DIGBY WELLS
ENVIRONMENTAL

SAHRIS Case No: 12431

Environmental Impact Assessment for the Proposed Future Developments within the Sun City Resort Complex

Heritage Impact Assessment

Project Number:

SUN4642

Prepared for:

Sun International (Pty) Ltd

October 2018

Digby Wells and Associates (South Africa) (Pty) Ltd
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This document has been prepared by Digby Wells Environmental.

Report Type:	**Heritage Impact Assessment**
Project Name:	**Environmental Impact Assessment for the Proposed Future Developments within the Sun City Resort Complex**
Project Code:	**SUN4642**

Name	Responsibility	Signature	Date
Shannon Hardwick Assistant HRM Consultant ASAPA Member: 451	Baseline research Report compilation		October 2018
Justin du Piesanie Divisional Manager: Social and Heritage Services ASAPA Member 270	Pre-disturbance survey; Technical review		
Danie Otto Technical Director Manager: Specialised Services	ExCo Review		
Carol Hooghiemstra Project Manager	Project management		

EXECUTIVE SUMMARY

Sun International (Pty) Ltd (hereinafter Sun International) appointed Digby Wells Environmental (hereinafter Digby Wells) to complete an Environmental Impact Assessment (EIA) process in support of several proposed developments ("the Project") within the Sun City Resort Complex (hereinafter Sun City) in the North West Province. These developments include:

- Resort expansion projects;
- Utilities and services projects; and
- Maintenance projects.

This report constitutes a Heritage Impact Assessment (HIA) report submitted to the South African Heritage Resources Agency (SAHRA) and the North West Provincial Heritage Resources Authority (NWPHRA) for Statutory Comment in respect of Section 38(8) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) (NHRA).

The aim of the Heritage Resources Management (HRM) process was to comply with the regulatory requirements encapsulated in Section 38(3) of the NHRA. The following activities were completed in this phase of the HRM process:

- Undertaking historical layering to identify potential structures older than 60 years that are protected under Section 34 of the NHRA, or any other tangible heritage resources;
- Identifying of potential impacts to heritage resources relative to Cultural Significance (CS) of identified heritage resources and the sustainable socio-economic benefits that may be derived from the Project;
- Recommending feasible management or mitigation measures to avoid and/or minimise negative impacts and enhance potential benefits; and
- Submitting the HIA report to SAHRA and NWPHRA for Statutory Comment as required under Section 38(8) of the NHRA.

Justin du Piesanie and Johan Nel undertook a non-intrusive pre-disturbance survey of the site-specific study area, in particular the proposed development footprints. Through an understanding of the distribution of various heritage resources, the statement of CS below demonstrates an average medium significance rating for the defined cultural landscape (refer to Section 6.1 in the main text for more detail).

Summary of CS of Identified Heritage Resources

Resource ID	Description	Integrity	CS Value	Designation
Itlholanoga	Late Farming Community (LFC) stonewalling associated with the Moloko ceramic industry	4	18	Very High
STW-002	Stonewalling associated with the LFC.	3	11	Medium
STW-003	Stonewalling associated with the LFC.			
STW-004	Large stonewalled site, no association reported.			
STW-005	Stonewalling associated with the LFC.	3	8	Low
STW-001	Site including a central cluster of stonewalled enclosures, flanked by two curved stonewalls. Two additional features are located nearby on a rocky outcrop.	1	0	Negligible
STW-006	Open LFC site; no material culture described.	0		
STW-007	LFC site.			
STW-008	LFC site.			
STW-009	Stonewalling, no association reported.	1	1	

The proposed developments will present risk of damage to or destruction of identified heritage resources *Itlholanoga* and STW-002. A summary of the impacts is presented in the following table (refer to Section 6.2 in the main text for more detail). The next table summarises the potential risk to the heritage resources (Table 6-6 in the main text).

Summary of the Impact Assessment

Code	Impact	Duration	Extent	Intensity	Consequence	Probability	Significance
ITHL	Damage to or destruction of *Itlholanoga*	*Pre-Mitigation:*					
		Permanent	International	Extremely high - negative	Extremely detrimental	Highly probable	Major - negative
		Post Mitigation:					
		Beyond project life	Limited	High - positive	Moderately beneficial	Highly probable	Moderate - positive
STW-002	Damage to or destruction of STW-002	*Pre-Mitigation:*					
		Permanent	Province/ Region	Moderately high - negative	Highly detrimental	Likely	Moderate - negative
		Post Mitigation:					
		Permanent	Province/ Region	Very low - negative	Moderately detrimental	Unlikely	Negligible - positive

Summary of the Potential Risk

Phase	Activity	Risk	Potential Impact
Construction	Construction of infrastructure associated with Project activities described in Section 1.1.1	Damage to the identified heritage resources	Destruction of or disturbance to NHRA Section 35 resources, i.e. archaeological resources that will reduce the inherent CS of the site and greater cultural landscape.
Operation	Operation and maintenance of proposed developments as presented in Table 1-1	Damage to identified heritage resources	Damage to NHRA Section 35 resources, i.e. archaeological resources that will reduce the inherent CS of the site and greater cultural landscape.

The proposed developments within the Sun City Complex contribute to cumulative impacts within the site-specific study area as well as within the local area. These are summarised in the table below (Table 6-5 in the main text).

Summary of Potential Cumulative Impacts

Type	Cumulative Impact	Direction of Change	Extent of Impact
Additive	The continued developments, i.e. resort expansion projects, utilities and services projects and maintenance projects within the Sun City Complex, will affect the integrity of the heritage resources identified within the site-specific study area.	Negative	Site-specific
Additive synergistic	Remaining *in situ* archaeological heritage resources within the site-specific and local study area will increase in significance regardless of their integrity as more tangible heritage resources are removed from the landscape.	Negative	Local
Space-crowding	The increase in the density of developments within the region will alter the sense-of-place and integrity of *in situ* heritage resources that may result in degradation, or in an extreme case, sterilisation of the cultural landscape.	Negative	Regional

Based on Digby Wells' understanding of the Project and the risks associated with Project activities, Digby Wells recommends the following.

- The Project design must be altered to avoid, or at the very least limit, the identified potential direct negative impacts to the heritage resources *Itlholanoga* and STW-002. In terms of the pipeline proposed near STW-002, this can be achieved by routing the pipeline within the existing road;
- Sun International must enlist the services of a qualified archaeologist to undertake detailed mapping of the affected sites prior to the commencement of construction activities. The archaeologist must undertake a Watching Brief during earth-moving activities associated with the construction phase;
- No work on the developments proposed near the site *Itlholanoga* and/or STW-002 (i.e. the reservoirs and/or the pipeline) may be undertaken without a permit issued in respect of Section 35 of the NHRA and Chapters II and IV of the NHRA Regulations, 2000 (GN R 548), authorising the partial destruction of destruction of the archaeological site; and
- Sun International must develop and implement a Conservation Management plan (CMP) as a condition of authorisation and for approval by SAHRA and NWPHRA. The CMP must include *Itlholanoga* and STW-002 and must consider these resources in their entirety. These sites may present opportunities as tourist attractions, provided the correct management, which should be explored in the CMP.

Where these recommendations are adopted, Digby Wells does not object to the implementation of the Project. The CMP will be compiled during the next step of the HRM process Digby Wells was appointed to undertake.

DECLARATION OF THE SPECIALIST

Digby Wells and Associates (South Africa) (Pty) Ltd

Contact person: Shannon Hardwick

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48 Grosvenor Road	Fax:	011 789 9498
Turnberry Office Park, Bryanston	E-mail:	Shannon.hardwick@digbywells.com
2191		

I, Shannon Hardwick as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Sun International (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Heritage Resources Management (HRM) Process for the Environmental Authorisation Application for the proposed future developments to take place within the Sun City Resort Complex. I am fully aware of and meet all the requirements for specialist assessment, and that failure to comply may result in disqualification of this assessment. I have disclosed to the applicant all material information that has or may have the potential to influence the decision of the Department or the objectivity of this report as part of the application.

In signing this declaration, I am aware that a false declaration is an offence in terms of Regulation 48 of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, as amended.

Full Name:	Shannon Hardwick
Title/ Position:	Assistant HRM Consultant
Qualification(s):	MSc
Experience (Years):	1 year
Registration(s):	Association of Southern African Professional Archaeologists (ASAPA)

DECLARATION OF THE SPECIALIST

Digby Wells and Associates (South Africa) (Pty) Ltd

Contact person: Justin du Piesanie

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2191		

I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Sun International (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Heritage Resources Management (HRM) Process for the Environmental Authorisation Application for the proposed future developments to take place within the Sun City Resort Complex. I am fully aware of and meet all the requirements for specialist assessment, and that failure to comply may result in disqualification of this assessment. I have disclosed to the applicant all material information that has or may have the potential to influence the decision of the Department or the objectivity of this report as part of the application.

In signing this declaration, I am aware that a false declaration is an offence in terms of Regulation 48 of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, as amended.

Full Name:	Justin du Piesanie
Title/ Position:	Divisional Manager: Social and Heritage
Qualification(s):	MSc
Experience (Years):	12 years
Registration(s):	Association of Southern African Professional Archaeologists (ASAPA) International Council on Monuments and Sites (ICOMOS) South Africa International Association for Impact Assessment South Africa (IAIAsa)

Compliance with Appendix 6 of GN 326 of 7 April 2017

Regulatory Requirements	Section of Report
(a) The person who prepared the report; and the expertise of that person to carry out the specialist study or specialised process.	Section 1.4
(b) a declaration that the person is independent	Page vii and viii
(c) an indication of the scope of, and the purpose for which, the report was prepared	Section 1.3
(cA) an indication of the quality and age of base data used for the specialist report	Section 4.2
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 6
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 4.2
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 4
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives	Section 6
(g) an identification of any areas to be avoided, including buffers	Section 9
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Appendix B
(i) a description of any assumptions made and any uncertainties or gaps in knowledge	Section 3
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Section 6
(k) any mitigation measures for inclusion in the EMPr	Section 9
(l) any conditions for inclusion in the environmental authorisation	Section 9
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9

Regulatory Requirements	Section of Report
(n) a reasoned opinion— (i) whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Sections 9 and 10
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report	Section 8
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto	Section 8
(q) any other information requested by the competent authority	N/A

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1 Introduction

Sun International (Pty) Ltd (hereinafter Sun International) proposes to undertake several future developments ("the Project") within the Sun City Resort Complex (Sun City) in the North West Province. To this effect, they appointed Digby Wells Environmental (hereinafter Digby Wells) to complete an Environmental Impact Assessment (EIA) process in support of Environmental Authorisation (EA) for the Project.

In support of the EIA process, Digby Wells completed a Heritage Resources Management (HRM) process to comply with Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). The HRM process to date comprised a Notification of Intent to Develop (NID) and Heritage Scoping Report (HSR) submitted to the South African Heritage Resources Agency (SAHRA) and the North West Provincial Heritage Resources Agency (NWPHRA) for interim comment[1].

This report constitutes the specialist Heritage Impact Assessment (HIA) report in support of the EIA process and must be read in conjunction with the HSR.

1.1 Project Background

1.1.1 Project Overview

Sun City is located on 3 400 hectares (ha) of land leased from the National Department of Rural Development and Land Reform (DRDLR), of which 1 558 ha are actively utilized and managed by them. Figure 1-1 illustrates the Project area, divided into three sections. These sections comprise the following activities and developments:

- Area A – Approximately 492 ha of undeveloped land between Sun City and the town of Ledig;
- Area B – the 597 ha of developed land which comprises Sun City; and
- Area C – roughly 469 ha of undeveloped land which is used by Mankwe Gametrackers.

[1] Case ID: 12431. Available at: http://www.sahra.org.za/sahris/cases/sun4642-sun-city-developments

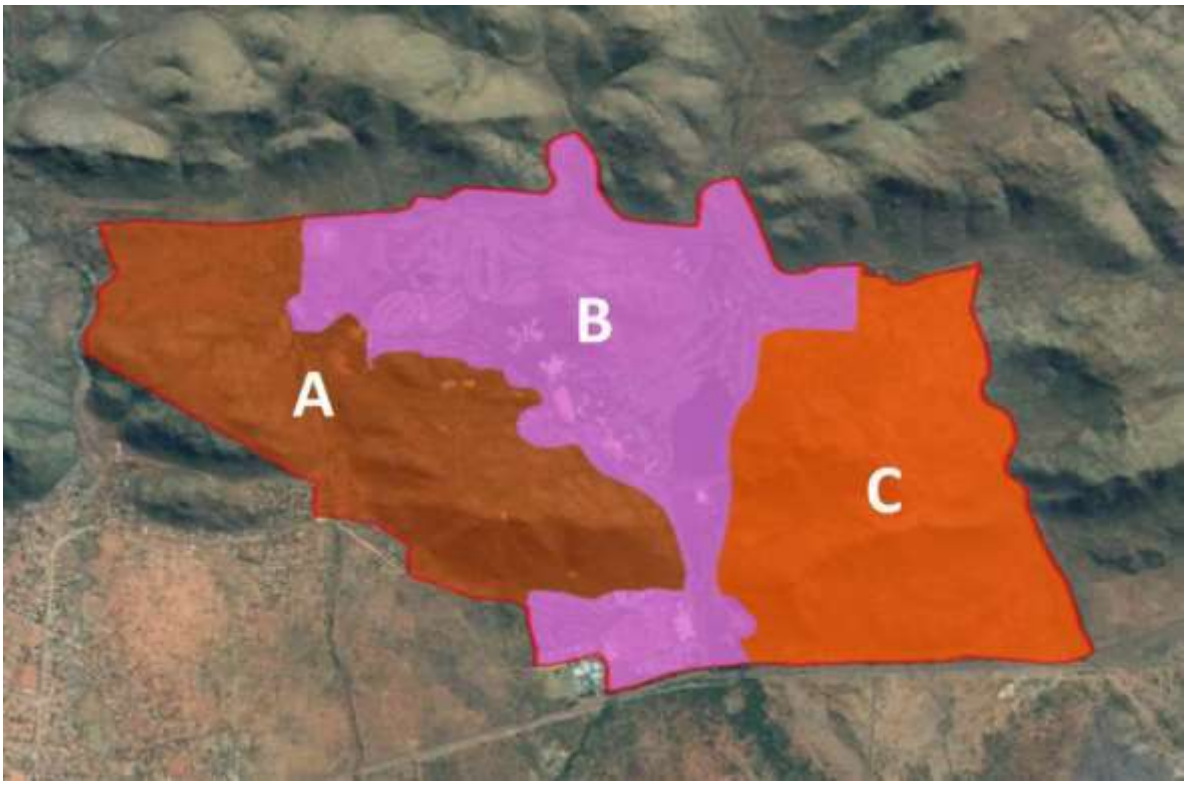

Figure 1-1: Sun City Boundary and Study Area

With the aim of retaining Sun City's status, Sun International identified several projects that are to be undertaken over the next ten to fifteen years that require various authorisations. These include, but are not limited to:

- Resort expansion projects;
- Utilities and services projects; and
- Maintenance projects.

The proposed projects relevant to this HIA are presented in Table 1-1 below and associated Listed Activities in Table 1-2[2]. Plan 3 presents illustrates the location and extent of these projects.

[2] Refer to Section 1.1.1 in the HSR for details regarding all the projects proposed in the Sun City complex as well as the applicable Listed Activities.

Table 1-1: Summary of the Proposed Developments within Sun City relevant to this Assessment

Category	Project Name		Project Description	GPS Points
Resort Expansion Projects	REP 4.2	Vacation Club Phase 4	Construction of a further 15 units and associated infrastructure between the landfill site and the Bakubung Gate.	25°20'18.23"S 27°04'15.69"E
Utilities and Service Projects	USP 2	Additional reservoirs to supplement existing water storage capacity	Construction of either two 10 M/ reservoirs or one 20 M/ reservoir on Telkom Hill next to the existing Upper Reservoir.	25°20'51.96"S 27°05'15.99"E
	USP 3	Effluent transfer line replacement	Establishment of a new effluent transfer line along the Letsasing fence. The existing old asbestos effluent transfer line between Sunset Drive and Hole 2 will be decommissioned but remain in place. The servitude of the pipe will vary between 2 m and 5 m and the pipe will be approximately 3 km long.	25°21'08.51"S 27°06'26.81"E
Maintenance Projects	MP 1	Clearance of fence roads	Establishment of maintenance roads and fire breaks (25 km) at the perimeter fences by clearing vegetation.	N/A (Sun City fence-line)

Table 1-2: Applicable Listed Activities

Notice No	Listing No	Activity No	Activity Description
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 2	The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where— (i) the electricity output is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 11	**Activity 11**: The development of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 12	The development of — (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) **infrastructure or structures with a physical footprint of 100 square metres or more**; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, **within 32 metres of a watercourse**, measured from the edge of a watercourse;

Notice No	Listing No	Activity No	Activity Description
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 14	The development and related operation of facilities or infrastructure for the storage, or for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 31	The decommissioning of existing facilities, structures or infrastructure for— (v) any activity regardless the time the activity was commenced with, where such activity: (a) is similarly listed to an activity [that is currently a listed activity]; and (b) is still in operation or development is still in progress;
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 46	The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure— (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;

Notice No	Listing No	Activity No	Activity Description
GN R 983 (as amended by GN R 327)	Listing Notice 1	Activity 48	The expansion of— (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or (ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more; where such expansion occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;
GN R 984 (as amended by GN R 324)	Listing Notice 2	Activity 15	Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation.
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 2	The Development of reservoirs (excluding dams) with a capacity of more than 250 cubic metres, in North-West in
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 4	The development of a road wider than 4 metres with a reserve less than 13,5 metres, in North-West: i. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 10	The development and related operation of facilities or infrastructure for the storage, or for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 cubic metres or more but not exceeding 80 cubic metres, in North-West, in Critical Biodiversity Areas, sensitive areas or within 100m from the edge of a watercourse or wetland.

Notice No	Listing No	Activity No	Activity Description
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation, in North-West: i. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; ii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or iii. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 16	The expansion of reservoirs excluding dams, where the capacity will be increased by more than 250 cubic metres, in North-West:
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 17	The expansion of a resort, lodge, hotel, tourism or hospitality facilities where the development footprint will be expanded and the expanded facility can accommodate an additional 15 people or more, in North-West: i. World Heritage Sites; core of biosphere reserve; or sites or areas identified in terms of an

Notice No	Listing No	Activity No	Activity Description
			international convention; ii. A protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation; iii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999); iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; v. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or vi. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre, in North-West: i. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve; ii. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland
GN R 985 (as amended by GN R 324)	Listing Notice 3	Activity 6	The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more, in North-West: i. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; ii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or iii. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.

1.1.2 Project Location

Sun City is located in the North West Province, north of Rustenburg. The Project area falls within the Moses Kotane Local Municipality (MKLM) within the Bojanala Platinum District Municipality (BPDM). The R556 borders Sun City in the south and the Pilanesberg borders Sun City to the north and east. The town of Ledig is located immediately south-west of Sun City.

The Project location details[3] are illustrated in Plan 1, which is included in Appendix B.

1.2 Terms of Reference

Sun International appointed Digby Wells as the Environmental Assessment Practitioner (EAP) to complete an independent EIA process in accordance with the national regulatory framework. This included a specialist HRM process to comply with the requirements encapsulated in Section 38 of the NHRA.

1.3 Scope of Work

The Scope of Work (SoW) for the specialist HRM process included the compilation of an HIA report to comply with the requirements of Section 38(8) of the NHRA.

The following activities were completed as part of this SoW:

- Undertaking historical layering to identify potential structures older than 60 years that are protected under Section 34 of the NHRA, or any other tangible heritage resources;
- Identifying of potential impacts to heritage resources relative to Cultural Significance (CS) of identified heritage resources and the sustainable socio-economic benefits that may be derived from the Project;
- Recommending feasible management or mitigation measures to avoid and/or minimise negative impacts and enhance potential benefits; and
- Submitting the HIA report to SAHRA and NWPHRA for Statutory Comment as required under Section 38(8) of the NHRA.

1.4 Expertise of the Specialist

The expertise of the various specialists involved in the compilation of this report is presented in Table 1-3 below. The full CVs of these specialists are included in Appendix A.

[3] Detailed project location information can be found in Section 1.1.2, Table 1-3 within the HSR.

Table 1-3: Expertise of the Specialists

Team Member	Bio Sketch
Shannon Hardwick ASAPA Member: 451 Years' Experience: 1	Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern, and has subsequently been appointed as an Assistant Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience through the compilation of Notification of Intent to Develop (NID) applications as well as HSRs and HIAs. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and researching Artisanal and Small-Scale Mining for input into a Livelihood Restoration Framework (LRF). Shannon's experience in the field includes pre-disturbance surveys in South Africa and fieldwork in Malawi.
Justin du Piesanie ASAPA Member 270 AMAFA Registered ICOMOS Member 14274 IAIAsa Member Years' Experience: 12	Justin is the HRM Manager at Digby Wells. Justin joined the company in August 2011 as an archaeologist and was subsequently made manager in the Social and Heritage Services Department. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. Justin is a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. He has over 12 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, and NHRA Section 34 application processes. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, Cameroon, the Democratic Republic of Congo, Liberia, Mali, Tanzania, and Senegal on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, Justin has acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. Justin's current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.

Team Member	Bio Sketch
Johan Nel The Heritage Foundation ASAPA Member 095 ICOMOS Member 13839 SAMA Member IAIAsa Member Years' Experience: 18	Johan is the Manager of Conservation Services at the Heritage Foundation. Johan has experience in the HRM field spanning the last 17 years, covering various aspects including research projects, archaeological and heritage assessments, social consultation and various mitigation projects. His experience has allowed him to integrate cultural HRM with Environmental Management processed to promote a holistic approach to understanding the value of heritage resources, the various aspects that influence value, and how to best manage the preservation or conservation of these. In his capacity of Manager of Conservation Services at the Heritage Foundation, he is currently focussed on reviewing, drafting and implementing Integrated Management Plans (IMPs) and CMPs for various heritage sites in South Africa. Commensurate to his position, he is also responsible for heritage focussed research and liaison with various government and NGO bodies.

1.5 Structure of the Report

The remainder of the report, with references to the relevant information required in terms of Section 38(3) of the NHRA, is structured as per Table 1-4.

Table 1-4: Structure of the Report

Section	Description	NHRA information requirements
2	Summarises the legislative framework relevant to the HIA.	-
3	Identifies the specific constraints and limitations of the HIA.	-
4	Describes the methodology employed in the compilation of this HIA.	-
5	Provides a summary of the baseline cultural landscape as relevant to this HIA.	38(3)(a)
6	Presents the defined CS of the identified heritage resources and landscape.	38(3)(b)
	Considers the potential impacts to heritage resources by Project-related activities.	38(3)(c)
	Outlines possible risks to heritage resources and heritage-related risks to the Project.	
7	Considers the development context to assess the socio-economic benefits of the Project in relation to the presented impacts and risks.	38(3)(d)
8	Presents the results of consultation	38(3)(e)

Section	Description	NHRA information requirements
9	Details the specific recommendations based on the contents of the HIA.	38(3)(g)
10	Collates the most salient points of the HIA and concludes with the specific outcomes and recommendations of the study.	38(3)(f) 38(3)(g)
11	Lists the source material used in the development of the report.	-

2 Legislative and Policy Framework

Sun International requires various authorisations for the proposed projects to comply with the national regulatory framework. Likewise, the HRM process is governed by the national legislative framework[4]. Applicable legislation to the HRM process includes:

- The National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA);
- The NEMA Regulations, 2017 (Government Notice Regulations [GN R] 982 as amended by GN R 326);
- The National Water Act, 1998 (Act No. 36 of 1998) (NWA); and
- The NHRA.

3 Constraints and Limitations

The following limitation and constraints were experienced in the compilation of this report:

- Whilst every attempt was made to obtain the latest available information, the reviewed literature does not represent an exhaustive list of information sources for the various study areas;
- Whilst every attempt was made to survey the extent of the site-specific study area[5], this report does not present an exhaustive list of identified heritage resources; and
- Palaeontological and archaeological resources commonly occur at subsurface levels. These types of resources may not be adequately recorded or documented by assessors without destructive and intrusive methodologies. Therefore, the reviewed literature, previously-completed assessments and the results of the field survey are in themselves limited to surface observations.

[4] A detailed summary of the relevant legislation and its applicability to the HRM process is presented in Section 2 of the HSR, and not repeated here for the sake of brevity.

[5] The site-specific study area, as defined in Section 4.1 of the HSR, comprises the farm portions of the Project area including a 500 m buffer area.

4 Methodology[6]

4.1 Definition of Heritage Impacts

Potential impacts to heritage resources may manifest differently across geographical areas or diverse communities when one considers the simultaneous affect to the tangible resource and social repercussions associated with the intangible aspects. Furthermore, potential impacts may concurrently influence the CS of heritage resources. This assessment therefore considers three broad categories adapted from Winter & Bauman (2005, p. 36).

Table 4-1: Impact Definition

Category	Description
Direct Impact	Affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
Indirect Impact	Occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its CS that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any direct impact, its significance is affected to the extent that it can ultimately result in the loss of the resource itself.
Cumulative Impact	Result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be: ▪ Additive: the simple sum of all the effects, e.g. the reclamation of a historical TSF will minimise the sense of the historic mining landscape. ▪ Synergistic: effects interact to produce a total effect greater than the sum of the individual effects, e.g. the removal of all historical TSFs will sterilise the historic mining landscape. ▪ Time crowding: frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building could be high. ▪ Neutralizing: where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes from a historic to modern mining landscape could reduce the overall impact on the sense-of-place of the study area. ▪ Space crowding: high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

[6] This section provides the specific methodologies utilised to compile the HIA. Methodologies employed to define study areas and develop the define CS and Field Ratings are described in Sections 4.1 and 4.2 of the HSR. These are not repeated here for the sake of brevity.

4.2 Data Collection

Data collection assists in the development of a cultural heritage baseline profile of the study area under consideration. This HIA was informed by qualitative data, which was primarily obtained though secondary information sources, i.e. desktop literature review[7] and historical layering.

Data for the socio-economic context around the Project area was sourced primarily from Wazimap (2017). This data was used because it realigns the 2011 Census data captured and presented by Statistics South Africa (2011) with new municipal boundaries used in the 2016 Municipal Elections (Open Up, 2017). These constitute resources used in addition to those used in the compilation of the HSR[8] and are cited in Section 11 of this report.

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using Geographic Information Systems (GIS). The rationale behind historical layering is threefold, as it:

- Enables a virtual representation of changes in the land use of a particular area over time;
- Provides relative dates based on the presence or absence of visible features; and
- Identified potential locations where heritage resources may exist within an area.

The historical maps and aerial imagery used in this report are referenced in Table 4-2.

Table 4-2: Historical Imagery Sources

Historical Imagery					
Aerial photographs					
Job no.	**Flight plan**	**Photo no.**	**Map Ref.**	**Area**	**Date**
218	Row 33	218_033_01477	2426 2427 2526 2527	Thabazimbi / Rustenburg	1948
		218_033_01478			
		218_033_01479			
		218_033_01480			
	Row 34	218_034_02179			
250	Row 6	250_006_09912	2527	North of Rustenburg	1961

[7] This section provides the specific methodologies utilised to compile the HIA. Methodologies employed in respect of primary and initial secondary data collection, including the relevant source material, are described in Sections 4.3 and 4.4 of the HSR respectively. These are not repeated here for the sake of brevity.

[8] References used in the compilation of the HSR are listed in Section 4.4 and cited in Section 11 in the document.

The results of the historical imagery are discussed in Section 5.1.

Subsequent to the original fieldwork, Mr du Piesanie and Mr Nel completed detailed mapping of the *Itlholanoga* settlements western extent between 01 and 05 October 2018. The detailed mapping was undertaken using the Trimble R4 GNNS System. Plan 5 presents the results of this mapping exercise[9].

5 Cultural Heritage Baseline Description[10]

This section provides a summary of the cultural heritage baseline description as relevant to the HIA.

The greater study area is underlain by the *Pilanesberg Alkaline Province* and the Quaternary Aged Sands (refer to Plan 2). The former formation is associated with volcanic activity between 1 450 and 1 200 million years ago (mya) and has zero paleontological sensitivity (Verwoerd, 2006; SAHRA, 2013). The latter formation is associated with glacial and interglacial cycles from approximately 2.6 mya and has a moderate palaeontological sensitivity (SAHRA, 2013; Groenewald, 2016).

Digby Wells submitted a Request for Exemption (RfE) from further palaeontological assessment in the HSR, on condition that a Fossil Finds Procedure (FFP)[11] be developed and implemented prior to the commencement of the Project. The palaeontological context is not considered further in this assessment.

The past is broadly divided into three socially-constructed periods: the Stone Age, the Farming Community period and the historical period. Heritage resources representing all three periods are known to occur within the greater study area. Within the site-specific study area, only the Farming Community period is represented. The presented baseline therefore focuses predominantly on the archaeo-historical context as relevant to this assessment.

The archaeo-historical context correlates to the movements of Bantu-speaking agro-pastoralists moving into and within southern Africa and the subsequent contact with European settlers. Broadly classified into three stages[12] to distinguish between widespread events, these comprise:

[9] It is anticipated that this mapping exercise will continue into the Conservation Management Plan (CMP) Phase. The results of further mapping will be included in the CMP.

[10] A detailed cultural heritage baseline is presented in Section 5 of the HSR and not repeated here for the sake of brevity.

[11] Refer to Section 10 of the HSR for a suggested FFP and monitoring programme.

[12] These stages are largely artificial as the associated processes between people and material culture overlap these socially-constructed boundaries.

- The Early Farming Community (EFC) between 200 and 1000 Common Era (CE[13]). This period is not represented in the records with respect to the greater study area and is therefore considered no further;
- The Late Farming Community (LFC), between 1000 and 1840 CE; and
- The subsequent 'historical' period which is broadly considered between 1500 CE and 1840[14].

Settlements and previous occupations are marked through archaeological material culture remains, the most visible of which are ceramics and stonewalling. Ceramics can help construct a relative cultural-historical sequence through time and space, which can aid in recognising ceramic users in the archaeological record (Huffman, 2007). Huffman's model of the geographical distribution of ceramics suggests that facies of the Urewe tradition are the most common within the regional study area. The relevant of these include the *Buispoort, Olifantspoort* and *Uitkomst* facies.

Stonewalling is the most visible and most easily identified indicator of previous occupations. Several types of stonewalling occur within southern Africa (Huffman, 2007). Within the greater study area, Type N and Molokwane are the most relevant stonewalling types.

The archaeological remains are tangible markers of occupation relating to Bantu-speaking groups within the Pilanesberg-Rustenburg area as the producers and consumers of these material cultures. Morton (2008) identified cultural groups within this greater study area between the 17th and 19th centuries relevant to this assessment. These include:

- The Kgatla (*baKgatla* or *Nakgatla baga Kgafela*), a group of Tswana origins;
- The Fokeng (*baFokeng*), a group of Tswana origins;
- The Kwena, a group of Tswana origins comprising:
  - Mogopa Kwena (*baKwena ba Mogopa*); and
  - Matlhaku / Mmatau Kwena (baKwena Modimosana Matlhaku / baKwena Modimosana Mmatau); and
- The Tlokwa, a group whose origins are contested.

Morton (2008) suggests a Tswana origin for the Tlokwa. Archaeological evidence suggests the Tlokwa may be linked to the Hurutshe with a western Sotho-Tswana origin in the

[13] Common Era (CE) refers to the same period as *Anno Domini* ("In the year of our Lord", referred to as AD): i.e. the time after the accepted year of the birth of Jesus Christ and which forms the basis of the Julian and Gregorian calendars. Years before this time are referred to as 'Before Christ' (BC) or, here, BCE (Before Common Era).

[14] In southern Africa, the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented, but is being explored through the 500 year initiative (Swanepoel, et al., 2008).

Rustenburg area. It is further argues that their origins may be Nguni south of the Vaal River (Mason, 1986; Huffman, 2007; Hall, et al., 2008).

Some researchers, including Huffman (2007) and Morton (2008), suggest that the regional study area may be the place of origin for the Sotho-Tswana cultural identity. The earliest oral histories allude to processes of fission amongst ancestral lineages within the Pilanesberg-Rustenburg area (Anderson, 2009). These processes were intrinsically associated with succession disputes and were influences by competition over resources, environmental concerns and increases in the population.

Later, fission gave way to fusion as communities moved into more condensed settlements which included new spatial characteristics and become more elaborate (Huffman, 2007; Anderson, 2009). These settlements also included chiefs, to whom all residents allied themselves. These settlements contributed to an increase in political centralisation.

Since the early 1800s, European travellers, including missionaries, settlers and traders, moving across the Highveld commented on and recorded stonewalled settlements they encountered, in varying levels of detail, which are useful as first-hand accounts, although problematic in their own ways. Many authors remarked on the size and scale of settlements that had been abandoned. Multiple authors associated these settlements with the Sotho-Tswana and the destruction of the settlements with the Ndebele (Anderson, 2009).

During approximately 1817 and 1826, Mzilikazi and his Ndebele migrated from KwaZulu-Natal into the interior during a period of violence and unrest referred to as the Difaqane (Sotho) or Mfecane (Nguni languages) (Anderson, 2009; Landau, 2010). Mzilikazi settled in the Pilanesberg during this migration. Previous occupants of the now-abandoned or destroyed settlements were either subdued and incorporated into the Ndebele, forgoing their original cultural identity, or were scattered across the landscape (Morton, 2008; Anderson, 2009; Landau, 2010).

The large settlements and herds of cattle attracted other invaders, besides Mzilikazi and his Ndebele. The first Boer settlers arrived in the Pilanesberg-Rustenburg region in the 1840s, using the location as a base for their expansion further into the Transvaal. This resulted in knock-on migrations, as some people left the area in response to the Boer presence, while others returned to the area (Morton, 2008). The European and Boer influx and subsequent settlement resulted in the development of towns, marked by the historical built environment.

Digby Wells identified fifteen heritage resources within the site-specific study area through the review of available literature and the pre-disturbance survey. These resources are primarily associated with the LFC, as represented by the stonewalled settlement complexes recorded within the site-specific study area. A preliminary visual assessment of the stonewalled complexes suggests they may be Molokwane settlements. This requires confirmation through detailed mapping of the sites.

The site Wits/2527 AC1 has been attributed to a capital site named *Itlholanoga* by several authors. The site has been subjected to limited excavations (Mason, 1986) and mapping activities (Huffman, 2007; Du Piesanie & Nel, 2016). The excavation completed by Mason

(1986) resulted in the recovery of ceramics from the *Uitkomst* and *Buispoort* facies. Based on the results of his mapping, Huffman (2007) suggested that the settlement included both Molokwane and Type N walling. The detailed mapping exercise completed during this assessment demonstrates the western extent of the *Itlholanoga* settlement comprises two stone walling types (Refer to Plan 5).

Huffman (2007) has argued that the archaeological evidence represents two occupations at the site: an original Tlokwa occupation followed by second, baKgatla occupation. This interpretation notwithstanding, *Itlholanoga* is generally associated with the Tlokwa in the literature (Morton, 2008; Anderson, 2009). Further research is necessary to draw meaningful conclusions regarding the occupation of *Itlholanoga* and any connections with the baKgatla, baFokeng and baKgafela. Such research currently falls outside the scope of this assessment.

5.1 Results from the Historical Imagery[15]

As presented in Section 4.2, historical imagery from two years was compared for the site-specific study area. No tangible heritage resources were visible on either of this imagery. The identified stonewalling was not visible on the imagery from either year, which may suggest that the vegetation was extremely dense during the time that the aerial photography was taken.

During 1948, the site-specific study area included a large faming component. Some farm buildings were visible on the 1948 imagery, but these had disappeared by 1961, as they are not on this imagery. Additional fields and farm buildings are visible on the 1961 imagery. These features are now included in the town of Ledig.

6 Impact Assessment

6.1 Cultural Significance of the Identified Landscape

Table 6-1 presents a summary[16] of the CS of the identified heritage resources as well as the mitigation measures as per the SAHRA Minimum Standards (2007).

[15] The results of the pre-disturbance survey are presented in Section 5.3.3 of the HSR. Plan 4 illustrates the heritage resources identified during the pre-disturbance survey.

[16] The CS of the identified heritage resources within the site-specific study area was discussed in Section 6.1 of the HSR. It is not repeated here for the sake of brevity.

Table 6-1: Summary of the CS Assessment of the Identified Heritage Resources

Resource ID	Description	Designation (Recommended Field Rating)	Recommended Mitigation based on SAHRA Minimum Standards (2007)
Itlholanoga	Wits/252 AC 1	Very High (Grade II[17])	Project design must change to avoid all change to resource; Conserved in entirety, Conservation Management Plan (CMP). The CMP should be completed in support of a Grade II Site Nomination
STW-002	Wits/2527AC 2 and Wits/2527AC 10	Medium (Grade III A)	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. Shovel Test Pits (STPs).
STW-003	Wits/2527AC 8		
STW-004	Wits/252 AC 13	Medium (Grade III B)	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
STW-005	Wits/252 AC 11	Low (General Protection IV A)	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
STW-001	1193/Site 1 to 1193/Site 4; 2372/Site 1 to 2372/Site 4; and LFC 1 and LFC 2	Negligible (General Protection IV C)	Sufficiently recorded, no mitigation required
STW-006	Wits/252 AC 9		
STW-007	Wits/252 AC 12		
STW-008	Wits/252 AC 14		
STW-009	Wits/252 AC 21		

6.2 Heritage Impact Assessment

The assessment of potential impacts to heritage resources considers the aforementioned activities associated with the Project, namely the construction of proposed infrastructure and the operation and maintenance of proposed developments described in Section 1.1.1. Table

[17] Notwithstanding that the NWPHRA has not been assessed competent to manage NHRA Section 35 heritage resources, *Itlholanoga* should be considered as an important provincial heritage resource; the Grade II Field Rating therefore aims to highlight the importance of these resources and the required management thereof.

6-2 presents the heritage resources that are at risk of negative impacts from Project-related activities.

Table 6-2: Sources of Risk to Identified Heritage Resources

Heritage Resource	Sources of risk
Itlholanoga	USP 2 (construction of reservoir).
STW-001	Project REP4.2 (Vacation Club Phase 4)
STW-002	Projects USP 3 (the establishment of a replacement effluent transfer pipeline) and MP1 (clearance of fence roads).
STW-003	No developments planned within the vicinity of this resource (Development Area C).
STW-004	No developments planned within the vicinity of this resource (Development Area C).
STW-005	No developments planned within the vicinity of this resource (Development Area C).
STW-006	Project USP 3 (the establishment of a replacement effluent transfer pipeline) and potentially MP1 (clearance of fence roads).
STW-007	No developments planned within the vicinity of this resource (Development Area C).
STW-008	No developments planned within the vicinity of this resource (Development Area C).
STW-009	No developments planned within the vicinity of this resource (Development Area A).

There are no direct impacts from Project-related activities foreseen to STW-003, STW-004, STW-005, STW-007, STW-008 and STW-009. These heritage resources will therefore not be considered in the present impact assessment. Furthermore, the SAHRA Minimum Standards recommend that the inclusion of heritage resources with negligible CS into an HIA report is sufficient in terms of recording these resources with no further mitigation required. To this effect, STW-001 and STW-006 will not be considered further.

The risks and potential impacts to *Itlholanoga* and STW-002 are discussed separately below.

6.2.1 Itlholanoga

The stonewalling attributed to the capital site *Itlholanoga* is a site with very high CS, as it represents an important feature on the landscape in the past and in the histories of peoples within the greater study area. *Itlholanoga* has previously been damaged through the construction of the reservoir that exists next to the site.

Itlholanoga is now at risk of further damage from the proposed construction of one 20 ML or two 10 ML reservoirs within the previously-disturbed area of the site. The footprint of the new reservoir/s lies approximately 10 m from *Itlholanoga* at the closest point. Figure 6-1 illustrates the distance between *Itlholanoga* and the proposed footprint for USP2. The extent of the site *Itlholanoga* is illustrated in three blue polygons. The proposed footprint for USP2 is indicated in yellow. Two other projects, REP7 (pink filled polygon) and MP1 (indicated by the blue/red dotted line) are planned near to the site; however, they are not expected to present a risk of negative impact to the site, based on the project description.

Table 6-3 below presents a summary of the potential impact to this resource. Plan 5 presents *Itlholanoga* in more detail.

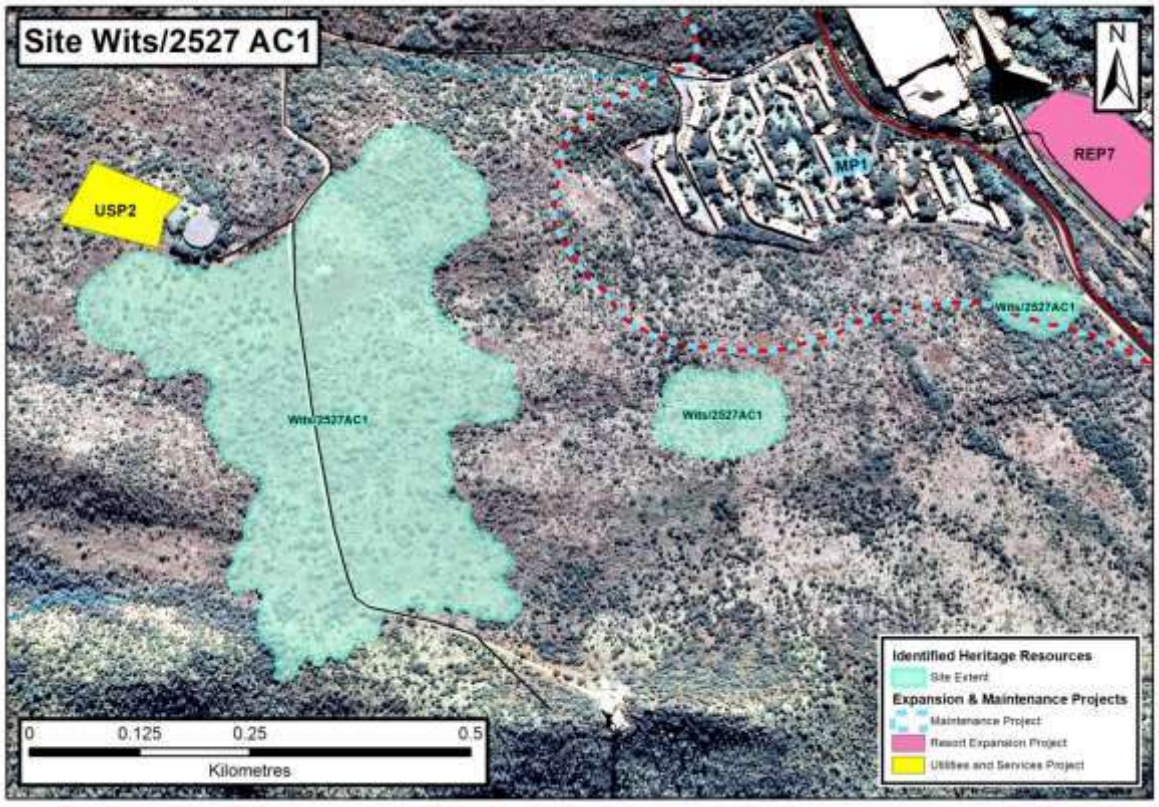

Figure 6-1: Itlholanoga in Relation to the Proposed Project USP2

Table 6-3: Summary of the Potential Direct Impact to Itlholanoga

IMPACT DESCRIPTION: Damage to *Itlholanoga*				
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Unmitigated change will result in the permanent damage to the	Consequence: Extremely	Significance: Major –

IMPACT DESCRIPTION: Damage to *Itlholanoga*				
Dimension	**Rating**	**Motivation**		
		heritage resource.	detrimental (-19)	negative (-114)
Extent	International (7)	The associated living community groups affiliated with the site residing within South Africa and abroad will be affected by the loss of components of traditional homesteads that are degrading the CS of the site and landscape. Damage to this resource could potentially have an international effect in terms of the scientific community who are conducting research on the stonewalled settlements of the Rustenburg-Pilanesberg area. Sun International's reputation may further be effected, which may affect patronage from national and international tourists and businesses.		
Intensity x type of impact	High - negative (-5)	Damage would constitute a negative minor change to a resources with a very high CS.		
Probability	Highly probable (6)	Without the implementation of mitigation or management measures, it is highly probable that the heritage resource will be damaged by the construction of the proposed reservoir.		
MITIGATION:				
The Project design must be altered to avoid, or at the very least limit the potential negative impact to this resource during construction. Sun International will be required to apply for a Section 35 Permit prior to construction to obtain authorisation for any partial destruction of the site. No work on the reservoir is permitted without a Section 35 Permit. Sun International must enlist the services of a qualified archaeologist to complete detailed mapping of the site prior to any construction activities, and undertake a Watching Brief during earth moving activities associated with the construction phase. Sun International must develop and implement an CMP as a condition of authorisation and for approval by SAHRA and NWPHRA, which considers this heritage resource in its entirety and includes *inter alia*: ▪ Descriptions of the site within the context of the greater cultural landscape; ▪ Defines the CS of the site in accordance with criteria encapsulated in the NHRA;			

IMPACT DESCRIPTION: Damage to *Itlholanoga*				
Dimension	**Rating**	**Motivation**		
▪ Outlines the objectives, targets and strategies for the continued maintenance of the CS; ▪ Details the ownership and management structures, responsibilities matrices and monitoring procedures; ▪ Defines the regulatory requirements as detailed in the NHRA Regulations (GNR 548); and ▪ Defines reporting requirements.				
POST-MITIGATION				
Duration	Beyond project life (6)	The effects of the impact will reduce after the Project life and the reservoirs are decommissioned and removed, and the site can be rehabilitated. Any further damage to the site during rehabilitation activities must be avoided.	Consequence: Moderately beneficial (14)	Significance: Moderate - positive (84)
Extent	Limited (2)	Mitigation measures will reduce the extent of the impacts to limited components of the site.		
Intensity x type of impact	Very high - positive (6)	The conservation of this resource through the implementation on an appropriate CMP will be considered a positive moderate change to a resource of very high CS.		
Probability	Certain (7)	Should an appropriate CMP be implemented and the site be managed appropriately, it is certain the site and its CS will be conserved.		

6.2.2 STW-002

STW-002 is a stonewalled settlement with a low CS and has strong affiliations to multiple cultural groups and their histories in the region. Project USP3, the construction of an effluent transfer pipeline, presents a risk to this resource. The clearing of fence roads, project MP1, may also impact this resource as the stonewalling occurs on both sides of the fence. A road currently runs through the site. Figure 6-2 presents site STW-002 in relation to projects USP3 and MP1. The extent of STW-002 (which includes Wits/2527 AC 2 and Wits/2527 AC 10) is illustrated in purple in the image. MP1 is indicated by the blue/red dotted line and USP3 is shown in yellow. Both these projects run through the site extent.

Table 6-4 below presents a summary of the impact assessment.

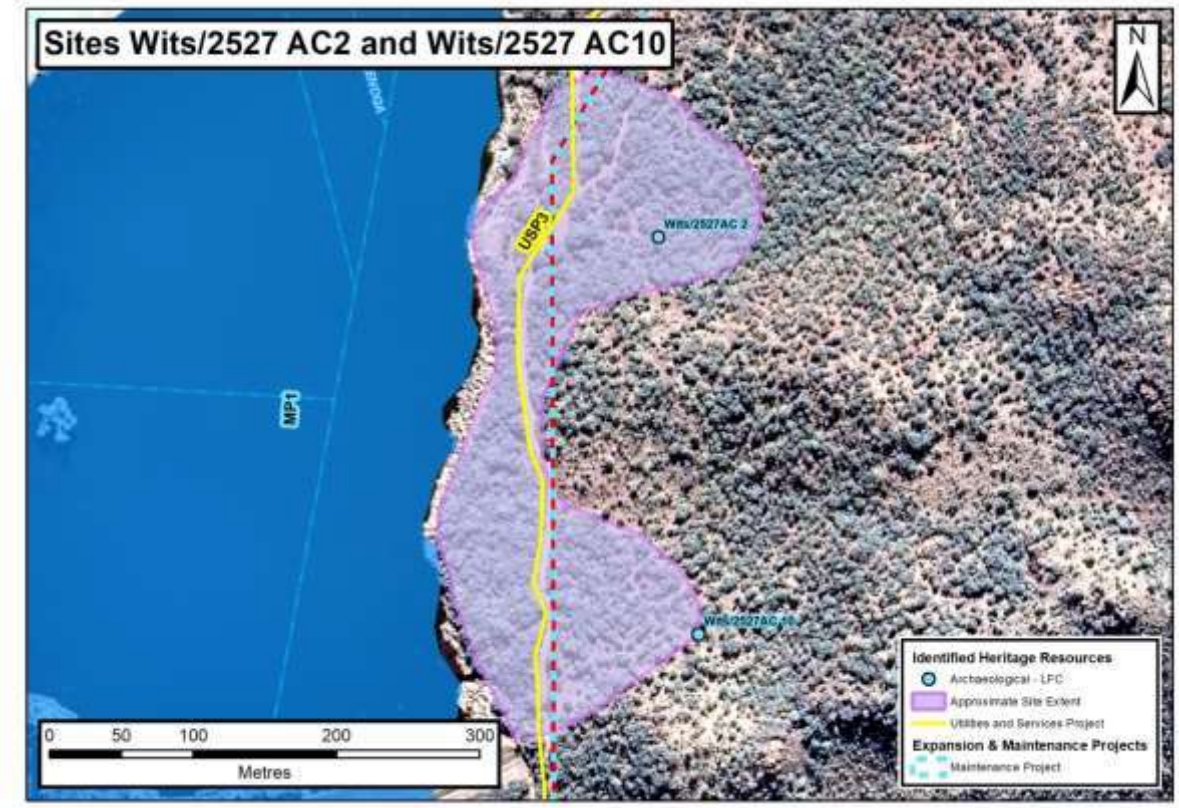

Figure 6-2: STW-002 in relation to the Proposed Projects USP3 and MP1

Table 6-4: Summary of the Potential Direct Impact to STW-002

IMPACT DESCRIPTION: Damage to or destruction of STW-002				
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Unmitigated change will result in the permanent damage to the heritage resource.	Consequence: Highly detrimental (-17)	Significance: Moderate – negative (-85)
Extent	International (7)	The associated living community groups affiliated with the site residing within South Africa and abroad will be affected by the loss of components of traditional homesteads that are degrading the CS of the site and landscape. Damage to this resource could potentially have an international effect in terms of the scientific		

IMPACT DESCRIPTION: Damage to or destruction of STW-002				
Dimension	**Rating**	**Motivation**		
		community who are conducting research on the stonewalled settlements of the Rustenburg-Pilanesberg area. Sun International's reputation may further be effected, which may affect patronage from national and international tourists and businesses.		
Intensity x type of impact	Moderate-negative (-3)	Damage would be considered a major change to a heritage resource of medium CS.		
Probability	Likely (5)	Without the implementation of mitigation or management strategies, it is likely that the heritage resource will be damaged through the construction of the proposed transfer pipeline.		
MITIGATION:				
The Project design must be amended to avoid, or at the very least limit the potential negative impact to the heritage resource. This can be achieved through routing the pipeline within the existing road. Sun International will be required to apply for a Section 35 Permit prior to construction to obtain authorisation for any partial destruction of the site. No work on the pipeline is permitted without a Section 35 Permit. Sun International must enlist the services of a qualified archaeologist to complete detailed mapping of the site prior to any construction activities, and undertake a Watching Brief during earth moving activities associated with the construction phase. This heritage resource must be included in the aforementioned CMP.				
POST-MITIGATION				
Duration	Beyond Project life (6)	The effects of the impact will reduce after the Project life and the pipeline is decommissioned and removed, and the site can be rehabilitated.	Consequence: Moderately beneficial (11)	Significance: Negligible - positive (33)
Extent	Limited (2)	Mitigation measures will reduce the extent of the impacts to limited components of the site.		
Intensity x type of impact	Moderate – positive (3)	The conservation of this resource through the implementation on an appropriate CMP will be considered a positive moderate		

IMPACT DESCRIPTION: Damage to or destruction of STW-002				
Dimension	**Rating**	**Motivation**		
		change to a resource of medium CS.		
Probability	Unlikely (3)	The implementation of the recommended mitigation measures will reduce the likelihood of the unmitigated impacts from manifesting		

6.3 Cumulative Impacts on the Cultural Landscape

Cumulative impacts occur from in-combination effects of various impacts on heritage resources acting within a host of processes that result in an incremental effect. The importance of identifying and assessing cumulative impacts is that the whole is often greater than the sum of its parts. This implies that the total effect of multiple stressors or change processors acting simultaneously on a system may be greater than the sum of their effects when acting in isolation.

As described above, *Itlholanoga* has already been disturbed through developments close to the site. The existing disturbance includes the concrete road which runs through the site and the existing reservoir which removed a portion of the site.

In addition to the second reservoir included in this assessment, Sun International plans to develop a chair-lift and a pipeline in close proximity to *Itlholanoga*. The chair lift will include ablution facilities on top of the mountain which will provide for 200 guests and a maximum of 400. This additional infrastructure is subject to a separate Basic Assessment (BA) process.

Individually, these developments do not constitute a major impact on *Itlholanoga*. Considered in combination, however, these projects will be encroaching on the site and present a risk to the integrity of site as a whole.

This Project, in conjunction with other planned developments, including mining operations and developments in line with strategic development plans for the North West Province, requires consideration to identify the possible in-combination effects of various impacts to known heritage resources.

Table 6-5 presents the possible cumulative impacts relevant to the Project.

Table 6-5: Summary of Potential Cumulative Impacts

Type	Cumulative Impact	Direction of Change	Extent of Impact
Additive	The continued developments, i.e. resort expansion projects, utilities and services projects and maintenance projects within the Sun City Complex, will affect the integrity of the heritage resources identified within the site-specific study area.	Negative	Site-specific

Type	Cumulative Impact	Direction of Change	Extent of Impact
Additive synergistic	Remaining *in situ* archaeological heritage resources within the site-specific and local study area will increase in significance regardless of their integrity as more tangible heritage resources are removed from the landscape.	Negative	Local
Space-crowding	The increase in the density of developments within the region will alter the sense-of-place and integrity of *in situ* heritage resources that may result in degradation, or in an extreme case, sterilisation of the cultural landscape.	Negative	Regional

6.4 Risks and Unplanned Events

Risk is defined as the potential consequence(s) of an interaction combined with its likelihood. Should a risk eventuate, it will manifest as an impact. This section considers the potential risks to protected heritage resources as well as the potential heritage-related risks that could arise *for* Sun International in terms of the implementation of the Project. These two aspects are discussed separately.

The construction and implementation of the projects detailed in Table 1-1 present the risk of direct impacts to the heritage resources identified within the site-specific study area. The identified risks to known heritage resources include damage and/or destruction. A summary of the potential risk to protected heritage resources is presented in Table 6-6.

Table 6-6: Potential Risk to Heritage Resources

Phase	Activity	Risk	Potential Impact
Construction	Construction of infrastructure associated with Project activities described in Section 1.1.1	Damage to and/or destruction of the identified and previously unidentified heritage resources.	Disturbance to and/or destruction of NHRA Section 35 resources (i.e. archaeological resources), which will reduce the inherent CS of the site and the greater cultural landscape.
Operation	Operation and maintenance of proposed developments	Damage to the identified and previously unidentified heritage resources.	Damage to NHRA Section 35 resources (i.e. archaeological resources) that will reduce the inherent CS of the site and greater cultural landscape.

Where Sun International knowingly does not take proactive management measures and the identified risks as per Table 6-6 manifest, possible risks for Sun International may include:

- Litigation in respect of Section 51 of the NHRA;
- Social repercussions; and
- Reputational risk.

The primary risks that may arise for Sun International are outlined in Table 6-7 below.

Table 6-7: Identified Heritage Risks that may arise for Sun International

Description	Primary Risk
Heritage resources with a high CS rating are inherently sensitive to any development in so far as the continued survival of the resource may be threatened. Additionally, certain heritage resources may be formally protected, thereby restricting various development activities. Within the site-specific study area, these include nine LFC stonewalling sites (protected by Section 35 of the NHRA).	Negative Record of Decision (RoD) and/or development restrictions issued by SAHRA and/or NWPHRA in terms of Section 38(8)
Impacting on heritage resources formally and generally protected by the NHRA without following due process. Due process may include social consultations and/or permit application processes to SAHRA and NWPHRA.	▪ Fines; ▪ Penalties; ▪ Seizure of Equipment; ▪ Compulsory Repair or Cease Work Orders; and/or ▪ Imprisonment.

The specific heritage resources at risk have been presented in Table 6-2 above.

7 Identified Heritage Impacts versus Socio-Economic Benefit

The site-specific study area is physically located within Ward 14 of MKLM within BPDM in the North West Province. The town of Ledig borders the Sun City boundary towards the south-west. This section presents a summary of the relevant information included in the Integrated Development Plans (IDPs) for BPDM and MKLM. Data from Statistics South Africa (2011) and Wazimap (2017) is included here (as discussed in Section 4.2).

BPDM is the largest district municipality in the North West Province, including almost half of the province's population (Statistics South Africa, 2011; Wazimap, 2017). MKLM is the third largest local municipality (in terms of population) within BPDM of five local municipalities.

Unemployment is a notable challenge faced by BPDM and MKLM (BPDM, 2012; MKLM, 2016). Table 7-1 and Figure 7-1 below present the employment statistics for both municipalities. Not applicable refers to the population that is under the age of 15. The unemployment rate for BPDM quoted in Table 7-1 is a value estimated for the year 2010 (BPDM, 2012, p. 12). This figure is lower than previous years, following a general downward trend which was influenced by the 2009 Confederations Cup and the 2010 FIFA World Cup.

An upswing in mining expansions and activities after the 2008/2009 recession also contributed to the lower rate of unemployment.

Table 7-1: Summary of Employment Statistics for BPDM and MKLM

Population (2011)	BPDM		MKLM	
Total Population	1 507 506	-	242 554	-
Working Age (15-64)	958 451	63.58 %	139 469	57.50 %
Employed	436 692	45.56 %	46 416	33.28 %
Reported Unemployment Rate	-	14.6 %	-	37.9 %

(Adapted from Statistics South Africa 2011 and Wazimap 2017)

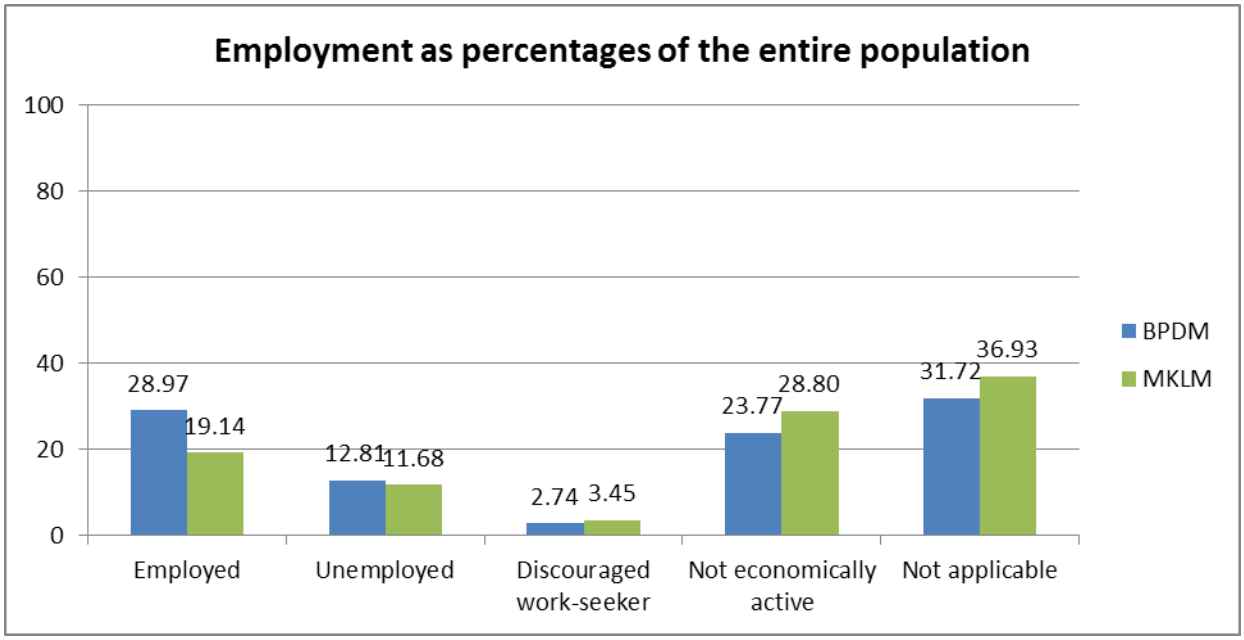

Figure 7-1: Employment Statistics for BPDM and MKLM as Percentages

(Adapted from Wazimap 2017)

Mining is the most significant contributor to the economy of BPDM, followed by community services and trade (BPDM, 2012). In MKLM, the significant sectors are trade, community services and mining respectively. Tourism is not considered an industry in either IDP document, although tourism is considered a potentially significant development opportunity to be utilised in the near future in both BPDM and MKLM (BPDM, 2012; MKLM, 2016).

MKLM in particular considers its location close to the Gauteng Province as a strength upon which to increase tourism (MKLM, 2016). Beyond Sun City, the Pilanesberg National Park and a 'heritage walk' are considered potential tourism assets. Between 2006 and 2010, tourism in BPDM generally experienced steady growth, averaging 20% per year between this period (BPDM, 2012). This was attributed to the afore-mentioned 2009 Confederate Cup and 2010 FIFA World Cup. The majority of tourists enter BPDM to visit family and friends, followed by leisure, business and 'other' (including medical tourism and religious tourism)

respectively. The relatively small portion of leisure tourism has been attributed to a lack of marketing (in terms of existing attractions) and insufficient utilisation of present opportunities, including existing travel hubs (such as the Pilanesberg Airport) and proximity to large markets, including Gauteng.

The various projects described in Section 1.1.1 would contribute to new and continued employment and tourism within BPDM and MKLM. The Resort Expansion projects would contribute to employment in the short term and long-term: construction activities will require short-term labour as the expansion projects are implemented and completed and more permanent staff would be required as these projects become operational. These projects would be able to accommodate more tourists, contributing more to the tourism industry. The maintenance and utilities projects will similarly provide short-term employment opportunities through the construction and implementation of the projects. Long-term employment opportunities will be limited, as these projects are unlikely to require staff once operational. The proposed generator park and WWTW may potentially provide long-term employment.

Based on the review of the applicable planning documents and the motivation above, the potential socio-economic benefits that may result from the Project and the intended resort expansion, services and utilities and maintenance projects outweigh the identified impacts and risks to known heritage resources within the site-specific study area, provided the recommended mitigations are implemented. This statement is supported by the following:

- The affected heritage resources can be maintained *in situ*;
- Identified impacts and risks can be managed through the proposed recommendations;
- The Sun City Resort contributes to the economic development of BPDM and MKLM and these projects will aid the Sun City Resort in increasing its contribution; and
- The aforementioned projects will provide short-term and long-term employment opportunities within MKLM and BPDM.

8 Consultation

Site surveys can often present an opportunity for informal consultation with specific stakeholders, usually farm owners, managers and employees. In this instance, employees of Sun International may include residents of local communities, notably Ledig.

Consultation of this kind can result in the identification of burial grounds and graves. Importantly, these could include formal burial grounds or graves, sometimes with no visible surface markers. Sacred sites and other places of importance can also be identified through consultation, which may otherwise not be identified. No informal consultation was undertaken during this study.

Formal consultation undertaken during the regulated Stakeholder Engagement Process (SEP) affords Interested and Affected Parties (I&APs) opportunities to engage in the EIA process. The objectives of the SEP include:

- To ensure that I&APs are informed about the Project;
- To provide I&APs with an opportunity to engage and provide comment on the Project;
- To draw on local knowledge by identifying environmental and social concerns associated with the Project;
- To involve I&APs in identifying methods in which concerns can be addressed;
- To verify that stakeholder comments have been accurately recorded; and
- To comply with legal requirements.

This report was undertaken prior to the commencement of the regulated SEP. Any heritage-specific comments received during the SEP will be considered in the Comments and Response Report and submitted to SAHRA and NWPHRA via SAHRIS.

9 Recommendations

The site-specific study area is underlain predominantly by the *Pilanesberg Alkaline Province* which is interlinked with the Quaternary Aged Sands. Based on Digby Wells' understanding of the Project, no impact to the palaeontologically-sensitive layers are foreseen and no further action is required. An RfE from further palaeontological assessment was included in the HSR submitted to SAHRA and NWPHRA.

The proposed projects present risks of damage or destruction to two heritage resources of very-high and low CS. To mitigate against the identified impacts, Digby Wells has made the following recommendations:

- The Project design must be altered to avoid, or at the very least limit, the identified potential direct negative impacts to the heritage resources *Itlholanoga* and STW-002. In terms of the pipeline proposed near STW-002, this can be achieved by routing the pipeline within the existing road;
- Sun International must enlist the services of a qualified archaeologist to undertake detailed mapping of the affected sites prior to the commencement of construction activities. The archaeologist must undertake a Watching Brief during earth-moving activities associated with the construction phase;
- No work on the developments proposed near the site *Itlholanoga* and/or STW-002 (i.e. the reservoirs and/or the pipeline) may be undertaken without a permit issued in respect of Section 35 of the NHRA and Chapters II and IV of the NHRA Regulations, 2000 (GN R 548), authorising the partial destruction of destruction of the archaeological site;
- Sun International must develop and implement a CMP as a condition of authorisation and for approval by SAHRA and NWPHRA. The CMP must include *Itlholanoga* and STW-002 and must consider these resources in their entirety. These sites may

present opportunities as tourist attractions, provided the correct management, which should be explored in the CMP.

The CMP will be compiled during the next step of the HRM process Digby Wells was appointed to undertake. The CMP will include, *inter alia:*

- Descriptions of the sites within the context of the greater cultural landscape;
- Definitions of the CS of the sites in accordance with criteria encapsulated in the NHRA;
- The objectives, targets and strategies for the continued maintenance of the CS;
- Details of the ownership and management structures as well as responsibilities matrices and monitoring procedures;
- Definitions of the regulatory requirements as outlined in the NHRA Regulations (GN R 548); and
- An outline of the reporting requirements.

The CMP will be informed by the CS of the identified heritage resources[18] and the assessment of the impacts presented in this HIA report.

10 Conclusions

The aim of the HRM process was to comply with the regulatory requirements contained within Section 38 of the NHRA through the following:

- Defining the cultural landscape within which the Project is situated;
- Identify, as far as is feasible, heritage resources that may be impacted upon by the Project and the CS of those resources;
- Assess the possible impacts to the identified heritage resources;
- Consider the socio-economic benefits of the Project; and
- Provide feasible mitigation and management measures to avoid, remove or reduce perceived impacts and risks.

These objectives were met as presented in Sections 5 to 9 above. Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project where the provided recommendations are adopted. As per the recommendations presented above, Digby Wells will compile a CMP, informed by this report and through input from Sun International, as the next step in the HRM process.

[18] As presented in Section 6 of the HSR.

11 Works Cited

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Appendix A: Specialist CV

DIGBY WELLS
ENVIRONMENTAL

Miss Shannon Hardwick

Assistant Heritage Resources Management Consultant

Social and Heritage Services Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	MSc (Archaeology)	University of the Witwatersrand
2010	BSc (Honours) (Archaeology)	University of the Witwatersrand
2009	BSc	University of the Witwatersrand
2006	Matric	Rand Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Basic	Basic

3 Employment

Period	Company	Title/position
2018 to present	Digby Wells Environmental	Assistant Heritage Resources Management Consultant
2017-2018	Digby Wells Environmental	Intern: Heritage Resources Management
2016-2017	Tarsus Academy	Facilitator
2011-2016	University of the Witwatersrand	Teaching Assistant
2011	University of the Witwatersrand	Collections Assistant

4 Experience

Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern, and has subsequently been appointed as an Assistant Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience through the compilation of Notification of Intent to Develop (NID) applications as well as Heritage Basic Assessment Reports (HBARs), Heritage Scoping Reports (HSRs) and Heritage Impact Assessment (HIA) reports. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and researching Artisanal and Small-Scale Mining for input into a Livelihood Restoration Framework (LRF). Shannon's experience in the field includes pre-disturbance surveys in South Africa and fieldwork in Malawi.

5 Project Experience

My project experience is listed in the table below:

Project Title	Project Location	Date:	Description of the Project	Name of Client
Kilbarchan Colliery Environmental Authorisations and Closure Study	Newcastle, KwaZulu-Natal, South Africa	Ongoing	Heritage Impact Assessment	Eskom Holdings SOC Limited

Project Title	Project Location	Date:	Description of the Project	Name of Client
Belfast Implementation Project	Mpumalanga Province, South Africa	Ongoing	Section 34 Permit Application	Exxaro Coal Mpumalanga (Pty) Ltd
The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project	Northern Cape Province, South Africa	Ongoing	Heritage Impact Assessment and Conservation Management Plan	The South African Radio Astronomy Observatory (SARAO)
Heritage Resources Management Process for the Exxaro Matla Mine	Mpumalanga Province, South Africa	January 2018	Heritage Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd
Newcastle Landfill Project	Newcastle, KwaZulu-Natal, South Africa	March 2018	Heritage Impact Assessment	GCS Water and Environmental Consultants
Tharisa Apollo (UG1) Plant	Marikana, North-West Province, South Africa	Ongoing	Heritage Impact Assessment	GCS Water and Environmental Consultants
National Heritage Resources Act, 1999 (Act No. 25 of 1999) Section 34 Permit Application Process for the Davin and Queens Court Buildings on Erf 173 and 174, West Germiston, Gauteng Province	Johannesburg, Gauteng, South Africa	April 2018	Section 34 Permit Application	IDC Architects
Environmental Impact Assessment for the proposed Future Developments within the Sun City Resort Complex	North West Province, South Africa	Ongoing	Heritage Impact Assessment	Sun International (Pty) Ltd
Basic Assessment and Environmental Management Plan for the Proposed pipeline from the Mbali Colliery to the Tweefontein Water Reclamation Plant, Mpumalanga Province	Mpumalanga Province, South Africa	January 2018	Heritage Basic Assessment Report	HCI Coal (Pty) Ltd (Mbali Colliery)

Project Title	Project Location	Date:	Description of the Project	Name of Client
Environmental Fatal Flaw Analysis for the Mabula Filling Station	Waterberg, Limpopo Province, South Africa	November 2017	Fatal Flaw Analysis	Mr van den Bergh
Zuurfontein NID	Ekurhuleni, Johannesburg, South Africa	July 2017	Notification of Intent to Develop	Shuma Africa Projects
Liwonde Additional Studies	Liwonde, Southern Region, Malawi	Ongoing	Resettlement Action Plan, Community Health, Safety and Security Management Plan	Mota-Engil Africa
National Heritage Resources Act, 1999 (Act No. 25 of 1999) Section 35 Archaeological Investigations, Lanxess Chrome Mine, North-West Province	Rustenburg, North West Province, South Africa	July 2017	Phase 2 Mitigation Assessment	Lanxess Chrome Mines (Pty) Ltd
Environmental and Social Input for the Pre-Feasibility Study	Bougouni, southern Mali	July 2017	Pre-Feasibility Study	Birimium Gold

6 Professional Registrations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA)	451

7 Publications

Esterhuysen, A.B. & Hardwick, S.K. 2017. Plant remains recovered from the 1854 siege of the Kekana Ndebele, Historic Cave, Makapan Valley, South Africa. *Journal of Ethnobiology* 37(1): 97-119.

DIGBY WELLS
ENVIRONMENTAL

Mr. Justin du Piesanie

Manager: Heritage Resources Management

Social and Heritage Services Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2015	Continued Professional Development, Intermediate Project Management Course	PM.Ideas: A division of the Mindset Group
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

Period	Company	Title/position
2016 to present	Digby Wells Environmental	Unit Manager: Heritage Resources Management
2011-2016	Digby Wells Environmental	Heritage Management Consultant: Archaeologist
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

4 Experience

I joined the company in August 2011 as an archaeologist and was subsequently made unit manager in the Social and Heritage Services Department in 2016. I obtained my Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. I further attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. I am a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. I am also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. I have over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, and NHRA Section 34 application processes. I gained further generalist experience since my appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, I have acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. My current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.

5 Project Experience

Please see the following table for relevant project experience:

Project Title	Project Location	Date:		Description of the Project	Name of Client
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005	2006	Archaeological surveys	ARM
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006	2006	Phase 2 Mapping	Sun International
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007	2007	Archaeological survey	ARM
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008	2008	Heritage Basic Assessment	ARM
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008	2008	Heritage Impact Assessment	Rhino Mines
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008	2008	Archaeological surveys	Cronimet
Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008	2008	Heritage Statement	Eskom
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009	2009	Phase 2 Excavations	Heritage Contracts Unit
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009	2009	Phase 2 Mapping	University of the Witwatersrand
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010	2010	Heritage survey	Umlando Consultants
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010	2010	Archaeological Impact Assessment	ARM
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010	2010	Phase 2 Excavations	Heritage Contracts Unit
De Brochen and Booysendal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010	2010	Phase 2 Mapping	Heritage Contracts Unit
Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010	2010	Heritage Statement	Strategic Environmental Focus
Batlhako Mine Expansion	North-West Province, South Africa	2010	2010	Phase 2 Mapping	Heritage Contracts Unit
Kibali Gold Project Grave Relocation Plan	Orientale Province, Democratic Republic of Congo	2011	2013	Grave Relocation	Randgold Resources Limited

Project Title	Project Location	Date:		Description of the Project	Name of Client
Kibali Gold Hydro-Power Project	Orientale Province, Democratic Republic of Congo	2012	2014	Heritage Impact Assessment	Randgold Resources Limited
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012	2012	Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012	2012	Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012	2012	Burial Grounds and Graves Survey	Platreef Resources
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012	2012	Phase 2 Excavations	Resources Generation
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012	2012	Watching Brief	Bokoni Platinum Mine
SEGA Gold Mining Project	Burkina Faso	2012	2013	Socio Economic and Asset Survey	Cluff Gold PLC
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012	2015	Heritage Impact Assessment	Aquarius Resources
SEGA Gold Mining Project	Burkina Faso	2013	2013	Technical Reviewer	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013	2013	Heritage Impact Assessment	Msobo
New Liberty Gold Project	Liberia	2013	2014	Grave Relocation	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013	2013	Heritage Scoping	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013	2014	Heritage Impact Assessment	Atkins Limited
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013	2014	Notification of Intent to Develop	ERM Southern Africa
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013	2013	Heritage Impact Assessment	ERM Southern Africa
Exxaro Belfast GRP	Belfast, Mpumalanga, South Africa	2013	-	Grave Relocation	Exxaro Coal Mpumalanga (Pty) Ltd
Nzoro 2 Hydro Power Project	Orientale Province, Democratic Republic of Congo	2014	2014	Social consultation	Randgold Resources Limited
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014	2014	Heritage Impact Assessment	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014	2014	Heritage Impact Assessment	Ergo (Pty) Ltd

Project Title	Project Location	Date:		Description of the Project	Name of Client
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014	2014	Heritage Impact Assessment	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014	2014	Heritage Impact Assessment	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014	2014	Heritage Basic Assessment	Ergo (Pty) Ltd
Kibali ESIA Update Project	Orientale Province, Democratic Republic of Congo	2014	2014	Heritage Impact Assessment	Randgold Resources Limited
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014	2014	Gap analysis	Gold One International
Yzermite PIA	Wakkerstroom, Mpumalanga, South Africa	2014	2014	Palaeontological Assessment	EcoPartners
Sasol Mooikraal Basic Assessment	Sasolburg, Free State, South Africa	2014	2014	Heritage Basic Assessment	Sasol Mining
Oakleaf ESIA Project	Bronkhorstspruit, Gauteng, South Africa	2014	2015	Heritage Impact Assessment	Oakleaf Investment Holdings
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014	2014	Heritage Impact Assessment	ILISO Consulting
Imvula Project	Kriel, Mpumalanga, South Africa	2014	2015	Heritage Impact Assessment	Ixia Coal
Sibanye WRTRP	Gauteng, South Africa	2014	2016	Heritage Impact Assessment	Sibanye
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014	2015	Heritage Impact Assessment	VM Investment Company
NLGM Constructed Wetlands Project	Liberia	2015	2015	Heritage Impact Assessment	Aureus Mining
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015	2015	Section 34 Destruction Permit Applications	Ergo (Pty) Ltd
JMEP II EIA	Botswana	2015	2015	Heritage Impact Assessment	Jindal
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015	2016	Heritage Impact Assessment and Section 34 Destruction Permit Application	Bigen Africa Services (Pty) Ltd
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015	2016	Heritage Impact Assessment and Section 34 Permit Application	Bigen Africa Services (Pty) Ltd
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015	2016	Heritage Impact Assessment	Namane Resources (Pty) Ltd
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015	2016	Heritage Impact Assessment	Namane Resources (Pty) Ltd
Groningen and Inhambane PRA	Limpopo Province, South Africa	2016	2016	Heritage Basic Assessment	Rustenburg Platinum Mines Limited

Project Title	Project Location	Date:		Description of the Project	Name of Client
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014	2016	Technical Review	IMIC plc
Palmietkuilen MRA	Springs, Gauteng, South Africa	2016	2016	Heritage Impact Assessment	Canyon Resources (Pty) Ltd
Copper Sunset Sand Mining S.102	Free State, South Africa	2016	2016	Heritage Basic Assessment	Copper Sunset Sand (Pty) Ltd
Grootvlei MRA	Springs, Gauteng, South Africa	2016	2016	Notification of Intent to Develop	Ergo (Pty) Ltd
Lambda EMP	Mpumalanga, South Africa	2016	2016	Palaeontological Impact Assessment	Eskom Holdings SOC Limited
Kilbarchan Basic Assessment and EMP	Newcastle, KwaZulu-Natal, South Africa	2016	2016	Heritage Basic Assessment	Eskom Holdings SOC Limited
Grootegeluk Amendment	Lephalale, Limpopo Province, South Africa	2016	2016	Notification of Intent to Develop	Exxaro
Garsfontein Township Development	Pretoria, Gauteng, South Africa	2016	2016	Notification of Intent to Develop	Leungo Construction Enterprises
Massawa EIA	Senegal	2016	2017	Technical Reviewer Heritage Impact Assessment	Randgold Resources Limited
Louis Botha Phase 2	Johannesburg, Gauteng, South Africa	2016	2016	Phase 2 Excavations	Royal Haskoning DHV
Beatrix EIA and EMP	Welkom, Free State, South Africa	2016	2017	Heritage Impact Assessment	Sibanye Gold Ltd
Sun City Heritage Mapping	Pilanesberg, North-West Province, South Africa	2016	2016	Phase 2 Mapping	Sun International
Sun City Chair Lift	Pilanesberg, North-West Province, South Africa	2016	2017	Notification of Intent to Develop and Heritage Basic Assessment	Sun International
Hendrina Underground Coal Mine EIA	Hendrina, Mpumalanga, South Africa	2016	2017	Heritage Impact Assessment	Umcebo Mining (Pty) Ltd
Elandsfontein EMP Update	Clewer, Mpumalanga, South Africa	2016	2017	Heritage Impact Assessment	Anker Coal
Eskom Northern KZN Strengthening	KwaZulu-Natal, South Africa	2016	-	Heritage Impact Assessment	ILISO Consulting
Thabametsi GRP	Lephalale, Limpopo Province, South Africa	2017	-	Grave Relocation	Exxaro Resources Ltd
Grootegeluk Watching Brief	Lephalale, Limpopo Province, South Africa	2017	2017	Watching Brief	Exxaro Resources Ltd
Matla HSMP	Kriel, Mpumalanga Province, South Africa	2017	2017	Heritage Site Management Plan	Exxaro Coal Mpumalanga (Pty) Ltd
Ledjadja Coal Borrow Pits	Lephalale, Limpopo Province, South Africa	2017	2017	Heritage Basic Assessment	Ledjadja Coal (Pty) Ltd
Exxaro Belfast Implementation Project PIA	Belfast, Mpumalanga, South Africa	2017	2017	Palaeontological Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd

Project Title	Project Location	Date:		Description of the Project	Name of Client
Lanxess Chrome Mine Archaeological Mitigation	Rustenburg, North West Province, South Africa	2017	2017	Phase 2 Excavations	Lanxess Chrome Mine (Pty) Ltd
Goulamina EIA Project	Goulamina, Sikasso Region, Mali	2017	2017	Heritage Impact Assessment	Birimian Limited
Zuurfontein Residential Establishment Project	Ekurhuleni, Gauteng, South Africa	2017	2017	Notification of Intent to Develop	Shuma Africa Projects
Kibali Grave Relocation Training and Implementation	Orientale Province, Democratic Republic of Congo	2017	-	Grave Relocation	Randgold Resources Limited
Exxaro Matla HRM	Kriel, Mpumalanga	2017	-	Heritage Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd

6 Professional Registrations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A
Member	International Association of Impact Assessors (IAIA) South Africa	5494

7 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

du Piesanie, J.J., 2017. Book Review: African Cultural Heritage Conservation and Management. South African Archaeological Bulletin 72(205)

Reg 2002/022710/08 MSW/NPC

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CURRICULUM VITA

1 PERSONAL DETAILS

Full names	Johan Nel
Nationality	South African citizen
Date of birth	7 January 1980
South African identity number	80 01 07 50 11 080
Driver's licence type	South Africa code B
Home language	Afrikaans and English
Highest qualification obtained	BA Honours (Archaeology) (UP), 2002
Current employer	The Heritage Foundation
Current position	Manager: Conservation Services
Health	Excellent
Criminal record	None

2 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria

2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

3 LANGUAGE

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

4 EMPLOYMENT

Period	Company	Title/position
11/2016 –	The Heritage Foundation	Manager: Conservation Services
09/2011 to 10/2016	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007		Freelance archaeologist
(2004-2005)	Rock Art Mapping Project	Resident archaeologist
2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

5 BIOGRAPHY

My involvement in Cultural Heritage Resources Management spans a period of 17 years. This includes *inter alia* research projects, archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have worked in both urban settings and remote rural landscapes throughout South Africa, as well as Botswana, the Democratic Republic of the Congo, Liberia Sierra Leone and Swaziland. In addition, I have also acted as a specialist reviewer of heritage studies undertaken by local specialists in countries such as Cameroon, Malawi, Mali and Tanzania.

Since 2010 I have been fortunate to complement my experience in the heritage arena with Integrated Environmental Management. This exposure has enabled me to investigate and implement the integration of Cultural Heritage Resources Management into Environmental Management processes. Many of the projects have required compliance with International Finance Corporation requirements and other World Bank standards. This knowledge has allowed me to develop and implement a Cultural Heritage Resources Management approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS.

I have been appointed by the Heritage Foundation, a Section 21 not-for-profit company in November 2016 as Manager: Conservation Services. My duties here include among other things review, drafting and implementing Integrated Management Plans and Conservation Management Plans for various heritage sites in South Africa, identifying funding opportunities and drafting funding proposals, heritage focussed research and liaison with various government and NGO bodies. In addition, I still maintain a level of general Heritage Resources Management consulting services through the Heritage Foundation.

I am fluent in English and Afrikaans, with excellent writing and research skills. My fully computer literacy includes proficiency in all Microsoft programmes. I am fortunate to be able to work very well under pressure, especially when projects demand grasping complex, interconnected processes.

6 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Professional member (Council member) (2013-2015)	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Council on Monuments and Sites (ICOMOS)	13839

Professional member	International Association of Impact Assessors – South Africa (IAIAsa)	NA
Institutional member	South African Museums Association (SAMA)	NA

7 PUBLICATIONS AND CONFERENCE PAPERS

Author/s & date	Title	Published in/presented at
Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001.	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004.	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.

Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.
Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.
Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

8 PROJECT EXPERIENCE

Archaeological and Heritage Impact Assessments	80+
Burial grounds and graves consultation and relocation processes	20
Heritage mitigation projects	10+
Research reports and reviews	10+
Management plans	2

9 REFEREES

A list of referees can be provided on request.

Appendix B: Maps and Plans

Plan 1

Sun City Complex EIA

Locality Map

Legend

- Development Area (Site Specific Study Area)
- City
- Main Road
- Arterial / National Route
- Railway Line
- Perennial Stream
- Dam
- District Municipality (2016)
- Regional Study Area
- Local Municipality (2016)
- Local Study Area

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Projection: Transverse Mercator	Ref #: meg.SUN4642.201711.064
Datum: WGS 1984	Revision Number: 2
Central Meridian: 27°E	Date: 24/01/2018

N

0 5 10 20 30

Kilometres

1:725 000

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Plan 2

Sun City Complex EIA

Regional Geology

Legend

- Development Area
- Settlement
- Power Line
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Non-Perennial Pan / Stream

Regional Geology

- Quaternary
- Chakise Foyaiite, Pilanesberg Complex
- Ledig Foyaite, Pilanesberg Complex
- Tusschenkomst Foyaite, Pilanesberg Complex
- Welgeval Foyaite, Pilanesberg Complex
- Wydhoek Foyaite, Pilanesberg Complex
- Sun City Syenite, Pilanesberg Complex
- Beacon Heights Tinguaite, Pilanesberg Complex
- Mankwe Pilanesberg Complex
- Rustenburg Layered Suite, Bushveld Complex
- Bierkraal Magnetite Gabbro, Bushveld Complex
- Pyramid Gabbro-Norite, Bushveld Complex
- Kolobeng Norite, Bushveld Complex
- Magaliesberg Fm, Pretoria Grp, Transvaal SpGrp
- Silverton Fm, Pretoria Grp, Transvaal SpGrp

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Ref #: meg.SUN4642.201801.058
Revision Number: 1
Date: 24/01/2018

N

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Kilometres
1:70 000

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Map Reference	Project Name
REP1	Eco-Lodge
REP2	Driving Range Road
REP3	Kwena Gardens Expansion
REP4.1	Vacation Club (VC) Phase 3
REP4.2	Vacation Club (VC) Phase 4
REP5	Recreational Lake Beach Expansion
REP6	Helipad Relocation and Expansion
REP7	Additional Parking Garage, Convention Centre and Hotel
REP8	Soccer Fields
USP1	Stormwater Culverts at Golf Course Roads
USP2	Additional Reservoirs to Supplement Existing Water Storage Capacity
USP3	Effluent Transfer Line Replacement
USP4	Sunset-Sky-Train Fresh Water Line
USP5	Ledig Sewer Line Replacement
USP6	South Village Pipeline
USP7	Generator Park
MP1	Clearance of Fence Roads
MP2	Sun Park Culverts

27°4'0"E 27°5'0"E 27°6'0"E 27°7'0"E

25°19'0"S 25°20'0"S 25°21'0"S 25°22'0"S

MOLAPOMOTSHO

LEITHOLENOGA

GA-MAMOSADIE

USP1.1 USP1.2 REP1 REP4.2 REP4.1 REP6.1 REP6.2 REP2 USP5 Development Area B MP1 REP7 REP5 USP2 Development Area A USP7.2 MP2 USP3 USP4 Development Area C USP6 USP7.1 REP3 REP8 MP1

Plan 3

Sun City Complex EIA

Expansion & Maintenance Projects

Legend

- Developed Footprint
- Undeveloped Footprint
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Dam Wall
- Dam / Lake

Expansion & Maintenance Projects

- Maintenance Project
- Resort Expansion Project
- Utilities and Services Project
- Resort Expansion Project
- Utilities and Services Project
- Maintenance Project
- Resort Expansion Project
- Utilities and Services Project

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Ref #: meg.SUN4642.201801.019
Revision Number: 1
Date: 19/04/2018

N

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Kilometres

1:26 000

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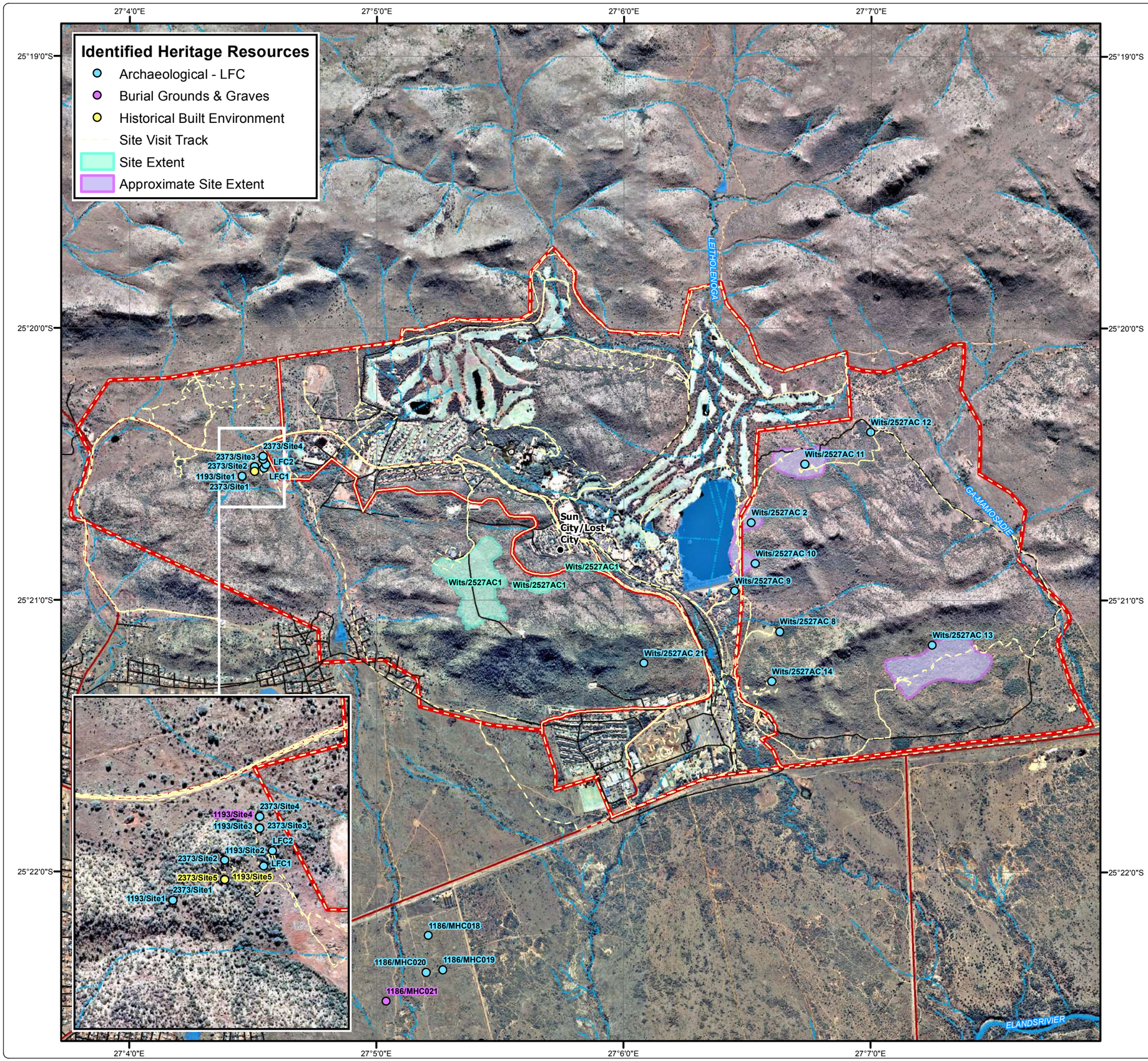
Plan 4

Sun City Complex EIA

Identified Heritage Resources



Legend

- Development Area
- Settlement
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake

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Datum: WGS 1984	Revision Number: 1
Central Meridian: 27°E	Date: 24/01/2018

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Kilometres

1:26 000

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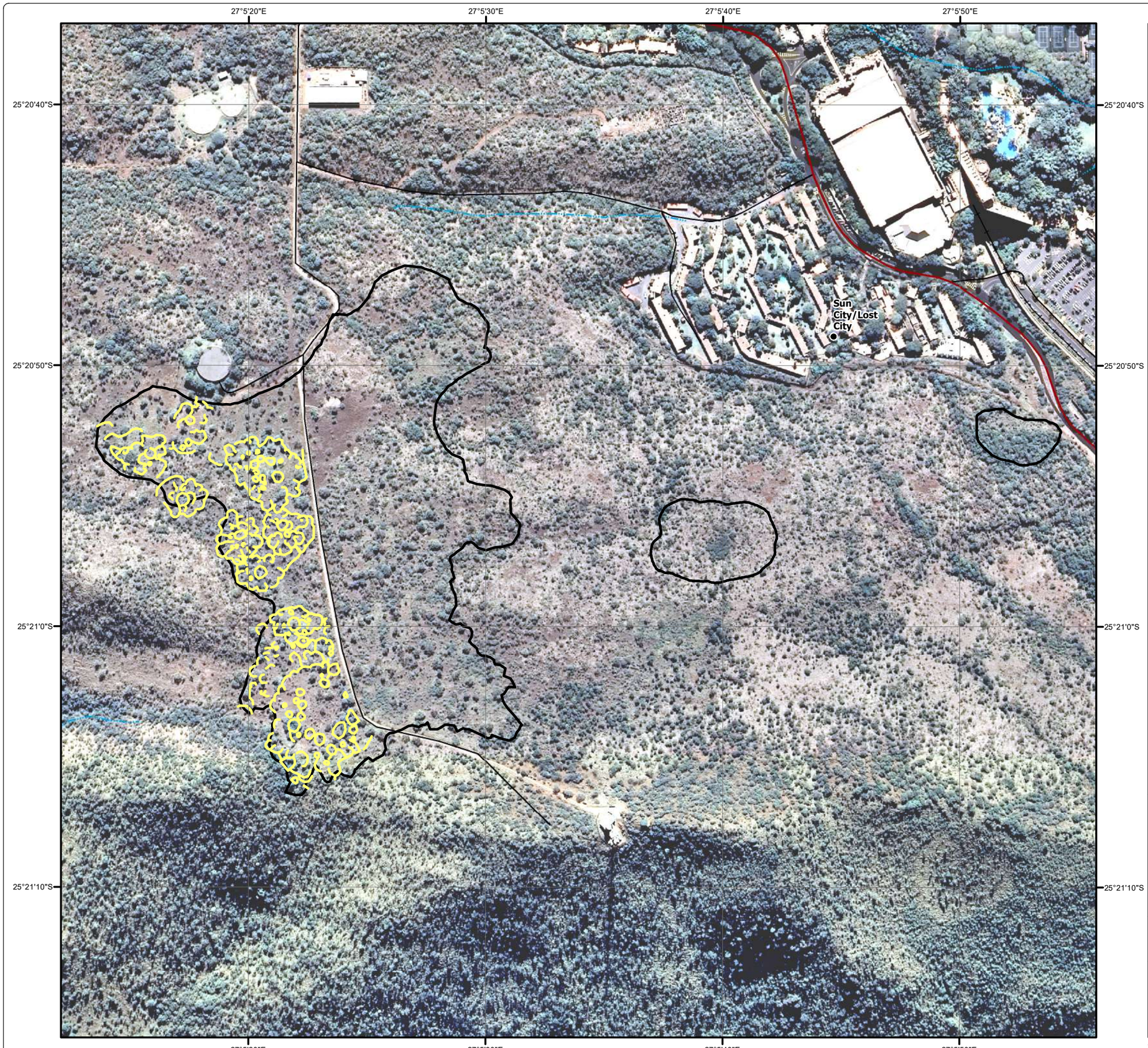
Plan 5

Sun City Complex EIA

Itlholanoga



Legend

- Itlholanoga Site Extent
- Stonewalling
- Settlement
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream

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Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 27°E

Ref #: scm.SUN4642.201810.126
Revision Number: 1
Date: 11/10/2018

N

0 50 100 200

Metres

1:4 500

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