DIGBY WELLS
ENVIRONMENTAL

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

Visual Impact Assessment Report

Project Number:

SUN4642

Prepared for:

Sun International (Sun City Resort)

October 2018

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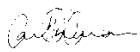
This document has been prepared by Digby Wells Environmental.

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

Name	Responsibility	Signature	Date
Alistair Main	Report Writer		October 2018
Stephanie Mulder	Technical Review		October 2018
Caitlin O'Connor	External Review		October 2018

EXECUTIVE SUMMARY

Introduction

Digby Wells Environmental (hereafter Digby Wells) has been appointed by Sun City Resort to undertake an Environmental Impact Assessment (EIA) in relation to proposed future developments within the Sun City Resort Complex located near Rustenburg, North West Province.

The significance of the long term visual impacts of a proposed development will determine the acceptability of the development to receptors. An understanding of the visual/aesthetic character of a landscape allows the sensitivity of the landscape to be determined. This in turn indicates the ability of the landscape to accommodate visual change. A Visual Impact Assessment (VIA) is performed to identify the potential visual impacts of a proposed project on the receiving environment.

This report constitutes the VIA required as part of the EIA process and describes the visual/aesthetic character of the receiving environment and the expected visual impacts of the proposed Project. The impacts are described and rated, and mitigation/management actions proposed to reduce the negative visual impacts of the Project.

Methodology

This VIA was performed using geographically referenced information and aerial photography, together with the professional opinion of an experienced visual assessor.

The study identified and evaluated the surface features using ArcGIS 3D Analyst Extension to create a topographical model, and the resultant slope intensity and slope aspect models. The topographical model was used to create viewshed models using the Viewshed Tool of the ArcGIS 3D Analyst Extension. These viewshed models illustrate the areas from which the Project will potentially be visible, taking into account the estimated height of the proposed infrastructure.

Theoretical viewshed models were created for the Project for the existing infrastructure, both the existing and proposed infrastructure and only the proposed infrastructure. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models depict worst case scenarios and show the areas from which the Project may potentially be visible. A site visit was taken to validate and confirm these findings. The site visit was conducted on 24 and 25 May, 2018 in good weather and visibility.

Findings

The theoretical viewshed models were refined to daytime practical viewshed models with a buffer of 10 km around the proposed infrastructure and divided into areas that are likely to experience different categories of visual exposure. Due to the undulating topography and vegetation of the receiving environment, it is noted that the visual impact of the proposed infrastructure is minimal outside of this 10 km zone of influence.

Observations during the site visit were that Sun City has very low light emission and pollution at night. This is due to both visual screening in the form of terrain and vegetation screening, but more importantly very well positioned and non-invasive down-lighting. The impact of lighting of the proposed infrastructure is therefore expected to be negligible.

The daytime viewshed models showed that the proposed infrastructure will be visible to sensitive receptors. The primary affected viewshed for the proposed infrastructure is within the Sun City Development Area that is not classified as a sensitive receptor. The viewshed models for the proposed infrastructure also reveal that the proposed infrastructure will be visible in the Pilansberg National Park to the north and west of the Project area.

Specific sensitive receptors that are likely to fall within the viewshed include residents and tourists at the newly constructed Bakubung Luxury Lodge, staff residences within the Pilansberg National Park, and visitors to the Pilansberg National Park.

Impact Assessment

The impact of the proposed infrastructure is moderate-negative for most of the proposed activities. The main impact will result from the construction and operation of the Vacation Club as these are in the closest proximity to sensitive visual receptors. With suggested mitigation, this impact can be reduced to a minor-negative impact.

Mitigation

General mitigation/management actions that should be implemented where possible include:

- As much existing natural vegetation as possible should be retained, specifically bushes and trees if present. This will assist to conceal the development;
- Indigenous trees and vegetation should specifically be planted between buildings of the Vacation Club (Phase 3 and 4) to minimise the visual impact on the sensitive receptors;
- Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible;
- Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used;
- Where possible avoid construction and operational activities at night. If construction and operational activities take place at night, then only areas where these activities are taking place should be lit and the number of lights and brightness must not exceed the minimum requirements for safety and security. Down-lighting and low-pressure sodium light sources must be implemented to minimise light pollution. Lights should be directed inwards towards the Project area and not outwards from the Project area; and

- An appropriate grievance mechanism should be developed to respond to grievances from receptors that relate to visual aspects.

Conclusion

The Project will remain indefinitely resulting in a permanent moderate–negative impact. However, with the proposed mitigation measures, the visual impact significance rating from the VIA will be reduced to minor in most instances. The largest impact will be from the proposed Vacation Club 4 as it is in the closest proximity and most visible to sensitive receptors. Visual impacts do result from the infrastructure within the current resort extent, however the impact on sensitive receptors in minimal due to screening from the natural terrain and vegetation.

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3D	Three-Dimensional
CD:NGI	Chief Directorate: National Geospatial Information
CV	Curriculum Vitae
DEA	Department of Environmental Affairs
DEM	Digital Elevation Model
Digby Wells	Digby Wells Environmental
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EPFI	Equator Principles Financial Institution
ESRI	Environmental Systems Research Institute
GHG	Greenhouse Gas
GIS	Geographic Information System
GN	Government Notice
GPGC	Gary Player Golf Course
ha	hectares
IFC	International Finance Corporation
km	kilometres
LCGC	Lost City Golf Course
m.a.m.s.l.	metres above mean sea level
Ml	Mega litre
MP	Maintenance Project
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:PAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
REP	Resort Expansion Project
SAPAD	South African Protected Areas Database
USP	Utilities and Services Project
VAC	

VC	Vacation Club
VIA	Visual Impact Assessment
VOW	Valley of Waves
WBG	World Bank Group

1 Introduction

Digby Wells Environmental (hereafter Digby Wells) has been appointed by Sun City Resort to undertake an Environmental Impact Assessment (EIA) in relation to proposed future developments within the Sun City Resort Complex located near Rustenburg, North West Province. The proposed project infrastructure is displayed in Table 1-1 and Figure 1-1.

Table 1-1: Summary of Projects

Category	No.	Project Name	Project Summary
Resort Expansion Projects (REP)s	REP1	Eco-Lodge	Development of a Bush Lodge/Eco-Lodge at Gary Player Golf Course Workshop.
	REP2	Driving Range Road	Construct a Road to connect the Driving Range at Lost City Golf Course (LCGC) to the Gary Player Golf Course (GPGC) via the Palace garden road and Valley of Waves (VOW) road.
	REP3	Kwena Gardens Expansion	Construct 20 additional Rustic Chalets at Kwena Gardens.
	REP4	Vacation Club (VC) Phase 3	Construct an additional 150 simplex units, 2-3 bed units and associated infrastructure to expand capacity at the VC. The site identified for the expansion currently houses the Helipad and Nursery.
	REP5	Recreational Lake Beach Expansion	Expand the existing artificial beach at the Lake and construct an additional shallow swimming pool at Waterworld Beach.
	REP6	Helipad relocation and expansion	Decommission the existing helipad, to make space for VC Phase 3, and construct a new helipad with increased bays closer to the Palace.
	REP7	Additional Parking Garage, Convention Centre and Hotel	Construct an additional parking garage, Convention Centre and Hotel (250 rooms) including a bridge link from Sun Central to the new Hotel.
	REP8	Soccer Fields	Develop 2 soccer fields at the Warehouse.
Utilities and Services Projects (USP)	USP1	Stormwater culverts at Golf Course Roads	Install Stormwater pipes/culverts at Golf Course Roads to allow water to flow under the roads and maintain the road surface for fence inspections by security (prevent floods washing away the road).
	USP2	Additional Reservoirs to Supplement existing	Construct 2 x 10Ml reservoirs or alternatively 1x 20Ml Reservoir on Telkom Hill next to existing

		water storage capacity	Upper Reservoir.
	USP3	Effluent transfer line replacement	Currently there is an effluent transfer line (old asbestos line) through Sunset Drive to Hole 2. This line will be decommissioned (shut down) but remain in place. A new line will then be installed against the fence of Letsatsing.
	USP4	Sunset-Sky-train Fresh Water Line	Construct a main water line from the Welcome Centre to Sky-train (pipe will be attached to sky-train route).
	USP5	Ledig Sewer Line decommissioning, New WWTW for VC and Palace	Currently the sewer line running through Ledig (old asbestos line) is leaking. The line will be decommissioned (shut down but remain in place). A new Wastewater Treatment Works (WWTW) will be established to manage sewage from VC and The Palace. A new pipeline will be required to the Lost City hole 3 dam to return the treated water for irrigation.
	USP6	South Village Pipeline	Construct an additional pipeline for water supply to South Village.
	USP7	Generator Park	Consolidate the generators throughout the site into one area for effective monitoring and control, or establish a generator park to service the east side business units.
Maintenance Projects (MP)	MP1	Clearance of Fence Roads	Vegetation Clearance at perimeter fences to serve as maintenance roads and Fire Breaks (25 km).
	MP2	Sun Park Culverts	Clear the Culverts under the road at Sun Park from debris and siltation. Construct maintenance road to facilitate future maintenance.

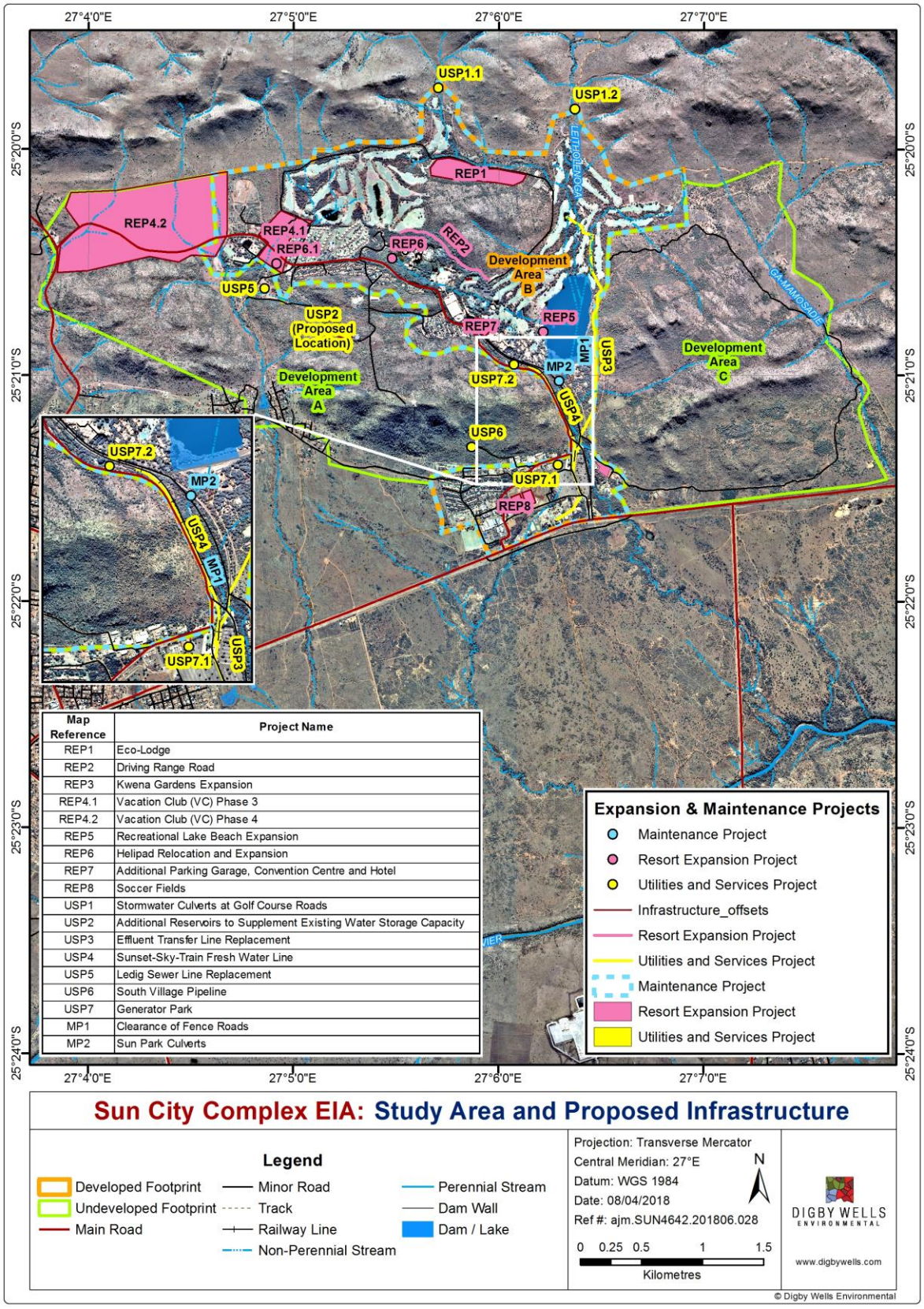

Figure 1-1: Proposed Surface Infrastructure

Activities that are listed in the National EIA Regulations[1] require Environmental Authorisation prior to commencing. The proposed projects at Sun City constitute Listed Activities in terms of Government Notice (GN) R983 (Listing Notice 1); GN R984 (Listing Notice 2) and GN R985 (Listing Notice 3) as amended.

This specialist Visual Impact Assessment (VIA) Report has been compiled in terms of Appendix 6 of the National Environmental Management Act (NEMA) EIA Regulations, 2014, (as amended) in terms of the Scoping and EIA process which is being followed in applying for Environmental Authorisation.

The requirements of Appendix 6 are presented in Table 1-2 and cross-referenced to the relevant sections of this Report.

Table 1-2: Structure of this report in accordance with the EIA Regulations

Regulatory Requirement for EIA Reports	Relevant Section of this report
1. (1) A specialist report prepared in terms of these Regulations must contain -	
(a) details of— (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Please refer to Section 2 and Appendix A of this Report
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Please refer to Section 2
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Please see Section 3:
(cA) an indication of the quality and age of base data used for the specialist report;	Please see Section 5:
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Please see Section 7:
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Please see Section 5:
(e) a description of the methodology adopted in preparing the report inclusive of equipment and modelling used;	Please see Section 6: Methodology
(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;	Please see Section 8
(g) an identification of any areas to be avoided, including buffers;	Please see Section 8

[1] As published in Government Notices R982; R983; R984 and R985 on 4 December 2014, as Amended 7 April 2017.

(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;	Please see Section 8.1
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Please see Section 10: Assumptions, Limitations and Gaps in Knowledge
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Please see Section 12
(k) any mitigation measures for inclusion in the EMPr;	Please see Section 13
(l) any conditions for inclusion in the environmental authorisation;	
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Please see Section 14
(n) a reasoned opinion— (i) whether the proposed activity, activities or portions thereof should be authorised; (i) (A) 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;	Please see Section 16
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Please see Section 15
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	
(q) any other information requested by the competent authority.	No additional information was requested.

2 Details of the Specialist

This Specialist Report has been compiled by the following specialists (CVs of the Project Team are included in Table 2-1:

Table 2-1: Details of the Specialist who Prepared this Report

Responsibility	**Report compilation**
Full Name of Specialist	Alistair John Main
Highest Qualification	BA Geography and Environmental Science
Years of experience in specialist field	9 years

Responsibility	**Report review**
Full Name of Specialist	Stephanie Claire Mulder
Highest Qualification	BSc Geography Honours
Years of experience in specialist field	11.5 years

2.1 Declaration of the Specialist

I, Alistair John Main, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;

- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the Specialist:

Alistair John Main

Full Name and Surname of the Specialist:

Digby Wells Environmental

Name of Company:

October 2018

Date:

I Stephanie Claire Mulder, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected

parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;

- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the Specialist:

Stephanie Claire Mulder

Full Name and Surname of the Specialist:

Digby Wells Environmental

Name of Company:

October 2018

Date:

3 Scope and Purpose of this Report

This report constitutes a VIA and describes the visual/aesthetic character of the receiving environment. The aim of this VIA is to determine the nature of the Project area and the potential impact of the proposed Project on the visual/aesthetic character of the surrounding landscape. The following objectives were identified to achieve this aim:

- Examine aerial photography available for the Project area;
- Create and analyse a topographical model in ArcGIS 3D Analyst Extension;
- Create and analyse viewshed models in ArcGIS 3D Analyst Extension;
- Describe the topography and visual/aesthetic character of the receiving environment based on desktop modelling and field observation during the site visit;
- Describe the current and post development visual aspects of the Project area;

- Identify sensitive visual receptors and key public viewpoints that will be impacted on by the proposed Project;
- Identify the impacts, pre- and post-mitigation that the proposed infrastructure will have on the topographical and visual landscape, by rating the scale, duration, severity and probability of the impacts occurring;
- Provide graphic photo simulations of identified infrastructure that will have a significant potential impact on sensitive receptors; and
- Provide mitigation measures and recommendations in an attempt to reduce the potential visual impacts.

4 Relevant Legislation

The following international, national and regional documents form part of the legislative and policy framework of the visual assessment.

4.1 International Finance Corporation Performance Standards and Equator Principles

Visual assessments are required by the International Finance Corporation (IFC) Performance Standards (IFC, 2012) and the Equator Principles (EPFI, 2013). These standards will be treated as a best practice guideline.

Equator Principle 3: Applicable Environmental and Social Standards states that “the Equator Principles Financial Institution (EPFI) will require that the Assessment process evaluates the compliance with the applicable standards as follows:

- For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group (WBG) Environmental, Health and Safety Guidelines (EHS Guidelines); and
- For Projects located in Designated Countries, the Assessment process evaluates compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. Host country laws meet the requirements of environmental and/or social assessments (Principle 2), management systems (Principle 4), Stakeholder Engagement (Principle 5) and, grievance mechanisms (Principle 6).”

The Equator Principles Association defines Designated Countries as “those countries deemed to have robust environmental and social governance, legislation and institutional capacity designed to protect their people and the natural environment.” South Africa is not on the Equator Principles Association’s list of Designated Countries and therefore the IFC Performance Standards are applicable to this Project (EPFI, 2013).

IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts is applicable to the EIA and all specialist studies including the visual assessment. Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. The objectives of this Performance Standard are:

- To identify and evaluate environmental and social risks and impacts of the project;
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise impacts, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities and the environment;
- To promote improved environmental and social performance of clients through the effective use of management systems;
- To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately; and
- To promote and provide means for adequate engagement with Affected Communities throughout the project cycle issues that could potentially affect them and to ensure that the relevant environmental and social information is disclosed and disseminated (IFC, 2012).

IFC Performance Standard 3: Resource Efficiency and Pollution Prevention is applicable to the visual assessment. Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional and global levels. For the purposes of this Performance Standard, the term ‘pollution’ is used to refer to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases, and includes other components such as pests, pathogens, thermal discharge to water, Greenhouse Gas (GHG) emissions, nuisance odours, noise, vibration, radiation, electromagnetic energy and the creation of potential visual impacts including light (IFC, 2012).

IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources is applicable to the visual assessment. Performance Standard 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. Ecosystem services are the benefits that people, including businesses, derive from ecosystem services. Ecosystem services are organised into four types:

- Provisioning services, which are the products people obtain from ecosystems;
- Regulating services, which are the benefits people obtain from the regulation of ecosystem processes;
- Cultural services, which are the nonmaterial benefits people obtain from ecosystems; and

- Supporting services, which are the natural processes that maintain the other services.

Examples of cultural services include natural areas that are sacred sites and areas of importance for recreation and aesthetic enjoyment (IFC, 2012).

IFC Performance Standard 8: Cultural Heritage applies to the visual assessment. Performance Standard 8 recognises the importance of cultural heritage for current and future generations. For the purposes of this Performance Standard, cultural heritage refers to:

- Tangible forms of cultural heritage, such as tangible movable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic and religious values;
- Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and
- Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

Tangible cultural heritage is considered a unique and often non-renewable resource that possesses cultural, scientific, spiritual, or religious value and includes moveable or immovable objects, sites, structures, groups of structures, natural features, or landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural value. The requirements of Performance Standard 8 do not apply to the cultural heritage of Indigenous Peoples which is covered under Performance Standard 7 (IFC 2012).

4.2 National Legislation and Policy

At a national level, the following legislative documents potentially apply to the visual assessment:

- Regulations in Chapter 5 (Integrated Environmental Management) of the NEMA, 1998 (Act No. 107 of 1998) (NEMA) and the Act in its entirety. The Act states that “the State must respect, protect, promote and fulfil the social, economic and environmental right of everyone…” Landscape is both moulded by, and moulds, social and environmental features;
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and related provincial regulations – in some instances there are policies or legislative documents that give rise to the protection of listed sites. The NHRA states that it aims to promote “good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed for future generations”. A holistic landscape whose character is a result of the action and interaction and/or human factors has strong cultural associations as societies and the landscape in which they live are affected by one another in many ways; and

- Section 17 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA) sets out the purposes of the declaration of areas as protected areas which includes the protection of natural landscapes. Landscapes are defined by the natural, visual and subjectively perceived landscape; these aspects of a landscape are intertwined to form a holistic landscape context.

4.3 Guidelines

The “Guideline for involving visual and aesthetic specialists in EIA processes” document by Oberholzer (2005) has been used as a best practice guideline for this Visual Impact VIA. Although these guidelines were developed for the Western Cape province of South Africa they are relevant for this VIA as “the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements” (Oberholzer, 2005).

5 Data Used in this Report

The data used for the VIA is summarised in Table 5-1 below.

Table 5-1: Data for VIA

Data	Source	Date
Site Layout and Dimensions from client	Sun International (Sun City Resort)	2017/18
Aerial Imagery	CD:NGI	2013
5 m Contour Lines	CD:NGI	-
1: 50 000 Topographical Data	CD:NGI	-
Local Municipality Boundary	Municipal Demarcation Board	2016
District Municipality Boundary	Municipal Demarcation Board	2016
Provincial Boundary	Municipal Demarcation Board	2016
South African Protected Areas Database	DEA	2017
Vegetation	Mucina and Rutherford	2012

5.1 Details of the Site Visit

The site visit was conducted on 23 and 24 May 2018. The conditions for the site visit were good, with sunny, clear weather conditions and little haze. The weather and atmospheric conditions were suitable for the collection of sufficient photographs and necessary visual observations.

The site visit was focused on pre-identified visual receptors in and around the Sun City precinct.

6 Methodology

This section of the report describes the methodology adopted in determining the status quo of the visual environment on the various Project sites.

6.1 Determining the Baseline Environment

This VIA was performed using geographically referenced information and aerial photography, together with the professional opinion of an experienced visual assessor.

The study identified and evaluated the surface features using ArcGIS 3D Analyst Extension to create a topographical model, and the resultant slope intensity and slope aspect models.

6.1.1 Characterisation of Visual Impacts

The expected visual impact of the Project was categorised based on the type of receiving environment and the type of development as detailed in Table 6-1 (Oberholzer, 2005). This table provides an indication of the visual impacts that can be expected for different types of developments in relation to the nature of the receiving environment. Following this classification system, the Project is classed as a **Category 3 development**. The receiving environment adjacent to a **protected area of national and regional significance** as the Project area falls adjacent to the Pilansberg National Park. It is therefore expected that the Project will potentially have a **high visual impact** on the receiving environment.

Table 6-1: Key to Categorisation of Development (adapted from Oberholzer, 2005)

Type of Development	Examples of Development
Category 1	Nature reserves, nature related recreation, camping, picnicking, trails and minimal visitor facilities.
Category 2	Low-key recreation/resort/residential type development, small-scale agriculture/nurseries, narrow roads and small-scale infrastructure.
Category 3	**Low density resort/residential type development, golf or polo estates**, low to medium-scale infrastructure.
Category 4	Medium density residential development, sports facilities, small-scale commercial facilities/office parks, one-stop petrol stations, light industry, medium-scale infrastructure.
Category 5	High density township/residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

Table 6-2: Categorisation of Expected Visual Impact (adapted from Oberholzer, 2005)

Type of Environment	Type of Development (Low to High Intensity)				
	Category 1 Development	**Category 2 Development**	**Category 3 Development**	**Category 4 Development**	**Category 5 Development**
Protected/wild areas of international, national or regional significance	Moderate visual impact expected	High visual impact expected	**High visual impact expected**	Very high visual impact expected	Very high visual impact expected
Areas or routes of high, scenic, cultural or historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural or historical significance	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites/run down urban areas/wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

For projects where a high or very high visual impact is expected, Oberholzer (2005) recommends that a Level 4 visual assessment be conducted. A Level 4 visual assessment includes the following:

- Identification of issues raised in the scoping phase, and site visit;
- Description of the receiving environment and the proposed project;
- Establishment of view catchment area, view corridors, viewpoints and receptors;
- Indication of potential visual impacts using established criteria;
- Inclusion of potential lighting impacts at night;
- Description of alternatives, mitigation measures and monitoring programmes; and

- Complete 3D modelling and simulations, with and without mitigation.

6.1.2 Visual/Aesthetic Character and Topography

A desktop study was conducted to evaluate the topography of the receiving environment and CD:NGI aerial photography of the area was examined to determine the surface features. Vector GIS data was used to determine the relative location of the features surrounding the Project area.

A topographical model (Figure 6-3) was created and the resultant model was then used to create a slope intensity model (Figure 6-4) using the Slope tool of ArcGIS 3D Analyst Extension. The slope model indicates the slope degree and was classified using the Natural Breaks (Jenks)[2] classification method.

The topographical model indicates that the elevation of the Project area increases from 1,056 metres above mean sea level (m.a.m.s.l.) in the Leitholenoga River valley below the dam to 1,352 m.a.m.s.l. on the hilltops. Such terrain is conducive to high visual screening. This was verified during the site visit and field photographs within the Project Area and the surrounding environment illustrate the highly undulating terrain and the resulting visual screening associated with such terrain as illustrated by Figure 6-1 and Figure 6-2 below.

Figure 6-1: Photograph looking eastwards from the western extent of the Development Area

[2] The Natural Breaks (Jenks) classification method splits data into classes based on natural groupings within the data. Natural breaks occur at low points on the histogram and are used to identify classes that group similar values together while maximising the differences between classes. This method accurately depicts trends in the data (Cartographica, 2010 and ESRI, 2016).

Figure 6-2: Photograph looking eastwards from the Bakubung new development towards the Development Area

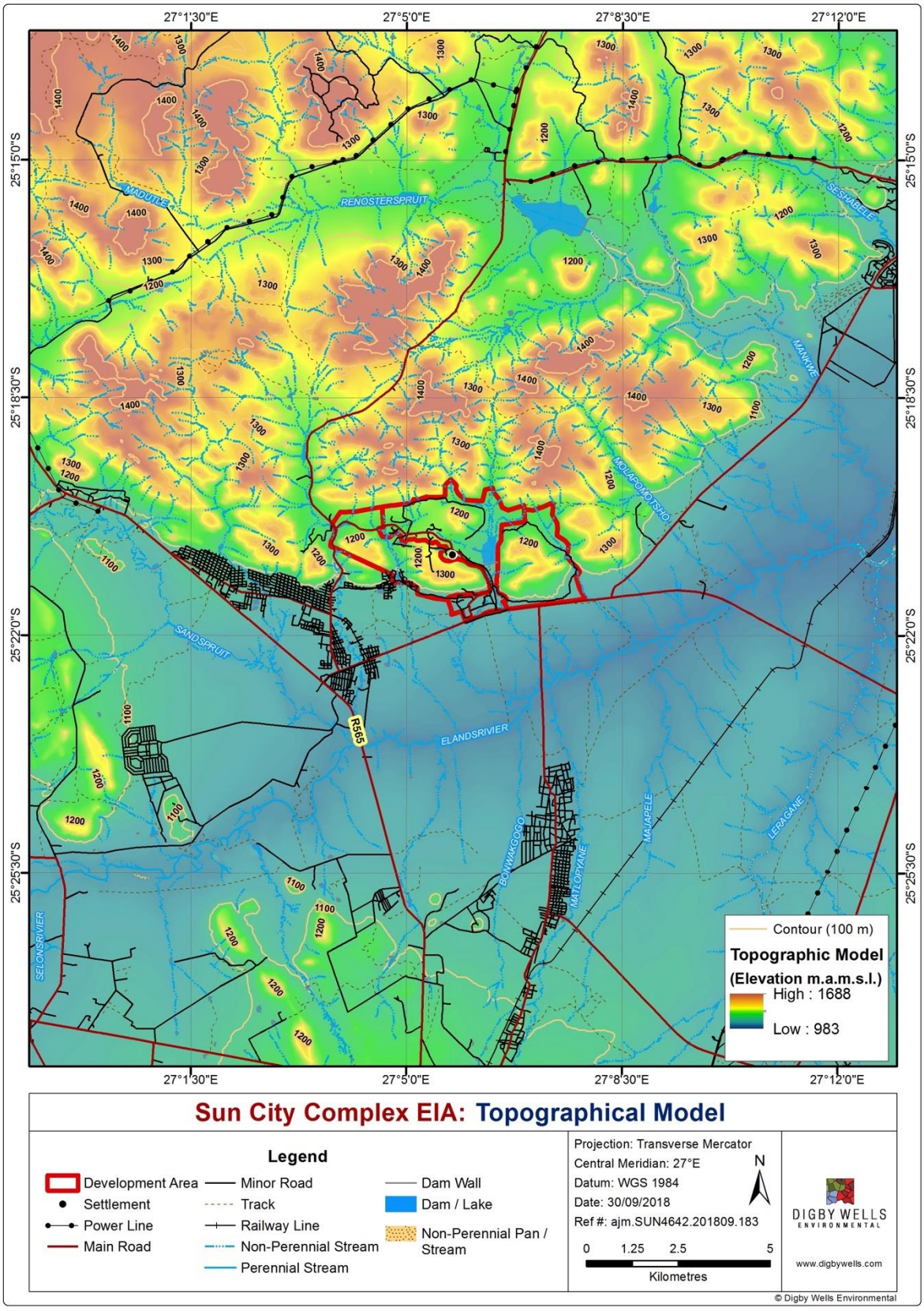

Figure 6-3: Topographical Model

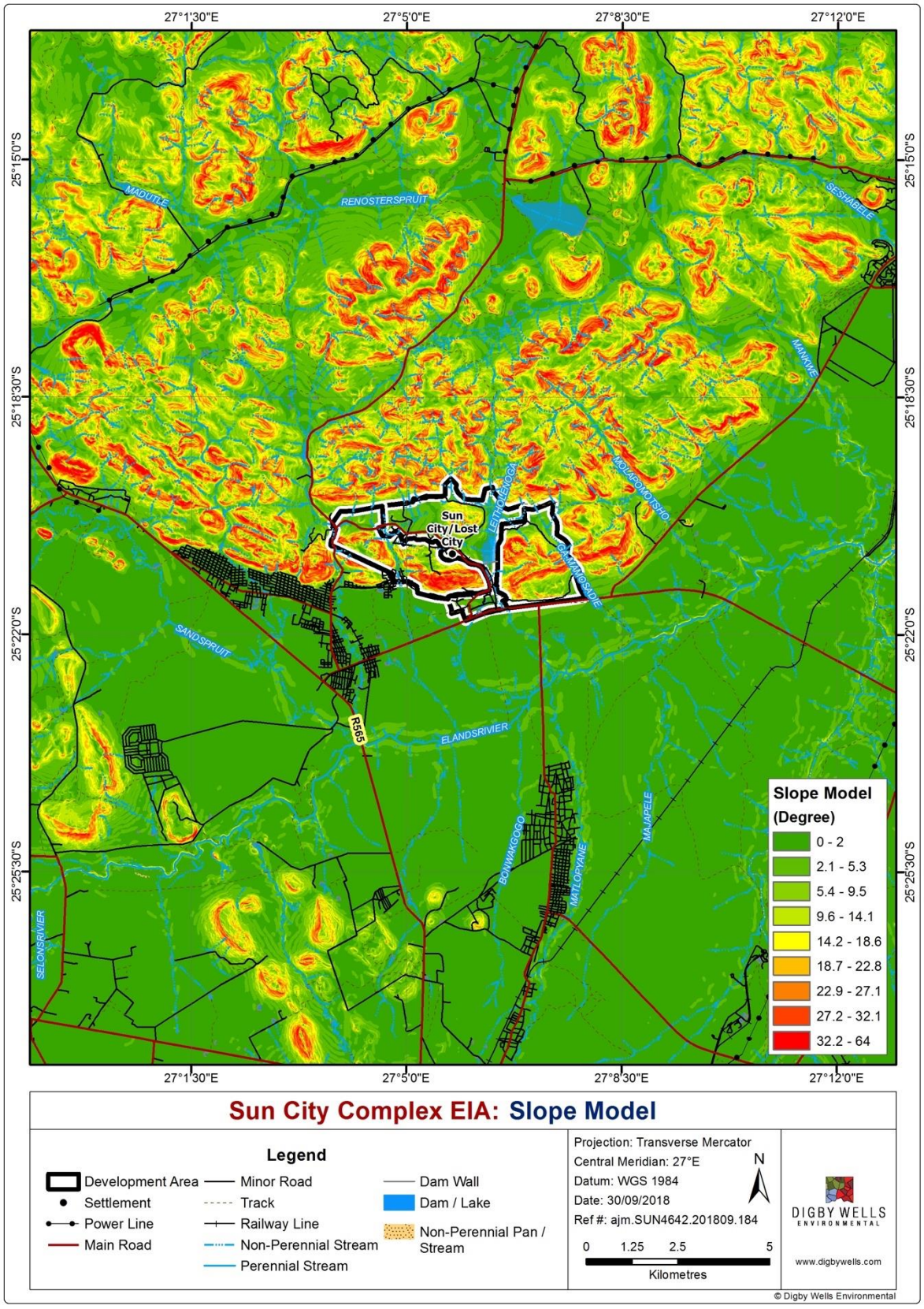

Figure 6-4: Slope Model

6.1.3 Regional Vegetation

Based on the Mucina and Rutherford Vegetation Classification (2012) dataset, the surrounding area is characterised by Pilanesberg Mountain Bushveld and Zeerust Thornveld. During the site visit, it was observed that the natural vegetation has largely been preserved in the areas surrounding the Development Area. It was observed that built up areas within the Development Area have foreign vegetation species giving the Sun City Resort the appeal of a more tropical landscape. Such vegetation, both natural and alien, provides moderate screening properties with average heights between 2 and 5 m allowing for limited screening of small buildings and associated infrastructure (refer to Figure 6-5 and Figure 6-6 below).

Figure 6-5: Photograph illustrating mixed vegetation types of exotic and indigenous vegetation. The natural Pilanesberg Mountain Bushveld is noticeable on the hill

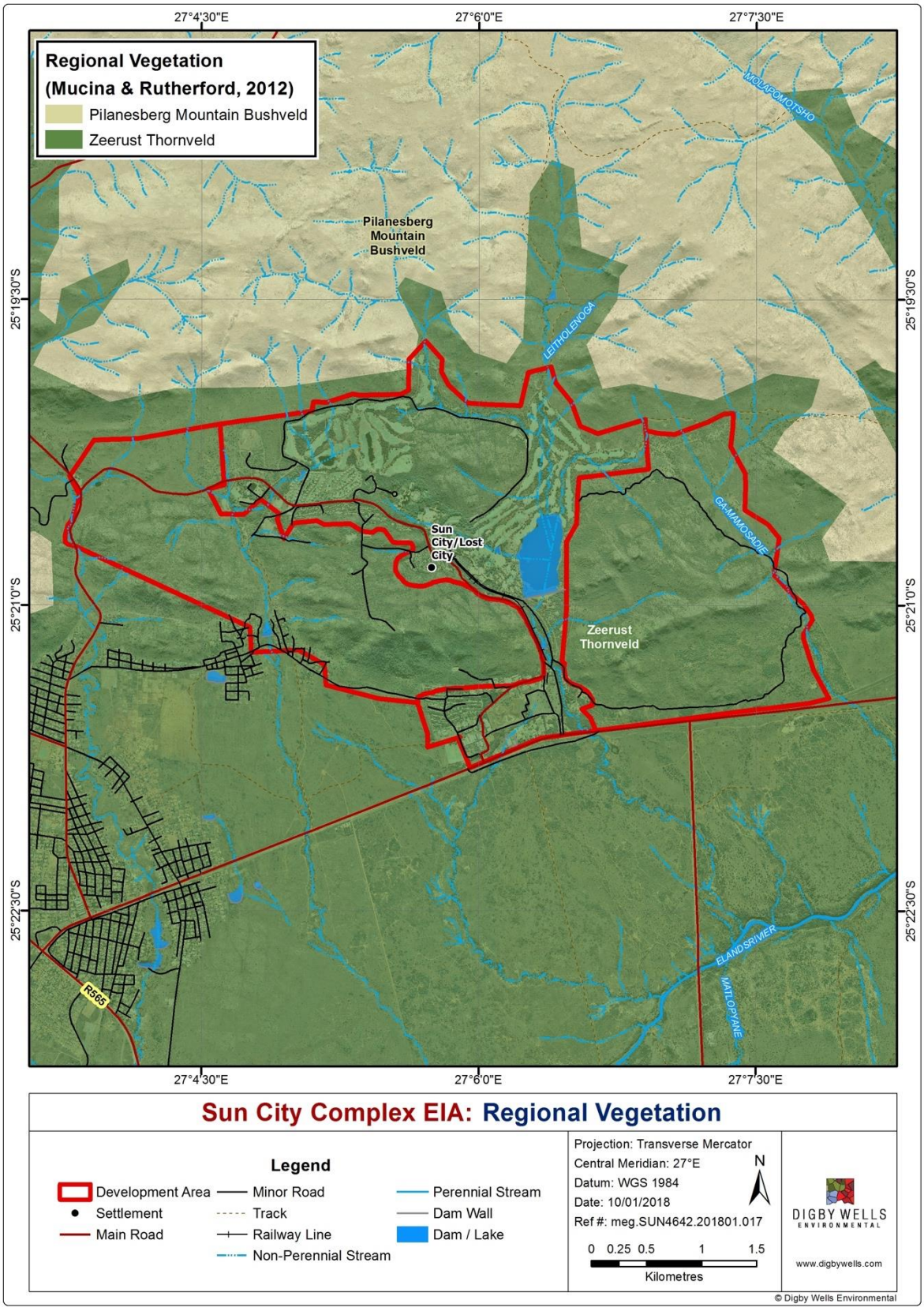

Figure 6-6: Regional Vegetation

7 Existing Environment

Sun City Resort (the Project area) was opened in 1979 (Sun International, 2017) and is located 36.1 km north-north-west of the town of Rustenburg. The Project area is located on the southern edge of the Pilanesberg National Park. The surrounding area is characterised by natural and agricultural areas interspersed with settlements. There is a narrow band of scattered platinum mines running in a southerly direction from the Project Area.

The Project Area is divided into three development areas. Development areas A and C are undeveloped and cover areas of 492.1 hectares (ha) and 468.2 ha respectively. Development area B is developed and covers an area of 595.9 ha. The combined Project area is 1 556.2 ha. The coordinates of the centre of the Project area are 25° 20’ 45.952” S and 27° 05’ 56.766” E.

The Project area falls within the Moses Kotane Local Municipality and the Bojanala District Municipality of the North West Province, South Africa. The Project area is bordered by the Rustenburg Local Municipality on the south. The settlement of Sun City/Lost City is situated within the Project area.

The residential areas in the Project area and surrounds are all potential visual receptors of the proposed Projects. The closest towns and settlements, as well as their direct distance and direction from the Project area are summarised in Table 7-1. All distances are straight line distances measured from the edge of the Project area to the centre of the towns/settlements.

Table 7-1: Closest Towns and Settlements

Name	Type	Direct Distance	Direction
Sun City/Lost City	Settlement	0 km	-
Ledig	Settlement	2.1 km	SW
Matooster	Settlement	6 km	W
Chaneng	Settlement	6.2 km	SSE
Phatsima	Settlement	7.1 km	SW
Frischgewaagd	Settlement	7.9 km	S
Robega	Settlement	7.9 km	SSE
South Village	Settlement	8.1 km	E
Mabele-a-Podi	Settlement	9.4 km	NE
Mahobieskraal	Settlement	9.6 km	W

Oberholzer (2005) defines sense of place as “the unique quality or character of a place, whether natural, rural or urban”. Sense of place “relates to uniqueness, distinctiveness or strong identity” and is “sometimes referred to as *genius loci* meaning *spirit of the place*” (Oberholzer, 2005). Prior to the development of Sun City Resort in 1979, the Project area

and surrounds had a largely rural sense of place. The existing Sun City Resort has a tourism–orientated sense of place and the proposed future developments are not expected to change this sense of place.

Road users in the Project area and surrounds are potential visual receptors of the proposed Projects. The R565 regional road is located 3 km south-west of the Project area.

The Project area and surrounds have numerous heritage sites including archaeological sites, burial grounds and graves, historical built environment and recent heritage sites (Digby Wells, 2018). Visitors to these heritage sites are potential visual receptors of the Projects.

People visiting the area for birdwatching and game viewing are potential visual receptors of the Projects. The entire Project area is located adjacent to the Pilanesberg National Park and the McGregor Private Nature Reserve. The closest protected areas identified from the South African Protected Areas Database (SAPAD) (Department of Environmental Affairs, 2017, as well as their direct distance and direction from the Project area are summarised in Table 7-2. All distances are straight line distances measured from the edge of the Project area to the edge of the protected area.

Table 7-2: Protected Areas

Name	Type	Direct Distance	Direction
Pilansberg National Park	Nature Reserve	0.1km	-
Kosmo Private Nature Reserve	Nature Reserve	21.7 km	WSW
Deon Private Nature Reserve	Nature Reserve	27 km	NNE
Matlapeng Private Nature Reserve	Nature Reserve	28.9 km	W

The affected visual receptors will be determined in the investigation to follow (refer to Section 12).

7.1 Visual/Aesthetic Character and Topography

This section describes the results obtained from the analysis of the topographical and slope models created in ArcGIS.

The Project area is situated on the southern slopes of the Pilanesberg and has an undulating topography. The Pilanesberg is the crater of an ancient volcano that sticks out above the flat Bushveld plains. With the exception of the Pilanesburg, the surrounding area is relatively flat. The Elands River valley is located south of the Project area.

The topographical model indicates that the elevation of the Project area increases from 1,056 m.a.m.s.l. in the Leitholenoga River valley below the dam to 1,352 m.a.m.s.l. on the hilltops. Figure 6-3 illustrates the topographical model and features of the Project area and surrounds.

The lower-lying areas of the Project area have gentle slopes of between 0° and 8.2° while the higher-lying areas have steeper slopes of between 8.3° and 43.6°. The steepest slopes

occur on the hilltops. Most of the existing developments are located on the flatter low-lying areas of the Project area. Figure 6-4 illustrates the slope model of the Project area.

Due to the undulating topography, the slope aspect/direction of the Project area is not in any specific direction. The sides of the hills slope in various directions as illustrated in Figure 6-3.

The undulating topography of the Pilansberg is expected to provide moderate to high screening of the proposed developments; however, if the developments are located on a hill they will be more visible than if they are located in a lower-lying area.

According to Mucina & Rutherford (2012) the dominant vegetation types of the Project area and surrounds are Pilanesberg Mountain Bushveld and Zeerust Thornveld. The Project area has been transformed by the Sun City Resort. Parts of the surrounding area have been transformed by residential areas, agriculture and mining and only some natural vegetation remains. The remaining natural Bushveld and Thornveld vegetation is expected to provide moderate screening of the proposed developments.

7.2 Viewshed Analysis

The resultant topographical model was used to create viewshed models using the Viewshed Tool of the ArcGIS 3D Analyst Extension. These viewshed models illustrate the areas from which the proposed projects will potentially be visible, taking into account the estimated height of the proposed infrastructure. For the purpose of this study, individual viewshed models were run for the different proposed projects. Proposed projects with the largest footprints and potential vertical offset heights were categorised individually, with smaller operational and maintenance projects grouped as per Table 7-3 below.

Table 7-3: Infrastructure Heights and Categories for Viewshed Modelling

Project	Offset Height	Source	Viewshed Category
Vacation Club (VC) Phase 4	5 m	Based on existing Vacation Club	Vacation Club Phase 4
Vacation Club (VC) Phase 3	5 m	Based on existing Vacation Club	Vacation Club Phase 3
Additional Parking Garage, Convention Centre and Hotel	50 m (16 storey)	Confirmed by client	Hotel
Eco-Lodge	5 m	Confirmed by client	Eco-Lodge
Clearance of Fence Roads	Ground level	Based on similar projects	Alternative Infrastructure
Soccer Fields	Ground level	Based on similar projects	
Additional Reservoirs to Supplement existing water storage capacity	10 m	Based on existing	

		Reservoir
South Village Pipeline	1 m	Based on similar projects
Generator Park	2 m	Based on similar projects
Sun Park Culverts	1 m	Based on similar projects
Recreational Lake Beach Expansion	Ground level	Based on similar projects
Ledig Sewer Line replacement	1 m	Based on similar projects
Helipad relocation and expansion	Ground level	Based on similar projects
Stormwater culverts at Golf Course Roads	Ground level	Based on similar projects
Stormwater culverts at Golf Course Roads	Ground level	Based on similar projects

The concept of viewshed modelling is depicted in Figure 7-1. The topography denotes whether or not a development will be visible from a receptor. In Figure 7-1 the development is only visible from the receptors within the valley and on the slopes of the hills facing it. The development will be hidden from all receptors beyond the first hills.

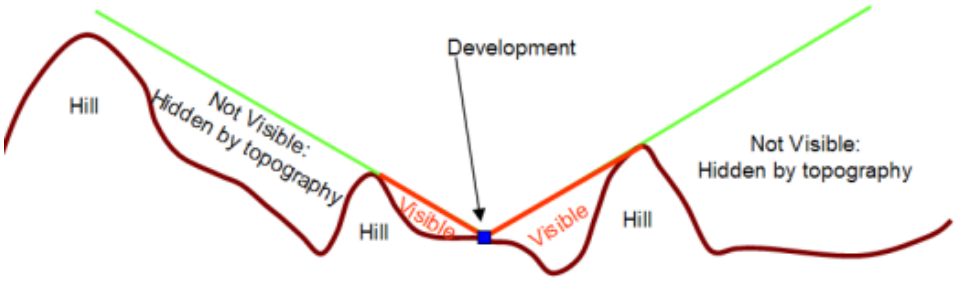

Figure 7-1: Theoretical Background of Viewshed Modelling

Viewshed models were created for daytime conditions only. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models depict worst case scenarios and show the areas from which the Project may potentially be visible.

The viewshed models were used to quantify the worst-case scenario. Visual exposure and the visual impact of a development diminish exponentially with distance (Oberholzer, 2005).

Based on the visibility of the existing infrastructure and the location of the main sensitive receptors, and based on the heavily disturbed peripheral environment, the zone of influence was determined to be within 10 km for the purpose of this study. Given the presence of visual screening in the form of natural terrain screening, the impact beyond 10 km was deemed negligible.

Based on the findings of fieldwork conducted, the following categories were used for the viewshed models:

- 0 – 2 km: Potentially high visual exposure;
- 2 – 5 km: Potentially moderate visual exposure; and
- 5 – 10 km: Potentially low visual exposure.

8 Findings

The findings include a description of the results of the viewshed analysis, and the identification of the sensitive receptors of the Project area.

Six viewshed models were run to quantify the visibility of the proposed infrastructure based on the categories listed in Table 7-3. A viewshed model was run to determine the visibility of the each infrastructure category to determine areas where the proposed infrastructure will be visible in order to quantify the impact of the proposed infrastructure.

These viewshed models were based on the topography only and do not take the screening effect of vegetation into account. These viewshed models depict the worst-case scenario and show the areas from which the Project may potentially be visible.

8.1 Viewshed Model

The theoretical viewshed models were refined to daytime practical viewshed models with a buffer of 10 km around the proposed infrastructure and divided into areas that are likely to experience different categories of visual exposure. Due to the undulating topography and vegetation of the receiving environment, it is noted that the visual impact of the proposed infrastructure is minimal outside of this 10 km zone of influence.

Observations during the site visit were that Sun City has very low light emission and pollution at night. This is due to both visual screening in the form of terrain and vegetation screening, but more importantly very well positioned and non-invasive down-lighting on the existing infrastructure as illustrated in Figure 8-1 from a position of less than 500 m from the largest building within the Development Area (the Lost City Palace Hotel). Based on this, it was determined that the proposed infrastructure will have similar lighting plans and will therefore have a negligible impact on the surrounding environment and therefore the viewshed models are restricted to daytime practical viewshed models.

Figure 8-1: Photograph illustrating low impact lighting within Sun City Resort

8.1.1 Proposed Vacation Club Phase 4

The daytime practical viewshed model (Figure 8-2) depicts the area from which the proposed infrastructure may potentially be visible during the day. This daytime viewshed model covers an area of approximately 53.94 km^2. The viewshed is noticeably limited by topographic screening in all directions, with the majority of its visibility remaining confined to the Sun City Project area and the western border of the Pilanesberg National Park where the terrain slopes directly towards the proposed infrastructure area. The visibility also extends further to the south where visibility of the proposed infrastructure will be visible between the lower lying corridors of the valley to the south of the proposed infrastructure area. The viewshed areas for the categories are listed in Table 8-1 below.

Table 8-1: Viewshed Area per Category (Vacation Club 4)

Category	Impact	Viewshed Area
0 – 2 km	Potentially Very High Visual Exposure	13.58 km^2
2 – 5 km	Potentially Moderate Visual Exposure	10.95 km^2
5 – 10 km	Potentially Low Visual Exposure	29.41 km^2

8.1.2 Proposed Vacation Club Phase 3

The daytime practical viewshed model (Figure 8-3) depicts the area from which the proposed infrastructure may potentially be visible during the day. This daytime viewshed model covers an area of approximately 22.41km^2. The viewshed is noticeably limited by topographic screening in all directions, with the majority of its visibility remaining confined to

the Sun City Project area and the western and southern border of the Pilanesberg National Park where the terrain slopes directly towards the proposed infrastructure area. The visibility also extends further to the south where visibility of the proposed infrastructure will be visible between the lower lying corridors of the valley to the south of the proposed infrastructure area. The viewshed areas for the categories are listed in Table 8-2 below.

Table 8-2: Viewshed Area per Category (Vacation Club 3)

Category	Impact	Viewshed Area
0 – 2 km	Potentially Very High Visual Exposure	7.65 km^2
2 – 5 km	Potentially Moderate Visual Exposure	2.13 km^2
5 – 10 km	Potentially Low Visual Exposure	12.63 km^2

8.1.3 Proposed Eco-Lodge

The daytime practical viewshed model (Figure 8-4) depicts the area from which the proposed infrastructure may potentially be visible during the day. This daytime viewshed model covers an area of approximately 13.61 km^2. The viewshed is noticeably limited by topographic screening in all directions, with the majority of its visibility remaining confined to the Sun City Project area and the western and southern western border of the Pilanesberg National Park where the terrain slopes directly towards the proposed infrastructure area. The visibility of the proposed infrastructure is completely contained to within 5 km of the proposed infrastructure. The viewshed areas for the categories are listed in Table 8-3 below.

Table 8-3: Viewshed Area per Category (Eco-Lodge)

Category	Impact	Viewshed Area
0 – 2 km	Potentially Very High Visual Exposure	10.15 km^2
2 – 5 km	Potentially Moderate Visual Exposure	3.46 km^2
5 – 10 km	Potentially Low Visual Exposure	-

8.1.4 Proposed Hotel

The daytime practical viewshed model (Figure 8-5) depicts the area from which the proposed infrastructure may potentially be visible during the day. This daytime viewshed model covers an area of approximately 26.24 km^2. The viewshed is noticeably limited by topographic screening in all directions, with the majority of its visibility remaining confined to the Sun City Project area and the eastern and southern border of the Pilanesberg National Park where the terrain slopes directly towards the proposed infrastructure area. The visibility also extends further to the south-east where visibility of the proposed infrastructure will be visible between in the lower lying corridors of the Elands River valley to the south-east of the proposed infrastructure area. The viewshed areas for the categories are listed in Table 8-4 below.

Table 8-4: Viewshed Area per Category (Hotel)

Category	Impact	Viewshed Area
0 – 2 km	Potentially Very High Visual Exposure	8.52 km^2
2 – 5 km	Potentially Moderate Visual Exposure	5.46 km^2
5 – 10 km	Potentially Low Visual Exposure	12.26 km^2

8.1.5 Alternative Infrastructure

The daytime practical viewshed model (Figure 8-6) depicts the area from which the proposed infrastructure may potentially be visible during the day. This daytime viewshed model covers an area of approximately 16.37 km^2. The viewshed is noticeably limited by topographic screening in all directions, with the majority of its visibility remaining confined to the Sun City Project area and the eastern and southern border of the Pilanesberg National Park where the terrain slopes directly towards the proposed infrastructure area. The visibility also extends further to the south-east where visibility of the proposed infrastructure will be visible between in the lower lying corridors of the Elands River valley to the south-east of the proposed infrastructure area. The viewshed areas for the categories are listed in Table 8-5 below.

Table 8-5: Viewshed Area per Category (Alternative Infrastructure)

Category	Impact	Viewshed Area
0 – 2 km	Potentially Very High Visual Exposure	11.65 km^2
2 – 5 km	Potentially Moderate Visual Exposure	3.65 km^2
5 – 10 km	Potentially Low Visual Exposure	1.07 km^2

8.2 Sensitive Receptors

The visual sensitivity of receptors is dependent on the nature of the receptors (Oberholzer, 2005). Receptors in residential areas or nature reserves have a high sensitivity while receptors in industrial or mining areas have a low sensitivity. This section identifies the sensitive visual receptors in each category of the daytime practical viewshed models.

8.2.1 Proposed Vacation Club Phase 4

The potential visual receptors within the daytime practical viewshed model of the proposed infrastructure include the existing and new Bakubung Bush Lodges, the southern Pilanesberg National Park (including the main gate, the road leading to the main gate, and the employee residences directly west of the proposed infrastructure), a section of the Ledig settlement to the south and a section of the R556 regional road to the south of proposed infrastructure. The proposed infrastructure will also be visible to large parts of the south-western section of the Sun City Development Area, however the resort is not considered a

sensitive receptor. Table 8-6 and Figure 8-2 below illustrate the sensitive receptors by category.

Table 8-6: Sensitive Receptors per Category (Vacation Club Phase 4)

Category	Impact	Receptors
0 – 2 km	Potentially High Visual Exposure	Bakubung Bush Lodge (existing and newly constructed luxury lodge), Pilanesberg National Park (staff housing and small bush tracks bordering Sun City), Ledig, R556 motorists
2 – 5 km	Potentially Moderate Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
5 – 10 km	Potentially Low Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)

8.2.2 Proposed Vacation Club Phase 3

The potential visual receptors within the daytime practical viewshed model of the proposed infrastructure include the existing Bakubung Bush Lodge and the southern boundary of the Pilanesberg National Park (limited to small bush tracks). The proposed infrastructure will be visible from large parts of the Sun City Development Area, however the resort is not considered a sensitive receptor to its own infrastructure. Table 8-7 and Figure 8-3 below illustrate the sensitive receptors by category.

Table 8-7: Sensitive Receptors per Category (Vacation Club Phase 3)

Category	Impact	Receptors
0 – 2 km	Potentially High Visual Exposure	Bakubung Bush Lodge (existing bush lodge), Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
2 – 5 km	Potentially Moderate Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
5 – 10 km	Potentially Low Visual Exposure	No receptors identified

8.2.3 Proposed Eco-Lodge

The potential visual receptors within the daytime practical viewshed model of the proposed infrastructure include the existing Bakubung Bush Lodge and the southern boundary of the Pilanesberg National Park (limited to small bush tracks). The proposed infrastructure will be visible from large parts of the Sun City Development Area, however the resort is not considered a sensitive receptor to its own infrastructure. Table 8-8 and Figure 8-4 below illustrate the sensitive receptors by category.

Table 8-8: Sensitive Receptors per Category (Eco-Lodge)

Category	Impact	Receptors
0 – 2 km	Potentially High Visual Exposure	Bakubung Bush Lodge (existing bush lodge), Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
2 – 5 km	Potentially Moderate Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
5 – 10 km	Potentially Low Visual Exposure	No receptors identified

8.2.4 Proposed Hotel

The potential visual receptors within the daytime practical viewshed model of the proposed infrastructure include the southern boundary of the Pilanesberg National Park (limited to small bush tracks) and a small section of the R566 regional road. The proposed infrastructure will be visible from large parts of the Sun City Development Area, however the resort is not considered a sensitive receptor to its own infrastructure. Table 8-9 and Figure 8-5 below illustrate the sensitive receptors by category.

Table 8-9: Sensitive Receptors per Category (Hotel)

Category	Impact	Receptors
0 – 2 km	Potentially High Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks), R556 motorists
2 – 5 km	Potentially Moderate Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
5 – 10 km	Potentially Low Visual Exposure	No receptors identified

8.2.5 Alternative Infrastructure

The potential visual receptors within the daytime practical viewshed model of the proposed infrastructure include the southern Pilanesberg National Park (including the employee residences directly west of the proposed infrastructure). The proposed infrastructure will be visible from large parts of the Sun City Development Area; however the resort is not considered a sensitive receptor to its own infrastructure. Table 8-10 and Figure 8-6 below illustrate the sensitive receptors by category.

Table 8-10: Sensitive Receptors per Category (Alternative Infrastructure)

Category	Impact	Receptors
0 – 2 km	Potentially High Visual Exposure	Pilanesberg National Park (staff housing and small bush tracks bordering Sun City)
2 – 5 km	Potentially Moderate Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)
5 – 10 km	Potentially Low Visual Exposure	Pilanesberg National Park (no residents or lodges, only small game vehicle tracks)

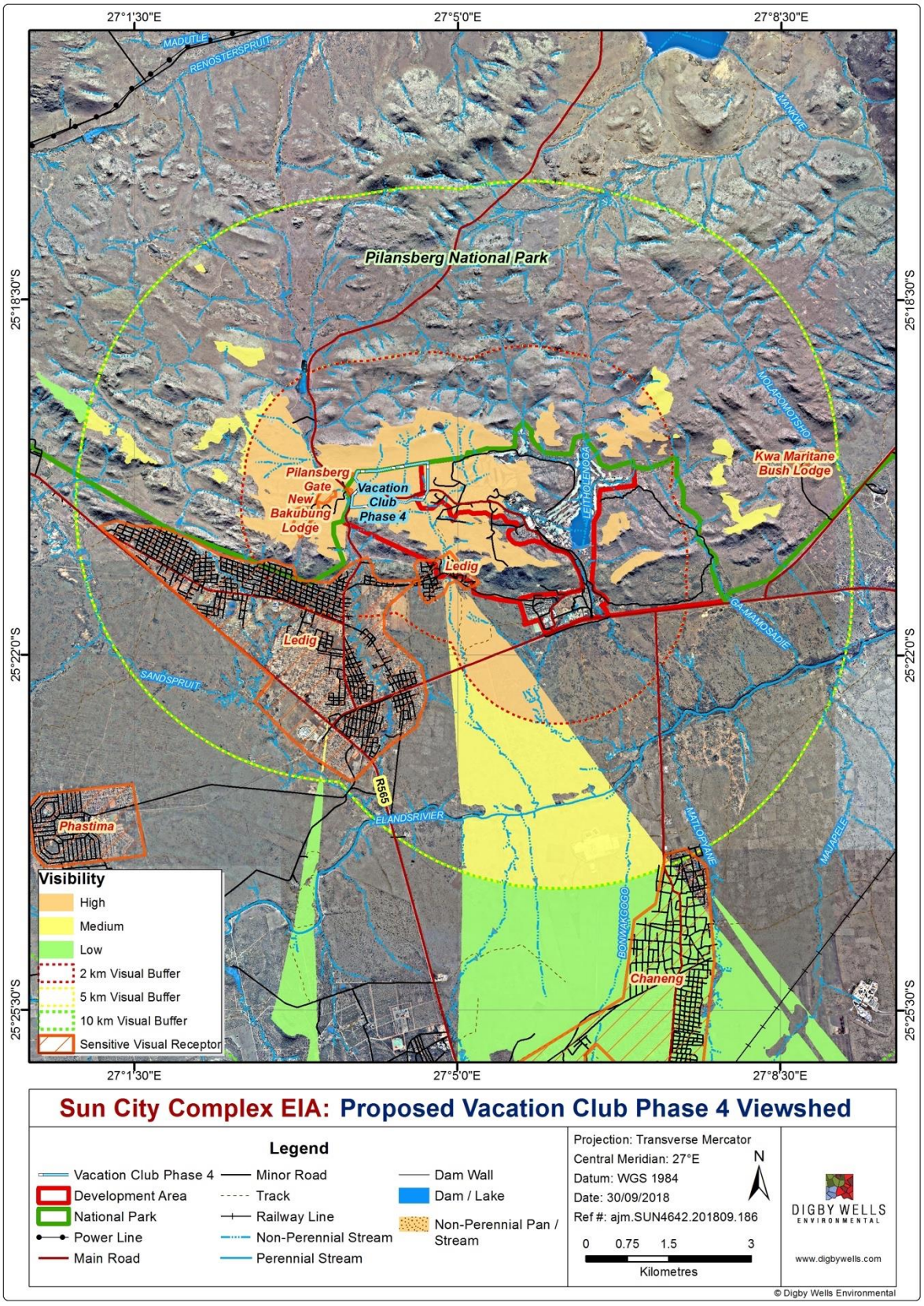

Figure 8-2: Proposed Vacation Club Phase 4 Viewshed

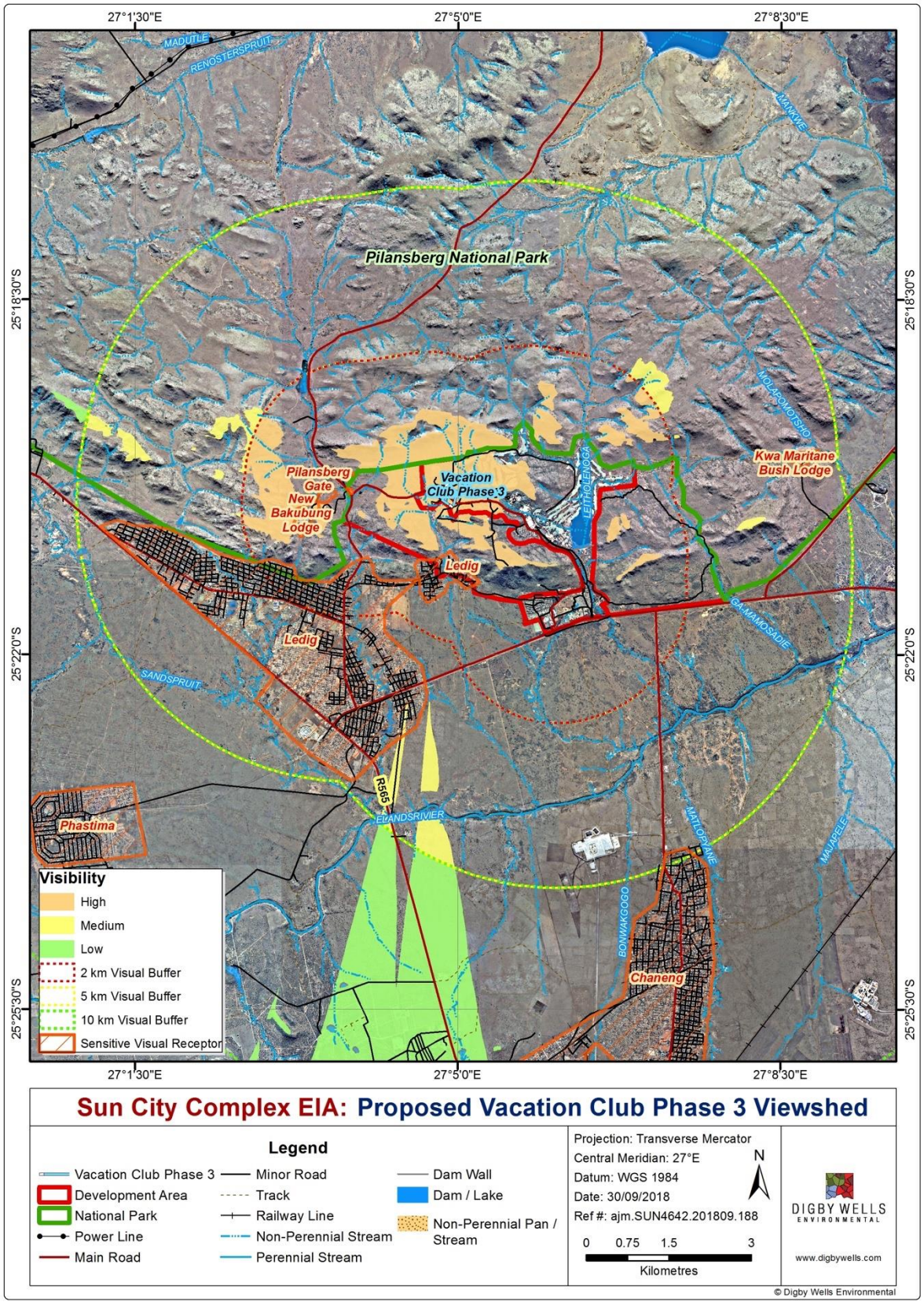

Figure 8-3: Proposed Vacation Club Phase 3 Viewshed

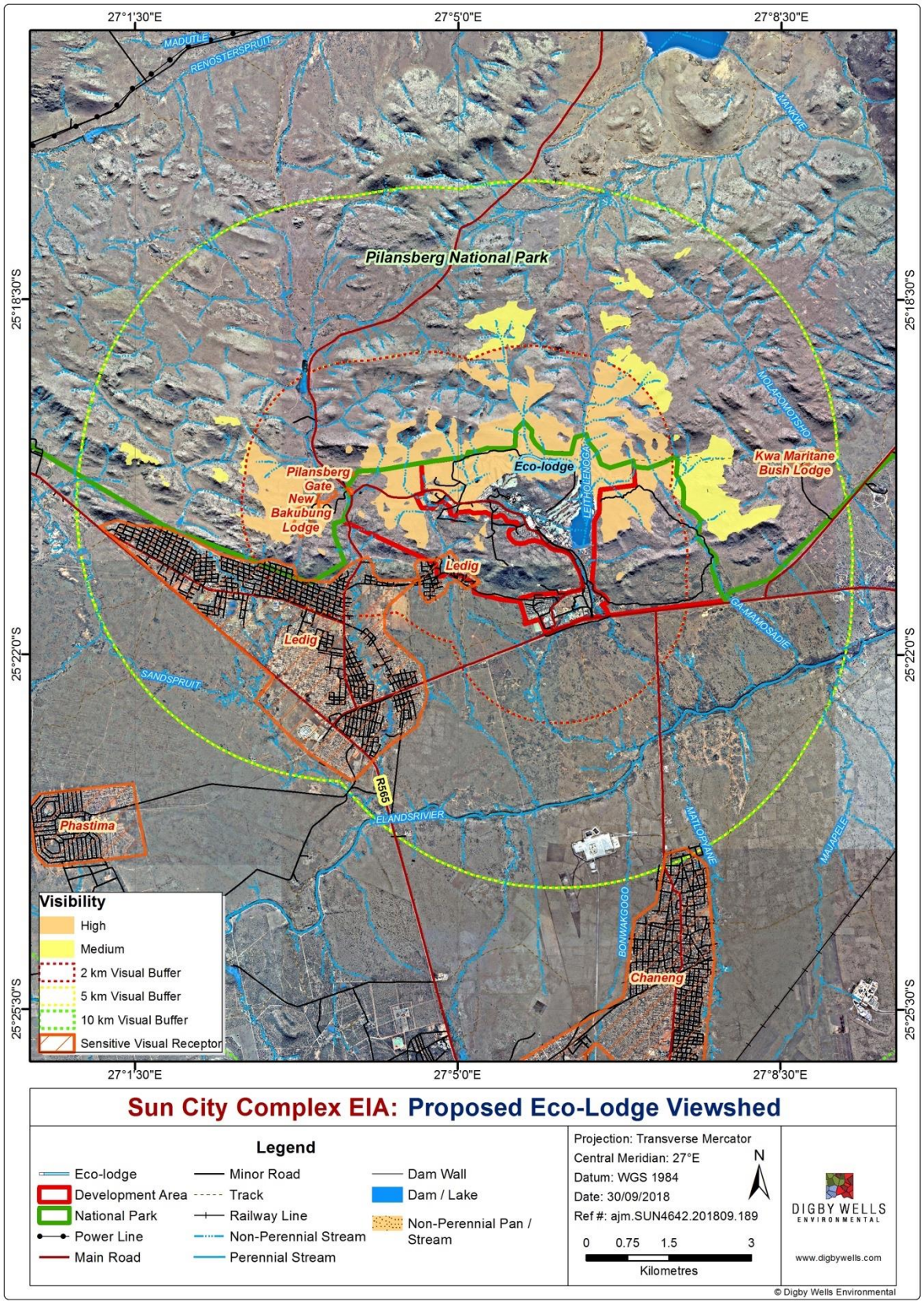

Figure 8-4: Proposed Eco-Lodge Viewshed

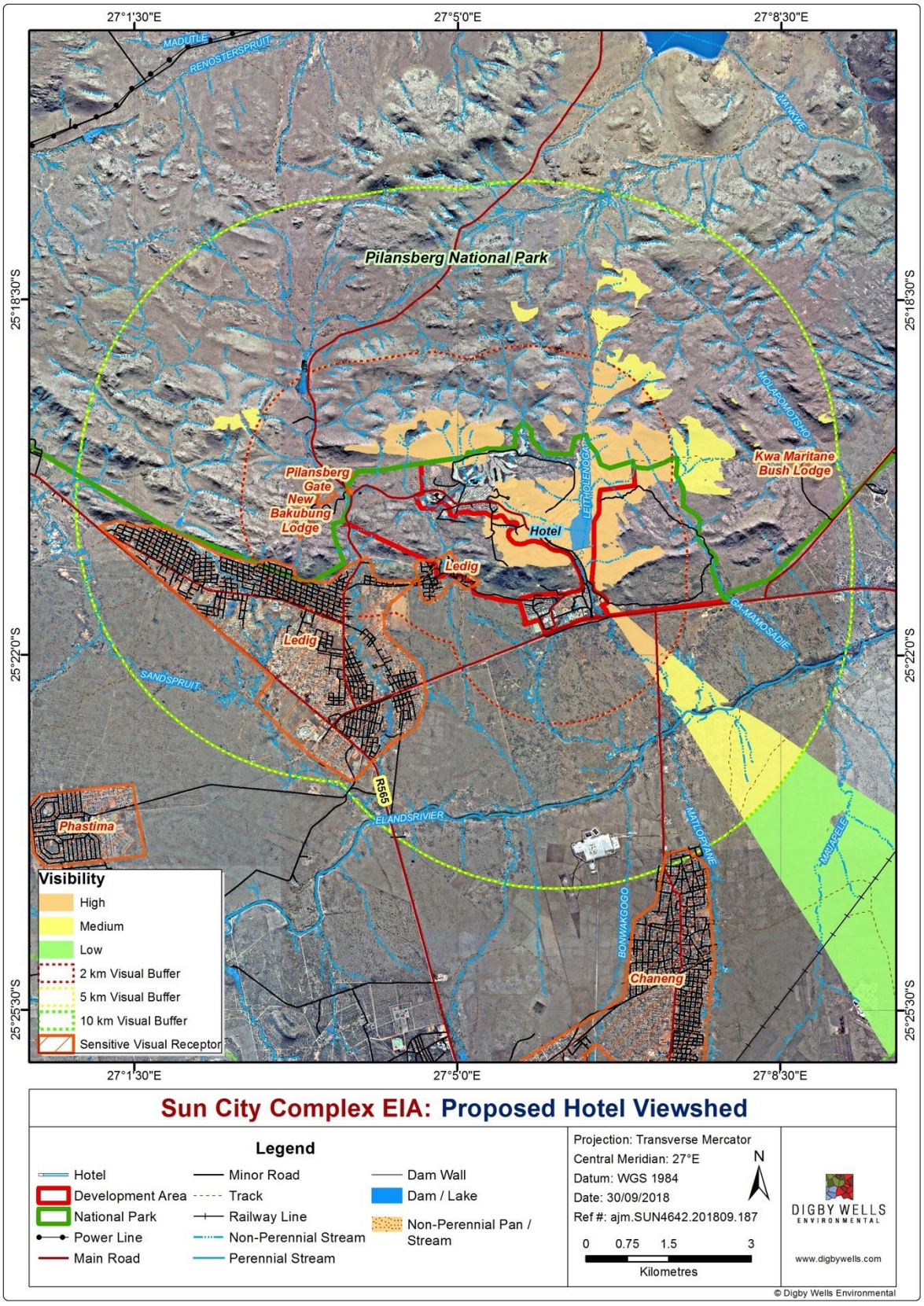

Figure 8-5: Proposed Hotel Viewshed

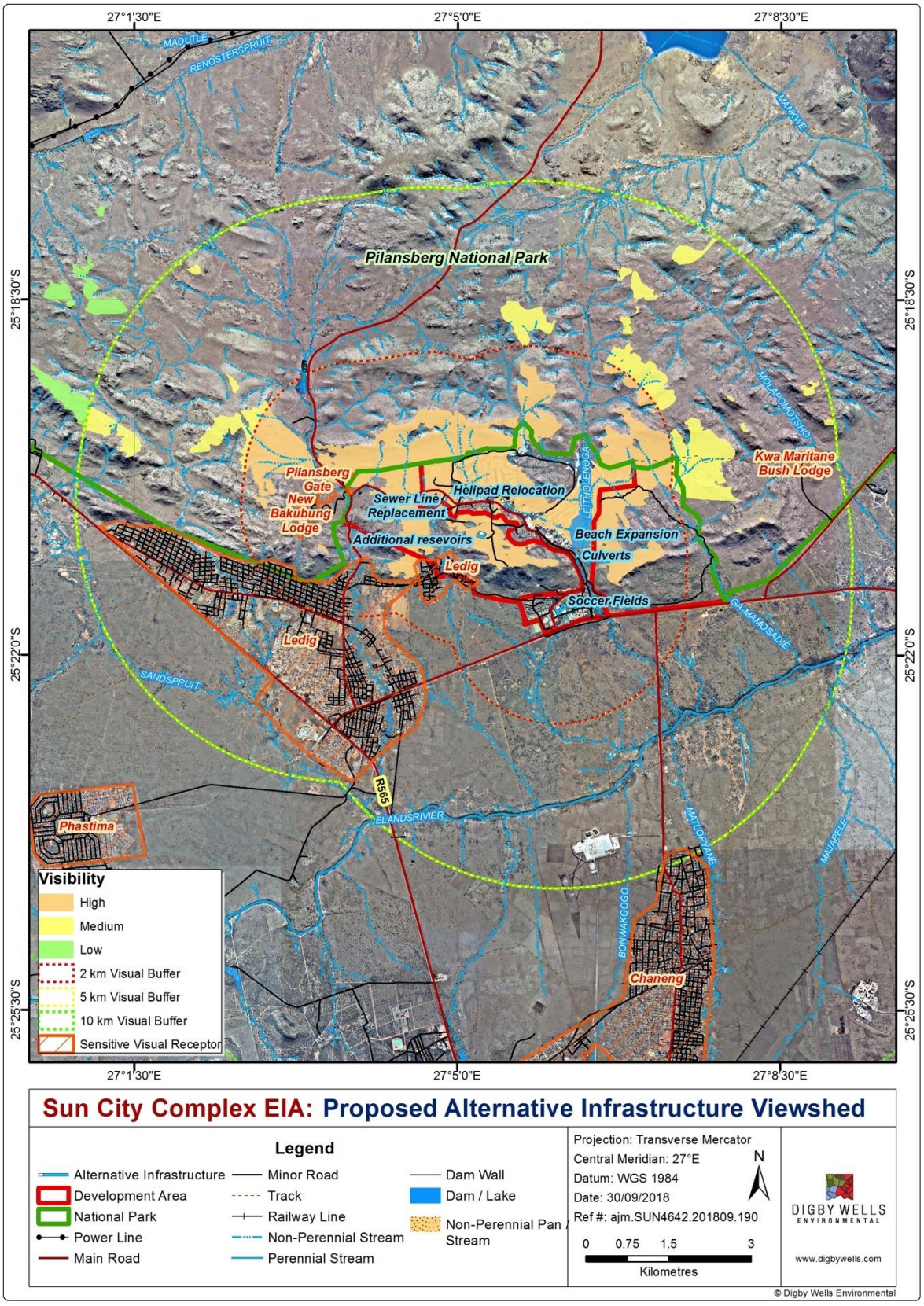

Figure 8-6: Alternative Infrastructure Viewshed

8.3 Photomontages

This section presents the photomontages created for the Project. Based on the viewshed model, two photomontages were created to illustrate the potential impact of the most visually prominent proposed infrastructure. The most visually intrusive infrastructure based on the viewshed and confirmed during the site visit will be the proposed Vacation Club (Phase 4).

The other photomontage was created by taking a photo from the most visible location to simulate the proposed infrastructure from within the Sun City Development Area. The location and view direction of the photo base used in the photomontages is illustrated in Figure 8-7.

The photomontages were created by adding the proposed infrastructure to photographs of the current views. The scale of the images was measured by comparing the length of an object in the photo to the length of the object in reality. This scale was then used to calculate the size of the proposed infrastructure based on the estimated heights of the proposed infrastructure.

The infrastructure was overlaid on the original photograph in their respective locations (based on the line of sight from the point the photograph was taken) to give an approximation of what the view will look like before and during the operation of the Project.

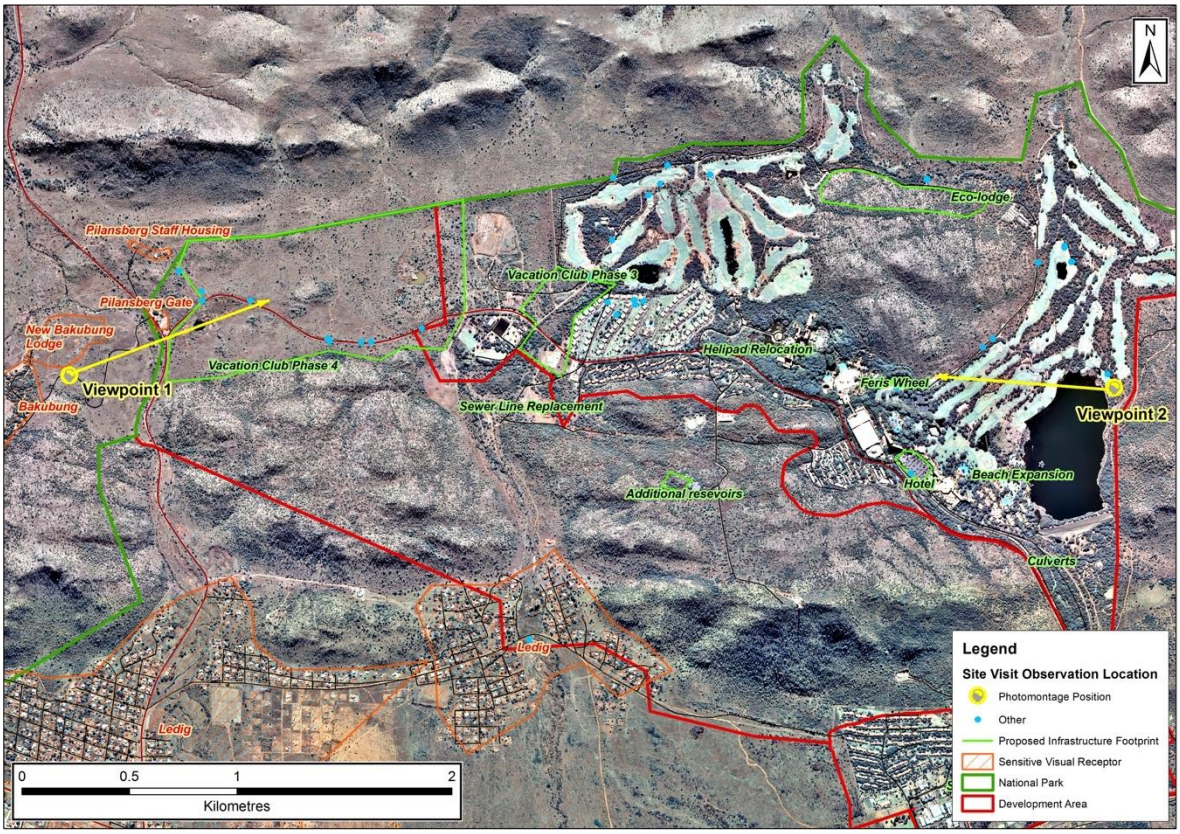

Figure 8-7: Photomontage Locations

8.3.1 Viewpoint 1

Viewpoint 1 is located at the new Bakubung Luxury Lodge, looking in an easterly direction. The distance of the visual receptor from the proposed Vacation Club Phase 4 is 500 m from the closest boundary of the Bakubung Luxury Lodge. Refer to Figure 8-8 and Figure 8-9.

Figure 8-8: Current view from Viewpoint 1 in an easterly direction towards the Vacation Club (Phase 4)

Figure 8-9: Potential future view from Viewpoint 1 in an easterly direction towards the Vacation Club (Phase 4)

8.3.2 Viewpoint 2

Viewpoint 2 is located on the 17th Tee of the Gary Player Country Club looking in a north-westerly direction towards the proposed infrastructure. This location was chosen as the best location within Sun City to simulate the visual appearance of the proposed hotel from within the Sun City complex. The distance of the visual receptor from the proposed infrastructure is 900 m. Refer to Figure 8-10 and Figure 8-11.

Figure 8-10: Current view from Viewpoint 2 in a westerly direction towards the hotel

Figure 8-11: Potential future view from Viewpoint 2 in a westerly direction towards the hotel

9 Sensitivity of the Site

The Project will have a moderate visual impact on the receiving environment. The most significant daytime visual impact will be from the Vacation Club (Phase 4 which will have a noticeable change in landscape from the existing landscape. The buildings will stand out against the natural landscape considering the design and colour of the existing Vacation Club developments. The visual impact will be limited to specific receptors, mainly the New Bakubung lodge, residents within Ledig and the Pilanesberg National Park.

The visual impact of the other proposed infrastructure is mainly contained within the Sun City Development Area and the Pilanesberg National Park. Although the National Park is a sensitive receptor, the proposed infrastructure is not expected to have a major negative visual impact considering that the affected park areas already have partial visibility of the existing Sun City infrastructure. It must also be noted that Sun City Resort is regarded to be a low impact receptor as the resort serves as a major tourism hub for the region. The resort, in general is well screened and vegetated resulting in infrastructure being sporadically visible within the resort, and particular attention is made to minimise light emission and glow through effective down-lighting and strategically placed security lighting.

Oberholzer (2005) provides a number of criteria related specifically to VIAs (Table 9-1) and suggests that a proposed project should be assessed against these criteria before conducting the impact assessment. Table 9-1 provides a summary of the criteria and they are discussed in more detail in Sections 9.1 to 9.6 below.

Table 9-1: Specific Criteria for VIAs (adapted from Oberholzer, 2005)

Criteria	Rating	Description
Visibility of the project	High visibility	Visible from a large area (e.g. several square kilometres)
	Moderate visibility	**Visible from an intermediate area (e.g. several hectares)**
	Low visibility	Visible from a small area around the project site
Visual exposure	High exposure	Dominant or clearly noticeable
	Moderate exposure	**Recognisable to the viewer**
	Low exposure	Not particularly noticeable to the viewer
Visual sensitivity of the area	High visual sensitivity	Highly visible and potentially sensitive areas in the landscape
	Moderate visual sensitivity	**Moderately visible areas in the landscape**
	Low visual sensitivity	Minimally visible areas in the landscape
Visual sensitivity of receptors	**High sensitivity**	**Residential areas, nature reserves and scenic routes or trails**
	Moderate sensitivity	Sporting or recreational areas, or places of work
	Low sensitivity	Industrial, mining or degraded areas
Visual absorption capacity (VAC)	**High VAC**	**Effective screening by topography and vegetation**
	Moderate VAC	Partial screening by topography and vegetation
	Low VAC	Little screening by topography or vegetation
Visual intrusion	High visual intrusion	Results in a noticeable change or is discordant with the surroundings
	Moderate visual intrusion	**Partially fits into the surroundings, but clearly noticeable**
	Low visual intrusion	Minimal change or blends in well with the surroundings

9.1 Visibility of the Project

The visibility of the project refers to the viewshed area and is also related to the number of receptors affected (Oberholzer, 2005). The Project has a **moderate visibility** as it is visible from a large area (defined by Oberholzer (2005) as several hectares) with visual receptors.

9.2 Visual Exposure

Visual exposure is “based on the distance from the infrastructure area to selected viewpoints” and “tends to diminish exponentially with distance” (Oberholzer, 2005). The Project has a **moderate exposure** as it will be moderately recognisable in the landscape and noticeable to receptors within the viewshed area. This is illustrated by the photomontages (Section 8.3).

9.3 Visual Sensitivity of the Area

The visual sensitivity of the area refers to “the inherent visibility of the landscape, usually determined by a combination of topography, landform, vegetation cover and settlement pattern” (Oberholzer, 2005). The receiving environment of the Project has a **moderate visual sensitivity** as there is a significant amount of terrain and vegetation screening for much of the proposed infrastructure.

The receiving environment has a largely rural, bushveld sense of place (Figure 9-1). The surrounding, receiving environment of the largely natural, bushveld environment has an extremely strong sense of place. It has a landscape character typical of the Pilanesberg area. The hilly topography is expected to provide significant screening of the proposed infrastructure while the natural Bushveld and Thornveld vegetation of the Development area and surrounds is expected to provide some form of screening of the proposed infrastructure.

Figure 9-1: Surrounding Sense of Place

9.4 Visual Sensitivity of Receptors

The visual sensitivity of receptors is dependent on the nature of the receptors (Oberholzer, 2005). Receptors in residential areas or nature reserves have a high sensitivity while receptors in industrial or mining areas have a low sensitivity. The identified receptors (residents within the Pilanesberg National Park and tourists at the Bakubung Bush Lodge) have a **high sensitivity** as they include residential areas and tourism sites.

9.5 Visual Absorption Capacity

The Visual Absorption Capacity (VAC) refers to "the potential of the landscape to conceal the proposed project" (Oberholzer, 2005). The receiving environment of the Project has a **high VAC** because there is sufficient screening by the topography and vegetation.

9.6 Visual Intrusion

The visual intrusion of the project refers to "the level of compatibility or congruence of the project with the particular qualities of the area, or its sense of place". Visual intrusion is "related to the idea of context and maintaining the integrity of the landscape or townscape" (Oberholzer, 2005). The Project has a **moderate visual intrusion** as it partially fits in with the surroundings.

10 Assumptions, Limitations and Gaps in Knowledge

Despite the evidence presented in this report, it must be noted that a VIA is arguably subjective by nature. This subjectivity is due to the different opinions receptors may have of a proposed project. Oberholzer (2005) defines receptors as "individuals, groups or communities who are subject to the visual influence of a particular project". A receptor may be partial to the fact that a proposed project is occurring in an area, which becomes a source of economic upliftment for a community, whereas another receptor may view a proposed project as a negative factor which could hamper tourism or recreational activities.

Many factors can enhance or reduce the visual impact of a proposed project. Vegetation near a receptor's viewpoint can greatly reduce that receptor's view of a proposed project. Other factors such as weather/climatic conditions and seasonal change can also affect a receptor's view of a proposed project.

The topographical model was created using the available 5 m contour relief data from Chief Directorate: National Geo-Spatial Information (CD:NGI). This data is generalised in the surrounding area outside of the Development Area and some of the topography detail is lost. *It must be noted that vegetation and existing surface infrastructure was not included in the practical viewshed models*.

A major limitation to this study was the lack of detailed design drawings and vertical heights of proposed infrastructure. The expansion activities are still mainly in a conceptual phase with no detailed engineering or lighting plans. The models predicting the likely impact are therefore subject to change and the resulting impacts and significance of these impacts may change in the future.

The photomontages were created without design drawings, lighting plans, or textural information. The photomontages are therefore a culmination of an approximation of the proposed infrastructure's likely appearance, and the appearance of existing similar infrastructure in the Development Area.

11 Impact Assessment Methodology

Impacts and risks have been identified based on a description of the activities to be undertaken. Once impacts have been identified, a numerical environmental significance rating process will be undertaken that utilises the probability of an event occurring and the severity of the impact as factors to determine the significance of a particular environmental impact.

The severity of an impact is determined by taking the spatial extent, the duration and the severity of the impacts into consideration. The probability of an impact is then determined by the frequency at which the activity takes place or is likely to take place and by how often the type of impact in question has taken place in similar circumstances.

Following the identification and significance ratings of potential impacts, mitigation and management measures will be incorporated into the Environmental Management Plan (EMP).

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability x Nature

Where

Consequence = Intensity + Extent + Duration

And

Probability = Likelihood of an impact occurring

And

Nature = Positive (+1) or negative (-1) impact

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts.

The matrix calculates the rating out of 147, whereby intensity, extent, duration and probability are each rated out of seven as indicated in Table 11-1. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation has been applied; post-mitigation is referred to as the residual impact. The significance of an impact is determined and categorised into one of eight categories (Table 11-1). The descriptions of the significance ratings are presented in Table 11-2.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, (i.e., there may already be some mitigation included in the engineering design). If the specialist determines the potential impact is still too high, additional mitigation measures are proposed.

Table 11-1: Impact Assessment Parameter Ratings

Rating	Intensity/ Replaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
7	Irreplaceable loss or damage to biological or physical resources or highly sensitive environments. Irreplaceable damage to highly sensitive cultural/social resources.	Noticeable, on-going natural and/or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent The impact is irreversible, even with management, and will remain after the life of the project.	Definite There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability
6	Irreplaceable loss or damage to biological or physical resources or moderate to highly sensitive environments. Irreplaceable damage to cultural/social resources of moderate to high sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond Project Life The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost Certain/Highly Probable It is most likely that the impact will occur. < 80% probability
5	Serious loss and/or damage to biological or physical resources or highly sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/Region Will affect the entire province of region.	Project Life (> 15 years) The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely The impact may occur. < 65% probability

Rating	Intensity/ Replaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
4	Serious loss and/or damage to biological or physical resources or moderately sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures/items of cultural significance.	Average to intense natural and/or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long Term 6-15 years and the impact can be reversed with management.	Probable Has occurred here or elsewhere and could therefore occur. < 50% probability
3	Moderate loss and/or damage to biological or physical resources or low to moderately sensitive environments, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local extending only as far as the development site area.	Medium Term 1-5 years and the impact can be reversed with minimal management.	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. < 25% probability

Rating	Intensity/ Replaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
2	Minor loss and/or effects to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experienced by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	Short Term Less than 1 year and is reversible.	Rare/Improbable Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. < 10% probability
1	Minimal to no loss and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to common place structures.	Some low-level natural and/or social benefits felt by a very small percentage of the baseline.	Site Specific Limited to specific isolated parts of the site.	Immediate Less than 1 month and is completely reversible without management.	Highly Unlikely/None Expected never to happen. < 1% probability

Table 11-2: Probability/Consequence Matrix

Probability	Significance																																								
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	**-20**	**-19**	**-18**	**-17**	**-16**	**-15**	**-14**	**-13**	**-12**	**-11**	**-10**	**-9**	**-8**	**-7**	**-6**	**-5**	**-4**	**-3**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Consequence																																								

Table 11-3: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive) (+)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long term positive change to the (natural and/or social) environment.	Major (positive) (+)
36 to 72	A positive impact. These impacts will usually result in positive medium to long term effects on the natural and/or social environment.	Minor (positive) (+)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and/or social environment.	Negligible (positive) (+)
-3 to -35	An acceptable negative impact for which mitigation is desirable. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and/or social environment.	Negligible (negative) (-)
-36 to -72	A minor negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long term effects on the natural and/or social environment.	Minor (negative) (-)
-73 to -108	A moderate negative impact which may prevent the implementation of the project. These impacts would be considered as constituting a major and usually a long term change to the (natural and/or social) environment and result in severe changes.	Moderate (negative) (-)
-109 to -147	A major negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative) (-)

12 Impact Assessment

The Project activities and infrastructure will be rated according to the visual impact they will have on the receiving environment, i.e. the environment before potential development. Negative visual impacts decrease the visual character of the pre-development environment. Neutral visual impacts assist to minimise the negative visual impacts of a development but do not result in a positive visual impact. A positive visual impact only occurs when an area is rehabilitated to a state that is better than the state of the pre-development environment, e.g. an infrastructure project area on previously agricultural land is rehabilitated to an area of natural vegetation and all visible signs of agriculture and infrastructure are removed. Positive visual impacts may only occur during the decommissioning and closure phase.

The lifespan of the proposed infrastructure is expected to be permanent and therefore no closure/decommissioning phase has been included. The main activities for each phase is detailed in Table 12-1.

Table 12-1: Project Activities

Phase	***Activity***	***Duration***
Construction	Change of Land Use	Permanent (land use will be permanently changed)
	Site Clearance	Site clearance will be short term
Construction / Operation	Construction and expansion of Vacation Club (Phase 4) to maximum height	Permanent once infrastructure reaches full vertical extent
	Construction and expansion of Vacation Club (Phase 3) to maximum height	Permanent once infrastructure reaches full vertical extent
	Construction and expansion of Eco-lodge to maximum height	Permanent once infrastructure reaches full vertical extent
	Construction and expansion of Hotel to maximum height	Permanent once infrastructure reaches full vertical extent
	Construction and expansion of Alternative infrastructure to maximum height	Permanent once infrastructure reaches full vertical extent
Operation	Lighting of Proposed Infrastructure	Permanent

12.1.1 Construction Phase

The construction phase is characterised by site development and infrastructure construction. This includes site clearing, vegetation removal, topsoil removal, and the construction and expansion of infrastructure. The establishment of infrastructure and the related site clearing and construction activities will draw attention to the Project area making receptors aware of the Project. The construction phase will have negative visual impacts on the receiving environment.

12.1.1.1 Site Clearing

Site clearing will have a minor negative visual impact on sensitive receptors considering the proposed footprint areas for all the proposed infrastructure areas. The slight change of land use will contribute to the cumulative impacts of the development on the regional environment as shown in Table 12-2.

Table 12-2: Potential Impacts of Site Clearance

IMPACT DESCRIPTION: Potential Impacts of Site Clearing on the Receiving Environment				
Dimension	**Rating**	**Motivation**	**Significance**	
PRE-MITIGATION				
Duration	Short term (2)	The impact will occur during the construction phase.	Consequence: Slightly detrimental (-7)	Significance: Minor - negative (-42)
Extent	Local (3)	Site clearing activities will be visible from the area surrounding the construction site.		
Intensity x type of impact	Low - negative (-2)	Site clearing is expected to cause a moderate visual disturbance. The natural vegetation will be cleared to make way for the Project. The Project area will become noticeable to the nearby receptors as it will contrast the surrounding areas.		
Probability	Highly probable (6)	The impact will most probably occur.		
MITIGATION:				
Only remove vegetation within the infrastructure footprint areas; Only remove topsoil within the infrastructure footprint areas; Vegetate the topsoil spoils as soon as possible so that they blend into the surrounding landscape; Limit the footprint area and height of any topsoil spoils; and Apply dust suppression techniques to limit dust generated from the topsoil spoils.				
POST-MITIGATION				
Duration	Short-term term (2)	The impact will occur during the construction phase.	Consequence: Slightly detrimental (-6)	Significance: Negligible - negative (-30)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation actions listed above.		
Intensity x type of impact	Low - negative (-2)	The visual disturbance will be reduced by implementing the mitigation measures above.		
Probability	Likely (5)	It is most likely that the impact will occur.		

12.1.2 Construction/Operational Phase

The construction and expansion of infrastructure until the infrastructure reaches its full extent have been combined into a construction/operational phase as the impacts that have been rated are based on a worst-case scenario that will occur when the proposed infrastructure reaches its maximum vertical extent.

12.1.2.1 Construction and Operation of the Vacation Club (Phase 4)

The construction and operation of the Vacation Club (Phase 4) will have a moderate negative visual impact on sensitive receptors considering the proposed footprint areas for all the proposed infrastructure areas. The presence of the structures will contribute to the cumulative impacts of the development on the regional environment. This impact will be reduced to a minor negative impact provided the listed mitigation measures in Table 12-3 are implemented.

Table 12-3: Potential Impacts of Construction and Operation of the Vacation Club (Phase 4)

IMPACT DESCRIPTION: Potential Impacts of Construction and Operation of the Vacation Club (Phase 4)				
Dimension	**Rating**	**Motivation**	**Significance**	
PRE-MITIGATION				
Duration	Permanent (7)	There will be a negative impact during the construction and expansion of the vacation club. The impact is like to remain indefinitely	Consequence: Highly detrimental (-14)	Significance: Moderate - negative (-98)
Extent	Municipal Area (4)	The daytime practical viewshed model indicates that the Project will be visible from a distance of up to 10 km during the day.		
Intensity x type of impact	Moderate - negative (-3)	Construction and operation of the vacation club will have a moderate visual disturbance on potential receptors.		
Probability	Certain (7)	The impact will definitely occur.		
MITIGATION:				
Ensure the Vacation Club buildings do not exceed the proposed heights by limiting them to single storey buildings; Where possible, surface infrastructure must be painted natural tones so that it blends into the surrounding landscape; Limit the footprint area of the surface infrastructure; The planting of natural vegetation amongst the buildings of the Vacation Club will assist in screening the buildings and unnatural structures. Specific vegetation screening should be focused between the proposed buildings and the sensitive receptors; Associated infrastructure such as street lights must be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, a neutral matt finish must				

be used; and Avoid construction activities at night. If construction activities take place at night then down-lighting must be implemented to minimise light pollution. Down-lighting must also be implemented for any permanent lights installed during the construction phase.				
POST-MITIGATION				
Duration	Beyond project life (6)	There will be a long-term negative visual impact on the receiving environment. The buildings and associated infrastructure will remain for an indefinite duration.	Consequence: Moderately detrimental (-12)	Significance: Minor - negative (-72)
Extent	Municipal Area (4)	The extent of the impact will be reduced by implementing the mitigation actions listed above.		
Intensity x type of impact	Low - negative (-2)	The visual disturbance will be reduced by implementing the mitigation measures above.		
Probability	Highly probable (6)	It is most likely that the impact will occur.		

12.1.2.2 Construction and Operation of the Vacation Club (Phase 3)

The construction and operation of the Vacation Club (Phase 3) will have a moderate negative visual impact on sensitive receptors considering the proposed footprint areas for all the proposed infrastructure areas. The presence of the structures will contribute to the cumulative impacts of the development on the regional environment. This impact will be reduced to a minor negative impact provided the listed mitigation measures are implemented.

Table 12-4: Potential Impacts of Construction and Operation of the Vacation Club (Phase 3)

IMPACT DESCRIPTION: Potential Impacts of Construction and Operation of the Vacation Club (Phase 3)				
Dimension	***Rating***	**Motivation**	**Significance**	
PRE-MITIGATION				
Duration	Permanent (7)	There will be a negative impact during the construction an expansion of the vacation club. The impact is like to remain indefinitely	Consequence: Moderately detrimental (-13)	Significance: Moderate - negative (-91)

Extent	Municipal Area (4)	The daytime practical viewshed model indicates that the Project will be visible from a distance of up to 10 km during the day.		
Intensity x type of impact	Low - negative (-2)	Construction and operation of the large vacation club will have a moderate - negative visual disturbance on potential receptors.		
Probability	Certain (7)	The impact will definitely occur.		
MITIGATION:				
Ensure the Vacation Club buildings do not exceed the proposed heights by limiting them to single storey buildings; Where possible, surface infrastructure must be painted natural tones so that it blends into the surrounding landscape; Limit the footprint area of the surface infrastructure; The planting of natural vegetation amongst the buildings of the vacation club will assist in screening the buildings and unnatural structures; Associate infrastructure such as street lights must be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, a neutral matt finish must be used; and Avoid construction activities at night. If construction activities take place at night then down-lighting must be implemented to minimise light pollution. Down-lighting must also be implemented for any permanent lights installed during the construction phase.				
POST-MITIGATION				
Duration	Beyond project life (6)	There will be a long-term negative visual impact on the receiving environment. The buildings and associated infrastructure will remain for an indefinite duration.	Consequence: Moderately detrimental (-12)	Significance: Minor - negative (-72)
Extent	Municipal Area (4)	The extent of the impact will be reduced by implementing the mitigation actions listed above.		
Intensity x type of impact	Low - negative (-2)	The visual disturbance will be reduced by implementing the mitigation measures above.		
Probability	Highly probable (6)	It is most likely that the impact will occur.		

12.1.2.3 Construction and Operation of the Eco-Lodge

The construction and operation of the eco-lodge will have a moderate negative visual impact on sensitive receptors considering the proposed footprint areas for all the proposed infrastructure areas. The presence of the structures will contribute to the cumulative impacts of the development on the regional environment. This impact will be reduced to a minor negative impact provided the listed mitigation measures are implemented.

Table 12-5: Potential Impacts of Construction and Operation of the Eco-Lodge

<table>
<tr><th colspan="5">IMPACT DESCRIPTION: Potential Impacts of Construction and Operation of Eco-Lodge</th></tr>
<tr><th>Dimension</th><th>Rating</th><th>Motivation</th><th colspan="2">Significance</th></tr>
<tr><td colspan="5">PRE-MITIGATION</td></tr>
<tr><td>Duration</td><td>Permanent (7)</td><td>There will be a negative impact during the construction an expansion of the eco-lodge. The impact is like to remain indefinitely</td><td rowspan="4">Consequence: Moderately detrimental (-12)</td><td rowspan="4">Significance: Moderate - negative (-84)</td></tr>
<tr><td>Extent</td><td>Local (3)</td><td>The daytime practical viewshed model indicates that the Project will be visible from a distance of up to 5 km during the day.</td></tr>
<tr><td>Intensity x type of impact</td><td>Low - negative (-2)</td><td>Construction and operation of the large eco-lodge will have a moderate - negative visual disturbance on potential receptors.</td></tr>
<tr><td>Probability</td><td>Certain (7)</td><td colspan="2">The impact will definitely occur.</td></tr>
<tr><td colspan="5">MITIGATION:</td></tr>
<tr><td colspan="5">Ensure the eco-lodge buildings do not exceed the proposed heights by limiting them to single story buildings;
Where possible, surface infrastructure must be painted natural hues so that it blends into the surrounding landscape;
Limit the footprint area of the surface infrastructure;
The planting of natural vegetation amongst the buildings of the eco-lodge will assist in screening the buildings and unnatural structures;
Associate infrastructure such as street lights must be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, a neutral matt finish must be used; and
Avoid construction activities at night. If construction activities take place at night then down-lighting must be implemented to minimise light pollution. Down-lighting must also be implemented for any permanent lights installed during the construction phase.</td></tr>
<tr><td colspan="5">POST-MITIGATION</td></tr>
<tr><td>Duration</td><td>Beyond project life (6)</td><td>There will be a negative impact during the construction an expansion of the eco-lodge. The impact is like to remain indefinitely</td><td rowspan="3">Consequence: Moderately detrimental (-11)</td><td rowspan="3">Significance: Minor - negative (-55)</td></tr>
<tr><td>Extent</td><td>Local (3)</td><td>The daytime practical viewshed model indicates that the Project will be visible from a distance of up to 5 km during the day.</td></tr>
<tr><td>Intensity x type of impact</td><td>Low - negative (-2)</td><td>Construction and operation of the large eco-lodge will have a moderate - negative visual disturbance on</td></tr>
</table>

		potential receptors.		
Probability	Likely (5)	It is most likely that the impact will occur.		

12.1.2.4 *Construction and Operation of the Hotel*

The construction and operation of the hotel will have a low negative visual impact on sensitive receptors considering the proposed footprint areas for all the proposed infrastructure areas. The presence of the proposed hotel will contribute to the cumulative impacts of the development on the regional environment. This impact will be reduced to a minor negative impact provided the listed mitigation measures are implemented.

Table 12-6: Potential Impacts of Construction and Operation of the Hotel

IMPACT DESCRIPTION: Potential Impacts of Construction and Operation of Hotel				
Dimension	**Rating**	**Motivation**	**Significance**	
PRE-MITIGATION				
Duration	Permanent (7)	There will be a negative impact during the construction an expansion of the hotel. The impact is like to remain indefinitely	Consequence: Moderately detrimental (-13)	Significance: Moderate - negative (-91)
Extent	Municipal Area (4)	The daytime practical viewshed model indicates that the Project will be visible from a distance of up to 10 km during the day.		
Intensity x type of impact	Low - negative (-2)	Construction and operation of the hotel will have a moderate - negative visual disturbance on potential receptors.		
Probability	Certain (7)	The impact will definitely occur.		
MITIGATION:				
Ensure the hotel does not exceed the proposed height; Where possible, the hotel must be painted natural tones so that it blends into the surrounding landscape; In the design phase, the hotel should be kept in conformity with the colours and textures of the existing surrounding infrastructure; Avoid construction activities at night. If construction activities take place at night then down-lighting must be implemented to minimise light pollution. Down-lighting must also be implemented for any permanent lights installed during the operation phase.				
POST-MITIGATION				

Duration	Beyond project life (6)	There will be a long-term negative visual impact on the receiving environment. The hotel and associated infrastructure will remain for an indefinite duration.	Consequence: Moderately detrimental (-12)	Significance: Minor - negative (-72)
Extent	Municipal Area (4)	The extent of the impact will be reduced by implementing the mitigation actions listed above.		
Intensity x type of impact	Low - negative (-2)	The visual disturbance will be reduced by implementing the mitigation measures above.		
Probability	Highly probable (6)	It is most likely that the impact will occur.		

12.1.2.5 Construction and Operation of the Associated Infrastructure

The construction and operation of the associated infrastructure will have a minor negative visual impact on sensitive receptors considering the proposed footprint areas for all the proposed infrastructure areas. The presence of the proposed associated infrastructure will contribute to the cumulative impacts of the development on the regional environment. This impact will be reduced but remain a minor negative impact provided the listed mitigation measures are implemented.

Table 12-7: Potential Impacts of Construction and Operation of the Associated Infrastructure

IMPACT DESCRIPTION: Potential Impacts of Construction and Operation of Alternative Infrastructure				
Dimension	**Rating**	**Motivation**	**Significance**	
PRE-MITIGATION				
Duration	Permanent (7)	There will be a permanent and irreversible negative visual impact on the receiving environment. The alternative infrastructure will remain for an indefinite period.	Consequence: Moderately detrimental (-11)	Significance: Minor - negative (-66)
Extent	Local (3)	The alternative infrastructure will be visible from the surrounding area.		
Intensity x type of impact	Very low - negative (-1)	Construction and operation of the alternative infrastructure minor visual disturbance.		
Probability	Highly probable (6)	The impact will definitely occur.		
MITIGATION:				

Ensure the alternative infrastructure does not exceed the proposed heights; Where possible, the infrastructure must be painted natural hues so that it blends into the surrounding landscape; Limit the footprint area of the surface infrastructure; Metal structures such as pipelines and generators are painted, a neutral matt finish must be used; and Avoid construction activities at night. If construction activities take place at night then down-lighting must be implemented to minimise light pollution. Down-lighting must also be implemented for any permanent lights installed during the operation phase.				
POST-MITIGATION				
Duration	Beyond project life (6)	There will be a long-term negative visual impact on the receiving environment. The associated and infrastructure will remain for an indefinite duration.	Consequence: Moderately detrimental (-10)	Significance: Minor - negative (-50)
Extent	Local (3)	The extent of the impact will be reduced by implementing the mitigation actions listed above.		
Intensity x type of impact	Very low - negative (-1)	The visual disturbance will be reduced by implementing the mitigation measures above.		
Probability	Likely (5)	It is most likely that the impact will occur.		

13 Mitigation and Management Measures

According to Brush *et al*. (1979), vegetation screening is the best mitigation/management action to conceal a development. Figure 13-1 illustrates the screening effect of vegetation. It is recommended that any natural vegetation which may potentially conceal the proposed development be left undisturbed, especially on the Project boundary. Vegetation left undisturbed along the perimeter of the Project has the ability to conceal the proposed infrastructure from nearby receptors. Figure 13-2 illustrates the effect of cleared vegetation allowing direct views of the proposed infrastructure.

The natural vegetation of the Project area and surrounds is Mountain Bushveld and Thornveld and contains various large tree species that assist in screening of infrastructure as observed during the site visit. The natural screening within the Sun City resort as a result of vegetation in between buildings aids in the screening of concrete structures, buildings and anthropogenic activities. Trees in amongst buildings within the existing vacation club assist with the screening of the simplex buildings and it is therefore advised that indigenous and mid-sized trees are planted between buildings to limit the visual exposure of the proposed vacation club on the surrounding sensitive receptors. This is also applicable to areas that will be cleared for buildings or associated infrastructure.

Figure 13-1: Screening Effect of Vegetation

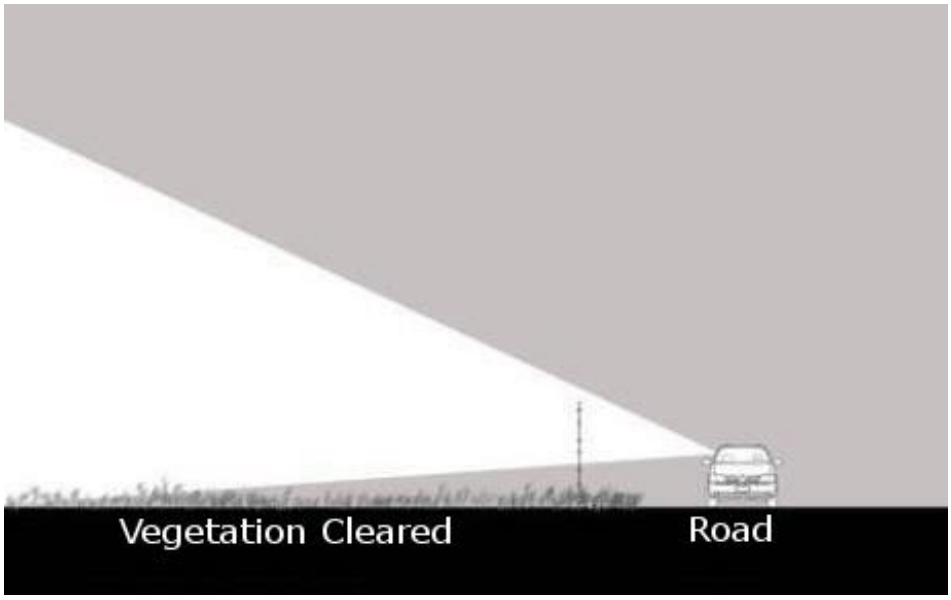

Figure 13-2: Effect of Cleared Vegetation

Other general mitigation/management actions that should be implemented where possible include:

- As much existing natural vegetation as possible should be retained, specifically bushes and trees if present. This will assist to conceal the development;
- Areas susceptible to dust should be frequently wetted by means of a water bowser during the construction phase. It is extremely important to suppress the visual aspects of dust to avoid creating the impression of a polluting industry;

- Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible;
- Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used;
- Where possible avoid construction and operational activities at night. If construction and operational activities take place at night, then only areas where these activities are taking place should be lit and the number of lights and brightness must not exceed the minimum requirements for safety and security. Down-lighting and low-pressure sodium light sources must be implemented to minimise light pollution. Lights should be directed inwards towards the Project area and not outwards from the Project area; and
- An appropriate grievance mechanism should be developed to respond to grievances from receptors that relate to visual aspects.

14 Monitoring Requirements

It is recommended that a professionally registered landscape architect is contracted to develop an annual landscape aesthetic plan to limit any potential impacts on the surrounding environment.

15 Public Consultation

Consultation with Pilansberg National Park and surrounding Interested and Affected Parties will be addressed through the Public Participation Process.

16 Recommendations and Reasoned Opinion of Specialist

It is recommended that the mitigation/management actions in Sections 12 and 13 are implemented to reduce the impact that the Project will have on the visual character of the receiving environment. The Project will have a moderate negative visual impact on the receiving environment and will be visible for a distance of 10 km during the day. This visual impact will remain indefinitely or until such time that the proposed infrastructure is decommissioned and removed.

In the opinion of the specialist, the majority of the proposed infrastructure will not have a highly intrusive impact on surrounding receptors. This is given in part to the existing presence of the resort and its well-known buildings such as the Palace and Lost City. Sun City serves as a regional tourism hub in conjunction with the Pilansberg National Park, attracting local, regional, and international tourists. The Sun City Resort serves as a popular attraction for tourists and provides many activities that attract tourists to the region.

The proposed infrastructure is likely to enhance the land use and reputation of the resort and the general infrastructure is not highly invasive, such as heavy industry or mining activities. It

is however noted, that through quantitative components of this report that the proposed Vacation Club 4 is likely to have specific negative visual impacts on the neighbouring Bakubung luxury lodge that is currently under construction. Due to the impact on the lodge and the staff residences in the Pilansberg National Park, it is advised that specific attention be paid to the mitigation of the visual impact of the Vacation Club. This includes limiting the Vacation Club to simplex units no higher than 5 m tall, painting the buildings and associated structures a tanned, natural hue to blend in with the surrounding environment, planting of indigenous thornveld vegetation amongst the buildings, and implementation of subtle down-lighting.

17 Conclusion

The Project comprises the construction and operation of Vacation Clubs, a hotel, an eco-lodge and alternative infrastructure. Theoretical and practical viewshed models were created for the Project. These viewshed models were based on the topography only and do not take the screening effect of vegetation into account. The viewshed models depict worst case scenarios and show the areas from which the Project may potentially be visible.

The potential visual receptors within the theoretical viewshed include sensitive receptors in the form of tourists and residents at Bakubung lodge and the Pilansberg National Park, staff housing within the Pilansberg National Park, motorists along the R555, and the settlements of Ledig to the south of the Project area.

In accordance with the guidelines by Oberholzer the “Guideline for involving visual and aesthetic specialists in EIA processes” document by Oberholzer (2005) the medium-scale infrastructure is categorised a Category 3 development. The receiving environment of the Project has a **moderate visual sensitivity** as there is a significant amount of terrain and vegetation screening for much of the proposed infrastructure.

The receiving environment has a largely rural, bushveld sense of place. The hilly topography is expected to provide significant screening of the proposed infrastructure while the natural Bushveld and Thornveld vegetation of the Development area and surrounds is expected to provide some form of screening of the proposed infrastructure.

No significant change in land use will result from the Project due to the infrastructure falling within an existing resort.

The Project will remain indefinitely therefore there will be a permanent moderate – negative visual impact. However, with the proposed mitigation measures, the visual impact significance rating from the VIA will be reduced to minor in most instances.

18 References

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Appendix A: Specialist CV

Mr. Alistair Main

GIS Specialist

GIS

Digby Wells Environmental

1 Biography

Alistair has worked in the consulting environment since graduating with a BA degree in Geography and Environmental Science from Monash University South Africa in 2007. His main focus is providing specialist GIS consulting and support services to the environmental, mining, exploration, and agricultural sectors, specifically for environmental management, engineering, locational planning and management objectives. Professional ambitions include development as a GIS Professional providing specialist input into large mining and infrastructure projects; and focusing on GIS system design and implementation to improve workflow and information management; with particular focus on developing markets where access to high-level GIS information and services is critical to successful project implementation.

Key experience includes the application of GIS to specialist studies including Visual Assessments, Site Selections, and Bathymetric studies. GIS experience includes GIS mapping, data acquisition, and specialist assessments for over 15 countries in Africa.

2 Education

Bachelor of Arts - Geography and Environmental Science [Monash University South Africa]

3 Language Skills

English

4 Employment

GIS Specialist – Digby Wells Environmental

GIS Specialist - Geosemantic Solutions

GIS Technologist - GCS (Pty) Ltd

GIS Operator - The MSA Group

5 Project Experience

MAPPING

- Johannesburg Roads Agency – Mapping of various assets, movable and immovable for the Johannesburg Roads Agency. Included temporal updates of their street centerlines, bridge assets, roads and stormwater assets, traffic signals and intersections, and spatial tracking of movable assets such as technicians, vehicles and heavy duty equipment;
- Total Coal South Africa – GIS database management and mapping for Total Coal SA operations in Mpumalanga including Forzando North, South and West; Dorstfontein Coal Mine, and Eloff Prospecting Area;
- Exxaro Resources – GIS database management and mapping for the Matla Colliery in Mpumalanga;
- Sasol – GIS database management and mapping of Sasol petrol stations in Gauteng, North-West, Limpopo and Mpumalanga as a part of the Sasol Groundwater Contamination Study;
- Kangra – GIS database management and mapping of Kangra Coal operations in Mpumalanga and Kwazulu Natal;
- Johannesburg Roads Agency – Update of City of Johannesburg street centerline dataset, including all attribute data; and
- Implementation of the mobile and web Smart Traffic system for the Johannesburg Roads Agency, including training, documentation, and procedures for the system.

VISUAL IMPACT ASSESSMENTS

- Dwarsrivier Chrome Mine (Assmang Chrome) – Comprehensive VIA for proposed Tailings Storage Facility;
- Springlake Colliery (Shanduka Coal) – Comprehensive VIA for proposed Opencast Pits and new Boxcut Facility;
- Witkop Colliery (Slater Coal) - Comprehensive VIA for proposed Colliery, including Discard dump, Stockpiles, Office and Plant area;
- Matla Colliery (Exxaro Resources) - Comprehensive VIA for proposed Brine Ponds and Water Treatment Plant and proposed Opencast Pits and associated dumps and ancillary infrastructure;
- Schoongezicht Colliery (Umthombo Resources) - Comprehensive VIA for Schoongezicht Colliery;
- Wits Gold DGM Mine (Wits Gold) - Comprehensive VIA for proposed Gold Mine operations, including a Tailings Storage Facility, Shaft headgear, and Processing Plant;
- Two Rivers Platinum Mine (African Rainbow Minerals) - Comprehensive VIA for proposed Tailings Storage Facility;

- Molo Graphite Mine (Energizer Resources) – Comprehensive VIA for proposed Graphite Mine operations, including an Open Pit, Process Plant, Tailings Storage Facilities and three alternative Water Supply Dams; and
- De Aar Visual Impact Assessments – Scoping and Comprehensive VIA for proposed solar parks in the Northern Cape of South Africa.

6 Publications

SA SURVEYORS AND GEOMATICS INDABA (SASGI) 2013 - Geomatics in Mining: The Need for Consolidated Geodatabases for Improved Planning and Decision-Making.