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Environmental Impact Assessment for the Proposed Hendrina Underground Coal Mine, Mpumalanga

Heritage Scoping Report

Project Number:

XST3791

Prepared for:

Umcebo Mining (Pty) Ltd

April 2016

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48
Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: AJ Reynolds (Chairman) (British)*, GE Trusler (C.E.O), B Beringer, LF Koeslag, J Leaver*,
NA Mehlomakulu, DJ Otto
*Non-Executive



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Report Type:	Heritage Scoping Report
Project Name:	Environmental Impact Assessment for the Proposed Hendrina Underground Coal Mine, Mpumalanga
Project Code:	XST3791

Name	Responsibility	Signature	Date
Justin du Piesanie Heritage Management Consultant: Archaeologist ASAPA Member: 270	Research Report compilation Recommendations		April 2016
Johan Nel HRM Unit Manager ASAPA Member: 095	Technical review		March 2016

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EXECUTIVE SUMMARY

Umcebo Mining (Pty) Ltd (Umcebo) is proposing the development and operation of a new underground coal mine with associated infrastructure at a site situated approximately 10 - 22 kilometres (km) southeast of Hendrina in Mpumalanga Province, South Africa (the Project). Umcebo is a subsidiary of Glencore Operations South Africa (Pty) Ltd (Glencore) and holder of two Prospecting Rights (PR) in the Ermelo Coal Field, namely:

- MP 1265 PR (referred to as Mooivley East and Mooivley West); and
- MP 1266 PR (referred to as Hendrina South).

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. The EIA process will also serve to support the following applications:

- Environmental Authorisation (EA) for listed activities as contained in Listing Notices (GN R 983, 984 and 985); and
- Waste Management Licence (WML) in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA).

Furthermore, an Integrated Water Use Licence Application (IWULA) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will also be made for water uses associated with the Project.

Project Overview

Operational activities, i.e. mining, are proposed to be undertaken through an underground bord and pillar mining method. The Mooivley Reserves (Mooivley West and East) will require the development of two incline shafts to gain access to the two underground areas. The Hendrina South Reserve will require the development of one incline shaft to gain access to the underground area. Mooivley West and Hendrina South will be mined concurrently, with mining operations only commencing at Mooivley East after decommissioning of Hendrina South.

Currently, the Project is scheduled to commence with development in 2017, reaching full production by 2019. The estimated Life of Mine (LoM) is calculated at 36 years for all mining areas. The operation is envisaged to produce an approximate 78 million tonnes (Mt) of which 57 Mt will be saleable product. The current suggestion is that the Run-of-Mine (RoM) be transported via conveyor to the Crushing and Screening Plant for beneficiation. The grade of coal from the Hendrina Reserve has been identified as of poor quality, and not suitable for



export, therefore the processed coal will be transported via road to an inland Eskom power station.

Results

This scoping assessment was aimed at developing a cultural heritage baseline, identify potential risks to the Project, and identify any potential impacts to heritage resources through project related activities with the development, operation and decommissioning of the Project. It has been demonstrated that the Project is situated in an area that can be primarily categorised as a historic agrarian landscape with a significant palaeontological and archaeological aspects.

Identified heritage resources from the pre-disturbance survey include the following:

Site Name	Description Summary	Description Detail	Latitude	Longitude
BGG-001	Burial ground: ≤20 graves	Burial ground containing at least 17 graves. Two graves have concrete slabs with rocks as headstones. Remainder either ferricrete cairns or with rock headstones. – outside of the infrastructure footprint, however within the proposed mining right area.	-26.2566330	29.7596080
BGG-002	Burial ground: ≤10 graves	Burial ground containing at least eight graves, associated with an occupied werf. Site recorded from roadside as access was not granted by owner (Mr Jannie Davel); therefore no detailed records. – outside of the infrastructure footprint, however within the proposed mining right area.	-26.2024760	29.7477250
BGG-005	Burial ground: ≤50 graves	Burial ground containing at least 27 graves. Two graves with formal dressings and headstones associated with Lekgari and Marazwani families. Remainder stone cairns or rocks as headstones. – outside of the infrastructure footprint, however within the proposed mining right area.	-26.1911020	29.7971450
RA-001	Rock art: painting	Rock art comprising a panel with very faded images including humans and antelope. Antelope may represent eland (yellow pigment) and hartebeest or tsessebe (red pigment). Humans painted in reddish-brown pigment. Site is situated in a low shelter, fronted by wattle and eucalyptus bush. Active decay (exfoliation) evident - outside of the infrastructure footprint, however within the proposed mining right area.	-26.1909350	29.7917750
RA-002	Rock art: painting	Rock art comprising a panel with very faded images including antelope. Site is situated in a low shelter, fronted by wattle and eucalyptus. Very active decay (exfoliation) evident - outside of the infrastructure footprint, however within the proposed mining right area.	-26.1900260	29.7891380
Wf-009	Structural: complex, e.g. werf	Abandoned werf comprising a residence, cow shed and several other structures such	-26.255163	29.770847



Site Name	Description Summary	Description Detail	Latitude	Longitude
		as troughs, broken down pens and water tank structure. Residence is constructed of clay brick, cinder blocks and dressed sandstone, with a corrugated roof. Building U-shaped with additions to back - outside of the infrastructure footprint, however within the proposed mining right area.		

Potential impacts

Phase	Activity	Risk	Potential Impact
Construction	Site clearing or top soil removal	Change to the <i>status quo</i> of heritage resources	Destruction or alteration of NHRA Section 34 resources, i.e. structures and built environment resources older than 60 years
			Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological and/or palaeontological resources
			Damage or destruction of, and loss of access to, NRHA Section 36 resources, i.e. burial grounds and graves.
Operational	Blasting	Vibrations from blasting affecting the status quo of physical heritage sites within proximity to the Project	Compromising the physical integrity of heritage sites, including rock art sites and historical buildings
		Dust generation from blasting affecting the status quo of physical heritage sites within proximity to the Project	Dust fallout may adversely affect rock art panels / motifs
	Bord and pillar mining method	Shallow bord and pillar mining method may result in subsidence	Destruction or alteration of NHRA Section 34 resources, i.e. structures and built environment resources older than 60 years
			Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological and/or palaeontological resources
			Damage or destruction of, and loss of access to, NRHA Section 36 resources, i.e. burial grounds and graves.



Phase	Activity	Risk	Potential Impact
Decommissioning	Closure	Underground mining voids may result in subsidence	Destruction or alteration of NHRA Section 34 resources, i.e. structures and built environment resources older than 60 years
			Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological and/or palaeontological resources
			Damage or destruction of, and loss of access to, NHRA Section 36 resources, i.e. burial grounds and graves.
	Dismantling of surface infrastructure	Dismantling of built environment structures older than 60 years	Structures older than 60 or 100 years at the time of decommissioning will be generally protected under Section 34 of the NHRA and be subject to permitting requirements regulated by Chapter III of GN R 548.

Recommendations

Based on our understanding of the cultural landscape, potential impacts to heritage resources were identified. Briefly, these can be summarised as damage to and/or destruction of heritage resources generally protected under sections 34 – 37 of the NHRA during construction, operational and decommissioning phases.

The EA process is scheduled to continue with an impact assessment phase, during which a full EIA will be undertaken and submitted for adjudication. An HIA will be completed during the EIA phase inclusive of the following:

- An Archaeological Impact Assessment (AIA) that considers project related activities, CS of identified heritage resources, potential impacts and provides recommendations for mitigation or management.

It is further recommended that exemption from further palaeontological assessment at this stage be granted. The motivation for this request for exemption is based on conditions that a fossil monitoring programme is developed and included in the EMP as a condition of authorisation as operational activities will be completed through underground mining methods and possible surface fossil remains are not envisaged to be impacted upon.



TABLE OF CONTENTS

1	Introduction	1
2	Description of the scope of the proposed project.....	2
2.1	Project overview	2
2.2	Listed and Specified Activities	3
2.3	Mineral Resource	6
2.4	Mining Method.....	6
2.5	Mineral Processing.....	6
2.6	Infrastructure Requirements	7
3	Terms of reference.....	7
4	Expertise of the specialists.....	8
5	Policy and legislative framework	9
6	Methodology.....	12
6.1	Defining the study areas.....	12
6.2	Defining heritage impacts	12
6.3	Data collection.....	13
6.4	Pre-disturbance survey.....	14
7	Constraints and limitations	15
8	Cultural heritage baseline description	15
8.1	Local study area.....	15
8.1.1	<i>Geology and palaeontological sensitivity</i>	<i>16</i>
8.1.2	<i>Stone Age.....</i>	<i>18</i>
8.1.3	<i>Rock art.....</i>	<i>20</i>
8.1.4	<i>Farming communities</i>	<i>20</i>
8.1.5	<i>Historical period.....</i>	<i>22</i>
8.1.6	<i>Socio-economic baseline conditions.....</i>	<i>23</i>
8.2	Secondary / Site-specific study area.....	24
8.2.1	<i>Palaeontology.....</i>	<i>25</i>



8.2.2	<i>Rock Art</i>	25
8.2.3	<i>Historical period</i>	26
8.2.4	<i>Results of the pre-disturbance survey</i>	26
9	Possible heritage risks	28
9.1	Heritage resources with high significance.....	29
9.2	Impacts on heritage resources	29
10	Possible heritage impacts	29
11	Proposed terms of reference for the EIA and HIA.....	31
12	Conclusion	32
13	Bibliography	33

LIST OF FIGURES

Figure 8-1:	The location of the Main Karoo Basin (Johanson, et al., 2006).....	16
Figure 8-2:	Envisaged plate tectonic setting of the basin during the Late Triassic. Bf = Beaufort Group, with associated Adelaide Subgroup. E = Ecca Group (Johanson, et al., 2006)	17
Figure 8-3:	Palaeo-sensitivity of the secondary study area (adapted from SAHRIS, 2014) .	18
Figure 8-4:	Breakdown of known heritage resources in site-specific study area	24
Figure 8-5:	Example of fossil <i>Breytenia</i> recorded as 1722/S.35-036 and 1722/S.35-042 (du Piesanie & Nel, 2013)	25
Figure 8-6:	Example of Bushman (A - 1722/S.35-015) and pastoralist (B - 1722/S.35-019) paintings in the secondary study area	26
Figure 8-7:	Examples of identified heritage resources A- BGG-002; B – Historic built structures older than 60 years; C – RA-001	28

LIST OF TABLES

Table 2-1:	Project location details	4
Table 2-2:	Project Activities.....	4
Table 6-1:	Information sources.....	14



Table 8-1: The southern African MSA and LSA sequence (Lombard, et al., 2012).....	19
Table 8-2: Stone walled settlement types (adapted from Huffman, 2007).....	21
Table 8-3: Mining and energy generation operations within proximity to the Project.....	23
Table 8-4: Identified heritage resources	27
Table 10-1: Potential risks and heritage impacts per phase of the Project.....	29
Table 10-2: Identified potential cumulative impacts	31

LIST OF APPENDICES

Appendix A: Specialist CV

Appendix B: Plans & site list



1 Introduction

Umcebo Mining (Pty) Ltd (Umcebo) is proposing the development and operation of a new underground coal mine with associated infrastructure at a site situated approximately 10 - 22 kilometres (km) southeast of Hendrina in Mpumalanga Province, South Africa (the Project). Umcebo is a subsidiary of Glencore Operations South Africa (Pty) Ltd (Glencore) and holder of two Prospecting Rights (PR) in the Ermelo Coal Field, namely:

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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. The EIA process will also serve to support the following applications:

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Furthermore, an Integrated Water Use Licence Application (IWULA) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will also be made for water uses associated with the Project.

The purpose of the EIA process is to ensure that potential environmental and social impacts associated with construction, operation and closure of the Project are identified, assessed and appropriately managed. There are two primary phases of an EIA process, namely the Scoping Phase and the Impact Assessment Phase. Identification of potential impacts occurs during the Scoping Phase, whilst the assessment and mitigation of those impacts occurs during the Impact Assessment Phase.

This Heritage Scoping Report (HSR) presents the findings of the Scoping Phase of the EIA process. The report aims to provide a description of the overall project and activities, the cultural heritage landscape within which the Project is being proposed and the potential heritage impacts that the Project may have on this landscape.

The remainder of this HSR is structured as follows:

- Chapter 2 outlines the scope of the Project;
- Chapter 3 stipulates the terms of reference for the specialist heritage assessment;
- Chapter 4 details the relevant expertise of the specialists that conducted the heritage study;



- Chapter 5 summarises the legislative framework within which the HSR was completed;
- Chapter 6 explains the methodological approach adopted in the compilation of this HSR;
- Chapter 7 identifies the constraints and limitations to the specialist heritage assessment;
- Chapter 8 defines the cultural heritage landscape within which the Project is situated;
- Chapter 9 identifies the possible heritage risks of the Project to Umcebo;
- Chapter 10 identifies the potential impacts to identified heritage resources within the site specific study area;
- Chapter 11 proposes the terms of reference for the heritage assessment during the impact assessment phase; and
- Chapter 12 concludes the report with the specialist professional opinion.

2 Description of the scope of the proposed project

This section summarises the overall scope of the Project. Listed and specified activities in terms of the EIA Regulations, 2014 and proposed project activities are discussed based on their potential to affect the cultural landscape and heritage resources.

2.1 Project overview

As introduced in 1 above, the Project area comprises three underground reserve blocks, i.e. Mooivley East, Mooivley West and Hendrina South. The location details of these underground reserve blocks are provided in Table 2-1.

Operational activities, i.e. mining, are proposed to be undertaken through an underground bord and pillar mining method (see 2.4 below). The Mooivley Reserves (Mooivley West and East) will require the development of two incline shafts to gain access to the two underground areas. The Hendrina South Reserve will require the development of one incline shaft to gain access to the underground area. Mooivley West and Hendrina South will be mined concurrently, with mining operations only commencing at Mooivley East after decommissioning of Hendrina South.

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2.2 Listed and Specified Activities

The provisional infrastructure layout plan is illustrated in Plan 1. The project activities as well as the aerial extents of the activities are provided in Table 2-2. The table also provides an indication of those activities listed in terms of the EIA Regulations.

Table 2-1: Project location details

Prospecting Right	Farm	Portions	Extent		Distance and Direction from Hendrina
MP 1265 PR – Mooivley East & West	Mooivley 219 IS	2, 4, 5 and RE	1 018 ha	3 923 ha	12 km South East
	Tweefontein 203 IS	2, 15, 16 and 17	1 023 ha		8 km South East
	Uitkyk 220 IS	2 and 3	1 246 ha		10 km South
	Orange Vallei 201 IS	1 and RE	639 ha		8 km South East
MP 1266 PR – Hendrina South	Elim 247 IS	RE	516 ha	2 787 ha	19 km South East
	Geluksdraai 240 IS	1 and 2	258 ha		22 km South East
	Bosmanskrans 217 IS	1, 3, 4, 6, 8, 9 and RE	1 941 ha		22 km South East
	Orpenskraal 238 IS	RE	65 ha		22 km South East

Table 2-2: Project Activities

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
Coal Mining (Bord and Pillar)	6 710 ha	X – Activity 17	GNR 984
Site Clearance (boxcut, roads and infrastructure placement)	14 ha	X – Activity 27	GNR 983
		X – Activity 12	GNR 985
Development of haul/access roads	To be confirmed	X – Activity 24	GNR 983

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
Establishment of boxcut and incline shafts	Adit 1 = 2.5 ha Adit 2 = 2.5 ha Adit 3 = 2.5 ha	X - Activity 17 X - Activity 12	GNR 984 GNR 985
Establishment of offices, workshop, change house, silo bins, security fencing	Offices, Change house and Workshops = 0.11 ha Shaft Site Office (x2) = 0.02 ha each Silo Bin (x 2) = 0.45 ha each	N/A	Not Listed
Crushing and Screening Plant	5 ha	X - Activity 21	GNR 984
Waste Rock Dump	To be confirmed	N/A	Not Listed
Sewage Treatment Plant	To be confirmed	X - Activity 25	GNR 983
Development of ROM stockpile and stockpile loading area	To be confirmed	X - Activity 6 X - Activity 17	GNR 984 GNR 984
Pollution Control Dam (PCD)	0.41 ha	X - Activity 6	GNR 984
Water pipelines	To be confirmed	X - Activity 9	GNR 983
Storage of fuel, lubricant and explosives	To be confirmed	X - Activity 4	GNR 984
Generation and temporary storage of waste (hazardous and general)	To be confirmed	N/A	Not Listed
Coal transport via conveyor	Conveyor = 2592.2 metres (length)	X - Activity 17 X - Activity 7 X - Activity 8	GNR 984 GNR 984 GNR 985
Rehabilitation of Project area	14 ha	N/A	Not Listed



2.3 Mineral Resource

The coal deposit is situated within the Karoo Sequence and varies between 32 - 128 metres below ground level (mbgl). The Project area is underlain by Ecca Group, sandstone, shale and coal seams of the *Vryheid Formation* which may be intruded by dolerite sills and dykes. In the northern portion of the Ermelo coal field the coal seams are named from A at the top down to E at the base. Towards the south the nomenclature is the same as that used in northern KwaZulu-Natal. The E-seam has a maximum thickness of over 3 m in the northern part of the coal field. It is composed predominantly of bright banded coal but it becomes torbanitic and/or shaly towards the north. The C-seam is normally split into several plies by partings of variable thickness, a fact which may lead to correlation problems. It is traditionally subdivided into the C Lower and C Upper-seams. The C Lower-seam is normally less than 0.6 m thick. The upper portion of the C Upper-seam is of low grade and may be torbanitic in places. The thickness of the composite seam varies between 0.7 and 4 m. The B-seam may reach a thickness of up to 3 m and comprise mainly dull coal. The A-seam is normally less than 1 m thick and of low grade.

The exploration results revealed a structurally complex coal reserve with high occurrences of dolerite intrusions in the form of sills and dykes. The following seams were intersected namely, A, B, C and D however only seams B and C can potentially be mineable due to reasonable heights.

2.4 Mining Method

Due to the depth of the resource (i.e. 32 – 128 m), underground mining will be used to access the ore body. The proposed mining method for the extraction of coal will be bord and pillar mining method. The underground mine will commence two years after the commencement of the mining activities and reach full production within the first four years.

In mechanised bord and pillar mining, extraction is achieved by developing a series of roadways (bords) in the coal seam and connects them by splits (cut-throughs) to form pillars. These pillars are left behind as part of primary roof support system. In partial pillar extraction, every alternative pillar is left behind to support the overburden or all the pillars are extracted to allow the roof to collapse in a controlled manner. There is no plan to extract any of the pillars for the Project. It is expected that there will be dolerite intrusions and a dyke development section will be deployed for the purpose of mining through these and preparing new mining sections.

2.5 Mineral Processing

The current suggestion is that the Run-of-Mine (RoM) be transported via conveyor to the Crushing and Screening Plant situated in the Mooivley West area for beneficiation. The CHPP is proposed to receive the RoM material which is then fed into the tipping bin with a grizzly. Raw coal from the bin will be sized in a double roll primary crusher to 350 mm material. The material will then be fed into the secondary crusher to produce 120 mm



material. The material from the secondary crusher will be fed into a vibrating screen with 50 mm screen apertures. The screen oversize material (+50 mm) will be fed into the tertiary crusher to produce -50 mm material. The tertiary crusher product and the screening undersize material will be combined together resulting in a -50 mm stockpile. The process is designed to remove the contamination (rock) from the RoM coal and to crush the oversize coal to the desired size. The expected yield, including all losses, is 90%. Coal quantity and quality will be monitored daily for moisture, ash, volatile, fixed carbon, calorific value and sulphur.

2.6 Infrastructure Requirements

The provisional infrastructure layout plan is included in Plan 1. The proposed infrastructure associated with the project includes:

- Haul and access roads;
- Three incline shafts;
- Change house (including ablution facilities) and workshop;
- Pollution Control Dam (PCD) and water pipelines;
- Two site offices;
- Two RoM silo bins located near shaft 2 and 3;
- Overland conveyor belts;
- Stockpiles located near shaft 1;
- Aboveground Storage Tanks for the storage of diesel;
- Three waste bins per shaft;
- Site fencing;
- Diesel generator set; and
- Sewage Treatment Plant.

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 environmental authorisation applications applicable to 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 a HSR to comply with parts of Section 38(3) of the NHRA (the remaining subsections will be addressed in the ensuing HIA). The following activities were completed as part of this SoW:



- Completing a literature review to assist in defining the predominant cultural landscape;
- Undertaking historical layering to identify potential structures older than 60 years that are protected under section 34 of the NHRA, or any other tangible heritage resources;
- Identification of potential heritage impacts based on the Project activities presented in Table 2-2;
- Determining possible Project risks associated with heritage resources and impacts; and
- Developing specific ToR for the ensuing Heritage Impact Assessment (HIA).

4 Expertise of the specialists

Johan Nel is the manager of the HRM unit. He joined Digby Wells in June 2010 as an archaeologist and was subsequently made 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 Association of Southern African Archaeologists (ASAPA, No. 095), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council for Monuments and Sites (ICOMOS, No. 13839), an advisory body to the UNESCO World Heritage Convention. He has more than 16 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.

Justin du Piesanie 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. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. 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.



Justin is a professional and accredited CRM member of ASAPA (*Member No. 270*) and the ICOMOS South Africa (*Member No. 14274*).

5 Policy and legislative 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.

Applicable legislation and guidelines 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> <ul 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>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>A MRA for the project has been lodged with the DMR on X April 2016.</p> <p>This HSR, which relates specifically to the Umcebo Mining Right has been compiled in accordance with the MPRDA read with the EIA Regulations,2014.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied
<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 for 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 listed activities which are potentially triggered under the Listing Notices are provided in Table 2-2.</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. ▪ 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 	<p>Refer to Table 2-2 above for the listed activities which could potentially be triggered by the Project.</p>



Applicable legislation and guidelines used to compile the report	Reference where applied
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 Mpumalanga Heritage Resources Authority (MPHRA), 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 MPHRA. The HSR was compiled to comply with the following parts 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>



6 Methodology

6.1 Defining the 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 are 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 statements of Cultural Significance (CS), predict the types and intensity of impacts, and develop management plans. 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, three ‘concentric’ study areas will be defined to enable CS to be determined that will inform predicted impacts and guide appropriate management measures. The proposed study areas are:

- A **primary study area**, which will comprise the Project’s physical development footprint. It is anticipated that this will be where heritage impacts are most probable.
- A **secondary or site specific study area**, which will comprise the Project boundary, including any exclusion zones, servitudes and other operational boundaries.
- A **tertiary or local study area**, which will comprise the applicable local municipality and include the land and properties adjacent to and surrounding the Project area. In this instance, the local study area is roughly bounded by four major towns, to the north, south, east and west. These towns are Emalahleni (North), Bethal (South), Carolina (East) and Kriel (West).

6.2 Defining heritage impacts

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

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For



example, restricted access to a heritage resource resulting in the gradual erosion of its cultural significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any primary impact, its significance is affected that can ultimately result in the loss of the resource itself.

- **Cumulative heritage impacts** result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
 - **Additive:** the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area.
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area.
 - **Time crowding:** frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
 - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area.
 - **Space crowding:** high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

6.3 Data collection

Data collection was done to develop a cultural heritage baseline profile of the study areas under consideration. Secondary data was collected to inform this HSR and primarily obtained through secondary information sources, i.e. desktop literature review and historical layering. Primary (field-based) data was not obtained at this stage of the study.

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

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

Repositories that were surveyed included the South African Heritage Resources Information System (SAHRIS), online / electronic journals and platforms, and certain internet sources. This HSR only includes a summary and discussion of the most relevant findings: Relevant sources were cited and included in the reference list in 13.

**Table 6-1: Information sources**

Databases		
University of the Witwatersrand (Wits) Archaeological Database (2010)	Genealogical Society of South Africa (GSSA)	SAHRIS
Publications		
Anonymous, 2013	Huffman, 2007	Murimbika, 2007
Bamford, 2011	Huffman & van der Merwe, 1993	Ouzman, 2009
Clark, 1982	Johanson, et al., 2006	Pistorius, 2015
Deacon & Deacon, 1999	Jones, 1999	Smith & Zubieta, 2007
Delius & Cope, 2007	Lombard, et al., 2012	Wilson & Anhaeusser, 1998
Eastwood, et al., 2002	Maggs, 1976	
Garstang, Coleman, & Therrell, 2014	Mitchell, 2002	

6.4 Pre-disturbance survey

One pre-disturbance survey was completed for the Project over the period from 15 – 17 March 2016. The pre-disturbance survey completed by Johan Nel and Justin du Piesanie that focussed primarily on undisturbed areas, outcrops and watercourses within the secondary study area.

The survey was a non-intrusive (i.e. no sampling was undertaken), primarily vehicular based to cover as much of the extent of the secondary study area in the time allotted. The primary study area and other areas of interest / potential for high heritage sensitivity were traversed through pedestrian survey. The objectives of the pre-disturbance survey were to:

- Record visually the current state of the cultural landscape;
- Ground truth certain heritage resources and sites identified through the literature; and
- Record a representative sample of visible tangible heritage resources present within the secondary study area.

Identified heritage resources were recorded as waypoints using handheld GPS and documented through written and photographic record. The actual surveys were recorded as track logs.



7 Constraints and limitations

The following constraints and limitations were experienced as part of the compilation of this report:

- Historical aerial imagery does not cover the secondary or primary study area as defined under 6.1 above, therefore the changes to the landscape through time could not be identified, nor the relative age of identified built structures;
- Given the large aerial extent of the secondary study area as defined in 6.1 above and limited time and resources to conduct surveys, detailed pre-disturbance pedestrian surveys were limited to areas earmarked for proposed infrastructure construction and other surface disturbances and natural landscape features with known, high heritage potential were also surveyed in detail, such as rocky outcrops. The result is that large parts of the secondary area were not surveyed;
- The surveys were further constrained due to large areas being inaccessible, either due to unharvested maize fields or because access to properties were not granted at the time of the surveys, with specific reference to:
 - Oranjevallei 201 IS Portion 1; and
 - Tweefontein 203 IS Portions 2, 4, and 17.
- The inherent nature of heritage resources, i.e. occurring at sub-surface levels with no or limited trace evidence on the surface, highlights the potential of subsurface occurrences. To investigate these occurrences, permits regulated under Section 35 of the NHRA are required. No permits were held by the specialists, and as such, it is possible that archaeological sites may be identified during the construction phase of the project; and
- Adverse weather conditions, i.e. extensive rain, caused some of the dirt roads to become impassable or pose health and safety risks to the specialists conducting the pre-disturbance survey.

8 Cultural heritage baseline description

The cultural heritage baseline considers information obtained from the literature review discussed in Section 6.3 above. This section considers the cultural heritage landscape on two levels. The local study area is first discussed, followed by the site-specific study area.

8.1 Local study area

The geology and associated palaeontological potential is first described. The archaeology of the local study area is then introduced with the Stone Age period, followed by a discussion on rock art and then Farming Community period archaeology. The section concludes with a summary of the historical period.



8.1.1 Geology and palaeontological sensitivity

Geologically, this region of Mpumalanga is underlain by lithostratigraphic units associated with the Karoo Supergroup (Main Karoo Basin), ranging in age from Late Carboniferous to Middle Jurassic. The bulk of the Karoo strata occur in the main basin, covering an area of approximately 700 000 km², which was much more extensive during the Permian Period (Figure 8-1). The Karoo Supergroup is famously known for its terrestrial vertebrate fossils, distinctive plant assemblages, thick glacial deposits and extensive dolerite dykes and sills (Johanson, et al., 2006).

The Main Karoo Basin constitutes a retro-arc foreland basin as it contains a thick flysch-molasse succession that wedges out northwards over the adjacent craton, and is situated behind an inferred magmatic arc and associated fold thrust belt produced by northward subduction of oceanic lithosphere located south of the arc (Johanson, et al., 2006). Through this process, the sedimentation of the basin occurred through which the various groups, sub-groups and formations of the Karoo Supergroup of the Project area were formed (Figure 8-2).



Figure 8-1: The location of the Main Karoo Basin (Johanson, et al., 2006)

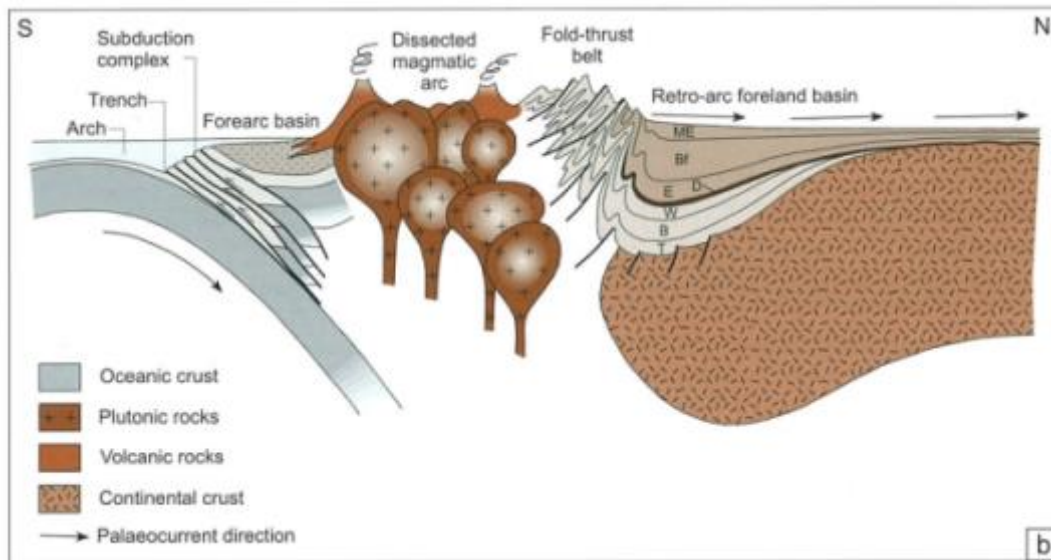
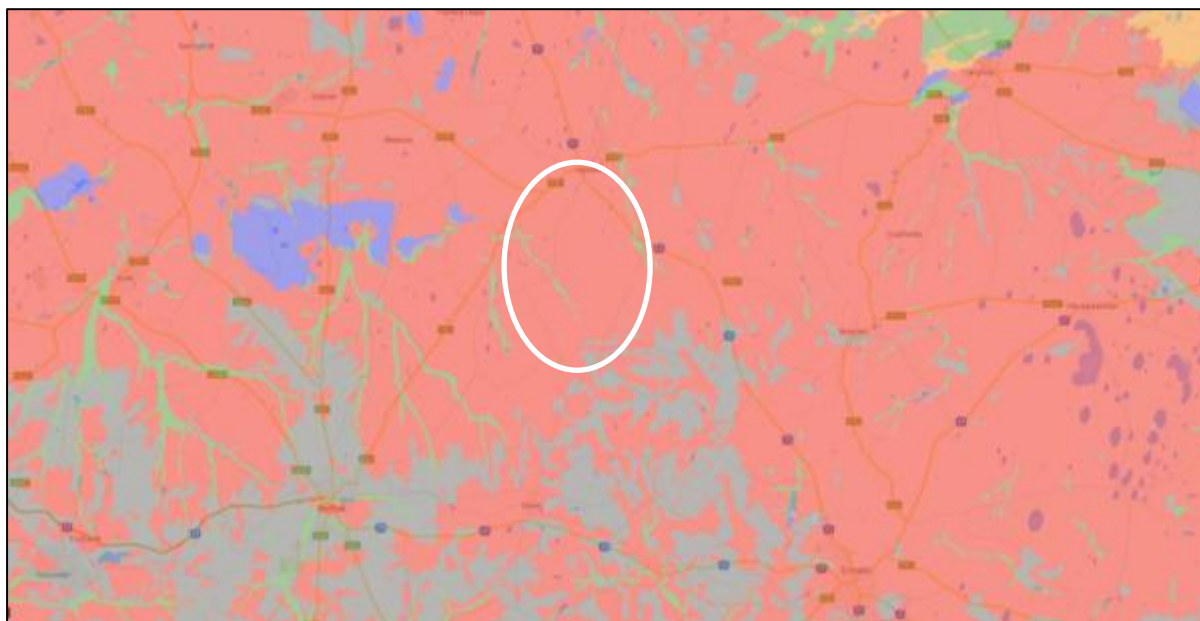


Figure 8-2: Envisaged plate tectonic setting of the basin during the Late Triassic. Bf = Beaufort Group, with associated Adelaide Subgroup. E = Ecca Group (Johanson, et al., 2006)

The Karoo Supergroup comprises the Dwyka, Ecca and Beaufort Groups. Within the local study area the Dwyka Group is unconformably overlain by the Ecca Group, with the primary underlying stratigraphic unit being the *Vryheid Formation* deposited during the Permian era about 280 million years ago (mya). The *Vryheid Formation* consists of sandstone, shale, mudstone and coal (Wilson & Anhaeusser, 1998) occasionally interrupted by intrusive dolerite dykes of the Jurassic period, as introduced in 2.3 above. Fossil plants are the predominant palaeontological resource found in this region of South Africa. Around Ermelo, in particular, there are exposures of Permian rocks of the *Vryheid Formation* which contain fossil plants of the *Glossopteris* flora but no vertebrates (Bamford, 2011). Palaeontologically, the *Vryheid Formation* has a very high sensitivity (see Figure 8-3).



Colour	Sensitivity	Required Action
Red	VERY HIGH	field assessment and protocol for finds is required
Yellow	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
Green	MODERATE	desktop study is required
Blue	LOW	no palaeontological studies are required however a protocol for finds is required
Grey	INSIGNIFICANT	no palaeontological studies are required

Figure 8-3: Palaeo-sensitivity of the secondary study area (adapted from SAHRIS, 2014)

8.1.2 Stone Age

The Stone Age is defined by the production of lithic tools by various hominid species. The Stone Age is classified into three time periods, namely the Early (ESA), Middle (MSA) and Late Stone Age (LSA). The literature review did not provide any evidence for ESA accumulations in the local study area, and is therefore not considered further at this stage.

The MSA dates from approximately 300 000 years ago (kya) to 20 kya. Early MSA industries are characterised by high proportions of minimally modified blades, represented by the Levallois technique (Clark, 1982). 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 LSA dates from approximately 40 kya to the historical period. 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). LSA sites commonly contain diagnostic artefacts, such as microlithic scrapers and segments. In a southern African context, the LSA is closely associated with hunter-gatherer groups, such as the San. Due to the nomadic nature of LSA people, open sites are difficult to identify and usually poorly preserved. In addition to the production of LSA lithics, this period is characterised by evidence of ritual practises and complex societies, as well as rock art (Deacon & Deacon, 1999).

Table 8-1: The southern African MSA and LSA sequence (Lombard, et al., 2012)

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



8.1.3 Rock art

The economy of the LSA people is associated with San (hunter-gatherer) or Khoekhoen (pastoralist) societies. Within Mpumalanga, three rock art painting traditions are represented that are widely dispersed but have been most notably recorded in the northern and eastern regions. Each of these is associated with particular cultural groups:

- The first and oldest tradition is the fine line paintings associated with autochthonous LSA hunter-gatherer groups;
- The second tradition is the finger paintings associated with the later arrival of pastoralists; and
- The last, third tradition is finger paintings associated with much later and possibly historic farming communities.

Bushmen rock art was produced using fine brushes, quills or sticks predominantly done in red, white and black, and more rarely bichrome and polychrome. Realistic and proportionally correct animals such as various antelope species are often found. In addition, human figures and more symbolic beings are also represented (Eastwood, van Schalkwyk, & Smith, 2002).

In contrast to the hunter-gatherer tradition, pastoralists are typified by predominantly finger-painted geometric images. Initially identified by Ben Smith and Sven Ouzman, the tradition extends in linear bands following the proposed migration routes of the pastoralists from southern Angola/western Zambia to the southern Cape (Smith & Zubieta, 2007). The geometric designs are composed entirely of circles, finger lines, finger dots, and handprints that are mostly painted in red pigment, sometimes in red and white, and occasionally only in white (Eastwood, van Schalkwyk, & Smith, 2002; Smith & Zubieta, 2007).

A prominent site located on the farm De Wittekrans 218 IS is the De Wittekrans Rock Art Complex. In the report completed by Ouzman (2009) the complex is described as consisting of four individual sites all with archaeological deposit, including stone tools and pottery. The rock art within the complex consist of fine-line, brush painted images made by hunter-gatherers and finger painted rock paintings associated with herder people. The co-occurrence of two or more of these traditions suggests that there were some cultural interactions between these groups.

The third tradition is associated with farming communities. In Mpumalanga, the ancestors to the Sotho-Tswana and Nguni created rock art as part of their expressive culture. Research suggests that the Sotho-Tswana almost exclusively created painted art (finger painted) where the Nguni art is almost exclusively engravings (Smith & Zubieta, 2007).

8.1.4 Farming communities

The Farming Community period is divided into two stages to distinguish between widespread events:

- Early Farming Communities (EFC) (200 CE – 1000 CE); and



- Late Farming Communities (LFC) (1000 CE – 1840 CE).

The most visible indicator of farming community settlements are stone walled settlements. Stone walled settlements in South Africa have been characterised and defined into two clusters and several types. These are summarised in Table 8-2 below.

According to Huffman (2007) KwaMaza walling (1700 CE – 1840 CE) is located within the local study area and is related to the Ndzundza Ndebele. Here there was an emphasis on back/front spatial layout, where the beehive huts were placed at the back of terraced platforms and the cattle kraals and courts were built to look the same.

Type V walling consists of the standard core of cattle enclosures surrounded by beehive houses and grain bins, but no surrounding wall is present (Maggs, 1976). These are the most common and widely distributed settlement pattern in the south east of Mpumalanga around Bethal and Ermelo. This differs from the settlements found around Carolina through to Lydenburg, where the settlement units have surrounding walls and are linked by trackways with large areas of terracing (Maggs, 1976).

Material culture, specifically ceramics, is the second most visible indicator of farming communities. Murimbika (2007) states that during this period, the region was predominantly occupied by Ndebele Nguni-speaking groups and the predominant ceramic facies identified are *Blackburn* (1050 CE - 1500 CE), characterised by rim notching, spaced motifs, chevrons, punctates and appliqué, *Moor Park* (1350 CE - 1700 CE), characterised by punctates, rim notching and appliqué, and *Nqabeni* (1700 CE - 1850 CE) characterised by high black and red burnish, appliqué and fingernail impressions (Huffman, 2007).

Table 8-2: Stone walled settlement types (adapted from Huffman, 2007)

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



8.1.5 Historical period¹

In the 1820's, a rebellious lieutenant of King Shaka, known as Mzilikazi fled northwards from the coast with his warriors. As he moved inland, he raided settlements, absorbing survivors into his group, all the while growing his army. His movement through the interior resulted in forced migrations of many inhabitants, and caused the remaining people to suffer under harsh conditions. The period was known as the *Mfecane* (Garstang, Coleman, & Therrell, 2014).

Pedi and smaller groups of Ndzundza Ndebele and Kopa also occupied the region during the mid-19th century, but unlike the larger Swazi and Pedi groups, often came into direct conflict with the *Zuid Afrikaansche Republiek* (ZAR) (Delius & Cope, 2007). Tensions came to a head in the late 1840s when the Kopa were accused of raiding horses from the Boers. A retaliatory raid was organised, and the Kopa chief was captured and flogged. The resultant action from the Kopa was increased raids. The Boers requested the Swazi to assist who besieged and destroyed the Kopa stronghold Thaba Ntsho in 1864, near Groblersdal. The Swazi/Boer alliance subsequently focussed on the Ndzundza Ndebele, but was unsuccessful at defeating them. A tribute system was implemented as a compromise where the Boers ostensibly leased land from the Ndzundza chief.

Subsequent to this, tensions between Great Britain and the ZAR culminated in the South African War (i.e. Anglo Boer War) of 1899 – 1902. Within this region, the British under the command of Gen. H.L. Smith-Doriens were encamped around Lake Chrissie on 6 February 1901. The Boers under the command of General Louis Botha, intended to conduct a surprise attack on the British forces. The Boers enlisted the help of the local San community who were monitoring the British movements in the area. With the San's knowledge of the terrain, the Boers were able to launch the surprise attack and repel the British. The battle continued until the 9 February 1901 when adverse weather caused the Boers to lose their advantage and was eventually forced to retreat (Jones, 1999; Delius & Cope, 2007; Anonymous, 2013).

After the war, the farm Bothasrus was given to Lukas Potgieter as compensation for losing a leg during the first Anglo-Boer War. He later sold the farm to field-cornet Nicolaas Breytenbach who formed the town Breyten in his own name.

Subsequently, the town of Hendrina was established in 1924 on the farm Garsfontein. The town, named after the wife of the farm owner Gert Beukes, serviced local farmers and later in time, mine and power station workers (Pistorius, 2015).

¹ The author acknowledges that in southern Africa, especially in Mpumalanga, the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented and is being explored through the 500 year initiative.

8.1.6 Socio-economic baseline conditions

Socio economic information presented in this section was extracted from the socio-economic baseline conditions description within the Social Scoping Report for the Project (Erwee, 2016).

The Project is situated within an area that has a relatively diverse and mature economy. Sectors that dominate the economy include:

- Mining;
- Manufacturing;
- Finance;
- Transport; and
- Trade.

At a provincial level, the mining and power generation sector is a significant contributor to the local economy, as well as a major source of employment. Within proximity to the Project, several mining and power generation operations exist. These are summarised in Table 8-3. The increasing importance of mining, especially coal mining, to Local Economic Development (LED) is recognised at both District and Local Municipal level. However, while mining could contribute to socio-economic development, it also poses constraints to urban development and growth, as well as threatening surrounding ecosystem services that more rural areas may depend on.

Table 8-3: Mining and energy generation operations within proximity to the Project

Mining operations	Koorfontein Coal Mine
	Kranspoort Coal Mine
	Middelburg Mine
	New Clydesdale Colliery
	Optimum Colliery
	Tavistock Coal Mine
	Woestalleen Coal Colliery
	Arnot Coal Mine
Power generation	Eskom's Arnot Coal-fired Power Station
	Eskom's Hendrina Coal-fired Power Station
	Eskom's Komati Coal-fired Power Station

Other sectors that are considered important to socio-economic development include agriculture and tourism. While this region of Mpumalanga is reportedly the best agricultural land in South Africa, agricultural involvement appears to be declining. This decline is through to be attributed to a stronger dependence on other monetary resources such as social grants



or employment in different sectors. This decline is recognised at a municipal level, and LED strategies are prioritising growth within this sector.

Finally, tourism is also recognised as an economic development opportunity through the incorporation of existing natural environment, cultural heritage and man-made resources into municipal structures. Relevant spatial development frameworks (SDFs) closely link tourism and conservation in the form of eco-tourism, for which the balance and co-existence with mining, agriculture and urban development is considered important.

8.2 Secondary / Site-specific study area

The cultural heritage baseline for the site-specific study area considers quantitative data gathered from the data collection and characterises the dominant landscape based on identified heritage resources. As demonstrated in Figure 8-4, this study area is predominantly associated with the historical, agrarian landscape (60% historical built environment resources and 10% burial grounds and graves), with a significant palaeontological and archaeological component.

The palaeontological resources are first described. The archaeology of the secondary study area is then introduced with a discussion of the identified rock art sites. The section concludes with a summary of the historical period and the results of the pre-disturbance survey.

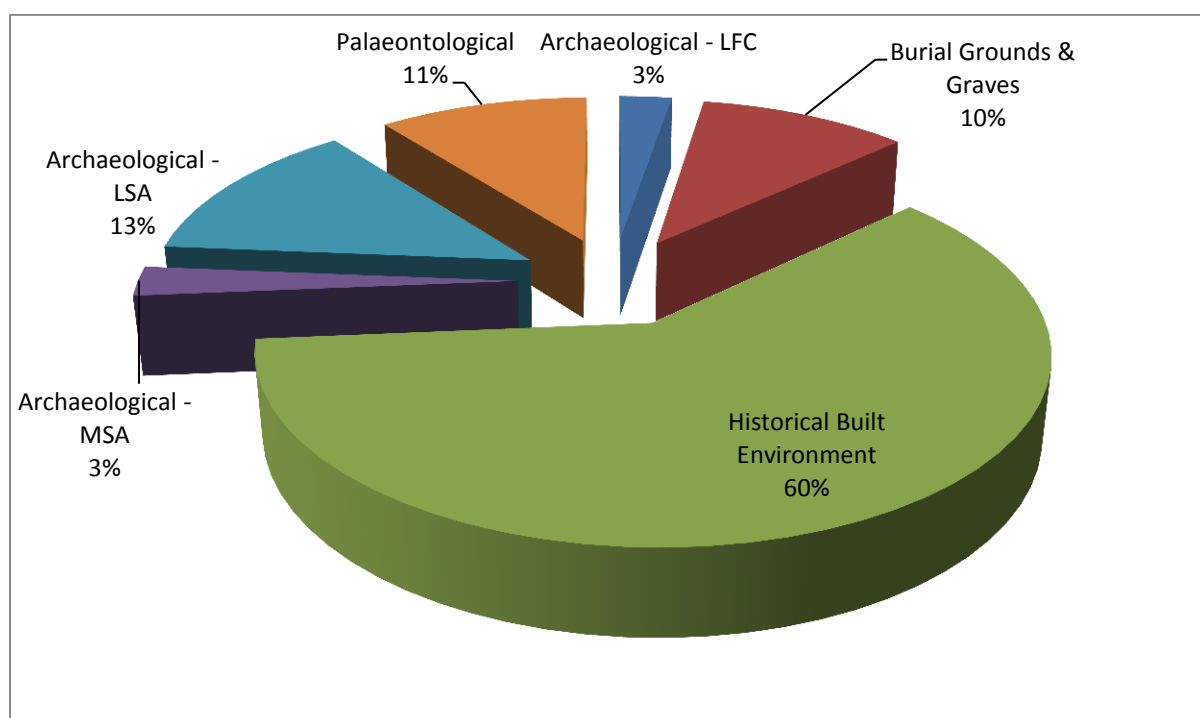


Figure 8-4: Breakdown of known heritage resources in site-specific study area



8.2.1 Palaeontology

Within the secondary study area, a total of four palaeontological resources were identified. These comprised of fossilised plants and bones within sandstone outcrops and ridges (du Piesanie & Nel, 2013). Of significance is the identification of three instances of the fossil *Breytenia* (Figure 8-5). At the time of the identification of this fossil, only one other specimen was available for research. Based on the lack of research undertaken of this rare plant fossil, description and classification of *Breytenia* is not well known.



Figure 8-5: Example of fossil *Breytenia* recorded as 1722/S.35-036 and 1722/S.35-042 (du Piesanie & Nel, 2013)

Similar to this, very few specimens of the vertebrate fossils (1722/S.35-43) from the Mpumalanga coal fields available for research, therefore detailed descriptions and classifications are not well known.

Based on the potential scientific information that these identified fossils could yield and contribute to the understanding of the fossil record, they were determined to have a high CS.

8.2.2 Rock Art

A total of three rock art sites were previously identified within the secondary study area (du Piesanie & Nel, 2013). Of these identified sites, these were recorded as fine lined paintings associated with the Bushman traditions (1722/S.35-015), finger paintings associated with the later arrival of pastoralists (1722/S.35-019), and undetermined tradition (1722/S.35-029). Two additional Bushman panels were identified during the pre-disturbance survey (see 8.2.4 below).

The Bushman painting panels comprised animal imagery, primarily antelope figures on exposed sandstone surfaces in shelters along the Klein Olifants River and sandstone ridges. The pastoralist painting panels, described as monochrome single lined shaped figures, were identified along shelters associated with the sandstone ridge running through the secondary study area. These sites were also noted to be fairly degraded and subject to severe weathering in the form of exfoliation.

These sites were determined to have a medium CS.

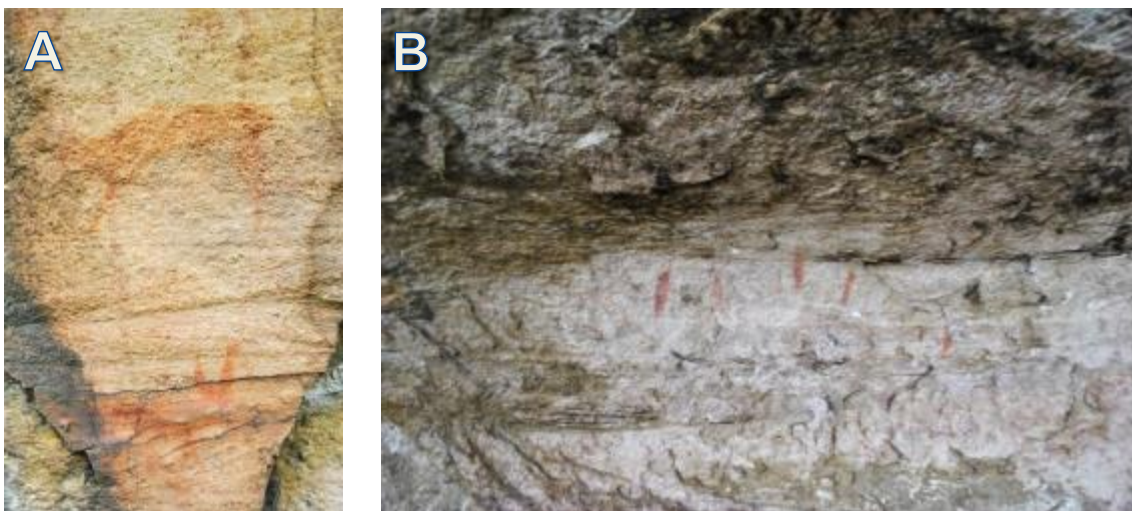


Figure 8-6: Example of Bushman (A - 1722/S.35-015) and pastoralist (B - 1722/S.35-019) paintings in the secondary study area

8.2.3 Historical period

Three historical period sites were previously identified in the secondary study area (du Piesanie & Nel, 2013). These comprise one cemetery of approximately 22 graves (1722/S.36-017), and two stone walled historic enclosures (1722/S.35-018 and 1722/S.34-030).

An additional 20 historical period resources were identified through an aerial survey of recent imagery. No relative dates for these resources could be assigned as historic aerial imagery for the secondary study area is not available. A list of these resources is provided in Appendix B.

8.2.4 Results of the pre-disturbance survey

The pre-disturbance survey was undertaken from 15 – 17 March 2016. During the survey, a total of six previously unidentified heritage resources were recorded. The results of the survey are presented in Table 8-4 below.

**Table 8-4: Identified heritage resources**

Site Name	Description Summary	Description Detail	Latitude	Longitude
BGG-001	Burial ground: ≤20 graves	Burial ground containing at least 17 graves. Two graves have concrete slabs with rocks as headstones. Remainder either ferricrete cairns or with rock headstones – outside of the infrastructure footprint, however within the proposed mining right area.	-26.2566330	29.7596080
BGG-002	Burial ground: ≤10 graves	Burial ground containing at least eight graves, associated with an occupied werf. Site recorded from roadside as access was not granted by owner (Mr Jannie Davel); therefore no detailed records – outside of the infrastructure footprint, however within the proposed mining right area.	-26.2024760	29.7477250
BGG-005	Burial ground: ≤50 graves	Burial ground containing at least 27 graves. Two graves with formal dressings and headstones associated with Lekgari and Marazwani families. Remainder stone cairns or rocks as headstones – outside of the infrastructure footprint, however within the proposed mining right area.	-26.1911020	29.7971450
RA-001	Rock art: painting	Rock art comprising a panel with very faded images including humans and antelope. Antelope may represent eland (yellow pigment) and hartebeest or tsessebe (red pigment). Humans painted in reddish-brown pigment. Site is situated in a low shelter, fronted by wattle and eucalyptus bush. Active decay (exfoliation) evident - outside of the infrastructure footprint, however within the proposed mining right area.	-26.1909350	29.7917750
RA-002	Rock art: painting	Rock art comprising a panel with very faded images including antelope. Site is situated in a low shelter, fronted by wattle and eucalyptus. Very active decay (exfoliation) evident - outside of the infrastructure footprint, however within the proposed mining right area.	-26.1900260	29.7891380
Wf-009	Structural: complex, e.g. werf	Abandoned werf comprising a residence, cow shed and several other structures such as troughs, broken down pens and water tank structure. Residence is constructed of clay brick, cinder blocks and dressed sandstone, with a corrugated roof. Building U-shaped with additions to back - outside of the infrastructure footprint, however within the proposed mining right area.	-26.255163	29.770847



Figure 8-7: Examples of identified heritage resources A- BGG-002; B – Historic built structures older than 60 years; C – RA-001

9 Possible heritage risks

Heritage risks refer to potential issues that could affect the Project. Potential heritage risks are associated with:

- Identified, significant heritage resources; and
- Heritage impacts that may have repercussions to Umcebo.

These are discussed separately below.



9.1 Heritage resources with high significance

Heritage resources with a high CS are inherently sensitive to any development in so far that the continued survival of the resource could be threatened. In addition to this, certain heritage resources are formally protected thereby restricting various development activities. An example here would be the burial grounds and graves within the site specific study area or proposed development footprint.

The main heritage risks to the Project are:

- Negative Environmental Authorisations (EAs) due to possible presence of very significant or sensitive heritage resources;
- Delays in Project development and implementation due to possible heritage permit requirements; and
- Possible restrictions imposed on development activities as part of heritage impact mitigation measures.

9.2 Impacts on heritage resources

Project activities that impact negatively on heritage resources, such as burial grounds and graves, may have social repercussions. These could range from low-level issues to public confrontation and litigation. Umcebo may also experience reputational risks.

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

10 Possible heritage impacts

No heritage resources were identified within the proposed infrastructure footprint based on surface observations during the pre-disturbance survey, however, heritage resources are known to occur within the mining right areas. The potential heritage impacts refer to the direct, indirect or cumulative impacts on heritage resources by the Project related activities during the various phases of the Project. These are summarised in Table 10-1 and Table 10-2 below.

Table 10-1: Potential risks and heritage impacts per phase of the Project

Phase	Activity	Risk	Potential Impact
Construction	Site clearing or top soil removal	Change to the <i>status quo</i> of heritage resources	Destruction or alteration of NHRA Section 34 resources, i.e. structures and built environment resources older than 60 years
			Destruction of or disturbance to NHRA



Phase	Activity	Risk	Potential Impact
			Section 35 resources, i.e. archaeological and/or palaeontological resources
			Damage or destruction of, and loss of access to, NRHA Section 36 resources, i.e. burial grounds and graves.
Operational	Blasting	Vibrations from blasting affecting the status quo of physical heritage sites within proximity to the Project	Compromising the physical integrity of heritage sites, including rock art sites and historical buildings
		Dust generation from blasting affecting the status quo of physical heritage sites within proximity to the Project	Dust fallout may adversely affect rock art panels / motifs
	Bord and pillar mining method	Shallow bord and pillar mining method may result in subsidence	Destruction or alteration of NHRA Section 34 resources, i.e. structures and built environment resources older than 60 years
			Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological and/or palaeontological resources
			Damage or destruction of, and loss of access to, NRHA Section 36 resources, i.e. burial grounds and graves.
	Decommissioning	Closure	Underground mining voids may result in subsidence
Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological and/or palaeontological resources			
Damage or destruction of, and loss of access to, NRHA Section 36 resources, i.e. burial grounds and graves.			



Phase	Activity	Risk	Potential Impact
	Dismantling of surface infrastructure	Dismantling of built environment structures older than 60 years	Structures older than 60 or 100 years at the time of decommissioning will be generally protected under Section 34 of the NHRA and be subject to permitting requirements regulated by Chapter III of GN R 548.

Table 10-2: 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 presented in Table 8-3.	Local study area
Synergistic Time crowding	The synergistic effects of the Project and other operations in proximity, and repetitive impacts on archaeological resources may manifest as regular blasting activities that threaten the physical integrity of rock art sites and the historic built environment.	Local and primary study area

11 Proposed terms of reference for the EIA and HIA

Based on our understanding of the cultural landscape, potential impacts to heritage resources were presented and summarised in Table 10-1. Briefly, these can be summarised as damage to and/or destruction of heritage resources generally protected under sections 34 – 37 of the NHRA during construction, operational and decommissioning phases.

The EA process is scheduled to continue with an impact assessment phase, during which a full EIA will be undertaken and submitted for adjudication. An HIA will be completed during the EIA phase inclusive of the following:

- An Archaeological Impact Assessment (AIA) that considers project related activities, CS of identified heritage resources, potential impacts and provides recommendations for mitigation or management.

It is further recommended that exemption from further palaeontological assessment at this stage be granted. The motivation for this request for exemption is based on conditions that a fossil monitoring programme is developed and included in the EMPr as a condition of authorisation as operational activities will be completed through underground mining



methods (see 2.4 above) and possible surface fossil remains are not envisaged to be impacted upon.

12 Conclusion

Umcebo is in the process of undertaking the necessary studies in support of EA for an MRA for their reserves within the Ermelo Coal Field, approximately 10-22 km south east of the town Hendrina. Three underground reserve blocks have been identified, namely Mooivley East, Mooivley West and Hendrina South. Operational activities, i.e. mining, are proposed to be undertaken through an underground bord and pillar mining method.

This scoping assessment was aimed at developing a cultural heritage baseline, identify potential risks to the Project, and identify any potential impacts to heritage resources through project related activities with the development, operation and decommissioning of the Project. It has been demonstrated that the Project is situated in an area that can be primarily categorised as a historic agrarian landscape with a significant palaeontological and archaeological aspects. Identified heritage resources are discussed under 7 above, and comprise of palaeontological, archaeological and historic period resources.

Digby Wells is of the professional opinion that the Listed Activities will have a limited impact upon heritage resources within the site specific study area. These potential impacts as identified within this HSR under Table 10-1 and Table 10-2 will be assessed as part of the HIA.



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Heritage Scoping Report

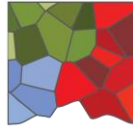
Environmental Impact Assessment for the Proposed Hendrina Underground Coal Mine,
Mpumalanga

XST3791



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 Yzermyne 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	



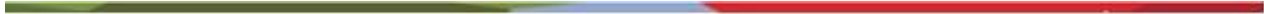
Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014 2014	Heritage Impact Assessment on 2 structures 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



JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

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

2 LANGUAGE SKILLS

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

3 EMPLOYMENT

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



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

4 EXPERIENCE

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

5 PROFESSIONAL REGISTRATION

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



6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at
Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001.	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004.	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.



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

7 PROJECT EXPERIENCE

7.1 Archaeological Surveys and Impact Assessments

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

7.2 Archaeological Mitigation

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

7.3 Heritage Impact Assessments

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

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



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



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



7.4 Burial Grounds and Graves Consultation and Relocation

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

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

7.5 Research Reports and Reviews

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

Heritage Scoping Report

Environmental Impact Assessment for the Proposed Hendrina Underground Coal Mine,
Mpumalanga

XST3791



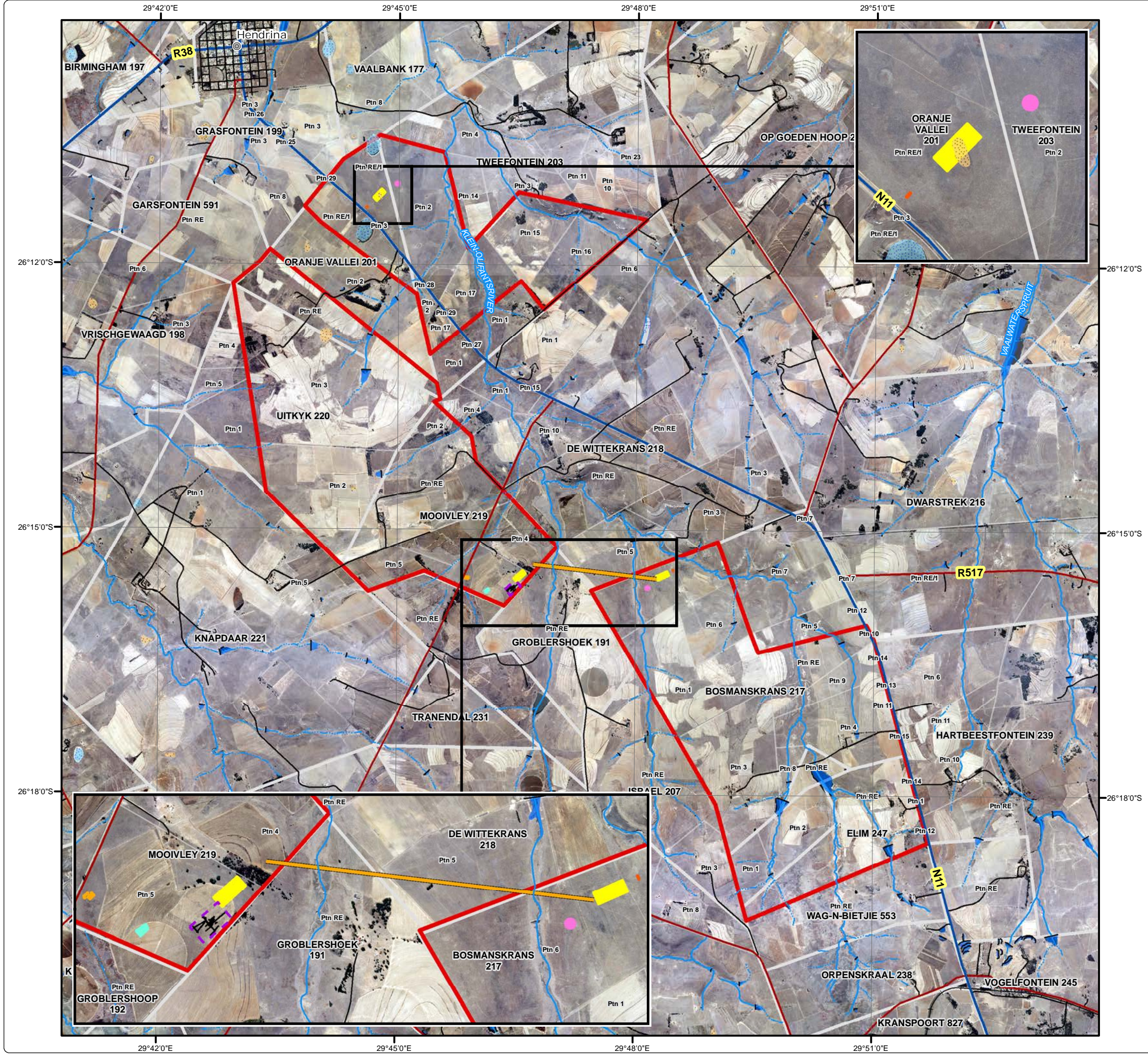
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Appendix B: Plans & site list

Umcebo Mining Hendrina Underground Coal Mine EIA Primary Study Area

Legend

- Project Area
 - Other Town
 - Arterial/National Route
 - Main Road
 - Minor Road
 - Railway Line
 - Non-Perennial Stream
 - Perennial Stream
 - Dam Wall
 - Dam/Lake
 - Non-Perennial Pan
 - Perennial Pan
 - Wetland
 - Farm Boundary
 - Farm Portion
- ### Infrastructure
- Overland Conveyor
 - Adit
 - Crushing and Screening Plant
 - Offices, Change House and Workshop
 - Plant Area
 - PCD
 - Shaft Site Office
 - Silo Bin


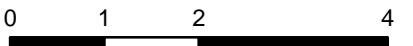




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• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

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Datum: WGS 1984	Revision Number: 1
Central Meridian: 29°E	Date: 31/03/2016

















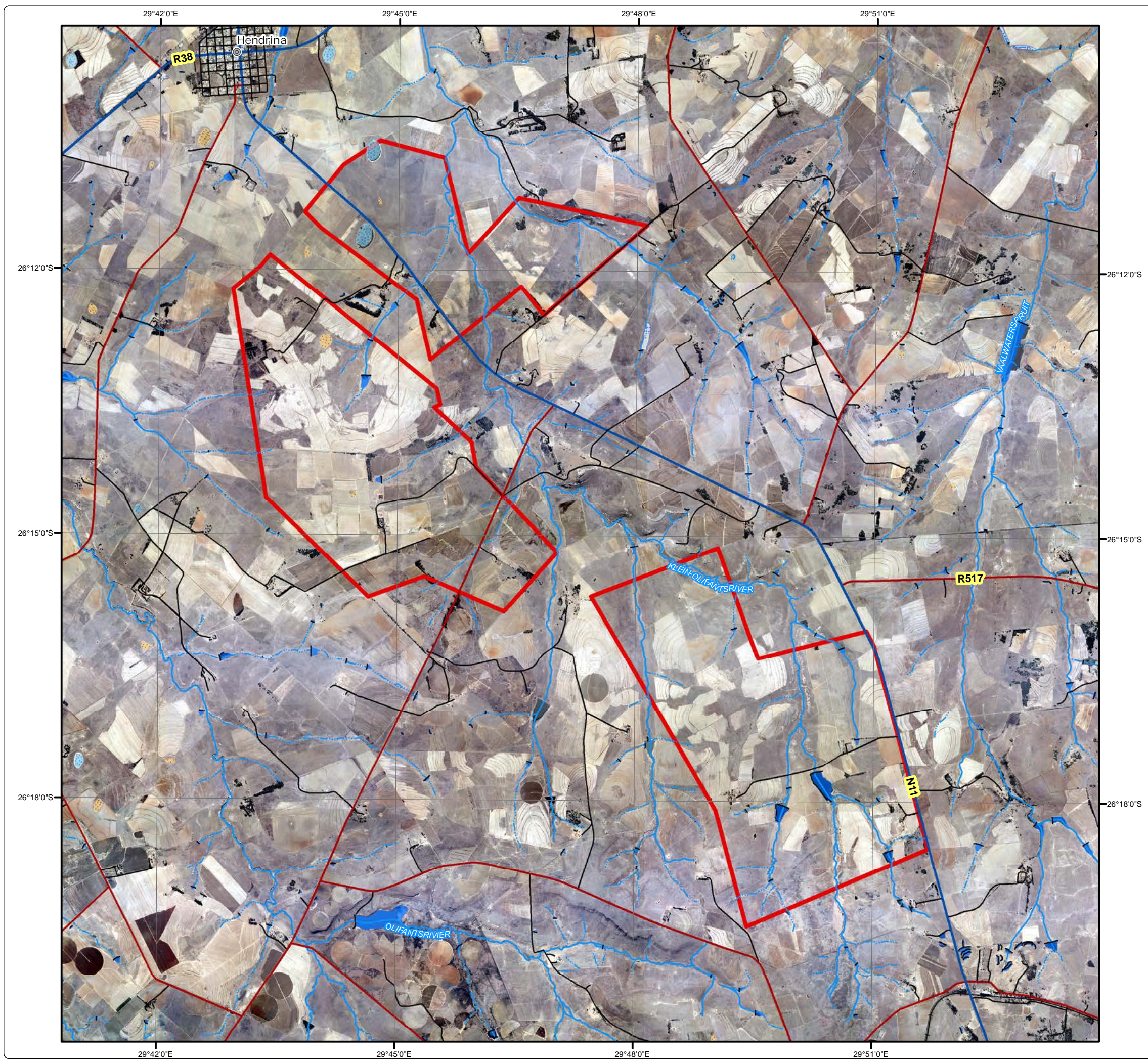
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Umcebo Mining Hendrina Underground Coal Mine EIA Secondary Study Area

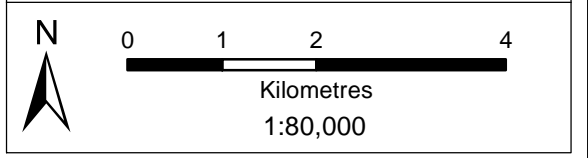
Legend

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















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

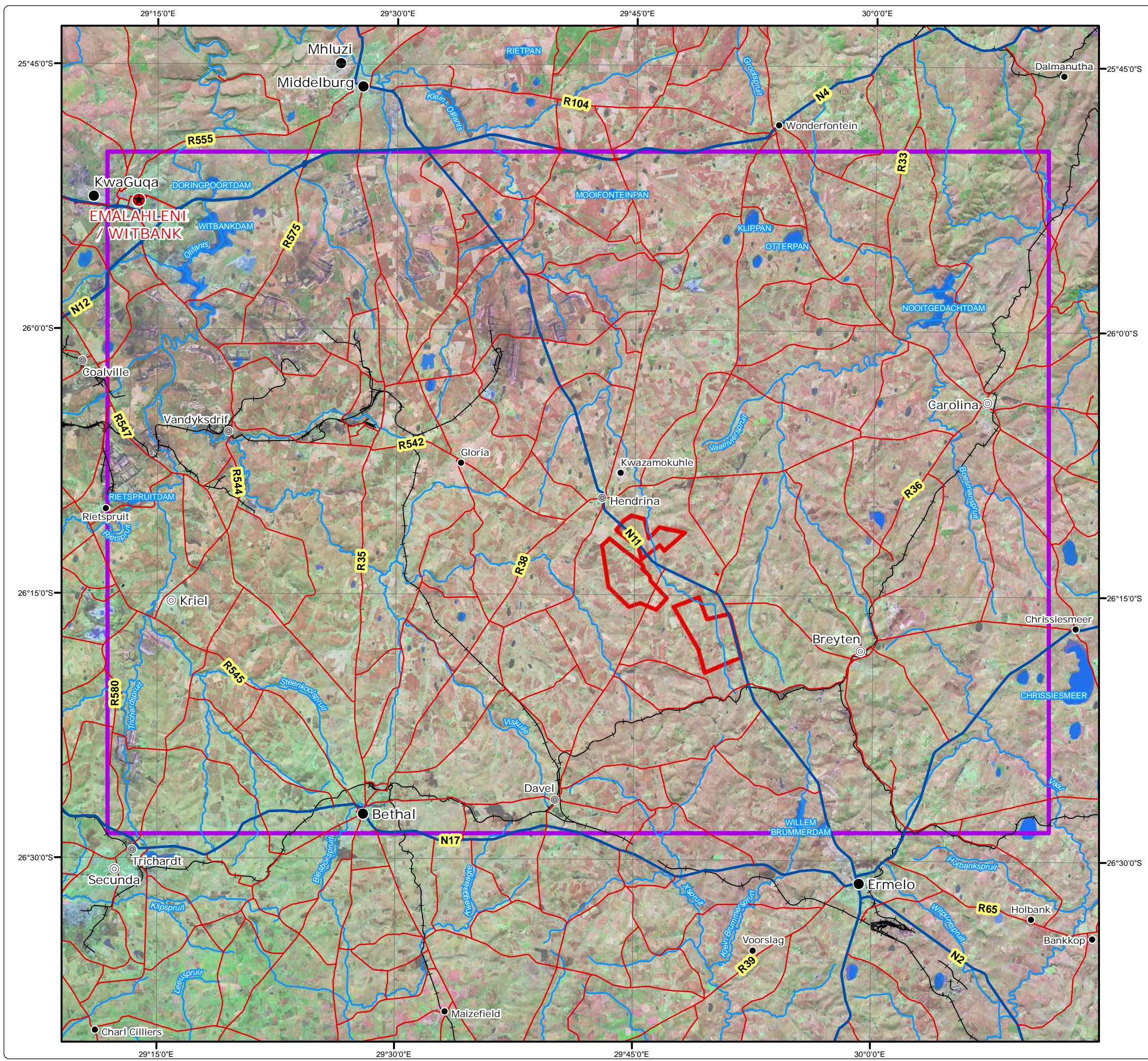
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 Central Meridian: 29°E Date: 31/03/2016



Umcebo Mining Hendrina Underground Coal Mine EIA Tertiary Study Area

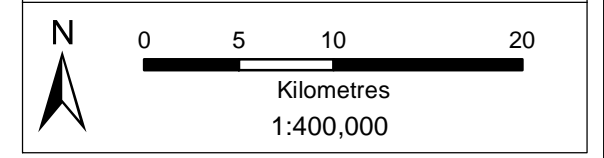
Legend

-  Project Area
-  Tertiary Study Area
-  City
-  Major Town
-  Secondary Town
-  Other Town
-  Settlement
-  Main Road
-  National Road
-  Railway Line
-  River
-  Dam



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

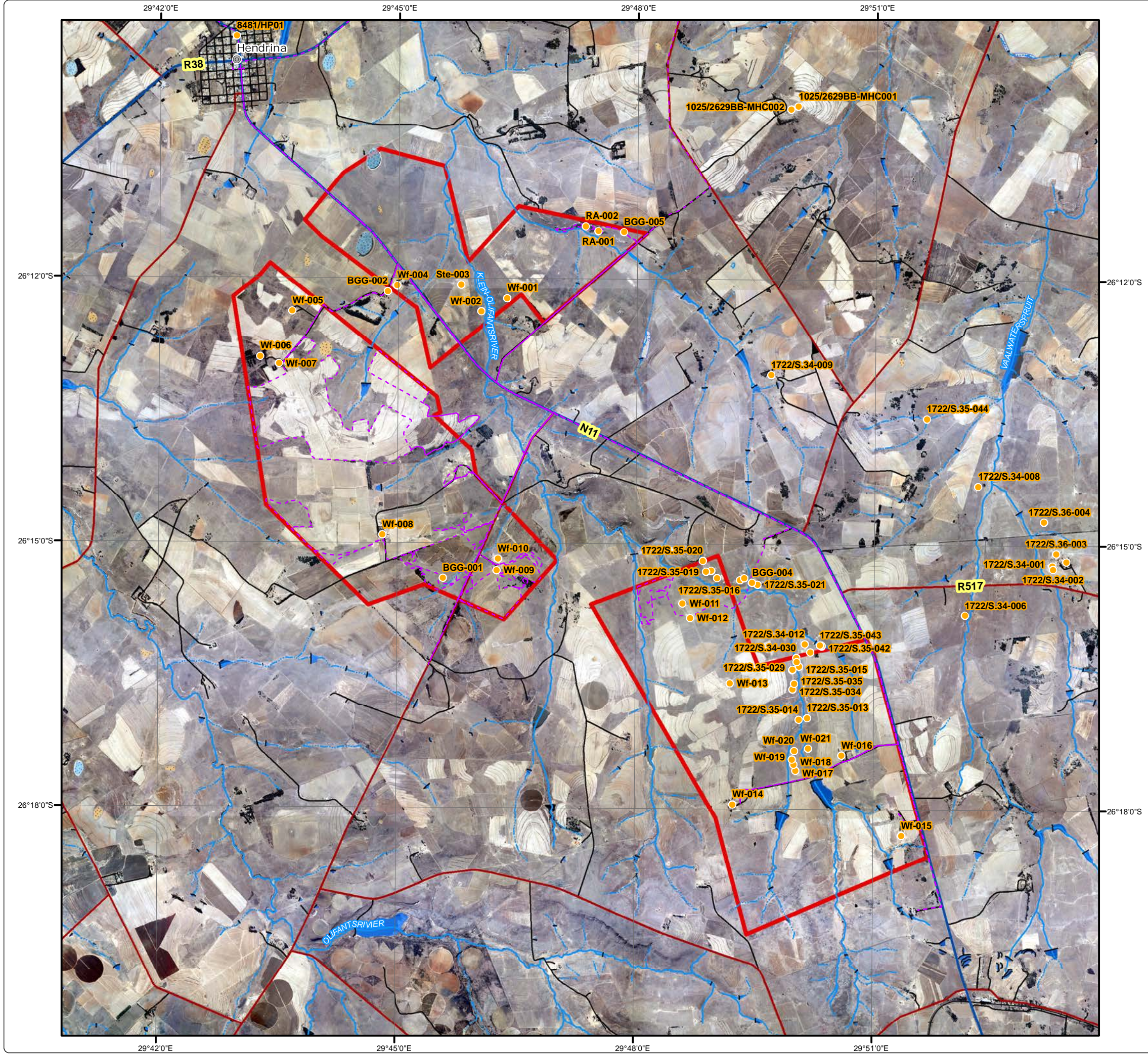
Projection: Transverse Mercator Ref #: kam.XST3791.201603.172
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 29°E Date: 31/03/2016



Umcebo Mining Hendrina Underground Coal Mine EIA Identified Heritage Resources

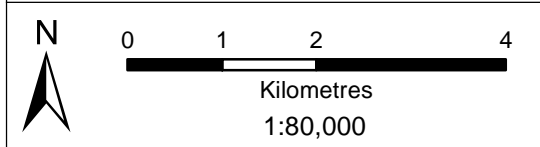
Legend

- Project Area
- Other Town
- Identified Heritage Resources
- Track Log
- Arterial/National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam/Lake
- Non-Perennial Pan
- Perennial Pan
- Wetland



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

Projection: Transverse Mercator Ref #: kamo.XST3791.201603.173
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 29°E Date: 31/03/2016



Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Archaeological - LFC	1121/Site26	-26.04644	29.699576	10-20 km
Local study area	Archaeological - LFC	1121/Site27	-26.04657	29.700357	10-20 km
Local study area	Archaeological - LFC	1165/TAV1	-26.12972222	29.26333333	20-50 km
Local study area	Archaeological - LFC	1165/TAV2	-26.10527778	29.15083333	50-100km
Local study area	Archaeological - LFC	1165/TAV4	-26.06083333	29.24972222	20-50 km
Local study area	Archaeological - LFC	1179/FIG01	-25.43111111	29.99861111	50-100km
Local study area	Archaeological - LFC	1722/S.35-023	-26.2647476	29.9480593	5-10 km
Local study area	Archaeological - LFC	1722/S.35-025	-26.2651181	29.949145	5-10 km
Local study area	Archaeological - LFC	1724/S.35-045	-25.83841667	30.21334722	50-100km
Local study area	Archaeological - LFC	1724/S.35-051	-25.79222222	30.17960556	50-100km
Local study area	Archaeological - LFC	1724/S.35-055	-25.69079722	30.216525	50-100km
Local study area	Archaeological - LFC	2179/Site3	-26.02861	29.26645	20-50 km
Local study area	Archaeological - LFC	5472/2530CC/S.35-004	-25.78262	30.01371	50-100km
Local study area	Archaeological - LFC	5472/2530CC/S.35-005	-25.77899	30.01805	50-100km
Local study area	Archaeological - LFC	672/2629AD104	-26.45655556	29.36538889	20-50 km
Local study area	Archaeological - LFC	672/2629AD105	-26.45311111	29.37536111	20-50 km
Local study area	Archaeological - LSA	1121/Site25	-26.04511	29.699321	10-20 km
Local study area	Archaeological - LSA	1165/TAV6	-26.06305556	29.24861111	20-50 km
Local study area	Archaeological - LSA	1722/S.35-016	-26.2567781	29.8219027	100-500 m
Local study area	Archaeological - LSA	1722/S.35-021	-26.2575935	29.8255654	500-1000 m
Local study area	Archaeological - LSA	1724/S.35-057	-25.68173056	30.21634444	50-100km
Local study area	Archaeological - LSA	659/2630AA3	-26.2	30.11666667	20-50 km
Local study area	Archaeological - MSA	1165/TAV3	-26.06277778	29.24833333	20-50 km
Local study area	Archaeological - MSA	1165/TAV5	-26.06222222	29.24833333	20-50 km
Local study area	Burial Grounds & Graves	1025/2629BB-MHC001	-26.167182	29.833532	1-5km
Local study area	Burial Grounds & Graves	1121/Site1	-26.02905	29.70858	10-20 km
Local study area	Burial Grounds & Graves	1121/Site11	-26.06165	29.73187	10-20 km
Local study area	Burial Grounds & Graves	1121/Site12	-26.05346	29.70794	10-20 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	1121/Site13	-26.05793	29.70924	10-20 km
Local study area	Burial Grounds & Graves	1121/Site14	-26.05617	29.70866	10-20 km
Local study area	Burial Grounds & Graves	1121/Site17	-26.04345	29.70358	10-20 km
Local study area	Burial Grounds & Graves	1121/Site18	-26.04399	29.70523	10-20 km
Local study area	Burial Grounds & Graves	1121/Site23	-26.04496	29.69539	10-20 km
Local study area	Burial Grounds & Graves	1121/Site24	-26.0473	29.6955	10-20 km
Local study area	Burial Grounds & Graves	1121/Site28	-26.07968	29.72251	10-20 km
Local study area	Burial Grounds & Graves	1121/Site29	-26.0876	29.735046	5-10 km
Local study area	Burial Grounds & Graves	1121/Site3	-26.03799	29.71769	10-20 km
Local study area	Burial Grounds & Graves	1121/Site30	-26.09163	29.73067	5-10 km
Local study area	Burial Grounds & Graves	1121/Site31	-26.08895	29.736358	5-10 km
Local study area	Burial Grounds & Graves	1121/Site34	-26.0961	29.70839	5-10 km
Local study area	Burial Grounds & Graves	1121/Site35	-26.09404	29.70996	5-10 km
Local study area	Burial Grounds & Graves	1121/Site37	-26.10118	29.72247	5-10 km
Local study area	Burial Grounds & Graves	1121/Site38	-26.09044	29.71513	5-10 km
Local study area	Burial Grounds & Graves	1121/Site39	-26.11469	29.71696	5-10 km
Local study area	Burial Grounds & Graves	1121/Site4	-26.03789	29.71708	10-20 km
Local study area	Burial Grounds & Graves	1121/Site41	-26.1218	29.72672	5-10 km
Local study area	Burial Grounds & Graves	1121/Site42	-26.12204	29.72638	5-10 km
Local study area	Burial Grounds & Graves	1121/Site43	-26.01972	29.72638	10-20 km
Local study area	Burial Grounds & Graves	1121/Site44	-26.02389	29.76528	10-20 km
Local study area	Burial Grounds & Graves	1121/Site45	-26.02472	29.77	10-20 km
Local study area	Burial Grounds & Graves	1121/Site48	-26.12749	29.72394	5-10 km
Local study area	Burial Grounds & Graves	1121/Site7	-26.06887	29.74246	10-20 km
Local study area	Burial Grounds & Graves	1121/Site9	-26.06963	29.73549	10-20 km
Local study area	Burial Grounds & Graves	11253/GY01	-26.01972222	29.79916667	10-20 km
Local study area	Burial Grounds & Graves	11253/GY02	-26.05777778	29.2825	20-50 km
Local study area	Burial Grounds & Graves	11253/GY03	-26	29	50-100km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	11253/GY04	-26.04666667	29.26611111	20-50 km
Local study area	Burial Grounds & Graves	11253/GY05	-26.03972222	29.26805556	20-50 km
Local study area	Burial Grounds & Graves	11253/GY06	-26.08305556	29.27611111	20-50 km
Local study area	Burial Grounds & Graves	1164/2629AA21	-26.12888889	29.02352778	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA22	-26.007	29.02238889	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA24	-26.03894444	29.05108333	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA25	-26.06891667	29.02580556	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA26	-26.077	29.02827778	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA28	-26.05533333	29.01225	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA29	-26.05069444	28.99869444	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA30	-26.03416667	29.01291667	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA31	-26.03416667	29.02566667	50-100km
Local study area	Burial Grounds & Graves	1164/2629AA32	-26.02838889	29.03033333	50-100km
Local study area	Burial Grounds & Graves	1165/TAV10	-26.10527778	29.15083333	50-100km
Local study area	Burial Grounds & Graves	1165/TAV11	-26.10527778	29.17027778	50-100km
Local study area	Burial Grounds & Graves	1165/TAV12	-26.10444444	29.17777778	50-100km
Local study area	Burial Grounds & Graves	1165/TAV13	-26.11361111	29.17555556	50-100km
Local study area	Burial Grounds & Graves	1165/TAV14	-26.1225	29.19138889	50-100km
Local study area	Burial Grounds & Graves	1165/TAV15	-26.07916667	29.23194444	50-100km
Local study area	Burial Grounds & Graves	1165/TAV16	-26.07888889	29.23055556	50-100km
Local study area	Burial Grounds & Graves	1165/TAV17	-26.0725	29.23416667	50-100km
Local study area	Burial Grounds & Graves	1165/TAV18	-26.06694444	29.24416667	20-50 km
Local study area	Burial Grounds & Graves	1165/TAV19	-26.06194444	29.24444444	20-50 km
Local study area	Burial Grounds & Graves	1165/TAV20	-26.05444444	29.2225	50-100km
Local study area	Burial Grounds & Graves	1165/TAV21	-26.05833333	29.21722222	50-100km
Local study area	Burial Grounds & Graves	1165/TAV22	-26.10138889	29.15333333	50-100km
Local study area	Burial Grounds & Graves	1165/TAV7	-26.11888889	29.13194444	50-100km
Local study area	Burial Grounds & Graves	1165/TAV8	-26.11666667	29.16583333	50-100km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	1165/TAV9	-26.14305556	29.16194444	50-100km
Local study area	Burial Grounds & Graves	138/Site Ramp 9/1	-25.73191667	30.09083333	50-100km
Local study area	Burial Grounds & Graves	1487/GN1	-25.84816667	29.87351667	20-50 km
Local study area	Burial Grounds & Graves	1487/GN5	-25.837	29.8974	20-50 km
Local study area	Burial Grounds & Graves	1487/GN6	-25.83771667	29.89328333	20-50 km
Local study area	Burial Grounds & Graves	1487/GN7	-25.84126667	29.91205	20-50 km
Local study area	Burial Grounds & Graves	1487/GY01	-25.887	29.87935	20-50 km
Local study area	Burial Grounds & Graves	1487/GY02	-25.88753333	29.6954948	20-50 km
Local study area	Burial Grounds & Graves	1487/GY03	-25.88008333	29.87891667	20-50 km
Local study area	Burial Grounds & Graves	1487/GY04	-25.87761667	29.6954948	20-50 km
Local study area	Burial Grounds & Graves	1487/GY05	-25.88416667	29.6954948	20-50 km
Local study area	Burial Grounds & Graves	1487/GY06	-25.8593	29.87336667	20-50 km
Local study area	Burial Grounds & Graves	1487/GY07	-25.85843333	29.87026667	20-50 km
Local study area	Burial Grounds & Graves	1487/GY08	-25.83508333	29.87905	20-50 km
Local study area	Burial Grounds & Graves	1487/GY09	-25.83973333	29.87236667	20-50 km
Local study area	Burial Grounds & Graves	1487/GY10	-25.83081667	29.89246667	20-50 km
Local study area	Burial Grounds & Graves	166/Site 1	-26.22930678	29.1716	50-100km
Local study area	Burial Grounds & Graves	1665/TAV23	-26.03388889	29.03888889	50-100km
Local study area	Burial Grounds & Graves	1668/Site2	-26.2039805	29.0352237	50-100km
Local study area	Burial Grounds & Graves	1668/Site3	-26.202162	29.0268606	50-100km
Local study area	Burial Grounds & Graves	1718/GY01	-26.21005	29.35915	20-50 km
Local study area	Burial Grounds & Graves	1718/GY02	-26.19116667	29.67792721	1-5km
Local study area	Burial Grounds & Graves	1718/GY02	-26.19116667	29.67792721	20-50 km
Local study area	Burial Grounds & Graves	1722/S.36-003	-26.2514798	29.8880871	1-5km
Local study area	Burial Grounds & Graves	1722/S.36-004	-26.2455143	29.8854878	1-5km
Local study area	Burial Grounds & Graves	1722/S.36-010	-26.2703012	29.8367239	<50 m
Local study area	Burial Grounds & Graves	1722/S.36-028	-26.2503167	29.9363396	5-10 km
Local study area	Burial Grounds & Graves	1724/S.36-047	-25.84275	30.23258611	50-100km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	1724/S.36-048	-25.83616389	30.22273056	50-100km
Local study area	Burial Grounds & Graves	1724/S.36-052	-25.77941389	30.17960556	50-100km
Local study area	Burial Grounds & Graves	174/GY01	-26.12575	29.77658703	5-10 km
Local study area	Burial Grounds & Graves	174/GY02	-26.12575	28.86208333	50-100km
Local study area	Burial Grounds & Graves	174/GY03	-26.23433333	28.85488333	50-100km
Local study area	Burial Grounds & Graves	174/GY04	-26.24336667	28.86098333	50-100km
Local study area	Burial Grounds & Graves	1803/Site 1	-25.89247	29.68424	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 10	-25.89134	29.6839	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 11	-25.89074	29.68281	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 12	-25.88977	29.68324	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 13	-25.8895	29.68414	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 16	-25.8969	29.73574	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 17	-25.89604	29.72943	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 18	-25.88338	29.74118	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 19	-25.87869	29.74446	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 2	-25.89398	29.68801	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 20	-25.88004	29.74565	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 21	-25.87973	29.74557	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 22	-25.88121	29.74552	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 23	-25.88209	29.74382	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 24	-25.88442	29.74226	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 25	-25.86495	29.68434	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 27	-25.86477	29.7237	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 29	-25.88141	29.7195	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 3	-25.90261	29.69	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 30	-25.88429	29.71473	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 31	-25.88586	29.71754	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 32	-25.88663	29.71729	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	1803/Site 33	-25.8899	29.71794	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 34	-25.89107	29.71741	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 35	-25.89289	29.71804	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 36	-25.90786	29.74041	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 4	-25.90521	29.69504	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 5	-25.90779	29.69918	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 7	-25.90398	29.72239	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 8	-25.89263	29.68508	20-50 km
Local study area	Burial Grounds & Graves	1803/Site 9	-25.89189	29.68511	20-50 km
Local study area	Burial Grounds & Graves	2179/Site2	-26.05725	29.28211	20-50 km
Local study area	Burial Grounds & Graves	2261/ADC1	-26.15984	29.16321	50-100km
Local study area	Burial Grounds & Graves	2261/ADC10	-26.14646	29.10326	50-100km
Local study area	Burial Grounds & Graves	2261/ADC12	-26.14593	29.13098	50-100km
Local study area	Burial Grounds & Graves	2261/ADC13	-26.14	29.13471	50-100km
Local study area	Burial Grounds & Graves	2261/ADC14	-26.14666	29.12284	50-100km
Local study area	Burial Grounds & Graves	2261/ADC15	-26.15251	29.12332	50-100km
Local study area	Burial Grounds & Graves	2261/ADC16	-26.14969	29.11686	50-100km
Local study area	Burial Grounds & Graves	2261/ADC17	-26.15633	29.12293	50-100km
Local study area	Burial Grounds & Graves	2261/ADC18	-26.16228	29.11701	50-100km
Local study area	Burial Grounds & Graves	2261/ADC19	-26.165	29.11289	50-100km
Local study area	Burial Grounds & Graves	2261/ADC2	-26.15438	29.15111	50-100km
Local study area	Burial Grounds & Graves	2261/ADC20	-26.17045	29.11955	50-100km
Local study area	Burial Grounds & Graves	2261/ADC21	-26.17011	29.12195	50-100km
Local study area	Burial Grounds & Graves	2261/ADC22	-26.15747	29.11505	50-100km
Local study area	Burial Grounds & Graves	2261/ADC25	-26.16066	29.13275	50-100km
Local study area	Burial Grounds & Graves	2261/ADC28	-26.16826	29.13972	50-100km
Local study area	Burial Grounds & Graves	2261/ADC3	-26.16677	29.15696	50-100km
Local study area	Burial Grounds & Graves	2261/ADC30	-26.178	29.11986	50-100km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	2261/ADC31	-26.16756	29.17903	50-100km
Local study area	Burial Grounds & Graves	2261/ADC32	-26.172	29.17852	50-100km
Local study area	Burial Grounds & Graves	2261/ADC33	-26.17176	29.17626	50-100km
Local study area	Burial Grounds & Graves	2261/ADC36	-26.16583	29.1694	50-100km
Local study area	Burial Grounds & Graves	2261/ADC37	-26.1516	29.17094	50-100km
Local study area	Burial Grounds & Graves	2261/ADC38	-26.14507	29.17782	50-100km
Local study area	Burial Grounds & Graves	2261/ADC39	-26.15463	29.15522	50-100km
Local study area	Burial Grounds & Graves	2261/ADC4	-26.16518	29.15306	50-100km
Local study area	Burial Grounds & Graves	2261/ADC42	-26.14412	29.16989	50-100km
Local study area	Burial Grounds & Graves	2261/ADC46	-26.12278	29.19102	50-100km
Local study area	Burial Grounds & Graves	2261/ADC47	-26.12132	29.19411	50-100km
Local study area	Burial Grounds & Graves	2261/ADC48	-26.1332	29.17236	50-100km
Local study area	Burial Grounds & Graves	2261/ADC49	-26.1432	29.16193	50-100km
Local study area	Burial Grounds & Graves	2261/ADC5	-26.18682	29.12319	50-100km
Local study area	Burial Grounds & Graves	2261/ADC50	-26.13571	29.14169	50-100km
Local study area	Burial Grounds & Graves	2261/ADC51	-26.1273	29.14683	50-100km
Local study area	Burial Grounds & Graves	2261/ADC53	-26.15418	29.13205	50-100km
Local study area	Burial Grounds & Graves	2261/ADC6	-26.14973	29.09588	50-100km
Local study area	Burial Grounds & Graves	2261/ADC60	-26.12726	29.13438	50-100km
Local study area	Burial Grounds & Graves	2261/ADC61	-26.19421	29.13142	50-100km
Local study area	Burial Grounds & Graves	2261/ADC7	-26.14531	29.09689	50-100km
Local study area	Burial Grounds & Graves	2261/ADC8	-26.14436	29.09784	50-100km
Local study area	Burial Grounds & Graves	2859/Site9	-25.86166667	29.40222222	20-50 km
Local study area	Burial Grounds & Graves	3020/S.36-001	-26.063025	29.248608	20-50 km
Local study area	Burial Grounds & Graves	3020/S.36-002	-26.07916	29.231954	50-100km
Local study area	Burial Grounds & Graves	3020/S.36-003	-26.078884	29.230551	50-100km
Local study area	Burial Grounds & Graves	4249/GY01	-26.07485001	29.54141253	20-50 km
Local study area	Burial Grounds & Graves	4249/GY02	-25.9571	29.54141253	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	4309/Site 1	-26.09315	29.98875	20-50 km
Local study area	Burial Grounds & Graves	4309/Site 3	-26.08621667	29.99103333	20-50 km
Local study area	Burial Grounds & Graves	4309/Site 4	-26.0709	30.00123333	20-50 km
Local study area	Burial Grounds & Graves	466/Rood 1	-26.18704	29.23396	20-50 km
Local study area	Burial Grounds & Graves	4912/S.36-001	-26.36965	29.09981111	50-100km
Local study area	Burial Grounds & Graves	4912/S.36-002	-26.38976944	29.10240833	50-100km
Local study area	Burial Grounds & Graves	4912/S.36-003	-26.40796944	29.09373056	50-100km
Local study area	Burial Grounds & Graves	4912/S.36-004	-26.42571389	29.14623333	50-100km
Local study area	Burial Grounds & Graves	5472/2530CC/S.36-006	-25.76638	30.02074	50-100km
Local study area	Burial Grounds & Graves	5472/2530CC/S.36-007	-25.76956	30.015025	50-100km
Local study area	Burial Grounds & Graves	5914/Site 1	-25.69269444	29.23411111	50-100km
Local study area	Burial Grounds & Graves	6251/G01	-25.88488333	29.77403333	20-50 km
Local study area	Burial Grounds & Graves	6251/G04	-25.88025	29.77583333	20-50 km
Local study area	Burial Grounds & Graves	6251/G09	-25.87376667	29.80775	20-50 km
Local study area	Burial Grounds & Graves	6251/G11	-25.88538333	29.82498333	20-50 km
Local study area	Burial Grounds & Graves	6251/G12	-25.8974	29.81385	20-50 km
Local study area	Burial Grounds & Graves	6251/G26	-25.99546667	29.79648333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY02	-25.88616667	29.77266667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY03	-25.87913333	29.77065	20-50 km
Local study area	Burial Grounds & Graves	6251/GY05	-25.88165	29.78318333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY06	-25.85918333	29.77363333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY07	-25.86076667	29.77521667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY08	-25.85676667	29.79895	20-50 km
Local study area	Burial Grounds & Graves	6251/GY10	-25.88013333	29.82401667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY13	-25.89665	29.82583333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY14	-25.89665	29.82583333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY15	-25.87015	29.82911667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY16	-25.85815	29.81855	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	6251/GY17	-25.87526667	29.81801667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY18	-25.8661	29.85133333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY19	-25.932	29.86703333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY20	-25.94383333	29.86896667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY21	-25.94083333	29.86881667	20-50 km
Local study area	Burial Grounds & Graves	6251/GY22	-25.9282	29.87125	20-50 km
Local study area	Burial Grounds & Graves	6251/GY23	-25.92488333	29.87605	20-50 km
Local study area	Burial Grounds & Graves	6251/GY24	-25.89391667	29.85948333	20-50 km
Local study area	Burial Grounds & Graves	6251/GY27	-26.00158333	29.79271667	10-20 km
Local study area	Burial Grounds & Graves	6251/GY28	-25.86115	29.75461	20-50 km
Local study area	Burial Grounds & Graves	6251/GY29	-25.88423	29.76413	20-50 km
Local study area	Burial Grounds & Graves	6251/GY30	-25.88791	29.76916	20-50 km
Local study area	Burial Grounds & Graves	6251/GY31	-25.89949	29.7778	20-50 km
Local study area	Burial Grounds & Graves	6251/GY32	-25.89888	29.7647	20-50 km
Local study area	Burial Grounds & Graves	6251/GY33	-25.92141	29.76779	20-50 km
Local study area	Burial Grounds & Graves	6357/2530CC/S.36-003	-25.8674	30.00715	20-50 km
Local study area	Burial Grounds & Graves	6357/Site 1	-25.86778	30.00930556	20-50 km
Local study area	Burial Grounds & Graves	6391/AE6	-26.09254	29.27044	20-50 km
Local study area	Burial Grounds & Graves	6391/AR10	-26.09985278	29.27390556	20-50 km
Local study area	Burial Grounds & Graves	6391/AR16	-26.1067	29.26826111	20-50 km
Local study area	Burial Grounds & Graves	6391/AR17	-26.09841667	29.27015556	20-50 km
Local study area	Burial Grounds & Graves	6391/AR18	-26.08719167	29.23938889	20-50 km
Local study area	Burial Grounds & Graves	6391/AR20	-26.10647778	29.26791944	20-50 km
Local study area	Burial Grounds & Graves	6391/AR9	-26.10584444	29.26701389	20-50 km
Local study area	Burial Grounds & Graves	6391/AS4	-26.096125	29.26695833	20-50 km
Local study area	Burial Grounds & Graves	6391/AS5	-26.09978333	29.27348611	20-50 km
Local study area	Burial Grounds & Graves	6391/FR3	-26.10595	29.26771389	20-50 km
Local study area	Burial Grounds & Graves	6391/FR4	-26.10670833	29.26865833	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	6391/Grave Site 1	-26.07129722	29.25150556	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 2	-26.07245556	29.24863056	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 3	-26.08113333	29.24959444	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 4	-26.099875	29.26221389	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 5	-26.10074167	29.28993056	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 6	-26.10788611	29.26966667	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 7	-26.10869444	29.26858056	20-50 km
Local study area	Burial Grounds & Graves	6391/Grave Site 9	-26.12147778	29.27035278	20-50 km
Local study area	Burial Grounds & Graves	6391/K10	-26.10579722	29.26761389	20-50 km
Local study area	Burial Grounds & Graves	6391/K11	-26.10553333	29.26761389	20-50 km
Local study area	Burial Grounds & Graves	6391/K12	-26.106375	29.26862778	20-50 km
Local study area	Burial Grounds & Graves	6391/K13	-26.10549444	29.26781111	20-50 km
Local study area	Burial Grounds & Graves	6391/K30	-26.09865833	29.28529167	20-50 km
Local study area	Burial Grounds & Graves	6391/K31	-26.10611111	29.26798611	20-50 km
Local study area	Burial Grounds & Graves	6391/K32	-26.08848889	29.25175	20-50 km
Local study area	Burial Grounds & Graves	6391/K9	-26.10591111	29.26752778	20-50 km
Local study area	Burial Grounds & Graves	6391/KR1	-26.08918889	29.25225278	20-50 km
Local study area	Burial Grounds & Graves	6391/KR12	-26.09235	29.25459167	20-50 km
Local study area	Burial Grounds & Graves	6391/KR13	-26.08699722	29.25125833	20-50 km
Local study area	Burial Grounds & Graves	6391/KR14	-26.08191667	29.24974444	20-50 km
Local study area	Burial Grounds & Graves	6391/KR16	-26.07115	29.25132222	20-50 km
Local study area	Burial Grounds & Graves	6391/KR17	-26.07088889	29.24822778	20-50 km
Local study area	Burial Grounds & Graves	6391/KR18	-26.08650833	29.25113611	20-50 km
Local study area	Burial Grounds & Graves	6391/KR2	-26.09045	29.27833333	20-50 km
Local study area	Burial Grounds & Graves	6391/KR3	-26.08578056	29.25093056	20-50 km
Local study area	Burial Grounds & Graves	6492/GY01	-25.98556667	29.54141248	20-50 km
Local study area	Burial Grounds & Graves	6492/GY02	-26.07485	29.54141248	20-50 km
Local study area	Burial Grounds & Graves	6492/GY03	-25.97243333	29.61337417	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	6492/GY04	-25.99895	29.61337417	20-50 km
Local study area	Burial Grounds & Graves	6492/GY05	-25.99301667	29.61337417	20-50 km
Local study area	Burial Grounds & Graves	6492/GY06	-25.9932	29.61337417	20-50 km
Local study area	Burial Grounds & Graves	6492/GY07	-25.95078333	29.67792721	20-50 km
Local study area	Burial Grounds & Graves	6492/GY08	-25.9509	29.67792721	20-50 km
Local study area	Burial Grounds & Graves	654/2629AA1	-26.19838889	29.17413889	50-100km
Local study area	Burial Grounds & Graves	654/2629AA13	-26.23488889	29.13819444	50-100km
Local study area	Burial Grounds & Graves	654/2629AA14	-26.21247222	29.12622222	50-100km
Local study area	Burial Grounds & Graves	654/2629AA15	-26.19422222	29.15394444	50-100km
Local study area	Burial Grounds & Graves	654/2629AA16	-26.20975	29.15577778	50-100km
Local study area	Burial Grounds & Graves	654/2629AA18	-26.20122222	29.17552778	50-100km
Local study area	Burial Grounds & Graves	654/2629AA19	-26.17666667	29.17208333	50-100km
Local study area	Burial Grounds & Graves	654/2629AA2	-26.19541667	29.17563889	50-100km
Local study area	Burial Grounds & Graves	654/2629AA4	-26.19511111	29.17880556	50-100km
Local study area	Burial Grounds & Graves	654/2629AA7	-26.20458333	29.15677778	50-100km
Local study area	Burial Grounds & Graves	654/2629AA8	-26.20386111	29.15691667	50-100km
Local study area	Burial Grounds & Graves	659/2630AA5	-26.17066667	30.15219444	20-50 km
Local study area	Burial Grounds & Graves	659/2630AA7	-26.19716667	30.109	20-50 km
Local study area	Burial Grounds & Graves	659/2630AA8	-26.20205556	30.10169444	20-50 km
Local study area	Burial Grounds & Graves	662/2629BC2	-26.39694444	29.615	10-20 km
Local study area	Burial Grounds & Graves	662/2629BC3	-26.3975	29.61555556	10-20 km
Local study area	Burial Grounds & Graves	662/2629BC4	-26.41444444	29.56527778	20-50 km
Local study area	Burial Grounds & Graves	662/2629BC5	-26.41916667	29.50305556	20-50 km
Local study area	Burial Grounds & Graves	672/2629AC16	-26.52183333	29.23708333	50-100km
Local study area	Burial Grounds & Graves	672/2629AD103	-26.43613889	29.42761111	20-50 km
Local study area	Burial Grounds & Graves	684/2629AB7	-26.16302778	29.47255556	20-50 km
Local study area	Burial Grounds & Graves	684/2629BA1	-26.15530556	29.52438889	10-20 km
Local study area	Burial Grounds & Graves	684/2629BA2	-26.15791667	29.57805556	10-20 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Burial Grounds & Graves	687/GY01	-26.01972222	29.79916667	10-20 km
Local study area	Burial Grounds & Graves	687/GY02	-26.02388889	29.76527778	10-20 km
Local study area	Burial Grounds & Graves	687/GY03	-26.02472222	29.77	10-20 km
Local study area	Burial Grounds & Graves	710/2628AA33	-26.20858333	29.00730556	50-100km
Local study area	Burial Grounds & Graves	710/2628AA34	-26.21069444	29.04983333	50-100km
Local study area	Burial Grounds & Graves	710/2628BB2	-26.23277778	28.99288889	50-100km
Local study area	Burial Grounds & Graves	710/2628BB3	-26.16663889	28.99572222	50-100km
Local study area	Burial Grounds & Graves	710/2628BB4	-26.12072222	28.96247222	50-100km
Local study area	Burial Grounds & Graves	710/2628BB5	-26.13180556	28.96563889	50-100km
Local study area	Burial Grounds & Graves	710/2628BB6	-26.13197222	28.97138889	50-100km
Local study area	Burial Grounds & Graves	710/2628BB7	-26.15877778	28.96525	50-100km
Local study area	Burial Grounds & Graves	710/2628BB8	-26.16705556	28.97791667	50-100km
Local study area	Burial Grounds & Graves	710/2629AA35	-26.15025	29.00375	50-100km
Local study area	Burial Grounds & Graves	711/2629AA26	-26.077	29.02827778	50-100km
Local study area	Burial Grounds & Graves	711/2629AA36	-26.08405556	29.02972222	50-100km
Local study area	Burial Grounds & Graves	711/2629AA37	-26.08866667	29.02644444	50-100km
Local study area	Burial Grounds & Graves	711/2629AA41	-26.11244444	29.01975	50-100km
Local study area	Burial Grounds & Graves	8410/Site 13	-26.12225	29.41036111	20-50 km
Local study area	Burial Grounds & Graves	8410/Site 5	-26.12313889	29.46605556	20-50 km
Local study area	Burial Grounds & Graves	8410/Site 6	-26.13863889	29.41883333	20-50 km
Local study area	Historical Built Environment	1025/2629BB-MHC002	-26.1677274	29.832038	1-5km
Local study area	Historical Built Environment	1121/Site10	-26.06819	29.73092	10-20 km
Local study area	Historical Built Environment	1121/Site15	-26.05386	29.7114	10-20 km
Local study area	Historical Built Environment	1121/Site16	-26.04687	29.70436	10-20 km
Local study area	Historical Built Environment	1121/Site19	-26.05046	29.69876	10-20 km
Local study area	Historical Built Environment	1121/Site2	-26.02833	29.70855	10-20 km
Local study area	Historical Built Environment	1121/Site20	-26.04724	29.69121	10-20 km
Local study area	Historical Built Environment	1121/Site21	-26.04693	29.69306	10-20 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Historical Built Environment	1121/Site22	-26.04732	29.69502	10-20 km
Local study area	Historical Built Environment	1121/Site32	-26.08639	29.69277	10-20 km
Local study area	Historical Built Environment	1121/Site33	-26.09255	29.70178	10-20 km
Local study area	Historical Built Environment	1121/Site36	-26.10527	29.71892	5-10 km
Local study area	Historical Built Environment	1121/Site40	-26.11782	29.71884	5-10 km
Local study area	Historical Built Environment	1121/Site46	-26.02444	29.77467	10-20 km
Local study area	Historical Built Environment	1121/Site47	-26.02599	29.76549	10-20 km
Local study area	Historical Built Environment	1121/Site49	-26.06534	29.68195	10-20 km
Local study area	Historical Built Environment	1121/Site5	-26.03889	29.71731	10-20 km
Local study area	Historical Built Environment	1121/Site50	-26.07145	29.68473	10-20 km
Local study area	Historical Built Environment	1121/Site51	-26.08701	29.707837	10-20 km
Local study area	Historical Built Environment	1121/Site52	-26.09743	29.70837	5-10 km
Local study area	Historical Built Environment	1121/Site53	-26.12344	29.72345	5-10 km
Local study area	Historical Built Environment	1121/Site54	-26.1172	29.72311	5-10 km
Local study area	Historical Built Environment	1121/Site55	-26.0318	29.75694	10-20 km
Local study area	Historical Built Environment	1121/Site56	-26.02852	29.72181	10-20 km
Local study area	Historical Built Environment	1121/Site6	-26.04495	29.71545	10-20 km
Local study area	Historical Built Environment	1121/Site8	-26.0656	29.73982	10-20 km
Local study area	Historical Built Environment	1164/2629AA23	-26.02686111	29.05186111	50-100km
Local study area	Historical Built Environment	1164/2629AA27	-26.07786111	29.02725	50-100km
Local study area	Historical Built Environment	138/Site Ramp 9/2	-25.72983333	30.08686111	50-100km
Local study area	Historical Built Environment	1487/HH01	-25.88578333	29.87758333	20-50 km
Local study area	Historical Built Environment	1487/HH02	-25.83353333	29.87741667	20-50 km
Local study area	Historical Built Environment	1668/Site1	-26.2027682	29.0292263	50-100km
Local study area	Historical Built Environment	1718/HFC1	-26.20923333	29.67792721	1-5km
Local study area	Historical Built Environment	1718/HFC1	-26.20923333	29.67792721	20-50 km
Local study area	Historical Built Environment	1718/HFC2	-26.19668333	29.34203333	20-50 km
Local study area	Historical Built Environment	1718/MH01	-26.20408333	29.36448333	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Historical Built Environment	1722/S.34-001	-26.2538161	29.8873307	1-5km
Local study area	Historical Built Environment	1722/S.34-002	-26.254398	29.8874342	1-5km
Local study area	Historical Built Environment	1722/S.34-005	-26.2529932	29.890238	1-5km
Local study area	Historical Built Environment	1722/S.34-006	-26.2632221	29.8690339	1-5km
Local study area	Historical Built Environment	1722/S.34-008	-26.2388446	29.8716846	1-5km
Local study area	Historical Built Environment	1722/S.34-009	-26.2179778	29.8281673	1-5km
Local study area	Historical Built Environment	1722/S.34-011	-26.269217	29.8390613	50-100 m
Local study area	Historical Built Environment	1722/S.34-012	-26.268828	29.8355174	100-500 m
Local study area	Historical Built Environment	1722/S.34-022	-26.2681458	29.9393975	5-10 km
Local study area	Historical Built Environment	1722/S.34-026	-26.2644655	29.9491191	5-10 km
Local study area	Historical Built Environment	1722/S.34-027	-26.2574826	29.9508838	10-20 km
Local study area	Historical Built Environment	1722/S.35-020	-26.2531263	29.8140734	<50 m
Local study area	Historical Built Environment	1724/S.34-046	-25.84254722	30.22794167	50-100km
Local study area	Historical Built Environment	1724/S.34-050	-25.78314167	30.185625	50-100km
Local study area	Historical Built Environment	1724/S.34-053	-25.7836	30.17581111	50-100km
Local study area	Historical Built Environment	1724/S.34-054	-25.79304167	30.16973889	50-100km
Local study area	Historical Built Environment	1724/S.35-049	-25.84153611	30.20179722	50-100km
Local study area	Historical Built Environment	174/S01	-26.04502983	28.86128333	50-100km
Local study area	Historical Built Environment	1803/Site 14	-25.88617	29.67254	20-50 km
Local study area	Historical Built Environment	1803/Site 15	-25.89399	29.68478	20-50 km
Local study area	Historical Built Environment	1803/Site 26	-25.86865	29.7335	20-50 km
Local study area	Historical Built Environment	1803/Site 28	-25.87163	29.71016	20-50 km
Local study area	Historical Built Environment	1803/Site 6	-25.90897	29.70108	20-50 km
Local study area	Historical Built Environment	2179/Site1	-26.0579	29.28435	20-50 km
Local study area	Historical Built Environment	2179/Site4	-26.05588	29.27154	20-50 km
Local study area	Historical Built Environment	2261/ADC11	-26.14581	29.13192	50-100km
Local study area	Historical Built Environment	2261/ADC23	-26.15598	29.13552	50-100km
Local study area	Historical Built Environment	2261/ADC24	-26.14796	29.13173	50-100km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Historical Built Environment	2261/ADC26	-26.16537	29.13039	50-100km
Local study area	Historical Built Environment	2261/ADC27	-26.16451	29.13931	50-100km
Local study area	Historical Built Environment	2261/ADC29	-26.17416	29.12332	50-100km
Local study area	Historical Built Environment	2261/ADC34	-26.16961	29.17858	50-100km
Local study area	Historical Built Environment	2261/ADC35	-26.16836	29.17985	50-100km
Local study area	Historical Built Environment	2261/ADC40	-26.15834	29.16134	50-100km
Local study area	Historical Built Environment	2261/ADC41	-26.16072	29.16217	50-100km
Local study area	Historical Built Environment	2261/ADC43	-26.13604	29.18111	50-100km
Local study area	Historical Built Environment	2261/ADC44	-26.13561	29.17715	50-100km
Local study area	Historical Built Environment	2261/ADC45	-26.14992	29.15601	50-100km
Local study area	Historical Built Environment	2261/ADC52	-26.15248	29.16907	50-100km
Local study area	Historical Built Environment	2261/ADC54	-26.14478	29.16482	50-100km
Local study area	Historical Built Environment	2261/ADC55	-26.14081	29.18462	50-100km
Local study area	Historical Built Environment	2261/ADC56	-26.13586	29.1843	50-100km
Local study area	Historical Built Environment	2261/ADC57	-26.15047	29.14557	50-100km
Local study area	Historical Built Environment	2261/ADC58	-26.16516	29.1636	50-100km
Local study area	Historical Built Environment	2261/ADC59	-26.13477	29.09018	50-100km
Local study area	Historical Built Environment	2261/ADC62	-26.16685	29.16678	50-100km
Local study area	Historical Built Environment	2261/ADC63	-26.16186	29.12073	50-100km
Local study area	Historical Built Environment	2261/ADC64	-26.1606	29.11272	50-100km
Local study area	Historical Built Environment	2261/ADC65	-26.17031	29.123032	50-100km
Local study area	Historical Built Environment	2261/ADC9	-26.14551	29.10272	50-100km
Local study area	Historical Built Environment	2859/Site10	-25.865	29.40277778	20-50 km
Local study area	Historical Built Environment	2859/Site4	-25.85694444	29.40666667	20-50 km
Local study area	Historical Built Environment	2859/Site5	-25.85833333	29.4075	20-50 km
Local study area	Historical Built Environment	2859/Site6	-25.85444444	29.41611111	20-50 km
Local study area	Historical Built Environment	2859/Site7	-25.85611111	29.40194444	20-50 km
Local study area	Historical Built Environment	2859/Site8	-25.86111111	29.4125	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Historical Built Environment	2907/Site1	-26.22666667	29.29888889	20-50 km
Local study area	Historical Built Environment	2907/Site2	-26.23388889	29.30361111	20-50 km
Local study area	Historical Built Environment	3020/S.34-005	-26.0725	29.234167	50-100km
Local study area	Historical Built Environment	3020/S.34-006	-26.066944	29.244167	20-50 km
Local study area	Historical Built Environment	3020/S.34-007	-26.061914	29.244516	20-50 km
Local study area	Historical Built Environment	3020/S.34-008	-26.046016	29.19529	50-100km
Local study area	Historical Built Environment	4309/Site 2	-26.09171667	29.98826667	20-50 km
Local study area	Historical Built Environment	4912/S.34-001	-26.37108611	29.10101944	50-100km
Local study area	Historical Built Environment	4912/S.34-002	-26.42892222	29.13667222	50-100km
Local study area	Historical Built Environment	4912/S.34-003	-26.38339722	29.16727778	50-100km
Local study area	Historical Built Environment	4912/S.34-004	-26.44124722	29.15248611	50-100km
Local study area	Historical Built Environment	5472/2530CC/S.34-001	-25.7777	30.02106	50-100km
Local study area	Historical Built Environment	5472/2530CC/S.34-002	-25.766331	30.034507	50-100km
Local study area	Historical Built Environment	5472/2530CC/S.34-003	-25.787703	30.010818	20-50 km
Local study area	Historical Built Environment	6251/CE01	-25.87635	29.76806667	20-50 km
Local study area	Historical Built Environment	6251/CE02	-25.86276667	29.82128333	20-50 km
Local study area	Historical Built Environment	6251/FC01	-25.85615	29.78875	20-50 km
Local study area	Historical Built Environment	6251/FC02	-25.88555	29.82593333	20-50 km
Local study area	Historical Built Environment	6251/FC03	-25.8881	29.82628333	20-50 km
Local study area	Historical Built Environment	6251/FC04	-25.85161667	29.85826667	20-50 km
Local study area	Historical Built Environment	6251/FC05	-25.89885	29.81158333	20-50 km
Local study area	Historical Built Environment	6251/FC06	-25.91778333	29.81813333	20-50 km
Local study area	Historical Built Environment	6251/FC07	-25.90571667	29.85996667	20-50 km
Local study area	Historical Built Environment	6251/FC08	-25.99196667	29.80261667	20-50 km
Local study area	Historical Built Environment	6251/FC09	-25.86639	29.75548	20-50 km
Local study area	Historical Built Environment	6251/FC10	-25.91395	29.76516	20-50 km
Local study area	Historical Built Environment	6251/HH01	-25.85566667	29.78933333	20-50 km
Local study area	Historical Built Environment	6251/HH02	-25.88363333	29.82033333	20-50 km

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Historical Built Environment	6251/HH04	-25.92016667	29.85925	20-50 km
Local study area	Historical Built Environment	6251/HH05	-25.87457225	29.86768333	20-50 km
Local study area	Historical Built Environment	6251/HH06	-25.99768333	29.79703333	20-50 km
Local study area	Historical Built Environment	6251/SR01	-25.88006667	29.7839	20-50 km
Local study area	Historical Built Environment	6357/Site 2	-25.86594	30.00752778	20-50 km
Local study area	Historical Built Environment	6391/AR19	-26.09291667	29.25718333	20-50 km
Local study area	Historical Built Environment	6391/AR5	-26.09284444	29.25672778	20-50 km
Local study area	Historical Built Environment	6391/FH6	-26.09266667	29.25591944	20-50 km
Local study area	Historical Built Environment	6391/FH7	-26.09191944	29.25431944	20-50 km
Local study area	Historical Built Environment	654/2629AA10	-26.21894444	29.14375	50-100km
Local study area	Historical Built Environment	654/2629AA11	-26.22397222	29.14347222	50-100km
Local study area	Historical Built Environment	654/2629AA12	-26.22569444	29.1405	50-100km
Local study area	Historical Built Environment	654/2629AA17	-26.20122222	29.17091667	50-100km
Local study area	Historical Built Environment	654/2629AA3	-26.19552778	29.17630556	50-100km
Local study area	Historical Built Environment	654/2629AA5	-26.19838889	29.17783333	50-100km
Local study area	Historical Built Environment	654/2629AA6	-26.20458333	29.15677778	50-100km
Local study area	Historical Built Environment	654/2629AA9	-26.21122222	29.13194444	50-100km
Local study area	Historical Built Environment	684/2629AB6	-26.16408333	29.4645	20-50 km
Local study area	Historical Built Environment	711/2629AA27	-26.07786111	29.02725	50-100km
Local study area	Historical Built Environment	711/2629AA38	-26.08925	29.022	50-100km
Local study area	Historical Built Environment	711/2629AA39	-26.10316667	29.02255556	50-100km
Local study area	Historical Built Environment	711/2629AA40	-26.11125	29.01716667	50-100km
Local study area	Historical Built Environment	8410/Site 7	-26.11522222	29.41136111	20-50 km
Local study area	Historical Built Environment	8481/HP01	-26.15436	29.71589	1-5km
Local study area	Historical Built Environment	8481/HP02	-26.10691	29.69598	5-10 km
Local study area	Historical Built Environment	8481/HP03	-26.06565	29.68197	10-20 km
Local study area	Historical Built Environment	8481/HP04	-26.03408	29.66188	10-20 km
Local study area	Palaeontological	1722/S.35-042	-26.26908	29.839051	50-100 m

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Local study area	Palaeontological	1722/S.35-043	-26.268997	29.838686	100-500 m
Local study area	Palaeontological	1722/S.35-044	-26.226136	29.860824	1-5km
Local study area	Palaeontological	1724/S.35-056	-25.68111667	30.21679167	50-100km
Local study area	Recent heritage	1718/RP01	-26.20111667	29.35095	20-50 km
Local study area	Recent heritage	1718/RP02	-26.2021	29.34045	20-50 km
Local study area	Recent heritage	687/RRP01	-26.02027778	29.79583333	10-20 km
Local study area	Recent heritage	8481/FT01	-26.07707	29.68679	10-20 km
Local study area	Recent heritage	8481/FT02	-26.05546	29.67407	10-20 km
Secondary study area	Archaeological - LFC	1722/S.35-013	-26.2827161	29.8360834	<50 m
Secondary study area	Archaeological - LSA	1722/S.35-015	-26.2730562	29.8343102	<50 m
Secondary study area	Archaeological - LSA	1722/S.35-019	-26.2552449	29.8147442	<50 m
Secondary study area	Archaeological - LSA	1722/S.35-029	-26.273691	29.832906	<50 m
Secondary study area	Archaeological - MSA	1722/S.35-014	-26.283057	29.8343425	<50 m
Secondary study area	Burial Grounds & Graves	1722/S.36-017	-26.2563554	29.8170457	<50 m
Secondary study area	Historical Built Environment	1722/S.34-030	-26.271387	29.833757	<50 m
Secondary study area	Historical Built Environment	1722/S.35-018	-26.2550143	29.8158297	<50 m
Secondary study area	Palaeontological	1722/S.35-034	-26.277381	29.832992	<50 m
Secondary study area	Palaeontological	1722/S.35-035	-26.276266	29.833314	<50 m
Secondary study area	Palaeontological	1722/S.35-036	-26.273667	29.832995	<50 m
Secondary study area	Palaeontological	1722/S.35-040	-26.272183	29.833864	<50 m
Unknown	Burial Grounds & Graves	687/GY04			Unknown – Information unavailable
Unknown	Burial Grounds & Graves	687/GY05			
Unknown	Burial Grounds & Graves	687/GY06			
Unknown	Burial Grounds & Graves	687/GY07			
Unknown	Historical Built Environment	687/HH01			
Unknown	Historical Built Environment	687/HH02			
Unknown	Historical Built Environment	687/HH03			
Unknown	Historical Built Environment	687/HH04			

Study Area	Heritage Resource Type	Site Name	Latitude	Longitude	Distance from Development Footprint
Unknown	Recent heritage	687/MFC01			
Unknown	Recent heritage	687/MFC02			
Unknown	Recent heritage	687/MFC03			
Unknown	Recent heritage	687/MFC04			