

**NEW LARGO COAL PROJECT: EMPr AMENDMENT – UPDATED PHASE 1 CULTURAL HERITAGE
IMPACT ASSESSMENT**

Prepared for:

Golder Associates Africa (Pty) Ltd: Ms A Dower

- Address: P O Box 6001, Halfway House, 1685; Tel: 011 254 4800; E-mail: ADower@golder.co.za

Prepared by:

J A van Schalkwyk (D Litt et Phil),

- Heritage Consultant: ASAPA Registration No.: 164 - Principal Investigator: Iron Age, Colonial Period, Industrial Heritage.
- Postal Address: 62 Coetzer Avenue, Monument Park, 0181; Tel: 076 790 6777; E-mail: jvschalkwyk@mweb.co.za

Report No: 2020/JvS/048

- Status: Final
- Date: July 2020
- Revision No: -
- Date: -

Submission of the report:

It remains the responsibility of the client to submit the report to the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Agency (PHRA) by means of the online SAHRIS System.



Copyright:

This report is intended solely for the use of the individual or entity to whom it is addressed or to whom it was meant to be addressed. It is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose or by a third party, without the author's prior written consent.

Specialist competency:

Johan A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 40 years. Originally based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape Province, Northern Cape Province, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 70 papers, most in scientifically accredited journals. During this period, he has done more than 2000 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.



J A van Schalkwyk
Heritage Consultant
July 2020

**DECLARATION OF INDEPENDENCE BY SPECIALIST**

I, J A van Schalkwyk, as the appointed independent heritage specialist for the proposed New Largo Coal EMPr Amendment, hereby declare that:

- I act as the independent specialist in this application;
- I 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- 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 have no vested interest in the proposed activity proceeding;

- 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;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study 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

A handwritten signature in black ink, appearing to read 'J A van Schalkwyk', written in a cursive style.

J A van Schalkwyk
July 2020

EXECUTIVE SUMMARY

NEW LARGO COAL PROJECT: EMPr AMENDMENT – UPDATED PHASE 1 CULTURAL HERITAGE IMPACT ASSESSMENT

New Largo Coal (Pty) Ltd (New Largo) has acquired the New Largo Coal reserve from Anglo American Inyosi Coal (Anglo). Since acquiring the reserve, New Largo has re-evaluated how to initiate the project and some changes in both infrastructure and mine scheduling have occurred. These changes largely reflect matters of timing, size of the mining fleet and orientation of mining cuts; with a key change in timing relating to the planned commencement of mining through mini pits Pit D and Pit H. The EA (and EMPr) for the project therefore needs to be amended through a Part 2 (substantive) amendment in terms of the EIA Regulations (GN R. 326) (as amended), to accommodate the proposed changes to the Project.

- The aim is not to redo the entire impact assessment and changing the evaluation of impact from what was permitted. The project has been assessed in its entirety, it has been authorised. We are only assessing the change brought about by infrastructure and mining schedule changes.

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. The HIA consisted of a desktop study (archival sources, database survey, maps and aerial imagery) and a physical survey that included the interviewing of relevant people. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Golder Associates Africa (Pty) Ltd* to conduct a cultural heritage assessment to determine if the proposed Project changes would have an impact on any sites, features or objects of cultural heritage significance.

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a much later colonial (farmer) one, most of which developed during the last 150 years or less. Recently it gave rise to large-scale mining developments.

Identified sites

During the physical survey no sites, features or objects of cultural significance were identified.

Impact assessment and proposed mitigation measures

- For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed.

Heritage sites	Significance of impact	Mitigation measures
New Largo Pit D and Pit H: Construction Phase		
Without mitigation	n/a	n/a
With mitigation	n/a	n/a
New Largo Pit D and Pit H: Operation Phase		
Without mitigation	n/a	n/a
With mitigation	n/a	n/a

Legal requirements

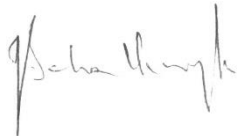
The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that no sites, features or objects of heritage significance occur in the study area. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- As per SAHRA's requirement, the Palaeontological Sensitivity Map (SAHRIS) was consulted. This indicated that the study area (Fig. 7) has a high significance of fossil remains to be found and a palaeontological field assessment and protocol for finds is therefore required.
- Should archaeological sites or graves be exposed during mining activities, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.





J A van Schalkwyk
Heritage Consultant
July 2020

TECHNICAL SUMMARY

Project description	
Description	New Largo Coal Project Pit D and Pit H Assessment
Project name	New Largo Coal Project

Applicant
New Largo (Pty) Ltd

Environmental assessors
Golder Associates Africa (Pty) Ltd
Ms A Dower

Property details						
Province	Mpumalanga					
Magisterial district	Witbank					
District municipality	Nkangala					
Topo-cadastral map	2528DD & 2628BB					
Farm name	Klipfontein 568JR, Vandyksput 214IR & Heuvelfontein 215IR					
Closest town	Ogies					
Coordinates	Centre point (approximate)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 25,98702	E 28,92602	2	S 26,02811	E 28,93269
	.kml files ¹		 Pit D.kmz  Pit H.kmz			

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 sq m	No
Any other development category, public open space, squares, parks, recreation grounds	No

Land use	
Previous land use	Farming
Current land use	Vacant/Farming

¹ Left click on the icon to open the file in Google Earth, if installed on the computer. Alternatively, in .PDF version of the report, if Google Earth is not installed, right click on icon. In dialog box, select "Save Embedded File to Disk" and save to folder of choice.

TABLE OF CONTENTS

	Page
DECLARATION OF INDEPENDENCE BY SPECIALIST	I
EXECUTIVE SUMMARY	III
TECHNICAL SUMMARY	V
COMPLIANCE WITH APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)	IX
1.0 INTRODUCTION AND BACKGROUND.....	1
2.0 PROJECT LOCATION AND EXTENT	3
3.0 KEY CHANGES FROM EXISTING AUTHORISED PROJECT	4
4.0 PROJECT DESCRIPTION	5
5.0 METHODS	9
6.0 RESULTS.....	14
7.0 CONCLUSION.....	21
8.0 REFERENCES.....	22
9.0 ADDENDUM	24
1. Indemnity and terms of use of this report.....	24
2. Legislative framework.....	25
3. Heritage resources	28
4. Mitigation measures	30
5. Relocation of graves.....	32
6. Curriculum vitae	33

LIST OF FIGURES

	Page
Figure 1. Project locality	3
Figure 2. New Largo MRA, authorised extent of mining and pit locations	6
Figure 3 – Pit H Layout and Infrastructure.....	7
Figure 4 – New Phase 0 infrastructure (2020) and authorised infrastructure (2012)	7
Figure 5 – Pit D Layout and Infrastructure.....	8
Figure 6. Location of known heritage sites and features in relation to the study area	10
Figure 7. The landscape encountered during the site visit.....	11
Figure 8. The Palaeontological sensitivity of the study area	14
Figure 9. Early military map (Heidelberg) indicating the larger region, dating to 1900	17
Figure 10. Aerial view of the Block study region dating to 1958.....	17
Figure 11. Aerial view of Block the study region dating to 1958.....	18
Figure 12. Remains of built features on the southern boundary of Pit D	18
Figure 13. Remains of built features on the northern boundary of Pit H	19
Figure 14. Location of heritage sites in the study area	19

LIST OF TABLES

	Page
Table 1: Assessment of existing information base	10
Table 2: Ranking scales for magnitude, duration, scale and probability	12

GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Bioturbation: The burrowing by small mammals, insects and termites that disturb archaeological deposits.

Cumulative impacts: “Cumulative Impact”, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Debitage: Stone chips discarded during the manufacture of stone tools.

Factory site: A specialised archaeological site where a specific set of technological activities has taken place – usually used to describe a place where stone tools were made.

Historic Period: Since the arrival of the white settlers - c. AD 1830 - in this part of the country.

Holocene: The most recent time period, which commenced c. 10 000 years ago.

Iron Age (also referred to as **Early Farming Communities**): Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Later Iron Age	AD 1300 - AD 1830

Midden: The accumulated debris resulting from human occupation of a site.

Mitigation, means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

National Estate: The collective heritage assets of the Nation.

Pleistocene: Geological time period of 3 000 000 to 20 000 years ago.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 500 000 - 250 000 Before Present
Middle Stone Age	250 000 - 40 000 - 25 000 BP
Later Stone Age	40-25 000 - until c. AD 200

Tradition: As used in archaeology, it is a seriated sequence of artefact assemblages, particularly ceramics.

ACRONYMS and ABBREVIATIONS

AD	Anno Domini (the year 0)
ASAPA	Association of Southern African Professional Archaeologists
BC	Before the Birth of Christ (the year 0)
BCE	Before the Common Era (the year 0)
BP	Before Present (calculated from 1950 when radio-carbon dating was established)
CE	Common Era (the year 0)
CRM	Cultural Resources Management
CS-G	Chief Surveyor-General
EAP	Environmental Assessment Practitioner
EIA	Early Iron Age
EMPr	Environmental Management Programme
ESA	Early Stone Age
HIA	Heritage Impact Assessment
I & AP's	Interested and Affected Parties
ICOMOS	International Council on Monuments and Sites
LIA	Late Iron Age
LSA	Later Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

COMPLIANCE WITH APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)

Requirements of Appendix 6 – GN R982	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	
a) details of-	
i. the specialist who prepared the report; and	Front page
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Page i Addendum Section 5
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 4
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 5
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 4
f) 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;	Section 5; Figure 11
g) an identification of any areas to be avoided, including buffers;	-
h) 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;	Figure 11 Section 6
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 6
k) any mitigation measures for inclusion in the EMPr;	Section 6
l) any conditions for inclusion in the environmental authorisation;	Section 6
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	-
n) a reasoned opinion-	
i. whether the proposed activity, activities or portions thereof should be authorised;	Section 6
(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;	Section 6
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	-
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	-
q) any other information requested by the competent authority.	-
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	-

NEW LARGO COAL PROJECT: EMP_r AMENDMENT – UPDATED PHASE 1 CULTURAL HERITAGE IMPACT ASSESSMENT
--

1.0 INTRODUCTION AND BACKGROUND

Mining of the New Largo Coal reserve, previously owned by Anglo American Inyosi Coal (Anglo), is authorised through an Environmental Impact Assessment (EIA) process under the requirements of the National Environmental Management Act (NEMA) and the Mineral and Petroleum Resources Development Act (MPRDA). The Environmental Authorisation (EA) was issued by the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) in 2012, and the Environmental Management Programme (EMPr) was approved by the Department of Mineral Resources and Energy (DMRE) in 2013. Furthermore, the Department of Water and Sanitation (DWS) issued three Water Use Licences (WULs) between 2013 and 2015. Thereafter, Anglo put the New Largo Coal Mine project on hold and submitted requests for extension of the validity of the authorisations to the Regulators.

New Largo Coal (Pty) Ltd. (New Largo) acquired the New Largo Coal Mine Project from Anglo in August 2018 and subsequently commissioned a Bankable Feasibility Study (BFS) of Pit H to re-evaluate the deposit as a standalone mining operation, and a separate BFS for the remainder of the mine (referred to as the Main Mine). New Largo now proposes to amend the original mine schedule to commence mining of Pit H at an earlier date than the timeframes stipulated in the original mining schedule. This earlier schedule will require the development of some infrastructure not previously included in the EMP. In addition, mining at the New Largo Pit D will commence sooner than originally planned. Pit D will be mined by Africoal SA (Pty) Ltd SA (Africoal), on behalf of New Largo, as an extension to their adjacent Klipfontein Colliery. The coal mined from Pit D and Pit H will be trucked to Kusile Power Station and other end users. To give effect to these proposed changes, New Largo must apply for amendments to its approved EA and prepare an updated EMP_r.

- The aim is not to redo the entire impact assessment and changing the evaluation of impact from what was permitted. The project has been assessed in its entirety, it has been authorised. We are only assessing the change brought about by infrastructure and mining schedule changes.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Golder Associates Africa (Pty) Ltd* to conduct a cultural heritage assessment to determine if the proposed Project changes would have an impact on any sites, features or objects of cultural heritage significance.

This report documents the assessment of the potential impacts of the proposed Project changes on cultural heritage resources within the mining rights area (MRA) (if any), and as required, provides recommended measures for the mitigation of any negative impacts to inform the updated Environmental Management Programme (EMPr) for the Project.

1.2 Terms and references

The aim of a full heritage impact assessment (HIA) investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.

The result of this investigation is a heritage impact assessment report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed development.

Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.

1.2.1 Scope of work

The aim of this study is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where the mining activities is to take place. This included:

- Conducting a desk-top investigation of the area;
- A visit to the proposed development site.

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Identify any potential 'fatal flaws' related to the proposed development;
- Evaluate the potential impacts of the change in mining schedule, and development of mine-associated infrastructure at Pit H on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance;
- Provide guideline measures to manage any impacts that might occur during the construction phase as well as the implementation phase.

2.0 PROJECT LOCATION AND EXTENT

The Main New Largo resource lies between the N4 and N12 national freeway, some 30 kilometres west of eMalahleni and 100 kilometres east of Johannesburg in the Mpumalanga Province (Fig. 1). The full extent of the New Largo Mining Rights Area (MRA) extends from the N4 (Pretoria-Witbank National Road) to the south of the N12 (Johannesburg-Witbank National Road). The extent of the proposed opencast operation and pits are shown in Figure 2. The New Largo mine will supply coal to Eskom's Kusile Power Station, which is located immediately adjacent to the west/north-west of the mine.

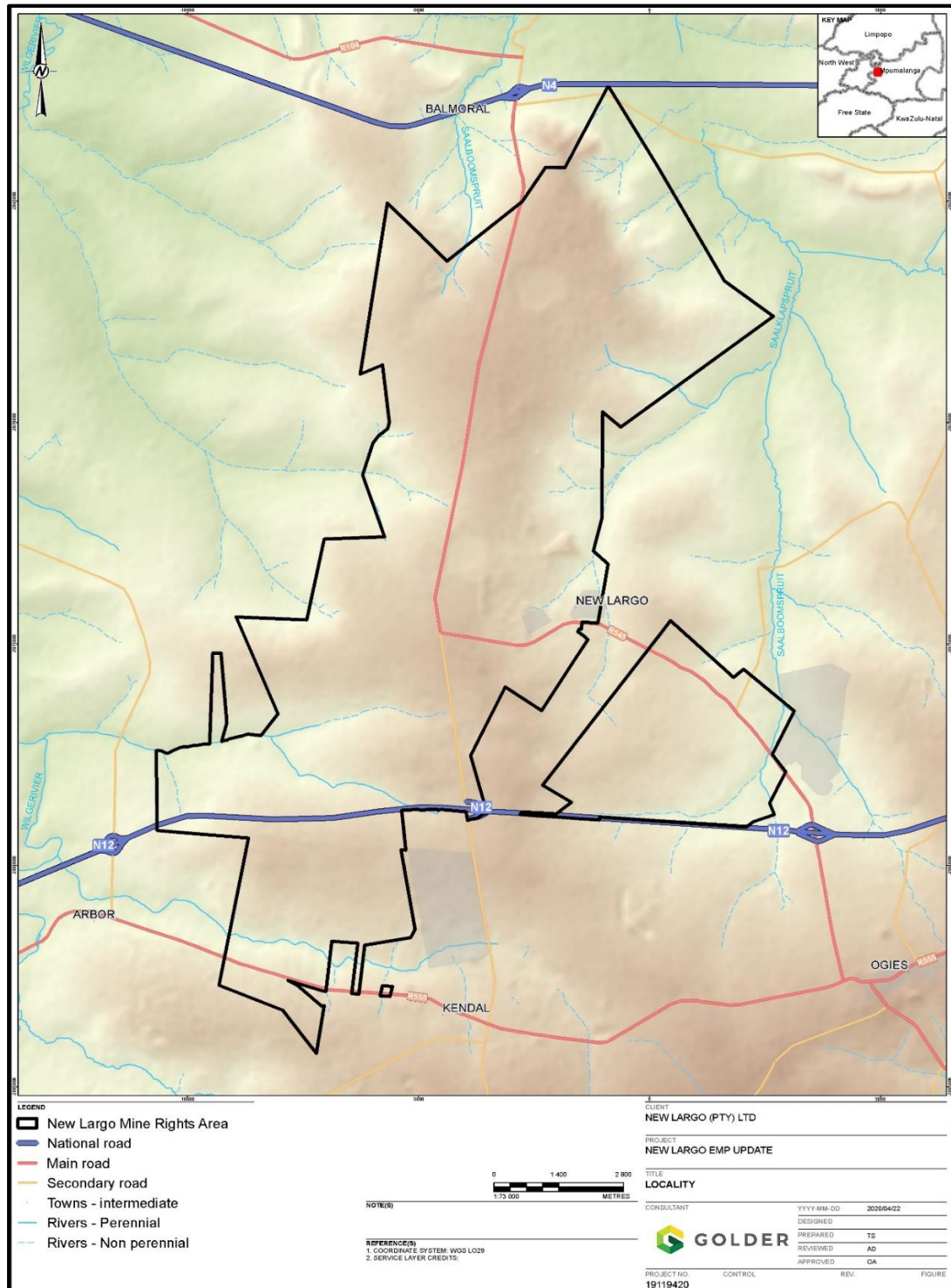


Figure 1. Project locality

3.0 KEY CHANGES FROM EXISTING AUTHORISED PROJECT

The following key changes are noted:

- The overland conveyor system will not be constructed until later in the project lifetime. Instead, coal will be trucked from Pits D and H
 - Pit D = 220 000 Tonne (T) per month at 25 working days per month = 275 truck loads per day on 32T coal road trucks; and
 - Pit H = 200 000 T per month at 25 workings days per month = 250 truck loads per day on 32T coal road trucks.
- The planned commencement of mining is now through pits Pit D and H.
- Because mining is now starting at Pit H, the following infrastructure is necessary to support mining at this location (Figure 3):
 - haul roads, access roads, product stockpiles, de-stoning plant, Pollution Control Dam (PCD) with a silt trap for dirty water management.
- The extent of Pit D has been defined. No new infrastructure is required; this pit will be mined through from the neighbouring Africoal pit, whose existing infrastructure will be used to support mining at Pit D (Figure 4);
- Phase 0 has been added to the Project which entails the construction of an offloading facility and link to the Kusile Main Feed conveyor adjacent to the MRA boundary with Kusile Power station, as well as the (authorised) northern access road.

4.0 PROJECT DESCRIPTION

The New Largo mine (the Project) will supply coal to Eskom's Kusile Power Station, which is located immediately adjacent to the west/north-west of the mine, as well as other potential markets. The project development will be phased. The principal activities and infrastructure that will be implemented during each phase are summarised as follows:

- 2020: Commence truck-and-shovel mining at Pit D, construct Phase 0 infrastructure;
- 2022: Commence truck-and-shovel mining at Pit H;
- 2025: Commence mining at the main New Largo mine:
 - New Largo prefers to develop the main ore body in three stages, whereby truck and shovel mining commences initially until the first dragline is deployed in year two, a second dragline in year five and a third dragline in year 12:
 - Mining Phase 1 (2025-2028): Mining Phase 1 will mainly consist of the first box-cut and dragline operation and will include the start of construction of most of the infrastructure. All Phase 1 infrastructure will be implemented by the end of Year 5; and
 - Mining Phase 2 (2032-2039): will be implemented by end of Year 8. It will entail the development of a coal processing plant, the construction of haul roads, permanent Water Treatment Plant, Run-of-Mine (ROM) stockpiles and the introduction of Dragline 2.
- The operational life of the main New Largo mine is estimated to be 50 years.



Figure 2. New Largo MRA, authorised extent of mining and pit locations

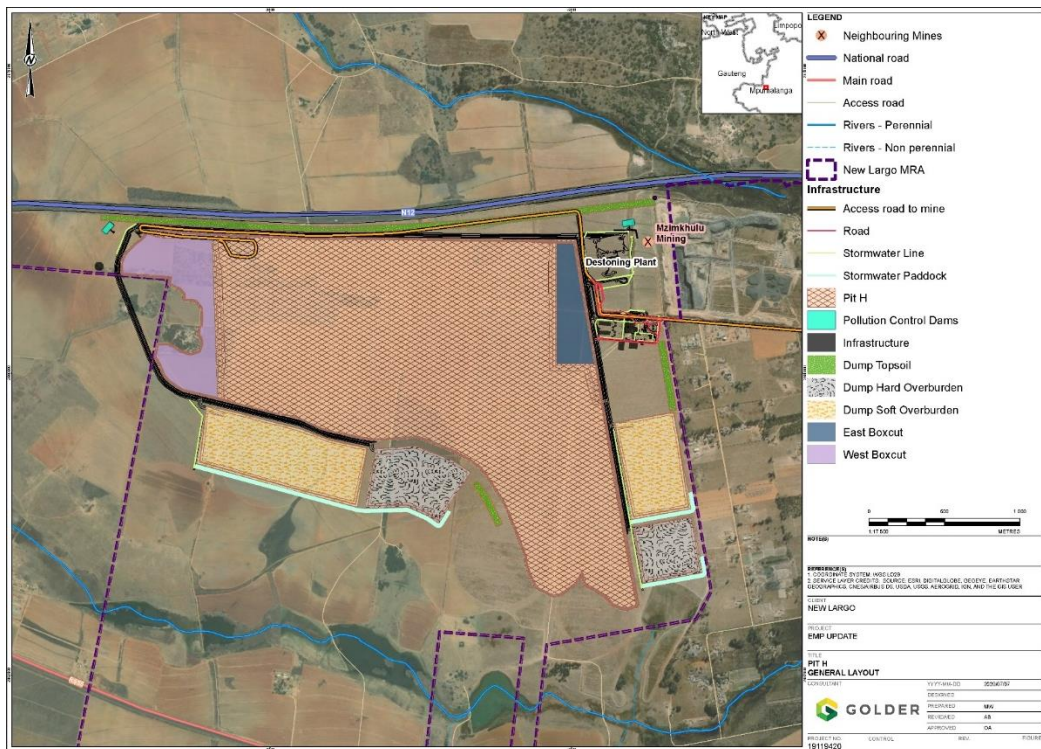


Figure 3 – Pit H Layout and Infrastructure

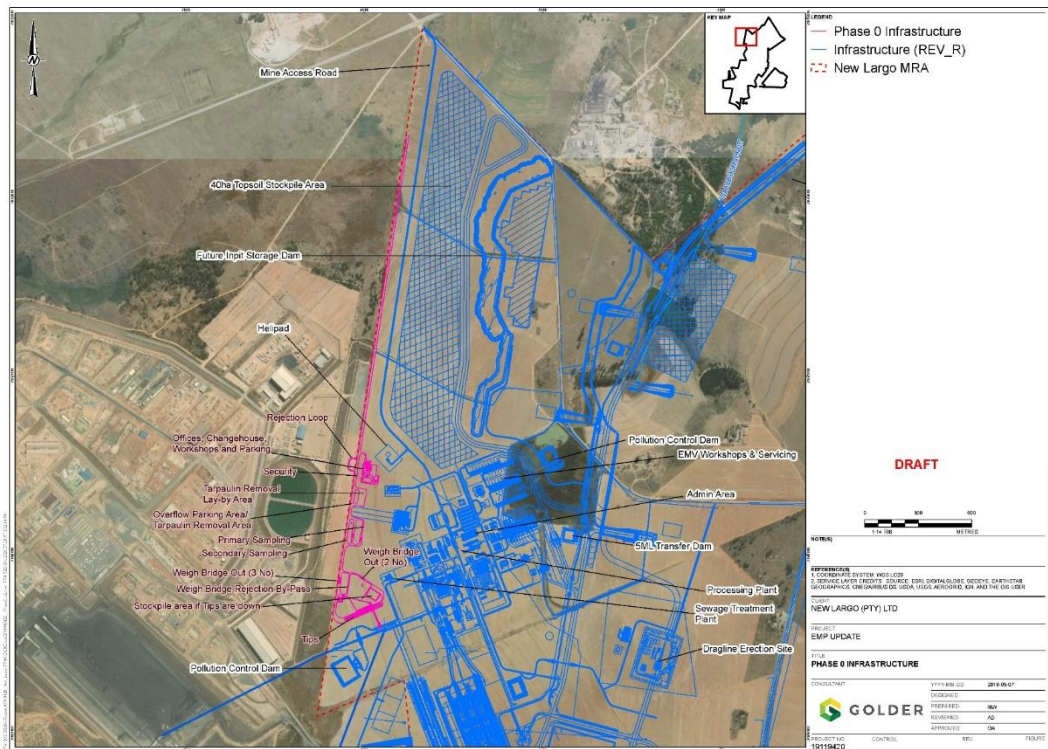


Figure 4 – New Phase 0 infrastructure (2020) and authorised infrastructure (2012)



Figure 5 – Pit D Layout and Infrastructure

5.0 METHODS

5.1 Cultural heritage methodology

5.1.1 Literature review

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted – see list of references in Section 8

- Information on events, sites and features in the larger region were obtained from these sources.

5.1.1.1 Survey of heritage impact assessments (HIAs)

A survey of HIAs done for projects in the region by various heritage consultants was conducted with the aim of determining the heritage potential of the area – see list of references in Section 7.

- Information on sites and features in the larger region were obtained from these sources.

5.1.1.2 Data bases

The *Heritage Atlas Database*, various SAHRA databases, the *Environmental Potential Atlas*, the *Chief Surveyor General* and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.

5.1.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature were obtained from these sources

The results of the above investigation are presented in Table 1 and Figure 6 below – see list of references in Section 11 – and can be summarised as follows:

- Stone Age tools, dating to the MSA and LSA occur as low-density scatters on some outcrops to the north in the larger region;
- Stone walled settlement sites dating to the Late Iron Age occur to the north and east of the study area;
- Historic structures, inclusive of buildings, monuments and bridges, occur mostly in an urban environment, although they are also found sporadically on farms in the region;
- Formal and informal burial sites occur in the various towns, but also sporadically on farms throughout the region.

*Based on the above assessment, the probability of cultural heritage sites, features and objects occurring in the study area is deemed to be **low**.*

Table 1: Assessment of existing information base

Category	Period	Probability	Reference
Landscapes			
Natural/Cultural		None	Aerial photographs; Historic maps;
Early hominin	Pliocene – Lower Pleistocene		
	Early hominin	None	-
Stone Age	Lower Pleistocene – Holocene		
	Early Stone Age	None	-
	Middle Stone Age	Low	Heritage Atlas Database
	Later Stone Age	Low	Heritage Atlas Database; Wadley & Turner (1987)
	Rock Art	Low	Heritage Atlas Database; Wadley & Turner (1987)
Iron age	Holocene		
	Early Iron Age	None	-
	Middle Iron Age	None	-
	Late Iron Age	Low	Heritage Atlas Database; Huffman (2007); Pelsler, van Schalkwyk, Teichert & Masiteng (2007); Van Schalkwyk (2001)
Colonial period	Holocene		
	Contact period/Early historic	Low	Van Schalkwyk (2000, 2002a&b, 2004a-c, 2005, 2006, 2016)
	Recent history	High	Heritage Atlas Database; Pistorius (2004, 2008); Van Schalkwyk (2000, 2002a&b, 2004a-c, 2005, 2006, 2016)
	Industrial heritage	Low	Heritage Atlas Database

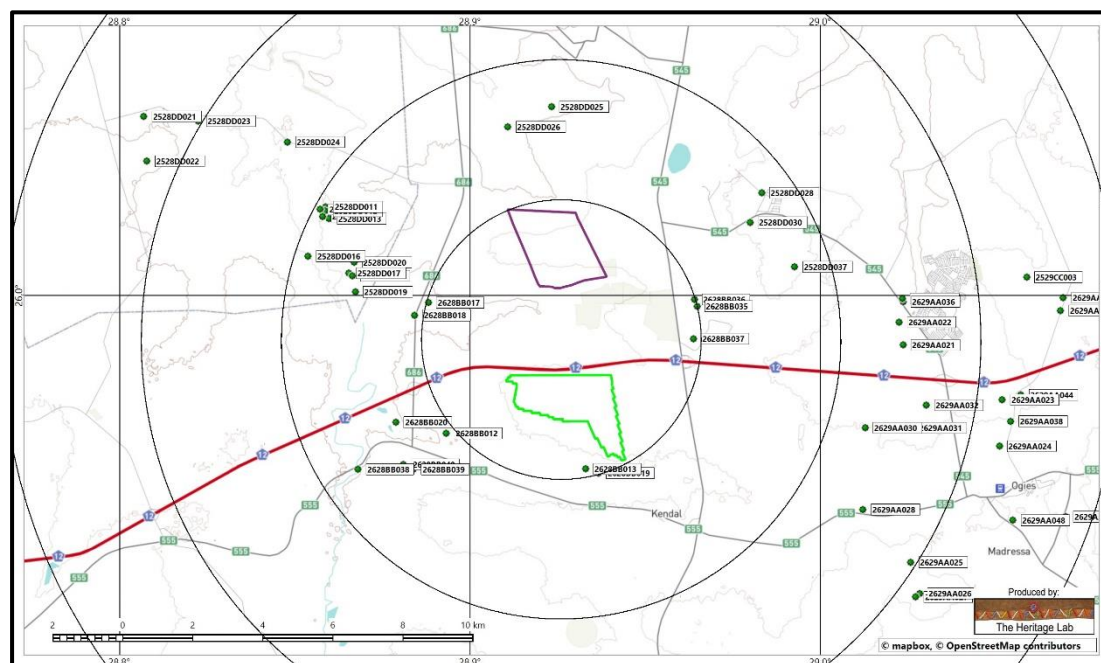


Figure 6. Location of known heritage sites and features in relation to the study area (Circles spaced at a distance of 4km: heritage sites = coded green dots)

5.1.2 Field programme

The field survey was aimed at locating all possible sites, objects and structures. The Pit D and Pit H areas that had to be investigated was identified by the Golder Associates Africa (Pty) Ltd by means of maps and .km/ files indicating the mining areas. This was loaded onto a Samsung digital device and viewed via the Google Earth application during the field survey of the area.

Note that since the Phase 0 infrastructure is situated in an area currently under intensive agricultural cultivation (maize lands), no field survey for heritage features was considered necessary at that location.

The site was visited on 12 June 2020 and was investigated by using internal roads and tracks to access previously identified features and then walking transects across the site.

- During the site visit, archaeological visibility was much limited due to the presence of tall and dense vegetation growth (grass and crops) and mining activities on the site – see Fig. 7 below.

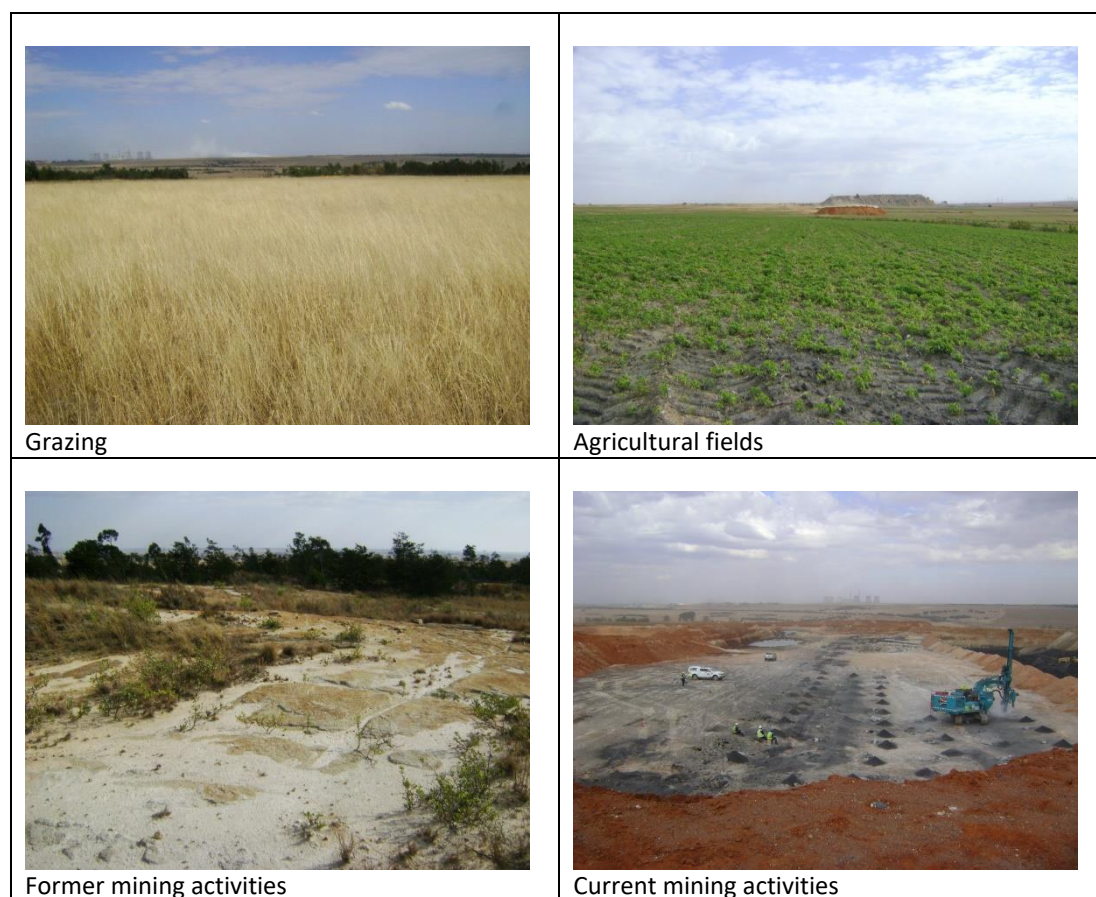


Figure 7. The landscape encountered during the site visit

5.2.1 Impact Assessment Methodology (for new/changed impacts)

The significance of identified impacts will be determined using the approach outlined below (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998). This approach incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further subdivided as follows:

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude of impact

Table 1: Ranking scales for magnitude, duration, scale and probability

Magnitude	Duration
10- Very high/unknown	5 – Permanent. Residual impacts will remain after decommissioning and closure.
8- High	4: Long-term. May occur throughout the life of the mine, but will cease after operations ceases either because of natural processes or human intervention (15 – 50 years, impact ceases after site closure has been obtained).
6- Moderate	3: Medium-term. May occur for the first few years of the project, during construction. Impacts reversible within a three-year period.
4- Low	2: Short-term. Impact may occur for weeks or a few months and is rapidly reversible.
2- Minor	1: Immediate.
Scale	Probability
5- International	5- Definite/Unknown
4- National	4- Highly Probable
3- Regional	3- Medium Probability
2- Local	2- Low Probability
1- Site Only	1- Improbable
0- None	0- None

The following definitions are applicable to the ranking scales outlined above:

- **Magnitude:** is a measure of the degree of change in a measurement or analysis (e.g., the area of pasture or the concentration of a metal in water compared to the water quality guideline value for the metal), and is classified as none/negligible, low, moderate or high. The categorisation of the impact magnitude may be based on a set of criteria (e.g. health risk levels, ecological concepts and professional judgement) pertinent to each of the discipline areas and key questions analysed. The specialist study must attempt to quantify the magnitude and outline the rationale used. Appropriate, widely recognised standards are to be used as a measure of the level of impact;
- **Scale/Geographic extent:** refers to the area that could be affected by the impact and is classified as site, local, regional, national, or international;

- **Duration:** refers to the length of time over which an environmental impact may occur i.e. immediate/transient, short-term (0 to 7 years), medium-term (8 to 15 years), long-term (greater than 15 years with impact ceasing after closure of the project), or permanent; and
- **Probability of occurrence:** is a description of the probability of the impact actually occurring as improbable (less than 5% chance), low probability (5% to 40% chance), medium probability (40% to 60% chance), highly probable (most likely, 60% to 90% chance) or definite (impact will definitely occur)

Once these factors are ranked for each impact, the significance of the two aspects, occurrence and severity, is assessed using the following formula:

$$\text{Significance Points} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability.}$$

The maximum value is 100 significance points (SP). The impact significance will then be rated as follows:

Points	Significance	Description
SP>60	High environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 - 60	Moderate environmental significance	An impact or benefit which is sufficiently important to require management, and which could have an influence on the decision unless it is mitigated.
SP<30	Low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive consequences/effects.

5.3 Study limitations

- It is assumed that the description of the proposed project, provided by the client, is accurate.
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the heritage impact assessment.
- The various topographic maps available from the Chief Surveyor-General are not always up to date and accordingly does not reflect the current state of development in any particular area.
- The unpredictability of buried archaeological features/remains.
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities, and the study area was considered low risk for the presence of subsurface features.

6.0 RESULTS

6.1 Natural Environment

The vegetation cover in the eastern part of the study area is classified as Eastern Highveld Grassland, a grassland biome that forms part of the Mesic Highveld Grassland. Halfway through to the west this changes to the Rand Highveld Grassland, which is also a grassland biome that forms part of the Mesic Highveld Grassland. However, most of this has been transformed due to former farming and recent mining activities.

The geology of the region is made up of diamictite (polymictic clasts, set in a poorly sorted, fine-grained matrix) with varved shale, mudstone with dropstones and fluvioglacial gravel common in the north, belonging to the Dwyka Group of the Karoo Supergroup. The topography of the region is classified as moderately undulating plains and pans.

As per SAHRA's requirement, the Palaeontological Sensitivity Map (SAHRIS) was consulted. This indicated that the study area (Fig. 8) has a high significance of fossil remains to be found and a palaeontological field assessment and protocol for finds is therefore required.

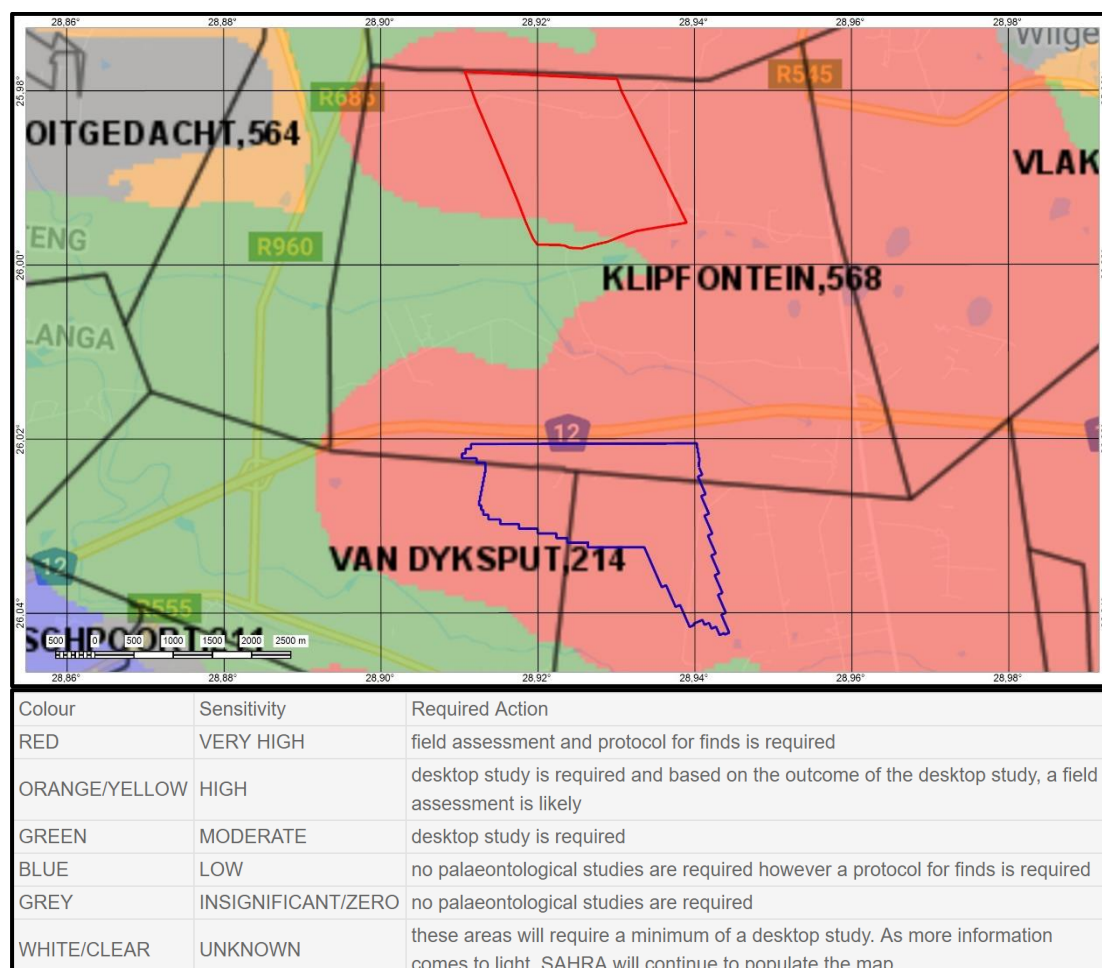


Figure 8. The Palaeontological sensitivity of the study area

6.2 Cultural Landscape

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the study area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity.

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a much later colonial (farmer) one, most of which developed during the last 150 years or less. Recently it gave rise to large-scale mining developments.

6.2.1 Stone Age

Very little habitation of the highveld area took place during Stone Age times. Tools dating to the Early Stone Age period are mostly found in the vicinity of larger watercourses, e.g. the Vaal River, or in sheltered areas such as the Magaliesberg. During Middle Stone Age (MSA) times (c. 150 000 – 30 000 BP), people became more mobile, occupying areas formerly avoided. The MSA is a technological stage characterized by flakes and flake-blades with faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology. Open sites were still preferred near watercourses.

Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Some sites are known to occur in the region. These vary from sealed (i.e. cave) sites, located to the south of the study area (Wadley & Turner 1987), to open sites near the Vaal River. Also, for the first time we get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments with incised markings are traditionally linked with the LSA. The LSA people have also left us with a rich legacy of rock art, which is an expression of their complex social and spiritual beliefs.

6.2.2 Iron Age

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area. Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes, but also for firewood and water.

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating conditions that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the treeless plains of the Free State and the Mpumalanga highveld.

This wet period came to a sudden end sometime between 1800 and 1820 by a major drought lasting 3 to 5 years. The drought must have caused an agricultural collapse on a large, subcontinent scale.

This was also a period of great military tension. Military pressure from Zululand spilled onto the highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. The Boers trekked into this area in the 1830s, and throughout this time, settled communities of Tswana people also attacked each other.

As a result of this troubled period, Sotho-Tswana people concentrated into large towns for defensive purposes. Because of the lack of trees they built their settlements in stone. These stone-walled villages were almost always located near cultivatable soil and a source of water. Such sites are known to occur near Kriel (e.g. Pelser, et al 2006) and to the south (Taylor 179).

6.2.3 Historic period

White settlers moved into the area during the first half of the 19th century. They were largely self-sufficient, basing their survival on cattle/sheep farming and hunting. Few towns were established, and it remained an undeveloped area until the discovery of coal and later gold. The establishment of the Nederlandsche Zuid-Afrikaansche Spoorweg Maatskappij railway line in the 1880s, linking Pretoria with Lourenço Marques and the world at large, brought much infra-structural and administrative development to the area. This railway line also became the scene of many battles during the Anglo-Boer War and after the battle of Bakenlaagte (30 October 1901) the Clewer station served as hospital for the wounded British soldiers. A concentration camp was established near the Balmoral station, northwest of the study area (Cloete 2000). In line with the 'scorched earth' policy, most farmsteads were destroyed by the British during the latter part of the hostilities.

Coal mining occurred only sporadically in the area. However, with the discovery of the Witwatersrand gold fields, the need for a source of cheap energy became important, and coal mining developed on a large scale in various regions. By 1899, at least four collieries were operating in the Middelburg-Witbank² district, supplying the gold mining industry (Praagh 1906).

When coal had to be transported from the coal fields of the Witbank to the Witwatersrand area, a need for a direct railway link with the industries in the Rand area arose. In 1906, a railway line was opened between Apex and Witbank, crossing Witklip to where coal was located on the farm Brakfontein of Mr NC Erasmus. In 1907 the surveyor Ewan Curry, instructed by Frank Campbell Dumat, surveyed the layout for the town on the farm Witklip. The name Delmas refers to a small farm (in southern French dialect: *mas*) of Dumat's grandfather in France.

6.3 Site specific review

Although landscapes with cultural significance are not explicitly described in the NHRA, they are protected under the broad definition of the National Estate (Section 3): Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate.

The examination of historical maps and aerial photographs help us to reconstruct how the cultural landscape has changed over time as is show how humans have used the land.

One of the earliest maps of the region (Fig. 9), dating to 1900, shows a region that is largely devoid of any development. The main focus is the old NZASM railway line from Pretoria to Lourenço Marques (Maputo).

From the official aerial photographs (Fig. 10 & Fig. 11), dating to 1958, it can be seen that development in the region largely consisted of agricultural fields, with some windbreaks planted in both pit areas. In addition, some built features can be seen on the southern boundary of Pit D.

- During the site visit it was determined that all of these structures have been demolished and all recyclable material have been removed (Fig. 12).

² Witbank was established only after 1903.

- Due to their relatively young age and current state of preservation, these features are viewed to have: Low significance 4C - Requires no further recording before destruction (see Addendum Section 2.3).
- A similar situation was found on the northern boundary of Pit H, where an old homestead was identified (Fig. 13).
 - Due to its relatively young age and current state of preservation, this feature is viewed to have: Low significance 4C - Requires no further recording before destruction (see Addendum Section 2.3).

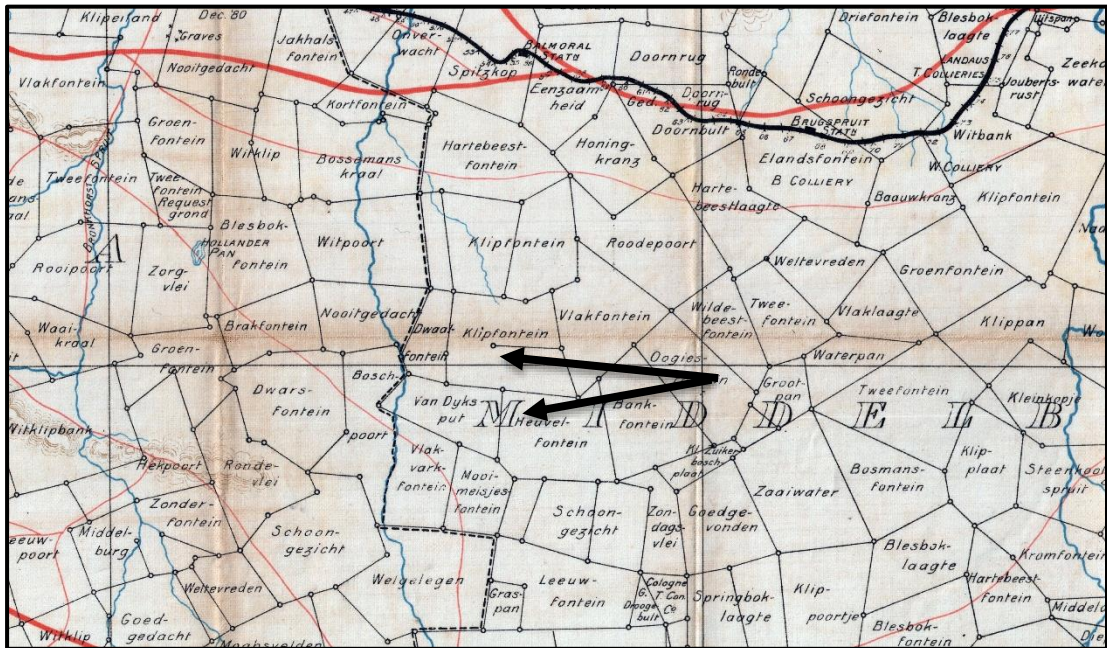


Figure 9. Early military map (Heidelberg) indicating the larger region, dating to 1900
Imperial Map of South Africa, Compiled for the Field Intelligence Department, Cape Town



Figure 10. Aerial view of the Block study region dating to 1958
(CS-G photograph: 412_001_03380)



Figure 11. Aerial view of Block the study region dating to 1958 (CS-G photograph: 412_002_02206)



Figure 12. Remains of built features on the southern boundary of Pit D



Figure 13. Remains of built features on the northern boundary of Pit H

6.4 Survey results

During the physical survey, the following sites, features and objects of cultural significance were identified in the study area (Fig. 14).

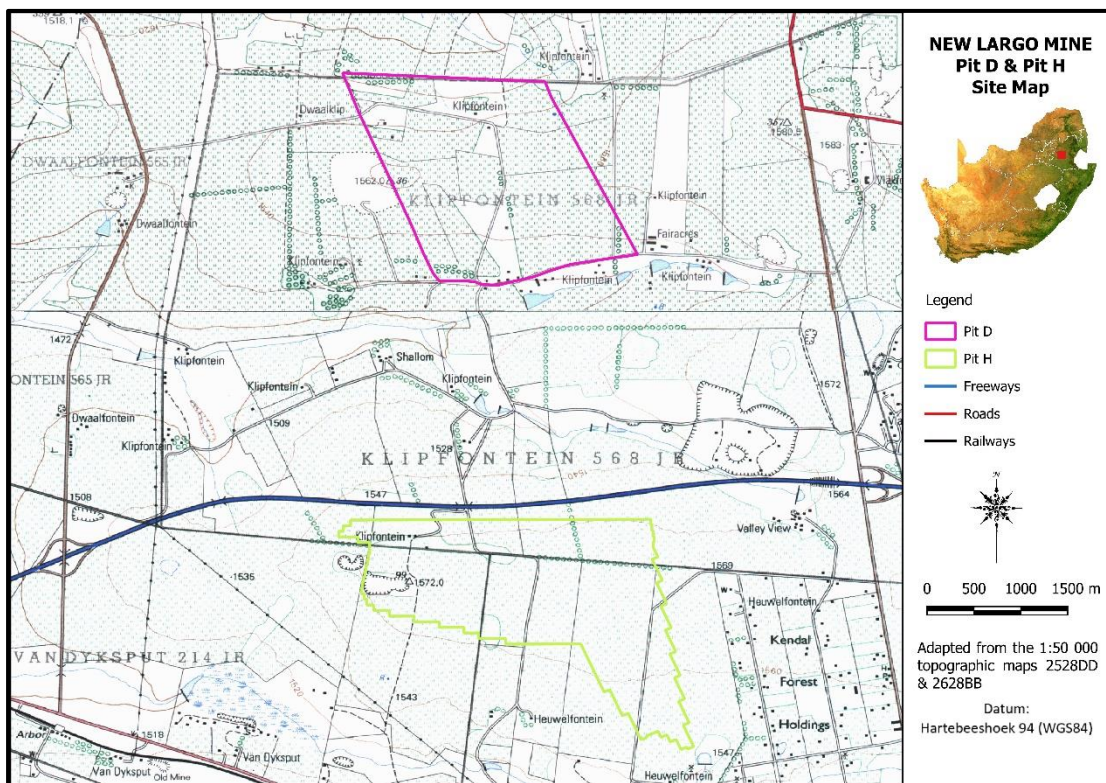


Figure 14. Location of heritage sites in the study area
(Please note that as no sites of cultural significance were identified, nothing is indicated on the map.)

6.4.1 Stone Age

- Chance finds: A single Stone Age artefact, dating to the Middle Stone Age, was identified as surface occurrence. It is made from quartzite and was probably used as scraper.

- Although occurrences of such tools in this part of the world is rare, as it is a surface find it is viewed not to be in its original context and is therefore classified as having low significance: Grade 4-C - no further action is required.



6.4.2 Iron Age

- No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.

6.4.3 Historic period

- No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.

7.0 CONCLUSION

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. The HIA consisted of a desktop study (archival sources, database survey, maps and aerial imagery) and a physical survey that included the interviewing of relevant people. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a much later colonial (farmer) one, most of which developed during the last 150 years or less. Recently it gave rise to large-scale mining developments.

Identified sites

During the physical survey no sites, features or objects of cultural significance were identified.

Impact assessment and proposed mitigation measures

- For the current study, as no sites, features or objects of cultural significance were identified, no additional mitigation measures to those already contained in the authorised EMP are proposed.

Heritage sites	Significance of impact	Mitigation measures
New Largo Pit D and Pit H: Construction Phase		
Without mitigation	n/a	n/a
With mitigation	n/a	n/a
New Largo Pit D and Pit H: Operation Phase		
Without mitigation	n/a	n/a
With mitigation	n/a	n/a

Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that no sites, features or objects of heritage significance occur in the study area. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- As per SAHRA's requirement, the Palaeontological Sensitivity Map (SAHRIS) was consulted. This indicated that the study area has a high significance of fossil remains to be found and a palaeontological field assessment and protocol for finds is therefore required.
- Should archaeological sites or graves be exposed during mining activities, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

8.0 REFERENCES

8.1 Data bases

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria
National Archives of South Africa
SAHRA Archaeology and Palaeontology Report Mapping Project (2009)
SAHRIS Database

8.2 Literature

Fourie, W. 2012. *Proposed Kusile/Kendal to Zeus 400kv transmission line: archaeological and palaeontological walk down*. Unpublished report: PGS Heritage and Grave Solutions.

Pelser, A., van Schalkwyk, J.A., Teichert, F. & Masiteng, I. 2007. The archaeological investigation of an Iron Age site on the farm Rietfontein 101IS, Emalahleni district, Mpumalanga Province. *NCHM Research Journal* 2:1-24.

Pistorius, J.C.C. 2004. *A heritage impact assessment (HIA) study for the proposed new Goedgevonden expansion project on the farms Goedgevonden 10IS, Zaaiwater 11IS and Kleinzuikerboschkraal 8IS in the Eastern Transvaal Highveld in the Mpumalanga Province of South Africa*. Pretoria: Unpublished report.

Pistorius, J.C.C. 2008. *A Phase 1 Heritage Impact Assessment (HIA) study for Eskom's proposed Bravo Project on the Eastern Highveld in the Gauteng and Mpumalanga Provinces of South Africa; the construction of two 400kV power lines from Kendal power station to Zeus substation*. Unpublished report. Pretoria.

Taylor, M.O.V. 1979. Wildebeestfontein: a Late Iron Age site in the southeastern Transvaal. In Van der Merwe, N.J. & Huffman, T.N. (eds.) 1979. *Iron Age studies in Southern Africa*. Goodwin Series No. 3. Cape Town: South African Archaeological Society. Pp. 120-132.

Van Schalkwyk, J.A. 1997. *A survey of cultural resources in the Pit 5 & 6 mining areas, Kriel Colliery, Kriel district, Mpumalanga Province*. Unpublished report 1997KH20. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 1998. *A survey of cultural resources for Secunda Collieries block 5 and Syferfontein mining area, Highveld Ridge District, Mpumalanga*. Unpublished report 1998KH10. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2000. *A survey of cultural resources for the Kriel South EMPR, Mpumalanga Province*. Unpublished report 2000KH08. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2001. *A survey of cultural resources for the Kriel Colliery haul road, Mpumalanga Province*. Unpublished report 2001KH01. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2002a. *A survey of cultural resources for the Middelbult mining development, Highveld Ridge district, Mpumalanga Province*. Unpublished report 2002KH26. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2002b. *A survey of cultural resources for the Zondagsfontein mining development, Witbank district, Mpumalanga Province*. Unpublished report 2002KH28. Pretoria: National Cultural History Museum.

Van Schalkwyk, J. 2004a. *Heritage survey for the proposed Nooitgedacht underground coal mine, Witbank district, Mpumalanga*. Unpublished report 2004KH34B. Pretoria: National Cultural History Museum.

Van Schalkwyk, J. 2004b. *Heritage impact assessment for the Smithfield mining development, Witbank district, Mpumalanga*. Unpublished report 2004KH34C. Pretoria: National Cultural History Museum.

Van Schalkwyk, J. 2004c. *Heritage impact assessment for the Weltevreden, New Largo Underground and New Largo Pit 4 mining developments, Witbank district, Mpumalanga*. Unpublished report 2004KH34D. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2005. *Heritage impact assessment for the Vaal River eastern sub-system augmentation project, Gauteng and Mpumalanga*. Unpublished report 2005KH58. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2006. *Heritage impact assessment for the proposed new power station, Witbank Area*. Unpublished report 2006KH111. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2016. Cultural heritage impact assessment for the proposed development of the Bravo 4 power lines, Kusile Power Station to Zeus Substation, Mpumalanga Province. Pretoria: Unpublished report 2016JvS042.

Wadley, L & Turner, G. 1987. Hope Hill shelter: a Later Stone Age site in southern Transvaal. *South African Journal of Science* 83(3):98-105.

8.3 Archival sources, maps and aerial photographs

1: 50 000 Topographic maps: Chief Surveyor-General
Google Earth
Aerial Photographs: Chief Surveyor-General
<http://vmus.adu.org.za>

9.0 ADDENDUM

1. Indemnity and terms of use of this report

The findings, results, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and the author reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. The author of this report will not be held liable for such oversights or for costs incurred as a result of such oversights.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

2. Legislative framework

2.1 Background

Heritage Impact Assessments are governed by national legislation and standards and International Best Practise. These include:

- South African Legislation
 - National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
 - Mineral and Petroleum Resources Development Act, 2002 (Act No. 22 of 2002) (MPRDA);
 - National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA); and
 - National Water Act, 1998 (Act No. 36 of 1998) (NWA).
- Standards and Regulations
 - South African Heritage Resources Agency (SAHRA) Minimum Standards;
 - Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics;
 - Anthropological Association of Southern Africa Constitution and Code of Ethics.
- International Best Practise and Guidelines
 - ICOMOS Standards (Guidance on Heritage Impact Assessments for Cultural World Heritage Properties); and
 - The UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (1972).

2.2 Heritage Impact Assessment Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, Section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority.

The National Heritage Resources Act (Act No. 25 of 1999, Section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of a site:*
 - (i) exceeding 5 000 m² in extent; or*
 - (ii) involving three or more existing erven or subdivisions thereof; or*
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."*

And:

“38 (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

- (a) The identification and mapping of all heritage resources in the area affected;*
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) an assessment of the impact of the development on such heritage resources;*
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.”*

A system for site grading was established by the NHRA and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

2.3 Significance of the identified heritage resources

According to the NHRA, Section 2(vi) the **significance** of a heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. SITE EVALUATION	
1.1 Historic value	
Is it important in the community, or pattern of history	
Does it have strong or special association with the life or work of a person, group or organisation of importance in history	
Does it have significance relating to the history of slavery	
1.2 Aesthetic value	
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group	
1.3 Scientific value	
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage	
Is it important in demonstrating a high degree of creative or technical achievement at a particular period	
1.4 Social value	
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons	
1.5 Rarity	
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage	
1.6 Representivity	
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects	
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class	
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.	

2. Sphere of Significance		High	Medium	Low
International				
National				
Provincial				
Regional				
Local				
Specific community				
3. Field Register Rating				
1.	National/Grade 1: High significance - No alteration whatsoever without permit from SAHRA			
2.	Provincial/Grade 2: High significance - No alteration whatsoever without permit from provincial heritage authority.			
3.	Local/Grade 3A: High significance - Mitigation as part of development process not advised.			
4.	Local/Grade 3B: High significance - Could be mitigated and (part) retained as heritage register site			
5.	Generally protected 4A: High/medium significance - Should be mitigated before destruction			
6.	Generally protected 4B: Medium significance - Should be recorded before destruction			
7.	Generally protected 4C: Low significance - Requires no further recording before destruction			

3. Heritage resources

3.1 The National Estate

The National Heritage Resources Act (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to 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 Human Tissue Act, 1983 (Act No. 65 of 1983);
- 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).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

4. Mitigation measures

- *Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.*

Impacts can be managed through one or a combination of the following mitigation measures:

- Avoidance
- Investigation (archaeological)
- Rehabilitation
- Interpretation
- Memorialisation
- Enhancement (positive impacts)

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed development activities:

- (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
 - 10 metres for a single grave, or a built structure, to
 - 50 metres where the boundaries are less obvious, e.g. a Late Iron Age site.
- (2) Archaeological investigation/Relocation of graves: This option can be implemented with additional design and construction inputs. This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
 - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
 - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements must be adhered to.
 - Impacts can be beneficial – e.g. mitigation contribute to knowledge
- (3) Rehabilitation: When features, e.g. buildings or other structures are to be re-used. Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use.
 - The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
 - Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
 - Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (4) Mitigation is also possible with additional design and construction inputs. Although linked to the previous measure (rehabilitation) a secondary though 'indirect' conservation measure would be to use the existing architectural 'vocabulary' of the structure as guideline for any new designs.
 - The following principle should be considered: **heritage informs design**.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.
 - Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage/remains are destroyed.

5. Relocation of graves

If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits and have their own requirements that must be adhered to.

If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave.

Information needed for the SAHRA permit application

- The permit application needs to be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- If graves have not been identified and there are no headstones to indicate the grave, these are then unknown graves and should be handled as if they are older than 60 years. This information also needs to be given to SAHRA.
- A letter from the landowner giving permission to the developer to exhume and relocate the graves.
- A letter from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

6. Curriculum vitae

Johan Abraham van Schalkwyk

Personal particulars

Date of birth: 14 April 1952
Identity number: 520414 5099 08 4
Marital status: Married; one daughter
Nationality: South African

Current address: home

62 Coetzer Ave, Monument Park, Pretoria, 0181
Mobile: 076 790 6777; E-mail: jvschalkwyk@mweb.co.za

Qualifications

1995 DLitt et Phil (Anthropology), University of South Africa
1985 MA (Anthropology), University of Pretoria
1981 BA (Hons), Anthropology, University of Pretoria
1979 Post Graduate Diploma in Museology, University of Pretoria
1978 BA (Hons), Archaeology, University of Pretoria
1976 BA, University of Pretoria

Non-academic qualifications

12th HSRC-School in Research Methodology - July 1990
Dept. of Education and Training Management Course - June 1992
Social Assessment Professional Development Course - 1994
Integrated Environmental Management Course, UCT - 1994

Professional experience

Private Practice
2017 - current: Professional Heritage Consultant

National Museum of Cultural History

1992 - 2017: Senior researcher: Head of Department of Research. Manage an average of seven researchers in this department and supervise them in their research projects. Did various projects relating to Anthropology and Archaeology in Limpopo Province, Mpumalanga, North West Province and Gauteng. Headed the Museum's Section for Heritage Impact Assessments.
1978 - 1991: Curator of the Anthropological Department of the Museum. Carried out extensive fieldwork in both anthropology and archaeology

Department of Archaeology, University of Pretoria

1976 - 1977: Assistant researcher responsible for excavations at various sites in Limpopo Province and Mpumalanga.

Awards and grants

1. Hanisch Book Prize for the best final year Archaeology student, University of Pretoria - 1976.
2. Special merit award, National Cultural History Museum - 1986.
3. Special merit award, National Cultural History Museum - 1991.
4. Grant by the Department of Arts, Culture, Science and Technology, to visit the various African countries to study museums, sites and cultural programmes - 1993.
5. Grant by the USA National Parks Service, to visit the United States of America to study museums, sites, tourism development, cultural programmes and impact assessment programmes - 1998.
6. Grant by the USA embassy, Pretoria, under the Bi-national Commission Exchange Support Fund, to visit cultural institutions in the USA and to attend a conference in Charleston - 2000.
7. Grant by the National Research Foundation to develop a model for community-based tourism - 2001.

8. Grant by the National Research Foundation to develop a model for community-based tourism - 2013. In association with RARI, Wits University.

Publications

Published more than 70 papers, mostly in scientifically accredited journals, but also as chapters in books.

Conference Contributions

Regularly presented papers at conferences, locally as well as internationally, on various research topics, ranging in scope from archaeology, anthropological, historical, cultural historical and tourism development.

Heritage Impact Assessments

Since 1992, I have done more than 2000 Phase 1 and Phase 2 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.