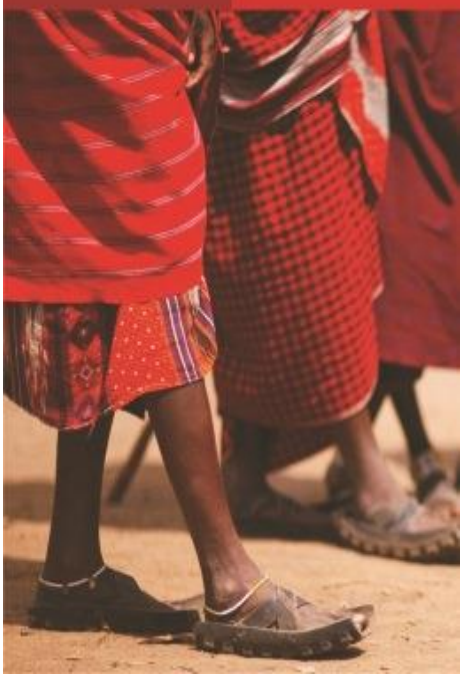

DIGBY WELLS
ENVIRONMENTAL

Rietfontein Prospecting EMP, Rietfontein 101IS, 2629AD, Kriel, Mpumalanga Province

Heritage Impact Assessment

Project Number:

APM2880

Prepared for:

Rustenburg Platinum Mines (Pty) Ltd

March 2015

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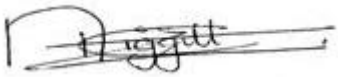
This document has been prepared by Digby Wells Environmental.

Report Type:	**Heritage Impact Assessment**
Project Name:	**Rietfontein Prospecting EMP, Rietfontein 101IS, 2629AD, Kriel, Mpumalanga Province**
Project Code:	**APM2880**

Name	Responsibility	Signature	Date
Natasha Higgitt Assistant Heritage Management Consultant: Archaeologist ASAPA Member: 355	Researcher Field Survey Statement of Significance Impact Assessment Recommendations		April 2015
Johan Nel HRM Unit Manager ASAPA Member 095	1st review		March 2015

EXECUTIVE SUMMARY

Digby Wells Environmental (hereafter Digby Wells) was requested by Rustenburg Platinum Mines (Pty) Ltd (hereafter RPM), a subsidiary of Anglo American Platinum Limited (AAP) for the compilation and submission of an Environmental Management Plan (EMP) and Consultation Report for the Rietfontein Prospecting Project. The EMP was conducted in support of a Prospecting Right Application (Ref No. MP30//5/1/1/2/11683PR).

The Rietfontein Project is located on the farm Rietfontein 101IS Portions 1-5 and remaining, approximately 9 km from Kriel, Mpumalanga Province. The project will entail five prospecting boreholes to be drilled (one per year).

A Notification of Intent to Develop (NID) was compiled and submitted to the South African Heritage Resources Agency (SAHRA) (Case ID: 6397) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA) for Statutory Comment as prescribed under Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). Statutory Comment was issued on 23 October 2014 and again on the 14 November 2014. SAHRA requested that the identified sites be assigned a value of significance and an impact assessment must be done. Additionally, SAHRA requested that the identified heritage resources be verified and photographs taken and the proposed prospecting sites be surveyed.

A total of 14 heritage resources were identified within the project area, however all identified heritage resources are over 150 m from all proposed drill points. These, with the significance rating and designation are summarised in the table below.

Heritage Resources	**Recommended Field Rating**
General Protection IV A field rating	**3**
Very High significance	**1**
APM2880/BGG/004	1
A fenced burial ground containing 9 graves, the oldest being from 1923. This cemetery is within 20m of a discard dump and haul road and is located 610m from Rietfontein 003.	1
Medium High significance field rating	**2**
IXI3003/St/001	1
The site comprises three individual features i.e. historic homestead, burial ground and a midden. The site measures 40 m x 20 m in extent and is located 1 km from the Rietfontein 005 prospecting borehole (closest prospecting site)	1
IXI3003/St/002	1
The site comprises three individual features i.e. historic homestead, burial ground and a midden. The site measures 70 m x 50 m in extent and is located 955 m from the Rietfontein 005 prospecting borehole (closest prospecting site)	1
General Protection IV B field rating	**3**
Medium significance	**1**
APM2880/Ft/007	1
Sandstone rocky outcrop with possible fossil imprint located 180m from	1

Rietfontein 002	
Low significance	**2**
APM2880/IA/008	1
Large stone walled settlement measuring 400m x 300m in extent located 250m from Rietfontein 002	1
APM2880/IA/009	1
Large stone walled settlement measuring 100m x 50m in extent located 328m from Rietfontein 002	1
General Protection IV C field rating	**8**
Low significance	**8**
APM2880/Wf/003	1
A historical cattle kraal located 660m from Rietfontein 003, which has been severely impacted on by associated mining activities. Only the stone-walled cattle kraal remains and has been damaged	1
IXI3002/Ft/004	1
Some stone walling and foundations located 1 km from Rietfontein 005 (closest prospecting site).The site has several mounds that could possibly be hut foundations.	1
IXI3002/Ft/003	1
Collapsed stone walling and foundations of homestead located 980 m from Rietfontein 003 (closest prospecting site). Appears to be in a square shape and is most likely more recent. These are adjacent to large mounds thought to be foundations and could be associated with a larger settlement.	1
IXI3002/Ft/005	1
Stone walling associated with approximately 4 mounds that could be hut foundations located 950m from Rietfontein 001 (closest prospecting site)	1
APM2880/St/001	1
The site comprises two individual features i.e. historic homestead and a midden. The site measures 50 m x 20 m in extent and is located 350m from the Rietfontein 005 prospecting borehole (closest prospecting site)	1
APM2880/St/002	1
The site comprises two individual features i.e. historic homestead and a midden. The site measures 100 m x 50 m in extent and is located 960m from the Rietfontein 005 prospecting borehole (closest prospecting site)	1
APM2880/IA/005	1
Stone walling and surface scatters of undiagnostic potsherds located 870m from Rietfontein 002	1
APM2880/IA/006	1
Surface scatter of undiagnostic potsherds located 140m from Rietfontein 002.	1
Total	**14**

The impact assessment was conducted on the proposed prospecting drill points and associated access routes and to assess how they would impact the heritage resources surrounding the points, taking into consideration the significance ratings of the identified heritage.

Code	Impact	Pre-mitigation:						Post-mitigation:					
		Duration	Extent	Intensity	Consequence	Probability	Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Rietfontein 001	Changes to fabric of and integrity of identified heritage resources by Rietfontein 001	Project Life	Very limited	Very low - negative	Slightly detrimental	Improbable	Negligible - negative	Immediate	Very limited	Very low - positive	Negligible	Highly unlikely	Negligible - positive
Rietfontein 002	Changes to fabric of and integrity of identified heritage resources by Rietfontein 002	Project Life	Limited	Low - negative	Slightly detrimental	Unlikely	Negligible - negative	Immediate	Very limited	Very low - positive	Negligible	Highly unlikely	Negligible - positive
Rietfontein 003	Changes to fabric of and integrity of identified heritage resources by Rietfontein 003	Immediate	Very limited	Very low - negative	Negligible	Highly unlikely	Negligible - negative	Immediate	Very limited	Very low - positive	Negligible	Highly unlikely	Negligible - positive
Rietfontein 004	Changes to fabric of and integrity of identified heritage resources by Rietfontein 004	Immediate	Very limited	Very low - negative	Negligible	Highly unlikely	Negligible - negative	Immediate	Very limited	Very low - positive	Negligible	Highly unlikely	Negligible - positive
Rietfontein 005	Changes to fabric of and integrity of identified heritage resources by Rietfontein 005	Project Life	Very limited	Very low - negative	Slightly detrimental	Improbable	Negligible - negative	Immediate	Very limited	Very low - positive	Negligible	Highly unlikely	Negligible - positive
Access routes	Damage to and/or destruction to surface heritage resources when establishing access routes	Project Life	Limited	High - negative	Moderately detrimental	Probable	Minor - negative	Immediate	Very limited	Very low - positive	Negligible	Highly unlikely	Negligible - positive

Based on the findings of the NID and this report, Digby Wells recommend the following:

- There is no need for any further palaeontological assessment as there are no rocky outcrops in close proximity to the prospecting drill points. If fossil plant material is discovered during prospecting, it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue the fossils if necessary;
- A Watching Brief is recommended when drilling commences at Rietfontein 001, 002 and 005. The Watching Brief will require a qualified accredited archaeologist be on site monitoring the proposed drill point during the drilling process and during the rehabilitation process;
- A final site-walk down is recommended if new access routes are to be established as these routes have not been finalised;
- No further mitigation measures are recommended for Rietfontein 003 and 004 as they are located in disturbed areas;
- Additionally, should the prospecting prove to be successful and a Mining Right be applied for, a full HRM process should be implemented inclusive of a Heritage Impact Assessment (HIA) which must include a Palaeontological Impact Assessment (PIA).

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1 Introduction

Digby Wells Environmental (Digby Wells) was appointed by Rustenburg Platinum Mines Limited (RPM), a subsidiary of Anglo American Platinum Limited (AAP) for the compilation and submission of an Environmental Management Plan (EMP) and Consultation Report. The EMP was conducted in support of a Prospecting Right Application (Ref No. MP30//5/1/1/2/11683PR).

A Notification of Intent to Develop (NID) was compiled and submitted to the South African Heritage Resources Agency (SAHRA) (Case ID: 6392) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA) for Statutory Comment as prescribed under Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). An Interim Comment was issued on the 23 October 2014 and on the 14 November 2014.

1.1 SAHRA Terms of Reference

As per the Interim Comments (Case ID: 6392), a Heritage Impact Assessment (HIA) must be conducted to assign significance values to identified heritage resources and to assess the possible impacts on the heritage resources. SAHRA required that a site visit be undertaken and proposed prospecting sites be investigated.

1.2 Scope of Work

The Scope of Work (SoW) for the HIA was based on the requirements contained in the SAHRA Interim Comment. This included the following:

- A field reconnaissance that identified, recorded and documented tangible heritage resources in the project area;
- An assessment of all identified heritage resources within the project area, and
- Recommended mitigation measures to avoid negative and enhance positive heritage impacts

1.3 Expertise of the Specialist

Natasha Higgitt undertook a site visit and compiled the HIA. She obtained her Bachelor of Arts (BA) with majors in Archaeology and Geography in 2008, and a BA Honours degree in Archaeology in 2010 from the University of Pretoria. She currently holds the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than three years' experience in archaeological survey's and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia. Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (*Member No: 335*).

Johan Nel reviewed the HIA. He has more than 13 years of combined experience in the field of HRM including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. He has gained experience both within

urban settings and remote rural landscapes. Since 2010 he has been actively involved in environmental management that has allowed him to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. This exposure has allowed Johan to develop and implement a HRM approach that is founded on international best practice, leading international conservation bodies such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and ICOMOS and aligned to the South African legislation. Johan has worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone. Johan is a professional member of ASAPA (*Member No. 095*) and ICOMOS South Africa (*Member No. 13839*).

The curricula vita of the specialists is attached in Appendix A.

2 Project Description

The Prospecting Right Application is for portions 1-5 and Re of the farm Rietfontein 101 IS in the Magisterial District of Bethal. Prospecting activities will be undertaken over a period of five (5) years where one prospecting borehole will be drilled per year.

According to the EMP, the project is divided into three phases defined as the following:

2.1 Construction Phase (Site clearing)

No physical construction will take place as no permanent infrastructure will be established. Activities will relate to the possible establishment of a temporary access road, as well as the clearing of vegetation for the establishment of the prospecting drill site (See Figure 2-1 and Figure 2-2).

Figure 2-1: Current prospecting activity on adjacent property, Rietfontein 100 IS.

Figure 2-2: Example of typical access route to drill site.

2.2 Operational Phase (Drilling)

The drill rig will be brought onto the identified prospecting drill site to commence drilling. The drill rig will target the reef of the Southern Limb of the BIC for drill core which will be sent to a laboratory for analysis. Water stored within the prospecting drill site will be circulated and re-used to cool the drill rig until drilling on site is complete. It is anticipated that one (1) prospecting drill site will be established per twelve (12) month period.

2.3 Decommissioning Phase (Rehabilitation)

Once drilling has concluded at a particular prospecting drill site, rehabilitation will commence immediately. All mobile equipment will be removed from the site to allow for rehabilitation.

The rehabilitation activities will include the following:

- Rehabilitation of each prospecting drill site concurrently with the prospecting work schedule. As the drill rig is removed from the site, rehabilitation will commence; and
- Where necessary, the site will be ripped where the soil has become compressed and compacted.

2.4 Proposed Prospecting Boreholes

Three of the proposed drill site locations are located in undisturbed areas, while the remaining two drill site are located within an agricultural field and topsoil stockpile area. See Table 2-1 for borehole locations and Figure 2-3 to Figure 2-7 for depictions of the prospecting sites.

Table 2-1: Location of the prospecting boreholes

Prospecting Borehole	Year of Prospecting	Coordinates	
		Latitude	Longitude
Rietfontein 001	Year 1	26° 21' 01.96"	29° 13' 53.39"
Rietfontein 002	Year 2	26° 21' 14.68"	29° 15' 31.02"
Rietfontein 003	Year 3	26° 19' 23.12"	29° 14' 28.10"
Rietfontein 004	Year 4	26° 20' 26.12"	29° 16' 16.44"
Rietfontein 005	Year 5	26° 20' 14.38"	29° 15' 07.42"

Figure 2-3: General view of Rietfontein 001

Figure 2-4: General view of Rietfontein 002

Figure 2-5: General view of Rietfontein 003

Figure 2-6: General view of Rietfontein 004

Figure 2-7: General view of Rietfontein 005

Additional project descriptions can be found in the EMP, available at http://www.sahra.org.za/cases/rietfontein-101is-prospecting.

3 HIA Methodology

3.1 Primary Data Collection

Field based data collection was undertaken by Natasha Higgitt, a qualified and accredited archaeologist on 27 February 2015. The project area was surveyed through vehicular and pedestrian methods. Each proposed prospecting drill site was inspected for heritage resources. The survey was record as a GPS track logs. Identified heritage resources were mapped as GPS waypoints and documented through photographic and written records.

3.1.1 Site naming

Sites identified during field surveys are prefixed by the internal project code assigned to the study followed by the relevant period / feature code and site number, i.e. **APM2880/BGG-001.** Sites identified as part of adjacent project are prefixed with the correlating project code: **IXI3002**

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

Period codes used during this report are contained in Table 3-1

Table 3-1: Period codes used in this HIA

Period / Feature	Period / Feature Code
Burial Grounds and Graves	BGG
Feature	Ft
Iron Age	IA
St	Site
Wf	Werf

3.2 Assessment

3.2.1 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance[1] of identified heritage resources. The evaluation was done as objectively as possible through a matrix developed by Digby Wells for this purpose. In addition, the methodology aims to allow ratings to be reproduced independently should it be required, provided that the same information sources are used. This matrix takes into account heritage resources assessment criteria set out in subsection 3(3) of the NHRA, which determines the intrinsic, comparative and contextual significance of identified heritage resources.

A resource's importance rating is based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist). The final significance attributed to a resource furthermore takes into account the physical integrity of the fabric of the resource. The formula used to determine significance can therefore be summarised as:

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

Value = Importance x Integrity

where

Importance = average sum of Aesthetic + Historic + Scientific + Social Significance

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

This matrix rates the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social. These values are based on, and summarised from, the criteria for inclusion into the national estate as outlined in subsection 3(3) of the NHRA, listed in Table 3-2.

Table 3-2: NHRA criteria for inclusion of heritage resources into the national estate

NHRA reference	Description of defining criteria
3(1)(a)	its importance in the community, or pattern of South Africa's history;
3(1)(b)	its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
3(1)(c)	its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
3(1)(d)	its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
3(1)(e)	its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
3(1)(f)	its importance in demonstrating a high degree of creative or technical achievement at a particular period;
3(1)(g)	its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
3(1)(h)	its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
3(1)(i)	sites of significance relating to the history of slavery in South Africa.

The significance of a resource is directly related to the impact on it that could result from project-related activities, as it provides minimum accepted levels of change to the resource. SAHRA has published minimum standards that include minimum required mitigation of heritage resources. These minimum requirements are integrated into the matrix to guide

both assessments of impacts and recommendations for mitigation and management of resources.

The weight assigned to the various parameters for significance in the formula, significance ratings and recommended mitigation are presented in Table 3-3 to Table 3-6.

Table 3-3: Rating options: Importance

Rating	Description / guideline
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.
1	Common, well represented throughout diverse cultural landscapes
2	Generally well represented but exhibits superior qualities in comparison to other similar examples
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.
4	Rare and uncommon, value of national importance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.
-	Not assessed - dimension and/or attribute not considered in determining value.

Table 3-4: Rating options: Integrity

Rating	Description / guideline
0	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost
1	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting
2	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting

3	Fabric well preserved, good quality information and meaning evident, limited encroachment
4	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting

Table 3-5: Significance ratings

Score	Description	Rating
0-5	Resource of negligible heritage value	Negligible
6-10	Resource of low heritage value; change to resource not significant	Low
11-12	Resource of medium heritage value: project mitigation must aim to reduce negative change	Medium
13-14	Resource of medium high heritage value: heritage mitigation to reduce negative change	Medium High
15-17	Resource of high heritage value: resource must be partly conserved and heritage mitigation implemented to reduce negative change	High
17-20	Resource of very high heritage value: resource must be preserved/conserved and included in a management plan	Very High

Table 3-6: Recommended minimum level of required mitigation

Designation	Recommended mitigation
Negligible	Sufficiently recorded, no mitigation required
Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
Medium High	Project design should aim to reduce or remove changes; Mitigation of resource to include extensive sampling and recording, e.g. test excavation, analyses, etc.
High	Project design must aim to avoid change to resource; Partly conserved, Conservation Management Plan (CMP)

Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP

3.2.2 Field Ratings

Although grading of heritage resources remains the responsibility of heritage resources authorities, SAHRA requires in terms of its Minimum Standards that heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. The NHRA in terms of section 7 provides for a system of grading of heritage resources that form part of the national estate, distinguishing between three categories.

The field rating process is designed to provide a numerical rating of the recommend grading of identified heritage resources. The evaluation was done as objectively as possible by integrating the field rating into the significance matrix. Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with section 8 of the NHRA. The formula used to determine field ratings can be summarised as:

Field rating = average sum of Aesthetic + Historic + Scientific + Social Field Ratings

The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are is presented in Table 3-7 and Table 3-8.

Table 3-7: Rating options: Field Ratings

Rating	Grade	Description
7	Grade I	Mainly of national significance
6	Grade II	Mainly of provincial significance
5	Grade III A	Mainly local with very high significance
4	Grade III B	Mainly local with high significance
3	General Protection A	Generally protected resource with Medium to Medium-High significance
2	General Protection B	Generally protected resource with Low significance
1	General Protection C	Generally protected resource with Negligible significance

Table 3-8: Field ratings

Score	Description	Rating
6,5 to 7,0	Heritage resources with qualities so exceptional that they are of special national significance	Grade I
5,5 to 6,4	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region	Grade II
4,5 to 5,4	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within a more localised context - very high significance rating	Grade III A
3,5 to 4,4	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within a more localised context - high significance rating	Grade III B
2,5 to 3,4	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance	General Protected IV A
1,5 to 2,4	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance	General Protected IV B
1,0 to 1,4	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance	General Protected IV C

3.2.3 Impact Assessment

The impact of the proposed prospecting drill points and associated access routes was assessed. The assessment has taken into account the significance value of identified heritage resources surrounding the drill points and how likely they are to be impacted on by the prospecting drill points and the access routes.

The impact rating process is designed to provide a numerical rating of the identified impacts of the drill sites. The significance rating follows an established impact/risk assessment formula, as shown below:

Significance = consequence of an event x probability of the event occurring

Where:

Consequence = Type of impact x (Intensity + Spatial Scale + Duration)

And:

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

***Type of impact* = +1** (for positive impacts) ***or* -1** (for negative impacts)

The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 3-3 to Table 3-13 below.

The magnitude will then be applied to pre- and post-mitigation scenarios with the intention of removing all impacts on heritage resources. Where project related mitigation does not avoid or sufficiently reduce negative changes/impacts on heritage resources with high values, mitigation of these resources may be required. This may include alteration, restoration or demolition of structures under a permit issued by MPHRA and/or SAHRA.

Table 3-9: Rating options: Intensity

Rating	Type of impact
+/- 7	Major change to Heritage Resource with High-Very High Value
+/- 6	Moderate change to Heritage Resource with High-Very High Value
+/- 5	Minor change to Heritage Resource with High-Very High Value
+/- 4	Major change to Heritage Resource with Medium-Medium High Value
+/- 3	Moderate change to Heritage Resource with Medium - Medium High Value
+/- 2	Minor change to Heritage Resource with Medium - Medium High Value
+/- 1	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value

Table 3-10: Rating options: Spatial scale

Value	Exposure	Description
7	International	The effect will occur across international borders
6	National	Will affect the entire country
5	Region	Heritage resources within region
4	Municipal area	Heritage resources outside project area changed
3	Local	Most or all heritage resources change
2	Limited	One or more heritage resource will be changed
1	Very Limited	Isolated aspects of individual heritage resource

Table 3-11: Rating options: Duration

Value	Probability	Description
7	Permanent	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)
6	Beyond Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)
5	Project Life	The impact will cease after project life.
4	Long Term	Impact will remain for >50% - Project Life
3	Medium Term	Impact will remain for >10% - 50% of Project Life
2	Short Term	Impact will remain for <10% of Project Life
1	Transient	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.

Table 3-12: Rating options: Probability

Value	Probability	Description
7	Certain/Definite	Happens frequently.
		The impact will occur regardless of the implementation of any preventative or corrective actions.
6	High probability	Happens often.
		It is most likely that the impact will occur.
5	Likely	Could easily happen.
		The impact may occur.
4	Probable	Could happen.
		Has occurred here or elsewhere.
3	Unlikely / Low probability	Has not happened yet but could happen once in the lifetime of the project.
		There is a possibility that the impact will occur.
2	Rare / Improbable	Conceivable, but only in extreme circumstances.
		Have not happened during lifetime of the project but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Highly Unlikely /None	Expected never to happen.
		Impact will not occur.

Impacts are rated prior to mitigation and again after consideration of the proposed mitigation measures. The impact is then determined and categorised into one of eight categories, as indicated in Table 3-13 and Table 3-14 below. The relationship between the consequence, probability and significance ratings is graphically depicted in Figure 3-1 below.

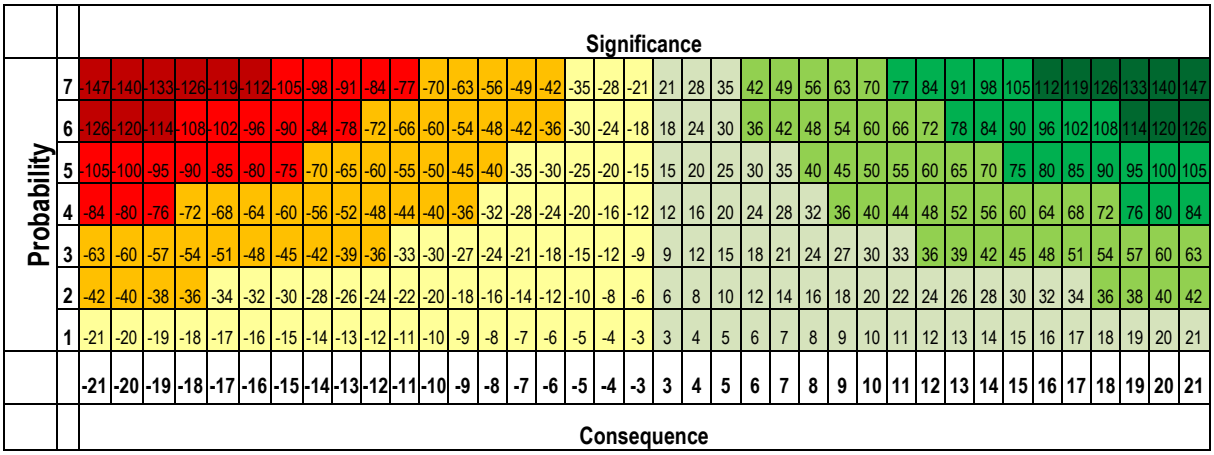

Figure 3-1: Relationship between consequence, probability and significance ratings

Table 3-13: Impact significance ratings

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)

Score	Description	Rating
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Table 3-14: Relationship of significance of negative impacts to specific categories of heritage

Score	Archaeological attributes	Built heritage or Historic Urban Landscape attributes	Historic landscape attributes	Intangible Cultural Heritage attributes or Associations	Rating
-3 to -35	No change.	No change to fabric or setting.	No change to elements, parcels or components; no visual or audible changes; no changes in amenity or community factors.	No change	Negligible
-36 to -72	Very minor changes to key archaeological materials, or setting.	Slight changes to historic building elements or setting that hardly affect it.	Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.	Very minor changes to area that affect the ICH activities or associations or visual links and cultural appreciation.	Minor
-73 to -108	Changes to key archaeological materials, such that the resource is slightly altered. Slight changes to setting.	Change to key historic building elements, such that the asset is slightly different. Change to setting of an historic building, such that it is noticeably changed.	Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; limited changes to noise levels or sound quality; slight changes to use or access; resulting in limited change to historic landscape character.	Changes to area that affect the ICH activities or associations or visual links and cultural appreciation.	Moderate

-109 to -147	Changes to many key archaeological materials, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset. Changes to attributes that convey outstanding value of national estate. Most or all key archaeological materials, including those that contribute to outstanding value of national estate such that the resource is totally altered. Comprehensive changes to setting	Changes to many key historic building elements, such that the resource is significantly modified. Changes to the setting of an historic building, such that it is significantly modified. Change to key historic building elements that contribute to outstanding value of national estate, such that the resource is totally altered. Comprehensive changes to the setting.	Change to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; considerable changes to use or access; resulting in moderate changes to historic landscape character. Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit and loss of outstanding value of national estate.	Considerable changes to area that affect the ICH activities or associations or visual links and cultural appreciation. Major changes to area that affect the ICH activities or associations or visual links and cultural appreciation.	Major

3.3 Mitigation Measures and Recommendations

The desired outcome of an impact assessment is the removal of negative impacts on heritage resources through the implementation of feasible mitigation measures. The mitigation and management measures recommended in this section comply with the General Principles set out under section 5 of the NHRA. The recommendations further considered the cultural significance of heritage resources and the recommended minimum level of mitigation as published in the SAHRA Minimum Standards. Recommended mitigation is therefore divided into categories: *project related* and *mitigation of heritage resources* defined below.

Project-related mitigation requires changes or amendments to project design, planning and siting of infrastructure to avoid or reduce physical impacts on heritage resources. Project-related mitigation measures are always the preferred option, especially where heritage resources with higher cultural significance will be impacted on. Project-related mitigation may include:

- *In situ* preservation (i.e. no-development) of heritage resources for which Conservation Management Plans (CMPs) are required; and
- Conservation of heritage resources through, for example, incorporating the resources into project design and planning, for which CMPs are also required.

Mitigation of heritage resources may be necessary where project-related mitigation will not sufficiently conserve or preserve heritage resources, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be mitigated to ensure that they are fully recorded, documented and researched before any negative change occurs. This may require mitigation such as:

- Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”;
- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is a regulated permitted activity for which permits need to be issued by the relevant heritage authorities. Such mitigation may result in a reassessment of the value of a resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled; and
- Where resources have negligible significance the specialist may recommend that no further mitigation is required and the site may be destroyed, for which a destruction permit must be applied for.

Appropriate mitigation measures were identified for each impact, and the procedure discussed above was to assess the possible consequence, probability and significance of each impact post-mitigation.

The post-mitigation rating provided an indication of the significance of residual impacts, while the difference between an impact's pre- and post-mitigation ratings represents the degree to which the recommended mitigation measures are expected to be effective in reducing or ameliorating that impact.

3.4 Constraints and Limitations

The following constraints and limitations were experienced as part of this study:

- Due to time and budgetary constraints, systematic controlled survey of the project area was not possible;
- Identified heritage resources are not an exhaustive list of all heritage resources that may occur within the project area;
- Heritage resources commonly occur at sub-surface levels with no visible surface features to assist in their identification. This assessment, while as comprehensive as possible, does acknowledge this constraint and provide appropriate management measures in the event of discovery.

4 Identified Heritage resources

Through the reconnaissance, nine tangible heritage resources / sites were identified within the site specific study area, described in Table 4-1. An additional five sites have been identified during a scoping survey undertaken by Digby Wells on the neighbouring property, Rietfontein 100IS and Rietfontein 101IS.

In general, all identified sites were more than 200 m from any proposed drill sites. Two sites were identified 150 m and 180 m respectively from the proposed drill point Rietfontein 002 i.e. APM2880/IA/006 and APM2880/Ft/007. However, no sites were identified in the at the proposed drill point footprint areas.

Table 4-1: Identified heritage resources

Site Name: IXI3002/St/001	Co-ordinates: -26.335912/ 29.241507	Field rating: General Protection IV A

Description: A site comprising three individual features namely Ft-001, BGG-002 and Ft-003.

Ft/001 - This feature of Site 001 consists of foundations of a historic homestead. Stone foundations are configured in a square shape. This feature is located approximately 25 m east from an associated burial ground BGG-002 and 35 m from the associated midden Ft/003

BGG/002 - This is a burial ground consisting of approximately 10 graves. Only two of the possible ten graves had tombstones. These were weathered and no information was visible on them. The graves are located in the centre of the site between Ft/001 and Ft/002

Ft/003 is third feature of Site 001. It is a large midden associated with historic homestead Ft-001. The midden was very ashy and contained material cultural such as beads, porcelain and animal bones

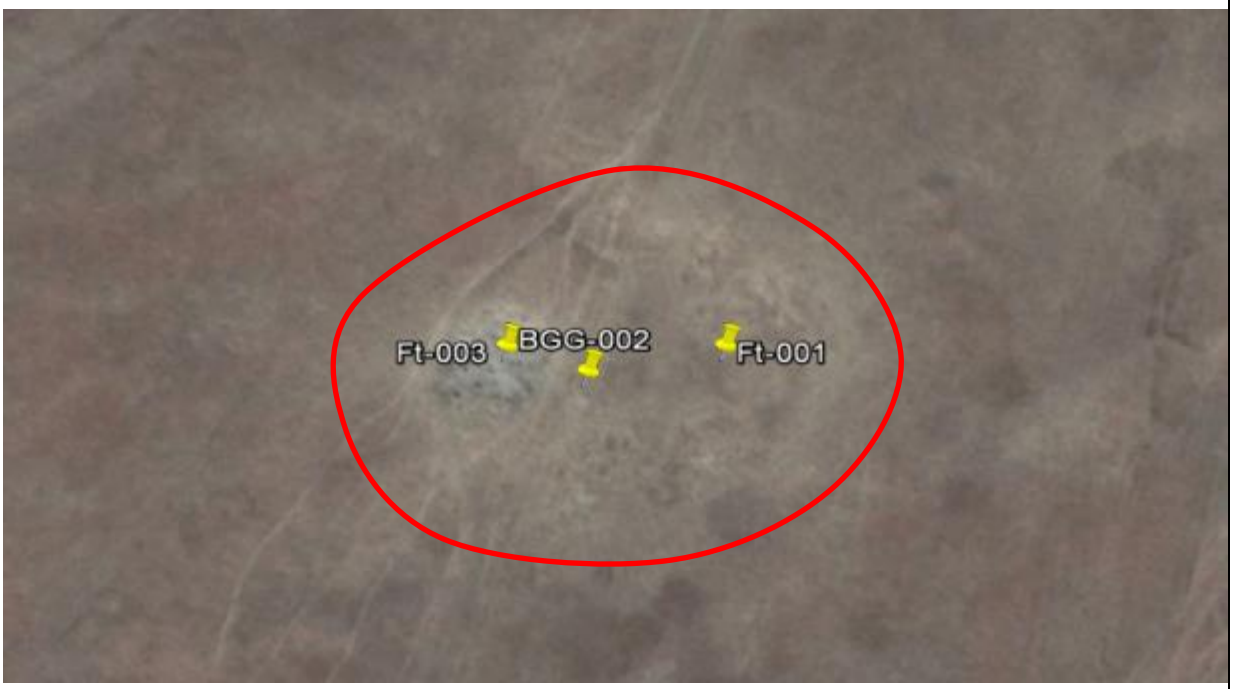

Figure 4-1: Approximate extent of homestead Site 001, indicating the three site components

Figure 4-2: Site 001 with Ft/001, BGG/002 and Ft/003 from top to bottom

Site name: IXI3003/St/002	**Co-ordniates: -26.333874/ 29.238692**	**Field rating: General Protection IV A**

Description: A site comprising three individual features namely Ft-001, BGG-002 and Ft-003.

Ft/001 - Large midden adjacent to BGG-005 and several larger mounds that appear to have been hut foundations. Material culture from this site includes bones and glass.

BGG/002 - Cemetery containing at least 14 graves. Some have formal surface dressing, including granite and stone dressings. The earliest date observed is 1936. Family names include Shabanju, Masongo and Kabini. An informant stated that the graves are still visited.

Ft/003 - The site consists of stone foundations. This site is most likely associated with Ft-004 and BGG-005

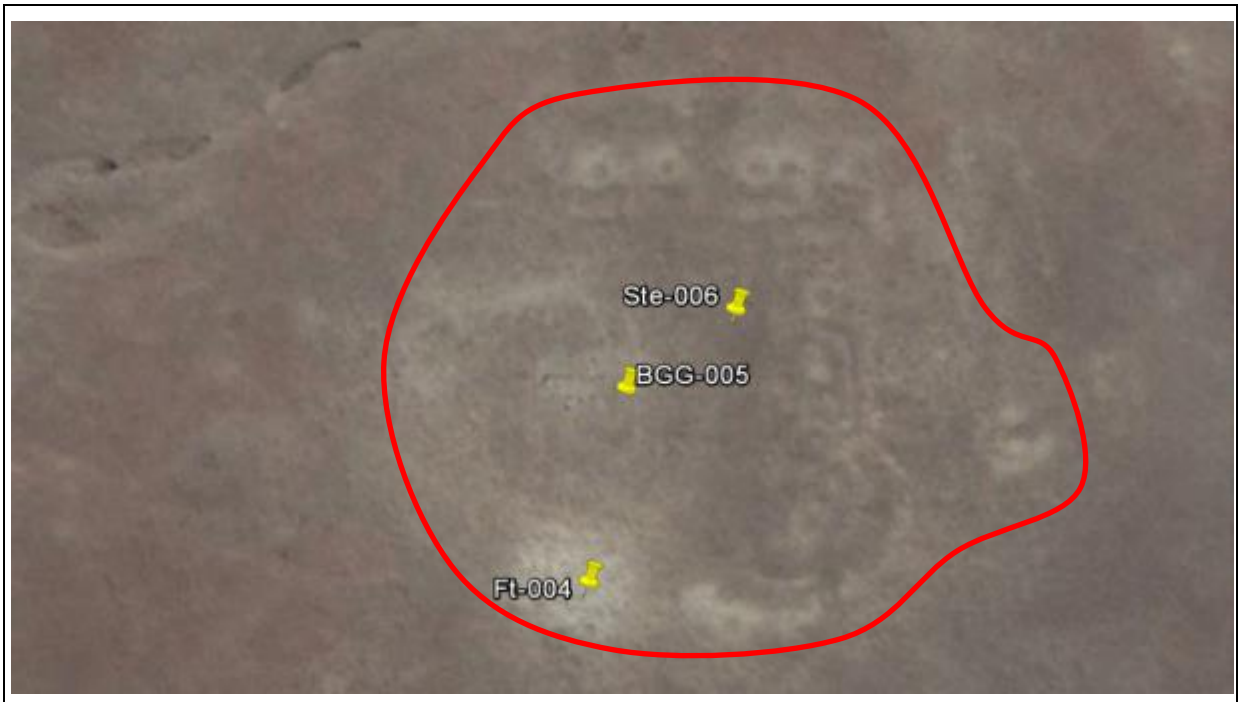

Figure 4-3: Approximate extent of homestead Site 002, indicating the three site components

Figure 4-4: Site 002 with Ft/001, BGG/002 and Ft/003 from top to bottom

Site Name: IXI3002/Ft/003	Co-ordinates: -26.331953/ 29.238537	Field rating: General Protection IV C

Description: Collapsed stone walling and foundations of homestead located 980 m from Rietfontein 003 (closest prospecting site). Appears to be in a square shape and is most likely more recent. These are adjacent to large mounds thought to be foundations and could be associated with a larger settlement.

Figure 4-5: Stone foundation and collapsed walls of homestead

Site Name: IXI3002/Ft/004	Co-ordinates: -26.344883/ 29.245927	Field rating: General Protection IV C

Description: Some stone walling and foundations located 1 km from Rietfontein 005 (closest prospecting site).The site has several mounds that could possibly be hut foundations.

Figure 4-6: Collapsed stone walling and foundations

Site Name: IXI3002/Ft/005	Co-ordinates: -26.348685/ 29.240802	Field rating: General Protection IV C

Description: Stone walling associated with approximately 4 mounds that could be hut foundations located 950m from Rietfontein 001 (closest prospecting site)

Figure 4-7: Remnants of stone walling indicated in red

Site Name: APM2880/St/001	Co-ordinates: -26.334536/ 29.250444	Field rating: General Protection IV C

Description: The site comprises two individual features i.e. Ft/001 - historic homestead and a midden (Ft/002). The site measures 50 m x 20 m in extent and is located 350m from the Rietfontein 005 prospecting borehole (closest prospecting site)

Figure 4-8: Possible extent of APM2880/St/001

Figure 4-9: Ft/001 and Ft/002 from left to right

Site Name: APM2880/St/002	Co-ordinates: -26.340994/ 29.243307	Field rating: General Protection IV C

Description: The site comprises two individual features i.e. historic homestead and a midden. The site measures 100 m x 50 m in extent and is located 960m from the Rietfontein 005 prospecting borehole (closest prospecting site)

Figure 4-10: Possible extent of Site 4

Figure 4-11: Ft/001 and Ft/002 from left to right

Site Name: APM2880/Wf/003	Co-ordinates: -26.346515/ 29.270643	Field rating: General Protection IV C

Description: A historical cattle kraal located 660m from Rietfontein 003, which has been severely impacted on by activities associated with the adjacent mining workshop and parking area

Figure 4-12: Stone-walled historic cattle kraal used to store road signs and other equipment

Site Name: APM2880/BGG/004	**Co-ordinates: -26.345782/ 29.273385**	**Field rating: General Protection IV A**
Description: A fenced burial ground containing 9 graves, the oldest being from 1923. This cemetery is within 20m of a discard dump and haul road, and is located 610m from Rietfontein 003.		

Figure 4-13: Burial ground located near the discard dump and haul road

Site Name: APM2880/IA/005	**Co-ordinates: -26.346343/ 29.257277**	**Field rating: General Protection IV C**
Description: Stone walling and surface scatters of undiagnostic potsherds located 870 m from Rietfontein 002		

Figure 4-14: Area with stone walling and undiagnostic potsherd scatters

Site Name: APM2880/IA/006	**Co-ordinates: -26.352853/ 29.259034**	**Field rating: General Protection IV C**

Description: Surface scatter of undiagnotic potsherds located 140m from Rietfontein 002.

Figure 4-15: Surface scatter of undiagnostic potsherds

Site Name: APM2880/Ft/007	**Co-ordinates: -26.352694/ 29.257638**	**Field rating: General Protection IV B**

Description: Sandstone rocky outcrop with possible fossil imprint[2] located 180m from Rietfontein 002

Figure 4-16: Sandstone rocky outcrop (left) and possible fossil imprint (right)

Site Name: APM2880/IA/008	**Co-ordinates: -26.352855/ 29.255184**	**Field rating: General Protection IV B**

Description: Large stone walled settlement measuring 400m x 300m in extent located 250m from Rietfontein 002

[2] Input on possible plant fossil provided by **Shahzaadee Karodia Khan** (BSc Honours degree in Palaeontology in 2007 and a Master of Science (MSc) degree in Archaeology), registered with the Association of Southern African Professional Archaeologists (ASAPA) membership no. 376, Geological Society of South Africa (GSSA), the Palaeontological Society of Southern Africa (PSSA), and the South African Society for Amateur Palaeontologists (SASAP).

Figure 4-17: Possible extent of IA/008

Site Name: APM2880/IA/009	Co-ordinates: -26.357255/ 29.25925	Field rating: General Protection IV B

Description: Large stone walled settlement measuring 100m x 50m in extent located 328m from Rietfontein 002

Figure 4-18: Possible extent of IA/009

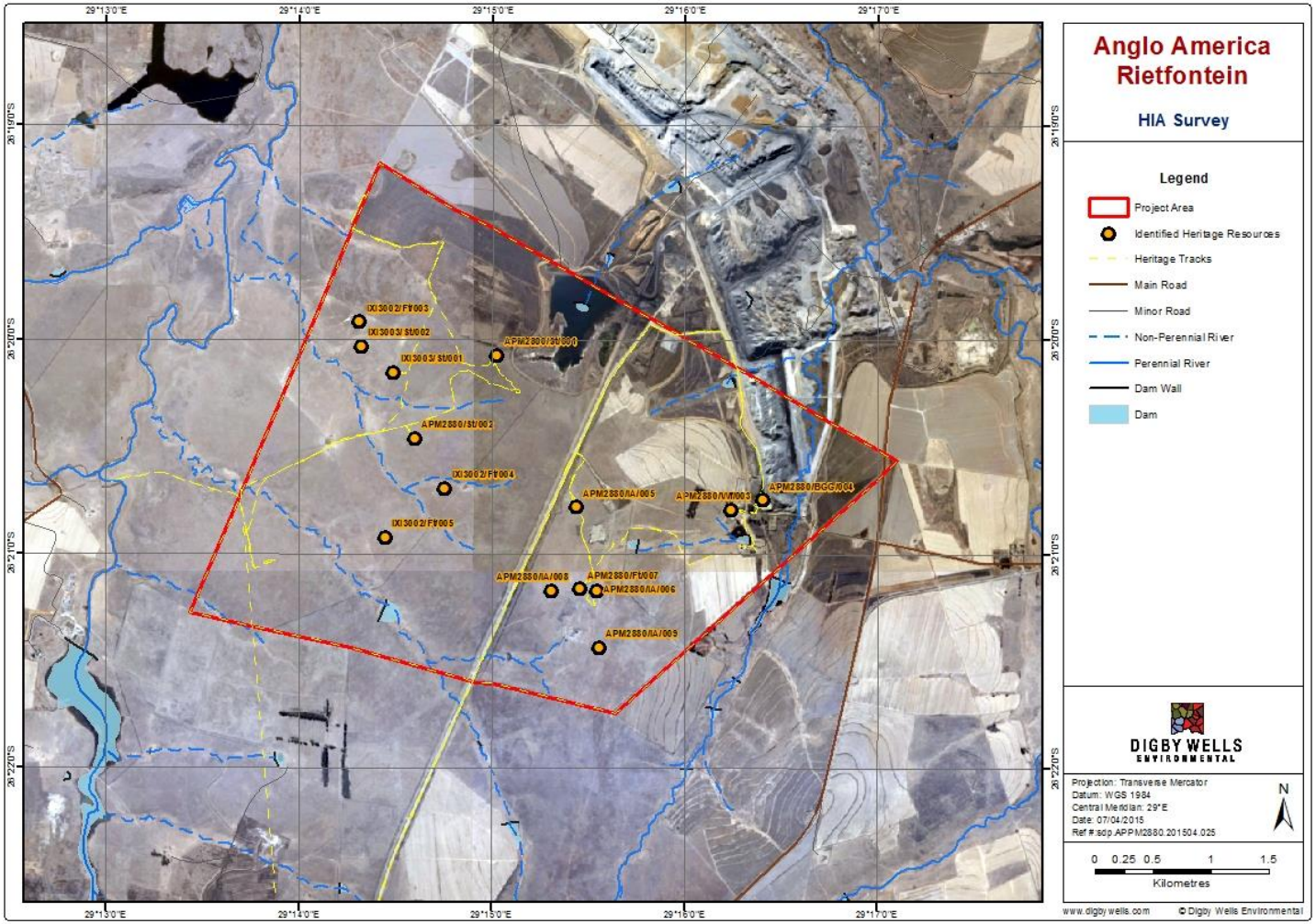

Figure 4-19: Identified heritage resources for the Rietfontein project

5 Cultural Significance and Field Ratings

The cultural significance and associated field rating assigned to each identified heritage resources are presented in Table 5-1. The assigned values take into consideration the importance of individual resources in relation to aesthetic, historic, scientific and social criteria, as well as the integrity of the resource.

Three sites were given the field rating General Protection IV A due to their high historical, scientific and social values. In terms of the NHRA, these are resources protected under general protection in terms of sections 34 to 37 with Medium to Medium-High significance. The burial ground APM2880/BGG/004 was given a very high cultural significance due to its strong social associations and high integrity. Burial grounds are always inherently highly significant due to the importance placed on them by local communities and their associated Next-of-Kin. Historical homesteads IXI3002/St/001 and IXI3002/St/002 were given a medium-high cultural significance due to their historic, scientific and social associations with a medium integrity.

Three sites were given a field rating of General Protection IV B due to their medium historical and scientific values. In terms of the NHRA, these are resources protected under general protection in terms of sections 34 to 37 with Low significance. The possible fossil imprint site APM2880/Ft/007, was given a medium cultural significance, however the individual rating on a scientific level is high due to the highly significant Vryheid formation which is present within the project area. The two Iron Age stone-walled settlements APM2880/IA/008 and APM2880/IA/009 were given low cultural significance ratings due to their historical and scientific associations with a medium integrity.

A total of eight sites were given a field rating of General Protection IV C. In terms of the NHRA, these are resources protected under general protection in terms of sections 34 to 37 with negligible significance. All of the sites i.e. IXI3002/Ft/003, Ft/004; Ft/005; APM2880/St/001, St/002, Ft/003, IA/005 and IA/006 were given a low cultural significance rating due to the historic and scientific associations with medium to low site integrity.

Table 5-1: Summary of Statements of Significance for identified heritage resources

Resource ID	Type	Description	VALUE	Designation	Recommended Field Rating	Recommended Field Rating2	Latitude	Longitude
IXI3003/St/001	Site	The site comprises three individual features i.e. historic homestead, burial ground and a midden. The site measures 40 m x 20 m in extent and is located 1 km from the Rietfontein 005 prospecting borehole (closest prospecting site)	13	Medium High	3.00	General Protection IV A	-26.335912	29.241507

IXI3003/St/002	Site	The site comprises three individual features i.e. historic homestead, burial ground and a midden. The site measures 70 m x 50 m in extent and is located 955 m from the Rietfontein 005 prospecting borehole (closest prospecting site)	13	Medium High	3.00	General Protection IV A	-26.333874	29.238692
IXI3002/Ft/003	Feature	Collapsed stone walling and foundations of homestead located 980 m from Rietfontein 003 (closest prospecting site). Appears to be in a square shape and is most likely more recent. These are adjacent to large mounds thought to be foundations and could be associated with a larger settlement.	6	Low	1.00	General Protection IV C	-26.331953	29.238537
IXI3002/Ft/004	Feature	Some stone walling and foundations located 1 km from Rietfontein 005 (closest prospecting site).The site has several mounds that could possibly be hut foundations.	6	Low	1.00	General Protection IV C	-26.344883	29.245927
IXI3002/Ft/005	Feature	Stone walling associated with approximately 4 mounds that could be hut foundations located 950m from Rietfontein 001 (closest prospecting site)	6	Low	1.00	General Protection IV C	-26.348685	29.240802
APM2880/St/001	Site	The site comprises two individual features i.e. historic homestead and a midden. The site measures 50 m x 20 m in extent and is located 350m from the Rietfontein 005 prospecting borehole (closest prospecting site)	6	Low	1.00	General Protection IV C	-26.334536	29.250444
APM2880/St/002	Site	The site comprises two individual features i.e. historic homestead and a midden. The site measures 100 m x 50 m in extent and is located 960m from the Rietfontein 005 prospecting borehole (closest prospecting site)	6	Low	1.00	General Protection IV C	-26.340994	29.243307
APM2880/Wf/003	Feature	A historical cattle kraal located 660m from Rietfontein 003, which has been severely impacted on by associated mining activities . Only the stone-walled cattle kraal remains and has been damaged	6	Low	1.00	General Protection IV C	-26.346515	29.270643
APM2880/BGG/004	Burial / grave	A fenced burial ground containing 9 graves, the oldest being from 1923. This cemetery is within 20m of a discard dump and haul road and is located 610m from Rietfontein 003.	20	Very High	3.00	General Protection IV A	-26.345782	29.273385
APM2880/IA/005	Iron Age site	Stone walling and surface scatters of undiagnostic potsherds located 870m from Rietfontein 002	6	Low	1.00	General Protection IV C	-26.346343	29.257277

APM2880/IA/006	Iron Age site	Surface scatter of undiagnostic potsherds located 140m from Rietfontein 002.	6	Low	1.00	General Protection IV C	-26.352853	29.259034
APM2880/Ft/007	Feature	Sandstone rocky outcrop with possible fossil imprint located 180m from Rietfontein 002	12	Medium	2.00	General Protection IV B	-26.352694	29.257638
APM2880/IA/008	Iron Age site	Large stone walled settlement measuring 400m x 300m in extent located 250m from Rietfontein 002	6	Low	2.00	General Protection IV B	-26.352855	29.255184
APM2880/IA/009	Iron Age site	Large stone walled settlement measuring 100m x 50m in extent located 328m from Rietfontein 002	6	Low	2.00	General Protection IV B	-26.357255	29.25925

6 Impact Assessment and Mitigation

6.1 Summary of Possible Heritage Impacts

Impacts associated with the Rietfontein project are related to the proposed project activities. The construction phase i.e. site clearance has the highest likelihood for negative impacts on heritage resources. Site establishment may potentially damage and/or destroy sub-surface heritage resources that may be present around each prospecting drill point.

The impacts during the operational phase i.e. drilling will be limited. The impacts during the decommissioning phase i.e. rehabilitation will also be limited, however if additional topsoil is required for rehabilitation, borrowing material from outside the prospecting site may damage and/or destroy heritage resources. If the ground becomes compacted due to the drilling activities and ripping will be necessary (as referred to in section 2.3 above), sub-surface heritage resources may be damaged and/or destroyed.

However it must be noted that the location of the prospecting drill points are located over 150 m away from any identified heritage resources. Two of the drill points are located in disturbed areas such as a maize field (Rietfontein 003) and a topsoil dump (Rietfontein 004) and no impacts are expected on heritage resources around these points.

The conceptually identified impacts caused by the proposed drill points and access routes are as follows:

- Changes to fabric of and integrity of identified heritage resources by prospecting points; and

- Accidental damage to and/or destruction to sub-surface heritage resources if new access routes are established.

Cumulative impacts associated with the prospecting are transient as the time spent on site conducting the drilling will be limited. The sense of place will remain the same due to the limited impact of the prospecting points, how should the prospecting results show the viability of the project, it may lead the a full scale mining operation, and the impacts associated with mining increase exponentially.

The impact assessment for the proposed drill points and access routes is summarised in Table 6-1 to Table 6-6:

Table 6-1: Summary of Impact Assessment in regards to Rietfontein 001

<table>
<tr><th colspan="5">IMPACT DESCRIPTION: Changes to fabric of and integrity of identified heritage resources by Rietfontein 001</th></tr>
<tr><th>Predicted for project phase:</th><td>Pre-construction</td><td>Construction</td><td>Operation</td><td>Decommissioning</td></tr>
<tr><th>Dimension</th><th>Rating</th><th colspan="3">Motivation</th></tr>
<tr><td colspan="5">PRE-MITIGATION</td></tr>
<tr><td>Duration</td><td>Project Life (5)</td><td>Where mitigations are not implemented, project related activities will occur for the duration of the project life.</td><td rowspan="3">Consequence: Slightly detrimental (-7)</td><td rowspan="4">Significance: Negligible - negative (-14)</td></tr>
<tr><td>Extent</td><td>Very limited (1)</td><td>The impacts of the prospecting will have very limited extent.</td></tr>
<tr><td>Intensity x type of impact</td><td>Very low - negative (-1)</td><td>Without appropriate mitigation, a very low impact will occur.</td></tr>
<tr><td>Probability</td><td>Improbable (2)</td><td colspan="2">Without appropriate mitigation, project related activities related activities are improbable as no heritage resources are located in close proximity to the prospecting point.</td></tr>
<tr><td colspan="5">MITIGATION:
A watching brief should be implemented during the establishment of the prospecting point Rietfontein 001 as it is located within an undisturbed area;
A watching brief must be conducted if new access routes are to be established for Rietfontein 001.</td></tr>
<tr><td colspan="5">POST-MITIGATION</td></tr>
<tr><td>Duration</td><td>Immediate (1)</td><td>Where mitigations are implemented, project related activities will result in negligible impacts for a very short period of time.</td><td rowspan="3">Consequence: Negligible (3)</td><td rowspan="3">Significance: Negligible - positive (3)</td></tr>
<tr><td>Extent</td><td>Very limited (1)</td><td>As for pre-mitigation</td></tr>
<tr><td>Intensity x type of impact</td><td>Very low - positive (1)</td><td>Mitigation measures will ensure the retention and management of the tangible remains, although this will a very low positive result of negligible significance</td></tr>
<tr><td>Probability</td><td>Highly unlikely (1)</td><td colspan="2">If mitigation measures are implemented, it is still highly unlikely that negative impacts will occur</td></tr>
</table>

Table 6-2: Summary of Impact Assessment in regards to Rietfontein 002

IMPACT DESCRIPTION: Changes to fabric of and integrity of identified heritage resources by Rietfontein 002				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Project Life (5)	Where mitigations are not implemented, project related activities will occur for the duration of the project life.	Consequence: Slightly detrimental (-9)	Significance: Negligible - negative (-27)
Extent	Limited (2)	The impacts of the prospecting will be limited		
Intensity x type of impact	Low - negative (-2)	Without appropriate mitigation, a low negative impact will occur.		
Probability	Unlikely (3)	As the footprint of the proposed prospecting is small, it is unlikely that the activity will damage or destroy any sub-surface heritage resources		
MITIGATION: -A watching brief should be implemented during the establishment of prospecting point Rietfontein 002 as it is located within 150m of identified surface heritage resources and a sandstone outcrop; and -A watching brief must be conducted if new access routes are to be established for Rietfontein 002.				
POST-MITIGATION				
Duration	Immediate (1)	Where mitigations are implemented, project related activities will result in negligible impacts for a very short period of time.	Consequence: Negligible (3)	Significance: Negligible - positive (3)
Extent	Very limited (1)	The impact of the prospecting will be very limited		
Intensity x type of impact	Very low - positive (1)	Mitigation measures will ensure the retention and management of the tangible remains, although this will a very low positive result of negligible significance		
Probability	Highly unlikely (1)	If mitigation measures are implemented, it is highly unlikely that negative impacts will occur.		

Table 6-3: Summary of Impact Assessment in regards to Rietfontein 003

IMPACT DESCRIPTION: Changes to fabric of and integrity of identified heritage resources by Rietfontein 003				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				

Duration	Immediate (1)	Where mitigations are not implemented, project related activities will result in negligible impacts for a very short period of time.	Consequence: Negligible (-3)	Significance: Negligible - negative (-3)
Extent	Very limited (1)	The impacts of the prospecting will have very limited extent.		
Intensity x type of impact	Very low - negative (-1)	Without appropriate mitigation, a negligible impact will occur.		
Probability	Highly unlikely (1)	As the proposed prospecting is located within a disturbed area, it is highly unlikely that the activity will damage or destroy any sub-surface heritage resources		
MITIGATION: As no heritage resources are expected to be identified during the establishment of prospecting point Rietfontein 003 as it is located within a disturbed area, no further mitigation measures are recommended				
POST-MITIGATION				
Duration	Immediate (1)	As for pre-mitigation	Consequence: Negligible (3)	Significance: Negligible - positive (3)
Extent	Very limited (1)	As for pre-mitigation		
Intensity x type of impact	Very low - positive (1)	Mitigation measures will ensure the retention and management of the tangible remains, although this will be a very low positive result		
Probability	Highly unlikely (1)	If mitigation measures are implemented, it is highly unlikely that negative impacts will occur.		

Table 6-4: Summary of Impact Assessment in regards to Rietfontein 004

IMPACT DESCRIPTION: Changes to fabric of and integrity of identified heritage resources by Rietfontein 004				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Immediate (1)	Where mitigations are not implemented, project related activities will result in negligible impacts for a very short period of time.	Consequence: Negligible (-3)	Significance: Negligible - negative (-3)
Extent	Very limited (1)	The impacts of the prospecting will have very limited extent.		
Intensity x type of impact	Very low - negative (-1)	Without appropriate mitigation, a negligible impact will occur.		
Probability	Highly unlikely (1)	As the proposed prospecting is located within a disturbed area, it is highly unlikely that the activity will damage or destroy any sub-surface heritage resources		

MITIGATION: As no heritage resources are expected to be identified during the establishment of prospecting point Rietfontein 004 as it is located within a disturbed area, no further mitigation measures are recommended				
POST-MITIGATION				
Duration	Immediate (1)	As for pre-mitigation	Consequence: Negligible (3)	Significance: Negligible - positive (3)
Extent	Very limited (1)	As for pre-mitigation		
Intensity x type of impact	Very low - positive (1)	Mitigation measures will ensure the retention and management of the tangible remains, although this will be a very low positive result		
Probability	Highly unlikely (1)	If mitigation measures are implemented, it is highly unlikely that negative impacts will occur.		

Table 6-5: Summary of Impact Assessment in regards to Rietfontein 005

IMPACT DESCRIPTION: Changes to fabric of and integrity of identified heritage resources by Rietfontein 005				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Project Life (5)	Where mitigations are not implemented, project related activities will occur for the duration of the project life.	Consequence: Slightly detrimental (-7)	Significance: Negligible - negative (-14)
Extent	Very limited (1)	The impacts on the heritage resources will have very limited extent.		
Intensity x type of impact	Very low - negative (-1)	Without appropriate mitigation, a very low impact will occur.		
Probability	Improbable (2)	Without appropriate mitigation, project related activities related activities are improbable as no heritage resources are located in close proximity to the prospecting point.		
MITIGATION: A watching brief should be implemented during the establishment of the prospecting point Rietfontein 005 as it is located within an undisturbed area; A watching brief must be conducted if new access routes are to be established for Rietfontein 005.				
POST-MITIGATION				
Duration	Immediate (1)	Where mitigations are implemented, project related activities will result in negligible impacts for a very short period of time.	Consequence: Negligible (3)	Significance: Negligible - positive (3)
Extent	Very limited (1)	As for pre-mitigation		

Intensity x type of impact	Very low - positive (1)	Mitigation measures will ensure the retention and management of the tangible remains, although this will be a very low positive result		
Probability	Highly unlikely (1)	If mitigation measures are implemented, it is still highly unlikely that negative impacts will occur		

Table 6-6: Summary of impact in regards to access routes

IMPACT DESCRIPTION: Damage to and/or destruction to surface heritage resources when establishing access routes				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Project Life (5)	Where mitigations are not implemented, project related activities will occur for the duration of the project life.	Consequence: Moderately detrimental (-12)	Significance: Minor - negative (-48)
Extent	Limited (2)	The impacts of establishing access routes will be limited		
Intensity x type of impact	High - negative (-5)	Without appropriate mitigation, a highly negative impact will occur.		
Probability	Probable (4)	It is probably that sub-surface and unidentified surface heritage resources may be impacted		
MITIGATION: A final walk-down should be conducted should new access roads be established for the prospecting phase to ensure no heritage resources are impacted				
POST-MITIGATION				
Duration	Immediate (1)	Where mitigations are implemented, project related activities will result in negligible impacts for a very short period of time.	Consequence: Negligible (3)	Significance: Negligible - positive (3)
Extent	Very limited (1)	The impact of the access roads will be limited		
Intensity x type of impact	Very low - positive (1)	Mitigation measures will ensure the retention and management of the tangible remains, although this will be a very low positive result		
Probability	Highly unlikely (1)	If mitigation measures are implemented, it is still highly unlikely that negative impacts will occur		

7 Conclusion and Recommended Mitigation Measures

The proposed Rietfontein Project is located on the farm Rietfontein 101IS Portion1-5 and Re in the Bethal Magisterial District, Mpumalanga Province. An NID was completed and submitted to SAHRA and MPHRA in terms of Section 38(8) of the NHRA. The NID presented a baseline of the cultural landscape that informed this report. Statutory Comment issued on the 23 October 2014 and on the 14 November 2014 required that an HIA and field assessment be undertaken.

A total of 14 heritage resources were identified within the project boundaries during the field survey. One heritage resource (APM2880/BGG/004) was given a very high cultural significance value, two were given medium-high cultural significance values (IXI3002/St/001 and St/002), one was given a medium cultural significance value (APM2880/Ft/007) and the remaining 10 were given low cultural significance values.

Two heritage sites were located within 150 m of a proposed drill point i.e. Pottery surface scatter APM2880/IA/006 and possible fossil site APM2880/Ft/007. The remaining heritage resources are located over 200 m from any proposed drill point and will not be impacted on.

An impact assessment was completed for the five drill points and any access routes that may be established should they not follow existing routes. Recommendation to the mitigation and management of the impacts was presented and discussed and summarised below.

Recommended mitigation and management plans are provided for project and heritage related mitigation measures. Project related mitigation measures refer to actions that can be taken at a project level to address potential impacts. An example of a project related mitigation measure is the adjustment of the project boundary to exclude heritage resources from the impact footprint and preserve them *in situ*. Where these types of mitigation measures are not feasible or possible, heritage related mitigation measures are recommended. An example of a heritage related mitigation measure is a Phase 2 archaeological excavation.

Based on the findings of the NID and this report, Digby Wells recommend the following:

- There is no need for any further palaeontological assessment as there are no rocky outcrops in close proximity to the prospecting drill points. If fossil plant material is discovered during prospecting, it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue the fossils if necessary;
- A Watching Brief is recommended when drilling commences at Rietfontein 001, 002 and 005. The Watching Brief will require a qualified accredited archaeologist be on site monitoring the proposed drill point during the drilling process and during the rehabilitation process;
- A final site-walk down is recommended if new access routes are to be established as these routes have not been finalised;

- No further mitigation measures are recommended for Rietfontein 003 and 004 as they are located in disturbed areas;
- Additionally, should the prospecting prove to be successful and a Mining Right be applied for, a full HRM process should be implemented inclusive of a Heritage Impact Assessment (HIA) which must include a Palaeontological Impact Assessment (PIA).

Appendix A: Specialist CV

NATASHA HIGGITT

Ms Natasha Higgitt

Assistant Heritage Consultant

Social Department

Digby Wells Environmental

1 EDUCATION

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

2 LANGUAGE SKILLS

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

3 EMPLOYMENT

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

4 FIELD EXPERIENCE

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

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

5 PROJECT EXPERIENCE

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

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

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

6 PROFESSIONAL AFFILIATIONS

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

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		Freelance archaeologist
	Rock Art Mapping Project	Resident archaeologist

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

4 EXPERIENCE

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

5 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.
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