HERITAGE IMPACT ASSESSMENT FOR RHODIUM REEF LIMITED PLATINUM OPERATION, 2430CC KENNEDYS VALE, DE GOEDEVERWATCHING 332 KT, LIMPOPO PROVINCE

RHODIUM REEF LIMITED PLATINUM

APRIL 2013

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DIGBY WELLS ENVIRONMENTAL

This document has been prepared by **Digby Wells Environmental**.

Report Title: **HERITAGE IMPACT ASSESSMENT FOR RHODIUM REEF LIMITED PLATINUM OPERATION, 2430CC KENNEDYS VALE, DE GOEDEVERWATCHING 332 KT, LIMPOPO PROVINCE**

Project Number: **RH01867**

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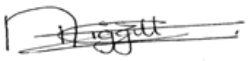
Natasha Higgitt	Report Compiler		16 April 2013
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EXECUTIVE SUMMARY

Digby Wells was requested by Rhodium Reefs Limited to conduct a Heritage Assessment for the Environmental Authorisation in support of a Mining Rights Application (MRA) for the extension of the Spitzkop / Rhodium Reefs Platinum operation.

Based on comments from the South African Heritage Resources Agency (SAHRA), SAHRA stipulated that a Heritage Impact Assessment (HIA) report must be completed for the development footprint area and submitted for assessment. The HIA report presented here is, according to the Terms of Reference (ToR) received from SAHRA, inclusive of:

- A HIA on the development footprint area.

A total of four heritage resources were identified during the pedestrian survey, two of which lay within the project boundary and may be impacted upon.

The burial S.36-002 was given a medium heritage value. The burial is located near the south-western corner of the development area. According to the current development plan, the burial will not be impacted upon by the development. The site was given a Grade III B field rating, and as such it is recommended that the burial must be fenced off and that a site management plan is to be implemented.

The archaeological surface occurrence S.35-001 is of a negligible heritage value. It is located near the south-west border of the development and will be impacted on. However, the resource was given a Grade IV C field rating and as a result, no project-related mitigation measures are recommended for the site. The heritage resource was adequately recorded and mapped.

The remaining archaeological surface occurrences S.35-003 and S.35-004 were located 27 m and 19 m respectively outside of the proposed development footprint area but are located within a 100 m buffer zone. These heritage resources are of a negligible heritage value and may not be impacted on by the proposed development. The resources were given a Grade IV C field rating and as a result, no project-related mitigation measures are recommended for the sites. The heritage resources were adequately recorded and mapped.

GLOSSARY OF ABBREVIATIONS AND TERMS

ASAPA	Association of Southern African Professional Archaeologists
BEE	Black Economic Empowerment
BGGC	Burial Grounds and Graves Census
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
GTM	Greater Tubatse Local Municipality
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
HSMP	Heritage Site Management Plan
MJS	Major Jackson Series
MPRDA	Mineral and Petroleum Resources Development Act
MRA	Mining Right Application
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
NID	Notification of Intent to Develop
PPP	Public Participation Process
RRL	Rhodium Reef Limited
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SCPE	Sekhukhuneland Centre of Plant Endemism

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1 INTRODUCTION

Digby Wells Environmental (Digby Wells) was requested by Rhodium Reefs Limited (Rhodium Reefs) to conduct a Heritage Impact Assessment (HIA) for the extension of their underground mining area to include a vertical shaft on De Goedverwachting 322 KT.

A Heritage Statement and Notice of Intent to Develop (NID) was compiled and submitted to SAHRA for comment. An interim comment was received stating that an HIA was to be completed for the development footprint area.

2 BACKGROUND INFORMATION OF PROJECT

An Eastplats Group company, Spitzkop Platinum (Spitzkop), holds a mining right over the farm Spitskop 333KT, where it plans to develop a shallow underground mine. Both developments are covered under the same Environmental Impact Assessment (EIA) and approved environmental authorisation. The ore mined at Mareesburg Platinum (Mareesburg), another Eastplats Group company, will also be directed to the Rhodium Reefs concentrator. Eastplats owns approximately 74% of both Spitzkop and Rhodium Reefs, however the 26% Black Economic Empowerment (BEE) component, is different for each entity.

A consolidated mining plan was developed wherein it is proposed that underground mining on the farm Spitskop will extend across farm boundaries into the farms De Goedeverwachting and Kennedy's Vale. Later underground mining may also extend into some adjacent portions of the farms Boschkloof 331 KT, Tweefontein 360 KT and Belvedere 362 KT. The extended area will enable the scale of mining operations to be increased (partly through the use of the existing vertical shaft infrastructure on Kennedy's Vale), the life of mine to be materially extended and increase the financial viability of the entire project. Exploration of the entire property has been undertaken and a mineral resource defined.

The proposed project will exploit the UG2 platinum reef to a final depth of approximately 1 700 metres below surface. The platinum group metals, and all metals and minerals found in association therewith, will be mined and processed at the Rhodium Reefs platinum concentrator which is currently being constructed.

Work on re-opening the existing vertical shaft is planned to commence in year 4 of operation and a sub-vertical shaft is planned to be sunk in year 22. At that point in time all environmental authorisations and licences will be in place.

An additional vertical shaft and ventilation shaft with supporting infrastructure is proposed to be constructed on De Goedverwachting 332KT.

Digby Wells Environmental completed an Scoping Report in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The Scoping Report was undertaken for Spitzkop Platinum, an Eastplats company, on the farms De

Goedeverwatching 332 KT; Boschkloof 331 KT; Belvedere 362 KT; Kennedy's Vale 361 KT; and Tweefontein 360 KT.

The pending EIA includes a specialist heritage component that was undertaken in two phases. The first phase comprised a primarily desktop assessment of the cultural landscape. This desktop assessment presented as a Heritage Statement report that was summarised in a NID. Specialist recommendations made in the NID included:

- A Letter of Recommendation for Exemption for a Palaeontological Assessment for the project area; and
- A Phase 1 HIA for the impact footprint only and not the entire proposed project area.

Both the Heritage Statement and NID were submitted online on the South African Heritage Resources Information System (SAHRIS) on 23rd October 2012. Case reference numbers and a case officer were assigned to the project as summarised in Table 2-1.

Interim Comment on the NID and Heritage Statement were received on 30th October 2012 stating that a Heritage Impact Assessment is required. The Interim Comment also provided Terms of Reference and Scope of Work for the HIA. The Interim Comment further exempted Rhodium Reefs from undertaking a palaeontological assessment of the project area.

Table 2-1: Summary of SAHRIS Case reference

Case reference:	DWE_RHO1867_NID
Case ID:	707
Case officers:	Phillip Hine
Official reference:	9/2/236/0002

2.1 Report type: Section 38(8) Heritage Impact Assessment

The HIA was undertaken in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) as a specialist component on the EIA/EMP required in terms of the MPRDA and NEMA.

2.2 Context of Development

2.2.1 Type of development

Underground mining with limited surface infrastructure including:

- A vertical shaft;
- Ventilation shaft; and
- Supporting infrastructure (offices, topsoil stockpiles etc.).

2.2.2 Rezoning and/or land subdivision

No rezoning or subdivision will take place for the Rhodium Reef Project.

2.2.3 Development context of study area

The project area is located within the Greater Tubatse Local Municipality (GTM). The municipal area is primarily rural in nature and has been historically used for agricultural purposes. Development priorities in the region have been described in the 2012-2013 Final Integrated Development Plan (GTM-IDP) and included:

- Community development through supporting of the local trade sector;
- Job creation through supporting economic activities in manufacturing, construction and urban renewal.

According to the GTM-IDP (Greater Tubatse Municipality 2012: 200) economic focus is three-tiered, with emphasis being placed on mining, agriculture and tourism. Currently the mining industry represents the greatest potential for local economic growth. Although mining exists in the area, many resources remain unexploited (Greater Tubatse Municipality 2012: 61). The GTM viewed investment in the mining sector as important due to its potential to increase infrastructure capitalisation, create employment opportunities and generate other economic spin-offs (Greater Tubatse Municipality, 2012).

2.3 Client, consultant and land owner contact details

The following tables summarise the contact details of the client, consultant and landowner.

Table 2-2: Client contact details

ITEM	COMPANY CONTACT DETAILS
Company/Institution:	Rhodium Reef Limited
Contact person:	David Marsden
Tel no:	(011) 463 0050
Fax no:	011) 463 0090
E-mail address:	dmarsden@eastplats.co.za

Table 2-3: Consultant contact details

ITEM	COMPANY CONTACT DETAILS
Company/Institution:	Digby Wells Environmental
Contact person:	Marcelle Radyn
Tel no:	(011) 789 9495
Fax no:	(011) 789 9498
E-mail address:	marcelle.radyn@digbywells.com
Postal address:	Fern Isle, Section 5, 359 Pretoria Avenue, Randburg, 2125, Private Bag X10046

Table 2-4: Land owner contact details

De Goedeverwachting 332 KT Portion 1 and Remaining Extent	
ITEM	**CONTACT DETAILS**
Company/Institution:	National Government of the Republic of South Africa
Contact person/s:	Mr G.O Xaba/ Bheki Nyathikazi and Mr Gumbi (Republic of South Africa/ Department of Rural Development and Land Reform)
Tel no:	(017) 819-2076
E-mail address:	goxaba@mpg.gov.za / nyathikazibw@mpg.gov.za; MAJGumbi@ruraldevelopment.gov.za
Title Deed Surface Right Owner:	National Government of the Republic of South Africa

3 TERMS OF REFERENCE

3.1 Client Terms of Reference

Rhodium Reefs has requested Digby Wells to undertake an EIA / EMP in support of environmental authorisation in accordance with the MPRDA and the NEMA.

Subsequent to the Heritage Statement and NID, Rhodium Reefs has requested Digby Wells to undertake a HIA for the proposed development footprints in the project area as required in the Interim Comment received from SAHRA.

3.2 SAHRA Interim Comment

The requirements contained in the Interim Comment (SAHRA 2012) formed the basis for the Terms of Reference and Scope of Work for this HIA. Based on these requirements the Scope of Work was determined to include:

- A Phase 1 Archaeological Impact Assessment of the proposed infrastructure footprints in the project area.

The area to be developed was also exempt from a palaeontological assessment.

3.3 Aim and Objectives

The primary aim of this HIA was to identify heritage resources that may exist in the development footprints in the project area in order to affectively protect and manage such resources.

To achieve this aim certain objectives needed to be completed that included:

- Identification, recording and documentation of all visible, tangible heritage resources present within the proposed development footprints in the project area;
- Evaluation of the significance or value of identified heritage resources;
- Identification and definition of potential environmental impacts that may result in changes to heritage resources;
- Assessment of the intensity of environmental impacts on identified heritage resources; and
- Recommended management measures to avoid or reduce environmental impacts that will result in adverse change to identified heritage resources.

3.4 Legislative Requirements

3.4.1 Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)

Section 38 of the MPRDA stipulates that the holder of a prospecting or mining right must at all times comply to the general objectives of integrated environmental management outlined in the Chapter 5 of the NEMA. In addition, Section 39 of provides a framework and criteria within the EIA/EMP must be completed. Subsection 3(b)(iii) requires the applicant to conduct an impact assessment on any national estate referred to in Section 3(2) of the NHRA.

3.4.2 National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)

Chapter 5 of the NEMA promotes the application of appropriate environmental management tools ensuring integrated environmental management. Implementations of specialist heritage assessments are given effect in Section 24 of the NEMA. Subsection 7(b) specifically addresses potential impacts and cumulative effects of activities, including alternatives, on cultural heritage. Listed Activities that may impact on heritage resources are summarised in Table 3-1 below.

Table 3-1: Listed Activities in terms of the GNRs stipulated under NEMA

Number and date of the relevant notice:	Activity No	Description of each listed activity as per project description
R. 544, 18 June 2010	9	Pipelines for the transportation of sewage, bulk water supply and stormwater will be longer than 1 km and may have an internal diameter of 0.36 m or more, and a throughput of more than 120 litres per second.
	11	The construction of infrastructure within 32 metres of a water course may be done. This infrastructure will consist of bulk stormwater outlets, dams for water management functions, and the construction of infrastructure and structures of a combined area of 50 square metres or more (See section A).
	22	Construction of internal haul roads in a rural area where the reserve will be wider than 13.5 metres. Where there are no reserves, the road will be wider than 8 metres.
	26	Any process or activity identified, during scoping phase, in terms of section 53(1) of the National Environmental Management: Biodiversity Act. Although this is to be confirmed during the scoping phase, it is anticipated that the construction of infrastructure, haul roads will be in close proximity to water courses and potential wetlands
R. 545, 18 June	3	Infrastructure will be constructed for the storage and handling of dangerous goods, more specifically: fuel,

Number and date of the relevant notice:	Activity No	Description of each listed activity as per project description
2010		lubricants, chemicals, gas, burning oils and explosives (See section A).
	5	A sewage treatment plant will be constructed for the treatment of sewage.
	19	Stormwater management and pollution control dams will be constructed of which the highest part of the dam wall may be higher than 5 metres, and the dams may be larger than 10 hectares

3.4.3 National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)

The NHRA provides the framework within which integrated heritage resources management (HRM) must take place. The NHRA makes provision for the general protection of certain types of heritage resources, in addition to ensuring living and intangible heritage is preserved. NHRA sections that define heritage resources that are generally protected include:

- Section 34 – historical built environment, i.e. structures, places and sites and associated material older than 60 years;
- Section 35 – archaeological and palaeontological resources and meteorites: any material cultural remains associated with human activity older than 100 years, any place, object or site that has palaeontological significance and any meteorite; and
- Section 36 – burial grounds and graves: any burial ground and grave older than 60 years, or not administered by a local authority, including graves of victims of conflict and persons of royal descent.

Section 38 of the NHRA provides the basic legislative process within which integrated HRM should take place and stipulates minimum requirements for a HIA report. Subsection 1 categorises development activities that inherently require HIAs.

Subsection 8 however states that HIAs are required irrespective of subsection 1 requirements if an evaluation of impacts on heritage resources is required in terms of the MPRDA or NEMA, and any other legislation. As noted above, Sections 38 and 39 of the MPRDA and Section 24 of the NEMA both require the undertaking of HIAs.

3.4.3.1 Section 38 – Heritage Resources Management (HRM)

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is

required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

The Listed Activities in terms of the Government Notice Regulations (GNRs) stipulated under NEMA for which Environmental Authorisation (EA) will be applied for will trigger a HIA as contemplated in Section 38(1) above as follows:

3.5 Expertise of Specialists

Justin du Piesanie completed his Master of Science (MSc) degree in Archaeology at the University of the Witwatersrand in 2008. He is currently employed as an Archaeology Consultant at Digby Wells Environmental. He has 10 years of experience in archaeology of which five years in been spent in heritage management through being involved in several Archaeological and Heritage Impact Assessments in South Africa and the Democratic Republic of Congo.

Natasha Higgitt completed her Honours in Archaeology at the University if Pretoria in 2009. She is currently employed as an archaeology consultant at Digby Wells Environmental. She has three years' experience in the Heritage Impact Assessment field. She has experience in Archaeology and Heritage impact assessments in South Africa, including Archaeological mitigation. She has experience with social projects including Resettlement Action Plans and Public Participation in Liberia.

4 METHODOLOGY

4.1 Survey and sampling

The project area is dominated by low thorn bushes and dense vegetation. Pedestrian surveys were conducted in and around the proposed infrastructure footprint areas, concentrating on open areas and features within the landscape, such as erosion gullies. The survey was logged using GPS track logs and heritage resource positions recorded as waypoints.

Identified heritage resources were documented through photographs and detailed written descriptions. More significant or intact sites were mapped using sophisticated land survey GPS equipment.

All survey data was collated and integrated in a Geographical Information System (GIS) to create detailed site and location plans.

Equipment that was used during the field survey included:

- Canon SX30 digital camera;
- Garmin Etrex handheld Global Positioning System (GPS) device, average accuracy 5 m;
- Trimble R4 GNSS differential GPS, average accuracy 20 mm.

4.1.1 Site naming

Heritage resources identified during the survey recorded using automatic waypoints generated by the handheld GPSs. Subsequently, site references were assigned that included the Digby Wells project number, followed by the map sheet number and the relevant NHRA section suffixed with the site number: **RHO1867/2430CC/S.35-001**

This reference was abbreviated in tables and/or on plans or maps using the NHRA reference number suffixed with the site number: **S.35-001**.

4.2 Data collection

Data collection was aimed at gathering information relating to known heritage resources within and surrounding the proposed area for development. Data collection included literature review of primary and secondary sources such as academic journals, textbooks and archival records, national and provincial websites, archaeological field guides, national guidelines, maps, photographs and plans.

Desktop surveys of historical aerial photographs, historical maps, topographical maps and satellite imagery were undertaken to plot potential sites as well as determine possible relative ages of existing infrastructure.

4.3 Public participation and consultation

The public participation process (PPP) conducted for this project followed a consultative approach. This was achieved by encouraging active engagement from stakeholders so that suggestions and comments can be incorporated into the project design and that concerns and conflicts can be openly addressed in an on-going manner. Through the PPP, adequate and timely information was provided to all Interested and Affected Parties (I&AP) to ensure they are given sufficient opportunity to voice their opinions, concerns and issues. The PPP provided a platform for issues and comments to be raised that will add value to the EIA process, thereby influencing the decision-making process. The following tasks were undertaken:

- Stakeholder identification;
- Development of appropriate documentation;
- Stakeholder notification (through the dissemination of information and meeting invitations);

- One-on-one meetings were undertaken with relevant local authorities, directly affected and surrounding landowners, farm occupiers and land claimants;
- The compilation of a Draft Scoping Report in terms of NEMA process which was made available to I&AP in November 2012; and
- The compilation of a Draft EIA that was submitted to the DMR on 7 January 2013 and made available for public review until 28 January 2013, during which two public meetings were held on 16 and 17 January 2013.

See Appendix D: Registered Stakeholders for a complete list of all registered stakeholders.

4.4 Assessment

4.4.1 Assessment of Resource Significance/Value

The significance or value of identified heritage resources were was assessed relative to the National Estate in terms of Section 3 of the NHRA. Potential impacts on the heritage resources were assessed in terms of Digby Wells' standard EIA methodology, as well as in terms of the impact assessment criteria and ratings as detailed in the Association of Southern African Professional Archaeologists (ASAPA) guidelines and the SAHRA guidelines. The site significance and impact assessment will be integrated into the final EIA Report.

The assessment of heritage resources includes three distinct but complimentary assessment criteria: value, field rating, and impact assessment. A brief description of the assessment methodology will be presented here. See Appendix B for a full description of the assessment methodology.

4.4.2 Assessment of Environmental Impacts

Environmental impacts are measured against the value of a heritage resources and how that value may change due to an environmental aspect. The significance of change to a heritage resource due to environmental impacts is determined as follows:

Impact significance	=	Value	x	Magnitude		
		where				
Magnitude	=	Consequence	x	Probability		
		and				
Consequence	=	Spatial Scale	+	Duration	+	Intensity

(For definitions, see Appendix B)

What this equates to is that if the value of the heritage resource is low, and the magnitude is high, the impact significance rating will be low whereas if the value of the heritage resources

is high, and the magnitude is low, the impact significance rating will be high as well. This indicates that rather than the activity / aspect causing the impact being rated, it is the change to the value of the heritage resource that is assessed.

4.5 Mitigation

Mitigation measures fall in two categories: project-related mitigation and mitigation of sites/heritage resources.

Project-related mitigation: impacts on heritage resources may be avoided or reduced through the implementation of feasible mitigation measures related to the project design and planning. For instance, an historical building may be preserved *in situ* by changing infrastructure footprints.

Mitigation of heritage resources: where project-related mitigation does not reduce of remove impacts on a heritage resource, the resource itself may require mitigation. For example, any resource located in the open-cast pit area will inevitably be destroyed, irrespective of any project-related mitigation measures as the pit cannot be moved. Depending on the value of a resource (field rating/grading) certain prescribed site mitigation measures must then be implemented. This could include:

- *Site preservation*: Conservation is essentially a no-development recommendation and may be achieved through appropriate project-related mitigation;
- *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.

5 RESTRICTIONS, LIMITATIONS, AND KNOWLEDGE GAPS

Restrictions, limitations and knowledge gaps for the proposed project include:

- Large parts of the development footprint areas comprised dense vegetation affecting surface visibility; and
- Thickets of impenetrable thorn bush covered some parts of the footprint areas that were avoided as required by health and safety conditions.

6 RESULTS OF CONSULTATION WITH STAKEHOLDERS AND INTERESTED AND AFFECTED PARTIES

6.1 Parties Consulted

No local heritage conservation bodies were consulted as part of the PP Process. The South African Heritage Resources Agency was notified of the development via a Heritage Statement with a NID.

6.2 Comments with specific reference to heritage resources

The Comments and Response Report completed for the scoping phase of the Rhodium Reefs Project was reviewed to gather any public comments regarding heritage resources.

Concerns were raised by Mr Freddy Makola on behalf of the Makola Community and Makola Community Trust (Digby Wells Environmental, 2012: 5-7). These concerns included:

- Possible impact on ancestral graves allegedly located within the project area; and
- Alleged protected heritage sites located in the project area associated with the Makola community.

7 DESCRIPTION OF PROPERTY AND/OR AFFECTED ENVIRONMENT

The following chapter serves as a description of the receiving environment of the proposed project area. This includes a description of the natural and cultural environment of the area.

7.1 Details of Area Surveyed

The proposed project area is located in the Steelpoort Valley approximately 15 km north-east of the project area. The development footprint is located on the De Goedverwachting 322KT. The approximate size of the development footprint is 4 ha. Location details are summarised in Table 7-1 below.

The project area is located in the Sekhukhuneland Centre of Plant Endemism (SCPE). Of the three vegetation types found in the SCPE, the project area falls within the Sekhukhune Plains Bushveld. The ecosystem status within the project area has been assessed as being vulnerable. The project area can be divided into three main sections: Transformed, Degraded and Natural land. The project area consists predominantly of the settlement associated farming or grazing land. Areas of the study site on hill slopes remain largely natural with some disturbance from grazing evident. Some parts of the study site are difficult to access and, as a result, are in a pristine condition. These pristine areas tend to be on hill slopes and crests, very rocky, and at least one kilometre from any roads. Four vegetation types were found in the study area; these are Bushveld, Rocky Bushveld, Riparian vegetation and Magnetite Vegetation (Greffrath, 2012).

Table 7-1: Location Data

Province	Limpopo Province
Magisterial District / Local Authority	Lydenburg District Municipality
Municipality	Greater Tubatse Local Municipality
Property Name and Number	De Goedeverwatching 332KT
1: 50 000 Map Sheet	2430 CC Kennedy's Vale
1: 10 000 Aerial Photo/s	■ Steelpoort 1980 - 498_156_005_00295 ■ Ohrigstad 1971 - 681_012_00485 ■ Ohrigstad 1970 - 652_020_08090 ■ Pilgrim's Rest/Sabie/Leydsdorp 1954 325_033_07987 ■ Tzaneen/Ohrigstad1938 131_017_75145
GPS Co-ordinates (relative centre point of study area)	East/LON/X: -24.783670
	South/LAT/Y: 30.140202

The development footprint area was dominated by low thorn bushes and dense vegetation making ground visibility difficult as shown in Figure 7-1 and Figure 7-2. The site is situated on a gentle to steep slope facing south-east. Access roads were identified within the project area, and erosion gullies are present. An old field/cleared area is located on the south-east section of the project area.

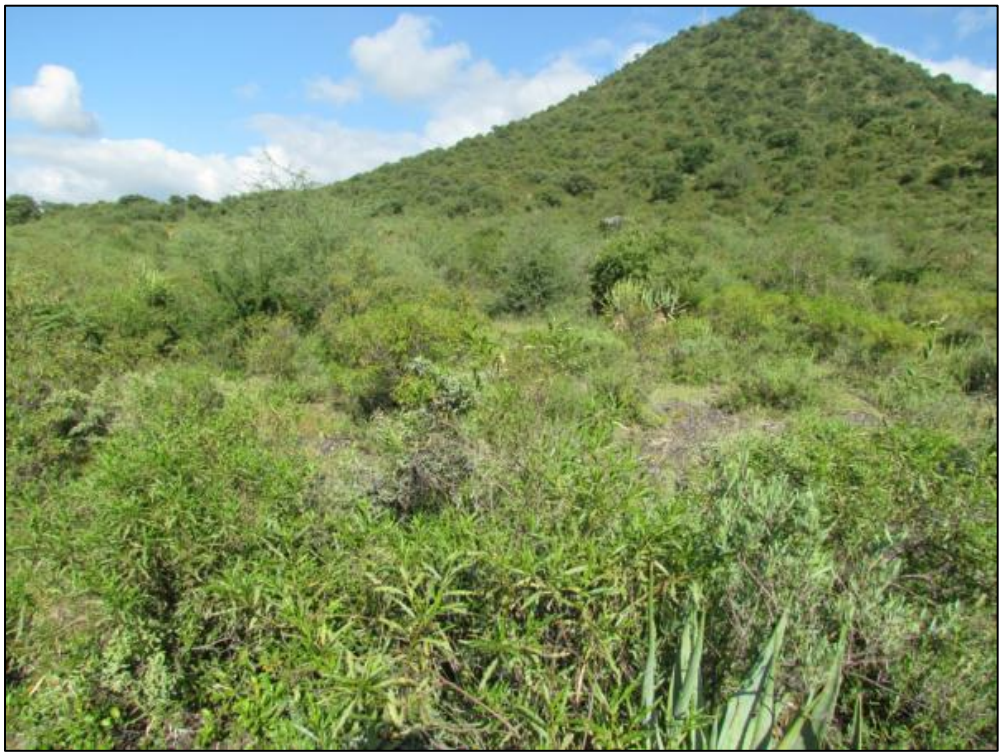

Figure 7-1: General conditions on site facing north-west

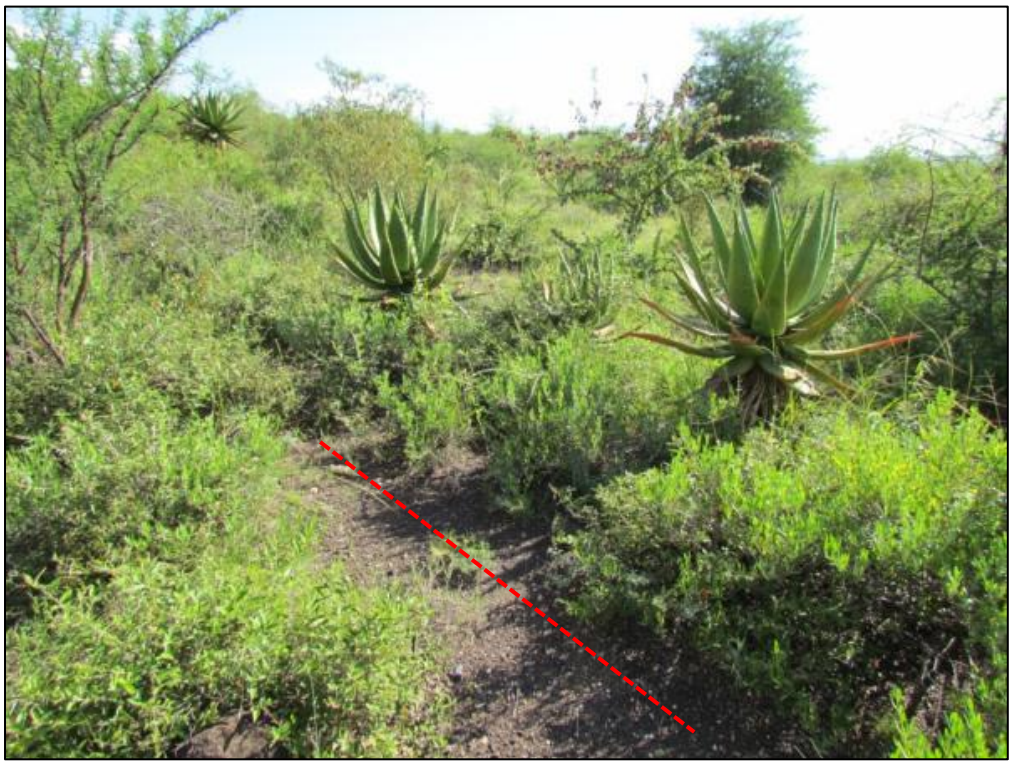

Figure 7-2: Site conditions facing north. Note erosion gully.

8 STATE OF RECEIVING ENVIRONMENTAL - CULTURAL LANDSCAPE

8.1 Literature Review

8.1.1 Palaeontology Heritage

The bedrock in the area is of the Bushveld Complex and comprises igneous rocks. It has does not have intrinsic palaeontological potential.

The proposed Rhodium Reefs project area is situated on the Dsjate Sub-suite and the Dwars River Sub-suite of the Rustenburg Layered Suite. These formations include platinum group metals and do not have palaeontological potential.

Overall, the geological formations found in the project area are of low palaeontological sensitivity as no records of fossil discoveries in the geological formations of the project area have been found. As a result, the project was exempted from a palaeontological assessment.

8.1.2 The Stone Age

The Stone Age in South Africa is divided into three periods:

- Early Stone Age (ESA) (2 million years ago - 200 000 years ago)
- Middle Stone Age (MSA) (300 000 years – 20 000 years ago)
- Later Stone Age (LSA) (20 000 years ago – 2 000 years ago)

Based on the criteria for classification, it is evident that the initial model[1] of ESA, MSA, and LSA (*with variants*) developed by Goodwin and Van Riet Lowe (1929) is appropriate. Having stated this, the last formal summary of the southern African Stone Age Sequence prior to (Lombard, et al., 2012) was conducted in 1984. Within the surveyed area, stone tools associated with the MSA were identified. Lombard et al. (2012) summarises the MSA as consisting of the various technocomplexes as described in Table 8-1.

Table 8-1: South African and Lesotho MSA sequence as described in Lombard et al. (2012), including alternative names and regional variants

Period	Technocomplex	Also known as (including regional variants)
Middle Stone Age	final MSA 20-40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally

[1] This model has been reassessed and modified through time (Clark, 1959; Clark, Cole , Isaac, & Kleindienst, 1966; Sampson, 1974)

>20 ka - <300 ka	Sibudu 45-58 ka	late MSA / post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	Howieson's Poort 58-66 ka	
	Still Bay 70-77 ka	
	pre-Still Bay 72-96 ka	(informal designation)
	Mossel Bay 77-105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
	Klasies River 105-130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)
	early MSA 130-300 ka	(informal designation)

Although the Stone Age is fairly well researched and understood in southern Africa there is little Stone Age research published on the Mpumalanga region (Esterhuysen & Smith, 2007). Most Stone Age sites recorded during previous assessments near the project area were found to be MSA and LSA.

8.1.3 The Iron Age

The Iron Age is divided into three main temporal periods:

- Early Iron Age (EIA) (AD 200 – 900)
- Middle Iron Age (MIA) (AD 900 – 1300)
- Late Iron Age (LIA) (AD 1300 – 1840)

A cluster of pits were uncovered approximately 21km north of the project area during excavations for a pipeline trench. These pits were interpreted as dating to the Early Iron Age and being associated with Lebalelo, an archaeological site near Bugersfort. Heritage resources recovered from these pits include bone and ceramics within ashy dung deposits. Ceramics facies that were identified are that of the *Mzonjani facies*, dating to AD 685-795 (Huffman & Schoeman, 2011).

Later Iron Age remains within and surrounding the project area includes sites such as KwaMaza and Esikhunjini approximately 65 km south west from the project area. A complex mix of Pedi, Nguni and Ndebele cultural markers are evident at these sites of which include *Eiland facies* ceramics (Schoeman 1998a; Schoeman 1998b). *Eiland facies* range between AD 1000 and AD 1300 (Huffman, 2007). A variation of Moor Park walling is associated with these settlements. Beehive huts were positioned on the back of terraced platforms with

cattle kraals and the central court built to be the same with two lobes and a small court in a side chamber (Huffman, 2007).

8.1.4 The Historical Period and Social History

The region surrounding Steelpoort was settled by the Bapedi from the north-west around 1650 CE. These groups were primarily scattered throughout the landscape until they were united under chief Thulare at Manganeng some 15 km north of the project area. Two years after his death in 1824, Mzilikazi attacked the Bapedi, causing them to flee into caves and the mountains (Kinsey, 1973).

His son Sekwati and his followers fled north and settled at Phiring, approximately 60 km north east from the project area. In 1857, Sekwati came to an agreement with the Boers and declared the Steelpoort River as the boundary to the Bapedi Kingdom (Kinsey, 1973). Sekwati's son, Sekhukhune led the war against the Boers in the so-called First Sekhukhune War. The *Volksraad* declared war upon Sekhukhune on 16 May 1876 (Anonymous, The Kingdom of Bapedi Nation, 2012). President Thomas Francois Burgers marched on Thaba Mosega on the 1 August 1976 and suffered a humiliating defeat at the hands of King Sekhukhune (Anonymous, South African History Online, 2012). When the Transvaal was annexed, the Bapedi Kingdom fell within British rule, King Sekhukhune did not agree with this, and so began the Second Sekhukhune War. The British troops attacked the Bapedi in 1878 near Magnet Heights (*Ibid*). By 1879 the war had ended (Phala, 2007).

Sekhukhune was killed by his brother Mampuru. The Boers, who viewed Sekhukhune as an ally after the Transvaal was annexed, retaliated against Mampuru and began the so-called Mapoch's War against the Ndebele (Coertze, 1983).

At present, the communities residing on the project area include the Ga-Mampuru and Ga-Matate. The people in the Ga-Mampuru, Ga-Matate, Dithamaga and Ga-Phasha communities predominantly belong to the Pedi (babina Noko clan) (Metago Environmental Engineers, 2009). During the 19th century, the *Voortrekkers* (Boers) surveyed and fenced off land in an area to the south of the Steelpoort River in the current Mpumalanga Province (formerly known as the Eastern Transvaal). This fenced-off land was then allocated to white settlers and farmers (Delius & Cope, 2007: 142). After the Second Anglo-Boer War (1899 – 1902), patterns of land use and occupation were established along racial lines as the Government Commissions began to designate the Steelpoort River as the boundary between white South Africa and the 'native reserve' (Schirmer, 2007: 295; Mulaudzi & Schirmer, 2007: 356). Reserves were established and governed under three different acts. These included the Land Act of 1913, The Development Trust and Land Act (Act 18 of 1936) and The Native Trust and Land Act of 1936. Under these three Acts there was a formalisation of separation between white and black rural areas

Over time, and with the Natives Service Contracts Act of 1932 coming into effect, many black farmers were displaced from land that was originally their own. These black farmers either opted to move to the cities, farm on other white-owned land, or settle within the African

reserves (James, 2009). According to the National Archives, The Native Trust and Land Act of 1936 established a South African Native Trust (SANT) which purchased all reserve land not yet owned by the state, and had responsibility for administering African reserve areas.

During the 1970's, portions of the farms De Goedeverwachting and Boschkloof were sold and transferred to the South African Bantu Trust (aka Native Trust) (Archive Ref: D45/1396/31/1). It is during this period that Kgoši Arthur Mampuru Makopole and his followers were moved to live on the reserve at Boschkloof. It is with the establishment of this reserve on the farm Boschkloof that the settlement of Ga-Mampuru came into being.

With regards to more recent social history, there are currently a total of 20 separate land claims for De Goedverwatchting 332KT that have been lodged with the Department of Rural Development and Land Reform. The Mampura Community is one of the claimants. Refer to Appendix D for the list of land claimants for De Goedverwatchting 332KT.

8.2 Desktop cartographic survey

The 1902 Major Jackson map did not cover the project area and was not used in the cartographic survey analysis. The Transvaal Degrees series Sheet 14 Ohrigstad dating to 1902-1909 was examined. The farm property of De Goede Verwachting 313 (now De Goedeverwachting 332 KT) was indicated on the map. Only main roads running through or adjacent to the project area were indicated on this map. No other structures were indicated.

Historical aerial photographs

Historical aerial photographs from 1938 to 1980 were surveyed for potential historical structures. Any structures such as a house or homestead, a residential complex, or industrial and mining buildings that were identified in these photographs could be older than 60 years and would therefore be considered historical structures in accordance with Section 34 of the NHRA.

The following historical aerial photographs were surveyed:

- 1980 - 498_156_005_00295
- 1971 - 681_012_00485
- 1970 - 652_020_08090
- 1954 - 325_033_07987
- 1938 - 131_017_75145

No structures or sites could be identified from the aerial photographs. No fields could be identified adjacent to the project area on the 1938-1980 aerial photographs, therefore the fields are approximately 33 years old, however fields are visible on the eastern side of the river in the 1938 aerial photograph. No other settlements could be identified near the project area.

8.3 Relevant Previous Impact Assessment Reports

Seven heritage impact assessment reports were found relevant the project area and were reviewed:

Huffman, T. N & Schoeman, M. H. 2002. Archaeological Assessment of the Der Brochen Project, Mpumalanga. Unpublished report for SRK Consulting.

- A total of 25 sites were recorded. These include Middle Stone Age lithics, Eiland ceramics, historic Pedi stone walling, an iron smelting site, engravings (geometric and animal figures) and graves.
- Recommendations in the report include archaeological mitigation such as mapping, recording and excavation of the smelting site and Eiland sites. Graveyards must be fenced off or relocated if impacted upon, and the engraved boulders should be relocated.

Roodt, F. 2003. Phase 1 Heritage Resources Impact Assessment. Der Brochen Tailings Dams: Farms: Helena and St. George Mpumalanga Province. Unpublished report for SRK Consulting.

- A total of 39 sites were identified during the survey. These include Iron Age stone walled settlements with associated Eiland ceramics, terracing and communal grinding areas, as well as historical ruins and graves. The area surveyed is approximately 17 km south of the project area.
- Recommendations in the report include the *in situ* preservation of a large communal grinding area, recording, mapping and excavation of specific Iron Age sites, and possible relocation of graves.

Murimbika, M. 2005. Olifants River Water Resources Development Project. Environmental Impact Assessment: Infrastructure Development Specialist Study: Cultural Heritage Assessment. Unpublished report for ACER (Africa) Environmental Management Consultants.

- A total of 110 sites were identified during the survey. These include Stone Age sites, Iron Age sites, Historic sites and graves and cemeteries. The area surveyed is approximately 12 km south west from the project area.
- Recommendations in the report included relocation of graves and cemeteries, archaeological mitigation including excavation and recording of archaeological sites, as well as a site museum for the public to view excavated material.

Coetzee, F. P. 2007. Cultural Heritage Impact Assessment of the Proposed Chrome Mine on Portions 4 & 5 of the Farm Spitskop 333KT, Steelpoort, Mpumalanga Province. Unpublished report for M2 Environmental Connections.

- A total of 5 sites were identified during the survey. These include 4 Later Iron Age sites, two of which are stone walled hilltop settlements. A modern homestead was

also recorded. The hilltop sites are suggested of being associated with rain-making. The survey was conducted within 3 km east of the project area.

- Recommendations in the report include archaeological mitigation including excavation and recording of the hilltop Iron Age stone walled settlements.

Roodt, F. 2008. Phase 1 Heritage Resources Scoping Report: Der Brochen Mine Richmond Farm: Mpumalanga.

- A total of 30 sites were recorded during the survey. These include Stone Age lithics, Early and Later Iron Age sites with *Eiland*, *Doornkop*, *Icon* and *Marateng* ceramics and graves. A sacred site (large boulder) which is used as a ritual space was also identified. The area surveyed is approximately 17 km south of the project area.
- Recommendations in the report include relocation of the graves, archaeological mitigation include excavation and recording of Iron Age sites and collection of Stone Age lithics.

De Kamper, G & Nel, J. 2008. Heritage Resources Scoping survey and Preliminary Assessment of the Proposed Establishment of Township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. Unpublished report for AGES Environmental Division.

- A total of 10 sites were identified during the survey. These include Middle Stone Age and Later Stone Age lithics, Early Farmer ceramics (*Eiland* and *Icon*) and Later Iron Age to Historical stone walling and historical ruins. The area surveyed during this survey falls within the Rhodium project area.
- Recommendations in the report include recording and documenting of Iron Age sites and historic ruins before destruction, watching briefs, as well as archaeological mitigation measures to excavate and record Iron Age sites.

Pistorius, J. C. C. 2009. Phase 1 Heritage Impact Assessment (HIA) study for Xstrata's proposed Kuka Aerial Ropeway Project between Steelpoort and Lydenburg in the Limpopo and Mpumalanga provinces of South Africa. Unpublished report for Golder and Associates.

- Sites identified during the survey include burial grounds, Stone Age lithics and Later Iron Age settlements (Choma village complex). The survey was conducted approximately within a 30 km radius from the project area.
- Recommendations in the report include collecting Stone Age lithics, conserve or relocated burial grounds, and archaeological mitigation measures to excavate and record Iron Age sites such as the Choma village complex.

Identified heritage resources in the surrounding areas include Stone Age occurrences, Iron Age settlements with *Eiland* and *Icon* type facies, Historical ruins and burial grounds. Sites such as the Choma village complex have an intangible heritage component as contemporary burials can be found within and near the village, suggesting an on-going use of the site, for ritual and spiritual use.

Of these seven reports, five had identified graves and burial grounds. In most cases the recommendations for mitigation measures included fencing off the burial grounds if possible and grave relocation if not possible.

9 DISCUSSION OF RESULTS AND FINDINGS

The project area is characterised by the presence of Stone Age occurrences, Iron Age settlements (with associated *Eiland* and *Icon* ceramic facies), historical ruins and graves. During the pedestrian field survey, a total of four heritage resources were identified, two of which fall within the 100 m buffer zone around the development footprint. They were found to have negligible value and were not assessed. The remaining two heritage resources are located within the proposed development area; however one of these heritage resources was found to be of negligible value and a full impact assessment was not conducted on the resources. For a full list of identified heritage resources refer to Appendix E.

The identified site that will be impacted on is a single stone packed burial located within the development footprint area. It does not have any markers, so age could not be determined. Refer to Section 10 of this report for full description of the burial. The impact on the burial will be a minor negative impact, while the significance value of the burial is medium.

As seen from above results and findings, the identified burial is of great importance to the community and should be handled with respect. With reference to Section 6 of this report and the Comments and Response Report, the community has strong feeling towards any graves that are identified, and have insisted that they are consulted regarding such burials. As the burial is unmarked with no indication of age, the community should be consulted in order to ascertain the age and affinity of the burial as stated in the SAHRA guidelines for consultation regarding burial grounds and graves (NHRA, 1999 Regulations Chapter XI).

10 STATEMENTS OF SIGNIFICANCE AND IMPACT ASSESSMENT

10.1 NHRA Section 36 resources: Burial grounds and graves

10.1.1 RHO1867/2430CC/S.36-002 – Informal burial ground

10.1.1.1 Detailed description

S.36-002 is an unfenced, informal burial identified and recorded during the HIA field survey. The burial is approximately 1 m x 3 m in extent. It is located in the southern corner in relation to the proposed development plan. Refer to Figure 10-1-Figure 10-4 and Table 10-1 to for site description and photographs of the identified burial.

Table 10-1: Summary of Site S.36-002

SITE DESCRIPTION	
Site location	South/LAT/Y: -24.78483 East/LON/X: 30.14008 The site is located in the southern corner in relation to the infrastructure footprint.
Physical Description	One informal burial present surrounded by cut thorn bush branches as a makeshift fence
Type	Informal burial
Context	Primary
Dimensions	1 m x 3 m
Orientation	South-east
Dressing	Stones encircling the grave mound
Inscriptions / identifying features	Remains of metal grave marker
Condition	Overgrown with cut thorn tree branches as a makeshift fence
Age	Unknown
Possible Affinity	Possible affinity with local community
Persons consulted	None

Figure 10-1: General site view of S.36-002

Figure 10-2: General view of burial at S.36-002

Figure 10-3: Detail of the remains of the metal marker on burial site S.36-002

Figure 10-4: Close-up of the remains of the metal marker at S.36-002

The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources such as the Comments and Response Report. It is in good condition and is well-preserved. There is little degradation present with only a small bush growing through the grave and little restoration is required. Based on these attributes, the burial ground was given a medium heritage value as shown in Table 10-2.

Table 10-2: Value and field rating of Heritage Resource

VALUE OF HERITAGE RESOURCE	
Criteria	**Summary of reasoning**
Importance and credibility	The social importance of the burial is high due to the high level of perceived social value. However, the burial is not scientifically important, or show great artistic traits, nor is it of high local or provincial historical value. The burial was not previously known to the specialists, assuming that an important burial would be known and recorded as part of the National Estate. The information sources that were used, such as the Comments and Response report, show that the public has placed a high importance value on any graves within the area. Other impact assessments conducted previously in the surrounding areas, again show the high value placed on burials by the community. The credibility of these sources are of a medium value as the claims by the community are not substantiated by fact.

Authenticity	The authenticity of the site is of low value as the information sources used to assess the credibility of the site are of medium value.
Integrity	The site is fairly preserved with little degradation present, and can be easily restored.
Statement of Value	The burial is of medium heritage value due to the high social importance, the medium credibility of the information sources used to assess the importance, low authenticity of the site and fair integrity of the site.
Field Rating	The burial is generally protected. This falls under the responsibility of the local municipality and or Provincial Heritage Resource Agency (PHRA).

10.1.1.2 Description and assessment of impacts

The activities that are associated with the establishment and operation of the development have the potential to impact the identified burial. The heritage resource is situated within the development footprint; however it is not situated where any infrastructure is to be constructed. Site clearance that will be required could destroy or cause damage to S.36-002.

In addition, site clearance and construction of the development will increase human traffic thereby increasing the risk to site S.36-002 in terms of accidental or purposeful damage or destruction. The operation and maintenance of the development will also create long-term risks associated with more regular and increased human traffic, allowing access to site S.36 -002. The construction of the development may change the landscape character and may impact on the integrity of site S.36-002.

Table 10-3: Impact Assessment Pre-Mitigation

IMPACT ASSESSMENT PRE-MITIGATION		
Type of Impact	Negative direct impact	
Summary of reasoning	The development will damage and destroy the burial	
RATING OF IMPACT		
Characteristic	**Value**	**Summary of Reasoning**
Scale	High	Most or entire heritage resource will be affected.
Duration	High	Change will be immediate, permanent and irreversible.
Intensity	High	Change to integrity that will cause change to overall
Probability	Certain	Project-related mitigation measures will not avoid change.
SIGNIFICANCE RATING BEFORE MITIGATION		
Impact	Negative	
Magnitude of Impact	Low	

Table 10-4: Impact Assessment Post-Mitigation

IMPACT ASSESSMENT POST MITIGATION		
Type of Impact	Positive direct impact	
Summary of reasoning	The development will preserve the burial *in situ*.	
RATING OF IMPACT		
Characteristic	**Value**	**Summary of Reasoning**
Scale	Low	Isolated parts/aspects of heritage resource will be affected.
Duration	Low	Change will occur over the long term, result will be non-permanent and reversible
Intensity	Low	No change to integrity and authenticity
Probability	Unlikely	Project-related mitigation measures will avoid change
SIGNIFICANCE RATING AFTER MITIGATION		
Impact	Positive	
Magnitude of Impact	Negligible	

Sensitive receptors for this heritage site include community members whose access may be restricted. Project-related mitigation measures will ensure that this is rectified.

The impact related to the construction of the development on heritage resources (Pre-Mitigation) will be a 'Minor Negative Impact' as shown in Table 10-3. Post-mitigation impact on the heritage resource will be a 'Minor Positive Impact' as shown in Table 10-4.

10.1.1.3 Recommended mitigation measures

Recommendations for the project include the following:

- Fencing off and compiling a Heritage Site Management Plan (HSMP) is recommended for the identified informal burial. However if the proposed infrastructure plan changes, relocation of the grave may be necessary.
- If relocation is necessary, a Burial Grounds and Grave Census (BGGC) is recommended. This will assist in identifying *bona fide* stakeholders and descendants who will be consulted with regards to the pending grave relocation.
- A Heritage Watching Brief is recommended for the construction phase when ground clearance commences. This task includes the presence of a qualified archaeologist to identify and assess any heritage resources that may be uncovered during ground clearance.

11 CONCLUSION

Digby Wells was requested by Rhodium Reefs to conduct a Heritage Assessment for the Environmental Authorisation in support of a MRA for the extension of the Spitzkop / Rhodium Reefs Platinum operation.

A total of four heritage resources were identified during the pedestrian survey, two of which lay within the project boundary and may be impacted upon, however only one heritage resource S.36-002 was assessed as the remaining heritage resources were of negligible value.

The burial S.36-002 was given a medium heritage value. The burial is located near the southern corner of the development area. According to the current development plan, the burial will not be impacted upon by the development. The site was given a Grade III B field rating, and as such it is recommended that the burial must be fenced off and that a site management plan is to be implemented.

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Roodt, F. 2003. *Phase 1 Heritage Resources Impact Assessment. Der Brochen Tailings Dams: Farms: Helena and St. George Mpumalanga Province*. Unpublished report for SRK Consulting.

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Greffrath, R. 2012. *Rhodium Reefs Flora and Fauna Report*. Unpublished report for Digby Wells Environmental.

Roodt, F. 2008. *Phase 1 Heritage Resources Scoping Report: Der Brochen Mine Richmond Farm: Mpumalanga*.

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12.3 Databases

University of the Witwatersrand Archaeological Site Database

The Genealogical Society of Southern Africa (GSSA)

South African Heritage Resources Information System (SAHRIS)

Chief Surveyor General of South Africa

National Archives of South Africa (NASA)

- MAN - National Registers of Manuscripts and photographs (NAREM and NAREF) National Archives' cartographic and library material, microfilms and copies; and
- TAB - National Archives Repository (Public Records of Former Transvaal Province and its predecessors as well as of magistrates and local authorities)

12.4 Websites

Anonymous. (2012). *South African History Online*. Retrieved October 10, 2012, from www.sahistory.org.za

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Appendix A: Curriculum Vitae of Specialist

JOHAN NEL

Mr. Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

2002 BA Honors - Archaeology

2001 BA Anthropology & Archaeology

1997 Matriculated Brandwag Hoërskool

2 LANGUAGE SKILLS

Fluent in English and Afrikaans

3 EMPLOYMENT

2011 to present	Unit manager: Heritage Resources Management, Digby Wells Environmental
2010-2011	Archaeologist, Digby Wells Environmental
2005-2010	Manager and co-owner, Archaic Heritage Project Management
2003-2005	Freelance archaeologist
	Resident archaeologist, Rock Art Mapping Project, Ndidima, Ukhahlamba-Drakensberg World Heritage Site
2002-2003	Special Assistant: Anthropology, Department of Anatomy, University of Pretoria
2001-2002	Technical Assistant: Department of Anatomy, University of Pretoria
1999-2001	Assistant: Mapungubwe Project, National Cultural History Museum & Department of Anthropogy and Archaeology, UP

4 EXPERIENCE

I have 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 wells Swaziland, the Democratic Republic of the Congo and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROJECT EXPERIENCE

PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS:

- Above Ground Storage Tanks survey, SASOL Oil (Pty) Ltd, Free State Province, South Africa
- Access road establishment , AGES-SA, Tzaneen, South Africa
- Boikarabelo Railway Link, Resgen South Africa, Steenbokpan, South Africa
- Conversion of prospecting rights to mining rights, Georock Environmental, Musina, South Africa
- Galaxy Gold Agnes Mine, Barberton, South Africa
- HCI Khusela Palesa Extension, Bronkhorstspruit, South Africa
- Kennedy's Vale township establishment, AGES-SA, Steelpoort, South Africa
- Koidu Diamond Mine, Koidu Holdings, Koidu, Sierra Leone
- Lonmin Platinum Mine water pipeline survey, AGES-SA, Lebowakgomo, South Africa
- Mining right application, DERA Environmental, Hekpoort, South Africa
- Mogalakwena water pipeline survey, AGES-SA, Limpopo Province, South Africa
- Nzoro Hydropower Station, Environmental and Social Impact Assessment, DRC
- Randgold Kibali Gold Project, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo
- Randwater Vlakfontein-Mamelodi water pipeline survey, Archaeology Africa cc, Gauteng, South Africa
- Residential and commercial development, GO Enviroscience, Schoemanskloof, South Africa
- Temo Coal, Limpopo, South Africa
- Transnet Freight Line survey, Eastern Cape and Northern Cape, ERM, South Africa
- Van Reenen Eco-Agri Development Project, GO Enviroscience, South Africa
- Platreef Platinum Mine, Ivanhoe Nickel & Platinum, Mokopane, South Africa

MITIGATION PROJECTS:

- Mitigation of Iron Age archaeological sites: Kibali Gold Project, DRC
- Mitigation of Iron Age metalworking site: Koidu Diamond Mine, Sierra Leone
- Mitigation of Iron Age sites: Boikarabelo Coal Mine, South Africa
- Exploratory test excavations of alleged mass burial site: Rustenburg, Bigen Africa Consulting Engineers, South Africa
- Mitigation of Old Johannesburg Fort: Johannesburg Development Agency (JDA), South Africa
- Site monitoring and watching brief: Department of Foreign Affairs Head Office, Imbumba-Aganang Design & Construction Joint Venture, South Africa

GRAVE RELOCATION

- Du Preezhoek-Gautrain Construction, Bombela JV, Pretoria, South Africa
- Elawini Lifestyle Estate social consultation, PGS (Pty) Ltd, Nelspruit, South Africa;
- Motaganeng social consultation, PGS (Pty) Ltd Burgersfort, South Africa
- Randgold Kibali Mine, Relocation Action Plan, Kibali, DRC
- Repatriation of Mapungubwe National Park and World Heritage Site, DEAT, South Africa
- Smoky Hills Platinum Mine social consultation, PGS (Pty) Ltd Maandagshoek South Africa
- Southstock Colliery, Doves Funerals, Witbank, South Africa
- Tygervallei. D Georgiades East Farm (Pty) Ltd, Pretoria, South Africa
- Willowbrook Ext. 22, Ruimsig Manor cc, Ruimsig, South Africa
- Zondagskraal social consultation, PGS (Pty) Ltd,Ogies, South Africa
- Zonkezizwe Gautrain, PGS, (Pty) Ltd, Midrand, South Africa

OTHER HERITAGE ASSESSMENTS AND REVIEWS:

- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa
- Heritage Statement and Cultural Resources Pre-assessment scoping report on Platreef Platinum Mine, Mokopane: Platreef Ltd
- Heritage Statement and Scoping Report on five proposed Photo Voltaic Solar Power farms, Northern Cape and Western Cape: Orlight SA
- Land claim research Badenhorst family vs Makokwe family regarding Makokskraal, Van Staden, Vorster & Nysschen Attorneys, Ventersdorp South Africa
- Research report on Cultural Symbols, Ministry for Intelligence Services, Pretoria, South Africa
- Research report on the location of the remains of kings Mampuru I and Nyabela, National Department of Arts and Culture, Pretoria, 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

6 PROFESSIONAL AFFILIATIONS

Society for Africanist Archaeologogists (SAfA)

7 PROFESSIONAL REGISTRATION

Association fo Southern African Professional Archaeologists (ASAPA)

Accredited by ASAPA Cultural Resources Management section

International Association of Impact Assessors (IAIA)

8 PUBLICATIONS

Nel, J. 2001. Cycles of Initiation in Traditional South African Cultures. *South African Encyclopaedia* (MWEB).

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JUSTIN DU PIESANIE

Mr. Justin du Piesanie

Archaeology Consultant

Social Sciences Department

Digby Wells Environmental

1 EDUCATION

University of the Witwatersrand

- BA Degree (2004)
- BA Honours Degree (2005) - Archaeology
    - Title of Dissertation - Seal Skeletal Distribution of Herder and Forager Sites at Kasteelberg, Western Cape Province of South Africa.
- Master of Science (MSc) Degree (2008) – Archaeology
    - Title of Dissertation – Understanding the Socio-Political Complexity of Leokwe Society during the Middle Iron Age in the Shashe-Limpopo Basin through a Landscape Approach

2 LANGUAGE SKILLS

English First Language

Afrikaans Second Language

3 EMPLOYMENT

2011 to Present:	Archaeology Consultant at Digby Wells Environmental
2009 to 2011:	Archaeology Collections Manager at the University of the Witwatersrand.
2009 to 2011:	Freelance Archaeologist for Archaeology Resource Management (ARM), Matakoma Heritage Consultants, Wits Heritage Contracts Unit & Umlando Heritage Consultants.
2006 to 2007:	Tour Guide at Sterkfontein Caves World Heritage Site.

4 EXPERIENCE

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

5 PROJECT EXPERIENCE

- Phase 2 Mitigation at Meyersdal, Klipriviersberg Johannesburg (ARM)
- Phase 1 Mitigation – Mapping of Late Iron Age Site in Pilansberg, Sun City (ARM)
- Phase 1 Mitigation – Survey of Witbank dam development (ARM)
- Phase 1 Mitigation – Survey of Glen Austin AH, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 34, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 38, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 44, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 46, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 47, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 48, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 49, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 50, Johannesburg (Matakoma)

- Phase 1 Mitigation – Survey of Modderfontein AH Holding 61, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 62, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 71, Johannesburg (Matakoma).
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 72, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein 35IR Portion 40, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Rhino Mines, Thabazimbi Limpopo Province (ARM)
- Phase 1 Mitigation – Survey of Moddergat 389KQ, Schilpadnest 385KQ, Swartkop 369KQ, Cronimet Project, Thabazimbi Limpopo Province (Matakoma)
- Desktop Study – Desktop study for the Eskom Thohoyandou SEA Project, Limpopo Province (Matakoma)
- Phase 2 Mitigation – Excavation of Iron Age site on Wenzelrust, Shoshanguve Gauteng (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of Late Stone Age shelter, Parys, Free State
- Phase 1 Mitigation – Survey of Vaalkrans Battlefield for the Transnet NMPP Line (Umlando)
- Phase 1 Mitigation – Survey of Portion 222 of Mindale Ext 7 Witpoortjie 254 IQ & Portion 14 of Nooitgedacht 534 IQ, Johannesburg (ARM)
- Phase 2 Mitigation – Excavation of Site 19 for the Anglo Platinum Mines Der Brochen & Booysendal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of sites 23, 26, 27, 28a & b for the Anglo Platinum Mines Der Brochen & Booysendal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Desktop Study - Desktop study for the inclusion into the Thohoyandou Electricity Master Network for Eskom, Limpopo Province (Strategic Environmental Focus)
- Phase 1 Mitigation – Mapping of historical sites as part of the mitigation for the expansion of the Bathlako Mine's impact area (Heritage Contracts Unit).
- Phase 2 Mitigation – Kibali Grave Relocation Project (KGRP) for the Kibali Gold Project, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Assessment and Survey for the proposed Kibali Hydro Power Stations, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment & Survey of the farm Vygenhoek for Aquarius Resources Everest North Mining Project, Steelpoort, Mpumalanga (Digby Wells)
- Phase 1 Mitigation – Heritage Impact Assessment for the Gold One International Ltd Proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure, Johannesburg, Gauteng Province (Digby Wells)
- Phase 1 Mitigation – Burial Grounds and Graves Survey (BGGS) for Platreef Resources, Mokopane, Limpopo Province (Digby Wells)
- Phase 2 Mitigation – Archaeological Impact Assessment of sites for Resource Generation Boikarabelo Mine, Steenbokpan, Limpopo Province (Digby Wells)

- Phase 1 Mitigation – Watching Brief for Bokoni Platinum Mines (Pty) Ltd, Burgersfort, Limpopo Province (Digby Wells)
- Heritage Statement for Rhodium Reefs Limited Platinum Operations on the Farm Kennedy's Vale 361 KT, Steelpoort, Mpumalanga Province (Digby Wells).
- Socio-Economic and Asset Survey, SEGA Gold Mining Project, Cluff Gold PLC, Burkina Faso (Digby Wells)

6 PROFESSIONAL AFFILIATIONS

Society for Africanist Archaeologists (SAfA) Member

7 PROFESSIONAL REGISTRATION

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

8 PUBLICATIONS

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

NATASHA HIGGITT

Ms Natasha Higgitt

Archaeology Consultant

Social Department

Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2009)
- 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: Archaeology 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 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

- 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: Member

Appendix B: EIA Methodology and Assessment of Resource Significance/Value

HERITAGE IMPACT MATRIX METHODOLOGY

CRM UNIT MANAGER: JOHAN NEL

September 2012

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GLOSSARY

HRM	Heritage Resources Management
ICOMOS	International Council on Monuments and Sites
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Authority
UNESCO	United Nations Education, Scientific and Cultural Organisation

1 INTRODUCTION

The impact assessment stage includes several steps aimed to evaluate the way in which environmental aspects will/may interact with the cultural landscape (the environment) resulting in environmental impacts to heritage resources. Environmental aspects and impacts are defined as:

- *Environmental aspects*: an element of an organisation's activities or products or services that can interact with the environment' (ISO 14001: 2004 - 3.6); and
- *Environmental impacts*: any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects (ISO 14001: 2004 - 3.7).

However, in terms of cultural heritage resources, environmental impacts should be assessed relative to the heritage value or significance of a resource. The methodology employed in the various stages of the impact assessment process is described in more detail below.

2 STATEMENT OF SIGNIFICANCE OR VALUE

Heritage resources – both cultural and natural – are finite, non-renewable and irreplaceable. They characterise community identity and cultures and are therefore are intrinsic to the history and beliefs of communities. As sources of information, heritage resources have inherent potential to contribute significantly to research, education and tourism, as well as allowing capacity for reconciliation, understanding and mutual respect.

Considering the innate value of heritage resources, the foundation of heritage resources management (HRM) is the acknowledgement that heritage resources have lasting worth as evidence of the origins of life, humanity and society. Every generation is therefore morally obligated to act as trustees of heritage for future generations through conservation, preservation and protection.

Accordingly, HRM must take into account rights of affected communities to be consulted and to participate. Where heritage resources are developed and presented the dignity and respect of diverse cultural values must be ensured. In addition, heritage in its broadest sense must never be used for sectarian purposed or political gain.

Notwithstanding the fundamental value ascribed to heritage, significance of individual resources needs to be determined to allow implementation of appropriate management measures. This is achieved through assessing a heritage resource's value relative to certain

prescribed criteria, encapsulated in the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) as well as several international conventions. The significance of a resource thus determines the magnitude of change that may result from environmental impacts. As a result, environmental impacts that are rated low may cause severe change in a heritage resources rated as highly significant. Vice versa, severe impacts may cause negligible change to an insignificant resource. Value is determined by assessing the authenticity and integrity of a resource by applying the formula provided in Table 1. Value thresholds are provided Table 2.

Table 1: Formula calculating heritage resource value

multiplied by		Authenticity					
		0	3	6	9	12	15
Integrity	0	0	0	0	0	0	0
	1	0	3	6	9	12	15
	2	0	6	12	18	24	30
	3	0	9	18	27	36	45

Value = authenticity + integrity

where

Authenticity = importance (average sum of attributes per dimension) + credibility

Table 2: Value thresholds

Score	Description	Rating
0	Resource of no/negligible heritage value as part of national estate	None/negligible
1-15	Resource of low value heritage value: change to resource not significant	Low
16-30	Resource of medium heritage value: project mitigation must aim to reduce any impacts on resource; conservation may be required.	Medium
31-45	Resource of exceptional value and must be considered for inclusion in national estate: project mitigation must attempt to remove all impacts; consideration must be given to conservation/preservation of resource.	High

The steps involved in determining the value of a heritage resource is described in more detail below.

2.1 Authenticity

The Nara Document on Authenticity (1993) forms the basis of determining authenticity. Based on this document, it is accepted that understanding and determining importance attributed to heritage resources rely on credible information sources[1]. These sources need to be assessed as credible or truthful. This requires knowledge and understanding of information sources employed in relation to original and subsequent characteristics of heritage resources, and their meaning.

Authenticity is therefore determined in terms of the importance of a resource considering available sources of information. Thresholds for authenticity are provided in Table 3.

[1] **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 (Nara Document on Authenticity, 1993)

Table 3: Authenticity thresholds

Score	Description	Rating
0	None	None/negligible
1-5	Negligible to low level of authenticity evident.	Low
6-10	Authenticity merely evident: importance illustrated in credible information sources.	Medium
11-15	Authenticity of resource undisputed.	High

2.1.1.1 Importance

The importance of a heritage resource is determined on four dimensions – aesthetic, historic, scientific, and social. In turn, each dimension is measured against one or more descriptive attributes, defined in national legislation and international convention: NHRA (1999), the United Nations Education, Scientific and Cultural Organisation (UNESCO) World Heritage Convention (1972), International Council on Monuments and Sites (ICOMOS) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties and the Australian ICOMOS Charter for Places of Cultural Significance (1999) (Burra Charter). These attributes, or criteria, are aimed to provide a guide as to whether a resource should be included in the national estate as defined in these documents and presented in Table 4 below.

Table 4: Summary of dimensions and attributes

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

Importance ratings need to be provided for each applicable attribute per dimension. Each dimension's ratings are averaged and rounded off to allow a consistent rating irrespective of whether one or more attributes are considered. Definitions and ratings are provided in Table 5 below.

Table 5: Importance definitions

Importance	
0	None
1	Attributes considered commonplace, well or over represented; Importance generally not considered by any community
2	Attributes considered uncommon, underrepresented; Importance generally considered by some communities.
3	Attributes considered singular, unique, irreplaceable; Importance always considered by most communities.

2.1.1.2 Credibility

Credibility of information sources forms the basis in determining the importance of heritage resources. The importance rating per dimension and attribute discussed above is thus intrinsically linked to the credibility of information sources used. Credibility thresholds and definitions are provided in Table 6 below.

Table 6: Credibility definitions

Credibility	
0	Credibility of information cannot be determined: Conjecture, unverified personal opinions; biases evident.
1	Secondary and tertiary information sources: Popular media, newspapers, magazines; 'Information' websites e.g. Wikipedia, etc.; Individual opinions.
2	Credible secondary sources: Factually correct textbooks and popular publications, etc.; Official websites; Verifiable oral accounts.
3	Highly credible information sources: Peer-reviewed publications; Primary sources; Verified oral accounts.

2.2 Integrity

Integrity is determined by examining the physical condition of a heritage resource – as witnessed at the time of assessment – compared to an ideal or other existing example. Integrity ought to be assessed only after the resource's authenticity has been determined, as the information source/s used should provide comparative examples against which its present condition may be measured. Thresholds and definitions for integrity are described in Table 7 below.

Table 7: Integrity definitions

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

3 IMPACT ASSESSMENT

Assessing environmental impacts on heritage resources are based first on the value of a resource and second how that value may change due to environmental aspects. Environmental management systems employ relative standard terminology that characterises impacts. This terminology has been adapted to provide a well-defined descriptive terminology for use in assessing environmental impacts on heritage resources summarised in Table 8.

Table 8: Impact characteristic terminology

Characteristic	Description	Designation
Type	Relationship of an assumed impact to a heritage resource (in terms of cause and effect).	Direct Indirect Induced
Scale of change	The physical area (size) of a heritage resource that may change	None Isolated parts / aspects will change Large parts / aspects will change Most or entire resource will change
Duration	Time period over which resource will change	Immediate, non-permanent and fully reversible Long-term, non-permanent and reversible Long-term, permanent and irreversible Immediate, permanent and irreversible
Intensity	How an impact could change the authenticity and integrity, thus importance, of a resource	None Change in integrity without affecting authenticity Change in integrity will affect aspects of authenticity Change in integrity will affect overall authenticity

Characteristic	Description	Designation
Probability	Likelihood of change occurring	None Project-related mitigation will remove change Project-related mitigation will reduce change Project-related mitigation will not reduce change

The significance of change to heritage resources due to environmental impacts is determined as follows:

Impact significance = Value x Magnitude

where

Magnitude = Consequence x Probability

and

Consequence = Spatial Scale + Duration + Intensity

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 9: Scale thresholds, definitions and designation

Score	Description	Rating
0	No change	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

Table 10: Duration thresholds, definitions and designation

Score	Description	Rating
0	Change will be immediate, non-permanent and fully reversible	None
1	Change will occur over the long term, result will be non-permanent and reversible	Low
2	Change will occur over the long term, result will be permanent and irreversible	Medium
3	Change will be immediate, permanent and irreversible	High

Table 11: Intensity thresholds, definitions and designations

Score	Description	Rating
0	No change to integrity and authenticity	None
1	Change to integrity that will not cause any change in authenticity (importance).	Low
2	Change to integrity that will cause change to certain authentic aspects (importance) (describe and define aspects).	Medium
3	Change to integrity that will cause change to overall authenticity (importance)	High

Table 12: Probability thresholds, definitions and designations

Score	Description	Rating
0	No change	None
1	Project-related mitigation measures will avoid change	Unlikely
2	Project-related mitigation measures will reduce change	Probable
3	Project-related mitigation measures will not avoid change	Certain

Table 13: Magnitude of change thresholds, designations and definitions in relation to three categories of heritage resources

Score	Designation	Archaeology, Palaeontology	Built Environment/Structures	Historic Landscape
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.
1-49	**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.
50-98	**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.
99-147	**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

Score	Designation	Archaeology, Palaeontology	Built Environment/Structures	Historic Landscape
				access; resulting in moderate changes to historic landscape character.
		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 buildings 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.

4 FIELD RATING (SOUTH AFRICAN PROJECTS)

Field ratings, or proposed grading of heritage resources, are required by the South African Heritage Resources Agency (SAHRA) in terms of Section 7(1) of the NHRA. Field ratings are based on the assessments of heritage resources in relation to criteria contained in Section 3(3) of the NHRA (see above). Section 7 further outlines a three-tier system for heritage resources management of the national estate based on proposed grading:

- 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.

Field ratings are based on (equal to) the value of a heritage resource. The thresholds for field ratings are present in Table 14 below.

Table 14: Field rating thresholds and descriptions

NHRA SECTION 7 GRADING			
Score	**Grade**	**Protection**	**Recommended Heritage Mitigation**
41-45	Grade I	National	Heritage resource should be nominated as a National Site/Object, included in National Estate
36-40	Grade II	Provincial	Heritage resource should be nominated as a Provincial Site/Object, included in National Estate
31-35	Grade III A	Local	Heritage resource should be nominated as a Regional Site/Object, included in National Estate
16-30	Grade III B	Local	The heritage resource must be mitigated and partly conserved/preserved
8-15	Grade IV A	General	The heritage resource must be mitigated before destruction
1-7	Grade IV B	General	The heritage resource must be recorded before destruction
0	Grade IV C	General	No mitigation required - application for destruction permit

Appendix C: Location and Site Maps

Plan 1

Rhodium Reefs Environmental Authorisation

1:250000

Legend

- Mining Rights Area
- Infrastructure Area

2430 Pilgrim's Rest

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator	Ref #:mpl.RHO1867.201210.053
Datum: Hartebeesthoek 1994	Revision Number: 1
Central Meridian: 31°E	Date: 08/10/2012

N

0 10 20 40

Kilometres

1:750,000

Plan 2

Rhodium Reefs Environmental Authorisation

1:50000

29°55'0"E 30°0'0"E 30°5'0"E 30°10'0"E 30°15'0"E 30°20'0"E

24°35'0"S
24°40'0"S
24°45'0"S
24°50'0"S
24°55'0"S

Legend

- Mining Rights Area
- Infrastructure Area

2430CA Steelpoort
2430CC Kennedy's Vale

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator	Ref #:mpl.RHO1867.201210.054
Datum: Hartebeesthoek 1994	Revision Number: 1
Central Meridian: 31°E	Date: 08/10/2012

N

0 3 6 12

Kilometres
1:200,000

Plan 3

Rhodium Reefs Environmental Authorisation

1:10000

Legend

- Mining Rights Area
- Infrastructure Area

29°55'0"E
30°0'0"E
30°5'0"E
30°10'0"E
30°15'0"E
30°20'0"E

24°35'0"S
24°40'0"S
24°45'0"S
24°50'0"S
24°55'0"S

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator	Ref #:mpl.RHO1867.201210.055
Datum: Hartebeesthoek 1994	Revision Number: 1
Central Meridian: 31°E	Date: 08/10/2012

N

0 3 6 12

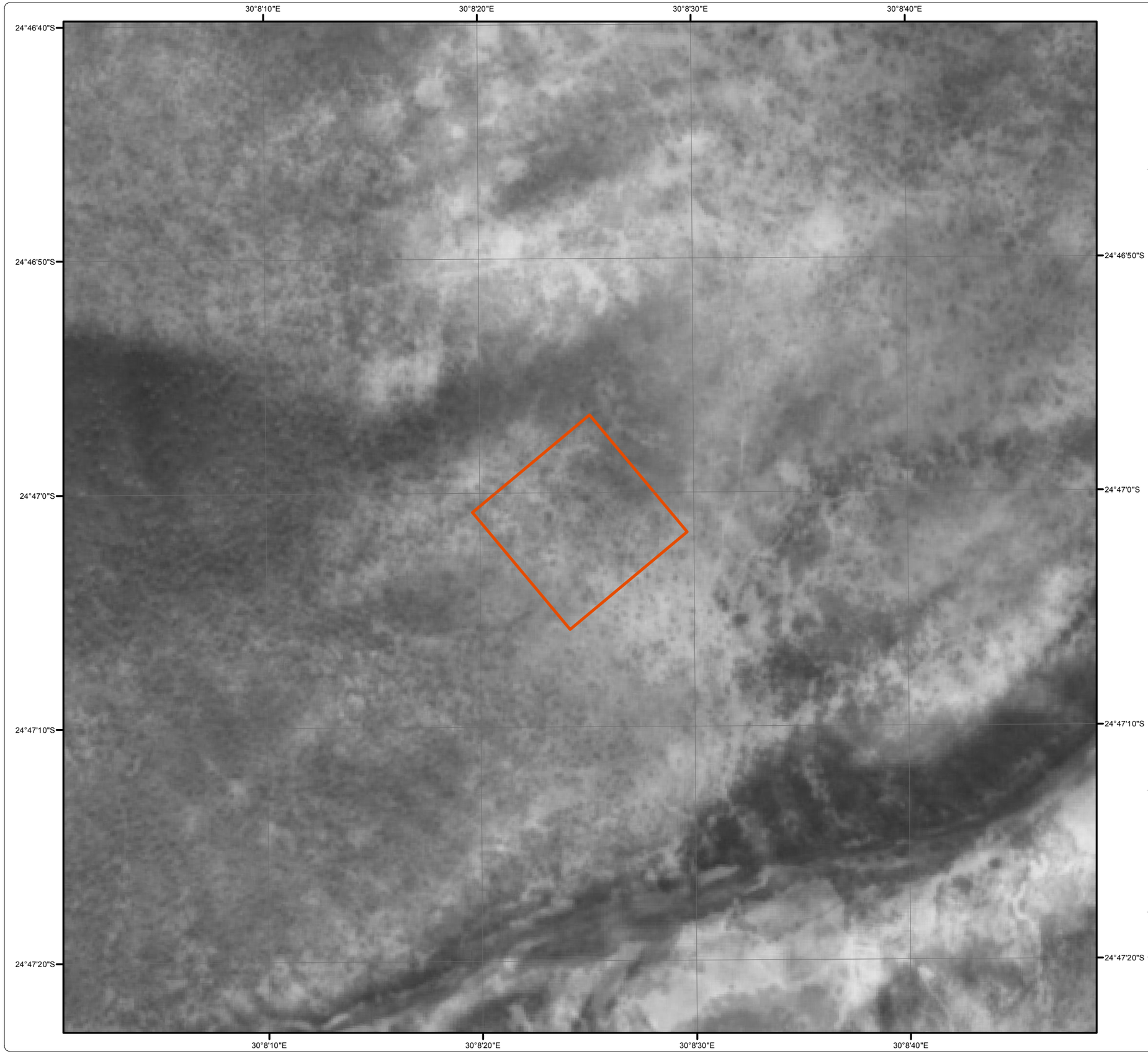
Kilometres

1:200,000

Plan 4

Rhodium Reefs Environmental Authorisation

Historical Layering



Legend

Infrastructure Area

Historical Layering Aerial Photos
Year 1980 - Photo no. 498_156_005_00295
Year 1971 - Photo no. 681_012_00485
Year 1970 - Photo no. 652_020_08090
Year 1954 - Photo no. 325_033_07987
Year 1938 - Photo no. 131_017_75145

DIGBY WELLS ENVIRONMENTAL
www.digbywells.com

Projection: Transverse Mercator	Ref #: mpl.RHO1867.201303.052
Datum: Hartebeeshoek 1994	Revision Number: 1
Central Meridian: 31°E	Date: 15/11/2012

N

0 60 120 240

Metres

1:5,000

Plan 5

Rhodium Reefs Environmental Authorisation

Identified Heritage Resources

30°8'20"E 30°8'25"E 30°8'30"E 30°8'35"E

24°46'55"S

24°47'0"S

24°47'5"S

001 002 003 004

Legend

- Infrastructure Area
- Identified Heritage Resources
- Fieldwork Tracks
- Access Road
- Railway
- Power Line (Lines In)
- Raw Water
- Dirty Water Drain

Infrastructure Plan

- Bankmans Cabin
- Covered Explosives Yard
- Diesel Tanks
- Erikson Dam
- Eskom Yard & Substation
- Fence
- Lamp & Crush
- Offices/Toilets/First Aid
- PCD
- Parking
- Potable Water Tanks
- Salvage Bays
- Security
- Sewage Works
- Store
- Timber Yard
- Topsoil Stockpile
- V Drain
- Ventilation Shaft
- Vertical Shaft
- Water Treatment
- Winder House
- Workshop

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 31°E

Ref #:mpl.RHO1867.201303.088
Revision Number: 1
Date: 15/03/2013

N

0 20 40 80 120

Metres

1:2,000

Plan 6

Rhodium Reefs Environmental Authorisation

Grave Site

30°8'21"E 30°8'24"E 30°8'27"E 30°8'30"E

24°46'57"S 24°47'0"S 24°47'3"S 24°47'6"S

V Drain
Timber Yard
Eskom Yard & Substation
Covered Explosives Yard
Salvage Bays
Winder House
Diesel Tanks
Bankmans Cabin
Vertical Shaft
Parking
Store
Ventilation Shaft
Offices/Toilets/First Aid
Topsoil Stockpile
Workshop
Lamp & Crush
Security
Potable Water Tanks
Water Treatment
Sewage Works
Erikson Dam
PCD

BG_Site No. 002
Grave No. 001

0 0.75 1.5
Metres

BG_Site No. 002
Grave No. 001

Legend

- Infrastructure Area
- Grave Site
- Track

Infrastructure Plan

- Access Road
- Dirty Water Drain
- Power Line (Lines In)
- Railway
- Raw Water
- Bankmans Cabin
- Covered Explosives Yard
- Diesel Tanks
- Erikson Dam
- Eskom Yard & Substation
- Fence
- Lamp & Crush
- Offices/Toilets/First Aid
- PCD
- Parking
- Potable Water Tanks
- Salvage Bays
- Security
- Sewage Works
- Store
- Timber Yard
- Topsoil Stockpile
- V Drain
- Ventilation Shaft
- Vertical Shaft
- Water Treatment
- Winder House
- Workshop
- Buffer

DIGBY WELLS ENVIRONMENTAL
www.digbywells.com

Projection: Transverse Mercator
Datum: Hartebeeshoek 1994
Central Meridian: 31°E

Ref #: mpl.RHO1867.201303.051
Revision Number: 1
Date: 11/03/2013

N

0 15 30 60
Metres
1:1,200

Appendix D: Registered Stakeholders

	A	B	C
1	**First Name**	**Last Name**	**Company**
2	**NATIONAL**		
3	Nhlamula	Shiluvana	Department of Agriculture,Forestry and Fisheries
4	N	Dlamini	Department of Agriculture, Forestry and Fisheries
5	Ndina	Mudau	Department of Agriculture, Forestry and Fisheries
6	M	Ligege	Department of Agriculture,Forestry and Fisheries
7	T	Machate	Department of Agriculture,Forestry and Fisheries
8	Ndiafhi	Tuwani	Department of Energy: Designated National Authority
9	A	Matukane	Department of Water Affairs
10	Phillip	Hine	South African Heritage Resources Agency
11	Sandile	Vilakazi	Department of Environmental Affairs
12	Mazwi	Lushaba	Department of Environmental Affairs
13	Debbie	Khan	Department of Rural Development and Land Reform - Pretoria
14	**PROVINCIAL**		
15	E.V	Maluleke	Limpopo Department of Economic Development, Environment and Tourism
16	Nicolas	Avhashoni	Department of Rural Development and Land Reform - Limpopo
17	Edward	Nesamvuni	Limpopo Department of Agriculture
18	Nhlamula	Shiluvana	Department of Agriculture,Forestry and Fisheries
19	N	Dlamini	Department of Agriculture,Forestry and Fisheries
20	M	Ligege	Department of Agriculture,Forestry and Fisheries
21	T	Machate	Department of Agriculture,Forestry and Fisheries
22	T	Malatji	Department of Rural Development and Land Reform - Limpopo
23	Tam	Nematandani	Department of Rural Development and Land Reform - Limpopo
24	Edward	Nesamvuni	Limpopo Department of Agriculture
25		Manager	Limpopo Department of Roads and Transport
26	T	Khuzwayo	Limpopo Provincial House of Traditiona Leaders
27	Masame	Masha	Steelpoort Forum (Spitzkop Farm)
28	**DISTRICT**		
29	Sporo	Masemola	Greater Skhukhune District Municipality
30	**LOCAL**		
31	Thabiso	Mokoena	Greater Tubatse Municipality
32	M.M	Lingwati	Greater Tubatse Local Municipality
33	M	Makine	Greater Tubatse (Ward 2 Councillor)
34	Ephraim	Hlatswayo	Greater Tubatse Ward 3 Councillor
35	Emily	Sebei	Mapodile Satellite- Greater Tubatse Municipality
36	**TRADITIONAL COUNCILS**		
37	Pule	Nkosi	Bengwenyama Tribal Authority
38	Chief	Nkosi	Be Ngwenyama yamaswazi Traditional

	A	B	C
1	**First Name**	**Last Name**	**Company**
39	M	Fenyane	Ga- Mampuru Traditional Council
40	M.J	Radingwana	Ga-Mampuru Traditional Council
41	N.M	Malekane	Ga- Malekane Traditional Council
42	M	Sello	Ga-Malakane Traditional Council
43	M	Makofane	Roka Phasha Pokwane
44		Phasha	Ga-Phasha Traditional Council
45	Godfrey	Mabelane	Ga-Phasha Village
46	Patson	Phasha	Ga-Phasha village
47	**INTERESTED AND AFFECTED PARTY**		
48	Jan	Louw	Tweefontein Farm
49	Lukas	Kgabo	Dithamaga Trust
50	Silas	Hlapolosa	Assmang Dwarsriver
51	Kgaume	Makola	Babina Phuthi Ba Makola Mashego Community
52	Petrus	Mosehla	Bakgatla a Mosehla - Land Claimants
53	Hester	Erasmus	Adjacent Landowner Kennedy's Vale Portion 12
54	Aili	Zeeman	Samancor Chrome Ltd
55	Jacques	Niekerk	Samancor- Tubatse Chome
56	Brenton	Parrot	Olifants Catchment Environmental Protection Group
57	Rainbow	Matodzi	Xstrata South Africa (Pty) Ltd
58		Masha	Tubatse Taxi Association
59	Erasmus	Kgakishe	Ga- Mampuru Farming Committee
60	Carolyn	Ah Shene-Verdoo	Bird Life Soth Africa
61	Tristen	Taylor	Earthlife Africa
62	Siebert	Labuschagne	Eskom - Land Rights
63	Eddie	van Rensburg	Ngululu Bulk Carriers
64	Rossouw	Choma	
65	Stephan	Choma	
66	Granny	Choma	Beweldere Mooimiesiefontein farm
67	Sonia	Choma	Ga-Masha Village
68	Klass	Choma	Mahlhkwena village
69	Given	Choma	Mooimeisiefontein Development Forum
70	Patrick	Dolo	Ga-Masha
71	Elizabeth	Dolo	Ga-Masha village
72	Marcia	Dolo	Ga-Masha village
73	Barodi	Dolo	Ga-Masha village
74	Philimone	Dolo	Ga-Masha village
75	Frenk	Dolo	Ga-Masha village

	A	B	C
1	**First Name**	**Last Name**	**Company**
76	Lydia	Dolo	Ga-Masha village
77	Caleb	Dolo	Ga-Masha village (Stand 307)
78	Sharloo	Dolo	Kutullo village
79	Maggy	Dolo	Kutullo village
80	Godfrey	Fenayne	
81	Esrom	Fenyane	
82	Agnes	Fenyane	
83	Thomas	Fenyane	
84	M	Fenyane	Ga- Mampuru Traditional Council
85	Silas	Hlapolosa	Assmang Dwarsriver
86	Hellen	Hlatshwayo	Ga-Phasha village
87	Masehelise	Hlatswayo	Ga-Phasha village
88	Lukas	Kgabo	Dithamaga Trust
89	Erasmus	Kgakishe	Ga- Mampuru Farming Committee
90	Kgopane	Kgakistle	Ga-Mampuru village
91	Elizabeth	Kgalema	Ga-Mmapuru village
92	Moganedi	Kgapane	
93	Nthabiseng	Kgaphola	Ga-Mampuru village
94	Marble	Kgetsepe	Ga-Mmapuru village
95	Hunadi	Kgoedi	Ga-Phasha TA
96	Sina	Kgole	African National Congress
97	Makopole	Kgole	Ga-Phasha village
98	Mahlako	Kgole	Ga-Masha village
99	Hlabirwa	Kgole	Ga-Masha village
100	Moipone	Kgole	Ga-Masha village
101	Lethiba	Kgole	Ga-Phasha village (stand A43 Ngwaabe)
102	Fanme	Kgopane	Bakgatla a Mosehla Community Trust - Land Claimants
103	Mavis	Kgopane	Bakgatla a Mosehla Community Trust - Land Claimants
104	Nhloma	Kgopane	Ga - Phasha village
105	Seiphai	Komane	
106	Formena	Komane	Ga-Malekana resident
107	Magdelina	Komane	Malekane Community Forum
108	Siebert	Labuschagne	Eskom - Land Rights
109	Albert	Lekgeu	Dithamaga Trust
110	Mamasele	Lekgeu	Dithamaga Trust
111	Matshehle	Lekgeu	Dithamaga Trust
112	Elizabeth	Lekgeu	Dithamaga Trust

	A	B	C
1	**First Name**	**Last Name**	**Company**
113	Abram	Lekwadi	Bakgatla a Mosehla Community Trust - Land Claimants
114	Joseph	Lengwati	Ga-Phasha village
115	C	Leshaba	
116	Sondo	Lesufi	Ga-Mampuru village
117	Maggy	Letlapa	Bakgatla a Mosehla Community Trust - Land Claimants
118	Meiky	Letlapa	Ga-Phasha village
119	Jan	Louw	Tweefontein Farm
120	Lethaba	Maabane	Bakgatla a Mosehla - Land Claimants
121	Piet	Maabane	Bakgatla a Mosehla Community Trust - Land Claimants
122	Tiny	Maabane	Ga-Malekane TA- Makakatela resident
123	Portia	Maapoti	Ga-Mampuru village
124	Forest	Mabanna	Mahlakoena village (Winterveld)
125	Muriel	Mabatamela	Ga-Phasha village
126	Bellyboy	Mabela	Dithamaga Trust
127	Esther	Mabelane	
128	Modikanalo	Mabelane	Ga-Phasa TA
129	Lizzy	Mabelane	Ga-Phasha TA
130	Godfrey	Mabelane	Ga-Phasha Village
131	Pennel	Mabelane	Kgebo Lerakong Trading
132	Maputle	Mabelane	Tubatse Steelpoort Community Forum
133	Abram	Mabilu	
134	Patrick	Maboa	
135	Linky	Maboki	Ga-Rantho village
136	Sanman	Mabola	
137	Margret	Mabowa	Ga-Malekane TA- Tsakane resident
138	Oupa	Mabowa	Ga-Malekane TA- Tsakane resident
139	Ben	Mabuza	Bakgatla a Mosehla - Land Claimants
140	Girly	Mabuza	Bakgatla a Mosehla Community Trust - Land Claimants
141	Dinah	Macata	Bakgatla a Mosehla Community Trust - Land Claimant
142	Ivy	Madalane	
143	Makula	Madikadika	Ga-Phasha village
144	Lucy	Maduana	Ga-Masha village stand no 314
145	Johannes	Maduano	Ga-Masha village
146	Mohlale	Magabane	
147	Kuki	Magagula	African National Congress
148	Maggy	Magagula	Bakgatla a Mosehla Community Trust - Land Claimants
149	E	Magapa	

	A	B	C
1	**First Name**	**Last Name**	**Company**
150	Moses	Magapa	
151	Jane	MAgatsela	Ga-Malekane resident
152	Rosah	Magatsela	Ga-Malekane resident
153	Maaphasi	Magolego	Dithamaga Trust
154	Mokuabudi	Magolego	Dithamaga Trust
155	Rachel	Magolego	Dithamaga Trust
156	Mawela	Magolego	Dithamaga Trust
157	Batshibi	Magolego	Dithamaga Trust
158	Maleke	Magolego	Dithamaga Trust
159	Maria	Magolego	Ga-Phasha village
160		Magolego	Magolego Traditional Council
161	Sarah	Mahlaela	Ga-Malekane TA
162	Mmagoletsoni	Mahlako	Ga-Matsho village
163	Modira	Mahlakwana	
164	Patrick	Mahlanyane	Ga-Mampuru village
165	Lorraine	Mahudu	Ga-phasha (Magaseng)
166	Magret	Maidi	
167	Michael	Maidi	Ga-Malekane Traditional Authority
168	Phillip	Mailula	
169	Sevh	Maimela	Ga-Malekane TA- Tsakane resident
170		Maimela	Spitskop Community Trust
171	Frans	Maimela	Spitskop Trust
172	Mapule	Makau	Bokome ba Ga-Phasha
173	Tebele	Makgale	Ga-Masha Village
174	Tebogo	Makgoloane	
175	Nono	Makofane	Ga-Phasha village
176	M	Makofane	Roka Phasha Pokwane
177	Peter	Makola	
178	Pretty	Makola	
179	Ketty	Makola	
180	Donald	Makola	
181	Christina	Makola	
182	De-suy	Makola	
183	K	Makola	
184	Kgaume	Makola	Babina Phuthi Ba Makola Mashego Community
185	Matsepe	Makola	Bakgatla a Mosehla Community Trust - Land Claimants
186	S	Makola	Bakgatla a Mosehla Community Trust - Land Claimants

	A	B	C
1	**First Name**	**Last Name**	**Company**
187	J	Makola	Ga-Malekane Traditional Authority
188	Mahwiti	Makola	Ga-Malekane Traditional Authority
189	Johannes	Makola	Ga-Phasha TA
190	Francina	Makola	Ga-Phasha village
191	Phaswane	Makolane	Bakgatla a Mosehla Community Trust - Land Claimants
192	Johannes	Makua	Ga-Malekane TA (new stand)
193	Frida	Makula	Ga-Phasha village
194	Violet	Makuwa	African National Congress
195	Nantso	Makuwa	Ga-Mampuru village
196	Annikie	Makuwa	Ga-Mampuru village
197	Hollon	Makuwa	Magaseng section
198	Pertunia	Makwetle	Ga-Masha village
199	Julia	Malapane	
200	Alfred	Malapane	Ga-Mampuru village
201	Saronah	Malapane	Ga-Mampuru village
202	Jastice	Malapane	Ga-Mampuru village
203	Matias	Malapane	Ga-Mampuru village
204	Cinda	Malapane	Ga-Mampuru village
205	Letlotlo	Malapane	Ga-Mampuru village
206	William	Malata	Bakgatla a Mosehla Community Trust - Land Claimants
207	T	Malatji	Department of Rural Development and Land Reform - Limpopo
208	Elsie	Maleka	Ga-Malekana (Makakatela section)
209	Delson	Maleka	Ga-Masha village
210	Sambey	Maleka	Makatsile clan (member of the Moretsele)
211	Justice	Malekana	Ga-Malekane Traditional Authority
212	Andronicca	Malekane	Ga-Masha village
213	N.M	Malekane	Ga- Malekane Traditional Council
214	Ivy	Maleke	Ga-Mampuru village
215	Mashack	Malema	Ga-Mampuru village
216	Matlala	Malokane	Ga-Mampuru village
217	Martha	Malome	Bakgatla a Mosehla Community Trust - Land Claimants
218	Annah	Malope	Bakgatla a Mosehla Community Trust - Land Claimants
219	Foriki	Malope	Bakgatla a Mosehla Community Trust - Land Claimants
220	Kaboni	Malope	Bakgatla a Mosehla Community Trust - Land Claimants
221	Simon	Malope	Bakgatla a Mosehla Community Trust - Land Claimants
222	Vusi	Maluleke	Limpopo Department of Economic Development, Environment nd Tourism
223	Daniel	Mamaro	

	A	B	C
1	**First Name**	**Last Name**	**Company**
224	Piet	Mamela	Bakgatla a Mosehla Community Trust - Land Claimants
225	Punny	Mamosadi	Bakgatla a Mosehla Community Trust - Land Claimants
226	Masakeng	Mampuru	Ga-Mampuru TA
227	Tshegofatso	Mampuru	Ga-Mampuru Village
228	Kedibone	Mampuru	Ga-Mampuru village
229	Machaba	Mampuru	Mmapuru Community Trust
230	Rhine	Mampuru	Mmapuru Developmnet Trust
231	Biggy	Mampuru	Mohlaletsi
232		Manager	Limpopo Department of Roads and Transport
233	Anikie	Manganeng	African National Congress
234	Lucky	Mankgane	Ga-Phasha TA
235	Anikie	Mankgane	Ga-Phasha village
236	Lazarus	Mankge	
237	Regina	Mankge	
238	Piet	Mankge	
239	Emmauel	Mankge	African National Congress
240	Promise	Mankge	Ga-Phasha village
241	Bushy	Maokanyane	
242	David	Maome	Ga-Malekane TA- Makakatela resident
243	S	Maopa	
244	Johannes	Maphanga	Bakgatla a Mosehla Community Trust - Land Claimants
245	Mapace	Mapjane	Bakgatla a Mosehla Community Trust - Land Claimants
246	Jacob	Mapona	Kutullo village
247	Irene	Mapote	Ga-Phasha village
248	Mangwedi	Maredi	
249	Frank	Maredi	
250	Jane	Maredi	Ga-Mampuru village
251	Enock	Maredi	Kgetja Le Dimo construction project
252	Makoma	Maripane	Bakgatla a Mosehla - Land Claimants
253	Refiloe	Maripane	Ga-Masha Stand No 20
254	Sydeny	Maroma	Ga-Phasha village
255	Magolego	Masagobotja	Dithamaga Trust
256	Sporo	Masemola	Greater Skhukhune District Municipality
257	Polinah	Maseteo	Bakgatla a Mosehla Community Trust - Land Claimants
258	Constance	Masha	
259	Brian	Masha	Ga-Masha village
260	Maria	Masha	Ga-Masha village

	A	B	C
1	**First Name**	**Last Name**	**Company**
261	Mapogo	Masha	Ga-Masha village
262	Phatane	Masha	Ga-Masha village
263	Dinah	Masha	Ga-Masha village (Stand no 439)
264	Masame	Masha	Steelpoort Forum (Spitzkop Farm)
265		Masha	Tubatse Taxi Association
266	Maria	Mashaba	Mokgethi village
267	Germinah	Mashegoane	
268	Johannes	Mashegoane	Ga-Rantsho village
269	Thabiso	Mashegoane	Kutullo section
270	Albert	Mashiane	
271	M	Mashiane	
272	Betty	Mashilo	Ga- Masha,Mokgatlo MEYER
273	Phaswane	Mashilo	Maila Mapitsane
274	Faneng	Mashilo	Winterverd village (Mahloakoena)
275	Lucy	Mateneni	African National Congress
276	Sade	Matenjie	Ga-Malekane TA- Tsakane resident
277	Constance	Mathabela	Ga-Mampuru village
278	Idah	Mathabela	Ga-Mampuru village
279	Karabo	Mathaila	
280	Kenneth	Mathaila	
281	Lizzy	Mathaila	
282	Sylvia	Mathaila	
283	S	Mathaila	
284	Florence	Mathaila	Ga-Malekane TA
285	Modidi	Mathaila	Ga-Malekane TA- Tsakane resident
286	Mamosadi	Mathebe	Bakgatla a Mosehla Community Trust - Land Claimants
287	M	Mathibe	
288	Irene	Mathunyane	Ga-Mampuru village
289	Winky	Mathunyane	Ga-Mamputu village
290	Rainbow	Matodzi	Xstrata South Africa (Pty) Ltd
291	Kgoputso	Matsailane	Ga Mampuru Village
292	Yvonne	Matsemele	P O Box 66
293	Mabuza	Matshege	Ga-Mampuru village
294	Poulos	Mgiba	
295	Kedibone	Mgiba	Ga-Malekane TA resident
296	Sibongile	Mgiba	Ga-Malekane TA- Tsakane resident
297	T	Mkhabela	Ga-Phasha - Bokome

	A	B	C
1	**First Name**	**Last Name**	**Company**
298	Sarah	Mkhombothi	Ga-Malekane
299	M	Mmabane	
300	Patricia	Mndebele	Stocking/Magaseng section
301	Dingane	Mndebele	Stocking/Nagaseng section
302	Itumeleng	Mogwana	Ga-Malekane TA
303	Annikile	Mohlahlo	Ga-Malekane TA
304	Judas	Mohlahlo	Ga-Malekane TA
305	Bella	Mohlahlo	Ga-Malekane TA House No55 Makakatela section
306	Martha	Mohlahlo	Ga-Masha village
307	Beatrice	Mohlahlo	P O Box 218
308	Eva	Mohlala	Ga-Malekane TA (New stand)
309	Rememberense	Mohlala	Ga-Mampuru village
310	Lekobe	Mohlala	Ga-Mampuru village
311	Zaira	Mohlala	Ga-Mampuru village
312	Thabo	Mohlala	Mapodile Township
313	Mohuke	Mojalodi	Ga-Mampuru village
314	Tseke	Mojalodi	Ga-Mampuru village
315	Candle	Mojalodi	Ga-Mampuru village
316	Gladys	Mojalodi	Ga-Mampuru village 20572
317	Creator	Mokabane	Ga-Malekane TA- Tsakane resident
318	Tebadi	Mokganyetsi	Ga-Mmapuru village
319	Yvonne	Mokobake	Ga-phasha village
320	N	Mokoena	
321	Elizabeth	Mokoena	Ga-Mampuru village
322	Thabiso	Mokoena	Greater Tubatse Municipality
323	Emely	Mokwena	
324	Cathrine	Molapo	
325	Lazarus	Molapo	Bakgatla a Mosehla Community Trust - Land Claimants
326	William	Molapo	Bakgatla a Mosehla Community Trust - Land Claimants
327	Leah	Molapo	Ga-Phasha village
328	Thomas	Molapo	Ga-Phasha village
329	Frase	Morestele	Ga-Malekane TA
330	Aron	Moretsele	
331	Linky	Moretsele	
332	Thapelo	Moretsele	
333	Germinah	Moretsele	Ga-Malekane
334	Mavis	Moretsele	Ga-Malekane TA

	A	B	C
1	**First Name**	**Last Name**	**Company**
335	Frans	Moretsele	Ga-Malekane TA
336	Junior	Moretsele	Ga-Malekane TA
337	Patience	Moretsele	Ga-Malekane TA (new stand)
338	Johanna	Moretsele	Ga-Masha (Stand 20)
339	Paul	Moretsele	Ga-Masha resident
340	Maria	Moretsele	Ga-Masha resident No 208
341	Mohube	Moretsele	Ga-Masha resident stand no 208
342	Mamorake	Moretsele	Ga-Masha stand No 20
343	Lucky	Moretsele	Ga-Masha village
344	Eliah	Moretsele	Ga-Masha village (Zone 5)
345	Phineas	Moretsele	Ga-MAsha village (Zone5)
346	Jacob	Moretsele	Ga-Masha village Stand 20
347	Maleke	Moretsele	Ga-Phasha village
348	Dudu	Moretsele	Ga-Rantho village
349	Mias	Moretsele	Ga-Rantho village
350	Jim	Moretsele	Ga-Rantho village
351	Moses	Moretsele	Riverside B Moloi
352	Tsietse	Morewane	Mampuru Community Trust
353	Jan	Morura	
354	Jodus	Morura	Ga- Malekane Village
355	Rachel	Morura	Ga-Malekana village
356	Betty	Morura	Ga-Malekane resident
357	Jane	Morura	Ga-Malekane Stand No35
358	Peggy	Morura	Ga-Malekane TA (stand 34)
359	Petrus	Mosehla	Bakgatla a Mosehla - Land Claimants
360	Makgae	Mosehla	Bakgatla a Mosehla - Land Claimants
361	Barshin	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
362	David	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
363	George	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
364	Jack	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
365	Klass	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
366	Kolane	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
367	Mabolala	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
368	Manabeng	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
369	Mtutwana	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
370	Pauls	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants
371	William	Mosehla	Bakgatla a Mosehla Community Trust - Land Claimants

	A	B	C
1	**First Name**	**Last Name**	**Company**
372	Simon	Mosehla	Bakgatla Ba Ga - Mosehla Community Trust (Land claimants
373	Michael	Mosehla	E P W P Environmental Affairs
374	Tukishi	Mosehla	Ga-Phasha village
375	Annah	Mosotho	Bakgatla a Mosehla Community Trust - Land Claimants
376	Mahlako	Mothupi	
377	Kgolane	Mothupi	
378	Reineth	Motubatse	Ga-Mampuru village
379	Martha	Mphela	Ga- Mampuru village
380	Dumisani	Mthembu	Department of Environmental Affairs
381	A	Mthimunye	
382	Sebolaetse	Napjane	Bakgatla a Mosehla Community Trust - Land Claimants
383	Rebone	Ngoatle	Ga-Malekane TA- Tsakane resident
384	Rebecca	Ngwatle	Ga-Malekane TA- Tsakane resident
385	Jacques	Niekerk	Samancor- Tubatse Chome
386	N	Nkosi	
387		Nkosi	Be Ngwenyama yamaswazi Traditional
388	Sophy	Nkosi	Ga-Phasha village
389	Melisa	Nkosi	Mahlakoeng village (winterveld 293 KT)
390	Lethabo	Nkosi	Stocking Magaseng section
391	Lomathinda	Nkosi	Stocking/Magaseng Section
392	Magumeni	Nkosi	Stocking/Magaseng Section
393	Elias	Nkosi	Winterveld Farm
394	Suzan	Nkune	Ga-Phasha village
395	Margaresh	Nkwana	Ga-Mampuru village
396	Lahlli	Nkwana	Ga-Mmapuru village
397	M	Ntsodi	
398	Alex	Nzimande	
399	Enicca	Nzimande	Ga-Phasha village
400	Menlam	Paile	
401	Daisy	Phahlamohlaka	Ga-Masha village
402		Phasha	Ga-Phasha Traditional Council
403	Maditsi	Phasha	Ga-Phasha village
404	Ireen	Phasha	Ga-Phasha village
405	Patson	Phasha	Ga-Phasha village
406	Nelson	Phetla	
407	Solly	Phetla	
408	Thomas	Phetla	Ga-Malekane TA

	A	B	C
1	**First Name**	**Last Name**	**Company**
409	Deborah	Phetla	Ga-Malekane TA- Tsakane resident
410	Ruth	Phorutshe	
411	Marinda	Prinsloo	Impala- Two Rivers
412	M.J	Radingwana	Mampuru Traditional Council
413	Thabo	Riba	Bakgatla a Mosehla Community Trust - Land Claimants
414	Emily	Sebei	Mapodile Satellite- Greater Tubatse Municipality
415	Thabaha	Sebola	Ga-Malekane TA Resident
416	Weekend	Sebulela	Dithamaga village
417	Mankie	Sebulela	Stocking village
418	Tebogo	Segokodi	Ga- Mampru village
419	Fiaviour	Sekgothe	African National Congress
420	Tshehla	Selepe	Ga-Masha village
421	M	Sello	Malakane Traditional Council
422	Moreki	Selota	Bakgatla a Mosehla Community Trust - Land Claimants
423	Marcus	Senamela	Business
424	Johannes	Senwane	Ga-Phasha village
425	Mowgadi	Serothoane	
426	Prince	Serothoane	
427	Johny	Serotoane	
428	Thomas	Serotwane	
429	Eric	Sewane	Ga-Phasha village
430	Mamsi	Sewane	Ga-Phasha village
431	Mandla	Sibanyone	
432	Godfrey	Sihlangu	
433	Maleke	Sikhosana	African National Congress
434	Dusty	Sithole	Bakgatla a Mosehla Community Trust - Land Claimants
435	Polinah	Sithole	Bakgatla a Mosehla Community Trust - Land Claimants
436	Simon	Sithole	Bakgatla a Mosehla Community Trust - Land Claimants
437	Dimakatso	Sithole	Ga-Phasha village
438	Tebogo	Tau	Ga-Malekane TA- Resident
439	Mahlatse	Tau	Ga-Malekane TA- Tsakane resident
440	Agnes	Tau	Ga-Phasha village
441	Vinolia	Tebele	Ga-Masha village
442	Conny	Tebele	Ga-Masha village
443	Londa	Tebele	Ga-Masha village
444	Mando	Tebele	Ga-Masha village
445	Jacob	Tebele	Ga-Rantho village

	A	B	C
1	**First Name**	**Last Name**	**Company**
446	Sipho	Tebele	Ga-Rantsho village
447	Paulinah	Thamane	Ga-Mampuru village
448	Dolly	Thipe	Ga-Mampuru village
449	Mathabo	Thobejane	Ga-Malekane TA (33 Makakatele village)
450	Khomotso	Thokoane	African National Congress
451	Kraise	Thokoane	Bakgatla a Mosehla Community Trust - Land Claimants
452	Samuel	Thokoane	Bakgatla a Mosehla Community Trust - Land Claimants
453	Sepeke	Thokoane	Bakgatla a Mosehla Community Trust - Land Claimants
454	Rudolph	Thokomane	Bakgatla a Mosehla Community Trust - Land Claimants
455	Beauty	Thokwane	
456	Sello	Thokwane	Belvedere 362 KT
457	Lawrence	Thsehla	
458	Elliot	Tokolo	Ga-Malekane village
459	Mmapthapelo	Tolo	Ga- Masha (New stands)
460	Nels	Tolo	Ga-Malekana village resident
461	Frans	Tolo	Ga-Malekane TA (33 Makakatela village)
462	Amos	Tolo	Ga-Malekane village
463	Lettie	Tolo	Ga-Malekane village
464	Mabatho	Tolo	Ga-Masha (Stand 308)
465	L	Tshehla	
466	Caroline	Tshehla	
467	Richard	Tshona	Ga-Malekane TA- Tsakane resident

Appendix E: Identified Heritage Resources

Heritage Resource ID	GPS LOCATION	TYPE	CATEGORY	CONTEXT	CULTURAL AFFINITIES	Description	Value	Impact Assessment: before project mitigation	Impact Assessment: after project mitigation	Suggested Field Rating	Recommended Heritage Mitigation
RHO1867/2430CC/S.35-001	-24.78453 30.13987	Occurrence		Secondary	Iron Age/ Historical	Iron Age and Stone Age surface occurrence	0	0	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
RHO1867/2430CC/S.36-002	-24.78483 30.14008	Burial		Primary	Historical	Single stone dressed burial	10	5	1	Field Rating IV A - General	Mitigation before destruction
RHO1867/2430CC/S.35-003	-24.78475 30.14077	Occurrence		Secondary	Iron Age/ Historical	Upper grinding stone fragment	0	0	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
RHO1867/2430CC/S.35-004	-24.78448 30.14100	Occurrence		Secondary	Iron Age/ Historical	Iron Age surface ceramic occurrence	0	0	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required

CONSTRUCTION PHASE

Heritage Resource, Activity Type, Development Phase and Aspect					STATEMENT OF SIGNIFICANCE / VALUE												Impact Rating							Impact Rating (after project							FIELD RATING	Recommended Heritage Mitigation
					Importance									Value Rating			Before project mitigation							After project mitigation								
Resource ID	Activity	NHRA Trigger	Source of Risk	Impact	Artistic		Historic			Scientific			Social	Credibility	AUTHENTICITY	INTEGRITY	VALUE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE		
					1	2	3	4	5	6	7	8	9																			
RHO1867/2430CC/S.35-001	Ground clearance	38.(1)c(iii)	None	None	0	0	0	0	0	0	0	0	0	3	3	0	0	0	3	3	0	0	3	0	0	0	0	0	0	0	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
RHO1867/2430CC/S.36-002	Ground clearance	38.(1)c(iii)	Site clearance and construction of the development will increase human traffic thereby increasing the risk to the site. There will also be a access restriction for the community due to the development.	Minor Negative	0	0	0	0	0	0	0	0	3	2	5	2	10	-1	3	3	3	5	3	14	1	1	1	0	1	1	1	Field Rating IV A - General	Mitigation before destruction
RHO1867/2430CC/S.35-003	Ground clearance	38.(1)c(iii)	None	None	0	0	0	0	0	0		0	0	3	3	0	0	-1	0	3	0	0	3	0	0	0	0	0	0	1	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
RHO1867/2430CC/S.35-004	Ground clearance	38.(1)c(iii)	None	None	0	0	0	0	0	0		0	0	3	3	0	0	-1	0	3	0	0	3	0	0	0	0	0	0	0	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
																	0																

Appendix F: Chance Find Procedures, Fossil Find Procedures and Fossil Monitoring

1 CHANCE FIND PROCEDURCES FOR HERITAGE RESOURCES

The following procedures must be considered in the event that previously unknown heritage resources, including burial grounds or graves, are exposed or found during the life of the project (extracted and adapted from the National Heritage Resources Act, 1999 Regulations Reg No. 6820, GN: 548).

List of Acronyms

CRM	Cultural Resources Management
HIA	Heritage Impact Assessment
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service

For simplicity, the term 'heritage resource' includes burial grounds and graves, unless these are specifically addressed.

Heritage Resources: structures, archaeology, palaeontology, meteors, public monuments

1. The heritage resource must be avoided and all activities in the immediate vicinity temporarily ceased;
2. The Digby Wells Environmental (Digby Wells) project manager and/or Cultural Resources Management (CRM) Unit must be notified of the discovery;
3. Digby Wells will deploy a qualified specialist to consider the heritage resource, either via communicating with the Environmental Officer via telephone or email, or based on a site visit;
4. Appropriate measures will then be presented to Rhodium Reefs;
5. Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), Digby Wells will notify the South African Heritage Resources Agency (SAHRA) and/or the Limpopo Provincial Heritage Resources Agency (LPHRA) on behalf of Rhodium Reefs; and

6. SAHRA/LPHRA may require that a Heritage Impact Assessment (HIA) in terms of NHRA Section 38 must take place that may include rescue excavations, for which Digby Wells will submit costs and proposal as relevant.

Burial grounds and graves

1. In the event that human remains were accidently exposed, the Digby Wells project manager and/or the CRM Unit must immediately be notified of the discovery in order to take the required further steps:
    a. The local South African Police Service (SAPS) will be notified on behalf of Rhodium Reefs;
    b. Digby Wells will deploy a suitably qualified specialist to inspect the exposed burial and determine in consultation with the SAPS whether:
        i. The temporal context of the remains, i.e.:
            - forensic,
            - authentic burial grave (informal or older than 60 years, NHRA (1999) Section 36); or
            - archaeological (older than 100 years, NHRA (1999) Section 38).
        ii. Any additional graves may exist in the vicinity.
2. Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999) Section 35 and NHRA (1999) Regulations (Regulation 38, 39, 40), Digby Wells will notify SAHRA and/or LPHRA on behalf of Rhodium Reefs;
3. SAHRA/LPHRA may require that an identification of interested parties, consultation and /or grave relocation take place;
4. Consultation must take place in terms of NHRA (1999) Regulations 39, 40, 42;
5. Grave relocation must take place in terms of NHRA (1999) Regulations 34

Digby Wells can facilitate and assist with all chance find procedures outlined above.

CRM Unit:	Johan Nel
	Work: 011 789 9495
	Cell: 072 288 5496

2 FOSSIL FIND PROCEDURES

List of Acronym

ECO	Environmental Control Officer

2.1 Introduction

In the context under consideration, it is improbable that fossil finds will require declarations of permanent “no go” zones. At most, a temporary pause in activity at a limited locale may be required. The strategy is to rescue the material as quickly as possible.

The procedures suggested below are in general terms, to be adapted as befits a context. They are described in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur.

Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

2.2 Isolated Bone Finds

In the process of digging excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds six pieces, the finds must be treated as a bone cluster (below).

2.2.1 Response by personnel in the event of isolated bone finds

The following responses should be undertaken by personnel in the event of isolated bone finds:

- **Action 1:** An isolated bone exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside;
- **Action 2:** The site foreman and Environmental Control Officer (ECO) must be informed;
- **Action 3:** The responsible field person (site foreman or ECO) must take custody of the fossil. The following information is to be recorded:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of hole showing vertical section (side); and
  - Digital image of fossil.
- **Action 4:** The fossil should be placed in a bag (e.g. a Ziploc bag), along with any detached fragments. A label must be included with the date of the find, position information, and depth; and

- **Action 5:** The ECO is to inform the developer who then contacts the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

2.2.2 Response by Palaeontologist in the event of isolated bone finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established.

2.3 Bone Cluster Finds

A bone cluster is a major find of bones (e.g. several bones in close proximity or bones resembling parts of a skeleton). These bones will likely be seen in broken sections of the sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

2.4 Response by personnel in the event of a bone cluster find

The following responses should be undertaken by personnel in the event of bone cluster finds:

- **Action 1:** Immediately stop excavation in the vicinity of the potential material. Mark or flag the position as well as the spoil heap that may contain fossils;
- **Action 2:** Inform the site foreman and the ECO; and
- **Action 3:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is then to describe the occurrence and provide images via email.

2.5 Response by Palaeontologist in the event of a bone cluster find

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out.

It will be probably be feasible to avoid the find and continue to the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with the developer/owner and the environmental consultant.

The Field Assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist to decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.

2.6 Rescue Excavation

Rescue Excavation refers to the removal of the material from the “design” excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonable rapid to avoid any undue delays, e.g. one to three days and definitely less than one week.

In principle, the strategy during the mitigation is to “rescue” the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossil and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material in sand; and
- Fragile material in loose sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar.

If the fossil occurrence is dense and is assessed to be a “Major Find”, a carefully controlled excavation is required.

2.7 Major Finds

A Major Find is the occurrence of material that, by virtue of quantity, importance and time constraints, cannot be feasibly rescued without compromise of detailed material recovery and contextual observations.

2.7.1 Management Options for Major Finds

In consultation with the developer/owner and the environmental consultant, the following options should be considered when deciding on how to proceed in the event of a Major Find.

Option 1: Avoidance

Avoidance of the Major Find through project redesign or relocation. This ensures minimal impact to the site and is the preferred option from a heritage resource management perspective. When feasible, it can also be the least expensive option from a construction perspective.

The find site will require site protection measures, such as erecting fencing or barricades. Alternatively, the exposed finds can be stabilised and the site refilled or capped. The latter is preferred if excavation of the find will be delayed substantially or indefinitely. Appropriate protection measures should be identified on a site-specific basis and in wider consultation with the heritage and scientific communities.

This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.

Option 2: Emergency Excavation

Emergency excavation refers to the “no option” situation where avoidance is not feasible due to design, financial and time constraints. It can delay construction and emergency excavation itself will take place under tight time constraints, with the potential for irrevocable compromise of scientific quality. It could involve the removal of a large, disturbed sample by an excavator and

conveying this by truck from the immediate site to a suitable place for “stockpiling”. This material could then be processed later.

Consequently, the emergency excavation is not the preferred option for a Major Find.

2.8 Exposure of Fossil Shell Beds

2.8.1 Response be personnel in the event of intersection of fossil shell beds

The following responses should be undertaken by personnel in the event of intersection with fossil shell beds:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of the hole showing the vertical section (side); and
  - Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

2.8.2 Response by the palaeontologist in the event of fossil shell bed finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

2.9 Exposure of Fossil Wood and Peats

2.9.1 Response be personnel in the event of exposure of fossil wood and peats

The following responses should be undertaken by personnel in the event of exposure of fossil wood and peats:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of the hole showing the vertical section (side); and

- Digital images of the fossiliferous material.

- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

2.9.2 Response by the palaeontologist in the event of exposure of fossil wood and peats

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.