



DIGBY WELLS
ENVIRONMENTAL



Application for a Mining Right and Environmental Authorisation of the proposed Palmietkuilen Mining Project, Gauteng Province

Heritage Scoping Report

Project Number:

CNC4065

Prepared for:

Anglo Operations (Pty) Ltd

August 2016



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This document has been prepared by Digby Wells Environmental.

Report Type:	Heritage Scoping Report
Project Name:	Application for a Mining Right and Environmental Authorisation of the proposed Palmietkuilen Mining Project, Gauteng Province
Project Code:	CNC4065

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EXECUTIVE SUMMARY

Pandospan (Pty) Ltd (Pandospan forms part of the Canyon Group of Companies) concluded a contract with Anglo Operations (Pty) Ltd (AOL) in support of the acquisition of a prospection right for coal. The enviro-legal applications for the project will be managed by Pandospan on behalf of AOL, the project applicant.

The services of Digby Wells Environmental (hereinafter Digby Wells) was enlisted to undertake necessary studies and compile an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) in support of AOL Environmental Authorisation (EA) application for the Palmietkuilen Mining Project (the Project).

This report constitutes a specialist Heritage Scoping Report (HSR).

A number of sensitive, protected heritage resources were identified in the baseline that occurs within the Project study areas. These include:

- Fossil heritage that may be present in the *Vryheid Formation* in the site-specific study area;
- One Middle Stone Age (MSA) resource in the regional study area;
- At least one Late Farming Community (LFC) settlement site in the local study area, and four in the regional study area;
- Various historical structures in the local and site-specific study areas; and
- 50 burial grounds and graves in the regional study area, 70 burial grounds and graves and one public monument and memorial within the local study area.

In compliance with Section 38(8) of the NHRA, an HIA will be completed during the Impact Assessment Phase of the Project.

It is proposed that a Heritage Impact Assessment (HIA) be completed that considers the following components:

- Section 34 – Built Structures;
- Section 35 – Archaeology;
- Section 36 – Burial grounds and graves; and
- Section 37 – Public monuments and memorials.

The HIA will include assessments of the identified heritage resources to determine CS and Field Ratings, the intensity of predicted heritage impacts on heritage resources by projected related activities and the development of reasonable and feasible management and mitigation measures.

Based on our understanding of the Project and through experience on similar projects, we are of the opinion that inclusion of a detailed palaeontological assessment will not add value at this stage. While it is acknowledged that the site-specific study area is underlain by



lithostratigraphy that is palaeontologically sensitive, fossils that may be of scientific value commonly occur in the shale lenses between coal seams at sub-surface levels (Bamford, 2016). Furthermore, Bamford (2016) notes that neither additional desktop nor field assessments would reveal any additional information until excavation of the coal seams themselves take place.

Considering the aforementioned reasoning, a Request for Exemption (RfE) from further palaeontological assessment will be made on the basis that a Fossil Chance Find Procedure is included in the final EMP as a condition of authorisation.

The following Fossil Chance Finds Procedure compiled by Bamford (2016) is recommended:

Table 1-1: Recommended fossil finds procedure

Phase	Procedure
Construction	<p>Surface excavations should be monitored by the geologist and any fossil material disturbed should be put aside and the palaeontologist called to inspect the material within a reasonable timeframe in order to minimise delays to the project. The geologist should also receive from the palaeontologist some photographs and descriptions of what palaeontological material to look out for.</p> <p>The schedule of monitoring should be set up between the mine and palaeontologist and the agreement letter submitted to SAHRA.</p> <p>If it is not feasible for the palaeontologist to visit the mine timeously then digital photographs of good quality and resolution should be sent to the palaeontologist to assess and make recommendations.</p> <p>From visits or photographs supplied the palaeontologist must make the following recommendations:</p> <ul style="list-style-type: none"> • Material is of no value so development can proceed, or • Fossil material is of some interest so a representative sample should be carefully collected and put aside for further study and incorporated into a recognised repository (Ditsong Museum, Council for Geosciences, Pretoria; Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg) and a permit obtained from SAHRA for the removal of the fossils, then development may proceed, or • Fossils are scientifically important and the palaeontologist must obtain a SAHRA permit to excavate the fossils and put them into a recognised repository, then development may proceed.
Operational	<p>Once the mine is operational and the coals and shales are exposed the palaeontologist should visit the mine to see what fossils are present. Then the above procedure, a-c, can be followed.</p> <ul style="list-style-type: none"> • At each stage a report should be sent to SAHRA by the palaeontologist detailing the fossil finds and where they are being kept.
Decommissioning	<p>A palaeontologist should search through the dumps and exposed shales and seams, rescue any fossil material of scientific interest, store it in a recognised repository so it is available for future research, and then the land must be rehabilitated.</p>



TABLE OF CONTENTS

1	Introduction	7
2	Description of the scope of the proposed project.....	7
2.1	Project overview	7
2.2	Listed and specified activities	9
2.3	Project alternatives.....	13
3	Terms of reference.....	14
4	Details of the specialists.....	14
5	Policy and legal framework	15
6	Methodology.....	18
6.1	Defining study areas.....	18
6.2	Baseline Statement of Cultural of Significance	19
6.3	Defining heritage impacts	19
6.4	Data collection.....	21
6.4.1	<i>Literature review</i>	21
6.4.2	<i>Historical layering</i>	21
7	Constraints and limitations	22
8	Cultural heritage baseline profile.....	22
8.1	Paleontological context.....	22
8.2	Archaeological context	26
8.2.1	<i>Stone Age</i>	26
8.2.2	<i>Farming community</i>	26
8.3	Historical context.....	27
8.3.1	<i>Historical layering</i>	31
9	Cultural significance of identified landscape	33
10	Possible heritage risks	34
11	Predicted heritage impacts.....	35
12	Scoping assessment.....	41



13	Proposed terms of reference for the EIA and HIA.....	41
14	Conclusion	42
15	Bibliography	43

LIST OF FIGURES

Figure 8-1: Palaeo-sensitivity map of the Palmietkuilen Project (adapted from SAHRIS)	24
Figure 8-2: 1899 Jeppes Map of the Transvaal. Site-specific project area indicated in red. Farms associated with the Battle of Witpoort indicated in green. Geduld 134 Farm on which gold was discovered in 1899 in pink.....	30
Figure 8-3: Battle of Witpoort, 16 July 1900 (© samilitaryhistory.org)	30
Figure 8-4: Examples of sangars from the Battle of Witpoort (Panagos, 1999).....	31
Figure 8-5: Aerial imagery dated 1952	32
Figure 8-6: Aerial imagery dated 1958	33

LIST OF TABLES

Table 1-1: Recommended fossil finds procedure	iii
Table 2-1: Supporting infrastructure for the Project	8
Table 2-2: Identified listed activities.....	9
Table 2-3: Specified activities for the Project.....	12
Table 4-1: Expertise of specialists.....	14
Table 5-1: Applicable legislation considered in the HRM process	15
Table 5-2: Applicable policies considered in the HRM process	18
Table 6-1: Summary of reviewed literature, reports and databases.....	21
Table 6-2: Aerial imagery relevant to this assessment	22
Table 8-1: Geological context and palaeo-sensitivity of the site-specific study area	25
Table 9-1: Identified CS of heritage resources in cultural heritage landscape	34
Table 11-1: Summary of potential heritage impacts	36
Table 11-2: Identified potential cumulative impacts	38
Table 11-3: Possible risks to heritage resources	39



Table 11-4: Scoping assessment of potential impacts to heritage resources.....	40
Table 13-1: Recommended fossil finds procedure	42

LIST OF APPENDICES

Appendix A: Specialist CV

Appendix B: Plans



1 Introduction

Pandospan (Pty) Ltd (Pandospan forms part of the Canyon Group of Companies) concluded a contract with Anglo Operations (Pty) Ltd (AOL) in support of the acquisition of a prospection right for coal. The enviro-legal applications for the project will be managed by Pandospan on behalf of AOL, the project applicant.

Pandospan propose to initiate their Palmietkuilen Mining Project (*the Project*) pending necessary environmental and other authorisations. In terms of the requirements of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) as amended, a Mining Right Application (MRA) must be submitted to the Department of Mineral Resources (DMR) for the Project. In support of the MRA, an Environmental Impact Assessment (EIA) process must be undertaken in accordance with the new EIA Regulations, 2014 (GN R 982) promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended.

Pandospan enlisted the services of Digby Wells Environmental (hereinafter Digby Wells) to undertake necessary studies and compile an EIA and Environmental Management Plan (EMP) in support of AOLs Environmental Authorisation (EA) application.

This report constitutes a specialist Heritage Scoping Report (HSR). The HSR aims to present an abbreviated project description, a cultural heritage baseline, potential heritage risks and impacts, and proposed Terms of Reference for the ensuing impact assessment phase.

2 Description of the scope of the proposed project

This section summarises the overall scope of the Project, identifying specified activities that may potentially impact upon the receiving cultural heritage resources and landscape. The Project and associated activities are considered in relation to the cultural heritage baseline presented in Section 8 below.

2.1 Project overview

In June 2016, Pandospan concluded a contract with AOL for the acquisition of a Prospecting Right (DMR Ref: GP 30/5/1/1/2 (201/10026) PR) on Portions 1, 2, 4, 9, 13 and 19 of Palmietkuilen 241 IR.

These properties comprise the Palmietkuilen Mining Project, situated east of Springs in the Sedibeng District Municipality, Gauteng Province. The enviro-legal applications of the Project will be managed by Pandospan on behalf of AOL as the applicant.

The Project will entail the establishment of a new open pit coal mine and supporting infrastructure. Proposed mining methods include bench and strip mining techniques. Drilling and blasting will be employed to remove overburden or bedrock and expose the coal seams.



Extracted coal will be transported via haul roads and stored on a Run of Mine (RoM) stockpile area. It is proposed that the coal be transported to the processing plant via conveyor for beneficiation, after which the coal product will be stored prior to distribution.

From the processing plant, the coal product is proposed to be transport to the Welgedacht siding for distribution rail or directly via truck to the relevant markets. A temporary discard dump containing one year's capacity will be constructed to store discard before being either reworked or backfilled into mined out areas.

Proposed supporting infrastructure is summarised in Table 2-1:

Table 2-1: Supporting infrastructure for the Project

Component	Details
Stockpile areas	Topsoil, sub-soil and overburden for rehabilitation
	RoM stockpile
	Product stockpile
Process Plant	Screening and crushing
	Washing and processing
Water supply and management	Slurry dam
	Pollution control dam (PCD)
Power supply	Substation
	Diesel generators
	Solar power generation (<i>under investigation</i>)
Waste management	Sewage treatment plant
Access and site roads	Existing road network
Rail siding	Existing Welgedacht siding
Workshop Area	Contractors yard
	Offices
	Laboratory
	Wash bays
	Storage facilities



	Workshop
Hazardous storage	Diesel storage tanks

2.2 Listed and specified activities¹

Listed and specified activities considered in identifying the potential heritage risks and impacts for the Project are presented in Table 2-2 and Table 2-3 respectively.

Table 2-2: Identified listed activities

NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
Listing Notice 1: GN R 983			
X – 9 (i) and /or (ii)	38(1)(a)	Water pipelines. The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.	Construction & Operation
X – 10 (i) or (ii)	38(1)(a)	Process water, waste water, return water pipelines The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or	Construction & Operation

¹ Listed activities refer to activities and their applicable thresholds contained in the EIA Regulations, 2014. Specified activities refer to activities that are specific to the Project.



NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
		(ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.	
X – 12 (xii)	38(1)(c)(i)	Development of open pit and topsoil dump- the development of- infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse	Operation
X – 13	38(1)(c)(i)	Pollution control dam The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50,000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	Construction & Operation
X – 19	38(8)	Mining through wetlands / pans The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is	Operation



NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
		the greater but excluding where such infilling, depositing , dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	
X –24 (ii)	38(1)(a)	Roads on site The development of- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding- (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.	Construction & Operation
Listing Notice 2: GN R 984			
X – 4	38(8)	Diesel storage, explosives magazine The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	Operation
X – 6	38(8)	Water Use Licence The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.	Operation
X –15	38(1)(c)(i)	Site establishment and vegetation removal. The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance	Construction & Operation



NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
		with a maintenance management plan.	
X – 17	38(8)	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	Pre-construction
Waste Activities – GN R 921			
Category B 4 (1)	38(8)	The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage. (Slurry dam)	Operation
Category B 4 (10)	38(1)(c)(i)	The construction of a facility for a waste management activity listed in Category B of this Schedule	Construction
Category B 4 (11)	38(1)(c)(i)	The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	Operation

Table 2-3: Specified activities for the Project

Project Phase	Activity
Construction	Site establishment
	Site clearing, including removal of topsoil and vegetation
	Construction of mine related infrastructure, including haul roads, pipes and dams
	Construction of washing plant
	Relocation of infrastructure
	Blasting and development of initial box-cut, including stock piling



Project Phase	Activity
	Temporary storage of hazardous products, i.e. fuel, explosives, waste, sewage
Operational	Stripping of topsoil and soft overburden
	Removal of overburden, including drilling and blasting
	Loading, hauling and stockpiling of overburden
	Drilling and blasting
	Load, haul and stockpiling of RoM coal
	Use and maintenance of haul roads
	On-site water use and storage
	Storage, handling and treatment of hazardous products and waste
Decommissioning and closure	Demolition and removal of all infrastructure
	Rehabilitation
	Environmental monitoring of decommissioning activities
	Storage, handling and treatment of hazardous products and waste
	Post-closure monitoring and rehabilitation

2.3 Project alternatives

For the purposes of this HSR proposed alternatives were identified and screened to determine whether they are reasonable and feasible. Detailed consideration of alternatives will be assessed in the Heritage Impact Assessment (HIA) that will be completed during the impact assessment phase.

The identified alternatives considered in this HSR include the following:

- Use of Portions 1, 2, 4, 9, 13 and 19 of Palmietkuilen 241 IR for infrastructure placement versus (vs.) only the use of Portion 19;
- Coal transport via a conveyor system vs. the proposed hauling via road to the Welgedacht Siding;
- Underground mining methods vs. the proposed open pit bench and strip mining; and
- A no-go alternative.



3 Terms of reference

The Terms of Reference (ToR) for the specialist heritage study was to conduct a Heritage Resources Management (HRM) Process in support of the EA applications required for the MRA. The HRM Process is being completed in accordance with Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

The Scope of Work (SoW) for the specialist HRM process included the compilation of an HSR and HIA to comply with Section 38(3) of the NHRA. The following activities were completed as part of the HSR SoW:

- A literature review was completed to develop a cultural heritage baseline profile;
- Historical layering was done to identify physical features older than 60 years that are protected in terms of Section 34 of the NHRA, as well other tangible heritage resources;
- Potential heritage impacts were identified based on the Project activities presented in Table 2-3;
- Possible Project risks that could manifest due to heritage resources and impacts; and
- Specific ToR were developed for the ensuing HIA.

4 Details of the specialists

The relevant expertise of the specialists involved in the HRM process are summarised in Table 4-1.

Table 4-1: Expertise of specialists²

Justin du Piesanie ASAPA Member 270 ICOMOS Member 14274	Justin holds the position of Heritage Management Consultant: Archaeologist at Digby Wells, after joining the company in August 2011. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. Justin is a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. He has over 10 years combined experience in 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 Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage.
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² Please refer to Appendix A for the Curriculum Vitae of the relevant specialists.



Johan Nel ASAPA Member 095 ICOMOS Member 13839	Johan is the manager of the HRM unit. He joined Digby Wells in June 2010 as an archaeologist and was subsequently made the unit manager of the HRM unit in the Social Department. Johan holds an Honours degree in Archaeology from the University of Pretoria. He is a professional member of the ASAPA, and accredited by the association's CRM section. He is also a member of the ICOMOS. He has more than 17 years' experience in undertaking HRM projects, including archaeological mitigation and grave relocation. Johan has diverse international HRM experience in various African countries including Botswana, the Democratic Republic of Congo, Liberia, Sierra Leone and South Africa. This experience includes archaeological surveys, excavations, community consultation and grave relocations completed to IFC and other international standards. He has also acted as an expert reviewer of HRM projects undertaken in, amongst other countries, Malawi and Tanzania. Johan's present focus at Digby Wells is to develop the HRM unit into an integrated vehicle for assessing impacts on heritage resources through multidisciplinary approaches, following international HRM principles and standards.
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5 Policy and legal framework

The HRM process is governed by the national legislative framework. This section provides a brief summary of the relevant legislation pertaining to the conservation and responsible management of heritage resources.

Table 5-1: Applicable legislation considered in the HRM process

Applicable legislation used to compile the report	Reference where applied
<p><u>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</u></p> <p>Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that –</p> <ol style="list-style-type: none"> i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development 	<p>The EIA process and associated HRM process is being undertaken to identify heritage resources and determine heritage impacts associated with the project.</p> <p>As part of the HRM process, mitigation measures and monitoring plans will be recommended to ensure that any potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.</p>
<p><u>Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002)</u></p> <p>The MPRDA sets out the requirements relating to the development of the nation's mineral and petroleum resources. It also aims to ensure the promotion of economic and social development through exploration and mining-related activities.</p>	<p>An MRA for the project has been lodged with the DMR on 4 August 2016.</p> <p>This HSR, which relates specifically to the Palmietkuilen Mining Right has been compiled in accordance with the MPRDA read with the EIA Regulations, 2014.</p>



Applicable legislation used to compile the report	Reference where applied
<p>The MPRDA requires that mining companies assess the socio-economic impacts of their activities from start to closure and beyond. Companies must develop and implement a comprehensive Social and Labour Plan (SLP) to promote socio-economic development in their host communities and to prevent or lessen negative social impacts.</p> <p>A Mining Right Application (MRA) submitted to the DMR in terms of the Mineral and Petroleum Resources Act, 2002 (Act No.28 of 2002) (MPRDA) must be succeeded by various documents including a Scoping Report, EIA Report and an Environmental Management Plan (EMP).</p>	
<p><u>National Environmental Management Act, 1998 (Act No. 107 of 1998)</u></p> <p>The NEMA, as amended, was set in place in accordance with section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making on issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that:</p> <p><i>The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.</i></p> <p>The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of sections 24(2) and 24D of the NEMA, as amended.</p>	<p>The EIA process is being undertaken in accordance with the principles of Section 2 of NEMA as well as with the EIA 2014 Regulations, promulgated in terms of NEMA.</p> <p>These Listed Notices have been reviewed against the project activities to determine the likely triggers. The activities which are potentially triggered under the Listing Notices are provided in Table 2-3.</p> <p>Based on the activities listed, it has been identified that a full EIA process is required for the project. An application for the listed activities will be submitted to the DMR who is the relevant Competent Authority in terms of this application for Environmental Authorisation.</p>
<p><u>GN R. 982: Environmental Impact Assessment Regulations, 2014</u></p> <p>These three listing notices set out a list of identified activities which may not commence without an Environmental Authorisation from the relevant Competent Authority through one of the following processes:</p> <ul style="list-style-type: none"> ▪ Regulation GN R. 983 - Listing Notice 1: This listing notice provides a list of various activities which require environmental authorisation and which must follow a basic assessment process. 	<p>Refer to Table 2-3 above for the activities which could potentially be triggered by the Project.</p>



Applicable legislation used to compile the report	Reference where applied
<ul style="list-style-type: none"> ▪ Regulation GN R. 984 – Listing Notice 2: This listing notice provides a list of various activities which require environmental authorisation and which must follow an environmental impact assessment process. ▪ Regulation GN R. 985 – Listing Notice 3: This notice provides a list of various environmental activities which have been identified by provincial governmental bodies which if undertaken within the stipulated provincial boundaries will require environmental authorisation. The basic assessment process will need to be followed. 	
<p><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></p> <p>The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa, with specific reference to the following Sections:</p> <ul style="list-style-type: none"> ▪ 5. General principles for HRM ▪ 6. Principles for management of heritage resources ▪ 7. Heritage assessment criteria and grading ▪ 38. Heritage resources management <p>The Act requires that Heritage Resources Authorities (HRAs), in this case the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Authority of Gauteng (PHRA-G), be notified as early as possible of any developments that may exceed certain minimum thresholds in terms of Section 38(1), or when assessments of impacts on heritage resources are required by other legislation in terms of Section 38(8) of the Act.</p>	<p>A Notice of Intent to Develop (NID) will be submitted, as part of this HSR, to the SAHRA and PHRA-G. The HSR was compiled to comply with of subsection 3(3)(a) and (b) of the NHRA.</p> <p>Furthermore, a Heritage Impact Assessment (HIA) will be undertaken to comply with the remaining subsections during the EIA.</p>

**Table 5-2: Applicable policies considered in the HRM process**

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

6 Methodology

6.1 Defining study areas

As heritage resources do not exist in isolation from the wider natural, social, cultural and heritage landscape, assessment of potential impacts on heritage resources is complicated by the fact that diverse heritage impacts may manifest in different geographical areas and affect different communities.

Defined study areas are necessary to develop a baseline Statement of Cultural Significance (CS), predict the types and intensities of impacts, and develop management and mitigation measures. The general definition for a “study area” in terms of an impact assessment is the area most likely to experience impacts arising from, or to exert an influence on, the project or activity being assessed.

For the purposes of this study, four ‘concentric’ study areas were defined to enable CS to be determined that will inform predicted impacts and guide appropriate management measures. The defined study areas are:

- A **primary study area** that comprises the Project’s physical development footprint. It is anticipated that this is where heritage impacts are most probable;



- A **site-specific study area**, which comprises the Project boundary, including any exclusion zones, servitudes and other operational boundaries;
- A **local study area**, which comprises the applicable local municipality and includes the land and properties adjacent to and surrounding the Project area; and
- A **regional study area**, which comprises the district municipality. Where necessary, the regional study area was extended outside the boundaries of the district municipality to include much wider regional expressions of specific types of heritage resources and historical events. In this instance, the Project lies on the provincial boundary between Gauteng and Mpumalanga Provinces, and considers the wider regional expressions of heritage resources and historical events to define the cultural landscape.

6.2 Baseline Statement of Cultural of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance³ of identified heritage resources. This process considered heritage resources assessment criteria set out in subsection 3(3) of the NHRA, which determined the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating was based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist).

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

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

6.3 Defining heritage impacts

Project activities can impact on heritage resources in a number of ways. For instance, although identified heritage resources may not be physically (i.e. directly) affected by project activities, the same activities could impact on the intangible nature of heritage resources.

An example that best illustrates the complexity of heritage impacts is where burial grounds occur within the site-specific project area, but will not be physically affected by any project activities. Access to such sites by descendants of the deceased or other parties may be restricted or lost; the intangible heritage associated with graves as places of memory, ritual,

³ Cultural significance is defined in the NHRA as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.



identity, etc., can therefore be impacted without actual, physical impact on the sites. Such impacts may manifest in social repercussions.

Heritage impacts are further compounded when the intensity of predicted impacts and the assigned CS of heritage resources differ significantly. Again, burial grounds are the best example. These resources are generally considered to be of very high CS; even low ranked impacts may therefore be detrimental to their tangible and intangible conservation.

Predicted heritage impacts were therefore placed into the following three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** that could change the fabric or physical integrity of heritage resources: 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 if the CS of sites are not considered;
- **Indirect, induced or secondary heritage impacts** that can change the fabric or intangible quality of heritage resources later in time or at a different place from the causal activity (e.g. descendants of deceased), 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** that change the CS and integrity of heritage resources due to 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.



6.4 Data collection

Data collection was aimed at information gathering relating to known heritage resources within and surrounding the site-specific study area. Individual data collection activities are described in more detail below.

6.4.1 Literature review

Relevant information was sourced from a diverse range of information repositories including:

- South African Heritage Resources Information System (SAHRIS);
- University of the Witwatersrand Archaeological Site Database (Wits ASD);
- Online / electronic journals and platforms, and
- Certain internet sources.

A summary of the reviewed literature is presented in Table 6-1.

Table 6-1: Summary of reviewed literature, reports and databases

Geology & Palaeontology		
Bamford, 2016	Johanson, et al., 2006	SAHRA, 2013a
Eriksson & Altermann, 1998	Rubidge, 2013a	SAHRA, 2013b
Eriksson, Altermann, & Hartzler, 2006	Rubidge, 2013b	SAHRA, 2013c
Stone Age		
Clark, 1982	Goodwin & Van Riet Lowe, 1929	Mitchell, 2002
Deacon & Deacon, 1999	Hodgskiss & du Piesanie, 2015	
Esterhuysen & Smith, 2007	Lombard, et al., 2012	
Farming Community		
Maggs, 1976	Maggs, 2011	Mason, 1986
Colonial / Historical		
Brodie, 2008	Panagos, 1999	Warwick, 1983
Garstang, Coleman, & Therrell, 2014	Swanepoel, Esterhuysen, & Bonner, 2008	
Golan, 1990	The Voortrekkers, 2014	
Databases		
GSSA	SAHRIS	Wits Archaeological Site Database

6.4.2 Historical layering

Historical layering was completed as a desktop Geographic Information System (GIS) based survey of diverse cartographic sources from various time periods. These maps were layered chronologically to:



- Identify potential protected heritage resources, especially built environment resources; and
- Provide relative dates based on the presence / absence of visible features on maps of known dates.

Table 6-2: Aerial imagery relevant to this assessment

Aerial photographs					
Job no.	Flight plan	Photo nos.	Area	Date	Reference
314	6	44520; 44521; 44522; 44523	Johannesburg / Vereeniging	1952	314/1952
	7	43595; 43596; 43597; 43598			
412	6	02078; 02079; 02080; 02081	Springs / Delmas	1958	1958/412
	7	02063; 02064; 02065; 02066			

7 Constraints and limitations

The results reported in this HSR are limited to information obtained through the desktop studies described in Section 6.4 above. This limitation was due to access not having been obtained to the site-specific study area as land tenure information could not be verified at the time of compiling this report. Consequently, a pre-disturbance survey to collect primary baseline information and ground-truth select heritage resources was not completed.

The pre-disturbance survey will be completed during the compilation of the HIA report in the impact assessment phase of the Project.

8 Cultural heritage baseline profile

8.1 Palaeontological context

The local study area of the Project is underlain by the Chuniespoort Group of the Transvaal Supergroup, and the Dwyka and Ecca Groups of the Karoo Supergroup (see Table 8-1).

The Transvaal Supergroup is preserved in three structural basins, of which the Transvaal Basin is relevant to the Project. The Chuniespoort Group is the basal unit (*i.e. oldest*) sequence of the Basin that encompasses an extensive sedimentary rock sequence (Eriksson, Altermann, & Hartzler, 2006). The Malmani Subgroup in the Chuniespoort Group is typified by a thick succession of dolomites formed ~2.6 to 2.5 billion years ago (*Archaean and early Proterozoic aeons*) (Eriksson & Altermann, 1998).

Expressions of Malmani dolomites have been identified in borehole data collected on Palmietkuilen 241 IR (Anglo Coal Geological Services, n.d.). Malmani dolomites are known to contain a range of shallow marine to intertidal algae colonies or *stromatolites* from as early as 3.5 billion years ago.



In addition, Malmani dolomites have the potential for karst topography, i.e. the creation of voids / sinkholes / caves formed from the dissolution of soluble rocks. In turn, these voids have the potential to contain fine- to coarse-grained alluvium accumulated during periodic flooding. These features may be represented by bodies of breccia, sandstone and siltstone with a likelihood of containing palaeontological or archaeological material.

Lithologies of the Karoo Supergroup, specifically the Dwyka and Ecca Groups, overlie the Transvaal Basin. Lithostratigraphic units associated with the Dwyka Group, namely diamictites / tillite of the late Carboniferous to early Permian Periods dated to ~300 million years ago (Ma). These strata are considered to have been deposited in a marine basin with little palaeontological potential (Johanson, et al., 2006) (SAHRA, 2013b).

The Ecca Group comprises 16 formations, of which *Vryheid Formation* is relevant to this Project. This Formation overlays the Dwyka Group on the north-western margins of the Eastern Basin of the Karoo Main Basin. This formation is primarily arranged in upward-coarsening cycles essentially deltaic in origin (Johanson, et al., 2006). The *Vryheid Formation* comprise shales, sandstones, mudstones and coals (Rubidge, 2013a; Rubidge, 2013b), all of which have been identified in the borehole data collected on Palmietkuilen 241 IR (Anglo Coal Geological Services, n.d.).

The *Vryheid Formation* is the main potential fossiliferous rock underlying the site-specific study area of the Project and rated as having a very high sensitivity on the Palaeontological-Sensitivity Map (PSM). This formation is inherently associated with coal and fossil plants. Fossil plants in general resemble modern plants – leaves of various shapes and sizes, twigs with leaf scars long the surface, chunks of wood, seeds, cones, ferns, etc.

These fossils are more likely to be recognised in the shales between the coal seams or in fine grained mudstones and shales. They may be found in sandstone, but are not as well preserved (Bamford, 2016). Common fossils associated with the *Vryheid Formation* include Permian *Glossopteris* flora, diverse palynomorphs, rare insects and fossil woods, and non-marine bivalves (SAHRA, 2013c).

According to Bamford (2016) associated fossil plants, in general, resemble modern plants – leaves of various shapes and sizes, twigs with leaf scars along the surface, chunks of wood, seeds, cones, ferns, etc. These fossils are more likely to be recognised in the shales between the coal seams or in fine-grained mudstones and shales. They may be found in sandstone, but are not as well preserved. The colour of the matrix can be black, red, grey, white and the fossil plant may be an impression (no colour difference) or be stained with some mineral.

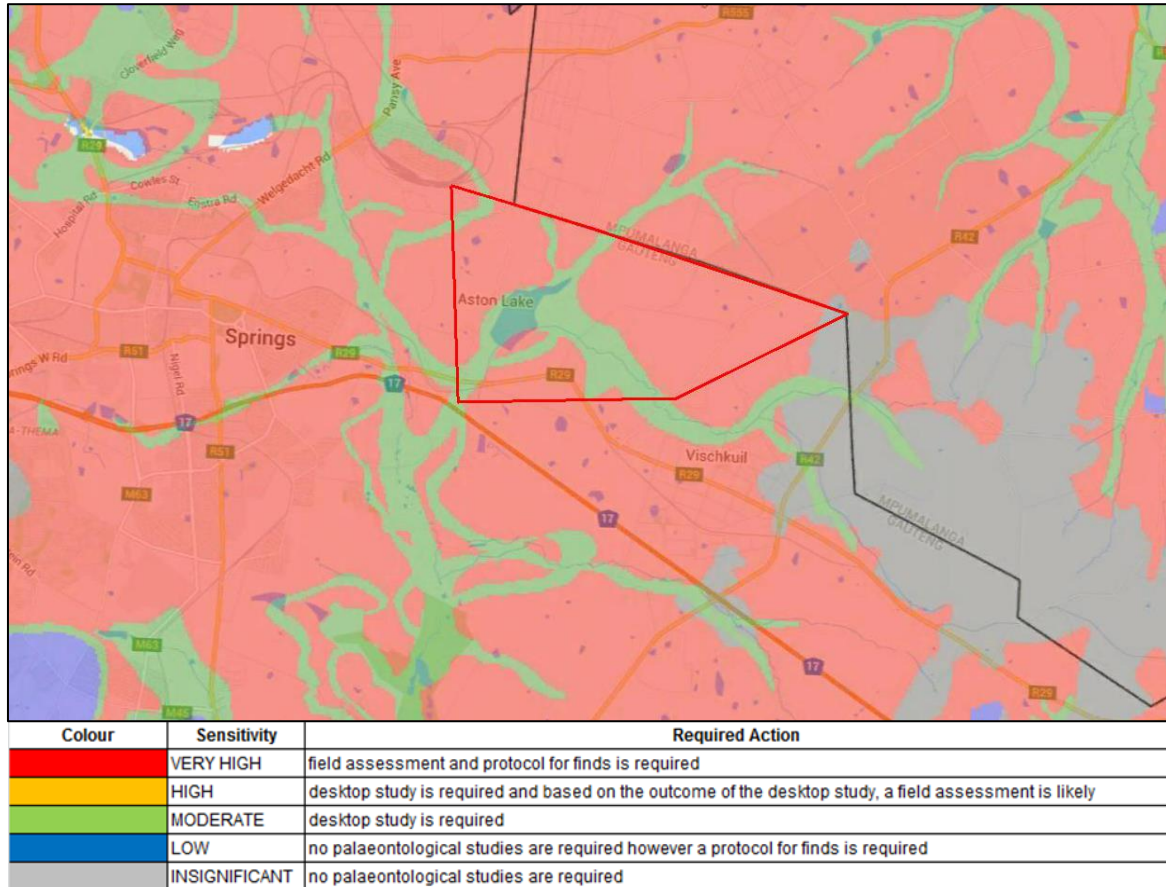


Figure 8-1: Palaeo-sensitivity map of the Palmietkuilen Project (adapted from SAHRIS)



Table 8-1: Geological context and palaeo-sensitivity of the site-specific study area

Eon	Era	Period	Ma	Lithographic Units				Sensitivity	Fossils
				Supergroup	Group	Sub-group	Formation		
Phanerozoic	Palaeozoic	Permian	320	Karoo	Ecca		Vryheid	Very high	Abundant plant fossils of Glossopteris and other plants. Trace fossils. The reptile Mesosaurus has been found in the southern part of the Karoo Basin. Rich fossil plant assemblages of the Permian Glossopteris Flora (lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers, ginkgoaleans), rare fossil wood, diverse palynomorphs. Abundant, low diversity trace fossils, rare insects, possible conchostracans, non-marine bivalves, fish scales
		Carboniferous							
Proterozoic	Vaalian		2500	Transvaal	Chumiespoort	Malmmani	Frisco	Very high	Range of shallow marine to intertidal stromatolites (domes, columns etc), organic-walled microfossils
Archaean							Eccles		
	Lyttelton								
	Monte Christo								
	Oaktree								



8.2 Archaeological context

8.2.1 Stone Age

The Stone Age denotes the period in which hominids, primarily of the genus *Homo*, produced stone tools, also referred to as lithics. The characteristics of this Age have been influenced through time, to some extent, by environmental variations including geology, geomorphology, climate, fauna and flora (Lombard, et al., 2012). In South Africa this Age is divided into three periods, name the Early (ESA), Middle (MSA) and Later Stone Age (LSA) after Goodwin and Van Riet Lowe (1929). The principle characteristics of these periods are briefly presented here.

Large hand axes and cleavers produced from coarse-grained material dominate the ESA assemblage, dated to between ~2 Ma - 250 000 years ago (Ka) (Esterhuysen & Smith, 2007). The ESA is generally associated with the first *Homo* species (e.g. *H. habilis*), and possibly with some *Australopithecus* species.

The MSA dates from approximately 300 Ka to 20 Ka. Early MSA industries are characterised by high proportions of minimally modified blades, represented by the Levallois technique (Clark, 1982). Other diagnostic stone tool identifiers including convergent flake scars, multi-faceted platforms, retouched points and backing (Hodgskiss & du Piesanie, 2015). In general, the MSA can be broadly defined by the occurrence of blades and points produced from good quality raw material. (Deacon & Deacon, 1999). The MSA is generally associated with archaic *H. sapiens* (e.g. *H. rhodesiensis*) through to early anatomically modern *H. sapiens sapiens*.

The LSA dates from approximately 40 Ka to the historical period and is wholly associated with anatomically modern *H. sapiens sapiens*. Lithics associated with the LSA are specialised: specific tools being created for specific purposes, and the inclusion of bone tools into the assemblages (Mitchell, 2002). Briefly, these may include microlithic (bladelet) production technology, increased practice of ritual, long-distance movement and the widening of social relations, complex societies and rock art (Deacon & Deacon, 1999).

A review of previous studies and available literature did not provide any evidence for Stone Age accumulations in the local or site-specific study area. The lack of available information does not preclude the existence of Stone Age lithics from occurring, rather suggests that the study area has not been investigated in detail.

8.2.2 Farming community⁴

The Farming Community Period (FCP, also known as the Iron Age) correlates with the arrival in and migration through the landscape of various Bantu-speaking groups. Although the FCP is generally subdivided into an Early Farming Community (EFC) period (200 CE to

⁴ Term replacing the *Iron Age* as a more accurate description for groups who practiced agriculture and animal husbandry, extensive manufacture and use of ceramics, and metalworking



1000 CE) and a Late Farming Community (LFC) period (1000 CE to 1840 CE), the only known FCP expressions in the Project area are associated with LFC groups.

Within the regional study area, sites associated with the EFC period have not been identified, and this period is not considered further in this report. The earliest identified formal settlement in the local study area dates to the LFC period from around 1500 CE. The first LFC groups to enter the area were early BaFokeng. Identifiable tangible markers for the presence of these early settlers are material cultural remains⁵ and stonewalled settlements. The BaFokeng established Type N stonewalled settlements. Type N refers to the type site *Ntsuanatsatsi* near Vrede in the Free State. Other stonewall types include Type V, associated with later LFC groups (named after Vegkop near Heilbron) (Maggs, 2011; Maggs, 1976). Characteristically both settlement units consist of a number of primary enclosures grouped in a ring. The primary difference is that the settlement unit in Type N is surrounded and defined by a wall which encloses all the structural components (Maggs, 1976). Within the regional study area, a considerable number of LFC stonewalled sites dating from the 18th and 19th centuries occur along and on top of the rocky ridges of the eastern part of the Klipriviersberg (Mason, 1986), some 40 km west of the site-specific study area.

8.3 Historical context⁶

There is sufficient evidence to prove the continuity of the LFC period into the historical period, rendering the division largely artificial. This section considers the historical context of the various study areas from the beginning of the 18th century as pre-European history was predominantly presented in Section 8.2.2 above.

The conflict between several large indigenous polities, especially along the eastern coast of South Africa, culminated with the creation of the Zulu nation under Shaka in the early part of the 18th century. During his reign, he expanded the kingdom and developed numerous attack tactics that helped him win many battles (Golan, 1990). A largely militant nation, the lieutenant Mzilikazi rebelled against Shaka and fled northwards from the coast with his warriors. As he moved inland, he raided settlements, absorbing survivors into his group, growing his army as he moved. This path of destruction “emptied” the lands of many inhabitants, and caused the remaining people to suffer under harsh conditions. The period, known as the *Mfecane*, has been attributed to a time of great upheaval and violence (Garstang, Coleman, & Therrell, 2014).

⁵ Material culture remains are discussed in terms of ceramic distribution in the region. To this end the works of Huffman (1980; 2007) are used as the primary text to identify ceramics that in turn provide relative temporal markers for occupation in the region. Although ceramics are used as broad cultural and/or linguistic markers as well, it is acknowledged that ceramics do not necessarily equate to narrowly defined ethnic groups.

⁶ The historical period is commonly regarded as successive to the LFC, dated from approximately the mid-19th century with the permanent settlement of Europeans within the interior and contact with the indigenous peoples. This distinction however, is now largely considered artificial in many ways, and the current definition of the historical period includes the past 500 years (Swanepoel, Esterhuysen, & Bonner, 2008).



The period of the *Mfecane* coincided with the migration of the *Voortrekkers* from the Cape Colony during the 1830's. The Great Trek was initiated in response to several grievances with the British, such as the adoption of the English language, the abolishment of slavery and several skirmishes. These circumstances forced these Dutch farmers or Boers to take a collective decision to move into the interior of the country to form an independent state (The Voortrekkers, 2014). During this period the mass emigration of indigenous populations from the interior left large tracts of land abandoned. While the *Voortrekkers* kept records of contact with the local inhabitants, including information in terms of trade and conflict, they settled in the land they perceived to be void of indigenous populations and that have remained uninhabited.

The *Voortrekker* settlements in the region were primarily agrarian, characterised by an economy based on cultivation and stock farming. The settlements were typically *werfs* (homesteads) accommodating large family and labour units located on large farms on which crops were cultivated and livestock raised. Small towns developed to serve the administrative needs of the Voortrekker communities, usually established on parts of the larger farms. Limited infrastructure was constructed, such as wagon roads, river crossings. The earliest settlements also produced a unique, vernacular architecture including simple houses (colloquially known as *hartbeeshuisies*). These were usually constructed of reeds or poles, either thatched in total, or walls plastered with mud and cow dung. In areas where little suitable wood occurred, the walls were constructed of stone or sunbaked clay bricks and plastered with mud and cow dung. As these settlements became more permanent, another typical vernacular architecture developed, typified by square houses surrounded by a porch covered by a veranda (*stoep*).

It was not until the 1880's, with the discovery of gold on the Witwatersrand, that the primary economy of the region changed. Gold was discovered by George Harrison in 1886. This discovery sparked a "gold rush", inciting many prospectors to stake claim to the land. Initial mining in the region focussed on gold-bearing conglomerate from surface outcrops. The resource could easily be extracted from these outcrops as they had been weathered by the elements (Brodie, 2008). As mining progressed through the years, the gold reef occurred at deeper subsurface levels and it became more difficult to reach the gold. To overcome this, new mining methods had to be adopted that paved the way for large-scale mining within the region (Brodie, 2008).

Within the local study area, gold was first discovered in 1899, some 14 years after the initial discovery. Gold was discovered in the east on the farm Geduld 134, adjacent to the site-specific study area (*then known as Palmietfontein 61*) (Figure 8-2). This discovery occurred immediately prior to the outbreak of the South African War of 1899 – 1902 (*also known as the Second Anglo-Boer War*).

The South African War commenced on 11 October 1899. A number of battles and skirmishes occurred during the war, but the most notable in proximity to the site-specific study area was the Battle of Witpoort on 16 July 1900.



The battle took place within the Bronberg range of hills (Figure 8-2), some 38 km south-east of Pretoria, following failed negotiations between the British and Boers in June 1900. Topographically, Witpoort consisted of three small hills off the old waggon road to KwaZulu-Natal (*now the R50*). Three companies of the Royal Irish Fusiliers and 60 troopers of the New Zealand Mounted Rifles were placed on the three hills straddling the Witpoort Pass. Probing of the eastern British outposts by the Boers caused them to lose their element of surprise, and General Hutton has reinforced his positions and established a line of semi-circular *sangars*⁷ (Figure 8-4). General Ben Viljoen positioned his burghers during the night of the 15th, launching a three-pronged attack on the British at daybreak on the 16th of July (Panagos, 1999).

Storming the British entrenchments, the Boers took over the rock-strewn terrain returning fire at the British positioned in their sangars (Figure 8-3). The sangars however, are considered to have provided a false sense of security as they could not command the dead ground at the foot of the hill, allowing the Boers to charge directly up to their cover. The Boers gained ground and captured a captain and 20 New Zealanders, but were subsequently overrun by three companies who held two hillocks. The Boers lost two and sustained seven injuries during the attack, markedly less than the seven fatalities and 30 wounded recorded by the British (Panagos, 1999).

This battlefield represents one of the few associated with the South African War which presents well preserved traces of sangars, with at least 51 recorded (Panagos, 1999).

During the period of the war, several migrant African mine workers experienced hardships. Those that remained in the mining compounds suffered outbreaks of scurvy due to the lack of fresh produce, while those that fled were robbed of their wages and possessions by Boer commandos (Warwick, 1983). During 1901, 'native' concentration camps were established by the British to deal with African refugees in the aftermath of the war. The South African War ceased in 1902, on 31 May.

During the South African War, mining operations functioned at limited capacity. The Main Reef was therefore only identified after the war towards the east. This discovery ultimately culminated in the establishment of the Grootvlei Proprietary Mine Limited and town of Springs in 1904.

⁷ A name brought in by the British Army from India to denote man-made stone breastwork utilised as an alternative to trenches (Panagos, 1999)

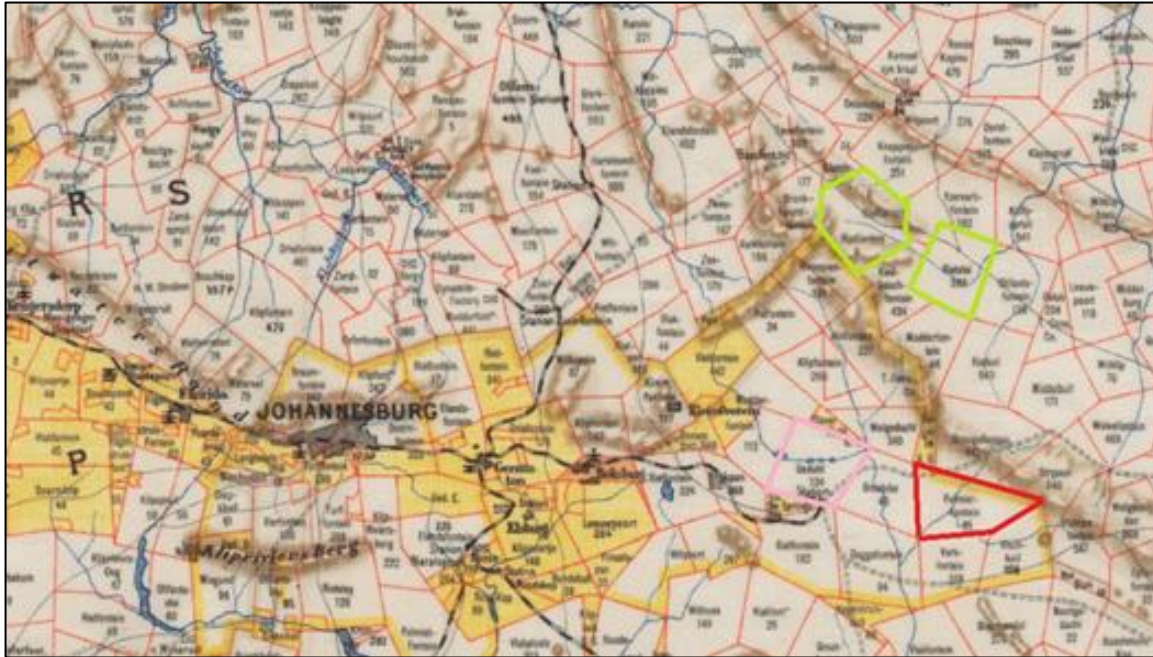


Figure 8-2: 1899 Jeppes Map of the Transvaal. Site-specific project area indicated in red. Farms associated with the Battle of Witpoort indicated in green. Geduld 134 Farm on which gold was discovered in 1899 in pink

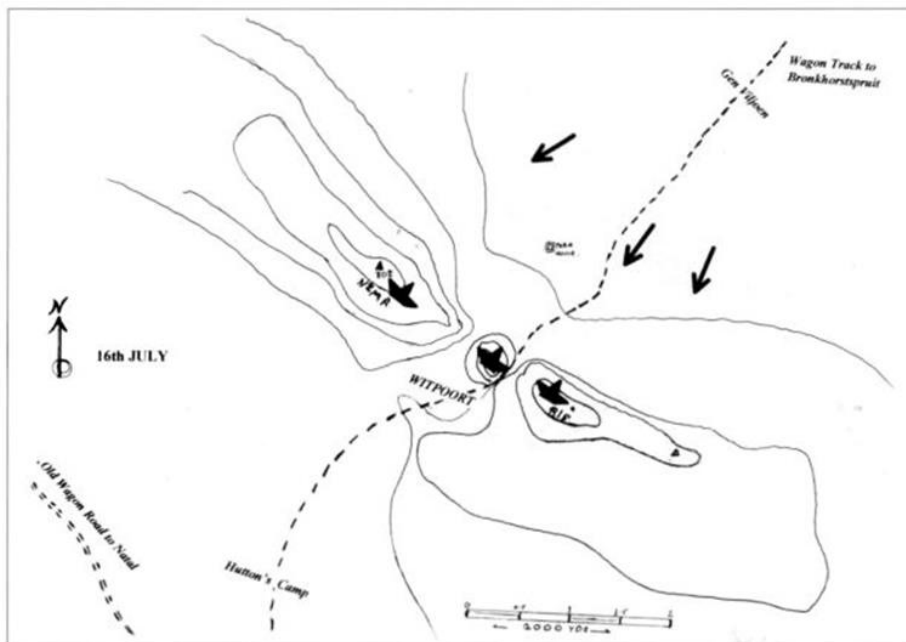


Figure 8-3: Battle of Witpoort, 16 July 1900 (© samilitaryhistory.org)

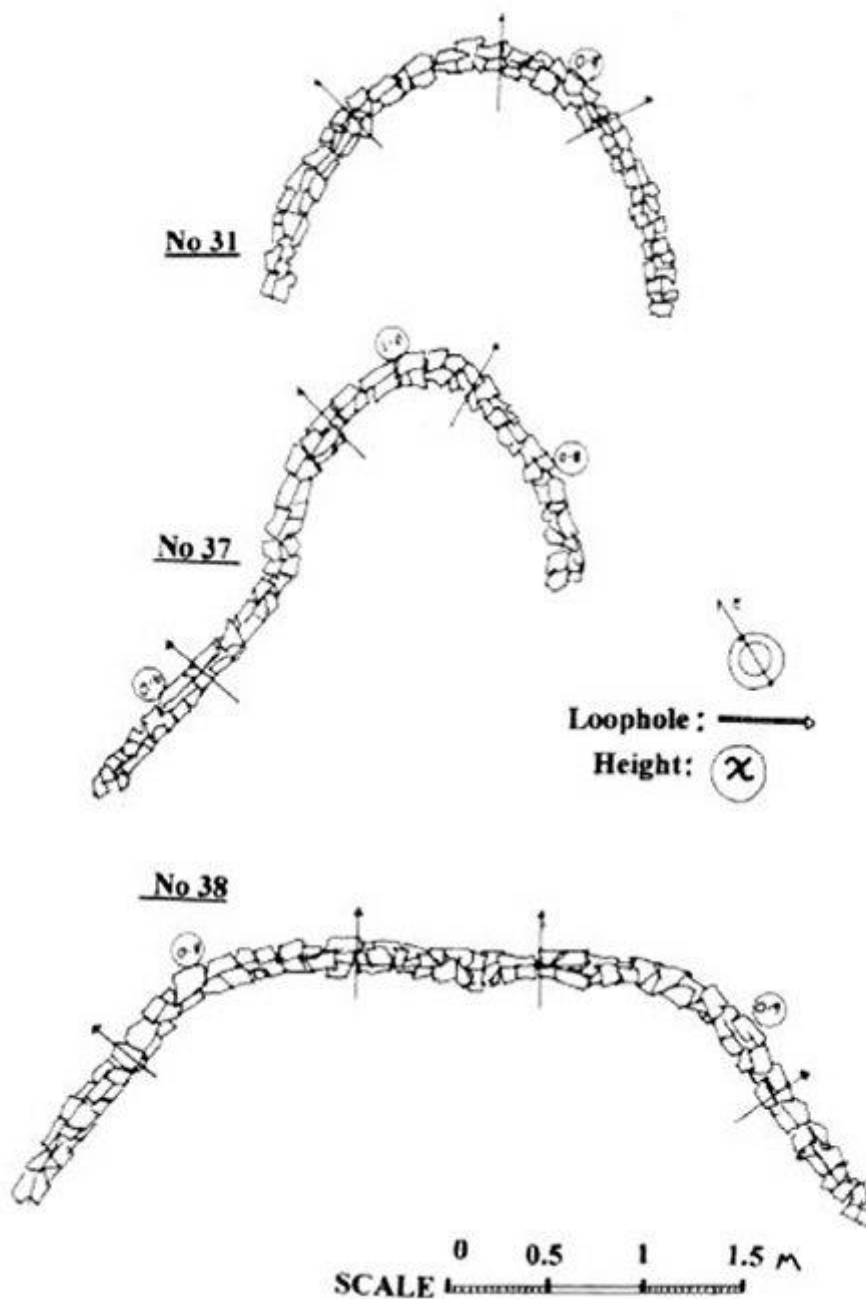


Figure 8-4: Examples of sangars from the Battle of Witpoort (Panagos, 1999)

8.3.1 Historical layering

A survey of historical aerial photographs of the site-specific study area was undertaken. This process assisted in the identification of built structures and other potential features generally protected in terms of the NHRA. Aerial imagery dating to 1952 and 1958 were reviewed (Figure 8-5 and Figure 8-6).



The review of the aerial imagery demonstrates that the site-specific study area was predominantly associated with an agrarian landscape, with several associated built structures established. In addition to the agricultural activities, small areas of industrialisation, primarily mining, and urban developments were also noted. The dominant land use has remained relatively unchanged since the 1950's. This being stated, increased urbanisation surrounding the site-specific study area did occur.

Based on the results of the historical layering, it is evident that built structures protected in terms of Section 34 of the NHRA are located within the site-specific study area. Furthermore, a burial ground of Malay, coloured and native soldiers who perished during World War II, as well as a public memorial are situated on the periphery of the site-specific study area.



Figure 8-5: Aerial imagery dated 1952



Figure 8-6: Aerial imagery dated 1958

9 Cultural significance of identified landscape

A number of sensitive, protected heritage resources were identified in the baseline that occurs within the Project study areas. These include:

- Fossil heritage that may be present in the *Vryheid Formation* in the site-specific study area;
- One MSA resource in the regional study area;
- At least one LFC settlement site in the local study area, and four in the regional study area;
- Various historical structures in the local and site-specific study areas; and
- 50 burial grounds and graves in the regional study area, 70 burial grounds and graves and one public monument and memorial within the local study area.

Based on the results of the baseline research, the cultural heritage landscape has a designated CS value ranging from negligible to very-high. This assessment will be refined during the subsequent impact assessment phase.


Table 9-1: Identified CS of heritage resources in cultural heritage landscape

Resource ID	Description	Aesthetic	Historic	Scientific	Social	INTEGRITY	VALUE	Designation
Palaeontological Resources	Vryheid Formation	-	-	5	-	4	20	Very High
Archaeological - MSA	Middle Stone Age surface accumulations	5	-	5	-	1	5	Negligible
Archaeological - LFC	LFC Stonewalled Settlements	5	5	5	3	3	14	Medium High
Historical Built Structures	Historical Built Environment protected under Section 34 of the NHRA	3	3	4	3	4	13	Medium High
Burial Grounds and Graves	Burial Grounds and Graves protected under Section 36 of the NHRA	-	-	-	5	4	20	Very High
Public Monuments and Memorials	Memorial for World War 2 Soldiers	5	5	-	5	4	20	Very High

10 Possible heritage risks

Different categories of heritage resources are afforded formal or general protection through the NHRA and are thus inherently sensitive to changes that may result from development. Formal and general protected heritage resources may not be altered, removed or destroyed without permits issued by the relevant heritage resources authorities. The levels of acceptable change to heritage resources are furthermore compounded by their cultural significance.

If development activities are expected to result in unacceptable or unmanageable changes to resources' cultural significance, heritage authorities may impose various restrictions on the proposed Project or development activities. The primary heritage risks to the Project include:

- A negative Record of Decision (RoD) for the EA application due to the possible presence of very significant or sensitive heritage resources;
- Delays in the implementation of the Project due to possible heritage permitting required; or
- Possible restrictions imposed on the Project as part of required heritage impact management or mitigation measures.

Furthermore, failure to consider impacts to heritage resources or apply for the necessary permits in terms of the NHRA and Regulations to the Act (SAHRA Regulations) may result in fines, penalties, seizure of equipment, compulsory repair or cease work orders, or imprisonment

11 Predicted heritage impacts

The identified heritage resources may, to lesser or greater extent, be directly, indirectly or cumulatively impacted on by development activities.

Potential heritage impacts presented in Table 11-1 consider direct and indirect impacts on heritage resources by the related activities during the various phases of the Project. The potential cumulative impacts are presented in Table 11-2.

Possible risks *to heritage resources* are considered in Table 11-3.

Table 11-1: Summary of potential heritage impacts

Project Phase	Project Activity	Risk	Potential Impact	Proposed Mitigation	Potential for Residual Risk
Construction	Site clearing	Change to the <i>status quo</i> and cultural significance of heritage resources	Destruction or alteration of NHRA Section 34 resources, i.e. structures and built environment resources older than 60 years	Conduct an HIA to: Identify heritage resources in relation to the Project; Determine the actual CS of heritage resources; Assess impacts on heritage resources based on development activities and CS; and Develop mitigation and management measures the CS	Possible public resistance Additional requirements from the HRA's Negative RoD from HRAs for the development
			Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological and/or palaeontological resources		
	Relocation of infrastructure		Damage or destruction of, and loss of access to, NRHA Section 36 resources, i.e. burial grounds and graves.		
			Blasting		

Project Phase	Project Activity	Risk	Potential Impact	Proposed Mitigation	Potential for Residual Risk
			Compromising the physical integrity of Section 37 resources, i.e. public monuments and memorials		
Operational	Stripping topsoil and soft overburden	Change to the <i>status quo</i> of heritage resources	Destruction or alteration of NHRA Section 34 resources	Conduct an HIA to: Identify heritage resources in relation to the Project; Determine the actual CS of heritage resources; Assess impacts on heritage resources based on development activities and CS; and Develop mitigation and management measures the CS	Possible public resistance Additional requirements from the HRA's Negative RoD from HRAs for the development
			Destruction of or disturbance to NHRA Section 35 resources		
			Damage or destruction of, and loss of access to, NRHA Section 36 resources.		
	Blasting	Vibrations from blasting affecting the <i>status quo</i> of physical heritage sites within proximity to the Project	Compromising the physical integrity of NHRA Section 34 resources		
			Compromising the physical integrity of NHRA Section 36 resources		
			Compromising the physical integrity of		

Project Phase	Project Activity	Risk	Potential Impact	Proposed Mitigation	Potential for Residual Risk
			Section 37 resources		
Decommissioning	Demolition and removal of infrastructure	Dismantling of infrastructure protected under NHRA Section 34	Destruction or alteration of NHRA Section 34 resources	<p>Conduct an HIA to: Identify heritage resources in relation to the Project;</p> <p>Determine the actual CS of heritage resources;</p> <p>Assess impacts on heritage resources based on development activities and CS; and</p> <p>Develop mitigation and management measures the CS</p>	<p>Possible public resistance</p> <p>Additional requirements from the HRA's</p> <p>Negative RoD from HRAs for the development</p>

Table 11-2: Identified potential cumulative impacts

Cumulative impact	Description	Extent
Additive	The Project will have an additive effect on the cultural landscape as it will contribute to the change from an historical, agrarian landscape with significant archaeological components into an industrialised mining landscape associated with several operations to the west of the site-specific study area.	Local study area
Synergistic	The synergistic effects of the Project and other operations in proximity, and repetitive impacts on archaeological resources may manifest as regular blasting activities that	Site-specific study area

Cumulative impact	Description	Extent
Time crowding	threaten the physical integrity historic built environment.	

Table 11-3: Possible risks to heritage resources

Project Phase	Aspect Potentially Impacted	Potential Project Risk (Unplanned Occurrences)
Construction / Operational	Heritage – palaeontology and archaeology	Accidental exposure of subsurface heritage resources
	Heritage – Built environment	Accidental damage from fly rock and vibrations to built structures older than 60 years within the 500 m blasting buffer
	Heritage – Burial grounds and graves	Accidental exposure of unidentified graves and human remains

Table 11-4: Scoping assessment of potential impacts to heritage resources

Phase	Specific activity	Risk	Probability of impacts (0 - zero / negligible, 1 - low, 2 likely, 3 - certain)										
			National / Provincial heritage sites (S. 27)	Protected areas (S. 28)	Provisional protection (S. 28)	Heritage areas (S. 31)	Heritage objects (S. 32)	Structures (S. 34)	Archaeology (S. 35)	Palaeontology (S. 35)	Meteorites (S. 35)	Burial grounds and graves (S. 36)	Public monuments and memorials (S. 37)
Construction	Site clearing	Change to the <i>status quo</i> of heritage resources	0	0	0	0	0	3	1	1	0	2	0
Construction	Relocation of infrastructure	Change to the <i>status quo</i> of heritage resources	0	0	0	0	0	2	1	0	0	1	0
Construction	Blasting	Vibrations from blasting affecting the status quo of physical heritage sites within proximity to the Project	0	0	0	0	0	3	1	3	0	2	1
Operational	Stripping topsoil and soft overburden	Change to the status quo of heritage resources	0	0	0	0	0	3	1	2	0	2	0
Operational	Blasting	Vibrations from blasting affecting the status quo of physical heritage sites within proximity to the Project	0	0	0	0	0	1	1	3	0	2	1
Decommissioning	Demolition and removal of infrastructure	Dismantling of infrastructure protected under NHRA Section 34	0	0	0	0	0	1	0	0	0	0	0

RfE	RfE	RfE	RfE	RfE	Assess in EIA	Assess in EIA	Assess in EIA	RfE	Assess in EIA	Assess in EIA
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12 Scoping assessment

A preliminary assessment of the potential impacts to heritage resources as described in Table 11-1 is presented in Table 11-4. Based on the defined cultural landscape presented in Section 8 above and the known heritage resources within or in proximity to the site-specific study area, further assessment of the potential impacts protected under Sections 34, 35, 36 and 37 of the NHRA is required.

The detailed proposed ToR for the EIA and HIA are presented and motivated in Section 13 below.

13 Proposed terms of reference for the EIA and HIA

The EA process is scheduled to continue with an impact assessment phase during which a full EIA will be undertaken and submitted for adjudication by the competent authorities. As part of this process, and in compliance with Section 38(8) of the NHRA, an HIA will be completed during this phase.

It is proposed that the HIA considers the following components:

- Section 34 – Built Structures;
- Section 35 – Archaeology;
- Section 36 – Burial grounds and graves; and
- Section 37 – Public monuments and memorials.

The HIA will include assessments of the identified heritage resources to determine CS and Field Ratings, the intensity of predicted heritage impacts on heritage resources by projected related activities and the development of reasonable and feasible management and mitigation measures.

Based on our understanding of the Project and through experience on similar projects, we are of the opinion that inclusion of a detailed palaeontological assessment will not add value at this stage. While it is acknowledged that the site-specific study area is underlain by lithostratigraphy that is palaeontologically sensitive, fossils that may be of scientific value commonly occur in the shale lenses between coal seams at sub-surface levels (Bamford, 2016). Furthermore, Bamford (2016) notes that neither additional desktop nor field assessments would reveal any additional information until excavation of the coal seams themselves take place.

Considering the aforementioned reasoning, a Request for Exemption (RfE) from further palaeontological assessment will be made on the basis that a Fossil Chance Find Procedure is included in the final EMP as a condition of authorisation.

The following Fossil Chance Finds Procedure compiled by Bamford (2016) is recommended:

**Table 13-1: Recommended fossil finds procedure**

Phase	Procedure
Construction	<p>Surface excavations should be monitored by the geologist and any fossil material disturbed should be put aside and the palaeontologist called to inspect the material within a reasonable timeframe in order to minimise delays to the project. The geologist should also receive from the palaeontologist some photographs and descriptions of what palaeontological material to look out for.</p> <p>The schedule of monitoring should be set up between the mine and palaeontologist and the agreement letter submitted to SAHRA.</p> <p>If it is not feasible for the palaeontologist to visit the mine timeously then digital photographs of good quality and resolution should be sent to the palaeontologist to assess and make recommendations.</p> <p>From visits or photographs supplied the palaeontologist must make the following recommendations:</p> <ul style="list-style-type: none"> • Material is of no value so development can proceed, or • Fossil material is of some interest so a representative sample should be carefully collected and put aside for further study and incorporated into a recognised repository (Ditsong Museum, Council for Geosciences, Pretoria; Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg) and a permit obtained from SAHRA for the removal of the fossils, then development may proceed, or • Fossils are scientifically important and the palaeontologist must obtain a SAHRA permit to excavate the fossils and put them into a recognised repository, then development may proceed.
Operational	<p>Once the mine is operational and the coals and shales are exposed the palaeontologist should visit the mine to see what fossils are present. Then the above procedure, a-c, can be followed.</p> <ul style="list-style-type: none"> • At each stage a report should be sent to SAHRA by the palaeontologist detailing the fossil finds and where they are being kept.
Decommissioning	<p>A palaeontologist should search through the dumps and exposed shales and seams, rescue any fossil material of scientific interest, store it in a recognised repository so it is available for future research, and then the land must be rehabilitated.</p>

14 Conclusion

This scoping assessment was aimed at developing a cultural heritage baseline for the site-specific study area taking into consideration the local and regional context. This baseline was utilised to preliminarily assess both the potential risks, as well as the potential impacts to heritage resources by project related activities. This high level assessment assisted in the determination and motivation for the proposed ToR for the ensuing impact assessment phase.

Based on the contents of this report, Digby Wells is of the opinion that known heritage resources within and surrounding the site-specific study area will be subjected to various activities that will alter the current *status-quo*. These potential impacts must be considered and assessed in detail as part of the HIA to provide reasonable and feasible mitigation and management measures that will aim to remove or reduce the intensity of the potential impacts.



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Heritage Scoping Report

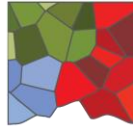
Application for a Mining Right and Environmental Authorisation of the proposed Palmietkuilen
Mining Project, Gauteng Province

CNC4065



DIGBY WELLS
ENVIRONMENTAL

Appendix A: Specialist CV



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



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
Eskom Thohoyandou 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 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



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
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
Bathako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathako 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	ESIA	Heritage Consultant	2 Years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldreources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	EIA and EMP	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	EIA and EMP	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



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
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	EIA and EMP	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	5 Months	Aureus Mining	Grave Relocation completed	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Environmental Assessment	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	EIA and EMP	Heritage Consultant	6 Months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinsglobal.com



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
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	2 Years	Exxaro	Burial Grounds and Graves consultation complete and applications to authorities submitted for permitting	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com
Nzoro 2 Hydro Power Project	Orientele 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	2 Months	Randgold Resources	Completed introductory meetings – project has been placed on hold	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	EIA and EMP	Heritage Consultant	2 Months	AECOM	Completed HIA and submitted to the authorities	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	EIA and EMP	Heritage Consultant	3 Months	ERGO	Completed HIA and submitted to the authorities	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	EIA and EMP	Heritage Consultant	6 Months	BHP Billiton	HIA finalised and submitted to the authorities	BHP Billiton



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
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	EIA and EMP	Heritage Consultant	6 Months	BHP Billiton	HIA finalised and submitted to authorities	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	BA	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO Greg Ovens greg.ovens@drdgold.com
Kibali ESIA Update Project	Orientele Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	ESIA	Heritage Consultant	1 Month	Randgold Resources	Completed heritage assessment and input into the ESIA	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	1 Month	Gold One International	Gap analysis complete and proposed way forward submitted	Gold One International
Yzermite PIA	Wakkerstroom, Mpumalanga, South Africa	2014 2014	Palaeontological Assessment for the Yzermite Project	PIA	Project Management	1 Month	EcoPartners	Completed report and submitted to authorities	EcoPartners San Oosthuizen san@ecopartners.co.za
Sasol Mooikraal Basic Assessment	Sasolburg, Free State, South Africa	2014 2014	Heritage Basic Assessment for the proposed Mooikraal Pipeline	HBA	Heritage Consultant	4 Months	Sasol Mining	Completed Heritage Basic Assessment and submitted to the authorities	
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2015	EIA and EMP for the Aquarius Everest North Mining Project	EIA and EMP	Project Manager	1 Year	Aquarius Resources	EIA and EMP amended and submitted to authorities. Authorisation received.	Aquarius Resources Robyn Mellett Robyn.Mellett@aquariussa.co.za
Oakleaf ESIA Project	Bronkhorstspuit, Gauteng, South Africa	2014 2015	Heritage impact Assessment for the Oakleaf Project	EIA and EMP	Heritage Consultant	4 Months	Oakleaf Investment Holdings	HIA report finalised and submitted to the authorities	



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
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014 2014	Heritage Impact Assessment on 2 structures along Rea Vaya Routing	HIA	Project Manager	1 year	Iliso Consulting	HIA report finalised and submitted to the authorities	Iliso Consulting
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014 2015	Review of Heritage Impact Assessment for the NTEM ESIA	EIA and EMP	Specialist Reviewer	1 Month	International Mining and Infrastructure Corporation plc	Specialist reports reviewed and comments provided	
Imvula Project	Kriel, Mpumalanga, South Africa	2014 2015	Heritage Scoping Report for Imvula EIA	EIA and EMP	Heritage Consultant	1 Year 4 Months	Ixia Coal	Project completed and submitted	
Sibanye WRTRP	Gauteng, South Africa	2014 2016	Heritage Impact Assessment for the Sibanye WRTRP	EIA and EMP	Heritage Consultant	On-going	Sibanye	Project is on-going	
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014 2015	Heritage Impact Assessment for the Vanadium Project	EIA and EMP	Heritage Consultant	1 Year	VM Investment Company	HIA report finalised and submitted to the authorities	
NLGM Constructed Wetlands Project	Liberia	2015 2015	Heritage Assessment for the proposed constructed wetlands	HIA	Heritage Consultant	1 Month	Aureus Mining	HIA report finalised and submitted	
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015 2015	Section 34 Destruction Permit Applications for the SEV and Cason Shafts	HIA and S.34 Applications	Project Manager	4 Months	Ergo Mining	Application submitted and permits received	Ergo Mining Greg Ovens greg.ovens@drdgold.com
JMEP II EIA	Botswana	2015 2015	Heritage Impact Assessment for the JMEP II Wellfields	HIA	Heritage Consultant	2 Months	Jindal	HIA completed and submitted to authorities	
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Destruction Permit Application	HIA and S. 34 Applications	Project Manager	On-going	Bigen Africa Services (Pty) Ltd	Project is on-going	Bigen Africa Services (Pty) Ltd Kamantha Veerasamy Kamantha.Veerasamy@bigenafrica.com
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Permit Application	HIA and S. 34 Applications	Project Manager	On-going	Bigen Africa Services (Pty) Ltd	Project is on-going	Bigen Africa Services (Pty) Ltd Taka Sande Taka.Sande@bigenafrica.com

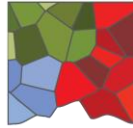


Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	EIA and EMP	Heritage Consultant	On-going	Namane Resources (Pty) Ltd	Project is on-going	
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	EIA and EMP	Heritage Consultant	On-going	Namane Resources (Pty) Ltd	Project is on-going	



DIGBY WELLS
ENVIRONMENTAL





DIGBY WELLS

ENVIRONMENTAL

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
2009/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
2005/2010-2011	Digby Wells Environmental	Archaeologist
2010/2005-2005/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007		Freelance archaeologist

	Rock Art Mapping Project	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 Project Experience

5.1 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.

5.2 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.

5.3 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.

5.4 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.

5.5 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.

6 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)	13839
Member	Society for Africanist Archaeologists (SAfA)	N/A

7 Publications

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.

Heritage Scoping Report

Application for a Mining Right and Environmental Authorisation of the proposed Palmietkuilen Mining Project, Gauteng Province

CNC4065

















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Appendix B: Plans

Palmietkuilen Colliery EIA

Local Setting

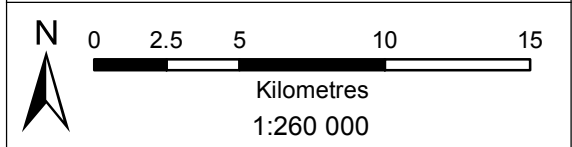
Legend

-  Project Area
-  Major Town
-  Secondary Town
-  Other Town
-  Settlement
-  Main Road
-  Arterial / National Route
-  Railway Line
-  Perennial Stream
-  Dam
-  Provincial Boundary (2016)
-  District Municipal Boundary (2016)
-  Local Municipal Boundary (2016)
-  Affected Local Municipality



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity





















Projection: Transverse Mercator Ref #: meg.CNC4065.201606.092
 Datum: WGS 1984 Revision Number: 3
 Central Meridian: 29°E Date: 13/07/2016



Palmietkuilen Colliery EIA

Site Specific Setting

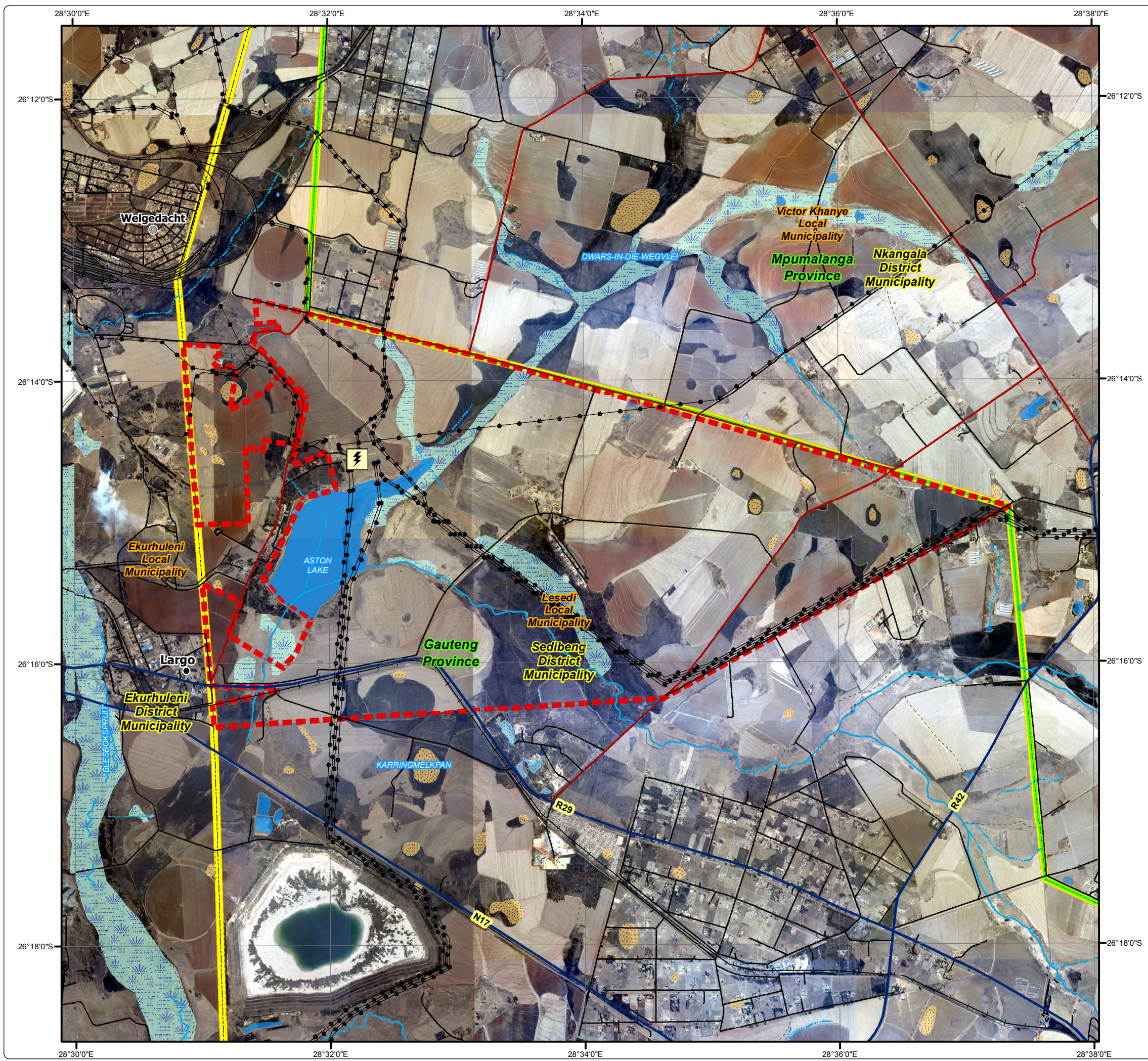
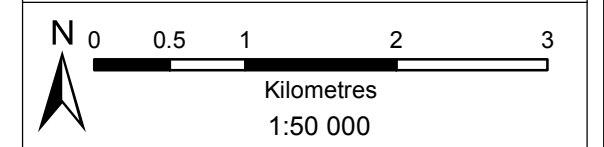
Legend

-  Project Area
-  Other Town
-  Settlement
-  Sub-Station
-  Power Line
-  Arterial / National Route
-  Main Road
-  Minor Road
-  Track
-  Railway Line
-  Non-Perennial Stream
-  Perennial Stream
-  Dam Wall
-  Dam / Lake
-  Wetland
-  Perennial Pan
-  Non-Perennial Pan / Stream
-  Provincial Boundary (2016)
-  District Municipal Boundary (2016)
-  Local Municipal Boundary (2016)



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

















Projection: Transverse Mercator Datum: WGS 1984 Central Meridian: 29°E Ref #: meg.CNC4065.201607.047 Revision Number: 1 Date: 13/07/2016









Palmietkuilen Colliery EIA

Regional Geology

Legend

-  Project Area
-  Other Town
-  Settlement
-  Sub-Station
-  Power Line
-  Arterial / National Route
-  Main Road
-  Minor Road
-  Track
-  Railway Line
-  Non-Perennial Stream
-  Perennial Stream
-  Dam / Lake
-  Wetland
-  Perennial Pan
-  Non-Perennial Pan / Stream

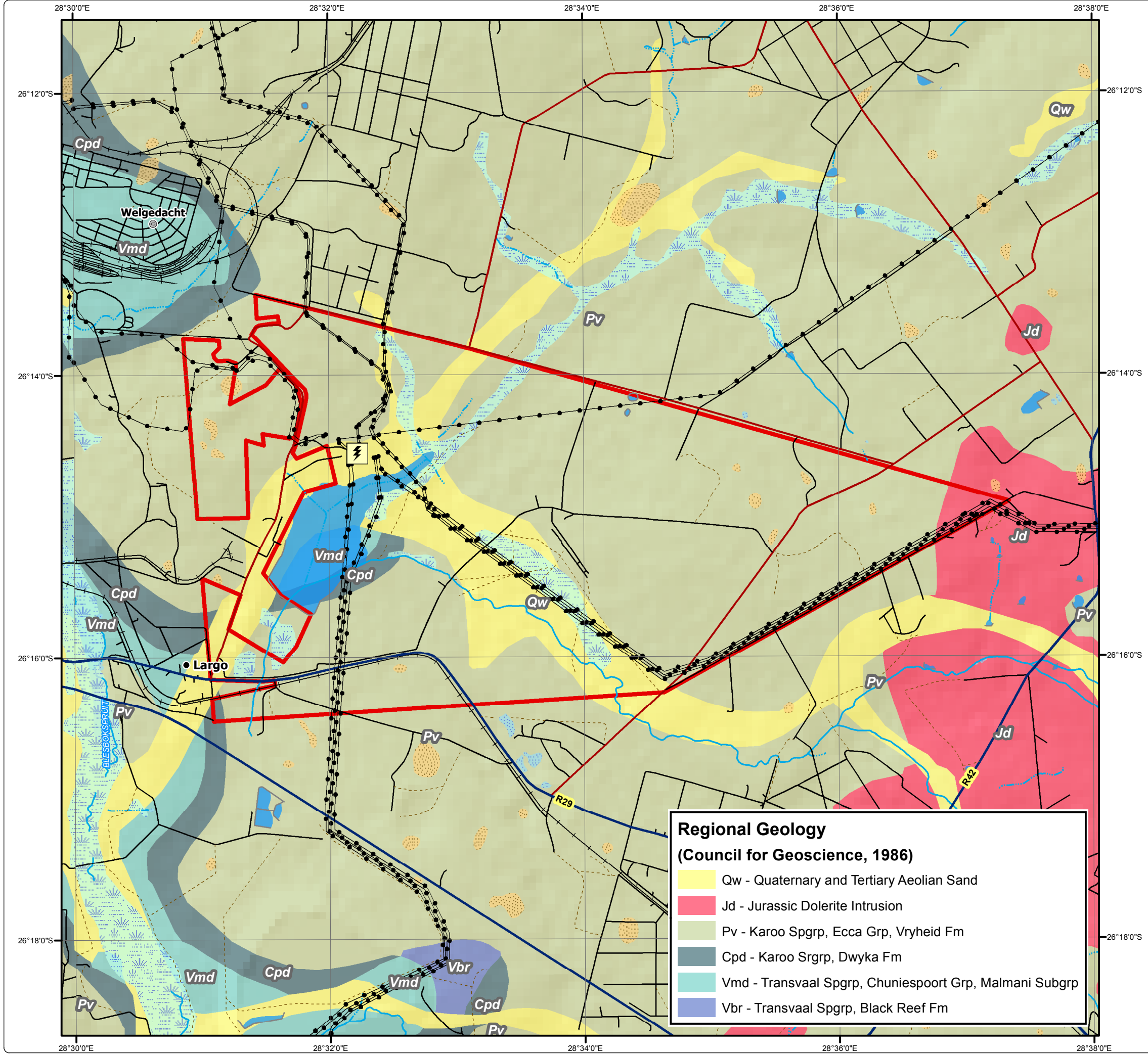
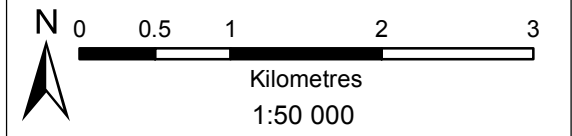
Regional Geology
(Council for Geoscience, 1986)

-  Qw - Quaternary and Tertiary Aeolian Sand
-  Jd - Jurassic Dolerite Intrusion
-  Pv - Karoo Spgrp, Ecca Grp, Vryheid Fm
-  Cpd - Karoo Srgrp, Dwyka Fm
-  Vmd - Transvaal Spgrp, Chuniespoort Grp, Malmani Subgrp
-  Vbr - Transvaal Spgrp, Black Reef Fm



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Projection: Transverse Mercator Ref #: meg.CNC4065.201607.048
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 29°E Date: 13/07/2016



Palmietkuilen Colliery EIA

Identified Heritage Resources

Legend

- Project Area
- Other Town
- Settlement
- Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

Identified Heritage Resource

- Archaeological - LFC
- Burial Grounds & Graves
- Historical Built Environment
- Public Monument and Memorial
- Historical Built Environment



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