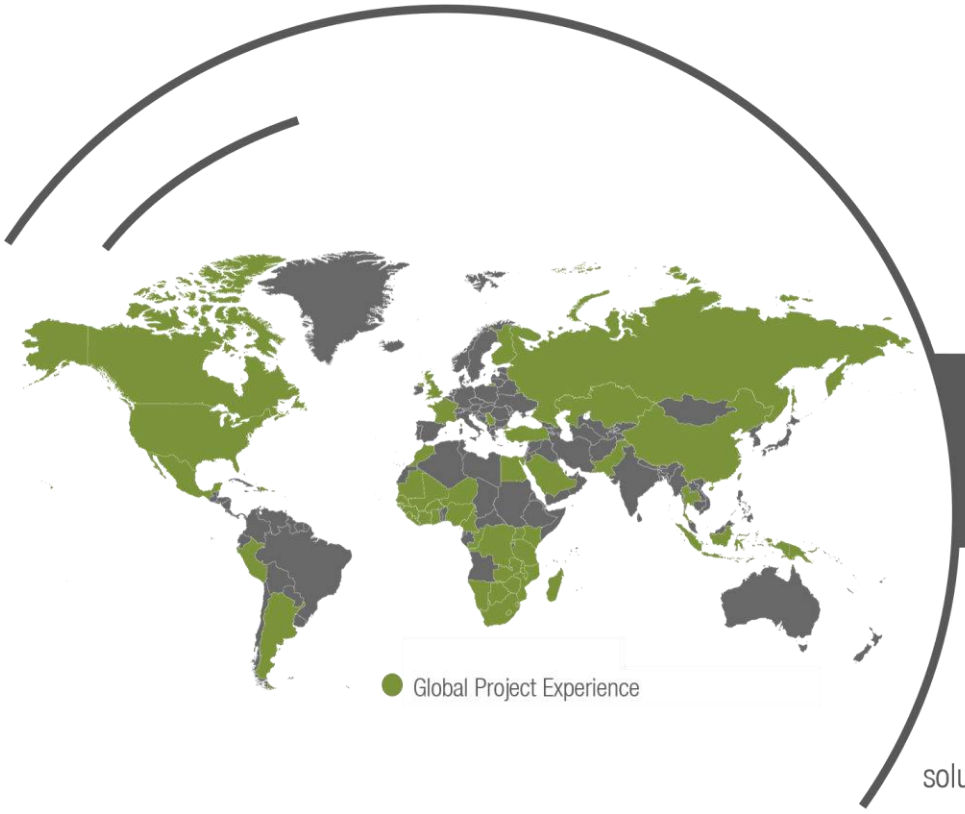

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Integrated Regulatory Process for the De Beers Group Venetia Mine near Alldays, Limpopo Province

Consolidated Heritage Impact Assessment

Prepared for:
De Beers Group

Project Number:
DBG6952

October 2022

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This document has been prepared by Digby Wells Environmental.

Report Type:	Consolidated Heritage Impact Assessment
Project Name:	Integrated Regulatory Process for the De Beers Group Venetia Mine near Alldays, Limpopo Province
Project Code:	DBG6952

Name	Responsibility	Signature	Date
Shannon Hardwick HRM Consultant ASAPA Member: 451	Report Compilation		October 2022
Johan Nel Manager: Heritage Services ASAPA Member 095	Technical Review		October 2022
Brett Coutts	Project Manager Review		October 2022

DETAILS AND DECLARATION OF THE SPECIALIST

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

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Full name:	Shannon Hardwick
Title/ Position:	Heritage Resources Management Consultant
Qualification(s):	Master of Science (MSc) Archaeology
Experience (years):	5 years
Registration(s):	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 14/11/2022*

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

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

EXECUTIVE SUMMARY

The De Beers Group (De Beers) received Environmental Authorisation (EA) to continue with the conversion from an open pit to an underground mining operation at Venetia Mine and is currently implementing this conversion. De Beers appointed Digby Wells Environmental (Digby Wells) as the independent Environmental Assessment Practitioner (EAP) to undertake an Integrated Regulatory Process (IRP) to obtain further EA for additional infrastructure required for this transition.

As part of the IRP, a Gap Analysis was undertaken. This included a site visit followed by a desktop review of all existing authorisations in line with proposed changes to activities, products and services at the mine, including closure risks and requirements, to identify listed activities that may be triggered by the project and all other regulatory procedural requirements. The Gap Analysis concluded with recommendations on a way forward for the mine to achieve compliance with all relevant legislation. An IRP consisting of a Basic Assessment (BA) and Regulation 29 and 31 Amendment Process in terms of the Environmental Impact Assessment Regulations, 2014 (GN R982 of 04 December 2014, as amended) (EIA Regulations, 2014) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) needs to be followed and concluded prior to proposed activities commencing.

This document constitutes a consolidated Heritage Assessment Report and Heritage Impact Assessment (HIA) Report in support of the Project and IRP for submission to the Heritage Resources Authorities (HRAs) in compliance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

This submission will allow the HRAs to provide comment on the proposed mitigation measures and management strategies, informed by the rest of the report. The HRAs may further include recommendations or conditions of authorisation or detail any additional studies that may be required, through Interim or Final Comment. De Beers or Venetia Mine will be responsible for implementing these conditions and may need to appoint an independent consultant to meet these requirements.

This assessment was informed by secondary data only and no in-field assessments were carried out as the scope of the proposed project area has been previously assessed. The secondary data was obtained predominantly from heritage assessments completed previously at the Venetia Mine. Heritage resources identified through these heritage assessments are presented in the table below. Some of these heritage resources have been subjected to Phase 2 Mitigations to minimise identified impacts. This has affected the Cultural Significance of the heritage resources (as indicated below).

Summary of the Cultural Significance of Identified Heritage Resources

Resource ID	Description	Cultural Significance
Venetia 103: Graveyard	Burial Grounds & Graves	High
Venetia 103: TVT1/1, TVT1/2	Iron Age Village (cluster of sites)	Low to Medium
Elesger 98		
Venetia 103: TVT3/1, TVT3/2, TVT3/3, TVT3/4		
Venetia 103: TVT2/1	MSA Stone Tool Scatter	Low
Venetia 103: TVT2/1	Remainder after mitigation	
Venetia 103: TVT3/1, TVT3/2, TVT3/3, TVT3/4		

Based on the findings of the assessment, Digby Wells does not envisage any impacts to the identified heritage resources. Detailed heritage assessments have been undertaken for the entire project area and all relevant sites have appropriate mitigation measures that have been adopted.

The proposed Project does, however, present a risk (low risk exposure) 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.

The table below summaries potential risks to these resources, however it should be noted that all appropriate mitigation measures that are currently in place to address the below mentioned risk, such as the Chance Find Procedure and Heritage Management Plan are in place.

Summary of the potential risk to heritage resources

Unplanned event	Potential impact	Comments
Accidental exposure of fossil bearing material implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA.	The underlying Precambrian rocks of the Beit Bridge Complex do not host fossils and no fossils have been reported from the overlying Quaternary sediments. The rocks of the Ecca group are known to host fossil glossopterid plants but these fall outside the limits of the study area. It is thus extremely unlikely that fossils will be found in the study area. In the event that fossils are found the CFP must be implemented (Rubidge, 2021)[1]. Low risk o exposure.
Accidental exposure of *in situ* archaeological material during the implementation of the Project.		Low risk of exposure. No archaeological material is known to occur in the mine footprint area. Implement the CFP if such resources are encountered.
Accidental exposure of *in situ* historical built environment sites during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA	Low risk of exposure. Implement the CFP if such resources are encountered.
Accidental exposure of *in situ* burial grounds or graves during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA.	Low risk of exposure. Implement the CFP if such resources are encountered.
Accidental exposure of human remains during the construction phase of the Project.		Low risk of exposure. Implement the CFP if such resources are encountered.

The recommendations included in the previous heritage assessments undertaken remain relevant and must be applied were appropriate. Some of these have been implemented, but

[1] Desktop Palaeontological Impact Assessment: Venetia Mine - Water Management Development, Rubige, 2021).

are not applicable to the current Project. The table below presents a summary of the recommendations applicable to this project.

Status of Current Recommendations applicable to this Project

Recommendations	Status
Adopting mitigation measures to reduce the impact of noise while blasting.	Ongoing
Investigating in more detail the potential impacts of dust fallout on the heritage landscape, particularly rock art.	No rock art has been identified in the proposed Project area. Fall-out dust monitoring is undertaken monthly.
Develop and implement an effective Heritage Management Plan to monitor applicable heritage resources and implement medium to long-term management objectives.	This management plan has been developed and is in place. De Beers intend to update this plan by the first quarter of 2023.
Any development within the Venetia Mine that disturbs currently undisturbed ground must be assessed through an HIA process.	Noted by De Beers.
Any additional developments or maintenance activities in the Mapungubwe National Park and World Heritage Site must be preceded by an HIA process in terms of Section 38 of the NHRA.	

Considering the nature and the scope of the Project, Digby Wells recommends De Beers continues to:

- Follow the existing Chance Finds Protocol (CFP)[2], including during the construction and operation of this Project;
- Implement the existing grievance mechanism in place, which also includes heritage resources;

Digby Wells further recommends De Beers:

- Monitor undisturbed areas for the exposure of archaeological or tangible heritage resources during project work; and
- Should a change to the proposed project present a risk direct negative impact to the identified heritage resources, the mitigation measures included in the original heritage

[2] Such as the Venetia Mine EMS Heritage Resources Procedure.

assessment report or the minimum mitigation measures as outlined above remain applicable.

The above recommendations are described in more detail in the report. Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project provided all previous and current recommendations are adopted and implemented.

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ACRONYMS, ABBREVIATIONS AND DEFINITION

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

Abbreviation	Meaning
Kya	Thousand years ago
LED	Local Economic Development
LFC	Late Farming Community also known as Late Iron Age
LIHRA	Limpopo Provincial Heritage Resource Authority
LSA	Late Stone Age
MIA	Middle Iron Age
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MR	Mining Right (boundary)
MRA	Mining Right Application
MSA	Middle Stone Age
MSc	Master of Science
Mtpa	Million tonnes per annum
Mya	Million years ago
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
PCD	Pollution Control Dam
PHRA	Provincial Heritage Resources Authority
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SCF	Statutory Comment Feedback
SEP	Stakeholder Engagement Process
SoW	Scope of Work
ToR	Terms of Reference
Wits	University of the Witwatersrand
Werf	A farmstead or multiple outbuildings associated with a farmhouse or agricultural activities. Plural: *werwe* (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)	-	0 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: - Existing impacts on the site; - Possible risks to heritage resources; - Cumulative impacts of the proposed development; - Acceptable levels of change; and - Heritage-related risks to the project.	1(cB)	38(3)(c)	7
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

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 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)		
Any mitigation measures for inclusion in the Environmental Management Programme (EMPr)	1(k)		8
Any conditions for inclusion in the environmental authorisation.	1(l)		11
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	1(m)		9
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)	12.2
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)	0
Lists the source material used in the development of the report.	1(cA)	-	13
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)	-	
Any other information requested by the competent authority.	1(q)	-	N/A

1. Introduction

The De Beers Group (De Beers) received Environmental Authorisation (EA) to continue with the conversion from an open pit to an underground mining operation at Venetia Mine and is currently implementing this conversion. De Beers appointed Digby Wells Environmental (Digby Wells) as the independent Environmental Assessment Practitioner (EAP) to undertake an Integrated Regulatory Process (IRP) to obtain further EA for additional infrastructure required for this transition.

As part of the IRP, a Gap Analysis was undertaken. This included a site visit followed by a desktop review of all existing authorisations in line with proposed changes to activities, products and services at the mine, including closure risks and requirements, to identify listed activities that may be triggered by the project and all other regulatory procedural requirements. The Gap Analysis concluded with recommendations on a way forward for the mine to achieve compliance with all relevant legislation. An IRP consisting of a Basic Assessment (BA) and Regulation 29 and 31 Amendment Process in terms of the Environmental Impact Assessment Regulations, 2014 (GN R982 of 04 December 2014, as amended) (EIA Regulations, 2014) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) needs to be followed and concluded prior to proposed activities commencing.

This document constitutes a consolidated Heritage Assessment Report and Heritage Impact Assessment (HIA) Report in support of the Project and IRP for submission to the Heritage Resources Authorities (HRAs) in compliance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

This assessment was informed by secondary data only and no in-field assessments were carried out as the scope of the proposed project area has been previously assessed. The secondary data was obtained predominantly from heritage assessments completed previously at the Venetia Mine. Heritage resources identified through these heritage assessments are presented in Section 6.2 . Some of these heritage resources have been subjected to Phase 2 Mitigations to mitigate identified impacts – these are also summarised in Section 6.2.

1.1. Terms of Reference

De Beers appointed Digby Wells as the Independent Environmental Assessment Practitioner (EAP) to undertake an IRP in support of the transition to an underground mine at Venetia and a BA process. These processes include the consolidation of the heritage assessments undertaken at Venetia and the compilation of an HIA in compliance with Section 38 of 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 secondary data collection only, focused on the heritage assessments completed within the Venetia Mine operation [in compliance with Section 38(3)(a) of the NHRA] applicable to the proposed project footprint;
- Identification of potential impacts to heritage resources based on the Project description and Project activities [38(3)(c)];
- An evaluation of the potential impacts to heritage resources relative to the sustainable socio-economic benefits that may result from the Project [38(3)(d)];
- Recommending feasible management measures and/or mitigation strategies to avoid and/or minimise negative impacts and enhance potential benefits resulting from the Project [38(3)(g)]; and
- Submission of the HIA report (and supporting reports) to the HRAs for Statutory Comment as required under Section 38(8) of the NHRA.

Primary data collection in the form of a pre-disturbance survey was excluded from this process, due to the nature of the site (i.e., operational mine), location of the proposed infrastructure in disturbed areas and Venetia Mine's safety and security concerns.

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 A includes the full CVs of these specialists.

Table 1-1: Expertise of the Specialists

Team Member	Bio Sketch
Shannon Hardwick ASAPA Member: 451 ICOMOS Member 38048 Years' Experience: 5	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 *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience through the compilation of various heritage assessments, including Heritage Scoping Reports (HSRs), Heritage Impact Assessments (HIAs), Heritage Basic Assessment Reports (HBARs) and Section 34 permit applications. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and various social baselines. Shannon's experience in the field includes pre-disturbance surveys in South Africa, Malawi and the Democratic Republic of the Congo and other fieldwork in Malawi.

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

2. Project Background and Description

The Venetia Mine is located approximately 40 km northeast of Alldays and 80 km west of Musina in the Musina Local Municipality (MLM) within the Vhembe District Municipality (VDM) of the Limpopo Province. The international border with Botswana and Zimbabwe is approximately 30 km north of Venetia. Plan 1 presents an overview of the location of the location of the Project.

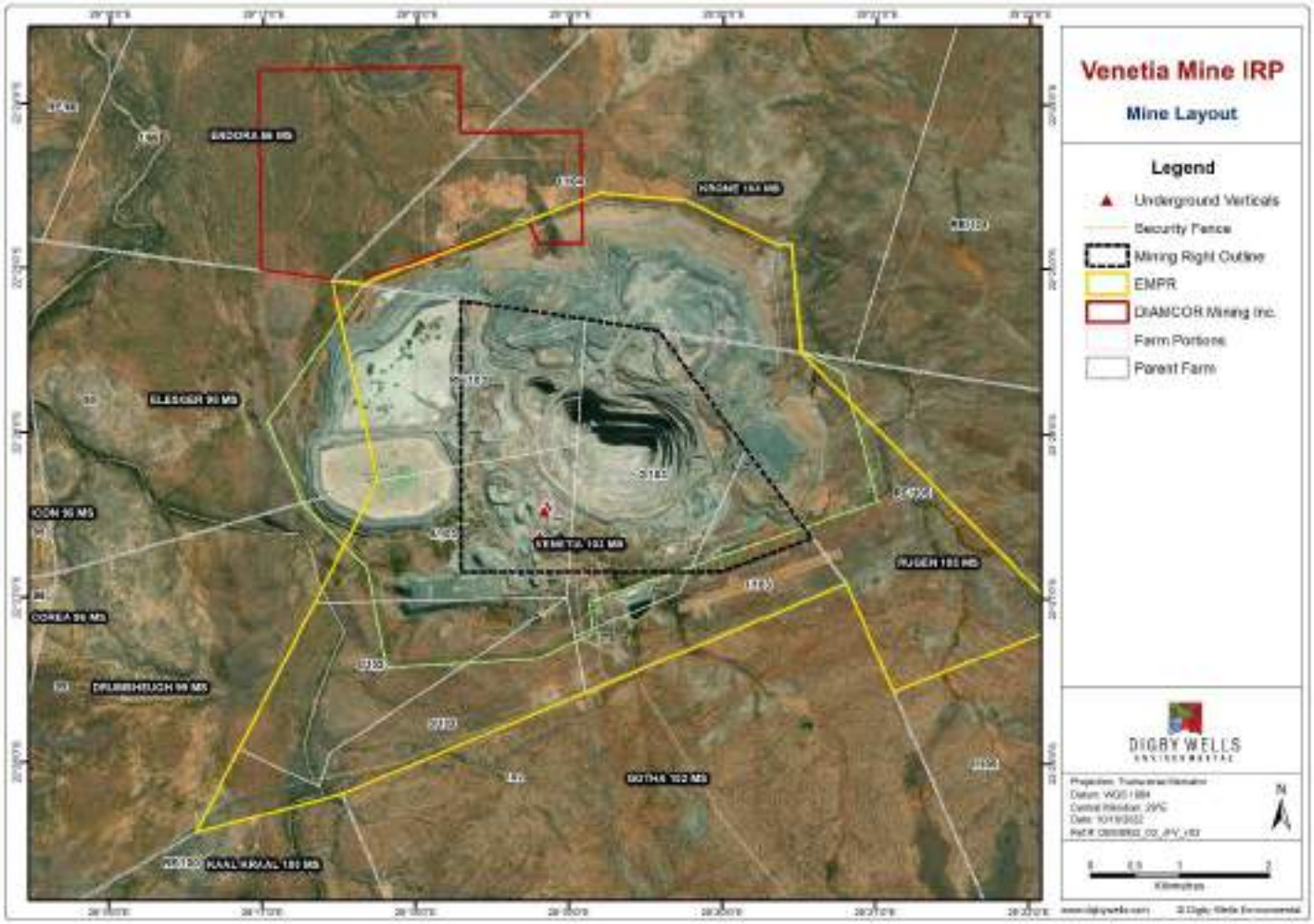
The Venetia mine boundary encompasses approximately 3 000 ha of land across five farms. These farms are:

- Drumsheugh 99 MS;
- Elesger 98 MS;
- Krone 104 MS (Portion 1 and the Remainder);
- Rugen 105 MS (Remainder); and
- Venetia 103 MS (Portions 1, 2, 3, 4, 5 and Remainder).

Venetia Mine is located approximately 25 km from the Mapungubwe Cultural Landscape World Heritage Site core area and is located within the buffer zone (refer to Section 6.1 for a more detailed description of this heritage site). Adjacent to the mine itself is the Venetia Limpopo Nature Reserve (VLNR), owned by De Beers and comprising approximately 36 000 ha.

Mining at Venetia began in 1992, originally as an open pit. However, as the open pit increased in depth, mining became non-viable financially. The EA has consequently been received to continue as an underground operation.

De Beers has appointed various consultants to undertake heritage assessments at Venetia in support of various projects. Table 2-1 includes an outline of the available existing heritage assessments and Table 2-2 includes a summary of the permits issued for heritage mitigations within the Venetia Mine.



Plan 1: Regional and Local Setting of the Project

Table 2-1: Existing Available Heritage Assessments to Date

Reference	Document Title
Pistorius, 2011	A Phase 1 Archaeological Impact Assessment (AIA) Study for De Beers Consolidated Mines (Venetia Mine) in the Limpopo Province: An Amendment of Existing Environmental Management Programmes / Programme Reports (EMPrs) and the Development of an Environmental Impact Assessment (EIA) for the Proposed Underground Mining Project and the Review and Consolidation of all EMPs and EMPrs for the Existing Operation.
Rubidge, 2011	Venetia Mine, Limpopo Province – Palaeontological Impact Assessment
Siyathembana, 2013	Heritage Impact Assessment Report and Heritage Management Plan for the Venetia Underground Project and Consolidation of Existing Operations for De Beers Consolidated Mines Limited – Venetia Mine
Chirikure & Murimbika, 2015	Monitoring of Archaeological Sites during Consolidation of Existing Activities for the Venetia Underground Project for De Beers Consolidated Mines Limited – Ventia Mine
Chirikure & Bandama, 2015	Mitigation of Archaeological Sites to be Impacted by the Consolidation of Existing Activities at Venetia mine near Alldays, Musina, Limpopo Province
Chirikure, 2018	Permit report for the refurbishment and re-drilling of boreholes along the Limpopo River in Mapungubwe National Park and World Heritage Site by Venetia Mine
Chirikure & Mathoho, 2020	Heritage Resources Monitoring Report: Limpopo Province, South Africa.
Miller, 2021	1st phase H.I.A. of a proposed upgrading and extension of the proposed storm-water management project at Venetia Mine, Limpopo Province, South Africa
	Addendum to the 1st phase H.I.A. of a proposed upgrading and extension of the proposed storm-water management project at Venetia Mine, Limpopo Province, South Africa
	2nd Addendum to the 1st phase H.I.A. of a proposed upgrading and extension of the proposed storm-water management project at Venetia Mine, Limpopo Province, South Africa
Rubidge, 2021	Desktop Palaeontological Impact Assessment: Venetia Mine - Water Management Development
De Beers, No Date	Cultural Heritage Management: Venetia Mine

Table 2-2: Heritage Permits Issued with Relevance to Venetia Mine

Number	Permit Holder	Permit Type	Affected Site	Expiration Date
2083	Dr Shadreck Chirikure	Excavation	Elseger 98	31 August 2016
2084	Dr Shadreck Chirikure	Excavation	Venetia 103 TVT3/2	31 August 2016
2086	Dr Shadreck Chirikure	Excavation	Venetia 103 TVT3/3	31 August 2016
2087	Dr Shadreck Chirikure	Excavation	Venetia 103 TVT3/1	31 August 2016
2639	Mr Petrus Visser	Maintenance / Restoration	"Mapungubwe Cultural Landscape" [3]	31 October 2018
3039	Ndivhuho Eric Mathoho	Maintenance / Restoration	"Mapungubwe Cultural Landscape" [4]	21 November 2022

2.1. Proposed Infrastructure and Activities

The following section outlines the Infrastructure and Activities that being applied and proposed as part of the BA Process.

2.1.1. Amendment of the EMPr

The approved EMPr does not explicitly mention the include the existing underground decline shaft; however, has included two shafts. The change in the access mining method will not in itself trigger a listed activity. However, it could be included as a non-substantive amendment, as the change has no new additional impacts based on the initial approval and no other person's rights will be affected by the change. The decline shaft will be included as a non-substantive amendment in terms of Regulation 29 Amendment Process in terms of the EIA Regulations 2014 promulgated under the NEMA.

2.1.2. New activities to be Applied for

- Additional pipelines to transport dangerous goods, such as hydrocarbons (diesel);
- Construction of the clean water attenuation pond and several small underground water storage dams;
- AEL variation application that is underway;
- Storage of hydrocarbons at underground and surface;
- Decommissioning of facilities and infrastructure;
- Expansion of the Waste Rock Dumps (WRD) and Red Area Tailings Footprint;
- Clearance of vegetation.

[3] As referred to in the permit. This permit was issued to allow De Beers to undertake maintenance on four boreholes located along the Limpopo River in the Mapungubwe National Heritage Site.
[4] As referred to in the permit. This permit was issued to allow De Beers to undertake maintenance on a 1.2 km stretch of powerline within the Mapungubwe National Heritage Site.

2.2. Alternatives Considered

This HIA process does not consider any alternatives in terms of the proposed technologies, methodologies or proposed infrastructure layout.

The HRM process considered the 'no-go' alternative. Should the Project not obtain approval, or not go ahead for any reason, potential negative environmental impacts associated with the construction and operation of the proposed additional infrastructure will not occur. However, the potential benefits (associated with the Project described in Section 12.1) would also not occur.

3. Relevant Legislation, Standards and Guidelines

This section describes the international, national and regional legislative framework and policy documents that inform 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 to this assessment)

Applicable legislation used to compile the report	Reference where applied
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) 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 – i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development	The HRM process was undertaken to determine heritage impacts associated with the Project. 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.

Applicable legislation used to compile the report	Reference where applied
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa, with specific reference to the following Sections: • 5. General principles for HRM • 6. Principles for management of heritage resources • 7. Heritage assessment criteria and grading • 38. Heritage resources management 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.	This 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 LIHRA.
NHRA Regulations, 2000 (GN R 548) 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: • II. Permit Applications and General Provisions for Permits; • III: Application for Permit: National Heritage Site, Provincial Heritage Site, Provisionally Protected Place or Structure older than 60 years; • IV: Application for Permit: Archaeological or Palaeontological or Meteorite; • IX: Application for Permit: Burial Grounds and Graves; • X: Procedure for Consultation regarding Protected Area; • XI: Procedure for Consultation regarding Burial Grounds and Graves; and • XII: Discovery of Previously Unknown Graves.	The HRM process was undertaken with cognisance of the applicable regulations. The proposed mitigation strategies and management measures must comply with these requirements.

Applicable legislation used to compile the report	Reference where applied
National Environmental Management Act, 1998 (Act No. 107 of 1998) 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: *The potential impact on the environment, socio-economic conditions and cultural heritage of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.* 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.	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.
GN R. 982: Environmental Impact Assessment Regulations, 2014 (as amended by GN R 326 of 7 April 2017) 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: • 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. • 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	Refer to the BAR for a full description of the Listed Activities triggered by the proposed Project. To comply with the regulations, an EIA process must be completed in support of the EA application. This report was completed to inform the EIA process to comply with Section 24 of the NEMA.

Applicable legislation used to compile the report	Reference where applied
authorisation and which must follow an environmental impact assessment process. • 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.	

Table 3-2: Applicable Policies Considered in the HRM process

Applicable policies used to compile the report	Reference where applied
SAHRA Archaeology, Palaeontology and Meteorites (APM) Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports (2007) 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: • Background information on the Project; • Background information on the cultural baseline; • Description of the properties or affected environs; • Description of identified sites or resources; • Recommended field rating of the identified sites to comply with Section 38 of the NHRA; • A statement of Cultural Significance in terms of Section 3(3) of the NHRA; and • Recommendations for mitigation or management of identified heritage resources.	This report was compiled to adhere to the minimum standards as defined by Chapter II of the SAHRA Minimum Standards (2007).

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 permitted activities, such as a Grave Relocation Process (GRP), may be required.

4. Assumptions, Limitations and Exclusions

Table 4-1 provides an overview of constraints and limitations encountered during the HRM process.

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 below is considered accurate but may not include new data or information which may not have been made available to the public.
This report was informed by secondary data collection only. The Project area was not surveyed in this HRM Process and the presence and condition of identified heritage resources was not verified by Digby Wells.	Archaeological and palaeontological resources commonly occur at subsurface levels. The reviewed literature is therefore typically limited to surface observations. Project activities can expose subsurface tangible heritage. De Beers must alert the HRAs of any chance finds as per the existing procedures[5]. De Beers has enlisted the services of a suitably qualified archaeologist or palaeontologist to review all identified resources in and around the mining footprint[6]. The outcomes will be furthered independently of this project. It is assumed the previously recorded heritage resources are accurate and true and that the condition of the heritage resources has remain unchanged since the relevant assessment was completed. Digby Wells has not reassessed the Cultural Significance of identified heritage resources, as the condition of such resources was not verified or assessed.

[5] Such as the Venetia Mine Environmental Management System (EMS) Heritage Resources Procedure.
[6] This process is being undertaken as part of the requirements of the Anglo American Social Way 3 (AASW 3.0) and is beyond Digby Wells' SoW.

Description	Consequence
The proposed Project design and infrastructure layout was not available at the time of compiling this report.	Digby Wells assumes that the proposed infrastructure will avoid impacts to known heritage resources, in line with recommendations included in existing heritage assessments. This has been considered in the impact assessment. The proposed Project layout will be informed, in part, by the outcomes of this assessment.

5. Methodology

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

5.1. Defining the Study Area

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

- The *infrastructure area*: the area affected by the proposed Project and proposed infrastructure, including a 500 m buffer zone. The infrastructure area may extend linearly, in which case the infrastructure area will include the linear development and a 200 m buffer on either side of the footprint;
- The *operational area*: the area covered by the Venetia Mine operation;
- The *local study area:* the area most likely to be influenced by any changes to heritage resources in the Project area, or where project development could cause heritage impacts. The local study area is defined as the area bounded by the local municipality and includes particular reference to the immediate surrounding properties or farms. The local study area is specifically examined to offer a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provides the local development and planning context that may contribute to cumulative impacts. The Project area is situated within the MLM; and
- The *regional study area:* the area bounded by the district municipality demarcation. In this case, the Project is located in the VDM. Where necessary, the regional study area may be extended outside the boundaries of the district municipality to include areas closest to the Project area. The aim of this is to include much wider expressions of specific types of heritage resources and historical events. The regional study area also provides the regional development and planning context that may contribute to cumulative impacts.

5.2. Statement of Cultural Significance

Digby Wells did not reassess the Cultural Significance of any identified heritage resources, as no primary data was collected (i.e., the condition and location of the identified heritage resources was not verified on site as part of this HRM process).

5.3. Definition of Heritage Impacts

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

Table 5-1: Impact Definition

Category	Description
Direct Impact	Affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense but can often be erroneously assessed as high-ranking.
Indirect Impact	Occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its Cultural Significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any direct impact, its significance is affected to the extent that it can ultimately result in the loss of the resource itself.
Cumulative Impact	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: • Additive: the simple sum of all the effects, e.g., the reclamation of a historical Tailings Storage Facilities (TSFs) will minimise the sense of the historic mining landscape. • 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. • 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. • Neutralizing: where the effects may counteract each other to reduce the overall effect, e.g., the effect of changes from a historic to

Category	Description
	modern mining landscape could reduce the overall impact on the sense-of-place of the study area. • 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.

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 report and was primarily obtained through secondary information sources, i.e., desktop literature review and historical layering.

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

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

Repositories that were surveyed included the South African Heritage Resources Information System (SAHRIS), online/electronic journals and platforms and select internet sources. This report includes a summary and discussion of the most relevant findings. Table 5-2 lists the sources consulted in the literature review (refer to Section 13 for more detailed references).

Table 5-2: Qualitative Data Sources

Reviewed Qualitative Data		
Databases		
Genealogical Society of South Africa (GSSA) database (2011)	SAHRIS Palaeosensitivity Map (PSM)	
Statistics South Africa (2011)	Wazimap (2017)	
SAHRIS Cases		
Case ID: 65 Case ID: 105 Case ID: 1052	Case ID: 4577 Case ID: 7890 Case ID: 11558	Case ID: 14561 Case ID: 16715

Reviewed Qualitative Data		
Cited Text		
Behrens & Swanepoel, 2008	Biemond, 2014	Clark, 1982
Deacon & Deacon, 1999	Delius, et al., 2014	Esterhuysen & Smith, 2007
Huffman, 2007	Huffman & Van der Walt, 2011	Makhado Local Municipality, 2018
Mitchell, 2002	Mott MacDonald, 2015	Mucina & Rutherford, 2010
Nel, 2012	Open Up, 2017	Roodt, 2011
Roodt & Roodt, 2014	Schapera, 1953	Silidi & Matenga, 2013
Smuts, 2018	Swanepoel, et al., 2008	Winter & Baumann, 2005

5.5. Primary Data Collection

No primary data was collected during this HRM process, due to the history of heritage assessments that have been undertaken at Venetia Mine.

5.6. Site Naming Convention

Digby Wells has followed the naming convention used by the authors of the relevant reports.

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 a summary of the relevant archaeological periods.

Table 6-1: Archaeological Periods in South Africa

The Stone Age	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[7])
Farming Communities (Iron Age)	Early Farming communities (EFC)	500 to 1400 CE
	Late Farming Communities (LFC)	1100 to 1800 CE
Historical Period	-	1500 CE to 1994 (Behrens & Swanepoel, 2008)

Adapted from Esterhuysen & Smith (2007)

In total, 187 heritage resources were identified within the regional, local and infrastructure study areas. Figure 6-1 illustrates the breakdown of the identified heritage resources. The historical period, including the historical built environment and burial grounds and graves, dominate the tangible heritage resources identified within the area under consideration. Expressions of resources associated with the palaeontological, Stone Age and Farming Community periods have been recorded within the regional study area.

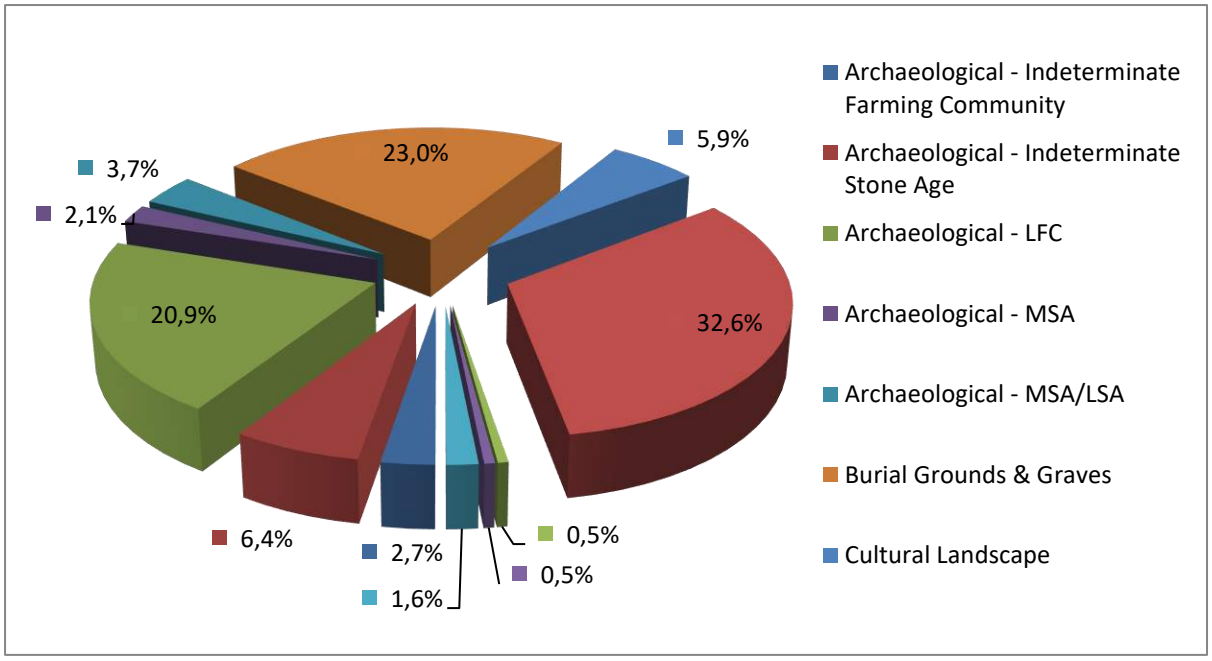


Figure 6-1: Heritage Resources Identified Within the Regional Study Area

[7] 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).

6.1.1. The Stone Age

The Stone Age in southern Africa comprises three broad phases, defined by the lithic tools and other material culture produced by the various hominid species through time. These phases are the ESA, the MSA and the LSA. Archaeological evidence suggests that hominids have inhabited the Limpopo Province since the ESA. No expressions of the ESA have been identified within the reviewed sample of previously-completed heritage assessments.

The MSA dates from approximately 300 kya to 20 kya. Early MSA lithic industries are characterised by high proportions of blades, which have been minimally modified and which were created using the Levallois technique (Clark, 1982; Deacon & Deacon, 1999). The use of good quality raw material defines this period, as does the use of bone tools, ochre, beads and pendants. MSA artefacts are usually associated with water sources, for example pans and the Limpopo River. However, these finds are often not found *in situ* and therefore offer limited contextual information.

The MSA accounts for 2.1% of the identified heritage resourced, mixed MSA/LSA for 3.7% and indeterminate Stone Age artefacts for an additional 6.4%. The Stone Age is represented in the regional study area as isolated artefacts, artefacts embedded in the surface matrix, and low- and high-density surface scatters (Silidi & Matenga, 2013; Smuts, 2018).

The LSA dates between 40 kya to the historical period. During the LSA, stone tools are specialised (i.e., specific tools have been created for specific tasks) (Mitchell, 2002). Bone points and diagnostic stone tools such as scrapers and segments are included in LSA assemblages. As with the MSA artefacts, LSA artefacts are usually associated with water sources and are not usually found *in situ*.

In southern Africa, the LSA is closely associated with hunter-gatherers. This period is further defined by evidence of ritual practices and complex societies (Deacon & Deacon, 1999). This is commonly expressed through rock art. No such expressions of the LSA were recorded within reviewed sample of previously-completed heritage assessments.

6.1.2. Farming Community Period

Hunter-gatherers were later followed by the various peoples of the Farming Community period. This time is characterised by the movements of Bantu-speaking agro-pastoralists moving into southern Africa and is divided into an early and late phase (EFC and LFC). Farming Community sites can be identified through secondary tangible surface indicators, such as ceramics and evidence for the domestication of animals (such as faunal remains or dung deposits). These resources can provide motivation for settlement and possible trade networks (Delius, et al., 2014) and are distributed across the region.

No expressions of the EFC were identified within reviewed heritage assessments. The LFC accounts for 20.9% of the identified heritage resources and indeterminate Farming Community artefacts account for an additional 2.7%.

Stonewalling is the most visible indicator of LFC settlements. Stonewalls attest to the complex processes of development and decline over several years (Delius, et al., 2014). The LFC can

also be identified through evidence for temporary or permanent settlement. This includes cattle posts which have been identified along the escarpment and settlements that were briefly occupied and which have been identified close to the workable soils along the Limpopo River (Huffman & Van der Walt, 2011). Ethnographic evidence suggests that the cattle posts may be associated with users of the *Letsibogo* ceramics; these users may have been the baKaa (Schapera, 1953; Huffman, 2007; Huffman & Van der Walt, 2011; Biemond, 2014). The *Letsibogo* ceramics are characterised by lines of punctates separated by red and black zones (Huffman, 2007; Huffman & Van der Walt, 2011; Biemond, 2014). These ceramics date between 1500 CE and 1700 CE.

Within the identified literature, the LFC is represented by:

- Stonewalling (Roodt, 2011; Silidi & Matenga, 2013);
- Isolated examples and low- density scatters of ceramic fragments (Roodt, 2011; Silidi & Matenga, 2013; Smuts, 2018);
- Deposits associated with cattle kraals (Silidi & Matenga, 2013); and
- Sites of low- to high-complexity (Silidi & Matenga, 2013).

The Mapungubwe Cultural Landscape includes fossil heritage as well as a history of human occupation from the Stone Age to the historical period (with living and intangible value remaining to present). However, it is the Farming Community occupation for which this site is most widely known and from which it derives its Outstanding Universal Value (OUV) (UNESCO, 2022). The Mapungubwe Cultural Landscape was inscribed as a World Heritage Site in 2003 and was modified in 2014 to include a buffer zone around the core area. The property itself covers almost 28 200 ha and the buffer zone an additional 104 800 ha.

Mapungubwe was inhabited for approximately 70 to 80 years, between 1220 and 1300 CE (Huffman, 2007). The site was inhabited following the abrupt abandonment of K2[8], another Farming Community site located 1 km away from the Mapungubwe Hill. This new Zhizo capital was characterised by “social stratification” where a few members of the community lived on the hilltop above the majority, who lived outside the court. During the period of occupation, the spatial organisation continued to evolve into a new elite pattern. The Mapungubwe settlement included homesteads scattered along the Limpopo River, on both sides of the national border.

Venetia Mine is located outside the Mapungubwe Cultural Landscape World Heritage Site core area but within the buffer. Refer to Siyathembana Trading 293 (Pty) Ltd (hereinafter Siyathembana) (2013) for a more detailed description of the relationship between the Mapungubwe World Heritage Site and De Beers and Ventia Mine.

The LFC transition to the historical period is characterised by the emergence of large agricultural settlements associated with the Tswana. Archaeological excavations within the regional study area indicate that the Tswana occupation of the area may have been brief (Nel, 2012). As demonstrated in the history of the Kwena, periods of political turbulence caused

8 Also referred to as Bambandyanalo.

disruptions during the 18th and 19th centuries (Schapera, 1953). These disruptions could be the cause of the ephemeral remains of the archaeological sites (Nel, 2012).

6.1.3. The Historical Period

The historical period[9] 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.

Historical heritage resources associated with the early settlement of the region make up 32.6% of the identified heritage resources in the area under consideration, with burial grounds and graves accounting for an additional 23%. Burial grounds and graves account for a further 10% of the records. These are expressed as single graves and burial grounds with fewer than 20 graves and one burial ground of indeterminate size (Roodt, 2011; Silidi & Matenga, 2013; Roodt & Roodt, 2014). Historical heritage resources within the regional study area are represented as:

- Sites of low and high complexity (Silidi & Matenga, 2013);
- Deposits associated with cattle kraals and historical structures (Silidi & Matenga, 2013); and
- Structural remains, standing buildings, remains of functional structures and the remains of complexes (i.e. *werwe* or farmsteads) (Silidi & Matenga, 2013; Smuts, 2018).

6.2. Project-specific Cultural Landscape

Table 6-2 presents a summary of the heritage resources identified during the available heritage resources undertaken on the Venetia Mine property to date. Plan 2 presents the geographical distribution of these resources. Plan 3 indicates the relationship between these heritage resources and the proposed Project infrastructure.

[9] In southern Africa, 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).

Table 6-2: Heritage Resources Identified within the Venetia Mine

Heritage Resource and Reference	Description
Venetia 103 **TVT1/1, TVT1/2** (Pistorius, 2011)	Farming Community (Iron Age) village comprising multiple sites associated with the Khami period (1400 to 1750 CE). Quartz outcrops were observed and had been mined for building materials. The Venetia 103 sites are marked by stone walls or lines with platforms and circles representing the remains of huts. Possible cattle enclosures, grain bin stands, and midden and undiagnostic potsherds are present.
Venetia 103 **TVT3/1, TVT3/2, TVT3/3, TVT3/4** (Pistorius, 2011)	Farming Community (Iron Age) village comprising multiple sites associated with the Khami period (1400 to 1750 CE). The Venetia 103 sites are marked by stone walls or lines with platforms and circles representing the remains of huts. Possible cattle enclosures, grain bin stands, and midden and undiagnostic potsherds are present. This site includes twelve possible grain bin stands, cattle kraals and collapsed houses. These sites are situated on low hills. *Sites TVT3/1, TVT 3/2 and TVT3/3 have been excavated under Permits 2087, 2084 and 2086 respectively. The final permit reports for Permit 2086 and 2087 have not been uploaded to the SAHRIS database. The final report for Permit 2084 has been submitted to SAHRIS, but is not publicly available.*
Elesger 98 (Pistorius, 2011)	Farming Community (Iron Age) village comprising one site, potentially associated with the Khami period (1400 to 1750 CE). The Venetia 103 sites are marked by stone walls or lines with platforms and circles representing the remains of huts. Possible cattle enclosures, grain bin stands, and midden and undiagnostic potsherds are present. This site is located along the hillside and on a flat surface. Some of the stone lines have been disturbed and may have been mixed with stones from road construction. *This site has been excavated under Permit 2083. The permit report has not been uploaded to the SAHRIS database.*
Venetia 103 **TVT2/1** (Pistorius, 2011)	A limited surface collection of MSA stone tools (dating to approximately 20 to 30 kya). This scatter occurs along a south-facing slope and includes: four prepared platform cores, one strangulated scraper, one scraper and multiple flakes.
Venetia 103 **Graveyard** (Pistorius, 2011)	A graveyard belonging to the Venter family. This graveyard includes one double grave and three additional single graves. All the graves have granite headstones and trimmings. Legible inscriptions date the graves to 1959 and 1973. The grave is demarcated by a fence.

Siyathembana (2013) did not identify additional heritage resources during their assessment. This report focused on the potential direct and indirect positive and negative impacts to the Mapungubwe Cultural Landscape World Heritage Site. Miller (2021) did not record any heritage resources during his assessment in his original report nor the two addenda added subsequently.

Plan 2: Project-specific Cultural Landscape

Plan 3: Cultural Heritage Resources as related to the Proposed Project Infrastructure

6.3. Socioeconomic Setting

The Venetia Mine is located within Ward 2 of the MLM of the VDM in the Limpopo 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 2011 Census (Statistics South Africa, 2011)[10].

In 2011, the Limpopo Province had a population of 5 404 868, which accounts for approximately 10% of the national population (Wazimap, 2017). The province includes five district municipalities, of which the VDM is the largest in terms of population size. The district included 1 294 722 residents (almost 24% of the population of the province). VDM is itself divided into four local municipalities. MLM is the smallest of the local municipalities in terms of population, which included 104 654 people in 2011 (8% of the population in the VDM).

The MLM includes twelve wards. Ward 2 includes a population of 14 291 people (Wazimap, 2017). The ward is mostly rural, but does include some settled areas, such as Pont Drift, Evangelina, Beitbridge and Mopane. The area is characterised by agriculture, including some crop cultivation. grazing of game animals, tourism and hunting.

Unemployment is a challenge within the regional study area. Table 6-3 presents an overview of the employment status of the populations within the regional study area.

Table 6-3: Employment Status of the Populations within the Study Area

Employment Statistics (Census 2011)	Ward 2		MLM		VDM	
	No.	%	No.	%	No.	%
Total Population	14 291	-	104 654	-	1 294 722	-
Working Age (18-64)	10 482	73.4	60 769	58.1	664 507	51.3
Employed	7 294	51.0	29 143	27.8	189 361	14.6
Discouraged Work Seeker	238	1.7	4 547	4.3	66 104	5.1
Unemployed	895	6.3	9 785	9.3	119 498	9.2
Other not economically active	2 489	17.4	23 582	22.5	387 005	29.9

Adapted from Wazimap (2017)

7. Impact Assessment

Digby Wells understands that the proposed Project infrastructure will be constructed within disturbed areas of the existing operation. The impact assessment considers this assumption.

This section presents a description of the Cultural Significance of identified heritage resources informed through secondary data collection. The Cultural Significance of the heritage

[10] 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).

resources informs the minimum required mitigation encapsulated in the NHRA and the SAHRA Minimum Standards.

7.1. Cultural Significance of Identified Heritage Resources

Heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures and are finite, non-renewable and irreplaceable. Considering the innate value of heritage resources, HRM acknowledges that these have lasting worth as evidence of the origins of life, humanity and society. Notwithstanding the inherent value ascribed to heritage, it is incumbent on the assessor to determine the significance of these resources to allow for the implementation of appropriate management. This is achieved through assessing the value of heritage resources relative to the prescribed criteria encapsulated in policies and legal frameworks.

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

During the pre-disturbance survey, three categories of heritage resources were recorded – one burial ground, three Farming Community sites and one MSA Stone Tool scatter.

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

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

Resource ID	Description	Cultural Significance / Field Rating	Reference	Value Description	Minimum Mitigation[11]
Venetia 103 TVT2/1	MSA Stone Tool Scatter	Low	Pistorius, 2011	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance.	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
	Remainder after mitigation	Low / Grade 3c	Siyathembana, 2013	(Mitigation complete, destruction permit required if not yet acquired)	
Venetia 103 TVT1/1, TVT1/2	Iron Age Village (cluster of sites)	Low to Medium	Pistorius, 2011	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g., Shovel Test Pits (STPs).
Elesger 98	Iron Age Village (cluster of sites)	Low to Medium	Pistorius, 2011		
Venetia 103 TVT3/1, TVT3/2, TVT3/3, TVT3/4	Iron Age Village (cluster of sites)	Low to Medium	Pistorius, 2011		
	Remainder after mitigation	Low / Grade 3c	Siyathembana, 2013	(Mitigation complete, destruction permit required if not yet acquired)	

[11] Please not, the recommended mitigation refers to the minimum mitigation requirements as encapsulated in the SAHRA Minimum Standards. Project-specific mitigation measures are presented in Section 11.

Resource ID	Description	Cultural Significance / Field Rating	Reference	Value Description	Minimum Mitigation[11]
Venetia 103 Graveyard	Burial Grounds & Graves	High	Pistorius, 2011	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within a more localised context - high significance rating	Project design must change to avoid such resources. These resources must be included in a Heritage Site Management Plan (HSMP). A GRP may be necessary should the project design not be changed.

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. Plan 3 presents a map of the identified cultural heritage resources in relation to the proposed Project infrastructure. Considering location of the heritage resources identified within the Venetia Mine area by the previous assessments, and the internal policies applicable within Venetia Mine, Digby Wells assumes that De Beers will avoid direct impacts to the heritage resources in line with recommendations in the current reports.

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

Interaction	Impact
Clearing of vegetation	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.
Construction of pipelines and water attenuation pond	

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.

7.3. Operational Phase

Table 7-3 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 7-3: Interactions and Impacts of Operational Phase Activities

Interaction	Impact
Operation of pipelines and water attenuation pond	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.
Storage of dangerous goods	
Maintenance activities (unspecified)	

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 7-4 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 7-4: Interactions and Impacts of Decommissioning Phase Activities

Interaction	Impact
Rehabilitation Activities (unspecified)	Digby Wells assumes no further earth moving activities or backfilling from other locations will be required in these rehabilitation activities. As such, Digby Wells envisages no impact to the cultural heritage landscape. Should any infrastructure intended for demolition increase in age to older than 60 years during the Project lifecycle, the structure must be considered a heritage structure. Any alterations to these structures will be subject to a NHRA Section 34 permit application process

Based on the findings of the assessment, Digby Wells does not envisage any impacts to the identified heritage resources. Detailed heritage assessments have been undertaken for the entire project area and all relevant sites have appropriate mitigation measures that have been adopted.

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 Limpopo Province requires consideration to identify the possible in-combination effects of various impacts to known heritage resources. Table 7-5 presents a summary of the possible cumulative impacts of the Project.

Table 7-5: 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	Operational 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 De Beers in terms of implementation of the Project. These two aspects are discussed separately in this section.

Section 6.2 describes the heritage resources identified during previous assessments in support of various projects at the Venetia Mine. This list is, however, not an exhaustive list of all heritage resources within the Project area. If heritage resources are subsequently identified, and where De Beers knowingly does not take proactive management measures, potential risks to De Beers may include litigation in terms of Section 51 of the NHRA and social or reputational repercussions. Table 7-6 presents a summary of the primary risks that may arise for De Beers.

Table 7-6: Identified Heritage Risks that may arise for De Beers

Description	Primary Risk
Heritage resources with a high Cultural Significance rating are inherently sensitive to any development in so far that the continued survival of the resource could be threatened. In addition to this, certain heritage resources are formally protected thereby restricting various development activities.	Negative Record of Decision (RoD) and/or development restrictions issued by LIHRA and/or SAHRA in terms of Section 38(8) of the NHRA.

Description	Primary Risk
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 LIHRA	• Fines; • Penalties; • Seizure of Equipment; • Compulsory Repair / Cease Work Orders; and • Imprisonment.

The proposed Project does, however, present a risk (low risk exposure) 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.

The table below summaries potential risks to these resources, however it should be noted that all appropriate mitigation measures that are currently in place to address the below mentioned risk, such as the Chance Find Procedure and Heritage Management Plan are in place. Table 7-7 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 7-7: Identified Unplanned Events and Associated Impacts

Unplanned event	Potential impact	Comments
Accidental exposure of fossil bearing material implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA.	The underlying Precambrian rocks of the Beit Bridge Complex do not host fossils and no fossils have been reported from the overlying Quaternary sediments. The rocks of the Eccagroup are known to host fossil glossopterid plants but these fall outside the limits of the study area. It is thus extremely unlikely that fossils will be found in the study area. In the event that fossils are found the Chance Find Protocol must be implemented (Rubidge, 2021)[12]. Low risk o exposure.

[12] Desktop Palaeontological Impact Assessment: Venetia Mine - Water Management Development, Rubige, 2021).

Unplanned event	Potential impact	Comments
Accidental exposure of *in situ* archaeological material during the implementation of the Project.		Low risk of exposure. No known archaeological material know in the mine footprint area, however if identified implement Chance Find Procedure.
Accidental exposure of *in situ* historical built environment sites during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA	Low risk of exposure, however if identified implement Chance Find Procedure.
Accidental exposure of *in situ* burial grounds or graves during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA.	Low risk of exposure, however if identified implement Chance Find Procedure.
Accidental exposure of human remains during the construction phase of the Project.		Low risk of exposure, however if identified implement Chance Find Procedure.

8. Environmental Management Programme

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

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

Activity/ies	Potential Impacts	Aspects Affected	Phase	Mitigation Measure	Mitigation Type	Time period for implementation
• All Activities outlined in Section 2.1 above	Damage to or destruction of previously unidentified heritage resources.	Cultural Heritage	Construction	• Implement existing CFP and Heritage Management Plan.	***Control***	Ongoing

9. Monitoring Programme

Section 11 includes recommended mitigation measures and management strategies. Digby Wells further recommends that a suitable responsible person or persons regularly monitor undisturbed areas for the exposure of archaeological or tangible heritage resources during project work

10. Results of Consultation and Stakeholder Engagement

The Public Participation Process (PPP) required in terms of the NEMA as a component of the BA 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 BA 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 the heritage assessment as this forms part of the PPP or SEP. Should any I&AP comments be submitted in relevance to heritage resources during the PPP, these will be considered in the final HIA report or BA 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, as this SoW excluded in-field assessment.

11. Recommendations

Pistorius (2011) recommended the following mitigation measures in respect of the potential impacts to the identified heritage resources as posed by the infrastructure assessed in this process:

- Excavation of the Farming Communities sites at risk of direct negative impact (in this assessment, this included Elseger 98 and Venetia 103 TVT3/1, TVT3/2 and TVT3/3);

- Where any other Farming Community sites are at risk of negative impact, such sites must be mitigated through a Phase 2 heritage mitigation process (such as excavation). These sites cannot be destroyed without such mitigations;
- Similarly, De Beers will require the correct permit to destroy the MSA stone tool scatter (site Venetia 103 TVT2/1); and
- No mitigation measures were recommended for the graveyard, as no impacts were envisaged.

Siyathembana (2013) added to the above recommendations, indicating that although the affected sites (Elseger 98 and Venetia 103 TVT3/1, TVT3/2 and TVT3/3) had been mitigated, De Beers requires a 'destruction permit' issued by SAHRA before the sites can be demolished. Similarly, following monitoring activities in 2014 and 2015, Chirikure & Murimbika (2015) recommended a destruction permit be obtained for a Khami site adjacent to a dam within the Fine Residue Deposit (FRD) following degradation of the site caused by flooding.

Siyathembana (2013) outlined recommendations with specific reference to potential impacts to the Mapungubwe Cultural Landscape World Heritage Site posed by operational activities at Venetia, with specific reference to protecting the OUV of the site. Following monitoring activities undertaken in 2014 and 2015, Chirikure & Murimbika (2015) concluded that the Venetia Mine does not have a direct impact on the OUV. This notwithstanding, some sites within the mining area required monitoring.

Chirikure & Mathoho (2020) have subsequently recommended that annual monitoring of sites around Venetia for potential impacts from mining is no longer necessary as heritage resources at risk of impact have been mitigated. This notwithstanding, any development that disturbs currently undisturbed ground must be assessed through an HIA process. Chirikure & Mathoho (2020) further recommended that the monitoring schedule for Venetia assets within the Mapungubwe National Park continues with reports submitted to South African National Parks (SANParks) through the Park Manager for Mapungubwe National Park and World Heritage Site. Any additional developments or maintenance activities in the Mapungubwe National Park and World Heritage Site must be preceded by an HIA process in terms of Section 38 of the NHRA.

The recommendations included in the previous heritage assessments undertaken remain relevant and must be applied where appropriate, refer to Table 11-1 below for the status of current recommendations and their applicability to this project.

Table 11-1: Status of Current Recommendations and applicability to this Project

Recommendations	Status
Adopting mitigation measures to reduce the impact of noise while blasting.	Ongoing.
Investigating in more detail the potential impacts of dust fallout on the heritage landscape, particularly rock art.	No rock art has been identified in the proposed Project area. Fall-out dust monitoring is undertaken monthly.
The design and layout of the water pipeline included in that assessment be amended to reduce the significant visual impact on the foot of the Mapungubwe Hill and the servitude where it crosses the core area.	This is outside the Venetia Mine area and must be managed by the Mapungubwe National Park.
Monitor the existing pipelines regularly for erosion and address this erosion where it occurs to minimise or avoid the associated negative visual impact.	This is outside the Venetia Mine area and must be managed by the Mapungubwe National Park.
The current monitoring schedule for Venetia assets within the Mapungubwe National Park continues with reports submitted to SANParks through the Park Manager.	This is outside the Venetia Mine area.
Participate with the relevant stakeholders to remove the existing powerline traversing the Mapungubwe Hill to eliminate the associated negative visual impact.	This is outside the Venetia Mine area and must be managed by the Mapungubwe National Park.
Participate with the relevant stakeholders to ensure water usage remains sustainable to avoid such impacts.	Applied to this Project.
Develop and implement an effective Heritage Management Plan to monitor applicable heritage resources and implement medium to long-term management objectives.	This management plan has been developed and is in place. De Beers intend to update this plan by the first quarter of 2023.
Any development within the Venetia Mine that disturbs currently undisturbed ground must be assessed through an HIA process.	Noted by De Beers.
Any additional developments or maintenance activities in the Mapungubwe National Park and World Heritage Site must be preceded by an HIA process in terms of Section 38 of the NHRA.	

Considering the nature and the scope of the Project, Digby Wells recommends De Beers continues to:

- Follow the existing Chance Finds Protocol (CFP)[13], including during the construction and operation of this Project;
- Consider the potential visual impacts of the proposed infrastructure (i.e., placement and potential for erosion) as with the previously-assessed pipelines;
- Implement the existing grievance mechanism in place, which also includes heritage resources;

Digby Wells further recommends De Beers:

- Monitor undisturbed areas for the exposure of archaeological or tangible heritage resources during project work; and
- Should a change to the proposed project present a risk direct negative impact to the identified heritage resources, the mitigation measures included in the original heritage assessment report or the minimum mitigation measures as outlined above remain applicable.

12. Conclusion

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

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

These objectives were met as presented in Sections 6 through 11 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.

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 above, the potential socio-economic benefits that will arise from the Project are expected to be negligible. This notwithstanding, no impact to heritage resources is anticipated to arise from the Project.

[13] Such as the Venetia Mine EMS Heritage Resources Procedure.

12.2. Reasoned Opinion on 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 all previous and current recommendations are adopted and implemented as detailed in Section 11 above are adopted.

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DIGBY WELLS
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Appendix A: Glossary of Terms

GLOSSARY OF TERMS

Term	Definition
Archaeological	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.
Archaeologist	A trained professional who uses scientific methods to excavate, record and study archaeological sites and deposits.
Artefact	Any object manufactured or modified by human beings.
Burial Grounds and Graves Consultation (BGGC)	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.
Ceramic (syn. pottery)	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.
Ceramic facies / facies	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.
Ceramic tradition	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.
Conservation	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
Cultural significance	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: • Importance in the community, or pattern of South Africa's history; • Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage; • Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage; • Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects: • Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group; • Importance in demonstrating a high degree of creative or technical achievement at a particular period; • Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; • Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and • Significance relating to the history of slavery in South Africa.
Development	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: • Construction, alteration, demolition, removal or change of use of a place or a structure at a place; • Carrying out any works on or over or under a place; • Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place; • Constructing or putting up for display signs or hoardings; • Any change to the natural or existing condition or topography of land; and • Any removal or destruction of trees, or removal of vegetation or topsoil.
Early Farming Community/ies	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.

Term	Definition
Early Stone Age	The South African ESA dates from ~3 Mya to c. 250 Kya. This period is associated with later *Australopithecus and* early *Homo* species. The lithic industries that characterise the ESA include Oldowan and Early Acheulian, typically as simple core tools, choppers handaxes and cleavers.
Excavation	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.
Farming Community/ies	Term signifying the appearance in the southern African archaeological of Bantu-speaking agriculturally based societies from the early first millennium CE. The term replaces the *Iron Age* 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.
Field Rating	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; and ● General Protected: i.e., generally protected in terms of Sections 33 to 37 of the NHRA.
Formal protection	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.
General protection	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; and ● Public monuments and memorials.

Term	Definition
Grave	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.
Heritage Impact Assessment (HIA)	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.
Heritage resource	Any place or object of cultural significance.
Heritage resources management	Process required when development is intended categorised as: • Any linear development exceeding 300 m 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; and • Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
Heritage site	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.
Late Farming Community/ies	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.

Term	Definition
Late Stone Age	The South African LSA dates from ~30 Kya. This period is associated with modern *Homo sapiens sapiens* 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 cryptocrystalines, quarts and chert. The LSA is also associated with archaeological rock art including both paintings and engravings.
Living / intangible heritage	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.
Management	In relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the NHRA.
Middle Stone Age	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 *Homo sapiens species.* The lithic industries that characterise the MSA are typically more complex tools with diagnostic identifiers, including convergent flake scars, multi-faceted platforms, retouch and backing. Assemblages are characterised as refined lithic technologies such as prepared core techniques, retouched blades and points manufactured from good quality raw material.

Term	Definition
National estate	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; and • 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).
Palaeontological	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 trance.
Palaeontologist	A trained professional who uses scientific methods to excavate, collect, record and study palaeontological sites and fossils.
Pedestrian survey	A method of examining a site in which surveyors, spaced at regular intervals, systematically walk over the area being investigated.

Term	Definition
Phase 1 Archaeological Impact Assessment (AIA)	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.
Phase 2 Archaeological Impact Assessment (AIA)	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.
Phase 3 Management Plan / Conservation Management Plan (CMP)	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).
Pre-disturbance survey (syn. reconnaissance)	A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.

Term	Definition
Reconnaissance	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).
Site	Any area of land, including land covered by water, and including any structures or objects thereon.
Structure	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.
Tangible heritage	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.

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

Project Title	Client	Project Location	Completed	Project Experience
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	Orientale 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

Project Title	Client	Project Location	Completed	Project Experience
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
Weltervreden 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

Project Title	Client	Project Location	Completed	Project Experience
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.

Name	Johan Nel
Profession	Manager: Heritage Resources
Department	Heritage Resources Management
Education	2012: Professional Development Certificate, Integrated Heritage Resources Management, Rhodes University 2002: BA (Honours) Archaeology, University of Pretoria 2001: BA, University of Pretoria
Registrations / Affiliations	International Council on Monuments and Sites (ICOMOS). ASAPA Cultural Resources Management (CRM) section (Registration Number - 095)

1 Overview

Specialisation

Heritage Resource Management

Expertise

Johan has more than 20 years' experience as an archaeologist and heritage specialist. He is currently Manager of the Heritage Resources Management department. He also served on the Council of the uMsunduzi Museum in Pietermaritzburg from December 2017 to November 2020. Johan has worked in both urban settings and remote rural landscapes throughout South Africa, as well as Botswana, the Democratic Republic of the Congo, Liberia Sierra Leone and Swaziland. In addition, I have also acted as a specialist reviewer of heritage studies undertaken by local specialists in countries such as Cameroon, Malawi, Mali, and Tanzania. His experience includes archaeological and heritage impact assessments, general research projects, grave relocations including consultation and permitting, and exhibition research and design.

Employment	2021 to present: Digby Wells Environmental; Manager: Heritage Resources Management 2019: Department of Anthropology and Archaeology, University of Pretoria; Part-time, contract lecturer 2018-2021: The Heritage Foundation; Head: Heritage Resources Management 2017-2020: uMsunduzi; Museum Council Member
Languages	English Afrikaans

2 Project Experience

Client	Lesotho Lowlands Water Development Project II
Location	Lesotho
Name of Project	LLWDP-II HRM Process
Year Completed	2021
Project Description	Heritage Impact Assessment

Client	Ergo (Pty) Ltd
Location	Johannesburg, Gauteng, South Africa
Name of Project	Ergo City Deep Heritage Mitigations
Year Completed	2021
Project Description	Heritage Impact Assessment, Rescue Permit Application and Monitoring

Client	Exxaro Coal Mpumalanga (Pty) Ltd
Location	Kriel, Mpumalanga, South Africa
Name of Project	Matla Mine 1 GRP
Year Completed	2021
Project Description	Grave Relocation

Client	Mafube Coal
Location	Middelburg, Mpumalanga, South Africa
Name of Project	Mafube RAP and GRP
Year Completed	2021

Project Description	Grave Relocation
Client	SARAO
Location	Carnarvon, Northern Cape, South Africa
Name of Project	SARAO SKA Project: Heritage Mitigations
Year Completed	2021
Project Description	Heritage Management and Mitigation
Client	Ergo (Pty) Ltd
Location	Johannesburg, Gauteng, South Africa
Name of Project	Ergo City Deep HSMP
Year Completed	2021
Project Description	Heritage Site Management Plan
Client	Ergo (Pty) Ltd
Location	Westonaria, Gauteng, South Africa
Name of Project	Ergo RTSF Section 34 Process
Year Completed	2021
Project Description	Section 34 Destruction Permit Applications
Client	Sun International
Location	Pilanesberg, North-West Province, South Africa
Name of Project	Sun City EIA and CMP

Year Completed	2019
Project Description	Heritage Impact Assessment and Conservation Management Plan
Client	Exxaro Coal Mpumalanga (Pty) Ltd
Location	Belfast, Mpumalanga, South Africa
Name of Project	Exxaro Belfast GRP
Year Completed	2018
Project Description	Grave Relocation
Publications	Antonites, A. R. & Nel, J. 2018. The Voortrekker Monument as memory institution: mediating collective memory, tourism and educational programming for a local and global audience. In: Ngulube, P (ed.) Handbook of Research on Advocacy, Promotion and Public Programming for Memory Institutions. Pretoria: UNISA Press. Nel, J. 2001. Cycles of Initiation in Traditional South African Cultures. South African Encyclopaedia (MWEB). Nel, J. 2009. Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture. The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society. Nel, J. 2011. Gods, Graves and Scholars: returning Mapungubwe human remains to their resting place. In: Mapungubwe Remembered. University of Pretoria commemorative publication. Johannesburg: Chris van Rensburg Publishers.

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
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This document has been prepared by Digby Wells Environmental.

Report Type:	**Methodology Statement**
Project Name:	**Cultural Significance, Field Rating and Impact Assessment**
Project Code:	**ZZZ9999**

Revision History

Name	Responsibility	Version	Date
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

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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[1] (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[2] and intangible[3] 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.

[1] 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.

[2] (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.

[3] 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

IMPORTANCE = AVERAGE SUM OF AESTHETIC + HISTORIC + SCIENTIFIC + SOCIAL

where

Aesthetic
Importance in aesthetic characteristics

Degree of technical / creative skill at a particular period

Historic
Importance to a community or pattern in the country's history

Site of significance relating to the history of slavery

Association with the life work of a person, group or organisation of importance in the history of the country

Scientific
Possession of uncommon, rare or endangered natural or cultural heritage aspects

Potential to yield information

Importance in demonstrating principle characteristics

Social
Association to a community or cultural group for social, cultural or spiritual reasons

rated against

IMPORTANCE: a site or heritage resource may be important in terms of one or more dimensions - aesthetic, historic, scientific and social. Each dimension consists of one or more attributes against which importance is determined. Importance of each dimension and subsequent attributes must be considered in relation to the resource's authenticity. Importance ratings must be informed and motivated by certain information sources. The credibility of information sources must therefore be evaluated and referred to when importance is discussed.	
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.
1	Common, well represented throughout diverse cultural landscapes
2	Generally well represented but exhibits superior qualities in comparison to other similar examples
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.
4	Rare and uncommon, value of national importance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.
-	Not assessed - dimension and/or attribute not considered in determining value.

×

Integrity
Physical status quo of preservation from observation

rated against

INTEGRITY: the undivided or unbroken state, material wholeness, completeness or entirety of a resource or site	
0	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost
1	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting
2	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting
3	Fabric well preserved, good quality information and meaning evident, limited encroachment
4	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting

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.

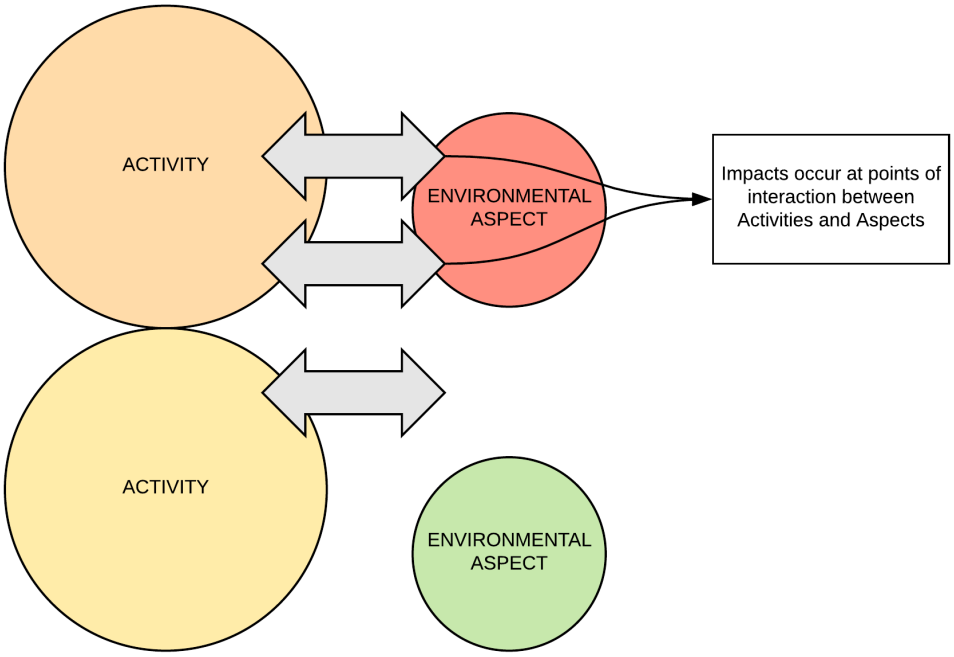

Figure 3-1: Graphical Representation of Impact Assessment Concept

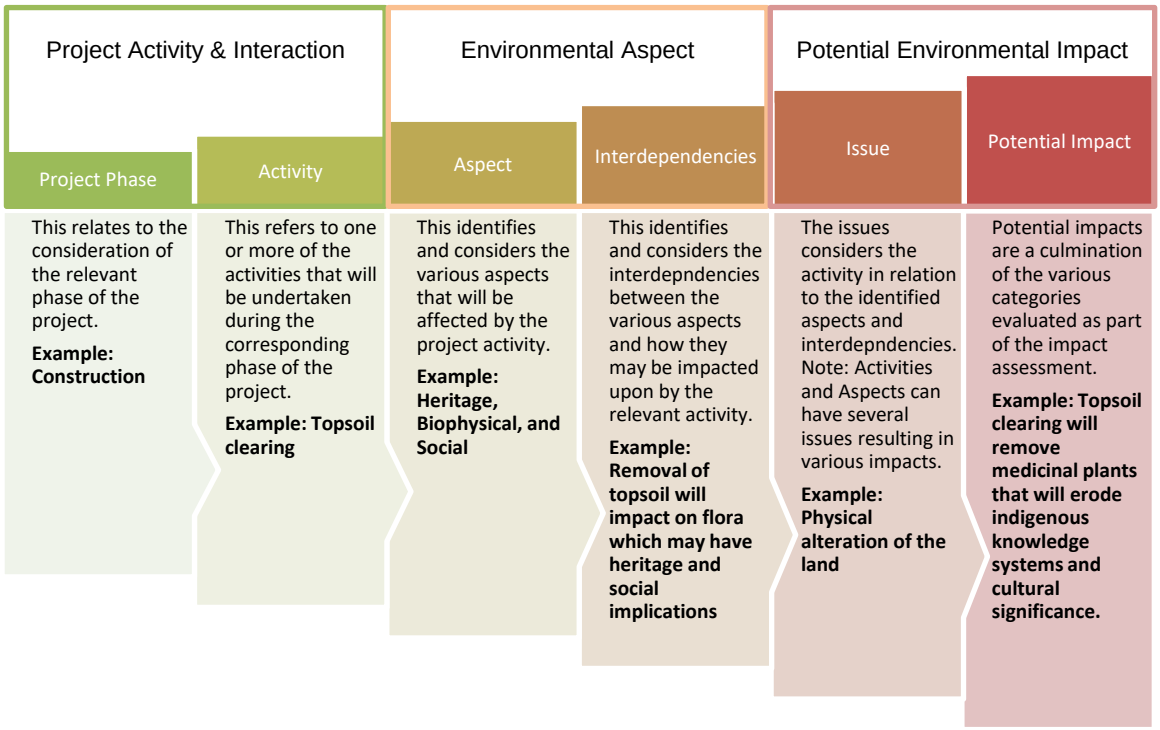

Figure 3-2: Example of how Potential Impacts are considered

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	Exposure	Description	Intensity	Description	Probability	Description
7	**Permanent**	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	**International**	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	**Extremely high**	Major change to Heritage Resource with High-Very High Value	**Certain/Definite**	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	**Beyond Project Life**	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	**National**	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	**Very high**	Moderate change to Heritage Resource with High-Very High Value	**High probability**	Happens often. It is most likely that the impact will occur.
5	**Project Life**	The impact will cease after project life.	**Region**	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	**High**	Minor change to Heritage Resource with High-Very High Value	**Likely**	Could easily happen. The impact may occur.
4	**Long Term**	Impact will remain for >50% - Project Life	**Municipal area**	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	**Moderately high**	Major change to Heritage Resource with Medium-Medium High Value	**Probable**	Could happen. Has occurred here or elsewhere
3	**Medium Term**	Impact will remain for >10% - 50% of Project Life	**Local**	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	**Moderate**	Moderate change to Heritage Resource with Medium - Medium High Value	**Unlikely / Low probability**	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	Exposure	Description	Intensity	Description	Probability	Description
2	**Short Term**	Impact will remain for <10% of Project Life	**Limited**	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site-specific study area.	**Low**	Minor change to Heritage Resource with Medium - Medium High Value	**Rare / Improbable**	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	**Transient**	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.	**Very Limited**	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	**Very low**	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	**Highly Unlikely /None**	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	-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
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

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

Determined CS	Minimum Management / Mitigation Requirements[4]
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.

[4] 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[5] 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.

[5] 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.