual Design alternatives 3, 4 and 5 has been re-named Alternatives 1, 2 and 3. The implementation of the 4-lane upgrade according to SANRAL`s revised program will be in 2022 with a 48 month construction period. Opening of the 4-lane facility will thus be in 2026 with the 6-lane facility being needed in 2045, 19 years from the opening date of the 4-lane facility.

All the alternatives discussed below include traffic accommodation maintaining the current 2+1 lane configurations. This requires temporary widening for alternatives 1 and 2. If single lane (i.e. 1+1) traffic accommodation is to be introduced no temporary widening will be needed but the level of service will drop to F in both directions. This is considered unacceptable and a 2+1 lane configuration will therefore be maintained.

Umlando was subcontracted by SLR Consulting to undertake the HIA for this project. An initial desktop study was undertaken that indicated several buildings were near the existing freeway. These buildings included farm labourer's houses and general farm buildings. The field survey was undertaken in May 2019. The footprint used was from the existing central road line to the existing fencing on each side of the N1.

Fig.'s 1 – 4 show the location of the project.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

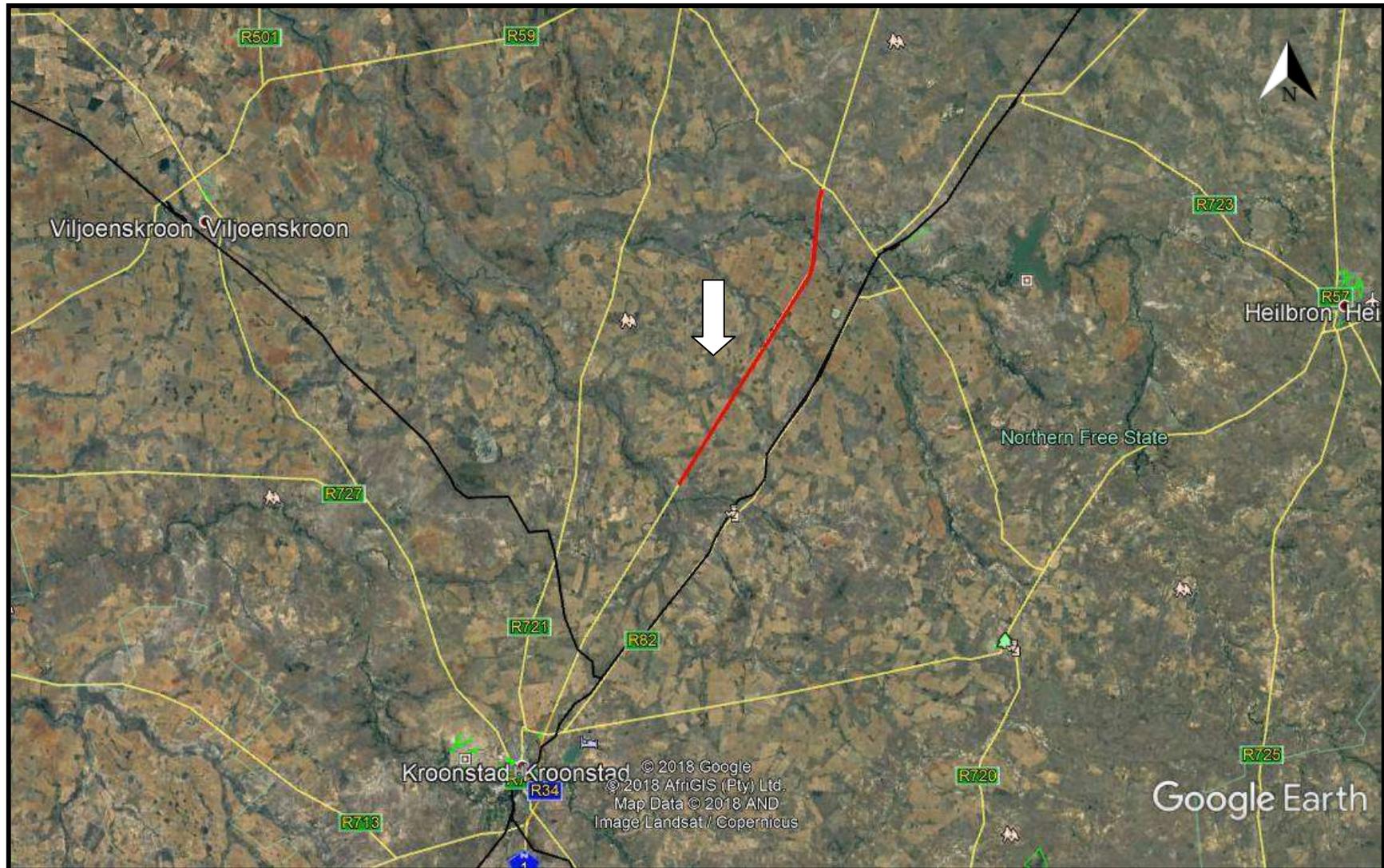


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA



FIG. 3: TOPOGRAPHICAL MAP OF THE STUDY AREA

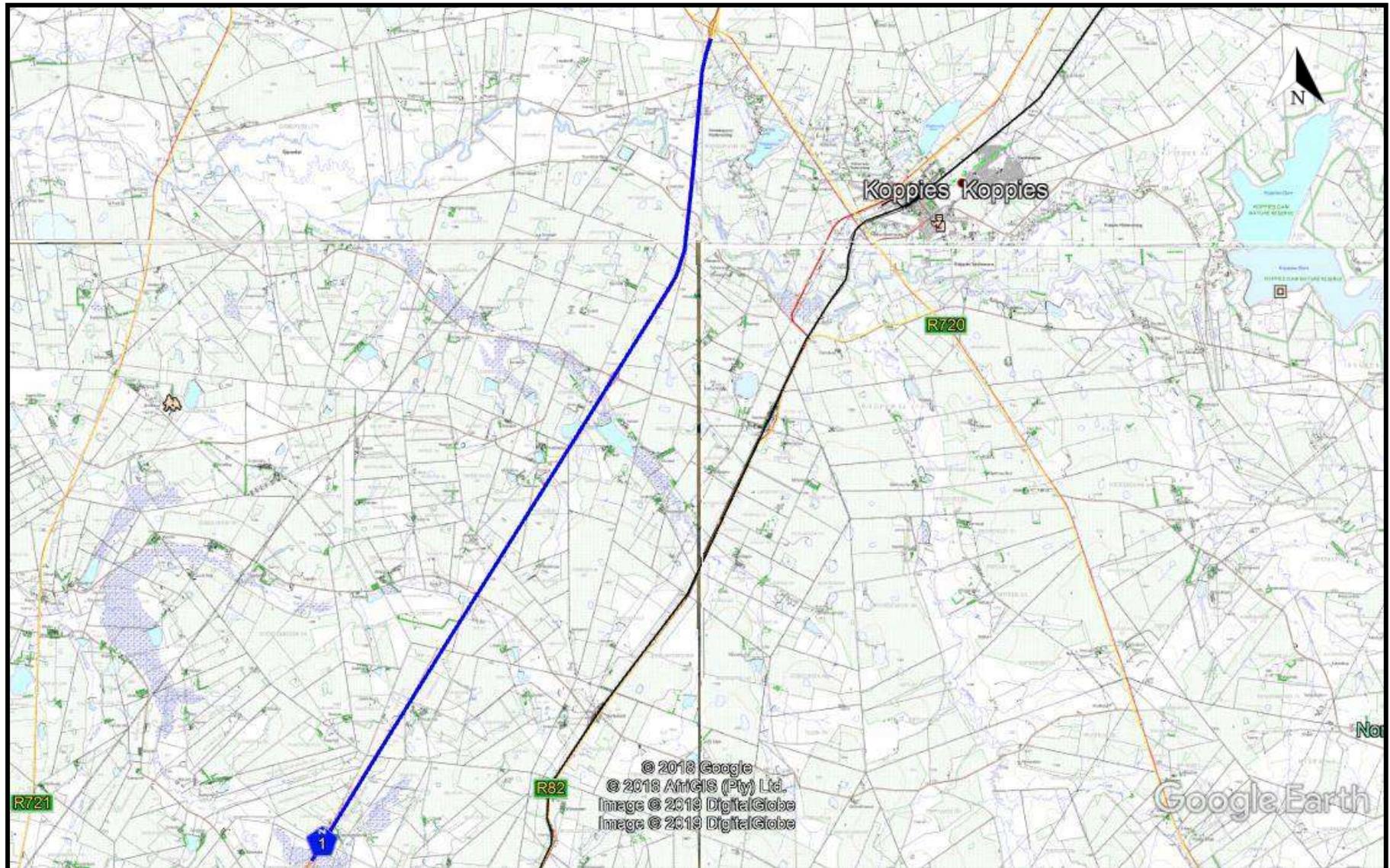


FIG. 4: SCENIC VIEWS OF THE STUDY AREA



NATIONAL HERITAGE RESOURCES ACT OF 1999

The National Heritage Resources Act of 1999 (pp 12-14) protects a variety of heritage resources. These resources are defined as follows:

1. “For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
2. Without limiting the generality of subsection (1), the national estate may include—
 - 2.1. Places, buildings, structures and equipment of cultural significance;
 - 2.2. Places to which oral traditions are attached or which are associated with living heritage;
 - 2.3. Historical settlements and townscapes;
 - 2.4. Landscapes and natural features of cultural significance;
 - 2.5. Geological sites of scientific or cultural importance;
 - 2.6. Archaeological and palaeontological sites;
 - 2.7. Graves and burial grounds, including—
 - 2.7.1. Ancestral graves;
 - 2.7.2. Royal graves and graves of traditional leaders;
 - 2.7.3. Graves of victims of conflict;
 - 2.7.4. Graves of individuals designated by the Minister by notice in the Gazette;
 - 2.7.5. Historical graves and cemeteries; and
 - 2.7.6. Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
3. Sites of significance relating to the history of slavery in South Africa;
 - 3.1. Movable objects, including—

4. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - 4.1. Objects to which oral traditions are attached or which are associated with living heritage;
 - 4.2. Ethnographic art and objects;
 - 4.3. Military objects;
 - 4.4. objects of decorative or fine art;
 - 4.5. Objects of scientific or technological interest; and
 - 4.6. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
5. Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—
 - 5.1. Its importance in the community, or pattern of South Africa's history;
 - 5.2. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
 - 5.3. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
 - 5.4. Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
 - 5.5. Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
 - 5.6. Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
 - 5.7. Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
 - 5.8. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and

5.9. sites of significance relating to the history of slavery in South Africa”

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. These database contain archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (<http://www.vuvuzela.com/googleearth/monuments.html>) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually

occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

Defining significance

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

1. State of preservation of:

- 1.1. Organic remains:
 - 1.1.1. Faunal
 - 1.1.2. Botanical
- 1.2. Rock art
- 1.3. Walling
- 1.4. Presence of a cultural deposit
- 1.5. Features:
 - 1.5.1. Ash Features
 - 1.5.2. Graves
 - 1.5.3. Middens
 - 1.5.4. Cattle byres
 - 1.5.5. Bedding and ash complexes

2. Spatial arrangements:

- 2.1. Internal housing arrangements
- 2.2. Intra-site settlement patterns
- 2.3. Inter-site settlement patterns

3. Features of the site:

- 3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

4. Research:

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

5. Inter- and intra-site variability

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

6. Archaeological Experience:

6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

7. Educational:

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

8. Other Heritage Significance:

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts.

The above significance ratings allow one to grade the site according to SAHRA's grading scale. This is summarised in Table 1.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	
High / Medium Significance	Generally Protected A		Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B		Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C		On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction

DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. I also used various sources for historical information.

PREVIOUS ACHAEOLOGICAL & HERITAGE SURVEYS

Only one study has been undertaken along the northern part of the route (De Jong 2011). This study was for the fibre optic cable and did not report any heritage sites. Fig. 4 shows known heritage sites near the study area. Other studies have been undertaken but are much further away to have relevance to the project. The known heritage sites are various types of graves or cemeteries. No national monuments, battlefields, or historical cemeteries are known to occur along the route.

The earliest aerial photographs for this area date to 1955 (fig. 5). Only two built structures occur within 100m of the N1. AH1 has since been demolished. AH2 appears to be a ruin in 1955, but has now been rebuilt or demolished and a new structure built.

The earliest available 1:50 000 topographical maps for this area date to 1979. A 1964 map occurs for the last 1km of the road. Several buildings are noted on these maps (fig. 6). There are three rows of trees used as boundary markers. By 2018, all of these structures either are demolished or have been abandoned. The important point in this study is that all of the buildings post-date 1955 and are thus just meet the criteria for protected buildings. Buildings on the cusp tend to be wavered if not of significance. The trees lines also post-date 1955 and are thus not historical cultural boundaries/landscapes.

FIG. 4: KNOWN HERITAGE SITES IN THE AREA

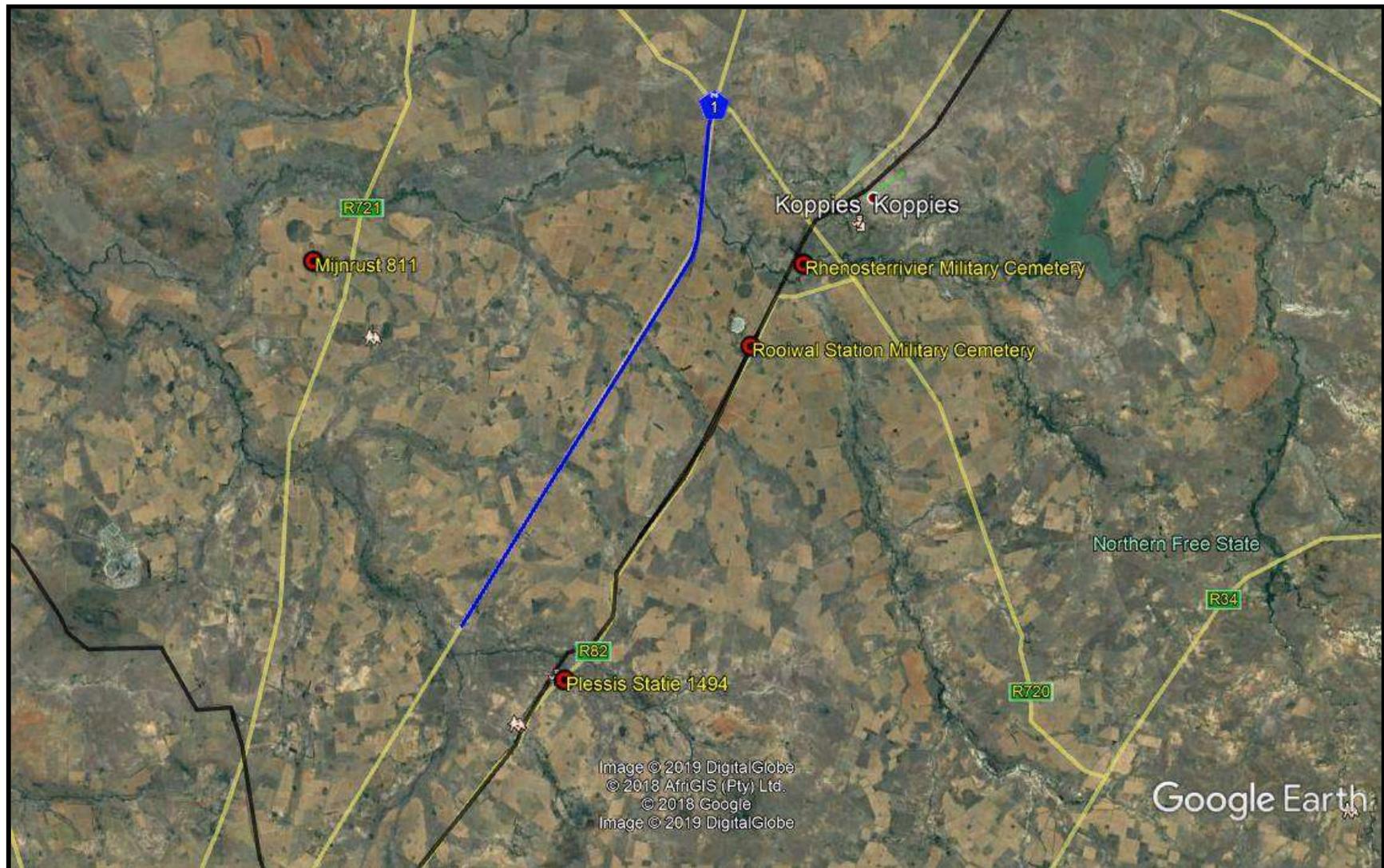


FIG. 5: AERIAL PHOTOGRAPH OF THE STUDY AREA IN 1955

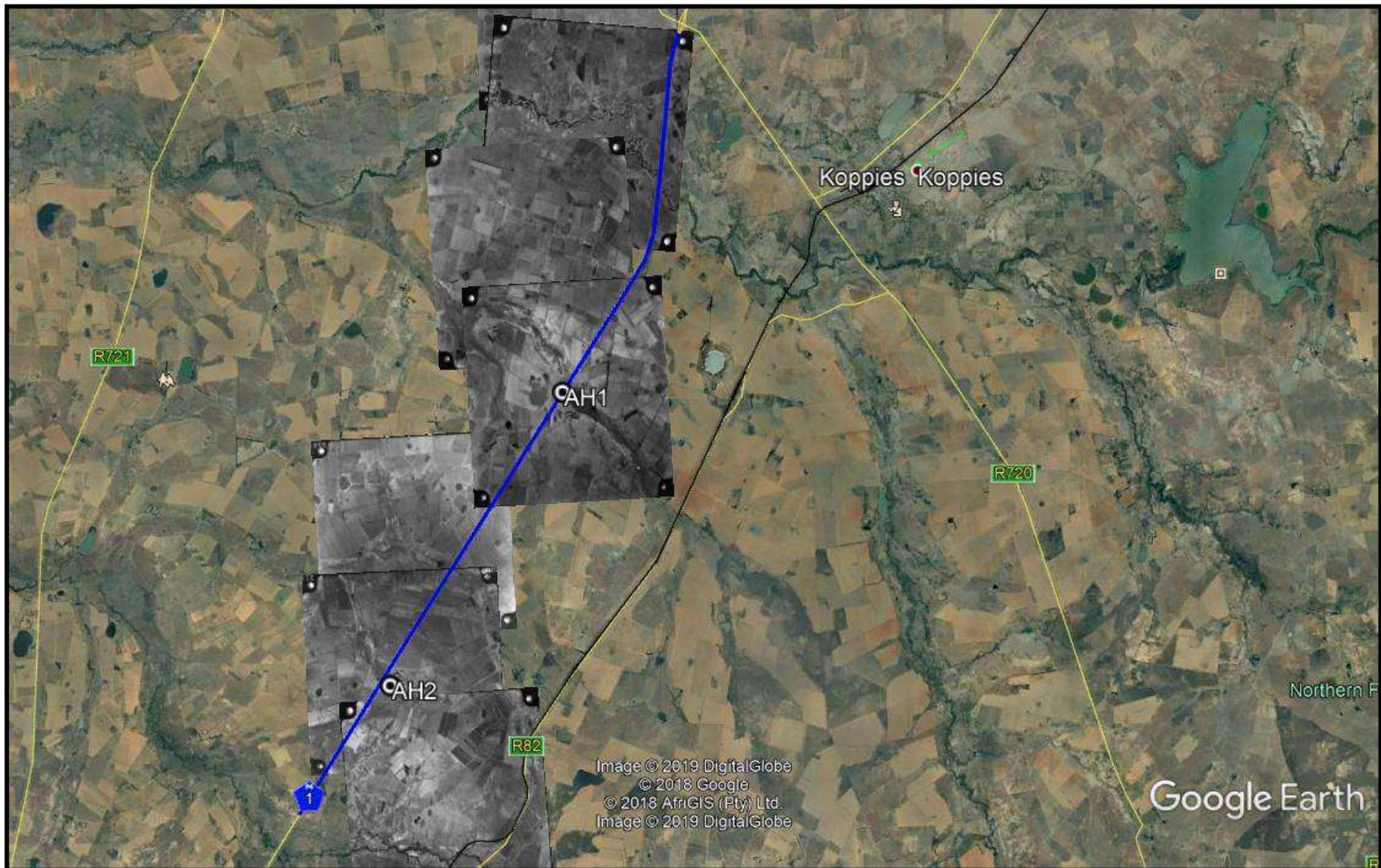
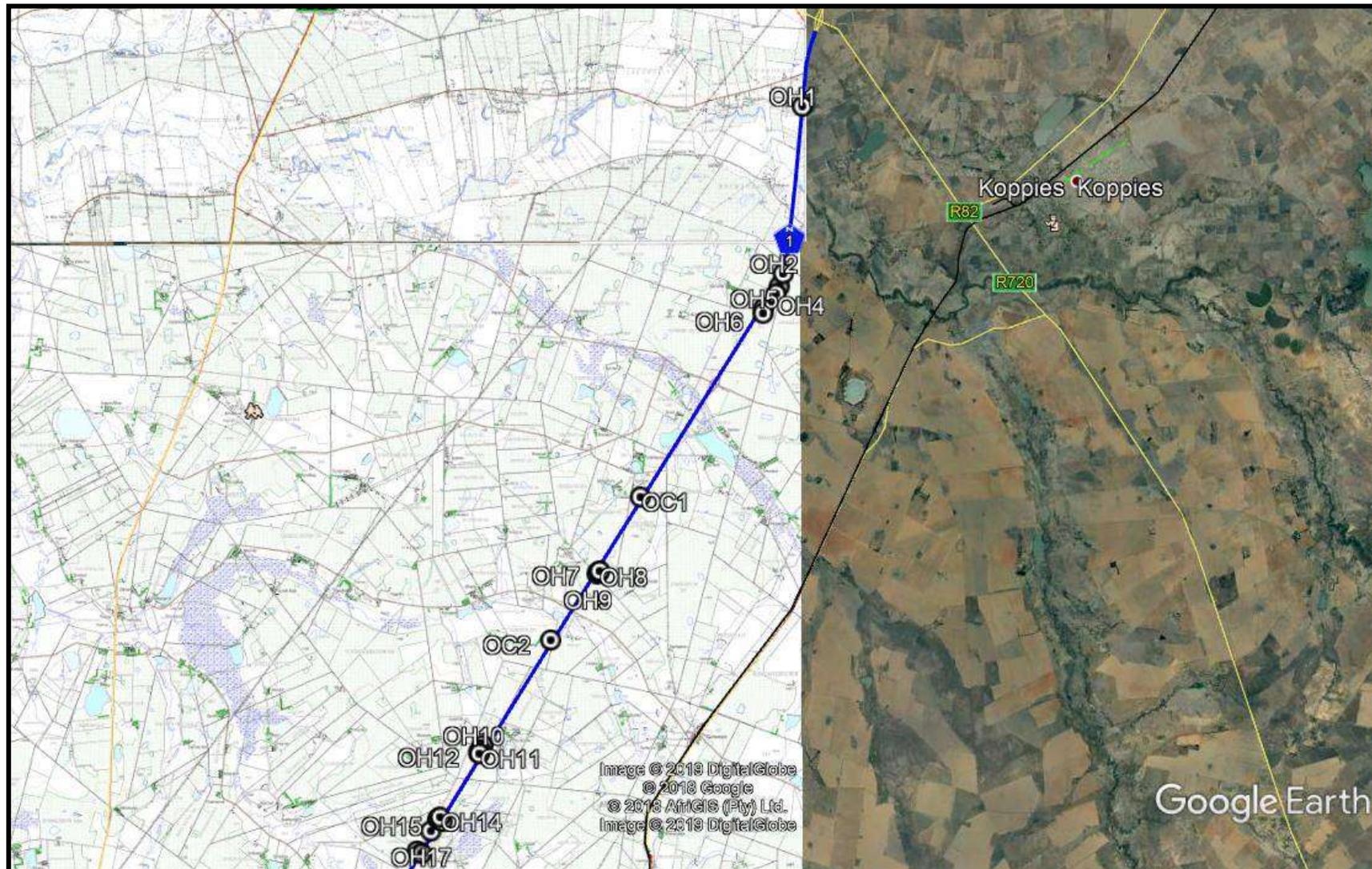


FIG. 6: 1:50 000 MAP OF THE STUDY AREA (1979)



OH1 – OH5 appear to be farm labourers houses and may have human graves associated with the buildings.

There are several culverts and bridges along this part of the N1 route. If any of these are older than 60 years in age, then they will require a permit if they are to be damaged, removed or altered.

The locations of these structures are given in Table 2

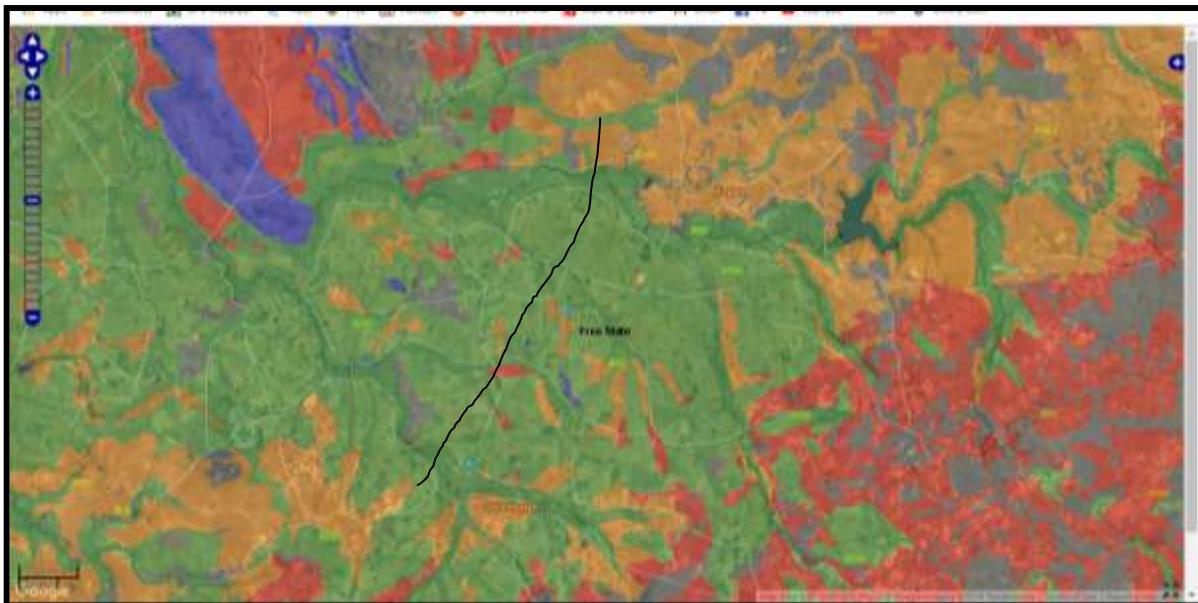
TABLE 2: LOCATION OF BUILT STRUCTURES ON HISTORICAL MAPS

NAME	LATITUDE	LONGITUDE	MAP DATE	DESCRIPTION
AH01	-27.299477140	27.463799064	1955	Houses?
AH02	-27.387423635	27.405536150	1955	ruins
OC01	-27.319379229	27.449036283	1997	Tree boundary
OC02	-27.358471701	27.421294403	1997	Tree boundary
OC03	-27.416892929	27.381323460	1997	Tree boundary
OH01	-27.212443232	27.499085347	1997	Built structures
OH02	-27.258238153	27.493150097	1997	Built structures
OH03	-27.261697400	27.491942367	1997	Built structures
OH04	-27.263814239	27.490927751	1997	Built structures
OH05	-27.267798920	27.487053301	1997	Built structures
OH06	-27.269116034	27.486903376	1997	Built structures
OH07	-27.339570082	27.436469657	1997	Built structures
OH08	-27.339890772	27.436092046	1997	Built structures
OH09	-27.340386589	27.435648721	1997	Built structures
OH10	-27.387297605	27.400369676	1997	Built structures
OH11	-27.389544975	27.399253880	1997	Built structures
OH12	-27.389211464	27.399116488	1997	Built structures
OH13	-27.388474443	27.399628455	1997	Built structures
OH14	-27.406898863	27.387085056	1997	Built structures
OH15	-27.408060168	27.387712787	1997	Built structures
OH16	-27.407413449	27.386352767	1997	Built structures
OH17	-27.410692980	27.384204830	1997	Built structures
OH18	-27.416225281	27.379956650	1997	Built structures

PALAEONTOLOGICAL DESKTOP STUDY

The palaeontological sensitivity map indicates that the area is in mostly areas of moderate sensitivity (fig. 7). The need for a PIA will be depend on the depths of excavations. Depths exceeding 1m would require input from a palaeontologist, especially if unweathered bedrock is affected. The current designs do not indicate that there will be any deep excavations. The request for an exemption of the PIA is in Appendix A

FIG. 7: PIA SENSITIVITY MAP



COLOUR	SENSITIVITY	REQUIRED ACTION
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light,

		SAHRA will continue to populate the map.
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FIELD SURVEY

The field survey was undertaken in May 2019. All points noted in the desktop that were in, or near, the footprints were visited. The survey did not include quarries.

It appears as if the footprint area has been levelled and cleared during the previous road upgrade. All possible sites that would have occurred in the footprint no longer exist.

No buildings were noted just outside of the footprint. All other buildings were more than 100m from the footprint border (fig. 8)

FIG. 8: HISTORICAL BUILDINGS OUTSIDE OF THE FOOTPRINT



CONCLUSION

A heritage survey was undertaken for the proposed N1 upgrade between Koppies and Heuningspruit. The desktop noted several built structures post dating 1955, and only two that predate 1955.

The field survey noted that no buildings existed in the footprint. These were probably cleared by previous upgrades.

The palaeontological sensitivity for the study area varies from medium to high. However, deep excavations greater than 1m are unlikely to occur according to the design maps. The plans will thus not affect unweathered deposits.

No further HIA mitigation is required.

REFERENCES

De Jong, R. 2011. Specialist Study: Heritage Impact Assessment For The Installation Of The Sirius Fibre Optic Cable Between Johannesburg And Yzerfontein, Gauteng, Free State, Eastern And Western Cape Provinces

Maps:

2727AD_1997 Heuningspruit

2727AB_1979, 1997 Vredefort

2727BA_1964, 1997 Koppies

354_06_4994

354_07_5013

354_08_5108

354_09_5109

354_010_05947

354_011_05209

354_012_05312

Database:

SAHRIS

Umlando

EXPERIENCE OF THE HERITAGE CONSULTANT

Gavin Anderson has a M. Phil (in archaeology and social psychology) degree from the University of Cape Town. Gavin has been working as a professional archaeologist and heritage impact assessor since 1995. He joined the Association of Professional Archaeologists of Southern Africa in 1998 when it was formed. Gavin is rated as a Principle Investigator with expertise status in Rock Art, Stone Age and Iron Age studies. In addition to this, he was worked on both West and East Coast shell middens, Anglo-Boer War sites, and Historical Period sites.

DECLARATION OF INDEPENDENCE

I, Gavin Anderson, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

A handwritten signature in black ink, appearing to read 'G. Anderson', with a horizontal line underneath.

Gavin Anderson
Archaeologist/Heritage Impact Assessor

APPENDIX A
PIA LETTER OF EXEMPTION

Dr Alan Smith
Alan Smith Consulting
29 Browns Grove
Sherwood
Durban
4091

Archaeological Surveys & Heritage Management PO
Box 102532, Meerensee, KwaZulu-Natal 3901

Dear Sir

Umlando Archaeological Surveys & Heritage Management are conducting a Heritage/
Palaeontological Impact Assessment on a portion of the N1: **N1 SECTION: KOPPIES TO
HEUNINGSPRUIT.**

Designs indicate there will be no earthmoving deeper than 1m, or new earthmoving
for culverts. All work will be on the present footprint (excludes borrow pits). Thus only the
weathered surface material will be impacted.

As the footprint will remain constant there is no reason to conduct a PIA, thus an
exemption is requested for this project..

Should plans change then the project will need to be reassessed in terms of a PIA

Dr Alan Smith.
Alan Smith Consulting
June, 6, 2019

