13 DESCRIPTION OF BURIAL GROUNDS AND GRAVES

One grave was identified during the survey. The identified grave is described below. The grave was given a unique reference number in the following format:

- Project Code/Map No./G_Site No.

13.1 BKS1319/2627BA/G012

BKS1310/2627BA/G012 is a single informal grave located approximately 20 m east of the proposed treated water pipeline route. Immediate threats can include threats such as erosion or vandalism, or development such as drilling and site clearing. Potential sources of threats and risk include the proposed development of pipelines and the HDS treatment plant. The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of graves.

Table 13-1: Summary of grave G012

Context	Informal grave
Type	Single grave
Orientation	East to west
Condition	Overgrown
Dressing	Stone
Inscriptions / identifying features	None
Age	Unknown
Possible Affinity	Unknown
Persons consulted	No consultation at this point
Threats or sources of risk and Legal Implications	
■ Erosion, vandalism or activities such as drilling and site clearing associated with the proposed development of the HDS treatment plant. ■ Legal implications are based on Section 36 of the NHRA (1999).	

Figure 13-1: Detail of grave G012

14 STATEMENT OF HERITAGE VALUE

The value of a heritage resource is determined on the importance of that heritage resource in terms of its authenticity and integrity. For a detailed explanation of the assessment methodology, see Appendix B.

Table 14-2 presents the individual values allocated to each heritage resource identified within the project area during the field survey.

Field ratings, or proposed grading of heritage resources, are required by SAHRA in terms of Section 7(1) of the NHRA (1999). Field ratings prescribe criteria for assessing heritage resources consistence with Section 3(3) of the NHRA (1999). Table 14-1 presents the field rating system describing the value of heritage resources based on Section 7(1) of the NHRA (1999). A detailed explanation of the site significance assessment methodology and archaeological impact assessment criteria and ratings is provided in Appendix B.

Table 14-1: Field rating thresholds and descriptions based on Section 7(1) of the NHRA (1999)

Score	Grade	Protection	Recommended Heritage Mitigation
16-18	Grade I	National	Heritage resource should be nominated as a National Site/Object, included in National Estate
13-15	Grade II	Provincial	Heritage resource should be nominated as a Provincial Site/Object, included in National Estate
10-12	Grade III A	Local	Heritage resource should be nominated as a Regional Site/Object, included in National Estate
7-9	Grade III B	Local	The heritage resource must be mitigated and partly conserved/preserved
4-6	Grade IV A	General	The heritage resource must be mitigated before destruction
1-3	Grade IV B	General	The heritage resource must me recorded before destruction
0	Grade IV C	General	No mitigation required - application for destruction permit

Table 14-2: The value of the heritage resources identified within the project area during the field survey

Heritage Resource, Activity Type, Development Phase and Aspect					Value of Heritage Resource													
					Importance											Value Rating		
Resource ID	NHRA (1999) Trigger	Activity	Summary of Impact	Reference in EIA	Artistic		Historic			Scientific			Social	IMPORTANCE (0-12)	Credibility (0-3)	AUTHENTICITY (0-15)	Integrity (0-3)	VALUE (0-18)
					e.	f.	a.	i.	h.	b.	c.	d.	g.					
Archaeology																		
PY013	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of possible fossil bearing strata.		0	0	0	0	0	0	1	0	0	0	0	0	0	0
PY014	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of possible fossil bearing strata.		0	0	0	0	0	0	1	0	0	0	0	0	0	0
PY015	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of possible fossil bearing strata.		0	0	0	0	0	0	1	0	0	0	0	0	0	0
BE009	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed AMD and treated water pipelines may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	0	1	0	0	0	0	0	1	1	2	3	2	5
BE010	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed AMD and treated water pipelines may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	0	0	0	0	0	0	0	0	0	0	0	1	1
BE011	38(1)(c)	The construction of the HDS treatment plant which will change the character of a site and is ≥5 000 m^2 in extent. Additionally, construction in the Western Basin involves three erven or subdivisions.	The construction of the proposed HDS treatment plant and associated infrastructure may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	0	0	0	0	0	0	0	1	1	1	2	1	3
BE016	38(1)(c)	The development of the abstraction site at Rand Uranium's No. 8 Shaft that will change the character of the site exceeding 5 000 m² in extent.	Construction and operational activities at the abstraction site at Rand Uranium's No. 8 Shaft may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	1	1	0	0	0	0	0	1	2	3	5	2	7
G012	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of graves.		0	0	0	0	0	0	0	0	3	3	0	3	1	4

15 DISCUSSION OF RESULTS AND FINDINGS

From the research conducted through archival sources, one can deduce that a great deal of development has occurred in the Western Basin, with comparatively less development in the area in the Krugersdorp Game Reserve. Farms have sub-divided and rezoned over the years, with buildings being demolished and townships expanding.

Arguably, the most important perceived landscape is the COH WHS and includes the fossil hominid sites of Sterkfontein and Swartkrans, and the newly discovered Sediba site. Other than representing human evolution and at least the ESA and MSA, the COH WHS also contains historical resources such as the above mentioned lime kilns. Based in the close proximity of the COH WHS to the Krugersdorp Nature Reserve, dolomite outcrops and heritage resources are expected to occur in the surrounding environment. However, the treated water pipeline route is directed along an access route that extends from the HDS treatment plant area to the proposed discharge point on the Tweelopiespruit in the Krugersdorp Game Reserve. This access route as well as features such as railways, fields, and mines, would have disturbed the area and any heritage resources that may have been present. For this reason, although dolomite outcrops may be present, heritage resources were not expected to occur along the treated water pipeline route.

The immediate receiving environment, which includes the proposed AMD abstraction site, HDS treatment plant and pipelines, is entirely industrial. Structures that may be considered heritage resources can include defunct operational infrastructure such as headgear as well as residential complexes. Randfontein Estates was a venture capitalised by J.B Robinson and formed in 1889 and continued to operate as a gold mine until 1950. References to the headgear in the literature indicate that it was around when Randfontein Estates was in operation in the late 1800s and early to mid-1900s. Rand Uranium operations started in 1952 after the successful application as a uranium producer (Anonymous, 1989). The infrastructure such as the headgear were used during this period and are therefore associated with the relatively new industrial landscape as all primary context with regard to older operations have been lost.

The physical survey was conducted by foot and vehicle survey. A review of previously identified sites was also completed, to verify sites and determine extent of sites. Identified sites are summarised in Table 14-2. For a list of the field rating thresholds and descriptions see Table 14-1.

15.1 Pipeline routes

The proposed AMD pipeline will run from the abstraction point at Rand Uranium's No. 8 Shaft to the proposed HDS treatment area. The proposed treated water pipeline will run from the proposed HDS treatment plant to a suitable discharge point on the Tweelopiespruit in the Krugersdorp Game Reserve. The proposed pipeline routes are currently projected to run within existing pipeline servitudes. As a result, the impact area has been highly disturbed and no impacts to heritage resources were identified during the survey.

A single informal grave (BKS1310/2627BA/G012) was found during the field survey. The grave had stone surface dressing with no headstone. The site was burnt during a recent veld fire, but it was evident that it is no longer tended, suggesting that the relatives of the deceased do not frequent the site. The grave lies approximately 20 m away from the proposed pipeline and will not be impacted upon.

A total of three dolomite outcrops were found during the survey. Sites BKS1310/2627BA/PY013, BKS1310/2627BA/PY014 and BKS1310/2627BA/PY015 lie within the Krugersdorp Game reserve and in close proximity to the proposed pipeline. These outcrops may be impacted upon.

15.2 HDS treatment plant

The proposed HDS treatment plant area is currently an open field with drilling taking place occasionally. As a result, the area is highly disturbed. Several built structures consisting of a residential area (BKS1310/2627BA/BE009 and BKS1310/2627BA/BE010) and an old horse stable (BKS1310/2627BA/BE011) were identified outside the development footprint of the proposed HDS treatment plant, and will not be impacted upon.

16 IMPACT ASSESSMENT

The section aims to assess the significance of the potential impacts (threats or sources of risk) on heritage resources in the proposed project area. The following impact assessment was completed in compliance with the significance ratings and archaeological impact assessment criteria established by the ASAPA and applicable international best practice guidelines. More information on the archaeological impact assessment criteria and rating used in this study and details on the weight assigned to the various parameters for positive and negative impacts in the formula are presented in Appendix B.

Table 16-1: Impact assessment

Heritage Resource, Activity Type, Development Phase and Aspect					Value of Heritage Resource													Impact Rating														
					Importance													Before project mitigation								After project mitigation								
Resource ID	NHRA (1999) Trigger	Activity	Summary of Impact	Reference in EIA	Artistic		Historic			Scientific			Social	IMPORTANCE (0-12)	Credibility (0-3)	AUTHENTICITY (0-15)	Integrity (0-3)	VALUE (0-18)	Nature of Impact (+/-)	Spatial Scale (0-3)	Duration (0-3)	Severity (0-3)	Consequence (0-9)	Probability (0-3)	Magnitude (0-27)	Significance (486)	Nature of Impact (+/-)	Spatial Scale (0-3)	Duration (0-3)	Severity (0-3)	Consequence (0-9)	Probability (0-3)	Magnitude (0-27)	Significance (486)	Field Rating
					e.	f.	a.	i.	h.	b.	c.	d.	g.																				
Archaeology																																
PY013	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of possible fossil bearing strata.		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	3	1	3	0		0	0	0	0	0	0	0	Field Rating IV C - General
PY014	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of possible fossil bearing strata.		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	3	1	3	0		0	0	0	0	0	0	0	Field Rating IV C - General
PY015	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of possible fossil bearing strata.		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	3	1	3	0		0	0	0	0	0	0	0	Field Rating IV C - General
BE009	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed AMD and treated water pipelines may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	0	1	0	0	0	0	0	1	1	2	3	2	5	0	0	0	0	0	0	0		0	0	0	0	0	0	0	Field Rating IV A - General

Heritage Resource, Activity Type, Development Phase and Aspect					Value of Heritage Resource													Impact Rating														
					Importance													Before project mitigation								After project mitigation								
Resource ID	NHRA (1999) Trigger	Activity	Summary of Impact	Reference in EIA	Artistic		Historic			Scientific			Social	IMPORTANCE (0-12)	Credibility (0-3)	AUTHENTICITY (0-15)	Integrity (0-3)	VALUE (0-18)	Nature of Impact (+/-)	Spatial Scale (0-3)	Duration (0-3)	Severity (0-3)	Consequence (0-9)	Probability (0-3)	Magnitude (0-27)	Significance (486)	Nature of Impact (+/-)	Spatial Scale (0-3)	Duration (0-3)	Severity (0-3)	Consequence (0-9)	Probability (0-3)	Magnitude (0-27)	Significance (486)	Field Rating
					e.	f.	a.	i.	h.	b.	c.	d.	g.																				
Archaeology																																
BE010	38(1)(a)	The construction of a pipeline exceeding 300 m in length.	The construction of the proposed AMD and treated water pipelines may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	0	0	0	0	0	0	0	0	0	0	0	1	1		0	0	0	0	0	0	0		0	0	0	0	0	0	0	Field Rating IV B - General
BE011	38(1)(c)	Construction of HDS plant will change character of site ≥5 000 m^2 in extent.	The construction of the proposed HDS treatment plant and associated infrastructure may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	0	0	0	0	0	0	0	1	1	1	2	1	3		0	0	0	0	0	0	0		0	0	0	0	0	0	0	Field Rating IV B - General
BE016	38(1)(c)	Construction of HDS plant will change character of site ≥5 000 m^2 in extent.	Construction and operational activities at the abstraction site at Rand Uranium's No. 8 Shaft may cause alteration, damage to or destruction of historical buildings and structures older than 60 years.		0	1	1	0	0	0	0	0	1	2	3	5	2	7		3	3	3	9	2	18	126		1	1	1	3	1	3	21	Grade III B - Local

Heritage Resource, Activity Type, Development Phase and Aspect					Value of Heritage Resource													Impact Rating														
					Importance												Value Rating	Before project mitigation								After project mitigation								
Resource ID	NHRA (1999) Trigger	Activity	Summary of Impact	Reference in EIA	Artistic		Historic			Scientific			Social	IMPORTANCE (0-12)	Credibility (0-3)	AUTHENTICITY (0-15)	Integrity (0-3)	VALUE (0-18)	Nature of Impact (+/-)	Spatial Scale (0-3)	Duration (0-3)	Severity (0-3)	Consequence (0-9)	Probability (0-3)	Magnitude (0-27)	Significance (486)	Nature of Impact (+/-)	Spatial Scale (0-3)	Duration (0-3)	Severity (0-3)	Consequence (0-9)	Probability (0-3)	Magnitude (0-27)	Significance (486)	Field Rating
					e.	f.	a.	i.	h.	b.	c.	d.	g.																				
Archaeology																																
G012	38(1)(a)	Construction of pipeline >300 m in length.	The construction of the proposed treated water pipeline may cause alteration, damage to or destruction of graves.		0	0	0	0	0	0	0	0	3	3	0	3	1	4		0	0	0	0	0	0	0		0	0	0	0	0	0	0	Field Rating IV A - General

16.1 Mitigation Measures and Management Plan

In the event of identified archaeological and cultural heritage resources situated within or in close proximity to proposed development areas, the specialist has to identify, document and make recommendations based on the particular resources' significance, which may include recommendations of:

- *Site preservation*: Conservation is essentially a no development recommendation;
- *Site mitigation*: Site conservation (no development in the particular area) or Phase 2 mitigation (Shovel Test Pits (STPs) after which development may legally proceed in the area; and
- *Site destruction*: If a particular identified resource is of little archaeological or cultural heritage significance, a recommendation of site destruction will be made by an accredited archaeologist. A site destruction recommendation essentially implies that the site may be destroyed during the course of development without the developer having to comply with any archaeological or cultural heritage requirements.

In terms of the NHRA (1999), structures older than 60 years are protected as heritage site of significance and a permit is required for any structural changes and demolition.

16.2 Detailed recommendations with regard to burial grounds and graves

A single informal grave was identified during the field survey of the treated water pipeline route in the Western Basin. The grave (BKS1310/2627BA/G013) was identified approximately 20 m from the proposed treated water pipeline route. In terms of Section 36 of the NHRA (1999), the identified grave falls outside the pipeline route and will therefore not be impacted upon. Although no mitigation measures are recommended for this site, it is suggested that the proposed treated water pipeline route follow the existing access road. Additionally, the grave must be demarcated by either fencing or marking of the grave to make it visible and to minimise the potential for accidental damage.

16.2.1 Recommendations for protection during development and long term

A total of three dolomite outcrops were identified during the field survey of the proposed treated water pipeline route in the Western Basin. Due to the proximity of the Western Basin to the COH WHS, the dolomite outcrops found here and particularly in the Krugersdorp Game Reserve, may be of palaeontological importance. It is recommended that this site be exempt from the proposed footprint area.

16.3 Indications of what must be done at each site

16.3.1 Medium Significance

Sites BKS1310/2627BA/BE009, BKS1310/2627BA/BE010 and BKS1310/2627BA/BE011 are built environment heritage resources that are of medium significance. Site BKS1310/2627BA/BE009, in particular, was part of Randfontein Estates. These structures are older than 60 years and are therefore protected heritage resources under the NHRA (1999). However, these structures may have been altered by recent developments thus disturbing site integrity and authenticity.

The structures currently fall outside the proposed HDS treatment plant area and the pipeline routes and will therefore not be impacted upon by the proposed development activities. No mitigation is therefore required.

Site BKS1310/2627BA/BE016 is the headgear at the No. 8 Shaft. The headgear was associated with the operation of Randfontein Estates which was formed in 1889. In 1952, Randfontein Estates became a uranium producer and operated under the name Rand Uranium. During operation of Rand Uranium, the existing headgear and associated infrastructure were used within a relatively recent industrial landscape. The site and associated structures are not unique and all primary contexts, with regard to older operations, have been lost.

A destruction permit must be applied for from the relevant HRA before any further alteration at the site takes place.

Site BKS1310/2627BA/G012 is a single informal grave that is of medium significance as it is protected by Section 36 of the NHRA (1999). However, the grave falls outside the proposed treated water pipeline route and will therefore not be impacted upon by the proposed development activities.

The grave currently falls outside the proposed HDS treatment plant area and the pipeline routes and will therefore not be impacted upon by the proposed development activities. No mitigation is therefore required.

16.3.2 High significance

Sites BKS1310/2627BA/PY013, BKS1310/2627BA/PY014 and BKS1310/2627BA/PY015 are dolomite outcrops that may be of palaeontological importance. Since it is not possible to predict the buried fossil content of an area, the palaeontological significance of these sites can only be determined through excavation. These sites fall within the proposed treated water pipeline route in the Krugersdorp Game Reserve. Any heritage resources located in the reserve are protected heritage resources themselves.

It is recommended that the dolomite sites are considered of high significance and should be conserved by excluding the Krugersdorp Game Reserve from the proposed treated water pipeline route. Alternatively, a Phase 2 Heritage Assessment may be required to determine the actual potential of palaeontological resources to occur in these dolomites

17 RECOMMENDATIONS

As the proposed activities will mainly impact at existing mining sites, very few impacts on heritage resources are expected to occur. The new HDS treatment plant will be situated on the Randfontein Estates property adjacent to the Rand Uranium property. The activities will include:

- Abstraction of AMD via installed pumps in Rand Uranium's No. 8 Shaft at a depth to achieve the ECL;
- Construction of a new HDS treatment plant on the Randfontein Estates site;
- Construction of a treated water pipeline to a suitable discharge point on the Tweelopiespruit; and
- Construction of waste sludge disposal pumps and pipeline to the old opencast pits for the disposal of the sludge from the treatment process.

Primary impacts will be associated with the construction phase, and specifically with the proposed new HDS facilities. However, as the immediate receiving environment is of a recent industrial landscape, impact on structural elements may be lower. Conversely, potential impacts on the general heritage landscape, particularly with regards to the COH WHS, are expected to be more likely.

18 CONCLUSION

Digby Wells has been requested by TCTA to conduct a HIA for the Western Basin of the Witwatersrand Gold Fields in the Gauteng Province. The DWA issued TCTA with a directive to act as the agent to plan, design, and implement immediate and short term measures to manage and control acid mine drainage in the Western, Central, and Eastern Basins of the Witwatersrand Gold Fields.

A single informal grave was identified during the field survey of the proposed HDS treatment plant and pipeline routes in the Western Basin (BKS1310/2627BA/G012). The grave is located outside of the development footprint and will not be impacted upon and therefore no mitigation measures are recommended for the grave. However, although no mitigation measures are recommended, it is suggested that the proposed treated water pipeline route follow the existing access road to avoid alteration, damage to, or destruction of potential graves that may exist in the area.

A total of three dolomite outcrops were identified during the field survey of the proposed treated water pipeline route in the Western Basin. Due to the proximity of the Western Basin

to the COH WHS, the dolomite outcrops found in the Krugersdorp Game Reserve may be of palaeontological importance. It is recommended that this site be exempt from the proposed footprint area.

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Appendix A: CVs of Specialists

SHAHZAADEE KARODIA

Ms Shahzaadee Karodia

Archaeology Consultant

Social Science Department

Digby Wells Environmental

1 EDUCATION

- 2006 BA Anthropology & Archaeology, University of the Witwatersrand
- 2007 BSc Honours. Palaeontology, University of the Witwatersrand
- 2012 MSc Archaeology, University of the Witwatersrand

2 LANGUAGE SKILLS

English (read, write, speak)

3 EMPLOYMENT

2012:	Archaeology consultant, Digby Wells Environmental
April 2012 – June 2012:	Archaeology consultant, EcoAfrica
April 2011 – November 2011:	Archaeology intern, University of Pretoria
2009 – 2011:	English tutor, Kip McGrath
2009 – 2011:	Online English tutor, Education First
2008 – 2009	English teacher, Yong Ju Elementary School
2007 – 2008:	Palaeontology collections assistant, BPI University of the Witwatersrand
2006 – 2007:	Tour guide, Sterkfontein Caves

4 EXPERIENCE

- Archaeology Field School in Klipriviersberg with Dr Karim Sadr, University of the Witwatersrand
- Archaeology Field School in Swartkrans and Maropeng with Dr Kathy Kuman, University of the Witwatersrand
- Archaeology Field School in Ottosdaal with Dr Thembi Russell, University of the Witwatersrand
- Palaeontology Field School in the Karoo with Professor Bruce Rubidge, University of the Witwatersrand
- Palaeontology Field School in Gladysvale with Professor Lee Berger, University of the Witwatersrand
- Palaeontology Field School in Wonderkrater with Dr Lucinda Backwell, University of the Witwatersrand

5 PROJECT EXPERIENCE

- Heritage Statement for the Central Basin, Witwatersrand Acid Mine Drainage Project
- Archaeological Watching Brief on Access Road for Bokoni Platinum Ltd
- Heritage Statement for Eskom Transmission Division – Roodepoort Strengthening Project;
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga
- Heritage Statement for Rhodium Reef Limited Platinum Operation, 2430 CA & CC, De Goedverwachting 332 KT, Boschkloof 331 KT and Belvedere 362 KT

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA)
- The Palaeontological Society of Southern Africa (PSSA)
- The South African Archaeology Society (SAAS)
- Society of Africanist Archaeologists (SAfA)
- The South African Society for Amateur Palaeontologists (SASAP)

CURRICULUM VITAE (CV) OF JOHAN NEL 2011

PERSONAL DETAILS

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PROFESSIONAL EDUCATION

2001 BA Anthropology & Archaeology, *University of Pretoria*

2002 BA Honours Archaeology, *University of Pretoria (UP) (2002)*

Current MA Archaeology

EMPLOYMENT

2010 – present: Archaeologist and CRM specialist, Digby Wells Environmental

2005 – 2010: Co-owner and manager of Archaic Heritage Project Management, Cultural Heritage Resources Management consultancy company;

2004 – 2005: Resident, professional archaeologist, Rock Art Mapping Project based at Didima / Cathedral Peak, Ukhahlamba-Drakensberg World Heritage Site, Department of Geomatics, University of KwaZulu-Natal;

2003 – 2004: Freelance, professional archaeologist;

2002 – 2003: Special Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;

2000 – 2002: Technical Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;

1999 – 2000: Assistant in Mapungubwe Project, Department of Anthropology and Archaeology, University of Pretoria;

1998 - 1999: Volunteer at National Cultural History Museum, Pretoria, Writer for BAT ('By About Town) arts section in Perdeby, official University of Pretoria student newspaper.

PROFESSIONAL MEMBERSHIPS

Association of Southern African Professional Archaeologists (ASAPA): Professional Member

ASAPA Cultural Resources Management (CRM) section: Accreditation in:

Grave Relocation – Field Director

Iron Age – Field Supervisor

Rock Art – Field Supervisor

International Association of Impact Assessors (South Africa)

Society for Africanist Archaeologists (SAfA)

EXPERIENCE

DIGBY WELLS PROJECT EXPERIENCE:

Phase 1 Archaeological Impact Assessments:

- Koidu Holdings, Koidu, Sierra Leone;
- Temo Coal, Limpopo, South Africa;
- Galaxy Gold Agnes Mine, Barberton, South Africa;
- HCI Khusela Palesa Extension, Bronkhorstspruit, South Africa
- Randgold Kibali Gold Project, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo;
- Nzoro Hydropower Station, Environmental and Social Impact Assessment, DRC;
- Boikarabelo Railway Link, Resgen South Africa, Steenbokpan, South Africa;

Mitigation projects:

- Mitigation of Iron Age archaeological site: Kibali Gold Project, DRC;
- Mitigation of precolonial metalworking site: Koidu Diamond Mine, Sierra Leone.

Grave relocation

- Randgold Kibali Mine, Relocation Action Plan, Kibali, DRC;

Other Heritage assessments and reviews:

- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa;
- Review of Archaeological Assessment: Resources Generation, Coal Mine Project in the Waterberg area, Limpopo Province;
- Review of CRM study and compilation of Impact Assessment report, Zod Gold Mine, Armenia.

ACADEMIC FIELDWORK

Five seasons hosted: survey, mapping and excavation historic / Late Farmer Community sites on farms Bivack 14 MR and Eerstekrans 16 MR for personal MA research, Department of Anthropology and Archaeology, UP.

Ten projects / seasons attended as Teaching Assistant / Member of Staff

Eight projects / field seasons attended on invitation as undergraduate and graduate student

LIST OF SELECTED UNPUBLISHED CRM AND OTHER REPORTS

Nel, J. 2009. *Final Report. Archaeological Impact Assessment. Proposed conversion of prospecting rights to mining rights on remainder of the farm Uitenpas 2 MT and portion 40 of the farm Messina 4 MT, Musina, Vhembe District, Limpopo Province.* Unpublished Archaeological Impact Assessment Report for Georock Environmental. Pretoria: Archaic.

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Nel, J. 2008. *Social Consultation on Graves: Elawini Lifestyle Estate (also known as Mahlasela Cemetery).* Unpublished Cultural Heritage Assessment Report for Professional Grave Solutions (Pty) Ltd (PGS). Pretoria: Archaic HPM.

Nel, J. 2008. *Social Consultation on graves affected by urban/residential evelopment. Apiesdoorndraai/Motaganeng, Burgersfort, Limpopo.* Unpublished Cultural Heritage Assessment

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Nel, J. In press. '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.

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Appendix B: Site Significance Assessment and Impact Rating System

HERITAGE IMPACT MATRIX METHODOLOGY

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SEPTEMBER 2012

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1 INTRODUCTION

Assessment of heritage resources includes three distinct but complimentary assessment criteria. The first is aimed at determining the value of a resource. The second is an assessment of impacts on the resource, taking into account its value and field rating if relevant. The third, only used in a South African context, is aimed at providing a proposed grading of the resource.

2 VALUE

In order to determine the value or significance of a heritage resource, the importance of that resource in terms of its authenticity and integrity at the time of assessment must be determined. Value is determined using the following formula:

Value (0-18) = Importance (0-12) + Credibility (0-3) + Integrity (0-3)

2.1 Importance

Importance is determined on four dimensions – artistic, historic, scientific, and social – each with a subset of attributes that may assist in determining the importance of the resources on each dimension.

The nine attributes are based in part on the UNESCO World Heritage Convention (1972) and the Australian ICOMOS Burra Charter. The attribute descriptions are however taken from the South African National Heritage Resources Act (Act 25 of 1999) (NHRA), which is based extensively on the Burra Charter, but has simplified those criteria sufficiently to be used here. In this manner, the nine attributes are divided into the four dimensions as relevant, summarised in Table 1 below.

Table 1: Summary of dimensions, attributes and references

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

2.2 Authenticity

The credibility of the information sources are vital in determining the importance and authenticity of heritage resources. The Nara Document on Authenticity forms the basis of determining authenticity. Based on this document, it is accepted that understanding and determining the value attributed to heritage resources rely on certain information sources. These sources need to be assessed as credible or truthful, which requires knowledge and understanding of such information sources in relation to original and

Information sources are defined as all physical, written, oral, and figurative sources, which make it possible to know the nature, specificities, meaning, and history of the cultural heritage. Therefore, determining authenticity of a resource requires a sound knowledge of the type of heritage resource as well as the context within which occurs – the cultural landscape. This knowledge must be gained through a detailed baseline that must aim to contextualise the resource. Information that should be considered are published, peer reviewed literature, archival research, popular publications, and any other information source that may be relevant.

subsequent characteristics of the cultural heritage, and their meaning.

The sum of the attributes, rated out of 3, are averaged per dimension to allow for an equally weighted calculation of each dimension. The sum of the four dimensions (rating out of 12) are added to a credibility rating (out of 3) to provide an authenticity rating, as follows:

Authenticity = Importance + Credibility

where

Importance = artistic + historic + scientific + social

The level of authenticity thus depends on credible information sources that determine the importance of a heritage resource. The thresholds for authenticity are provided in Table 2 below.

Table 2: Threshold and description of authenticity ratings

Score	Description	Rating
0	Credibility of information cannot be determined: conjecture, unverified personal opinions; biases evident.	None/negligible
1-5	Secondary and tertiary information sources: popular media, newspapers, magazines; 'information' websites e.g. Wikipedia, etc.; individual opinions.	Low
6-10	Credible secondary sources: factually correct textbooks, popular publications, etc.; official websites; verifiable oral accounts.	Medium
11-15	Highly credible information sources: peer reviewed publications; primary sources; verified oral accounts.	High

Authenticity

Credibility \ Importance	0	3	6	9	12
0	0	3	6	9	12
1	1	4	7	10	13
2	2	5	8	11	14
3	3	6	9	12	15

2.3 Integrity

The degree of integrity is based on the condition of the resource at the time of assessment, compared to an ideal or other example. Integrity can therefore only be assessed once the resource's authenticity has been determined, as information regarding a heritage resource

should provide comparative examples against which its condition may be measured. The degree of integrity is described Table 3 below.

Table 3: Description of integrity and ratings

Score	Description	Rating
0	Resource degraded to extent where no information potential exists; resource cannot be restored; single, isolated find, without any site context;	No/negligible
1	Poor condition, active decay visible; excessive restoration required; little information potential	Poor
2	Fair to good condition; well preserved; some decay present; can be easily restored/conserved/preserved; good information potential	Fair-good
3	Excellent/pristine; extremely well preserved; little to no decay present; little restoration required/restoration will greatly enhance resource; excellent information potential	Excellent/pristine

3 FIELD RATING

Field ratings, or proposed grading of heritage resources, are required by SAHRA in terms of S. 7(1) of the NHRA. Field ratings prescribe criteria for assessing heritage resources consistent with S. 3(3) of the act. It furthermore outlines a three tier system for heritage resources management of the national estate:

- National: SAHRA is responsible for identification and managing of Grade I heritage resources;
- Provincial: Provincial Heritage Resources Authorities (PHRAs) are responsible for identification and managing of Grade II heritage resources; and
- Local: Local authorities (municipalities, metros, local government) are responsible for identification and managing of Grade III heritage resources.

Identification and management responsibilities

However, few local authorities currently have the capacity to identify and manage Grade III heritage resources. The responsibility in practice thus reverts to the PHRA or SAHRA where a PHRA is absent. The only functioning PHRAs currently (2012) are Amafa-akwaZulu-Natali, Heritage Western Cape, and Eastern Cape Provincial Heritage Resources Authority (EC-PHRA). For courtesy and consistency, reports should still be submitted to absent PHRAs such as LIHRA (Limpopo Heritage Resources Authority) and G-PHRA (Gauteng Heritage Resources Authority).

Field ratings are based on (equal to) the value of a heritage resource. The thresholds for field ratings are present in Table 4 below.

Table 4: Field rating thresholds and descriptions

Score	Grade	Protection	Recommended Heritage Mitigation
16-18	Grade I	National	Heritage resource should be nominated as a National Site/Object, included in National Estate
13-15	Grade II	Provincial	Heritage resource should be nominated as a Provincial Site/Object, included in National Estate
10-12	Grade III A	Local	Heritage resource should be nominated as a Regional Site/Object, included in National Estate
7-9	Grade III B	Local	The heritage resource must be mitigated and partly conserved/preserved
4-6	Grade IV A	General	The heritage resource must be mitigated before destruction
1-3	Grade IV B	General	The heritage resource must me recorded before destruction
0	Grade IV C	General	No mitigation required - application for destruction permit

Value = Field Rating

Integrity \ Authenticity	0	3	6	9	12	15
0	0	3	6	9	12	15
1	1	4	7	10	13	16
2	2	5	8	11	14	17
3	3	6	9	12	15	18

Value = Authenticity + Integrity

4 IMPACT ASSESSMENT

Assessment of impacts on heritage resources rely on two factors that must be considered when rating impacts:

- The potential physical and/or visual impact on the resource; and
- The impact on the cultural landscape should any resource change or be destroyed.

The rating takes into account:

- Spatial scale of impact;
- Expected duration of impact; and
- Severity of impact;
- Consequence of impact;
- Probability of impact occurring; and
- Value of heritage resource

Impact significance = value x magnitude

where

Value = importance + credibility + integrity

and

Magnitude = consequence x probability

and

Consequence = spatial scale + duration + severity

The impact rating is applied to pre- and post-mitigation scenarios. The ideal is to remove all impacts to a heritage resource. Where post mitigation significance is not zero, the recommended field rating (heritage) mitigation must be undertaken. The tables below provide the various descriptions and thresholds applicable to the impact assessment ratings.

Table 5: Description of magnitude ratings

Score	Description	Rating
0	No/negligible environmental impacts expected on heritage resource.	None/negligible
1-8	Low magnitude of environmental impacts on heritage resource	Low
9-16	Medium magnitude of environmental impacts on heritage resource	Medium
17-27	High/exceptional magnitude of environmental impacts on heritage resource	High

Magnitude

Consequence

Probability	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27

Magnitude = Consequence x Probability

where

Consequence = scale + duration + severity

Table 6: Scores, descriptions and ratings determining consequence of impact

Scale		
Score	**Description**	**Rating**
0	No effect on any part/aspect of heritage resource	None
1	Isolated parts/aspects of heritage resource will be affected	Low
2	Large parts/aspects of heritage resource will be affected	Medium
3	Most or entire heritage resource will be affected	High
Duration		
Score	**Description**	**Rating**
0	No impact will occur during life of project	None
1	Impact will be short and reversible	Low
2	Impact will occur throughout life of project, but is reversible	Medium
3	Impact is permanent and irreversible	High
Severity		
Score	**Description**	**Rating**
0	Negligible to no change/alteration/damage/destruction of heritage resource	None
1	Reversible changes/alterations to heritage resource	Low
2	Parts/aspects of heritage resource will be permanently altered/changed/destroyed	Medium
3	Entire heritage resource will be permanently altered/changed/destroyed	High
Probability		
Score	**Description**	**Rating**
0	Impact will not occur	None
1	Impact could occur, but implementation of appropriate project mitigation measures reduce/remove impacts	Unlikely
2	Impact may occur during life of project regardless of implementation of project mitigation measures	Probable
3	Impact will definitely occur, project mitigation measures will not reduce or remove impacts	Certain

Table 7: Significance of impact on categories of heritage resources

		Magnitude of Impact			
		Archaeology, Palaeontology	Built Environment/Structures	Historic Landscape	Intangible/Associations
0	**No change**	No change	No change to fabric or setting	No changes to landscape elements, parcels, or components; no visual or audible changes; no changes in amenity or community factors.	No change
1-122	**Low**	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 or sound quality; very slight changes to use or access; resulting in 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
123-243	**Medium**	Changes to key archaeological materials, such that the resource is slightly altered; slight changes to the setting.	Change to key historic building elements, such that the resource 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 the historic landscape; limited changes in noise or sound quality; slight changes to use or access; resulting in limited changes to historic landscape character.	Changes to area that affect the ICH activities or associations or visual links and cultural appreciation
243-486	**High**	Changes to many key archaeological materials, such that the resource is clearly modified; changes to the setting that affect the character of the asset	Change to many key historic building elements, such that the resource is significantly modified; change to setting of an historic building, such that it is significantly modified.	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.	Considerable changes to area that affect the ICH activities or associations or visual links and cultural appreciation
		Changes to attributes that convey outstanding national value of national estate; Most or all key archaeological materials, including those that contribute to ONV such that the resource is totally altered; comprehensive changes to setting	Change to key historic building that contribute to outstanding national value of national estate such that the resource is totally altered; Comprehensive changes to setting.	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 on outstanding national value.	Major changes to area that affect the ICH activities or associations or visual links and cultural appreciation

		Significance Magnitude									
		0	3	6	9	12	15	18	21	24	27
Value	0	0	0	0	0	0	0	0	0	0	0
	3	0	9	18	27	36	45	54	63	72	81
	6	0	18	36	54	72	90	108	126	144	162
	9	0	27	54	81	108	135	162	189	216	243
	12	0	36	72	108	144	180	216	252	288	324
	18	0	54	108	162	216	270	324	378	432	486

Significance = Magnitude x Value