

**DIGBY WELLS**  
ENVIRONMENTAL

Your Preferred Environmental  
and Social Solutions Partner

Providing innovative and sustainable  
solutions throughout the resources sector

## Environmental Authorisation for Proposed Additional Infrastructure at the Universal Coal Development III (Pty) Ltd Ubuntu Colliery, Mpumalanga Province

### Heritage Impact Assessment

**Prepared for:**

Universal Coal Development III (Pty) Ltd

**Project Number:**

UCD6097

April 2021

Department of Mineral Resources and Energy Reference (DMRE) Reference:

MP 30/5/1/1/2/10027 EM



This document has been prepared by Digby Wells Environmental.

<b>Report Type:</b>	Heritage Impact Assessment
<b>Project Name:</b>	Environmental Authorisation for Proposed Additional Infrastructure at the Universal Coal Development III (Pty) Ltd Ubuntu Colliery, Mpumalanga Province
<b>Project Code:</b>	UCD6097

<b>Name</b>	<b>Responsibility</b>	<b>Signature</b>	<b>Date</b>
Shannon Hardwick HRM Consultant ASAPA Member: 451	Report Compilation Pre-disturbance Survey		April 2021
Justin du Piesanie Divisional Manager: Social and Heritage Services ASAPA Member 270	Technical Review		March 2021

*This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.*

## DETAILS AND DECLARATION OF THE SPECIALIST

Digby Wells and Associates (South Africa) (Pty) Ltd

**Contact person: Shannon Hardwick**

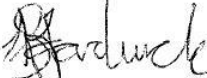
Digby Wells House  
Turnberry Office Park  
48 Grosvenor Road  
Bryanston  
2191

Tel: 011 789 9495  
Fax: 011 789 9498  
E-mail: [shannon.hardwick@digbywells.com](mailto:shannon.hardwick@digbywells.com)

<b>Full name:</b>	Shannon Hardwick
<b>Title/ Position:</b>	Heritage Resources Management Consultant
<b>Qualification(s):</b>	Master of Science (MSc) Archaeology
<b>Experience (years):</b>	3 years
<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: April 2021

*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.*

*No form of this report may be amended or extended without the prior written consent of the author and/or a relevant reference to the report by the inclusion of an appropriately detailed citation.*

*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

Universal Coal Development III (Pty) Ltd (hereinafter Universal Coal) holds a Mining Right (MR)<sup>1</sup>. Universal Coal has subsequently reconsidered the infrastructure necessary to support the approved mining activities. As such, Universal Coal intends to amend the existing approvals to include additional infrastructure (the Project).

The proposed additional infrastructure triggers activities listed in the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R 982 of 4 December 2014 as amended by GN R 326 of 7 April 2017) (EIA Regulations, 2014) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). To this end, Universal Coal appointed Digby Wells Environmental (hereinafter Digby Wells) as the independent Environmental Assessment Practitioner (EAP) to complete the Environmental Impact Assessment (EIA) in support of the EA application.

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 in support of the EIA process for submission to the Heritage Resources Authorities (HRAs). In this case, the applicable HRAs include the South African Heritage Resources Agency (SAHRA) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA).

Several heritage resources were identified in the HRM process undertaken in 2012 in support of the existing EA. Neither the Cultural Significance (CS) or the impacts to these heritage resources have not been reassessed in this report<sup>2</sup>.

Digby Wells identified one heritage resource within the proposed Project area – a burial ground which is considered to have very high CS as shown in the table. The proposed Project, specifically the diversion of the D2456 district road, poses a risk of direct negative impact to the heritage resource. This is summarised in the table below.

### Summary of the CS of Identified Heritage Resources

Resource ID	Description	INTEGRITY	CS
H013	Burial ground	4	Very High

<sup>1</sup> Formerly known and authorized as the Brakfontein Colliery. Refer to Section 2 for a summary of the background to the Project.

<sup>2</sup> This HIA report is available on the South African Heritage Resources Information System (SAHRIS), Case ID 479, accessible at: <https://sahris.sahra.org.za/cases/eia-brakfontein-thermal-coal-mine>

### Summary of the Impact Assessment

Impact	Duration	Extent	Intensity	Consequence	Probability	Significance
<b>Pre-mitigation:</b>						
Direct impact to BGG	Permanent	International	Extremely high - negative	Extremely detrimental	Highly probable	Major - negative
<b>Post-mitigation:</b>						
Direct impact to BGG	Beyond project life	Very Limited	High - positive	Moderately beneficial	Highly probable	Minor - positive

Additionally, the proposed Project presents a risk of direct negative impact to heritage resources that may exist within the Project area and which have not been identified to date. The table below summarises the risk to these resources.

### Summary of the potential risk to heritage resources

Unplanned event	Potential impact
Accidental exposure of fossil bearing material implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA.
Accidental exposure of <i>in situ</i> archaeological material during the implementation of the Project.	
Accidental exposure of <i>in situ</i> historical built environment sites during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA
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 construction phase of the Project.	

Considering the nature, location and scope of the Project, Digby Wells recommends Universal Coal implements the following:

- Redesign of the proposed Project design to avoid the impacts to H013 and implement a 100 m no-go buffer zone around the resource;
- A Heritage Site Management Plan (HSMP) to conserve H013 *in situ*, where Universal Coal has not done so to date. Where Universal Coal has an existing HSMP or Conservation Management Plan (CMP), this document must be updated to include H013; and

- To mitigate against potential direct impacts against previously unidentified heritage resources and where Universal Coal has not done so already, Universal Coal must develop and implement a CFP prior to the commencement of Project activities. This CFP must be approved by the HRAs prior to implementation.

It must be noted that the recommendations made in the existing HIA report (Higgitt & Nel, 2012) with reference to the heritage resources identified previously in the Project area remain applicable. Universal Coal must implement these recommendations where this has not been done to date.

Where these recommendations are implemented, Digby Wells does not object to the Project going forward from a heritage perspective.

## TABLE OF CONTENTS

1.	Introduction .....	1
1.1.	Terms of Reference.....	1
1.2.	Scope of Work.....	1
1.3.	Expertise of the Specialists .....	2
2.	Project Description .....	3
2.1.	Proposed Infrastructure and Activities .....	4
2.2.	Alternatives Considered .....	7
3.	Relevant Legislation, Standards and Guidelines .....	8
3.1.	National Legislation and Policy.....	8
3.2.	Regional Regulatory Context.....	11
4.	Assumptions, Limitations and Exclusions .....	11
5.	Methodology.....	13
5.1.	Defining the Study Areas.....	13
5.2.	Statement of Cultural Significance.....	13
5.3.	Definition of Heritage Impacts.....	14
5.4.	Secondary Data Collection .....	15
5.5.	Primary Data Collection.....	16
5.6.	Site Naming Convention.....	17
6.	Findings and Discussion .....	17
6.1.	Cultural Heritage Baseline Description .....	17
6.2.	Site-Specific Heritage Landscape.....	23
6.3.	Results from the Pre-Disturbance Survey.....	24
6.3.1.	Existing Environment .....	25
6.3.2.	Newly Identified Heritage Resources .....	27
6.3.3.	Results from Historical Layering.....	29
6.4.	Socioeconomic Setting.....	31
7.	Impact Assessment.....	32
7.1.	Cultural Significance of the Identified Landscape .....	32



---

7.2.	Construction Phase .....	35
7.2.1.	Impact Description .....	35
7.3.	Operational Phase.....	37
7.4.	Decommissioning Phase .....	37
7.5.	Cumulative Impacts .....	38
7.6.	Unplanned and Low Risk Events.....	38
8.	Environmental Management Programme .....	40
9.	Monitoring Programme.....	42
10.	Consultation and Results from Stakeholder Engagement .....	42
11.	Recommendations .....	42
12.	Reasoned Opinion Whether Project Should Proceed .....	43
12.1.	Socio-economic Benefit versus Heritage Impacts.....	43
13.	Conclusion .....	44
14.	References.....	45

## LIST OF TABLES

Table 1-1: Expertise of the Specialists .....	2
Table 2-1: Project Phases and Associated Activities .....	4
Table 3-1: Applicable Legislation considered in the HRM Process .....	8
Table 3-2: Applicable policies considered in the HRM process .....	11
Table 4-1: Constraints and Limitations .....	12
Table 5-1: Impact Definition .....	14
Table 5-2: Qualitative Data Sources.....	15
Table 5-3: Aerial imagery considered.....	16
Table 6-1: Archaeological Periods in Mpumalanga .....	17
Table 6-2: Heritage Resources identified within the MR Area.....	23
Table 6-3: Summary of the Vegetation Setting of the Project .....	25
Table 6-4: Heritage Resources identified within the MR Area.....	27
Table 6-5: Employment Status of the Populations within the Study Area.....	31
Table 7-1: CS and Field Ratings of Newly Identified Heritage Resources within the Project Area .....	34
Table 7-2: Interactions and Impacts of Construction Phase Activities.....	35
Table 7-3: Summary of the potential direct impact to Burial Grounds and Graves.....	35
Table 7-4: Interactions and Impacts of Operational Phase Activities .....	37
Table 7-5: Interactions and Impacts of Decommissioning Phase Activities.....	37
Table 7-6: Summary of Potential Cumulative Impacts .....	38
Table 7-7: Identified Heritage Risks that may arise for Universal Coal .....	39
Table 7-8: Identified Unplanned Events and Associated Impacts .....	40
Table 8-1: Heritage Specialist Input into the Environmental Management Program .....	41

## LIST OF FIGURES

Figure 2-1: Proposed Alternative Road Diversion Routing .....	7
Figure 6-1: Heritage Resources Identified within the Regional Study Area .....	18
Figure 6-2: Results of the Pre-disturbance Survey showing the Existing Environment .....	26
Figure 6-3: Results of the Pre-disturbance Survey showing Newly Identified Heritage Resources .....	27
Figure 6-4: Historical Imagery showing the Project Area in 1953 with Points of Interest .....	30

## LIST OF PLANS

Plan 1: Regional and Local Setting .....	5
Plan 2: Proposed Infrastructure Layout .....	6
Plan 3: Previously Identified Heritage Resources within the Regional Study Area .....	22
Plan 4: Results of the Pre-disturbance Survey .....	28

## LIST OF APPENDICES

Appendix A: Glossary	
Appendix B: Specialist CV	
Appendix C: HRM Methodology	

## ACRONYMS, ABBREVIATIONS AND DEFINITIONS

Abbreviation	Meaning
<b>ASAPA</b>	Association of Southern African Professional Archaeologists
<b>BA</b>	Bachelor of Arts, or Basic Assessment ( <i>the applicable term will be defined in the report</i> )
<b>BCE</b>	Before Common Era (also: Before Christ or BC)
<b>BID</b>	Background Information Document
<b>BSc</b>	Bachelor of Science
<b>c.</b>	Circa, meaning approximately
<b>CE</b>	Common Era (also: <i>Anno Domini</i> or AD)
<b>CFP</b>	Chance Find Protocol
<b>CRR</b>	Comments and Response Report
<b>CS</b>	Cultural Significance
<b>Digby Wells</b>	Digby Wells Environmental
<b>EA</b>	Environmental Authorisation
<b>EAP</b>	Environmental Assessment Practitioner
<b>EFC</b>	Early Farming Community ( <i>also known as Early Iron Age, see below</i> )
<b>EIA</b>	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>
<b>EMP</b>	Environmental Management Plan
<b>EMPr</b>	Environmental Management Programme
<b>ESA</b>	Early Stone Age
<b>GIS</b>	Geographical Information System
<b>GN R</b>	Government Notice Regulation
<b>GPS</b>	Global Positioning System
<b>HIA</b>	Heritage Impact Assessment
<b>Hons</b>	Honours degree
<b>HRAs</b>	Heritage Resources Authorities
<b>HRM</b>	Heritage Resources Management
<b>HSMP</b>	Heritage Site Management Plan
<b>ICOMOS</b>	International Council on Monuments and Sites

<b>Abbreviation</b>	<b>Meaning</b>
<b>Kya</b>	Thousand years ago
<b>LED</b>	Local Economic Development
<b>LFC</b>	Late Farming Community also known as Late Iron Age
<b>LSA</b>	Late Stone Age
<b>MIA</b>	Middle Iron Age
<b>MPHRA</b>	Mpumalanga Provincial Heritage Resources Authority
<b>MPRDA</b>	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
<b>MR</b>	Mining Right (boundary)
<b>MRA</b>	Mining Right Application
<b>MSA</b>	Middle Stone Age
<b>MSc</b>	Master of Science
<b>Mtpa</b>	Million tonnes per annum
<b>Mya</b>	Million years ago
<b>NEMA</b>	National Environmental Management Act, 1998 (Act No. 107 of 1998)
<b>NHRA</b>	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
<b>NID</b>	Notification of Intent to Develop
<b>PCD</b>	Pollution Control Dam
<b>PHRA</b>	Provincial Heritage Resources Authority
<b>RoD</b>	Record of Decision
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SAHRIS</b>	South African Heritage Resources Information System
<b>SCF</b>	Statutory Comment Feedback
<b>SEP</b>	Stakeholder Engagement Process
<b>SoW</b>	Scope of Work
<b>ToR</b>	Terms of Reference
<b>Wits</b>	University of the Witwatersrand
<b>Werf</b>	A farmstead or multiple outbuildings associated with a farmhouse or agricultural activities. Plural: <i>werwe</i> (Afrikaans).

Refer to Appendix A for a Glossary of Terms.

## NHRA and GN R 326 Appendix 6 Legislated Requirements

Description	App. 6	NHRA	Section
Declaration that the report author(s) is (are) independent.	1(b)	-	Page iii-iv
An indication of the scope of, and the purpose for which, the report was prepared.	1(c)	-	1.1 1.2
Details of the person who prepared the report and their expertise to carry out the specialist study.	1(a)	-	1.3
Outlines the legislative framework relevant to the specialist heritage study.	-	-	3
Identifies the specific constraints and limitations of the HIA, including any assumptions made and any uncertainties or gaps in knowledge.	1(i)	-	4
Describes the methodology employed in the compilation of this HIA.	1(e)	-	5
An indication of the quality and age of base data used for the specialist report.	1(cA)	-	5.4
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	1(d)	-	5.5
Provides the baseline cultural landscape.	-	38(3)(a)	6
Motivates for the defined CS of the identified heritage resources and landscape.	-	38(3)(b)	7.1
A description of the potential impacts to heritage resources by project related activities, including: <ul style="list-style-type: none"> <li>- Existing impacts on the site;</li> <li>- Possible risks to heritage resources;</li> <li>- Cumulative impacts of the proposed development;</li> <li>- Acceptable levels of change; and</li> <li>- Heritage-related risks to the project.</li> </ul>	1(cB)	38(3)(c)-	7.2 7.3 7.4
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)	
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.	1(f)	-	7 Plan 4

Description	App. 6	NHRA	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)	6.3.3 12.1
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
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)		8
Any mitigation measures for inclusion in the Environmental Management Programme (EMPr)	1(k)		11
Any conditions for inclusion in the environmental authorisation.	1(l)		8 9
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	1(m)		
A reasoned opinion— (i) whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	1(n)	38(3)(g)	12
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
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	1(h)	-	Plan 4
Any other information requested by the competent authority.	1(q)	-	N/A

## 1. Introduction

Universal Coal Development III (Pty) Ltd (hereinafter Universal Coal) holds a Mining Right (MR)<sup>3</sup>. Subsequent to the approval of the MR, Universal Coal has reconsidered the infrastructure necessary to support the approved mining activities. As such, Universal Coal intends to amend the existing approvals to include additional infrastructure (the Project).

The proposed additional infrastructure triggers activities listed in the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R 982 of 4 December 2014 as amended by GN R 326 of 7 April 2017) (EIA Regulations, 2014) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Universal Coal are therefore required to complete a Scoping and EIA process and, to this end, have appointed Digby Wells Environmental (hereinafter Digby Wells) as the independent Environmental Assessment Practitioner (EAP). 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 in support of the EIA process for submission to the Heritage Resources Authorities (HRAs). 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 as the independent EAP to undertake the EIA process required through the triggering of activities listed in the EIA Regulations, 2014, as amended. This EIA process includes a HIA in support of the EA applications and in compliance with the NHRA.

### 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 (CS) 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;

---

<sup>3</sup> Formerly known as the Brakfontein Colliery. Refer to Section 2 for a summary of the Project Background.



- 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 Specialists

Table 1-1 presents a summary of the expertise of the specialists involved in the compilation of this report. Appendix C includes the full 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: 3</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 fieldwork in Malawi.</p>
<p><b>Justin du Piesanie</b></p> <p>ASAPA Member 270</p> <p>ASAPA CRM Unit</p> <p>ICOMOS Member 14274</p> <p>IAIAsa Member</p> <p>Years' Experience: 13</p>	<p>Justin is the Divisional Manager for Social and Heritage Services at Digby Wells. Justin joined the company in August 2011 as an archaeologist and was subsequently made HRM Manager in 2016 and Divisional Manager in 2018. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. Justin is a professional member of the Association of Southern African Professional Archaeologists (ASAPA) and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. He has over 13 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, NHRA Section 34 application processes, and Conservation Management Plans (CMPs). Justin has gained further generalist experience since his appointment at Digby</p>

Team Member	Bio Sketch
	<p>Wells in Botswana, Burkina Faso, Cameroon, the Democratic Republic of Congo, Liberia, Malawi, Mali and Senegal on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, Justin has acted as a technical expert reviewer of HRM projects undertaken in Cameroon, Malawi and Senegal. Justin's current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.</p>

## 2. Project Description

The MR held by Universal Coal was issued in 2017 for the Brakfontein Colliery. Universal Coal subsequently applied for a change in the operation's name from Brakfontein to Ubuntu Colliery and this was approved in January 2019.

The Ubuntu Colliery is located on Portions 6, 8, 9, 10, 20, 26, 30 and the Remaining Extent of the farm Brakfontein 264 IR on the western margins of the Witbank Coalfields. The colliery is located approximately 14 km north of Devon, 16 km northeast from Delmas and 17 km north of Leandra. The Project area falls within the Victor Khanye Local Municipality (VKLM) in the Nkangala District Municipality (NDM) of the Mpumalanga Province. Plan 1 presents a summary of these details.

The following infrastructure is authorised as per the current Environmental Management Programme (EMPr):

- Parking and offices;
- Weighbridge;
- Run of Mine (RoM) pads and Pollution Control Dams (PCDs);
- Mine equipment workshop and stores; and
- Wash bay facility.

Following the approvals authorised for the Ubuntu Colliery, Universal Coal re-evaluated the mining plan and infrastructure design. The original proposal for the Colliery intended for the transfer of the coal for further processing (including crushing, screening and washing) and therefore excluded any processing infrastructure. This proposal is not feasible and crushing and screening is now taking place in the approved pit area through a mobile crushing and screening plant. Additionally, the re-evaluation identified the need for additional infrastructure, discussed separately under Section 2.1.

## 2.1. Proposed Infrastructure and Activities

Further to on-site crushing and screening, the following additional infrastructure must be included in the EMP. Based on Digby Wells' understanding of the Project, all the below listed infrastructure has been established on site, except for the road diversion:

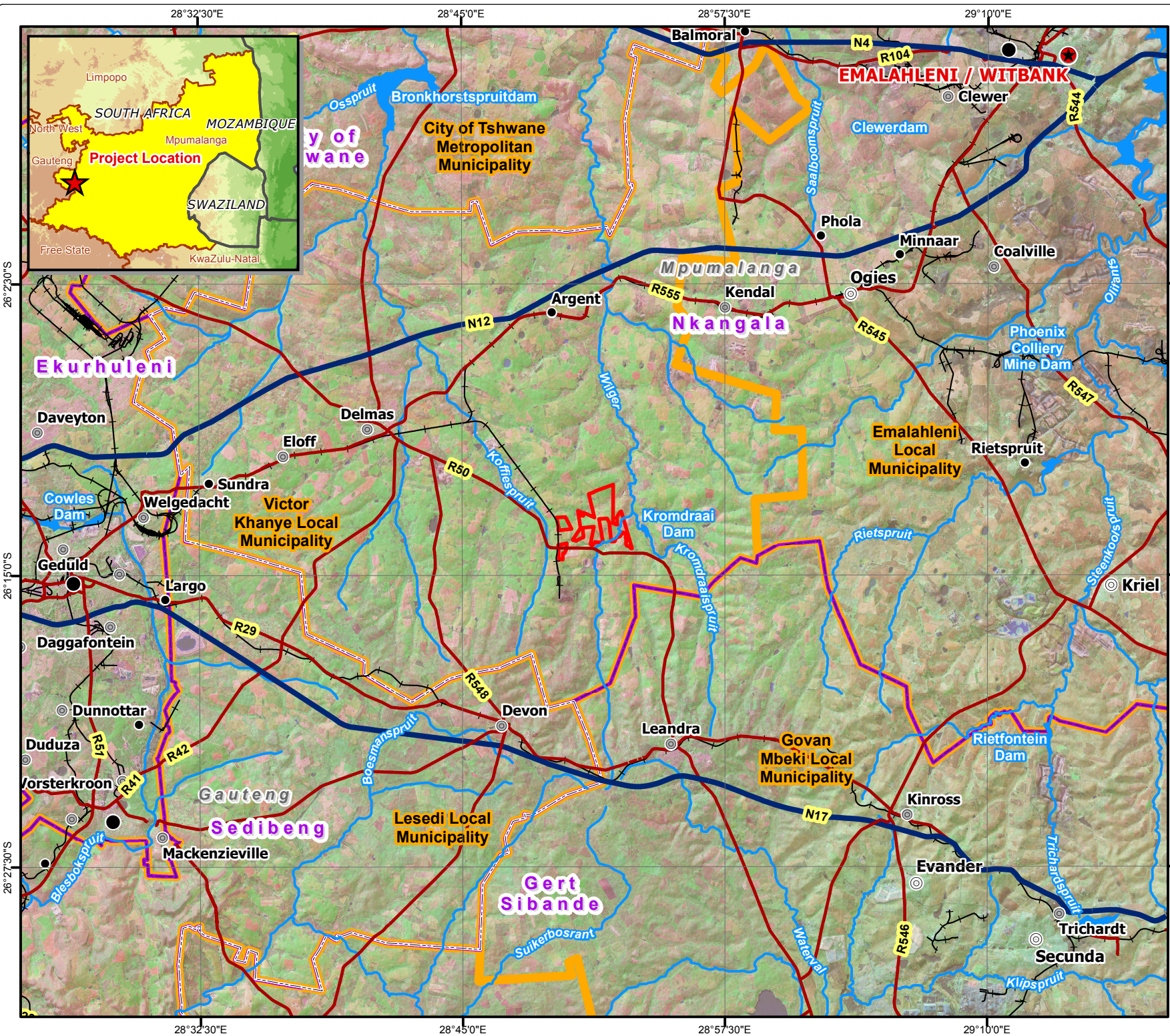
- Control room;
- Toilet facilities;
- Haulage truck queueing area;
- Hard park area;
- Brake test ramp area;
- Diesel depot area;
- Product stockpile;
- Perimeter fencing;
- Relocation of the D2546 district road;
- Crushing facilities and stockpile area;
- LDV and main access road;
- Heavy duty truck access road;
- Storm water diversion berm/trench;
- Access control and boom gate;
- Topsoil Safety berm;
- Lab office;
- Sewage Treatment Plant (STP);
- Contractors camp site;
- Water Treatment Plant (WTP);
- 45 000 litre Silo tank; and
- Guard house and access control gate.

The additional infrastructure, except for the road diversion, has been established and does not trigger NEMA Listed Activities. The additional infrastructure and the road will be relocated in 2023. The specific design of the D2546 relocation is yet to be confirmed but is proposed to be 2.5 km in length and with a 30 m reserve.

Table 2-1 presents a summary of the Project-related activities expected within each phase of the Project lifecycle.

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


Project Phase	Project Activities
Construction Phase	Surface preparation (including clearing) for infrastructure
	Construction of surface infrastructure
Operational Phase	Operation and maintenance of infrastructure
	Use and maintenance of haul roads (incl. transportation of coal to washing plant)
Decommissioning Phase	Demolition and removal of all infrastructure (incl. transportation off site)
	Rehabilitation (spreading of soil, re-vegetation and profiling/contouring)
	Installation of post-closure water management infrastructure



# Universal Coal Development III (Pty) Ltd Ubuntu Colliery EIA Regional Setting


### Legend

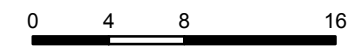
- Project Area
- ★ City
- Major Town
- Secondary Town
- ◉ Other Town
- Settlement
- Road\_Line
- National Route
- Main Road
- Railway Line
- Railway Line
- Perennial Stream
- Dam/ Lake
- Provincial Boundary (2016)
- District Municipal Boundary (2016)
- Local Municipal Boundary (2016)



**DIGBY WELLS**  
ENVIRONMENTAL

Projection: Transverse Mercator  
 Datum: WGS 1984  
 Central Meridian: 29°E  
 Date: 20/10/2020  
 Ref #: UCD6097\_H\_01\_AMT





0      4      8      16  
Kilometres

[www.digbywells.com](http://www.digbywells.com)      © Digby Wells Environmental

28°50'0"E

28°51'15"E

28°52'30"E

# Universal Coal Development III (Pty) Ltd Ubuntu Colliery EIA Infrastructure Layout

## Legend

-  Project Area
-  Main Road
-  Street
-  Railway Line
-  Non-Perennial River/Stream
-  Perennial River/Stream
-  Dam / Lake
-  Non-Perennial Pan
-  Perennial Pan

## Approved Infrastructure

-  Overburden
-  PCD
-  RoM Stockpile
-  UC Boxcut
-  Open Cast Pit

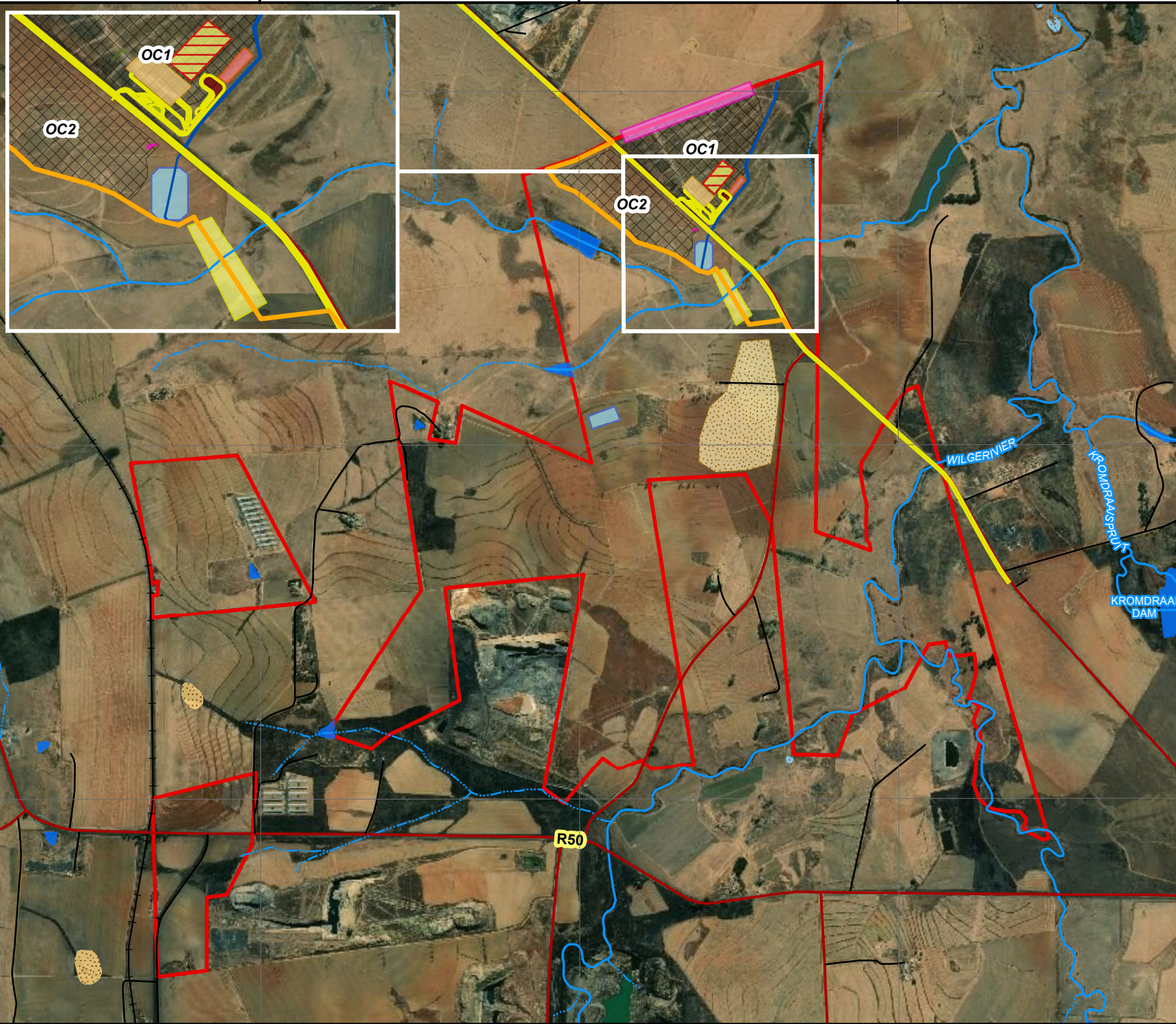
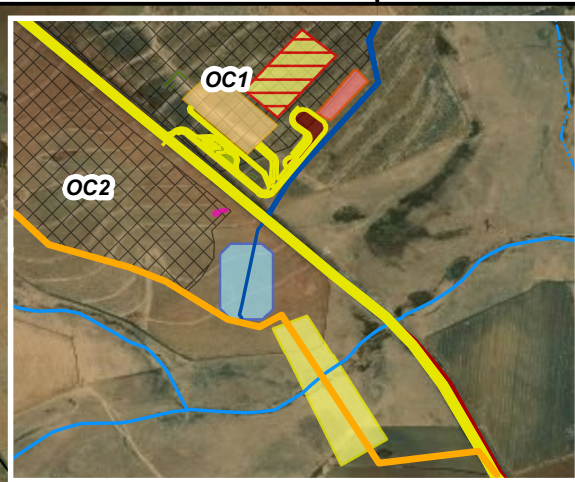
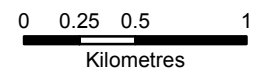
## Proposed Infrastructure

-  Access Road
-  Canal
-  D2546 District Road Diversion
-  Contractors Camp Site
-  Control Room Area
-  Culvert
-  Diesel Depot Area
-  Hard Park
-  Haul Truck Queueing Area
-  Product Stockpile
-  Sewage Treatment Plant
-  Workshop, Offices & Other Infrastructure



**DIGBY WELLS**  
ENVIRONMENTAL

Projection: Transverse Mercator  
Datum: WGS 1984  
Central Meridian: 29°E  
Date: 20/10/2020  
Ref #: UCD6097\_H\_02\_AMT



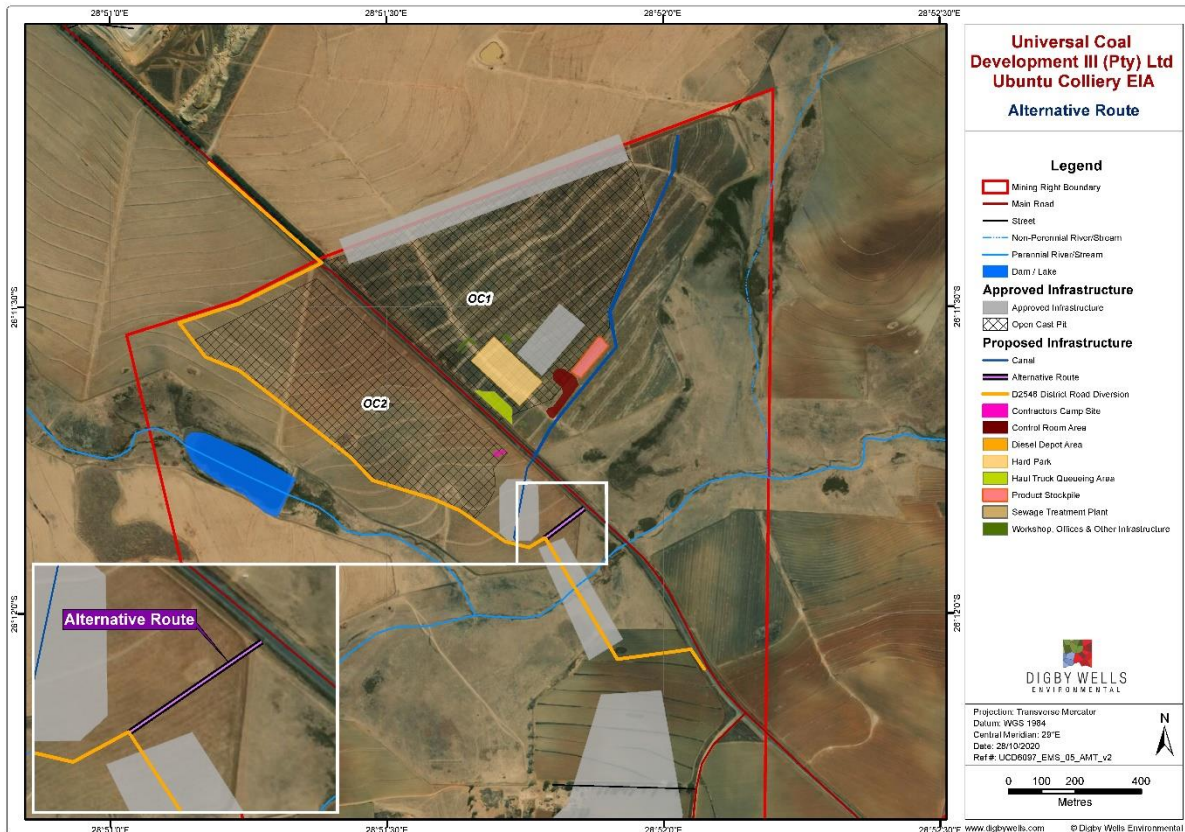
28°50'0"E

28°51'15"E

28°52'30"E

## 2.2. Alternatives Considered

Two routing options have been presented for the D2546 road diversion and are included in Figure 2-1. Both alternatives begin at the same point and following the same routing until reaching the approved and established culvert. This second option has been proposed in response to the identification of a graveyard in proximity to the first alternative.



**Figure 2-1: Proposed Alternative Road Diversion Routing**

The HRM process further considered the 'no-go' alternative. Should the Project not obtain approval, or not go ahead for any reason, the potential negative environmental impacts associated with the construction and operation of the proposed additional infrastructure and changes to the approved infrastructure layout will not occur. However, the potential benefits associated with the Project would 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 HRM 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> <ul 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> </ul>	<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 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</i></p>	<p>The application process was undertaken in accordance with the principles of Section 24 of NEMA as well as with the EIA Regulations 2014 (as amended), promulgated in terms of NEMA.</p>

Applicable legislation used to compile the report	Reference where applied
<p><i>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><b><u>GN R. 982: Environmental Impact Assessment Regulations, 2014 (as amended by GN R 326 of 7 April 2017)</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>• Regulation GN R. 983 (as amended by GN R 327) - Listing Notice 1: This listing notice provides a list of various activities which require environmental authorisation and which must follow a basic assessment process.</li> <li>• Regulation GN R. 984 (as amended by GN R 325) – Listing Notice 2: This listing notice provides a list of various activities which require environmental authorisation and which must follow an environmental impact assessment process.</li> <li>• Regulation GN R. 985 (as amended by GN R 324) – Listing Notice 3: This notice provides a list of various environmental activities which have been identified by provincial governmental bodies which if undertaken within the stipulated provincial boundaries will require environmental authorisation. The basic assessment process will need to be followed.</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>
<p><b><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></b></p> <p>The NHRA is the overarching legislation that protects and regulates the management of heritage resources</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>



Applicable legislation used to compile the report	Reference where applied
<p>in South Africa, with specific reference to the following Sections:</p> <ul style="list-style-type: none"> <li>• 5. General principles for HRM</li> <li>• 6. Principles for management of heritage resources</li> <li>• 7. Heritage assessment criteria and grading</li> <li>• 38. Heritage resources management</li> </ul> <p>The Act requires that Heritage Resources Authorities (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><b><u>NHRA Regulations, 2000 (GN R 548)</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>• II. Permit Applications and General Provisions for Permits;</li> <li>• III: Application for Permit: National Heritage Site, Provincial Heritage Site, Provisionally Protected Place or Structure older than 60 years;</li> <li>• IV: Application for Permit: Archaeological or Palaeontological or Meteorite;</li> <li>• IX: Application for Permit: Burial Grounds and Graves;</li> <li>• X: Procedure for Consultation regarding Protected Area;</li> <li>• XI: Procedure for Consultation regarding Burial Grounds and Graves; and</li> <li>• XII: Discovery of Previously Unknown Graves.</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>

**Table 3-2: Applicable policies considered in the HRM 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); and
- The Victor Khanye Local Municipality Cemeteries and Crematoria By-Laws of 29 May 2014 (Provincial Gazette Extraordinary No. 2307).

## 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.
The pre-disturbance survey focused on the proposed infrastructure footprint area and did not re-assess heritage resources identified to date through any other assessments undertaken to inform the current authorisations.	It is assumed the previously recorded heritage resources are accurate and true. It is also assumed that the <i>status quo</i> and the condition of these heritage resources has remained unchanged since their identification.
At the time of the pre-disturbance survey, access was not possible for the entire infrastructure footprint as the Ubuntu Colliery is presently operational. These properties were not surveyed by the heritage consultant. This includes the area of the Remaining Extent (RE) of the farm Brakfontein 264 IR covered by the approved OC1 footprint.	Digby Wells assumes the operational areas were surveyed in HRM processes completed previously to inform the current authorisations. 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.
At the time of the pre-disturbance survey, some of the site-specific Project areas had been cleared as part of the current and approved Ubuntu Colliery activities.	
Whilst every attempt was made to survey the extent of the site-specific study area <sup>4</sup> (considering the points above), this report does not present an exhaustive list of identified heritage resources. Overgrown vegetation limited visibility at the time of the pre-disturbance survey.	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.
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.

<sup>4</sup> Refer to Section 5.1 for a description of the study area.

## 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 HRM process methodologies.

### 5.1. Defining the Study Areas

Heritage resources do not exist in isolation to the greater natural and social environment, including the socio-cultural, socio-economic and socio-political environments. In addition, the NHRA requires the grading of heritage resources in terms of national, provincial and local concern based on their importance and consequent official (i.e., State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories. Digby Wells defined four nested study areas for the purposes of this study:

- The *site-specific* study area: the farm portions extent associated with the proposed infrastructure, including a 500 m buffer area. The site-specific study area may extend linearly, in which case the site-specific study area will include the linear development and a 200 m buffer on either side of the footprint;
- The *MR area*: the farm portions associated with the approved Ubuntu Colliery;
- 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. Defined as the area bounded by the local municipality, in this instance VKLM, with particular reference to the immediate surrounding properties and/or farms. The local study area was specifically examined to offer a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provided the local development and planning context that may contribute to cumulative impacts; and
- The *regional study area*: the area bounded by the district municipality, which here is the NDM. Where necessary, the regional study area may be extended outside the boundaries of the district municipality to include much wider regional expressions of specific types of heritage resources and historical events. The regional study area also provided the regional development and planning context that may contribute to cumulative impacts.

### 5.2. Statement of Cultural Significance

Digby Wells designed the significance rating process to provide a numerical rating of the CS 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 CS 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 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 CS 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	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: <ul style="list-style-type: none"> <li>• Additive: the simple sum of all the effects, e.g., the reclamation of a historical 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> </ul>

Category	Description
	<ul style="list-style-type: none"> <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 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)

Reviewed Qualitative Data		
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

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using Geographic Information Systems (GIS). The rationale behind historical layering is threefold, as it:

- Enables a virtual representation of changes in the land use of a particular area over time;
- Provides relative dates based on the presence or absence of visible features; and
- Identified potential locations where heritage resources may exist within an area.

Table 5-3 below lists the sources of historical imagery.

**Table 5-3: Aerial imagery considered**

Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Ref.
201	Strip 2	03507 03506	2629	Kinross / Trichardt	1955	NGI

## 5.5. Primary Data Collection

Shannon Hardwick undertook a pre-disturbance survey of the site-specific study area on 08 and 09 July 2020. This survey focused on areas covered by proposed infrastructure footprints and was predominantly pedestrian, with vehicular travel amongst areas under investigation.

The pre-disturbance survey was non-intrusive (i.e., no sampling was undertaken) with the aim 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 4 includes the results of the pre-disturbance survey.

## 5.6. Site Naming Convention

Following the site naming convention employed in the original HRM process, heritage resources identified by Digby Wells during the field surveys are prefixed by an 'H' to indicate a heritage resource. The identified heritage resources are then numbered in the order in which they were identified.

Heritage resources identified through secondary data collection were 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 (for example, 2077/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 12.1.

### 6.1. Cultural Heritage Baseline Description

The cultural heritage baseline description considered the predominant cultural landscape based on the identified heritage resources within the regional and local study area. Table 6-1 presents the broad timeframes for the major periods of the past in Mpumalanga.

**Table 6-1: Archaeological Periods in Mpumalanga**

<b>The Stone Age</b>	Early Stone Age (ESA)	2 million years ago (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> )

<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).



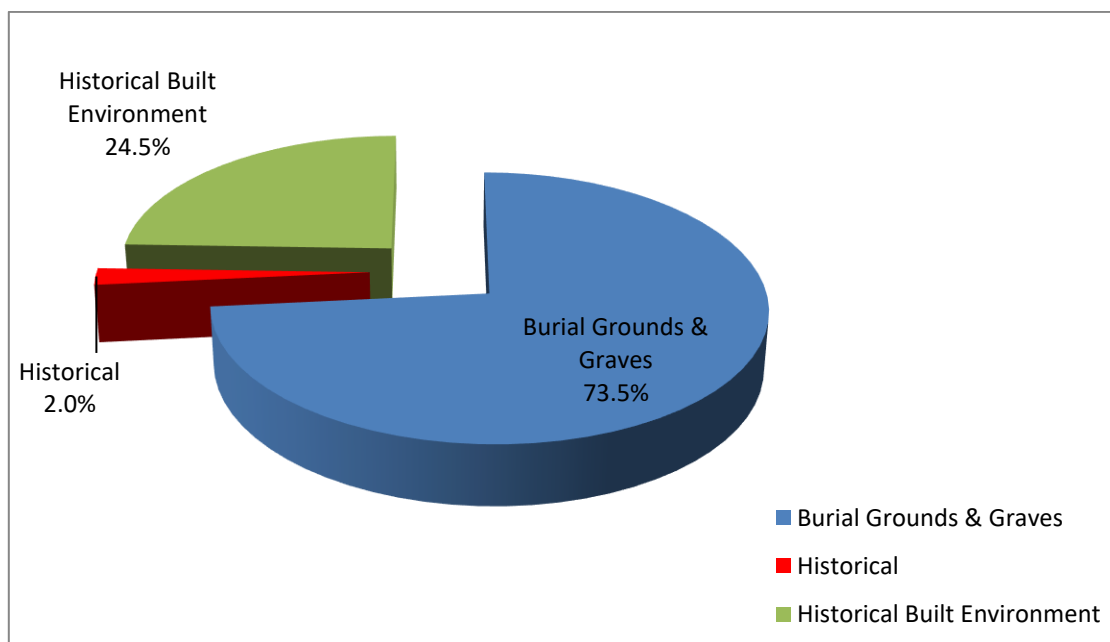
*There appears to be a gap in the record in Mpumalanga between approximately 7000 and 2000 Before Common Era (BCE).*

<b>Farming Communities</b>	Early Farming communities (EFC)	500 to 1400 CE
	Late Farming Communities (LFC)	1100 to 1800 CE
<b>Historical Period</b>	-	1500 CE to 1994 (Behrens & Swanepoel, 2008)

Adapted from Esterhuysen & Smith (2007)

In total, 49 heritage resources were identified in the literature applicable to the regional, local and site-specific study areas. Figure 6-1 presents the breakdown of the identified heritage resources in terms of the archaeological periods.

The predominant tangible heritage resources recorded in the area under consideration demonstrate affiliations with the historical period, dominated by the historical built environment and burial grounds and graves. No expressions of the archaeological periods were noted in the literature relevant to the greater study area<sup>6</sup>. This notwithstanding, the following section provides a brief description of these periods to provide context to the cultural heritage landscape.



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

<sup>6</sup> This is likely due to the relative lack of heritage assessments and studies in the regional study area and/or the level of anthropogenic impacts to the landscape over time and does not necessarily reflect the absence of archaeological heritage. The Mpumalanga Province is rich in cultural heritage, including archaeological artefacts, as is reflected in neighbouring municipalities.

The Stone Age in southern Africa comprises three broad phases. These phases are determined according to the lithic tools and material culture produced by the various hominid species through time. These phases are the ESA, the MSA and the LSA.

The ESA occurred between 2 mya and 250 kya. Lithics from this period comprise predominantly of large handaxes and cleavers made of coarse-grained materials (Esterhuysen & Smith, 2007). These tools are associated with *Australopithecus* and early *Homo* hominid species.

The MSA dates between approximately 300 kya and 20 kya. 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 characterise the early MSA lithic industries (Clark, 1982; Deacon & Deacon, 1999). These tools were made and used by archaic *Homo sapiens*.

The LSA dates from approximately 40 kya to the historical period. LSA lithics are specialised as specific tools each have specific uses (Mitchell, 2002). Assemblages from this period commonly include diagnostic tools such as scrapers and segments and 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 (and Mpumalanga) (Makhura, 2007).

The San were later followed by the various peoples of the Farming Community, including ancestors of modern Sotho-Tswana and Nguni peoples (Makhura, 2007). The farming community 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. These latter resources provide motivation for settlement and possible trade networks (Delius, et al., 2014) and are distributed across the region.

Type V settlements are the most common and most widely distributed within the local study area, around Bethel and Ermelo in the south-east region of Mpumalanga. These settlements comprise of a number of primary enclosures that are grouped around a ring (Maggs, 1976). The enclosures can be either contiguous or linked by secondary walling to form a secondary enclosure; there may also be free-standing structures around the periphery of the settlement, but there is no surrounding wall.

The historical period<sup>7</sup> 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 artificial, as there is a large amount of overlap between the two. Throughout the transitions between the LFC

---

<sup>7</sup> 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 but is being explored through the 500 Year Initiative (Swanepoel, et al., 2008).

and the historical period (and through 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.

An example of the overlap between the LFC and the historical period is the Mfecane or, north of the Orange River, the Difaqane. 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. 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. European settlers, traders, missionaries and travellers moving into the interior further added to instability and resulting power struggles. 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 of social and political upheaval, the Mpumalanga Highveld was vulnerable to intrusive groups including the Swazi and the *Voortrekkers*. Groups of Afrikaaners 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, Nduzundza 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) (Delius & Cope, 2007; Voortrekkers, 2014). Soon after settling in the area, the Trekboers (now farmers) discovered and exploited the Highveld Coalfields. The coal was initially used by the Boers as a domestic resource; however the discovery of gold in the Witwatersrand in 1886 created an enormous demand for coal (Brodie, 2008; Pistorious, 2008a; 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 (previously 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. Important events associated with the South African War in the broader study area include:

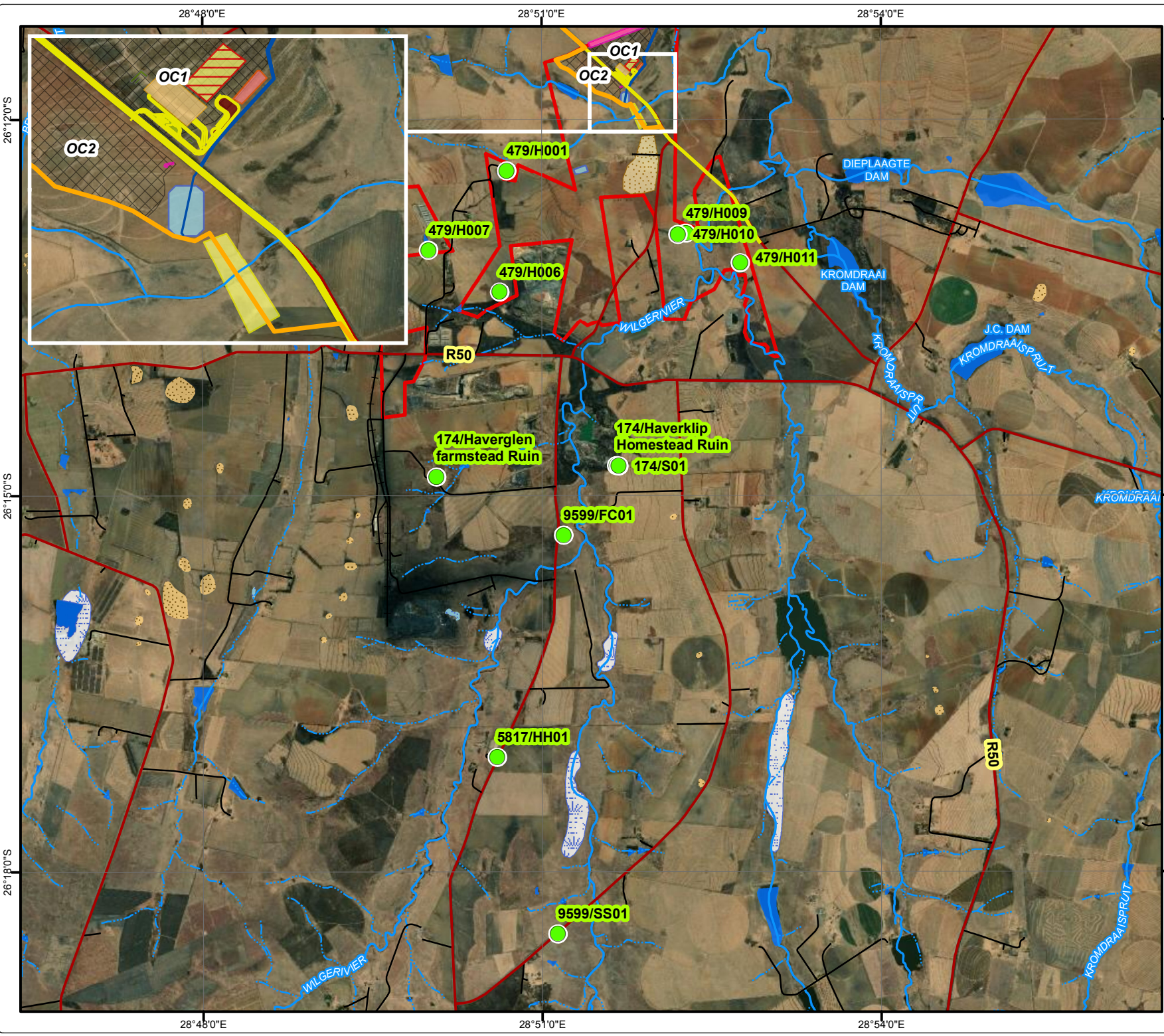
- Lake Chrissie (February 6<sup>th</sup>, 1901);
- Bakenlaagte (October 30<sup>th</sup>, 1901)

- Trigaardsfontein (10 December 1901),
- Klippan (18 February 1902); and
- Boschmanskop (1 April 1904) (Pakenham, 1979; Willsworth, 2006; Wessels, 2010; von der Heyde, 2013).

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.

Historical heritage resources within the regional study area are represented as:


- Burial grounds and graves, ranging from single burials to graveyards containing over one hundred graves (van Schalkwyk, 2002; De Jong, 2010; Higgitt & Nel, 2012; Pistorius, 2012; 2013; 2016; van Vollenhoven, 2012);
- An historical feature comprising a midden with material culture remains (Higgitt & Nel, 2012); and
- Historical built environment resources, such as structural remains (including stonewall structures, ruins of homesteads and farmhouses and functional structures) and standing structures (De Jong, 2010; Higgitt & Nel, 2012; Pistorius, 2012; 2013; 2016).



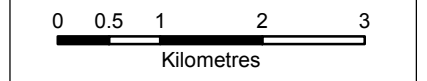
**Universal Coal  
Development III (Pty) Ltd  
Ubuntu Colliery EIA**

**Identified Heritage Resource**

- Legend**
- Project Area
  - Identified Heritage Resource**
  - Historical Built Environment
  - Main Road
  - Street
  - Railway Line
  - Non-Perennial River/Stream
  - Perennial River/Stream
  - Dam / Lake
  - Marsh / Swamp
  - Non-Perennial Pan
  - Perennial Pan
  - Approved Infrastructure**
  - Overburden
  - PCD
  - RoM Stockpile
  - UC Boxcut
  - Open Cast Pit
  - Proposed Infrastructure**
  - Access Road
  - Canal
  - D2546 District Road Diversion
  - Contractors Camp Site
  - Control Room Area
  - Culvert
  - Diesel Depot Area
  - Hard Park
  - Haul Truck Queuing Area
  - Product Stockpile
  - Sewage Treatment Plant
  - Workshop, Offices & Other Infrastructure

  
**DIGBY WELLS**  
ENVIRONMENTAL

Projection: Transverse Mercator  
Datum: WGS 1984  
Central Meridian: 29°E  
Date: 20/10/2020  
Ref #: UCD6097\_H\_03\_AMT



## 6.2. Site-Specific Heritage Landscape

Digby Wells undertook a pre-disturbance survey of the (then) Brakfontein MR Area during June 2012 in support of the HRM process<sup>8</sup> (Higgitt & Nel, 2012). The HRM process was undertaken as a component of the previous EIA process. Table 6-2 presents a summary of the heritage resources identified during the pre-disturbance survey. Plan 3 includes these resources.

**Table 6-2: Heritage Resources identified within the MR Area**

Heritage Resource	Description
H001	A farm complex including historical and more modern components. The complex is occupied and utilised. The complex includes a residence, workshops, sheds and cemented stonewalled cattle enclosures. A segment of stonewalling with wagon wheels is present on the perimeter of the <i>werf</i> , which may indicate an old entrance to the complex.
H002	A burial ground including 43 individual graves, orientated east-west and in at least four rows. Of these graves, eleven had headstones and nine had dressings. The headstones were either granite or cement and the dressings were cement. The graves with legible headstones belong to the Mokoena and Mbotou families and legible dates range from 1971 to 1985. The burial ground is not fenced.
H003	A burial ground including 14 individual graves. Dressings present in the burial ground include cement headstones, stone and brick borders, cement and granite dressings with granite headstones. The graves with legible headstones belong to the Mahlangu and Masielala families and legible dates range from 1989 to 2000. The burial ground is not fenced.
H004	An ash midden surrounded by dense grass cover. The midden includes burnt bone and fragments of glazed ceramics.
H005	A burial ground including 62 individual graves. Of these graves, 40 have headstones comprising granite, stone and cement. The graves with legible headstones belong to the Mahamba, Mashela, Mazibu, Mokwena, Mthethwa, Ntuli, Sibiya, Skaosa and Tsele families. Legible dates range from 1949 to 2000. The burial ground is not fenced.
H006	A dilapidated mud brick structure, measuring approximately 6 m by 3 m. Traces of blue plaster were observed on the walls of the structure. There were additional mud brick structures present at this point and two middens were identified next to the main structure. Green glass fragments, modern bricks, fragments of glazed ceramics, burnt bone, batteries and a rubber shoe were present in the middens.  This site might represent a historic or past labour cottage and may be associated with H005, which is located 100 m away.

<sup>8</sup> Case ID 479, accessible at: <https://sahris.sahra.org.za/cases/eia-brakfontein-thermal-coal-mine>

Heritage Resource	Description
<b>H007</b>	Two cylindrical brick towers, approximately 8 m high. These towers are capped with cement and there is no visible entrance or opening. A foundation and some remaining walls are adjacent to the towers.
<b>H008</b>	A burial ground including 11 individual graves. Of these graves, five have headstones comprising granite and cement graves. Seven of the graves are shaped as caskets, which have been placed side by side. Six of these graves are smaller and the one is larger. The graves with legible headstones belong to the Hartzenburg, Kotze and Vorster families. Legible dates range from 1932 to 1978. The burial ground is fenced off.
<b>H009</b>	Remains of a small structure with two rooms. This may be a storage room or a pen for animals and it may be associated with H010 (approximately 100 m away). The structure does not have a roof and glass and metal remains were present.
<b>H010</b>	This site includes two adjacent structures. The larger structure is approximately 30 m by 15 m wide and includes an entrance hall and room to the left of the entrance. The smaller structure measured approximately 15 m by 10 m. These structures were constructed from modern bricks with cement plaster. An additional structure made from mud bricks with cement plaster was located near the entrance to the larger structure. The mud brick structure measured approximately 4 m by 3 m. Fragments of glass, metal and building rubble were present on this site.
<b>H011</b>	A structure measuring approximately 30 m by 20 m. The structure was built from stonewalling and a combination of daga and cement mortar and was divided into three rooms by thick mud walls. A brick and cement structure was located 10 m from the main structure. This may have been a water tower but there was no water tank present.
<b>H012</b>	A burial ground including an unknown number of individual graves (the grave was identified by a different specialist and was not recorded by the heritage specialist). Nine graves had cement headstones. The burial ground is not fenced and is associated with H011.

### 6.3. Results from the Pre-Disturbance Survey

Shannon Hardwick undertook a pre-disturbance survey of the site-specific study area on 08 and 09 July 2020. This survey focused on areas covered by proposed infrastructure not investigated in the previous surveys and was predominantly pedestrian. The survey was recorded as GPS tracks and identified heritage resources were marked as waypoints. Identified heritage resources were also recorded through written notes and photographs. The GPS data are provided in Plan 3.

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

### 6.3.1. Existing Environment

The natural vegetation of the site-specific study area has been disturbed in varying degrees by human activities. Table 6-3 presents a summary description of the natural environment within which the Project is situated. Figure 6-2 below presents an overview of the environment at the time of the pre-disturbance survey.

The environment at the time of the verification survey was disturbed through anthropogenic and animal activities. There is evidence that cattle graze on the land and burrowing animals were present within the Project area.

Anthropogenic disturbances included the clearing of land and establishment of the approved infrastructure associated with the Ubuntu Colliery and the existing D2546 district road. Cultivation has been carried out in the area and cultivated and fallow fields were observed during the pre-disturbance survey. Additional farming infrastructure, including pump houses and dam walls were present within the site-specific study area. Both formal and informal roads have been established within the Project area.

**Table 6-3: Summary of the Vegetation Setting of the Project**

Biome	Bio-region	Vegetation Type
Grassland	Mesic Highveld Grassland	<p><u>Eastern Highveld Grasslands (Gm12)</u></p> <p>Vegetation in this type is characterised by short dense grassland dominated by the usual highveld grasses with small, scattered rocky outcrops with wiry sour grasses and some woody species. This vegetation type occurs on slightly to moderately undulating plains and includes some low hills and pan depressions. This unit is associated with the Vryheid Formation of the Karoo Supergroup.</p> <p>This vegetation type is considered endangered and approximately 44% of the type has been transformed. Cultivation may have had the most extensive impact on this vegetation type and plantations, mines, urbanisation and dams are the other primary contributors to this transformation. Erosion in this type is very low.</p>

Adapted from Mucina & Rutherford (2010)





**Figure 6-2: Results of the Pre-disturbance Survey showing the Existing Environment**

### 6.3.2. Newly Identified Heritage Resources

During the pre-disturbance survey undertaken for the current HRM process, one additional heritage resource was identified. Table 6-4 includes a summary of this heritage resource and Figure 6-3 includes photographs. Plan 4 includes the results of the pre-disturbance survey.

**Table 6-4: Heritage Resources identified within the MR Area**

Heritage Resource	Description
<b>H013</b>	A burial ground including six visible individual graves. Of these graves, two have cement headstones. One of these headstones is no longer legible and the other is partially legible. The date is illegible. The other graves are marked by stone piles with upright stones serving as headstones. The burial ground is unfenced and is located in an agricultural field.



**Figure 6-3: Results of the Pre-disturbance Survey showing Newly Identified Heritage Resources**

28°51'0"E

28°51'30"E

28°52'0"E

28°52'30"E

26°11'0"S

26°11'0"S

26°11'30"S

26°11'30"S

26°12'0"S

26°12'0"S

26°12'30"S

26°12'30"S

28°51'0"E

28°51'30"E

28°52'0"E

28°52'30"E

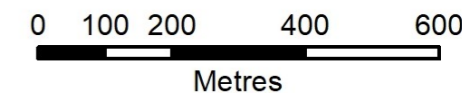
**Universal Coal Development III (Pty) Ltd  
Ubuntu Colliery EIA  
Pre-Disturbance Survey**

**Legend**

- Project Area
- Heritage Sites
- Heritage Tracks - 2020/07/08 Site Visit
- Heritage Tracks - 2020/07/09 Site Visit
- Approved Infrastructure**
- Overburden
- PCD
- RoM Stockpile
- UC Boxcut
- Open Cast Pit
- Proposed Infrastructure**
- Access Road
- Canal
- D2546 District Road Diversion
- Contractors Camp Site
- Control Room Area
- Culvert
- Diesel Depot Area
- Hard Park
- Haul Truck Queuing Area
- Product Stockpile
- Sewage Treatment Plant
- Workshop, Offices & Other Infrastructure



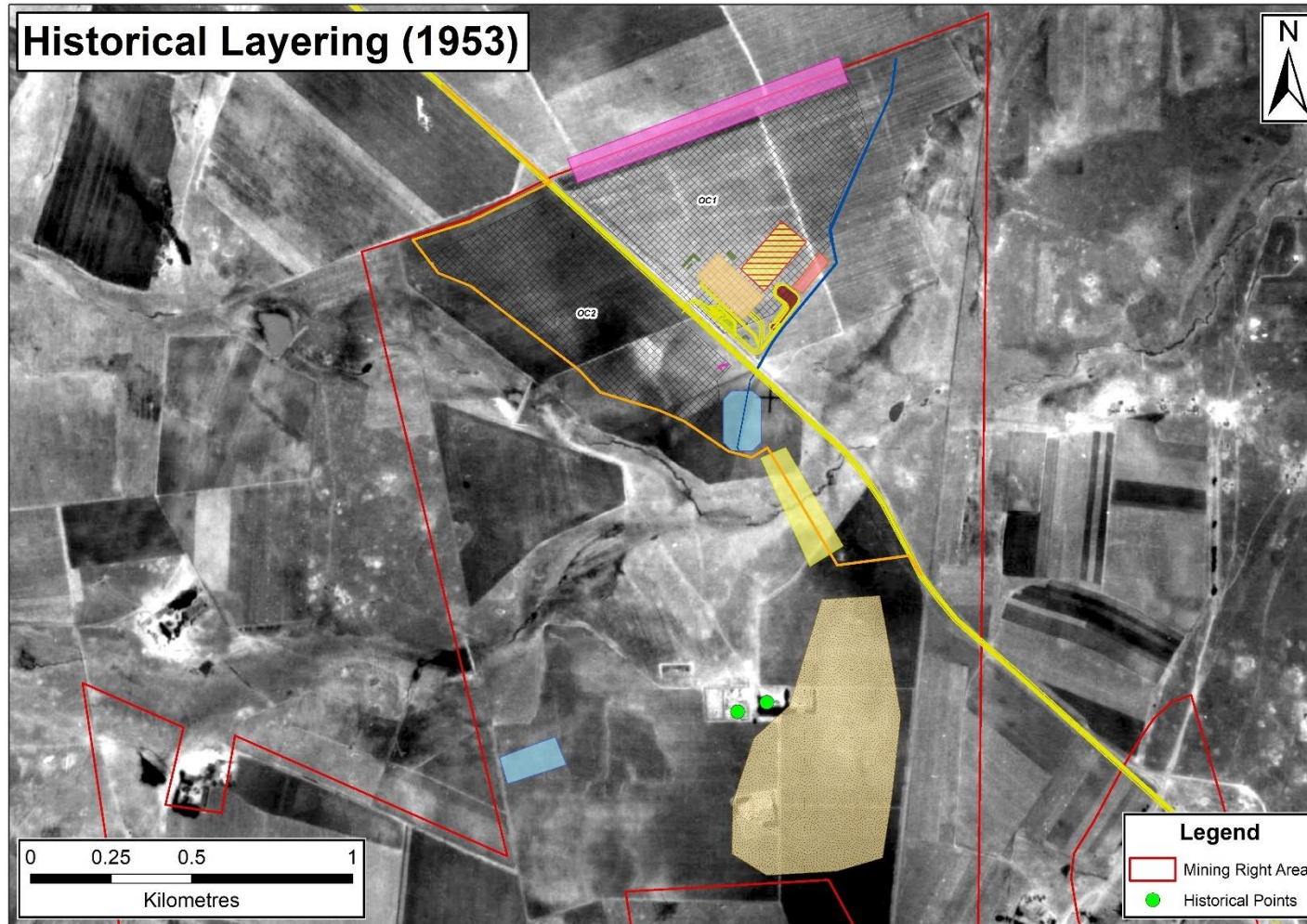
Projection: Transverse Mercator  
 Datum: WGS 1984  
 Central Meridian: 29°E  
 Date: 03/02/2021  
 Ref #: UCD6097\_H\_04\_AMT\_v2



### 6.3.3. Results from Historical Layering

Figure 6-4 presents the results of the historical layering. The landscape at that time is characterised by cultivated agricultural fields and some roads within the wider area. The Project area has a long history of disturbance through farming activities.

There are two points of interest highlighted in Figure 6-4. These represent structures which, if still remaining, would be older than 60 years and which will therefore be afforded general protection under Section 34 of the NHRA. These points were not ground-truthed during the pre-disturbance survey.



**Figure 6-4: Historical Imagery showing the Project Area in 1953 with Points of Interest**

## 6.4. Socioeconomic Setting

The Project is located within Ward 7 the VKLM 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 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. The district included 1 308 129 residents (32.4% of the population of the province). NDM is itself divided into six local municipalities. VKLM is the second smallest of the local municipalities in terms of population, which included 75 453 people in 2011 (5.8% of the population in the NDM).

The VLKM includes nine wards. Ward 7 includes a population of 10 230 people (VKLM, 2020). The ward is mostly rural, but does include some settled areas, including the outskirts of Delmas. The area is characterised by agriculture, including cultivation of crops, and mining (predominantly coal).

Unemployment is a challenge within the regional study area. Table 6-5 presents an overview of the employment status of the populations within the regional study area.

**Table 6-5: Employment Status of the Populations within the Study Area**

Employment Statistics (Census 2011)	Ward 7		VKLM		NDM	
	No.	%	No.	%	No.	%
Total Population	10 230	-	75 453	-	1 308 129	-
Working Age (18-64)	6 331	61.9	46 646	61.8	796 693	60.9
Employed	3 244	31.7	21 843	28.9	355 478	27.2
Discouraged Work Seeker	272	2.7	2 477	3.3	42 554	3.3
Unemployed	850	8.3	8 573	11.4	152 250	11.6
Other not economically active	2 485	24.3	17 712	23.5	319 641	24.4

Adapted from Wazimap (2017)

The unemployment level within the VKLM decreased between 2015 and 2011 from 28.2% to 21.6% (VKLM, 2020). As per the IDP, the VKLM expected further decreases in the unemployment rate as a result of additional employment opportunities expected from the mining sector. Employment within the mining sector showed growth although it was not the

largest contributor of employment in the period covered in the VKLM IDP. These sectors were the Trade, Agriculture and Community Services sectors employing 18.7%, 18.2% and 14.3% of the workforce respectively.

## 7. Impact Assessment

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

This report considers only the CS of heritage resources identified during the pre-disturbance survey undertaken in support of the current Project only. Digby Wells will only assess impacts to the newly identified heritage resources in relation to the proposed Project activities. The impact assessment of the previously identified heritage resources within the MRA are included Section 8 in the existing HIA report (Higgitt & Nel, 2012). A summary of the recommendations included in the existing HIA are included in Section 11 of this report.

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 12.1.

### 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 CS 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 CS and other values described in Section 3(3) of the NHRA.

Previously identified heritage resources<sup>9</sup> notwithstanding, one category of additional heritage resources was recorded during the pre-disturbance survey of the site-specific study area – one burial ground.

---

<sup>9</sup> The CS of the heritage resources identified in the previous HRM process is described in Section 7 of the existing HIA report (Higgitt & Nel, 2012). Digby Wells has not reassessed these heritage resources in this report.

The assessment of the CS and Field Ratings demonstrated that the identified resources have very high significance. Table 7-1 presents a summary of this assessment. Sites of the same type that share the same CS have been grouped together in terms of the impact assessment (refer to Sections 7.2 to 7.4 below).



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

Resource ID	Description	Aesthetic	Historic	Scientific	Social	INTEGRITY	Designation	Recommended Field Rating	Field Rating Description	Minimum Mitigation <sup>10</sup>
H013	Burial Grounds & Graves	- Burial grounds and graves were not assessed against aesthetic criteria as defined in Section 3(3) of the NHRA.	- Burial grounds and graves were not assessed against historic criteria as defined in Section 3(3) of the NHRA.	- Burial grounds and graves were not assessed against scientific criteria as defined in Section 3(3) of the NHRA.	5 Burial grounds and graves have specific connections to communities or groups for spiritual reasons. The significance is universally accepted.	4 The integrity of burial grounds is considered to be excellent with both tangible and intangible fabric preserved.	Very High 20	Grade I <sup>11</sup>	Heritage resources with qualities so exceptional that they are of special national significance.	Project design must change to avoid the resource completely and resources must be included in Heritage Site Management Plan (HSMP). A GRP may be necessary should the project design not be changed.

<sup>10</sup> Please note: this recommended mitigation refers to the minimum mitigation requirements as encapsulated in the NHRA. Project-specific mitigation measures are presented in Sections 7.2 to 0.

<sup>11</sup> The recommended field rating designates the level of governance associated with the resource. In this instance, the SAHRA Burial Grounds and Graves Unit is the designated competent authority responsible for the management of heritage resources contemplated in terms of Section 36 of the NHRA.

## 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
Surface preparation for infrastructure	Direct negative impacts to H013
Construction of surface infrastructure	

### 7.2.1. Impact Description

H013 is located within 10 m of the first alternative proposed for the diversion of the D2546 district road and, as such, it may be directly impacted through the construction of the new road. Table 7-3 presents a summary of the potential direct impact to this heritage resource.

**Table 7-3: Summary of the potential direct impact to Burial Grounds and Graves**

IMPACT DESCRIPTION: Direct impact to Heritage Resource H013				
Dimension	Rating	Motivation		
<b>PRE-MITIGATION</b>				
Duration	Permanent (7)	Unmitigated change will result in permanent damage to the heritage resource.	Consequence: Extremely detrimental (-21)	Significance: Major – negative (-126)
Extent	International (7)	Damage to these resources could potentially have an international effect in terms of Universal Coal's reputation (which could have a knock-on effect in terms of investment) and NoK could potentially reside outside South Africa.		
Intensity x type of impact	Extremely high - negative (-7)	Damage would constitute a major change to resource of Very High CS.		

<b>IMPACT DESCRIPTION: Direct impact to Heritage Resource H013</b>				
<b>Dimension</b>	<b>Rating</b>	<b>Motivation</b>		
Probability	Highly probable (6)	Without the implementation of mitigation or management measures and considering the location of the heritage resource relative to the infrastructure, it is highly probable that these resources will be damaged.		
<b>MITIGATION:</b>				
<p>The project related mitigation must aim to amend the project design to avoid the potential negative impact to the heritage resource and implement a 100 m no-go buffer zone around the heritage resource. Where it is determined that the negative impact may not manifest, the heritage resource must be incorporated into an HSMP for implementation. Should Universal Coal have an existing HSMP, H013 must be incorporated into the existing HSMP and be subject to the same requirements encapsulated therein.</p> <p>Where Project redesign and <i>in situ</i> conservation is not feasible based on the current mining operations and location of the mineral resources, heritage related mitigations must be employed. Heritage related mitigations will need to be undertaken in accordance with the requirements of the NHRA and NHRA Regulation, 2000 (GN R 548) will be required. Such mitigations may include a Burial Grounds and Graves Consultation (BGGC) to assess whether a GRP (which must be undertaken in accordance with Section 36 of the NHRA and Chapter IX and XI of the NHRA Regulations) is feasible.</p> <p>An alternative Project design has been proposed to avoid the identified burial ground. Digby Wells assumes that Project design is the preferred alternative, and the post-mitigation impact assessment considers this mitigation strategy.</p>				
<b>POST-MITIGATION</b>				
Duration	Beyond project life (6)	If the mitigation measures are put into place, specifically the <i>in situ</i> conservation and management of the resource through an HSMP, the benefits may continue after the Project is complete.	Consequence: Moderately beneficial (12)	Significance: Moderate – positive (72)
Extent	Very Limited (1)	The selection of the alternative routing will avoid the identified impact, which will result in a very limited impact.		

IMPACT DESCRIPTION: Direct impact to Heritage Resource H013			
Dimension	Rating	Motivation	
Intensity x type of impact	High - positive (5)	<i>In situ</i> conservation and management would constitute a minor change to a resource of Very High CS.	
Probability	Highly probable (1)	Should Universal Coal implement the mitigations effectively, it is highly probable that the anticipated benefits will manifest.	

### 7.3. Operational Phase

Table 7-4 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 7-4: Interactions and Impacts of Operational Phase Activities**

Interaction	Impact
Operation and maintenance of infrastructure	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.
Use and maintenance of haul roads (incl. transportation of coal to washing plant)	

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.

### 7.4. Decommissioning Phase

Table 7-5 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 7-5: 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
Rehabilitation (spreading of soil, re-vegetation and profiling/contouring)	

Interaction	Impact
Installation of post-closure water management infrastructure	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

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 7-6 presents a summary of the possible cumulative impacts of the Project.

**Table 7-6: 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.

Sections 6.2 and 6.3.2 describe the heritage resources identified by Digby Wells within the Project area to date. 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 7-7 presents a summary of the primary risks that may arise for Universal Coal.

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

Description	Primary Risk
Heritage resources with a high CS 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.
Impacting on heritage resources formally and generally protected by the NHRA without following due process. Due process may include social consultations and/or permit application processes to SAHRA and/or MPHRA.	<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>

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 7-8 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 7-8: 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	Establish Project-specific Chance Find Procedures (CFPs) as a condition of authorisation.  Refer to Section 11 for more detailed recommendations.
Accidental exposure of fossil bearing material implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA	
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. Environmental Management Programme

Table 8-1 below summarises the outcomes of the HRM process that must be included in the Environmental Management Program (EMPr).

**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>D2546 road diversion described in Section 2.1 above</li> </ul>	Damage to or destruction of H013	Cultural Heritage	Construction	<ul style="list-style-type: none"> <li>Project redesign to avoid the heritage resource and implement a 100 m no-go buffer zone around the resource.</li> </ul>	<b>Avoid</b>	Before the commencement of the Project
<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



## 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 Parties (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

The recommendations included in the existing HIA (Higgitt & Nel, 2012) include:

- The *in situ* preservation of all burial grounds and graves including a 20 m buffer zone that must be demarcated around each of the burial grounds. Monitoring must be conducted during blasting to assess any damage to the heritage resources and access must be granted to any heritage user;
- Where the *in situ* preservation of burial grounds is not feasible, a GRP in terms of Section 36 of the NHRA will be required. Universal Coal will be required to identify

*bona fide* Next-of-Kin (NoK) and reach agreement on the future of individual graves through consultation;

- A Phase 2 archaeological study for the site H004 (an ash midden) if the Project activities occur in proximity to this site;
- Where structures older than 60 years may be impacted, Universal Coal will require a destruction permit issued in terms of Section 34 of the NHRA; and
- A CFP, which must be developed and implemented during ground clearance activities.

These recommendations remain applicable and Universal Coal must implement these recommendations where this has not been done to date.

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:

- Universal Coal must avoid impacts to H013 through an amendment of the proposed D2456 district road diversion routing and implement a 100 m no-go buffer zone around the heritage resource;
- Universal Coal must develop and implement an HSMP to conserve H013 *in situ*. Where Universal Coal have developed such a management plan, this must be updated to include H013;
- Where Project design amendments are not feasible, Universal Coal will need to embark on a consultation process to assess whether a GRP is feasible; and
- To mitigate against potential direct impacts against previously unidentified heritage resources and where Universal Coal has not done so already, Universal Coal must develop and implement a CFP prior to the commencement of Project activities. This CFP must be approved by the HRAs prior to implementation.

## 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.

### 12.1. Socio-economic Benefit versus Heritage Impacts

Based on a review of the applicable planning documents and available socio-economic data detailed in Section 6.3.3 above, 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 statements:

- The identified impacts to the heritage resources can be mitigated through the recommendations included in Section 11;

- The Project will contribute to 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 CS;
- 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 through 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.

## 14. References

- Behrens, J. & Swanepoel, N., 2008. Historical Archaeologies of Southern Africa: Precedents and Prospects. In: N. Swanepoel, A. Esterhuysen & P. Bonner, eds. *Five Hundred Years Rediscovered: South African Precedents and Prospects*. Johannesburg: Wits University Press, pp. 23-39.
- Brodie, N., 2008. *The Joburg Book: A guide to the city's history, people and places*. Johannesburg: Sharp Sharp Media.
- Clark, J., 1982. The cultures of the Middle Palaeolithic/Middle Stone Age. In: J. Clark, ed. *The Cambridge History of Africa, Volume 1: From the Earliest Times to c. 500 BC*. Cambridge: Cambridge University Press, pp. 248-341.
- De Jong, R. C., 2010. *Specialist Study: Heritage Scoping (Basic Assessment) Report: Input into EIA, IWWMP and IWULA for the proposed Kuyasa IPP Power Generation Plan on Portions of the Farms Haverghen 269 IR and Haverklip 265 IR near Delmas, Mpumalanga Province*, Cultmatrix CC: Unpublished Report prepared for Jones & Wagener Consulting Civil Engineers. Case ID 174.
- Deacon, H. & Deacon, J., 1999. *Human Beginnings in South Africa*. Cape Town: David Phillip.
- Delius, P. & Cope, R., 2007. Hard-fought frontiers: 1845 - 1883. In: *Mpumalanga: History and Heritage*. Pietermaritzburg: University of KwaZulu-Natal Press, pp. 137-199.
- Delius, P., Maggs, T. & Schoeman, A., 2014. *Forgotten World: The Stone-Walled Settlements of the Mpumalanga Escarpment*. First ed. Johannesburg: Wits University Press.
- Esterhuysen, A. & Smith, J., 2007. Stories in stone. In: P. Delius, ed. *Mpumalanga: History and Heritage: reclaiming the past, defining the future*. Pietermaritzburg: University of KwaZulu-Natal Press, pp. 41-67.
- Genealogical Society of South Africa, 2011. *Google Earth Cemetery Initiative*. Google Earth Database: Genealogical Society of South Africa Database.
- Higgitt, N. & Nel, J., 2012. *Heritage Impact Assessment for the Brakfontein Thermal Coal Mine*, Digby Wells Environmental: Unpublished Report prepared for Universal Coal (Pty) Ltd. Case ID 479.
- Landau, P. S., 2010. *Popular Politics in the History of South Africa, 1400-1948*. Cambridge: Cambridge University Press.
- Maggs, T., 1976. *Iron Age Communities of the southern Highveld*. Pietermaritzburg: University of KwaZulu-Natal Press.
- Makhura, T., 2007. Early Inhabitants. In: *Mpumalanga: History and Heritage*. Pietermaritzburg: The University of KwaZulu-Natal Press, pp. 91-135.
- Mitchell, P., 2002. *The Archaeology of Southern Africa*. Cambridge: Cambridge University Press.

Mucina, L. & Rutherford, M. C., 2010. *The Vegetation of South Africa, Lesotho and Swaziland*. CD Edition ed. Pretoria: South African National Biodiversity Institute (SANBI).

Open Up, 2017. *Wazimap updated with 2016 Municipal Election Results and new municipalities*. [Online]

Available at: <https://openup.org.za/articles/wazimap-2016-update.html> [Accessed 25 September 2020].

Pakenham, T., 1979. *The Boer War*. Johannesburg: Johnathon Ball Publishers.

Pistorius, J., 2008a. *Phase 1 Heritage Impact Assessment (HIA) Study for the Total Coal South Africa's (TCSA) Proposed New Expansion of the Dorsfontein Coal Mine (DCM) near Kriel on the Eastern Highveld in the Mpumalanga Province of South Africa*, Pretoria: Unpublished report prepared for Total Coal Ground Water Consulting Services.

Pistorius, J., 2008b. *Phase 1 Heritage Impact Assessment (HIA) Study for Sasols proposed new shaft complex on Strybult 542 and for the North Block on the Eastern Highveld in the Mpumalanga Province of South Africa*, Pretoria: Unpublished Report prepared for Clean Stream Environmental and Sasol Secunda.

Pistorius, J. C. C., 2012. *A Phase 1 Heritage Impact Assessment (HIA) Study for a Proposed 600 MW Power Plant and Associated Infrastructure for KiPower (Pty) Ltd near Delmas on the Eastern Highveld in the Mpumalanga Province of South Africa*, Dr Julius CC Pistorius: Unpublished Report prepared for Jones & Wagener Consulting Civil Engineers (Pty) Ltd and Kuyasa Mining. Case ID 174.

Pistorius, J. C. C., 2013. *A Phase I Heritage Impact Assessment (HIA) Study for a Proposed Raw Water Supply Pipeline for KiPower (Pty) Ltd near Delmas on the Highveld and Eastern Highveld in the Gauteng and Mpumalanga Provinces of South Africa*, Dr Julius CC Pistorius: Unpublished Report prepared for Jones & Wagner Consulting Engineers. Case ID: 5817.

Pistorius, J. C. C., 2016. *A Phase I Heritage Impact Assessment (HIA) Study for the Proposed KiPower 400kV Loop-in and Loop-out Transmission Lines to connect to the KiPower Independent Power Station with the National Grid on the Eastern Highveld in the Mpumalanga Province*, Dr Julius CC Pistorius: Unpublished Report prepared for Jones & Wagenar Environmental and Engineering Consultants. Case ID 9599.

Statistics South Africa, 2011. *Statistics by Place*. [Online] Available at: [http://www.statssa.gov.za/?page\\_id=964](http://www.statssa.gov.za/?page_id=964) [Accessed 15 January 2021].

Swanepoel, N., Esterhuysen, A. & Bonner, P., 2008. *Five Hundred Years Rediscovered: Southern African Precedents and Prospects*. Johannesburg: Wits University Press.

van Schalkwyk, J., 2002. *A survey of cultural resources for the Zondagsfontein Mining Development, Witbank District, Mpumalanga Province*, National Cultural History Museum: Unpublished report prepared for Oryx Environmental. SAHRIS ID: 00710.

van Vollenhoven, A. C., 2012. *A Report on a Heritage Impact Assessment (HIA) for the Proposed Eyethu Kromdraai Coal Mine, close to Delmas, Mpumalanga Province*, Archaetnos: Unpublished Report prepared for Geovicon. Case ID 2077.

VKLM, 2020. *2017-2021 Draft Integrated Development Plan: 2020/21 Review*, Delmas: Unpublished Government Planning Document.

von der Heyde, N., 2013. *Field Guide to the Battlefields of South Africa*. Cape Town: Random House Struik.

Voortrekkers, T., 2014. *The Great Trek - South Africa 1835 - 1845.* [Online] Available at: <http://www.voortrekker-history.co.za/index.php#.VOBq3a8cTIU> [Accessed 25 October 2017].

Wazimap, 2017. *Wazimap.* [Online] Available at: <https://wazimap.co.za/> [Accessed 15 January 2021].

Wessels, A., 2010. *The Anglo-Boer War 1889-1902: White Man's War, Black Man's War, Traumatic War.* Stellenbosch: African Sun Media.

Willsworth, C., 2006. *Bakenlaagte - the Story*. Durban: Just Done Productions.

Winter, S. & Baumann, N., 2005. *Guidelines for involving heritage specialists in EIA processes: first edition*. CSIR Report No ENV-S-C 2005 053 E, Cape Town: Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning.



DIGBY WELLS  
ENVIRONMENTAL

## Appendix A: Glossary

## GLOSSARY OF TERMS

Term	Definition
<b>Archaeological</b>	Material remains resulting from human activity that are in a state of disuse and older than 100 years, including artefacts, human and hominid remains and artificial features and structures. Rock art created through human agency older than 100 years, including any area within 10 m of such representation. 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. 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.
<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 Act 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, etc.
<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.
<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.





Term	Definition
<b>Cultural significance (CS)</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.</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.</li> <li>Any removal or destruction of trees, or removal of vegetation or topsoil.</li> </ul>
<b>Early Farming Community/ies</b>	<p>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.</p>
<b>Early Stone Age</b>	<p>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.</p>
<b>Excavation</b>	<p>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.</p>

Term	Definition
<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</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: Grade I: Heritage resources with qualities so exceptional that they are of special national significance. 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. Grade III: Other heritage resources worthy of conservation. General Protected: i.e. generally protected in terms of Sections 33 to 37 of the NHRA.
<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.
<b>General protection</b>	General protections are afforded to: Objects protected in terms of laws of foreign states. Structures older than 60 years. Archaeological and palaeontological sites and material and meteorites. Burial grounds and graves. Public monuments and memorials.
<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.

Term	Definition
<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 clearly 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: Any linear development exceeding 300m in length. Construction of a bridge or similar structure exceeding 50 m in length. 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. Re-zoning of a site exceeding one hectare in extent. Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
<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 resources authority.
<b>Late Farming Community/ies</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>Late Stone Age</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 cryptocrystallines, quartz and chert. The LSA is also associated with archaeological rock art including both paintings and engravings.

Term	Definition
<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</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.
<b>National estate</b>	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: Places, buildings, structures and equipment of cultural significance. Places to which oral traditions are attached or which are associated with living heritage. Historical settlements and townscapes. Landscapes and natural features of cultural significance. Geological sites of scientific or cultural importance. Archaeological and palaeontological sites. 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. Sites of significance relating to the history of slavery in South Africa. 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. 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).



Term	Definition
<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.
<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>Term</b>	<b>Definition</b>
<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.
<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, etc. 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.



DIGBY WELLS  
ENVIRONMENTAL

## Appendix B: Specialist CV



Miss Shannon Hardwick  
 Heritage Resources Management Consultant  
 Social and Heritage Services  
 Digby Wells Environmental

## 1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2019	Heritage Resources Management short course (Continued Professional Development Programme)	University of Cape Town
2013	MSc (Archaeology)	University of the Witwatersrand
2010	BSc (Honours) (Archaeology)	University of the Witwatersrand
2009	BSc	University of the Witwatersrand
2006	Matric	Rand Park High School

## 2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Fair	Basic

## 3 Employment

Period	Company	Title/position
2019 to Present	Digby Wells Environmental	Heritage Resources Management Consultant
2017 to 2019	Digby Wells Environmental	Assistant Heritage Resources Management Consultant
2017 to 2017	Digby Wells Environmental	Social and Heritage Services Intern
2016 to 2017	Tarsus Academy	Facilitator
2011 to 2016	University of the Witwatersrand	Teaching Assistant
2011	University of the Witwatersrand	Collections Assistant



## 4 Experience

I joined the Digby Wells team in May 2017 as a Heritage Management Intern and have most recently been appointed as a Heritage Resources Management Consultant. I am an archaeologist and obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. I am a published co-author of one paper in *Journal of Ethnobiology*.

Since joining Digby Wells, I have gained generalist experience through the compilation of various heritage assessments, including Notification of Intent to Develop (NIDs), Heritage Scoping Reports (HSRs), Heritage Impact Assessment (HIA) reports, Heritage Basic Assessment Reports (HBARs) and applications to undertake permitted activities in terms of Sections 34 and 35 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). I have undertaken heritage mitigations including those permitted under Section 35 of the NHRA and I am currently gaining experience in Grave Relocation Processes (GRPs).

Besides heritage experience, I have also obtained experience in compiling socio-economic documents, including a Community Health, Safety and Security Management Plan (CHSSMP) and social baselines and data analysis for projects in South Africa, Malawi, Mali and Sierra Leone. I have also had experience in terms of auditing clients according to their environmental commitments.

My fieldwork experience includes heritage pre-disturbance surveys and impact assessments in South Africa, Malawi and the Democratic Republic of the Congo and social fieldwork in Malawi. All but one of these international projects conformed to the requirements of the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (PS) (2012).

I am a registered member of the Association of Southern African Professional Archaeologists (ASAPA) and the International Council on Monuments and Sites (ICOMOS).

## 5 Project Experience

The table below presents the Projects in which I have participated in Digby Wells throughout my employment.

### Project Experience at Digby Wells

Project Title	Client	Project Location	Completed	Project Experience
Cultural Heritage Management and Grave Relocation Process in support of the North Eastern Waste Rock Dump Extension Readiness at the Mogalakwena Platinum Mining Complex	Anglo American Platinum	Mokopane, Limpopo	Ongoing	Section 35 Permit Application Process Section 36 Permit Application and Grave Relocation Processes
Mafube Resettlement Action Plan and Grave Relocation Process	Mafube Coal Mining (Pty) Ltd	Middelburg, Mpumalanga	Ongoing	Section 36 Permit Application and Grave Relocation Processes
Environmental and Social Impact Assessment for the Sanankora Gold Mine Project	Cora Gold Limited	Koulikoro Region, Mali	Ongoing	Heritage Impact Assessment Process In-country consultant support
Environmental Authorisation Process for the Expansion of the Copper Sunset Mining Right Area	Copper Sunset Sands (Pty) Ltd	Viljoensdrift, Free State	Ongoing	Heritage Impact Assessment Process
Amendments to Environmental Licences associated with the West Rand Tailings Retreatment Project	Far West Gold Recoveries (Pty) Ltd	West Rand District Municipality, Gauteng	Ongoing	Heritage Impact Assessment Process
Regional Tailings Storage Facility Heritage Mitigations	Ergo Mining (Pty) Ltd	Randfontein, Gauteng	Ongoing	Section 34 Permit Application Process
City Deep 4L2 Mine Dump Heritage Management	Ergo Mining (Pty) Ltd	Johannesburg, Gauteng	Ongoing	Rescue Permit Application Process

<b>Project Title</b>	<b>Client</b>	<b>Project Location</b>	<b>Completed</b>	<b>Project Experience</b>
Exxaro Dorstfontein East Coal Mine Expansion Project	Exxaro Coal Central (Pty) Ltd	Kriel, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Grave Relocation Process at the Exxaro Matla Mine 1 Development Footprint	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	Ongoing	Section 36 Permit Application and Grave Relocation Processes
Environmental Authorisation for the proposed Musina-Makhado Special Economic Zone Development Project, Limpopo Province	Limpopo Economic Development Agency	Vhembe District Municipality, Limpopo	Ongoing	Heritage Impact Assessment Process Project Management
Lesotho Lowlands Water Development Project Phase II Heritage Impact Assessment	Lesotho Lowlands Water Development Project Phase II	Leribe and Berea Districts, Lesotho	Ongoing	Heritage Impact Assessment Process In-country consultant support Project Management
Songwe Hills Rare Earth Elements Project	Mkango Resources Limited	Phalombe District, Malawi	Ongoing	Heritage Impact Assessment Process
Environmental Authorisation Processes for the Blinkwater, Lisbon and Moorddrift Prospecting Right Applications	PalRho Exploration (Pty) Ltd	Mokopane, Limpopo	Ongoing	Heritage Basic Assessment Report (desktop)
Environmental and Social Impact Assessment for the Kalimva and Ikamva Satellite Pits and Updating of the Kibali Gold Project	Kibali Gold Mine	Orientele Province, Democratic Republic of the Congo	Ongoing	Heritage Impact Assessment Process In-country consultant support



Project Title	Client	Project Location	Completed	Project Experience
The South African Radio Astronomy Observatory Square Kilometre Array Phase 2 Heritage Mitigations	South African Radio Astronomy Observatory	Carnarvon, Northern Cape	Ongoing	Section 34 Permit Application Process Section 35 Permit Application Process and Mitigations Heritage Impact Assessment – Addendum Training Development and Implementation
Kroonstad Gas Exploration Project	Shango Solutions (Pty) Ltd	Kroonstad, Free State	Ongoing	Heritage Impact Assessment Process Project Management
Kroonstad South Section 102 Amendment Project	Shango Solutions (Pty) Ltd	Kroonstad, Free State	Ongoing	Heritage Impact Assessment Process Project Management
Rustenburg Base Metals Refinery Bulk Chemical Storage Facility Relocation Project	SRK Consulting (South Africa) Pty Ltd	Rustenburg, North West	Ongoing	Heritage Impact Assessment Process Project Management
Regulation 31 Amendment Report and Environmental Management Programme for Listed Activities and Amendment associated with the Sweet Sensation Sand Mine	Sweet Sensations Vaal Sand (Pty) Ltd	Vaal Eden, Free State	Ongoing	Heritage Site Management Plan Chance Finds Procedure

<b>Project Title</b>	<b>Client</b>	<b>Project Location</b>	<b>Completed</b>	<b>Project Experience</b>
Environmental Authorisation for the Proposed New Infrastructure at the Universal Coal Development III (Pty) Ltd Ubuntu Colliery	Universal Coal Development III (Pty) Ltd	Delmas, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Proposed Dalyshope Coal Mining Project	Anglo Operations (Pty) Ltd	Lephalale, Limpopo	Ongoing	Heritage Impact Assessment Process
Proposed Environmental Regulatory Process for the Middeldrift Resources within the Existing New Clydesdale Colliery Mining Right	Universal Coal Development IV (Pty) Ltd	Kriel, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Proposed Arnot South Coal Mining Project	Exxaro Coal Mpumalanga (Pty) Ltd	Hendrina, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Basic Assessment Process for the Closure of the Cooke Underground Operations	Sibanye Gold Limited	Randfontein, Gauteng	March 2021	Heritage Impact Assessment Process
Weltevreden Mine Environmental Authorisation, Water Use Licence and Mining Right Application Project	Mbuyelo Group (Pty) Ltd	Belfast, Mpumalanga	March 2021	Heritage Impact Assessment Process
Basic Assessment and Regulation 31 Amendment Processes for the Authorisation of Listed Activities and Amendment of the Environmental Impact Assessment and Environmental Management Plan for the Ixia Coal (Pty) Ltd Imvula Mine	Ixia Coal (Pty) Ltd	Kriel, Mpumalanga	November 2020	Heritage Basic Assessment Report
Burial Ground Site Inspection adjacent to the Goedgevonden Colliery	Glencore Operations South Africa (Pty) Ltd	Ogies, Mpumalanga	November 2020	Site Inspection and Report



Project Title	Client	Project Location	Completed	Project Experience
Belfast Coal Mine Grave Inspection	Exxaro Coal Mpumalanga (Pty) Ltd	Belfast, Mpumalanga	September 2020	Site Inspection and Report
Basic Assessment and Regulation 31 Amendment / Consolidation for Sigma Colliery: Mooikraal and Sigma Colliery: 3 Shaft	Sasol Mining (Pty) Ltd	Sasolburg, Free State	September 2020	Notification of Intent to Develop and Request for Exemption
Mining Permit Applications to undertake Sand Mining at the New Vaal Colliery	Copper Sunset (Pty) Ltd	Vereeniging, Free State	July 2020	Heritage Basic Assessment Report
Environmental Impact Assessment for the Klipspruit Colliery Water Treatment Plant and associated pipeline, Mpumalanga	South32 SA Coal Holdings (Pty) Ltd	Ogies, Mpumalanga	May 2020	Notification of Intent to Develop and Request for Exemption Social baseline
Environmental Authorisation for the Dagsoom Coal Mining Project near Ermelo, Mpumalanga Province	Dagsoom Coal Mining (Pty) Ltd	Ermelo, Mpumalanga	April 2020	Heritage Impact Assessment Process
Proposed construction of a Water Treatment Plant and associated infrastructure for the Treatment of Mine-Affected Water at the Kilbarchan Colliery	Eskom Holdings SOC Limited	Newcastle, KwaZulu-Natal	March 2020	Heritage Impact Assessment Process
External Environmental Audits of the Sasol Retail Stations in the Limpopo, North West, Free State, Mpumalanga and Northern Cape Province	Sasol Limited's South African Energy Business	Thirteen locations in Mpumalanga, North West, Free State and Northern Cape	March 2020	Environmental Audit and Report



Project Title	Client	Project Location	Completed	Project Experience
Environmental Management Programme Performance Assessment for the Impumelelo Colliery near Greylingstad, Mpumalanga	Sasol Mining (Pty) Ltd	Greylingstad, Mpumalanga	January 2020	Environmental Performance Audit and Report
Environmental Authorisation for the Temo Mine proposed Rail, Road and Pipeline Development, Limpopo Province	Temo Coal Mining (Pty) Ltd	Lephalale, Limpopo	November 2019	Heritage Impact Assessment Process Social baseline
Heritage Resources Management Process for the Proposed Upgrade of the Dersley Outfall Sewer Line, Ekurhuleni, Gauteng	Information Decision Systems (Pty) Ltd	Ekurhuleni (Johannesburg), Gauteng	July 2019	Archaeological Impact Assessment Process Project Management
Environmental Authorisation for the proposed Lephalale Pipeline Project, Limpopo Province	MDT Environmental (Pty) Ltd	Lephalale, Limpopo	October 2019	Notification of Intent to Develop & Request for Exemption
Heritage Resources Management Process Update for the Exxaro Matla Mine	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	September 2019	Heritage Site Management Plan Update
Environmental Authorisation Process to Decommission a Conveyor Belt Servitude, Road and Quarry at Twistdraai East Colliery	Sasol Mining (Pty) Ltd	Secunda, Mpumalanga	August 2019	Notification of Intent to Develop and Request for Exemption
Environmental Impact Assessment for the proposed Future Developments within the Sun City Resort Complex	Sun International (Pty) Ltd	Rustenburg, North West	August 2019	Heritage Impact Assessment Process Conservation Management Plan Social Baseline

<b>Project Title</b>	<b>Client</b>	<b>Project Location</b>	<b>Completed</b>	<b>Project Experience</b>
Environmental Authorisation for the Nomalanga Estates Expansion Project, KwaZulu-Natal	Nomalanga Property Holdings (Pty) Ltd	Greytown. KwaZulu-Natal	July 2019	Heritage Impact Assessment Process
City Deep 4L2 Mine Dump Heritage Management Process	Ergo Mining (Pty) Ltd	Johannesburg, Gauteng	July 2019	Site Inspection and Report
Proposed John Dube Extension 3 Township situated on Portions of Remaining Extent 1 and 83 of the farm Grootfontein 165 IR, Gauteng Province	Envirolution Consulting (Pty) Ltd	Ekurhuleni (Johannesburg), Gauteng	July 2019	Desktop Social Assessment
Constructed Landfill Site for the Sierra Rutile Limited Mining Operation, Southern Province, Sierra Leone	Sierra Rutile Limited	Southern Province, Sierra Leone	May 2019	Social Impact Assessment
Environmental and Social Impact Assessment for the Bougouni Lithium Project, Mali	Kodal Minerals Limited	Sikasso region, Mali	May 2019	Heritage Impact Assessment Process In-country consultant support
Belfast Implementation Project	Exxaro Coal Mpumalanga (Pty) Ltd	Belfast, Mpumalanga	March 2019	Section 34 Permit Application
Newcastle Landfill Project	GCS Water and Environmental Consultants	Newcastle, KwaZulu-Natal	March 2019	Heritage Impact Assessment Process
Elandsfontein Colliery Burial Grounds and Graves Chance Finds	Anker Coal and Mineral Holdings SA (Pty) Ltd Elandsfontein Colliery (Pty) Ltd	Clewer, Emalahleni, Mpumalanga	December 2018	Site Inspection and Report Project Management





Project Title	Client	Project Location	Completed	Project Experience
Environmental Impact Assessment for the Blyvoor Gold Mining Project near Carletonville, Gauteng Province	Blyvoor Gold Capital (Pty) Ltd	Carletonville, Gauteng	December 2018	Notification of Intent to Develop and Request for Exemption Social Baseline
Gorumbwa RAP Audit	Randgold Resources Limited	Kibali Sector, Democratic Republic of the Congo	December 2018	Resettlement Action Plan Audit (data management)
Sasol Sigma Defunct Colliery Surface Mitigation Project: Proposed Rover Diversion and Flood Protection Berms	Sasol Mining (Pty) Ltd	Sasolburg, Free State	November 2018	Notification of Intent to Develop and Request for Exemption
Heritage Resources Management Process for the Exxaro Matla Mine	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	October 2018	Heritage Impact Assessment Process
Environmental and Social Input for the Pre-Feasibility Study	Birimium Gold	Bougouni, Mali	October 2018	Pre-Feasibility Study; Heritage Impact Assessment Process
Environmental and Social Impact Assessment for the Bougouni Lithium Project, Mali	Future Minerals S.A.R.L.	Bougouni, Mali	July 2018	Heritage Impact Assessment Process
The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project	The South African Radio Astronomy Observatory (SARAO)	Carnarvon, Northern Cape	July 2018	Heritage Impact Assessment Process Conservation Management Plan
Sasol Mining Sigma Colliery Ash Backfilling Project, Sasolburg, Free State Province	Sasol Mining (Pty) Ltd	Sasolburg, Free State	July 2018	Heritage Basic Assessment Report Update



Project Title	Client	Project Location	Completed	Project Experience
Liwonde Additional Studies	Mota-Engil Africa	Liwonde, Malawi	June 2018	Community Health, Safety and Security Management Plan Social Fieldwork
NHRA Section 34 Permit Application process for the Davin and Queens Court Buildings on Erf 173 and 174, West Germiston, Gauteng Province	IDC Architects	Johannesburg, Gauteng	May 2018	Section 34 Permit Application Process
Basic Assessment and Environmental Management Plan for the Proposed pipeline from the Mbali Colliery to the Tweefontein Water Reclamation Plant, Mpumalanga Province	HCI Coal (Pty) Ltd Mbali Colliery	Ogies, Mpumalanga	February 2018	Heritage Basic Assessment Report
Heritage Resources Management Process for the Exxaro Matla Mine	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	January 2018	Heritage Impact Assessment Process
Environmental Impact Assessment for the Millsite TSF Complex	Sibanye-Stillwater	Randfontein, Gauteng	December 2017	Heritage Baseline Compilation
Environmental Fatal Flaw Analysis for the Mabula Filling Station	Mr van den Bergh	Waterberg, Limpopo	November 2017	Fatal Flaw Analysis
NHRA Section 35 Archaeological Investigations, Lanxess Chrome Mine, North-West Province	Lanxess Chrome Mine (Pty) Ltd	Rustenburg, North West	August 2017	Archaeological Phase 2 Mitigation
Heritage Resources Management Process for the Portion 296 of the farm Zuurfontein 33 IR Proposed Residential Establishment Project	Shuma Africa Projects (Pty) Ltd	Ekurhuleni (Johannesburg), Gauteng	June 2017	Notification of Intent to Develop and Request for Exemption

## 6 Professional Affiliations and Registrations

Position	Professional Body	Member Number
Member	Association of Southern African Professional Archaeologists (ASAPA)	451
Member	International Council on Monuments and Sites (ICOMOS)	38048

## 7 Publications

Esterhuysen, A.B. & Hardwick, S.K. 2017. Plant remains recovered from the 1854 siege of the Kekana Ndebele, Historic Cave, Makapan Valley, South Africa. *Journal of Ethnobiology* 37(1): 97-119.



Mr. Justin du Piesanie  
Divisional Manager  
Social and Heritage Services  
Digby Wells Environmental

## 1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2015	Continued Professional Development, Intermediate Project Management Course	PM.Ideas: A division of the Mindset Group
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

## 2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

### 3 Employment

Period	Company	Title/position
2018 to present	Digby Wells Environmental	Divisional Manager: Social and Heritage Services
2016-2018	Digby Wells Environmental	Unit Manager: Heritage Resources Management
2011-2016	Digby Wells Environmental	Heritage Management Consultant: Archaeologist
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

### 4 Experience

I joined the company in August 2011 as an archaeologist. Subsequently, Digby Wells appointed me as the Heritage Unit Manager and Divisional Manager for Social and Heritage Services in 2016 and 2018 respectively. I obtained my Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. I further attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. I am a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. I am also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. I have over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, and NHRA Section 34 application processes. I gained further generalist experience since my appointment at Digby Wells in Botswana, Burkina Faso, Cameroon, the Democratic Republic of Congo, Liberia, Malawi, Mali, Senegal and Tanzania on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, I have acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. As Divisional Manager for Social and Heritage Services at Digby Wells Environmental, I manage several large capital Projects and multidisciplinary teams placing me in the best position to identify and exploit points of integration between the HRM process and greater social landscape. This approach to HRM, as an integrated discipline, is grounded in

international HRM principles and standards that has allowed me to provide comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving the strategic objectives of our clients, as well as maintain or enhance Cultural Significance of the relevant cultural heritage resources.

## 5 Project Experience

Please see the following table for relevant Project experience:

PROJECT		LOCATION	DATES		PROJECT TYPE		CLIENT		
LLWDP-II Process	HRM	Lesotho	2020	-	Heritage Assessment	Impact	Lesotho Lowlands Development Project II	Water	
Ergo City Heritage Mitigations	Deep	Johannesburg, Gauteng, South Africa	2020	-	Heritage Assessment, Rescue Permit Application and Monitoring	Impact	Ergo (Pty) Ltd		
Marshall Barracks Archaeological Monitoring	Street	Johannesburg, Gauteng, South Africa	2020	-	Archaeological Monitoring		GVK-Siya Zama Construction		
Exxaro Belfast Inspection	Site	Belfast, Mpumalanga, South Africa	2020	2020	Site Inspection		Exxaro Coal Mpumalanga (Pty) Ltd		
Matla Mine 1 GRP		Kriel, Mpumalanga, South Africa	2020	-	Grave Relocation		Exxaro Coal Mpumalanga (Pty) Ltd		
Mafube RAP and GRP		Middelburg, Mpumalanga, South Africa	2019	-	Grave Relocation		Mafube Coal		
SARAO SKA Project: Heritage Mitigations		Carnarvon, Northern Cape, South Africa	2019	-	Heritage Management and Mitigation		SARAO		
Kibali Kalimva & Ikamva Pit ESIA		Orientele Province, Democratic Republic of Congo	2019	2019	Heritage Assessment	Impact	Barrick Gold Corporation		
Ergo City Deep HSMP		Johannesburg, Gauteng, South Africa	2019	2019	Heritage Management Plan	Site	Ergo (Pty) Ltd		
Ergo RTSF Section 34 Process		Westonaria, Gauteng, South Africa	2019	-	Section 34 Destruction Permit Applications		Ergo (Pty) Ltd		

PROJECT	LOCATION	DATES		PROJECT TYPE		CLIENT
Twyfelaar EIA	Ermelo, Mpumalanga, South Africa	2019	2019	Heritage Assessment	Impact	Dagsoom Coal Mining (Pty) Ltd
Sasol River Diversion	Sasolburg, Free State, South Africa	2019	2019	Heritage Assessment	Impact	Sasol Mining
Sun City EIA and CMP	Pilanesberg, North-West Province, South Africa	2018	2019	Heritage Assessment and Conservation Management Plan	Impact and	Sun International
Exxaro Matla HRM	Kriel, Mpumalanga, South Africa	2017	2019	Heritage Assessment and Conservation Management Plan	Impact	Exxaro Coal Mpumalanga (Pty) Ltd
Exxaro Belfast GRP	Belfast, Mpumalanga, South Africa	2013	2019	Grave Relocation		Exxaro Coal Mpumalanga (Pty) Ltd
Eskom Northern KZN Strengthening	KwaZulu- Natal, South Africa	2016	2018	Heritage Assessment	Impact	ILISO Consulting
Thabametsi GRP	Lephalale, Limpopo Province, South Africa	2017	2018	Grave Relocation		Exxaro Resources Ltd
SKA HIA and CMP	Carnarvon, Northern Cape, South Africa	2017	2018	Heritage Assessment and Conservation Management Plan	Impact and	SARAO
Grootegeeluk Watching Brief	Lephalale, Limpopo Province, South Africa	2017	2017	Watching Brief		Exxaro Resources Ltd
Matla HSMP	Kriel, Mpumalanga Province, South Africa	2017	2017	Heritage Management Plan	Site	Exxaro Coal Mpumalanga (Pty) Ltd
Ledjadja Coal Borrow Pits	Lephalale, Limpopo Province, South Africa	2017	2017	Heritage Assessment	Basic	Ledjadja Coal (Pty) Ltd
Exxaro Belfast Implementation Project PIA	Belfast, Mpumalanga, South Africa	2017	2017	Palaeontological Impact Assessment		Exxaro Coal Mpumalanga (Pty) Ltd

PROJECT	LOCATION	DATES	PROJECT TYPE	CLIENT	
Lanxess Chrome Mine Archaeological Mitigation	Rustenburg, North West Province, South Africa	2017	2017	Phase 2 Excavations	Lanxess Chrome Mine (Pty) Ltd
Tharisa Apollo EIA Project	KwaZulu-Natal, South Africa	2017	2017	Heritage Assessment Impact	GCS (Pty) Ltd
Queen Street Section 34 Process	Germiston, Johannesburg, Gauteng, South Africa	2017	2017	Section 34 Destruction Permit Applications	IDC Architects
Goulamina EIA Project	Goulamina, Sikasso Region, Mali	2017	2017	Heritage Assessment Impact	Birimian Limited
Zuurfontein Residential Establishment Project	Ekurhuleni, Gauteng, South Africa	2017	2017	Notification of Intent to Develop	Shuma Africa Projects
Kibali Grave Relocation Training and Implementation	Orientele Province, Democratic Republic of Congo	2017	2017	Grave Relocation	Randgold Resources Limited
Massawa EIA	Senegal	2016	2017	Heritage Assessment and Technical Reviewer Impact	Randgold Resources Limited
Beatrix EIA and EMP	Welkom, Free State, South Africa	2016	2017	Heritage Assessment Impact	Sibanye Stillwater
Sun City Chair Lift	Pilanesberg, North-West Province, South Africa	2016	2017	Notification of Intent to Develop and Heritage Assessment Basic	Sun International
Hendrina Underground Coal Mine EIA	Hendrina, Mpumalanga, South Africa	2016	2017	Heritage Assessment Impact	Umcebo Mining (Pty) Ltd
Elandsfontein Update	Clewer, Mpumalanga, South Africa	2016	2017	Heritage Assessment Impact	Anker Coal
Groningen and Inhambane PRA	Limpopo Province, South Africa	2016	2016	Heritage Assessment Basic	Rustenburg Platinum Mines Limited



PROJECT	LOCATION	DATES		PROJECT TYPE		CLIENT
Palmietkuilen MRA	Springs, Gauteng, South Africa	2016	2016	Heritage Assessment	Impact	Canyon Resources (Pty) Ltd
Copper Sunset Sand Mining S.102	Free State, South Africa	2016	2016	Heritage Assessment	Basic	Copper Sunset Sand (Pty) Ltd
Grootvlei MRA	Springs, Gauteng, South Africa	2016	2016	Notification of Intent to Develop		Ergo (Pty) Ltd
Lambda EMP	Mpumalanga, South Africa	2016	2016	Palaeontological Impact Assessment		Eskom Holdings SOC Limited
Kilbarchan Basic Assessment and EMP	Newcastle, KwaZulu- Natal, South Africa	2016	2016	Heritage Assessment	Basic	Eskom Holdings SOC Limited
Grootegeeluk Amendment	Lephalale, Limpopo Province, South Africa	2016	2016	Notification of Intent to Develop		Exxaro Coal Resources (Pty) Ltd
Garsfontein Township Development	Pretoria, Gauteng, South Africa	2016	2016	Notification of Intent to Develop		Leungo Construction Enterprises
Louis Botha Phase 2	Johannesburg, Gauteng, South Africa	2016	2016	Phase 2 Excavations		Royal Haskoning DHV
Sun City Heritage Mapping	Pilanesberg, North-West Province, South Africa	2016	2016	Phase 2 Mapping		Sun International
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015	2016	Heritage Assessment Section 34 Destruction Application	Impact and 34 Permit	Bigen Africa Services (Pty) Ltd
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015	2016	Heritage Assessment Section 34 Application	Impact and Permit	Bigen Africa Services (Pty) Ltd
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015	2016	Heritage Assessment	Impact	Namane Resources (Pty) Ltd

PROJECT	LOCATION	DATES	PROJECT TYPE	CLIENT
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Assessment Impact	Namane Resources (Pty) Ltd
Sibanye WRTRP	Gauteng, South Africa	2014 2016	Heritage Assessment Impact	Sibanye Stillwater
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014 2016	Technical Review	IMIC plc
NLGM Constructed Wetlands Project	Liberia	2015 2015	Heritage Assessment Impact	Aureus Mining
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015 2015	Section 34 Destruction Permit Applications	Ergo (Pty) Ltd
JMEP II EIA	Botswana	2015 2015	Heritage Assessment Impact	Jindal
Oakleaf ESIA Project	Bronkhorstspruit, Gauteng, South Africa	2014 2015	Heritage Assessment Impact	Oakleaf Investment Holdings
Imvula Project	Kriel, Mpumalanga, South Africa	2014 2015	Heritage Assessment Impact	Ixia Coal
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014 2015	Heritage Assessment Impact	VM Investment Company
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2015	Heritage Assessment Impact	Aquarius Resources
Nzoro 2 Hydro Power Project	Oriental Province, Democratic Republic of Congo	2014 2014	Social consultation	Randgold Resources Limited
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Assessment Impact	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Assessment Impact	Ergo (Pty) Ltd
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	Heritage Assessment Impact	BHP Billiton

PROJECT		LOCATION	DATES		PROJECT TYPE		CLIENT
Klipspruit Extension: Weltevreden Project		Ogies, Mpumalanga, South Africa	2014	2014	Heritage Assessment	Impact	BHP Billiton
Ergo Pipeline Assessment	Rondebult Basic	Johannesburg, South Africa	2014	2014	Heritage Assessment	Basic	Ergo (Pty) Ltd
Kibali Project	ESIA Update	Orientele Province, Democratic Republic of Congo	2014	2014	Heritage Assessment	Impact	Randgold Resources Limited
GoldOne Consolidation	EMP	Westonaria, Gauteng, South Africa	2014	2014	Gap analysis		Gold One International
Yzermite PIA		Wakkerstroom, Mpumalanga, South Africa	2014	2014	Palaeontological Impact Assessment		EcoPartners
Sasol Mooikraal Assessment	Basic	Sasolburg, Free State, South Africa	2014	2014	Heritage Assessment	Basic	Sasol Mining
Rea Vaya Project	Phase II C	Johannesburg, Gauteng, South Africa	2014	2014	Heritage Assessment	Impact	ILISO Consulting
New Project	Liberty Gold	Liberia	2013	2014	Grave Relocation		Aureus Mining
Putu Project	Iron Ore Mine	Petroken, Liberia	2013	2014	Heritage Assessment	Impact	Atkins Limited
Sasol Twistdraai Project		Secunda, Mpumalanga, South Africa	2013	2014	Notification of Intent to Develop		ERM Southern Africa
Kibali Project	Gold Hydro-Power	Orientele Province, Democratic Republic of Congo	2012	2014	Heritage Assessment	Impact	Randgold Resources Limited
SEGA Project	Gold Mining	Burkina Faso	2013	2013	Technical Reviewer		Cluff Gold PLC
Consbrey and Collieries Project	Harwar	Breyton, Mpumalanga, South Africa	2013	2013	Heritage Assessment	Impact	Msobo Coal
Falea Environmental Assessment	Uranium Mine	Falea, Mali	2013	2013	Heritage Scoping		Rockgate Capital

PROJECT	LOCATION	DATES		PROJECT TYPE	CLIENT
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013	2013	Heritage Impact Assessment	ERM Southern Africa
SEGA Gold Mining Project	Burkina Faso	2012	2013	Socio Economic and Asset Survey	Cluff Gold PLC
Kibali Gold Project Grave Relocation Plan	Orientele Province, Democratic Republic of Congo	2011	2013	Grave Relocation	Randgold Resources Limited
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012	2012	Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012	2012	Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012	2012	Burial Grounds and Graves Survey	Platreef Resources
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012	2012	Phase 2 Excavations	Resources Generation
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012	2012	Watching Brief	Bokoni Platinum Mine
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010	2010	Heritage survey	Umlando Consultants
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010	2010	Archaeological Impact Assessment	ARM
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010	2010	Phase 2 Excavations	Heritage Contracts Unit
De Brochen and Booyesdal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010	2010	Site Mapping Recording:	Heritage Contracts Unit
Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010	2010	Heritage Statement	Strategic Environmental Focus

PROJECT		LOCATION	DATES		PROJECT TYPE		CLIENT
Bathako Expansion	Mine	North-West Province, South Africa	2010	2010	Phase 2 Mapping		Heritage Contracts Unit
Wenzelrust Excavations		Shoshanguve, Gauteng, South Africa	2009	2009	Phase 2 Excavations		Heritage Contracts Unit
University of the Witwatersrand LIA Shelter Project	Parys	Free State, South Africa	2009	2009	Phase 2 Mapping		University of the Witwatersrand
Archaeological Assessment of Modderfontein Holdings	of AH	Johannesburg, Gauteng, South Africa	2008	2008	Heritage Assessment	Basic	ARM
Heritage Assessment of Rhino Mines		Thabazimbi, Limpopo Province, South Africa	2008	2008	Heritage Assessment	Impact	Rhino Mines
Cronimet Project		Thabazimbi, Limpopo Province, South Africa	2008	2008	Archaeological surveys		Cronimet
Eskom Thohoyandou SEA Project		Limpopo Province, South Africa	2008	2008	Heritage Statement		Eskom
Witbank Archaeological Assessment	Dam Impact	Witbank, Mpumalanga, South Africa	2007	2007	Archaeological survey		ARM
Sun City Archaeological Site Mapping		Sun City, Pilanesberg, North West Province, South Africa	2006	2006	Site Mapping	Recording:	Sun International
Klipriviersberg Archaeological Survey		Meyersdal, Gauteng, South Africa	2005	2006	Archaeological surveys		ARM

## 6 Professional Registration

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA);	270

Position	Professional Body	Registration Number
	ASAPA Cultural Resources Management (CRM) section	
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A
Member	International Association of Impact Assessors (IAIA) South Africa	5494

## 7 Publications

Huffman, T.N. & du Piesanie, J.J. 2011. Khami and the Venda in the Mapungubwe Landscape. *Journal of African Archaeology* 9(2): 189-206

du Piesanie, J.J., 2017. Book Review: African Cultural Heritage Conservation and Management. *South African Archaeological Bulletin* 72(205)



DIGBY WELLS  
ENVIRONMENTAL

## Appendix C: HRM Methodology



DIGBY WELLS  
ENVIRONMENTAL



---

## Cultural Significance, Field Rating and Impact Assessment

### Methodology Statement

---

**Project Number:**

ZZZ9999

**Prepared for:**

Internal Document

June 2019

---

Digby Wells and Associates (South Africa) (Pty) Ltd  
Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag  
X10046, Randburg, 2125, South Africa  
Tel: +27 11 789 9495, Fax: +27 11 069 6801, info@digbywells.com, www.digbywells.com

---

Directors: GE Trusler (C.E.O), LF Stevens, J Leaver (Chairman)\*, NA Mehlomakulu\*, DJ Otto  
\*Non-Executive

---





This document has been prepared by Digby Wells Environmental.

<b>Report Type:</b>	<b>Methodology Statement</b>
<b>Project Name:</b>	<b>Cultural Significance, Field Rating and Impact Assessment</b>
<b>Project Code:</b>	<b>ZZZ9999</b>

#### Revision History

<b>Name</b>	<b>Responsibility</b>	<b>Version</b>	<b>Date</b>
Johan Nel ASAPA Member 095	HRM Unit Manager	Ver. 1	May 2014
		Ver. 2	October 2014
		Ver. 3	May 2015
Justin du Piesanie ASAPA Member 270	Divisional Manager: Social and Heritage Services	Ver. 4	January 2016
		Ver. 5	June 2016
		Ver. 6	June 2019

*This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.*

## TABLE OF CONTENTS

1	Introduction .....	1
2	Evaluation of Cultural Significance and Field Ratings.....	1
2.1	Cultural Significance Determination.....	1
2.2	Field Rating Determination .....	2
3	Impact Assessment Methodology .....	4
3.1	Categorising Impacts to Cultural Heritage .....	6
3.2	Impact Assessment.....	7
4	Recommended Management and Mitigation Measures .....	11

## LIST OF FIGURES

Figure 2-2: Field Ratings Methodology.....	2
Figure 2-1: CS Determination Methodology .....	3
Figure 3-1: Graphical Representation of Impact Assessment Concept.....	5
Figure 3-2: Example of how Potential Impacts are considered .....	5

## LIST OF TABLES

Table 3-1: Description of Duration, Extent, Intensity and Probability Ratings Used in the Impact Assessment.....	8
Table 3-2: Impact Significance Scores, Descriptions and Ratings.....	10
Table 3-3 Relationship between Consequence, Probability and Significance.....	10
Table 4-1: Minimum Recommended Management or Mitigation Requirements Considering CS.....	11

## 1 Introduction

Cultural heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures, are finite, non-renewable and irreplaceable. Considering the innate value of cultural heritage resources, Heritage Resources Management (HRM) acknowledges that these have lasting worth as evidence of the origins of life, humanity and society. It is incumbent of the assessor to determine the cultural significance<sup>1</sup> (CS) of cultural heritage resources to allow for the implementation of appropriate management. This is achieved through assessing cultural heritage resources' value relative to certain prescribed criteria encapsulated in policies and legal frameworks, such as the South African National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

Commensurate to the NHRA, with specific reference to Section 38, this methodology aims to ensure that clients protect cultural heritage during implementation of project activities by either avoiding, removing or reducing the intensity of adverse impacts to tangible<sup>2</sup> and intangible<sup>3</sup> cultural heritage resources within the defined area of influence.

The methodology to define CS and assess the potential effects of a project is discussed separately in the sections below.

## 2 Evaluation of Cultural Significance and Field Ratings

### 2.1 Cultural Significance Determination

Digby Wells developed a CS Determination Methodology to assign identified cultural heritage resources with a numerical CS rating in an objective as possible way and that can be independently reproduced provided that the same information sources are used, should this be required.

This methodology determines the intrinsic, comparative and contextual significance of identified cultural heritage resources by considering their:

1. Importance rated on a six-point scale against four criteria; and
2. Physical integrity rated on a five-point scale.

---

<sup>1</sup> Cultural significance is defined as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a cultural heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.

<sup>2</sup> (i) Moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; (ii) unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls.

<sup>3</sup> Cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

The assigned ratings consider information obtained through a review of available credible sources and representativity or uniqueness (i.e. known examples of similar resources to exist), as well as the current preservation *status-quo* as observed.

Figure 2-2 depicts the CS formula and importance criteria, and it describes ratings on the importance physical integrity scales

## 2.2 Field Rating Determination

Grading of heritage resources remains the responsibility of heritage resources authorities. However, the South African Heritage Resources Agency (SAHRA) Minimum Standards requires heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. Section 7 of the NHRA provides for a system of grading of heritage resources that form part of the national estate and distinguishes between three categories.

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation is done as objectively as possible by integrating the field rating into the significance matrix.

Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with Section 8 of the NHRA. Figure 2-1 presents the formula and the parameters used to determine the Field Ratings.

Field Rating = Average Sum of Aesthetic + Historic + Scientific + Social			
rated against			
Value	Field Rating	Designation	Authority
0	Resource not assessed	None	None
1	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with negligible significance	Grade IV C	Local
2	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with low significance	Grade IV B	
3	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with medium-high significance	Grade IV A	
4	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with high significance	Grade III B	
5	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with very high significance	Grade II A	
6	Resources under formal protection that can be considered to have special qualities that make them significant within a province or region	Grade II	Provincial
7	Resources under formal protection that can be considered to have special qualities that make them significant within a national or international context	Grade I	National

**Figure 2-1: Field Ratings Methodology**

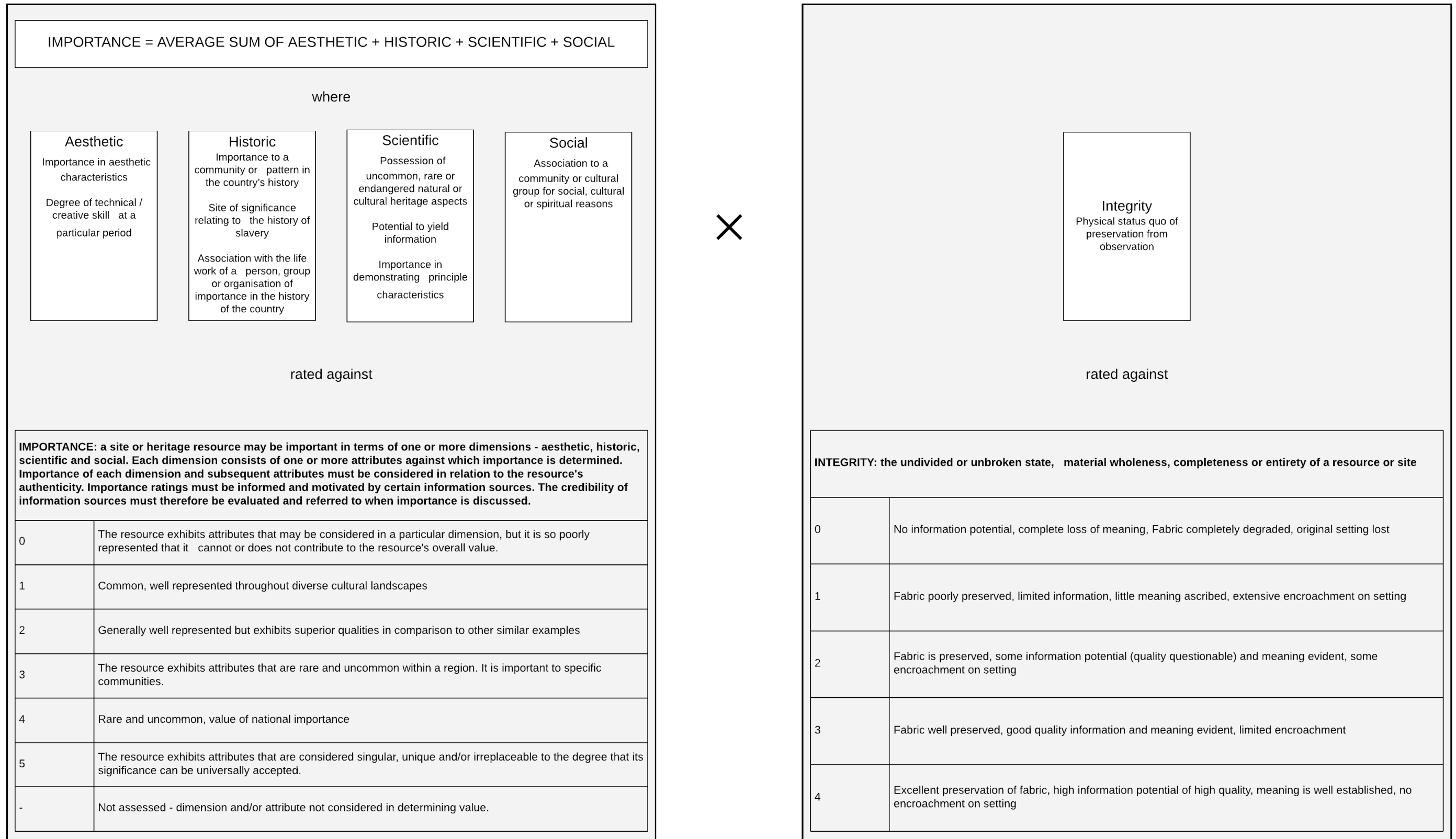


Figure 2-2: CS Determination Methodology

### 3 Impact Assessment Methodology

The rationale behind CS determination recognises that the value of a cultural heritage resource is a direct indication of its sensitivity to change (impacts) as well as the maximum acceptable levels of change to the resource. Therefore, the assessor must determine CS prior to the completion of any impact assessment.

These requirements in terms of international best practice standards are integrated into the impact assessment methodology to guide both assessments of impacts and recommendations for mitigation and management of resources.

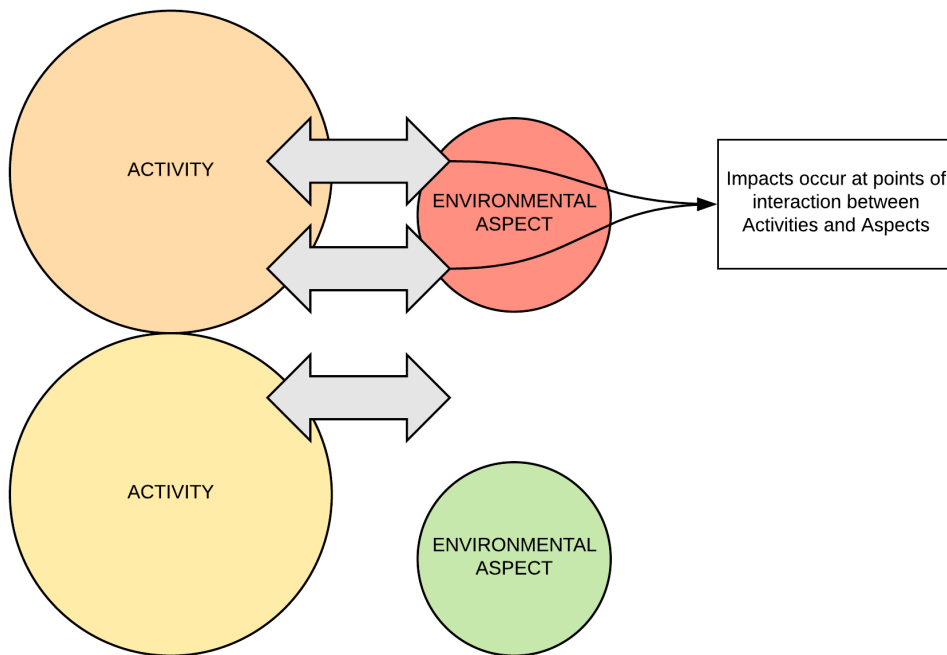
The following are terms and definitions applicable to the Environmental Impact Assessment (EIA) concept (ISO 14001):

- **Project Activity:** Activities associated with the Project that result in an environmental interaction during various phases, i.e. construction, operation and decommissioning, e.g., new processing plant, new stockpiles, development of open pit, dewatering, water treatment plant;
- **Environmental Interaction:** An element or characteristic of an activity, product, or service that interacts or can interact with the environment. Environmental interactions can cause environmental impacts (but may not necessarily do so). They can have either beneficial impacts or adverse impacts and can have a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change;
- **Environmental Aspect:** Various natural and human environments that an activity may interact with. These environments extend from within the activity itself to the global system, and include air, water, land, flora, fauna (including people) and natural resources of all kinds; and
- **Environmental Impact:** A change to the environment that is caused either partly or entirely by one or more environmental interactions. An environmental interaction can have either a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change. In addition, it can have either a beneficial environmental impact or an adverse environmental impact.

The assessment process identified potential issues and impacts through examination of:

- Project phases and activities,
- Interactions between activities and the environmental aspect; and
- The interdependencies between environmental aspects.

Figure 3-1 presents a graphical summary of this concept and Figure 3-2 provides an example of the process.



**Figure 3-1: Graphical Representation of Impact Assessment Concept**

Project Activity & Interaction		Environmental Aspect		Potential Environmental Impact	
Project Phase	Activity	Aspect	Interdependencies	Issue	Potential Impact
This relates to the consideration of the relevant phase of the project. <b>Example: Construction</b>	This refers to one or more of the activities that will be undertaken during the corresponding phase of the project. <b>Example: Topsoil clearing</b>	This identifies and considers the various aspects that will be affected by the project activity. <b>Example: Heritage, Biophysical, and Social</b>	This identifies and considers the interdependencies between the various aspects and how they may be impacted upon by the relevant activity. <b>Example: Removal of topsoil will impact on flora which may have heritage and social implications</b>	The issues considers the activity in relation to the identified aspects and interdependencies. Note: Activities and Aspects can have several issues resulting in various impacts. <b>Example: Physical alteration of the land</b>	Potential impacts are a culmination of the various categories evaluated as part of the impact assessment. <b>Example: Topsoil clearing will remove medicinal plants that will erode indigenous knowledge systems and cultural significance.</b>

**Figure 3-2: Example of how Potential Impacts are considered**



### 3.1 Categorising Impacts to Cultural Heritage

Impacts may manifest differently among geographical areas and diverse communities. For instance, impacts to cultural heritage resources can simultaneously affect the tangible cultural heritage resource and have social repercussions. The severity of the impact is compounded when the intensity of physical impacts and social repercussions differ significantly, e.g. removal of a grave surface dressings results in a minor physical impact but has a significant social impact. In addition, impacts to cultural heritage resources can influence the determined CS without a physical impact taking place. Given this reasoning, impacts as considered here are generally placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary impacts** affect the fabric or physical integrity of the cultural heritage resource, for example destruction of an archaeological site or historical building. Direct or primary 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. For example, the destruction of a low-density scatter of archaeological material culture may be assessed as a negatively high impact if CS is not considered;
- **Indirect, induced or secondary impacts** can occur later in time or at a different place from the causal activity, or because of a complex pathway. For example, restricted access to a cultural heritage resource resulting in the gradual erosion of its CS that may be dependent on ritual patterns of access. Although the physical fabric of the cultural heritage resource is not affected through any primary impact, its CS is affected, which can ultimately result in the loss of the resource itself; and
- **Cumulative impacts** result from in-combination effects on cultural 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:
  - **Additive:** the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area;
  - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area;
  - **Time crowding:** frequent, repetitive impacts on a cultural heritage resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building;
  - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area; and/or



- **Space crowding:** high spatial density of impacts on a cultural heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

The fact that cultural heritage resources do not exist in isolation from the wider natural, social, cultural and heritage landscape demonstrates the relevance of the above distinctions: CS is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

### 3.2 Impact Assessment

The impact assessment process is designed to provide a numerical rating of the identified potential impacts. This methodology follows the established impact assessment formula:

*Impact = consequence of an event x probability of the event occurring*

*where:*

*Consequence = type of impact x (Duration + Extent + Intensity)*

*and*

*Probability = Likelihood of an impact occurring*

*In the formula for calculating consequence:*

*Type of impact = +1 (positive) or -1 (negative)*

Table 3-1 presents a description of the duration, extent, intensity and probability ratings. The intensity rating definitions consider the determined CS of the identified cultural heritage resources. These criteria are used to determine the impact ratings as defined in Table 3-2 below. Table 3-3 represents the relationship between consequence, probability and significance.

The impact assessment process considers pre- and post-mitigation scenarios with the intention of managing and/or mitigating impacts in line with the EIA Mitigation Hierarchy, i.e. avoiding all impacts on cultural heritage resources. Where Project-related mitigation does not avoid or sufficiently minimise negative impacts on cultural heritage resources, mitigation of these resources may be required.

**Table 3-1: Description of Duration, Extent, Intensity and Probability Ratings Used in the Impact Assessment**

Value	CONSEQUENCE						PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		Probability	Description
	Probability	Description	Exposure	Description	Intensity	Description		
7	<b>Permanent</b>	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	<b>International</b>	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	<b>Extremely high</b>	Major change to Heritage Resource with High-Very High Value	<b>Certain/Definite</b>	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	<b>Beyond Project Life</b>	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	<b>National</b>	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	<b>Very high</b>	Moderate change to Heritage Resource with High-Very High Value	<b>High probability</b>	Happens often. It is most likely that the impact will occur.
5	<b>Project Life</b>	The impact will cease after project life.	<b>Region</b>	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	<b>High</b>	Minor change to Heritage Resource with High-Very High Value	<b>Likely</b>	Could easily happen. The impact may occur.
4	<b>Long Term</b>	Impact will remain for >50% - Project Life	<b>Municipal area</b>	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	<b>Moderately high</b>	Major change to Heritage Resource with Medium-Medium High Value	<b>Probable</b>	Could happen. Has occurred here or elsewhere
3	<b>Medium Term</b>	Impact will remain for >10% - 50% of Project Life	<b>Local</b>	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	<b>Moderate</b>	Moderate change to Heritage Resource with Medium - Medium High Value	<b>Unlikely / Low probability</b>	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.

Value	CONSEQUENCE						PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		Probability	Description
	Probability	Description	Exposure	Description	Intensity	Description		
2	<b>Short Term</b>	Impact will remain for <10% of Project Life	<b>Limited</b>	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site-specific study area.	<b>Low</b>	Minor change to Heritage Resource with Medium - Medium High Value	<b>Rare / Improbable</b>	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	<b>Transient</b>	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	<b>Very Limited</b>	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	<b>Very low</b>	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	<b>Highly Unlikely /None</b>	Expected never to happen. Impact will not occur.

**Table 3-2: Impact Significance Scores, Descriptions and Ratings**

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

**Table 3-3 Relationship between Consequence, Probability and Significance**

Relationship between consequence, probability and significance ratings																																							
		Significance																																					
Probability	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
	6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
	5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
	3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
	2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
	1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		Consequence																																					

## 4 Recommended Management and Mitigation Measures

The CS of an identified heritage resource informs the level of the identified potential impact to that resource which in turn informs the recommended management and mitigation requirements. Table 4-1 presents an overview of the minimum recommended mitigation requirements considering the CS of the heritage resource.

**Table 4-1: Minimum Recommended Management or Mitigation Requirements Considering CS**

<b>Determined CS</b>	<b>Minimum Management / Mitigation Requirements<sup>4</sup></b>
Negligible	Sufficiently recorded through assessment, no mitigation required
Low	Resource must be recorded before destruction, may include detailed mapping or surface sampling
Medium	Mitigation of the resource to include detailed recording and limited test excavations
Medium-High	Project design must aim to minimise impacts; Mitigation of resources to include extensive sampling through test excavations and analysis
High	Project design must aim to avoid impacts; Cultural heritage resource to be partially conserved, must be managed by way of Conservation Management Plan
Very High	Project design must be amended to avoid all impacts; Cultural heritage resources to be conserved in entirety and conserved and managed by way of Conservation Management Plan

The desired outcome of an impact assessment is the avoidance of all negative impacts and enhancement of positive ones. While this is not always possible, the recommended management or mitigation measures must be reasonable and feasible taking into consideration the determined CS and nature of the Project.

Two categories of impact management options are considered: avoidance and mitigation.

Avoidance requires changes or amendments to Project design, planning and siting of infrastructure to avoid physical impacts on heritage resources. It is the preferred option, especially where cultural heritage resources with high – very-high CS will be impacted.

<sup>4</sup> Based on minimum requirements encapsulated in guidelines developed by SAHRA

Mitigation of cultural heritage resources may be necessary where avoidance is not possible, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be protected until they are fully recorded, documented and researched before any negative impact occurs. Options for mitigating a negative impact can include minimization, offsets, and compensation. Examples of mitigation measures specific to cultural heritage include:

- Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”; and
- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is normally a regulated permitted activity for which permits<sup>5</sup> need to be issued by the Heritage Resource Authorities (HRAs). Such mitigation may result in a reassessment of the value of a cultural heritage resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled.

Where resources have negligible CS, the specialist may recommend that no further mitigation is required, and the site may be destroyed where authorised.

Community consultation is an integral activity to all above-mentioned avoidance and mitigation measures.

---

<sup>5</sup> Permit application processes must comply with the relevant Section of the NHRA and applicable Chapter(s) of the NHRA Regulations, 2000 (Government Notice Regulation [GN R] 548) and must be issued by SAHRA or the Provincial Heritage Resources Authority (PHRA) as is applicable.