

Archaeological Impact Assessment
For The
HCI Khusela Coal: Palesa Extension ESIA Update
On portions of the farm Roodepoort 349 JR,
Thembisile Local Municipality (Mpumalanga) & Kungwini Local
Municipality (Gauteng)

HCI KHUSELA

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Prepared by



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EXECUTIVE SUMMARY

The Archaeological Impact Assessment (AIA) is part of an update to the Environmental and Social Impact Assessment (ESIA) undertaken by Digby Wells Environmental (Digby Wells) on behalf of HCI Khusela. The AIA was undertaken as stipulated in the National Heritage Resources Act (no 25 of 1999) (NHRA) and South African Heritage Resources Agency (SAHRA) Minimum Standards (2006). The AIA consisted of a desktop study, including background literature reviews, aerial and historical map surveys and review of relevant impact assessment reports, as well as a site survey.

The survey area was located on portions of the farm Roodepoort 349 JR, situated in the local municipalities of Thembisile (Nkangala District Municipality, Mpumalanga Province) and Kungwini (Metsweding District Municipality, Gauteng Province). The area surveyed totalled approximately 730 ha.

During the site survey, no sites of archaeological significance were identified. However, a total of six burial grounds were identified and recorded, as well as three buildings consisting of: 1) a single structure consisting of three dilapidated and destroyed walls, 2) an occupied house and 3) damaged, broken and destroyed foundations of a recent (<20 years) labourer cottage.



According to the current mine plan, two burial grounds will potentially be directly impacted on by mining activities during the construction phase namely sites 2528BD/HCI759/005 and 2528BD/HCI759/009. Both these sites may need to be relocated, as they are located within the coal resources area. Safe access to the graves will be impossible and the sites will in all probability be damaged or destroyed during construction and operational phases.



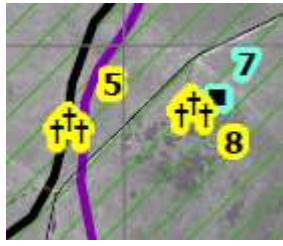
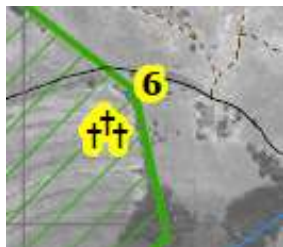

Site 2528BD/HCI759/002 is a dilapidated structure of which most walls have been destroyed. No material culture or foundations were visible. This site may be closely associated with the burial ground site 2528BD/HCI759/009. However, this site has been damaged, altered and parts destroyed to such an extent that the site is negligible in terms of heritage significance and no mitigation is thus recommended.



Site 2528BD/HCI759/003 is not a heritage resource, but an occupied house, and subsequently it will form part of the separate social studies and public participation processes of the proposed project.

All other identified sites are situated sufficiently far enough of the mineable coal resource area not to be directly impacted on. However, sites 2528BD/HCI759/007 and 2528BD/HCI759/008 may also be impacted by secondary impacts resulting from increased activity and traffic associated with the construction phase. Site 2528BD/HCI759/007 is, however, of negligible heritage significance, and any negative impact will be irrelevant. During the construction and operational phases, mitigation will thus be required for sites 2528BD/HCI759/005 and 2528BD/HCI759/009.

A summary of the findings and impacts associated with the proposed development is presented in the following table:

SITE DESCRIPTION	PROPOSED IMPACT	SIGNIFICANCE	MITIGATION
2528BD/HCI759/001 GPS: S25.51349 E28.78637 	Cemetery consists of at least 12 visible graves with informal stone cairns and formal grave dressings. Three headstones are associated with the formal dressings. Dates range from 1886 to 1904. All graves oriented east-west. Cemetery is situated ±1.5 km north of coal resource area.	49%	No mitigation necessary
2528BD/HCI759/002 GPS: S25.53187 E28.79136 	A dilapidated square structure of which only parts of three walls remain. The structure is built in stone. No associated material culture was visible. Very close to, and possibly associated with 2528BD/HCI759/009. Site 2 is situated ±250 m of mineable coal resource area, and located inside the coal resource area	22%	No mitigation necessary
2528BD/HCI759/003 GPS: S25.54658 E28.81177	An inhabited residence in the coal resource area. House has been significantly altered and damaged. Total area associated with building, i.e. Fenced yard and outbuildings, ± 100 x 100 m. Site is situated inside the coal resource area, on the border of the mineable coal resource area.	24%	Public Participation (PPP), Social Impact Assessment (SIA), and Relocation according to relevant

			legislative requirements
<p>2528BD/HCI759/004 GPS: S25.53652 E28.82347</p> 	<p>The cemetery is located outside Mr Amos Mahlangu's homestead, but is not related to his family. At least six graves are visible, with one new, covered headstone and formal dressing. Cemetery is situated outside the coal resource area. Site is situated ±600 m east of mineable coal resource area and ±450 m east of coal resource area.</p>	49%	No mitigation necessary
<p>2528BD/HCI759/005 GPS: S25.54333 E28.81541</p> 	<p>Cemetery consists of at least 5 visible graves, 3 of which have formal grave dressings and headstones. The remainder are stone cairns. One headstone is legible. The inscription dates the grave to 1969 and identifies it as Lea Geresi Chili's grave. The graves are oriented east-west and north-south. Cemetery is situated within the coal resource area, less than 10 m east of the coal resource area.</p>	49%	1) Relocation of graves
<p>2528BD/HCI759/006 GPS: S25.53978 E28.82682</p> 	<p>Cemetery consisting of at least 12 visible graves is located in a field belonging to Mr Amos Mahlangu. Graves are all damaged and only one headstone was visible, with a date of 1886 visible. Cemetery is situated more than ±900 east of the coal resource area.</p>	49%	No mitigation necessary
<p>2528BD/HCI759/007 GPS: S25.54272 E28.81878</p> 	<p>Foundations of buildings consisting of stone and cement bricks. Very damaged. Close to 2528BD/HCI759/008, and probably associated with these graves. Site is situated ±300 m east of coal resource area.</p>	24%	No mitigation necessary

<p>2528BD/HCI759/008 GPS: S25.54298 E28.81823</p> 	<p>Three graves in a black wattle bush. All three consist of concrete headstones and stone cairns. One name is visible and identifies a person named Madzimba. No dates were visible. Graves are situated ±350 m east of coal resource area.</p>	<p>49%</p>	<p>1) Fencing of site 2) Site monitoring</p>
<p>2528BD/HCI759/009 GPS: S25.53118 E28.79162</p> 	<p>At least 7 graves are located close to 2528BD/HCI759/002 (±80 m north), underneath large black wattle trees. Some of the graves have grave goods, e.g. enamel cups, on the dressings. All dressings consist of stone cairns. At least 2 graves have deep animal burrows into the grave pit. All the graves are oriented east-west. Site 9 is situated ±250 m of mineable coal resource area, and located inside the coal resource area</p>	<p>49%</p>	<p>1) Relocation of graves</p>

Recommendations for the sites identified in this report include monitoring, fencing of certain cemeteries, and a public participation process and possible social impact assessment; as well as a Phase 3 Heritage Site Management Plan. Heritage constitutes wholly non-renewable resources and should be protected wherever possible. Although there is an evident lack of information both in the literature and on the ground, this does not necessarily indicate the non-existence of heritage resources. Absence of evidence is not evidence of absence.

According to the current mine plan, mitigation will only be required for sites 2528BD/HCI759/005 and 2528BD/HCI759/009. If the mine plan is altered to avoid sensitive archaeological and heritage sites, the heritage resources can be protected *in situ* where necessary. Failure by parties to react to the procedures, recommendations and legal requirements outlined in this report will lead to penalties prescribed in the NHRA and by SAHRA.

Conditional to the effective implementation of mitigation and management measures outlined in this AIA report, the overall impact on archaeological and heritage elements resulting from project related activities will be medium-low.

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GLOSSARY OF ABBREVIATIONS & TERMS

AIA	Archaeological Impact Assessment
ASAPA	Association of Southern African Professional Archaeologists
DEAT	Department of Environmental Affairs and Tourism
DMR	Department of Mineral Resources
EFC	Early Farmer Community
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Earlier Stone Age
GIS	Geographical Information System
GPS	Global Positioning System
HAU	Heritage and Archaeology Unit
HIA	Heritage Impact Assessment
HSMP	Heritage Site Management Plan
IA	Iron Age
IFC	International Finance Corporation
LFC	Later Farmer Community
LSA	Later Stone Age
MCR	Mineable Coal Resource
MPRDA	Mineral and Petroleum Resources Development Act, 28 of 2002
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 107 of 1998
NHRA	National Heritage Resources Act, 25 of 1999
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency
STP	Shovel Test Pit

1. INTRODUCTION

1.1. Project Overview

This Archaeological Impact Assessment (AIA) was undertaken by Digby Wells Environmental (Digby Wells) as part of the compilation of an Environmental Impact Assessment, Environmental Management Programme (EIA/EMP) for proposed open cast mining activities. Digby Wells is involved in various projects for HCI Khusela, including the current Palesa Colliery immediately adjacent to the proposed Palesa extension. The AIA was undertaken for the project in order to identify, document and evaluate any potential archaeological and heritage sites of significance in the proposed project area that may be impacted on by the proposed mining activities.

1.2. Project Description

HCI Khusela Coal Mining (HKC), a subsidiary of HCI Holdings is operating the Palesa Colliery which is situated approximately 30 km north of Bronkhorstspuit and 60 km northwest of Emalahleni in the Thembisile Local Municipality (TLM) of the Mpumalanga Province. Apart from the mining right to Palesa Colliery, HKC also have prospecting rights immediately east of the Palesa Colliery to determine the further extent of the coal. The prospecting undertaken to date have indicated that the coal deposit extends to the east and can be economically mined.

HKC therefore intend to apply for mining rights over this additional coal reserve, the project is called the Palesa Extension (Palesa Ext.). The Palesa Ext. falls within both the Mpumalanga and Gauteng Provinces. Palesa Colliery's mining right was issued by the Mpumalanga Office. The local municipal area occupies an area of approximately 2 385 km² in the western region of the Nkangala District Municipality. According to the Integrated Development Plan (IDP) of the TLM, approximately 258 875 people currently reside within the municipal boundaries (TLM, 2008).

The following infrastructure is proposed for the Palesa Ext. Colliery:

- Opencast Mine Workings;
- Top Soil Stockpiles;
- Hard Overburden Stockpiles;
- Haul Roads; and

- In pit sump and pumping infrastructure to link to the existing water management network of Palesa Colliery.

1.3. Contact details of Applicant

Applicant: HCI Khusela Coal (Pty) Ltd
33 Flicker Road PO Box 594
Illovo Boulevard Northlands
Illovo 2116
2196
Tel: 011 448 4900 Fax: 011 448 4901

1.4. Contact details of Consultant

Environmental Consultant: Digby Wells Environmental

Project Code: HCI759

Project Manager: Irene Bopp

Archaeologist: Johan Nel

Tell: 011 789 9495

Email: info@digbywells.co.za

1.5. Terms of Reference

The Terms of Reference for this project is reflected in the project proposal submitted to HCI Khusela Coal on 2010. The project was been divided into two phases:

- Phase 1: The current EMPR was aligned to conform to the MPRDA requirements. This involved the updating of the EMP section to include the required outstanding plans.
- Phase 2: In conjunction with the upgrading/aligning of the current EMPR a comprehensive EIA was conducted on the land on which the extension of the tailings dam will be placed.

1.6. Aims and objectives

Digby Wells aims to assist the applicant in identifying, documenting and managing archaeological and heritage resources found in the proposed project

area in a responsible manner, in order to protect, preserve, and develop these resources within relevant legislative frameworks. This study aims to:

- Identify, record and document potential archaeological, cultural and historic sites of significance within the proposed development area;
- Evaluate whether proposed mining activities will have any negative impacts on archaeological, cultural, historical and natural heritage resources during construction, operation and decommissioning phases;
- Recommend mitigation and management measures to avoid or ameliorate any negative impacts on areas of archaeological, cultural or historical importance; and
- Promote the overall conservation and protection of natural and cultural resources.

The overall objective of this study is to conserve, mitigate and manage heritage sites and artefacts according to the recommendations and criteria of the relevant heritage authorities and legislation.

1.7. Legislation

According to the National Heritage Resources Act, No. 25 of 1999 (NHRA) Section 38, no mining, prospecting and/or associated development exceeding the limitations provided in the Act, is allowed in an area without an archaeological assessment and approval from the relevant heritage authority.

In addition, the National Environmental Management Act (NEMA) (Act 107 of 1998) (as amended in August 2010) states that an integrated environmental management plan should (23:2 (b)) "...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage..." For the purpose of the proposed project, an AIA report was therefore compiled to ensure that significant resources are effectively identified, recorded and assessed by qualified specialists prior to development. After the AIA has been submitted and reviewed, development may proceed within legislative guidelines and approval by the relevant heritage authority. The compilation of the AIA report, fieldwork and associated surveys will be conducted according to structures approved in South African legislation.

2. GEOGRAPHICAL DESCRIPTION

2.1 Details of survey area

The proposed Palesa Extension is located approximately of 60 km north-west of Bronkhorstspuit in the Thembisile Local Municipality of the Mpumalanga Province, South Africa. The survey area covers approximately 730 ha, of which the mineable coal resource area is approximately 450 ha.

2.2 Location data

The following table describes the location of the proposed Palesa Extension project area, as well as the GPS locations of various archaeological and heritage sites identified in the project area. With reference to this table, the regional location of project area is illustrated in figures 1 and 2 and the location of Archaeological and Heritage Sites in context of the current mine plan is illustrated in figure 3.

Table 1: Location data

Province	Mpumalanga; Gauteng		
Local Authority	Thembisile Local Municipality (MP); Kungwini Local Municipality (GP)		
Magisterial district	Nkangala District Municipality (MP); Metsweding District Municipality (GP)		
Property	Portions of Roodepoort 349 JR		
Closest town	Bronkhorstspuit	1:50000 map no.	2528DB
Datum	WGS 84	Average accuracy	5 meter
GPS co-ordinates (Garmin Etrex Legend Cx)	2528BD/HCI759/001	-25.51349	28.78637
	2528BD/HCI759/002	-25.53187	28.79136
	2528BD/HCI759/003	-25.54658	28.81177
	2528BD/HCI759/004	-25.53652	28.82347
	2528BD/HCI759/005	-25.54333	28.81541
	2528BD/HCI759/006	-25.53978	28.82682
	2528BD/HCI759/007	-25.54272	28.81878
	2528BD/HCI759/008	-25.54298	28.81823

	2528BD/HCI759/009	-25.53118	28.79162
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Figure 1: Regional Location of Project Area

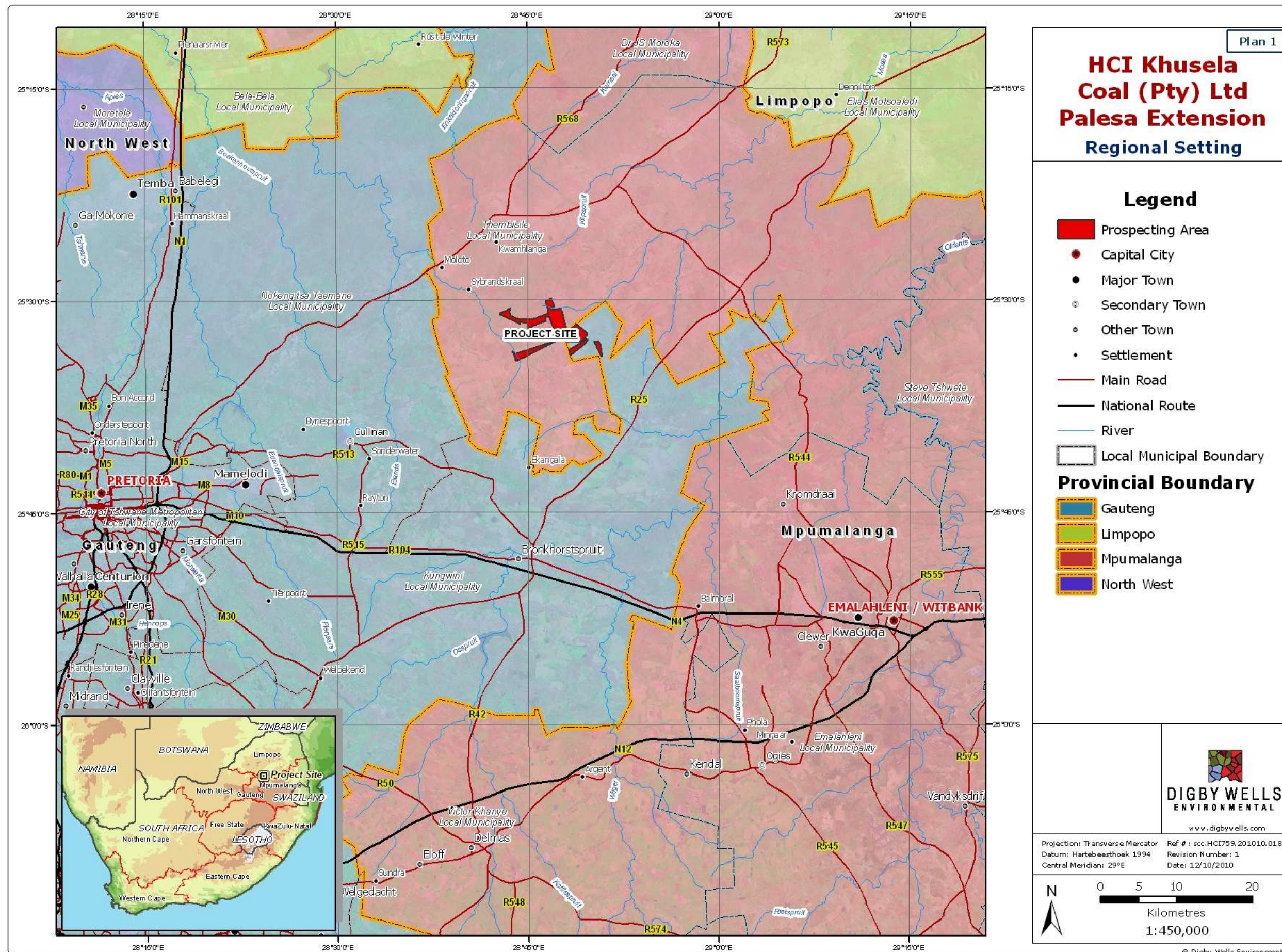


Figure 2: Location of survey area on 1: 50 000 map sheet 2528 DB Sokhulumu

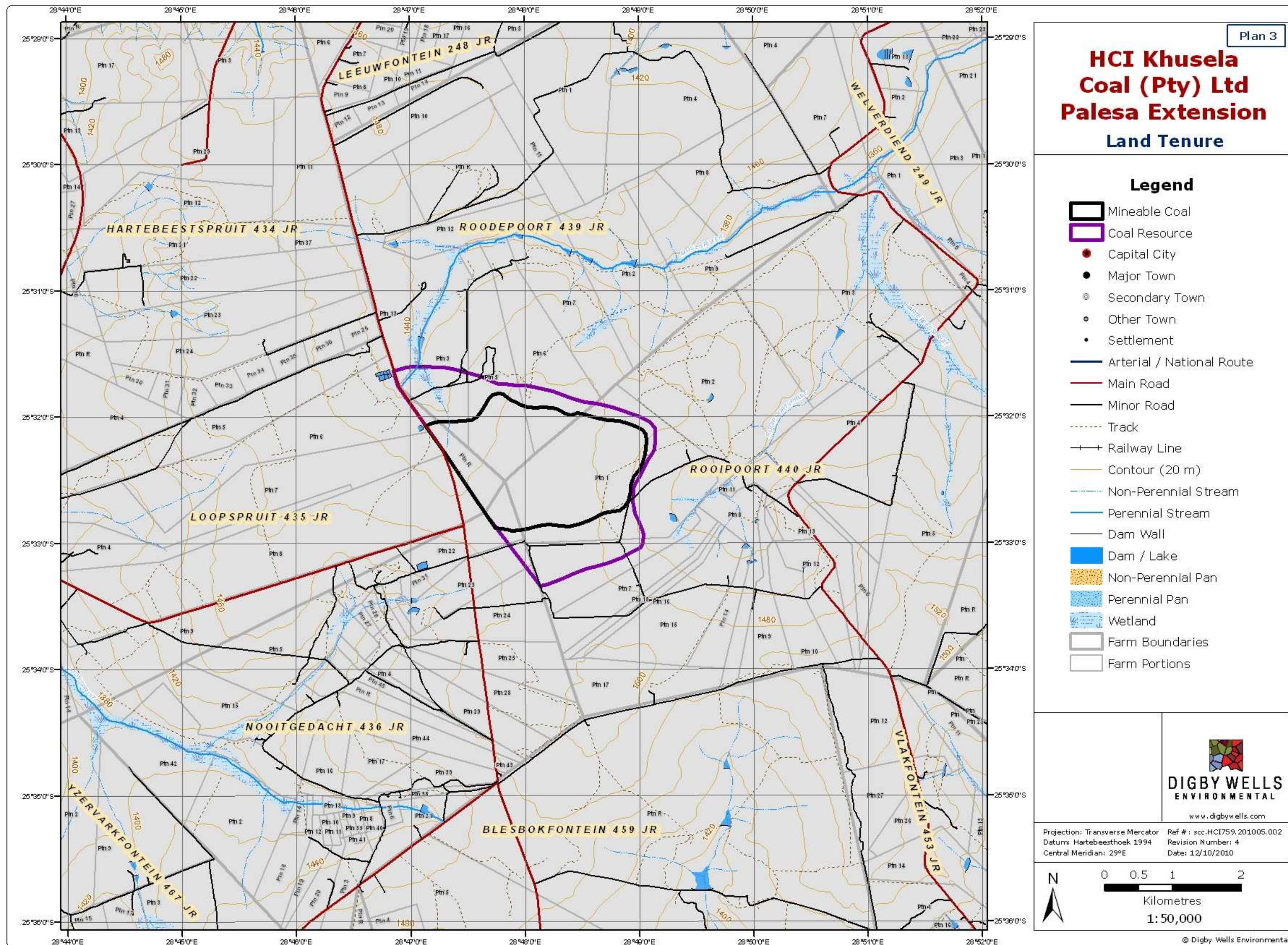
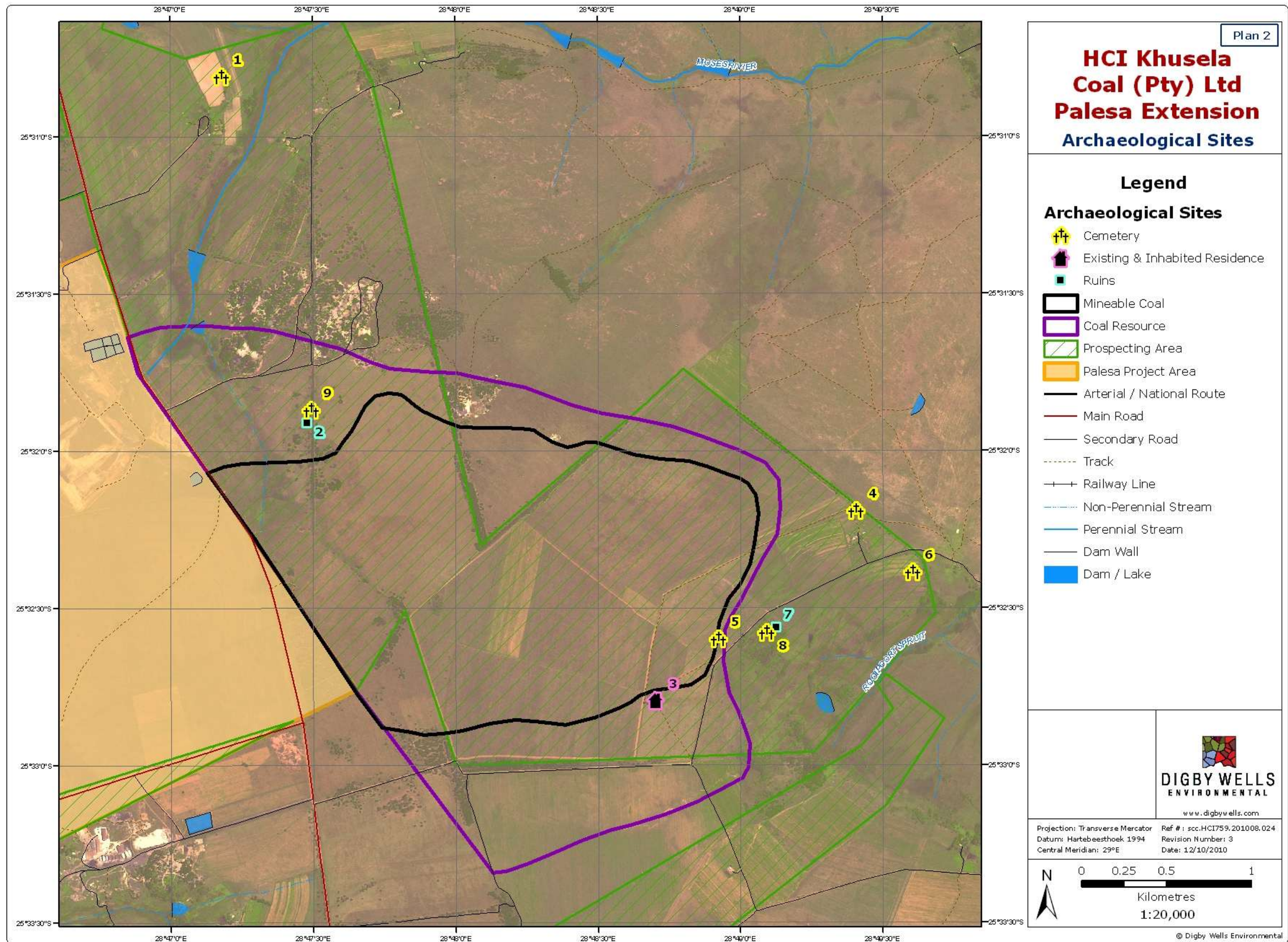


Figure 3: Archaeological and Heritage Sites in context of the current mine plan



3. METHODOLOGY

This archaeological impact assessment consisted of a desktop study – including background literature reviews, aerial and historical map surveys and review of relevant impact assessment reports – and a physical site survey. An archaeological site visit was undertaken by a qualified and accredited archaeologist for the identification and documentation of potential heritage resources, as stipulated in the NHRA (1999) and SAHRA Minimum Standards (2006). The field survey was conducted by Johan Nel (BA Honours Archaeology), an accredited professional archaeologist in the employ of Digby Wells Environmental. Field work took place over two days on 4 and 6 August 2010. The AIA report was compiled by Johan Nel and Marike Fourie (MA Sustainable Development). In essence, the integrated Phase 1 AIA process consisted of the following four steps:

3.1. Baseline Study: Desktop research

The first step was aimed at information gathering relating to known archaeological and heritage resources within and surrounding the proposed development area. Project information and data was obtained through intensive research, data gathering and consultation, including a variety of primary and secondary sources such as journals, textbooks and records, national and provincial websites, archaeological field guides, national guidelines, maps, photographs and plans. Surveys of aerial photographs, topographical maps, satellite imagery and other cartographic material was undertaken to plot potential sites. Some older maps, such as the Major Jackson series of early 20th century topographical maps, were also consulted and integrated into the AIA. These are invaluable resources, as they often include features and information not recorded on later maps.

3.2. Physical Study: Survey & Site Visit

A physical survey and site visit was undertaken by Johan Nel, an accredited and qualified archaeologist, in the proposed project area on 04 and 06 August 2010. A transect grid of 125 m x 125 m was plotted on the 1: 50 000 topographical map. This grid was loaded onto a GPS and used to guide the survey. The survey took place per vehicle and on foot and incorporated the following methodology:

- The 125 m transect grid was surveyed in a vehicle with periodic pedestrian spot checks every 50 – 100 m;
- All places inaccessible to vehicles, such as areas where black wattle trees occur densely, were surveyed on foot;

-
- Site naming was done in accordance with established principles in southern African archaeology. Each recorded site was allocated an arbitrary field label usually derived from the GPS numbering sequence, e.g. 001. This label was given a site name wherein the 1: 50 000 map number, the project code and the site number is reflected, facilitating future references to sites. E.g. 2528BD (map sheet number)/HCI759 (Digby Wells project code)/ 001 (site number).
 - No artefacts or samples were collected.
 - Sites and artefacts were recorded through GPS and GIS technology and high-resolution digital photographs and geographic co-ordinates were recorded with a Garmin Etrex Cx, average accuracy of ± 5 m, using the WGS 84 datum.
 - Photographic documentation was made using a Canon EOS 20D DSLR camera and a 17-28 mm Canon EFS lens.
 - All sites and find spots were plotted on 1: 10 000 orthographic aerial photographs and 1: 50 000 topographical maps using a GIS programme.

3.3. Data Interpretation: Assessment of Significance and Impacts

The identified heritage resources were assessed to determine their significance in context of the National Estate in terms of Section 3 of the NHRA. Potential impacts on the heritage resources were assessed in terms of Digby Wells" standard EIA methodology, as well as in terms of the impact assessment criteria and ratings as detailed in the Association of South African Professional Archaeologist (ASAPA) guidelines and the South African Heritage Resources Agency (SAHRA) guidelines (see Appendix 2). The site significance and impact assessment were integrated into the final EIA report.

3.4. Report Compilation: Report writing and documentation

Once the relevant field survey and report compilation was completed an AIA report was submitted to the relevant heritage/environmental authority for their perusal. This included:

- the identification and mapping of all archaeological and heritage resources in the affected area;
- an assessment of the significance of such resources in terms of the heritage assessment criteria;
- an assessment of the impact of the development of such resources; the consideration of alternatives; and

-
- proposed recommendations – based on the site significance and impact assessment – towards mitigation of any adverse effects during and after the completion of the development.

Subsequent to the completion of these steps, it was determined whether a Phase 2 Mitigation of identified sites will be required (e.g. grave relocation and/or the excavation of specific archaeological sites and/or detailed collection of artefacts at sites of significance that may be adversely affected by the proposed development.)

3.5. Interviews and inferred information findings

As part of the PPP process, questions pertaining to living and intangible heritage were included. These questions were designed to determine the potential existence of any sites of significance in terms of section 3 of the NHRA. The results were reported on in the PPP report. .

3.6. Restrictions and limitations

Although this report has been written as comprehensively and inclusive as possible, it should be noted that some archaeological and heritage sites may be located on sub-surface level. In addition, approximately 70% or more of the surveyed area is or was under cultivation. This may have destroyed any surface features that could be used to identify heritage resources. Large, open-cast quarries also occurred. These were ignored during the survey, as any probability of heritage resources occurring here is negligible. Surface visibility was also hampered by dense grass cover.

This report may therefore not give a full perspective of archaeological and heritage sites found in the project area and consequently chance find procedures must be implemented. This implies that an archaeologist or heritage specialist must immediately be contacted should any archaeological or heritage features be uncovered during the construction or operational phase (i.e. environmental monitoring). Such archaeological and heritage features and/or objects may not be disturbed or removed in any way until such time that the specialist has been able to do an assessment of the site (or object).



Figure 4: Typical landscape of survey area, tall and dense grass cover



Figure 5: Grazing and fallow fields, visibility good but heritage resources probably destroyed.



Figure 6: Previous season's lands

4. SITE DESCRIPTIONS

During the physical survey for the proposed project, a total of nine sites were recorded. These findings include cemeteries and remains of buildings or structures, as well as an existing house and associated infrastructure (see Table 2). In terms of this AIA report, sites constitute a collection of artefacts of three or more, or where features occur. These sites are depicted on the site map in Figure 2.

Table 2: Brief summary of recorded heritage resources.

Period	Number	Significance	Impact
Cemeteries / graves	7	Gr. 3B High	Low to High
Building remains	2	Gr. 4C Low	Low
House	1	Gr. 4B Medium	Low
Total	9		

4.1. 2528BD/HCI759/001 (S25.51349 E28.78637)

Site 1 is situated more than 1 km outside the coal resource area, as indicated on the project map in Figure 2, and illustrated below.



At least 12 graves were identified at this site. The cemetery is neglected (Figure 6). Most graves consist of informal stone cairn dressings without headstones. Three of the graves in the project area have slate headstones. The graves date to the late 19th and early 20th century, based on visible inscriptions on the headstones. One inscription names the deceased as one Hermanus Stephanus van Jaarsveld who died in 1913 (see Figure 7). This is probably family of the first farm owners, as the farm was registered in 1895 (see Appendix 1). According to Mr Johannes Mahlangu – current landowner – the relatives visit the graves from time to time. As the cemetery is located so far outside the coal resource area, no mitigation is necessary.



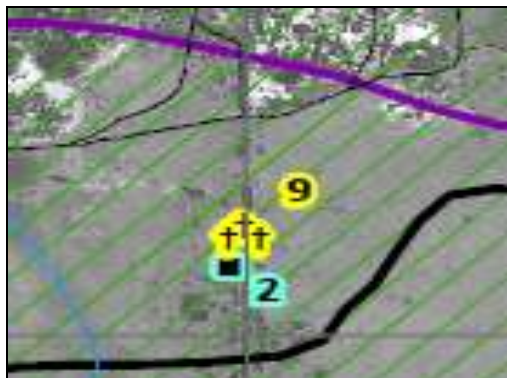
Figure 7: General view of cemetery 2528BD/HCI759/001. Graves are hardly visible due to long grass and neglect.



Figure 8: Headstone of one grave – a van Jaarsveld child who died in 1913.

4.2. 2528BD/HCI759/002 (S25.53187 E28.79136)

Site 2 is situated next to site 2528BD/HCI759/009 and may possibly be associated with the latter. Site 2 is located inside the coal resource area and less than 500 meters from the mineable coal area, as indicated on the project map in Figure 2, and illustrated below.



Remains of a stonewalled building are found at this site and may possibly be associated with cemetery 2528BD/HCI759/009. The only remaining structures are three low walls built with local stone and cement mortar (Figures 8 & 9). No visible material culture was found that would allow the site to be dated. However, a steel reinforced concrete lintel is built into the wall that could indicate a fairly recent date (figure9). The building was probably a labourer cottage. This area falls within the coal resource area and may be impacted on. The site has been damaged, altered and destroyed to such an extent resulting in it having negligible heritage significance. Mitigation is therefore not recommended.



Figure 9: General view of building



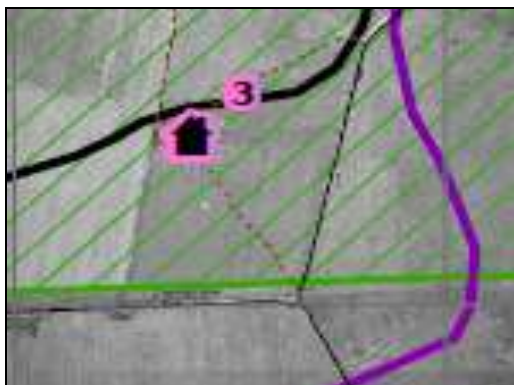
Figure 10: View of possible doorway, note cement mortar used.



Figure 11: Detail of outer wall. Note the reinforced lintel (in red outline) as well as repairs to wall (different stone).

4.3. 2528BD/HCI759/003 (S25.54658 E28.81177)

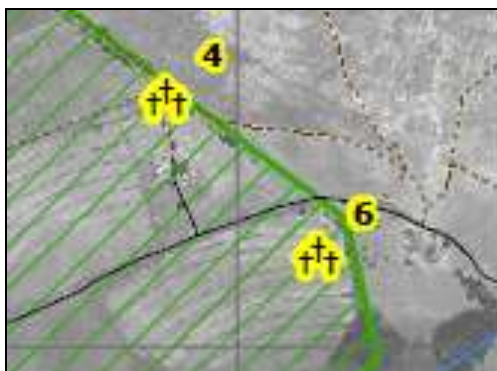
Site 3 is an inhabited house, located in the coal resource area, as indicated below.



The site is not considered a heritage resource (older than 60 years), but may need to be mitigated through relocation of the residents. This will be addressed through a public participation process.

4.4. 2528BD/HCI759/004 (S25.53652 E28.82347)

Site 4 is situated outside the coal resource area and more than 500 meters from the mineable coal area, as indicated on the project map in Figure 2, and illustrated below.



This site consists of a small cemetery situated where at least six graves were identified (Figure 11). The site is located on land owned by Mr Amos Mahlangu, although none of the graves are related to his family. The graves have informal stone cairns as well as more formal dressings. One grave has a new formal dressing and headstone (covered). The cemetery is fenced off and well maintained. As no one was available to grant permission, the cemetery was not entered for closer inspection. The site is located outside the mineable coal resource area, and as such need not be mitigated other than being monitored during construction phase.



Figure 12: View of cemetery. Note the newly erected dressing and headstone at far right.

4.5. 2528BD/HCI759/005 (S25.54333 E28.81541)

Site 5 is situated inside the coal resource area and borders the mineable coal area (less than 10 meters), as indicated on the project map in Figure 2, and illustrated below.



This site is largely overgrown with grass and vegetation (Figure 12). At least five graves were identified within a fenced off camp. The dressings range from informal stone cairns (Figure 13), semi-formal cement and stone dressings (Figure 14) and one formal dressing and headstone (Figure 15). The inscription on the headstone identifies the deceased as Lea Geresi Chili who died in 1969. According to some persons that were questioned, this is a known surname in the area. The arrangement of the graves is peculiar as some are oriented

in the traditional east-west manner, whilst others are north-east. This may indicate some cultural custom or significance.

Due to the cemetery's proximity to the mineable coal resource area, it will be negatively impacted on. The preferred mitigation option for site 5 would be *in situ* protection. If possible, mitigation measures should include fencing off of the site, allowing for a buffer zone of at least 100 m. The mine plan should also be adjusted as to avoid this site. The safety aspects associated with access to the cemetery for relatives should also be taken into consideration at this site. However, based on this site's proximity to the mineable coal resource area, the the cemetery may need to be relocated.



Figure 13: General view of site.



Figure 14: Example of informal stone cairn.



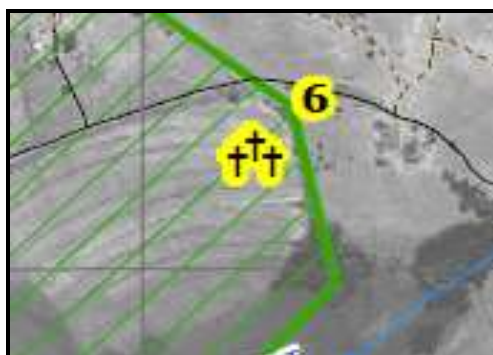
Figure 15: Semi-formal dressing built with local stone and cement.



Figure 16: Formal granite dressing and headstone.

4.6. 2528BD/HCI759/006 (S25.53978 E28.82682)

Site 6 is situated outside the coal resource area in the prospecting area located between 950 m and 1100 m of the mineable coal resource area, as indicated on the project map in Figure 2, and illustrated below.



Site 6 consist of a cemetery with at least 12 graves located in a field belonging to Mr Amos Mahlangu, although none of the graves are related to his family. The graves have informal stone cairns (Figure 16) and several broken slate headstones inscribed in Dutch (Figure 17). The graves are all neglected. As mentioned above, site 6 is located outside the mineable coal resource area, and as such need not be mitigated other than being protected *in situ* and monitored during construction phase. The graves should be fenced to prevent further

damage as a result farming activity, although this may not be considered HCI Khusela's responsibility if it is not located within the property rights or project area of HCI.



Figure 17: General view of site 2528BD/HCI759/006. Note lack of grave dressings due to neglect and damage.



Figure 18: Broken slate headstones at site 2528BD/HCI759/006 indicated by outlines

4.7. 2528BD/HCI759/007 (S25.54272 E28.81878)

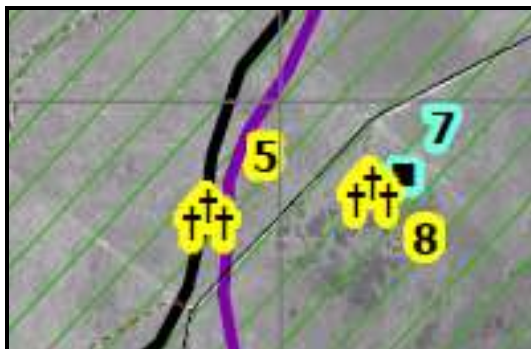
Site 7 is situated within 10 m of cemetery 2528BD/HCI759/008, and is probably associated with the latter. Site 7 is situated outside the coal resource and mineable coal resource areas, as indicated on the project map in Figure 2, and illustrated below.



Some evidence of old foundations occurs here, although it is completely out of context. The foundations consist of cement bricks and stone, and seem to have been dug out at some stage, possibly to be used at some other location.

4.8. 2528BD/HCI759/008 (S25.54298 E28.81823)

Site 8 is situated within 10 m of site 7 (2528BD/HCI759/007), and is probably associated with the latter. Site 8 is also situated outside the coal resource and mineable coal resource areas, as indicated on the project map in Figure 2, and illustrated below.



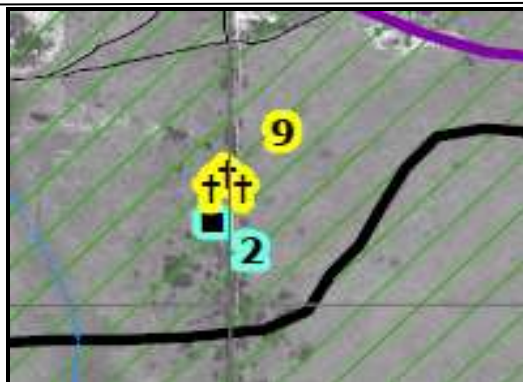
Site 8 consisted of at least three burials with informal dressings and cement headstones. The site is situated outside the coal resource area and thus no mitigation is recommended.



Figure 19: General view of Site 8 graves

4.9. 2528BD/HCI759/009 (S25.53118 E28.79162)

Site 9 is situated next to site 2528BD/HCI759/002 and may possibly be associated with the latter. Site 9 is located inside the coal resource area and less than 500 meters from the mineable coal area, as indicated on the project map in Figure 2, and illustrated below.



Site 9 consisted of at least seven graves with informal stone dressings. Two graves have deep burrows into the grave pits, probably due to animals. The site is situated beneath and in between large black wattle trees, the roots of which have further damaged the graves. Due to the site's proximity to the mineable coal resource area, safe access will not be possible, and the graves will probably be damaged or destroyed. Relocation of the graves are thus recommended.



Figure 20: General view of site 9.







Figure 21: Detail of grave dressing at site 9






Figure 22: Example of damage caused by vegetation to graves

Table 3: Sites of archaeological and heritage significance in the footprint and adjacent areas of the proposed Palesa extension mining area

SITE ID	GPS LOCATION		TYPE	CATEGORY	CONTEXT	CULTURAL AFFINITIES	EXTENT	STRATIFICATION	PAST ENVIRONMENTS	DESCRIPTION	ILLUSTRATION	SIGNIFICANCE ASSESSMENT
	LAT	LON										
2528BD/HCI759/001	-25.51349	28.78637	Cemetery	Historic	Primary	Historic occupation	12 graves	N/A	N/A	Cemetery consists of at least 12 visible graves with informal stone cairns and formal grave dressings. Three headstones are associated with the formal dressings. Dates range from 1886 to 1904. All graves oriented east-west. Cemetery is situated ±1.5 km north of coal resource area.		17
2528BD/HCI759/002	-25.53187	28.79136	Building	Historic	Secondary	Historic occupation	±6 x 8 m	N/A	N/A	A dilapidated square structure of which only parts of three walls remain. The structure is built in stone. No associated material culture was visible. Very close to, and possibly associated with 2528BD/HCI759/009. Site 2 is situated ±250 m of mineable coal resource area, and located inside the coal resource area		16
2528BD/HCI759/003	-25.54658	28.81177	Building	Modern	Primary	Current occupation	±100 x 100 m	N/A	N/A	An inhabited residence in the coal resource area. House has been significantly altered and damaged. Total area associated with building, i.e. fenced yard and outbuildings, ± 100 x 100 m. Site is situated inside the coal resource area, on the border of the mineable coal resource area.		17
2528BD/HCI759/004	-25.53652	28.82347	Cemetery	Historic	Primary	Historic occupation	5 graves	N/A	N/A	The cemetery is located outside Mr Amos Mahlangu's homestead, but is not related to his family. At least six graves are visible, with one new, covered headstone and formal dressing. Cemetery is situated outside the coal resource area. Site is situated ±600 m east of mineable coal resource area and ±450 m east of coal resource area.		11
2528BD/HCI759/005	-25.54333	28.81541	Cemetery	Historic	Primary	Historic occupation	6 graves	N/A	N/A	Cemetery consists of at least 5 visible graves, 3 of which have formal grave dressings and headstones. The remainder are stone cairns. One headstone is legible. The inscription dates the grave to 1969 and identifies it as Lea Geresi Chili's grave. The graves are oriented east-west and north-south. Cemetery is situated within the coal resource area, less than 10 m east of the coal resource area.		17

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2528BD/HCI759/006	-25.53978	28.82682	Cemetery	Historic	Primary	Historic occupation	12 graves	N/A	N/A	Cemetery consisting of at least 12 visible graves is located in a field belonging to Mr Amos Mahlangu. Graves are all damaged and only one headstone was visible, with a date of 1886 visible. Cemetery is situated more than ±900 east of the coal resource area.		11
2528BD/HCI759/007	-25.54272	28.81878	Building	Historic	Secondary	Historic occupation	±5 x 5 m	N/A	N/A	Foundations of buildings consisting of stone and cement bricks. Very damaged. Close to 2528BD/HCI759/008, and probably associated with these graves. Site is situated ±300 m east of coal resource area.		17
2528BD/HCI759/008	-25.54298	28.81823	Cemetery	Historic	Primary	Historic occupation	3 graves	N/A	N/A	Three graves in a black wattle bush. All three consist of concrete headstones and stone cairns. One name is visible and identifies a person named Madzimba. No dates were visible. Graves are situated ±350 m east of coal resource area.		11
2528BD/HCI759/009	-25.53118	28.79162	Cemetery	Historic	Primary	Historic occupation	7 graves	N/A	N/A	At least 7 graves are located close to 2528BD/HCI759/002 (±80 m north), underneath large black wattle trees. Some of the graves have grave goods, e.g. enamel cups, on the dressings. All dressings consist of stone cairns. At least 2 graves have deep animal burrows into the grave pit. All the graves are oriented east-west. Site 9 is situated ±250 m of mineable coal resource area, and located inside the coal resource area		11

5. SITE SIGNIFICANCE ASSESSMENT

Site significance is determined by Section 3 of the NHRA. This act provides nine categories whereby heritage resources' significance may be measured against, namely:

- (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 principle 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 a 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 organisation of importance in the history of South Africa; and
- (i) sites of significance relating to the history of slavery in South Africa."

Each heritage resource's significance is measured against the above parameters, based on whether such an object, feature or structure conforms to the following criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Uniqueness and
- Potential to answer present research questions.

A detailed explanation of the site significance assessment methodology and archaeological impact assessment criteria and ratings is provided in Appendix 2.

Table 4: Site significance assessment in terms of Section 3 of the NHRA

Site number	(A) Importance to community or pattern in country's history	(B) Possession of uncommon, rare or endangered natural or cultural heritage aspects	(C) Information potential	(D) Importance in demonstrating principle characteristics	(E) Importance in aesthetic characteristics	(F) Degree of technical / creative skill at a particular period	(G) Association to community or cultural group for social, cultural or spiritual reasons	(H) Association with life or work of a person, group or organisation of importance in the history of the country	(I) Site of significance relating to history of slavery	Site significance rating (Σ)	Site significance rating (percentage)
2528BD/HCI759/001	5	1	5	3	3	3	7	3	1	31	49%
2528BD/HCI759/002	2	1	2	1	1	2	3	1	1	14	22%
2528BD/HCI759/003	2	1	2	1	2	2	3	1	1	15	24%
2528BD/HCI759/004	5	1	5	3	3	3	7	3	1	31	49%
2528BD/HCI759/005	5	1	5	3	3	3	7	3	1	31	49%
2528BD/HCI759/006	5	1	5	3	3	3	7	3	1	31	49%
2528BD/HCI759/007	2	1	2	1	2	2	3	1	1	15	24%
2528BD/HCI759/008	5	1	5	3	3	3	7	3	1	31	49%
2528BD/HCI759/009	5	1	5	3	3	3	7	3	1	31	49%

6. IMPACT ASSESSMENT

This section aims to assess the significance of the potential impacts (threats or sources of risk) on archaeological and heritage resources in the proposed project area. The following impact assessment was completed in compliance with the impact assessment criteria implemented for the environmental impact assessment report, as well as in accordance with significance ratings and archaeological impact assessment criteria established by the Association of Southern African Professional Archaeologists (ASAPA) and applicable international best practice guidelines. More information on the archaeological impact assessment criteria and ratings used in this study and details on the weight assigned to the various parameters for positive and negative impacts in the formula are presented in Appendix 2.

Table 5: Impact assessment of potential risks and threats to heritage resources

SITE ID	GPS LOCATION		TYPE	CATEGORY	CONTEXT	CULTURAL AFFINITIES	EXTENT	STRATIFICATION	PAST ENVIRONMENTS	DESCRIPTION	SIGNIFICANCE ASSESSMENT	IMPACT ASSESSMENT
	LAT	LON										
2528BD/HCI759/001	-25.51349	28.78637	Cemetery	Historic	Primary	Historic occupation	12 graves	N/A	N/A	Cemetery consists of at least 12 visible graves with informal stone cairns and formal grave dressings. Three headstones are associated with the formal dressings. Dates range from 1886 to 1904. All graves oriented east-west. Cemetery is situated ±1.5 km north of coal resource area.	31	34
2528BD/HCI759/002	-25.53187	28.79136	Building	Historic	Secondary	Historic occupation	±6 x 8 m	N/A	N/A	A dilapidated square structure of which only parts of three walls remain. The structure is built in stone. No associated material culture was visible. Very close to, and possibly associated with 2528BD/HCI759/009. Site 2 is situated ±250 m of mineable coal resource area, and located inside the coal resource area	14	17
2528BD/HCI759/003	-25.54658	28.81177	Building	Modern	Primary	Current occupation	±100 x 100 m	N/A	N/A	An inhabited residence in the coal resource area. House has been significantly altered and damaged. Total area associated with building, i.e. Fenced yard and outbuildings, ± 100 x 100 m. Site is situated inside the coal resource area, on the border of the mineable coal resource area.	15	148
2528BD/HCI759/004	-25.53652	28.82347	Cemetery	Historic	Primary	Historic occupation	5 graves	N/A	N/A	The cemetery is located outside Mr Amos Mahlangu's homestead, but is not related to his family. At least six graves are visible, with one new, covered headstone and formal dressing. Cemetery is situated outside the coal resource area. Site is situated ±600 m east of mineable coal resource area and ±450 m east of coal resource area.	31	34
2528BD/HCI759/005	-25.54333	28.81541	Cemetery	Historic	Primary	Historic occupation	6 graves	N/A	N/A	Cemetery consists of at least 5 visible graves, 3 of which have formal grave dressings and headstones. The remainder are stone cairns. One headstone is legible. The inscription dates the grave to 1969 and identifies it as Lea Geresi Chili's grave. The graves are oriented east-west and north-south. Cemetery is situated within the coal resource area, less than 10 m east of the coal resource area.	31	109
2528BD/HCI759/006	-25.53978	28.82682	Cemetery	Historic	Primary	Historic occupation	12 graves	N/A	N/A	Cemetery consisting of at least 12 visible graves is located in a field belonging to Mr Amos Mahlangu. Graves are all very damaged and only one headstone was visible, with a date of 1886 visible. Cemetery is situated more than ±900 east of the coal resource area.	31	34
2528BD/HCI759/007	-25.54272	28.81878	Building	Historic	Secondary	Historic occupation	±5 x 5 m	N/A	N/A	Foundations of buildings consisting of stone and cement bricks. Very damaged. Close to 2528BD/HCI759/008, and probably associated with these graves. Site is situated ±300 m east of coal resource area.	15	18
2528BD/HCI759/008	-25.54298	28.81823	Cemetery	Historic	Primary	Historic occupation	3 graves	N/A	N/A	Three graves in a black wattle bush. All three consist of concrete headstones and stone cairns. One name is visible and identifies a person named Madzimba. No dates were visible. Graves are situated ±350 m east of coal resource area.	31	34
2528BD/HCI759/009	-25.53118	28.79162	Cemetery	Historic	Primary	Historic occupation	7 graves	N/A	N/A	At least 7 graves are located close to 2528BD/HCI759/002 (±80 m north), underneath large black wattle trees. Some of the graves have grave goods, e.g. enamel cups, on the dressings. All dressings consist of stone cairns. At least 2 graves have deep animal burrows into the grave pit. All the graves are oriented east-west. Site 9 is situated ±250 m of mineable coal resource area, and located inside the coal resource area	31	109

6.1 Construction and Operational Phase

As described in Table 5, two sites (excluding the inhabited house) will potentially be directly impacted on by mining activities during the construction phase namely sites 2528BD/HCI759/005 and 2528BD/HCI759/009. Site 2528BD/HCI759/003 is not a heritage resource, but an occupied house. As such the impact is of a social nature, and will not be discussed further. Site 2528BD/HCI759/005 and 2528BD/HCI759/009 are cemeteries located inside the coal resource area. Although the site may potentially be negatively impacted on, following the recommended mitigation measures outline below will ensure that the site remains protected. All other identified sites are situated sufficiently far enough of the mineable coal resource area not to be directly impacted on. However, sites 2528BD/HCI759/007 and 2528BD/HCI759/008 may also be impacted by secondary impacts resulting from increased activity and traffic associated with the construction phase. Site 2528BD/HCI759/007 is, however, of negligible heritage significance, and any negative impact will be irrelevant.

During the construction and operational phases, mitigation will thus be required for sites 2528BD/HCI759/002, 2528BD/HCI759/005, 2528BD/HCI759/008 and 2528BD/HCI759/009.

6.2 Decommissioning and Closure Phase

During the decommissioning and closure phase of the project, no additional surface disturbance activities or impacts are expected. The majority of sites of archaeological and heritage significance (cultural and natural) will have been recorded, assessed and mitigated or conserved in preceding phases. Conditional to the effective identification, documentation and mitigation or protection of these sites during the construction and operational phases of the project, the significance of impacts anticipated for archaeological and heritage sites during these phases are low. However, site 2528BD/HCI759/005 and 2528BD/HCI759/009, if not relocated will need to be monitored to avoid accidental damage during rehabilitation, decommissioning and closure.

6.3 Cumulative Impacts

Cumulative impacts on archaeological and heritage sites may include structural damage resulting from blasting or vibrations, pollution from acid mine drainage or seepage, vandalism and property damage due to influx of workers. In Mpumalanga Province, various developments have resulted in the relocation of graves, which has negative emotional and socio-cultural impacts on the values and identities of communities. With reference to the

proposed HCI Palesa Extension project, negative cumulative impacts on sites of archaeological or heritage sites are therefore expected as result of potential grave relocation procedures for sites 2528BD/HCI759/005 and 2528BD/HCI759/009; however, the cumulative impacts associated with the proposed project is not considered to be significant. Cumulative impacts of industrial developments may also be beneficial/ positive if contributions are made towards archaeology and heritage disciplines through research and effective documentation and mitigation of relevant heritage sites in the area. For the purpose of this project, no significant positive impacts are foreseen on the archaeological or heritage sites located in the project area.

In essence, it is important to preserve and raise awareness of the importance of archaeological and heritage conservation, including the conservation and monitoring of historical structures in the surrounding area.

7. DISCUSSION OF FINDINGS

The recorded sites only represent historic to more recent graves and structures.

7.1. Cemeteries and graves

In terms of the cemeteries and graves, these all constitute social and cultural sensitive heritage resources. The graves may have intrinsically different meanings and significance to different people and communities. As far as possible, these sites should be managed *in situ* and protected from any impact – either direct, primary impact or secondary impact. Based on the inscriptions and dates of some of the graves, it is evident that these are probably the earliest Europeans to have settled in the area. All graves and cemeteries are thus considered to be of local significance (Grade 3A), and as such should be conserved.

7.2. Buildings and ruins

The foundations of ruined buildings that were identified are impossible to date visually. They have been allowed to fall into disrepair to such an extent that very little information may be generated through study. As such, these foundations are considered to be physically of very low significance (Grade 4C) and may be destroyed where necessary.

8. MITIGATION, MANAGEMENT AND MONITORING MEASURES

In the event of identified archaeological and cultural heritage resources situated within or in close proximity to proposed development areas, the specialist will identify, document and make recommendations based on the particular resources' significance, which may include recommendations of:

- i. *Site preservation*: Conservation is essentially a no development recommendation;
- ii. *Site mitigation*: Site conservation (no development in the particular area) or Phase 2 mitigation: Shovel Test Pit (STP) after which development may legally proceed in the area.
- iii. *Site destruction*: If a particular identified resource is of little archaeological or cultural heritage significance, a recommendation of site destruction will be made by an accredited archaeologist/ specialist. A site destruction recommendation essentially implies that the site may be destroyed during the course of development without the developer having to comply with any archaeological or cultural heritage requirements

In terms of the NHRA (no 25 of 1999), man-made structures older than 60 years are protected as heritage sites of significance and a permit is required for any structural changes and/or demolition. It is recommended that if any of the ruins be affected by mining, a conservation architect evaluate them for significance and make the appropriate recommendations and implement the relevant mitigation measures.

Table 6: Recommended mitigation of heritage resources

Activity, phase and Impact					Recommended mitigation	Management actions	Site significance	Impact significance	Site significance (post-mitigation)	Impact significance (post-mitigation)
2528BD/HCI759/001	C, O, D				No mitigation necessary	A	31	34	31	34
2528BD/HCI759/002	C, O, D				No mitigation necessary	A	14	17	14	17
2528BD/HCI759/003	C, O, D				1) Public Participation Process to determine residents' willingness to relocate. 2) Social Impact Assessment and Relocation Action Plan should be implemented.	A	15	148	15	39
2528BD/HCI759/004	C, O, D				No mitigation necessary	A	31	34	31	34
2528BD/HCI759/005	C, O, D				1) Site must be fenced off, allowing for access by relatives. A buffer zone of at least 50 - 100 m must be included to protect the site from any accidental damage during the construction, operational and decommissioning phases. 2) A HSMP should be drafted that will be affective for the LoM. 3) Periodic monitoring of the site should take place during at least the construction phase, to monitor mining activities' potential impact. 4) Only if no other option is available, should grave relocation be a possibility.	A	31	109	31	52
2528BD/HCI759/006	C, O, D				No mitigation necessary	A	31	34	31	34
2528BD/HCI759/007	C, O, D				No mitigation necessary	A	15	18	15	18

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2528BD/HCI759/008	C, O, D			<ol style="list-style-type: none"> 1) Due to the proximity of the site to the mining area, the site must be fenced off, allowing for access by relatives. 2) A buffer zone of at least 20 m must be included to protect the site from any accidental damage during the construction, operational and decommissioning phases. 3) Periodic monitoring of the site should take place during the construction phase and erection of fences. 4) Grave relocation should not be necessary, nor a viable option. 	A	31	34	31	34
2528BD/HCI759/009	C, O, D			<ol style="list-style-type: none"> 1) Due to the proximity of the site to the mining area, the site must be fenced off, allowing for access by relatives. 2) A buffer zone of at least 20 m must be included to protect the site from any accidental damage during the construction, operational and decommissioning phases. 3) Periodic monitoring of the site should take place during the construction phase and erection of fences. 4) Only if no other option is available, should grave relocation be a possibility. 	A	31	109	31	52

1.1 Monitoring programme

The purpose of this monitoring program is to provide general information to the developer with regards to management recommendations for the archaeological component of the EIA/EMP. Such a monitoring programme is planned for observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land where there is a possibility that an archaeological deposit may be disturbed or destroyed. In essence, the main purpose of a management and monitoring programme is:

- To allow, within the resources available, the preservation by record of archaeological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works;
- To provide an opportunity, if required, for the monitoring archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the monitoring programme itself are not sufficient to support treatment to a satisfactory and proper standard;
- To emphasise the requirement for excavation and/or preservation of known or inferred deposits and guide any requirement for contingent excavation or preservation of possible deposits; and
- To establish and disclose information about the archaeological resource existing on a site.

Table 7: Roles and responsibilities of archaeological and heritage management

ROLE	RESPONSIBILITY	IMPLEMENTATION
A responsible specialist needs to be allocated and should attend all relevant meetings, especially when changes in design are discussed.	HCI Khusela	Archaeologist and a competent archaeology support team
If chance finds and/or graves or burial grounds are identified during construction or operational phases, a specialist must be contacted in due course for evaluation.	HCI Khusela	Archaeologist and a competent archaeology support team
Comply with defined national or local cultural heritage regulations or the protected area management plans.	HCI Khusela	Environmental Consultancy and the Archaeologist

Consult the protected area sponsors and managers, local communities and other key stakeholders on the proposed project.	HCI Khusela	Environmental Consultancy and the Archaeologist
Implement additional programmes, as appropriate, to promote and enhance the conservation aims of the protected area. (i.e. integrate the archaeological components into employee induction course)	HCI Khusela	Archaeologist, Local/Provincial/ National Museum and/or competent authority for training services
If required, conservation or relocation of burial grounds and/or graves according to the applicable regulations and legislation of the South Africa and the Mpumalanga Province.	HCI Khusela	Archaeologist, Local/Provincial/ National Museum and/or competent authority for relocation services
Financial provisions of services and activities related to the management and monitoring of significant archaeological sites	HCI Khusela	The client
After specialist/archaeologist has been appointed, comprehensive feedback reports should be submitted to relevant authorities during each phase of development.	HCI Khusela and Archaeologist	Archaeologist

9. RECOMMENDATIONS

No mitigation is recommended for sites 2528BD/HCI759/001 (site 1), 2528BD/HCI759/002 (site 2), 2528BD/HCI759/004 (site 4), 2528BD/HCI759/006 (site 6) and 2528BD/HCI759/007 (site 7), as these sites are either of no heritage value or further than 500 m outside the coal resource area. However, all sites that fall inside the coal resource area or within 500 m of the mineable coal resource area should be mitigated.

- Site 2528BD/HCI759/003 is located inside the coal resource area and within 50 m of the mineable coal resource area. Although this site has no heritage value, it is currently occupied. Mitigation measures fall outside the ambit of this study, but should include public participation, social impact assessments and probable relocation.

- Site 2528BD/HCI759/005 is the only site that will be directly impact on by all phases of mining. Recommended preventative mitigation includes fencing off of the site and realignment of the mine plan. Alternatively, grave relocation will be required, which will involve a time- and cost-intensive grave relocation process in terms of the NHRA and other legislative requirements;
- Although site 2528BD/HCI759/008 falls outside the coal resource area, it is within 500 m of the mineable coal resource area (± 250 m). Site 2528BD/HCI759/009 falls within the coal resource area, but is situated between ± 250 and 300 m of the mineable coal resource area. Both these sites are thus sufficiently near to the mineable coal resource area to warrant preventative mitigation.
- Sites 2528BD/HCI759/005, 008 and 009 should all include a monitoring aspect during at least the construction phase of the mine, as well as the fencing off of the sites.
- A Heritage Site Management Plan should furthermore be drafted for 2528BD/HCI759/005 (site 5), 2528BD/HCI759/008 (site 8) and 2528BD/HCI759/009 (site 9) specifically to ensure adequate management and protection of this site throughout the life of the mine.

10. CONCLUSION

Archaeology and heritage constitutes wholly non-renewable resources, and should be protected wherever possible. When protection is not possible, such resources must be recorded, documented and sampled to provide a lasting archive for future generations. Failure by parties to react to the procedures, recommendations and legal requirements outlined in this report will lead to penalties prescribed in the NHRA and by SAHRA. Although the identified sites seem to be far and few, and their individual ratings low, they are nevertheless significant. Although there is an evident lack of information both in the literature and on the ground, this does not necessarily indicate the non-existence of heritage resource. Absence of evidence is not evidence of absence.

It is recommended that the mine plan be altered, where possible, so that none of the identified heritage resources be negatively impacted on.

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**APPENDIX 1:
Literature Review
(Digby Wells Environmental, 2009)**

**APPENDIX 2:
Archaeological Impact Assessment Criteria and Ratings
(Digby Wells Environmental, 2010)**

1. ARCHAEOLOGICAL IMPACT ASSESSMENT CRITERIA

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region is generally used for the purpose of archaeological impact assessment reports. This classification has been adapted to better integrate into the EIA/EMP Assessment Methodology.

1.1 SAHRA AND ASAPA ASSESSMENT METHODOLOGY:

The significance of archaeological sites is generally based on four main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Uniqueness and
- Potential to answer present research questions.

These criteria are based on Section 3(3) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). This section states the following:

“[A] place or object is to be considered part of the national estate if it has cultural significance or other special value because of –

- (j) its importance in the community, or pattern of South Africa’s history;
- (k) its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- (l) its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- (m) its importance in demonstrating the principle characteristics of a particular class of South Africa’s natural or cultural places or objects;
- (n) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- (o) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- (p) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- (q) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- (r) sites of significance relating to the history of slavery in South Africa.”

The site significance is calculated according to Section 3(3) of the NHRA. Each aspect of significance is given an individual rating out of 7, based on the SAHRA significance rating. The rating is given per each individual aspect which is added, totalled, and converted into a percentage e.g.:

$$7+5+6+4+4+2+1+3+1 = 33$$

Where 33 is converted to a percentage, i.e. $33/63 = 52\%$ (Local Significance / Gr. 3B)

Thus, the matrix first calculates the rating out of 63 and then converts this into a percentage out of 100.

Site Significance (based on NHRA and SAHRA standards)

SAHRA FIELD RATING & GRADING	Digby Wells GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION	PERCENTAGE
National Significance (NS)	Gr. 1	-	Conservation; National Site nomination (D)	87% - 100%
Provincial Significance (PS)	Gr. 2	-	Conservation; Provincial Site nomination (D)	72% - 86%
Local Significance (LS)	Gr. 3A	High Significance	Conservation; Mitigation not advised (D)	56% - 71%
Local Significance (LS)	Gr. 3B	High Significance	Mitigation (Part of site should be retained) (C)	41% - 55%
Generally Protected A (GP.A)	Gr. 4A	High / Medium Significance	Mitigation before destruction (B)	29% - 40%
Generally Protected B (GP.B)	Gr. 4B	Medium Significance	Recording before destruction (B)	15% - 28%
Generally Protected C (GP.C)	Gr. 4C	Low Significance	Destruction (A)	0% - 14%

Management actions and recommended mitigation, which aims to mitigate and reduce the impact on sites, are expressed as follows:

- A - No further action necessary;
- B - Mapping of the site and controlled sampling required;
- C - Preserve site, or extensive data collection and mapping of the site; and
- D - Preserve site

This process has been summarised in the table below.

Archaeological Impact Assessment for the proposed HCI Khusela Palesa Extension project (HCI759)

Site Significance (SAHRA and ASAPA)

Value	Site Significance (SAHRA rating)	Recommended mitigation (SAHRA)	(A) Importance to community or pattern in country's history	(B) Possession of uncommon, rare or endangered natural or cultural heritage aspects	(C) Information potential	(D) Importance in demonstrating principle characteristics	(E) Importance in aesthetic characteristics
7	High / Gr. 1	Conservation: National Site Nomination	Extremely important to the country's community or to the country's history on a national level.	Endemic / exclusive to very specific localities / other occurrences unknown	Extremely high information potential: national and international	Exceptional example, complete, unique	Exceptional example, complete, unique
6	High / Gr. 2	Conservation: Provincial Site Nomination	Extremely important to the country's community or to the country's history on a provincial level.	Endemic / exclusive to specific localities / other occurrence infrequent	Extremely high information potential: national	Exceptional example, mostly complete, rare	Exceptional example, mostly complete, rare
5	High Gr. 3A	Conservation: Regional Site Nomination	Extremely important to the community or to the history on a regional level.	Localised to only few specific localities	High information potential: national	Exceptional example, incomplete, rare	Exceptional example, incomplete, rare
4	High / Gr. 3B	Mitigation and partly conserved	Very important to the community or to the history on a district level.	Rarely occurs at this locality	High information potential	Exceptional example, common	Exceptional example, common
3	High / Gr. 4A (Generally Protected A)	Mitigation before destruction	Important to the community or to the history on a municipal level.	Occurs at this locality, but occurrence unusual	Average Information potential	Good example, incomplete, common	Good example, incomplete, common
2	Medium / Gr. 4B (Generally Protected B)	Record before destruction	Important to the community or to the history on a local level.	Occurs at this locality, but not widespread	Low information potential	Common example, incomplete	Common example, incomplete
1	Low / Gr. 4C (Generally Protected C)	Destruction / none	Little importance to the community or to the history on any level.	Occurs widespread	No information potential	Damaged, destroyed, altered to extent where example is useless	Damaged, destroyed, altered to extent where example is useless

Archaeological Impact Assessment for the proposed HCI Khusela Palesa Extension project (HCI759)

Value	Site Significance	Recommended mitigation	(F) Degree of technical / creative skill at a particular period	(G) Association to community or cultural group for social, cultural or spiritual reasons	(H) Association with life or work of a person, group or organisation of importance in the history of the country	(I) Site of significance relating to history of slavery	Significance Range
7	High / Gr. 1	Conservation: National Site Nomination	Uncommon / unique skill for period	Exceptional high socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	Exceptional high association	Exceptionally important site, great significance on national and international slavery	59-63
6	High / Gr. 2	Conservation: Provincial Site Nomination	Exception degree of skill for period	Very high socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	Very high association	Very important site, high significance on national and international slavery	53-58
5	High Gr. 3A	Conservation: Regional Site Nomination	High degree of skill for period	High socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	High association	Important site, high significance on national slavery	47-52
4	High / Gr. 3B	Mitigation and partly conserved	Above average degree of skill for period	Above average socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	Above average association	Important site, areas may have significance on national slavery	31-46
3	High / Gr. 4A	Mitigation before destruction	Average degree of skill for period	Average socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	Average association	Site has a high likelihood of being associated with slavery	24-30
2	Medium / Gr. 4B	Record before destruction	Limited degree of skill for period	Low socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	Lesser association	Possible slavery site, but unlikely	16-23
1	Low / Gr. 4C	Destruction / none	Common skill for period	No socio-cultural significance in terms of identity, custom, religion, ancestry, etc.	No association	No significance	0-15

APPENDIX 3:
Curriculum Vitae of Specialists
(Johan Nel & Marike Fourie)

CURRICULUM VITAE OF JOHAN NEL

Archaeologist

PERSONAL INFORMATION

Date of Birth: 07/01/1980

Languages: English, Afrikaans

Motor Vehicle License: code 08

Tel: (011) 504 1404 / 072 288 5496

Email: johan.nel@digbywells.co.za

EDUCATION

Potchefstroom Gimnasium (1993 – 1995)

Hoërskool Brandwag (1996-1997)

Matric Exemption (Standard 10 / Grade 12) English, Afrikaans, History, Art, Biology, Geography

University of Pretoria (UP) (1998-2001)

BA Degree (Bachelor of Arts) with Majors in Anthropology & Archaeology

Subjects included: Anthropology, Archaeology, IsiZulu, History of Ancient Cultures, Geography, Philosophy.

University of Pretoria (UP) (2002)

BA (Honours) Degree specialising in Archaeology, focussed on Isotopic Analysis of Human Remains from the Ben Alberts Nature Reserve, Thabazimbi, and documentation of ritual initiation structures (*phiri*) from Maleoskop, Groblersdal.

University of Pretoria (UP) (2002)

Attended a course on physical anatomy and dissection for non-degree purposes.

University of Pretoria (UP) (2007 – present)

M.A (*Magister Artium*) Degree, specialising in Archaeology. Dissertation title: Finding Frontiers: An Archaeology of Landscape in South Africa's northern frontier during the last 500 years. The study uses a landscape approach to determine whether pottery analysis and settlement layout are adequate heuristics to interpret notions of „frontiers“ and identity. Received an National Research Foundation / Five Hundred Year Initiative research bursary over the years 2008 to 2009.

EMPLOYMENT

- 2010 – present: Archaeologist and CRM specialist, Digby Wells Environmental
- 2005 – 2010: Co-owner and manager of Archaic Heritage Project Management, Cultural Heritage Resources Management consultancy company;
- 2004 – 2005: Resident, professional archaeologist, Rock Art Mapping Project based at Didima / Cathedral Peak, Ukhahlamba-Drakensberg World Heritage Site, Department of Geomatics, University of KwaZulu-Natal;
- 2003 – 2004: Freelance, professional archaeologist;
- 2002 – 2003: Special Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;
- 2000 – 2002: Technical Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;
- 1999 – 2000: Assistant in Mapungubwe Project, Department of Anthropology and Archaeology, University of Pretoria;
- 1998 - 1999: Volunteer at National Cultural History Museum, Pretoria, Writer for BAT („By About Town) arts section in Perdeby, official University of Pretoria student newspaper.

EXPERIENCE

Johan has volunteered at museums since childhood. His first formal experience in the archaeological and heritage environment during his tertiary studies, where he assisted professional archaeologists in cataloguing excavated material from a historical site in Pretoria. He was employed by the Department of Anthropology and Archaeology in his second year of study to assist in the Mapungubwe Project. This entailed collections management of certain artefacts from the Mapungubwe archaeological site to be included in the Mapungubwe Museum at UP. By his third year of study he was permanently employed by the Department of Anatomy, UP, where his training and experience included grave relocation, forensic archaeology, collections management, fossil preparation, as well as intensive archaeological fieldwork. He left this department soon after qualifying as a professional archaeologist to pursue a freelance career. He gained valuable experience in Cultural Resources Management, being contracted by established companies in addition to undertaking his own projects. In 2004 an opportunity arose for him to be the resident, professional archaeologist for the Rock Art Mapping Project. This entailed survey and documentation of known rock art sites, as well as the identification of new sites. Johan established Archaic Heritage Project Management with a partner towards the end of 2005. He managed this company until his appointment at Digby Wells in 2010. During the five years managing Archaic, Johan

has undertaken numerous projects that included archaeological impact assessments and Phase 2 projects, grave relocation, social consultation, and general heritage research projects such as land claims. Current areas of expertise at Digby Wells include archaeological field work, historical research, managing Archaeological and Heritage Impact Assessments, and drafting and reviewing reports.

PROFESSIONAL MEMBERSHIPS

Association of Southern African Professional Archaeologists (ASAPA): Professional Member

ASAPA Cultural Resources Management (CRM) section: Accreditation in:

Grave Relocation – Field Director

Iron Age – Field Supervisor

Rock Art – Field Supervisor

International Association of Impact Assessors (South Africa)

Society for Africanist Archaeologists (SAfA)

DIGBY WELLS PROJECT EXPERIENCE:

- Archaeological Impact Assessment – Phase 1: Galaxy Gold Agnes Mine, Barberton, South Africa;
- Archaeological Impact Assessment – Phase 1: HCI Khusela Palese Extension, Bronkhorstspuit, South Africa
- Archaeological Impact Assessment – Phase 1: Randgold Kibali Mine, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo;
- Archaeological Impact Assessment – Phase 1: Nzoro Hydropower Station, Environmental and Social Impact Assessment, Democratic Republic of the Congo;
- Grave relocation process: Randgold Kibali Mine, Relocation Action Plan, Kibali, Democratic Republic of the Congo;
- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa;
- Review of Archaeological Assessment: Resources Generation, Coal Mine Project in the Waterberg area, Limpopo Province.

PERSONAL INFORMATION:

Name: MARIKE FOURIE
Title: Environmental Consultant
Company: Digby Wells Environmental

EDUCATION

- University of Pretoria (UP) 2000 – 2002: BhcS. Degree *Cum Laude*;
- University of Pretoria (UP) 2003 – BhcS. (Hon) Degree *Cum Laude* Specializing in Cultural and Heritage Tourism Management;
- University of Johannesburg (R.A.U) 2005 – 2006: (M.A.) Degree, specializing in Sustainable Development;
- Wildlife Campus (Ecolife) 2007, Certificate in Wildlife Management;
- University of Johannesburg 2008 – present, (PhD) Degree in Environmental Management

Lifetime Membership: Goldenkey International Honorary Society: Membership attained through academic achievement (Honorary Colours) in the BhcS. Degree.

EMPLOYMENT

- 2005 – Lecturer in Sustainable Tourism Development at the University of Johannesburg (previously known as R.A.U)
- 2005 – Lecturer in Geography at Abbott's College, Northcliff
- 2004 – Researcher for South African Veterinary Association (SAVA): Development of Veterinary Museum at Onderstepoort, Pretoria
- 2004 – Administrative Assistant at Financial Services Compensation Scheme (FHCS), London, U.K
- 2002 – 2003 : Research Assistant at University of Pretoria (UP), Archive Assistant & Part-time Travel Writer for Campus Newspaper

EXPERIENCE

Whilst completing a BhcS. (Hon) and Masters Degree, she has done intensive research, fieldwork and impact assessments in the Blouberg area (Limpopo Province). The Hananwa community formed an integral part of the Masters Degree in Sustainable Development as well as an Ethno-botanical assessment of the region (Bhcs). As a lecturer in Sustainable Tourism Development and Geography, she was responsible for the preparation of formal lectures, presentations, practical guidance (excursions) and student evaluation. Other work experiences such as Research assistant for South African Veterinary Association (SAVA) and University of Pretoria (UP) were primarily focussed on resource analysis, literature reviews, compilation of development proposals, data input and constructive recommendations. Current area of expertise at Digby Wells lies in the formulation and implementation of sustainable development initiatives, archaeological impacts assessments and assisting with scoping reports, Environmental Impact Assessments (EIA), local economic development plans (LED) and Environmental Management Plans (EMP).

Projects involved at Digby Wells include:

- Sadiola Deep Sulphides Project (EIA/EMP, Project Manager), AngloGold Ashanti (AGA), Mali, West Africa;
- Valencia Uranium (EIA/EMP, Assistant Project Manager), Forsys Metals, Namibia, Southern Africa;
- Tselentis and Spitzkop Mining developments (EIAs/EMPs, Archaeological Management), Xstrata, Mpumalanga, South Africa;
- Crown Ergo Mining Operation and related reclamation activities (EIAs/EMPS, Air Quality and Archaeological Management), Gauteng;
- Northern Coal, Weltevreden (EIA/EMP, Archaeological Management), Mpumalanga;
- Etoile (BFS, Preliminary Archaeological Investigations), IMC, Democratic Republic of Congo (DRC);
- Khutala Mineral Optimisation Project, EIA/EMPR, Ingwe Colliery, Mpumalanga, South Africa ;
- Klippoortjie 5 Seam EMPR Addendum, Xstrata Coal, Mpumalanga
- Cleaner Production (CP) Campaign, Water Research Commission (WRC), South Africa;
- Op Goeden Hoop Mining Right Application, NuCoal, Mpumalanga
- Mmamabula Energy Project, CIC, Botswana, including:
 - Mine & Power station EIA/EMPR,
 - Transmission Lines EIA/EMPR,
 - Railway Link and Service Corridor,
 - Kudumatse Groundwater exploration boreholes and
 - Calcrete Mine.
- ATC Mini Opencast Pits EMPR Addendums, Xstrata Coal, Mpumalanga.
- Mareesburg Platinum Joint Venture, Eastern Platinum, Mpumalanga.
- Bankfontein EIA/EMPR, Vaalsands (Pty) Ltd, Free State
- 3L2 Dump EIA/EMPR, Crown Gold Recoveries, Gauteng
- Lime-Chem EIA/EMPR, Lime-Chem (Pty) Ltd, Limpopo Province

Courses and seminars recently attended include:

- Medical Health Seminar (October 2006 , Geosciences MSA Medical);
- Coal Business Seminar (October 2006, Hyatt Hotel, Rosebank);
- Health and Safety Course (January 2007; Edwilo Risk Consultants);
- Corporate Social Investment (March 2007 at Randfontein Estate) .