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## **Environmental Regulatory Process for the Middeldrift Resources within the Existing New Clydesdale Colliery Mining Right, Nkangala Magisterial District, Mpumalanga Province**

### **Heritage Impact Assessment**

**Prepared for:**

Universal Coal Development IV (Pty) Ltd

**Project Number:**

UCD6587

June 2021

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<b>Report Type:</b>	Heritage Impact Assessment
<b>Project Name:</b>	Environmental Regulatory Process for the Middeldrift Resources within the Existing New Clydesdale Colliery Mining Right, Nkangala Magisterial District, Mpumalanga Province
<b>Project Code:</b>	UCD6587

<b>Name</b>	<b>Responsibility</b>	<b>Signature</b>	<b>Date</b>
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<b>Registration(s):</b>	ASAPA, ICOMOS

I, Shannon Hardwick, declare that: –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
  - I declare that there are no circumstances that may compromise my objectivity in performing such work;
  - I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

*Signature of the Specialist*

*Date*

*Findings, recommendations, and conclusions provided in this report are based on the best available scientific methods and the author's professional knowledge and information at the time of compilation. Digby Wells employees involved in the compilation of this report, however, accepts no liability for any actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, and by the use of the information contained in this document.*

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*Any recommendations, statements or conclusions drawn from or based on this report must clearly cite or make reference to this report. Whenever such recommendations, statements or conclusions form part of a main report relating to the current investigation, this report must be included in its entirety.*

## EXECUTIVE SUMMARY

### Introduction

Universal Coal Development IV (Pty) Ltd (Universal Coal) operates the New Clydesdale Colliery (NCC), located near Kriel in the Mpumalanga Province<sup>1</sup>. Universal Coal has identified additional coal resources, referred to as the Middeldrift Resources (Middeldrift) in the northern area of the existing Mining Right (MR) **MP30/5/1/2/2/492MR** and intends to extend the current operations to exploit Middeldrift. This Project will include:

- Opencast mining through a pan (wetland);
- Diversion of the current district road D1651;
- Construction of a new road linked to the diversion; and
- Construction of a bridge over the Steenkoolspruit.

The Project is located approximately 10 km north of Kriel in the Emalahleni Local Municipality (ELM) of the Nkangala District Municipality (NDM) of the Mpumalanga Province.

### Scope of Work

The Scope of Work (SoW) for the specialist HRM process included the compilation of a Heritage Impact Assessment (HIA) report to comply with the requirements encapsulated in Section 38(3) of the National Heritage Resources Act (Act No. 25 of 1999) (NHRA). Digby Wells completed the following activities as part of the SoW:

- Description of the predominant cultural landscape supported through primary and secondary data collection;
- Assessment of the Cultural Significance of the identified heritage resources;
- Identification of potential impacts to heritage resources based on the Project description and Project activities;
- An evaluation of the potential impacts to heritage resources relative to the sustainable socio-economic benefits that may result from the Project;
- Recommending feasible management measures and/or mitigation strategies to avoid and/or minimise negative impacts and enhance potential benefits resulting from the Project; and
- Submission of the HIA (as well as the Environmental Impact Assessment (EIA) report and supporting specialist reports) to the Heritage Resources Authorities (HRAs) for Statutory Comment, as required under Section 38(8) of the NHRA.

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<sup>1</sup> Mining Right (MR) reference number: MP 30/5/1/2/2/492 MR

## Baseline Cultural Heritage Landscape

In total, 589 heritage resources were identified within the regional study area. Within the areas under consideration, the predominant tangible heritage resources demonstrate affiliations with the historical period, including the historical built environment and burial grounds and graves. This notwithstanding, expressions of the Stone Age, the Farming Community Period, historical battlegrounds and palaeontological resources have also been recorded in the regional study area.

The natural environment has been subjected to major anthropogenic changes specifically related to farming activities. A large portion of the Project area consists of cultivated fields and informal roads between the fields. Natural pans cover a significant portion of the Project area. Mining activities occur on the adjacent property.

Pre-disturbance surveys undertaken by Digby Wells of the site-specific study area identified only two heritage sites: the remains of a historical structure (STE-001); and a burial ground (BGG-001). The burial ground, however, falls outside the NCC MR area.

**Table 1-1: Cultural Significance of Identified Cultural Heritage**

Map ID	Type	Description	Cultural Significance	Recommended Field Rating
BGG-001	Burial / grave	Burial ground including several graves identified by upright stones serving as headstones. The burial ground is not demarcated by a fence.	Very High	Grade III A
STE-001	Historical Built Environment	Remains of what appears to be a one-roomed structure with no internal divisions. The wall has a dog-legged corner. The wall is made of stone with cement / plaster in between the stones. The walls are in varying stages of collapse, from standing above head height to total collapse. The structure does not have a roof, doors, or windows. The structure is surrounded by a dense stand of trees. No debris, midden or material culture associated with the structure is visible.	Negligible	General Protection IV C

## Impact Assessment and Mitigation Measures

Site STE-001 falls within the footprints of both proposed open pit options. This site is, however, of negligible cultural significance. All impacts on this site are expected to occur as a result of any one or more construction phase activities. Impacts are negligible given the negligible significance of this site. Although this site does not require any mitigation, permits to demolish the structure may be necessary if it is near or older than 60 years at the time.

The burial ground BGG-001 is included in the impact assessment although it falls outside the MR area and approximately 1 km from the project boundary. Burial grounds are always considered as being of very high significance. Any impacts on burial grounds and graves are of major concern irrespective of the likelihood that this impact may occur. The SAHRA BGG Burial grounds and graves also pose a significant risk to the operations of the proposed Project should any proposed activity encroach within 100 m of the site as SAHRA will require a 100 m buffer to established around any burial ground or grave. This site must be monitored to determine if any proposed mining activities affect the site and whether the proximity of the site affects the operations of NCC.

## Reasoned Opinion Whether Project Should Proceed

Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project provided the recommendations detailed in Section 11 of the report are adopted. This opinion is further motivated by the absence of visible cultural heritage in general within the MR area, as well as the potential socio-economic benefits that will arise from the Project outweigh the identified risks and impacts to the known heritage resources within the site-specific study area.

This statement is supported by the following:

- The identified impacts to the heritage resources can be mitigated through the recommendations included in Section 11 of this report;
- The Project will extend the life of the existing operation, which has created long-term employment opportunities, and which generates revenue feeding into the regional and national economies in a sector which is employing a growing portion of the workforce; and
- The construction of additional infrastructure will create short-term employment opportunities and will generate revenue which will feed into the local economy.

## Recommendations

Considering the nature and the scope of the Project, Digby Wells recommends the following additional actions be implemented prior to the commencement of the Project:

- A Chance Finds Protocol (CFP) be drafted and implemented as part of the Environmental Management Programme (EMPr).

- The structure STE-001 may be subject to permitting to demolish the site if it near or older than 60 years at the time. This requirement must be verified prior to demolition.
- The burial ground BGG-001 must be monitored to determine if any proposed mining activities affect the site, or if the proximity of the site affects the operations of the NCC.



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Appendix C: HRM Methodology

## ACRONYMS, ABBREVIATIONS AND DEFINITION

Acronym, Abbreviation or Term	Meaning
ASAPA	Association of Southern African Professional Archaeologists
BCE	Before Common Era (also: Before Christ or BC)
BGG	Burial Grounds and Graves
BID	Background Information Document
BSc	Bachelor of Science
c.	Circa, meaning approximately
CE	Common Era (also: <i>Anno Domini</i> or AD)
CFP	Chance Find Protocol
CHPP	Coal Handling and Processing Plant
CRR	Comments and Response Report
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EFC	Early Farming Community ( <i>also known as Early Iron Age</i> )
EIA	Environmental Impact Assessment. <i>Please note that EIA can also refer to the 'Early Iron Age'; however, in this document, this time period is referred to as 'Early Farming Community'.</i>
ELM	Emalahleni Local Municipality
EMPr	Environmental Management Programme
ESA	Early Stone Age
GIS	Geographical Information System
GN R	Government Notice Regulation
GPS	Global Positioning System
GRP	Grave Relocation Process
HIA	Heritage Impact Assessment
HLP	Historical Layering Point
Hons	Honours degree
HRAs	Heritage Resources Authorities
HRM	Heritage Resources Management

<b>Acronym, Abbreviation or Term</b>	<b>Meaning</b>
HSMP	Heritage Site Management Plan
HST	Historical Structure
I&AP	Interested and Affected Persons
ICOMOS	International Council on Monuments and Sites
IDP	Integrated Development Plan
IWUL	Integrated Water Use Licence
IWWMP	Integrated Water and Waste Management Plan
Kya	Thousand years ago
LFC	Late Farming Community also known as Late Iron Age
LoM	Life of Mine
LSA	Late Stone Age
MCCEBA	Mpumalanga Cemeteries, Crematoria and Exhumation of Bodies Act, 2005 (Act No. 8 of 2005)
MIA	Middle Iron Age
Middeldrift	Identified additional coal resources referred to as Middeldrift Resources
MPHRA	Mpumalanga Provincial Heritage Resources Authority
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MR	Mining Right
MSA	Middle Stone Age
MSc	Master of Science
Mya	Million years ago
NCC	New Clydesdale Colliery
NDM	Nkangala District Municipality
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PHRA	Provincial Heritage Resources Authority
PPP	Public Participation Process

<b>Acronym, Abbreviation or Term</b>	<b>Meaning</b>
RoD	Record of Decision
ROM	Run of Mine
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SCF	Statutory Comment Feedback
SEP	Stakeholder Engagement Process
SEP	Stakeholder Engagement Process
SoW	Scope of Work
The Project	Refers to the NCC Project
ToR	Terms of Reference
Universal Coal	Universal Coal Development IV (Pty) Ltd
UP	University of Pretoria
VKLM	Victor Khanye Local Municipality
Werf	A farmstead or multiple outbuildings associated with a farmhouse or agricultural activities. Plural: <i>werwe</i> (Afrikaans).
Wits	University of the Witwatersrand
ZAR	<i>Zuid-Afrikaansche Republiek</i>

Refer to Appendix A for a Glossary of Terms.

## NHRA and GN R326 Appendix 6 Legislated Requirements

Description	Appendix 6	NHRA	Section
Declaration that the report author(s) is (are) independent.	1(b)	-	Page iii
An indication of the scope of, and the purpose for which, the report was prepared.	1(c)	-	Section 1.2
Details of the person who prepared the report and their expertise to carry out the specialist study.	1(a)	-	Page iii Section 1.3



Description	Appendix 6	NHRA	Section
Outlines the legislative framework relevant to the specialist heritage study.	-	-	Chapter 3
Identifies the specific constraints and limitations of the HIA, including any assumptions made and any uncertainties or gaps in knowledge.	1(i)	-	Chapter 4
Describes the methodology employed in the compilation of this HIA.	1(e)	-	Chapter 5

Description	App. 6	NHRA	Section
An indication of the quality and age of base data used for the specialist report.	1(cA)	-	Section 5.4 Chapter 14
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	1(d)	-	Section 6.2
Provides the baseline cultural landscape.	-	38(3)(a)	Section 6.1

Description	App. 6	NHRA	Section
Motivates for the defined Cultural Significance of the identified heritage resources and landscape.	-	38(3)(b)	Section 7.1



<p>A description of the potential impacts to heritage resources by project related activities, including:</p> <ul style="list-style-type: none"> <li>- Existing impacts on project areas;</li> <li>- Possibilities</li> </ul>	<p>1(c)(B)</p>	<p>38(3)(c)-</p>	<p>Chapter 7</p>
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Description	App. 6	NHRA	Section
- and Heritit age - relat a t e d r i s k s t o t h e p r o j e c t .			

Description	Appendix 6	NHRA	Section
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	1(j)	38(3)(c)	



Description	Appendix 6	NHRA	Section
<p>Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives.</p>	<p>1(f)</p>	<p>-</p>	<p>Chapter 2</p>

Description	App. 6	NH RA	Section
Considers the development context to assess the socio-economic benefits of the project in relation to the presented impacts and risks.	-	38(3)(d)	Section 6.3

Description	Appendix 6	NHRA	Section
A description of any consultation process that was undertaken during the course of preparing the specialist report and the results of such consultation.	1(o)	38(3)(e)	10

Description	Appendix 6	NHRA	Section
A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	1(p)	38(3)(e)	
Details the specific recommendations based on the contents of the HIA.	-	38(3)(g)	11
An identification of any areas to be avoided, including buffers.	1(g)		

Description	Appendix 6	NHRA	Section
Any mitigation measures for inclusion in the Environmental Management Programme (EMPr)	1(k)		8
Any conditions for inclusion in the environmental authorisation.	1(l)		8
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	1(m)		8



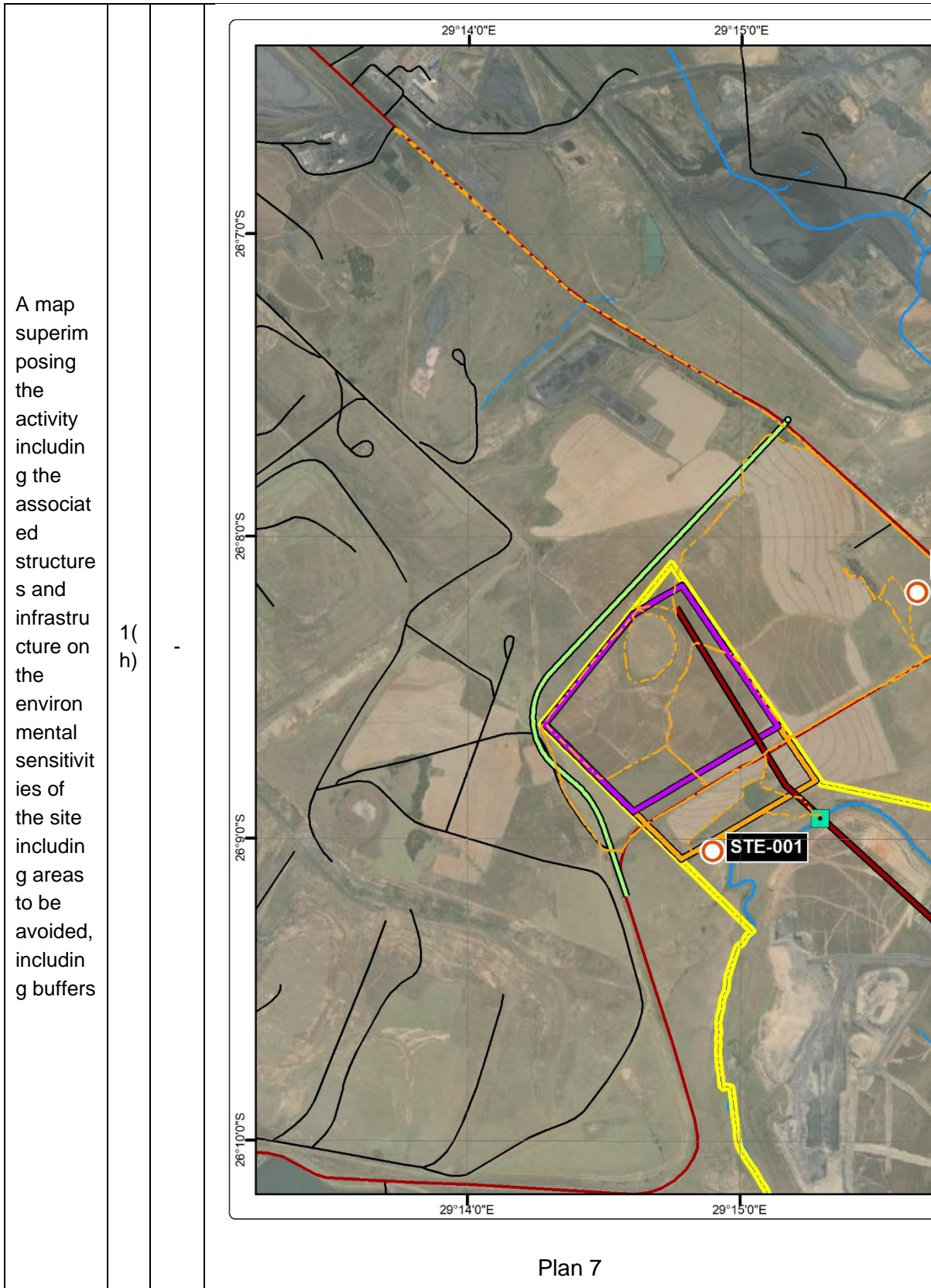
<p>A reasoned opinion —</p> <p>(i) whether the proposed activity, activities or portions there of should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that</p>	<p>1(n)</p>	<p>38(3)(g)</p>	<p>12</p>
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the proposed activity, activities, or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMP, and where applicable, the clos			
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Description	Appendix 6	NHRA	Section
ure plan			
Collates the most salient points of the HIA and concludes with the specific outcomes and recommendations of the study.	-	38(3)(f) 38(3)(g)	13
Lists the source material used in the development of the report.	1(cA)	-	14





Description	Appendix 6	NHRA	Section
Any other information requested by the competent authority.	1(q)	-	

## 1. Introduction

Universal Coal Development IV (Pty) Ltd (Universal Coal) operates the New Clydesdale Colliery (NCC), located near Kriel in the Mpumalanga Province<sup>2</sup>. Universal Coal has identified additional coal resources, referred to as the Middel drift Resources (Middel drift) in the northern area of the existing Mining Right (MR) and intends to extend the current operations to exploit Middel drift. This Project will include:

- Opencast mining through a pan (wetland);
- Diversion of the current district road D1651;
- Construction of a new road linked to the diversion; and
- Construction of a bridge over the Steenkoolspruit.

Universal Coal requires Environmental Authorisation (EA) to implement the proposed Project and appointed Digby Wells Environmental (hereinafter Digby Wells) to undertake the necessary Environmental Impact Assessment (EIA) process, compilation of an Environmental Management Programme (EMPr), an Integrated Water Use Licence (IWUL) application and compilation of an Integrated Water and Waste Management Plan (IWWMP). These processes will be undertaken in compliance with:

- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The Environmental Impact Assessment (EIA) Regulations, 2014 (GN R982 of 4 December 2014, as amended) (EIA Regulations, 2014) promulgated under the NEMA;
- The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA); and
- The National Water Act, 1998 (Act No. 36 of 1998) (NWA).

The EIA process includes a specialist Heritage Resources Management (HRM) process in compliance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). This document comprises the specialist Heritage Impact Assessment (HIA) report for submission to the Heritage Resources Authorities (HRAs) and in support of the EIA process.

In this case, the applicable HRAs include the South African Heritage Resources Agency (SAHRA) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA).

### 1.1. Terms of Reference

Universal Coal appointed Digby Wells to undertake the necessary applications required for EA for the proposed exploitation of Middel drift within the current NNC MR boundary. The EIA process includes a specialist HRM process in compliance with Section 38 of the NHRA.

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<sup>2</sup> Mining Right (MR) reference number: MP 30/5/1/2/2/492 MR

## 1.2. Scope of Work

The Scope of Work (SoW) for the specialist HRM process included the compilation of an HIA report to comply with the requirements encapsulated in Section 38(3) of the NHRA. Digby Wells completed the following activities as part of the SoW:

- Description of the predominant cultural landscape supported through primary and secondary data collection;
- Assessment of the Cultural Significance of the identified heritage resources;
- Identification of potential impacts to heritage resources based on the Project description and Project activities;
- An evaluation of the potential impacts to heritage resources relative to the sustainable socio-economic benefits that may result from the Project;
- Recommending feasible management measures and/or mitigation strategies to avoid and/or minimise negative impacts and enhance potential benefits resulting from the Project; and
- Submission of the HIA (as well as the EIA report and supporting specialist reports) to the HRAs for Statutory Comment as required under Section 38(8) of the NHRA.

## 1.3. Expertise of the Specialist

Table 1-1 presents a summary of the expertise of the specialists involved in the compilation of this report. Appendix A includes the full curriculum vitae (CVs) of these specialists.

**Table 1-1: Expertise of the Specialists**

Team Member	Bio Sketch
<p><b>Shannon Hardwick</b></p> <p>ASAPA Member: 451</p> <p>ICOMOS Member 38048</p> <p>Years' Experience: 4</p>	<p>Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern and has most recently been appointed as a Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in <i>Journal of Ethnobiology</i>.</p> <p>Since joining Digby Wells, Shannon has gained generalist experience through the compilation of various heritage assessments, including Heritage Scoping Reports (HSRs), HIAs, Heritage Basic Assessment Reports (HBARs) and Section 34 permit applications. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and various social baselines. Shannon's experience in the field includes pre-disturbance surveys in South Africa, Malawi and the Democratic Republic of the Congo and other fieldwork in Malawi.</p>

Team Member	Bio Sketch
<p><b>Johan Nel</b></p> <p>ASAPA Member 095</p> <p>ICOMOS Member</p> <p>Years' Experience: &gt;20</p>	<p>Johan is a qualified archaeologist, heritage specialist and Manager of the Heritage Services department in Digby Wells. He obtained a BA Honours degree in Archaeology from the University of Pretoria in 2001. He also completed a Professional Development Certificate in Integrated Heritage Resources Management through Rhodes University in 2016. Johan is a professional and accredited member of the Association of Southern African Professional Archaeologists (ASAPA) and a member of the International Council on Monuments and Sites (ICOMOS) South Africa. He has more than 20 years' extensive and diverse experience in heritage resource management. Johan has worked in numerous African settings including South Africa, Botswana, the Democratic Republic of Congo, Liberia, and Sierra Leone. His current interests include ways to empower local communities to use, conserve, and manage heritage resources themselves, as well as integrating living and intangible heritage practices with the more traditional heritage approaches to heritage management. Key concepts he is exploring include cultural humility and so-called People-centred Approaches to conservation of both natural and cultural heritage.</p>

## 2. Project Description

The Project is located approximately 10 km north of Kriel in the Emalahleni Local Municipality (ELM) of the Nkangala District Municipality (NDM) of the Mpumalanga Province. Plan 1 presents the geographical setting of the Project. The NCC operation presently includes:

- Diepspruit Underground: three bord-and-pillar sections mining the No. 2 lower seam;
- Diepspruit West: opencast mining operation using truck and shovel mining methods; and
- Roodekop: opencast truck and shovel mining operation.

The Diepspruit West and Roodekop resources are currently being exploited and, when these resources are depleted, Universal Coal will begin mining Middeldrift. Universal Coal will establish the box cut to exploit Middeldrift at the same time as the Roodekop resources become depleted to allow for continuous uninterrupted mining.

The proposed Middeldrift operation will also be an opencast truck and shovel operation exploiting the No. 1 and No. 1A seams, No. 2 upper and lower seams, and the No. 4 upper and lower seams. The anticipated Life of Mine (LoM) for Middeldrift is ten years.

No new infrastructure is proposed for Middeldrift. From Middeldrift, coal will be transported to the NCC by truck via haul roads. Run of Mine (ROM) coal will be washed at the existing NCC Coal Handling and Processing Plant (CHPP).

The Steenkoolspruit separates Middeldrift from the current NCC operations. To protect the watercourse, Universal will mine Middeldrift as a separate opencast pit. This will require the

diversion of the district road D1651 north of the Roodekop pit. Universal also intends to construct a bridge over the Steenkoolspruit to access Middeldrift.

## 2.1. Proposed Infrastructure and Activities

This Project will include:

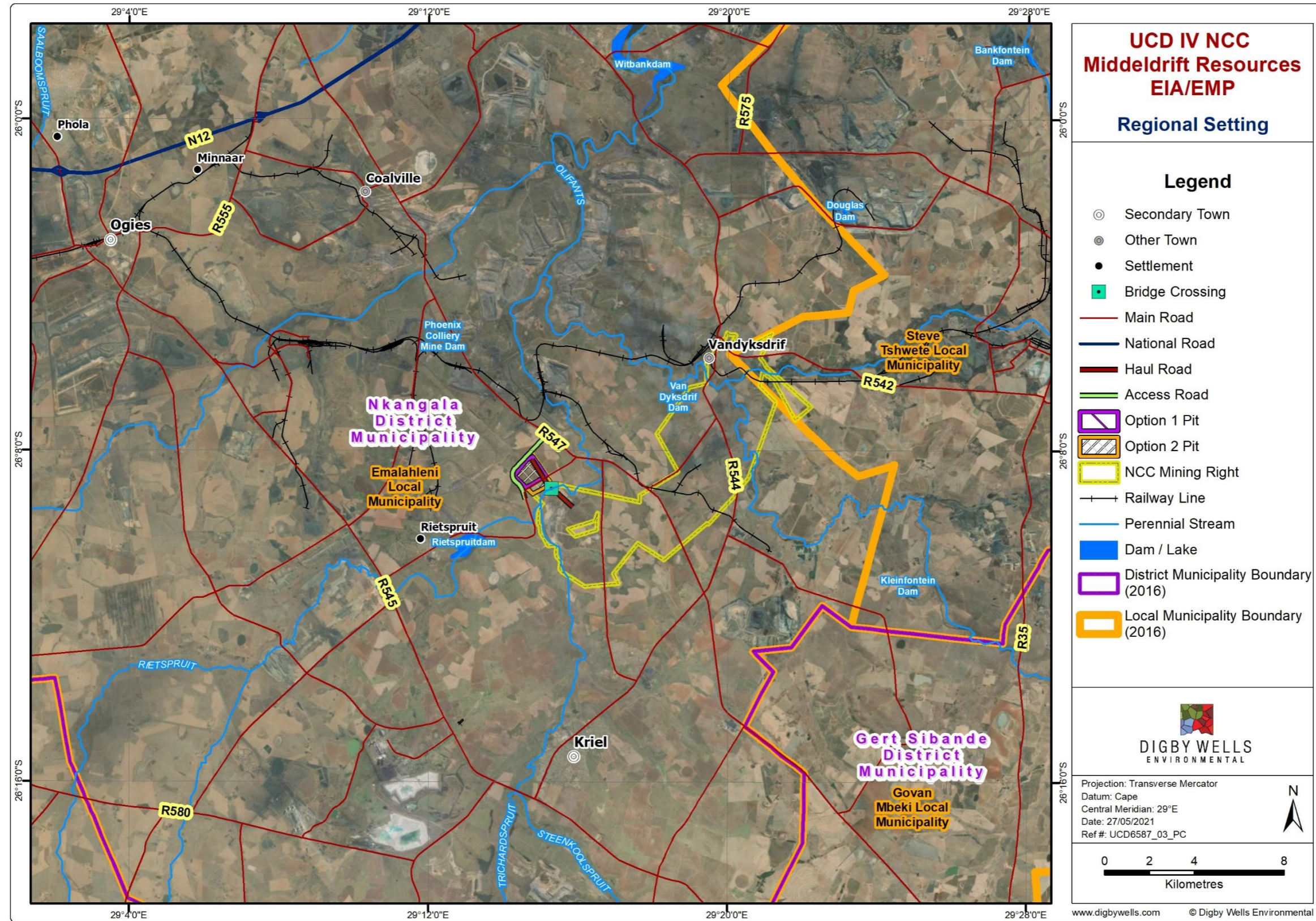
- Opencast mining through a pan (wetland);
- Diversion of the current district road D1651;
- Construction of a new road linked to the diversion; and
- Construction of a bridge over the Steenkoolspruit.

Table 5-1 presents a summary of the activities to be included in the Project and indicates the phases in which they are expected to occur. Plan 3 presents the proposed Project layout and infrastructure design.

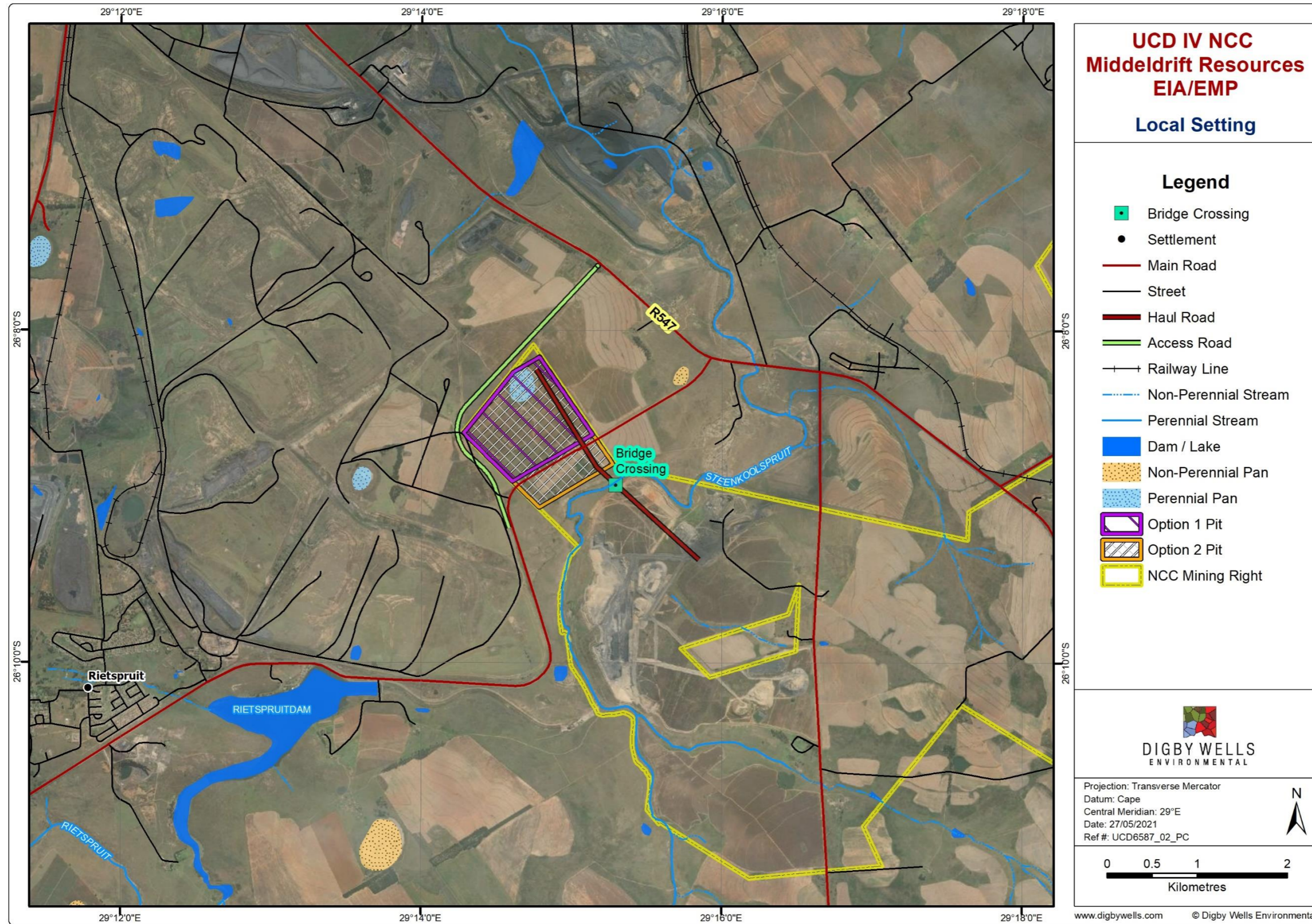
**Table 2-1: Project Phases and Associated Activities**

Project Phase	Project Activity
Construction Phase	Site/vegetation clearance
	Contractors laydown yard
	Access and haul road construction
	Topsoil stockpiling
Operational Phase	Open pit establishment
	Removal of rock (blasting)
	Stockpiling (i.e., soils) establishment and operation
	Operation of the open pit workings
Decommissioning Phase	Rehabilitation – rehabilitation mainly consists of spreading of the preserved subsoil and topsoil, profiling of the land and re-vegetation
	Post-closure monitoring and rehabilitation

Plan 1: Regional Setting

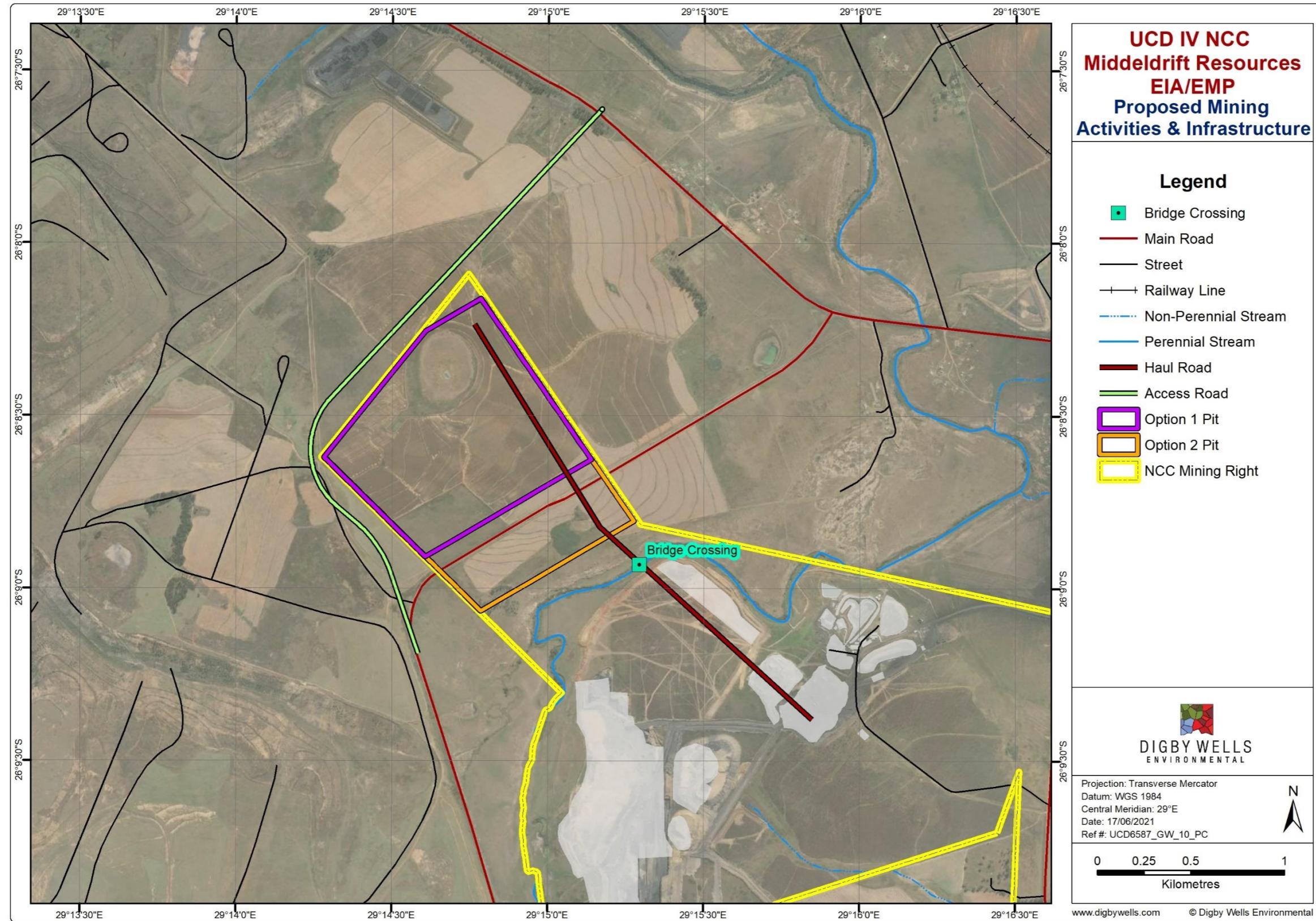


Plan 2: Local Setting





### Plan 3: Proposed Project Design and Infrastructure Layout



## 2.2. Alternatives Considered

Only the 'no-go' alternative is considered in this assessment. This alternative comprises the case in which the Project does not obtain approval or does not go ahead for any reason. In such a case, the potential environmental impacts associated with the Project will not occur. This includes the potential impacts to heritage resources as described in Sections 7.2 to 7.4. However, the potential benefits associated with the Project (as described in Section 12) will also not occur.

## 3. Relevant Legislation, Standards and Guidelines

This section describes the international, national, and regional legislative documents and policy documents that inform the legislative and policy framework of the HRM process. The objective is to ensure that the assessments meet all stipulated requirements to ensure legal compliance and successful integration into the regional planning context.

### 3.1. National Legislation and Policy

Table 3-1 presents a summary of the national legislation applicable to this HRM process and illustrates how it will be considered in the HIA.

Table 3-2 below presents the applicable policies considered in the HRM process.

**Table 3-1: Applicable Legislation Considered in the Heritage Resources Management Process**

Applicable legislation used to compile the report	Reference where applied
<p><b><u>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</u></b></p> <p>Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that –</p> <ol style="list-style-type: none"> <li>i. Prevent pollution and ecological degradation;</li> <li>ii. Promote conservation; and</li> <li>iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development</li> </ol>	<p>The HRM process was undertaken to identify heritage resources and determine heritage impacts associated with the Project.</p> <p>As part of the HRM process, applicable mitigation measures, monitoring plans and/or remediation were recommended to ensure that any potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.</p>
<p><b><u>National Environmental Management Act, 1998 (Act No. 107 of 1998)</u></b></p>	<p>The application process was undertaken in accordance with the principles of Section 24 of NEMA as well as with the</p>

Applicable legislation used to compile the report	Reference where applied
<p>The NEMA, as amended, was set in place in accordance with Section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making on issues affecting the environment. Section 24 (1)(a), (b) and (c) of NEMA state that:</p> <p><i>The potential impact on the environment, socio-economic conditions and cultural heritage of activities that require authorisation or permission by law, and which may significantly affect the environment, must be considered, investigated, and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.</i></p> <p>The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended.</p>	<p>EIA Regulations 2014 (as amended), promulgated in terms of NEMA.</p>
<p><b><u>EIA Regulations, 2014</u></b></p> <p>These three listing notices set out a list of identified activities which may not commence without an Environmental Authorisation from the relevant Competent Authority through one of the following processes:</p> <ul style="list-style-type: none"> <li>• Listing Notice 1 (GN R983 of 04 December 2014, as amended): This listing notice provides a list of various activities which require environmental authorisation, and which must follow a basic assessment process.</li> <li>• Listing Notice 2 (GN R984 of 04 December 2014, as amended): This listing notice provides a list of various activities which require environmental authorisation, and which must follow an environmental impact assessment process.</li> <li>• Listing Notice 3 (GN R985 of 04 December 2014, as amended): This notice provides a list of various environmental activities which have been identified by provincial governmental bodies which if</li> </ul>	<p>Refer to the EIA report for a full description of the Listed Activities triggered by the proposed Project.</p> <p>To comply with the regulations, an EIA process must be completed in support of the EA application. This HIA report was completed to inform the EIA process to comply with Section 24 of the NEMA.</p>

Applicable legislation used to compile the report	Reference where applied
<p>undertaken within the stipulated provincial boundaries will require environmental authorisation. The basic assessment process will need to be followed.</p>	
<p><b><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999)</u></b></p> <p>The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa, with specific reference to the following Sections:</p> <ul style="list-style-type: none"> <li>• Section 5. General principles for HRM.</li> <li>• Section 6. Principles for management of heritage resources.</li> <li>• Section 7. Heritage assessment criteria and grading.</li> <li>• Section 38. Heritage resources management.</li> </ul> <p>The Act requires that HRAs, be notified as early as possible of any developments that may exceed certain minimum thresholds in terms of Section 38(1), or when assessments of impacts on heritage resources are required by other legislation in terms of Section 38(8) of the Act.</p>	<p>The HIA report was compiled to comply with Section 5, 38(3), (4) and (8) of the NHRA. This report was submitted to the responsible HRAs, which in this instance is SAHRA and MPHRA.</p>
<p><b><u>NHRA Regulations, 2000</u></b></p> <p>The NHRA Regulations regulate the general provisions and permit application process in respect of heritage resources included in the national estate. Applications must be made in accordance with these regulations. The following Chapters are applicable to this assessment:</p> <ul style="list-style-type: none"> <li>• Chapter II. Permit Applications and General Provisions for Permits;</li> <li>• Chapter III: Application for Permit: National Heritage Site, Provincial Heritage Site, Provisionally Protected Place or Structure older than 60 years;</li> <li>• Chapter IV: Application for Permit: Archaeological or Palaeontological or Meteorite;</li> <li>• Chapter IX: Application for Permit: Burial Grounds and Graves;</li> <li>• Chapter X: Procedure for Consultation regarding Protected Area;</li> </ul>	<p>The HRM process was undertaken with cognisance of the applicable regulations. The proposed mitigation strategies and management measures must comply with these requirements.</p>

Applicable legislation used to compile the report	Reference where applied
<ul style="list-style-type: none"> <li>Chapter XI: Procedure for Consultation regarding Burial Grounds and Graves; and</li> <li>Chapter XII: Discovery of Previously Unknown Graves.</li> </ul>	

**Table 3-2: Applicable Policies Considered in the Heritage Resources Management Process**

Applicable policies used to compile the report	Reference where applied
<p><b><u>SAHRA Archaeology, Palaeontology and Meteorites (APM) Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports (2007)</u></b></p> <p>The guidelines provide the minimum standards that must be adhered to for the compilation of a HIA (2007). Chapter II Section 7 outlines the minimum requirements for inclusion in the heritage assessment as follows:</p> <ul style="list-style-type: none"> <li>Background information on the Project;</li> <li>Background information on the cultural baseline;</li> <li>Description of the properties or affected environs;</li> <li>Description of identified sites or resources;</li> <li>Recommended field rating of the identified sites to comply with Section 38 of the NHRA;</li> <li>A statement of Cultural Significance in terms of Section 3(3) of the NHRA; and</li> <li>Recommendations for mitigation or management of identified heritage resources.</li> </ul>	<p>The HIA report was compiled to adhere to the minimum standards as defined by Chapter II of the SAHRA Minimum Standards (2007).</p>

### 3.2. Regional Regulatory Context

The HRM process was completed to comply with the requirements of the South African national legislative framework as described above. Provincial legislation and municipal by-laws are applicable to graves and cemeteries and are considered in our recommendations where a Grave Relocation Process (GRP) may be required. These include the Mpumalanga Cemeteries, Crematoria and Exhumation of Bodies Act, 2005 (Act No. 8 of 2005) (MCCEBA).

## 4. Assumptions, Limitations and Exclusions

Digby Wells encountered constraints and limitations during the compilation of this report. Table 4-1 presents an overview of these limitations and the consequences.

**Table 4-1: Constraints and Limitations**

Description	Consequence
Whilst every attempt was made to obtain the latest available information, the reviewed literature does not represent an exhaustive list of information sources for the various study areas.	The cultural heritage baseline presented in Section 6.1 below is considered accurate, but may not include new data or information which may not have been made available to the public.
Whilst every attempt was made to survey the extent of the site-specific study area <sup>3</sup> , this report does not present an exhaustive list of identified heritage resources. Overgrown vegetation limited visibility at the time of the pre-disturbance survey and the pre-disturbance survey focused on the proposed infrastructure footprint area specifically.	Previously unidentified heritage resources may be encountered. Should this occur, Universal Coal must alert the HRAs of the find and may need to enlist the services of a suitably qualified archaeologist to advise them on the way forward. A CFP must therefore be included in the EMPr.
Archaeological and palaeontological resources commonly occur at subsurface levels. These types of resources cannot be adequately recorded or documented by assessors without destructive and intrusive methodologies and without the correct permits issued in terms of Section 35 of the NHRA.	The reviewed literature previously completed heritage assessments and the results of the field survey are in themselves limited to surface observations.  Subsurface tangible heritage may be exposed during Project activities. Should this occur, Universal Coal must alert the HRAs of the find and may need to enlist the services of a suitably qualified archaeologist or palaeontologist to advise them on the way forward. A CFP must therefore be included in the EMPr.

## 5. Methodology

The following section presents a summary of the methodologies employed in the HRM process. Appendix C includes a more detailed description of the methodologies employed during the HRM process.

### 5.1. Defining the Study Areas

Heritage resources do not exist in isolation to the greater natural and social environment (which includes the socio-economic, socio-political, and socio-cultural aspects). To develop an applicable cultural heritage baseline for the Project, Digby Wells defined three nested study areas to be considered. These include:

- The *site-specific study area*: the farm portions extent associated with the proposed Project and proposed infrastructure, including a 500 m buffer area;

<sup>3</sup> Refer to Section 5.1 for a description of the study area.

- The *local study area*: the area most likely to be influenced by any changes to heritage resources in the Project area, or where project development could cause heritage impacts. The local study area is defined as the area bounded by the local municipality and includes particular reference to the immediate surrounding properties or farms. The local study area is specifically examined to offer a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provides the local development and planning context that may contribute to cumulative impacts. The Project area is situated in the ELM; and
- The *regional study area*: the area bounded by the district municipality demarcation. In this case, the Project is located in the NDM. Where necessary, the regional study area may be extended outside the boundaries of the district municipality to include areas closest to the Project area. The aim of this is to include much wider expressions of specific types of heritage resources and historical events. The regional study area also provides the regional development and planning context that may contribute to cumulative impacts.

## 5.2. Statement of Significance

Digby Wells designed the significance rating process to provide a numerical rating of the Cultural Significance of identified heritage resources. This process considers heritage resources assessment criteria set out in subsection 3(3) of the NHRA, which determines the intrinsic, comparative, and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representativity or uniqueness (i.e., known examples of similar resources to exist).

The rationale behind the heritage value matrix takes into account that a heritage resource's value is a direct indication of its sensitivity to change (i.e., impacts). Value, therefore, was determined prior to completing any assessment of impacts.

The matrix rated the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social. Resource significance is directly related to the impact on it that could result from Project activities, as it provided minimum accepted levels of change to the resource.

## 5.3. Definition of Heritage Impacts

Potential impacts to heritage resources may manifest differently across geographical areas or diverse communities when one considers the simultaneous effect to the tangible resource and social repercussions associated with the intangible aspects. Furthermore, potential impacts may concurrently influence the Cultural Significance of heritage resources. This assessment therefore considers three broad categories adapted from Winter & Baumann (2005, p. 36). Table 5-1 presents a summary of these impact categories.

**Table 5-1: Impact Definition**

Category	Description
Direct Impact	Affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense but can often be erroneously assessed as high-ranking.
Indirect Impact	Occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its Cultural Significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any direct impact, its significance is affected to the extent that it can ultimately result in the loss of the resource itself.
Cumulative Impact	<p>Result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:</p> <ul style="list-style-type: none"> <li>● Additive: the simple sum of all the effects, e.g., the reclamation of a historical Tailings Storage Facility (TSF) will minimise the sense of the historic mining landscape.</li> <li>● Synergistic: effects interact to produce a total effect greater than the sum of the individual effects, e.g., the removal of all historical TSFs will sterilise the historic mining landscape.</li> <li>● Time crowding: frequent, repetitive impacts on a particular resource at the same time, e.g., the effect of regular blasting activities on a nearby rock art site or protected historical building could be high.</li> <li>● Neutralizing: where the effects may counteract each other to reduce the overall effect, e.g., the effect of changes from a historic to modern mining landscape could reduce the overall impact on the sense-of-place of the study area.</li> <li>● Space crowding: high spatial density of impacts on a heritage resource, e.g., density of new buildings resulting in suburbanisation of a historical rural landscape.</li> </ul>

## 5.4. Secondary Data Collection

Data collection assists in the development of a cultural heritage baseline profile of the study area under consideration. Qualitative data was collected to inform this HIA report and was primarily obtained through secondary information sources, i.e., desktop literature review and historical layering.



A survey of diverse information repositories was made to identify appropriate relevant information sources. These sources were analysed for credibility and relevance. These credible, relevant sources were then critically reviewed. The objectives of the literature review include:

- Gaining an understanding of the cultural landscape within which the proposed Project is located; and
- Identify any potential fatal flaws, sensitive areas, current social complexities and issues and known or possible tangible heritage.

Repositories that were surveyed included the South African Heritage Resources Information System (SAHRIS), online/electronic journals and platforms and select internet sources. This HIA includes a summary and discussion of the most relevant findings. Table 5-2 lists the sources consulted in the literature review (refer to Section 14 for more detailed references).

**Table 5-2: Qualitative Data Sources**

Reviewed Qualitative Data		
Databases		
Genealogical Society of South Africa (GSSA) database (2011)	SAHRIS Palaeosensitivity Map (PSM)	
Statistics South Africa (2011)	Wazimap (2017)	
SAHRIS Cases		
Map ID: 710	Case ID: 479	Case ID: 5817
Case ID: 174	Case ID: 2077	Case ID: 9599
Cited Text		
Behrens & Swanepoel, 2008	Brodie, 2008	Clark, 1982
Deacon & Deacon, 1999	Delius & Cope, 2007	Delius, et al., 2014
Esterhuysen & Smith, 2007	Higgitt & Nel, 2012	Landau, 2010
Maggs, 1976	Makhura, 2007	Mitchell, 2002
Mucina & Rutherford, 2010	Pakenham, 1979	Swanepoel, et al., 2008
VKLM, 2020	Voortrekkers, 2014	Wessels, 2010
Willsworth, 2006	Winter & Baumann, 2005	von der Heyde, 2013

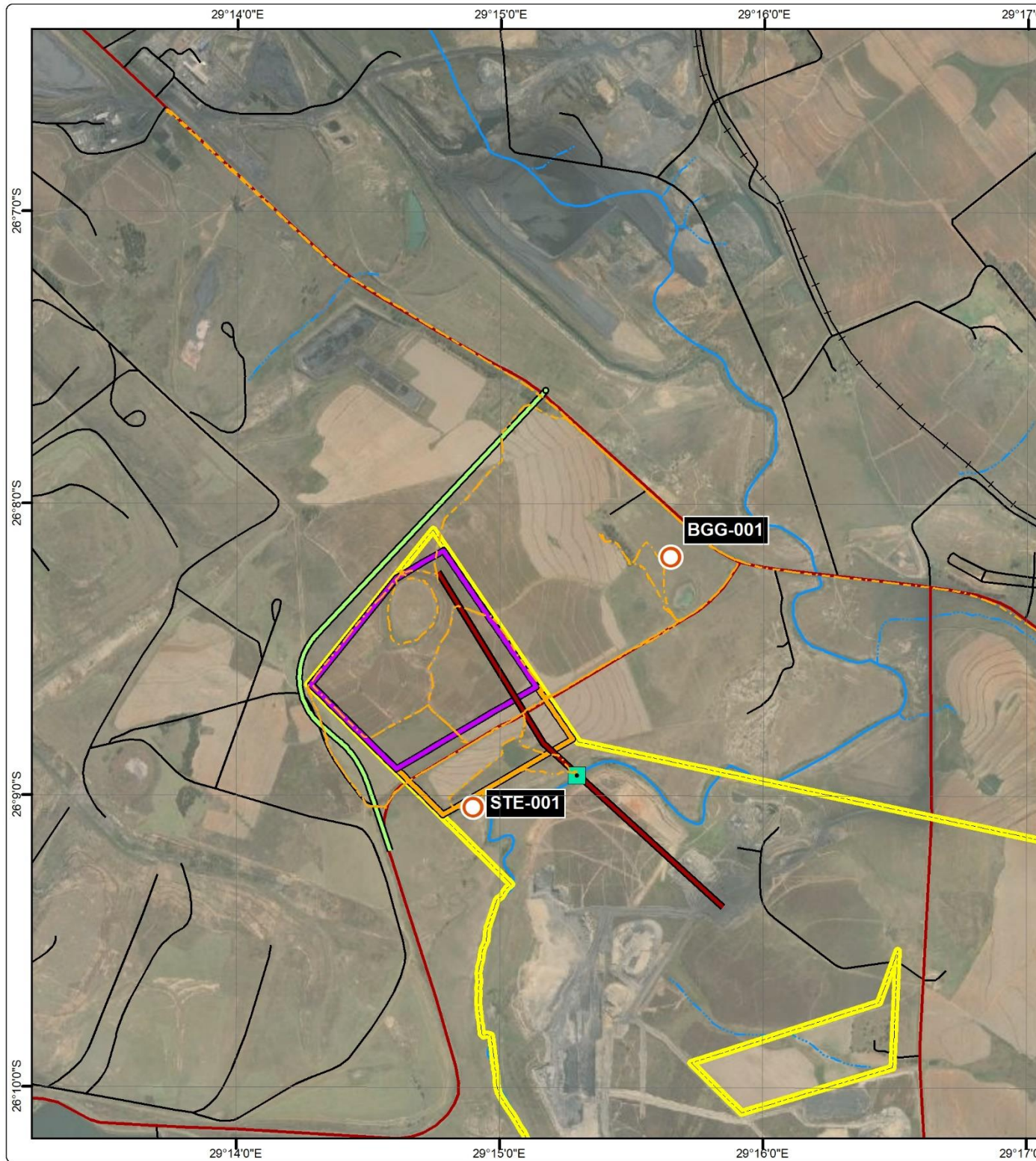
## 5.5. Primary Data Collection

Shannon Hardwick undertook a pre-disturbance survey of the Project area on 10 February 2021. The survey was a combination of a vehicular and pedestrian survey, which was adapted

to the terrain and the likelihood of heritage resources occurring in the area. The surveys were non-intrusive (i.e., no sampling was undertaken). The aim of the surveys was to:

- Visually record the current state of the cultural landscape; and
- Record a representative sample of the visible, tangible heritage resources present within the development footprint area, site-specific study area and greater study area.

**Identified heritage resources were recorded as waypoints using a handheld GPS device. The heritage resources were also recorded through written and photographic records.**



Plan 7 presents the results of the pre-disturbance survey, including the waypoints and GPS tracks.

## 5.6. Site Naming Convention

Heritage resources identified by Digby Wells during the field survey are prefixed by the SAHRIS case identification generated for this Project. Information on the relevant period or feature code and site number follows (e.g., 11829/BGG-001). The site name may be shortened on plans or figures to the period/feature code and site number (e.g., BGG-001). Table 5-3 presents a list of the relevant period and feature codes.

**Table 5-3: Relevant Feature and Period Codes**

Feature or Period Code	Reference
BGG	Burial Grounds and Graves
HLP	Historical Layering Point
HST	Historical Structure

Heritage resources identified through secondary data collection are prefixed by the relevant SAHRIS case or map identification number (*where applicable*) and the original site name as used by the author of that assessment (e.g., 1668/Site 1).

## 6. Findings and Discussion

This section presents a description of the cultural heritage baseline informed through primary and secondary data collection. The section also includes a summary of the developmental context within which the Project is located and presents the potential socio-economic benefits anticipated to arise from the Project. As required by Section 38(3)(d) of the NHRA, the socio-economic benefits are compared to the heritage impacts is considered in Section 12.

### 6.1. Cultural Heritage Baseline Description

The Mpumalanga Province is underlain by valuable geological formations, both in terms of mineral and fossil wealth. Coal is formed through the compression and heat alteration of plant matter. During these processes, alteration happens to such an extent that potential plant fossil remains are no longer recognisable. The shales between the coal horizons, however, have the potential to preserve very good examples of plant fossils (Bamford, 2014; 2016). To a lesser extent, the sandstone surface outcrops may also preserve fossil plants. Coal deposits can potentially also include fossils of mammal-like reptiles and mammals, but these are rarely, if ever, preserved with plant fossils.

The greater study area forms part of the Highveld Coalfield, which extends approximately 7 000 km<sup>2</sup> (Johnson, *et al.*, 2006). The regional and local study areas are predominantly underlain by the Main Karoo Basin, which comprises lithostratigraphic units associated with

the Karoo Supergroup. Table 6-1 presents a truncated geological sequence applicable to the regional study area. The specialist Palaeontological Impact Assessment (PIA) report will present the site-specific geological context and the associated palaeontological sensitivities in more detail.<sup>4</sup>

The Main Karoo Basin dates to the late Carboniferous to Middle Jurassic Periods, roughly 320 to 145 million years ago (mya). Within the Karoo Supergroup are the sediments of the Ecca Group. These sediments date to the Permian Period and overlie the *Dwyka Formation*. These layers also include significant coal reserves and is the most palaeontologically sensitive unit of the Karoo Supergroup (Johnson, *et al.*, 2006; Groenewald & Groenewald, 2014). The Ecca Group is well known for its wealth of plant fossils, characterised by the assemblage of *Glossopteris* fossils (a plant species defined through fossil leaves).

The Ecca Group includes three formations:

- The *Pietermaritzburg Formation*, which is of moderate palaeontological sensitivity. This formation rarely forms good outcrops and fossils are rare and difficult to find;
- The *Vryheid Formation*, which is the main coal-producing formation in South Africa. This formation has produced a number of fossils, including extensive *Glossopteris* fossil assemblages. Trace fossils, rare insects, possible conchostracans (bivalve crustaceans and shrimp clams, which are still extant), non-marine bivalves and fish scales. This formation is of very high palaeosensitivity; and
- The *Volksrust Formation*: a monotonous sequence of grey shale. Fossils are significant but rare and include temnospondyl amphibian remains, invertebrates and minor coal with plant remains, petrified wood and trace fossils assemblages (Groenewald & Groenewald, 2014).

The *Vryheid Formation* is the predominant geographical present in proximity to the Project area. As indicated above, this feature is known for its wealth of plant fossils. These include fossils of *Breytenia*. These fossils are extremely rare, comprising only four known instances, one of which is available for research. The other three examples were identified during site inspections for a coal mine approximately 50 km away from the Project Area.

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<sup>4</sup> The PIA study has not been completed at the time of compiling this HIA report and will be attached to the report and SAHRA case as an addendum.

**Table 6-1: Geological Sequence and Palaeontological Sensitivity for the Local Study Area**

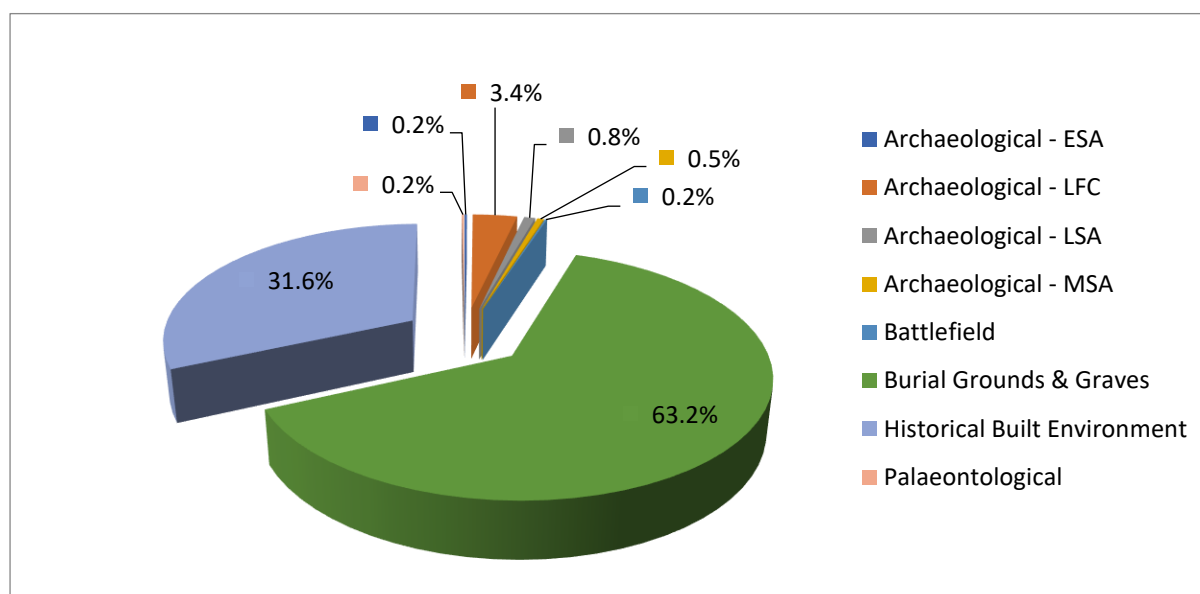
Eon	Era	Period	Mya	Lithographic Units			Significance	Fossils
				Supergroup	Group	Formation		
Phanerozoic	Palaeozoic	Permian	300	Karoo Supergroup	Ecca Group	Volksrust	High	The Volksrust Formation comprises of trace fossils, rare temnospondyl amphibian remains, invertebrates (bivalves, insects), minor coals with plant remains, petrified wood, organic microfossils (acritarchs), and low-diversity marine to non-marine trace fossil assemblages.
						Vryheid	Very-high	Abundant plant fossils of <i>Glossopteris</i> and other plants. Trace fossils. The reptile Mesosaurus has been found in the southern part of the Karoo Basin. Rich fossil plant assemblages of the Permian <i>Glossopteris</i> flora (lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers, ginkgoaleans), rare fossil wood, diverse palynomorphs. Abundant, low diversity trace fossils, rare insects, possible conchostracans, non-marine bivalves, fish scales.

Table 6-2 presents an overview of the broad timeframes for the major periods of the past in Mpumalanga. Figure 6-1 presents a summary of the heritage resources identified within the larger study area. The figure presents the relative abundance of these heritage resources as grouped by the periods listed in Table 6-2.

**Table 6-2: Archaeological Periods in Mpumalanga**

<b>The Stone Age</b>	Earlier Stone Age (ESA)	2 mya to 250 thousand years ago (kya)
	Middle Stone Age (MSA)	250 kya to 20 kya
	Later Stone Age (LSA)	20 kya to 500 CE (Common Era <sup>5</sup> )
There appears to be a gap in the record in Mpumalanga between approximately 7000 and 2000 BCE.		
<b>Farming Communities</b>	Early Farming communities (EFC)	500 to 1400 CE
	Late Farming Communities (LFC)	1100 to 1800 CE
<b>Historical Period<sup>6</sup></b>	-	1500 CE to 1850 (Behrens & Swanepoel, 2008)

Adapted from Esterhuysen & Smith (2007)

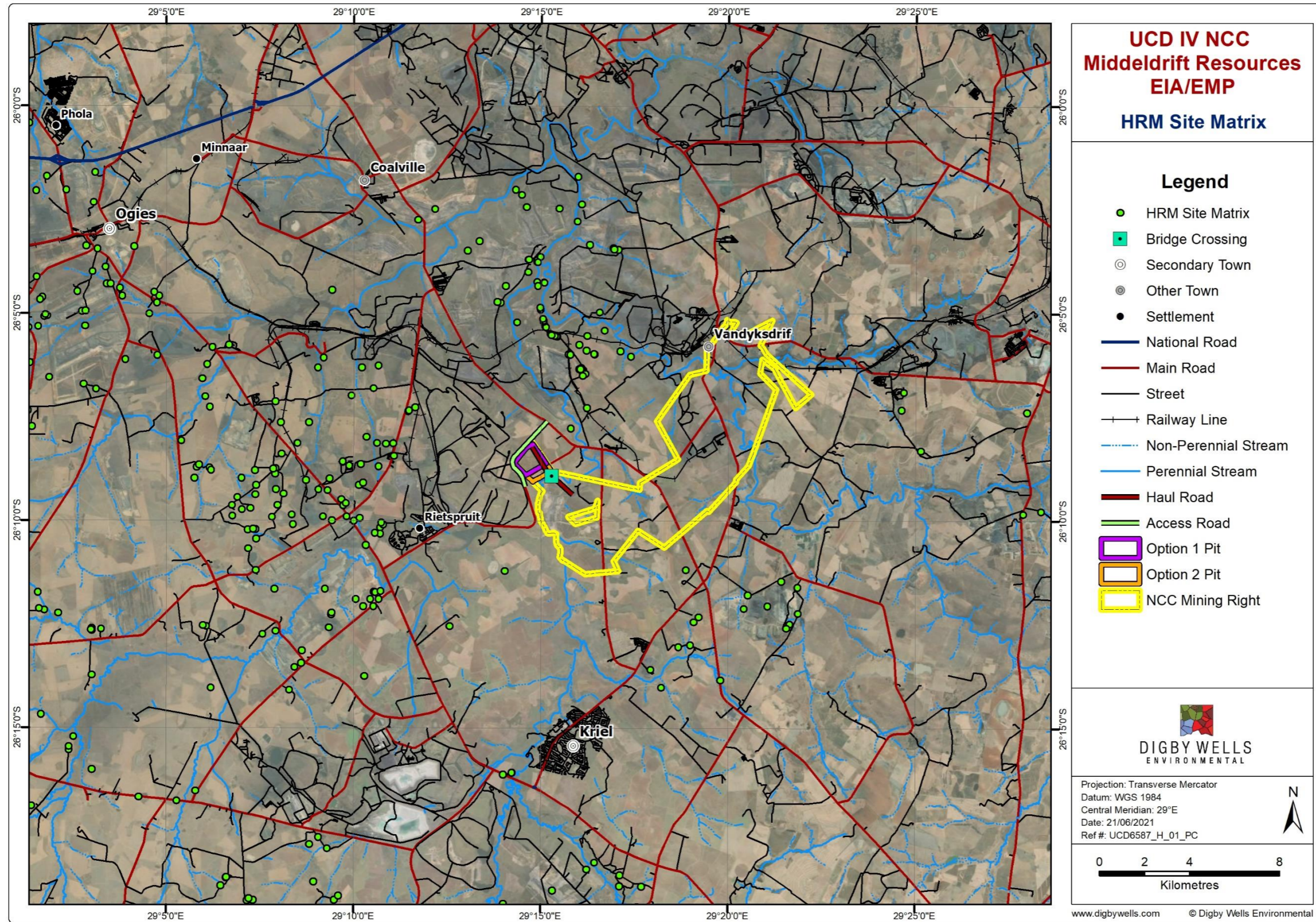


**Figure 6-1: Heritage Resources Identified within the Greater Study Area**

<sup>5</sup> Common Era (CE) refers to the same period as *Anno Domini* ("In the year of our Lord", referred to as AD): i.e., the time after the accepted year of the birth of Jesus Christ and which forms the basis of the Julian and Gregorian calendars. Years before this time are referred to as 'Before Christ' (BC) or, here, BCE (Before Common Era).

<sup>6</sup> The author acknowledges that in southern Africa, especially in Mpumalanga, the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented and is being explored through the 500 Year Initiative (Behrens & Swanepoel, 2008).

**Plan 4: Distribution of Recorded Cultural Heritage Resources in the Greater Study Area**





In total, 589 heritage resources were identified within the regional, local and site-specific study areas. Within the areas under consideration, the predominant tangible heritage resources demonstrate affiliations with the historical period, including the historical built environment and burial grounds and graves. This notwithstanding, expressions of the Stone Age, the Farming Community Period, historical battlegrounds, and palaeontological resources have also been recorded in the regional study area.

The Stone Age of southern Africa is divided into three broad phases: the ESA, MSA and LSA. These phases are defined according to the various hominid species and the lithic tools and associated materials they created through time.

The ESA period occurred between 2 mya and 250 kya and comprised predominantly of large handaxes and cleavers made of coarse-grained materials (Esterhuysen & Smith, 2007). This period is associated with *Australopithecus* and early *Homo* hominid species. Within the reviewed data, one example of ESA lithics was identified, which comprised a low-density artefact scatter (Huffman, 1999). This represents 0.2% of the data set.

The MSA dates between approximately 300 kya and 20 kya. The early MSA lithic industries are characterised by high proportions of minimally modified blades, created using the Levallois technique, the use of good quality raw material and the use of bone tools, ochre, and pendants (Clark, 1982; Deacon & Deacon, 1999). These tools were made and used by archaic *Homo sapiens*. The review of available data included 3 records of expressions of MSAS (0.5% of the total identified heritage resources). These include low- and medium-density surface scatters (Fourie, *et al.*, 2000; du Piesanie & Nel, 2016b).

The LSA dates from approximately 40 kya to the historical period. LSA lithics are specialised, (i.e., specific tools each have specific uses) (Mitchell, 2002). Assemblages from this period commonly include diagnostic tools such as scrapers and segments. Assemblages may include bone points as well. In southern Africa, the LSA is closely associated with hunter-gatherers. The San (including hunter-gatherer, Basarwa and Bathwa groups) are generally accepted as the first inhabitants of southern Africa (Makhura, 2007).

The review of available data included few expressions of the LSA (5 records or 0.8% of the total identified heritage resources). Within the regional study area, expressions of the LSA include:

- Isolated artefacts and low-density scatters of lithic accumulations (de Jong, 2006; Karodia, *et al.*, 2013);
- A rock shelter with deposit and artefacts (Fourie, *et al.*, 2000); and
- Rock art (du Piesanie & Nel, 2016a).

In Mpumalanga, three rock art painting traditions occur and are associated with cultural groups. These traditions are widely dispersed and include:

- Fine line painting associated with autochthonous LSA hunter-gatherer groups (Eastwood, *et al.*, 2002);

- Finger paintings associated with the later arrival of pastoralists (Smith & Ouzman, 2004; Eastwood, *et al.*, 2002; Smith & Zubieta, 2007); and
- Finger paintings associated with much later, possibly historic, farming communities. No expressions of this tradition are known to occur within the study area under consideration.

The San were later followed by the various peoples of the Farming Community, including ancestors of modern Sotho-Tswana and Nguni peoples (Makhura, 2007). This period correlates to the movements of Bantu-speaking agro-pastoralists moving into southern Africa. Farming Community settlements are identified through stonewalling and secondary tangible surface indicators, such as ceramics and evidence for domesticated animals, i.e., dung deposits or faunal remains.

The Farming Community Period is divided into two phases: the EFC and the LFC. No material associated with the EFC was identified within the broader study area. The LFC resources accounted for 20 (or 3.4%) of the identified heritage resources in the regional study area. The identified LFC heritage resources include:

- Structural sites, including stone walling or structural remains (ruins of homesteads or circular stone structures) (Fourie, *et al.*, 2000; van Schalkwyk, 2007; Pelser & van Vollenhoven, 2008; Karodia, *et al.*, 2013; Higgitt, *et al.*, 2014; Karodia & Nel, 2014); and
- Low density surface scatters (de Jong, 2006; Karodia, *et al.*, 2013).

The historical period is commonly regarded as the period characterised by contact between Europeans and Bantu-speaking African groups and the written records associated with this interaction. However, the division between the LFC and historical period is largely artificial, as there is a large amount of overlap between the two.

Throughout the transitions between the LFC and the historical period (and throughout the historical period itself), migration, population growth, climatic variation and trade to the east significantly impacted the Pedi, Koni and other groups on the Mpumalanga Highveld. The rise of power blocs, including violent displacement and political centralisation, characterised this time (Makhura, 2007). Within this region, the Pedi developed a system of centralisation where subordinate communities could retain their independence in exchange for tribute in various forms. The Pedi grew to become the strongest power in the north-east, amongst the escalating conflict and intensifying violence (Delius, *et al.*, 2014).

The Mfecane (or the Difaqane as it is known north of the Orange River) is one example of the overlap between the LFC and the historical period. These terms refer to a period of violence and unrest between approximately 1817 to 1826 AD (Landau, 2010). Many aspects of the Mfecane/Difaqane have been debated and challenged, but the traditional understanding of the period is that Mzilikazi and his Ndebele group were pushed out of their territory by the Zulu group led by Shaka. This displacement had a knock-on effect, as multiple groups were subsequently displaced to the north and the west. A drought during this time exacerbated the instability and increased the pressure on food supplies, which were already running low.

Adding to the instability and power struggles were the European settlers, traders, missionaries, and travellers now moving into the interior (Landau, 2010). The Mfecane/Difaqane was characterised by unprecedented (at least within the records of the Europeans travelling within southern Africa) social and political mobilisation and violence across the Highveld as individuals sought personal and food security. As a result, the Mpumalanga Highveld was vulnerable to intrusive groups including the Swazi and the *Voortrekkers*.

Groups of Afrikaners initiated a move from the Cape to the interior to establish an independent state in approximately 1835, in reaction to increased British liberalism and the abolishment of slavery and pass laws. The migration of these *Voortrekkers* is commonly referred to as the Great Trek (or *Groot Trek*) and it started with the first group, the Robert Schoon Party, in 1836. The first permanent settlement that was established as a result of this movement was Ohrigstad in 1845 – the *Voortrekkers* at this time were intruding into an already volatile interior and exacerbated the strife in this area, frequently skirmishing with remnant Pedi, Ndzundza Ndebele and Kopa groups (Delius & Cope, 2007; Voortrekkers, 2014).

In 1852, *Voortrekker* and British representatives signed the Sand River Convention into effect; the convention acknowledged Trekboer independence and officially established the *Zuid-Afrikaansche Republiek* (ZAR). ZAR independence allowed for land to be distributed to its citizens, though the demarcation of farms and the issuing of title deeds. The Trekboers continued their violent encounters with the smaller groups in this region, armed with their perceived right to land under the ZAR. These conflicts resulted in a Trekboer-Swazi alliance: the Swazi besieged and destroyed the Kopa and orchestrated assaults against the Ndzundza Ndebele. The Ndzundza Ndebele remained undefeated but came to a compromise with the Trekboers where land would be leased by the Trekboers through a system of tribute (Delius & Cope, 2007; Voortrekkers, 2014).

The Trekboers (now farmers) discovered and exploited the Highveld Coalfields soon after settling in the area. The Boers initially used the coal as a domestic resource; however, the discovery of gold in the Witwatersrand in 1886 created an enormous demand for coal (Brodie, 2008; Pistorious, 2008; 2008b). This increase in the demand for coal drove the commercial exploitation of the coal, until the industry was put on hold by the outbreak of war.

The South African War of 1899-1902 (also referred to as the Second Anglo-Boer War) officially started on October 9<sup>th</sup>, 1899. The war was the result of building tensions and conflicting political agendas between the Trekboers and the British. There are multiple notable battles associated with the South African War within the regional study area, one of which is the Battle of Bakenlaagte (October 30<sup>th</sup>, 1901). A battlefield relating to this event has been recorded within the greater study area.

Lieutenant Colonel George Benson's No. 3 Flying Column moved from the farm Syferfontein, marching north-west to the Bakenlaagte farmstead, where they intended to camp. The advance guard reached the farmstead and set up the camp, but by midday, the rear-guard had been hampered by unfavourable weather and were still some distance away from the farm. General Botha of the Boer commando and his 800 reinforcements planned to attack Benson's Column and this division of the force provided the Boers with an advantage.

Outnumbered four to one, the Boers decimated the rear-guard in a gun battle that lasted just 20 minutes; but the attack did allow the main column to deploy and set up a defensive perimeter. This perimeter prevented the Boers from capturing the main column as they had envisaged, and the Boers left with what spoils they could. The British transported their 134 wounded to the entrenched camp during the night (Pakenham, 1979; Willsworth, 2006; Wessels, 2010; von der Heyde, 2013). British losses included at least 66 dead, 120 were taken prisoner and the loss of two British guns. Boer casualties included at least 52 who were killed or wounded (Wessels, 2010)

Other important events associated with the South African War in the broader area include:

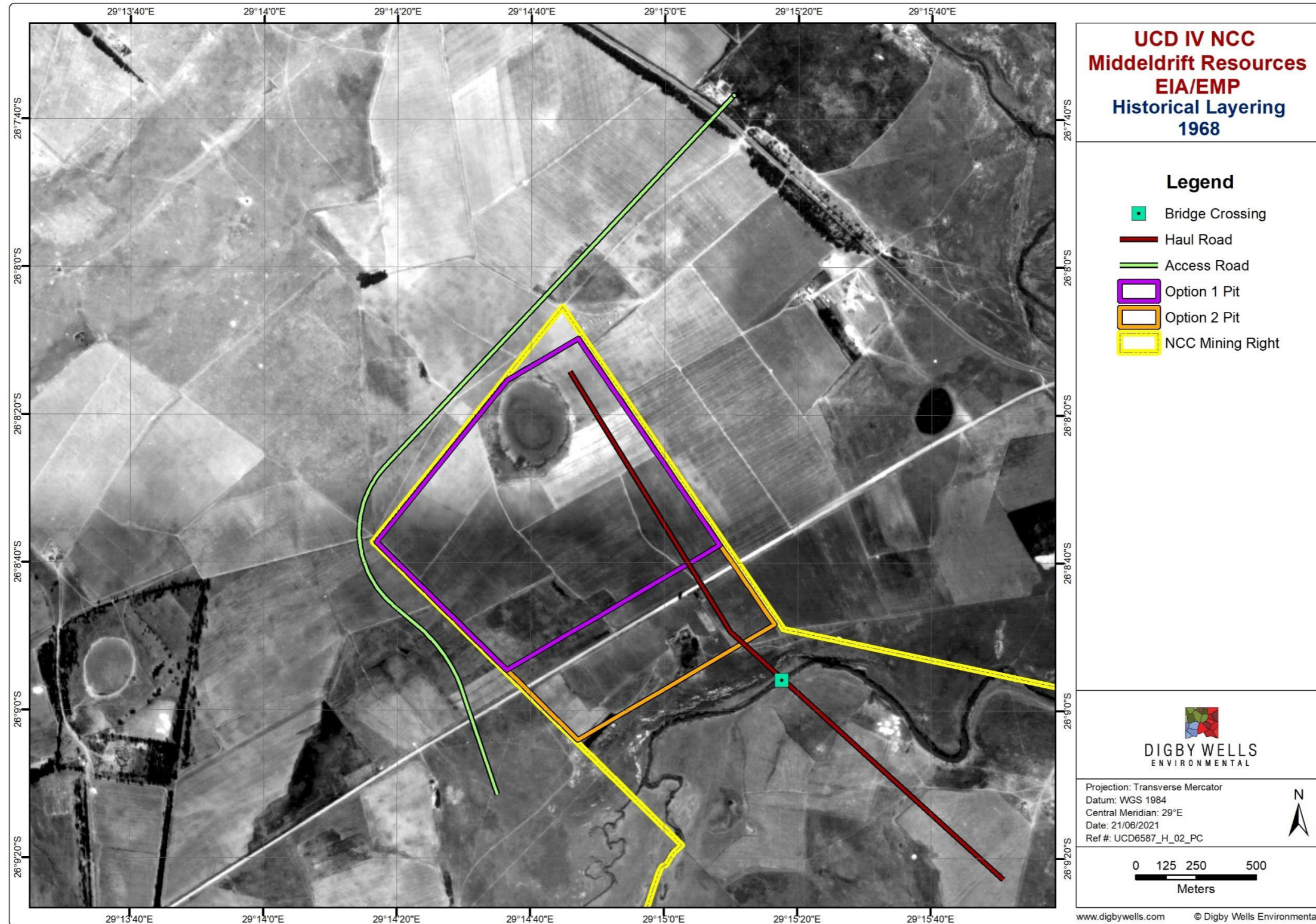
- The Battle of Lake Chrissie (6 February 1901);
- Trigaardsfontein (10 December 1901),
- Klippan (18 February 1902); and
- Boschmanskop (1 April 1904) (Van Vollenhoven, 2012).

Historical heritage resources associated with the early settlement of these groups in the region make up the large majority of the identified heritage resources in the area under consideration. Burial grounds and graves account for 372 records (63.2% of the identified heritage resources) and historical built environment resources account for 186 records (31.6%).

Historical resources are represented as:

- The Bakenlaagte battlefield referred to above (Van Vollenhoven, 2012a; Hardwick & du Piesanie, 2018);
- Burial grounds and graves, ranging from single burials to graveyards containing over one hundred individuals (van Schalkwyk, 1997a 1997b, 2002a, 2002b; Huffman 1999, Fourie, *et al.*, 2000, 2012; Pistorius, 2004a, 2004b, 2008, 2011, 2012, 2013a, 2014, 2015, 2016; de Jong, 2006, 2007; Pelser & van Vollenhoven, 2008, Fourie, 2008 2009; Birkholtz, 2011, 2013; Fourie & Hutton, 2012; Higgitt, *et al.*, 2013; Karodia, *et al.*, 2013; Higgitt, *et al.*, 2014; Karodia & Nel, 2014; van Vollenhoven & du Bruyn, 2014; van Vollenhoven, 2012a, 2012b, 2015a, 2015b; van der Walt, 2015; du Piesanie & Nel, 2016b; Coetzee & Fivaz, 2017; Hardwick & du Piesanie, 2018); and
- Historical built environment resources, such as structural remains (stonewall structures, homesteads, farmhouses and functional structures) and structural complexes; (Huffman & Calabrese, 1996; van Schalkwyk, 1997a 1997b, 2002a, 2002b; Huffman 1999, Pistorius, 2008, 2011, 2012, 2016; de Jong, 2006, 2007; Pelser & van Vollenhoven, 2008, Fourie, 2008 2009; Fourie & Hutton, 2012; Birkholtz, 2013; Higgitt, *et al.*, 2013; Karodia, *et al.*, 2013; Pelser, 2013; Higgitt, *et al.*, 2014; Karodia & Nel, 2014; van Vollenhoven, 2012a; 2015a, du Piesanie & Nel, 2016a; 2016b; Coetzee & Fivaz, 2017; Hardwick & du Piesanie, 2018).

### Plan 5: Historical Layering of New Clydesdale Colliery Mining Right



## 6.2. Results from the Pre-disturbance Survey

The following sections describe the observations made during the survey and the outcomes of the survey.

### 6.2.1. Existing Environment

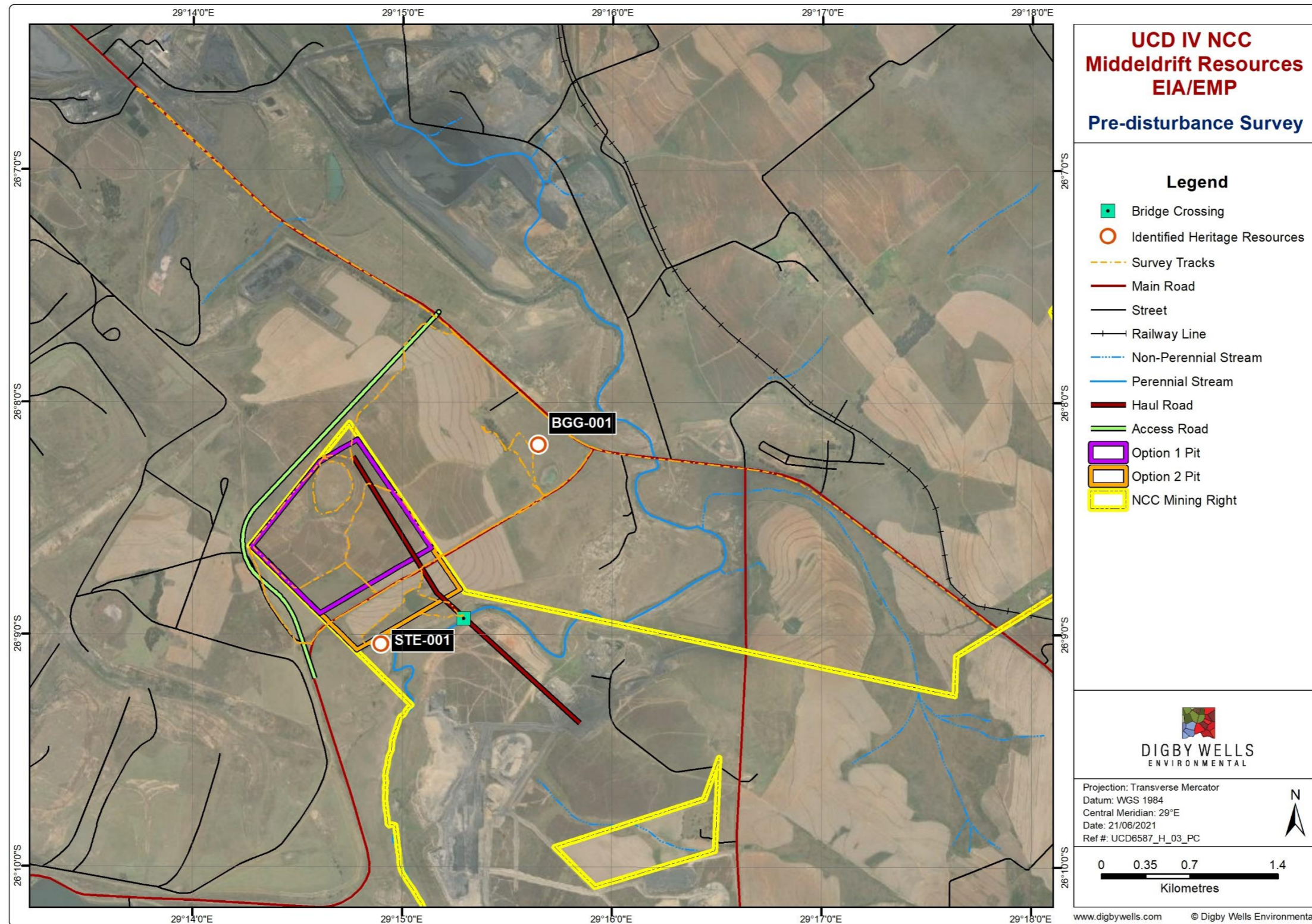
The Project area has been disturbed through anthropogenic activity, specifically related to farming activities. A large portion of the Project area consists of cultivated fields and informal roads between the fields. Natural pans cover a significant portion of the Project area. The present environment is illustrated in Figure 6-2.

Parts of the Project area had been disturbed through animal activity. Burrows were inspected for the presence of any archaeological materials.

Mining activities occur on the adjacent property.



**Figure 6-2: Current State of the Environment during the Pre-disturbance Survey**



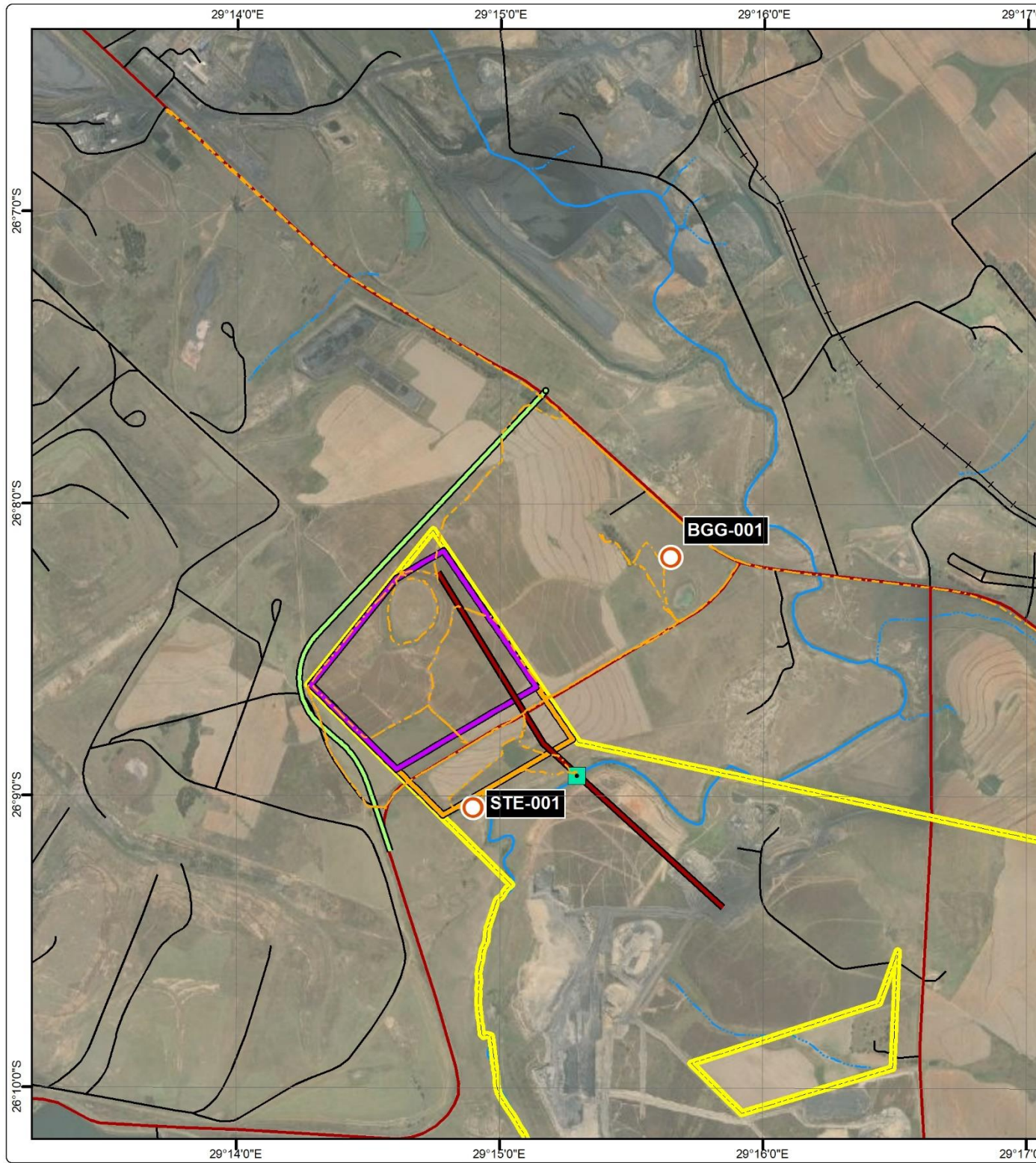
Plan 6: Pre-disturbance Survey GPS Tracklog and Identified Cultural Heritage Resources

### **6.2.2. Identified Heritage Resources**

**Table 6-3 includes descriptions of the heritage resources identified during the pre-disturbance and ground-truthing surveys. Figure 6-3 below presents photographs of heritage resources identified during the pre-disturbance survey and conditions at the**



time of the survey.



Plan 7 presents the spatial distribution of these sites and includes the tracks, indicating the areas that were surveyed.

A preliminary assessment of the Genealogical Society of South Africa (2011) database did not indicate additional burial grounds are known to exist within the Project area.

**Table 6-3: Heritage Resources Identified through the Pre-Disturbance Survey<sup>7</sup>**

Site Name	Description
BGG-001	Burial ground including several graves identified by upright stones serving as headstones. The burial ground is not demarcated by a fence. <i>This heritage resource was identified by the wetland specialist and was not inspected by the heritage specialist.</i>
STE-001	Remains of what appears to be a one-roomed structure with no internal divisions. The wall has a dog-legged corner. The wall is made of stone with cement / plaster in between the stones. The walls are in varying stages of collapse, from standing above head height to total collapse. The structure does not have a roof, doors, or windows. The structure is surrounded by a dense stand of trees. No debris, midden or material culture associated with the structure is visible.



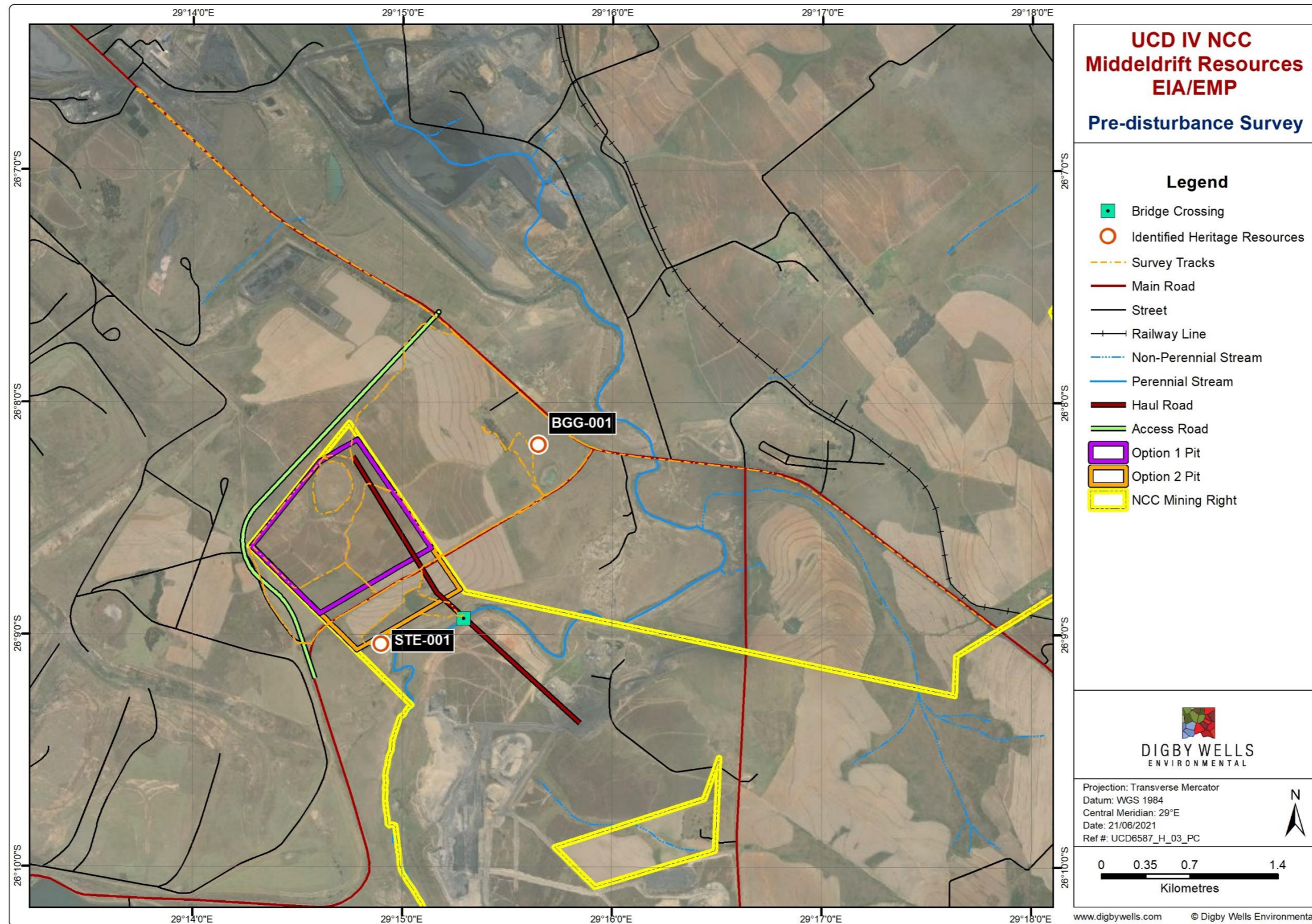
**Structural remains at STE-001**



**Structural remains at STE-001**

**Figure 6-3: Photographs of Select Heritage Resources Identified through the Pre-disturbance Survey**

<sup>7</sup> In accordance with SAHRA procedures, the GPS co-ordinates of these heritage resources have not been included in documents available to the public.



Plan 7: Results from the Pre-disturbance Survey

### 6.3. Socio-economic Setting

The Project is located within ELM of the NDM in the Mpumalanga Province. This section presents a brief summary of the demographic statistics relevant to the potential socio-economic benefit derived from the Project, informed by data collected during the 2016 Community Survey (Statistics South Africa, 2011). Wazimap (2017) has adjusted these data to conform with the updated ward and municipality boundaries which were altered ahead of the 2016 Municipal Elections (Open Up, 2017). These data are supplemented by information included in the Integrated Development Plan (IDP) for the Victor Khanye Local Municipality (VKLM) (2020).

As of the 2011 Census, Mpumalanga province had a population of 4 039 939, which accounts for approximately 7.8% of the national population (Wazimap, 2017). The province includes three district municipalities, of which the NDM is neither the largest nor the smallest in terms of population.

Table 6-4 presents an overview of the employment status of the populations within the regional study area.

**Table 6-4: Employment Status of the Populations within the Study Area**

Employment Statistics (Census 2011)	Ward		ELM		NDM	
	No.	%	No.	%	No.	%
Total Population					1 308 129	-
Working Age (18-64)					796 693	60.9
Employed					355 478	27.2
Discouraged Work Seeker					42 554	3.3
Unemployed					152 250	11.6
Other not economically active					319 641	24.4

Adapted from Wazimap (2017)

## 7. Impact Assessment

This section presents a description of the Cultural Significance of identified heritage resources informed through primary and secondary data collection. The Cultural Significance of the heritage resources informs the minimum required mitigation encapsulated in the NHRA and the SAHRA Minimum Standards.

### 7.1. Cultural Significance of the Identified Landscape

Heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures and are finite, non-renewable and irreplaceable. Considering the innate value of heritage resources, HRM acknowledges that these have lasting worth as

evidence of the origins of life, humanity and society. Notwithstanding the inherent value ascribed to heritage, it is incumbent on the assessor to determine the significance of these resources to allow for the implementation of appropriate management. This is achieved through assessing the value of heritage resources relative to the prescribed criteria encapsulated in policies and legal frameworks.

This section presents a statement of Cultural Significance as is relevant to newly identified heritage resources and the greater cultural landscape of the site-specific study area. The statement of significance considers the importance or the contribution of the identified heritage resources and the landscape to four broad value categories: aesthetic, historical, scientific, and social, to summarise the Cultural Significance and other values described in Section 3(3) of the NHRA.

Two categories of heritage resources were recorded during the pre-disturbance survey of the site-specific study area – one burial ground and one historical structure. The assessment of the Cultural Significance and Field Ratings demonstrated that the identified resources have very high and negligible significance. Table 7-1 presents a summary of this assessment. Sites of the same type that share the same Cultural Significance have been grouped together in terms of the impact assessment (refer to Sections 7.2 to 7.4 below).

**Table 7-1: Cultural Significance and Field Ratings of Newly Identified Heritage Resources within the Project Area**

Map ID	Type	Description	Cultural Significance	Recommended Field Rating
BGG-001	Burial / grave	Burial ground including several graves identified by upright stones serving as headstones. The burial ground is not demarcated by a fence.	Very High	Grade III A
STE-001	Historical Built Environment	Remains of what appears to be a one-roomed structure with no internal divisions. The wall has a dog-legged corner. The wall is made of stone with cement / plaster in between the stones. The walls are in varying stages of collapse, from standing above head height to total collapse. The structure does not have a roof, doors, or windows. The structure is surrounded by a dense stand of trees. No debris,	Negligible	General Protection IV C

		midden or material culture associated with the structure is visible.		
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## 7.2. Construction Phase

Table 7-2 presents the activities expected to occur during the Construction Phase and the expected impacts to the cultural heritage landscape that may arise from these activities.

**Table 7-2: Interactions and Impacts of Construction Phase Activities**

Interaction	Impact
Site/vegetation clearance	Damage to or destruction of tangible cultural heritage
Contractors laydown yard	
Access and haul road construction	
Topsoil stockpiling	

### 7.2.1. Impact Description

Construction activities will directly and physically impact STE-001 as it is located within the proposed both Option 1 and 2 of the open pit footprint areas. This will lead at least to damage and ultimately destruction of this identified cultural heritage resource. However, STE-001 is deemed to be of negligible significance and any impact on this site is commensurately negligible.

Based on the proposed mining activities and infrastructure it is unlikely that the burial ground will be directly or physically impacted as it located approximately 1 km from both proposed open pit options. This site is furthermore outside the NCC MR area. BGG-001 is from the proposed open pit.

**Table 7-3: Impacts on Cultural Heritage with Very High Cultural Significance and a Grade III A Field Rating**

Dimension	Rating	Motivation	Significance
<b>Cultural Heritage - Very High Cultural Significance - Grade IIIA (BGG-001)</b>			
<b>Impact Description:</b>			
Cultural heritage whose cultural significance is designated as very high are highly susceptible to changes that may result from any project-induced activities. This could range from loss of or restricted access, physical damage, or destruction, to the degradation of the cultural significance of the resource.			
<b>Prior to Mitigation/Management</b>			

Dimension	Rating	Motivation	Significance
<b>Duration</b>	7	Physical impacts on tangible cultural heritage resources are generally permanent as it affects the integrity of their fabric and cultural significance.	Major (negative) - 112
<b>Extent</b>	2	Physical impacts on tangible cultural heritage resources are generally limited to specific sites or aspects of cultural heritage. However, the rarity and cultural significance of every identified individual cultural heritage resource can extend the spatial impact up to international levels. Impacts on burial grounds pose specific risk for wider ranging social impacts.	
<b>Intensity</b>	7	Any impact on any cultural heritage with very high significance is irreparable.	
<b>Probability</b>	7	Without adequate mitigation impacts on cultural heritage are known to definitely occur.	
<b>Nature</b>	Negative		
<b>Mitigation/Management Actions</b>			
Project design must change to avoid all negative changes to identified tangible cultural heritage and ensure their continued in situ conservation.			
Where impacts cannot be avoided, mitigation of tangible cultural heritage will be required that may include relocation.			
<b>Post-Mitigation</b>			
<b>Duration</b>	7	Applying mitigation measures can generally maintain the cultural significance and integrity of cultural heritage resources.	Major (positive) 112
<b>Extent</b>	3	Applying mitigation measures ensures the continued conservation of the cultural significance of other similar cultural heritage resources within a more local context.	
<b>Intensity</b>	7	Conservation of cultural heritage provide noticeable and far-reaching benefits.	

Dimension	Rating	Motivation	Significance
<b>Probability</b>	6	Applying mitigation measures almost certainly ensures the continued conservation of cultural heritage.	
<b>Nature</b>	Positive		

**Table 7-4: Construction Phase Impacts on Cultural Heritage with Negligible Cultural Significance and a Grade IV C Field Rating**

Dimension	Rating	Motivation	Significance
<b>Cultural Heritage - Negligible Cultural Significance - Grade IV C (STE-001)</b>			
<b>Impact Description:</b>			
Changes to cultural heritage whose cultural significance are designated as negligible are usually also negligible.			
<b><i>Prior to Mitigation/Management</i></b>			
<b>Duration</b>	7	Cultural heritage can or will be destroyed.	Negligible (negative) -15
<b>Extent</b>	1	Impacts are limited to very specific, generally poorly preserved, and very common cultural heritage.	
<b>Intensity</b>	1	Impacts on cultural heritage with a negligible value are considered negligible.	
<b>Probability</b>	7	Impacts will definitely occur.	
<b>Nature</b>	Negative		
<b><i>Mitigation/Management Actions</i></b>			
Cultural heritage with negligible cultural significance is generally sufficiently recording during baseline surveys.			
Permitted processes to destroy such cultural heritage may be required.			
<b><i>Post-Mitigation</i></b>			



Dimension	Rating	Motivation	Significance
<b>Duration</b>	7	Destruction is permanent.	Negligible (negative) -10
<b>Extent</b>	1	Impacts are limited to very specific, generally poorly preserved, and very common cultural heritage.	
<b>Intensity</b>	1	Impacts on cultural heritage with a negligible value are considered negligible.	
<b>Probability</b>	2	Impacts following destruction of negligible cultural heritage is conceivable, but rarely occurs.	
<b>Nature</b>	Negative		

### 7.3. Operational Phase

Table 7-5 presents the activities expected to occur during the Operational Phase and the expected impacts to the cultural heritage landscape that may arise from these activities.

**Table 7-5: Interactions and Impacts of Operational Phase Activities**

Interaction	Impact
Open pit establishment	Direct impacts on STE-001 would already have taken place during the construction phase.  Indirect impacts may, however, manifest on BGG-001 during the operational phase.
Removal of rock (blasting)	
Stockpiling (i.e., soils) establishment and operation	
Operation of the open pit workings	

#### 7.3.1. Impact Description

Indirect impacts may manifest on BGG-001 during the operational phase including:

- Loss or restricted access to the burial ground by any relatives;
- Damage to grave monuments resulting from blasting; and
- Vandalism due to increased human traffic.

**Table 7-6: Impacts on Cultural Heritage with Very High Cultural Significance and a Grade III A Field Rating**

Dimension	Rating	Motivation	Significance
<b>Cultural Heritage - Very High Cultural Significance - Grade IIIA (BGG-001)</b>			
<b>Impact Description:</b>			
Cultural heritage whose cultural significance is designated as very high are highly susceptible to changes that may result from any project-induced activities. This could range from loss of or restricted access, physical damage, or destruction, to the degradation of the cultural significance of the resource.			
<b>Prior to Mitigation/Management</b>			
<b>Duration</b>	7	Physical impacts on tangible cultural heritage resources are generally permanent as it affects the integrity of their fabric and cultural significance.	Major (negative) - 112
<b>Extent</b>	2	Physical impacts on tangible cultural heritage resources are generally limited to specific sites or aspects of cultural heritage. However, the rarity and cultural significance of every identified individual cultural heritage resource can extend the spatial impact up to international levels. Impacts on burial grounds pose specific risk for wider ranging social impacts.	
<b>Intensity</b>	7	Any impact on any cultural heritage with very high significance is irreparable.	
<b>Probability</b>	7	Without adequate mitigation impacts on cultural heritage are known to definitely occur.	
<b>Nature</b>	Negative		
<b>Mitigation/Management Actions</b>			
Project design must change to avoid all negative changes to identified tangible cultural heritage and ensure their continued in situ conservation.			
Where impacts cannot be avoided, mitigation of tangible cultural heritage will be required that may include relocation.			

Dimension	Rating	Motivation	Significance
<b>Post-Mitigation</b>			
<b>Duration</b>	7	Applying mitigation measures can generally maintain the cultural significance and integrity of cultural heritage resources.	Major (positive) 112
<b>Extent</b>	3	Applying mitigation measures ensures the continued conservation of the cultural significance of other similar cultural heritage resources within a more local context.	
<b>Intensity</b>	7	Conservation of cultural heritage provide noticeable and far-reaching benefits.	
<b>Probability</b>	6	Applying mitigation measures almost certainly ensures the continued conservation of cultural heritage.	
<b>Nature</b>	Positive		

#### 7.4. Decommissioning Phase

Table 7-7 presents the activities expected to occur during the Decommissioning Phase and the expected impacts to the cultural heritage landscape that may arise from these activities.

**Table 7-7: Interactions and Impacts of Decommissioning Phase Activities**

Interaction	Impact
Demolition and removal of all infrastructure (incl. transportation off site)	Digby Wells envisages no impact to the cultural heritage landscape, given the nature of the proposed activities and the location of identified heritage resources in relation to the proposed Project infrastructure.  Should any infrastructure intended for demolition increase in age to older than 60 years during the Project lifecycle, the structure must be considered a heritage structure. Any alterations to these structures will be subject to a NHRA Section 34 permit application process
Rehabilitation (spreading of soil, re-vegetation, and profiling/contouring)	
Installation of post-closure water management infrastructure	

Digby Wells does not envisage any impact to the identified heritage resources from the above-mentioned activities and has therefore not assessed these impacts further in this report.

## 7.5. Cumulative Impacts

Cumulative impacts occur from in-combination effects of various impacts on heritage resources acting within a host of processes that result in an incremental effect. The importance of identifying and assessing cumulative impacts is that the whole is often greater than the sum of its parts. This implies that the total effect of multiple stressors or change processes acting simultaneously on a system may be greater than the sum of their effects when acting in isolation.

This Project in conjunction with other planned developments in line with the strategic development plans for the Mpumalanga Province requires consideration to identify the possible in-combination effects of various impacts to known heritage resources. Table 7-8 presents a summary of the possible cumulative impacts of the Project.

**Table 7-8: Summary of Potential Cumulative Impacts**

Type	Cumulative Impact	Direction of Impact	Extent of Impact
Space-crowding	The proposed infrastructure will add to the existing infrastructure associated with activities characterising the area immediately surrounding the proposed Project area and further afield. This installation of this infrastructure will result in a loss of the area within which heritage resources can exist. The area earmarked for the proposed infrastructure does, however, occur within an area approved for mining activities.	Neutral	Site-specific study area

## 7.6. Unplanned and Low Risk Events

This section considers the potential risks to protected heritage resources, as well as the potential heritage risks that could arise for Universal Coal in terms of implementation of the Project. These two aspects are discussed separately.

Section 6.2 describes the heritage resources identified by Digby Wells within the Project area. This list is, however, not an exhaustive list of all heritage resources within the Project area. If heritage resources are subsequently identified, and where Universal Coal knowingly does not take proactive management measures, potential risks to Universal Coal may include litigation in terms of Section 51 of the NHRA and social or reputational repercussions. Table 7-9 presents a summary of the primary risks that may arise for Universal Coal.

**Table 7-9: Identified Heritage Risks that may arise for Universal Coal**

Description	Primary Risk
Heritage resources with a high Cultural Significance rating are inherently sensitive to any development in so far that the continued survival of the resource could be threatened. In addition to this, certain heritage resources are formally protected thereby restricting various development activities.	Negative Record of Decision (RoD) and/or development restrictions issued by MPHRA and/or SAHRA in terms of Section 38(8) of the NHRA.
<p>Impacting on heritage resources formally and generally protected by the NHRA without following due process.</p> <p>Due process may include social consultations and/or permit application processes to SAHRA and/or MPHRA.</p>	<ul style="list-style-type: none"> <li>• Fines;</li> <li>• Penalties;</li> <li>• Seizure of Equipment;</li> <li>• Compulsory Repair / Cease Work Orders; and</li> <li>• Imprisonment.</li> </ul>
Proximity of mining activities to burial grounds and graves specifically in terms of the Mine Health and Safety Act and the SAHRA BGG Policy. The former regards graves as structures and prohibits blasting activities from taking place within 500 m of structures unless the owner thereof provides consent. The latter requires that 100 m buffer zone be maintained between graves and mining activities.	<ul style="list-style-type: none"> <li>• Cease Work Orders; and</li> <li>• Compulsory grave relocation.</li> </ul>

If additional heritage resources are identified during decommissioning and dismantling of the proposed infrastructure and/or activities undertaken during the rehabilitation processes, potential risks to those heritage resources will need to be assessed. Table 7-10 provides an overview of these potential unplanned events, the subsequent impact that may occur and mitigation measures and management strategies to remove or reduce these risks.

**Table 7-10: Identified Unplanned Events and Associated Impacts**

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Encountering unidentified in situ remnants of historical built environment resources during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA	

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Accidental exposure of fossil bearing material implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA	Establish Project-specific CFPs as a condition of authorisation. Refer to Section 11 for more detailed recommendations.
Accidental exposure of <i>in situ</i> archaeological material during the implementation of the Project.		
Accidental exposure of <i>in situ</i> burial grounds or graves during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA.	
Accidental exposure of human remains during the decommissioning and rehabilitation and closure phases of the Project.		

## 8. Specialist Inputs into the Environmental Management Program

Table 8-1 below summarises the outcomes of the HRM process that must be included in the EMP.

**Table 8-1: Heritage Specialist Input into the Environmental Management Program**

Activities	Potential Impacts	Aspects Affected	Phase	Mitigation Measure	Mitigation Type	Time period for implementation
<ul style="list-style-type: none"> <li>All Activities outlined in Section 2.1 above</li> </ul>	Damage to or destruction of previously unidentified heritage resources.	Cultural Heritage	Construction	<ul style="list-style-type: none"> <li>Develop and implement CFP.</li> </ul>	<b>Control</b>	Before the commencement of the Project
<ul style="list-style-type: none"> <li>Construction Activities outlined in Section 2.1 above</li> </ul>	Damage to or destruction of STE-001	Cultural Heritage	Construction	<ul style="list-style-type: none"> <li>Determine if a NHRA Section 34 permit will be required prior to demolition of historical built environment / structures older than 60 years.</li> </ul>	<b>Permit</b>	Before destruction.
<ul style="list-style-type: none"> <li>Construction and Operational Activities outlined in Section 2.1 above</li> </ul>	Loss of or restricted access to BGG-001	Cultural Heritage	Construction and Operation	<ul style="list-style-type: none"> <li>Develop a Conservation Management Plan (CMP) including identification of any living relatives or persons who may have <i>bona fide</i> interests in the site.</li> </ul>	<b>Control</b>	Before commencement of the Project.

## 9. Monitoring Programme

Section 11 includes recommended mitigation measures and management strategies. These recommendations do not require a monitoring programme.

## 10. Consultation and Results from Stakeholder Engagement

The Public Participation Process (PPP) required in terms of the NEMA as a component of the EIA process has not been completed in part to date but will be completed as a process separate to the heritage specialist assessment. This consultation process affords Interested and Affected Persons (I&APs) opportunities to engage in the EIA process. The objectives of the PPP or Stakeholder Engagement Process (SEP) include the following:

- To ensure that I&APs are informed about the project;
- To provide I&APs with an opportunity to engage and provide comment on the project;
- To draw on local knowledge by identifying environmental and social concerns associated with the project;
- To involve I&APs in identifying methods in which concerns can be addressed;
- To verify that stakeholder comments have been accurately recorded; and
- To comply with the legal requirements.

No formal consultation was undertaken as part of this assessment. Should any I&AP comments be submitted in relevance to heritage resources during the PPP, these will be considered in the final HIA or EIA report.

Site surveys can often present an opportunity for informal consultation with specific stakeholders (usually farm owners, managers, and employees). This consultation can result in the identification of burial grounds and graves – importantly, these could include formal burial grounds or graves, sometimes with no visible surface markers – or in the identification of sacred sites or other places of importance, which may not otherwise be identified. No such informal consultation was undertaken as part of this assessment.

## 11. Recommendations

Considering the nature and the scope of the Project, Digby Wells recommends the following additional recommendations be implemented prior to the commencement of the Project:

- A CFP be drafted and implemented as part of the EMPr;
- The structure STE-001 may be subject to permitting to demolish the site if it near or older than 60 years at the time. This requirement must be verified prior to demolition.
- The burial ground BGG-001 must be monitored to determine if any proposed mining activities affect the site and whether the proximity of the site affects the operations of the NCC.



## 12. Reasoned Opinion Whether Project Should Proceed

Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project provided the recommendations detailed in Section 11 above are adopted. This opinion is further motivated by the absence of visible cultural heritage in general within the MR area as well as the potential socio-economic benefits that will arise from the Project outweigh the identified risks and impacts to the known heritage resources within the site-specific study area.

This statement is supported by the following:

- The identified impacts to the heritage resources can be mitigated through the recommendations included in Section 11 of this report;
- The Project will extend the life of the existing operation, which has created long-term employment opportunities, and which generates revenue feeding into the regional and national economies in a sector which is employing a growing portion of the workforce; and
- The construction of additional infrastructure will create short-term employment opportunities and will generate revenue which will feed into the local economy.

## 13. Conclusion

The aim of the HRM process was to comply with regulatory requirements contained within Section 38 of the NHRA through the following:

- Defining the cultural landscape within which the Project is situated;
- Identifying, as far as is feasible, heritage resources that may be impacted upon by the project as well as define the Cultural Significance;
- Assessing the possible impacts to the identified heritage resources;
- Considering the socio-economic benefits of the Project; and
- Providing feasible mitigation and management measures to avoid, remove or reduce perceived impacts and risks.

These objectives were met as presented in Sections 6 to 12 above. Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project provided the recommendations detailed above are adopted.

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## Appendix A: Glossary

## GLOSSARY OF TERMS

Term	Definition
<b>Archaeological</b>	<p>Material remains resulting from human activity that are in a state of disuse and older than 100 years, including:</p> <ul style="list-style-type: none"> <li>● Artefacts, human and hominid remains and artificial features and structures;</li> <li>● Rock art created through human agency older than 100 years, including any area within 10 m of such representation;</li> <li>● Wrecks older than 60 years - either vessels or aircraft - or any part thereof that was wrecked in South Africa on land, internal or territorial waters, and any cargo, debris or artefacts found or associated therewith; and</li> <li>● Features, structures, and artefacts associated with military history that are older than 75 years and the sites on which they are found, e.g., battlefields.</li> </ul>
<b>Archaeologist</b>	A trained professional who uses scientific methods to excavate, record and study archaeological sites and deposits.
<b>Artefact</b>	Any object manufactured or modified by human beings.
<b>Burial Grounds and Graves Consultation (BGGC)</b>	The regulated consultation process required in terms of Section 36 of the NHRA and Regulation GNR 548 to the NHRA when burial grounds and graves are identified within a project area.
<b>Ceramic (syn. pottery)</b>	In an archaeological context any vessel or other object produced from natural clay that has been fired. Indigenous ceramics associated with Farming Communities are low-fired wares, typically found as potsherds. Imported and more historic ceramics generally include high-fired wares such as porcelain, stoneware, for example.
<b>Ceramic facies / facies</b>	Subgroups of a primary ceramic tradition or sequence. Typically used in ceramic analyses. Various facies are attributed to different temporal periods based of radiometric dates obtained from archaeological contexts. Facies are often used to infer cultural identity of archaeological groups. However, in context of this study identified ceramic facies merely provide a relative temporal context for archaeological sites in the landscape.
<b>Ceramic tradition</b>	The sequence of ceramic styles that develop out of each other and form a continuum. A tradition is the primary group to which subsequent ceramic facies belong. A ceramic tradition can be broadly associated with various linguistic and cultural groups, but do not represent any given ethnic identity, especially during the LFC period.

Term	Definition
<b>Conservation</b>	In relation to heritage resources includes the protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance.
<b>Cultural significance</b>	<p>The aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance. A heritage may have cultural significance or other special value because of its:</p> <ul style="list-style-type: none"> <li>● Importance in the community, or pattern of South Africa's history;</li> <li>● Possession of uncommon, rare, or endangered aspects of South Africa's natural or cultural heritage;</li> <li>● Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;</li> <li>● Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;</li> <li>● Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;</li> <li>● Importance in demonstrating a high degree of creative or technical achievement at a particular period;</li> <li>● Strong or special association with a particular community or cultural group for social, cultural, or spiritual reasons;</li> <li>● Strong or special association with the life or work of a person, group, or organisation of importance in the history of South Africa; and/or</li> <li>● Significance relating to the history of slavery in South Africa.</li> </ul>
<b>Development</b>	<p>Any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance, or physical nature of a place, or influence its stability and future well-being, including:</p> <ul style="list-style-type: none"> <li>● Construction, alteration, demolition, removal or change of use of a place or a structure at a place;</li> <li>● Carrying out any works on or over or under a place;</li> <li>● Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;</li> <li>● Constructing or putting up for display signs or hoardings;</li> <li>● Any change to the natural or existing condition or topography of land; and</li> <li>● Any removal or destruction of trees, or removal of vegetation or topsoil.</li> </ul>



Term	Definition
<b>Early Farming Community/ies (EFC)</b>	The first Farming Communities (also known as Early Iron Age) that appear in the southern archaeological record during the early first millennium CE. The EFC period is generally dated from c. 200 CE to 1000 CE.
<b>Early Stone Age (ESA)</b>	The South African ESA dates from ~3 Mya to c. 250 Kya. This period is associated with later <i>Australopithecus</i> and early <i>Homo</i> species. The lithic industries that characterise the ESA include Oldowan and Early Acheulian, typically as simple core tools, choppers handaxes and cleavers.
<b>Excavation</b>	The scientific excavation, recording and retrieval of archaeological deposit and objects through the use of accepted archaeological procedures and methods, and excavate has a corresponding meaning.
<b>Farming Community/ies</b>	Term signifying the appearance in the southern African archaeological of Bantu-speaking agricultural-based societies from the early first millennium CE. The term replaces the <i>Iron Age</i> as a more accurate description for groups who practiced agriculture and animal husbandry, extensive manufacture and use of ceramics, and metalworking. The Farming Community period is divided into an Early and Late phase. The use of Later Farming Communities especially removes the artificial boundary between archaeology and history.
<b>Field Rating (FR)</b>	SAHRA requires heritage resources to be provisionally rated in accordance with Section 7 of the NHRA that provides a three-tier grading system of resources that form part of the national estate. The rating system distinguishes between four categories: <ul style="list-style-type: none"> <li>● Grade I: Heritage resources with qualities so exceptional that they are of special national significance;</li> <li>● Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region;</li> <li>● Grade III: Other heritage resources worthy of conservation; and</li> <li>● General Protected: i.e., in terms of Sections 33 to 37 of the NHRA.</li> </ul>
<b>Formal protection</b>	Places with qualities so exceptional that they are of special national significance as national heritage sites or that have special qualities as provincial heritage sites.



Term	Definition
<b>General protection</b>	General protections are afforded to: <ul style="list-style-type: none"> <li>● Objects protected in terms of laws of foreign states.</li> <li>● Structures older than 60 years.</li> <li>● Archaeological and palaeontological sites and material and meteorites.</li> <li>● Burial grounds and graves.</li> <li>● Public monuments and memorials.</li> </ul>
<b>Grave</b>	A place of interment and includes the contents, headstone, or other marker of such a place, and any other structure on or associated with such place.
<b>Heritage Impact Assessment (HIA)</b>	An assessment of the cultural significance of, and possible impacts on, diverse heritage resources that may be affected by a proposed development. A HIA may include several specialist elements such as archaeological, built environment and palaeontological studies. The HIA must supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved. The content of HIA reports are outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.
<b>Heritage resource</b>	Any place or object of cultural significance.
<b>Heritage resources management</b>	Process required when development is intended categorised as: <ul style="list-style-type: none"> <li>● Any linear development exceeding 300m in length.</li> <li>● Construction of a bridge or similar structure exceeding 50 m in length.</li> <li>● Any activity which will change the character of a site exceeding 0.5 hectares in extent or involving three or more existing erven or subdivisions thereof or that have been consolidated within the past five years or costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority.</li> <li>● Re-zoning of a site exceeding one hectare in extent.</li> <li>● Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.</li> </ul>
<b>Heritage site</b>	Any place declared to be a national heritage site by SAHRA, or a place declared to be a provincial heritage site by a Provincial Heritage Resource Authority (PHRA).

Term	Definition
<b>Late Farming Community/ies (LFC)</b>	Farming Communities who either developed / evolved from EFC groups, or who migrated into southern African from the late first millennium / early second millennium CE. The LFC period evidences distinct changes in socio-political organisation, settlement patterns, trade, and economic activities, including extensive trade routes. The LFC period is generally dated from c. 1000 CE well into the modern historical period of the nineteenth century.
<b>Later Stone Age (LSA)</b>	The South African LSA dates from ~30 Kya. This period is associated with modern <i>Homo sapiens sapiens</i> and the complex hunter-gatherer societies, ancestral to the Bushmen / San and Khoi. The LSA lithic assemblage contains microlithic technology and composite tools such as arrows commonly produced from fine-grained cryptocrystalline, quartz and chert. The LSA is also associated with archaeological rock art including both paintings and engravings.
<b>Living / intangible heritage</b>	The intangible aspects of inherited culture that could include cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems, the holistic approach to nature, society, and social relationships.
<b>Management</b>	In relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the NHRA.
<b>Middle Stone Age (MSA)</b>	The South African MSA dates from ~300 Kya to c. 30 Kya. This period is associated with the changing behavioural patterns and the emergence of modern cognitive abilities in early <i>Homo sapiens species</i> . The lithic industries that characterise the MSA are typically more complex tools with diagnostic identifiers, including convergent flake scars, multi-faceted platforms, retouch and backing. Assemblages are characterised as refined lithic technologies such as prepared core techniques, retouched blades and points manufactured from good quality raw material.



Term	Definition
<b>National estate</b>	<p>The national estate as defined in Section 3 of the NHRA, i.e., heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations. The national estate may include:</p> <ul style="list-style-type: none"> <li>● Places, buildings, structures, and equipment of cultural significance;</li> <li>● Places to which oral traditions are attached or which are associated with living heritage;</li> <li>● Historical settlements and townscapes;</li> <li>● Landscapes and natural features of cultural significance;</li> <li>● Geological sites of scientific or cultural importance;</li> <li>● Archaeological and palaeontological sites;</li> <li>● Graves and burial grounds, including ancestral graves, royal graves and graves of traditional leaders, graves of victims of conflict, graves of individuals designated by the Minister by notice in the Gazette, historical graves and cemeteries, and other human remains which are not covered in terms of the National Health Act, 2003;</li> <li>● Sites of significance relating to the history of slavery in South Africa;</li> <li>● Movable objects, including objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites, and rare geological specimens; objects to which oral traditions are attached or which are associated with living heritage; ethnographic art and objects; military objects; objects of decorative or fine art; objects of scientific or technological interest; and</li> <li>● 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(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).</li> </ul>
<b>Palaeontological</b>	Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.
<b>Palaeontologist</b>	A trained professional who uses scientific methods to excavate, collect, record and study palaeontological sites and fossils.
<b>Pedestrian survey</b>	A method of examining a site in which surveyors, spaced at regular intervals, systematically walk over the area being investigated.

Term	Definition
<b>Phase 1 Archaeological Impact Assessment (AIA)</b>	Phase 1 AIAs generally involve the identification and assessment of sites during a field survey of a portion of land that is going to be affected by a potentially destructive or landscape-altering activity.
<b>Phase 2 Archaeological Impact Assessment (AIA)</b>	Phase 2 AIAs are primarily based on salvage or mitigation excavations preceding development that will destroy or impact on a site. This may involve collecting of artefacts from the surface and / or excavation of representative samples of the artefactual material to allow characterisation of the site and the collection of suitable materials for dating the sites. Phase 2 AIAs aim to obtain a general idea of the age, significance and meaning of the site that is to be lost and to store a sample that can be consulted at a later date for research purposes. Phase 2 excavations can only be done under a permit issued by SAHRA, or other appropriate heritage agency, to the appointed archaeologist.
<b>Phase 3 Management Plan / Conservation Management Plan (CMP)</b>	On occasion, a site may require a Phase 3 programme involving the modification of the site or the incorporation of the site into the development itself as a site museum, a special conservation area or a display. Alternatively, it is often possible to relocate or plan the development in such a way as to conserve the archaeological site or any other special heritage significance the place may have. For example, in a wilderness area or open space when sites are of public interest the development of interpretative material is recommended and adds value to the development. Permission for the development to proceed can be given only once the heritage resources authority is satisfied that measures are in place to ensure that the archaeological sites will not be damaged by the impact of the development or that they have been adequately recorded and sampled. Careful planning can minimise the impact of archaeological surveys on development projects by selecting options that cause the least amount of inconvenience and delay. The process as explained above allows the rescue and preservation of information relating to our past heritage for future generations. It balances the requirements of developers and the conservation and protection of our cultural heritage as required of SAHRA and the provincial heritage resources authorities (ASAPA).
<b>Pre-disturbance survey (syn. reconnaissance)</b>	A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.

Term	Definition
<b>Reconnaissance</b>	A broad range of techniques involved in the location of archaeological sites, e.g., surface survey and the recording of surface artefacts and features, the sampling of natural and mineral resources, and sometimes testing of an area to assess the number and extent of archaeological resources. However, in terms of South African practice, reconnaissance during a so-called Phase 1 AIA never includes sampling as this is a permitted activity, usually undertaken during so-called Phase 2 AIAs (ASAPA).
<b>Site</b>	Any area of land, including land covered by water, and including any structures or objects thereon.
<b>Structure</b>	Any building, works, device or other facility made by people, and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.
<b>Tangible heritage</b>	Physical heritage resources such as archaeological sites, historical buildings, burial grounds and graves, fossils. Tangible heritage may be associated with intangible elements, e.g., the living cultural traditions, rituals and performances associated with burial grounds and graves and deceased persons.



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## Appendix B: Specialist Curriculum Vitae



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## Appendix C: Heritage Resources Management Methodology