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**EXXARO BELFAST EXPANSION PROJECT: PHASE 1 CULTURAL
HERITAGE IMPACT ASSESSMENT STUDY WITHIN THE
JURISDICTION OF EMAKHAZENI LOCAL MUNICIPALITY OF
NKANGALA DISTRICT IN THE MPUMALANGA PROVINCE.**

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DECLARATION

ABILITY TO CONDUCT THE PROJECT

Alvord Nhundu is a professional archaeologist. He completed his Bachelor of Science with Honours degree in archaeology with the University of the Witwatersrand (Wits) and Masters in Archaeology with the University of Pretoria (UP). His research interest lies in old and new world archaeology, palaeoenvironmental and climatology, archaeological theory, Later Stone Age, rock art, hunter-gatherers, hunter-gatherer interactions, several aspects of Southern African Iron Age and Indigenous archaeologies. Alvord is an accredited Cultural Resource Management (CRM) member of the Association of southern African Professional Archaeologists (ASAPA #338). He is also affiliated to Society of South Africanist Archaeologists (SAfA) and the International Council of Archaeozoology (ICAZ). He has been practising CRM for more than 7 years, and has completed over 100 Archaeological Impact Assessments (AIA) for developmental projects in the Limpopo, Mpumalanga, North-West, Eastern Cape, Free State and KwaZulu Natal provinces of South Africa. The projects include establishment and upgrade of power substations, road construction, and establishment and expansion of mines. He has also conducted the relocation of graves. His detailed CV is available on request.

Munyadziwa Magoma is a professional archaeologist, having obtained his BA degree in Archaeology and Anthropology at University of South Africa (UNISA), an Honours degree at the University of Venda (UNIVEN), and a Master's degree at the University of Pretoria (UP). He is an accredited Cultural Resource Management (CRM) member of the Association for Southern African Professional Archaeologists (ASAPA) and Amafa aKwaZulu-Natali. Munyadziwa is further affiliated to the South African Archaeological Society (SAAS), the Society of Africanist Archaeologists (SAfA), Historical Association of South Africa (HESA); Anthropology Southern Africa (ASnA); International Association for Impact Assessment (IAIASa); International Council on Monuments and Sites (ICOMOS) and the International Council of Archaeozoology (ICAZ). He has more than fifteen years' experience in heritage management, having worked for different CRM organisations and government heritage authorities. As a CRM specialist, Munyadziwa has completed well over 1000 hundred Archaeological Impact Assessments (AIA) for developmental projects situated in several provinces of the Republic of South Africa. The AIAs projects he has been involved with are diverse, and include the establishment of major substation, upgrade and establishment of roads, establishment and extension of mines. In addition, he has also conducted Heritage Impact Assessments (HIAs) for the alteration to heritage buildings and the relocation of graves. His detailed CV is available on request.

INDEPENDENCE

We declare that this report has been prepared independently of any influence as may be specified by all relevant departments, institutions and organisations. We act as the independent specialists in this application, and will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant. We declare that there are no circumstances that may compromise our objectivity in performing such work. We vow to comply with all relevant Acts, Regulations and applicable Legislation. Furthermore, Vhubvo Consultancy Cc, which is a company we represent in this application, is an independent service provider and apart from fair remuneration for services rendered, it has no financial interest or vested interest in the proposed project.



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Executive summary

Vhubvo Consultancy Cc has been commissioned by Nsovo Environmental Consulting to conduct a Phase I Cultural Heritage Impact Assessment (HIA) Study for the proposed Belfast Expansion Project (BEP) in eMakhazeni Local Municipality of Nkangala District Municipality, Mpumalanga Province. The study was conducted with the main objective of investigating the availability of archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structures of historical significance that may be affected by the proposed project BEP. The findings of this report have been informed by desktop study and survey. Analysis of the archaeological, cultural heritage, environmental and historic contexts of the study area predicted that archaeological sites, cultural heritage sites, historic structures, burial grounds or isolated artifacts were likely to be present on the affected landscape, as well as around the town of Belfast. This town is named after Charles O'Neil, a descendant of Belfast in Northern Ireland. The historical archaeology of the town dates back to 1847 when Lydenburg was established as a town. In 1858, a war erupted that was ignited by boundary disputes between the Zuid Afrikaansche Republic (ZAR) and the Republic of Lydenburg. The war resulted in the heightened establishment of Belfast. In terms of altitude, the area where Belfast is founded upon is one of the highest in South Africa, measuring 2,025m above sea level. The town is renowned for producing coal and a black granite. During the Anglo-Boer War, several battles took place in and around the town. These include the Battle of Leliefontein and the Battle of Bergendal. The British also built a concentration camp to house women and children who were displaced by war in the area.

Methodology and Approach

The findings of this study have been informed by desktop and field survey. The desktop was undertaken through SAHRIS for previous Heritage Impact Assessments and Archaeological Impact Assessments conducted in the region. As a result, work by amongst others Celiers (2004); de Jongh (2009); Pierre (2016) were analysed and reviewed in the context of the proposed development. The University of Pretoria's library was also utilized and relevant publications there, consulted. These investigations were conducted to determine if there are any known sites around the proposed area. Analysis of these studies predicted that archaeological sites, cultural heritage sites, historic sites, historic structures, historical mining and burial grounds (especially dating to the historical era were likely to be present on the affected landscape). The field survey was carried out to test this hypothesis and verify this forecast within the proposed development area. The survey was conducted on **13 October 2020** by two archaeologists from Vhubvo.

Impact statement

Several Archaeological studies have been conducted around the immediate area of the proposed Belfast Expansion Project (BEP). From these studies, several sites of varying significance were documented. These sites mostly consist of historical farmhouse complexes and associated graveyards in the region of study. The



proposed Belfast Expansion Project will result in various threats to archaeological sites ranging from moderate to high. Thus, the impact of the proposed expansion on archaeological and cultural heritage remains is rated as being medium to high (see Table 1) on all proposed study areas. It is noteworthy that, where the development is linear, the impact will be minimal since the nature of liner project (s) always results in minimal impact to the ground.

Site-Location Model

Archaeologists who do research in the region generally accept a site-location model proposed by Maggs (1980). The model suggests that inland sites will be found in locations which bear the following:

- ✓ Limited to below an altitude of 1000 m asl;
- ✓ Situated on riverside or streamside locations, on deep alkaline colluvial soils; and
- ✓ In areas appropriate for dry-farming (with sufficient summer rainfall).

Survey Findings and Discussions

The phase 1 Archaeological and Cultural Heritage Impact Assessment for the proposed development resulted in the identification of the following

- ✓ A graveyard
- ✓ Historical farmhouse complexes
- ✓ Stonewalling
- ✓ Place of worship
- ✓ Historical households

The Phase I Archaeological and Cultural-Heritage Impact Assessment study for the proposed BEP revealed a grave site, some historical structures, stonewalls and a place of worship in the study area (For easy reference, a table detailing the finds has been offered on page 32).

The cemetery belongs to mine workers. It is demarcated by fence and is active. There are about 30 graves; five of the graves have headstones, while some are marked by stones. The graves are westerly positioned. The graveyard is known by the developer. Burial sites and its contents are accorded the highest heritage accolades in South Africa, and elsewhere, principally by their relation with human beings. Section 36 of the National Heritage Resources Act (3) states that, no person may, without a permit issued by SAHRA or a provincial heritage resources authority: destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. If the grave is less than 60 years of age it is protected against any damage, altering or exhumation by the Human Tissue Act, 1983 (Act 65 of 1983) as well as local regulations.

Historical farmhouse complexes were also noted in the study area. Most of them were built from sunburnt earth bricks, roofed by corrugated iron sheets and with some steel bars. Most of the farmhouses have old rusty farm equipment on the premises. There was also an old historical household in the study area.



Historical stonewalls were also noted and documented. Some appear to be cattle kraal, and some *ovis/capra*. Some of the historical stone-walling is collapsed. The farmhouse complexes and historical stone-walling have medium significance value of over 60 years of age, and most importantly their historical, social and aesthetic value. These structures are considered as heritage situated in the larger history of the region. According to Section 34 (1) of the National Heritage Resources Act no person may alter or demolish any structure or part of it, which is older than 60 years without a permit, issued by the relevant provincial heritage resources in this case Mpumalanga Heritage Resources Authority (MPHRA). Section of the same Act also protects the demolition or altering of any structure in the Republic of South Africa for its cultural significance or other special value.

An old Historical church was also noted in the area. It could not be established if the church is still active. The church is protected by Section 3 of the National Heritage Resources Act 1999 (Act 25 of 1999).

Recommendations and discussions

According to the ratings (see table 3) the proposed activity will have a negative impact on the landscape. Despite the fact that there is no presence of heritage resources in the proposed area, thus it is recommended that there is a need to exercise caution in case heritage resources are discovered during the construction and operational phases. Any alternative option is acceptable as the identified heritage resources are not impacted by the BEP. However, the developer is further reminded that unavailability of archaeological materials on the preferred alternatives does not mean absentee. Archaeological material (e.g., pottery, stone tools, remnants of stone-walling, graves, etc.) and fossils may be located underground. The developer should take precautions during construction. In the event that archaeological materials are unearthed, all activities within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or a SAHRA officer should be contacted immediately.

Pre-construction education and awareness training

Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some of the indicators of archaeological site that may be found during construction:

- ✓ Flaked stone tools, bone tools and loose pieces of flaked stone;
- ✓ Ash and charcoal;
- ✓ Bones and shell fragments;
- ✓ Artefacts (e.g., beads or hearths);
- ✓ Packed stones which might be uncounted underground, and might indicate a grave or collapse stone walling.



In the event that any of the above are unearthed, all mining within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or Provincial Heritage Resources Authority Mpumalanga (MPHRA) officer should be contacted immediately. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by MPHRA.

Conclusions

A thorough background study and survey of the proposed development was conducted and findings were recorded in line with SAHRA guidelines. It is recommended that the developer proceed with the project subject to the recommendations given above.



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Acronyms and abbreviations

AIA	Archaeological Impact Assessment
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
MIA	Middle Iron Age
EIA	Early Iron Age
HMP	Heritage Management Plan
LSA	Late Stone Age
MSA	Middle Stone Age
ESA	Early Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency



Glossary of terms

The following terms used in this Archaeology are defined in the National Heritage Resources Act [NHRA], Act Nr. 25 of 1999, South African Heritage Resources Agency [SAHRA] Policies as well as the Australia ICOMOS Charter (*Burra Charter*):

Archaeological Material: remains resulting from human activities, which are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures.

Artefact: Any movable object that has been used modified or manufactured by humans.

Conservation: All the processes of looking after a site/heritage place or landscape including maintenance, preservation, restoration, reconstruction and adaptation.

Cultural Heritage Resources: refers to physical cultural properties such as archaeological sites, palaeontological sites, historic and prehistorical places, buildings, structures and material remains, cultural sites such as places of rituals, burial sites or graves and their associated materials, geological or natural features of cultural importance or scientific significance. This include intangible resources such religion practices, ritual ceremonies, oral histories, memories indigenous knowledge.

Cultural landscape: “the combined works of nature and man” and demonstrate “the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both internal and external”.

Cultural Resources Management (CRM): the conservation of cultural heritage resources, management, and sustainable utilization and present for present and for the future generations

Cultural Significance: is the aesthetic, historical, scientific and social value for past, present and future generations.



Chance Finds: means Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities such as water pipeline trench excavations.

Compatible use: means a use, which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance.

Conservation means all the processes of looking after a place so as to retain its cultural significance.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Grave: A place of interment (variably referred to as burial), including the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

Heritage impact assessment (HIA): Refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorization of permission by law and which may significantly affect the cultural and natural heritage resources. The HIA includes recommendations for appropriate mitigation measures for minimizing or avoiding negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Historic Material: remains resulting from human activities, which are younger than 100 years, but no longer in use, including artifacts, human remains and artificial features and structures.

Impact: the positive or negative effects on human well-being and / or on the environment.

In situ material: means material culture and surrounding deposits in their original location and context, for instance archaeological remains that have not been disturbed.



Interested and affected parties Individuals: communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/ or who are concerned with a proposal or activity and its consequences.

Interpretation: means all the ways of presenting the cultural significance of a place.

Late Iron Age: this period is associated with the development of complex societies and state systems in southern Africa.

Material culture means buildings, structure, features, tools and other artefacts that constitute the remains from past societies.

Mitigate: The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

Place: means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Protected area: means those protected areas contemplated in section 9 of the NEMPAA and the core area of a biosphere reserve and shall include their buffers.

Public participation process: A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.

Setting: means the area around a place, which may include the visual catchment.

Significance: can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e., intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e., level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgments and science-based criteria (i.e., biophysical, physical cultural, social and economic).



Site: a spatial cluster of artifact, structures, organic and environmental remains, as residues of past human activity.



1. Introduction

Exxaro Resources Limited (hereafter referred to as Exxaro) has acquired the mining rights for new coal mines in the Mpumalanga region, collectively known as the Belfast Implementation Project (BIP) and Belfast Expansion Project (BEP). The BIP is already authorised and construction on this site began in November 2017, further, the first coal was produced in the second quarter of 2019. It is important to note that the BEP is an expansion of the BIP. Nsovo Environmental Consulting has been appointed by Exxaro to undertake Environmental Impact Assessment (EIA) for the proposed Belfast Expansion Project (BEP). Subsequently, Nsovo appointed Vhubvo Consultancy Cc (hereafter referred to as Vhubvo) to undertake the HIA for the project. The proposed project is located in the eMakhazeni Local Municipality within the Nkangala District Municipality in the Mpumalanga Province.

2. Site location and description

The proposed Belfast Expansion Project is located on the Farms Zoekop 426JS portions 3, 4, 6, 9, 11, 16, 21 and 24 and Leuwbank 427JS portions 4, 5, 6, 25 and 26 RE along the N4 Highway near the town of Belfast in the eMakhazeni Local Municipality of Nkangala District Municipality of Mpumalanga Province. Refer to Figure 1 below.



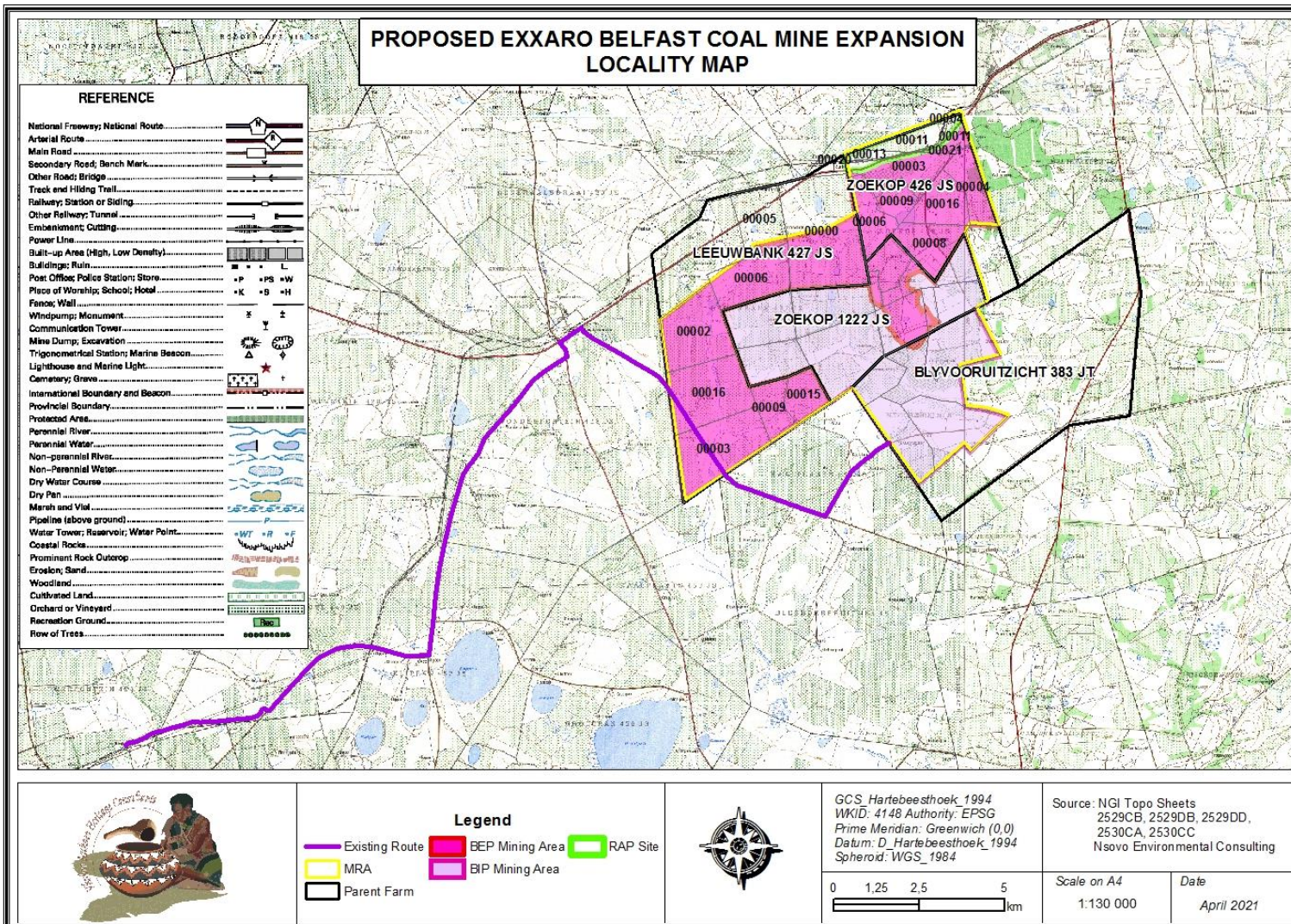


Figure 1: Topographical map of the area proposed for development.

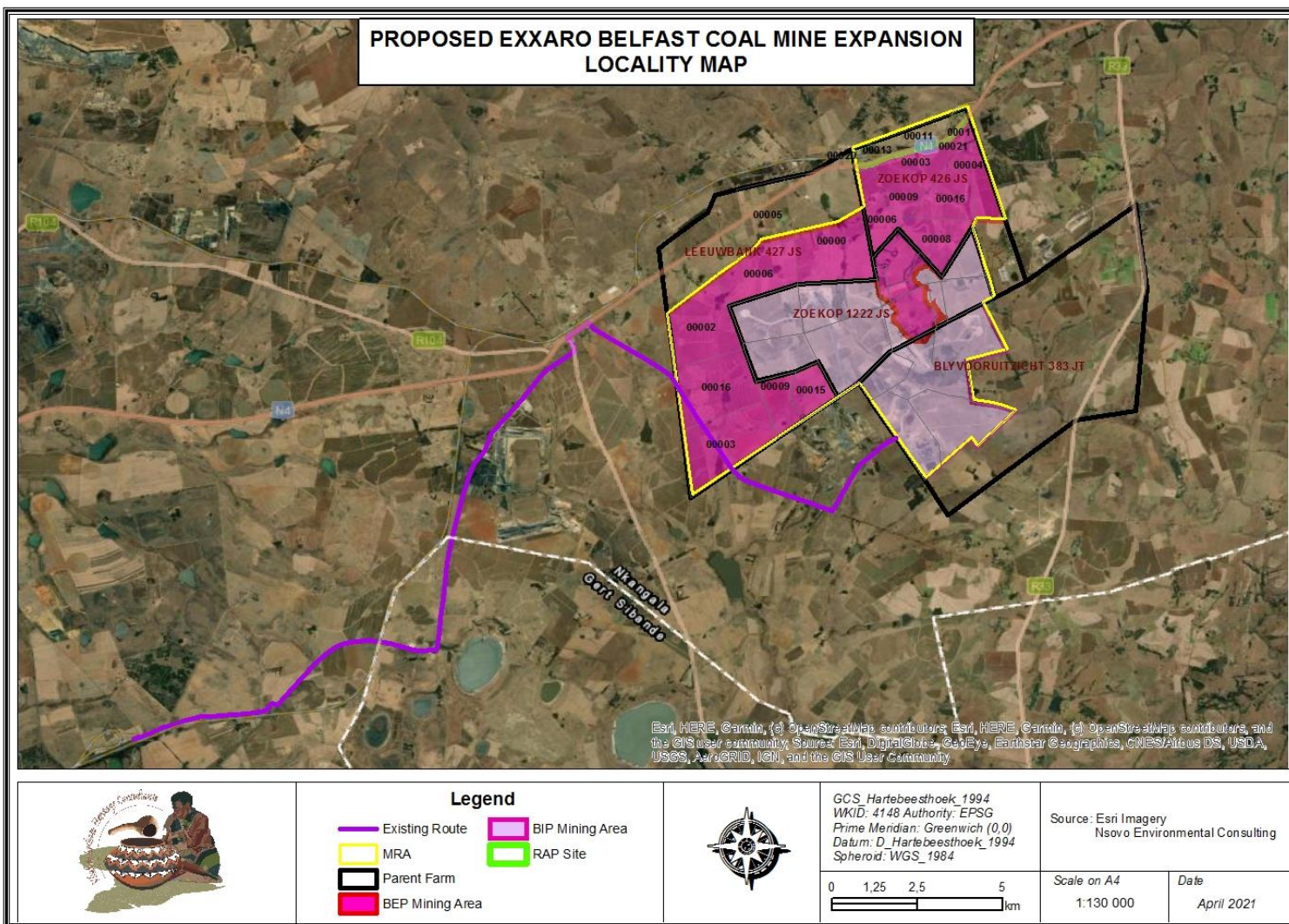


Figure 2 : Aerial map of the area proposed for development.





Figure 3: An overview section of the area within the wider proposed area.



Figure 4: View of some of the access roads within the proposed area.





Figure 5: View of some of the farms in the study area.



Figure 6: View of some mining activities in the area.



3. Proposed scope of work

The following are the proposed activities pertaining to the proposed BEP;

- Opencast and underground coal mine;
- Mine Residue Facility (MRF);
- Conveyor belt;
- A Shaft;
- Earthworks / Platforms, including cut and fill embankments;
- Haul roads;
- Storm water management systems, including clean and dirty water separation and

Pollution Control Dams (PCDs).

- Cable ducts;
- Sewer system;
- Fencing; and
- The water supply, i.e., potable, fire and wash water.

4. Purpose of the Cultural Heritage Study

The purpose of this Archaeological and Cultural Heritage study was to entirely identify and document archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed BEP. This study will in turn assist the developer in ensuring proper conservation measures in line with the National Heritage Resource Act, 1999 (Act 25 of 1999). Impact assessments highlight many issues facing sites in terms of their management, conservation, monitoring and maintenance, and the environment in and around the site. Therefore, this study involves the following:

- Identification and recording of heritage resources that maybe affected by the proposed BEP;
- Providing recommendations on how best to appropriately safeguard identified heritage sites. Mitigation is an important aspect of any development on areas where heritage sites have been identified.



5. Methodological approach

The methodological approach is informed by the 2012 SAHRA Policy Guidelines for impact assessment. As part of this study, the following tasks were conducted: 1) literature review, 2), consultations with the appointed consultants, 3), analysis of the acquired data, leading to the production of this report.

To understand the archaeology of the area proposed for development, a background study was undertaken and relevant institutions were consulted. These studies entail review of archaeological and heritage impact assessment studies that have been conducted around the proposed area through SAHRIS.

History Resource Centre was searched. The University of Pretoria's library collection was also utilised. These investigations were fundamental in shedding light on the archaeology of the area, as well as the compilation of this report. The field survey was conducted by two archaeologists from Vhubvo on the **13th of October 2020**.

Restrictions and Assumptions

As with any survey, archaeological materials may be under the surface and therefore unidentifiable to the surveyor until they are exposed once mining starts. As a result, should any archaeological /or grave site be observed during mining, a heritage specialist must immediately be notified.

6. Applicable heritage legislation

Several legislations provide the legal basis for the protection and preservation of both cultural and natural resources. These include the National Environment Management Act, 1998 (Act No. 107 of 1998); Tourism Act, 1993 (Act No. 72 of 1993); Cultural Institution Act, 1998 (Act No. 119 of 1998), and the National Heritage Resources Act, 1999 (Act No 25 of 1999). Section 38 (1) of the National Heritage Resources Act requires that where relevant, an Impact Assessment is undertaken in case where a listed activity is triggered. Such activities include:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the 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 -*
 - (i) exceeding 5 000 m² in extent;*



-
- (ii) involving three or more existing erven or subdivisions thereof; or*
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a Provincial Heritage Resources Authority;*
 - (d) the re-zoning of a site exceeding 10 000 m² in extent; or*
 - (e) any other category of development provided for in regulations by SAHRA or a Provincial Heritage Resources Authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

Section 3 of the National Heritage Resources Act (25 of 1999) lists a wide range of national resources protected under the act as they are deemed to be national estate. When conducting a Heritage Impact Assessment (HIA) the following heritage resources have to be identified:

- (a) Places, buildings structures and equipment of cultural significance*
- (b) Places to which oral traditions are attached or which are associated with living heritage*
- (c) Historical settlements and townscapes*
- (d) Landscapes and natural features of cultural significance*
- (e) Geological sites of scientific or cultural importance*
- (f) Archaeological and paleontological sites*
- (g) Graves and burial grounds including-*
 - (i) ancestral graves*
 - (ii) royal graves and graves of traditional leaders*
 - (iii) graves of victims of conflict*
 - (iv) graves of individuals designated by the Minister by notice in the Gazette*
 - (v) historical graves and cemeteries; and*
 - (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983)*
- (h) Sites of significance relating to the history of slavery in South Africa*
 - (i) moveable objects, including -*
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens*
 - (ii) objects to which oral traditions are attached or which are associated with living heritage*
 - (iii) ethnographic art and objects*
 - (iv) military objects*



-
- (v) *objects of decorative or fine art*
- (vi) *objects of scientific or technological interest; and*
- (vii) *books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).*

Section 3 of the National Heritage Resources Act of 1999, (Act No. 25 of 1999) also distinguishes nine criteria for places and objects to qualify as ‘part of the national estate if they have cultural significance or other special value ...’ These criteria are the following:

- (a) *Its importance in the community, or pattern of South Africa’s history*
- (b) *Its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage*
- (c) *Its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage*
- (d) *Its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects*
- (e) *Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group*
- (f) *Its importance in demonstrating a high degree of creative or technical achievement at particular period*
- (g) *Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons*
- (h) *Its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa; and*
- (i) *Sites of significance relating to the history of slavery in South Africa.*

Other sections of the Act with a direct relevance to the AIA are the following:

Section 34(1) *No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.*

Section 35(4) *No person may, without a permit issued by the responsible heritage resources authority :*

- *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite*

Section 36 (3) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority :*

- *destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside formal cemetery administered by a local authority; or*



-
- *bring onto or use at a burial ground or grave any excavation equipment, or any equipment which assists in detection or recovery of metals.*

7. Discussion of (Pre-) History of South Africa

Introduction

South Africa has one of the longest sequences of human development in the world. The prehistory and history of South Africa span the entire known life span of human on earth. It is thus difficult to determine exactly where to begin. A possible choice could be the development of genus Homo millions of years ago. South African scientists have been actively involved in the study of human origins since 1925 when Raymond Dart identified the Taung child as an infant halfway between apes and humans. Dart called the remains *Australopithecus africanus*, southern ape-man, and his work ultimately changed the focus of human evolution from Europe and Asia to Africa, and it is now widely accepted that humankind originated in Africa (Robbins *et al.* 1998). In many ways this discovery marked the birth of palaeoanthropology as a discipline. Nonetheless, the earliest form of culture known in South Africa is the Stone Age. This is the prehistoric period during which humans widely used stone for tool-making. These stone tools were made from a variety of different sorts of stone. For example, flint and chert were shaped for use as cutting tools and weapons, while basalt and sandstone were used for ground stone. Stone Age can be divided into Early, Middle and Late; it is argued that there are two transitional periods. Noteworthy that the time frame used for Stone Age period is an approximate and differ from researcher to researcher (see Korsman and Meyer 1999, Mitchell 2002, Robbins *et al.* 1998).

Early Stone Age (ESA)

Although a long history of research on Early Stone Age period of southern Africa has been conducted (Mason 1962, Sampson 1974, Klein 2000, Chazan 2003), it still remains a period were little is known. This may be due to many factors which include, though not limited to retrieval techniques used, reliance on secondary, at times unknown sources, and the fact that few fauna from this period has been analysed thus far (Chazan 2003). According to Robbins *et al.* (1998), the Stone Age is the period in human history when stone was mainly used to produce tools. This period began approximately 2.5 million years ago and ended around 200 000 years ago. During this period, human beings became the creators of culture and were basically hunters and gatherers, this era is identified by large stone artefacts.

Middle Stone Age (MSA)



The Middle Stone Age overlap with the Early Stone Age and possibly began around 100 000 to about 200 000 years ago and extends up to around 35 000 years ago. This period is marked by smaller tools than in ESA. Many MSA sites have evidence for control of fire, prior to this, rock shelters and caves would have been dangerous for human habitation due to predators (Deacon & Deacon 1999). MSA people made a wide range of stone tools from both coarse to fine-grained rock types. Sometimes the rocks used for tools were transported from considerable distances, presumably in bags or other containers. As such, tool assemblages from some MSA sites tend to lack some of the preliminary cores and contain predominantly finished products like flakes and retouched pieces (Mitchell 2002).

Later Stone Age (LSA)

Microlithic Later Stone Age began around 35 000 and extend to the later 1800 AD. According to Deacon (1984), LSA is a period when human beings refined small blade tools, conversely abandoning the prepared-core technique. Thus, refined artefacts such as convex-edge scrapers, borers and segments are associated with this period. Moreover, large quantity of art and ornaments were made during this period. This period overlaps with the Early Iron Age which will be discussed below.

Iron Age

The Iron Age is the name given to the period of human history when metal was mainly used to produce artefacts. Recently, there has been a debate about the use of the name. Other archaeologists have argued that the word “Iron Age” is problematic and does not precisely explain the event of what was happening in southern Africa, as such, the word farming communities has been proposed (Segobye 1998). Nonetheless, in South Africa this period can be divided into two phases. Early (200 - 1000 A.D) and Late Iron Age (1000 - 1850 A.D). Huffman (2007) has indicated that a Middle Iron Age (900 - 1300 A.D) should be included. According to Huffman (2007:361), until the 1960s and 1970s most archaeologists had not yet recognised a Middle Iron Age. Instead, they began the Late Iron Age at AD 1000. The Middle Iron Age (AD 900–1300) is characterised by extensive trade between the Limpopo Confluence and the East Coast of Africa. This has been debated, with other researchers, arguing that the period should be restricted to the Shashe-Limpopo Confluence. The characters of Iron Age groups include settled village life, metallurgy and manufacture of pottery. Their use of fire to clear agriculture land and felling of hardwood trees led to forests being replaced by secondary grassland. The Iron using peoples practiced agriculture and kept domestic animals such as dogs, cattle, goats, sheep and



chicken. There is however evidence that sheep spread across southern Africa a few centuries before the arrival of Early Iron Age farmers (Sadr 2004). According to Huffman (2007) there were two streams of Early Iron Age (EIA) expansion in southern Africa, one referred to as the Urewe-Kwale Tradition (or the eastern stream) and another called the Kalundu Tradition (or western stream). Refer to Figure 7 below.



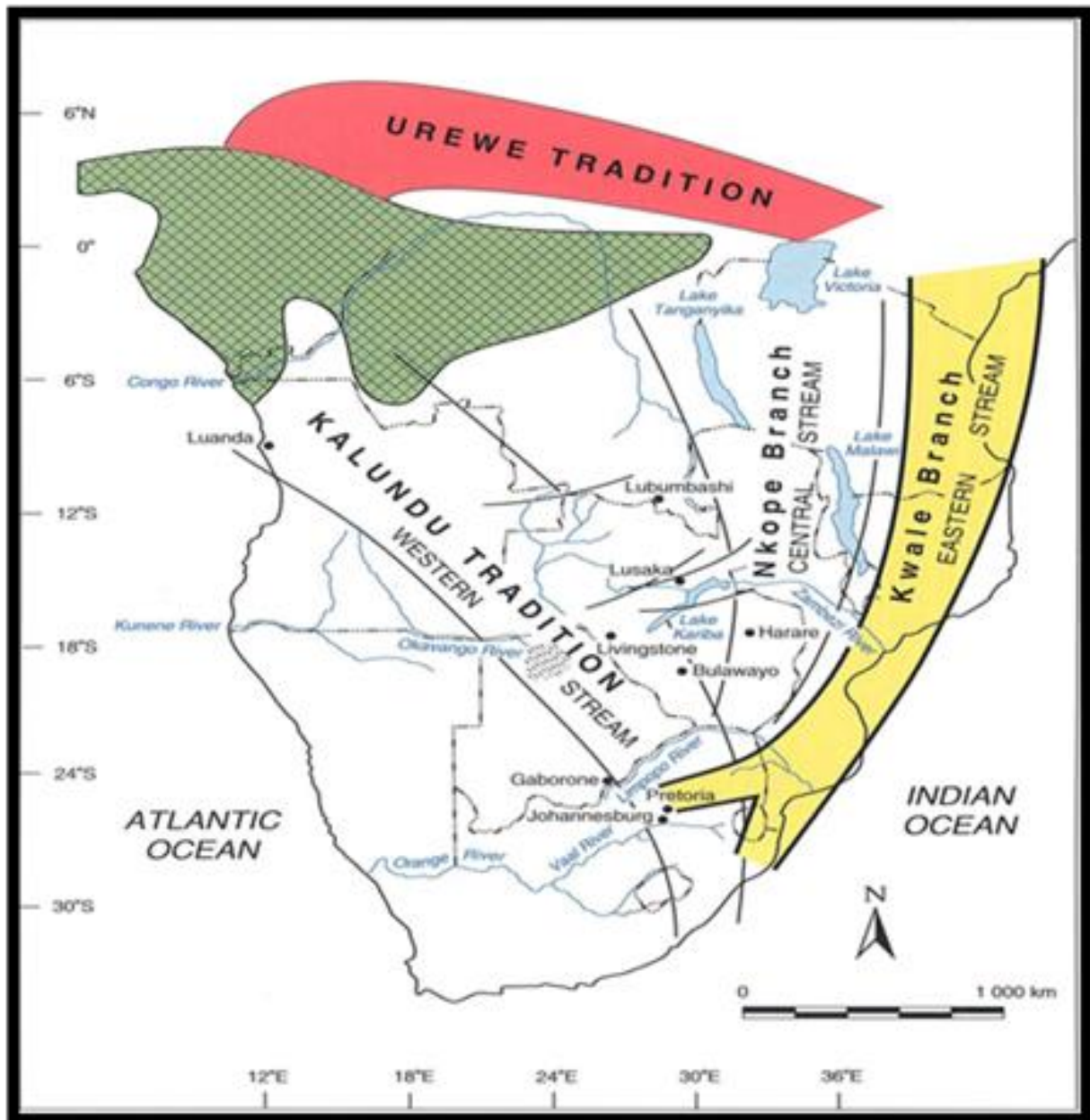


Figure 7: View of the spread of the Early Iron Age movements, namely Urewe-Kwale and Kalundu traditions in southern Africa (From Huffman 2007:122).

Early Iron Age (EIA)

Early Iron Age dwellings were built-in low-lying areas, such as river valleys and the coastal plains, where forests and savannas facilitated shifting (slash and burn). They also cultivated grains such as cow peas, ground beans, sorghum and millets. Unlike the broad and flat surface grinding stones of Late Iron Age, the Early Iron Age grinding stones are deeper and more lenticular grooves.



Late Iron Age (LIA)

Greater degree of economic specialisation is attributed to Late Iron Age, as such each village was no longer a self-sufficient unit, iron slag no-longer appears in every site instead there are centres that specialises in mining and production of iron. Also, Late Iron Age settlements were no longer located in river valleys, but were built on higher ground where homestead which in most instances were made of stone for building purposes would benefit from cooling breezes and good views most probably for strategic purposes. Pottery styles underwent significant changes, and maize was also introduced during this period (Maggs 1980).

Historical Period

The white population arrived on South African land long after the Iron Age settlement. Bartolomeu Dias was the first European to sail around the southern point of Africa in 1486. He named it “The Cape of Good Hope”, nine years later it was Vasco da Gama, however, these Portuguese seafarers were not seriously interested in southern Africa. Nevertheless, the history of southeast part will change forever on the 6th of April 1652. This is when the Dutch seafarer Jan van Riebeeck arrived in Table Bay with his three ships. His mission was not to establish a full-fledged colony at the Cape but to establish supply station on behalf of the Dutch East India Company (DEIC), however it committed itself when it granted nine company servants’ freedom in 1657 to establish private farms in the Rondebosch area below the eastern slopes of Table Mountain. One of the reasons why the Dutch settled at the Cape was to access the herds of cattle kept by the Khoi-Khoi. This was first achieved by friendly trade; however, it was not long before disputes over land erupted after Free Burghers began to encroach on traditional communal grazing lands. By the early 1700’s the Dutch colonists have prevailed (Bergh 1999).

These new white settlers will influence the context and content of South African’s culture forever, starting with development of Cape Town into an urban centre, however it took many years for it to equal the size of Mapungubwe Kingdom which was attained five centuries earlier (it is also argued that Mapungubwe was during its time more developed than other areas in Europe). These newcomers also introduced new style of houses consisting of flat roofs and ornate pediments. Slaves were also imported from other parts of the world i.e., Madagascar, India and East Asia, and these slaves who were used as labourers were skilled carpenters and bricklayers as such their skills played an invaluable role in speeding up the progress and development of the Cape. It is important to note that the intermingling between the slaves,



Africans and the European population marked the beginning of the coloured community. The DEIC continue to control the economy but in practise corruption was a dominant force.

One of the most significant historical occurrences in the early history of South Africa was the Mfecane/ Difaqane. The great Zulu and Sotho tribes fought each other for space and domination throughout southern Africa, killing and displacing hundreds of thousands of people across the sub-continent. A key figure in this all-out battle among the African tribes was the great Zulu leader, King Shaka. Over a span of three years starting in 1835, some 12,000 Voortrekkers (pioneers) left the Cape Colony and trekked into the interior by ox wagon. In time, these Voortrekkers who were escaping British policies started to build a unique identity and started calling themselves Afrikaners. They also developed a hybrid language, Afrikaans, which stemmed from high Dutch but incorporated strong French, Malay, German and Black influences. The Afrikaans - speaking descendants of these people would later simply be called “Boere” (boers or farmers) (Bergh 1999).

From the 1820s European missionaries worked tirelessly to Christianise indigenous communities and to in-culture them in a European way of life. Whatever intention these missionaries had, undermined Africans and contributed in displacing African tradition across South Africa. By the 1860s, African states began to weaken as Europeans were eager to exploit Africans as a source of labour and to acquire the fertile area. During this era most African leaders died, e.g.: Makapane (1854); Soshangane (1858); Sekwate (1861); Mswati (1865); Mzilikazi (1868); Moshoeshoe (1870); Mpande (1872); Sekhukhune (1882) and Makhado (1895).

With the discovery of diamonds and gold in the 19th century, urbanisation started in South Africa. People came from all over the world to claim their stake in the diamond fields. These discoveries also mad the British to realise that there was great wealth for the taking outside the Cape Colony, and with these discoveries, South African black’s view of life were further changed. Nevertheless, the 1902 Peace treaty in Vereeniging marked the end of Anglo/Boers war. This gave South African black people peace treaty as they hoped for better opportunity after all the suppression and domination by the minority, unfortunately it turned out differently as it made no provisions as far as human rights for black people were concerned. Actually, the process of segregation increased in South Africa.

8. Background history of the study area

One municipality, eMakhazeni Local Municipality will be affected as a result of this proposed



development. However, this municipality does not exist in vacuum, and to have a better understanding of the entire area where the municipality is located, it is necessary to understand the wider zone of the proposed development - Mpumalanga Province. According to SAHRA database, there are approximately 56 provincial heritage sites across the Mpumalanga Province, of these, six are located around Middleburg region, and include Botshabelo (9/2/242/0001), Fort Merensky (9/2/242/0002), Mapoch's Caves (9/2/242/0003), Meyer Bridge (9/2/242/0010), Dutch Reformed Gedenkkerk (9/2/242/0011) and NZASM Station (9/2/242/0015). There are also other heritage/ and archaeological sites of regional and local importance in the area at large. Majority of these were recorded by scholars and consultants (see reports by for example Bergh 1999, Fourie 2015, Huffman 2007, Magoma 2014, Pelsers 2012, Van Vollenhoven 2012, Van Warmelo 1935, Van Wyk Rowe 2013 and Van Zyl 2011). These sites and their contexts are discussed below:

Stone Age

There have been very few studies of Stone Age in Mpumalanga Province, hence there are very few known Stone Age sites. One of the very few example of stone age sites belonging to the Early Stone Age (ESA) era in Mpumalanga is Maleoskop on the Farm Rietkloof (Pelsers 2016). The Middle Stone Age (MSA) has not been extensively studied as well in the region but evidence of this period has been excavated at Bushman Rock Shelter on the Farm Klipfonteinhoek in the Ohrigstad district. No Earlier or Middle Stone Age sites are known to occur in the area of development (Bergh 1999). Later Stone Age (LSA) sites occur both at the coast and inland as caves deposits, rock shelters, open sites and shell deposits. It appears that there is a gap of approximately 4000 years in the Mpumalanga LSA record between 9000 BP and 5000 BP. This hiatus may be a result of generally minimal Stone Age research being conducted in the province or it could be due to a period known for rapid warming and major climate fluctuation which may have led people to seek out protected environments from this area. The Mpumalanga Later Stone Age sequence is visible again during the mid-Holocene at the Farm Honingklip near Badplaas in the Carolina district (Celiers, 2004). These two sites are located on the foothills of the Drakensberg where the climate is warmer than the Highveld but also cooler than the Lowveld (Bergh, 1999). Nearby the sites, dated between 4870 BP and 200 BP are four panels which contain rock art.

Iron Age



Iron Age people moved into Southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. In Mpumalanga, the last period of pre-colonial occupation consisted of Bakoni, Pedi, Swazi, and Ndebele-speaking people that settled on terraced sites at the foot of the mountains. The period referred to as the Early Iron Age (AD 200-1500 approx.) was initiated with the arrival of presumably Karanga (north-east African) Agro-pastoral groups, who may have been the makers of the famous Lydenburg Heads. These artifacts from the Lydenburg area date to approximately AD600. These people were Bantu herders and agriculturists and probably populated Southern Africa from areas north-east of the Limpopo River. Some archaeological research was done during the 1970's at sites belonging to the EIA location, Plaston, a settlement close to White River (Evers, 1988). Early Iron Age pottery was also excavated by Huffman during 1997 on a location where the Riverside Government complex is currently situated (Huffman 1998). This site known as the Riverside site is situated a few kilometers north of Nelspruit next to the confluence of the Nelspruit and Crocodile River. The Late Iron Age of the wider study area which dates to AD1600-1800 is represented by various tribes such as Bakoni, Pedi, Ndebele and Swazi. The province is strewn with stonewalled sites of this period particularly around Lydenburg, Bradfontein, Sekhukuneland, Rossenekal and Steelpoort. The Bakoni are the architects of these stone-walled enclosures found throughout the escarpment area of eastern Mpumalanga (Huffman 2007). The complex ruins may be divided into three basic features namely homesteads terraces and cattle tracks. Other scholars have divided them into simple and complex ruins depending on their nature (Evers 1975; Collett 1982).

Historical period

Mpumalanga meaning “a place of rising sun”, and previously Eastern Transvaal was the name given to the area in 1993. The province includes the old Transvaal, KaNgwane, as well as part of Gazankulu and Leboa. The province forms a very important part of South Africa's heritage which is inclusive of both the natural and the cultural heritage. The natural heritage consists of the Bourke's Luck pothole as well as the Sodwala caves together with the San rock paintings, Ndebele wall paintings and Pilgrim's Rest are amongst the cultural heritage. The first white people to move through this area were part of the traveler, Robert Scoon who passed through during 1836. Although the Voortrekkers moved across the Vaal River during the 1830's, it seems as if white people only settled around the study area after 1850. The first Trekkers to settle in the area were the followers of A. H. Potgieter, who relocated from Mooi River, and they will later be joined by other Trekkers led by J. J. Burger. Tensions between the two groups soon surfaced and



the difficulties facing the community were compounded by malaria, which decimated the population, and stock disease, which ravaged their herds.

In 1848, partly to escape malaria, and conflict-ridden community, Potgieter and his followers moved north and founded the town of Schoemansdal. Most of those who remained behind moved to higher-lying lands to the south, and the town of Lydenburg became the new centre of the community and white settlers slowly established themselves in the wider region. According to Van Warmelo (1935), African people who inhabited the area include the Ndebele, and various groups of the Ba-Sotho (BaKôpa and BaPedi). Due to internal strife and differences between the various Voortrekker groups that settled in the broader Transvaal region, the settlers in the Ohrigstad area now governed from the town of Lydenburg decided to secede from the Transvaal Republic in 1856. In the study area there are few officially proclaimed historic monuments; one such example is the historic naval canon's barrel at Belfast High School. Another one is the Great Trek commemorative monument erected in 1938 as part of the centenary celebrations (Pierre 2016:17).

Belfast was named after Charles O'Neil, a descendant of Belfast in Northern Ireland. The historical archaeology of the town dates back to 1847 when Lydenburg was established as a town. In 1858, a war erupted that was ignited by boundary disputes between the Zuid Afrikaansche Republic (ZAR) and the Republic of Lydenburg. The war resulted in the heightened establishment of Belfast. The area where Belfast is founded upon is one of the highest in South Africa, measuring 2,025m above sea level. The town is renowned for producing coal and a black granite. During the Anglo-Boer War, several battles took place in and around the town. These include the Battle of Leliefontein and the Battle of Bergendal. The British also built a concentration camp to house women and children who were displaced by war in the area.

Impact rating system

The table below is for the criteria used in the significance rating of the heritage resources in relation to the landscape.

Table 1: Impact criteria of significance

Status of Impact



<p>The impacts are assessed as either having a: negative effect (i.e., at a `cost' to the environment), positive effect (i.e., a `benefit' to the environment), or Neutral effect on the environment.</p>
<p>Extent of the Impact</p>
<p>(1) Site (site only), (2) Local (site boundary and immediate surrounds), (3) Regional (within the City of Johannesburg), (4) National, or (5) International.</p>
<p>Duration of the Impact</p>
<p>The length that the impact will last for is described as either: (1) immediate (<1 year) (2) short term (1-5 years), (3) medium term (5-15 years), (4) long term (ceases after the operational life span of the project), (5) Permanent.</p>
<p>Magnitude of the Impact</p>
<p>The intensity or severity of the impacts is indicated as either: (0) none, (2) Minor, (4) Low, (6) Moderate (environmental functions altered but continue), (8) High (environmental functions temporarily cease), or (10) Very high / Unsure (environmental functions permanently cease).</p>
<p>Probability of Occurrence</p>



The likelihood of the impact actually occurring is indicated as either:

- (0) None (the impact will not occur),
- (1) improbable (probability very low due to design or experience)
- (2) low probability (unlikely to occur),
- (3) medium probability (distinct probability that the impact will occur),
- (4) high probability (most likely to occur), or
- (5) Definite.

Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.

$$S=(E+D+M)P$$

The significance ratings are given below

- (<30) low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- (30-60) medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- (>60) high (i.e., where the impact must have an influence on the decision process to develop in the area).

9. Findings and Discussions

The phase 1 Archaeological and Cultural Heritage Impact Assessment for the proposed development have resulted in the identification of burial grounds, historical farmhouse complexes, a place of worship, stonewalling and some historical households (the findings are detailed in Table 2 below).

The proposed BEP and associated infrastructure will not affect the identified heritage resources (see Table 3), as the resources are not within the vicinity of the proposed BEP. However, if heritage resources are discovered during construction the proposed activity should cease and the area be demarcated by a danger tape. A professional archaeologist or MPHRA officer should be



contacted immediately. The rating of the BEP and associated infrastructure are summarized below in Table 3.

Table 2: Identification and significance of heritage sites.

Recorded Number	GPS	Description
Bel1	S25°47' 00.8" E29°57'11.0"	A grave site with approximately 13 graves was noted. Five of these graves have headstones with inscriptions, while others are demarcated by stones (See Figure 8).
Significance: High		Mitigation: Exercise caution
Bel2	S25° 47'19.3" E29°56'03.2"	Historical farmhouse complex built of old farm bricks were noted in the study area. The farmhouse complex have a white wall, with an extension of face-bricks (see figure 9)
Significance: Medium		Mitigation: Exercise caution
Bel3	S25° 46'47.8" E29°57'05.9"	A historical farmhouse complex with a green corrugated iron roof, it is still in use by the farm owner (See Figure 10).
Significance: Medium		Mitigation: Exercise caution
Bel4	S25° 47'00.6" E29°57'37.2"	A historical farmhouse complex, white-walled but with some darkish portions of the wall, probably due to smoke. There is old farm equipment outside (See Figure 11).
Significance: Medium		Mitigation:-Exercise caution
Bel5	S25° 47'43.0" E29°59'57.0"	A historical standing kraal, with some falling stones on the surface (See Figure 12)
Significance: Medium		Mitigation:-Exercise caution
Significance: Medium		Mitigation: Exercise caution
Bel6	S25°48' 10.6" E30°00'13.0"	A historical kraal possibly used for goats and sheep (See Figure 13)
Significance: Medium		Mitigation: Exercise caution
Bel7	S25° 49'47.9" E30°00'20.6"	A historical stone house with a firm standing wall (Figure 14)
Significance: Medium		Mitigation: Exercise caution
Bel8	S25° 49'50.6" E30°00'19.6"	A demolished historical house with bricks and stones strewn on the surface (See Figure 15)
Significance: Medium		Mitigation: Exercise caution
Bel9	S25°48' 10.6" E30°00'13.0"	An old historical house, white-walled with a corrugated iron roof (See Figure 16).
Significance: Medium		Mitigation: Exercise caution
Bel10	S25° 49'24.8" E30°00'21.3"	A historical farm church, white-walled, corrugated iron roof, possibly with a holding capacity of 100 people (See Figure 17)
Significance: Medium		Mitigation: Exercise caution



The community graveyard is viewed to have high significance on a regional level. The graveyard is demarcated by fence, and is still active. Five of the graves have tombstones, some are demarcated by stones. Most of the graves are westerly positioned. The cemetery is known by the developer. Burial sites and their contents are accorded the highest heritage accolades in South Africa, and elsewhere, principally by their relation with human beings. Section 36 of the National Heritage Resources Act (3) states that, no person may, without a permit issued by SAHRA or a provincial heritage resources authority: destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. If the grave is less than 60 years of age it is protected against any damage, altering or exhumation by the Human Tissue Act, 1983 (Act 65 of 1983) and to local regulations. In addition, The World Archaeological Congress (WAC) has set international ethical standards for the treatment of human remains, these include:

- Respect for the mortal remains of the dead shall be accorded to all, irrespective of origin, race, religion, nationality, custom and tradition;
- Respect for the wishes of the dead concerning disposition shall be accorded whenever possible, reasonable and lawful, when they are known or can be reasonably inferred;
- Respect for the wishes of the local community and of relatives or guardians of the dead shall be accorded whenever possible, reasonable and lawful;
- Respect for the scientific research value of skeletal, mummified and other human remains (including fossil hominids) shall be accorded when such value is demonstrated to exist;
- Agreement on the disposition of fossil, skeletal, mummified and other remains shall be reached by negotiation on the basis of mutual respect for the legitimate concerns of communities for the proper disposition of their ancestors, as well as the legitimate concerns of science and education; and
- The express recognition that the concerns of various ethnic groups, as well as those of science are legitimate and to be respected, will permit acceptable agreements to be reached and honored.

Historical farmhouse complexes were also found in the in the study area. Most of them were built from sunburnt earth bricks, corrugated iron roofed and with some steel bars. Most of the farmhouses have old rusty farm equipment on the premises. There was also an old historical household in the study area. Historical stonewalls were also noted and documented. Some appear to be cattle kraal, and some *ovis/capra* kraals. Some of the historical stone-walling is



collapsed. The farmhouse complexes and historical stone-walling have medium significance value of over 60 years of age, and most importantly their historical, social and aesthetic value. These structures are considered as heritage sites in the larger history of the region. According to Section 34 (1) of the National Heritage Resources Act no person may alter or demolish any structure or part of it, which is older than 60 years without a permit, issued by the relevant provincial heritage resources in this case Mpumalanga Heritage Resources Authority (MPHRA). Section of the same Act also protects the demolition or altering of any structure in the Republic of South Africa for its cultural significance or other special value.

An old Historical church was also noted in the area. It could not be established if the church is still active. The church is protected by Section 3 of the National Heritage Resources Act, 1999 (25 of 1999).



Figure 8: View of the burial ground noted in the proposed area.





Figure 9: Historical farmhouse structures.



Figure 10: View of the house with some historical significance noted in the area.





Figure 11: View of historical farmhouse complexes.



Figure 12: A structure of the old farm kraal.





Figure 13: View of the collapsed historical kraal.



Figure 14: View of a historical stone structure.





Figure 15: View of a demolished historical house.



Figure 16: Historical corrugated iron roofed house.



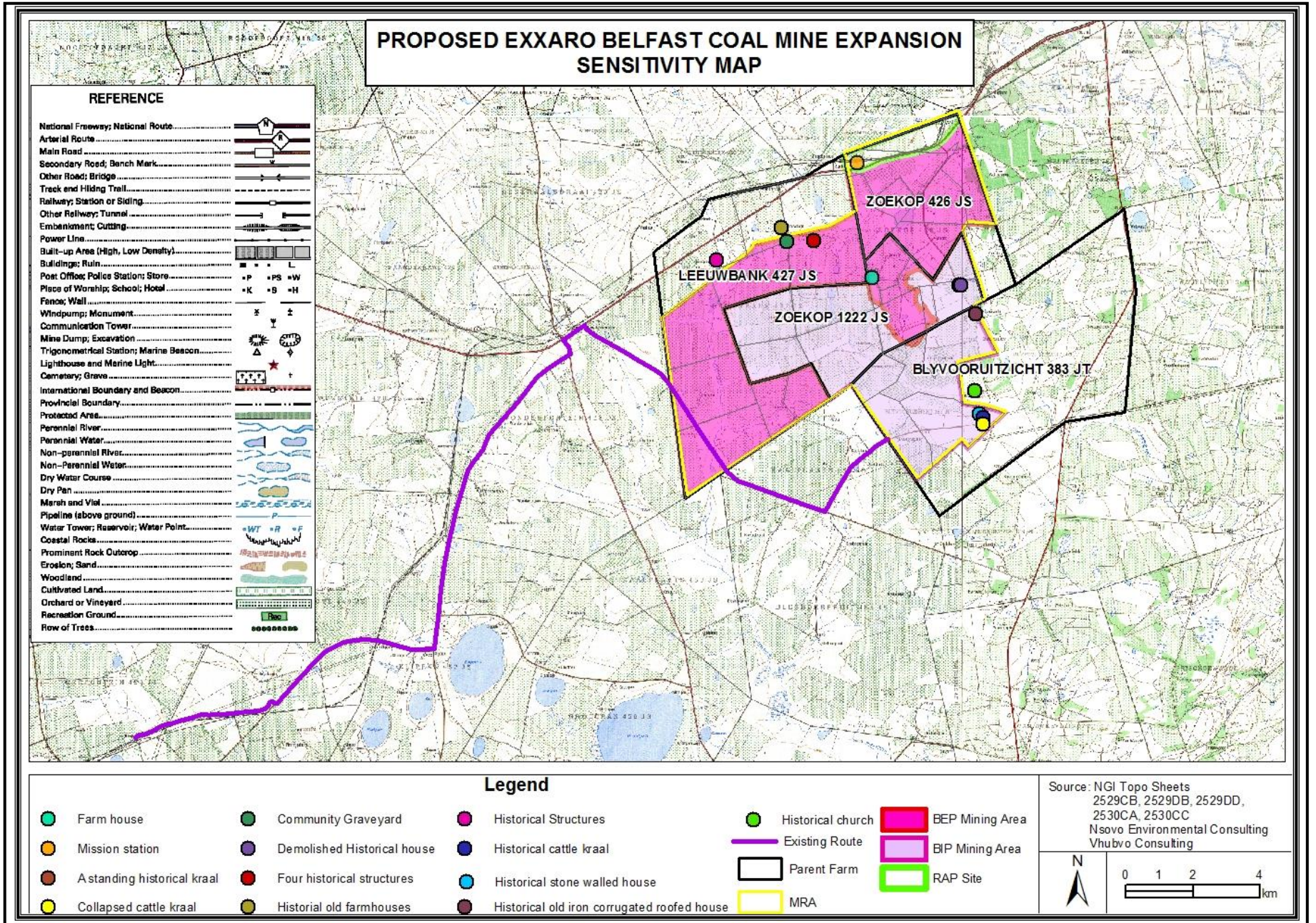


Figure 17: Sensitivity map showing the heritage resources.

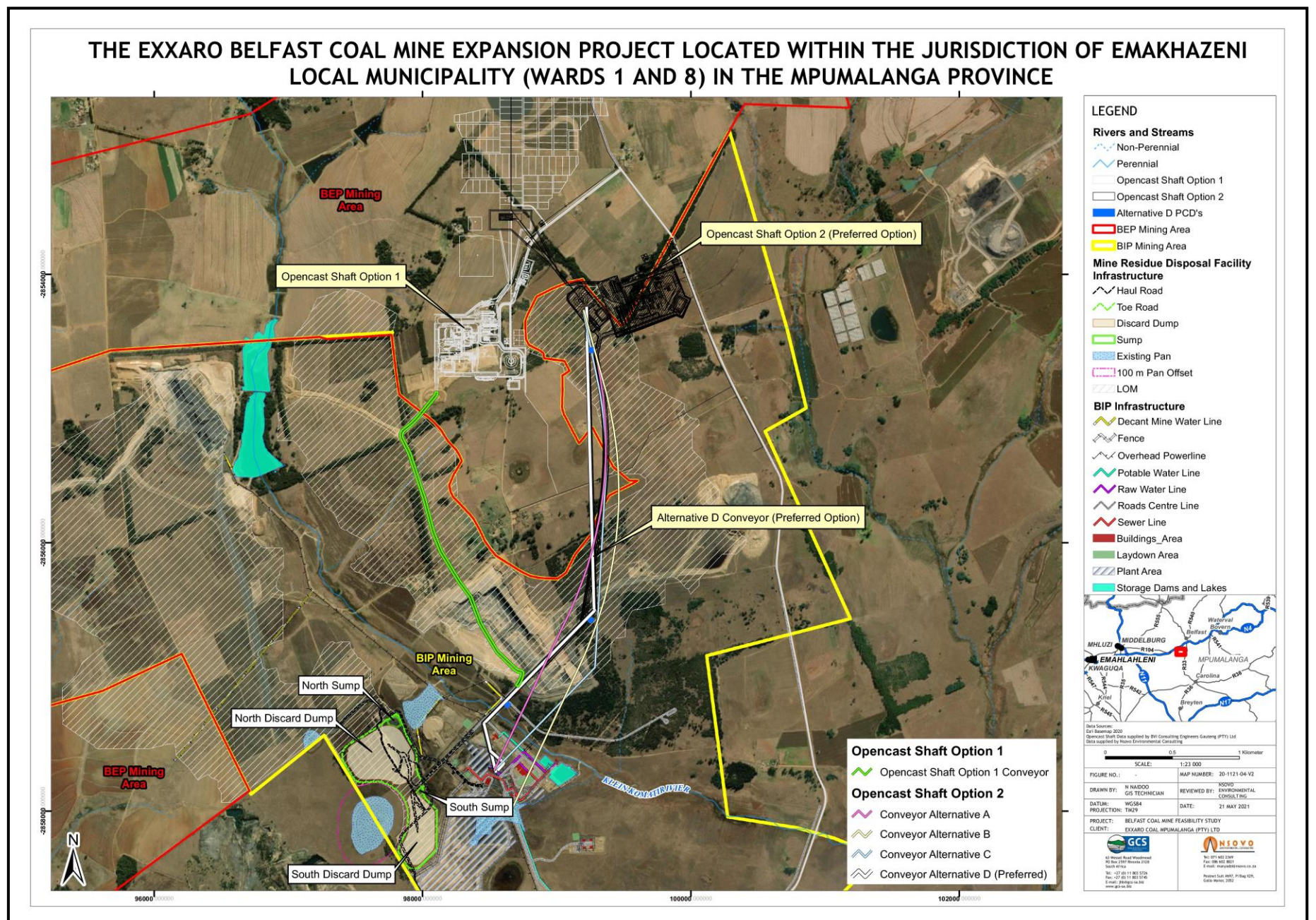


Figure 18: Map indicating proposed infrastructure.

Impact assessment

Below is the impact rating table of the proposed BEP and associated infrastructure. Note that these impacts are assessed as per section 9. Impact criteria of significance:

Table 3: Anticipated impact rating.

Issue	Mitigation measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
CONSTRUCTION PHASE &/ OPERATIONAL PHASE							
Heritage identification							
The footprint clearance will expose soil that could result into the exposure of heritage resources. Once the heritage resources are disturbed, they lose their archaeological context and significance. During the construction phase, the impact of the expansion activities on the heritage is low with mitigation measures and medium without mitigation measures. During the Heritage Impact Assessment survey, it is indicated that no heritage resources were identified on the BEP area and associated infrastructure, although that does not mean absentee as resources might be buried underground. The significance rate for both the Opencast Shaft Option 1 and 2 indicate that with or without mitigation measures the rate is medium. Then for the conveyors the significance rate with mitigation measures is low and without mitigation measures is high.							
Conveyor A	No	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	3 (Medium)	36 (Medium)
	Yes	Negative	1 (Site)	1 (Immediate)	2 (Minor)	2 (Low)	12 (Low)
Conveyor B	No	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	3 (Medium)	36 (Medium)
	Yes	Negative	1(Site)	1 (Immediate)	2 (Minor)	2 (Low)	12 (Low)
Conveyor C	No	Negative	1 (Site)	5 (Permanent)	6(Moderate)	3 (Medium)	36 (Medium)
	Yes	Negative	1 (Site)	1 (Immediate)	2 (Minor)	2 (Low)	12 (Low)
Conveyor D	No	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	3 (Medium)	36 (Medium)
	Yes	Negative	1 (Site)	1 (Immediate)	4 (Low)	2 (Low)	12 (Low)
Green Conveyor (5)	No	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	3 (Medium)	36 (Medium)
	Yes	Negative	1 (Site)	1 (Immediate)	4 (Low)	2 (Low)	12 (Low)
North dump	No	Negative	1 (Site)	1 (Immediate)	2 (Minor)	2 (Low)	8 (Low)
	Yes	Negative	1 (Site)	1 (Immediate)	2 (Minor)	2 (Low)	8 (Low)
South dump	No	Negative	1 (Site)	1 (Immediate)	2 (Minor)	2 (Low)	8 (Low)
	Yes	Negative	1 (Site)	1 (Immediate)	2 (Minor)	2 (Low)	8 (Low)



Issue	Mitigation measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
CONSTRUCTION PHASE &/ OPERATIONAL PHASE							
Opencast Shaft Option 1	No	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	4 (High)	48 (Medium)
	Yes	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	4 (High)	48 (Medium)
Opencast Shaft Option 2	No	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	4 (High)	48 (Medium)
	Yes	Negative	1 (Site)	5 (Permanent)	6 (Moderate)	4(High)	48 (Medium)
Mitigation measures							
Exercising caution during construction and operational phases.							

10. Recommendations

According to the ratings (see table 3) the proposed activity will have a negative impact on the landscape. Despite the fact that there is no presence of heritage resources in the proposed area, thus it is recommended that there is a need to exercise caution in case heritage resources are discovered during the construction and operational phases. Any alternative option is acceptable as the identified heritage resources are not impacted by the proposed BEP. However, the developer is further reminded that unavailability of archaeological materials on the preferred alternatives does not mean absentee. Archaeological material (e.g., pottery, stone tools, remnants of stone-walling, graves, etc.) and fossils may be located underground. The developer should take precautions during construction. In the event that archaeological materials are unearthed, all activities within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or a SAHRA officer should be contacted immediately.

Pre-construction education and awareness training

Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some of the indicators of archaeological site that may be found during construction:

- ✓ Flaked stone tools, bone tools and loose pieces of flaked stone;



-
- ✓ Ash and charcoal;
 - ✓ Bones and shell fragments;
 - ✓ Artefacts (e.g., beads or hearths);
 - ✓ Packed stones which might be uncounted underground, and might indicate a grave or collapse stone walling.

In the event that any of the above are unearthed, all mining within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or Provincial Heritage Resources Authority Mpumalanga (MPHRA) officer should be contacted immediately. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by MPHRA.

11. Conclusions

A thorough background study and survey of the proposed development was conducted and findings were recorded in line with SAHRA guidelines. It is recommended that the proposed development proceed on condition that the proposed recommendations detailed above are adhered to.

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13. Appendix 1: Site Significance

The following guidelines for determining site *significance* were developed by SAHRA in 2003. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

(a) Historic value

- Is it important in the community, or pattern of history?
- Does it have strong or special association with the life or work of a person, group or organization of importance in history?
- Does it have significance relating to the history of slavery?

(b) Aesthetic value

- Is it important in exhibiting particular aesthetic characteristics valued by a community or cultural group?

(c) Scientific value

- Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage?



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- Is it important in demonstrating a high degree of creative or technical achievement at a particular period?

(d) Social value

- Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?

(e) Rarity

- Does it possess uncommon, rare or endangered aspects of natural or cultural heritage?

(f) Representivity

- Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects?
- What is the 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?
- Is it important 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?

