VISUAL IMPACT REPORT FOR THE PROPOSED SHANGONI GATE AND ROAD UPGRADE IN THE KRUGER NATIONAL PARK. (BASIC ASSESSMENT)

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EXECUTIVE SUMMARY

I-scape was appointed by Envirolution Consulting (Pty) Ltd to compile a Visual Impact Assessment (VIA) for the proposed Shangoni Gate and road upgrade in the Kruger National Park (KNP). The applicant, SANParks, proposes a new entrance gate and reception near the Altein Village, Giyani area. The project also entails the upgraded of an existing ranger road from the gate position to the H1-6 tar road between Shingwedzi and Mopane camps. Along this road new tourist facilities will be constructed that includes a rustic camp site, caravan park and picnic site. This study will form part of a Basic Assessment (BA).

A VIA is a specialist study which assesses the potential visual changes to an existing visual environment that may result from the construction and operation of a proposed project. The associated visual changes could potentially impact on the character and value of the landscape and affect the views and perceptions of observers in the study area.

PROJECT DESCRIPTION

The motivation for the proposed project is multi-faceted but in broad terms, it has long been debated to introduce a new entrance to the KNP in this region, in order to enhance accessibility to the northern part of the park. Tourist development outside the park forms part of the larger masterplan and is aimed at benefitting the rural communities, bordering the park. It is important to note that this assessment only includes the infrastructure development inside the borders of KNP and any development west of the border is not part of the scope of works.

The proposed project consists of the following components:

- New entrance gate near the village of Altein on the border of KNP, to be named Shangoni Gate (Two alternative locations);
- A reception area east of the Shingwedzi River (Two alternative locations);
- A new single lane bridge over the Shingwedzi River to join the gate and the reception (Location fixed at Lat -23.143634°, Long 30.935475°);
- The upgrade of the 50 km stretch of dirt road from the Shangoni Gate to the H1-6 tar road between Mopane and Shingwedzi camps. It will follow the existing road alignment except for a new 1.2 km portion to be constructed to cut out the loop to the Shangoni Ranger village; and
- A rustic camp site, caravan park and picnic site inside a loop of the Shingwedzi River approximately 12 km south east from the Shangoni Gate (Two alternative locations for each of the facilities except the picnic site has three alternative locations).

The project may be implemented in phases, but it can be assumed that the construction phase may continue for 3-4 years. Some of the project components' construction may run concurrently and others can only follow the completion of certain activities. It can be assumed with reasonable certainty that the gate, reception, bridge and road upgrade is a priority and the rustic camp, caravan park and picnic site will follow.

LANDSCAPE CHARACTER ASSESSMENT

A Landscape Character Assessment (LCA) identifies and describes the comprising attributes and their qualities/values in the study area. It recognises that a landscape consists of interconnected systems, patterns and individual components that is defined by the natural, cultural and historical

aspects of the region.

The KNP is renowned for its pristine natural character and is a showroom for biodiversity and eco-system restoration and conservation. Its natural attributes and qualities has long been the main attraction for millions of tourists. An ecotourism business model has seen the expansion of tourist facilities and infrastructure over recent years. The proposed Shangoni Gate is one such tourist project that is aimed at enhancing accessibility to the northern part of the KNP. In the process it will increase the ecotourism potential in order to benefit ecosystem conservation and community upliftment.

The pristine natural character of the study area is the most valued attribute. Globally, pristine natural environments are severely under pressure and very few untouched ecosystems remain. It is only in the last century that the concept of nature conservation gained momentum in South Africa. The KNP was proclaimed in 1926 and has since become an iconic example of nature conservation. It is considered a rarity and offers unique experiences of undisturbed ecosystems.

Within the study area, the majestic river trees and serene pools of the Shingwedzi River, coheres to scenes of particularly high scenic quality. These unblemished natural features along with intangible qualities such as the remoteness and tranquillity contribute to a sense of place that can be described as uniquely secluded and completely unaffected by human interventions.

The Mopane woodlands can be experienced as uniform in its character due to the similarity in specie composition and the featureless topography over vast areas of the study area. It lacks a diversity of major landscape features but nevertheless, it does not detract from its pristine natural character and its value as a natural resource.

VISUAL AND LANDSCAPE RECEPTORS

Within the study area, observers experience and interact differently with their environment and therefore value it differently. They may be affected by the proposed project due to additions or alterations in the visual environment which may influence their experience and views of the visual resource. In this study a distinction is made between impacts on the **observers** and impacts on the **visual resource**. The observers represent all people that may be affected visually while the impacts on the visual resource strictly assess the changes to the landscape character and the impact on its visual value.

The sensitivity of an observer is related to the value an observer has for the particular visual resource being impacted on. Observer groups that will be affected by the proposed development is limited to park rangers that require access to the Shangoni Ranger village and tourists that pass the road construction activity along the H1-6 or S52.

Rangers are employed by SANParks and are in the area for a specific reason, i.e. to fulfil their service agreement or to travel to and from the Shangoni Ranger village. They will be exposed to the construction activity of the road. They will be essentially commuting between destinations therefore their sensitivity is regarded medium. Since this is not a tourist route, no members of the public will be allowed to enter this part of the study area.

Tourists will have a minimal exposure to the road construction. They will pass the most western section of the road when travelling on the H1-6. Their exposure to the construction activity will be limited to that specific location, and will be brief. Tourists are users of the roads passing the road construction and their main purpose for visiting, is to enjoy the pristine character of the landscape. They are classified as observers of high sensitivity.

The sensitivity of a landscape's character is a measure of the robustness of its character and the ability of the landscape to accommodate certain changes without detrimental impacts to its qualities. The tangible landscape receptors are essentially the vegetation and the rivers that contribute to the wilderness character of the visual resource. This, paired with the intangible attributes such as its secluded location, rarity and uniqueness, contributes to a highly valued landscape with exceptional scenic qualities.

The study area offers a very high VAC due to the dense vegetation growth and enables the landscape to provide high degrees of visual screening. It is however considered a pristine natural environment that is scares and valuable on a global scale, but not particularly uncommon on a local scale. The landscape character is considered moderately sensitive, with a robustness that can accommodate low intensity changes without detrimental effects to its character.

VISUAL IMPACT ASSESSMENT

During the construction of the proposed project, temporary construction camps may be present in the study area. A construction camp is usually a fenced area and includes staff accommodation, ablution facilities, site offices and storage space. It is likely that the construction camps will be located outside the KNP, but this information was not available at the time of the report compilation. As a worst case scenario it will be assumed that the construction camps will be inside the KNP.

The type of construction activity that is required varies between the different project components. The Shangoni gate, reception and the buildings at the picnic site, caravan park and rustic tented camp, are assumed to have similar construction activity. It is activities normally associated with building construction and includes basic steps such as foundation excavation and casting, brickwork and roof installation. Excavation will be done by hand or through the use of machinery. The brickwork, roof installation and finishes will be done by labourers. It is considered low intensity construction that will only disturb the footprints of the individual buildings. Vegetation will only be removed if absolutely necessary.

The bridge construction and road upgrade are more specialised activities and require specific equipment and machinery. This is considered high intensity construction and will make use of heavy machinery such as graders, rollers, excavators and mobile cranes. Large amounts of material will be delivered by trucks and the construction period may take several years. The bridge's construction will remain within the site's boundaries and is not expected to disturb the surrounding landscape in any significant way.

The road upgrade will require a wider corridor to be cleared than the existing ranger road. Large amounts of vegetation will be removed along the side of the road over its entire length. This will be mostly Mopane trees that is common in the region. Large trees will be preserved and slight road deviations may be made to avoid them.

One of the last activities will be rehabilitation and landscaping. Rehabilitation of the road shoulder and bridge site will occur to prevent exposed soil and the potential for erosion. Additional landscaping may occur around some of the facilities but will presumably be done in accordance with the existing vegetation character.

Once the construction phase is completed the facilities will come into operation. This will cause an influx of tourists to an area that was previously closed to the public. Vehicular traffic will increase through the area due to the Shangoni Gate and road providing a means of access. Low intensity accommodation and day visitor facilities in the form of the rustic camp, caravan park and picnic site will attract relatively small numbers of tourists, consistently throughout the year.

All the facilities and infrastructure will be similar in appearance and function compared to most of the other facilities in the park. It will be familiar additions that can be described as compatible with the KNP's existing infrastructure. This is considered in accordance with the KNP internal vision and planning strategy for the northern part of the park.

For the purpose of the impact determination, some of the project components are grouped together due to their similarities in location and nature of impact. The following tables summarise the impact severity of the:

- Shangoni gate, bridge and reception;
- Rustic camp, caravan park and picnic site; and
- Upgrade of the ranger road.

Shangoni gate, bridge and reception		
	Without mitigation	**With mitigation**
Construction phase		
Nature of impact: The construction activity will cause a disturbance to the existing landscape character and will impact on the site's pristine natural qualities. There will be a presence of construction equipment on the individual sites along with a workforce that is unfamiliar to the study area. Some vegetation will be removed inside the footprints of the individual structures, although it can be assumed that it will be kept to a minimum. The impact will only affect the natural character of the visual resource, but no observers will be impacted.		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (28)	Low (15)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: The presence of new infrastructure, that allows access to tourists, are unfamiliar to the site, but compatible in appearance to the rest of the KNP. It will affect the secluded sense of place and pristine natural character of the study area, although limited to the sites where the infrastructure is located. The impact will negatively affect the natural character of the visual resource. The impact on observers will be neutral as this will be their first exposure to this particular area and all the infrastructure will be familiar and similar to the park's existing infrastructure.		

Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (27)	Low (21)
Status (Positive/Negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated: Impacts can be mitigated through stringent control measures during construction and offset screen planting during operation.		
Mitigation: • Locate construction camps outside the borders of the KNP in areas that is already disturbed to avoid additional disturbance inside the park; • In the event that construction camps are located in the KNP, put stringent restrictions in place to contain the footprint of the camp by temporarily fencing it and clearly demarcating the entire construction area to minimise disturbance of areas outside the construction site; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area to avoid wind blowing waste into the bush; • Implement dust suppression measures during earthworks to minimise the impact of dust clouds; • Appoint a suitable architect and landscape architect to design the infrastructure and the adjoining surroundings with sensitivity towards the environment and its current character; • No structure may exceed the height of the surrounding vegetation; • Additional trees and shrubs can be planted around the structures as an offset measure to the loss in vegetation in the footprint of the infrastructure. Specie choices should be informed by the natural occurring vegetation; • All signage should be non-intrusive but clear. No sign boards will be placed on separate frameworks higher than 2 m above the ground level to avoid it exceeding the height of the vegetation.		
Cumulative impacts: Cumulative impacts can be described as a further loss in vegetation and additional intrusion on secluded and pristine natural environments. This is considered a minimal impact and should be seen in the light of sacrificing some natural environments to protect and conserve other features of the KNP through the funding of tourism.		
Residual Risks: No residual risks are identified		

Rustic camp, caravan park and picnic site		
	Without mitigation	**With mitigation**
Construction phase		
Nature of impact: The construction activity will cause a disturbance to the existing landscape character and will impact on the site's pristine natural qualities. There will be a presence of construction equipment on the individual sites along with a workforce that is unfamiliar to the study area. Some vegetation will be removed that will expose the underlying soil, although it can be		

assumed that it will be kept to a minimum. The impact will only affect the pristine natural character of the visual resource and the tranquil, remote sense of place, but no observers will be impacted.		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (28)	Low (15)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: The presence of new infrastructure is unfamiliar to the site, but compatible to similar developments in the rest of the KNP. The new development will add non-intrusive infrastructure to the individual sites that are currently free of any human intervention. An influx of small numbers of tourists will occur in this area that is currently inaccessible to any tourist activity. The development will affect the secluded nature and pristine natural character of the study area, although the natural features will remain largely untouched. The development is considered additive with very limited direct impact on the landscape's features. The impact on observers will be neutral as this will be their first exposure to this particular area and all the infrastructure will be familiar and similar to the park's existing infrastructure.		
Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (27)	Low (21)
Status (Positive/Negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated: Impacts can be mitigated to great effect.		
Mitigation: • Locate construction camps outside the borders of the KNP in areas that is already disturbed to avoid additional disturbance inside the park; • In the event that construction camps are located on the site, stringent restrictions must be put in place to contain the footprint of the camp by temporarily fencing it and fencing the entire construction area to minimise disturbance of areas outside the construction site; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area to avoid wind blowing waste into the bush; • Appoint a suitable architect and landscape architect to design the infrastructure and the adjoining surroundings with sensitivity towards the environment and its current character; • Additional trees and shrubs can be planted as an offset measure to the loss in vegetation where access roads and other infrastructure is placed; • No structures may exceed the height of its surrounding vegetation;		
Cumulative impacts: Cumulative impacts can be described as a further loss in vegetation and additional intrusion on secluded and pristine natural environments. This is considered a minimal		

impact and should be seen in the light of sacrificing some natural environments to protect and conserve other features of the KNP through the funding of tourism.
Residual Risks: No residual risks are identified

Ranger road upgrade		
	Without mitigation	**With mitigation**
Construction phase		
Nature of impact: The construction activity will widen the existing road from an estimated 7m to approximately 12m (including road reserve). There will be a presence of construction equipment and a workforce that is unfamiliar to the study area. Some vegetation will be removed to get to the required width, although it can be assumed that it will be kept to a minimum and that large and protected trees will be preserved. The road upgrade will disturb the remote and tranquil sense of place during its construction phase. A relatively narrow strip of vegetation will be removed that is considered part of the natural character of the study area. Observers and KNP staff travelling on the H1-6 and S52 may be exposed to the construction activity for a brief moment. The presence of construction equipment will be unfamiliar to the natural environment they come to enjoy and will cause a visual intrusion as a result of the ground works and machinery.		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (28)	Low (15)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: The presence of a new public road will allow access to tourists in an area that was previously only accessible to staff of the KNP. It will increase traffic through the area but with minimal impact on the original landscape character. The road upgrade will improve the current condition of the ranger road and will form a seamless part of the existing road network in the KNP. No negative impact on any observers are expected after the road is completed and taken into use.		
Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Minor (2)	Minor (2)
Severity	Low (15)	Low (15)
Status (Positive/Negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated: Impacts can be mitigated during the construction phase to limit impacts on the small number of observers that may be impacted and to limit more disturbance that is necessary. During operation basic road maintenance and erosion control is required.		
Mitigation: • Locate construction camps outside the borders of the KNP in areas that is already disturbed to avoid additional disturbance inside the park;		

• In the event that construction camps are located in the KNP, put stringent restrictions in place to contain the footprint of the camp by temporarily fencing it and fencing the entire construction area to minimise disturbance of areas outside the construction site; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area to avoid wind blowing waste into the bush; • Implement dust suppression measures during groundworks to minimise the impact of dust clouds; • Set up a temporary hessian or shade cloth barrier at the T-junction with the H1-6 to conceal the construction activity from this tourist road; • Provide clear signage at the H1-6 and S52 roads to inform tourists to the purpose of the construction. Tourist are generally more tolerant to construction in conservation areas if they understand the purpose thereof; • Maintain the road surface periodically and control erosion along the shoulder to avoid unsightly damages to the road and surroundings.
Cumulative impacts: Cumulative impacts can be described as a further loss in vegetation to establish more tourist routes inside the KNP. This is considered a minimal impact and should be seen in the light of sacrificing some vegetation to protect and conserve other features of the KNP through the funding of tourism.
Residual Risks: No residual risks are identified

CONCLUSION AND RECOMMENDATIONS

The essence of determining the significance of a visual impact, centres on the severity of the potential impacts, and the sensitivity of the affected receptors. In simple terms, a low severity impact affecting receptors of low sensitivity, will result in a low significance. On the other end of the scale, a highly severe impact, affecting highly sensitive receptors, will result in a high significance. A summary of the impacts during the construction and operational phases are represented in the following tables.

SUMMARY OF IMPACT DURING CONSTRUCTION PHASE			
Project component	**Sensitivity of receptors**	**Severity of Impact**	**Significance of Impact**
Shangoni gate, bridge and reception	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Rustic camp, caravan park and picnic site	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Ranger road upgrade	OB: High	OB: Low	OB: Moderate/Minor (-)
	VR: Medium	VR: Low	VR: Minor (-)

SUMMARY OF IMPACT DURING OPERATIONAL PHASE			
Project component	**Sensitivity of receptors**	**Severity of Impact**	**Significance of Impact**
Shangoni gate, bridge and reception	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Rustic camp, caravan park and picnic site	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Ranger road upgrade	OB: High	OB: Low	OB: Moderate/Minor (+)
	VR: Medium	VR: Low	VR: Minor (+)

The applicant, SANParks, has proposed low intensity development and an additional entrance gate into KNP for the northern part of the park. This has been part of an extensive planning process that is motivated by the need for an additional access point into the park between the existing Palaborwa and Punda Maria Gates. A current ranger road will be upgraded to a tar road that will connect the proposed Shangoni Gate to the public H1-6 road.

The project traverses an area that is best described as a Mopane dominated plain with no distinct topographic features. The Shingwedzi-and Tsange Rivers are major water courses in the study area and provide picturesque scenes of majestic trees and serene pools of water. The rivers are natural features of very high scenic quality and add to the pristine natural character of the study area.

For the most part, the project is located in areas that are secluded and are not visible from any public viewpoints. No negative impacts will be experienced by observers during the construction of the Shangoni gate, Shingwedzi bridge, reception and the rustic camp site, caravan park and picnic site. The only part of the project that will have any impact on tourists and KNP staff will be the ranger road upgrade that will be visible from the H1-6 and S52. Intrusive views may only be experienced during the construction phase when earthworks and construction equipment are active on the road.

The most significant impact will be on the character of the landscape. Currently, the various sites are inaccessible to tourists and are located in a fairly secluded part of the park. A pristine natural character prevails and is unblemished by any human intervention. With the introduction of the various project components, the individual sites will be developed to accommodate tourist activity. This will affect the untouched natural character, but the impacts are only limited to the individual sites.

The assessment acknowledges that SANParks is an institution that is very much concerned with the conservation of its natural assets. Although limited information is available on the particular project, it can be assumed with reasonable certainty that SANParks will develop the sites with sensitivity in order to preserve the natural attributes. Other similar projects are used as a reference to understand the potential impact on the landscape. Through this reasoning, all of the impacts are considered low and does not provide any reason for the project to be refused.

Various alternative locations have been proposed by the applicant. In all the cases the alternatives are either in close proximity to each other, or are located in areas that are identical in their landscape character. The difference in impacts between the alternatives is negligible and the ranking is differentiated by marginal preferences or disadvantages. None of the sites have a definite positive or negative motivation and all are considered acceptable.

ALTERNATIVE	RANKING	MOTIVATION
Shangoni Gate alternatives		
Applicant's preferred	1	The applicant's preferred location is considered the most appropriate based on the fact that it is the closest location to the bridge site and requires the shortest road section. The least amount of bush clearance is therefore required.
Alternative 1	2	
Reception alternatives		
Applicant's preferred	1	Both locations are in the Mopane dominated woodlands and will have the same impact on the landscape. No distinguishing advantage can be recognised to rank one alternative higher than the other.
Alternative 1	1	

Picnic Site alternatives		
Applicant's preferred	2	Alternative 1 is marginally more preferred than the applicant's preferred site. Alternative 2 is the least preferred. The motivation is purely based on the various distances from the ranger road that requires a shorter or longer access road to the alternatives.
Alternative 1	1	
Alternative 2	3	
Rustic Camp alternatives		
Applicant's preferred	1	The applicant's preferred site is considered the most appropriate based on the fact that it is the closest location to an existing dirt road that extends south from the ranger road. This is based on the assumption that the dirt road will be used as an access route instead of a new road.
Alternative 1	2	
Caravan Park alternatives		
Applicant's preferred	1	The applicant's preferred site is considered the most appropriate based on the fact that it is the closest location to an existing dirt road that extends south from the ranger road. This is based on the assumption that the dirt road will be used as an access route instead of a new road.
Alternative 1	2	

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LIST OF ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
DEM	Digital Elevation Model
GIS	Geographical Information System
I&AP	Interested and Affected Party
KNP	Kruger National Park
LCA	Landscape Character Assessment
OB	Observer
SANParks	South African National Parks
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
VR	Visual Resource
ZMVE	Zone of Maximum Visual Exposure
ZVI	Zone of Visual Influence

GLOSSARY OF TERMS

(Derived from the IEMA & LI Guidelines with additional descriptions)

Baseline: Record and analysis of existing landscape and visual conditions. A description of the status quo.
Cumulative effects/impacts: The summation of effects that result from changes caused by a development in the conjunction with other past, present and reasonably foreseeable actions.
Landscape: The European Landscape Convention (2000) defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors." It can also include rural landscapes, townscapes and seascapes.
No-Go or Do-Nothing alternative: Continued change/evolution of the landscape or of the environment in the absence of the proposed development.
Impact severity: A combination of the probability, duration, extent and magnitude of an impact. It is calculated with an equation of S=(E+D+M)P where E,D,M and P are given values in the impact report and impact severity is determined to be low, medium or high.
Impact significance: A combination of the impact severity and the receptor sensitivity based on values of high to insignificant.
Indirect Impacts: Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway. Sometimes referred to as secondary impacts.
Land use: The primary use of the landscape or dominant functions.
Land cover: Refers to the elements that are on the surface of the landscape. Relates to the land use.
Landform: Combinations of slope and elevation that produce the shape and form of the land surface.
Landscape Character Assessment: A Landscape Character Assessment (LCA) identifies and describes the comprising attributes and their qualities/values in the study area. It recognises that a landscape consists of interconnected systems, patterns and individual components that is defined by the natural, cultural and historical aspects of the region.
Landscape type: A landscape type will have broadly similar patterns of geology, landform, vegetation, land uses, settlement patterns, etc., that gives it a common character.
Landscape feature: A prominent eye-catching element that is unique to a specific landscape.
Landscape sensitivity: The extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects.
Mitigation: Measures, including any process, activity or design implementation to avoid, reduce, remedy or compensate for the adverse effect of an impact or visual effect due to a development.
Receptor (Landscape or viewer): A physical landscape feature, resource, character component or viewer group that will experience an effect from a development.
Residual risks: The risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014)
Study area: An area determined by the specialist to be the area of impact. May vary from project to project and is usually the extent of visibility.
Viewshed: A viewshed analysis or visibility map is a GIS generated area that calculates the direct line of sight of an object in a study area based on the topography in the study area. This provides a first order impression of the visibility of an object without the screening effect of vegetation or other structures.

Visual Absorption Capacity (VAC): VAC is the degree of ability of a study area/landscape to conceal or absorb the proposed project.
Zone of Visual Influence (ZVI): Area from which a proposed development is likely to be visible, based on GIS viewsheds and field observations.

1 INTRODUCTION

I-scape was appointed by Envirolution Consulting (Pty) Ltd to compile a Visual Impact Assessment (VIA) for the proposed Shangoni Gate and road upgrade in the Kruger National Park (KNP). The applicant, SANParks, proposes a new entrance gate and reception near the Altein Village, Giyani area. The project also entails the upgraded of an existing ranger road from the gate position to the H1-6 tar road between Shingwedzi and Mopane camps. Along this road new tourist facilities will be constructed that includes a rustic camp site, caravan park and picnic site (Figure 1 & Figure 2). This study forms part of a Basic Assessment (BA).

A VIA is a specialist study which assesses the potential visual changes to an existing visual environment that may result from the construction and operation of a proposed project. The associated visual changes could potentially impact on the character and value of the landscape and affect the views and perceptions of observers in the study area.

The information sources that are used include but are not limited to:

- The studying of aerial photographs found on Google Earth pro and Google Maps;
- Internet research of various websites and research papers pertaining to the study area;
- Information gathered during a site investigation done in the month of April 2016; and
- Project information as provided by the applicant and/or lead consultant.

2 ASSUMPTIONS AND LIMITATIONS

This section provides a clear understanding of the limitations and assumptions that influence the accuracy of the assessment and the confidence of the visual specialist in his professional judgement. The level of confidence is a function of the level of knowledge and information that is available with regards to the study area and the project. The following aspects are identified as uncertainties, unknowns or limitations:

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on assumed human perceptions. It is the visual specialist's intention to utilise as much quantitative data and scientific research as possible to substantiate professional judgement and to motivate subjective opinions;
- The study excludes the use of GIS generated visibility/viewshed analyses. It was realised early in the assessment process that impacts on observers will not cause any major issues and that the findings of visibility analyses will not contribute to the accuracy or credibility of the assessment. Instead, the site investigation was done more intensely and various locations were photographed and recorded throughout the study area;
- The site investigation was done during the month of April 2016 and portrays a landscape character typically associated with autumn. It was a particularly poor rainy season prior to the site investigation and the study area was affected by a national drought. Time and budget constraints does not allow the specialist to document views and landscape character changes during other seasons. Documentation of views and landscape character changes during other seasons is not regarded compulsory and does not influence the credibility of the findings in any significant way.
- No detailed layout drawings or architectural elevations/perspectives were provided by the applicant at the time of the assessment and only general location points were given where

certain project components may be placed. It can be assumed that the structures such as the gate, reception, rustic camp, caravan park and picnic site will be similar in appearance than other equivalent structures in KNP. The project description in Section 4 is based on pre-feasibility studies and engineering studies done in 2013;

- It is unknown when the project will be completed and how long the construction processes will be, although a four-year estimate is discussed in the pre-feasibility studies. It is assumed that a phased approach will be followed that is very much dependent on the acquiring of funds;
- It is unknown where the material for the road upgrade will be sourced from. Normally, borrow pits are made near a road to limit the distance of material delivery. Considering the sensitivity of the natural environment, it may be assumed that all material will be imported from outside the KNP and therefore the impact of borrow pits are not assessed. Should it become clear in future that material will be sourced inside the KNP, it is recommended that this report be revised to include the impact caused by borrow pits.
- No specialist integration workshops were held during the Basic Assessment process up until the completion of the report. No knowledge of any historical or cultural significant sites were discovered during the research stages, and should the Heritage Assessment deliver anything significant, it could alter the outcome if this report;
- No input was received from Interested and Affected Parties pertaining to visual issues prior or during the preparation of the report. Should there be any during the Basic Assessment process the visual specialist must be notified and cognisance should be taken as to the impact of such comments on the findings of this report.

The above-mentioned aspects do affect the visual specialist's confidence in the findings, mainly due to a lack of detailed project information. However, the visual specialist believes that the assumptions are reasonable and can fill the information voids in order to ensure an acceptable outcome.

3 METHODOLOGY STATEMENT

3.1 INTRODUCTION

According to a study by the Transportation Research Board of the National Academies (2013) a ten point criteria can be used to evaluate a VIA methodology. The ten points that define a good standard of reporting are described as being:

1. Objective – the procedure should be designed to eliminate individual bias;
2. Valid – the procedure should be defendable and legitimate within a legal framework;
3. Reliable – adequately trained professionals following the same procedure should reach similar results;
4. Precise – the data required by the procedure should be measured at a grain or scale sufficiently fine to validly measure or describe characteristics of substantive interest and sufficiently coarse to be pragmatically implemented;
5. Versatile – the procedure supports valid assessment of different types of proposed changes from the perspectives of different viewer groups interacting with different landscape settings;
6. Pragmatic – the procedure can be easily and efficiently implemented by a trained professional;

7. Easily understood– the procedure and assessment are accessible by the public and decision makers;
8. Useful – the procedure and assessments affect location, design or mitigation decisions.
9. Consistently implemented – the procedure can be applied consistently among different projects and individual assessments are consistent with the chosen procedure;
10. Legitimate – the procedure is supported by laws, regulations or other legal mechanisms, uses socially/culturally accepted standards and uses scientifically accepted standards.

These ten points are considered international benchmarks in the compilation of a Visual Impact Assessment and will dictate the VIA methodology and assessment strategy for this project.

3.2 DEFINING A SCALE AND LEVEL OF ASSESSMENT

The size of the study area and the extent of the project impact will determine the scale and level of assessment. The study area can be described as the area affected by visual impact. The study area can be defined by four assessment levels namely:

- **Site** is the smallest level of assessment and stipulates the extent of the activities related to the project. This is limited to the footprint of the project or the area of disturbance;
- The **local area** is limited to the immediate surroundings and will often be defined by the properties on which the project is located and could possibly include the surrounding properties;
- A **region** is described by area classifications such as cities/towns and municipalities/districts; and
- A **larger region** will be measured by provincial, national or international borders being crossed or affected.

The entire proposed project will be limited within the borders of the KNP and is therefore in one jurisdiction area. The project is considered a low intensity project with relatively small footprints that will affect the sites where the individual project components will be placed. None of the activities or project components are considered to affect an area outside the site boundaries and it is concluded that the project requires an assessment on a site scale.

3.3 VIA METHODOLOGY

1) **Site investigation:** Identify sensitive viewpoints and capture the character of the visual environment by establishing a photographic record;
2) **Define study area:** Establish limits to the study area based on the site investigation;
3) **Project description:** Describe the type, scale and visual characteristics of the proposed project;
4) **Compile a Landscape Character Assessment:** Discuss the tangible and intangible characteristics of the study area to determine its value and sensitivity;
5) **Visual Impact Assessment:** Determine the sensitivity of the receptors, the severity of the impacts and assess the significance of the potential impacts;
6) **Mitigation Measures:** Propose mitigation measures to avoid, reduce, or remediate the impacts or propose measures to compensate or enhance for the impacts; and
7) **Conclusion:** Discuss the project alternatives and provide closing statements.

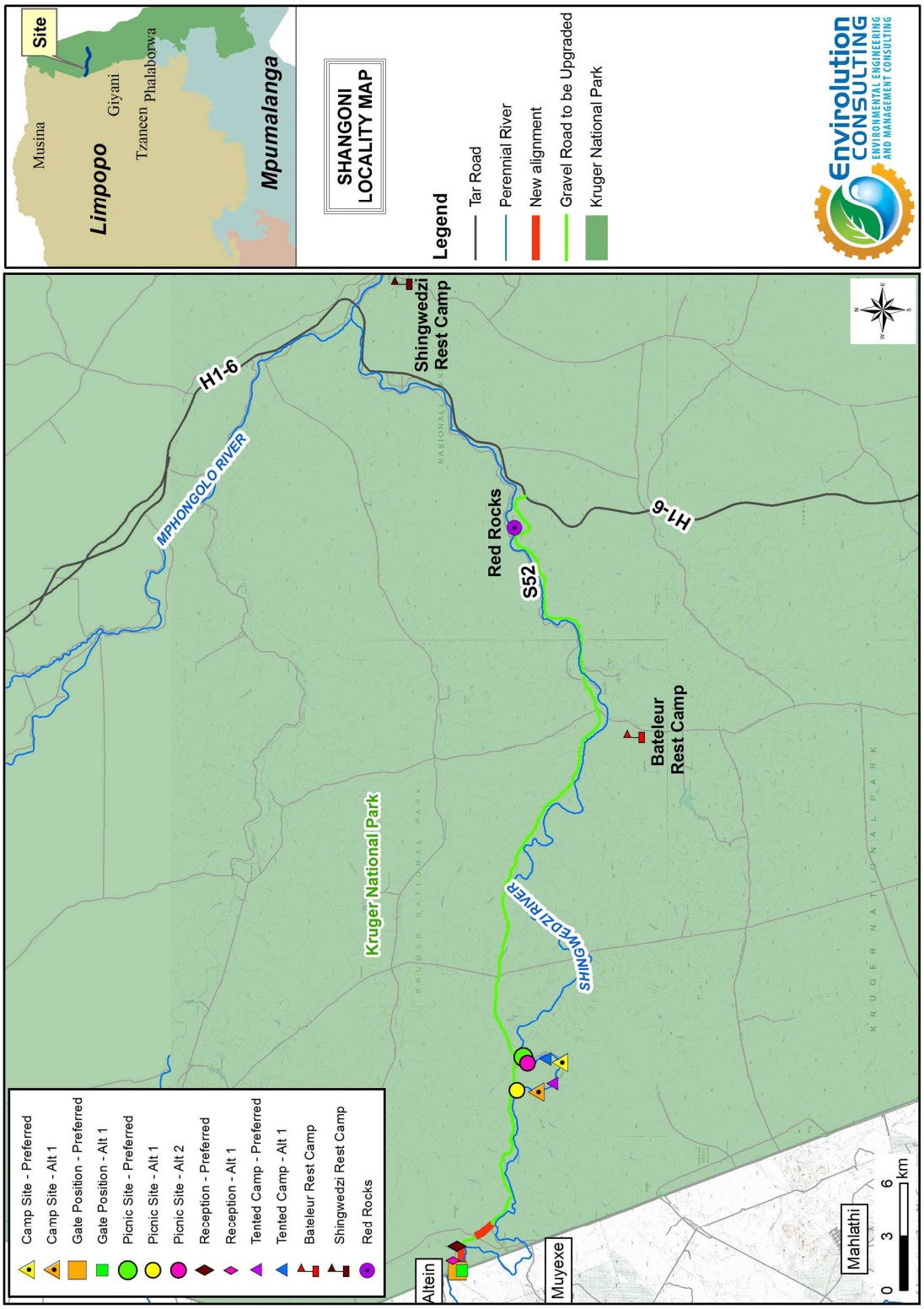

Figure 1: Locality map

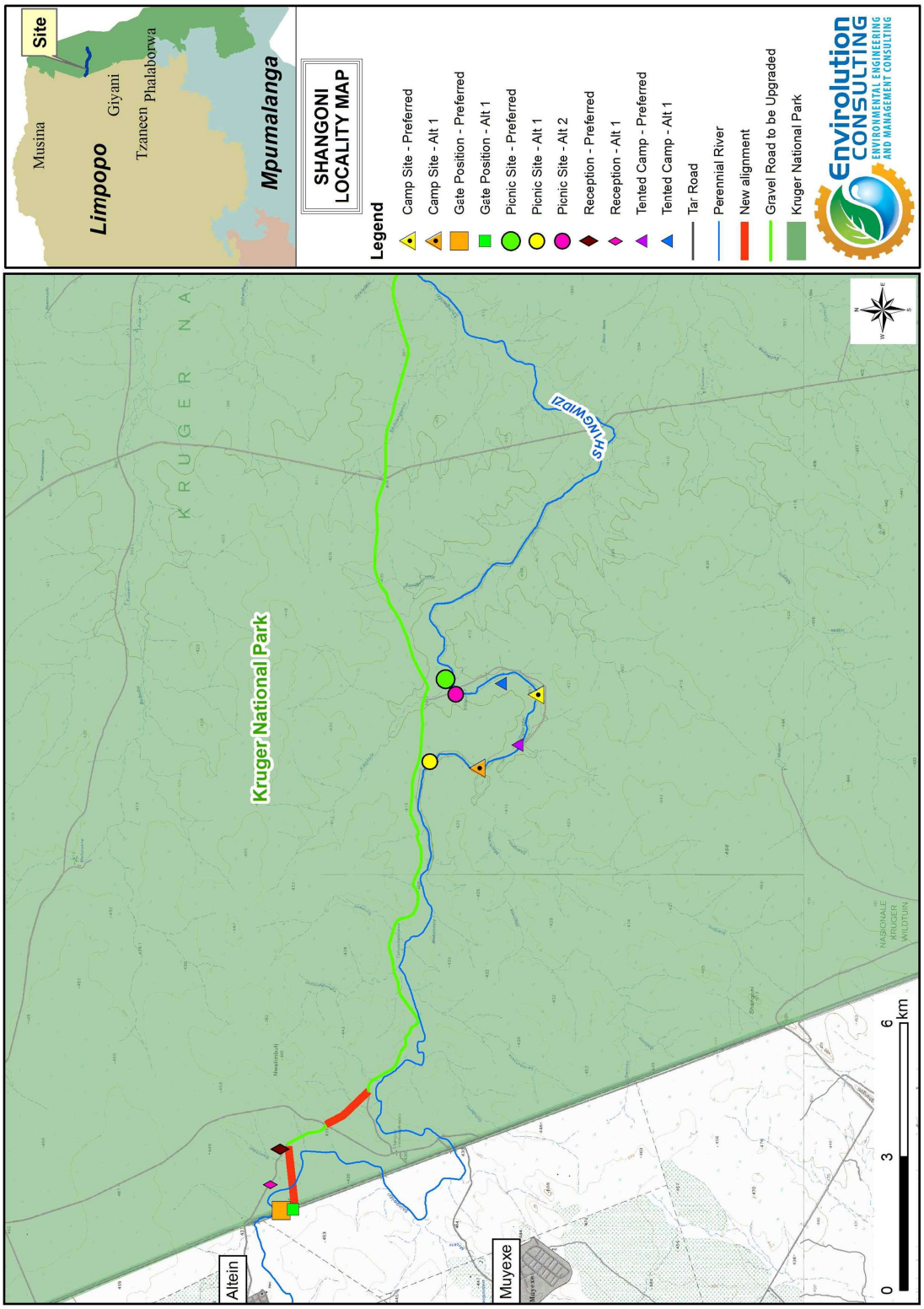

Figure 2: Enlarged locality map

4 PROJECT DESCRIPTION

The motivation for the proposed project is multi-faceted but in broad terms, it has long been debated to introduce a new entrance to the KNP in this region, in order to enhance accessibility to the northern part of the park. Tourist development outside the park forms part of the larger masterplan and is aimed at benefitting the rural communities, bordering the park. It is important to note that this assessment only includes the infrastructure development inside the borders of KNP and any development west of the border is not part of the scope of works.

The proposed project consists of the following components:

- New entrance gate near the village of Altein on the border of KNP, to be named Shangoni Gate (Two alternative locations);
- A reception area east of the Shingwedzi River (Two alternative locations);
- A new single lane bridge over the Shingwedzi River to join the gate and the reception (Location fixed at Lat -23.143634°, Long 30.935475°);
- The upgrade of the 50 km stretch of dirt road from the Shangoni Gate to the H1-6 tar road between Mopane and Shingwedzi camps. It will follow the existing road alignment except for a new 1.2 km portion to be constructed to cut out the loop to the Shangoni Ranger village; and
- A rustic camp site, caravan park and picnic site inside a loop of the Shingwedzi River approximately 12 km south east from the Shangoni Gate (Two alternative locations for each of the facilities except the picnic site has three alternative locations).

As mentioned in Section 2, the project may be implemented in phases, but it can be assumed that the construction phase may continue for 3-4 years. Some of the project components' construction may run concurrently and others can only follow the completion of certain activities. It can be assumed with reasonable certainty that the gate, reception, bridge and road upgrade is a priority and the rustic camp, caravan park and picnic site will follow.

4.1 ENTRANCE GATE

The entrance gate is expected to be the threshold between the wilderness area of the KNP and the non-protected area outside the park. It is assumed to be a simple gate structure that provides access control during operating hours and can be closed during non-operating hours. It will possibly consist of a roof structure, typically thatch roof, a small office and a security gate and cattle grid.

Two locations have been proposed for the entrance gate at Lat -23.144917°, Long 30.931880° (Applicant's preferred position) and Lat -23.147370°, Long 30.932098° (Alternative 1). Their locations are approximately 540 m apart.

Figure 3 is taken at Malelane Gate and is a possible example of the new Shangoni Gate. The structure will be as low as possible, not to exceed the height of the tree line. Additional trees can by planted around the gate complex to increase the screening capacity of the landscape.

Figure 3: Example of entrance gate

4.2 RECEPTION AREA

The reception area will be a relatively larger building complex that consists of a parking area, ablution facilities, reception and office, as well as another access control into the park. From the earlier concept drawings, it is clear that the building complex will be fragmented into smaller units, each housing its own function. The building character will presumably be similar to other reception complexes in KNP with thatch roofs and simple structures, maintaining a low profile.

Two locations have been identified at Lat -23.144687°, Long 30.944213° (Applicant's preferred site) and Lat -23.142714°, Long 30.937181° (Alternative 1). Both locations are on the existing ranger road and in the typical Mopane woodland. It can be expected that some bush clearing will be required to make place for the infrastructure. This will be kept to a minimum and part of the final design will be to preserve as many trees and natural features as possible and to rather design the infrastructure around it.

4.3 NEW SHINGWEDZI BRIDGE

The bridge will be a standard, single lane bridge, presumably constructed of concrete. It will be on the same level as the banks on both sides of the Shingwedzi River. Figure 4 is a longitudinal section of the bridge as proposed by the engineers. The engineering work is expected to be high intensity construction activity and will require major excavations to construct secure footings and anchors in the stable bedrock.

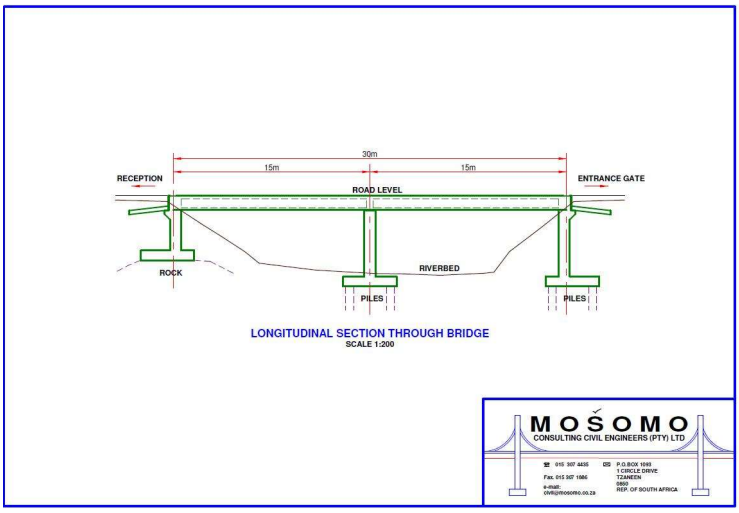

Figure 4: Shingwedzi Bridge

4.4 ROAD UPGRADE

The existing ranger road will be upgraded to a tar road. The entire route will follow the existing road's alignment except for a short 1.2 km divergence to cut out the loop that leads to the Shangoni Ranger village. The road will be slightly raised above the natural ground level (NGL) to facilitate storm water runoff. Typically, a tar road is 7 m wide but includes a shoulder of approximately 2.5 m on both sides of the road (Figure 5). This is wider than the current road, which will require the removal of vegetation along the length of the route. Normally, large and protected trees will be preserved or the road will be slightly diverted to avoid the removal of these trees.

The route crosses numerous small ephemeral streams and three large rivers. Each stream crossing will require culverts or drain pipes to facilitate water flow underneath the surface of the road. The route crosses the Shingwedzi River twice, and the Tshange River once. The first Shingwedzi River crossing is near the proposed Shangoni Gate and requires a constructed bridge as discussed in Section 4.3. The other two crossings are near the Bateleur Bushveld Camp and are on the S52 tourist route. These two crossings are currently low water bridges and will presumably remain the same with upgrades to its surface.

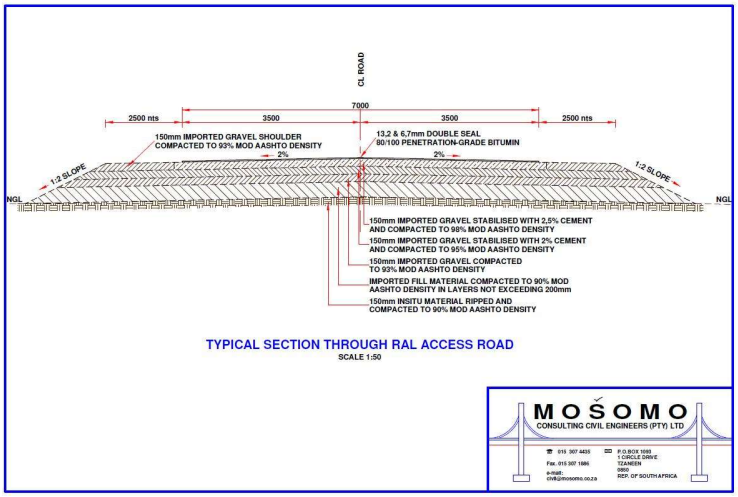

Figure 5: Road upgrade

4.5 RUSTIC CAMP, CARAVAN PARK AND PICNIC SITE

The rustic camp, caravan park and picnic site is proposed on the inside of a loop made by the Shingwedzi River, approximately 12 km south east of the Shangoni Gate. The three facilities will be spread out along the 6 km stretch of river. It is expected to be low intensity development, requiring very limited infrastructure. Access roads, presumably gravel, will be constructed from the new tar road to the individual sites. Other services such as electricity, water and sewage will be generated, sourced and managed on site, respectively.

The rustic camp site will facilitate approximately 10 double tent units. From the pre-feasibility studies, the tent units will be semi-permanent structures, but the possibility exists that it will be camp sites where tourists will erect their own tents. Ablution facilities and a camp office may also accompany the rustic camp site. Normally, these types of camps are designed to cause an absolute minimal disturbance. No trees will be removed and it is only the individual campsites, access roads and footpaths that will be cleared of undergrowth to facilitate vehicular and pedestrian circulation.

The caravan park will facilitate approximately 20 stands. Each stand will be slightly levelled and cleared of undergrowth. Vehicular access roads will be made to each caravan stand and should be wide enough to facilitate turning circles. Ablution facilities and camp office will be some of the ancillary structures. As with the rustic camp, the development will cause a minimal disturbance and at most, undergrowth will be removed in selected areas.

The picnic site will presumably consist of a complex that houses ablution facilities, a tuck- and curio shop and a take-away restaurant. Seating and tables will be provided for tourists under the trees. A parking area is also necessary and should be able to accommodate touring busses. All the activity areas will be cleared of the undergrowth, but trees will be preserved to provide shade. As with the other facilities, the design strategy will be to disturb the site to a minimum whilst preserving its characteristic features.

In all three instances the extent of the facilities is assumed to be no more than 1ha.

5 LANDSCAPE CHARACTER ASSESSMENT

A Landscape Character Assessment (LCA) identifies and describes the comprising attributes and their qualities/values in the study area. It recognises that a landscape consists of interconnected systems, patterns and individual components that is defined by the natural, cultural and historical aspects of the region. "…the character of a certain landscape segment is the result of the interplay of natural attributes (especially morphology, water bodies, character of vegetation), cultural attributes (land use, form and structure of built-up areas, individual buildings and their relationship with the surrounding landscape, the cultural value of the place) and historical attributes (the presence of elements and textures that bear witness to the historical development of a landscape and its continuity)." (Vorel, et al, 2006)

The KNP is renowned for its pristine natural character and is a showroom for biodiversity and eco-system restoration and conservation. Its natural attributes and qualities has long been the main attraction for millions of tourists. An ecotourism business model has seen the expansion of tourist facilities and infrastructure over recent years. The proposed Shangoni Gate is one such tourist project that is aimed at enhancing accessibility to the northern part of the KNP. In the process it will increase the ecotourism potential in order to benefit ecosystem conservation and community upliftment.

The study area is part of a greater ecological system and the following topics identify and describe the attributes that constitute the landscape character. It is divided into two components namely; natural attributes and cultural/historical attributes.

5.1 NATURAL ATTRIBUTES

5.1.1 LAND COVER

The study area is located in the northern part of the KNP and traverses an area, broadly classified as the Mopane-dominated woodlands with an underlying granite geology. As the classification states, Mopane trees dominate the landscape and occur in both a stunted shrub from and in a tree form. Few other tree species occur among the Mopanes, causing a monotonous and homogenous vegetation cover over much of the study area.

The riverine vegetation is however different and unique, but occurs in a narrow corridor along the major river systems. Majestic trees line the river banks and tower above the dense Mopane woodlands. Their sheer size is impressive and can be classified as natural attributes that contribute to a unique character of high visual quality.

5.1.2 LAND FORM

The study area is part of a large plain of which the relief is rather flat and featureless with a gentle slope from west to east. There are no distinguishable topographic features except for the Shingwedzi- and Tshange Rivers that carved out a sinuous path through the plain. No elevated vantage points, that exceed the height of the vegetation, are present, but on rare occasions the vegetation opens up slightly to reveal partial panoramic views of a level horizon.

The Shingwedzi River aligns the existing ranger road for much of the way and meanders in and out of the study area. This is considered one of the major rivers traversing the KNP and is classified as

an intermittent-seasonal river. More often than not, the Shingwedzi River is a dry river bed with isolated pools and rocky/sand surface with steep banks. It flows periodically during the rainy season and is known to cause major flooding in extreme cases. The deeply fissured river is seldom visible from the road due to the dense Mopane vegetation, but can be recognised by the majestic trees on the banks. Its only when crossing the Shingwedzi- and Tshange Rivers that one becomes aware of their size and depth.

5.2 CULTURAL AND HISTORIC ATTRIBUTES

The study area can be described as a wilderness with the only anthropogenic features being the KNP border fence at the Shangoni Gate site, and the existing ranger road. A couple of two-track ranger roads tee off from the road and disappear into the dense Mopane woodland. For all practical purposes, the study area has a pristine natural character with negligible human interference.

These statements are subject to the findings in the Heritage Assessment. If any significant findings are made, it could affect the results in this report.

5.3 CONCLUSION

The pristine natural character of the study area is the most valued attribute. Globally, pristine natural environments are severely under pressure and very few untouched ecosystems remain. It is only in the last century that the concept of nature conservation gained momentum in South Africa. The KNP was proclaimed in 1926 and has since become an iconic example of nature conservation. It is considered a rarity and offers unique experiences of undisturbed ecosystems.

Within the study area, the majestic river trees and serene pools of the Shingwedzi River, coheres to scenes of particularly high scenic quality. These unblemished natural features along with intangible qualities such as the remoteness and tranquillity contribute to a sense of place that can be described as uniquely secluded and completely unaffected by human interventions.

The Mopane woodlands can be experienced as uniform in its character due to the similarity in specie composition and the featureless topography over vast areas of the study area. It lacks a diversity of major landscape features but nevertheless, it does not detract from its pristine natural character and its value as a natural resource.

The following set of images (Figure 6-Figure 11) portray typical scenes in the study area and are representative of the landscape character. Two distinct landscape scenes are identified namely; the Mopane-dominated plains through which the road meanders, and the Shingwedzi River that creates the backdrop for the rustic camp, caravan park and picnic site. Figure 6 illustrates the photograph locations that can be revisited after completion of the project and used for monitoring purposes.

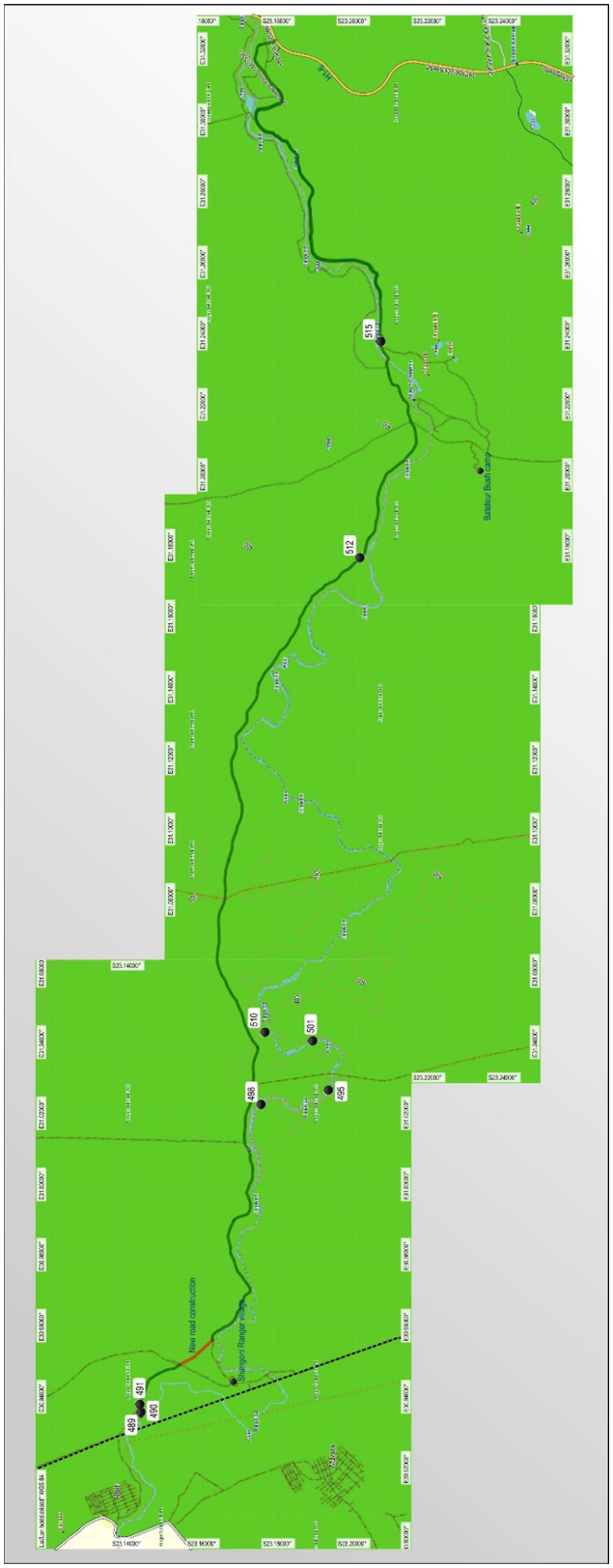

Figure 6: Viewpoint locations

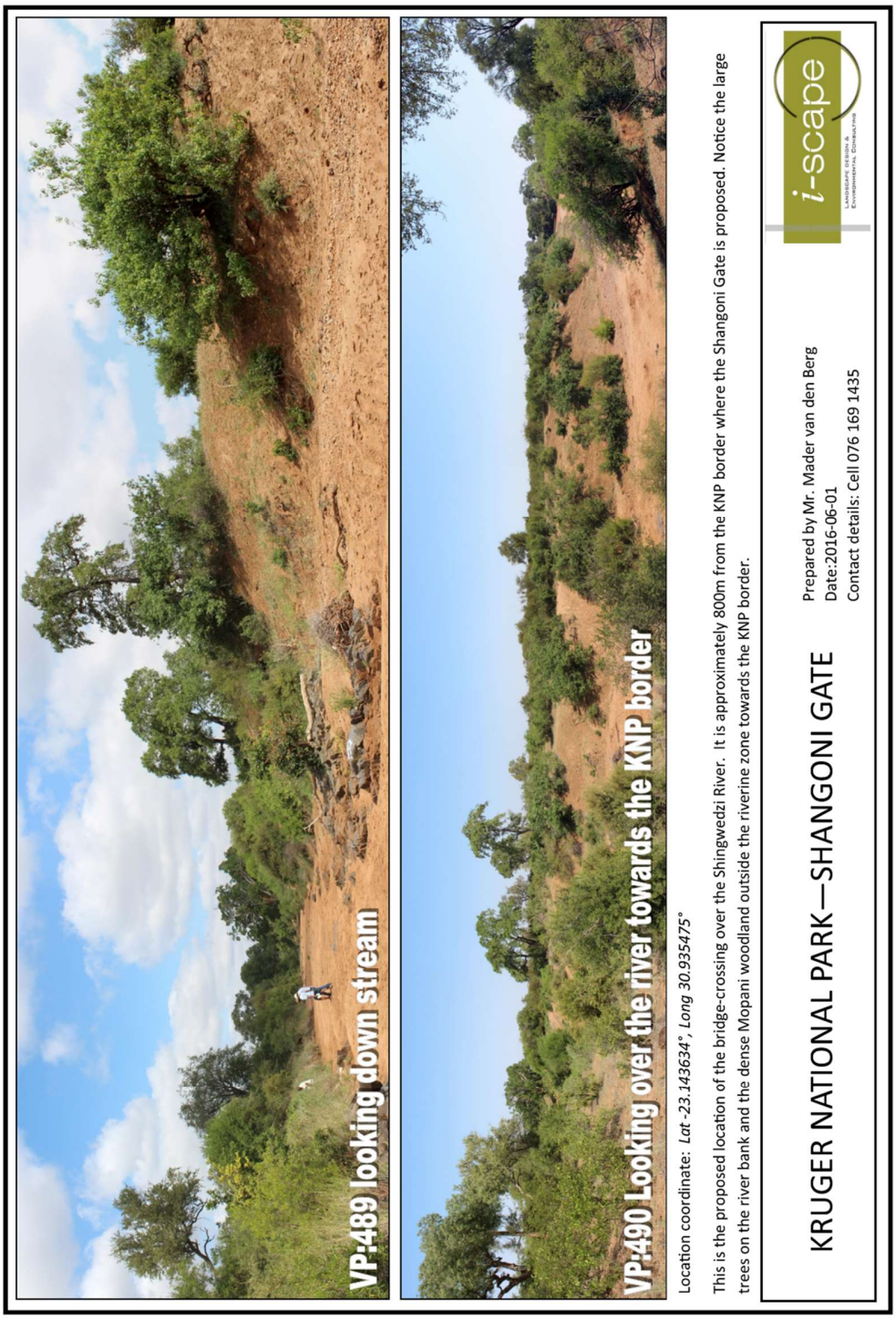

Figure 7: Viewpoints 489&490

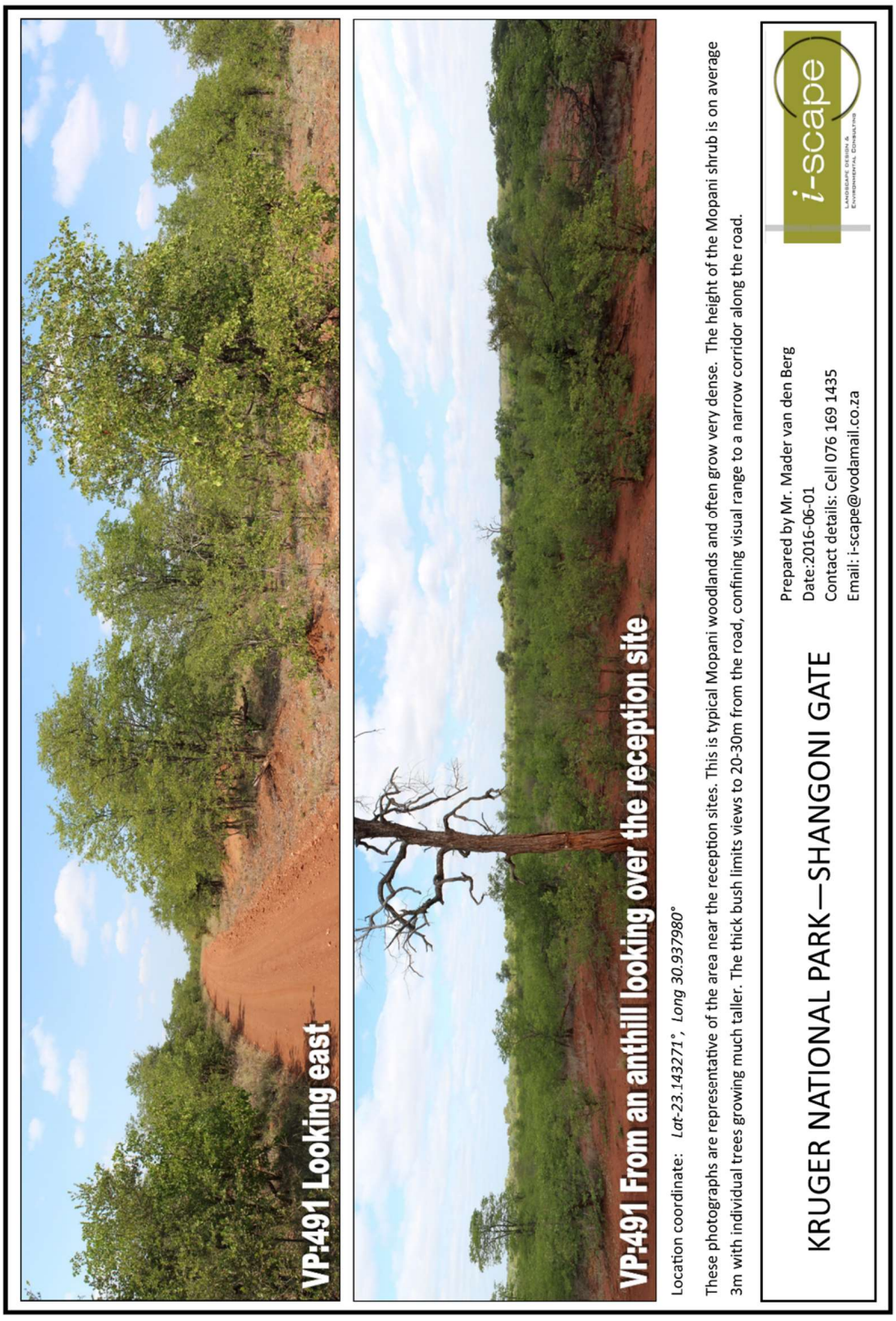

Figure 8: Viewpoint 491

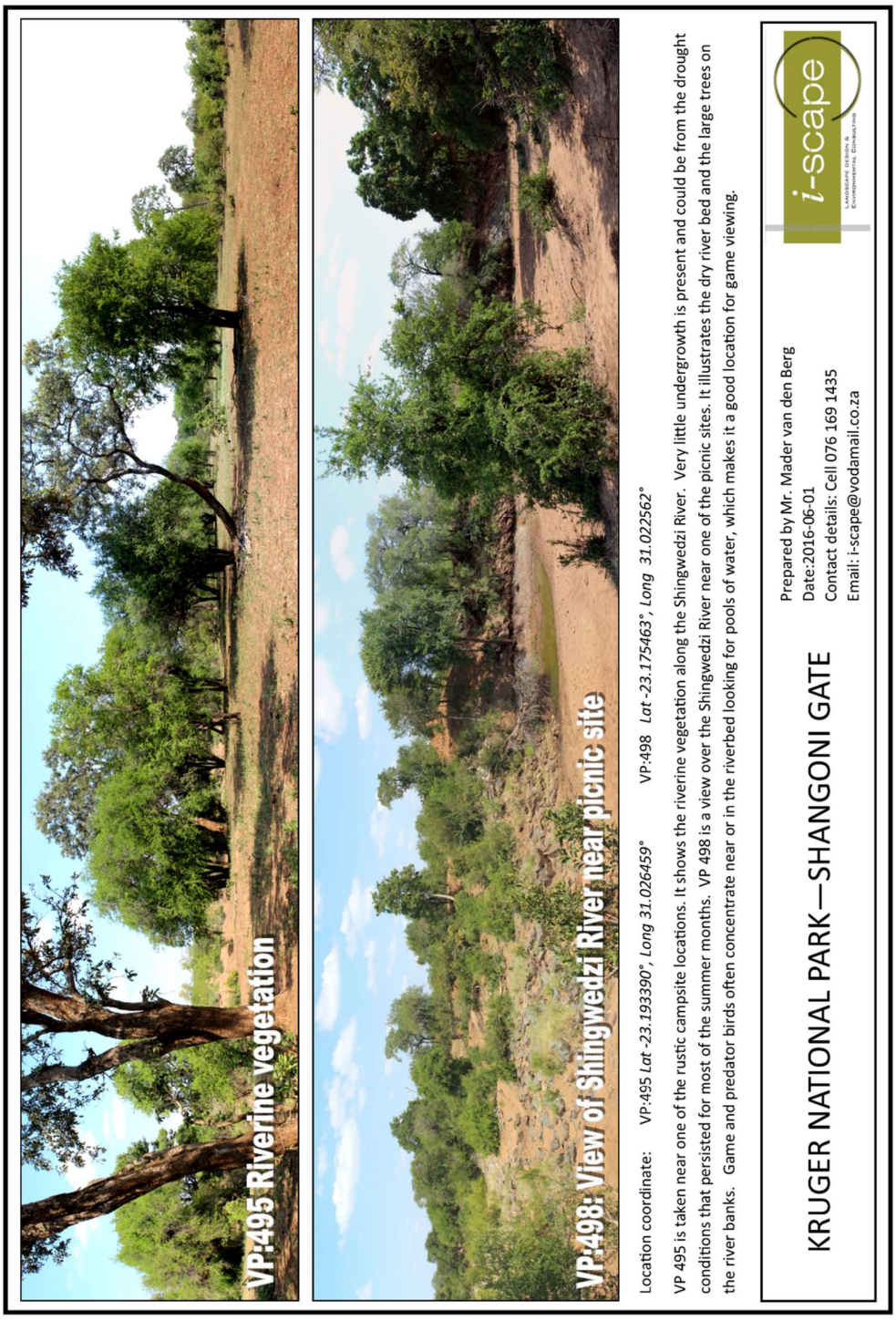

Figure 9: Viewpoints 495&498

Figure 10: Viewpoints 501&510

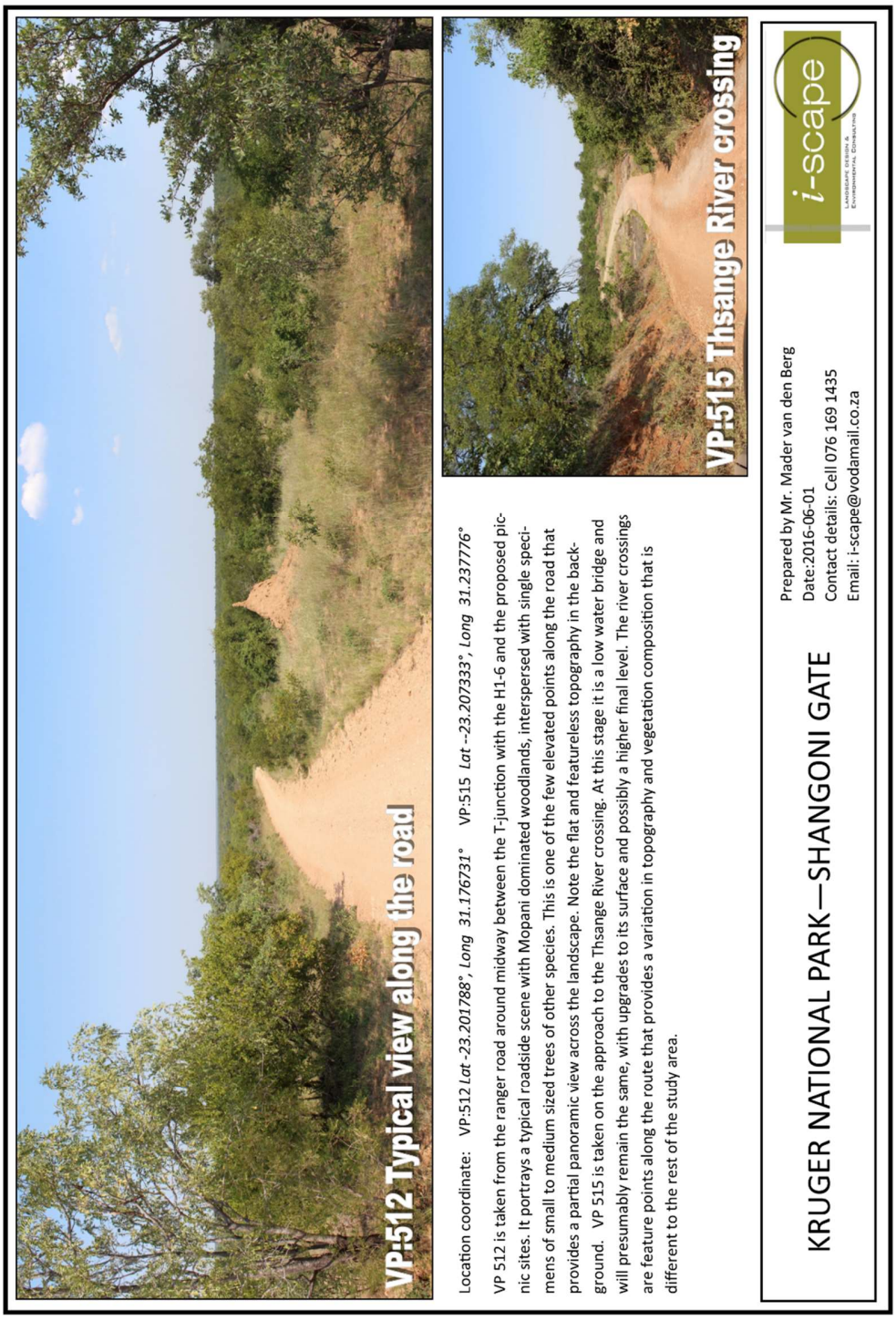

Figure 11: Viewpoints 512&515

6 VISUAL IMPACT ASSESSMENT

A VIA is a specialist study that assesses the potential visual changes/impacts to an existing baseline setting resulting from the implementation of a proposed project. This implies that, firstly, a baseline must be established and secondly, the visual change, resulting from the project, must be compared to the baseline. The quantification of the visual change is referred to as the severity of the impact and is a function of:

- The nature of the impact;
- The probability of the impact occurring;
- The duration of the impact;
- The extent of the impact; and
- The magnitude of the impact.

The essence of determining the significance of a visual impact, centres on the severity of the potential impacts, and the sensitivity of the affected receptors. In simple terms, a low severity impact affecting receptors of low sensitivity, will result in a low significance. On the other end of the scale, a highly severe impact, affecting highly sensitive receptors, will result in a high significance. This is illustrated in Table 1.

Table 1: Impact significance matrix

		Impact severity				
Receptor sensitivity		Very high	High	Medium	Low	Very low
	Very high	Substantial	Major	Major/Moderate	Moderate	Moderate/Minor
	High	Major	Major/Moderate	Moderate	Moderate/Minor	Minor
	Medium	Major/Moderate	Moderate	Moderate/Minor	Minor	Minor/Negligible
	Low	Moderate	Moderate/Minor	Minor	Minor/Negligible	Negligible
	Very low	Moderate/Minor	Minor	Minor/Negligible	Negligible	Negligible/None

6.1 BASELINE ESTABLISHMENT

The baseline environment is represented by the status quo scenario and provides the premise from which the visual change can be evaluated. The study area is assessed in Section **Error! Reference source not found.**4) and is subsequently described as a pristine natural environment with minimal anthropogenic alternations. Its secluded location and unblemished natural features are also noted as unique characteristics that offer high scenic value. Two distinguishing landscape variations have been identified, namely the Mopane-dominated woodlands, and the Shingwedzi River. The Shingwedzi River with its majestic trees and open water, is highly valued for its scenic quality. The Mopane woodlands are considered less interesting due to the limited variation in topography and specie composition. It is still considered to be in a pristine natural condition and is a habitat for a variety of game.

The only recognisable anthropogenic features in the study area are the existing ranger road and the border fence at the Shangoni gate site. Settlements are located not far from the border of the KNP,

but a dense vegetation barrier restricts any visual links. The baseline condition in the study area is considered highly natural with a wilderness character.

6.2 VISUAL AND LANDSCAPE RECEPTORS

Within the study area, observers experience and interact differently with their environment and therefore value it differently. They may be affected by the proposed project due to additions or alterations in the visual environment which may influence their experience and views of the visual resource. In this study a distinction is made between impacts on the **observers** and impacts on the **visual resource**. The observers represent all people that may be affected visually while the impacts on the visual resource strictly assess the changes to the landscape character and the impact on its visual value.

6.2.1 OBSERVER SENSITIVITY

The sensitivity of an observer is related to the value an observer has for the particular visual resource being impacted on. To determine viewer sensitivity a commonly used rating system is utilised (Table 2). This is a generic classification of observers and enables the Visual Specialist to establish a logical and consistent viewer sensitivity rating for viewers who are involved in different activities without engaging in extensive public surveys.

Table 2: Viewer Sensitivity

VIEWER SENSITIVITY	DEFINITION (BASED ON THE LANDSCAPE INSTITUTE, 2002 ED PP90-91)
Exceptional	Views from major tourist or recreational attractions or viewpoints promoted for or related to appreciation of the landscape, or from important landscape features.
High	Users of all outdoor recreational facilities including public and local roads or tourist routes whose attention or interest may be focussed on the landscape; Communities where the development results in changes in the landscape setting or valued views enjoyed by the community; Residents with views affected by the development; People generating an income from the visual resource or pristine quality of the environment.
Medium	People engaged in outdoor sport or recreation (other than appreciation of the landscape); People commuting between work place and home or other destinations that do so at regular intervals.
Low	People at their place of work or focussed on other work or activity; Views from heavily industrialised or blighted areas. Motorists travelling at high speed with their focus placed on the road ahead.

Observer groups that will be affected by the proposed development is limited to park rangers that require access to the Shangoni Ranger village and tourists that pass the road construction activity along the H1-6 or S52.

Rangers are employed by SANParks and are in the area for a specific reason, i.e. to fulfil their service agreement or to travel to and from the Shangoni Ranger village. They will be exposed to the construction activity of the road. They will be essentially commuting between destinations therefore their sensitivity is regarded medium. Since this is not a tourist route, no members of the public will be allowed to enter this part of the study area.

Tourists will have a minimal exposure to the road construction. They will pass the most western section of the road when travelling on the H1-6. Their exposure to the construction activity will be limited to that specific location, and will be brief. Tourists are users of the roads passing the road construction and their main purpose for visiting, is to enjoy the pristine character of the landscape. They are classified as observers of high sensitivity.

It is unclear how the tourist traffic to Bateleur camp will be managed. In the pre-feasibility studies it is mentioned that traffic on the S52 between H1-6 to Bateleur camp will be temporarily stopped, until construction is complete. As a worst case scenario it can be assumed that tourist traffic to this camp will resume with typical traffic control measures.

6.2.2 LANDSCAPE CHARACTER SENSITIVITY

The sensitivity of a landscape's character is a measure of the robustness of its character and the ability of the landscape to accommodate certain changes without detrimental impacts to its qualities.

A landscape character with a high sensitivity will typically have one or a combination of the following attributes:

- A low Visual Absorption Capacity (VAC);
- A high degree of inter-visibility with adjacent landscapes;
- A well-established identity and sense of place;
- Is often in a pristine natural condition with high ecological value that contributes to a valued aesthetic condition; and
- Is considered scarce or uncommon.

A landscape character with a low sensitivity will typically have one or a combination of the following attributes:

- A high VAC;
- Is often visually isolated with a low degree of inter-visibility with adjacent landscapes;
- A poorly established identity and sense of place;
- Is often greatly developed to an extent where no or very little aesthetic features exist; and
- Is considered common and found in numerous places.

The tangible landscape receptors are essentially the vegetation and the rivers that contribute to the wilderness character of the visual resource. This, paired with the intangible attributes such as its secluded location, rarity and uniqueness, contributes to a highly valued landscape with exceptional scenic qualities.

The study area offers a very high VAC due to the dense vegetation growth and enables the landscape to provide high degrees of visual screening. It is however considered a pristine natural environment that is scares and valuable on a global scale, but not particularly uncommon on a local scale. The landscape character is considered moderately sensitive, with a robustness that can accommodate low intensity changes without detrimental effects to its character.

6.3 CONSTRUCTION PHASE

During the construction of the proposed project, temporary construction camps may be present in the study area. A construction camp is usually a fenced area and includes staff accommodation,

ablution facilities, site offices and storage space. It is likely that the construction camps will be located outside the KNP, but this information was not available at the time of the report compilation. As a worst case scenario it will be assumed that the construction camps will be inside the KNP.

The type of construction activity that is required varies between the different project components. The Shangoni gate, reception and the buildings at the picnic site, caravan park and rustic tented camp, are assumed to have similar construction activity. It is activities normally associated with building construction and includes basic steps such as foundation excavation and casting, brickwork and roof installation. Excavation will be done by hand or through the use of machinery. The brickwork, roof installation and finishes will be done by labourers. It is considered low intensity construction that will only disturb the footprints of the individual buildings. Vegetation will only be removed if absolutely necessary.

The bridge construction and road upgrade are more specialised activities and require specific equipment and machinery. This is considered high intensity construction and will make use of heavy machinery such as graders, rollers, excavators and mobile cranes. Large amounts of material will be delivered by trucks and the construction period may take several years. The bridge's construction will remain within the site's boundaries and is not expected to disturb the surrounding landscape in any significant way.

The road upgrade will require a wider corridor to be cleared than the existing ranger road. Large amounts of vegetation will be removed along the side of the road over its entire length. This will be mostly Mopane trees that is common in the region. Large trees will be preserved and slight road deviations may be made to avoid them.

One of the last activities will be rehabilitation and landscaping. Rehabilitation of the road shoulder and bridge site will occur to prevent exposed soil and the potential for erosion. Additional landscaping may occur around some of the facilities but will presumably be done in accordance with the existing vegetation character.

6.4 OPERATIONAL PHASE

Once the construction phase is completed the facilities will come into operation. This will cause an influx of tourists to an area that was previously closed to the public. Vehicular traffic will increase through the area due to the Shangoni Gate and road providing a means of access. Low intensity accommodation and day visitor facilities in the form of the rustic camp, caravan park and picnic site will attract relatively small numbers of tourists, consistently throughout the year.

All the facilities and infrastructure will be similar in appearance and function compared to most of the other facilities in the park. It will be familiar additions that can be described as compatible with the KNP's existing infrastructure. This is considered in accordance with the KNP internal vision and planning strategy for the northern part of the park.

6.5 IMPACT SUMMARY

For the purpose of the impact determination, some of the project components are grouped together due to their similarities in location and nature of impact. Table 3 - Table 5 summarise the impact severity of the:

- Shangoni gate, bridge and reception;
- Rustic camp, caravan park and picnic site; and
- Upgrade of the ranger road.

Table 3: Impact Severity Summary – Shangoni gate, bridge and reception

Shangoni gate, bridge and reception		
	Without mitigation	**With mitigation**
Construction phase		
Nature of impact: The construction activity will cause a disturbance to the existing landscape character and will impact on the site's pristine natural qualities. There will be a presence of construction equipment on the individual sites along with a workforce that is unfamiliar to the study area. Some vegetation will be removed inside the footprints of the individual structures, although it can be assumed that it will be kept to a minimum. The impact will only affect the natural character of the visual resource, but no observers will be impacted.		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (28)	Low (15)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: The presence of new infrastructure, that allows access to tourists, are unfamiliar to the site, but compatible in appearance to the rest of the KNP. It will affect the secluded sense of place and pristine natural character of the study area, although limited to the sites where the infrastructure is located. The impact will negatively affect the natural character of the visual resource. The impact on observers will be neutral as this will be their first exposure to this particular area and all the infrastructure will be familiar and similar to the park's existing infrastructure.		
Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (27)	Low (21)
Status (Positive/Negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated: Impacts can be mitigated through stringent control measures during construction and offset screen planting during operation.		
Mitigation: • Locate construction camps outside the borders of the KNP in areas that is already disturbed to avoid additional disturbance inside the park; • In the event that construction camps are located in the KNP, put stringent restrictions in place to contain the footprint of the camp by temporarily fencing it and clearly demarcating the entire construction area to minimise disturbance of areas outside the construction site;		

• Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area to avoid wind blowing waste into the bush; • Implement dust suppression measures during earthworks to minimise the impact of dust clouds; • Appoint a suitable architect and landscape architect to design the infrastructure and the adjoining surroundings with sensitivity towards the environment and its current character; • No structure may exceed the height of the surrounding vegetation; • Additional trees and shrubs can be planted around the structures as an offset measure to the loss in vegetation in the footprint of the infrastructure. Specie choices should be informed by the natural occurring vegetation; • All signage should be non-intrusive but clear. No sign boards will be placed on separate frameworks higher than 2 m above the ground level to avoid it exceeding the height of the vegetation.
Cumulative impacts: Cumulative impacts can be described as a further loss in vegetation and additional intrusion on secluded and pristine natural environments. This is considered a minimal impact and should be seen in the light of sacrificing some natural environments to protect and conserve other features of the KNP through the funding of tourism.
Residual Risks: No residual risks are identified

Table 4: Impact Severity Summary – Rustic camp, caravan park and picnic site

Rustic camp, caravan park and picnic site		
	Without mitigation	**With mitigation**
Construction phase		
Nature of impact: The construction activity will cause a disturbance to the existing landscape character and will impact on the site's pristine natural qualities. There will be a presence of construction equipment on the individual sites along with a workforce that is unfamiliar to the study area. Some vegetation will be removed that will expose the underlying soil, although it can be assumed that it will be kept to a minimum. The impact will only affect the pristine natural character of the visual resource and the tranquil, remote sense of place, but no observers will be impacted.		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (28)	Low (15)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: The presence of new infrastructure is unfamiliar to the site, but compatible to similar developments in the rest of the KNP. The new development will add non-intrusive infrastructure to the individual sites that are currently free of any human intervention. An influx of small numbers of tourists will occur in this area that is currently inaccessible to any tourist activity. The development will affect the secluded nature and pristine natural character of the study area, although the natural features will remain largely untouched. The development is considered additive with very limited direct impact on the landscape's features. The impact on observers will		

be neutral as this will be their first exposure to this particular area and all the infrastructure will be familiar and similar to the park's existing infrastructure.		
Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (27)	Low (21)
Status (Positive/Negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated: Impacts can be mitigated to great effect.		
Mitigation: • Locate construction camps outside the borders of the KNP in areas that is already disturbed to avoid additional disturbance inside the park; • In the event that construction camps are located on the site, stringent restrictions must be put in place to contain the footprint of the camp by temporarily fencing it and fencing the entire construction area to minimise disturbance of areas outside the construction site; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area to avoid wind blowing waste into the bush; • Appoint a suitable architect and landscape architect to design the infrastructure and the adjoining surroundings with sensitivity towards the environment and its current character; • Additional trees and shrubs can be planted as an offset measure to the loss in vegetation where access roads and other infrastructure is placed; • No structures may exceed the height of its surrounding vegetation;		
Cumulative impacts: Cumulative impacts can be described as a further loss in vegetation and additional intrusion on secluded and pristine natural environments. This is considered a minimal impact and should be seen in the light of sacrificing some natural environments to protect and conserve other features of the KNP through the funding of tourism.		
Residual Risks: No residual risks are identified		

Table 5: Impact Severity Summary – Ranger road upgrade

Ranger road upgrade		
	Without mitigation	**With mitigation**
Construction phase		
Nature of impact: The construction activity will widen the existing road from an estimated 7m to approximately 12m (including road reserve). There will be a presence of construction equipment and a workforce that is unfamiliar to the study area. Some vegetation will be removed to get to the required width, although it can be assumed that it will be kept to a minimum and that large and protected trees will be preserved. The road upgrade will disturb the remote and tranquil sense of place during its construction phase. A relatively narrow strip of vegetation will be removed that is considered part of the natural character of the study area. Observers and KNP staff travelling on the H1-6 and S52 may be exposed to the construction activity for a brief moment. The presence of construction equipment will be unfamiliar to the		

natural environment they come to enjoy and will cause a visual intrusion as a result of the ground works and machinery.		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Low (4)	Minor (2)
Severity	Low (28)	Low (15)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: The presence of a new public road will allow access to tourists in an area that was previously only accessible to staff of the KNP. It will increase traffic through the area but with minimal impact on the original landscape character. The road upgrade will improve the current condition of the ranger road and will form a seamless part of the existing road network in the KNP. No negative impact on any observers are expected after the road is completed and taken into use.		
Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Contained on site (1)	Contained on site (1)
Magnitude	Minor (2)	Minor (2)
Severity	Low (15)	Low (15)
Status (Positive/Negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated: Impacts can be mitigated during the construction phase to limit impacts on the small number of observers that may be impacted and to limit more disturbance that is necessary. During operation basic road maintenance and erosion control is required.		
Mitigation: • Locate construction camps outside the borders of the KNP in areas that is already disturbed to avoid additional disturbance inside the park; • In the event that construction camps are located in the KNP, put stringent restrictions in place to contain the footprint of the camp by temporarily fencing it and fencing the entire construction area to minimise disturbance of areas outside the construction site; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area to avoid wind blowing waste into the bush; • Implement dust suppression measures during groundworks to minimise the impact of dust clouds; • Set up a temporary hessian or shade cloth barrier at the T-junction with the H1-6 to conceal the construction activity from this tourist road; • Provide clear signage at the H1-6 and S52 roads to inform tourists to the purpose of the construction. Tourist are generally more tolerant to construction in conservation areas if they understand the purpose thereof; • Maintain the road surface periodically and control erosion along the shoulder to avoid unsightly damages to the road and surroundings.		

Cumulative impacts: Cumulative impacts can be described as a further loss in vegetation to establish more tourist routes inside the KNP. This is considered a minimal impact and should be seen in the light of sacrificing some vegetation to protect and conserve other features of the KNP through the funding of tourism.
Residual Risks: No residual risks are identified

6.6 IMPACT SIGNIFICANCE

Table 6: Impact significance during construction phase

Project component	Sensitivity of receptors	Severity of Impact	Significance of Impact
Shangoni gate, bridge and reception	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Rustic camp, caravan park and picnic site	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Ranger road upgrade	OB: High	OB: Low	OB: Moderate/Minor (-)
	VR: Medium	VR: Low	VR: Minor (-)

Table 7: Impact significance during operational phase

Project component	Sensitivity of receptors	Severity of Impact	Significance of Impact
Shangoni gate, bridge and reception	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Rustic camp, caravan park and picnic site	OB: N/A	OB: N/A	OB: N/A
	VR: Medium	VR: Low	VR: Minor (-)
Ranger road upgrade	OB: High	OB: Low	OB: Moderate/Minor (+)
	VR: Medium	VR: Low	VR: Minor (+)

6.7 LIGHTING DESIGN GUIDELINES

External lighting is a design aspect that is only considered during detailed design phases and no information is provided in the project description. The possibility of lighting pollution or intrusive external lighting is considered extremely low to negligible. The reasons being that KNP has stringent internal guidelines with regards to this aspect and their policies condemn any light pollution conditions emanating from developments inside the park's borders. As a mitigation measure, the following guidelines are provided as a supplement to KNP's internal guidelines:

- Confine light output within property boundaries through using specifically designed luminaires such as full cut-off luminaires to minimise upward spread of light near to and above the horizontal (**Figure 12** – A[1]);
- Tilt spotlight luminaires to direct the light to the intended spot, instead of allowing it to light areas outside its purpose (**Figure 12** – B);
- Mount outdoor spot lights on the appropriate pole height. Higher mounting heights allow lower main beam angles which can reduce glare (**Figure 12** – C).
- Utilise control systems to reduce light levels during inactive periods or at predetermined times while maintaining sufficient lighting for safety and security (NEMA, 2000).

[1] Source: ILE, 2005

- Where vertical surfaces are illuminated, such as advertising signs or buildings façades, it is recommended that luminaires should light downwards. If up-lighting is the only alternative, the use of shields, baffles or louvers should be installed to reduce light spillage over or under the structure (**Figure 12** – E).
- Do not over illuminate areas. Use the correct illuminance intensity for the purpose intended.

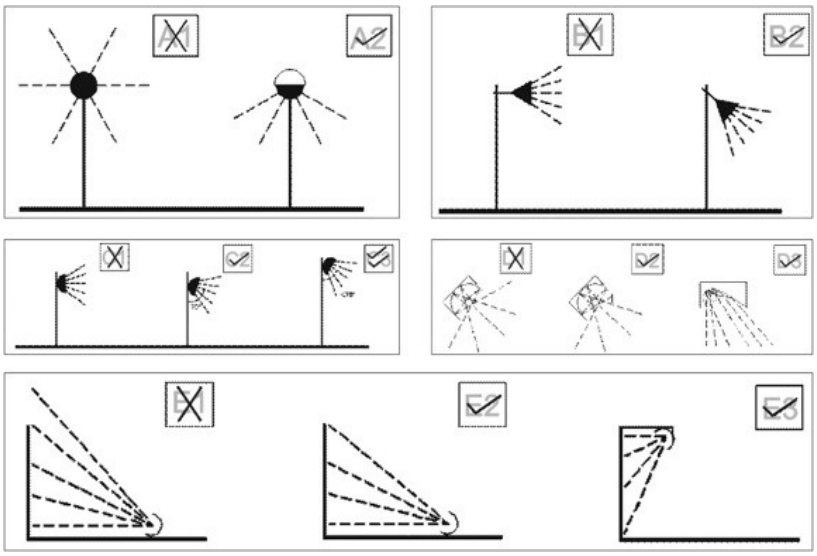

Figure 12: Lighting design guidelines

7 CONCLUSION AND RECOMMEDATIONS

The applicant, SANParks, has proposed low intensity development and an additional entrance gate into KNP for the northern part of the park. This has been part of an extensive planning process that is motivated by the need for an additional access point into the park between the existing Palaborwa and Punda Maria Gates. A current ranger road will be upgraded to a tar road that will connect the proposed Shangoni Gate to the public H1-6 road.

The project traverses an area that is best described as a Mopane dominated plain with no distinct topographic features. The Shingwedzi-and Tsange Rivers are major water courses in the study area and provide picturesque scenes of majestic trees and serene pools of water. The rivers are natural features of very high scenic quality and add to the pristine natural character of the study area.

For the most part, the project is located in areas that are secluded and are not visible from any public viewpoints. No negative impacts will be experienced by observers during the construction of the Shangoni gate, Shingwedzi bridge, reception and the rustic camp site, caravan park and picnic site. The only part of the project that will have any impact on tourists and KNP staff will be the ranger road upgrade that will be visible from the H1-6 and S52. Intrusive views may only be experienced during the construction phase when earthworks and construction equipment are active on the road.

The most significant impact will be on the character of the landscape. Currently, the various sites are inaccessible to tourists and are located in a fairly secluded part of the park. A pristine natural character prevails and is unblemished by any human intervention. With the introduction of the various

project components, the individual sites will be developed to accommodate tourist activity. This will affect the untouched natural character, but the impacts are only limited to the individual sites.

The assessment acknowledges that SANParks is an institution that is very much concerned with the conservation of its natural assets. Although limited information is available on the particular project, it can be assumed with reasonable certainty that SANParks will develop the sites with sensitivity in order to preserve the natural attributes. Other similar projects are used as a reference to understand the potential impact on the landscape. Through this reasoning, all of the impacts are considered low and does not provide any reason for the project to be refused.

Various alternative locations have been proposed by the applicant. In all the cases the alternatives are either in close proximity to each other, or are located in areas that are identical in their landscape character. The difference in impacts between the alternatives is negligible and the ranking is differentiated by marginal preferences or disadvantages. None of the sites have a definite positive or negative motivation and all are considered acceptable.

Table 8: Alternative site ranking

ALTERNATIVE	RANKING	MOTIVATION
Shangoni Gate alternatives		
Applicant's preferred	1	The applicant's preferred location is considered the most appropriate based on the fact that it is the closest location to the bridge site and requires the shortest road section. The least amount of bush clearance is therefore required.
Alternative 1	2	
Reception alternatives		
Applicant's preferred	1	Both locations are in the Mopane dominated woodlands and will have the same impact on the landscape. No distinguishing advantage can be recognised to rank one alternative higher than the other.
Alternative 1	1	
Picnic Site alternatives		
Applicant's preferred	2	Alternative 1 is marginally more preferred than the applicant's preferred site. Alternative 2 is the least preferred. The motivation is purely based on the various distances from the ranger road that requires a shorter or longer access road to the alternatives.
Alternative 1	1	
Alternative 2	3	
Rustic Camp alternatives		
Applicant's preferred	1	The applicant's preferred site is considered the most appropriate based on the fact that it is the closest location to an existing dirt road that extends south from the ranger road. This is based on the assumption that the dirt road will be used as an access route instead of a new road.
Alternative 1	2	
Caravan Park alternatives		
Applicant's preferred	1	The applicant's preferred site is considered the most appropriate based on the fact that it is the closest location to an existing dirt road that extends south from the ranger road. This is based on the assumption that the dirt road will be used as an access route instead of a new road.
Alternative 1	2	

8 REFERENCES

As a matter of best practice, this assessment is based on internationally accepted guidelines and standards with regards to VIA. The following sources are frequently referred to:

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