



DIGBY WELLS
ENVIRONMENTAL



Lanxess Chrome Mine: Section 102 Amendment

Heritage Scoping Report

Project Number:

LAN3111

Prepared for:

Lanxess Chrome Mine (Pty) Ltd

March 2015




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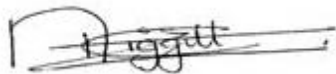
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EXECUTIVE SUMMARY

Introduction

Digby Wells Environmental (hereafter referred to as Digby Wells) has been appointed by Lanxess Chrome Mining (Pty) Ltd (herein referred to as Lanxess) for the Amendment of the existing Environmental Management Programme (EMP) Report for its Lanxess Chrome Mine (LCM), to include the expansion of the underground operations to neighbouring areas, a ventilation shaft to support the underground mining activities as well as the establishment of an open pit operation within LCM.

The heritage scoping study was designed to comply with the relevant national legislative requirements as contained in the National Heritage Resources Act, 1999 (NHRA), Minerals and Petroleum Resources Development Act, 2002 (MPRDA) and National Environmental Management Act, 1998 (NEMA).

Project Description and Activities

Lanxess has proposed an expansion of their existing underground chrome operations on the farm Rietfontein 338 near Rustenburg, North-West Province as well as the establishment of an open pit operation within their existing mining rights area.

Cultural Heritage Baseline

Considering the regional geology and palaeontological sensitivity, the site specific study area has no significance. All three Stone Age periods have been recorded in the regional study area and throughout the Limpopo Province: Early Stone Age (ESA, ca. 3 Ma to 300 Ka), Middle Stone Age (MSA, ca. 300 Ka to 30 Ka) and Later Stone Age (LSA, ca. 30 Ka to 2000 years ago). Several assessment studies have identified weathered MSA tools, however these were mostly found out of context.

Ceramic sherds and stone walled settlements were identified during the scoping survey of the project area, as well as in several archaeology and heritage studies previously completed in the region. The ceramics provide evidence of Iron Age settlement from at least the 17th century CE continuing to the 19th century CE. This is consistent with the regional study area.

A mine shaft that was sunk in 1949 was recorded during the scoping survey; however it was in operation until 1979. A total of two graves have been recorded in the surrounding areas during previous heritage assessments.

Scoping Survey Results

During the scoping survey, the following resources were identified within the proposed impact area:

Resource Type	Number
Stone Age Scatter	1
Iron Age / Historic	6

Identified Potential Risks and Impacts

Some heritage resources may be so significant or sensitive that any development will be detrimental to their continued survival. In addition, certain heritage resources are formally protected, and that restricts various development activities. The primary risk associated with highly significant heritage resources to the LCM Project is that the presence of any such resources may result in negative Records of Decision and / or restrictions imposed on development activities.

The highest likelihood of changes to heritage resources is associated with activities that will be undertaken during the construction phase. Here, the potential negative impacts, such as damage or destruction, are the greatest. During the operation phase of the proposed project, sources of risk to heritage resources are limited. The primary risk during the operational phase will be associated with the alteration of the sense-of-place of the project area. However, the study area is disturbed through urbanisation, agricultural and mining activities, thereby minimising the intensity of this risk to heritage resources.

Recommendations

Based on our understanding of the cultural landscape and the identified heritage resources within the project area, Digby Wells recommends the following:

- Exemption from further palaeontological assessments for the proposed infrastructure footprint as the palaeo-sensitivity is insignificant;
- An HIA be undertaken that includes the following heritage components:
 - An Archaeological Impact Assessment including reconnaissance to identify and record archaeological resources within the impact footprint; and
 - An assessment of burial grounds and graves including reconnaissance to identify, record and document all burials that may exist in the impact footprint.

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1 Introduction

Digby Wells Environmental (Digby Wells) has been appointed by Lanxess Chrome Mining (Pty) Ltd (Lanxess) for the Amendment of the existing Environmental Management Plan (EMP) for its Lanxess Chrome Mine (LCM). The amendment includes the expansion of the underground operations to neighbouring areas, as well as the establishment of an open pit operation within LCM.

Lanxess currently has an Environmental Impact Assessment (EIA) and EMP in line with the Minerals and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA) and would, therefore, need to amend the existing approved document to include the details of the proposed opencast mining operations as well as the extension of the underground sections (Segment 1, 2, 3 and 4) as part of a section 102 amendment. It must be noted that a Heritage component was not part of the previous EIA/EMP.

This document presents the specialist Heritage Scoping Report (HSR) to inform the EMP Section 102 amendment.

1.1 Terms of Reference for the Study

The Terms of Reference (ToR) for the heritage scoping assessment are to:

- Describe the baseline cultural landscape within which the LCM Project is located; and
- Identify the potential heritage impacts that may arise as a result of the proposed operation, and provide recommendations for further study and assessment.

1.2 Policy and legal framework

This section briefly discusses national and international legislation relevant to heritage resources management. The section begins with a summary of South African legislation, followed by an overview of relevant international law, standards and guidelines.

1.2.1 National Legislation

1.2.1.1.1 National Environmental Management Act, 1998 (NEMA)

This Act provides that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions so as to ensure that development serves present and future generations. The Act further sets out the process for public participation in terms of the NEMA Regulations GNR 733 of 8 December 2014.

1.2.1.1.2 National Heritage Resources Act, 1999 (NHRA)

The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa. This Act considers various heritage resources as forming

part of the national estate as contemplated in Section 3. In addition, certain other categories are afforded automatic formal or general protection, outlined below:

- Formal protection:
 - Section 27 - national (Grade I) and provincial (Grade II) heritage sites;
 - Section 28 - protected areas; and
 - Section 32 - heritage areas.
- General protection:
 - Section 34 – historical built environment;
 - Section 35 – archaeology, palaeontology and meteorites;
 - Section 36 – burial grounds and graves; and
 - Section 37 - public monuments and memorials.

Section 5 of the NHRA outlines general principles for heritage resources management that the specialist heritage component of the LCM Project aims to adhere to.

Section 38 provides the HRM process and minimum requirements that need to be complied with:

- Subsection (8) requires a HIA study to be conducted if an impact assessment is required in terms of any other Act. In this instance impact assessments are required by several Acts, but notably the NEMA and MPRDA; and
- Subsection (3) outlines the minimum information that must be included in a HIA report.

This report was completed to comply in part with Section 38 of the Act. Digby Wells has developed a HRM approach in an attempt to fully integrate with both the MPRDA and NEMA processes. This approach aims to comply with Sections 5 and 38(3) of the NHRA, and can be made available to interested parties on request. This report will be submitted to the South African Heritage Resources Agency (SAHRA) and the North West Provincial Heritage Resource Authority (NWPHRA) for Statutory Comments in accordance with Section 38 of the NHRA.

1.2.1.1.3 Mineral and Petroleum Resources Development Act, 2002 (MPRDA)

A Section 102 Amendment does not explicitly require a heritage study and therefore does not trigger a NHRA section 38(8) application (see below). However, a Section 102 Amendment does require that an existing EMP required in terms of section 39 of the MPRDA must be revised. Such revision must be made commensurate with requirements stipulated in section 22(4)(a) of the MPRDA that require the applicant to conduct an EIA and submit an EMP for approval.

The EIA must therefore be conducted in accordance with section 38 of the MPRDA that give effect to the general objectives of integrated environmental management encapsulated in Chapter 5 of NEMA. The EIA must furthermore speak to impacts that the mining will have on the environment in accordance with section 24(7) of the NEMA.

The EIA consequently informs the EMP. Any subsequent revision of an EMP must then also consider and integrate possible management of environmental impacts on heritage resources.

1.2.2 International standards and guidelines

1.2.2.1.1 International Finance Corporation Performance Standard 8: Cultural Heritage

This Performance Standard (PS) recognises the importance of cultural heritage for current and future generations. Consistent with the United Nations Education, Scientific and Cultural Organisation (UNESCO) World Heritage Convention (WHC), this PS aims to ensure that cultural heritage is protected in the course of project activities. In addition, the requirements of this PS on a project's use of cultural heritage are based in part on standards set by the UNESCO Convention on Biological Diversity. The objectives of PS 8 are:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation.
- To promote the equitable sharing of benefits from the use of cultural heritage.

1.2.2.1.2 UNESCO World Heritage Convention

The UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 is an international legal instrument that binds South Africa to its content and supplementary texts. In addition, the WHC is referenced in the IFC PS 8: Cultural Heritage. These texts include among others charters and doctrinal texts published by the International Council on Monuments and Sites (ICOMOS).

1.3 Constraints and Limitations

The following restrictions and limitations were encountered:

- The heritage scoping report is primarily desktop based – field work was limited to a screening site visit undertaken over 1 day and focused on the proposed infrastructure footprint;
- The HSR is not intended to present an exhaustive list and description of heritage resources;
- The purpose of the screening site visit was to visually document the current conservation status of the cultural landscape, and to ground-truth certain tangible heritage resources identified in the literature review. The screening survey did not use

systematic, controlled survey techniques, nor was it intended to be a comprehensive survey of the proposed project area;

- Desktop findings are based on available research from credible sources. While every attempt to obtain the latest available information was made, reviewed literature does not represent an exhaustive list of information sources for the study area;
- Time constraints did not allow the heritage specialists to engage any stakeholders in respect of heritage resources;
- Many tangible heritage resources, specifically archaeological resources, commonly occur below the visible surface, and may not be adequately recorded, documented and assessed without intrusive and destructive methods. Such investigations are outside the scope of this HSR and the consequent HIA, as well as beyond the requirements to conduct a HIA in terms of the NHRA.

1.4 Specialist Expertise

Natasha Higgitt undertook a screening site visit and compiled the HSR. She obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She currently holds the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than 3 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia.

Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (*Member No. 335*).

Justin du Piesanie provided the first review of the HSR. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. He has over 5 years combined experience in Heritage Resources Management (HRM) in South Africa, including heritage assessments, archaeological mitigation and grave relocation. Justin has gained further generalist experience since his appointment at Digby Wells in Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with International Finance Corporation (IFC) requirements such as Performance Standard 8: Cultural Heritage.

Justin is a professional member of ASAPA (*Member No. 270*) and the International Council on Monuments and Sites (ICOMOS) South Africa (*Member No. 14274*).

Johan Nel provided the final review of the HSR. He has more than 13 years of combined experience in the field of HRM including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. He has gained experience both within urban settings and remote rural landscapes. Since 2010 he has been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact

assessments (EIA). Many of the projects since have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. This exposure has allowed Johan to develop and implement a HRM approach that is founded on international best practice, leading international conservation bodies such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and ICOMOS and aligned to the South African legislation. Johan has worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone.

Johan is a professional member of ASAPA (*Member No. 095*) and ICOMOS South Africa (*Member No. 13839*).

The CV's of the specialists can be found in Appendix A.

1.5 Structure of the Heritage Scoping Report

The rest of this heritage scoping report is structured as follows:

- Section 2 describes the methodology adopted for this study and includes descriptions on the study areas, data collection and compilation of the cultural heritage baseline profile;
- Section 3 provides a summary of the proposed project, project activities and initially identifies project-related risks and impacts;
- Section 4 discusses the cultural heritage baseline profile and the results of the scoping survey;
- Section 5 presents a provisional Statement of Cultural Significance for the project area;
- Section 6 outlines possible heritage risks to the project;
- Section 7 discusses possible heritage impacts that may likely occur by the proposed project activities; and
- Section 8 concludes the study with recommendations regarding aspects that will require specific attention during the HIA that will be undertaken during the impact assessment phase of the project.

2 Methodology

The heritage scoping study was designed to comply with the relevant national legislative requirements as contained in the NHRA, MPRDA and NEMA. The activities undertaken as part of the study are described below.

2.1 Defining of the Study Areas

Notwithstanding that this report constitutes a scoping study, it forms the foundation the evaluation of cultural significance and impact assessment will be based. Defined study areas must therefore be useful for the impact assessment phase. The IFC (2012) generally

defines a “study area” for an impact assessment as the area most likely to experience impacts arising from or to exert an influence on, the project or activity being assessed.

In terms of heritage impact assessments this is complicated by the fact that different heritage impacts may manifest in different geographical areas and diverse communities. For instance, heritage impacts can simultaneously affect the physical resource and have social repercussions: this is compounded when the intensity of physical impacts and social repercussions differ significantly. In addition, heritage impacts can influence the cultural significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can therefore generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the 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.
- **Indirect, induced or secondary heritage impacts** can 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 primary impact, its significance is affected that can ultimately result in the loss of the resource itself.
- **Cumulative heritage impacts** 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 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 particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
 - **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.
 - **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.

The relevance of the above distinction to defining the study area arises from the fact that heritage resources do not exist in isolation to the wider natural, social, cultural and heritage landscape: cultural significance is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities. In addition, the NHRA requires that heritage resources are graded in terms of national, provincial and local concern based on their importance and consequent official (i.e. State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories. Two 'concentric' study areas were defined for the purposes of this study. These areas are defined below; each one encompasses its precursor and exceeds it in scale:

- First, it provided the context within which identified heritage resources need to be interpreted and understood to determine cultural significance; and
- Second, assessing the significance of impacts on heritage resources corresponding to the three impact categories listed above.

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. This area was defined as the immediate surrounding properties / farms, as well as the affected local municipality. The local study area was specifically examined to provide a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provided the local development and planning context that may contribute to cumulative impacts (See Figure 2-1).

The *site-specific study area* – this is the area where heritage impacts are most probable due to development. This area is defined as the extent of the farm portions of the proposed project area including a 500 m buffer area around project area. The site-specific study area may extend linearly. In such instances, the linear development, e.g. a road, is defined as the site-specific area including a 200 m buffer either side of the development footprint (See Figure 2-2).

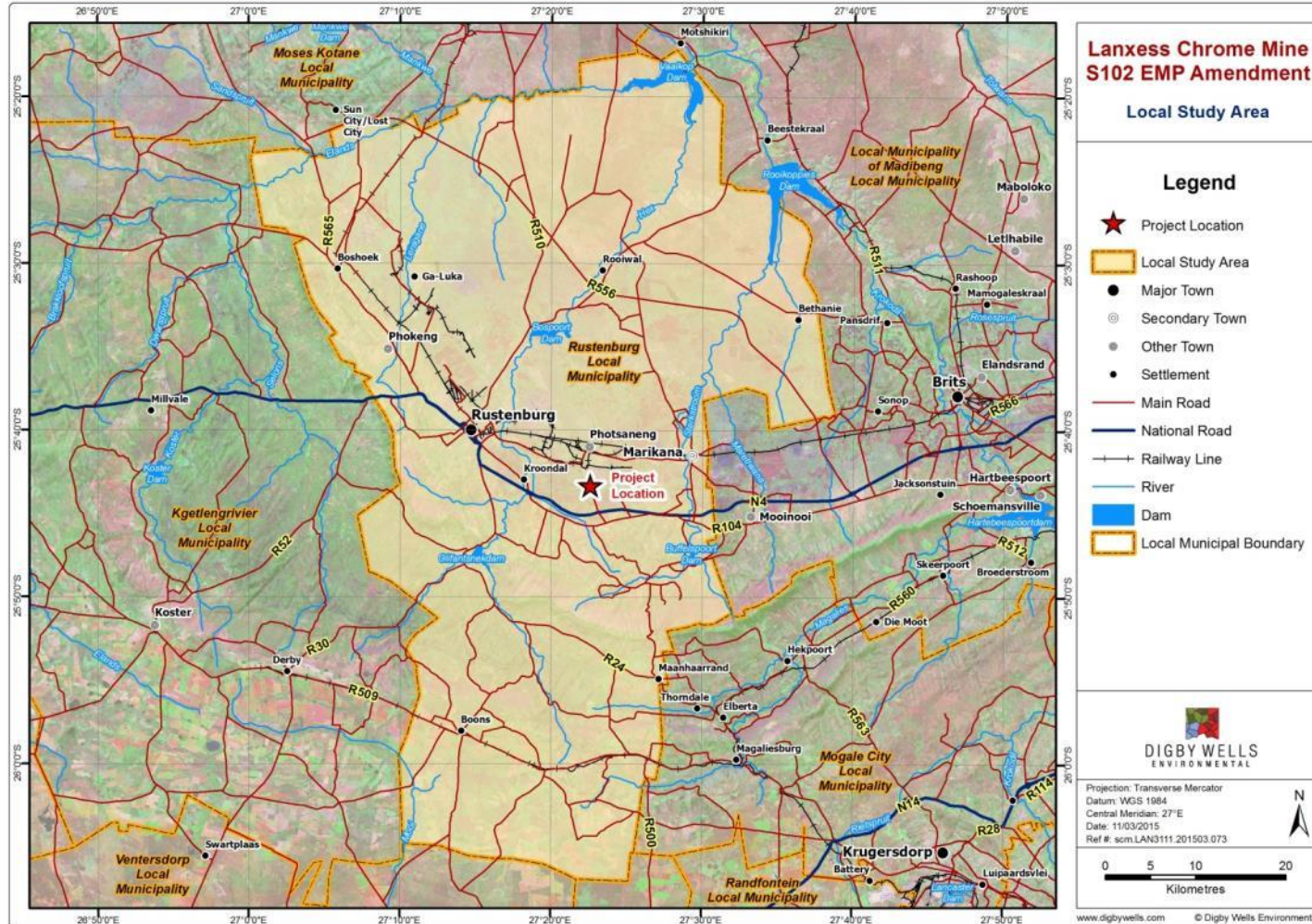


Figure 2-1: Local study area

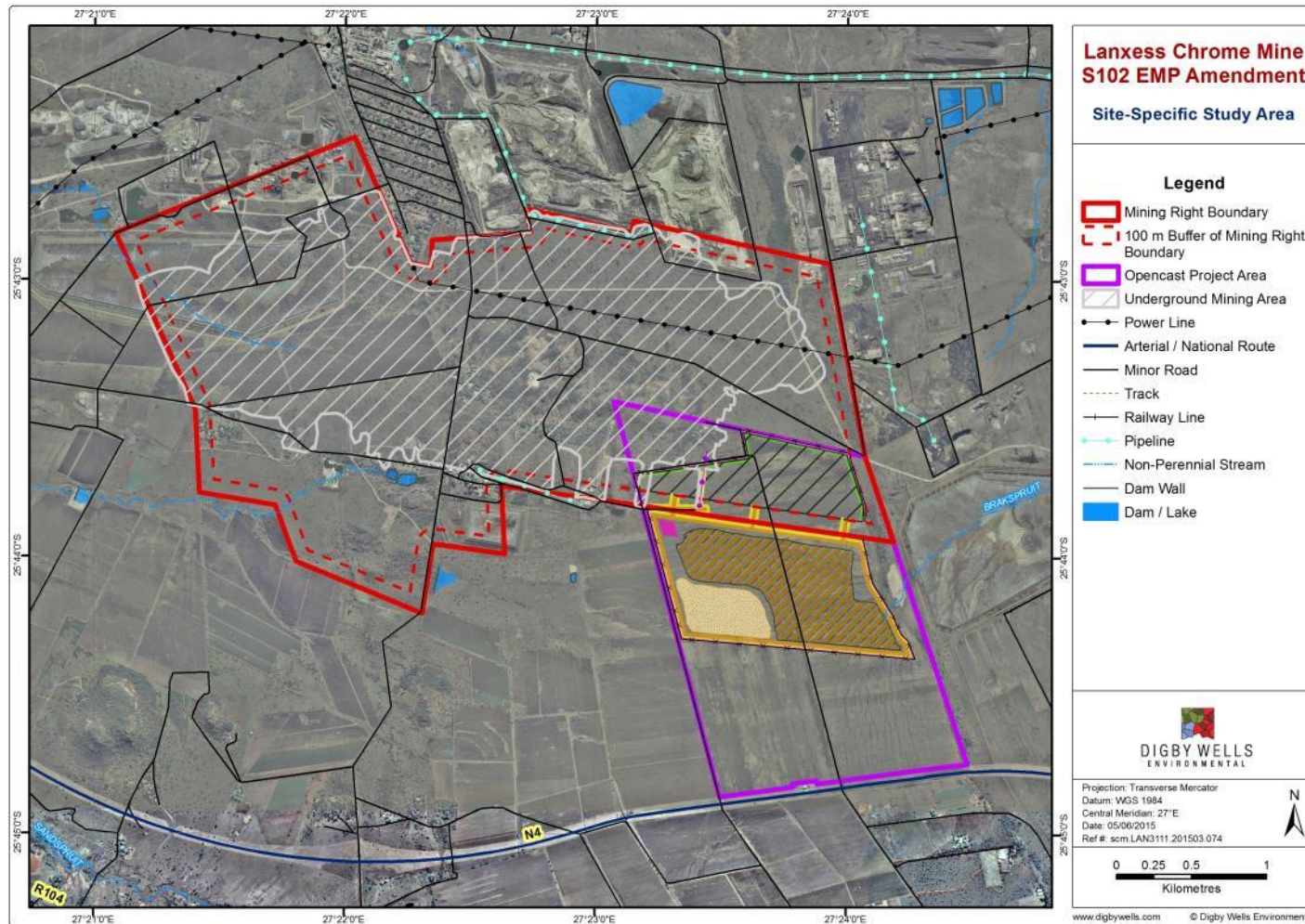


Figure 2-2: Site specific study area

2.2 Data Collection

The purpose of data collection is to gather relevant information to develop a cultural heritage baseline profile for the proposed LCM Project. Data collection was both qualitative and quantitative. Qualitative data was primarily obtained through secondary information sources, i.e. desktop literature review and historical layering. Quantitative data was obtained through field surveys where primary, raw data was collected – for example observed archaeological sites. Both methods are described in more detail below.

2.2.1 Qualitative data collection

Data collection was aimed at information gathering relating to known heritage resources within and surrounding the proposed area for development. Information was obtained through a high-level literature review of credible information sources such as previous impact assessments and databases. This will give context to the project area and it will also allow for appropriate recommendations for exemption for further assessments. Relevant sources were cited and included in the reference list in section 10.

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

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

Cartographic sources referred to in this report are listed in

Table 2-1: Summary of reviewed literature, reports and databases

Geology & Palaeontology		
Bamford, 2013	SAHRIS, 2014	
Stone Age		
Deacon & Deacon, 1999	Lombard, et al., 2012	Ouzman, 2012
Iron Age		
Huffman, 2007	Mitchell, 2002	
Colonial / Historical		
Brodie, 2008	Dalby, 1975	Mitchell, 2002
South African History Online, 2001	South African History Online, 2014	

Databases					
SAHRIS		Wits Archaeological Site Database			
Relevant assessment reports					
Author	Report type	SAHRA Reference	Author	Report type	SAHRA Reference
(Coetzee, 2008)	Cultural Heritage Survey	2008-SAHRA-0478	(Huffman & Schoeman, 2002)	Archaeological Study	2002-SAHRA-0037
(Van Schalkwyk & Pelser, 1999)	Survey of Cultural Resources	1999-SAHRA-0079	(van Schalkwyk & Pelser, 2001)	Survey of Cultural Resources	2001-SAHRA-0053

Table 2-2: Cartographic sources relevant to the project

Cartographic Sources					
Map series		Name / number			Date
Major Jackson		Sheet 18 Rustenburg			1902-1909
Aerial photographs					
Job no.	Flight plan	Photo nos.	Area	Date	Reference
350	007	05570	2527	Rustenburg	1955

2.2.2 Quantitative Data Collection

A scoping survey of the proposed LCM Project area was conducted by Natasha Higgitt (refer to Appendix A for detailed CV). The survey was completed over one day on the 10th December 2014 and focused mainly on undisturbed areas and hills within the project area.

The survey was a non-intrusive (i.e. no sampling of any kind took place) pedestrian survey. The objectives of the scoping survey to:

- Visually record the current state of the cultural landscape;
- Ground-truth certain sites identified in the literature; and
- Record a representative sample of visible tangible heritage resources present in the project area.

Visible tangible heritage resources were recorded as waypoints using a handheld GPS and documented through written and photographic records. The survey itself was recorded as a track log.

2.3 Site naming

Sites identified during the field survey are prefixed by the map sheet number; relevant period/ feature code and site number, i.e. **2527CB/Ft-001** (i.e. Ft – feature).

This number may be shortened on any plans or maps to the period / feature code with the site number used in that report. For example: **Ft-001**,

Site identified in previous relevant studies are prefixed by the SAHRIS case or map number and the original site name used by the author, i.e. **2002-SAHRA-0037/Site 47**

2.4 Compilation of a Cultural Heritage Baseline Profile

A cultural heritage baseline profile was compiled based on the information collected through the literature review and scoping survey. This profile focussed on the following:

- Local geology and palaeontological sensitivity; and
- The archaeological record considering Stone Age, Iron Age and Colonial / Historical periods.

3 Project Description

This section summarises basic project information relevant to the Heritage Scoping Report. More detailed project information is contained in the EMP. The main elements discussed in this section include: a general overview of the proposed LCM Project including activities currently being undertaken.

3.1 Project Overview

Lanxess Rustenburg Chrome mine is a well-established chrome mine in the Rustenburg area which has been operational since 1958 (See Table 3-1). Chromite ore is used in the ferrochrome industry as well as the production of chrome chemicals where the primary use is as leather tanning agents.

Lanxess has proposed an expansion of their existing underground chrome operations into neighbouring portions as well as the establishment of an open pit operation within their existing mining rights area.

The proposed project is obligated to comply with the requirements of the MPRDA and the EIA Regulations, 2014, promulgated in terms of Sections 24(5) and 44 of the NEMA (GN R982 of 4 December 2014). Lanxess currently has an EIA and EMP in line with the MPRDA and would, therefore, need to amend the existing approved document to include the details of the proposed opencast mining operations as well as the extension of the underground sections (Segment 1, 2, 3 and 4) as part of a Section 102 Amendment.

An amendment to the existing Integrated Water Use License Application (IWULA) submitted to the Department of Water Affairs (DWA) will also be required.

Table 3-1: Location of the Lanxess Project

Province	North West Province
Magisterial District / Local Authority	Rustenburg Magisterial District

District Municipality	Bojanala District Municipality
Local Municipality	Rustenburg Local Municipality
Nearest Town	Rustenburg (16 km north-west)
Property Name and Number	Rietfontein 338
1: 50 000 Map Sheet	2527CB Rustenburg
GPS Co-ordinates (relative centre point of study area)	-25.729101
	27.396818

3.2 Mining Method and Infrastructure Requirements

The proposed mining method will be an opencast operation. Primary infrastructure that will be required includes:

- Open pit;
- Haul road;
- Waste rock dump; and
- Stockpile.

Supporting infrastructure will include workshops, offices, parking areas, security facilities; haul roads, and access roads

3.2.1 Opencast Mining

Access to the shallow resource will be by an opencast pit cut 1 374m in strike length and down to a vertical depth between 50m and 70m below surface. The programme indicates that there will be free digging up to ± 14 m.b.s where after opencast blasting operations will take over mining 100m x 300m block sizes at 10m cuts (using Load Haul Dump (LHD) loaders with excavators and dump trucks). The opencast mining sequence will start on the eastern side of the proposed pit area and progress towards the west. The final void area will be at the western extent of the opencast pit. Waste rock and topsoil will be stockpiled separately to the south of the opencast area. As the opencast mining progresses, the voids created will be backfilled with overburden from the progressive opencast mining, and then overlain by the various soil horizons and rehabilitated. Ore production rate is estimated to be 40 000 tons per month with a LoM of 5 years for the opencast pit.

3.2.2 Underground Mining

The underground mining method used will be the standard bord and pillar system. The pillar dimensions and bord widths are such that a safety factor of 1.6 is maintained. Primary extraction is carried out by using drill rigs to drill the faces and conventional explosives. Access to the underground chrome reserves is gained by means of surface declines that are

developed from the reef outcrop. Run of Mine (RoM) clearance is facilitated by a series of conveyor belts fed by underground LHD loaders.

It is calculated that the production rate will be 30000 to 40000 tons per month with a total Life of Mine (LoM) of 14 years.

3.2.3 Proposed Surface Infrastructure

The following associated surface infrastructure will be constructed in support of the additional mining activities proposed for the site.

- Haul Roads and Service Road – Approximately 3km of haul roads to accommodate two lanes of traffic. A service road will be constructed to provide access to opencast pit from the southern boundary of the site. These roads will be gravel or tarred.
- Dump – An additional waste rock dump will be required alongside the opencast pit for overburden removed during mining.
- Stockpile – An additional topsoil stockpile will be located between the waste rock dump and the N4 highway. This will be screened off by trees.
- A small workshop, office block and parking area will be built in the area of the opencast pit

No additional infrastructure is required for the underground areas.

3.3 Project Activities

The following activities are envisioned for each of the Project phases as shown in Table 3-2 below:

Table 3-2: Project Activities for the Lanxess Project

Activity No.	Activity
Construction Phase	
1	The transportation of construction material to the Project site via national, provincial and local roads.
2	Storage of fuel, lubricant and explosives in temporary facilities for the duration of the construction phase.
3	Site clearance and topsoil removal prior to the commencement of physical construction activities across the project area.
4	The construction of waste rock dumps.
5	The construction of topsoil stockpiles.

Activity No.	Activity
6	The establishment of the initial box-cut and access ramps to the open-pit mining areas.
7	The establishment of underground access shaft.
8	The construction of haul roads on site
9	The construction of the access or service road.
10	The construction of the hard park area (this is made up of the workshop, office block and parking lot).
Operational Phase	
11	Drilling and blasting of the overburden rock for easy removal by excavators and dump trucks.
12	Dumping of waste rock and maintenance of waste rock dump
13	Removal and loading of ore onto trucks (O/C) or conveyor (U/G) to the plant.
14	Continuing operation of existing processing plant (Crusher, settler, gravity plant and reclamation plant).
15	Storage of fuel in diesel tanks, as well as lubricant and explosives in facilities for the duration of the Project.
16	Vehicular activity on the proposed roads and maintenance activities
17	The operation of the TSF (dirty water from stormwater and dewatering mining activities) and the connected return water dam
18	Continuing operation and maintenance of the stockpiles, including topsoil and ROM stockpiles.
19	Waste and sewage generation and disposal.
20	Maintenance of secondary infrastructure (offices, parking)
21	Concurrent replacement of overburden and topsoil and the re-vegetation of mined out strips. The mined strip will be backfilled with the overburden and compacted. Subsequently, the topsoil will be placed on top of the overburden and the area will be vegetated.
Decommissioning Phase	

Activity No.	Activity
22	Removal of surface infrastructure (Plant machinery, shafts, conveyors)
23	Decommissioning of services (if necessary, depending on post landuse) incl. waste treatment and removal, power & water facilities)
24	Rehabilitation of roads and cleared areas (offices and workshop area)
25	Removal of fuel, lubricant and explosives
26	Safe closure of shafts and mine access ramps
27	Final replacement of overburden and topsoil and the establishment of vegetation on the final open cast void. Overburden will be backfilled into the final void and compacted. Subsequently, topsoil will be placed and the area vegetated.
28	Waste handling of scrap metal and used oil as a result of the Decommissioning Phase will be undertaken.
Post-closure Phase	
29	Post-closure monitoring and rehabilitation will determine the level of success of the rehabilitation, as well as to identify any additional measures that have to be undertaken to ensure that the mining area is restored to an adequate state. Monitoring will include surface water, groundwater, soil fertility and erosion, natural vegetation and alien invasive species and dust generation from the discard dumps.

4 Cultural Heritage Baseline Description

4.1 Introduction

The cultural heritage baseline involves several periods in the history of the local and site specific areas within and surrounding the LCM Project area.

These periods are discussed to provide context for any identified heritage within and around the project. The following time periods are discussed in this cultural heritage baseline (See Table 4-1 below).

Table 4-1: List of periods forming part of the LCM Project cultural heritage baseline

1 Palaeontological and geological
Precambrian to late Pleistocene (1.2 billion to late 20 000 years ago)
2 Indigenous

Early Stone Age (ESA) (3 million to 300 00 ya)
Middle Stone Age (MSA) (c 300 000 to 30 000 ya)
Later Stone Age (LSA) (c 30 000 to 2000 ya)
Late Iron Age (LIA) (1500's to 1850's)
3 Colonial
British colony (1814 -1910)
4 Historical
Union of South Africa (1911-1961)

4.2 Local Study Area

A total of 22 heritage resources including Stone Age surface scatters, Iron Age stone-walled settlements, historical farmsteads and graves have been identified within 10 km from the LCM Project area (See Figure 4-1). These sites are discussed in the sections below.

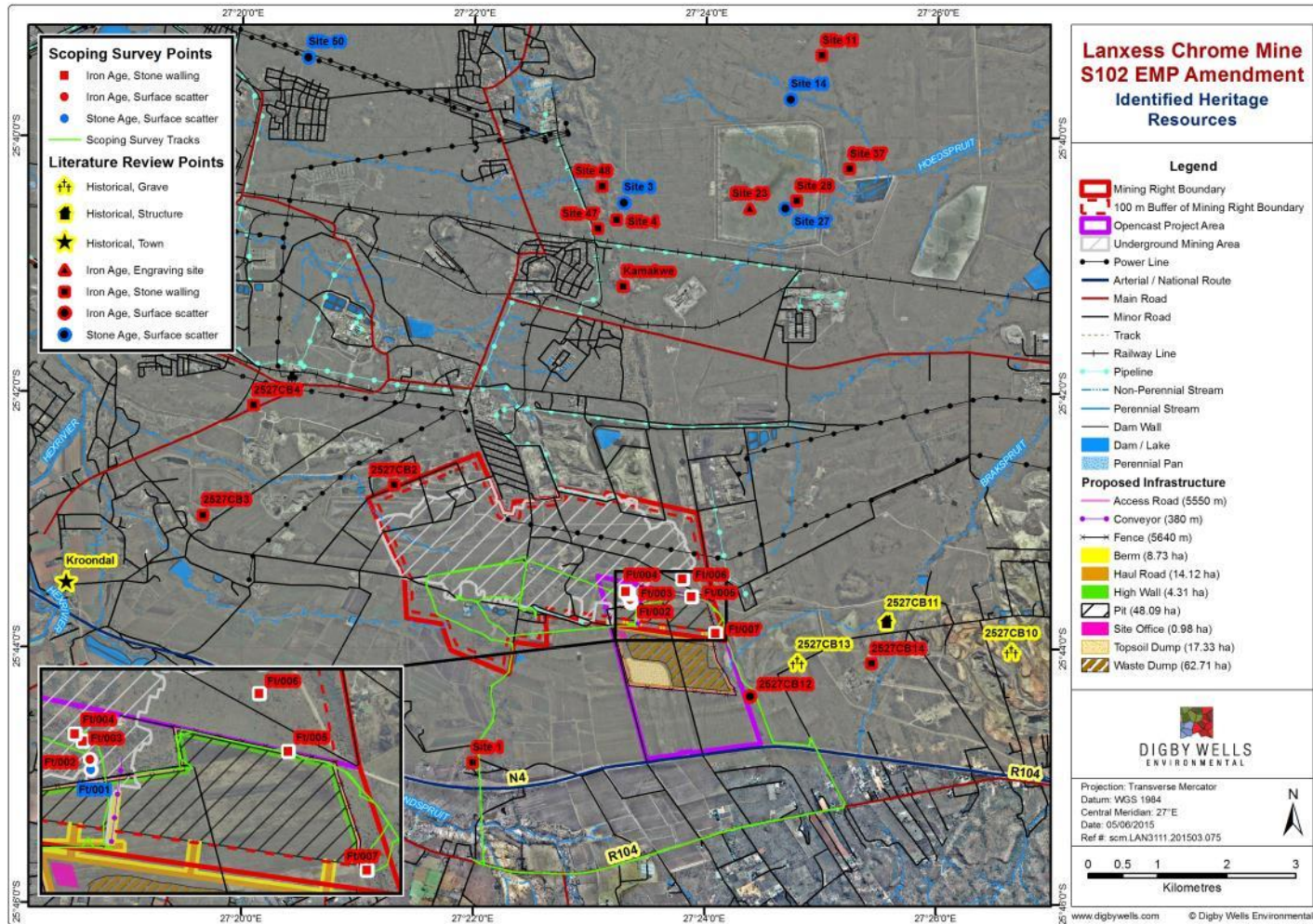


Figure 4-1: Identified Heritage Resources in the areas surrounding the LCM Project

4.2.1 Geology and Palaeontological Sensitivity

The local underlying geology is part of the Bushveld complex. The project area lies within the Western Limb of the Rustenburg Layered Suite which is a mafic formation (magma flows) which does not contain any sedimentary layers and therefore no fossils (Johnson, Anhaeusser, & Thomas, 2006).

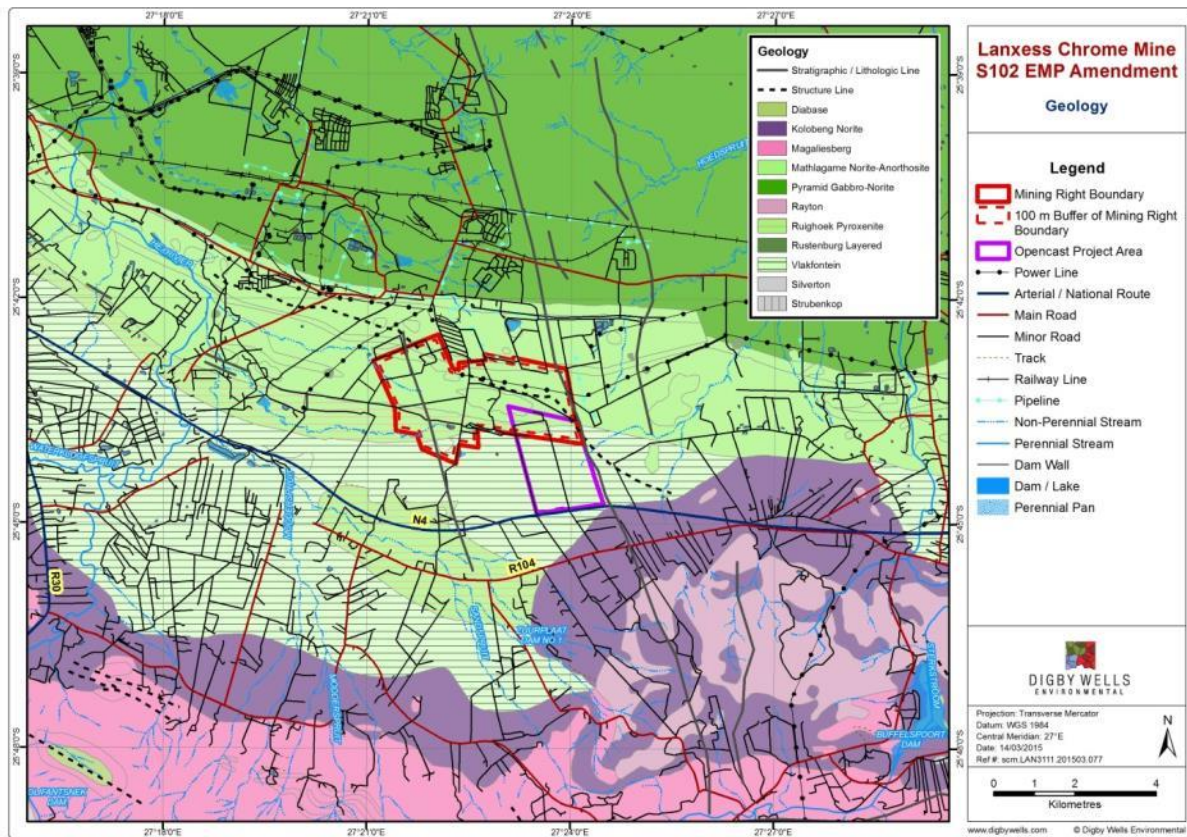


Figure 4-2: Geology of the LCM Project area

4.2.2 Stone Age

Three periods are defined for the Stone Age i.e. the Early Stone Age (ESA), the Middle Stone Age (MSA) and the Late Stone Age (LSA). Evidence for all three Stone Ages exists within the regional study area. The three Ages and associated techno complexes are listed in Table 4-2.

Table 4-2: The South African and Lesotho Stone Age sequence (Lombard, et al., 2012)

Period	Technocomplex	Also known as (including regional variants)
Later Stone Age <40 ka	ceramic final LSA <2 ka	Ceramic post-classic Wilton, Late Holocene with pottery (Doornfontein, Swartkop)
	final LSA 0.1-4 ka	Post-classic Wilton, Holocene microlithic (Smithfield, Kabeljous, Wilton)
	Wilton 4-8 ka	Holocene microlithic
	Oakhurst 7-1 ka	Terminal Pleistocene / early Holocene non-microlithic (Albany, Lockshoek, Kuruman)
	Robberg 12-18 ka	Late Pleistocene microlithic
	early LSA 18-40 ka	(informal designation) Late Pleistocene microlithic
Middle Stone Age >20 ka - <300 ka	final MSA 20-40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally
	Sibudu 45-58 ka	late MSA / post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	Howieson's Poort 58-66 ka	
	Still Bay 70-77 ka	
	pre-Still Bay 72-96 ka	(informal designation)
	Mossel Bay 77-105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
	Klasies River 105-130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)
early MSA 130-300 ka	(informal designation)	
Early Stone Age >200 ka	ESA-MSA transition >200-600 ka	(informal designation) (Fauresmith, Sangoan)
	Acheulean 300-1.5 Ma	
	Oldowan 1.5-2 Ma	

The ESA stone lithics are characterised as crude and rough implements. The MSA toolbox contains refined tools produced from fine grained materials, and is known for its blade and point tools, made from a medium to fine grained material (Deacon & Deacon, 1999).

The LSA consisted of very fine grained and highly sophisticated tools that were often used in composite tools such as arrows. See Figure 4-3 below for examples of the South African Stone Tool assemblage.



Figure 4-3: Examples of Stone Age lithics. ESA – Row A, MSA – Row B and LSA – Row C (Ouzman, 2012)

A total of four MSA surface scatters were identified through a review of relevant heritage reports, within 10 km of the LCM project area.

Weathered MSA tools were identified on the farm Kroondal 304JQ approximately 2 km from the LCM Project, during a survey conducted by van Schalkwyk and Pelsler (2001); however no exact co-ordinates were supplied for this site.

4.2.3 Iron Age

Approximately 1 800 years ago, northern Bantu-speaking groups began migrating southwards from the present Cameroon-Nigeria area (Dalby, 1975). Two migration paths have been traced and these paths spread the Western Bantu languages along the East African coast and through the interior (Huffman, 2007). Eastern Bantu languages are thought

to have spread eastwards along the perimeter of the rainforests, then southwards to the Great Lakes region, depicted in Figure 4-4. From there, Eastern Bantu-speakers migrated into southern Africa (Mitchell, 2002).

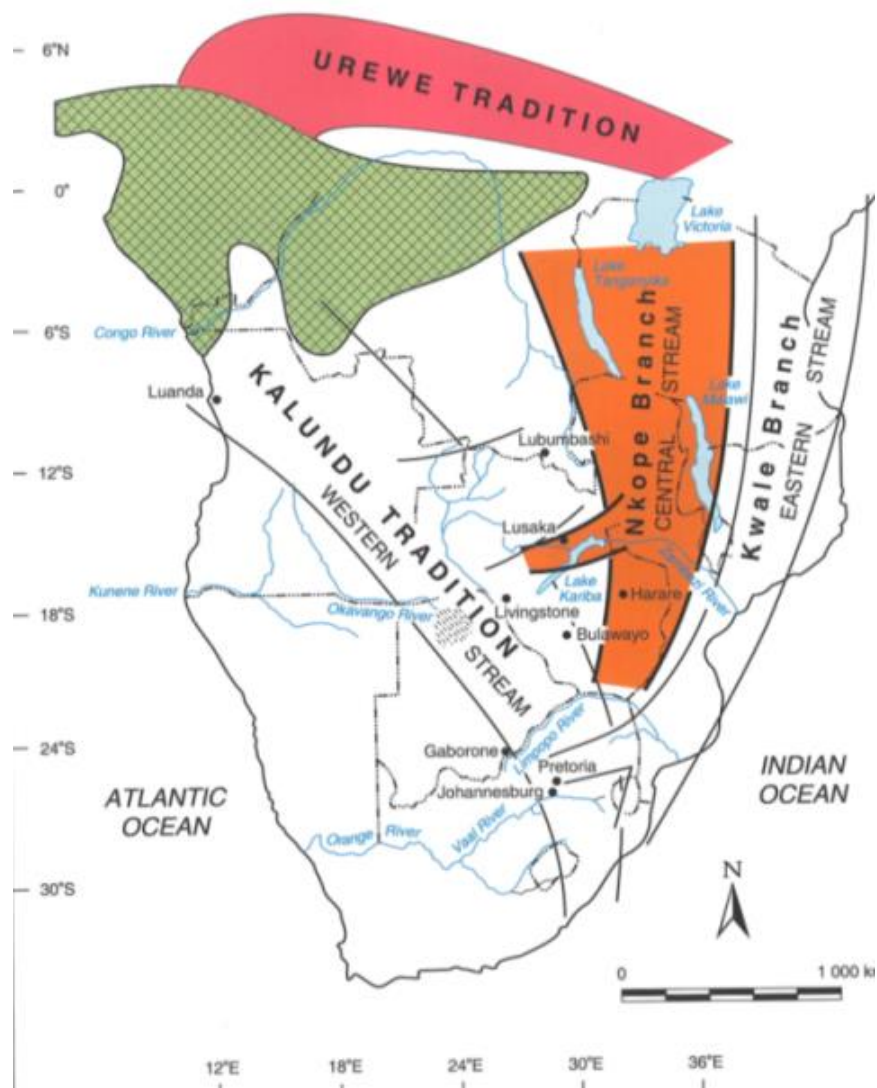


Figure 4-4: Eastern Bantu migrations to southern Africa (Huffman, 2007)

The migration of Bantu speakers into southern Africa approximately 2000 years ago marks the beginning of the Iron Age. In southern Africa, this period is divided into:

- Early Iron Age (200 CE – 900 CE);
- Middle Iron Age (MIA) (900 CE – 1300 CE) (*distribution limited to the northern Limpopo Province*); and
- Late Iron Age (LIA) (1300 CE – 1840 CE).

Ceramic facies that can be found in the project area include Ntsuanatsatsi, Uitkomst and Rooiberg (See Table 4-3).

Table 4-3: Ceramic facies within the LCM project area

Facies	Period	Key Characteristics
Ntsuanatsatsi	1450 BC – 1650 BC	Broad stamping in the neck, stamped arcades on shoulder and appliqué
Uitkomst	1650 BC – 1820 BC	Stamped arcades, appliqué and blocks of parallel incisions, stamping and chord impressions
Rooiberg	1650 BC – 1750 BC	Stamped rim band, mixture of stamped and incised bands, arcades and triangles in the neck

The most visible indicator of Late Iron Age settlements is that of the stone walls. Stone-walled settlements in South Africa have been characterised and defined into two clusters and several types (See Table 4-4 below). Stone walled settlement types found within the project area are that of the Molokwane type settlement.

Table 4-4: Stone walled settlement types

Central Cattle Pattern			
Moor Park Cluster		Ntsuanatsatsi Cluster	
Moor Park	14 th -16 th Century	Type N	15 th -17 th Century
Melora	16 th Century - ?	Badfontein	16 th Century
Kwamaza	18 th Century – Historic	Doornspruit	19 th Century
		Klipriviersberg	19 th Century
		Type V	19 th Century
		Molokwane	19th Century
		Type Z	19 th Century
		Type B	19 th Century
		Tukela	19 th Century

The majority of the Iron Age sites found in the areas surrounding the project area are that of the LIA (AD 1300 – 1840). A total of 14 Iron Age sites have been identified within 10 km of the LCM Project area. The majority of these sites are well preserved stone walled settlements with cattle kraals, terraces, pottery, grinding stones. Additionally, an Iron Age engraving site was recorded 6.2 km from the project area depicting a settlement layout of a stone-walled settlement (See Appendix B for site list).

4.2.4 Historical period

A total of four (4) heritage sites relating to historical or recent times were recorded within 10 km of the project area, including the historic town of Kroondal (See Appendix B for site list).

The town of Kroondal was established in 1843 on the farm Kronendal (today known as Kroondal). The town was surveyed in 1889 and the school was established in 1892 which was attended by Louis Botha who would become South Africa's first Prime Minister and the Afrikaans poet JD du Toit (Tourism North West, 1997).

Foundations of an old farmstead were identified within 4.5 km of the LCM project area and two unmarked graves were located within 5 km of the project area. Graves are often associated with historical homesteads and can be found in close proximity.

According to the Major Jackson 18 Rustenburg 1902-1909 Map, the farm of Rietfontein was situated on the edge of a Native Location (See blue shaded area in Figure 4-5). Native Locations were formally established with the Native Land Act of 1913, which saw the majority of the country's population forced into what were termed as "Homelands" (South African History Online, 2014).

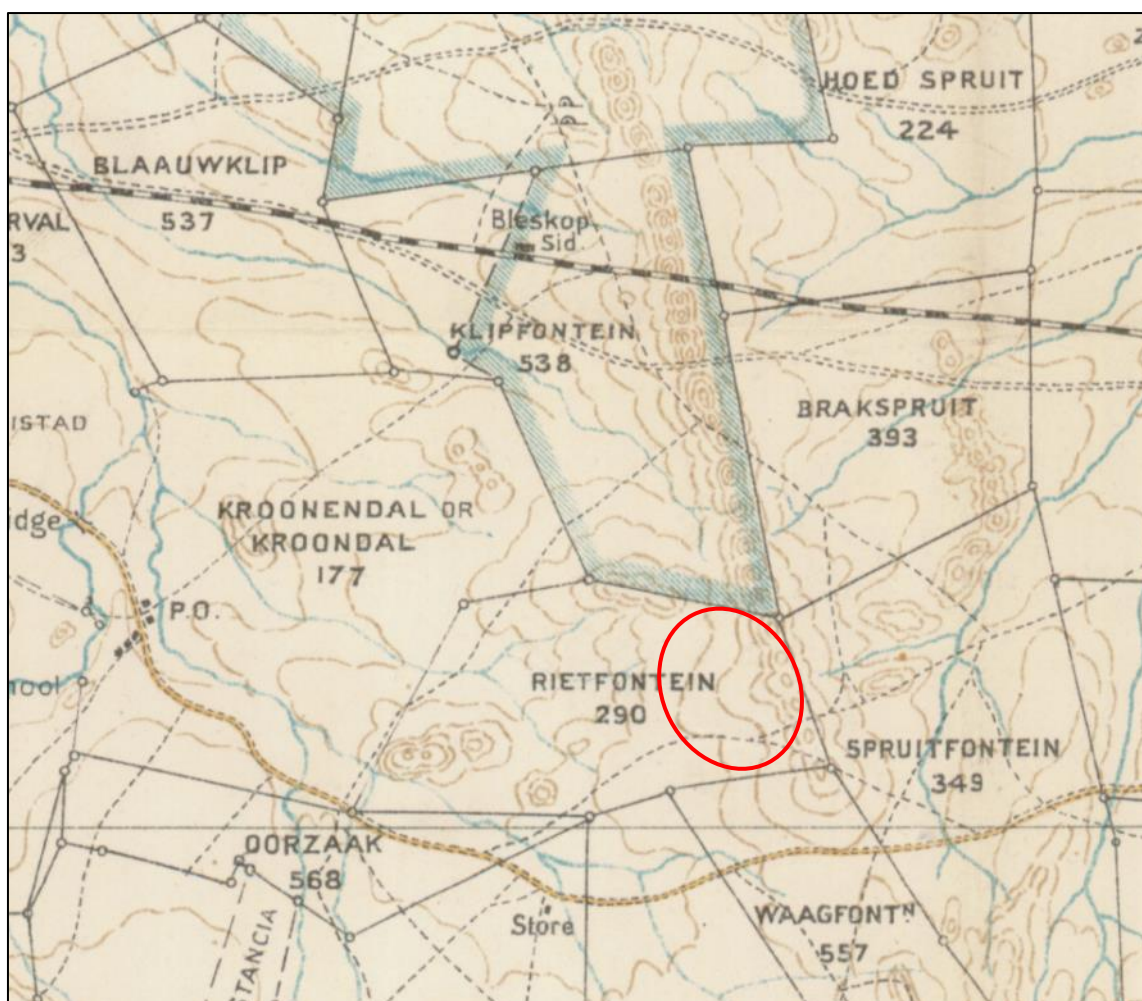


Figure 4-5: Major Jackson Rustenburg Map 1902-1909 depicting the farm Rietfontein 290 (known today as Rietfontein 338) with the proposed LCM Project area in red

4.3 Site Specific Study Area

4.3.1 Palaeontology and Geology

According to the SAHRIS PalaeoSensitivity Map, the project area (depicted as a red circle in Figure 4-6 below) is situated in an area of insignificant palaeontological sensitivity (grey area) depicted in Figure 4-6 below (SAHRIS, 2014).

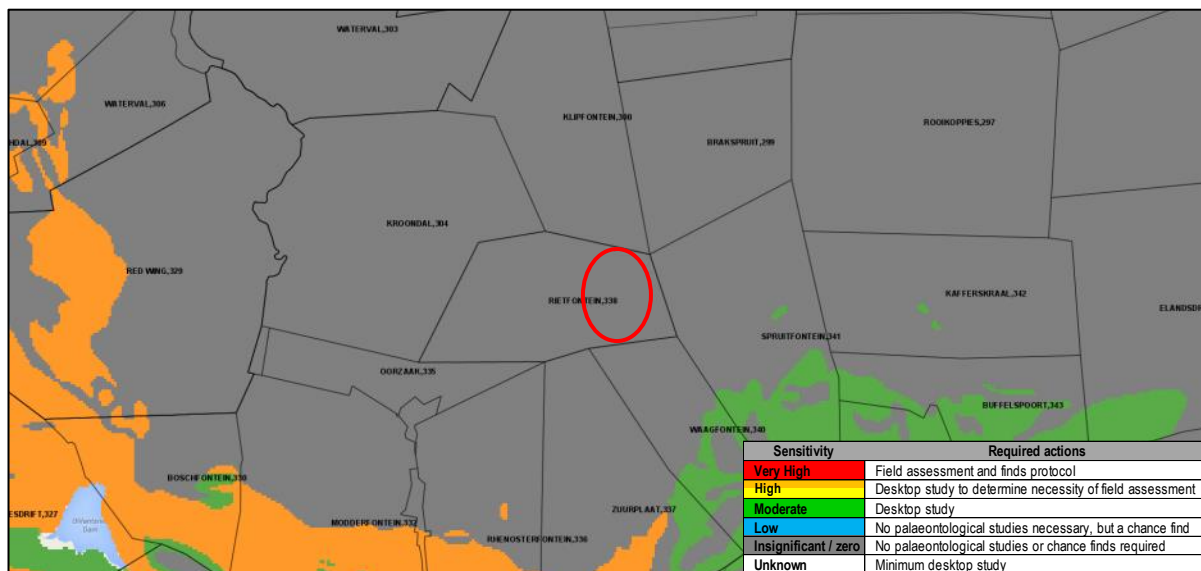


Figure 4-6: PalaeoSensitivity of the LCM Project area

4.3.2 Iron Age and Historical Period

Historical aerial imagery from 1955 of the farm shows faint outlines of stone-walled settlements on the hill to the north of the project area (circled in red below). One can also see that the proposed project area has been dominated by agricultural fields for over 60 years (See Figure 4-7).

An old mine shaft is located within the proposed open cast area (see orange square in Figure 4-7). This shaft was sunk in 1949 but production halted shortly afterwards (International Chromium Development Association, 2012). Archival records show labour quarters on the farm Rietfontein 290 between 1956 and 1975 [HKW; 1/1/295; (18) N3/12/2/14] associated with the company Rustenburg Chrome Mine (Pty) Ltd which was established in Rustenburg in 1938 (South African History Online, 2001). Early mining of the shaft began in the 1970's using trucks to transport the chrome, and in the late 1970's the operation became mechanised using the bord and pillar method (International Chromium Development Association, 2012).



Figure 4-7: Historical aerial from 1955 showing the agricultural fields in the proposed project area. Faint lines of stone walling settlements can be seen on the hill to the north (red circles). The proposed opencast pit area is shown in green.

4.4 Heritage Scoping Survey results

A HSS was conducted on the 10 December 2014. The Heritage Specialist was accompanied by a Health and Safety Officer from Lanxess for the duration of the site visit. The aim of the survey was to record the current state of the environment and assess the potential for heritage resources within the project area.

The area for the proposed waste rock dump and topsoil stockpile is located within well-established maize fields (See Figure 4-8). A large hill is located to the north of the proposed project area as referred to in Figure 4-7 above. It has a water reservoir located on the one side and is mostly undisturbed (See Figure 4-9).



Figure 4-8: View of maize fields where the proposed waste rock dump and topsoil stock pile will be located



Figure 4-9: Large hill located to the north of the project area.

A total of seven heritage resources were identified as part of the HSS. These are depicted in relation to the proposed project in Figure 4-1 above (See Appendix B for the site list).

Surface scatters of MSA lithics (Ft/001) were recorded around the base of the hill to the north of the proposed open cast pit area (See Figure 4-10). These tools are weathered, much like tools identified in other heritage reports (see section 4.2.2). They were found out of context and therefore providing limited scientific information beyond form, function and technique of manufacture.



Figure 4-10: MSA lithics identified around the base of the koppie to the north of the LCM Project area

A number of LIA stone walls were identified during the HSS to the north of the proposed opencast pit area (See Figure 4-11) (Ft/003-006). These are the stone walls referred to in Figure 4-7 above. These stone walls may constitute one large settlement, spread over an estimated 30 ha. Terraces walls were identified around the base of the koppie and on the southern slope of the koppie to the north of the proposed opencast pit area (See Figure 4-12). Surface scatters of undecorated and decorated ceramics were recorded around the base of the koppie (Ft/002) (See Figure 4-14 and Figure 4-10). The decorations on the ceramic sherds may be associated with the LIA *Uitkomst* facies (AD 1650 - 1820) and /or the *Rooiberg* facies (AD 1650 – 1750) (Huffman, 2007).

Stone walling was identified to the east of the maize fields that are located within the area earmarked for the proposed open cast pit (Ft/007). These walls are most probably associated with the walling near the koppie (See Figure 4-15) given their close proximity. Additionally, the stone walls are located less than 1 km north of site 2527CB12 identified by Van Schalkwyk & Pelsler (1999).



Figure 4-11: Example of double in-filled stone walls (Ft/006) identified to the north of the opencast project area



Figure 4-12: Double terrace walls (Ft/003) at the base of the kopie north of the opencast project area



Figure 4-13: Terrace walls (Ft/004) on the southern slope of the koppie north of the opencast project area



Figure 4-14: Decorated ceramic sherds (Ft/002) identified within the stone-walled settlement, north of the opencast project area



Figure 4-15: Example of stone walling to the east of the maize fields (Ft/007)

The mine shaft referred to in section 4.3.2 is currently being re-opened for the proposed LCM Project as shown in Figure 4-16 below.



Figure 4-16: Mine shaft currently being re-opened for the LCM Project

4.5 Summary discussion of heritage baseline

The local study area in which the proposed project is located is rich in history, ranging from the MSA to recent historical mining events. The geology of the project area is comprised of mafic rock; therefore there are no significant palaeontological resources within the project area due to the lack of sedimentary rock.

MSA heritage resources in the local and sit specific area have been recorded as surface scatters. The tools were undiagnostic and could not be attributed to a specific stone tool complex. These lithics are often identified in isolation and outside of discernible context, therefore providing limited scientific information beyond form, function and technique of manufacture.

LIA stone-walled settlements in the area are found on hilltops or around the base of hills and the settlement type is attributed to the LIA Molokwane type. The LIA stone-walled settlement identified on the koppie to the north of the LCM opencast project area may have extended much further south, but was destroyed the agricultural activities. Additionally, it may be associated with the 14 identified Iron Age settlements in the surrounding area and the regional Molokwane type stone-walled settlements of the area.

The historical period in the region began in the 1840's with the arrival of European settlers. Historical resources within the project area include mine shaft that was in use from 1949 to 1975.

The sensitive areas within and immediately surrounding the LCM project area are depicted below in Figure 4-17. These are areas which have been highlighted as high, medium and low sensitivity areas. These areas are mere estimations based on the cultural baseline profile and the scoping survey; the full extent of the sensitive areas still needs to be verified.

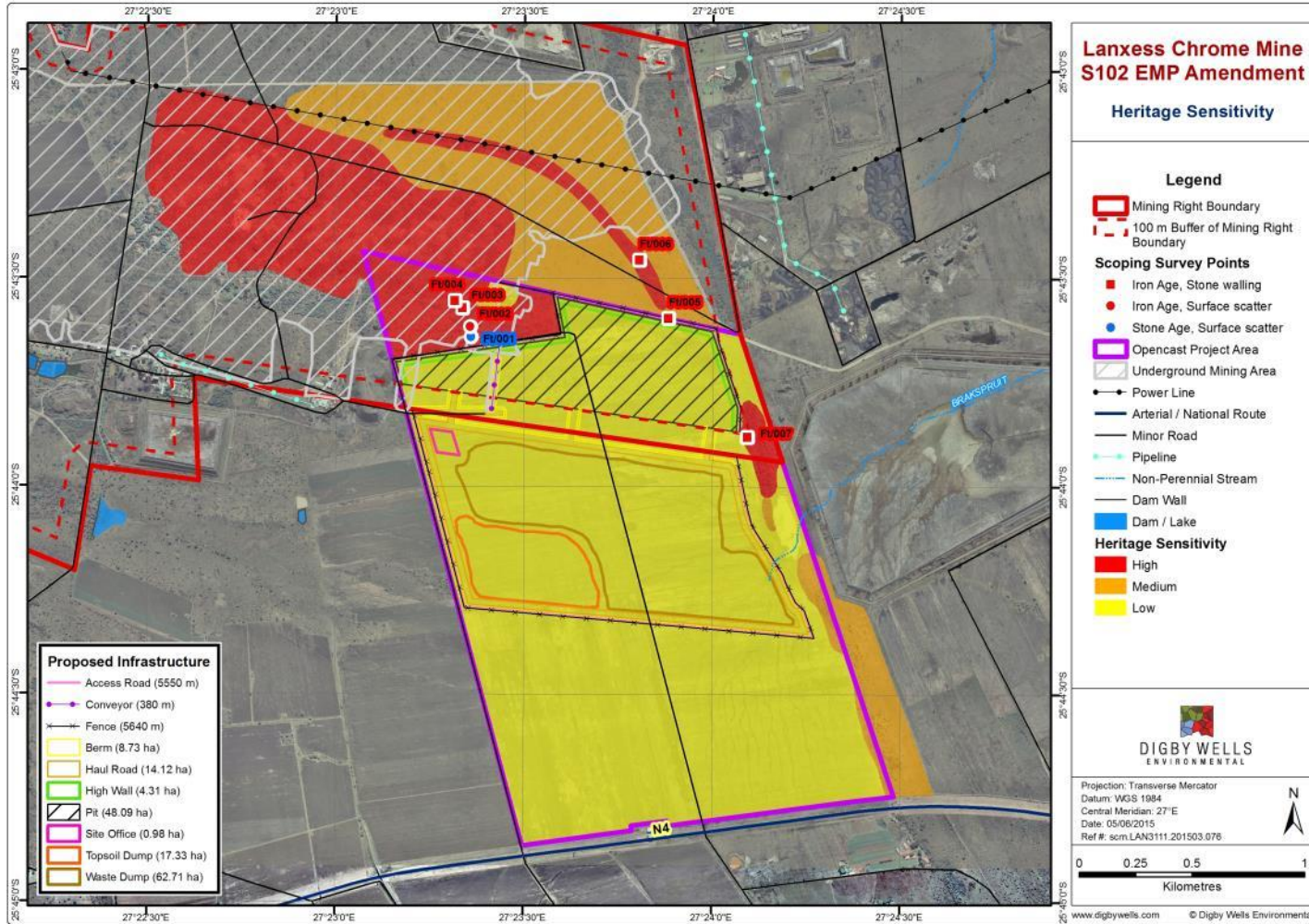


Figure 4-17: Heritage Sensitivity

5 Provisional Statement of Significance

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 heritage resources, the foundation of HRM is the acknowledgment that heritage resources have lasting worth as evidence of the origins of life, humanity and society. Notwithstanding the inherent value ascribed to heritage, significance of resources needs to be determined to allow implementation of appropriate management. This is achieved through assessing heritage resources value relative to certain prescribed criteria encapsulated in policies and legal frameworks as discussed under Section 1.2.

The importance of a heritage resource is determined on four dimensions – aesthetic, historic, scientific and social which in turn are measured against one or more descriptive attributes. This aims to guide whether a resource should be included in the national estate as defined in the NHRA and international conventions.

Table 5-1: Summary of dimensions and attributes

Dimension	Attributes considered		NHRA Ref.
Aesthetic & technical	1	Importance in aesthetic characteristics	S.3(3)(e)
	2	Degree of technical / creative skill at a particular period	S.3(3)(f)
Historical importance & associations	3	Importance to community or pattern in country's history	S.3(3)(a)
	4	Site of significance relating to history of slavery	S.3(3)(i)
	5	Association with life or work of a person, group or organisation of importance in the history of the country	S.3(3)(h)
Information potential	6	Possession of uncommon, rare or endangered natural or cultural heritage aspects	S.3(3)(b)
	7	Information potential	S.3(3)(c)
	8	Importance in demonstrating principle characteristics	S.3(3)(d)
Social	9	Association to community or cultural group for social, cultural or spiritual reasons	S.3(3)(g)

To provide a provisional Statement of Significance for the cultural landscape, the various types of potential heritage resources located within the LCM Project were assessed against the dimensions and attributes presented in Table 5-1.

The Digby Wells Heritage Impact Matrix Methodology can be made available to interested parties on request.

Table 5-2: Provisional Statement of Significance

Description	Aesthetic	Historic	Scientific	Social	Integrity	Value
Archaeological and historical sites associated with living communities - good integrity	5	5	5	5	4	20
Archaeological and historical sites associated with living communities - poor integrity	0	5	2	3	1	3
Burial grounds and graves	-	5	-	5	4	20
Archaeological and historical sites not associated with living communities - good integrity	5	5	5	-	4	20
Archaeological and historical sites not associated with living communities - poor integrity	0	1	1	-	1	1

6 Summary of Impacts / Sources of Risk

7 Possible Heritage Risks

Possible heritage risks to the proposed LCM Project can be broadly placed into two categories: risk of very significant heritage resources to project developments and impacts on heritage resources that may have social repercussions that pose risks to the applicant.

7.1 Heritage Resources with a Very High Cultural Significance

Some heritage resources may be so significant or sensitive that any development will be detrimental to their continued survival. In addition, certain heritage resources are formally protected that restricts various development activities.

The primary risk associated with highly significant heritage resources to the LCM Project is that the presence of any such resources may result in negative Records of Decision and / or restrictions imposed on development activities.

7.2 Impacts on Heritage Resources

Where heritage resources are impacted on by project activities and these resources may have special significance or importance for various communities, impacts on heritage could result in social repercussions. This could range from low-level issues to public confrontation and litigation. The applicant may experience reputational risk and withdrawal of any social licence to operate that may be in existence.

In addition, an impact on any heritage resource formally or generally protected in terms of the NHRA is an offence. Any impact that will change the nature or integrity of such resources must be permitted by SAHRA and / or the NWPHRA. Failure to apply for the necessary permits may result in fines, penalties, seizure of equipment, compulsory repair or cease work orders, or imprisonment.

8 Possible Heritage Impacts

8.1 Construction Phase

The highest likelihood of changes to heritage resources is associated with activities that will be undertaken during the construction phase of the proposed LCM project. Here, the potential negative impacts, such as damage or destruction, are the greatest.

Direct impacts will be limited to the impact footprint, and the construction of facilities, open pit, infrastructure, conveyor and roads will cause damage to or destroy any physical heritage resources that may be present within the footprint areas. Vandalism of the heritage sites by labour and mine workers may also occur. Additionally, as the extent of the heritage sites has not been determined, site clearance may unintentionally uncover sub-surface archaeological resources associated with the identified heritage resources.

Induced impacts will include social repercussions in the event that unidentified tangible heritage is affected e.g. accidental exposure of human remains may result in the client coming into conflict with local communities or family.

Cumulative impacts will be additive with the increase of mining activities in the area. This will change the character of the landscape and cause the significance of the heritage resources to decrease.

8.2 Operational Phase

During the operation phase of the proposed project, sources of risk to heritage resources are limited. The primary risk during the operational phase will be associated with the alteration of the sense-of-place of the project area. Direct impacts that may occur will be associated with any blasting, such as air blasts and fly-rock. Additionally, direct impacts may occur due to vandalism by labour and mine workers. Induced impacts may also occur such as described above in the construction phase. Cumulative impacts will be time-crowding as the ongoing blasting may cause heritage resources to become unstable and be damaged.

8.3 Decommissioning and Closure Phase

No impacts to heritage resources are envisaged for the decommissioning phase of the project at this stage as the LoM for the opencast activities is proposed at 5 years and the LoM of the underground activities is proposed at 14 years. However, if any mine infrastructure is older than 60 years old at the time of closure, they will need to be assessed and a destruction permit will need to be applied for in terms of section 34 of the NHRA.

8.4 Cumulative Impacts

The primary cumulative impact will be additive with the expansion of mining activities within the immediate area. Additionally, any further amendments to the project may cause encroachment of activities onto heritage resources which may damage and/or destroy the sites. Additional cumulative impacts that may occur include:

- Enhancing of the industrial, mining sense-of-place which is eroding the history of the region, therefore neutralising living heritage links to the land;
- Loss of identified heritage resources could decrease the significance of the landscape while increasing the significance of the remaining *in situ* heritage resources;
- Population increase through an influx of additional workers could potentially impact on tangible archaeological, built environment and burial grounds and graves heritage resources in the surrounding study area, and
- Loss of access to burial grounds and graves and/or intangible heritage.

9 Conclusion and Recommendations

The project area is located in the North West Province, 16 km from Rustenburg. Based on the literature review and scoping visit, the surrounding area is a culturally sensitive landscape. Geologically, the project area is located within the Western Limb of the Bushveld Complex. Paleontologically the primary impact footprint of the project area has an insignificant palaeo-sensitivity.

Stone Age material has been identified throughout the local study area and reported on in other relevant heritage studies. A few weathered examples were found to the north of the proposed open pit. These lithics are often identified in isolation and outside of discernible context, therefore providing limited scientific information beyond form, function and technique of manufacture.

The local study area contains a large number of LIA stone-walled settlements. A large LIA stone-walled settlement was identified just to the north of the proposed open pit and additional associated stone-walling to the east within the edge of the proposed pit.

Based on our understanding of the cultural landscape and the identified heritage resources within the project area, Digby Wells recommends the following:

- Exemption from further palaeontological assessments for the proposed infrastructure footprint as the palaeo-sensitivity is insignificant;
- An HIA be undertaken that includes the following heritage components:
 - An Archaeological Impact Assessment including reconnaissance to identify and record archaeological resources within the impact footprint; and
 - An assessment of burial grounds and graves including reconnaissance to identify, record and document all burials that may exist in the impact footprint.

10 References

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- van Schalkwyk, J., & Pelsler, A. (2001). *A survey of Cultural Resources on the farm Kroondal 304JQ, East of Rustenburg*. Pretoria: National Cultural History Musuem.

Heritage Scoping Report

Lanxess Chrome Mine: Section 102 Amendment

LAN3111



DIGBY WELLS
ENVIRONMENTAL

Appendix A: CV's of Specialists



DIGBY WELLS
ENVIRONMENTAL

NATASHA HIGGITT

Ms Natasha Higgitt
Assistant Heritage Consultant
Social Department
Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2010)
- Title of Dissertation- Pass the Salt: An Archaeological analysis of lithics and ceramics from Salt Pan Ledge, Soutpansberg, for evidence of salt working and interaction.

2 LANGUAGE SKILLS

- English - Excellent (read, write and speak)
- Afrikaans - Fair (read, write and speak)
- Italian – Poor (Speaking only)

3 EMPLOYMENT

- July 2011 to Present: Assistant Heritage Consultant at Digby Wells Environmental
- April 2011 to June 2011: Lab assistant at the Albany Museum Archaeology Department, Grahamstown, Eastern Cape
- April 2010 to March 2011: Intern at the Archaeology Department, Albany Museum, Grahamstown, Eastern Cape under the Department of Sports, Recreation, Arts and Culture, Eastern Cape Government, South Africa (DSRAC)

4 FIELD EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape
- Recorded two rock art sites at Blaauwbosch Private Game Reserve, Eastern Cape

- Attended a 2 week excavation/study tour in the Friuli Region in Italy, organised by the *Società Friulana di Archeologia*, sponsored by *Ente Friuli nel Mondo*, and excavated a 12th century medieval castle
- Attended a 2 week excavation in Limpopo, Waterpoort Archaeological Project organised by Xander Antonites (Yale PhD Candidate)
- A total of 5 University of Pretoria Archaeology field schools in Limpopo and Gauteng spanning over 4 years

5 PROJECT EXPERIENCE

- Notification of Intent to Develop for the Doornkloof Flood Remedial Measures Project, Centurion, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Oakleaf Open Cast Coal Mine, Bronkhorstspuit, Gauteng Province for Oakleaf Resources (Digby Wells Environmental)
- Notification of Intent to Develop for the Rietfontein 101IS Prospecting Project for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Impact Assessment for the Weltevreden Open Cast Coal Mine, Belfast, Mpumalanga for Northern Coal (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Grootegeeluk Expansion Project, Lephalale, Limpopo Province for Exxaro Resources (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop and Heritage Statement for the London Road Petrol Station, Alexandria, Gauteng for ERM Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Roodepoort Strengthening Project, Roodepoort, Gauteng for Fourth Element (Digby Wells Environmental)
- Heritage Statement for the Stoffel Park Bridge Upgrade, Mamelodi, Gauteng for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement for the Witrand Prospecting EMP, Bethal, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for the Onverwacht Prospecting EMP, Kinross, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for a Proposed Acetylene Gas Production Facility, located near Witkopdorp, Daleside, south of Johannesburg, Gauteng Province for Erm Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Platreef Platinum Project, Mokopane, Limpopo for Platreef Resources (Digby Wells Environmental)
- Heritage Statement for ATCOM and Tweefontein Dragline Relocation Project, near Witbank, Mpumalanga Province for Jones and Wagner Consulting Civil Engineers (Digby Wells Environmental)



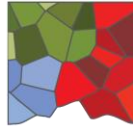
- Heritage Statement Report for the Wilgespruit Bridge Upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement Report for the Kosmosdal sewer pipe bridge upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Thabametsi Coal Mine, Lephalale, Limpopo for Exxaro Coal (Digby Wells Environmental)
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga for Xtrata Coal South Africa (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Brakfontein Thermal Coal Mine, Mpumalanga for Universal Coal (Digby Wells Environmental)
- Development of a RAP for Aureus Mining for the New Liberty Gold Mine Project, Liberia (Digby Wells Environmental)
- Phase 1 Archaeological Impact Assessment for the MBET Pipeline, Steenbokpan, Limpopo (Digby Wells Environmental)
- Notice of Intent to Develop and Cultural Resources Pre-Assessment for Orlight SA (PTY) Ltd Solar PV Project. 2012. (Digby Wells Environmental)
- Agricultural Survey for Platreef ESIA, Mokopane, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for the Proposed Sylvania Everest North Mining Development in Mpumalanga, near Lydenburg. 2011. (Digby Wells Environmental)
- Phase 2 Mitigation of Archaeological sites at Boikarabelo Coal Mine, Steenbokpan, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for Proposed Platinum Mine Prospecting in Mpumalanga, near Bethal for Anglo Platinum. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for proposed Platinum Mine at Mokopane, Limpopo for Ivanhoe Platinum. 2011. (Digby Wells Environmental)
- Phase 1 AIA Mixed-use housing Development, Kwanobuhle, Extension 11, Uitenhage, Eastern Cape. 2011.
- Phase 1 AIA Centane to Qholora and Kei River mouth road upgrade survey, Mquma Municipality, Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Clidet Data Cable survey, Western Cape, Northern Cape, Free State and Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Karoo Renewable Energy Facility, Victoria West, Northern Cape. 2011. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Hamburg, Eastern Cape. 2010. (Savannah Environmental)



- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [Africa] Environmental Management Consultants)
- Phase 1 AIA Quarry Survey at Port Elizabeth. 2010. (E.P Brickfields)

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional member
- Association of Southern African Professional Archaeologists (ASAPA): CRM Practitioner (Field Supervisor: Stone Age, Iron Age and Rock Art)
- South African Museums Association (SAMA): Member



DIGBY WELLS

ENVIRONMENTAL

Mr. Justin du Piesanie
Heritage Management Consultant: Archaeologist
Social Sciences Department
Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

Period	Company	Title/position
08/2011 to present	Digby Wells Environmental	Heritage Management Consultant: Archaeologist

Digby Wells and Associates (South Africa) (Pty) Ltd (Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

Period	Company	Title/position
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

4 Professional Affiliations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A

5 Publications

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

6 Experience

I have 5 years experiences in the field of heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. During my studies I was involved in academic research projects associated with the Stone Age, Iron Age, and Rock Art. These are summarised below:

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.

- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyerdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

Since 2011 I have been actively involved in environmental management throughout Africa, focusing on heritage assessments in compliance with International Finance Corporation (IFC) Performance Standards and other World Bank Standards and Equator Principles. This exposure to environmental, and specifically heritage management has allowed me to work to international best practice standards in accordance with international conservation bodies such as UNESCO and ICOMOS. In addition, I have also been involved in the collection of quantitative data for a Relocation Action Plan (RAP) in Burkina Faso. The exposure to this aspect of environmental management has afforded me the opportunity to understand the significance of integration of various studies in the assessment of heritage resources and recommendations for feasible mitigation measures. I have worked throughout South Africa, as well as Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

7 Project Experience

Please see the following table for relevant project experience:



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Survey of residential development in Meyersdal. This included the recording of identified stone walled settlements through detailed mapping and photographs. Included was the Phase 2 Mitigation of two stone walled settlements	Archaeological Impact Assessments	Researcher, Archaeological Assistant	2 months		Completed survey, excavations and reporting	Archaeological Resource Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Recording of an identified Late Iron Age stonewalled settlement through detailed mapping	Mapping	Archaeological Assistant, Mapper	1 month	Sun City	Completed mapping	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey for proposed residential development at the Witbank dam	Archaeological Impact Assessment	Archaeological Assistant	1 week		Completed Archaeological Impact Assessment report	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Archaeological survey and basic assessment of Modderfontein Holdings	Archaeological Impact Assessment	Archaeologist	1 month		Completed the assessment of 13 properties	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Assessment for expansion of mining area at Rhino Mines	Heritage Impact Assessment	Archaeologist	2 weeks	Rhino Mines	Completed the assessment	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological survey of Moddergat 389 KQ, Schilpadnest 385 KQ, and Swartkop 369 KQ,	Archaeological Impact Assessment	Archaeologist	1 weeks	Cronimet	Completed field survey and reporting	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Eskom Thohoyadou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
De Brochen and Booyensdal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booyensdal	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathhako Mine Expansion Area	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Oriental Province, Democratic Republic of Congo	2011 2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Oriental Province, Democratic Republic of Congo	2012 2014	Assessment of 7 proposed hydro-power stations along the Kibali River	Heritage Impact Assessment	Heritage Consultant	2 years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	Heritage Impact Assessment	Heritage Consultant	6 months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	Heritage Impact Assessment	Heritage Consultant	4 months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd



SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	Heritage Impact Assessment	Heritage Consultant	2 months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	On-going	Aureus Mining	Project is on-going	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Heritage Scoping	Heritage Consultant	2 months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	Heritage Impact Assessment	Heritage Consultant	6 months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinglobal.com
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein Projects	GRP	Project Manager, Heritage Consultant	On-going	Exxaro	Project is on-going	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com



Nzoro 2 Hydro Power Project	Oriental Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	On-going	Randgold Resources	Completed introductory meetings – project on-going	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	Heritage Impact Assessment	Heritage Consultant	On-going	AECOM	Project is on-going	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	Heritage Impact Assessment	Heritage Consultant	On-going	ERGO	Project is on-going	ERGO Greg Ovens Greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	NID	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO
Kibali ESIA Update Project	Oriental Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	Heritage Impact Assessment	Heritage Consultant	On-going	Randgold Resources	Project is on-going	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	On-going	Gold One International	Project is on-going	Gold One International

JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria
2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

2 LANGUAGE SKILLS

Language	Speaking	Writing	Reading
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

Period	Company	Title/position
09/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007	Rock Art Mapping Project	Freelance archaeologist Resident archaeologist



2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

4 EXPERIENCE

Johan Nel has 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	
Member	Society for Africanist Archaeologists (SAfA)	N/A



6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at
Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001.	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004.	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
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.



Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.
Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

7 PROJECT EXPERIENCE

7.1 Archaeological Surveys and Impact Assessments

- 2003-2004. Freelance consulting archaeologist. Roodt & Roodt CC. RSA. Archaeological surveys. Specialist.
- 2004-2005. Resident archaeologist Rock Art Mapping Project. University of KwaZulu-Natal. Kwazulu-Natal, RSA. Rock art mapping & recording. Specialist.

7.2 Archaeological Mitigation

- 2007. Archaeological investigation of Old Johannesburg Fort. Johannesburg Development Agency. Gauteng, RSA. Archaeological mitigation. Project manager.
- 2008. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Watching Brief. Project manager.
- 2011. Sessenge archaeological site mitigation. Randgold Resources. Doko, DRC. Archaeological mitigation. Specialist.
- 2011. Mitigation of three sites, Koidu Kimberlite Project. Koidu Holdings SA. Koidu, Sierra Leone. Archaeological mitigation. Project manager.
- 2012. Boikarabelo Phase 2 Mitigation of Archaeological Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2012. Additional Archaeology Mitigation of Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2013. Archaeological Excavations of Old Well, Rhodes University, Grahamstown. Rhodes University. Eastern Cape, RSA. Archaeological mitigation. Specialist.
- 2014. Archaeological Site Destruction. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.

7.3 Heritage Impact Assessments

- 2005. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Go-Enviroscience. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2006. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. ERM Southern Africa (Pty) Ltd. Northern & Eastern Cape, RSA. Heritage Scoping Assessment. Project manager.
- 2007. Proposed road upgrade of existing, and construction of new roads in Burgersfort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2007. Recommendation of Exemption: Above-ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Sasol Group Services (Pty) Ltd. Free State, RSA. Letter of Exemption. Project manager.
- 2008. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Archaeological Impact Assessment. Project manager.
- 2008. Van Reenen Eco-Agri Development Project. Go-Enviroscience. Kwazulu-Natal & Free State, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establishment of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Scoping Assessment. Project manager.
- 2008. Randwater Vlakfontein-Mamelodi water pipeline survey. Archaeology Africa CC. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2010. Heritage Impact Assessment for conversion of PR to MRA. Georock Environmental. Northwest, RSA. Heritage Impact Assessment. Project manager.
- 2010. Temo Coal Project. Namane Commodities (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2011. Marapong Treatment Works. Ceenex (Pty) Ltd. Limpopo, RSA. Archaeological Impact Assessment. Project manager.

- 2011. Complete Environmental Authorisation. Rhodium Reefs Ltd. Limpopo, RSA. Archaeological Impact Assessment. Specialist.
- 2011. Big 5 PV Solar Plants. Orlight (Pty) Ltd. Western and Northern Cape, RSA. Heritage Impact Assessment. Specialist.
- 2011. Heritage Impact Assessment for Koidu Diamond Mine. Koidu Holdings SA. Koidu, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. TSF and Pipeline. Gold One. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2012. Kangra Coal Heritage Screening Assessment. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Screening Assessment. Project manager.
- 2012. Environmental and Social Studies. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage specialist advice. Project manager.
- 2012. ESKOM Powerline EIA. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2012. Falea Project ESIA. Denison Mines Corp. (Rockgate Capital Corp). Falea, Mali. Heritage Impact Assessment. Specialist.
- 2012. EIA for Proposed Emergency Measures to Pump and Treat. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2012. Tonguma Baseline Studies. Koidu Holdings SA. Tonguma, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. Vedanta IPP. Black Mountain Mining (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Boikarabelo Railway Realignment. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Platreef ESIA. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Roodekop EIA. Universal Coal Development 4 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2012. Kangala HIA. Universal Coal Development 1 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment and permitting. Specialist.
- 2012. Roodepoort Strengthening. Eskom Holdings SOC Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
- 2012. Trichardtsfontein EIA / EMP. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Zandbaken EIA/EMPR. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.

- 2013. ATCOM Tweefontein NID. Jones & Wagener (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2013. Roodepoort Heritage Impact Assessment. Fourth Element Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2013. JHB BRT Phase 2 Heritage Impact Assessment. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2013. Kangra Coal HIA. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2013. Slypsteen Bulk Sample Application. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Project manager.
- 2013. Kempton Park Heritage Statement and NID. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. Sasol Twistdraai CFD. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. HRS & NID - River Crossings Upgrade. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. Waterberg Prospecting Right Applications. Platinum Group Metals (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2013. Landau Waste Licence Application. Anglo Operations (Pty) Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Prospecting Right Consultation Report. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Witrand Prospecting EMP. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. EMP Amendment for CST. Copper Sunset Trading (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Maseve IFC ESHIA. Maseve Investment (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Dalyshope ESIA. Anglo Operations (Pty) Limited. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2013. Klipfontein Opencast Project. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2013. Consbrey and Harwar MPRDA EIA/EMP. Msobo Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2013. Slypsteen 102 EMP Amendment. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Specialist.

- 2013. Putu Iron Ore ESIA. Atkins Limited Incorporated. Putu, Liberia. Heritage Impact Assessment. Specialist.
- 2013. Ash backfilling at Sigma Colliery. Sasol Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
- 2013. Syferfontein Block 4 - Underground Coal Mining for Sasol. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
- 2013. Prospecting Right Amendment to Include Bulk Sampling. Sikhuliso Resources (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
- 2013. Nooitgedacht EIA, EMP Amendment & Gap Analysis. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2014. Gold One EMP Consolidation Phase 0. Gold One. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Kilbarchan Audit and EIA. Eskom Holdings SOC Ltd. Kwazulu-Natal, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Klipspruit Extension Environmental Assessment. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Klipspruit South BECSA EIA. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. EIA/EMP Soweto Cluster. DRD GOLD ERGO (Ergo Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. London Road Heritage Statement. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. Grootegeluk MPRDA, NEMA and IWULA. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. Kibali ESIA & EMP Update. Randgold Resources. Doko, DRC. Heritage Impact Assessment. Specialist.
- 2014. Nokuhle Colliery NEMA Process. HCI Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. HRM Process for Hendrina Wet Ashing. Lidwala Consulting Engineers (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. Weltevreden NEMA. Northern Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. Sasol Sigma Mooikraal Pipeline BA. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.

7.4 Burial Grounds and Graves Consultation and Relocation

- 2005. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng D Georgiades East Farm (Pty) Ltd. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Southstock Collieries Grave Relocation. Doves Funerals, Witbank. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Social consultation for Smoky Hills Platinum Mine Grave Relocation. PGS (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2005. Social consultation for Elawini Lifestyle Estate Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Zonkezizwe Grave Relocation. PGS (Pty) Ltd. Gauteng, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Motaganeng Residential Development Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Zondagskraal Coal Mine Grave (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2007. Exploratory excavation of an unknown cemetery at Du Preezhoek, Fountains Valley, Portion 383 of the farm Elandspoort 357 JR, Pretoria, Gauteng. Bombela Civil Joint Venture. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2007. Final consolidated report: Phase 2 test excavations ascertaining the existence of alleged mass graves, Tlhabane West, Extension 2, Rustenburg, Northwest Province. Bigen Africa Consulting Engineers. Northwest, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2007. Repatriation of Mapungubwe Human Remains. Department of Environmental Affairs and Tourism. Limpopo, RSA. Repatriation. Project manager.
- 2008. Report on skeletal material found at Pier 30, R21 Jones Street off-ramp, Kempton Park. Bombela Civil Joint Venture. Gauteng, RSA. Heritage Scoping Assessment. Project manager.
- 2011. Kibali Grave Relocation. Randgold Resources. Doko, DRC. International grave relocation. Specialist.
- 2012. Platreef Platinum Mine Burial Grounds and Graves Census. Platreef Resources (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.



- 2013. New Liberty Grave Relocation Process. Aureus Mining Inc. Kinjor, Liberia. International grave relocation. Project manager.
- 2013. Bokoni Burial Grounds and Grave Census and Grave Relocation Plan. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.
- 2014. Arnot Colliery Grave Relocation Project. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2014. Paardeplaats and Belfast RAPs. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Reviewer / specialist.
- 2014. Thabametsi EIA, EMP, IWULA, IWWMP and PPP. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Specialist.

7.5 Research Reports and Reviews

- 2007. Research report on cultural symbols. Ministry of Intelligence Services. RSA. Research report. Project manager.
- 2007. Research report on the remains of kings Mampuru I and Nyabela. National Department of Arts and Culture. RSA. Research report. Project manager.
- 2012. Baseline Scoping and Pre-feasibility Songwe Rare Earth Element Project. Mkango Resources Limited. Songwe, Malawi. Heritage Impact Assessment. Reviewer / specialist.
- 2013. Fatal Flaw Analysis and EIA Process for AMD Man in Eastern Basin. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.

Appendix B: Site list

Sites identified as a result of the literature review

Map ID	Site ID	Source	Time period	Type	Latitude	Longitude	Distance from LCM project area	Description
2527CB10	1999-SAHRA-0079/2527CB10	Van Schalkwyk & Pelsler, 1999	Historical	Grave	-25.733639	27.444139	5 km	Unmarked grave
2527CB11	1999-SAHRA-0079/2527CB11	Van Schalkwyk & Pelsler, 1999	Historical	Structure	-25.729722	27.426167	4.5 km	Foundations/remains of an old homestead/farmstead
2527CB12	1999-SAHRA-0079/2527CB12	Van Schalkwyk & Pelsler, 1999	Iron Age	Surface scatter	-25.739583	27.406528	1.7 km	Undecorated pottery, grinding stones and hammer stones
2527CB13	1999-SAHRA-0079/2527CB13	Van Schalkwyk & Pelsler, 1999	Historical	Grave	-25.735139	27.413333	2.2 km	Unmarked grave
2527CB14	1999-SAHRA-0079/2527CB14	Van Schalkwyk & Pelsler, 1999	Iron Age	Stone walling	-25.735194	27.424	3.1 km	Extensive LIA site consisting of cattle kraals, terraces and other stone structures
Kroondal	Kroondal	van Schalkwyk & Pelsler, 2001	Historical	Town	-25.724768	27.308022	8.6 km	Town of Kroondal established in 1889
2527CB2	1997-SAHRA-0015/2527CB2	van Schalkwyk & Pelsler, 2001	Iron Age	Stone walling	-25.712111	27.355222	4.4 km	Extensive LIA stone walling and recent fire places (possible initiation site)
2527CB3	1997-SAHRA-0015/2527CB3	van Schalkwyk & Pelsler, 2001	Iron Age	Stone walling	-25.716056	27.327694	6.8 km	LIA stone walling and terraces
2527CB4	1997-SAHRA-0015/2527CB4	van Schalkwyk & Pelsler, 2001	Iron Age	Stone walling	-25.701722	27.334944	6.7 km	LIA stone walling and potsherds found on site
Site 3	2002-SAHRA-0037/Site 3	Huffman & Schoeman, 2002	Stone Age	Surface scatter	-25.67525	27.388167	6 km	MSA flakes, points and cores
Site 4	2002-SAHRA-0037/Site 4	Huffman & Schoeman, 2002	Iron Age	Stone walling	-25.677417	27.387083	5.9 km	Well preserved LIA stone walling
Site 11	2002-SAHRA-0037/Site 11	Huffman & Schoeman, 2002	Iron Age	Stone walling	-25.655917	27.416583	8.6 km	Well preserved LIA stone walling
Site 14	2002-SAHRA-0037/Site 14	Huffman & Schoeman, 2002	Stone Age	Surface scatter	-25.661722	27.412167	7.7 km	MSA flakes, points and cores
Site 23	2002-SAHRA-0037/Site 23	Huffman & Schoeman, 2002	Iron Age	Engraving site	-25.675972	27.406278	6.2 km	Iron Age Stone engravings site. The engravings appear to depict the settlement plan of early stone-walled settlements
Site 27	2002-SAHRA-0037/Site 27	Huffman & Schoeman, 2002	Stone Age	Surface scatter	-25.675944	27.411444	6.3 km	MSA flakes, points and cores
Site 28	2002-SAHRA-0037/Site 28	Huffman & Schoeman, 2002	Iron Age	Stone walling	-25.674889	27.413	6.5 km	Middle Iron Age stone walling site
Site 37	2002-SAHRA-0037/Site 37	Huffman & Schoeman, 2002	Iron Age	Stone walling	-25.670694	27.420611	7.2 km	Well preserved LIA stone walling
Site 47	2002-SAHRA-0037/Site 47	Huffman & Schoeman, 2002	Iron Age	Stone walling	-25.678611	27.384444	5.7 km	LIA stone walling and middens
Site 48	2002-SAHRA-0037/Site 48	Huffman & Schoeman, 2002	Iron Age	Stone walling	-25.673056	27.385	6.3 km	Extensive LIA stone walling site
Site 50	2002-SAHRA-0037/Site 50	Huffman & Schoeman, 2002	Stone Age	Surface scatter	-25.656389	27.342778	9.6 km	Isolated MSA flake
Site 1	2008-SAHRA-0478/Site 1	Coetzee, 2008	Iron Age	Stone walling	-25.748256	27.366596	3.3 km	Late Iron Age (LIA) stone walled settlement consisting of six enclosures with a main enclosure (8 m in diameter), a large enclosure (25 m in diameter) with several secondary stone enclosures attached and several large packed stone heaps
Kamakwe	2527CB1/CB2/CB3	WITS Archaeology Site Database	Iron Age	Stone walling	-25.686111	27.388056	4.5 km	Extensive LIA Stone walling complex (Moloko type walling)

Heritage Scoping Survey Results

Map ID	Time period	Type	Latitude	Longitude	Distance from proposed infrastructure
Ft/001	Stone Age	Surface scatter	-25.72735	27.389294	50 m from open cast pit
Ft/002	Iron Age	Surface scatter	-25.72693	27.389259	90 m from open cast pit
Ft/003	Iron Age	Stone walling	-25.72619	27.388933	170 m from open cast pit
Ft/004	Iron Age	Stone walling	-25.7259	27.388584	220 m from open cast pit
Ft/005	Iron Age	Stone walling	-25.72659	27.398045	20 m from open cast pit
Ft/006	Iron Age	Stone walling	-25.72426	27.396752	230 m from open cast pit
Ft/007	Iron Age	Stone walling	-25.73135	27.401548	Within open cast pit

Heritage Scoping Report

Lanxess Chrome Mine: Section 102 Amendment

LAN3111



DIGBY WELLS
ENVIRONMENTAL
