

Phase 1 Heritage Impact Assessment Report

NDANYANA ROAD UPGRADE PROJECT, NEAR
POMEROY, KWA ZULU NATAL PROVINCE

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Disclaimer; Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.

SIGNED OFF BY: STEPHAN GAIGHER



MANAGEMENT SUMMARY

Site name and location: Ndanyana Road Upgrade Project, Kwa Zulu Natal.

Municipal Area: Msinga Local Municipality, Umzinyathi District Municipality.

Developer: South African National Roads Agency.

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa.
38A Vorster St, Louis Trichardt, 0920

Date of Report: 21 September 2015

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the upgrade of two existing, un-surfaced roads near Pomeroy in the Umzinyathi District of Kwa Zulu Natal. The total length of the upgrades will be approximately 7 km combined.

A preliminary alignment following the existing road has been drawn to lead the study; however this could be altered to some extent to avoid any identified heritage sites.

The purpose of this heritage impact assessment is to outline the cultural heritage sensitivity of the proposed development area and to advise on mitigation should any heritage sites or landscapes be affected.

Findings

A site with burials was identified along the side of the proposed road upgrade, as well as 4 stone wall sites, one of which with terraces and 2 kraal sites.

Recommendations

The construction of the existing road has resulted in damage to any possible previous sites of heritage significance. It is not anticipated that any further sites will be affected. The gravesites and other sites located near to the road should be monitored and preserved during the process of upgrading the road.

Fatal Flaws

No fatal flaws were identified.

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LIST OF ABBREVIATIONS

Bp.....	Before Present
EIA.....	Early Iron Age
ESA.....	Early Stone Age
Fm.....	Femtometre (10^{-15} m)
GPS.....	Geographic Positioning System
HIA.....	Heritage Impact Assessment
LIA.....	Late Iron Age
LSA.....	Late Stone Age
MYA.....	Million Years Ago
MSA.....	Middle Stone Age
NHRA.....	National Heritage Resources Act no 22 of 1999
SAHRA.....	South African Heritage Resource Agency
S&EIR.....	Scoping & Environmental Impact Reporting
Um.....	Micrometre (10^{-6} m)
WGS 84.....	World Geodetic System for 1984

HERITAGE IMPACT REPORT

HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED NDANYANA ROAD UPGRADE, KWA ZULU NATAL.

INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by GBS Environmental Consultants to undertake a heritage impact assessment for the proposed upgrade of two sections of un-surfaced roads near Pomeroy, in Kwa Zulu Natal with a total length of approximately 7 km combined. Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken for:

- (a) Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) Construction of a bridge or similar structure exceeding 50 m in length; and
- (c) Any development, or other activity which will change the character of an area of land, or water –
 - (1) Exceeding 10 000 m² in extent;
 - (2) Involving three or more existing erven or subdivisions thereof; or
 - (3) Involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
 - (d) The costs of which will exceed a sum set in terms of regulations; or
 - (e) Any other category of development provided for in regulations.

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

- (8) *The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

In regards to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

- (3) *The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:*
 - (a) *The identification and mapping of all heritage resources in the area affected;*
 - (b) *An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;*
 - (c) *An assessment of the impact of the development on such heritage resources;*
 - (d) *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;*
 - (e) *The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
 - (f) *If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*

(g) *Plans for mitigation of any adverse effects during and after the completion of the proposed development.*

- (1) Ancestral graves,
 - (2) Royal graves and graves of traditional leaders,
 - (3) Graves of victims of conflict (iv) graves of important individuals,
 - (4) Historical graves and cemeteries older than 60 years, and
 - (5) Other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) Movable objects, including ;
- (1) Objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (2) Ethnographic art and objects;
 - (3) Military objects;
 - (4) Objects of decorative art;
 - (5) Objects of fine art;
 - (6) Objects of scientific or technological interest;
 - (7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - (8) Any other prescribed categories, but excluding any object made by a living person;
- (i) Battlefields;
- (j) Traditional building techniques.

A **'place'** is defined as:

- (a) A site, area or region;
- (b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
- (c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'Structures' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:

- (a) 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;
- (b) Rock art, being a 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; and
- (c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- (d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);

- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this heritage impact assessment are as follows;

- Field investigations were performed on foot and by vehicle where access was readily available.
- Sites were evaluated by means of description of the cultural landscape, direct observations and analysis of written sources and available databases.
- It was assumed that the site layout as provided by GBS Environmental Consultants is accurate.
- We assumed that the public participation process performed as part of the Scoping and Environmental Impact Reporting (S&EIR) process was sufficiently encompassing not to be repeated in the Heritage Assessment Phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	Yes	Mitigation
	36	Graves and burial sites	Yes	Mitigation
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	Yes	7 km road upgrade sections
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	No	N/A
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m ²	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

BACKGROUND INFORMATION

PROPOSED NDANYANA ROAD UPGRADE PROJECT

PROJECT DESCRIPTION

The project proposed the upgrade of two existing dirt roads, approximately 10 km northeast of Pomeroy in the Umzinyahiti District of KwaZulu-Natal.

Section 1 is approximately 5 km long.

The road starts on route P194 (at the co-ordinates S28° 28' 52.7" E30° 30' 19.3"), near the village of Ndanyana. It continues in a western direction for approximately 1 km before it reaches a fork in the road, where the proposed upgrade veers left (south). It continues to the coordinates, S28° 29' 25.6" E30° 29' 48.6" (where Section 2 begins). Section 1 continues south and southeast to where it ends at the coordinates S28° 30' 34.1" E30° 29' 54.0".

Section 2 is approximately 2 km long.

The road starts at a point on Section 1 (at the co-ordinates S28° 29' 25.6" E30° 29' 48.6"), also near the village of Ndanyana and runs southern direction for approximately 0.65 km, before it veers east to the end co-ordinates S28° 29' 49.3" E30° 30' 36.6".

Both sections have a 10m road reserve. The alignment of the existing roads will be followed. The upgrade forms part of the Department of Transport's Rural Development initiative. The road upgrade will result in a improved gravel surface and will not be an asphalt surface.

SITE LOCATION

The proposed road upgrades are located approximately 10 km northeast of Pomeroy in Kwa Zulu Natal.

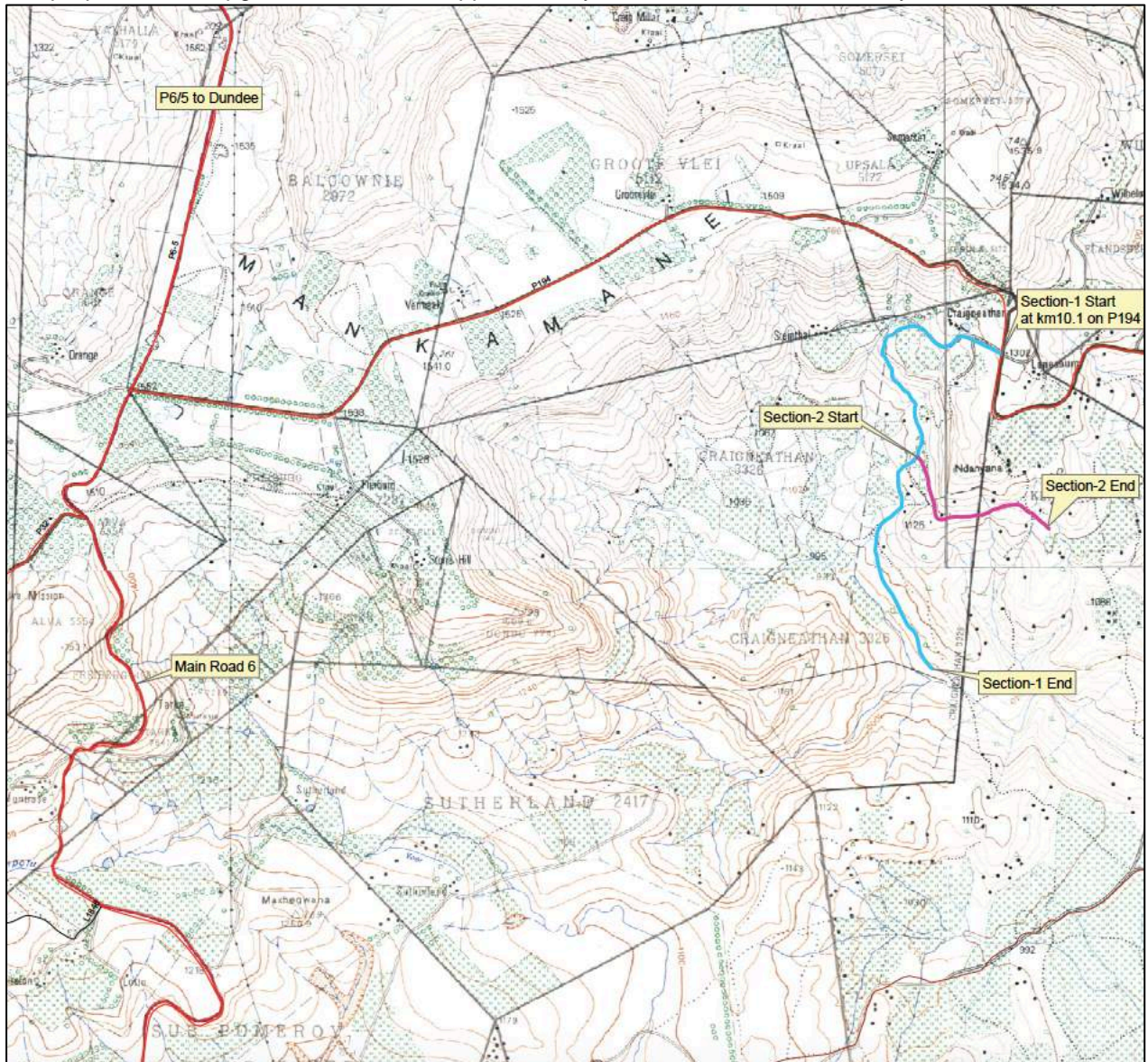


Figure 1: Location Map



Figure 2: Google Earth Image

ALTERNATIVES CONSIDERED

One alternative was considered

- No-go option where no development takes place.

"FOR THE EARLIER PERIODS OF HUMAN PREHISTORY NATAL, OWING TO ITS SPECIAL GEOGRAPHICAL AND GEOLOGICAL CONDITIONS, CAN PROVIDE A PATTERN FOR STUDIES IN ALL PARTS OF AFRICA SOUTH OF THE EQUATOR. TO STUDENTS IN THE NORTHERN HEMISPHERE ITS IMPORTANCE IS NATURALLY LESS; BUT THE CORRELATIONS WITH ALGERIA AND MOROCCO, LANDS OF SOMEWHAT SIMILAR FORMATION, PROVIDE A LINE, WHICH ARCHAEOLOGISTS THROUGHOUT AFRICA MAY GRASP. ONE SMALL PROVINCE CANNOT YIELD ALL THE EVIDENCE; BUT THIS SMALL PROVINCE IS ABLE TO GIVE AN UNUSUALLY COMPLETE AND CLEAR RECORD FROM DAYS WHEN MAN, AS A TOOL-MAKING ANIMAL, FIRST BECAME RECOGNISABLY HUMAN, TO THE TIME WHEN, WITH THE INVENTION OF THE BOW, HE ROSE ABOVE HIS BRUTE-SURROUNDINGS AND DONNED COMPLETE HUMANITY." O. DAVIES (1953).

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

REGIONAL CULTURAL CONTEXT

PALEONTOLOGY

Paleontological remains occur in the Cretaceous layer underlying the study area. These are of high significance but should not be impacted on as the ground intrusion is very limited and bedrock is not expected to be disturbed.

STONE AGE

This area is home to all three of the known phases of the Stone Age, namely: the Early- (2.5 million – 250 000 years ago), Middle- (250 000 – 20 000 years ago) and Late Stone Age (22 000 – 200 years ago). The Late Stone Age in this area also contains sites with rock art from the San and Khoekhoen cultural groups. Early to Middle Stone Age sites are uncommon in this area, however rock-art sites and Late Stone Age sites are much better known.

During the Middle Stone Age, 200 000 years ago, modern man or Homo sapiens emerged, manufacturing a wider range of tools, with technologies more advanced than those from earlier periods. This enabled skilled hunter-gatherer bands to adapt to different environments. From this time onwards, rock shelters and caves were used for occupation and reoccupation over very long periods of time.

The Middle Stone Age (MSA), as defined by Goodwin and Van Riet Lowe (1929), was viewed as a switch in technology from core tools to flake tools, and was thought to represent an intermediate technology between the Earlier and Later Stone Age (LSA). Triangular flakes with convergent dorsal scars and faceted butts distinguished the MSA, and radial and discoidal types, along with single and double platform examples, dominated cores. The 'type fossil' was considered to be the worked flake point. Due to both the relatively long time span encompassed by the MSA (c. 250 000-20 000BP) and the high degree of regional variation, it has proved difficult to include all MSA assemblages within Goodwin and Van Riet Lowe's criteria. More recent attempts have been made to revise the definition of the MSA (Klein 1970; Beaumont & Vogel 1972; Volman 1984) and to establish a cultural sequence but with limited success. As a result identifying and understanding the end of the MSA is still difficult. Disagreement concerning the MSA/LSA transition in southern Africa centres on four issues: 1) the definition of what constitutes final MSA technology; 2) the existence of a transitional MSA/LSA industry; 3) the dating of the MSA/LSA transition; and 4) the existence of an Early LSA (ELSA) which represents a distinct industry that is not part of the earliest recognized LSA, the Robberg (Clark, 1997).

1985 excavation at Umhlatuzana rock shelter in Natal by Kaplan yielded a long and detailed sequence of stone artefacts, which covered the time range from the Middle Stone Age (MSA) to the Later Stone Age (LSA), including the MSA/LSA transition, and early LSA microlithic bladelet assemblages. The change from the MSA to the beginning of the LSA took place between 35 000 and 25 000

BP. Robberg-like assemblages recovered from Umhlatuzana are the first to be positively identified in Natal. Pre-dating 18 000 BP and post-dating 12 000 BP, they show that assemblages of this nature were produced earlier and later in Natal than elsewhere in the country. Changes in the Umhlatuzana stone artefact assemblages were not the result of the introduction from elsewhere of new types of tools, but took place locally, as the result of a single evolving cultural tradition in a trajectory of cultural and social change (Kaplan, 1986).

Recent research by Wadley on the Middle Stone Age of Sibudu Cave north of Durban indicated that distinctions between the Middle Stone Age and the Late Stone Age based on backed blades could be misleading (Wadley, 2005). Although research on MSA sites is limited, this research illustrates the potential value of investigating Stone Age sites in KZN closer.

The Late Stone Age, considered to have started some 20 000 years ago, is associated with the predecessors of the San and Khoi Khoi. Stone Age hunter-gatherers lived well into the 19th century in some places in SA. Stone Age sites may occur all over the area where an unknown number may have been obliterated by mining activities, urbanisation, industrialisation, agriculture and other development activities during the past decades.

A large representation of Rock-Art sites is located in this area. During 1981 Mazel completed a survey of the Drakensberg and Southern Natal and documented over 400 rock art sites with more than 20 000 paintings (Mazel, 1981). The occurrence of these sites is however subject to very specific environmental parameters, none of which are present in the study area.

IRON AGE

During the third century AD, several groups of farming peoples from eastern and south central Africa began to settle along the east coast and river valleys that drain into the Indian Ocean (Maggs 1984a, 1989; Mitchell 2002). In eastern South Africa, these early farmers display a strong preference for settling a savannah environment along major water bodies where annual precipitation from 400 to over 1000mm provided adequate moisture for grain production. Over thirty EIA identified settlements in the Thukela Basin are clustered on discontinuous patches of rich colluvial soils within a short distance of the edge of the Thukela River or its tributaries. EIA settlements were initially established in the coastal forest in the fifth century AD and later in the savannah woodland belt alongside rivers in the (seventh century AD). The opening of riverine forest and woodlands by EIA farmers is apparent from the palaeobotanical record, current vegetation distribution (Hall 1981) and settlement distribution in the Thukela Basin. All documented sites are found within 100m of the relic canopy fringe (van Schalkwyk 1992).

EIA sites averaging 7 hectares in size are consistently located on the most productive nodes of soils confined to confluences and colluvial slip-off slopes along the major drainage courses, which comprise only about 9 per cent of the landscape (Maggs 1980: 7).

“Interpretations of the internal spatial organization of EIA sites in southern Africa are complicated by the relatively long use and frequent reoccupation of sites, often over several hundred years (Maggs 1984b, 1989). These reoccupations of the same places have created a palimpsest of flat, expansive settlements, with both superimposed and laterally displaced stratigraphy (Greenfield et al. 2000). Despite this situation, several large-scale horizontal excavations of settlements in the region have demonstrated a spatial layout of features that are similar to homestead spatial organization derived from nineteenth- and twentieth-century Nguni and Sotho-Tswana ethnography (Kuper 1982), called the Central Cattle Pattern (CCP). This pattern is characterized by domestic residences of the senior man’s wives placed in ranked order in an arc or circle around a central area containing livestock pens, the burials of high-status individuals and a court or assembly area where men gather to discuss political matters (Huffman 2001). Archaeologically, a similar pattern is represented by a series of domestic complexes (hut floors, grain bins or pits, ash and other refuse middens) surrounding a series of non-domestic activity areas, including livestock enclosures and specialist activity areas separated by an open space devoid of cultural materials. There is some variation in the size of the open space. At Broederstroom in north-eastern South Africa, the distance between hut floors and a livestock enclosure was as little as 10m (Huffman 1993). At KwaGandaganda in the Mngeni valley in KwaZulu-Natal, the open space was 90m across (Whitelaw 1994), and at Ndondondwane this open space was 60-100m” (Greenfield and van Schalkwyk 2003) (Huskel J, Greenfield, Kent, D, Fowler, & Leonard O, van Schalkwyk, 2005).

As well, faunal evidence suggests that certain species, such as nyala antelope, were forced to shift the range of their habitat after the woodland was opened (Maggs 1995:175). A

considerable number of Late Iron Age, stone walled sites, dating from the 18th and the 19th centuries (some of which may have been occupied as early as the 16th century), occur along and on top of the rocky ridges here. These settlements and features in these sites, such as huts, were built with dry stone, reed and clay.

Stone walled settlements are concentrated in clusters of sites and sometimes are dispersed over large areas making them vulnerable to developments of various kinds. A site consists of a circular or elliptical outer wall that is composed of a number of scalloped walls facing inwards towards one or more enclosures. Whilst the outer scalloped walls served as dwelling quarters for various family groups, cattle, sheep and goat were stock in the centrally located enclosures. Huts with clay walls and floors were built inside the dwelling units. Pottery and metal items are common on the sites. However, iron and copper were not produced locally on these sites.

Many of the Iron Age sites are also associated with Zulu encampments. Due to the often semi-nomadic nature of these and the use of removable huts, these sites are often difficult to identify and short term occupational sites might only manifest in some stone circles, used to anchor these structures to the ground.

THE HISTORIC ERA

British settlers first arrived at Port Natal (Durban) in 1824 when Shaka, King of the Zulu was firmly in charge of the hinterland. Thirteen years later a party of Boer families trekked in from the Free State. Between 1860 and 1911 shiploads of Indians arrived to work in the coastal sugar plantations. Since then, immigrants from around the world have brought with them different cultures, enriching the character of the province in many ways.

Northern and central KwaZulu-Natal is strewn with sites of battles between the Zulu, Boer and British during the 1800's and 1900's. The British finally conquered the Zulu in the Anglo-Zulu War of 1879 and later the Boers in the First and Second Anglo Boer wars. These conflicts are now collectively known as the South African War. A result of these conflicts was the construction of many forts in the area. Several gravesites, monuments, stone cairns and statues are the legacy of this violent time in our history. These remains are found scattered throughout the study area.

CULTURAL LANDSCAPE

The cultural landscape in the study area is strongly associated with rural living and subsistence farming. There is still a strong community feeling here with many ancient traditions still surviving. The landscape of high, enclosing mountains and spectacular views also results in a feeling of isolation.

PREVIOUS STUDIES

G&A Heritage performed several similar studies on road upgrades in this general area in 2012 and 2013 for the same client. These were referenced as follows;

- Busani Road Upgrade HIA
- Chibide Road Upgrade HIA
- Graig Millar Road Upgrade HIA
- Emahashini Road upgrade HIA
- Fahlaza Road Upgrade HIA
- Gazaneni Road Upgrade HIA
- Gidamasoka Road Upgrade HIA
- Haladu Road Upgrade HIA
- Jikijiki Road Upgrade HIA
- Khuthalani Road Upgrade HIA
- Kwa Shishi Road Upgrade HIA
- Kwavumbu Road Upgrade HIA
- Lethithema Road Upgrade HIA
- Machibini Road Upgrade HIA
- Mevane Road Upgrade HIA
- Mgazini Road Upgrade HIA
- Mngwenya Road Upgrade HIA
- Ncence Road Upgrade HIA

- Nembeni Road Upgrade HIA
- Ngqungqula Road Upgrade HIA
- Nomafu Road Upgrade HIA
- Nsimbini Road Upgrade HIA
- Ntabampisi Road Upgrade HIA
- Nyoka Road Upgrade HIA
- Okhalweni Road Upgrade HIA
- Sigidisabeth Road Upgrade HIA
- Sinayi Road Upgrade HIA
- Songela Road Upgrade HIA
- Sthozini Road Upgrade HIA
- Zitende Road Upgrade HIA
- Bethulo Road Upgrade HIA
- Kosibiya Road Upgrade HIA

FINDINGS

The following sites were identified during the course of the fieldwork and studies and archival research.

SITE 001

GPS S28° 28' 50"
E30° 30' 01"

This site is located on the southern side of the road along section 1. A stonewall site with extensive walling that is still in a good state of repair in most areas, most probably a livestock enclosure.



Figure 3: Stone wall at Site 001



Figure 4: Aerial view of proposed road upgrade with Site 001 indicated

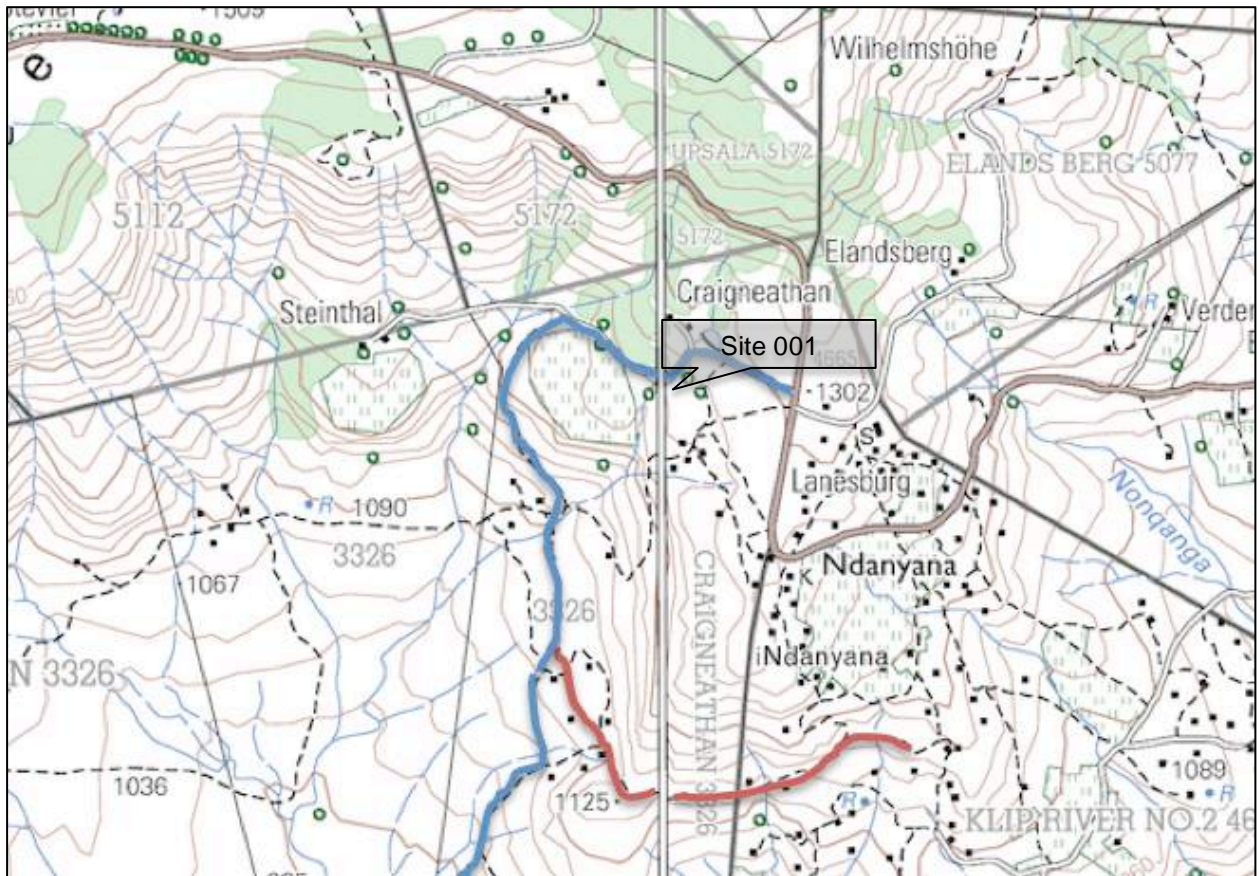


Figure 5. Location of Site 001 (2830 AD & BC)

SITE 002

GPS S28° 28' 50"
E30° 30' 00"

This site is located along section 1 of the road. A stonewalled site very similar in appearance to Site 001. Also most likely the roadway entrance to a site.



Figure 6: Stone wall at Site 002

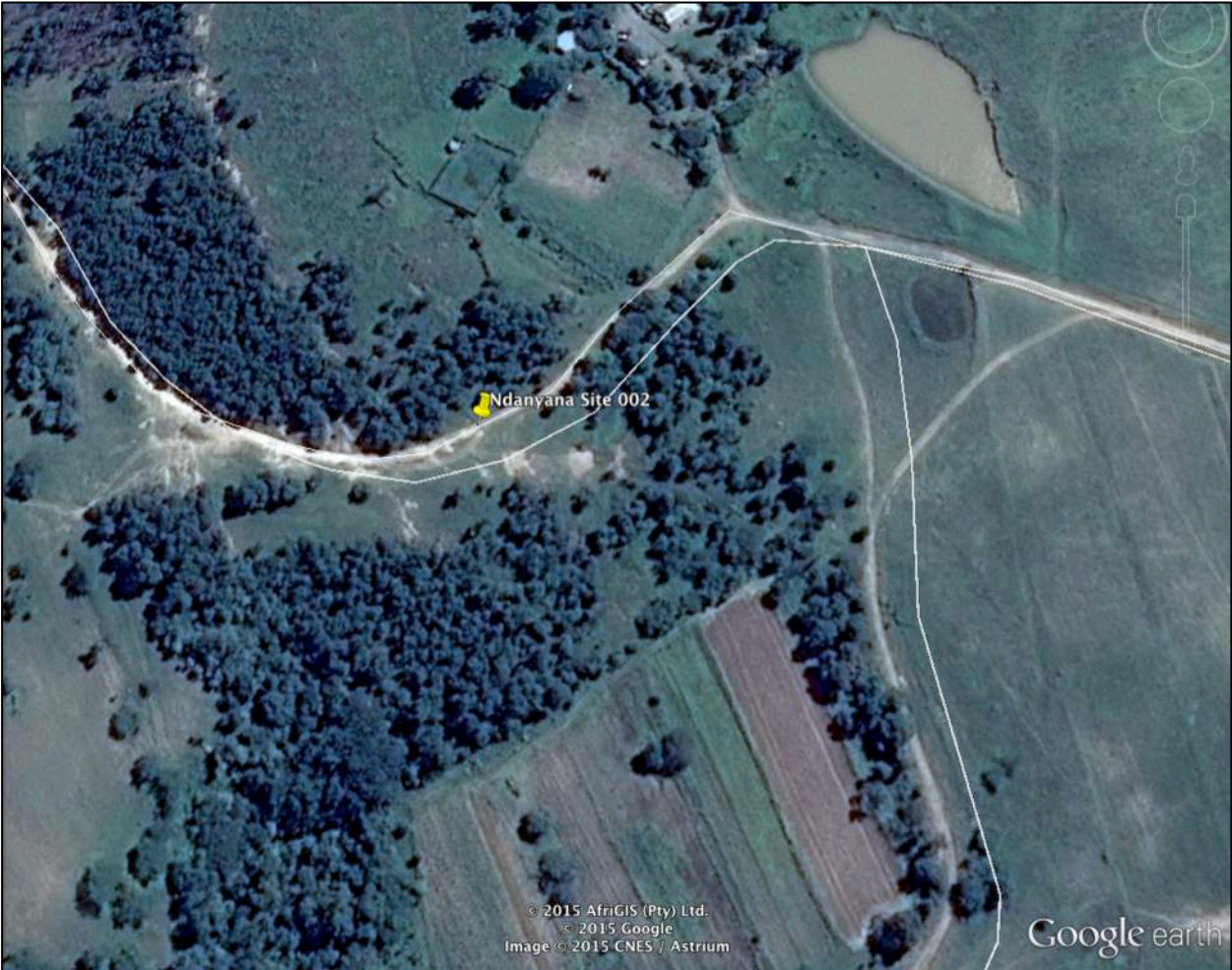


Figure 7. Aerial view of proposed road upgrade with Site 002 indicated

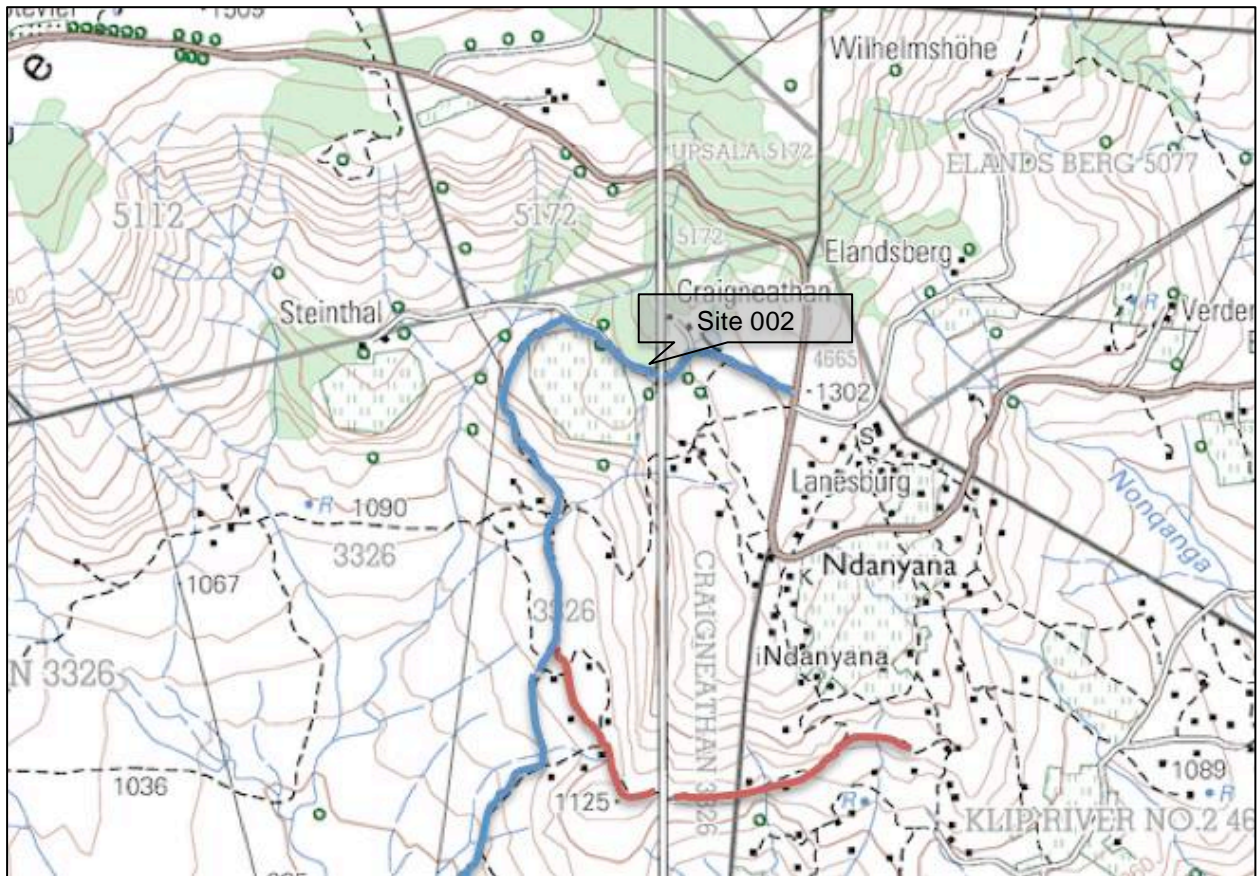


Figure 8. Location of Site 002 (2830 AD & BC)

SITE 003

GPS S28° 29' 46"
E30° 30' 32"

This site is located along section 2 of the road and is also a stonewalled site of more recent origin.



Figure 9: Stone wall at Site 003

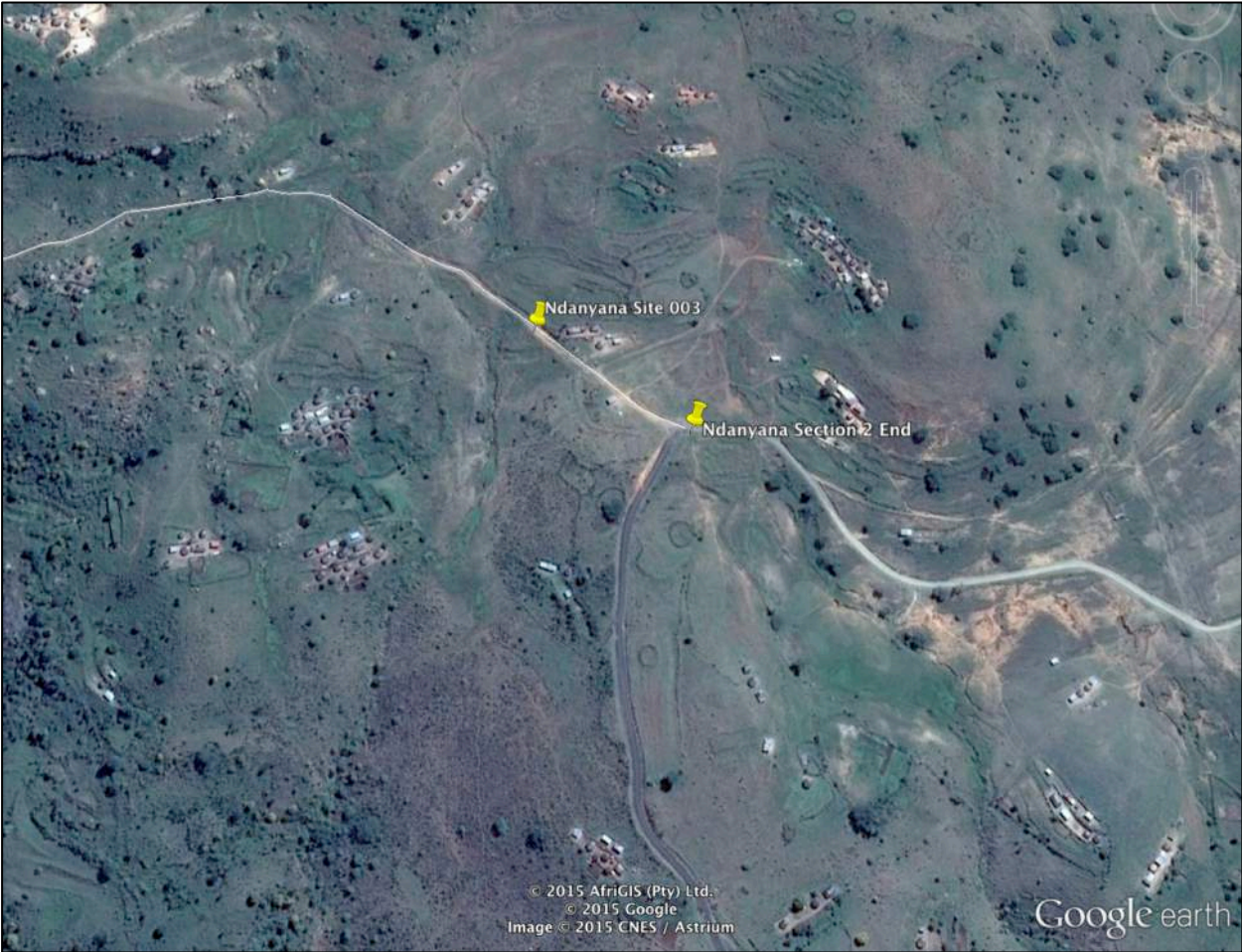


Figure 10: Aerial view of proposed road with Site 003 indicated

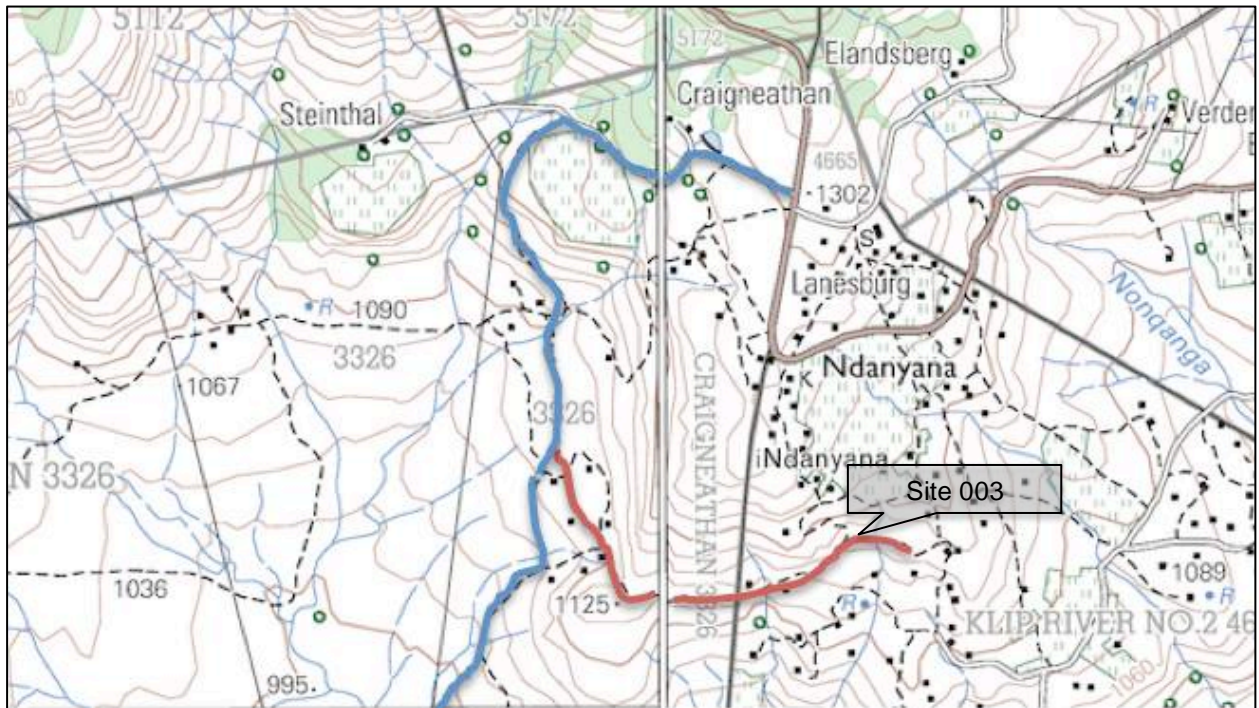


Figure 11: Location of Site 003 (2830 AD & BC)

SITE 004

GPS S28° 29' 44"
E30° 30' 05"

This site is located along section 2 of the road. Kraal structures of low stonewall. The site is around 600m² in size. Several different enclosures suggests several varying activities at the site.



Figure 12: Kraal at Site 004

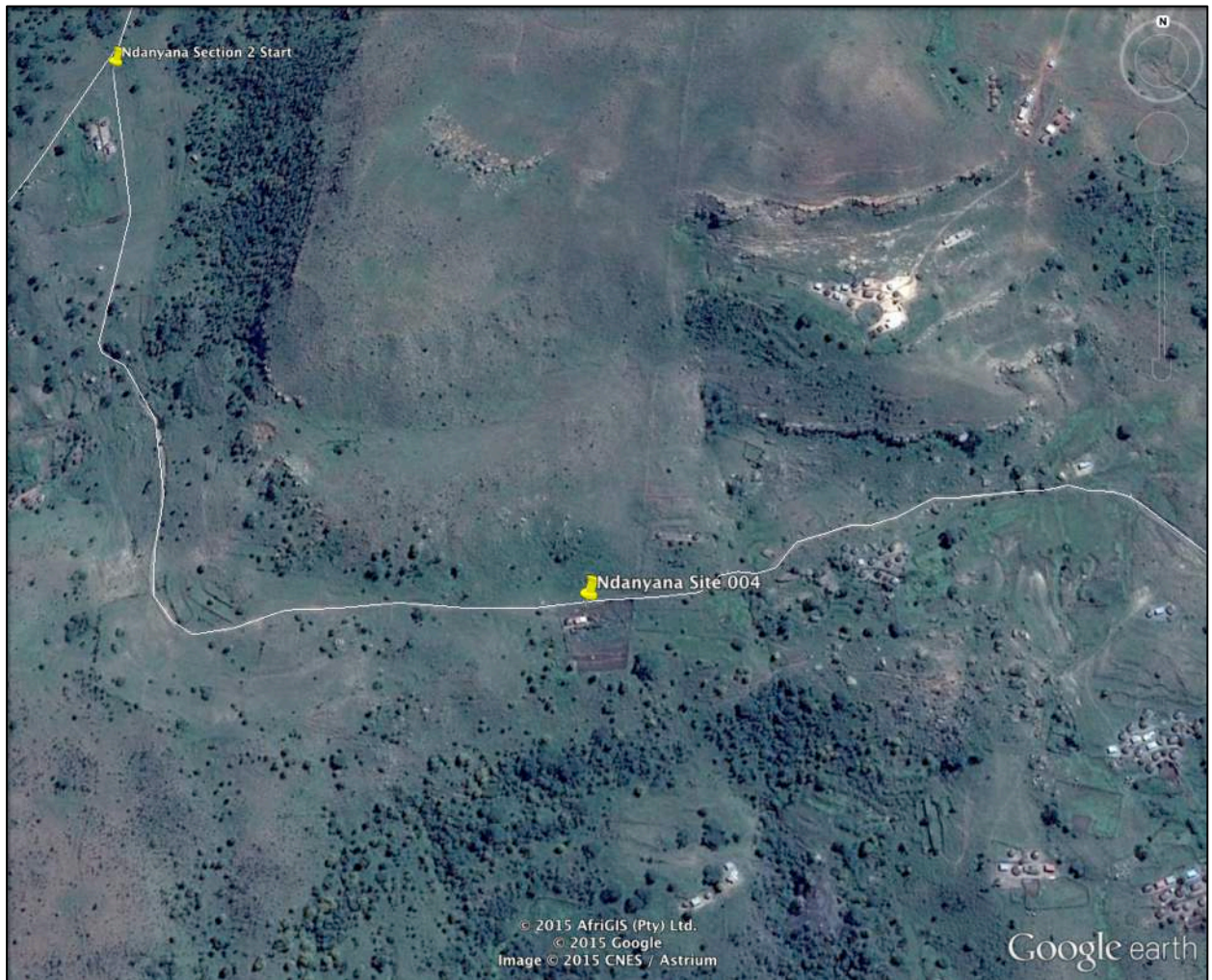


Figure 13: Aerial view of proposed road with Site 004 indicated

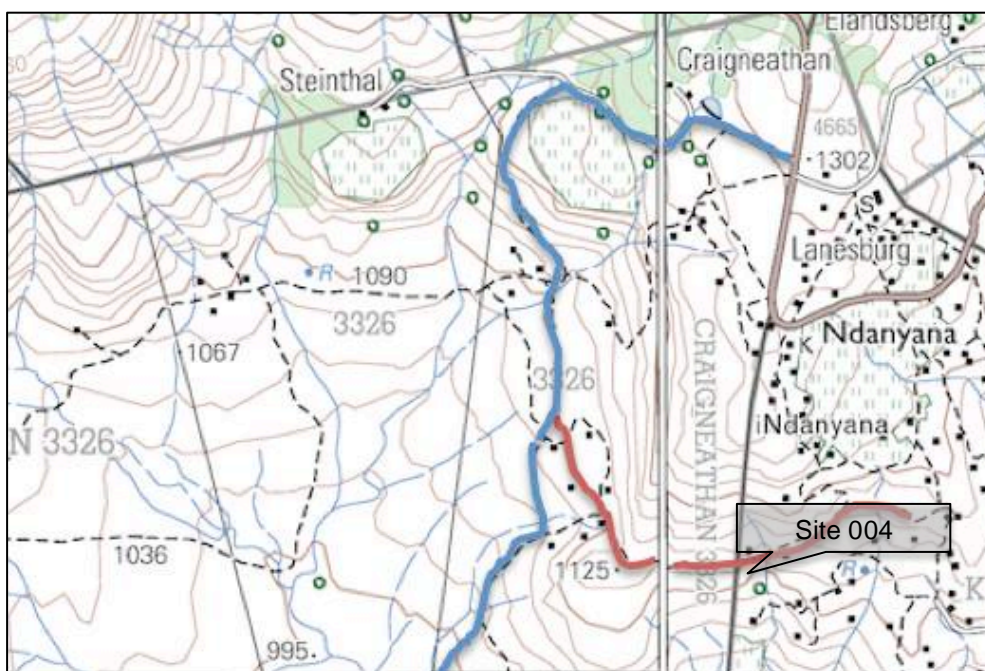


Figure 14: Location of Site 004 (2830 AD & BC)

SITE 005

GPS S28° 29' 44"
E30° 29' 57"

This site is located along section 2 of the road on both sides of the proposed upgrade. Big site of stonewalls and terraces. This could be a further extension of Sit 004.



Figure 15: Stone walls and terraces at Site 005



Figure 16: Stone walls at Site 005



Figure 17: Stone walls and terraces at Site 005



Figure 18: Stone walls at Site 005



Figure 19: Stone walls at Site 005

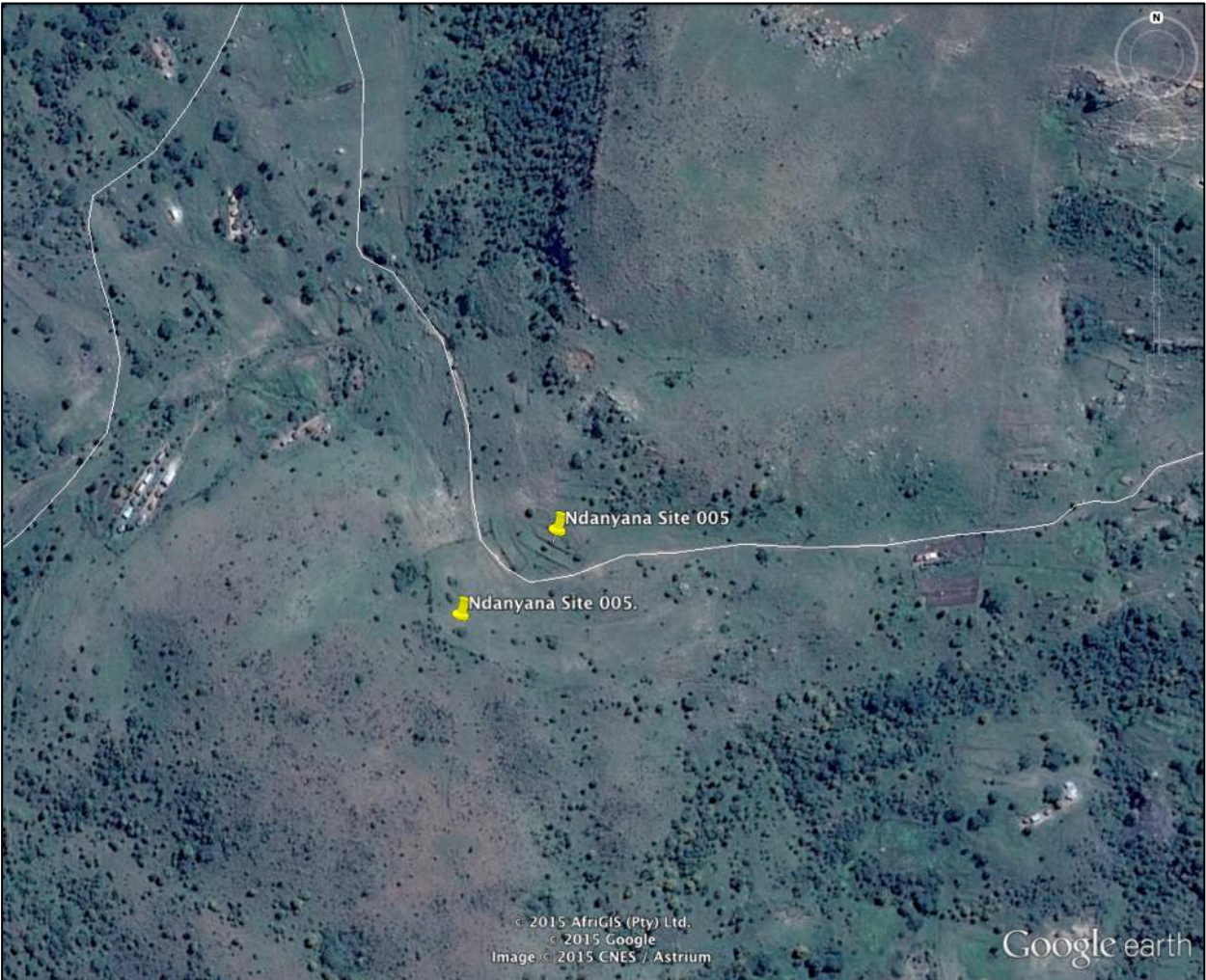


Figure 20: Aerial view of the proposed road with Site 005 indicated

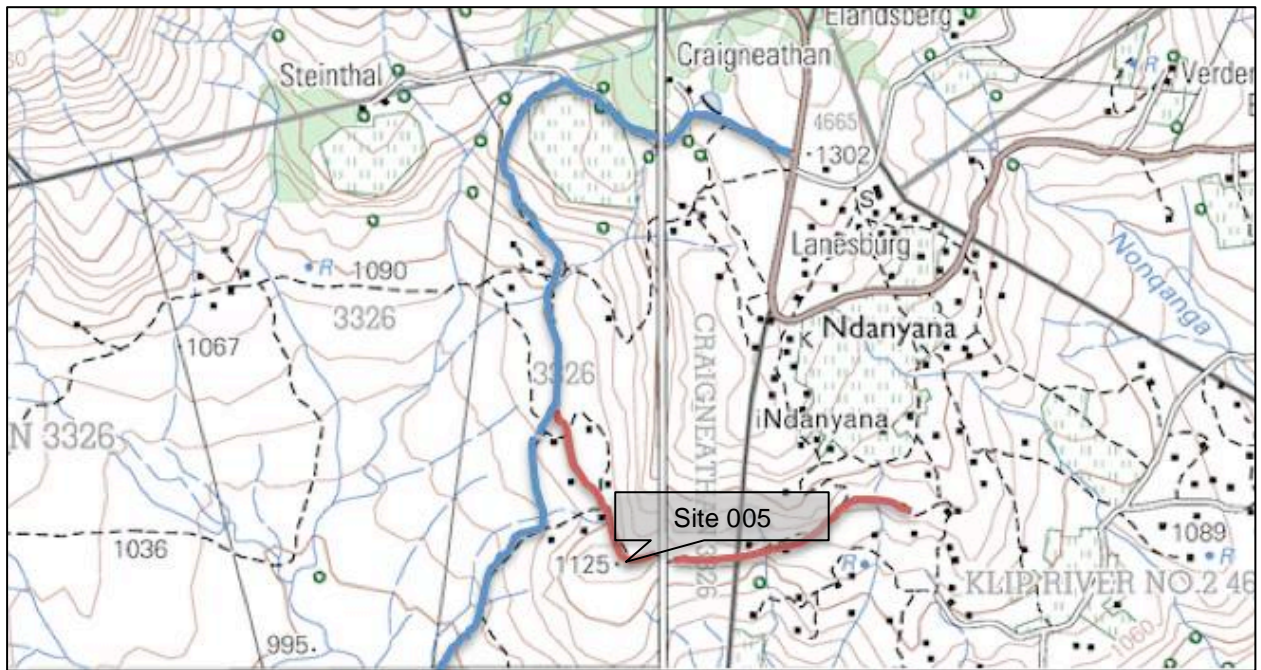


Figure 21: Location of Site 005 (2830 AD & BC)

SITE 6

GPS S28° 29' 34"
E30° 29' 51"

This site is located along section 2 of the road. A stonewalled enclosure incorporating the natural stone.



Figure 22: Stone wall at Site 006

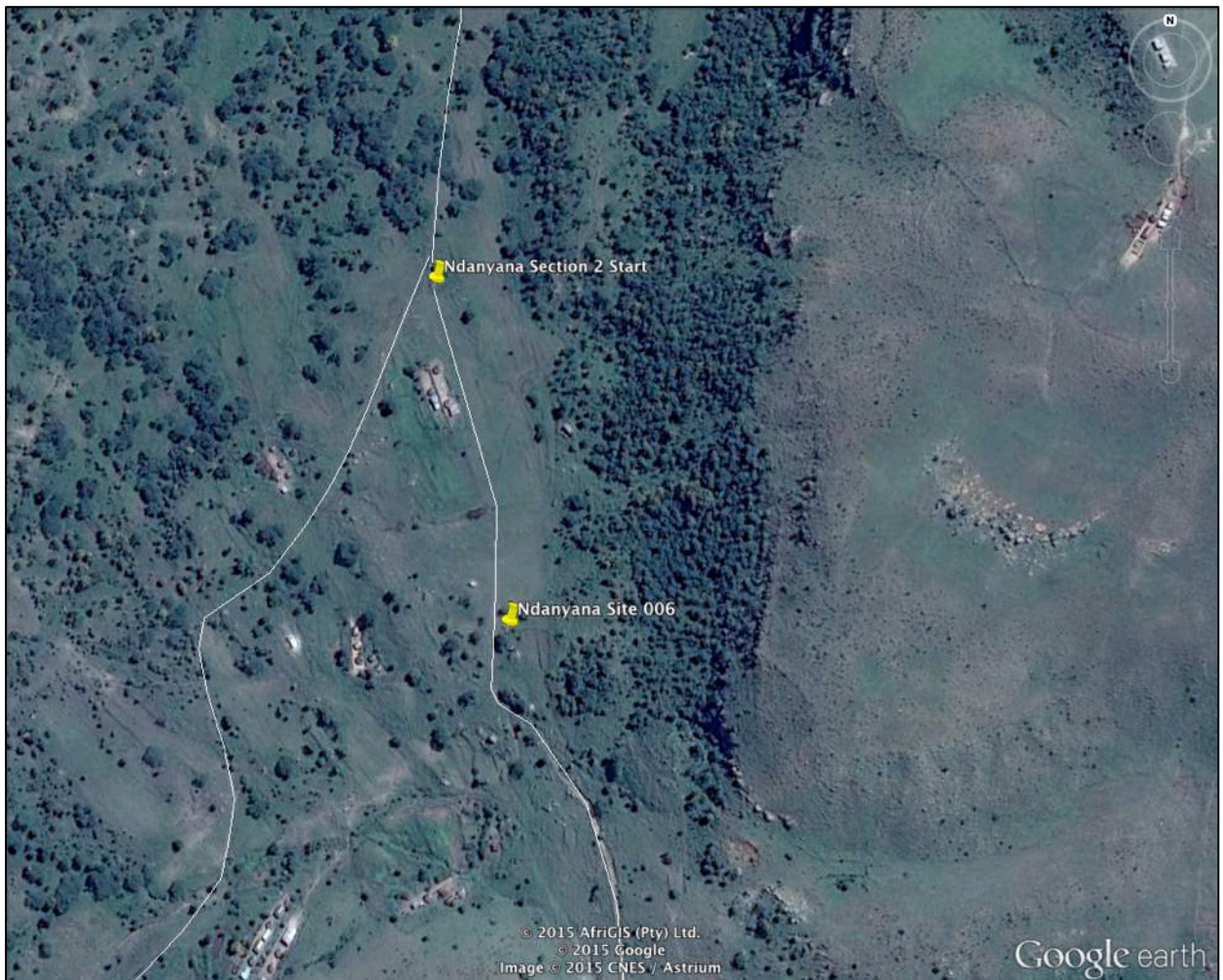


Figure 23: Aerial view of proposed road with Site 006 indicated

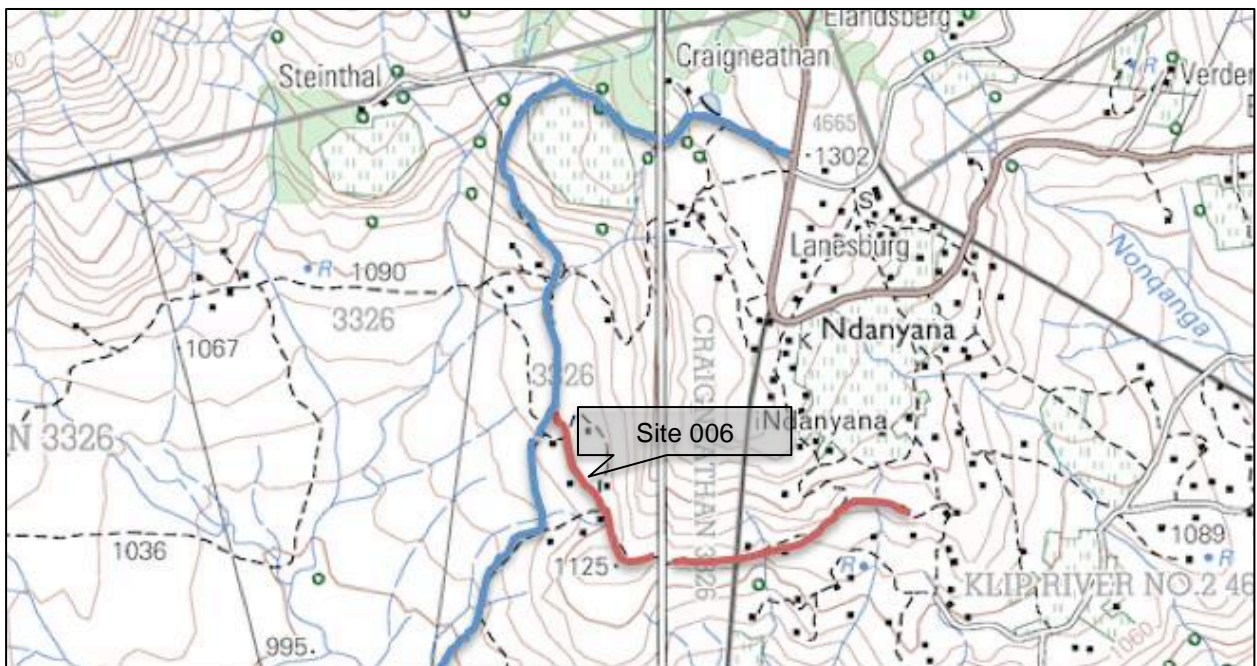


Figure 24: Location of Site 006 (2830 AD & BC)

SITE 0007

GPS S28° 29' 29"
E30° 29' 46"

This site is located along section 1 of the road. Graves approximately 15m north of the road.



Figure 25: Graves at Site 007

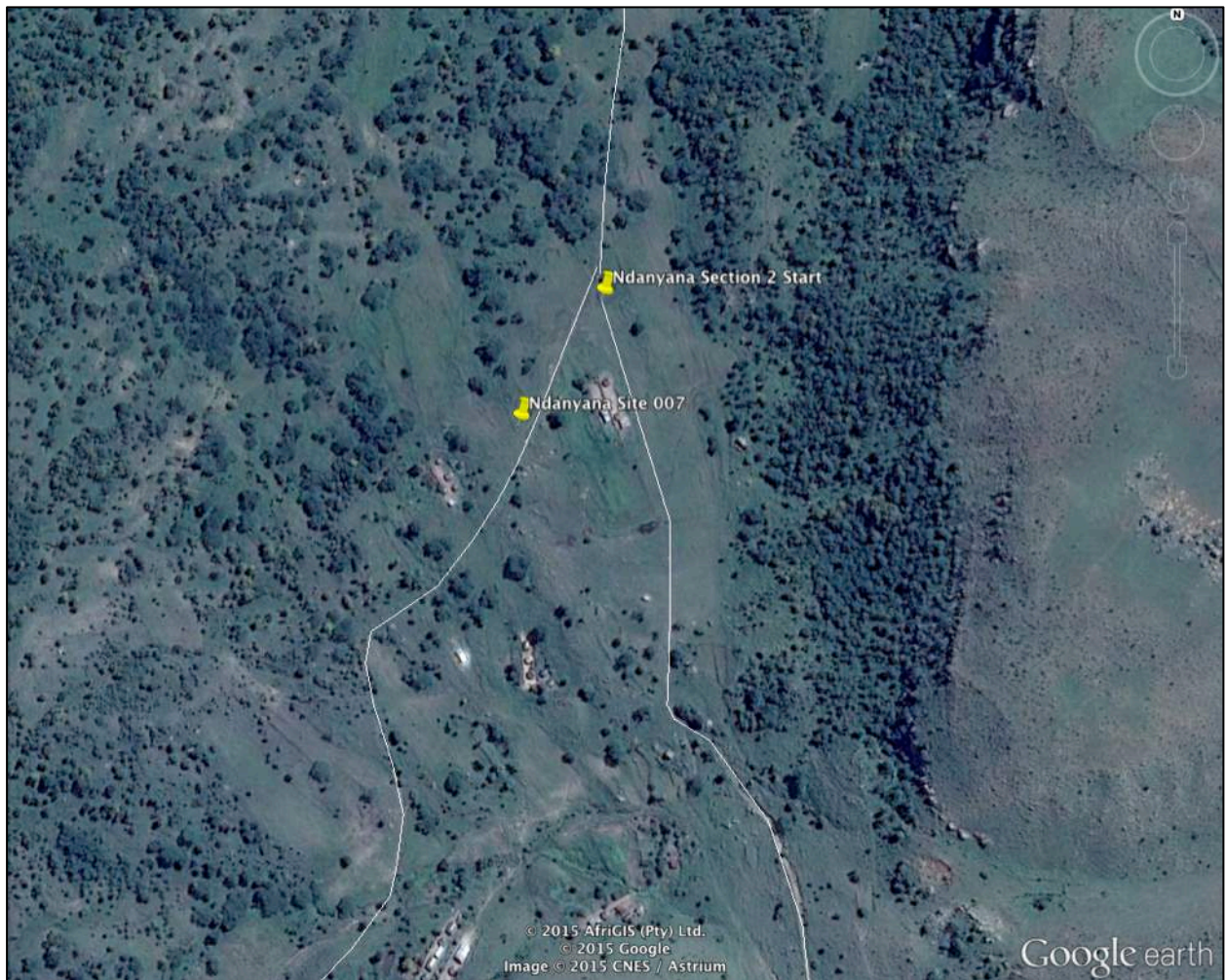


Figure 26: Aerial view of proposed road with Site 007 indicated

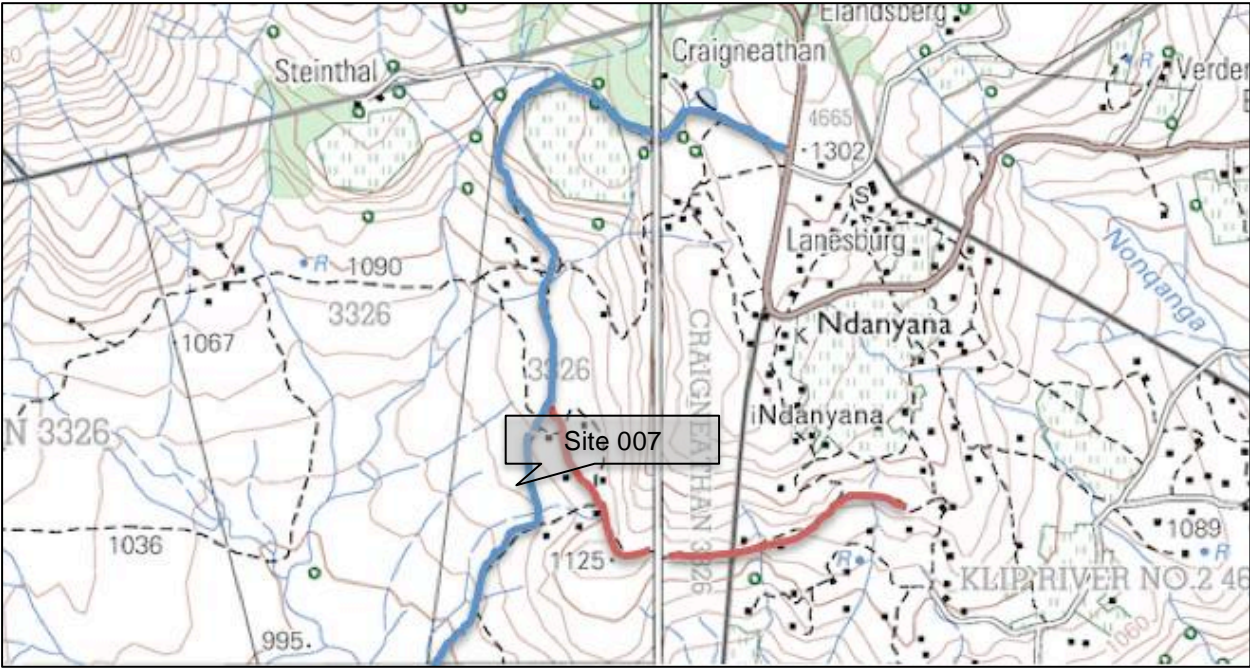


Figure 27: Location of Site 007 (2830 AD & BC)

METHODOLOGY

This study defines the heritage component of the S&EIR process being undertaken for the Ndanyana road upgrade. It is described as a first phase (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area as well as information derived from direct physical observations.

EVALUATING HERITAGE IMPACTS

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on a GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum.

Further techniques (where possible) included interviews with local inhabitants, visiting local museums and information centers and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on the SAHRA provincial databases.

This Heritage Impact Assessment relies on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with effected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.

The following documents were consulted in this study;

- South African National Archive Documents
- SAHRIS Database of Heritage Studies
- Talana Museum Information
- Internet Search
- Historic Maps
- 1965, 1967, 1981, 1996, 2000 and 2005 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2015 imagery
- Published articles and books
- JSTOR Article Archive

FIELDWORK

Fieldwork for this study was performed on the 11th of September 2015. Most of the areas were found to be accessible by vehicle. (A PART OF SECTION 1 WAS NOT ACCESSIBLE BY VEHICLE). Areas of possible significance were investigated on foot (such as the graves). The survey was tracked using GPS and a track file in GPX format is available on request.

MEASURING IMPACTS

In 2003 the SAHRA compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

TYPE OF RESOURCE

- Place
- Archaeological Site
- Structure

- Grave
- Paleontological Feature
- Geological Feature

TYPE OF SIGNIFICANCE

HISTORIC VALUE

It is important in the community, or pattern of history

- o Important in the evolution of cultural landscapes and settlement patterns
- o Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- o Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
- o Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history

- o Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

- o Importance for a direct link to the history of slavery in South Africa.

AESTHETIC VALUE

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

- o Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- o Importance for its creative, design or artistic excellence, innovation or achievement.
- o Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- o In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

SCIENTIFIC VALUE

It has potential to yield information that will contribute to an understanding of natural or cultural heritage

- o Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- o Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- o Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- o Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- o It is important in demonstrating a high degree of creative or technical achievement at a particular period
- o Importance for its technical innovation or achievement.

SOCIAL VALUE

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

DEGREES OF SIGNIFICANCE

RARITY

It possesses uncommon, rare or endangered aspects of natural or cultural heritage.

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

REPRESENTIVITY

- It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects.
- Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.

The table below illustrates how a site's heritage significance is determined

Spheres of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific Community			

What other similar sites may be compared to this site?

IMPACT STATEMENT

ASSESSMENT OF IMPACTS

Assessing site value by attribute

Table 5 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest

HISTORIC SIGNIFICANCE

No	Criteria	Significance Rating
1	Are any of the identified sites or buildings associated with a historical person or group? No	N/A
2	Are any of the buildings or identified sites associated with a historical event? No	N/A
3	Are any of the identified sites or buildings associated with a religious, economic social or political or educational activity?	

	No	N/A
4	Are any of the identified sites or buildings of archaeological significance? YES (STONE WALLS AND KRAALS)	Grade 3B
5	Are any of the identified buildings or structures older than 60 years? No	N/A

ARCHITECTURAL SIGNIFICANCE

No	Criteria	Rating
1	Are any of the buildings or structures an important example of a building type? No	N/A
2	Are any of the buildings outstanding examples of a particular style or period? No	N/A
3	Do any of the buildings contain fine architectural details and reflect exceptional craftsmanship? No	N/A
4	Are any of the buildings an example of an industrial, engineering or technological development? No	N/A
5	What is the state of the architectural and structural integrity of the building? No	N/A
6	Is the building's current and future use in sympathy with its original use (for which the building was designed)? N/A	-
7	Were the alterations done in sympathy with the original design? N/A	-
8	Were the additions and extensions done in sympathy with the original design? N/A	-
9	Are any of the buildings or structures the work of a major architect, engineer or builder? No.	N/A

SPATIAL SIGNIFICANCE

Even though each building needs to be evaluated as a single artefact the site still needs to be evaluated in terms of its significance in its geographic area, city, town, village, neighbourhood or precinct. This set of criteria determines the spatial significance.

No	Criteria	Rating
1	Can any of the identified buildings or structures be considered a landmark in the town or city? No	-
2	Do any of the buildings contribute to the character of the neighborhood? No	-
3	Do any of the buildings contribute to the character of the square or streetscape? No	-
4	Do any of the buildings form part of an important group of buildings? No	-

IMPACT EVALUATION

This HIA Methodology assists in evaluating the overall effect of a proposed activity on the heritage environment. The determination of the effect of a heritage impact on a heritage parameter is determined through a systematic analysis of the various components of the impact. This is

undertaken using information that is available to the heritage practitioner through the process of the heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

DETERMINATION OF SIGNIFICANCE OF IMPACTS

Significance is determined through a synthesis of impact characteristics, which include context, and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas Intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

IMPACT RATING SYSTEM

Impact assessment must take account of the nature, scale and duration of effects on the heritage environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact will be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

RATING SYSTEM USED TO CLASSIFY IMPACTS

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

NATURE		
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region

4	International and National	Will affect the entire country
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10

		– 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects
INTENSITY / MAGNITUDE		
Describes the severity of an impact		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.		

The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

ANTICIPATED IMPACT OF THE DEVELOPMENT

Sites 001, 002, 003 & 006

IMPACT TABLE FORMAT		
Heritage component	<i>Stone walls at Sites 001, 002, 003 & 006</i>	
Issue/Impact/Heritage Impact/Nature	<i>Upgrading of Ndanyana Road KZN</i>	
<i>Extent</i>	<i>Local</i>	
<i>Probability</i>	<i>Possible</i>	
<i>Reversibility</i>	<i>Irreversible</i>	
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources</i>	
<i>Duration</i>	<i>Medium term</i>	
<i>Cumulative effect</i>	<i>Medium cumulative effect</i>	
<i>Intensity/magnitude</i>	<i>High</i>	
<i>Significance Rating of Potential Impact</i>	<i>51 points. The impact will have a high negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	3	1
Reversibility	4	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	51 (high negative)	8 (low negative)

Mitigation measure	<p><i>The indicated stone walls should be marked by barrier tape before construction to prevent possible damage. No excavations should be undertaken within 10 meters of the sites. A heritage practitioner should monitor the excavation work at the sites.</i></p> <p><i>Operators of excavation equipment should be made aware of the possibility of unmarked graves in the area. Procedures for the handling of unmarked, exposed graves should be included in the environmental management plan (EMP) and should be implemented by the environmental control officer (ECO).</i></p>
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Site 004

IMPACT TABLE FORMAT		
Heritage component	<i>Kraal at Site 004</i>	
Issue/Impact/Heritage Impact/Nature	<i>Upgrading of Ndanyana Road KZN</i>	
<i>Extent</i>	<i>Local</i>	
<i>Probability</i>	<i>Possible</i>	
<i>Reversibility</i>	<i>Irreversible</i>	
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources</i>	
<i>Duration</i>	<i>Medium term</i>	
<i>Cumulative effect</i>	<i>Medium cumulative effect</i>	
<i>Intensity/magnitude</i>	<i>High</i>	
<i>Significance Rating of Potential Impact</i>	<i>51 points. The impact will have a high negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	3	1
Reversibility	4	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	51 (high negative)	8 (low negative)
Mitigation measure	<p><i>The indicated kraal should be marked by barrier tape before construction to prevent possible damage. No excavations should be undertaken within 10 meters of the site. A heritage practitioner should monitor the excavation work at the site.</i></p> <p><i>Operators of excavation equipment should be made aware of the possibility of unmarked graves in the area. Procedures for the handling of unmarked, exposed graves should be included in the environmental management plan (EMP) and should be implemented by the environmental control officer (ECO).</i></p>	

Site 005

IMPACT TABLE FORMAT	
Heritage component	<i>Stone walls and terraces at Site 005</i>
Issue/Impact/Heritage Impact/Nature	<i>Upgrading of Ndanyana Road KZN</i>

<i>Extent</i>	<i>Local</i>	
<i>Probability</i>	<i>Possible</i>	
<i>Reversibility</i>	<i>Irreversible</i>	
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources</i>	
<i>Duration</i>	<i>Medium term</i>	
<i>Cumulative effect</i>	<i>Medium cumulative effect</i>	
<i>Intensity/magnitude</i>	<i>High</i>	
<i>Significance Rating of Potential Impact</i>	<i>51 points. The impact will have a high negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	3	1
Reversibility	4	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	51 (high negative)	8 (low negative)
Mitigation measure	<p><i>The indicated stone walls and terraces should be marked by barrier tape before construction to prevent possible damage. No excavations should be undertaken within 10 meters of the site. A heritage practitioner should monitor the excavation work at the site.</i></p> <p><i>Operators of excavation equipment should be made aware of the possibility of unmarked graves in the area. Procedures for the handling of unmarked, exposed graves should be included in the environmental management plan (EMP) and should be implemented by the environmental control officer (ECO).</i></p>	

Site 007

IMPACT TABLE FORMAT		
Heritage component	<i>Graves and Burial Sites at Site 007</i>	
Issue/Impact/Heritage Impact/Nature	<i>Upgrading of Ndanyana Road KZN</i>	
<i>Extent</i>	<i>Local</i>	
<i>Probability</i>	<i>Possible</i>	
<i>Reversibility</i>	<i>Irreversible</i>	
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources</i>	
<i>Duration</i>	<i>Medium term</i>	
<i>Cumulative effect</i>	<i>Medium cumulative effect</i>	
<i>Intensity/magnitude</i>	<i>High</i>	
<i>Significance Rating of Potential Impact</i>	<i>51 points. The impact will have a high negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	3	1

Reversibility	4	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	3	1
Significance rating	51 (high negative)	8 (low negative)
Mitigation measure	<i>The indicated graves should be marked by barrier tape before construction to prevent possible damage. No excavations should be undertaken within 10 meters of the gravesites. A heritage practitioner should monitor the excavation work at Site 001. Operators of excavation equipment should be made aware of the possibility of unmarked graves in the area. Procedures for the handling of unmarked, exposed graves should be included in the environmental management plan (EMP) and should be implemented by the environmental control officer (ECO).</i>	

ASSESSING VISUAL IMPACT

Visual impacts of developments result when sites that are culturally celebrated are visually affected by a development. The exact parameters for the determination of visual impacts have not yet been rigidly defined and are still mostly open to interpretation. CndV Architects and The Department of Environmental Affairs and Development Planning (2006) have developed some guidelines for the management of the visual impacts of wind turbines in the Western Cape, although these have not yet been formalised. In these guidelines they recommend a buffer zone of 1km around significant heritage sites to minimise the visual impact.

ASSUMPTIONS AND RESTRICTIONS

- It is assumed that the SAHRIS database locations are correct.
- It is assumed that the paleontological information collected for the project is comprehensive.
- It is assumed that the social impact assessment and public participation process of the S&EIR will result in the identification of any intangible sites of heritage potential.

ASSESSMENT OF IMPACTS

IMPACT STATEMENT

PALEONTOLOGICAL SITES

Paleontological sites will not be affected as bedrock is not to be disturbed by the proposed activities.

Mitigation

No mitigation needed.

BUILT ENVIRONMENT

Some structures associated with rural living were identified;

- Brick outbuildings (modern)
- Barb-wire fences (modern)
- Mud-brick huts (modern)
- Dirt roads (modern)
- Footpaths

Mitigation

None of the structures will be affected by the road upgrade activities.

CULTURAL LANDSCAPE

The following landscape types were identified during the study.

Landscape Type	Description	Occurrence still possible?	Identified on site?
1 Paleontological	Mostly fossil remains. Remains include microbial fossils such as found in Barberton Greenstones	Yes, sub-surface	No
2 Archaeological	Evidence of human occupation associated with the following phases – Early-, Middle-, Late Stone Age, Early-, Late Iron Age, Pre-Contact Sites, Post-Contact Sites	Yes	Yes
3 Historic Built Environment	<ul style="list-style-type: none"> - Historical townscapes/streetscapes - Historical structures; i.e. older than 60 years - Formal public spaces - Formally declared urban conservation areas - Places associated with social identity/displacement 	No	No
4 Historic Farmland	<p>These possess distinctive patterns of settlement and historical features such as:</p> <ul style="list-style-type: none"> - Historical farm yards - Historical farm workers villages/settlements - Irrigation furrows - Tree alignments and groupings - Historical routes and pathways - Distinctive types of planting - Distinctive architecture of cultivation e.g. planting blocks, trellising, terracing, ornamental planting. 	Yes	Yes
5 Historic rural town	<ul style="list-style-type: none"> - Historic mission settlements - Historic townscapes 	No	No
6 Pristine natural landscape	<ul style="list-style-type: none"> - Historical patterns of access to a natural amenity - Formally proclaimed nature reserves - Evidence of pre-colonial occupation - Scenic resources, e.g. view corridors, viewing sites, visual edges, visual linkages - Historical structures/settlements older than 60 years - Pre-colonial or historical burial sites - Geological sites of cultural significance. 	No	No
7 Relic Landscape	<ul style="list-style-type: none"> - Past farming settlements - Past industrial sites - Places of isolation related to attitudes to medical treatment - Battle sites - Sites of displacement, 	Yes	No
8 Burial grounds and grave sites	<ul style="list-style-type: none"> - Pre-colonial burials (marked or unmarked, known or unknown) - Historical graves (marked or unmarked, known or unknown) - Graves of victims of conflict - Human remains (older than 100 years) - Associated burial goods (older than 100 years) - Burial architecture (older than 60 years) 	Yes	No
9 Associated Landscapes	<ul style="list-style-type: none"> - Sites associated with living heritage e.g. initiation sites, harvesting of natural resources for traditional medicinal purposes - Sites associated with displacement & contestation - Sites of political conflict/struggle - Sites associated with an historic event/person - Sites associated with public memory 	No	No

10 Historical Farmyard	<ul style="list-style-type: none"> - Setting of the yard and its context - Composition of structures - Historical/architectural value of individual structures - Tree alignments - Views to and from - Axial relationships - System of enclosure, e.g. defining walls - Systems of water reticulation and irrigation, e.g. furrows - Sites associated with slavery and farm labour - Colonial period archaeology 	No	No
11 Historic institutions	<ul style="list-style-type: none"> - Historical prisons - Hospital sites - Historical school/reformatory sites - Military bases 	No	No
12 Scenic visual	<ul style="list-style-type: none"> - Scenic routes 	No	No
13 Amenity landscape	<ul style="list-style-type: none"> - View sheds - View points - Views to and from - Gateway conditions - Distinctive representative landscape conditions - Scenic corridors 	No	No

Mitigation

It is recommended that the development designs take into account the positive and negative characteristics of the existing cultural landscape type and that they endeavor to promote the positive aspects while at the same time mitigating the negative aspects.

RESOURCE MANAGEMENT RECOMMENDATIONS

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact;
- Stone concentrations of any formal nature.

The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the South African Police Services (SAPS) should be notified.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.

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- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyze the finds.

CONCLUSION

The construction of the existing roads has resulted in damage to any possible previous sites of heritage significance. It is not anticipated that any further sites will be affected. Several gravesites were located near to the road and it is necessary that these sites be monitored and preserved during the process of upgrading the road.

Provided bedrock is not to be disturbed no further mitigation work for heritage management is needed for this project and the development may continue.

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HISTORICAL MAPS

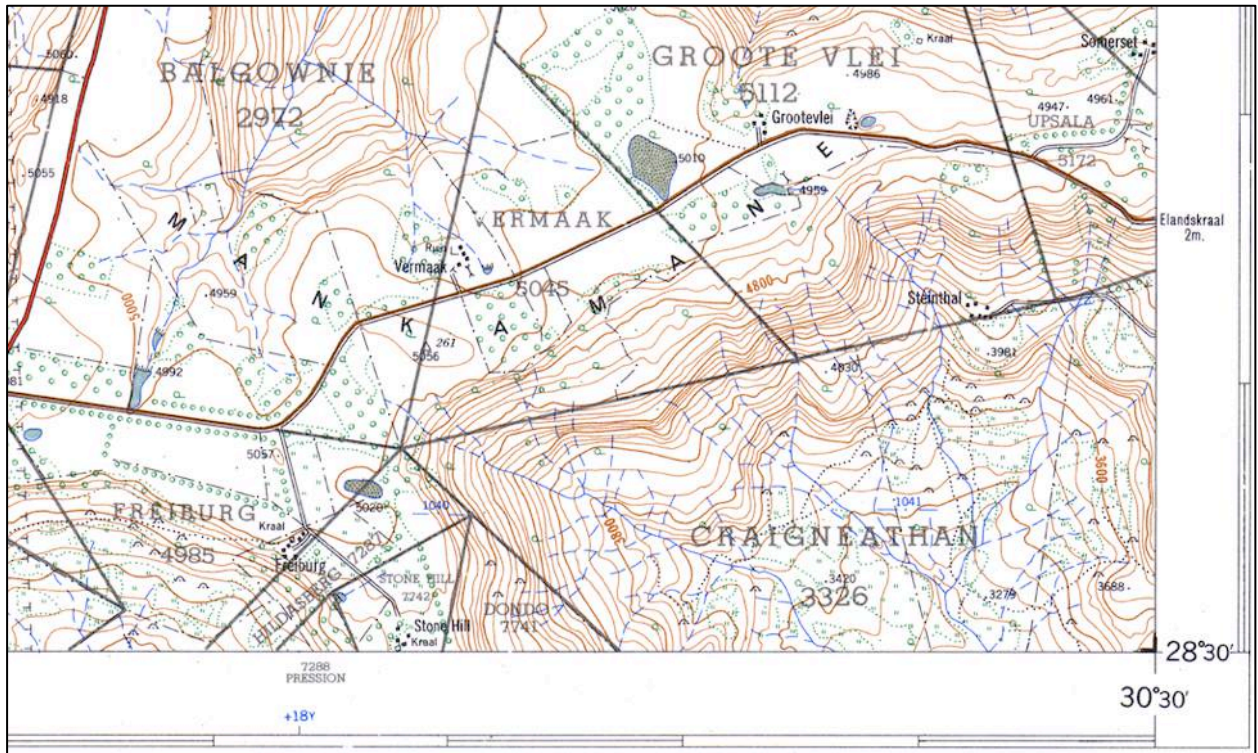


Figure 28: Historical Map 2830 AD 1967

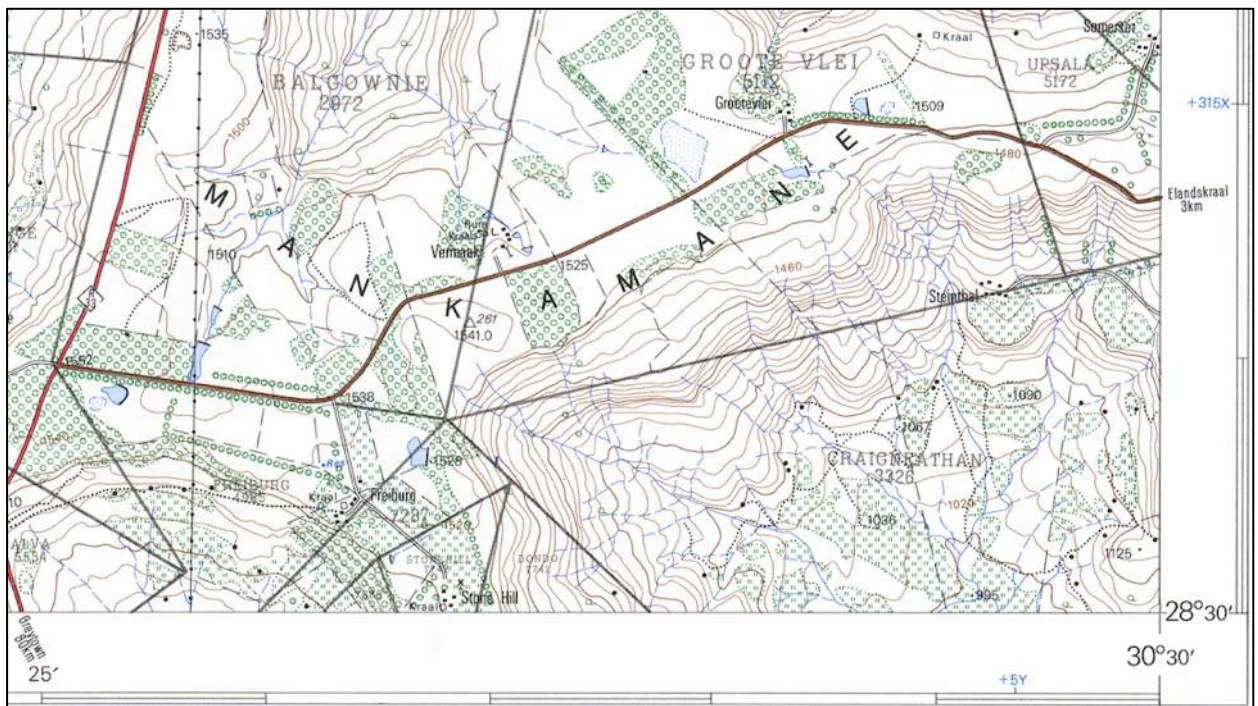


Figure 29: Historical Map 2830 AD 1981

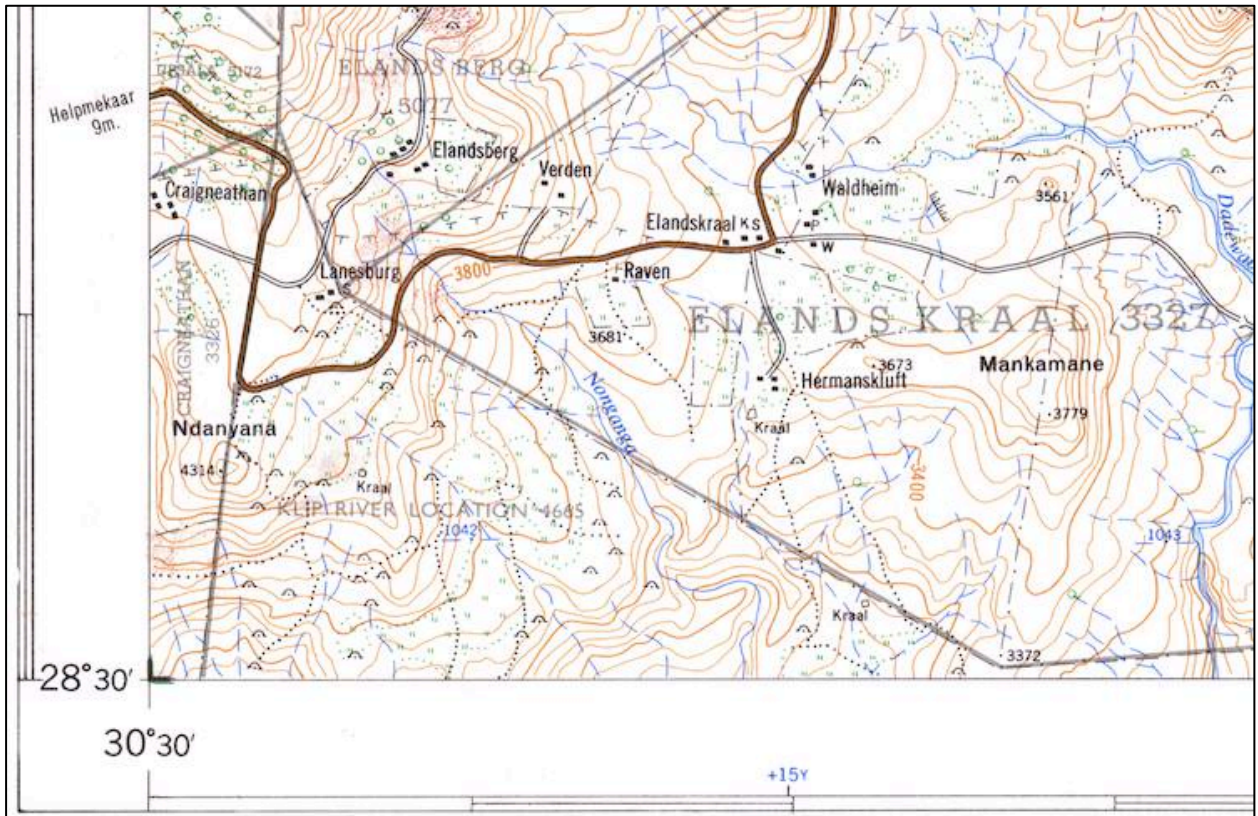


Figure 30: Historical Map 2830 BC 1967

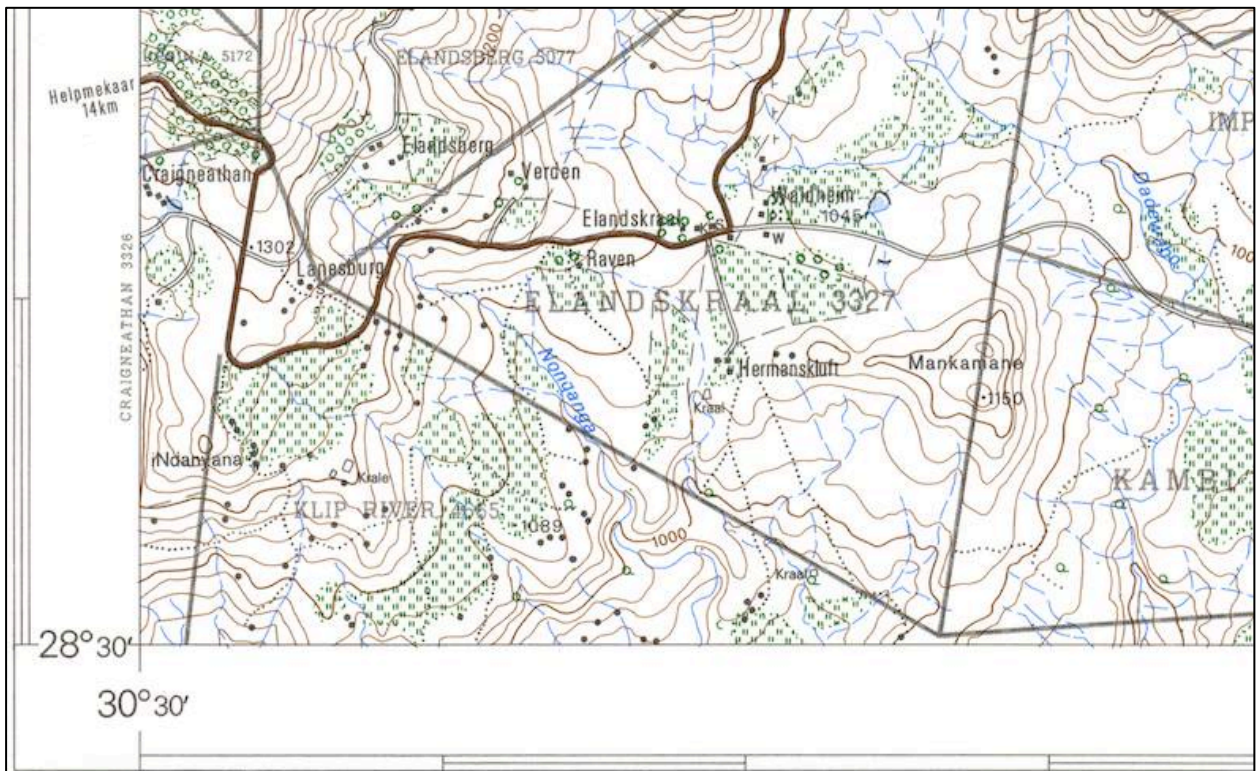


Figure 31: Historical Map 2830 BC 1981

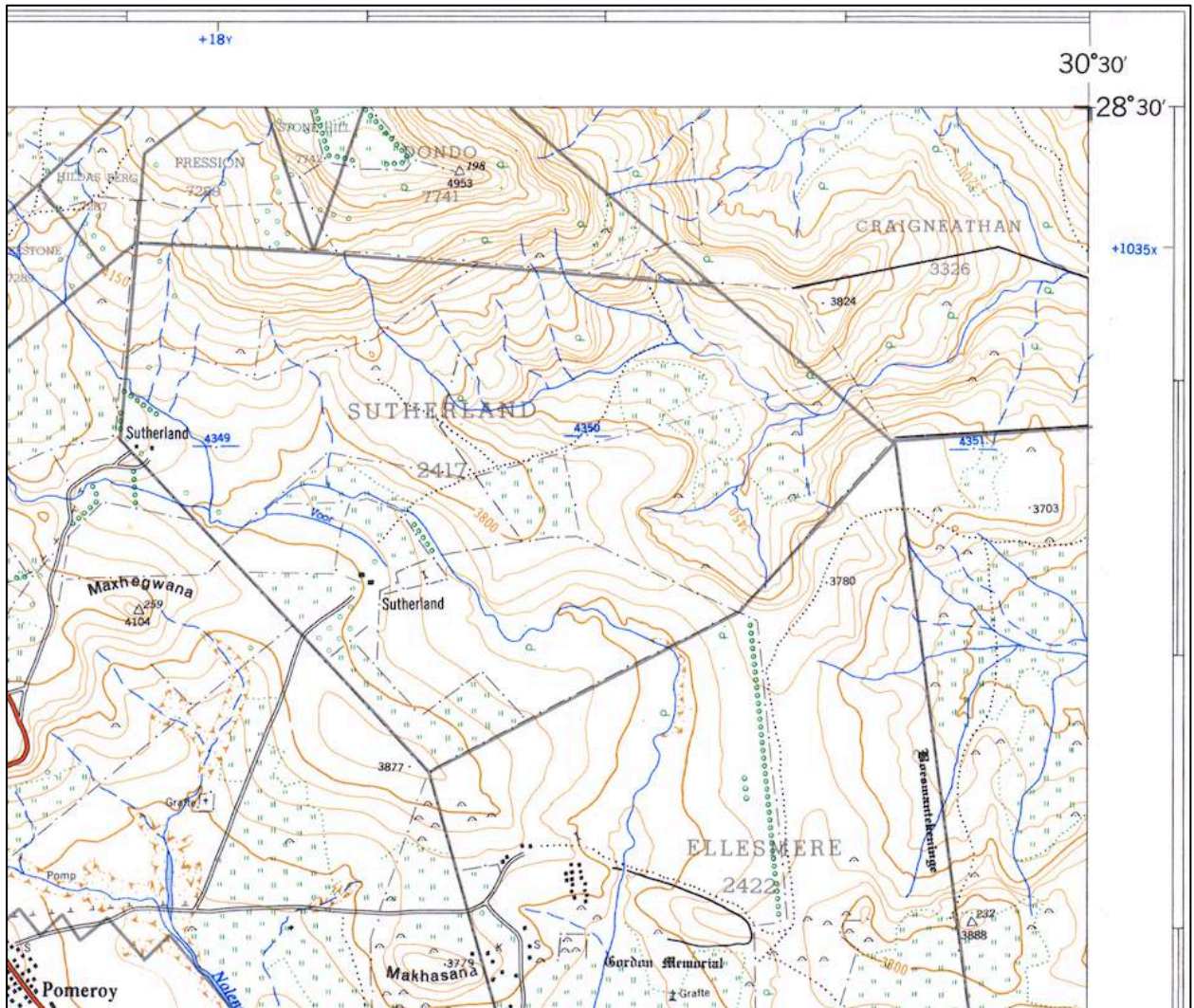


Figure 32: Historical Map 2830 CB 1965

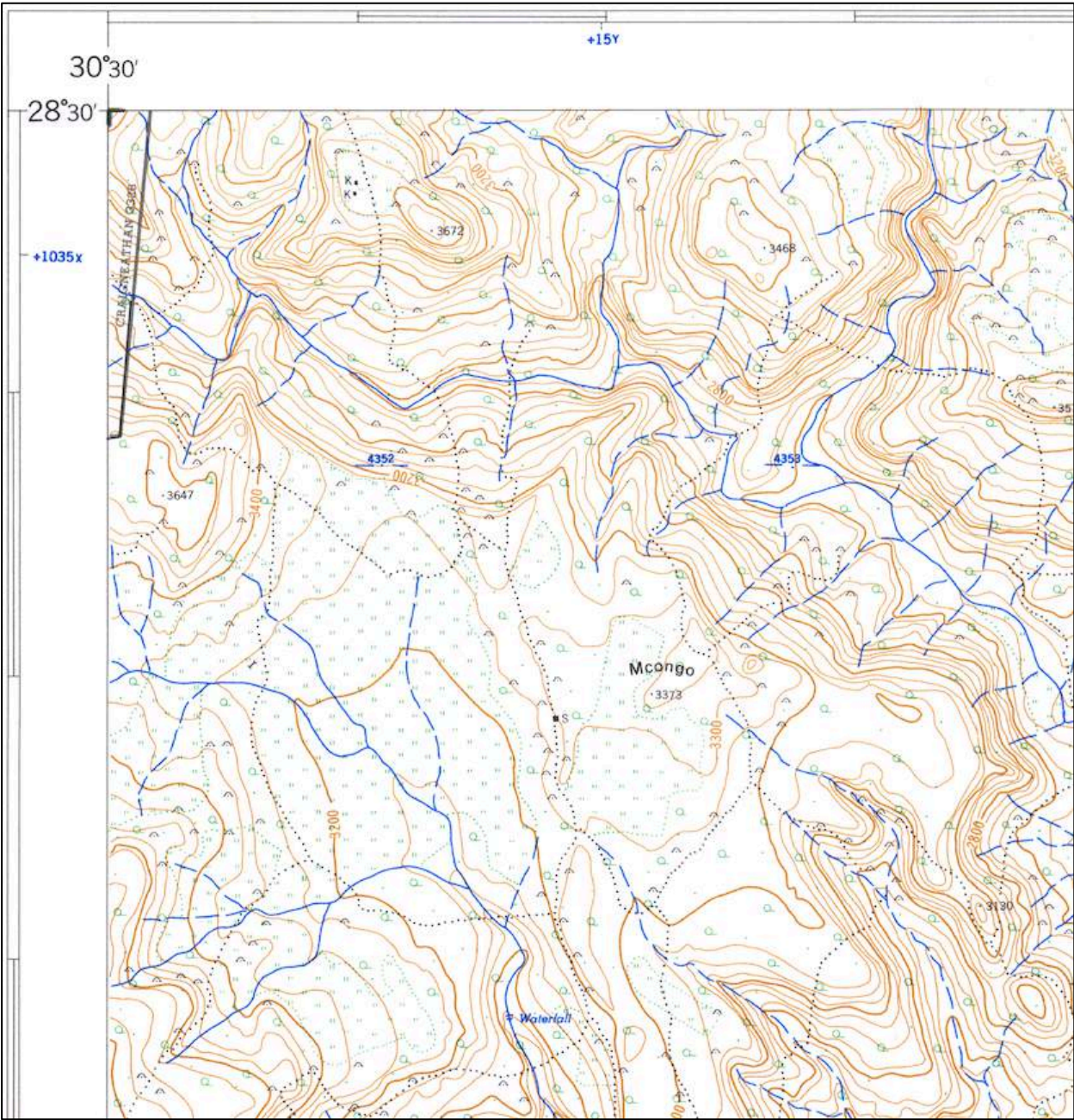


Figure 33: Historical Map 2830 DA 1965

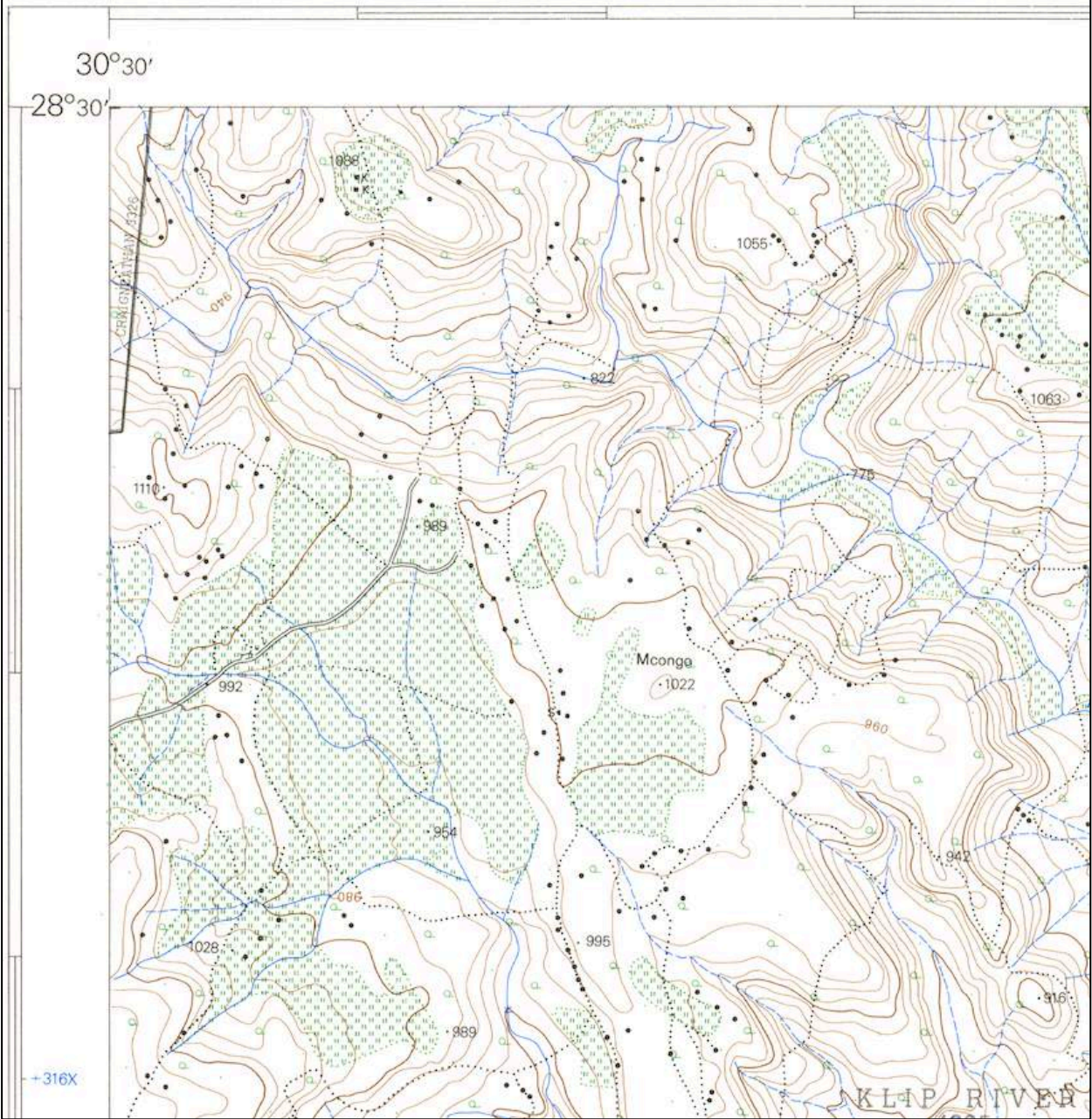


Figure 34: Historical Map 2830 DA 1981

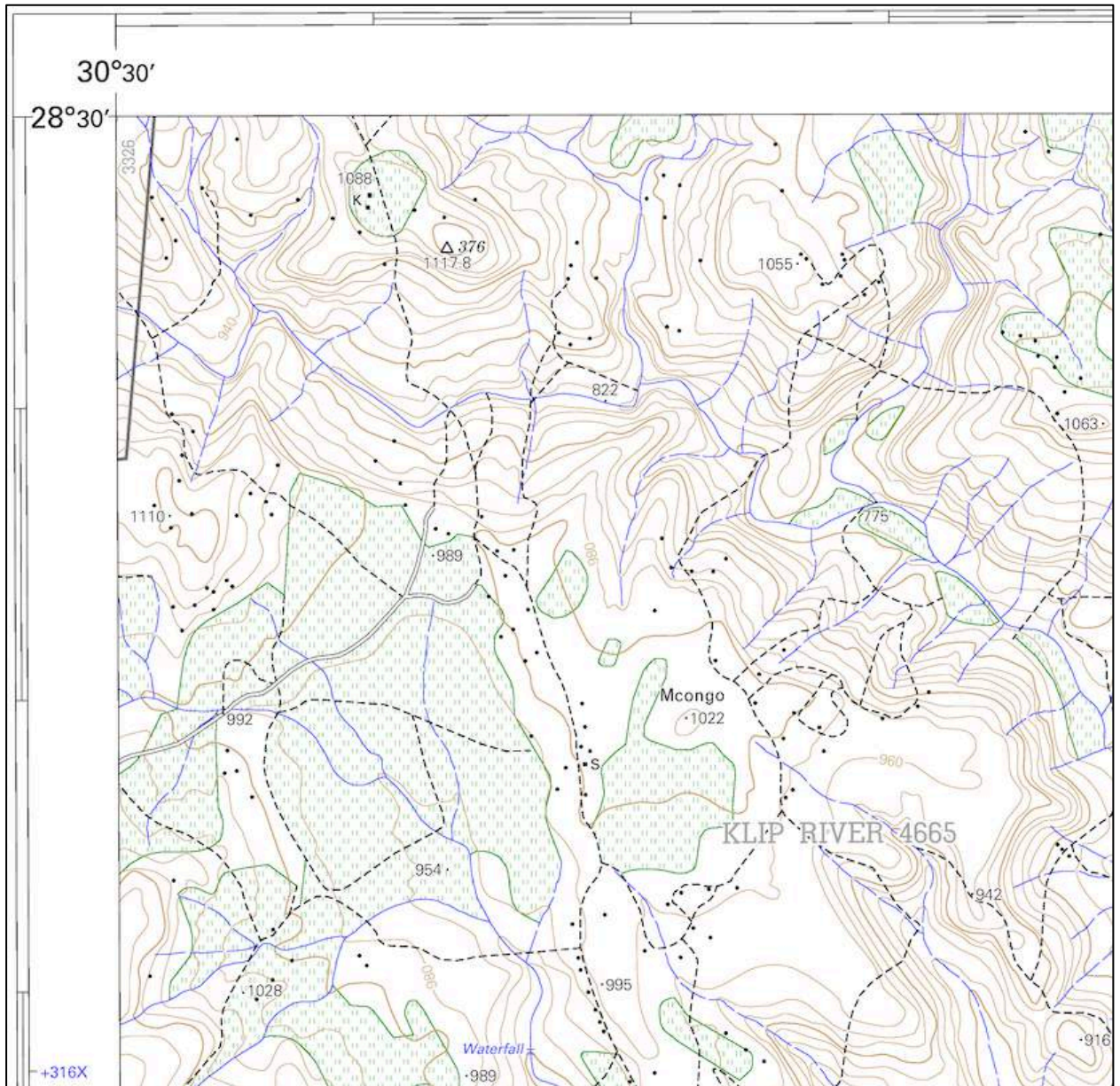


Figure 35: Historical Map 2830 DA 1996