

Phase 1 Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED
SANRAL R61 SECTION 6 BORROW PIT IN THE
ENGCOCO LOCAL MUNICIPALITY, CHRIS HANI
DISTRICT MUNICIPALITY OF THE EASTERN CAPE
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.*

Statement of Independence

As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

SIGNED OFF BY: STEPHAN GAIGHER



MANAGEMENT SUMMARY

Site name and location: Proposed SANRAL R61 Section 6 Borrow Pit.

Municipal Area: Engcobo Local Municipality, Chris Hani District Municipality, Eastern Cape Province.

Developer: SANRAL.

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

Date of Report: 23 October 2017

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 proposed SANRAL R61 Section 6 Borrow Pit, in the Engcobo Local Municipality, Chris Hani District Municipality, Eastern Cape Province.

This study encompasses the heritage impact investigation. A preliminary layout has been supplied to lead this phase of this study.

Scope of Work

A Heritage Impact Assessment (including Archaeological, Cultural heritage, Built Heritage and Paleontological Assessment) to determine the impacts on heritage resources within the study area.

The following are the required to perform the assessment:

- A desk-top investigation of the area;
- A site visit to the proposed development site;
- Identify possible archaeological, cultural, historic, built and paleontological sites within the proposed development area;
- Evaluate the potential impacts of construction and operation of the proposed development on archaeological, cultural, historical resources; built and paleontological resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural, historical, built and paleontological importance.
- Measure the above both against the requirements of the National Heritage Resources Act (NHRA) no 25 of 1999.

The purpose of this study is to determine the possible occurrence of sites with cultural heritage significance within the study area. The study is based on archival and document combined with fieldwork investigations.

Findings & Recommendations

The area was investigated during a field visit and through archival studies. The local community indicated that the study area contains several areas with graves of their ancestors. Surveying of the hill revealed at least 33 burial sites and possibly more could be obscured by plant growth. It is recommended that these graves be relocated to a community graveyard. The community has already indicated their willingness to support such a relocation.

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 SANRAL R61 SECTION 6 BORROW PIT IN THE ENGCOCO LOCAL MUNICIPALITY, CHRIS HANI DISTRICT MUNICIPALITY OF THE EASTERN CAPE PROVINCE.

1. INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by EOH Coastal & Environmental Consultants to undertake a heritage impact assessment for the Proposed SANRAL R61 Section 6 Borrow Pit in the Engcoco Local Municipality, Chris Hani District Municipality of the Eastern Cape Province.

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 EOH Coastal & Environmental Consultants is accurate.
- We assumed that the public participation process performed as part of the 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	Possible Impact	Mitigation
	36	Graves and burial sites	Yes	Management Guidelines
	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.	No	N/A
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	Yes	Borrow Pit
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

2. BACKGROUND INFORMATION

2.1 PROJECT BACKGROUND

This study focuses on the SANRAL R61 Section 6 Borrow Pit in the Engcobo Local Municipality, Chris Hani District Municipality of the Eastern Cape Province.



Figure 1. Turn off from the R61 en route to the Borrow Pit.

2.2 PROJECT DESCRIPTION

The scope of works is:

The excavation of a borrow pit as per the layout below;

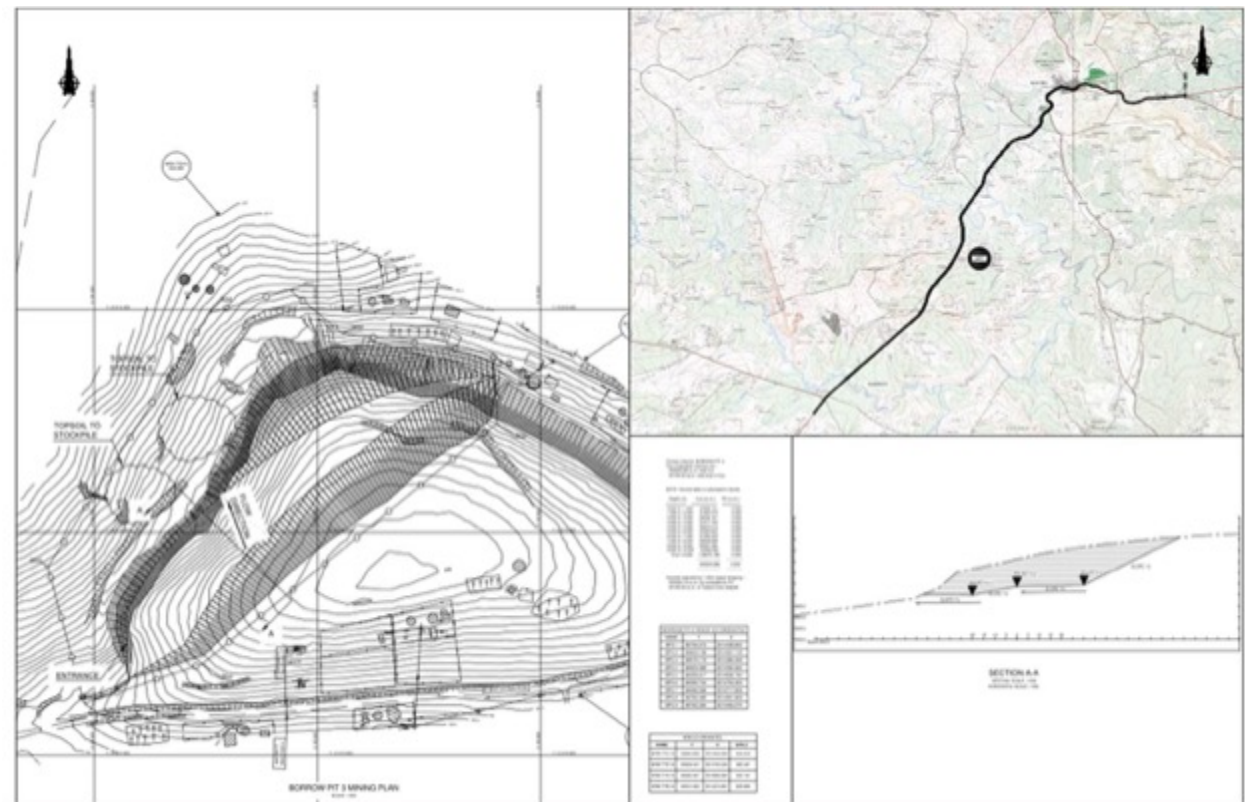


Figure 2. Proposed borrow pit layout



Figure 3. R61 near Ngcobo

2.3 PROJECT LOCATION

The study area is near Ngcobo and Mdeni, in the Engcobo Local Municipality, Chris Hani District Municipality of the Eastern Cape Province. The proposed project is situated on the National Route R61 Section 6 between Ngcobo and Queenstown. The borrow pit is located approximately 750 m off the R61 Section 6 at km 52.6.

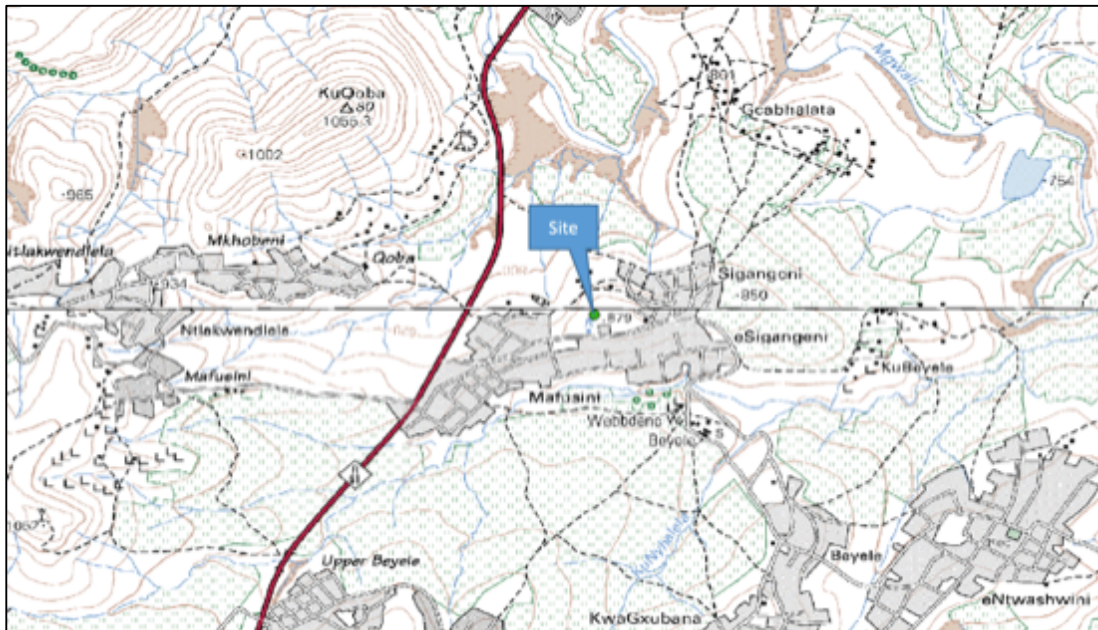


Figure 4. Project Location. Topographical Map 3127 DD 2009 & 3127 DB 2009

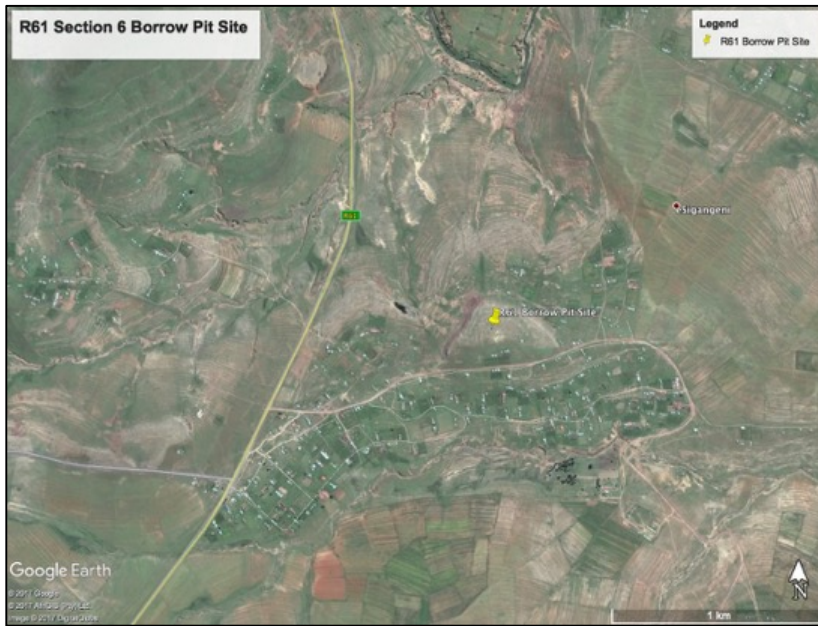


Figure 5. Google Earth Image of the Study Area

2.4 GPS TRACK PATHS

The track path information is available on request from G&A Heritage in GPX format.

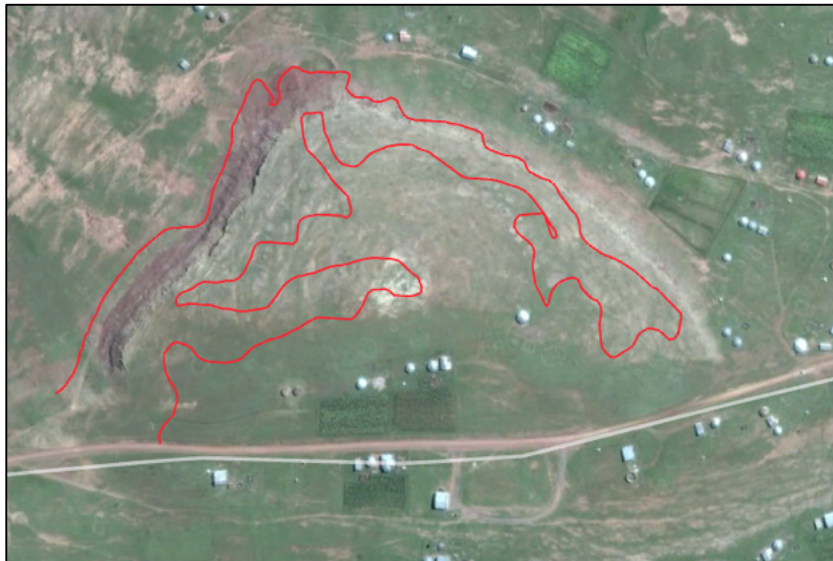


Figure 6. Trackpath

Chapter 2

FINDINGS

"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 RECOGNIZABLY 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

3. REGIONAL CULTURAL CONTEXT

3.1 PALEONTOLOGY

The Burgersdorp Formation sediments underlying the study area are potentially highly fossiliferous, having yielded elsewhere a diverse biota of Early to Mid-Triassic vertebrates, trace fossils and plants. However, in the Engcobo area these rocks are often poorly exposed due to a mantle of colluvium (e.g. doleritic scree) and alluvium. Furthermore, they have been thermally metamorphosed during dolerite intrusion, reducing their palaeontological heritage value. The Karoo dolerites contain no fossils, and the palaeontological sensitivity of the superficial sediments is generally low (Almond, 2010).

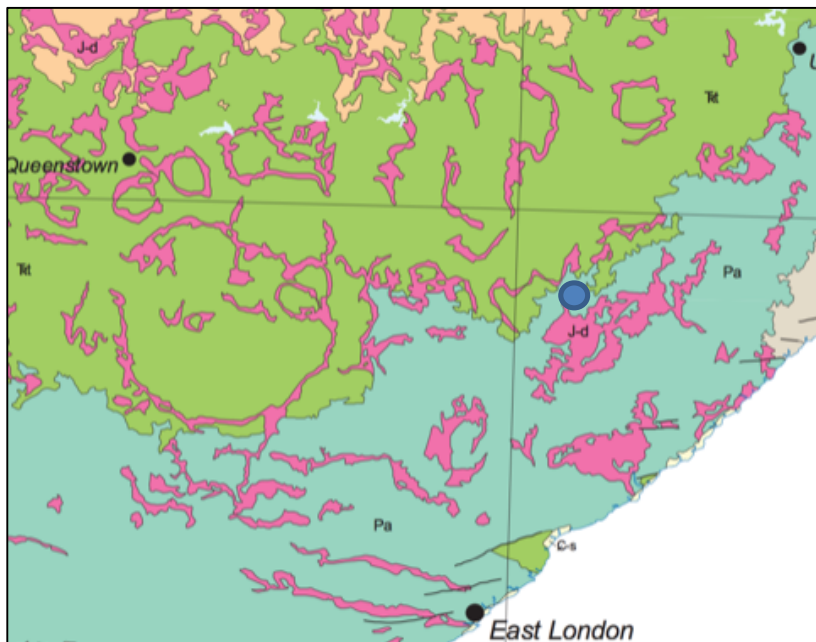


Figure 7. Location of two study areas

It was found that a very similar study was done for a borrow pit less than 6km north of the current study area in 2010. The geological map of South Africa shows that both study areas are underlain by the same formations i.e Early- to Mid-Triassic Burgersdorp Formation, Late-Triassic Molteno

Formation, Early-Jurassic intrusions of the Karoo Dolerite Suite and Late Cenozoic Alluvium.

Since the study areas and the development type as well as the underlying formations are exactly the same it was thought superfluous to commission another study. The relevant study is attached as an addendum to this and the recommendations made in that report is reproduced here.

3.2 STONE AGE

In 1929, archaeologists working in South Africa, devised a system of dividing the Stone Age into 3 periods, namely the Early Stone Age, the Middle Stone Age and the Later Stone Age.

The Early Stone Age (ESA) refers to stone tools made by *Homo erectus* groups and these tools date between 1,7 million and 125 000 thousand years ago. The most distinctive tool types of the ESA are handaxes, which are easy to identify and have been widely reported from the Eastern Cape. Handaxes were reported from the Gorah, but the site has recently been destroyed (Humphreys, 1975). None were discovered inside the study area during this survey, but they are known from the banks of the Bushmen's River. Large numbers of handaxes were excavated from around a spring at an important ESA site called Amanzi (ESA, 1964/65).

The Middle Stone Age (MSA) refers to very different stone tools. They are often triangular shaped or long blades. They are frequently made on more fine-grained stone and show more controlled use of stone. These tools date between 125 000 and 30 000 years ago. At Klasies River Cave near Humansdorp, they are associated with *Homo sapiens* (i.e. modern people). It is quite rare to find MSA remains in caves associated with bone and other food remains (Thackeray, 1983). The majority of MSA sites are surface scatters. Scatters of MSA tools are reported all along the Sundays River Valley, and also inland at Addo Heights and Korhaansvlakte.

The Later Stone Age (LSA) people were ancestral to the San (Bushmen) and Khoekhoen (Hottentot) peoples who lived in Southern Africa between 30 000 years ago and colonial times. During most of the Holocene, South Africa was inhabited by small groups of mobile hunter-gatherers. When they lived at the coast, they exploited the marine resources such as shell fish, seal and sea birds. Many hundreds of shell middens are found along the coast in the Bhishe area. Inland groups frequently lived in caves and rock shelters and there are many sites in the Zuurberg which testify to this (Schauder, 1963). Only a fraction of the caves sites in the area have been investigated but many have rock paintings and at least a shallow archaeological deposit.

Excavations at sites such as Melkhoutboom and Vygeboom have uncovered graves with rich grave goods indicating a complex belief system. The rock art too indicates the San occupants took part in trance before painting. The sites contain well- preserved plant remains which indicate how they utilized their environment (Brooker, 1989). The majority of hunter-gatherer groups had been pushed out of the Zuurberg by the 1820's and was forced to move further inland to escape European settlement on their lands.

Khoekhoen settlement

Sheep and pottery were first introduced to South Africa by pastoralists groups some 2000 years ago. By the 16th and 17th centuries, these tribal groups were spread all along the coastal forelands from Namibia to the Eastern Cape. They were known to the colonists as Hottentots. Today the term Khoikhoi (correct spelling Khoekhoen) is more acceptable. The earliest archaeological evidence for the Khoekhoen in the region comes from Cape St Francis and dates to 300AD.

There are numerous place names, which are derived from Khoekhoen. For example Kaba, Coerney (originally Koerne), Nanaga (although this cannot be confirmed by Nienaber & Raper 1997), Boknes, Gorah, Kabouga, Kariaga, Sapkamma, etc. These names confirm that this part of the Eastern Cape was settled in the 17th and 18th centuries by various Khoekhoen tribal groupings such as the Inqua, Damasqua and Gonaqua. They were absorbed into the colonial lifestyle of the 18th century, becoming farm workers for the Dutch and British or clients of the Xhosa where they were engaged in elephant hunting. A few groups settled at missions such as Enon, Bethelsdorp and Theopolis (*edited from De Klerk, 2002*).



Figure 8. Sundays River Finds - Kudu Ridge Website

3.3 IRON AGE

The first phase of a project to determine the distribution of pre-colonial farming settlement through space and time in the former Transkei, Eastern Cape, was carried out during 1983-87. This archaeological reconnaissance, using a stratified random sampling method, located 15 Early Iron Age settlement sites within and two next to five of the 12 study areas searched. These findings have largely escaped subsequent attention. An additional site was found adjacent to the Great Kei River after the project finished. The distribution and altitude of these sites indicate that they are confined to localities in deeply incised river valleys (as predicted from the pattern in KwaZulu-Natal), but at decreasing distances from the sea and declining altitudes in a southwesterly direction across the Eastern Cape. This might reflect the operation of a human rather than a physical geographical factor. One possibility is the early presence of Khoekhoen herders, perhaps with seasonal camps along rivers, westward of about 29°E. The distribution of a) rivers with names derived from Khoekhoen, b) isiXhosa dialects with a strong Khoekhoen component, and c) herder pottery along the coastline, all strongly support this proposal. The geographic limit of Early Iron Age settlement south-westward of East London remains to be determined. Woodland disturbance by early farmers in the larger, incised river valleys would have initiated processes of plant succession in a geographical patch-work in the later first millennium AD, that continue in places today, albeit with far greater intensity. This can be relevant to the management of such vegetation in protected areas (Feely, J. M.; Bell-Cross, S. M., 2011).

Early Xhosa Settlement

In addition to the Stone Age discussed above, archaeology can also inform us on the early contact period with black farmers in this area. While the majority of black farmers lived to the west of the Fish River, which forms an important ecological boundary between summer (eastern) and winter (western) rainfall, the *amaRharabe* were settled around Bedford/Fort Beaufort, while the *amaGcaleka* were living along the coastal areas around 1820.

Of particular interest in terms of this research, is the tantalizing possibility that the headquarters of two Xhosa chiefs were located here. These two sites have not been explored, but they offer the opportunity of archaeological research, which may inform us of 19th century Xhosa kraals.

The first site is '*Congoskraal*'. It was reported to WHR Gess (an amateur archaeologist) in 1962. According to his accounts 'we have the suspicion that this is a Bantu site, as the farm was ca. 1820 the home of a Bantu chief'. According to Skead (2002) this would have been *Chungwa's Kraal*. *Chungwa* was a *Gqunukhwebe* (a mixed *Khoekhoen/Xhosa* group) Chief. There is a small hill nearby which is now called Bailey's Kop, but which the local Xhosa calls *Ntaba kwaChungwa*.

The second Xhosa kraal is reputed to be that of Chief *Habona* of the '*Donge*' and was reported to have been near the Zuurberg Pass in the late 18th century. After coming across this

reference, our attention was drawn by John Adendorff to some aerial photographs, which showed several circular stone features on the farm Bassons Kloof. These stone circles resemble stone kraals, which clearly need to be investigated to determine their age (*edited from De Klerk, 2002*).

3.4 THE HISTORIC ERA

“On 1 November 1859, a day known in the Christian calendar as All Saints Day, Chief Fubu of the amaQwathi met with Archdeacon Waters and the Rev John Gordon of the Society for the Propagation of the Gospel in Foreign Parts (SPG). As a result they were granted a stretch of land in the Xuka valley, and soon thereafter the All Saints mission station was founded on the site under the leadership of the Rev Gordon. In 1876 Walter Stanford arrived at the station to take up his appointment as Resident Magistrate to the amaQwathi. He established the seat of his magistracy some some 8km from the station on a site known locally as Engcobo, a Xhosa term meaning "a green place next to a stream". In 1879 the amaQwathi rose in rebellion and, during the ensuing hostilities, both the mission and the magistracy were burnt to the ground, forcing their residents to flee. Following the surrender of the amaQwathi, the magistracy was re-established at Ngcobo in 1881.

Ngcobo Local Municipality is an administrative area in the Chris Hani District of the Eastern Cape in South Africa. Ngcobo is an isiXhosa name for a sweet grass found in the area.

Nelson Mandela received an excellent education by the standards for Xhosa boys of his time, here. His conscience was pricked early by the imperial attitudes embedded in his missionary education.

Intending to gain skills needed to become a privy councillor for the Thembu royal house, Mandela began his secondary education at Clarkebury Boarding Institute in Engcobo, a Western-style institution that was the largest school for black Africans in Thembuland.” (<http://www.sahistory.org.za/place/ngcobo>)

Walter Max Ulyate Sisulu (18 May 1912 – 5 May 2003), the South African anti-apartheid activist, was born in Ngcobo. He joined the ANC in 1941. In 1943, together with Nelson Mandela and Oliver Tambo, he joined the ANC Youth League, founded by Anton Lembede, of which he was initially the treasurer.

Sisulu was a political networker and had a prominent planning role in the militant *Umkhonto we Sizwe* ("Spear of the Nation"). He was made secretary general of the ANC in 1949, displacing the more passive older leadership, and held that post until 1954. He also joined the South African Communist Party.

As a planner of the Defiance Campaign from 1952, he was arrested that year and given a suspended sentence. He was jailed seven times in the next ten years, including five months in 1960, and was held under house arrest in 1962. At the Treason Trial (1956–1961), he was eventually sentenced to six years, but was released on bail pending his appeal. He went underground in 1963, resulting in his wife being the first woman arrested under the General Laws Amendment Act of 1963. He was caught at Rivonia on 11 July, along with 16 others. At the conclusion of the Rivonia Trial (1963–1964), he was sentenced to life imprisonment on 12 June 1964. With other senior ANC figures, he served the majority of his sentence on Robben Island.

In October 1989, he was released after 26 years in prison, and in July 1991 was elected ANC deputy president at the ANC's first national conference after its unbanning the year before. He remained in the position until after South Africa's first democratic election in 1994.

Traditionally known as emaQwathini (the land of the Qwathi people), the town of Ngcobo has evolved to accommodate many nationalities. Recently, this town is a home to many Chinese, Pakistani, North African traders and more. The first non-Xhosa professionals to settle in this area were Indian doctors working at All Saints Hospital and Ghanaian teachers who flooded the whole of the Transkei in the 1980s.

3.5 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.



Figure 9. Cultural Landscape

3.6 PREVIOUS STUDIES

An extensive research into the SAHRIS database resulted in the identification of the following heritage related studies that have been performed over the last decade in the study area. Only studies within a radius of 50km from the study area were considered.

- Anderson, G. 2015. Heritage Survey for the Ngcobo WWTW, Eastern Cape.
- Van Ryneveld, K. 2011. Bulk Rising Main East, Ngcobo Cluster, Eastern Cape, South Africa.
- Van Ryneveld, K. 2011. Gqaga Villages Water Reticulation Supply Scheme – Bulk Water Supply: Ngcobo Cluster 6, Eastern Cape, South Africa.
- Van Ryneveld, K. 2011. Manzimdaka Villages Water Reticulation Supply Scheme – Bulk Water Supply Backlog: Ngcobo Cluster 6, Eastern Cape, South Africa.
- Van Ryneveld, K. 2011. Qutubeni Villages Water Reticulation Supply Scheme: Bulk Water Supply Backlog-Ngcobo Cluster 6 (Lugolweni, Mareleni, Sidindi, Empindweni, Engxangxasi, Silindini and Hala Villages), Qutubeni, Eastern Cape, South Africa.
- Kruger, N. 2013. Archaeological Impact Assessment for the Ngcobo Cluster 6 Rising Main West Bulk Water Supply Scheme, Upper Gcaka Area, Eastern Cape Province.
- Van Schalkwyk, L., Wahl, E. 2010. Heritage Impact Assessment of Aggregate Mining on Unregistered State Land AA17 (Goso), Ngcobo Local Municipality, Eastern Cape Province, South Africa.
- Rossouw, L., Van Ryneveld, K. 2012. Phase 1 Palaeontological Impact Assessment of a Cluster 6 Borrow Pit Site, 30km northeast of Engcobo, Eastern Cape Province; and Phase 1 Archaeological Impact Assessment – Utilization of Existing Borrow Pit (Cluster 6 Bulk Water Supply Project), Engcobo, Eastern Cape, South Africa.
- Almond, J.E. 2010. Phase 1 Palaeontological Impact Assessment. Borrow Pit near Engcobo, Chris Hani District Municipality, Eastern Cape Province.
- Anderson, G. 2016. Heritage Survey of the Three Borrow Pits for Road Upgrades, Umthatha, Eastern Cape.
- Van Ryneveld, K. 2011. The Qumanco Borrow Pit, near Engcobo, Chris Hani District Municipality, Eastern Cape, South Africa.
- Van Schalkwyk, L. 2002. Cultural Heritage Assessment of Proposed Upgrade of District road 08257 between Engcobo and Idutywa, Eastern Cape Province, south Africa.
- Prins, F., Hall, S. 2011. Cultural Heritage Impact Assessment for the R61 Section 6 Road Upgrade Project between Cofinvaba and Engcobo, Eastern Cape.

3.7 HISTORICAL MAPS

Four versions of each (3127 DD 2009, 1995, 1982 and 1964 & 3127 DB 2009, 2001, 1981 and 1964) of the Surveyor General's 1:50 000 topographic map sets could be found during the archival study.

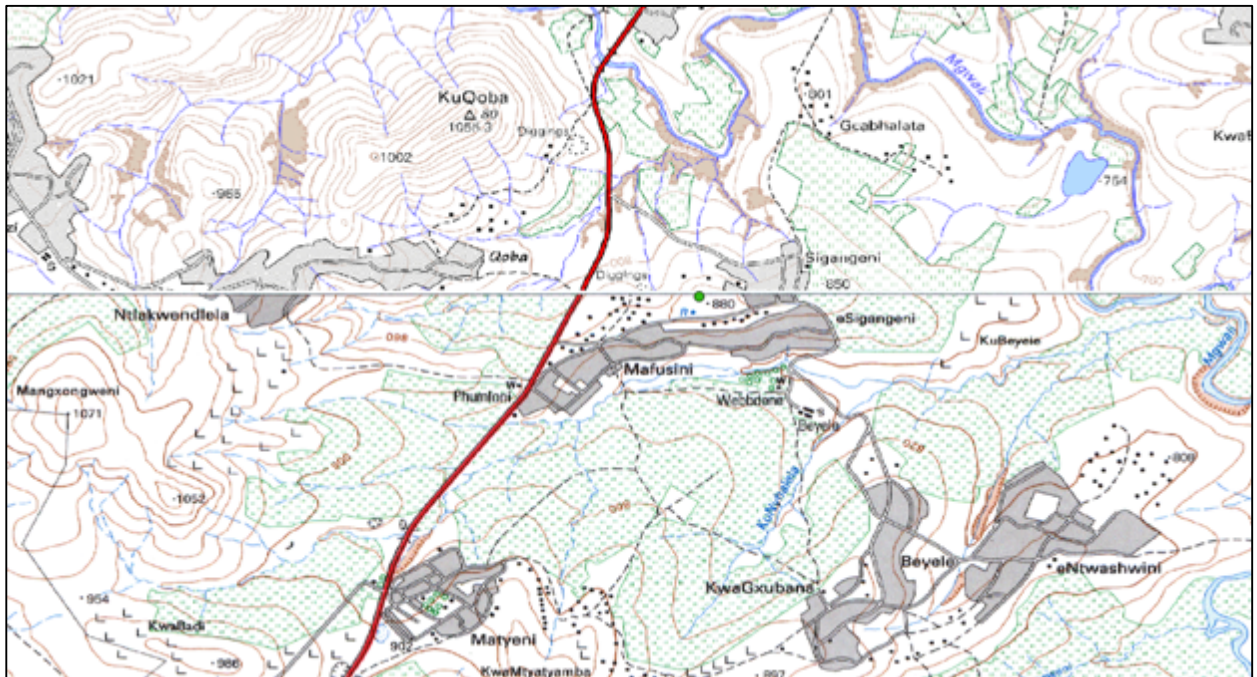


Figure 10. Topographical Map 3127 DD 1995 & 3127 DB 2001

Some structures are identified on the historical map 3127 DD 1995, which would mean that these are at least 22 years old, however not protected under the NHRA.

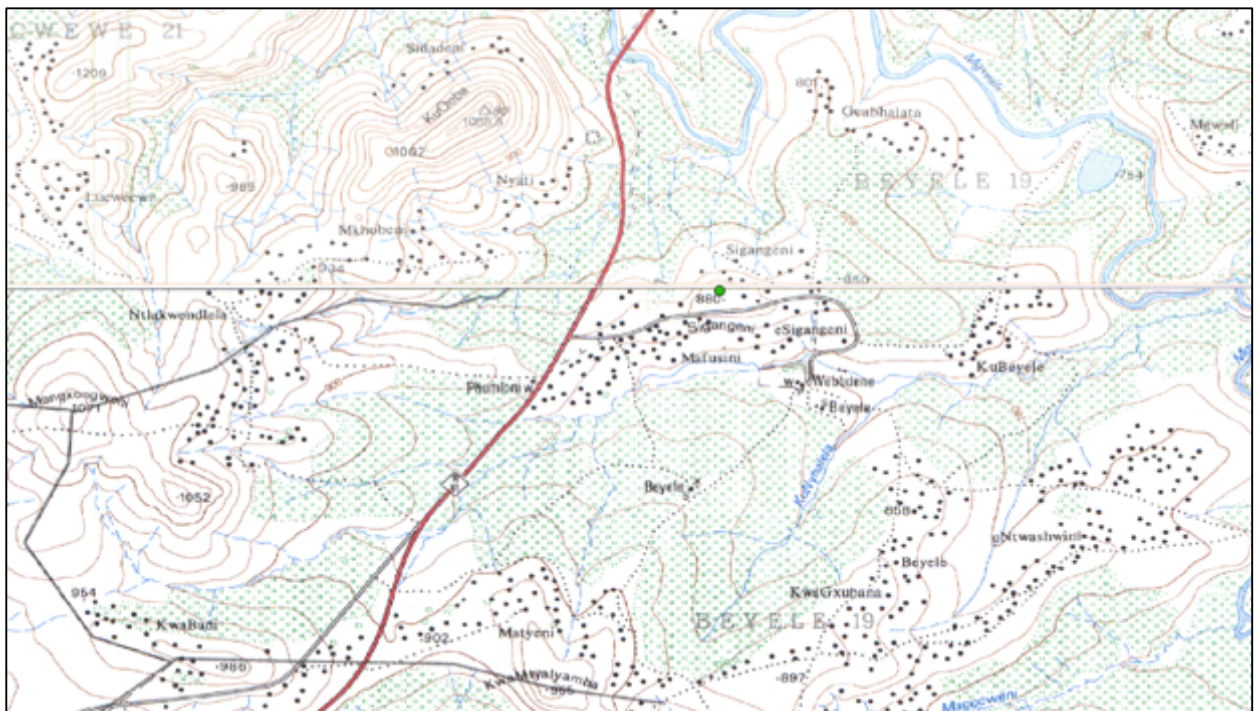


Figure 11. Topographical Map 3127 DD 1982 & 3127 DB 1981

Several structures are identified on the historical map 3127 DD 1982 and 3127 DB 1981. These buildings could thus not be older than 36 years and are therefore not protected under the NHRA.

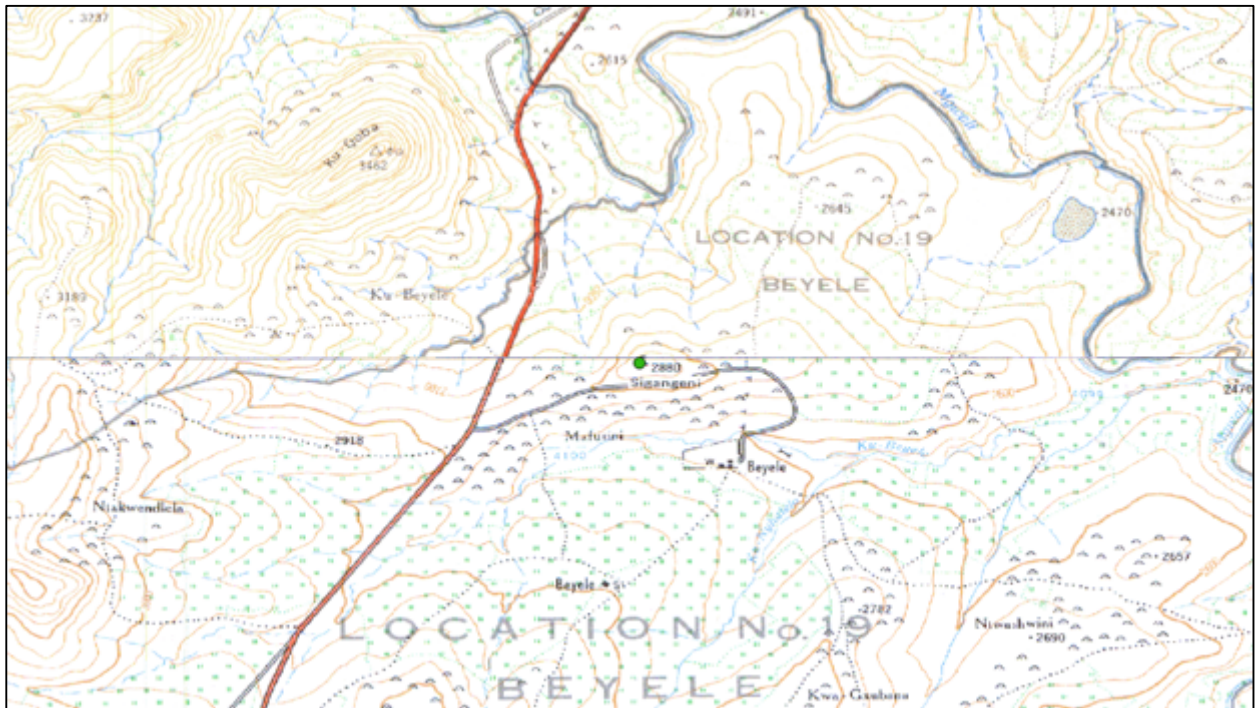


Figure 12. Topographical Map 3127 DD 1964 & 3127 DB 1964

Some structures are identified on the historical map 3127 DD 1964 and 3127 DB 1964. These buildings could thus not be older than 53 years and are therefore not protected under the NHRA.

4. FINDINGS

The study area was found to be

4.1 GRAVE AND BURIAL SITES

Several informal grave and burial sites were identified in and around the study area. In total 33 graves were identified, however there might be several more unidentified graves.



Figure 13. Burial Site



Figure 14. Burial Site

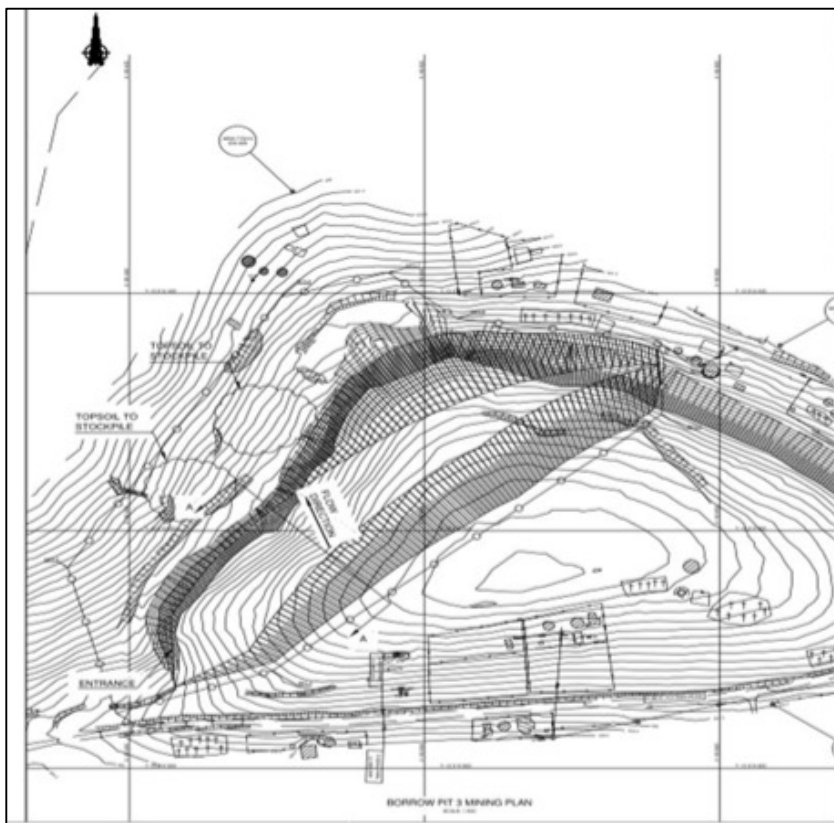


Figure 15. Burial sites indicated with crosses on surveyed map

5. PUBLIC PARTICIPATION

During the course of the fieldwork, the community liaison officer was asked to convene a meeting of elders and other interested and affected parties. This meeting took place on the 12th of October 2017 at the local headman's kraal. Several people including the local tribal council was present. A copy of the attendance register can be requested from the client.



Figure 16. Headman's kraal

The issue of the location and sensitivity of the graves were discussed with this group. They indicated that their ancestors have been buried on this hill for a long time and that they consider the hill to be a sacred heritage site for the inhabitants of the local villages. The grave sites are often visited when communing with the spirits of their deceased relatives.

Although the site was indicated as sacred, the elders indicated their appreciation that it was being taken into consideration during the lead up to the development. They indicated that the graves could possibly be relocated, however there will need to be a comprehensive social impact assessment to determine the specific wishes of every family member. The families indicated that they did not want an undertaker with an excavator to just come in and rip their remains up, but that a cultural process needs to be followed.



Figure 17. Community meeting



Figure 18. Elders of the village

6. METHODOLOGY

This study defines the heritage component of the EIA process being undertaken for the Proposed SANRAL R61 Section 6 Borrow Pit in the Engcobo Local Municipality, Chris Hani District Municipality of the Eastern Cape Province. 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.

5.1 INVENTORY

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed development area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific developments, direct implementation of an inventory study may preclude the need for an overview.

There are several different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation (*Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy 1984*).

5.2 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 centres 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 (South African Heritage Resource Agency) 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 (South African Heritage Resources Information System) Database of Heritage Studies
- Internet Search
- Historic Maps
- 1964, 1981, 1982, 1995, 2001 and 2009 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2017 imagery
- Published articles and books
- JSTOR Article Archive

5.3 FIELDWORK

Fieldwork for this study was performed on the 12th of October 2017. Most of the areas were found to be accessible on foot. The survey was tracked using GPS and a track file in GPX format is available on request.

The study was mainly focused on systematic field surveys of the study area.

Areas with less development impact was investigated closer to determine whether any sites of heritage value could still occur sub-surface, however no indications of such sites were evident (such as graves, shell middens, disposed pot sherd etc.).

Where sites were identified, it was documented photographically and plotted using GPS with the WGS 84 datum point as reference. GPX files are available on request from G&A Heritage.

The study area was surveyed using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by foot. This technique has proven to result in the maximum coverage of an area. This action is defined as;

'an archaeologist being present in the course of the carrying-out of the development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works' (DAHGI 1999a, 28).

Standard archaeological documentation formats were employed in the description of sites. Using standard site documentation forms as comparable medium, it enabled the surveyors to evaluate the relative importance of sites found. Furthermore, GPS (Global Positioning System) readings of all finds and sites were taken. This information was then plotted using a **Garmin Colorado** GPS (WGS 84-datum).

Indicators such as surface finds, plant growth anomalies, local information and topography were used in identifying sites of possible archaeological importance. Test probes were done at intervals to determine sub-surface occurrence of archaeological material. The importance of sites was assessed by comparisons with published information as well as comparative collections.

Test excavation is that form of archaeological excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location, which it is proposed to develop (though not normally to fully investigate those deposits or features) and allow an assessment to be made of the archaeological impact of the proposed development. It may also be referred to as archaeological testing' (DAHGI 1999a, 27).

'Test excavation should not be confused with, or referred to as, archaeological assessment which is the overall process of assessing the archaeological impact of development. Test excavation is one of the techniques in carrying out archaeological assessment which may also include, as appropriate, documentary research, field walking, examination of upstanding or visible features or structures, examination of aerial photographs, satellite or other remote sensing imagery, geophysical survey, and topographical assessment' (DAHGI 1999b, 18).

7. MEASURING IMPACTS

In 2003, the SAHRA (South African Heritage Resources Agency) compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

6.1 TYPE OF RESOURCE

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

6.2 TYPE OF SIGNIFICANCE

6.2.1 HISTORIC VALUE

It is important in the community, or pattern of history

- Important in the evolution of cultural landscapes and settlement patterns
- Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- 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.
- 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 organization of importance in history

- 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

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

6.2.2 AESTHETIC VALUE

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

- Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- Importance for its creative, design or artistic excellence, innovation or achievement.
- 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.
- 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.

6.2.3 SCIENTIFIC VALUE

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

- 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.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- 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.
- 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.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period

- Importance for its technical innovation or achievement.

(a) Does the site contain evidence, which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?

- internal stratification and depth
- chronologically sensitive cultural items
- materials for absolute dating
- association with ancient landforms
- quantity and variety of tool type
- distinct intra-site activity areas
- tool types indicative of specific socio-economic or religious activity
- cultural features such as burials, dwellings, hearths, etc.
- diagnostic faunal and floral remains
- exotic cultural items and materials
- uniqueness or representativeness of the site
- integrity of the site

(b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?

- monitoring impacts from artificial or natural agents
- site preservation or conservation experiments
- data recovery experiments
- sampling experiments
- intra-site spatial analysis

(c) Does the site contain evidence which can make important contributions to paleoenvironmental studies?

- topographical, geomorphological context
- depositional character
- diagnostic faunal, floral data

(d) Does the site contain evidence which can contribute to other scientific disciplines such as hydrology, geomorphology, pedology, meteorology, zoology, botany, forensic medicine, and environmental hazards research, or to industry including forestry and commercial fisheries?

6.2.4 SOCIAL VALUE / PUBLIC SIGNIFICANCE

- 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.

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

- integrity of the site
- technical and economic feasibility of restoration and development for public use
- visibility of cultural features and their ability to be easily interpreted
- accessibility to the public
- opportunities for protection against vandalism
- representativeness and uniqueness of the site
- aesthetics of the local setting
- proximity to established recreation areas
- present and potential land use
- land ownership and administration

- legal and jurisdictional status
- local community attitude toward development

(b) Does the site receive visitation or use by tourists, local residents or school groups?

6.2.5 ETHNIC SIGNIFICANCE

(a) Does the site presently have traditional, social or religious importance to a particular group or community?

- ethnographic or ethno-historic reference
- documented local community recognition or, and concern for, the site

6.2.6 ECONOMIC SIGNIFICANCE

What value of user-benefits may be placed on the site?

- visitors' willingness-to-pay
- visitors' travel costs

6.2.7 SCIENTIFIC SIGNIFICANCE

(a) Does the site contain evidence, which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?

(b) Does the site contain evidence, which can make important contributions to other scientific disciplines or industry?

6.2.8 HISTORIC SIGNIFICANCE

(a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa's cultural development?

(b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?

(c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?

(d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?

6.2.9 PUBLIC SIGNIFICANCE

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

- visibility and accessibility to the public
- ability of the site to be easily interpreted
- opportunities for protection against vandalism
- economic and engineering feasibility of reconstruction, restoration and maintenance
- representativeness and uniqueness of the site
- proximity to established recreation areas
- compatibility with surrounding zoning regulations or land use
- land ownership and administration
- local community attitude toward site preservation, development or destruction
- present use of site

- (b) Does the site receive visitation or use by tourists, local residents or school groups?

6.2.10 OTHER

- (a) Is the site a commonly acknowledged landmark?
- (b) Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?
- (c) Is the site a good typical example of an early structure or device commonly used for a specific purpose throughout an area or period of time?
- (d) Is the site representative of a particular architectural style or pattern?

6.3 DEGREES OF SIGNIFICANCE

6.3.1 SIGNIFICANCE CRITERIA

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating heritage resources. For any site, explicit criteria are used to measure these values. Checklists of criteria for evaluating pre-contact and post-contact archaeological sites are provided in. These checklists are not intended to be exhaustive or inflexible. Innovative approaches to site evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluated criteria.

Site integrity, or the degree to which a heritage site has been impaired or disturbed as a result of past land alteration, is an important consideration in evaluating site significance. In this regard, it is important to recognize that although an archaeological site has been disturbed, it may still contain important scientific information.

Heritage resources may be of scientific value in two respects. The potential to yield information, which, if properly recovered, will enhance understanding of Southern African human history, is one appropriate measure of scientific significance. In this respect, archaeological sites should be evaluated in terms of their potential to resolve current archaeological research problems. Scientific significance also refers to the potential for relevant contributions to other academic disciplines or to industry.

Public significance refers to the potential a site has for enhancing the public's understanding and appreciation of the past. The interpretive, educational and recreational potential of a site are valid indications of public value. Public significance criteria such as ease of access, land ownership, or scenic setting are often external to the site itself. The relevance of heritage resource data to private industry may also be interpreted as a particular kind of public significance.

Ethnic significance applies to heritage sites which have value to an ethnically distinct community or group of people. Determining the ethnic significance of an archaeological site may require consultation with persons having special knowledge of a particular site. It is essential that ethnic significance be assessed by someone properly trained in obtaining and evaluating such data.

Historic archaeological sites may relate to individuals or events that made an important, lasting contribution to the development of a particular locality or the province. Historically important sites also reflect or commemorate the historic socioeconomic character of an area. Sites having high historical value will also usually have high public value.

The economic or monetary value of a heritage site, where calculable, is also an important indication of significance. In some cases, it may be possible to project monetary benefits derived from the public's use of a heritage site as an educational or recreational facility. This may be accomplished by employing established economic evaluation methods; most of which have been developed for valuating outdoor recreation. The objective is to determine the willingness of users, including local residents and tourists, to pay for the experiences or services the site provides even though no payment is presently being made. Calculation of user benefits will normally require some study of the visitor population (*Smith, L.D. 1977*).

6.3.2 RARITY

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

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

6.3.3 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			

1. ASSESSMENT OF HERITAGE POTENTIAL

7.1 ASSESSMENT MATRIX: DETERMINING ARCHAEOLOGICAL SIGNIFICANCE

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (J) and Whitelaw (1997) for assessing archaeological significance has been developed for Eastern Cape settings (Morris 2007a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

Estimating site potential

Table 1 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon and, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, could be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 1: Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky Surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace

L3	Sandy ground, inland	Far from water	In floodplain or near features such as hill/dune	On old river terrace
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Loping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell of bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5m thick	Deposit >0.5 m thick

Table 2: Site attributes and value assessment (adopted from Whitelaw 1997 as used in Morris)

Class	Landforms	Type 1	Type 2	Type 3
1	Length of sequence /context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

7.2 ASSESSING SITE VALUE BY ATTRIBUTE

Table 2 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 significance.

7.3 IMPACT STATEMENT

7.3.1 ASSESSMENT OF IMPACTS

A heritage resource impact may be broadly defined as the net change between the integrity of a heritage

site with and without the proposed development. This change may be either beneficial or adverse.

Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions, which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.

More commonly, the effects of a project on heritage sites are of an adverse nature. Adverse impacts occur under conditions that include:

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

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.

Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon heritage sites. Increased vandalism of heritage sites, resulting from improved or newly introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on heritage resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what heritage values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined below:

- magnitude
- severity
- duration
- range
- frequency
- diversity
- cumulative effect
- rate of change

7.3.2 INDICATORS OF IMPACT SEVERITY

Magnitude

The amount of physical alteration or destruction, which can be expected. The resultant loss of heritage value is measured either in amount or degree of disturbance.

Severity

The irreversibility of an impact. Adverse impacts, which result in a totally irreversible and irretrievable loss of heritage value, are of the highest severity.

Duration

The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on heritage sites.

Range

The spatial distribution, whether widespread or site-specific, of an adverse impact.

Frequency

The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or on-going nature.

Diversity

The number of different kinds of project-related actions expected to affect a heritage site.

Cumulative Effect

A progressive alteration or destruction of a site owing to the repetitive nature of one or more impacts.

Rate of Change

The rate at which an impact will effectively alter the integrity or physical condition of a heritage site. Although an important level-of-effect indicator, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment. (*Zubrow, Ezra B.A., 1984*).

7.3.3 POST-CONTACT SITES

No sites associated with the post-contact era will be affected by the proposed development.

7.3.4 BUILT ENVIRONMENT

Several structures associated with rural living were identified;

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

7.3.5 HISTORIC SIGNIFICANCE

Built Environment within the Study Area.

No	Criteria	Significance Rating
1	Are any of the identified sites or buildings associated with a historical person or group? N/A	N/A
2	Are any of the buildings or identified sites associated with a historical event? N/A	N/A
3	Are any of the identified sites or buildings associated with a religious, economic social or political or educational activity? N/A	N/A
4	Are any of the identified sites or buildings of archaeological significance? N/A	N/A
5	Are any of the identified buildings or structures older than 60 years? No	N/A

7.3.6 ARCHITECTURAL SIGNIFICANCE

No	Criteria	Rating
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1	Are any of the buildings or structures an important example of a building type? N/A	N/A
2	Are any of the buildings outstanding examples of a particular style or period? N/A	N/A
3	Do any of the buildings contain fine architectural details and reflect exceptional craftsmanship? N/A	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? N/A	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	N/A
7	Were the alterations done in sympathy with the original design? N/A	N/A
8	Were the additions and extensions done in sympathy with the original design? N/A	N/A
9	Are any of the buildings or structures the work of a major architect, engineer or builder? No	N/A

7.3.7 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	N/A
2	Do any of the buildings contribute to the character of the neighborhood? No	N/A
3	Do any of the buildings contribute to the character of the square or streetscape? No	N/A
4	Do any of the buildings form part of an important group of buildings? No	N/A

8. 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 heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

8.1 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.

8.2 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.

8.3 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.

9. ANTICIPATED IMPACT OF THE DEVELOPMENT

9.1 PROPOSED SANRAL R61 SECTION 6 BORROW PIT:

9.1.1 OBSCURED OR BURIED HERITAGE SITES OF SIGNIFICANCE EXCLUDING PALAEOLOGY

IMPACT TABLE FORMAT			
Heritage component	<i>Heritage sites of significance excluding Palaeontology</i>		
Issue/Impact/Heritage Impact/Nature	<i>Proposed SANRAL R61 Section 6 Borrow Pit in the Engcobo Local Municipality, Chris Hani District Municipality of the Eastern Cape Province.</i>		
<i>Extent</i>	<i>Local</i>		
<i>Probability</i>	<i>Unlikely</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>High cumulative effect</i>		
<i>Intensity/magnitude</i>	<i>High</i>		
<i>Significance Rating of Potential Impact</i>	<i>39 points. The impact will have a medium high negative impact rating.</i>		
	<table border="1"> <tr> <td>Pre-mitigation impact rating</td> <td>Post mitigation impact rating</td> </tr> </table>	Pre-mitigation impact rating	Post mitigation impact rating
Pre-mitigation impact rating	Post mitigation impact rating		

Extent	2	2
Probability	1	1
Reversibility	3	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	2	1
Intensity/magnitude	3	1
Significance rating	39 (low negative)	8 (low negative)
Mitigation measure	<i>Should any sites be identified during the construction phase of the project the attached recommendations should be followed in the mitigation of them.</i>	

9.1.2 GRAVES

IMPACT TABLE FORMAT		
Heritage component	<i>Graves</i>	
Issue/Impact/Heritage Impact/Nature	<i>Borrow Pit</i>	
<i>Extent</i>	<i>Local</i>	
<i>Probability</i>	<i>Definite</i>	
<i>Reversibility</i>	<i>Irreversible</i>	
<i>Irreplaceable loss of resources</i>	<i>Complete Loss</i>	
<i>Duration</i>	<i>Medium term</i>	
<i>Cumulative effect</i>	<i>High cumulative effect</i>	
<i>Intensity/magnitude</i>	<i>High</i>	
<i>Significance Rating of Potential Impact</i>	<i>80 points. The impact will have a very high negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	4	1
Reversibility	4	2
Irreplaceable loss	4	1
Duration	2	2
Cumulative effect	4	1
Intensity/magnitude	4	1
Significance rating	80 (low negative)	8 (low negative)
Mitigation measure	<i>All affected graves are to be relocated to the area of choice indicated by the families.</i>	

9.2 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.

Since the project will mainly involve sub-surface infrastructure it is not anticipated that any visual impacts will be encountered. Pump stations will also be of low profile and will therefore have a minimum of impact.

9.3 ASSUMPTIONS AND RESTRICTIONS

- It is assumed that the South African Heritage Resources Information System (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 Basic Assessment will result in the identification of any intangible sites of heritage potential.

10. ASSESSMENT OF IMPACTS (IMPACT STATEMENTS)

10.1 BUILT ENVIRONMENT

Some structures associated with rural living were identified;

- Brick outbuildings (modern and historic)
- Barb-wire fences (modern)
- Dirt roads (modern)
- Footpaths
- Cement Road

Mitigation

None of the structures will be affected by the construction activities and none are considered to be of heritage value.

10.2 PALEONTOLOGY

The Burgersdorp Formation sediments underlying the study area are potentially highly fossiliferous, having yielded elsewhere a diverse biota of Early to Mid Triassic vertebrates, trace fossils and plants.

However, in the Engcobo area these rocks are often poorly exposed due to a mantle of colluvium (e.g. doleritic scree) and alluvium. Furthermore, they have been thermally metamorphosed during dolerite intrusion, reducing their palaeontological heritage value. The Karoo dolerites contain no fossils, and the palaeontological sensitivity of the superficial sediments is generally low.

The proposed mining of road material in the borrow pit will involve the excavation of substantial volumes of fresh bedrock of the Burgersdorp Formation that is potentially fossiliferous. However, the relatively small scale of the operation does not warrant monitoring or mitigation by a qualified palaeontologist. The responsible ECO should be alerted to the possibility of scientifically valuable fossil material being exposed by quarrying in the study area, for example through the attached report.

Should substantial fossil remains (notably articulated vertebrate skeletons or skulls) be exposed during construction, however, the ECO should safeguard these - in situ, where feasible. SAHRA and / or a professional palaeontologist should then be alerted as soon as possible so that appropriate mitigation measures can be implemented (Almond, 2010).

10.3 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, sub-surface	No
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 	Yes	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. 	No	No
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, 	No	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 consider the positive and negative characteristics of the existing cultural landscape type and that they endeavour to promote the positive aspects while at the same time mitigating the negative aspects.

11. 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.
- No media statements should be released until the heritage practitioner has had sufficient time to analyze the finds.

12. CONCLUSION

The SANRAL R61 Section 6 Borrow Pit in the Engcobo Local Municipality, Chris Hani District Municipality of the Eastern Cape was investigated and found to contain a substantial number of graves and burial sites. These should be relocated before the commencement of construction or excavation.

The site is also underlain by highly fossiliferous material from the Burgersfort Formation. Excavations should be monitored and if large amounts of fossiliferous material are unearthed it should be reported to the local heritage authority.

Provided the recommendations in this report is followed there is no reason, from a heritage point of view, why this development cannot continue.

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