

Phase 1 Archaeological Impact Assessment Report:

Proposed 132kV Power Line and Substation Infrastructure,
Melkhout-Dieprivier,
Kouga Local Municipality,
Cacadu District,
Eastern Cape Province, South Africa

Prepared for

GIBB Engineering & Science

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MANAGEMENT SUMMARY

eThembeni Cultural Heritage was appointed by GIBB Engineering & Science to undertake a Phase 1 Archaeological Impact Assessment of a proposed transmission power line and substation site in the Eastern Cape Province, in terms of the National Environmental Management Act 107 of 1998 as amended, in compliance with Section 38 of the National Heritage Resources Act 25 of 1999, as amended.

LOCATION AND ENVIRONMENT

The proposed power line extends from the Melkhout Substation north of the town of Humansdorp westwards to the Dieprivier Substation, Cacadu District. Historical agriculture related land-uses have resulted in degradation of portions of the route, most notably as a result of crop and pasture cultivation in flat, lower lying areas, and to some extent from regular burning of grazing areas on mountain and hill slopes. The easternmost section of the proposed route has severe alien vegetation invasions, including impenetrable wattle thickets.

ARCHAEOLOGICAL HERITAGE

The general area has low scientific archaeological significance, with known sites limited to Early and Middle Stone Age stone artefacts located in secondary context.

ARCHAEOLOGICAL SURVEY RESULTS

We assessed the proposed tower positions and new/upgraded access roads at numerous points along the proposed power line route, but identified no archaeological remains whatsoever. This observation is congruent with the findings of other impact assessments in the area and reflects the transformed vegetation and land uses.

ASSESSMENT OF DEVELOPMENT IMPACTS

The definitions of archaeological sites and remains and many archaeological terms imply an emphasis on their technological, scientific and historical values. However, credible heritage practitioners globally recognise the value and importance of this heritage to extant communities. In this context archaeological sites and remains with low significance for their scientific value might be imbued with high significance for specific communities or interest groups for their spiritual, social and cultural values.

However, since we observed no archaeological remains of any nature, and the archaeological sensitivity of the study area is relatively low, the potential overall impact of the proposed project on archaeological sites is low.

PUBLIC PARTICIPATION

The Gamtkwa KhoiSan Council reviewed the Phase 1 Heritage Impact Assessment report for this project and supported the recommendation that a heritage practitioner inspect areas of construction for the presence of archaeological and palaeontological sites. GIBB Engineering & Science will submit this report to the Council who will submit their written comments directly to GIBB.

CONCLUSION

We recommend that the development proceed with no further archaeological mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the NHRA.

If permission is granted for development to proceed, the client is reminded that the NHRA requires that a developer cease all work immediately and follow the protocol contained in Section 8 of this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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1 INTRODUCTION

eThembeni Cultural Heritage was appointed by GIBB Engineering & Science to undertake a Phase 1 Archaeological Impact Assessment (AIA) of a proposed transmission power line and substation site in the Eastern Cape Province, in terms of the National Environmental Management Act 107 of 1998 as amended (NEMA), in compliance with Section 38 of the National Heritage Resources Act 25 of 1999, as amended (NHRA; refer to Appendix A).

South Africa's heritage resources are both rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representivity of a particular time period; their rarity; and their sphere of influence.

The integrity and significance of heritage resources can be jeopardized by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of legislation exists to ensure the timeous identification and effective management of heritage resources for present and future generations.

This report represents compliance with a full Phase 1 AIA for the proposed development, for submission to the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) for review.

2 TERMS OF REFERENCE

An AIA must address the following key aspects:

- the identification and mapping of all archaeological sites in the area affected;
- an assessment of the significance of such sites in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on archaeological sites;
- an evaluation of the impact of the development on archaeological sites relative to the sustainable social and economic benefits to be derived from the development;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on archaeological sites;
- if archaeological sites will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

In addition, the AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of independence.

3 PROJECT DESCRIPTION¹

New 132 kV overhead transmission power lines are proposed to strengthen and upgrade the grid supply in the Patensie, Humansdorp and Kareedouw area of the Eastern Cape in order to support the recent and planned growth and development in the area. An upgrade of the existing electrical distribution network is therefore required to accommodate the new supply. This involves the construction of new 132 kV infrastructure, new substations and the decommissioning of certain facilities. The construction of new and upgrading of existing substations will further aid in strengthening of the local network. The total length of the proposed power lines amounts to approximately 90km. This project entails the following:

- Construction of approximately 26km of overhead 132kV power line from Melkhout to Dieprivier Substations.
- Decommissioning of redundant infrastructure once new infrastructure has been commissioned.
- Construction of new or maintenance of existing minor roads.

¹ Information obtained from Background Information Document prepared by the client.

4 PROJECT LOCATION AND ENVIRONMENTAL DESCRIPTION

The proposed power line extends from the Melkhout Substation north of the town of Humansdorp westwards to the Dieprivier Substation in the Kouga Local Municipality (EC108), Cacadu District (DC10) in the Eastern Cape Province (Figure 1). The relevant Surveyor-General 1:50 000 maps are 3324DC Andrieskraal, 3424BA Kruisfontein and 3424BB Humansdorp (Figures 2-4; [melkhout-patensie 132kv final design.kmz](#)).

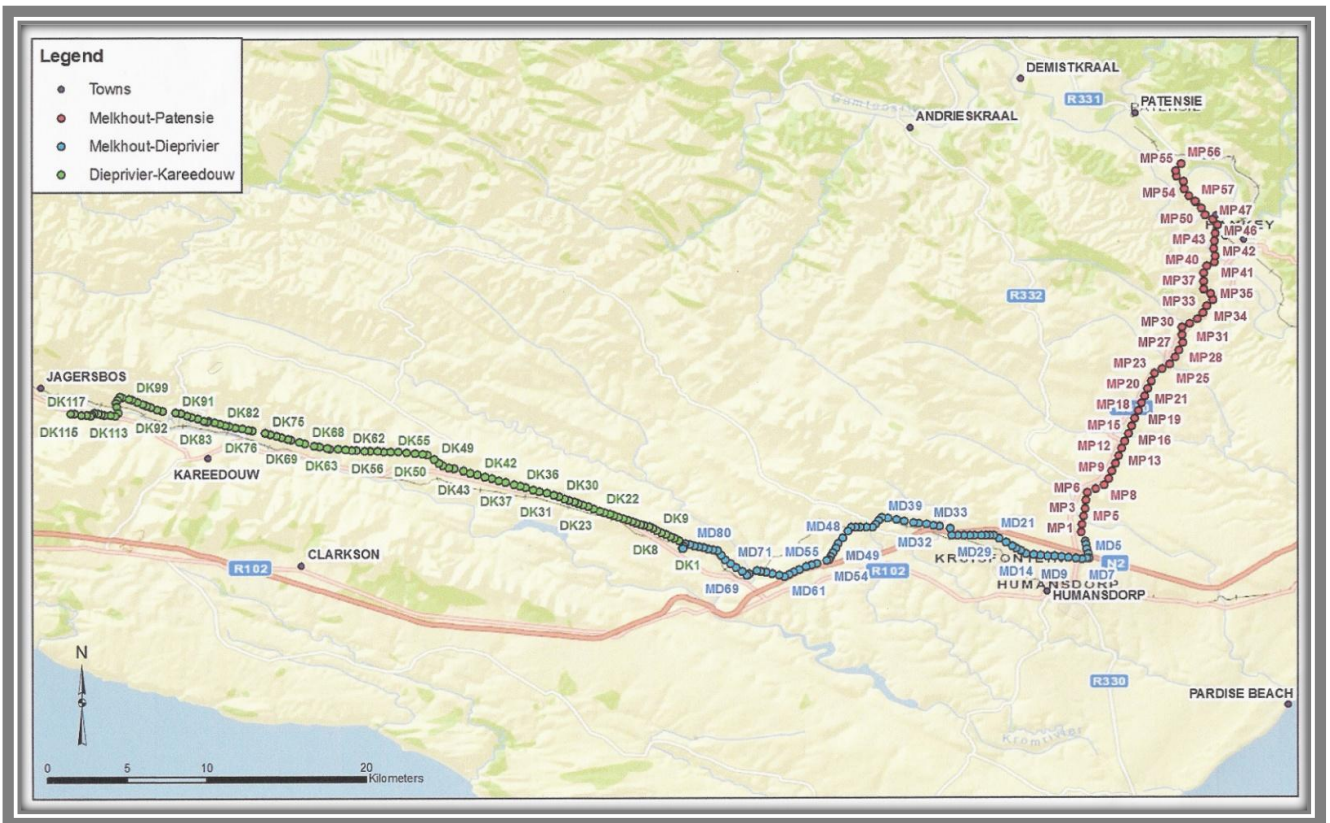


FIGURE 1 LOCATION OF THE PROPOSED PROJECT IN REGIONAL CONTEXT, WITH THE MELKHOUT-DIEPRIVIER SECTION INDICATED IN BLUE (SOURCE: GIBB).

Vegetation²

The perceived reference state of the vegetation is intact natural vegetation, with the dominant vegetation types present along the majority of the route being *Kouga Grassy Sandstone Fynbos (Least Threatened)*, and a central band of *Humansdorp Shale Renosterveld*. The line traverses a narrow band of *Langkloof Shale Renosterveld (Critically Endangered)* on the western side near the Dieprivier substation.

However, an assessment of the present ecological state indicates that historical agriculture related land-uses have resulted in degradation of portions of the route, most notably as a result of crop and pasture cultivation in flat, lower lying areas, and to some extent from regular burning of grazing areas on mountain and hill slopes. The easternmost section of the proposed route has severe alien vegetation invasions, including impenetrable wattle thickets (pers. obs.).

² Source: Pote (2012).

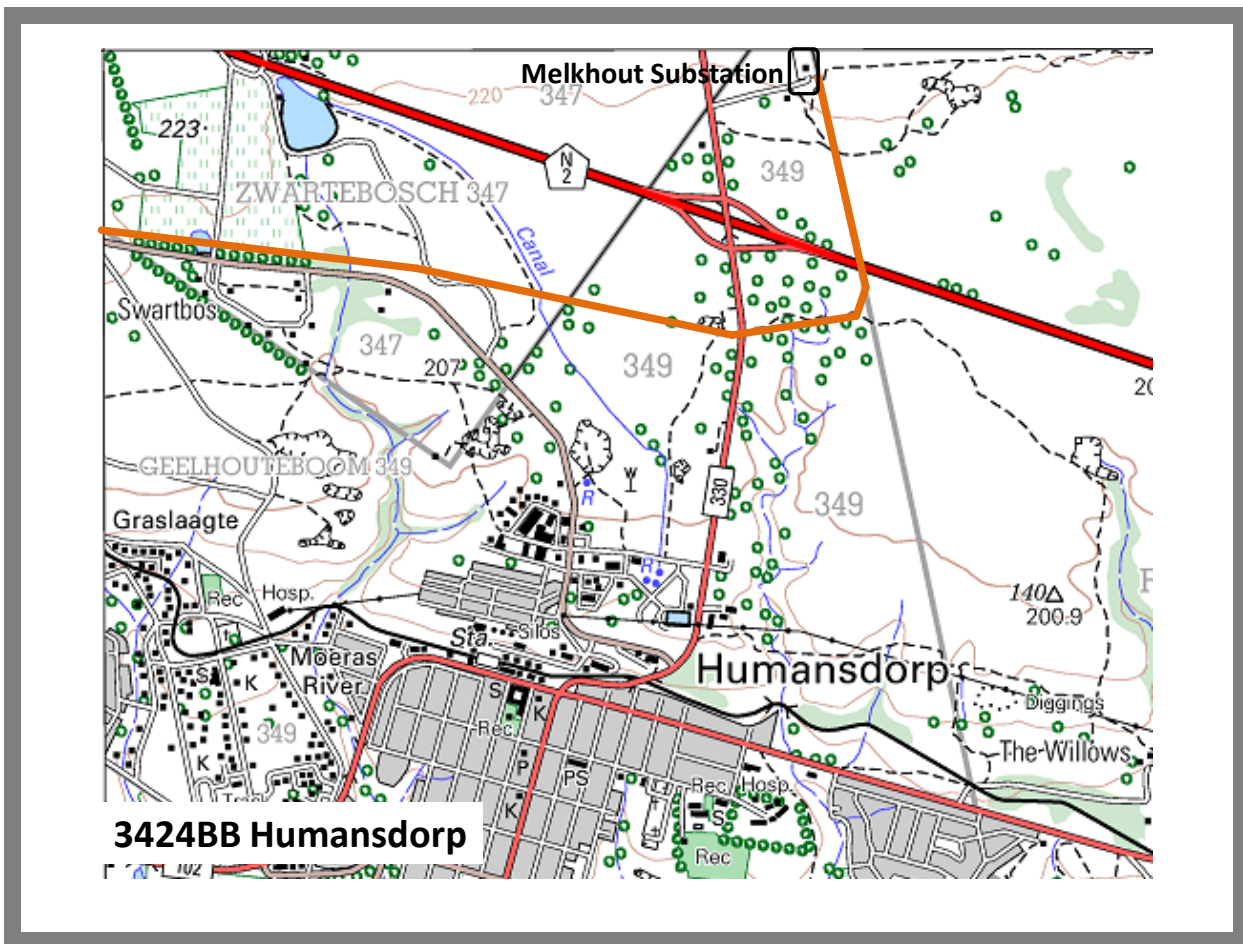


FIGURE 2 START OF THE PROPOSED POWER LINE AT MELKHOUT SUBSTATION, HUMANSDORP.

Kouga Grassy Sandstone Fynbos

- This is the predominant vegetation unit along the eastern portion of the servitude, with large areas transformed as a result of intensive cultivation, where intensive agricultural disturbances have not been excluded due to shallower soils and steep slopes.
- Incised drainage lines fragment the hilly terrain periodically bisect the area and these tend to be vegetated with either a taller Fynbos or where protected from fire or a thicket/forest community often becomes established.
- Regular burning has the altered composition in some areas which could be described as near-natural, but large parts still relatively natural and intact.
- Working for water has been very active in recent years in the Kromme River catchment area, and large areas have been successfully cleared of dense alien infestations.
- Remnant invasion tends to be scattered and at low densities. Some isolated dense clumps of exotic trees (such as Bluegums and Wattle) are present along the proposed route and will require removal before the power line can be installed.
- Conservation Status: *Least Threatened*
- Implications: Due to the low conservation status of the unit and the presence of the existing power line servitude directly adjacent to the proposed route, the impact to the vegetation unit, which encompass the majority of the proposed power line route, will be negligible. In drainage lines, where forest and thicket has developed, the lines must be strung over without clearing of vegetation, especially trees and riparian vegetation. No new access roads should be permitted unless no alternative options are possible.

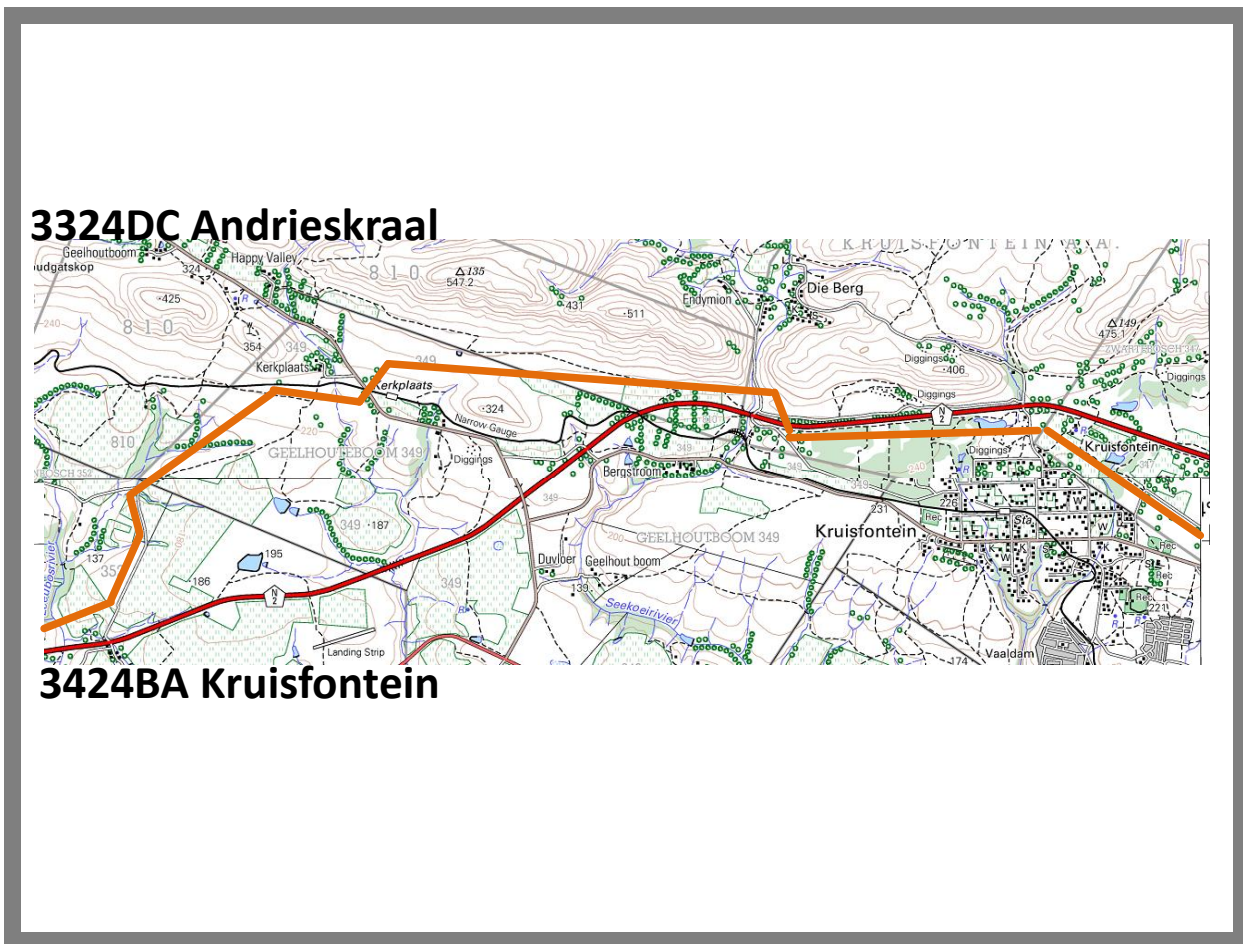


FIGURE 3 CENTRAL PORTION OF THE PROPOSED POWER LINE.

Humansdorp Shale Renosterveld

- This is the predominant vegetation unit along the central portion of the servitude, with large areas transformed as a result of intensive cultivation, where intense agricultural disturbances have not been excluded due to shallower soils and steep slopes.
- Incised drainage lines fragment the hilly terrain periodically and these tend to be vegetated with either a taller Fynbos or where protected from fire a thicket/forest community often becomes established.
- Regular burning has altered species composition in some areas which could be described as near-natural, but large parts still relatively natural and intact.
- Some alien invasion present at scattered and low densities. Some isolated dense clumps of exotic trees (such as Bluegums and Wattle) are present along the proposed route, including drainage lines and will require removal before the power line can be installed.
- Conservation Status: *Endangered*
- Implications: Due to the elevated conservation status of the unit the route could potentially result in a significant loss of habitat within this unit. However, the presence of the existing power line servitude directly adjacent to the proposed route, the impact to the vegetation unit, will be negligible. In drainage lines, where forest and thicket has developed, the lines must be strung over without clearing of vegetation, especially trees and riparian vegetation. Unless existing roads already cross these areas, they should not be traversed by vehicles during construction or operational maintenance. No new access roads should be permitted unless no alternative options are possible.

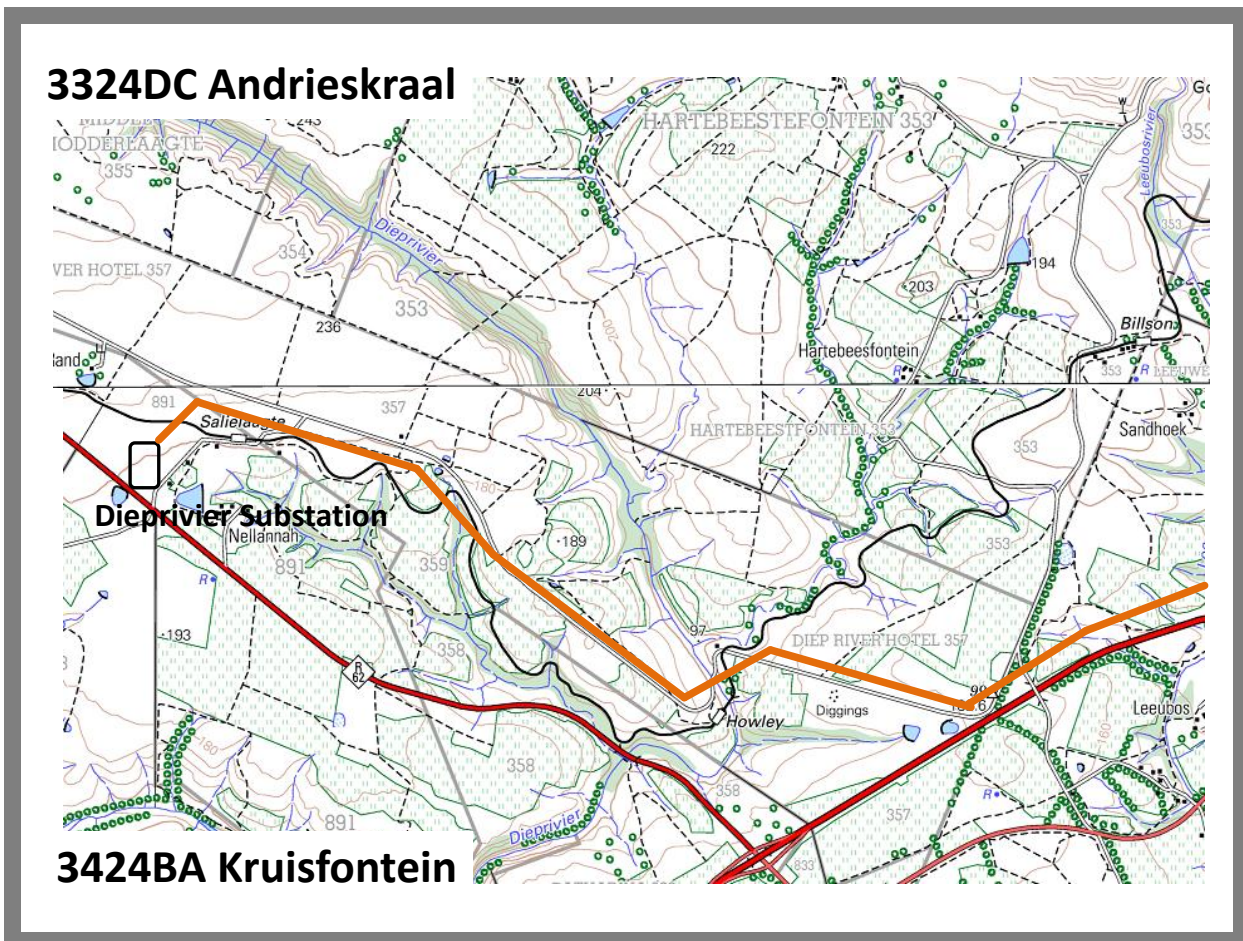


FIGURE 4 END OF THE PROPOSED POWER LINE AT DIEPRIVER SUBSTATION.

Langkloof Shale Renosterveld

Distribution in the study area: In the Langkloof Valley from Harmonie via Avontuur to Haarlem and further from Krakeelrivier via Joubertina and Kareedouw to Salielaagte.

Altitude: 22 - 950 m.

Geology and soils: A very narrow east-west distribution of clays and loams derived from shales of the Nardouw Subgroup of the Table Mountain Group as well as the Ceres Subgroup of the Bokkeveld Group. Prismacutanic and pedocutanic and Glenrosa and Mispah forms are prominent.

Vegetation and landscape features: Intermontane valleys and lower slopes with low, medium and dense graminoid, dense cupressoid-leaved shrubland, dominated by renosterbos and surrounded by fynbos.

Conservation: Endangered.

Suitability for power line

- Vegetation of this type is categorized as Endangered (NBA: Critically Endangered), and any disturbance relating to power line construction must be limited to unavoidable requirements.
- Proposed disturbance must occur on sites which have already undergone disturbance or impacts rather than on sites that are undisturbed.
- Where possible, existing roads servicing the current servitude must be used and pylon footprints must be kept to a minimum and preferably target transformed or disturbed areas.
- Where unavoidable, extreme care must be taken and any disturbance kept to an absolute minimum and post construction measures must be implemented ensure rapid and successful rehabilitation.

5 ARCHAEOLOGICAL BACKGROUND

The NHRA defines the term 'archaeological' as follows:

- material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act 15 of 1994, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

In archaeological terms South Africa's prehistory has been divided into a series of phases based on broad patterns of technology. The primary distinction is between a reliance on chipped and flaked stone implements (the Stone Age), the ability to work iron (the Iron Age) and the Colonial Period, characterised by the advent of writing and in southern Africa primarily associated with the first European travellers (Mitchell 2002). Spanning a large proportion of human history, the Stone Age in Southern Africa is further divided into the Early Stone Age, or Paleolithic Period (about 2 500 000–150 000 years ago), the Middle Stone Age, or Mesolithic Period (about 500 000–30 000 years ago), and the Late Stone Age, or Neolithic Period (about 30 000–2 000 years ago). The simple stone tools found with australopithecine fossil bones fall into the earliest part of the Early Stone Age.

To understand the archaeological context of the study area it is important to recognise the geographical division between the drier western third of southernmost Africa and the more humid, entirely summer rainfall region to its east (Mitchell & Whitelaw 2005). Because they farmed with summer rainfall crops such as sorghum and millet, Iron Age people were limited to the Miombo and Savannah biomes east of the 500mm isohyet; therefore excluded from much of the continent's western third by aridity (Maggs 1994). Accordingly a description of the Iron Age is omitted from this report.

The Stone Age

— Early Stone Age

Most Early Stone Age sites in South Africa can probably be connected with the hominin species known as *Homo erectus*. Simply modified stones, hand axes, scraping tools, and other bifacial artifacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most South African archaeological sites from this period are the remains of open camps, often by the sides of rivers and lakes, although some are rock shelters, such as Montagu Cave in the Cape region.

Early Stone Age archaeological sites in the general study area are found in the river gravels that cap hill slopes in the Humansdorp and Kareedouw regions and on the calcrete floors exposed in the dune systems along the coast towards Cape St Francis (Binneman 2004/5 & 2006/7). The large stone artefacts are classified by archaeologists as belonging to the Acheulean Industry dating to between 1.5 million and 250 000 years ago.

ESA stone artefacts are common throughout the region and a large site is present on the hill slopes close to the confluence of the Krom and Diep Rivers, about 3.5 km south-east of Dieprivier Substation (Figure 5; Binneman 2010; 2012). Binneman also identified MSA /ESA artefacts about 2.3 km south-east of Dieprivier Substation (Binneman 2010), a single ESA handaxe 2.7 km north-west of proposed Tower 46 (Binneman 2011) and a scatter of ESA artefacts about 8 km south-west of Dieprivier Substation (Binneman 2012; Figure 5).

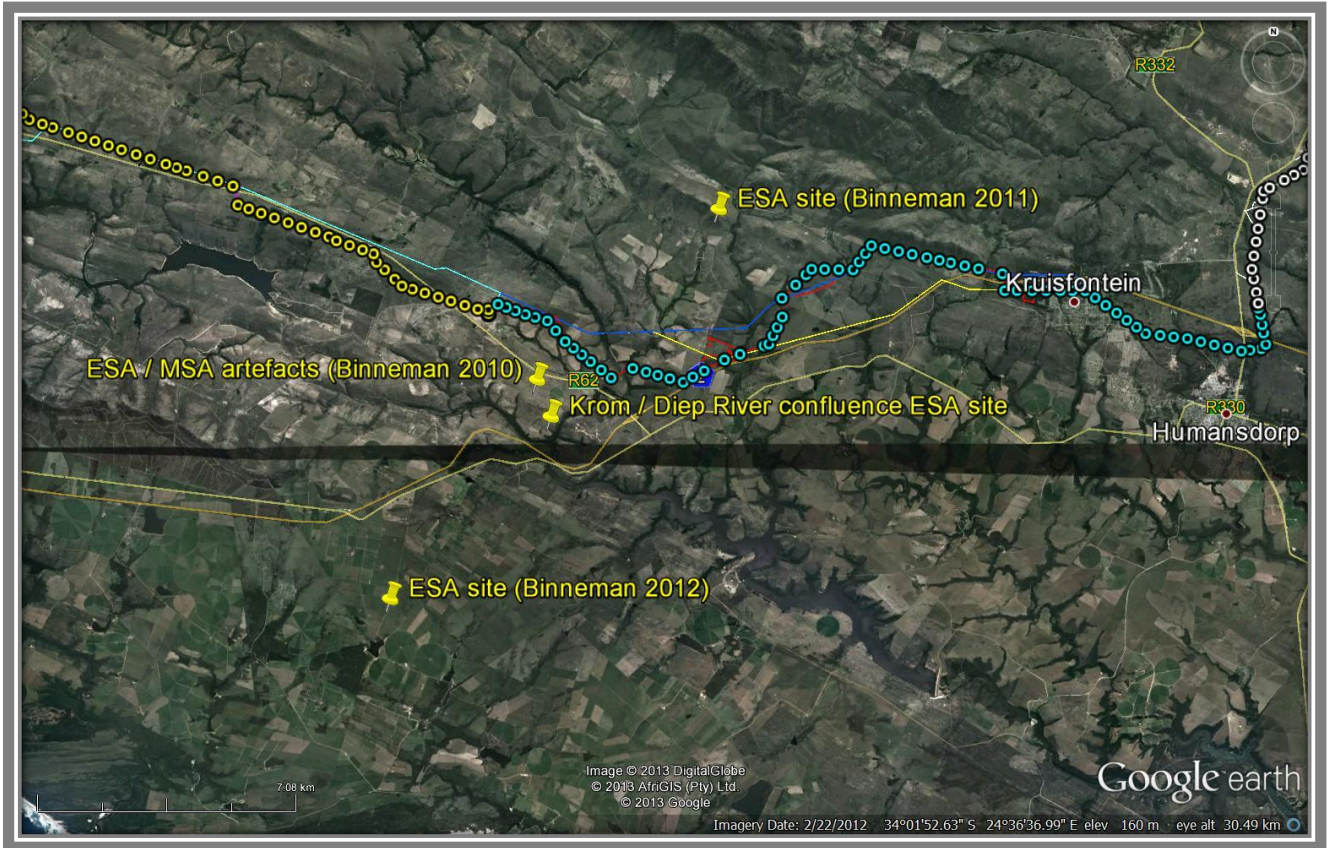


FIGURE 5 ESA/MSA ARCHAEOLOGICAL SITES KNOWN FROM THE STUDY AREA.

— Middle Stone Age

A long period of cultural and physical evolution gave way to an era of more rapid change about 120 000 years ago. Hand axes and large bifacial stone tools were replaced by stone flakes and blades that were fashioned into scrapers, spear points, and parts for hafted, composite implements. This technological stage, now known as the Middle Stone Age, is represented by numerous sites in South Africa.

Open camps and rock overhangs were used for shelter. Day-to-day debris has survived to provide some evidence of early ways of life, although plant foods have rarely been preserved. Middle Stone Age bands hunted medium-sized and large prey, including antelope and zebra, although they tended to avoid the largest and most dangerous animals, such as the elephant and the rhinoceros. They also ate seabirds and marine mammals that could be found along the shore and sometimes collected tortoises and ostrich eggs in large quantities.

The Middle Stone Age is perhaps most significant as the time period during which the first modern humans, *Homo sapiens sapiens*, emerged between 120 000 and 30 000 years ago. The Klasies River cave complex, located on the coast near Humansdorp, contains the oldest remains of anatomically modern humans in the world, dating to around 110 000 years ago (Singer & Wymer 1982; Rightmire & Deacon

1991). Humans were anatomically modern by 110 000 years ago but only developed into culturally modern behaving humans between 80 000 and 70 000 years ago, during cultural phases known as the Still Bay and Howieson's Poort time periods or stone tool traditions (Binneman 2012).

— Later Stone Age

Basic toolmaking techniques began to undergo additional change about 40 000 years ago. Small finely worked stone implements known as microliths became more common, while the heavier scrapers and points of the Middle Stone Age appeared less frequently. Archaeologists refer to this technological stage as the Later Stone Age or LSA, which can be divided into four broad temporal units directly associated with climatic, technological and subsistence changes (Deacon 1984):

1. Late Pleistocene microlithic assemblages (40-12 000 years ago);
2. Terminal Pleistocene / early Holocene non-microlithic (macrolithic) assemblages (12-8 000 years ago);
3. Holocene microlithic assemblages (8 000 years ago to the Colonial Period); and
4. Holocene assemblages with pottery (2 000 years ago to the Historic Period) closely associated with the arrival of pastoralist communities into South Africa (Mitchell 1997; 2002).

Animals were trapped and hunted with spears and arrows on which were mounted well-crafted stone blades. Bands moved with the seasons as they followed game into higher lands in the spring and early summer months, when plant foods could also be found. When available, rock overhangs became shelters; otherwise, windbreaks were built. Shellfish, crayfish, seals, and seabirds were also important sources of food, as were fish caught on lines, with spears, in traps, and possibly with nets.

Elements of material culture characteristic of the LSA that reflect cultural modernity have been summarised as follows (Deacon 1984):

- Symbolic and representational art (paintings and engravings);
- Items of personal adornment such as decorated ostrich eggshell, decorated bone tools and beads, pendants and amulets of ostrich eggshell, marine and freshwater shells;
- Specialized hunting and fishing equipment in the form of bows and arrows, fish hooks and sinkers;
- A greater variety of specialized tools including bone needles and awls and bone skin-working tools;
- Specialized food gathering tools and containers such as bored stone digging stick weights, carrying bags of leather and netting, ostrich eggshell water containers, tortoiseshell bowls and scoops and later pottery and stone bowls;
- Formal burial of the dead in graves, sometimes covered with painted stones or grindstones and accompanied by grave goods;
- The miniaturization of selected stone tools linked to the practice of hafting for composite tools production; and
- A characteristic range of specialized tools designed for making some of the items listed above.

During the Later Stone Age people were sometimes buried in caves and shelters, and these burials are often associated with grave goods and marked by painted stones. Archaeological deposits in some caves and shelters had remarkable preservation of organic material and yielded artefacts such as 'digging sticks (4 500 years old), fire sticks (5 800), decorated wooden sticks (9 200) and almost complete mummified human remains dating to some 2 000 years ago. Other interesting features are 'storage pits' (hollows lined with plant material) which were used to store seeds for later use, and 'postholes' (often with post still *in situ*)' (Binneman 2010: 3). Sometimes it appeared that shelters were divided into small family living areas (Binneman 1997, 1998, 1999a & b, 2000).

Paintings on the walls of rock shelters in the region are generally 'not well-preserved and appear to be of a similar 'style' throughout the region with the dominant colours being red and maroon, and red with black,

with yellow and white being present to a lesser degree. The paintings do not, for example, represent only a hunting scene or some or other daily activity, but each painting had a particular symbolic meaning for the painters' (Binneman 2010: 3).

A significant change in the Later Stone Age socio-economic landscape came some 2 000 years ago when Khoi pastoralists moved into the region, introducing domesticated animals (sheep, goats and cattle) and ceramic vessels. A few centuries after their arrival the first Europeans rounded the Cape, heralding the fundamental and irreversible alteration of the southern African prehistoric socio-economic landscape.

The first sheep in South Africa, dating to 1190 years ago, was identified in the 1960s from an archaeological Khoi pastoralist site near Patensie (Deacon 1967; Klein & Scott 1974). Plant remains were well-preserved and were the subject of the first archaeobotanical study in South Africa (Wells 1965). Also during the 1960s a large number of archaeological artefacts and human remains were found near Andrieskraal during the construction of irrigation canals in the Gamtoos Valley (Deacon 1965; De Villiers 1965).

Colonial Period³

By the closing decades of the 18th century during the Colonial Period South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers took increasingly more land from the Khoekhoe and from remnant hunter-gatherer communities, who were killed, were forced into marginal areas, or became labourers tied to the farms of their new overlords. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible.

A large group of British settlers arrived in the eastern Cape in 1820; this, together with a high European birth rate and wasteful land usage, produced an acute land shortage, which was alleviated only when the British acquired more land through massive military intervention against Africans on the eastern frontier. Until the 1840s the British vision of the colony did not include African citizens, so, as Africans lost their land, they were expelled across the Great Fish River, the unilaterally proclaimed eastern border of the colony.

Between 1811 and 1858 colonial aggression deprived Africans of most of their land between the Sundays and Great Kei Rivers and produced poverty and despair. From the mid-1850s British magistrates held political power in the region, destroying the power of the Xhosa chiefs. Following a severe lung sickness epidemic among their cattle in 1854–56, the Xhosa killed many of their remaining cattle and in 1857–58 grew few crops in response to a millenarian prophecy that this would cause their ancestors to rise from the dead and destroy the whites. Many thousands of Xhosa starved to death, and large numbers of survivors were driven into the Cape Colony to work. The region fused with the Cape Colony in 1865, and thousands of Africans newly defined as Fingo resettled east of the Great Kei, thereby creating Fingoland. The Transkei, as this region came to be known, consisted of the hilly country between the Cape and Natal. It became a large African reserve and grew in size when those parts that were still independent were annexed in the 1880s and '90s (Pondoland lost its independence in 1894).

³ <http://www.britannica.com>; article authored by Colin J. Bundy, Julian R. D. Cobbing, Martin Hall and Leonard Monteath Thompson. See also Milton (1983).

6 ARCHAEOLOGICAL SURVEY RESULTS

We assessed the proposed tower positions and new/upgraded access roads at numerous points along the proposed power line route, but identified no archaeological remains whatsoever. This observation is congruent with the findings of other impact assessments in the area (refer to Appendix B for a list of the relevant reports) and reflects the land uses described in the vegetation summary in Section 4.

In short, historical agriculture related land-uses have resulted in degradation of portions of the route, most notably as a result of crop and pasture cultivation in flat, lower lying areas, and to some extent from regular burning of grazing areas on mountain and hill slopes. The easternmost section of the proposed route has severe alien vegetation invasions, including impenetrable wattle thickets. The following figures illustrate the study environment.



FIGURE 6 MELKHOUT SUBSTATION.



FIGURE 7 DENSE WATTLE AROUND TOWERS 5-10.



FIGURE 8 LOCATION OF TOWER 20.



FIGURE 9 KRUISFONTEIN HOMES NEXT TO TOWER 20.



FIGURE 10 VIEW EASTWARDS OF TOWERS 32-35.



FIGURE 11 VIEW EASTWARDS OF TOWERS 29-32.



FIGURE 12 LOCATION OF TOWER 30.



FIGURE 13 DIEPRIVIER SUBSTATION.

7 ASSESSMENT OF DEVELOPMENT IMPACTS

The definitions of archaeological sites and remains and many archaeological terms imply an emphasis on their technological, scientific and historical values. However, credible heritage practitioners globally recognise the value and importance of this heritage to extant communities. In this context archaeological sites and remains with low significance for their scientific value might be imbued with high significance for specific communities or interest groups for their spiritual, social and cultural values.

However, since we observed no archaeological remains of any nature, and the archaeological sensitivity of the study area is relatively low, the potential overall impact of the proposed project on archaeological sites is low (Table 1).

TABLE 1 POTENTIAL IMPACT ON ARCHAEOLOGICAL SITES.

Nature	Extent	Duration	Intensity	Impact on irreplaceable resources	Consequence	Probability	Significance
Negative	Low	High	Low	Low	Low	Low	Low

8 PROTOCOL FOR THE IDENTIFICATION, PROTECTION AND RECOVERY OF HERITAGE RESOURCES DURING CONSTRUCTION AND OPERATION

It is possible that sub-surface heritage resources will be encountered during the construction phase of this project. The Project Engineer, Environmental Control Officer and all other persons responsible for site management and excavation should be aware that indicators of sub-surface sites could include:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments, including potsherds;
- Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial); and
- Fossilised remains of fauna and flora, including trees.

In the event that such indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- If no heritage practitioner has been appointed to monitor the project, Mr Sello Mokhanya must be contacted at the SAHRA Eastern Cape office; smokhanya@ecphra.org.za.

- The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.

9 CONCLUSION

We recommend that the development proceed with no further archaeological mitigation and have submitted this report to the ECPHRA in fulfilment of the requirements of the NHRA. According to Section 38(4) of the Act the report shall be considered timeously by the ECPHRA which shall, after consultation with the person proposing the development, decide –

- whether or not the development may proceed;
- any limitations or conditions are to be applied to the development;
- what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- whether the appointment of specialists is required as a condition of approval of the proposal.

Mr Sello Mokhanya may be contacted at the ECPHRA (74 Alexander Road, King Williams Town 5600; smokhanya@ecphra.org.za).

If permission is granted for development to proceed, the client is reminded that the NHRA requires that a developer cease all work immediately and follow the protocol contained in Section 8 of this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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Appendix C (Methodology)

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APPENDIX A STATUTORY REQUIREMENTS

General

The Constitution of the Republic of South Africa Act 108 of 1996 is the source of all legislation. Within the Constitution the Bill of Rights is fundamental, with the principle that the environment should be protected for present and future generations by preventing pollution, promoting conservation and practising ecologically sustainable development. With regard to spatial planning and related legislation at national and provincial levels the following legislation may be relevant:

- Physical Planning Act 125 of 1991
- Municipal Structures Act 117 of 1998
- Municipal Systems Act 32 of 2000
- Development Facilitation Act 67 of 1995 (DFA)

The identification, evaluation and management of heritage resources in South Africa is required and governed by the following legislation:

- National Environmental Management Act 107 of 1998 (NEMA)
- KwaZulu-Natal Heritage Act 4 of 2008 (KZNHA)
- National Heritage Resources Act 25 of 1999 (NHRA)
- Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA)

National Heritage Resources Act 25 of 1999

The NHRA established the South African Heritage Resources Agency (SAHRA) together with its Council to fulfil the following functions:

- co-ordinate and promote the management of heritage resources at national level;
- set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance;
- control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries;
- enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; and
- provide for the protection and management of conservation-worthy places and areas by local authorities.

Heritage Impact Assessments

Section 38(1) of the NHRA of 1999 requires the responsible heritage resources authority to notify the person who intends to undertake a development that fulfils the following criteria to submit an impact assessment report if there is reason to believe that heritage resources will be affected by such development:

- 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 a site—
 - (i) exceeding 5 000m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- the re-zoning of a site exceeding 10 000m² in extent; or
- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Reports in fulfilment of Section 38(3) of the Act must include the following information:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on such heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

APPENDIX B METHODOLOGY

Site survey

eThembeni staff members inspected the proposed activity area on 23-26 April 2013 and a controlled-exclusive surface survey, where 'sufficient information exists on an area to make solid and defensible assumptions and judgements about where [heritage resource] sites may and may not be' and 'an inspection of the surface of the ground, wherever this surface is visible, is made, with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident' (King 1978; see bibliography for other references informing methodological approach).

The site survey comprised drives and walks along the proposed servitude to inspect as many tower positions and access roads as possible. Photographs were taken with a Nikon D200 camera and a representative selection is included in this report. Geographic coordinates were obtained using two handheld Garmin global positioning units (WGS 84).

Tower locations accessed

Staff members made every effort to inspect as many proposed tower positions and access roads as possible. Where physical access was not possible due to dense vegetation, or where widespread environmental disturbance clearly indicated that archaeological remains could not be present, we inspected tower locations visually. Table 2 summarises the tower positions inspected, while Figure 18 provides a map of the survey route.

In short, staff members physically inspected tower positions and access roads in both disturbed and undisturbed areas, amounting to 70% of the study area.

TABLE 2 SUMMARY OF INSPECTION OF PROPOSED TOWER LOCATIONS.

	Tower number
Physical inspection	5-28 (highly disturbed wattle infested landscape) 32-42 (grazing and fynbos) 53-58 70-76 (railway and ploughed fields)
Visual inspection	1-4 (highly disturbed grazed and ploughed fields) 29-31 43-52 (landscape disturbed by railway, grazing and ploughing) 59-69 (ploughed fields)



FIGURE 14 SURVEY ROUTE: TOWERS 1-20.

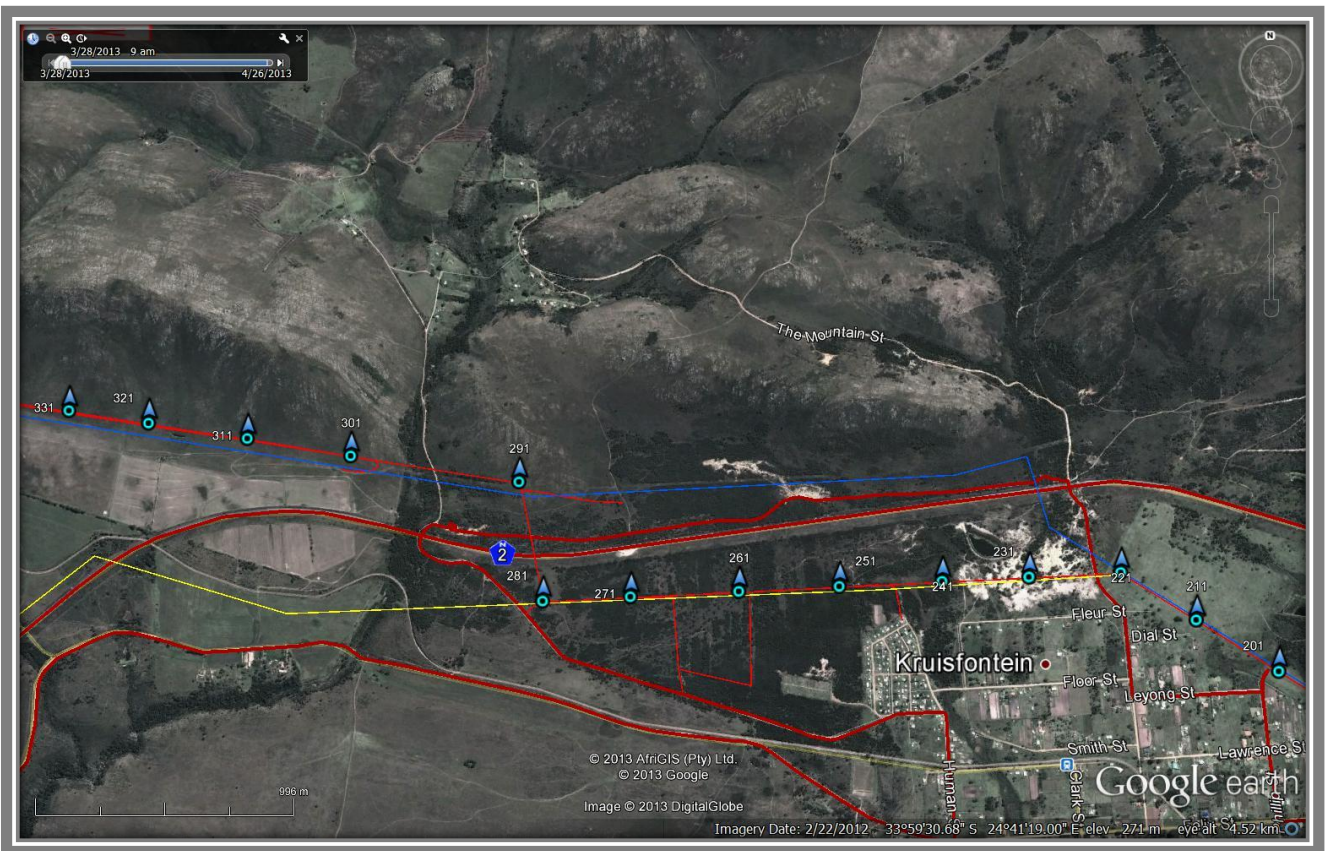


FIGURE 15 SURVEY ROUTE: TOWERS 20-33.

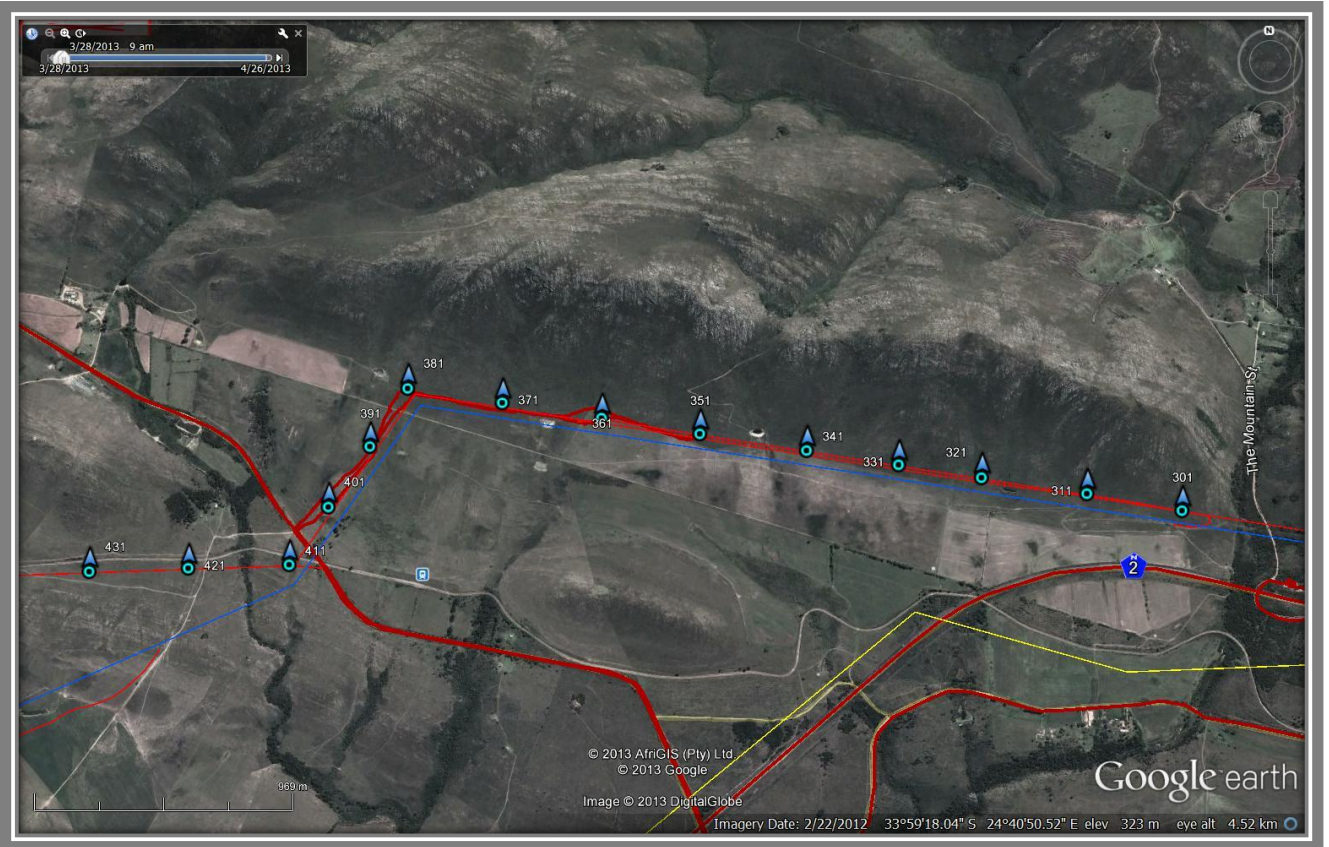


FIGURE 16 SURVEY ROUTE: TOWERS 30-43.

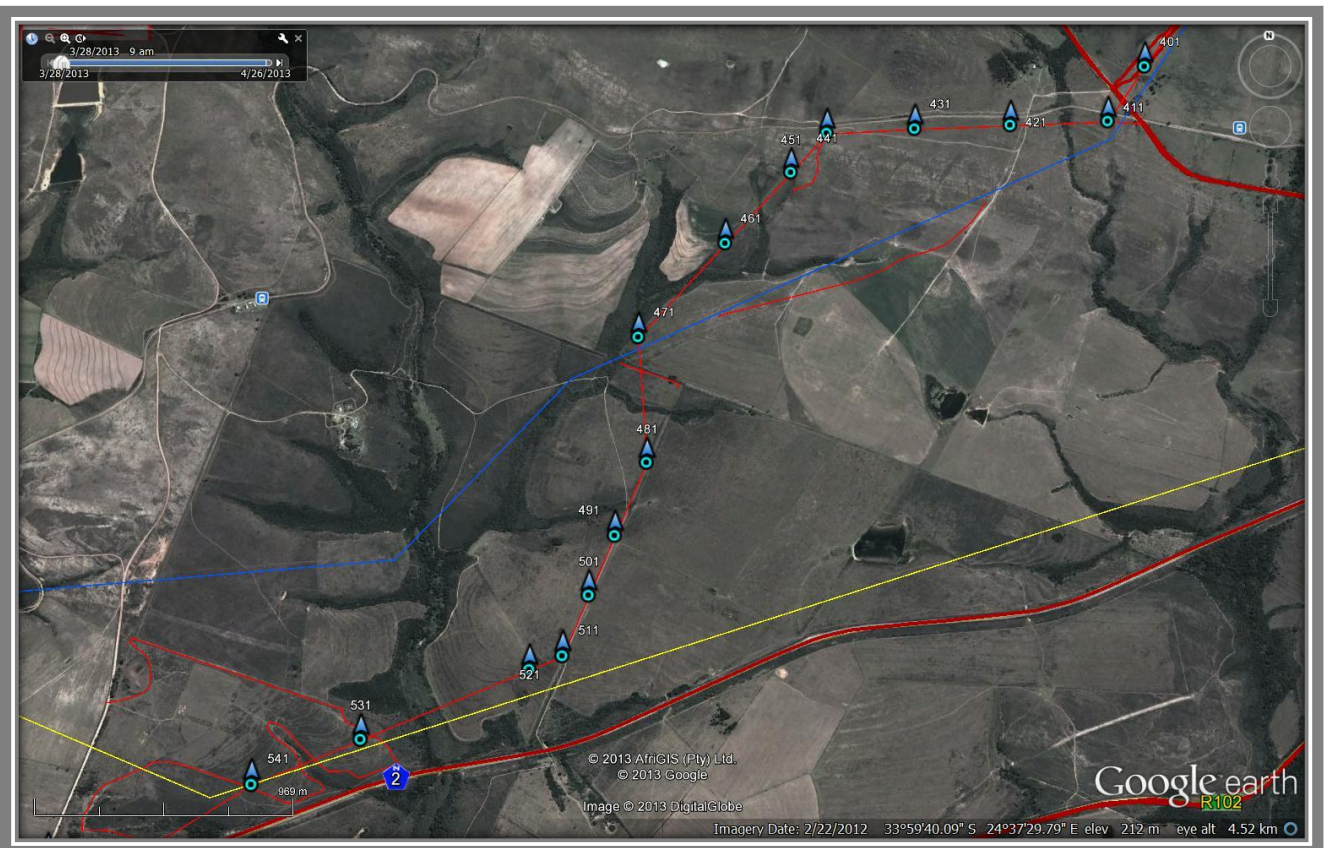


FIGURE 17 SURVEY ROUTE: TOWERS 41-54.

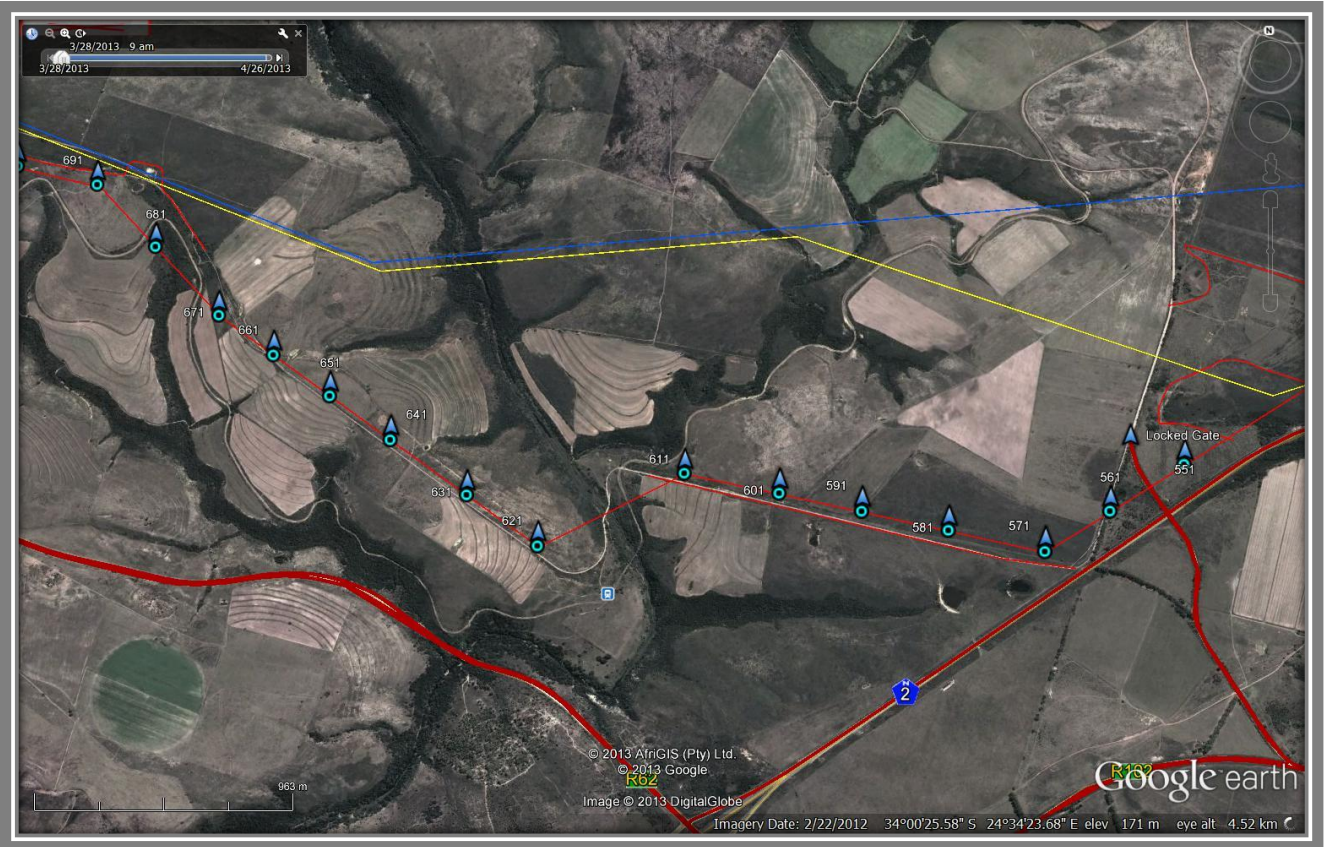


FIGURE 18 SURVEY ROUTE: TOWERS 55-69.

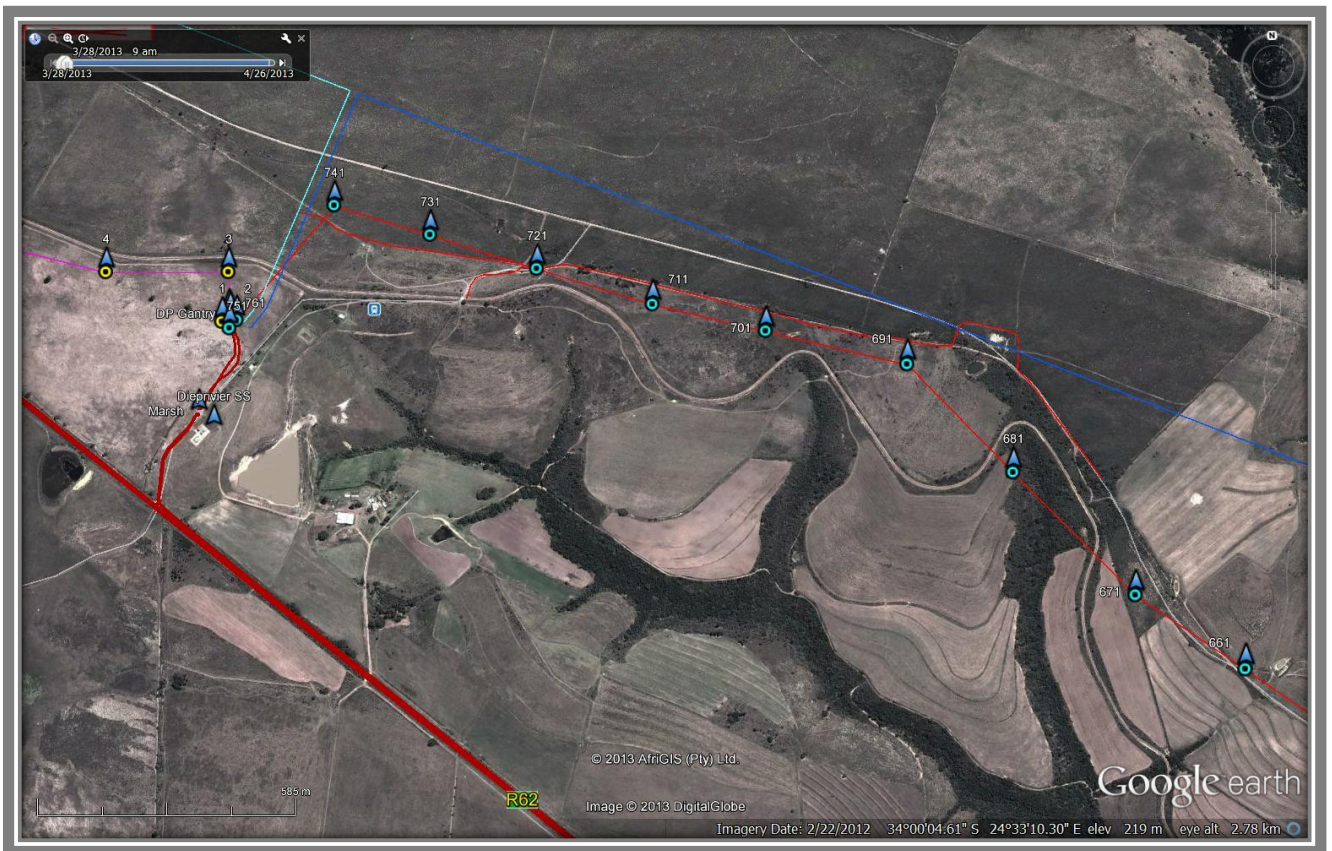


FIGURE 19 SURVEY ROUTE: TOWERS 66-76.

Database and literature review

Archaeological site data for the project area was obtained from HIA reports and is incorporated in Section 5. A concise account of the archaeology and history of the broader study area was compiled from various sources including those listed in the bibliography.

Relevant impact assessment reports

The following reports were identified on the SAHRIS database as relevant to this project due to their proximity (within 5 km) of the study area:

- Binneman, J. 2006. Letter of recommendation (with conditions) for the exemption of a full Phase 1 Archaeological Heritage Impact Assessment for the Rezoning and Subdivision of Portion 32 of the Farm Rheebofsfontein No. 346, Humansdorp District, Kouga Municipality, from Agricultural Use to Special Rural Residential Purposes and to divide it into 21 Units.
- Binneman, J. 2006. Letter of recommendation (with conditions) for the exemption of a full Phase 1 Archaeological Heritage Impact Assessment for the Rezoning of Erven 3279, 3280 and 3281 in Humansdorp (Kouga Municipality) from Agricultural to Residential Zone III and Subdivision of the Erven into eight units, each of ± 1 ha, where group housing will be developed.
- Binneman, J. 2006. Letter of recommendation (with conditions) for the exemption of a full Phase 1 Archaeological Heritage Impact Assessment on Portion 60 (part of Portion 57) of the Farm Klein Zeekoe Rivier No. 335, Humansdorp District (Kouga Municipality), concerning the Application and Approval of Mining Rights.
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- Binneman, J. 2012. A Phase 1 Archaeological Impact Assessment for the proposed 132kV Power Line linking the Tsitsikamma Community Wind Energy Facility to the proposed Extension of the Dieprivier Substation, Kouga Local Municipality, Humansdorp District, Eastern Cape Province.

Public participation

Consultation was undertaken with the Gamtkwa KhoiSan Council regarding the historical, social, cultural and spiritual values of their cultural heritage. The Council reviewed the Phase 1 HIA report for this project and supported the recommendation that a heritage practitioner inspect areas of construction for the presence of archaeological and palaeontological sites. GIBB Engineering & Science will submit this report to the Council who will submit their written comments directly to GIBB.

Assessment of heritage resource value and significance

Heritage resources are significant only to the extent that they have public value, as demonstrated by the following guidelines for determining site significance developed by Heritage Western Cape in 2007 and utilised during this assessment.

Grade I Sites (National Heritage Sites)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that: Grade I heritage resources are heritage resources with qualities so exceptional that they are of special national significance should be applied to any heritage resource which is

- a) Of outstanding significance in terms of one or more of the criteria set out in section 3(3) of the NHRA;
- b) Authentic in terms of design, materials, workmanship or setting; and is of such universal value and symbolic importance that it can promote human understanding and contribute to nation building, and its loss would significantly diminish the national heritage.

1. Is the site of outstanding national significance?
2. Is the site the best possible representative of a national issue, event or group or person of national historical importance?
3. Does it fall within the proposed themes that are to be represented by National Heritage Sites?
4. Does the site contribute to nation building and reconciliation?
5. Does the site illustrate an issue or theme, or the side of an issue already represented by an existing National Heritage Site – or would the issue be better represented by another site?
6. Is the site authentic and intact?
7. Should the declaration be part of a serial declaration?
8. Is it appropriate that this site be managed at a national level?
9. What are the implications of not managing the site at national level?

Grade II Sites (Provincial Heritage Sites)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that: Grade II heritage resources are those with special qualities which make them significant in the context of a province or region and should be applied to any heritage resource which -

- a) is of great significance in terms of one or more of the criteria set out in section 3(3) of the NHRA; and
- (b) enriches the understanding of cultural, historical, social and scientific development in the province or region in which it is situated, but that does not fulfil the criteria for Grade 1 status.

Grade II sites may include, but are not limited to –

- (a) places, buildings, structures and immovable equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites; and
- (g) graves and burial grounds.

The cultural significance or other special value that Grade II sites may have, could include, but are not limited to –

- (a) its importance in the community or pattern of the history of the province;
- (b) the uncommon, rare or endangered aspects that it possess reflecting the province's natural or cultural heritage
- (c) the potential that the site may yield information that will contribute to an understanding of the province's natural or cultural heritage;
- (d) its importance in demonstrating the principal characteristics of a particular class of the province's natural or cultural places or objects;
- (e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group in the province;
- (f) its importance in demonstrating a high degree of creative or technical achievement at a particular period in the development or history of the province;
- (g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- (h) its strong or special association with the life or work of a person, group or organization of importance in the history of the province.

Grade III (Local Heritage Resources)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that: Grade III heritage status should be applied to any heritage resource which

- (a) fulfils one or more of the criteria set out in section 3(3) of the NHRA; or

- (b) in the case of a site contributes to the environmental quality or cultural significance of a larger area which fulfils one of the above criteria, but that does not fulfill the criteria for Grade 2 status.

Grade IIIA

This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant *any* alteration being regulated. The significances of these buildings and/or sites should include at least some of the following characteristics:

- Highly significant association with a
 - historic person
 - social grouping
 - historic events
 - historical activities or roles
 - public memory
- Historical and/or visual-spatial landmark within a place
- High architectural quality, well-constructed and of fine materials
- Historical fabric is mostly intact (this fabric may be layered historically and/or past damage should be easily reversible)
- Fabric dates to the early origins of a place
- Fabric clearly illustrates an historical period in the evolution of a place
- Fabric clearly illustrates the key uses and roles of a place over time
- Contributes significantly to the environmental quality of a Grade I or Grade II heritage resource or a conservation/heritage area

Such buildings and sites may be representative, being excellent examples of their kind, or may be rare: as such they should receive maximum protection at local level.

Grade IIIB

This grading is applied to buildings and/or sites of a marginally lesser significance than grade IIIA; and such marginally lesser significance argues against the regulation of internal alterations. Such buildings and sites may have similar significances to those of a grade IIIA building or site, but to a lesser degree. Like grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than grade IIIA examples: as such they should receive less stringent protection than grade IIIA buildings and sites at local level and internal alterations should not be regulated (in this context).

Grade IIIC

This grading is applied to buildings and/or sites whose significance is, in large part, a significance that contributes to the character or significance of the environs. These buildings and sites should, as a consequence, only be protected and regulated *if the significance of the environs is sufficient to warrant protective measures*. In other words, these buildings and/or sites will only be protected if they are within declared conservation or heritage areas.

Assessment of development impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the aforementioned examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. The following assessment criteria have been used to assess the impacts of the proposed development on identified heritage resources:

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	Negative	
	Neutral	
Extent	Low	Site-specific, affects only the development footprint.
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national.
Duration	Low	0-4 years (i.e. duration of construction phase).
	Medium	5-10 years.
	High	More than 10 years to permanent.
Intensity	Low	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	Medium	Where the heritage resource is altered and its significance and value are measurably reduced.
	High	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	Low	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.
	High	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence a combination of extent, duration, intensity and the potential for impact on irreplaceable resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium and all three other criteria are rated low.
	Medium	Intensity is medium and at least two of the other criteria are rated medium.
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all of the other criteria being rated medium or higher.
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or less than 50 % likely that an impact will occur.
	Medium	It is between 50 and 70 % certain that the impact will occur.
	High	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.
	Medium	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	High	High consequence and medium probability. High consequence and high probability.

Assumptions and limitations of this HIA

- The description of the proposed project, provided by the client, is assumed to be accurate.
- Soil surface visibility was moderate to non-existent. Heritage resources might be present below the surface and we remind the client that the NHRA requires that a developer cease all work immediately and observe the protocol in Section 8 should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource.
- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- Human sciences are necessarily both subjective and objective in nature. eThembeni staff members strive to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that their opinions might differ from those of other heritage practitioners.
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the terms of reference (refer to Appendix C); and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists.
- eThembeni staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they will take all reasonable precautions against such misuse.

APPENDIX C SPECIALIST COMPETENCY AND DECLARATION OF INDEPENDENCE

Specialist competency

Len van Schalkwyk is accredited by the Cultural Resources Management section of the Association of Southern African Professional Archaeologists (ASAPA) to undertake HIAs in South Africa. He is also a member of the ASAPA Cultural Resources Management Committee for 2011 and 2012. Mr van Schalkwyk has a master's degree in archaeology (specialising in the history of early farmers in southern Africa) from the University of Cape Town and 25 years' experience in heritage management. He has worked on projects as diverse as the establishment of the Ondini Cultural Museum in Ulundi, the cultural management of Chobe National Park in Botswana and various archaeological excavations and oral history recording projects. He was part of the writing team that produced the KwaZulu-Natal Heritage Act 1997. He has worked with many rural communities to establish integrated heritage and land use plans and speaks good Zulu.

Mr van Schalkwyk left his position as assistant director of Amafa aKwaZulu-Natali, the provincial heritage management authority, to start eThembeni in partnership with Elizabeth Wahl, who was head of archaeology at Amafa at the time. Over the past decade they have undertaken almost 1000 heritage impact assessments throughout South Africa, as well as in Mozambique.

Elizabeth Wahl has a BA Honours in African Studies from the University of Cape Town and has completed various Masters courses in Heritage and Tourism at the University of KwaZulu-Natal. She is currently studying for an MPhil in the Conservation of the Built Environment at UCT. She is also a member of ASAPA.

Ms Wahl was an excavator and logistical coordinator for Glasgow University Archaeological Research Division's heritage programme at Isandlwana Battlefield; has undertaken numerous rock painting surveys in the uKhahlamba/Drakensberg Mountains, northern KwaZulu-Natal, the Cederberg and the Koue Bokkeveld in the Cape Province; and was the principal excavator of Scorpion Shelter in the Cape Province, and Lenjane and Crystal Shelters in KwaZulu-Natal. Ms Wahl compiled the first cultural landscape management plan for the Mnweni Valley, northern uKhahlamba/Drakensberg, and undertook an assessment of and made recommendations for cultural heritage databases and organisational capacity in parts of Lesotho and South Africa for the Global Environment Facility of the World Bank for the Maloti Drakensberg Transfrontier Conservation and Development Area. She developed the first cultural heritage management plan for the uKhahlamba Drakensberg Park World Heritage Site, following UNESCO recommendations for rock art management in southern Africa.

Declaration of independence

We declare that Len van Schalkwyk, Elizabeth Wahl and eThembeni Cultural Heritage have no financial or personal interest in the proposed development, nor its developers or any of its subsidiaries, apart from in the provision of heritage impact assessment and management consulting services.

