VISUAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED GOD'S WINDOW SKYWALK PROJECT

Visual Impact Assessment

Supporting the Scoping and Environmental Impact Reporting process (S&EIR)

Prepared for:

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STRATEGIC ENVIRONMENTAL FOCUS

SEF No: 505201
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Declaration of Independence

I, **Hanlie Van Greunen,** in my capacity as a specialist consultant, hereby declare that I –

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998 (NEMA) as amended);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of NEMA;
- Will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional judgement; and
- Undertake to have my work peer reviewed on a regular basis by a competent specialist in the field of study for which I am registered as a Candidate Landscape Technologist.

15.01.2015

_____ _____

Hanlie Van Greunen Date
Landscape Technologist

EXECUTIVE SUMMARY

Strategic Environmental Focus (Pty) Ltd (SEF) has been appointed as an independent environmental assessment practitioner and visual specialist by the Industrial Development Corporation (IDC), on behalf of the project applicant, Mpumalanga Parks and Tourism Agency (MTPA), to undertake Scoping and Environmental Impact Reporting (S&EIR) process as well as a Level 3 Visual Impact Assessment (VIA) for the proposed Skywalk Project.

This report addresses the expected visual impacts of the proposed project on the receiving environment and also recommends appropriate mitigation measures in order to reduce these impacts.

PROJECT DESCRIPTION

The God's Window viewpoint, located on the escarpment of the Blyde River Canyon, is part of the scenic Panorama Route. This popular tourist route starts in the town of Graskop and comprise of a number of attractions along the R532, R533 and R534 provincial roads, such as the God's Window Viewpoint, Pinnacle, Bourke's Luck Potholes, the Three Rondavels, the Berlin Falls, the Lisbon Falls and several other. These impressive beauty spots are very popular amongst national as well as international tourists which makes the Blyde River Canyon the second most visited tourist attraction in Mpumalanga (after the Kruger National Park).

The proposed Skywalk Project at God's Window is envisaged to be a cantilevered glass walkway, extending 12 metres over the Canyon's edge. This facility will offer 360° panoramic views and will expose the visitor to the exciting experience of walking over the sheer 700 meter vertical drop below. The proposed new building will host a cafeteria, gift shop and ablution facilities. As part of this project redevelopment of the existing facilities, such as the carpark, pathways, viewpoints market stalls and viewpoints, is proposed.

RECEIVING ENVIRONMENT

The Blyde River Canyon is the third largest canyon and largest green canyon on earth with altitudes that ranges from 580m to over 1900m above sea level. According to Bredenkamp *et al.* (1996), the Blyde River Canyon hosts a range of endemic plant species and can therefore be classified as an important conservation area.

The study site comprises of dense, low- to medium growing shrubby vegetation covered with lichens and moss to create a forest-like atmosphere. In some places the vegetation is so dense around and above the footpaths that a "green tunnel effect" is experienced when moving through the space. These vegetation tunnels open up at designated viewpoints where breath-taking views, as far as the human eye can see, can be experienced. At the edge of the escarpment, sheer rock face plummets down into a green mass of Mistbelt Forest and pine plantations below.

VISUAL ASPECTS

Visual impacts generally occur as a result of changes to the landscape (development). A distinction, however, should be made between impacts on the visual resource and impacts on the visual receptor (viewer). The former are impacts on the physical landscape that may result in changes to the landscape character, visual character and/or visual quality, while the latter are impacts on the viewers of the landscape and their viewing experience.

Aspects to be considered in order to establish the intensity of the impact that the proposed development would have on identified visual receptors include the following:

- Visual Receptor Sensitivity;
- Visual Exposure;
- Viewing Distance;
- Visual Absorption Capacity (VAC) of the landscape;
- Visual Contrast;
- Sense of Place; and
- Obtrusive Lighting.

IDENTIFIED IMPACTS

The following impacts were identified and assessed according to the criteria ratings based on the Department of Environmental Affairs and Tourism's (DEAT. now called the DEA) (1998) Guideline Document: EIA Regulations.

Direct Impacts:

- *Construction Phase Impact:*
  - Views experienced by visual receptors, of vegetation clearance, construction activities including construction camps, material lay-down yards, stockpiles, cranes, scaffolding, delivery vehicles and general construction operations.

- *Operational Phase Impacts:*
  - Views, experienced by visual receptors, of the skywalk structure, new building and associated upgraded infrastructure; and
  - Enhancement of the visitor's viewing experience.

Cumulative impact:

- Depleting natural visual resources by changing the natural landscape character through development.

Indirect Impact:

- Setting a president of developing an area located in a visually sensitive setting of international significance (i.e. on the escarpment of the world's largest green canyon).

Each of the above impacts was assessed and rated. The assessment of the data is based on accepted scientific techniques and professional expertise and experience.

CONCLUSION

The site identified for the Skywalk Project is situated on the edge of the Blyde River Canyon escarpment at a well-known viewpoint of God's Window. The site is fairly level right up to the escarpment edge where it drops at a perpendicular angle into a cliff, of approximately 700m, into a forest below.

The following visual receptors, that may experience views of the proposed development, were identified:

- Tourists visiting the God's Window viewpoint;

- Forestry workers (residents) living and working at the foot of the escarpment;
- Residents on the outskirts of Graskop;
- Recreational Users utilising the plantation roads and hiking routes in the area; and
- Motorist traveling along the R533 road between Graskop and Bushbuckridge, as well as along the R534 that runs past the study site. Both these provincial roads form part of the scenic Panorama Route.

Vegetation within and around the study site is extremely dense which will shelter development to an extent. Another aspect that will reduce the impact is the sheer viewing distance (between 4 and 10km) at which Residents, Recreational Users and Motorists would experience views of the development.

Tourists, however, would be directly exposed to the impacts and are also classified as the most sensitive of all receptors. Observers develop a sense of place through knowledge and experience of a particular area. The uniqueness of the landscape, simplicity and visual character of God's Window is already widely known. Many tourists (especially South Africans) therefore have a preconceived perception of the character of God's Window. Like other attractions along the Panorama route – the existing infrastructure is low-key, yet sensitive and doesn't impose itself on the natural environment. The fact that you are able to quickly pull over and admire the view (often alone or with 2 or 3 other groups) gives God's Window a unique and therefore strong sense of place (identity). It was therefore established that the impact of the proposed project on tourists would be much higher in comparison with the impact on other visual receptors.

It was also established that the proposed project will act as a gateway for other tourism-driven developments to establish along the Panorama Route. This could lead to the cumulative impact of the depletion of visual resources (natural open space) in the region. This impact was considered to be medium to high without mitigation. Implementation of appropriate mitigation measures will, however, decrease the significance of the impact to medium.

Another impact to consider is creating an example (president) of developing a sensitive site of international significance (i.e. on the escarpment of the world's largest green canyon). This could lead to other projects being initiated in similar sensitive areas – not only along the Panorama Route but throughout the rest of the country. The significance of this impact is considered to be medium to high and the only mitigation would be to follow the No-go option.

On the other hand the proposed project will also enhance the Tourist's viewing experience. Tourists will be able to experience the feeling of weightlessness when walking over 12 meter glass walkway – offering spectacular views in all directions. Better facilities (cafeteria and ablution) will also make the visit more convenient and pleasant. The visual impact of the improved facilities and the visual experience it will offer the Tourist will be high in a positive sense.

IMPACT STATEMENT

The finding of the VIA, undertaken for the proposed Skywalk Project and associated infrastructure upgrades, is that the study site will have an impact Tourists, Residents, Recreational Users and Motorists. The impact on the latter three visual receptors will be low to medium based on the VAC of the landscape (dense vegetation) as well as the sheer viewing distance these receptors will experience views at (4 – 10km away).

Tourists will be greatly impacted on, however, the impact will be twofold. On the one hand the existing strong sense of place (identity) will be altered and the God's Window viewpoint, as it has become known, will never be the same again. On the other hand the new Skywalk structure will improve the viewing experience and offer 360° views to visitors as well as the exhilarating experience of "walking over the edge".

Two other factors to consider is creating a president of development in sensitive locations (of international significance) as well as depletion of visual resources (rural character) in the region and also the rest of South Africa.

In light of the above and considering all factors, including the anticipated post mitigation impact significance ratings (mostly medium), it is the opinion of the author that that although the proposed Skywalk Project will have a definite impact on Tourists and change the visual character and quality of the landscape in the long term, that the implementation of this project will not be unacceptable from a visual point of view.

Whether or not the project is appropriate within this context (i.e. on the escarpment of the world's largest green canyon) is to be questioned. It is therefore recommended that the development, as proposed, be supported, pending documented reference of the Public Participation Process, indicating that public perception of the development is not negative.

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GLOSSARY OF TERMS

Glare	Is caused by a harsh uncomfortably bright light emitting from a luminaire shining into the cone of vision causing reduced vision or momentary blindness when shining into one's cone of vision.
Landscape characterisation/ character	This covers the gathering of information during the desktop study and field survey work relating to the existing elements, features, and extent of the landscape (character). It includes the analysis and evaluation of the above and the supporting illustration and documentary evidence.
Landscape condition	Refers to the state of the landscape of the area making up the site and that of the study area in general. Factors affecting the condition of the landscape can include the level maintenance and management of individual landscape elements such as buildings, woodlands, etc. and the degree of disturbance of landscape elements by non-characteristic elements such as invasive tree species in a grassland or car wrecks in a field.
Landscape impact	Changes to the physical landscape resulting from the development that include; the removal of existing landscape elements and features, the addition of new elements associated with the development and altering of existing landscape elements or features in such a way as to have a marked effect on the value of the landscape.
Sense of place	That distinctive quality that makes a particular place memorable to the visitor, which can be interpreted in terms of the visual character of the landscape. A more emotive sense of place is that of local identity and attachment for a place "which begins as undifferentiated space [and] becomes place as we get to know it better and endow it with value" (Tuan 1977).
Sky Glow	Is when light emitting from a luminaire shining into the sky and reflected by humidity and dust.
Up-light	Any light form a luminaire that shines above the horizontal at angles above the horizontal plane, causing illumination of the sky.
Viewer exposure	The extent to which viewers are exposed to views of the landscape in which the proposed development will be located. Viewer exposure considers the visibility of the site, the viewing conditions, the viewing distance, the number of viewers affected the activity of the viewers (tourists or workers) and the duration of the views.
Viewer sensitivity	The assessment of the receptivity of viewer groups to the visible landscape elements and visual character and their perception of visual quality and value. The sensitivity of viewer groups depends on their activity and awareness within the affected landscape, their preferences, preconceptions and their opinions.
Visual absorption capacity (VAC)	The inherent ability of a landscape to accept change or modification to the landscape character and/or visual character without diminishment of the visual quality or value, or the loss of visual amenity. A high VAC rating implies a high ability to absorb visual impacts while a low VAC implies a low ability to absorb or conceal visual impacts.
Visual amenity	The notable features such as hills or mountains or distinctive vegetation cover such as forests and fields of colour that can be identified in the landscape and described. Also included are recognised views and viewpoints, vistas, areas of scenic beauty and are-as that are protected in part for their visual value.
Visual character	This addresses the viewer response to the landscape elements and the relationship between these elements that can be interpreted in terms of aesthetic characteristics such as pattern, scale, diversity, continuity and dominance.

Visual contour	The outer perimeter of the visual envelope determined from the site of the development. The two dimensional representation on plan of the horizon contour.
Visual contrast	The degree to which the physical characteristics of the proposed development differ from that of the landscape elements and the visual character. The characteristics affected typically include: • Volumetric aspects such as size, form, outline and perceived density; • Characteristics associated with balance and proportion such scale, diversity, dominance, continuity; and • Surface characteristics such as colour, texture, reflectivity; and Luminescence or lighting.
Visual impact	Changes to the visual character of available views resulting from the development that include: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the view shed experienced by visual receptors and intrusion of foreign elements into the view shed of landscape features thereby detracting from the visual amenity of the area.
Visual impact assessment	A specialist study to determine the visual effects of a proposed development on the surrounding environment. The primary goal of this specialist study is to identify potential risk sources resulting from the project that may impact on the visual environment of the study area, and to assess their significance. These impacts include landscape impacts and visual impacts.
Visual intrusion	The level of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape or townscape.
Visual magnitude	Product of the vertical and horizontal angles of an object to describe quantitatively the visual dimension of an object, (Iverson, 1985). The visual magnitude is best described in terms of visual arcs with a one-minute arc usually considered as being the minimum resolution detectable by the human eye (equivalent to observing a 29mm ball at a distance of one hundred metres).
Visual quality	An assessment of the aesthetic excellence of the visual resources of an area. This should not be confused with the value of these resources where an area of low visual quality may still be accorded a high value. Typical indicators used to assess visual quality are vividness, intactness and unity.
Visual receptors	Includes viewer groups such as the local community, residents, workers, the broader public and visitors to the area, as well as public or community areas from which the development is visible. The existing visual amenity enjoyed by the viewers can be considered a visual receptor such that changes to the visual amenity would affect the viewers.
Visual resource	Visual resource is an encompassing term relating to the visible landscape and its recognisable elements, which through their co-existence; result in a particular landscape character.
Visual value	Visual value relates to those attributes of the landscape or elements in the landscape to which people attach values that, though not visually perceivable, still contribute to the value of the visual resource. These visual values are derived from ecological, historical, social and/or cultural importance and are described in terms of their uniqueness, scarcity, and naturalness and/or conservation status. The importance of visual value of a landscape or an element in the landscape is measured against its value on an international, national or local level.

1. INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF) has been appointed by the Industrial Development Corporation (IDC) on behalf of the Mpumalanga Tourism and Parks Agency (MTPA) (the applicant) to undertake Scoping and Environmental Impact Reporting (S&EIR) process as well as a level three Visual Impact Assessment (VIA) for the proposed Skywalk Project at God's Window in Mpumalanga.

This report addresses the expected visual impacts of the proposed project on the receiving environment and also recommends appropriate mitigation measures in order to reduce these impacts.

1.1 Study Area

The proposed Skywalk Project will be located on Farms De Houtbosch 503 KT and Portion 2 of Farm Lisbon 531 KT within the Thaba Chweu Local Municipality (TCM), in the Ehlanzeni District Municipality near Graskop. The site is known as the God's Window viewpoint and forms part of the scenic Panorama Route. This popular tourist route starts in the town of Graskop and comprise of a number of attractions along the R532, R533 and R534 provincial roads, such as the God's Window Viewpoint, Pinnacle, Bourke's Luck Potholes, the Three Rondavels, the Berlin Falls, the Lisbon Falls and several other. These impressive beauty spots are very popular amongst national as well as international tourists which makes the Blyde River Canyon the second most visited tourist attraction in Mpumalanga (after the Kruger National Park). Refer to Figure 1.

2. STUDY APPROACH

2.1 Information Base

This assessment is based on information from the following sources:

- Topographical maps and GIS generated data sourced from the Surveyor General, Surveys and Mapping in Mowbray, Cape Town and SEFGIS (2005);
- Aerial photography obtained from Google Earth;
- Observations made and photographs taken during site visit;
- Information with regards to the proposed skywalk structure and associated building and infrastructure;
- Conceptual locality map;
- Professional judgement based on experience gained from similar projects; and
- Literature research on similar projects.

2.2 Terms of Reference

The terms of reference for the Level 3 Visual Impact Assessment (VIA) for the study area have been summarised below (adapted from Oberholzer (2005):

- Identification of potential visual 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;
- Assessing the potential lighting impacts at night; and describe alternatives, mitigation measures and monitoring programmes.

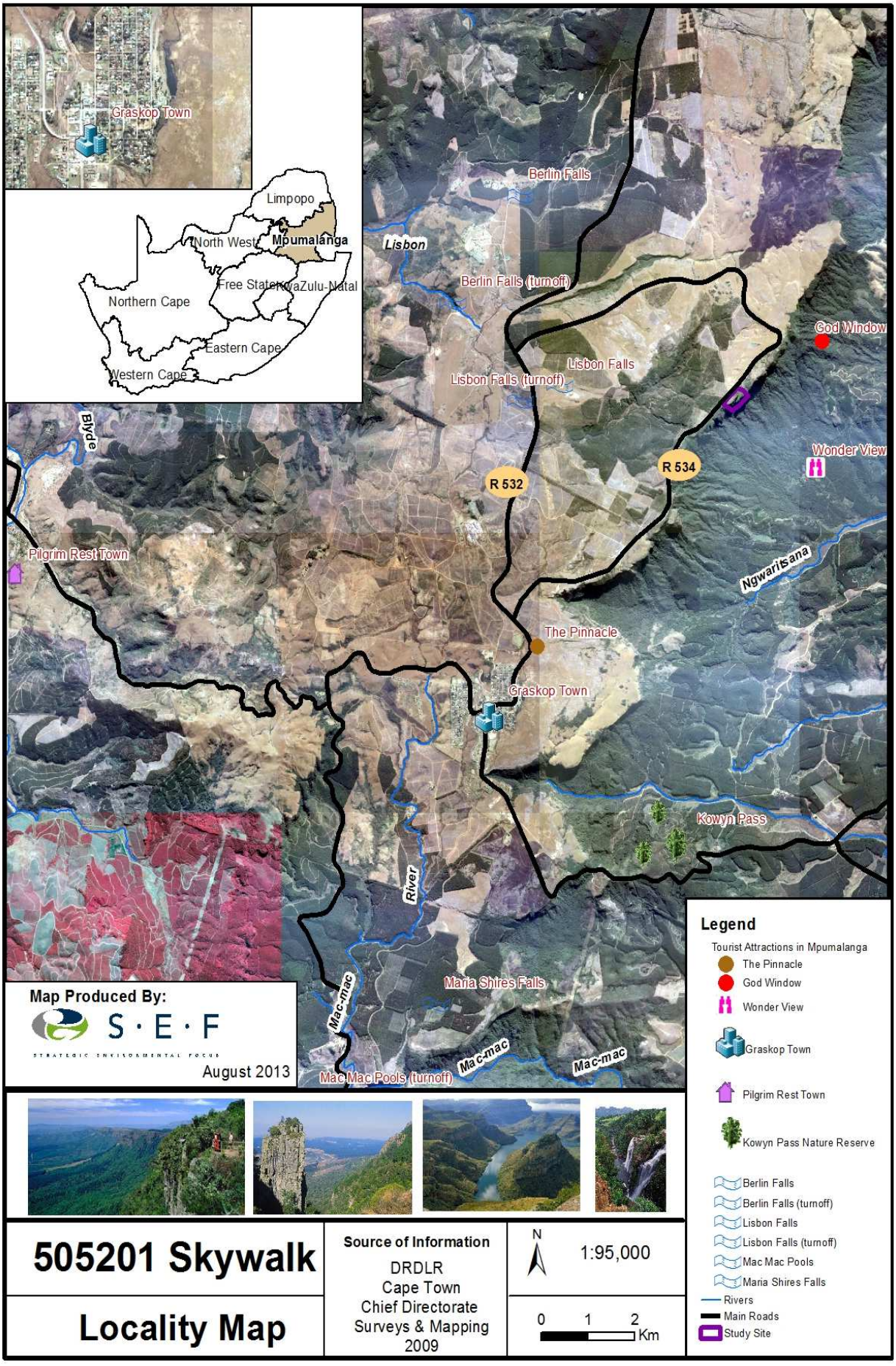

Figure 1: Locality Map

2.1. Methodology

In order to address the objectives of the terms of reference the following study method has been used:

- Provide a **project overview** which focuses on the project components and activities from a visual point of view.
- Determine the **landscape character** of the study area, as well as surrounding areas, in terms of:
    - Topography;
    - Hydrology;
    - Land use;
    - Vegetation Cover; and
    - Built Environment.
- Determine the **visual character and quality** of the study area, as well as surrounding areas.
- Identify **visual receptors** and their **sensitivity.** To assist in determining visual receptor sensitivity a commonly used rating system is utilised. This is a generic classification of visual receptors and enables the visual impact specialist to establish a logical visual receptor sensitivity rating for viewers who will be involved in different activities without engaging in extensive public surveys.
- Determine the **viewshed** of the proposed development by utilising digital elevation model (DEM) with 20m contour intervals analysed by the Geographic Information System (GIS), algorithms available in ArcView software.
- Outline aspects which will determine the **intensity** of the impact that the proposed project will have on visual receptors including the following:
    - Visual Exposure;
    - Viewing Distance;
    - Visual Receptor Sensitivity;
    - Critical Views;
    - Visual Absorption Capacity;
    - Visual Contrast; and
    - Obtrusive lighting.
- Evaluate **visual impact** on identified receptors against impact criteria ratings based on DEAT's (1998) Guideline Document: EIA Regulations. The assessment will consider impacts arising from the construction and operational phases of the proposed project both before and after the implementation of appropriate mitigation measures.

2.2. Assumptions and Limitations

This assessment has been undertaken during the conceptual stage of the project and is based on information available at the time. The following assumptions and limitations are applicable:

- As the development will generate its own electricity (either by means of solar or hydro-power) and waste will be contained / treated on site (conservancy tank or a Lilliput Sewage Treatment System) it was assumed that no linear infrastructure will be implemented as part of the development (besides the upgrading of existing walkways).
- In the absence of detailed designs for the proposed building a maximum height of approximately 1 storey (3 meters) was used.
- It was assumed that the new building and carpark will be lit.
- The visibility map (Figure 13) is computer generated and does not take into account minor visual intrusions such as vegetation and minor landforms.
- Access will be from the R534 through the existing entrance.
- No alternative site was available at the time of this study, meaning that no comparison study could be done to compare different outcomes per site selection.

- The "Do Nothing" alternative was not specifically addressed as it is likely that the existing landscape will remain in its existing condition from a visual point of view.

2.3. Level of Confidence

The level of confidence assigned to the findings of this assessment is based on:

- The level of information available and/or understanding of the study area (rated 3a); and
- The information available and/or knowledge and experience of the project (rated 2b).

The findings in this VIA are rated with a confidence level of 6 out of 9. This rating indicates that the author's confidence in the accuracy of the findings is high (see Table below).

Table 1: Confidence level chart and description

CONFIDENCE LEVEL CHART				
	Information, knowledge and experience of the **project**			
Information, and knowledge of the **study area**		3b	2b	1b
	3a	9	6	3
	2a	6	4	2
	1a	3	2	1

3a – A high level of information is available of the study area in the form of recent aerial photographs, GIS data, documented background information and a thorough knowledge base could be established during site visits, surveys etc. The study area is readily accessible.
2a – A moderate level of information is available of the study area in the form of aerial photographs GIS data and documented background information and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area is acceptable for the level of assessment.
1a – Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.
3b – A high level of information and knowledge is available of the project in the form of up-to-date and detailed engineering/architectural drawings, site layout plans etc. and the visual impact assessor is well experienced in this type of project and level of assessment.
2b – A moderate level of information and knowledge is available of the project in the form of conceptual engineering/architectural drawings, site layout plans etc. and/or the visual impact assessor is moderately experienced in this type of project and level of assessment.
1b – Limited information and knowledge is available of the project in the form of conceptual engineering/architectural drawings, site layout plans etc. and/or the visual impact assessor has a low experience level in this type of project and level of assessment (Adapted from Oberholzer. B, 2005)

3. PROJECT DESCRIPTION

3.1. Overview of the Project

The provincial government of Mpumalanga has developed a Tourism Growth Strategy (TGS) in 2007 which recognised that fact that despite an abundance of natural and cultural attractions across the province, there is a lack of adequate supporting facilities and services available; meaning that these key attractions cannot thrive. It was therefore proposed that exciting projects, such as the Skywalk Project, should be implemented in order to attract more tourists to the Mpumalanga Province

The concept of glass floor structures has been implemented successfully as tourist attractions in other parts of the world. Such attractions include the famous Sky Tower in New Zealand, the Balcony of the Alps in Austria as well as the Skywalk across the Grand Canyon in the USA.

Being the first project of its kind in South Africa and Africa, the proposed Skywalk Project is aimed at improving tourism in the Mpumalanga Province. This will boost economic growth and reduce unemployment. The infrastructure enhancement associated with the proposed project is also intended to open the way for other tourism related ventures to be implemented in the area.

Project Components and Activities provincial roads, such as the God's Window viewpoint, Pinnacle, Bourke's Luck Potholes, the Three Rondavels, the Berlin Falls, the Lisbon Falls and several other (Refer to Figure 2). These impressive beauty spots are very popular amongst national as well as international tourists which makes the Blyde River Canyon the second most visited tourist attraction in Mpumalanga (after the Kruger National Park).

3.2. The proposed Skywalk Project

The proposed Skywalk Project at God's Window is envisaged to be a cantilevered glass walkway, extending 12 metres over the Canyon's edge. This facility will offer 360° panoramic views and will expose the visitor to the exciting experience of walking

According to AECOM (2013) the Blyde River Canyon is a unique natural environment, with dramatic views across the world's deepest green canyon which extend down to the lowveld and across to the distant Kruger National Park. It is said that on a clear day, it is possible to see over Kruger National Park to Mozambique and beyond.

The well-known God's Window viewpoint, located on the escarpment of the Blyde River Canyon, is part of the Panorama Route. This popular route starts in the town of Graskop and comprise of a number of attractions along the R532, R533 and R534over the sheer 700 meter vertical drop below. The proposed new building will host a cafeteria, gift shop and ablution facilities (Refer to Figure 3). As part of this project redevelopment of the existing facilities, such as the carpark, pathways, viewpoints market stalls and viewpoints, is proposed.

The site itself does not have clearly defined boundaries, however it was estimated that the main area of the God's Window site (carpark, ablution facility and area up to the ridge) to be around 25,000m^2 (2.5 ha) in size. The area between the existing carpark and the ridge is considered as a 'disturbed area' due to prior environmental degradation. There is an additional area of some 50,000 m^2 (5 ha) (forested zone) that leads up to the highest viewpoint. The views from God's Window are extremely impressive, with a dramatic drop to the base of the canyon and to the lowveld below.

Where possible, the Skywalk structure will be placed in such a way that it is not visible from the existing viewpoints.

Figure 2: Panorama Route – Tourist Map (Source: Google images)

Figure 3: Proposed Skywalk Concept

3.3. Project Phases

The project will be discussed in two phases, namely the Construction Phase and the Operational Phase:

Construction Phase: All the construction related activities on site, until the contractor leaves the site.

Operational Phase: All activities, including the operation and maintenance of the proposed development.

3.3.1. Construction Phase

The Skywalk structure will be designed in such a way that it can be largely fabricated off-site and assembled on site in a short space of time. This will reduce the construction period and therefore disturbance to tourists. The construction phase is estimated to continue for approximately 10 - 12 months and is expected to progress as follows (not in specific chronological order):

- Construction materials will be off-loaded, from delivery vehicles and trucks, and stockpiled on site (this will take place for the duration of the construction period);
- The footprint of the new proposed building will be cleared and foundations will be laid;
- The proposed building will be constructed;
- The pre-constructed skywalk structure will be assembled;
- The extended carpark area will be cleared;
- The carpark will be constructed (design to be confirmed);
- The entrance will be upgraded (design to be confirmed);
- Existing market stalls will be upgraded (design to be confirmed);
- Existing footpaths will be upgraded (design to be confirmed); and
- Existing viewpoints will be upgraded (design to be confirmed).

3.3.2. Operational Phase

The relevant major visible elements of the proposed project are expected to include the following:

- The Skywalk structure with controlled access;
- The new Skywalk building - hosting a cafeteria, gift shop and ablution facilities;
- The upgraded entrance and extended carpark;
- The upgraded market stalls, footpaths and viewpoints; and
- Lighting (carpark and building).

3.4. Impacts Identified

The following impacts are anticipated from a visual point of view:

3.4.1. Direct Impacts

- **Construction Phase Impact:**
  - Views experienced by visual receptors, of vegetation clearance, construction activities including construction camps, material lay-down yards, stockpiles, cranes, scaffolding, delivery vehicles and general construction operations.

- **Operational Phase Impacts:**
  - Views, experienced by visual receptors, of the skywalk structure, new building and associated upgraded infrastructure; and
  - Enhancement of the visitor's viewing experience.

3.4.2. Cumulative impact

Depleting natural visual resources by changing the natural landscape character through development.

3.4.3. Indirect Impact

Setting a president of developing an area located in a visually sensitive setting of international significance (i.e. on the escarpment of the world's largest green canyon).

4. RECEIVING ENVIRONMENT (VISUAL RESOURCE)

Visual impacts generally occur as a result of changes to the landscape (i.e. development). A distinction, however, should be made between impacts on the visual resource (physical landscape) and impacts on the visual receptor (viewer). This section describes the visual resource in terms of its landscape character, perceived visual character and visual quality. Changes to the visual resource will impact on the viewing experience of its visual receptors. The intensity of these impacts will be determined by a range of visual aspects (as discussed in Section 5).

4.1. Landscape Character

Landscape Character can be classified as elements, components and features within a landscape that individually and collectively define the landscape's characteristics. These characteristics include the following:

4.1.1. Topography and Hydrology

The Blyde River Canyon is the third largest canyon and largest green canyon on earth with altitudes that ranges from 580m to over 1900m above sea level.

The study site for the proposed development is located on the edge of the canyon escarpment and is fairly level right up to the escarpment edge where it drops at a perpendicular angle into a cliff of approximately 700m. Refer to for a Digital Elevation Model of the area – illustrating the sudden loss in altitude at the escarpment edge.

Three perennial rivers flow around the proposed site, namely, Waterval Spruit (north of the site, approximately 5.2 km), Maritsane river (north east, approximately 5.3 km) and the Ngwaritsana river (north of the site, approximately 3.9 km). There are also strong drainage lines visible on the edge of the escarpment within the study site (Refer to Figure 4 and Figure 5). After rain events these drainage lines turn into a series of small waterfalls.

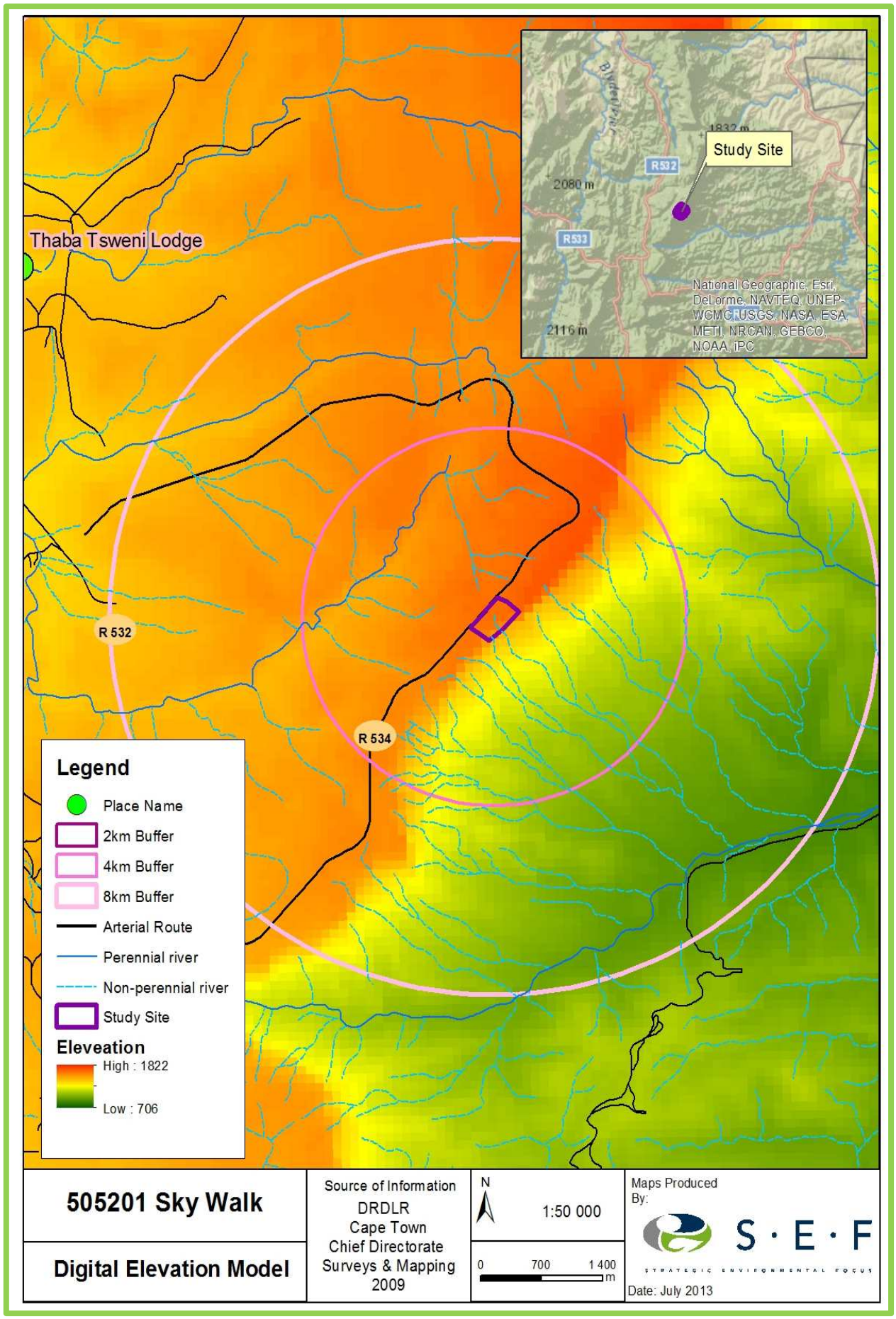

Figure 4: Digital Elevation Model

Figure 5: Drainage lines on escarpment edge.

4.1.2. Vegetation Cover

The study area is situated within two Biomes, namely Afrotemperate, Subtropical and Azonal Forests and the Grassland Biome. The Afrotemperate, Subtropical and Azonal Forests is defined as miltilayered vegegtation which is dominated by trees with overlapping crown cover and the graminoids in the herbaceous layer are generally rare (Mucina & Rutherford, 2006).

A large number of Rare and Threatened plant species in the summer rainfall regions of South Africa is restricted to high-rainfall grassland, making this the vegetation type in most urgent need of conservation.

Biomes can further be divided into smaller units known as vegetation types and according to Mucina and Rutherford (2006), three vegetation types namely Northern Mistbelt Forest, Northern Escarpment Afromantane Fynbos and Northern Escarpment Quartzite Sourveld are located within the study area (Figure 6).

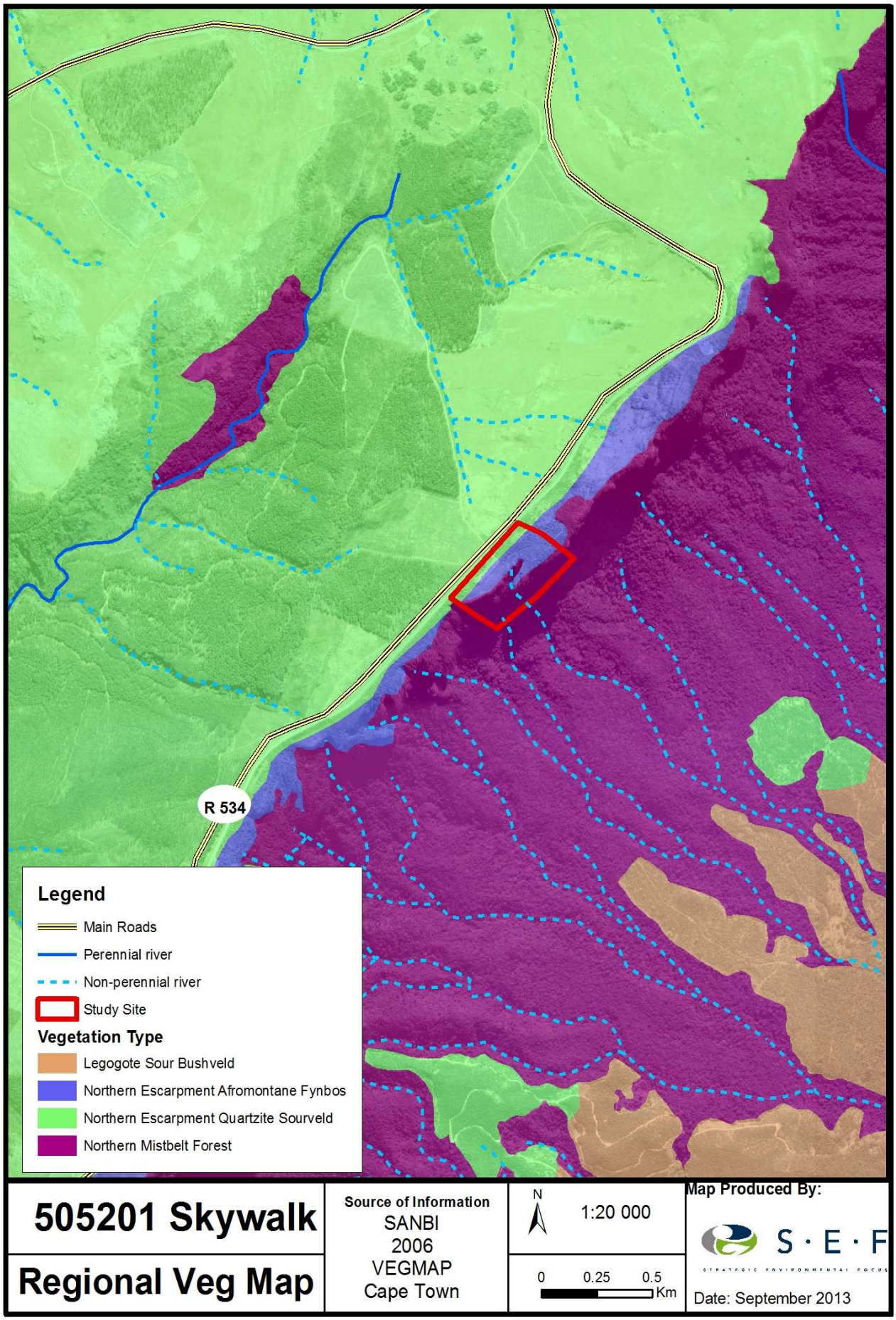

Figure 6: Vegetation Map

4.1.3. Land Use

The site is zoned as "Provincial Park" and is a well-known tourist attraction along the popular Panorama Route – visited by approximately 175 000 to 250 000 tourists annually (AECOM, 2013). The existing carpark is being utilised by vendors selling handcrafted curios to tourists.

4.1.4. Built Environment

Structures present on the study site include a security shelter, steel viewpoint structures, timber market stalls and ablution facilities which are currently locked due to their neglected state. Other infrastructure includes a carpark, dilapidated information board, stone pathways, benches and litterbins (refer to Figure 7 – 10).

Figure 7: Entrance and Security Shelter.

Figure 8: Information Board.

Figure 9: Carpark, Market Stalls and Ablution Facilities.

Figure 10: Stone-paved pathways

4.1.5. Visual Character

Visual quality relates to the human perception and the observer's response to the relationships between and composition of the landscape, the land uses and identifiable elements in the landscape. The description of the visual character includes an assessment of the scenic attractiveness regarding those landscape attributes that have aesthetic value and contribute significantly to the visual quality of the views, vistas and/or viewpoints of the study site and wider area.

The study site comprises of dense, low- to medium growing shrubby vegetation covered with lichens and moss to create a forest-like atmosphere. In some places the vegetation is so dense around and above the footpaths that a "green tunnel effect" is experienced when moving through the space. These vegetation tunnels open up at designated viewpoints where breath-taking views, as far as the human eye can see, can be experience. At the edge of the escarpment sheer rock face plummets down into a green mass of Mistbelt Forest and pine plantations below. Refer to Figure 11.

Figure 11: Visual character.

4.2. Visual Quality

Visual quality is a qualitative evaluation of the composition of landscape components and their influence on scenic attractiveness (FHWA, 1981). Several factors contribute to the visual quality of the landscape and are grouped under the following three main categories that are internationally accepted indicators of visual quality (Refer to Table 2).

Table 2: Criteria of Visual Quality (FHWA, 1981)

INDICATOR	CRITERIA
Vividness	The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
Intactness	The integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment.
Unity	The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony of inter-compatibility between landscape elements.

The landscape is allocated a rating from an evaluation scale of 1 to 7 and divided by 3 to get an average. The evaluation scale is as follows: Very Low =1; Low =2; Moderately Low =3; Moderate =4; Moderately High =5; High =6; Very High =7;

The landscape is assessed against each indicator separately. The evaluation is summarised in Table 3 below:

Table 3: Visual Quality of the regional landscape

VIVIDNESS	INTACTNESS	UNITY	VISUAL QUALITY
7	5	7	7 + 5 + 7 / 3 = 6.3 6.3= High

The visual quality of the site as well as the regional landscape is considered ***high*** due to the striking visual impression it leaves on the viewer (hence this being a famous viewpoint). The intactness would also have been very high if it wasn't for the some level of visual encroachment on the natural landscape by man-made elements. These elements include the car-park, stone-paved footpaths and structures on the study site as well as paved and unpaved roads, buildings and overhead transmission lines in the regional area.

5. VISUAL ASPECTS

This section outlines aspects to be considered in order to establish the intensity of the impact that the proposed development would have on identified visual receptors. These aspects include: visual receptor sensitivity, visual exposure, viewing distance, critical views, visual absorption capacity (VAC) of the landscape, visual contrast (VC), sense of place and obtrusive lighting.

5.1. Visual Receptor Sensitivity

Viewers (visual receptors) within the study area will visually experience the proposed development in different ways. Alteration to their existing views is therefore identified as part of the receiving and affected environment. The viewers are grouped according to their sensitivity and similarity in views and activity.

To determine viewer sensitivity a commonly used rating system (Refer to Table 4), is utilised. This is a generic classification of viewers and enables the visual impact specialist to establish a logical and consistent viewer sensitivity rating for visual receptors who are involved in different activities without engaging in extensive public surveys.

Table 4: Visual Receptor Sensitivity

VISUAL RECEPTOR SENSITIVITY	DEFINITION
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.
Moderate	People engaged in outdoor sport or recreation (other than appreciation of the landscape);
Low	• People at their place of work or focussed on other work or activity; • Views from urbanised areas, commercial buildings or industrial zones; • People travelling through or passing the affected landscape on transport routes.
Negligible (Uncommon)	Views from heavily industrialised or blighted areas

Based on the above Table, the sensitivity of the identified viewer groups of the Skywalk Project can be described as follows:

- **Tourists** visiting God's window are classified as visual receptors of ***exceptional*** sensitivity due to the fact that the sole purpose of them visiting this attraction is to experience the spectacular views that it is being promoted for.

- **Residents (forestry workers)** are classified as visual receptors of ***high*** sensitivity due to their sustained visual exposure to the proposed development.

- **Recreational Users** involved in outdoor recreational activities such as hiking and mountain biking are classified as visual receptors of ***moderate*** sensitivity. They utilise the landscape for enjoyment purposes and are aware of the qualities of the landscape which often include the visual quality that is associated with the landscape.

- **Motorists** are classified as visual receptors of ***low*** sensitivity due to their momentary view and experience of the proposed development. As a road user's speed increases, the sharpness of lateral vision declines and the road user tends to focus on the line of travel (USDOT, 1981). This adds weight to the assumption that under normal conditions motorist will show low levels of sensitivity as their attention is focused on the road.

5.2. Viewing Distance

According to Hull and Bishop (1988), the visual impact of an object in the landscape diminishes at an exponential rate as the distance between the observer and the object increases.

What this entails is that the visual impact on receptors 2km away from the proposed development would be twice as intimidating as for those 4km away from the proposed development. Receptors 8km away would only experience on sixteenth of the impact that is experienced by those 2km away. Refer to Figure 12 for an illustration of the exponential rate at which an impact is reduced with increase in distance. Figure 13 indicates the visual buffers around the study site at 2km, 4km and 8km respectively.

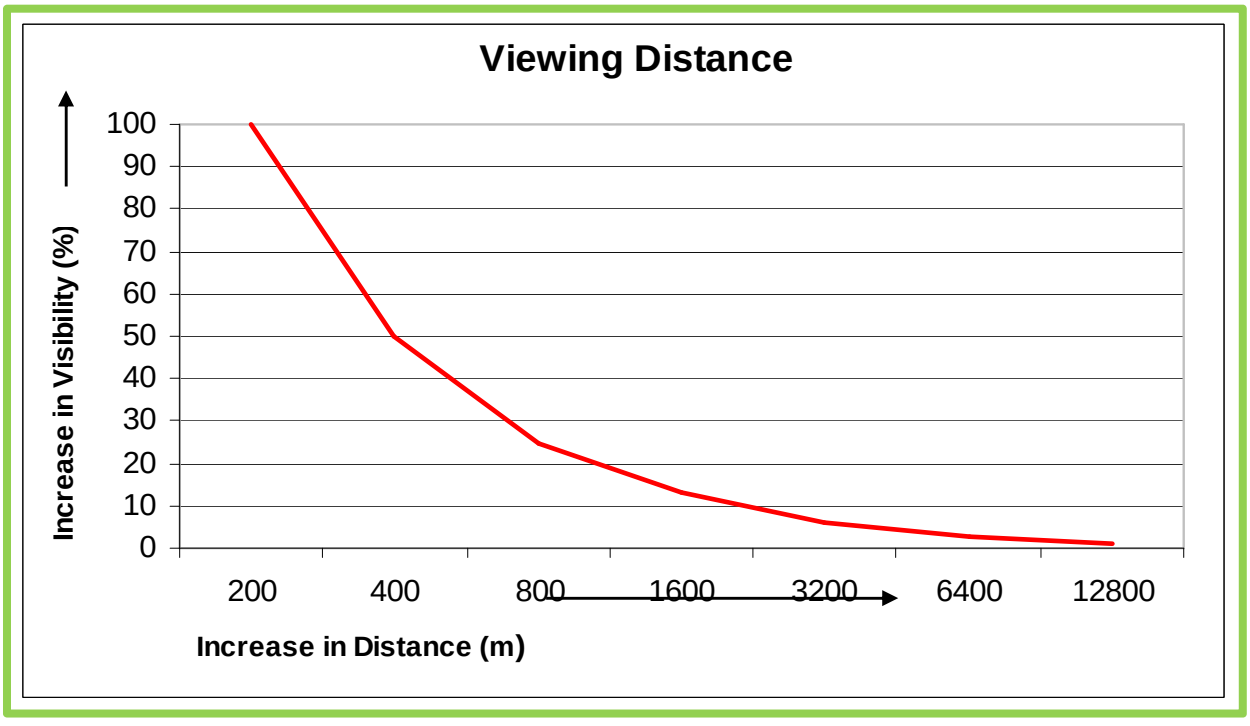

Figure 12: Viewing Distance Chart

5.3. Visual Exposure

In order to assess the extent of visual exposure in the area, a Geographical Information System (GIS) was utilised. A viewshed analysis was created by utilising a digital elevation model (DEM) with 20m contour intervals which provided the following information (Figure 13).

- The areas that may experience views of the proposed project (shaded according to sensitivity pink, yellow and green); and
- Areas that will not experience views of the proposed project (un-shaded)

Based on the graphical representation of Figure 13 visual receptors that would experience views of the proposed development include the following:

- Tourists visiting the God's Window viewpoint;
- Forestry workers (residents) living and working at the foot of the escarpment;
- Residents on the outskirts of Graskop;
- Recreational Users utilising the plantation roads and hiking routes in the area; and
- Motorist traveling along the R533 road between Graskop and Bushbuckridge, as well as along the R534 that runs past the study site. Both these provincial roads form part of the scenic Panorama Route (Refer to Figure 2).

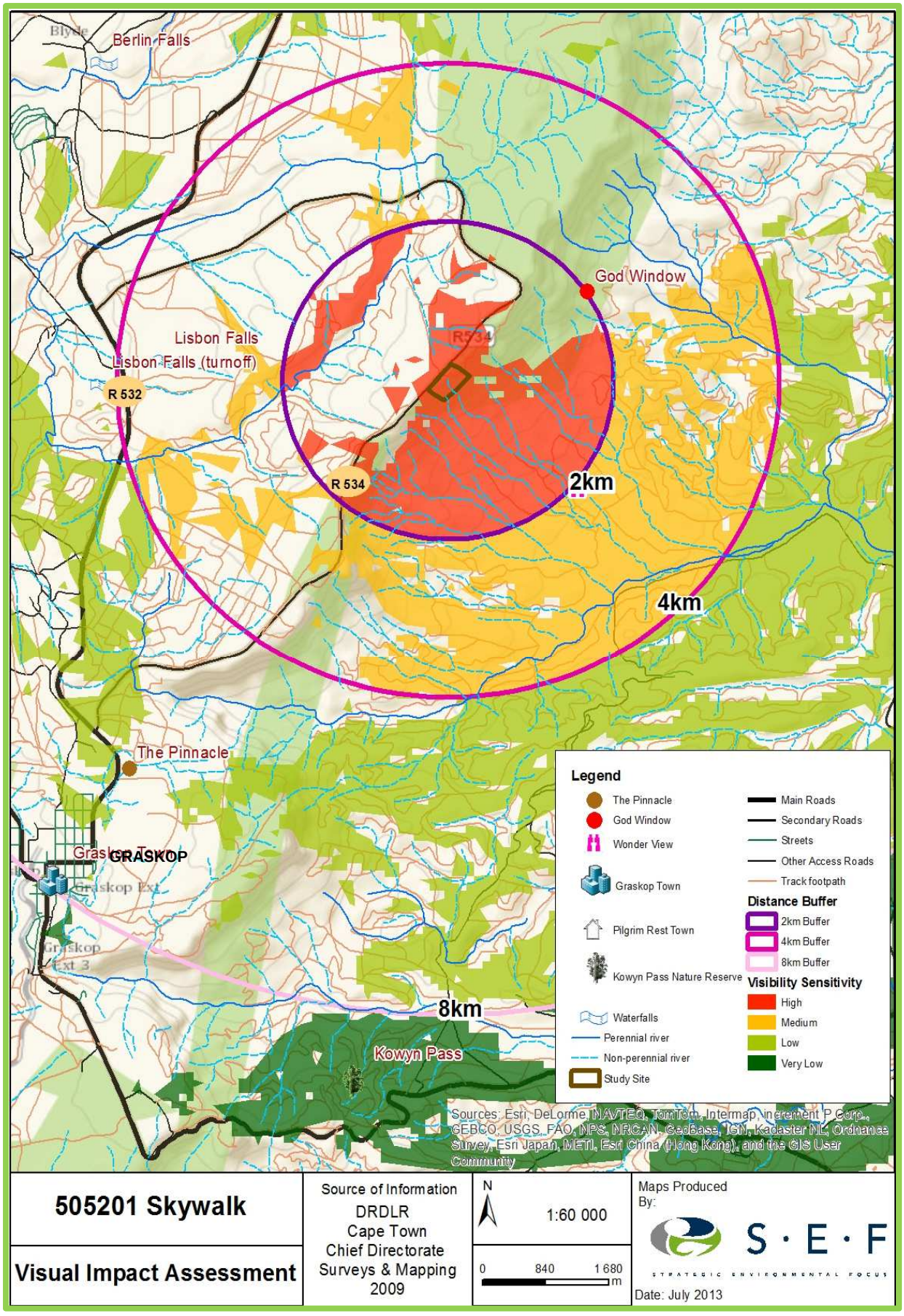

Figure 13: Visibility Map

5.3.1. Tourists

Tourists visiting the site will be directly exposed to the construction and operational activities of the proposed project – therefore well within the 2km buffer. Due to the short viewing distance the intensity of the impact on these receptors will be ***high.***

5.3.2. Residents

Residents (forestry workers) living in the plantations directly below the escarpment, between 4 and 8km away, may experience views of the proposed development (Refer to Figure 14).

Residents living on the on the southern outskirts of Graskop (approximately 7km away) could technically also experience views of the propose development (Refer to Figure 15). Due to the great viewing distance (between 4 and 8km) and other aspects such dense vegetation the intensity of the impact on these two groups of residential receptors will be ***low.***

Figure 14: Residents (forestry workers) living in the plantations below the escarpment (photo taken from God's Window)

Figure 15: Residents living on the southern outskirts of Graskop (Photo taken from God's Window)

5.3.3. Recreational Users

Recreational users (mostly hikers and mountain-bikers) utilising the plantation roads and hiking routes, between 2 and 8km away, will be mostly focusing on their immediate surroundings – the intensity of the impact on these receptors in terms of viewing distance is considered to be ***low.***

5.3.4. Motorists

Motorists traveling along the R534 road will pass the site directly. Views of the proposed development however would be limited because of the dense vegetation. The intensity of the impact based on viewing distance is therefore supposed to be high but due to the Visual Absorption Capacity (VAC) of the landscape the intensity of the impact is in fact ***low.***

Motorists traveling on the R533 could experience views of the proposed development, however, being further than 8km away from the site the intensity of this impact is considered to be ***very low***.

5.4. Visual Absorption Capacity

Visual Absorption Capacity (VAC) is the inherent ability of a landscape to accept change or modification to the landscape character and/or visual character without diminishment of the visual quality or value, or the loss of visual amenity. A high VAC rating implies a high ability to absorb visual impacts while a low VAC implies a low ability to absorb or conceal visual impacts. VAC is dependable on three characteristics: slope, vegetation height and visual pattern as outlined in Figure 17 below.

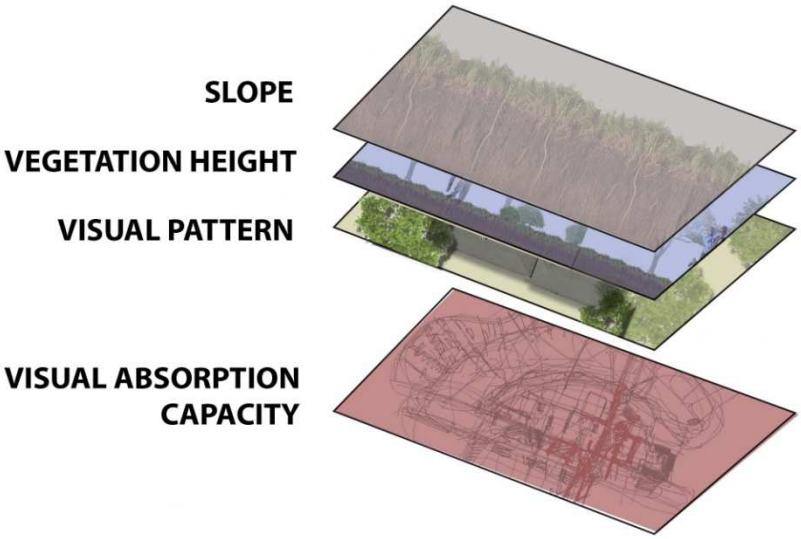

Figure 16: Overlay Methodology to define VAC of the landscape.

The proposed study site can be described as predominantly flat (0% - 3%) on the plateau with a sudden drop at the escarpment edge. The terrain at the foot of the edge could be described as moderately adulating (3 – 7%) which means that any change or modification to the study site would not be absorbed very well in terms of topography. The VAC of the site in terms of slope is therefore ***low***. Refer to Figure 18.

Figure 17: Slope and VAC.

Vegetation in the study area is very dense and up to 8 meters high which would mean that mostly any changes or modifications to the landscape will be highly absorbed by the vegetation. The VAC in terms of vegetation is therefore ***high***. Refer to Figure 19 and Figure 20.

Figure 18: Vegetation and VAC

Figure 19: High VAC in terms of dense vegetation.

Diversity in terms of visual pattern is moderate due to the low level of development and the uniform visual pattern that the escarpment edge forms with plantations below. The sheer cliff edge meets the plantation which seems to be spread out like a green carpet over the landscape. The VAC in terms of visual pattern is therefore ***moderate*****.** Refer to Figure 21.

Figure 20: Visual pattern and VAC

The study area is therefore considered to have an overall moderate VAC which means that it will conceal the proposed development to an extent but it will still be visible from a number of vantage points. The intensity of the impact, based on overall VAC, will therefore be ***medium.***

5.5. Visual Contrast

Visual Contrast (VC) is determined by the degree to which a development and its activities affects the visual quality of a landscape by the visual contrast created between the project and its existing landscape.

The colours, shape and texture of the proposed project (mainly steel and glass) will highly contrast the natural vegetation of the existing landscape. The high VC will therefore cause the intensity of the visual impact to be ***high.***

5.6. Sense of Place

Observers develop a sense of place through knowledge and experience of a particular area. The uniqueness of the landscape, simplicity and visual character of God's Window is already widely known. Many tourists (especially South Africans) therefore have a preconceived perception of the character of God's Window. Like other attractions along the Panorama route – the existing infrastructure is low-key, yet sensitive and doesn't impose itself on the natural environment. The fact that you are able to quickly pull off the road and admire the view (often alone or with 2 or 3 other groups) gives God's Window a unique and therefore strong sense of place (identity).

The intensity of any impact, by the proposed project, on the sense of place of the study area will therefore be considered to be ***high***.

5.7. Obtrusive Lighting

Obtrusive lighting occurs when a light source intrudes on, or interrupts a visual receptor's normal night time activity to detrimental effect (Refer to Figure 22). Obtrusive lighting can be described in terms of light trespass, which is a result of poor lighting design causing glare and light spillage to a degree where it may disturb neighbouring visual receptors.

Due to its location (right on the edge of an escarpment) the Skywalk Project would almost act as a light beacon and would be visible for many kilometres towards the west when lit at night. This would be experienced by motorists traveling along the R533, Residents on the outskirts of Graskop as well as by forestry workers in the area down below the proposed development towards the west. As the proposed development will mainly consist of glass – very little light mitigation would be possible. The sheer viewing distance of the visual receptors (between 2 and 10km) would however reduce this impact. The ***intensity*** of the impact that lighting will have on the receiving environment is therefore considered to be ***medium***.

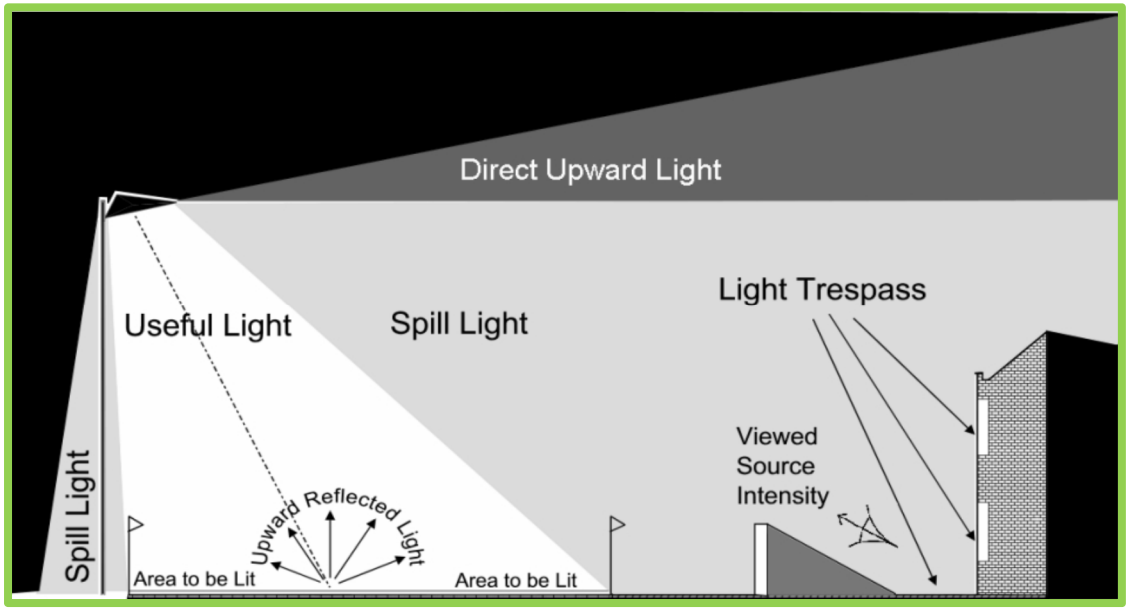

Figure 21: Obtrusive Lighting (ILE,2005)

6. ASSESSMENT CRITERIA

6.1. Impact identification and assessment

The assessment criteria must clearly identify the environmental impacts of the proposed development. The environmental impacts identified will be quantified and the significance of the impacts assessed according to the criteria set out below. The Environmental Assessment Practitioner (EAP) must make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the EAP must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/ her professional expertise and experience.

6.1.1. Assessment Procedure: Proposed Impact Assessment Methodology

For the purpose of assessing visual impacts of the proposed project on the landscape and its visual receptors, the project will be divided into two phases from which impacting activities can be identified, namely:

Construction Phase:	All the construction related activities on site, until the contractor leaves the site.
Operational Phase:	All activities, including the operation and maintenance of the proposed development.

The activities arising from each of the above phases will be included in the impact assessment tables. This is to identify activities that require certain environmental management actions to mitigate the impacts arising from them. The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure.

Extent The physical and spatial scale of the impact.	Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
	Site	The impact could affect the whole, or a significant portion of the site.
	Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
	National	The impact could have an effect that expands throughout the country (South Africa).
	International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.

Duration The lifetime of the impact, that is measured in relation to the lifetime of the proposed development.	Short Term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
	Short-Medium Term	The impact will be relevant through to the end of a construction phase.
	Medium Term	The impact will last up to the end of the development phases, where after it will be entirely negated.
	Long Term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.
	Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
Intensity Is the impact destructive or benign, does it destroy the impacted environment, alters its functioning, or slightly alter the environment itself?	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
	Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
Probability The likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time.	Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).
	Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.
	Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.
	Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.
	Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

Mitigation – The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. These measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

Determination of Significance – Without Mitigation – Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive". Significance will be rated on the following scale:

No significance: The impact is not substantial and does not require any mitigation action;
Low: The impact is of little importance, but may require limited mitigation;

Medium: The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels; and
High: The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

Determination of Significance – With Mitigation – Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation will be rated on the following scale:

No significance: The impact will be mitigated to the point where it is regarded as insubstantial;
Low: The impact will be mitigated to the point where it is of limited importance;
Low to medium: The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels;
Medium: Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw;
Medium to high: The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels; and
High: The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

Assessment Weighting – Each aspect within an impact description is assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it will be necessary to weigh and rank all the identified criteria.

Ranking, Weighting and Scaling – For each impact under scrutiny, a scaled weighting factor will be attached to each respective impact. The purpose of assigning such weightings serve to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance (Refer to Figure 23 below).

Extent	Duration	Intensity	Probability	Weighting Factor (WF)	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low 1	Low 0-19	High 0,2	Low 0-19
Site 2	Short to medium 2		Possible 2	Low to medium 2	Low to medium 20-39	Medium to high 0,4	Low to medium 20-39
Regional 3	Medium term 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0,6	Medium 40-59
National 4	Long term 4		Highly Likely 4	Medium to high 4	Medium to high 60-79	Low to medium 0,8	Medium to high 60-79
International 5	Permanent 5	High 5	Definite 5	High 5	High 80-100	Low 1,0	High 80-100

Figure 22: Description of visual assessment parameters with its respective weighting.

***Identifying the Potential Impacts Without Mitigation Measures (WOM)* –** Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1: Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

***Identifying the Potential Impacts With Mitigation Measures (WM)* –** In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it will be necessary to re-evaluate the impact.

***Mitigation Efficiency (ME)* –** The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation effectiveness (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2: Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency
Or
WM = WOM x ME

***Significance Following Mitigation (SFM)* –** The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact will, therefore, be seen in its entirety with all considerations taken into account.

7. IMPACT ASSESSMENT: CONSTRUCTION PHASE

7.1. Direct Impacts

7.1.1. Construction Phase Impacts

Views of ground clearance, the construction camp, material lay-down yards, stockpiles, cranes, scaffolding, delivery vehicles, dust and general construction operations will have a high visual contrast (VC) with the landscape character and cause a negative visual impact on Tourists visiting the God's Window viewpoints. The intensity of this impact on Tourists would be ***very high*** based on their exceptional sensitivity rating.

Motorists traveling along the R533 and 534 provincial roads as well as Residents (forestry workers) in the plantations below and as on the outskirts of Graskop may experience glimpses of higher construction elements such as cranes, scaffolding etc. Recreational Users utilising the plantation roads and hiking routes in the area may also experience views of the higher construction elements. The intensity of the impact on these views, however, is considered to be ***low*** based on the VAC of the landscape (especially through the dense vegetation) and the sheer viewing distance (between 4 and 10km).

Table 5: Visual impact of the Construction Phase on visual receptors.

Impact source(s)	Construction activities including the construction camp, material lay-down yards, stockpiles, cranes, scaffolding, delivery vehicles, dust and general construction operations.		
Nature of impact	Views of the above mentioned construction activities which are out of character with the surrounding landscape and which will progressively increase in intensity as the development and the ancillary components increase in scale.		
Reversibility of impact	The impact is partially reversible through the implementation of adequate visual mitigation measure during the construction phase.		
Degree of irreplaceable loss of resource	High		
Affected stakeholders	- Tourists visiting the God's Window viewpoint - Motorists traveling along the R533 and R534 provincial roads - Residents in the plantations below as well as on the outskirts of Graskop - Recreational Users utilising the plantation roads and hiking trails in the area		
Magnitude	*Extent*	International - 5	
	Intensity	Medium - 3	
	Duration	Short – Medium Term - 2	
	Probability	Highly Likely - 4	
Significance	*Without mitigation*	*(Extent + Intensity + Duration + Probability) x WF* (5+3+2+4) x 3 = 42 Medium	**M**
	With mitigation	*WOM x ME = WM* 42 x 0.6 =25.2 Low to Medium	**L-M**

Mitigation measures

- Locate the construction camps in areas that are already disturbed or where it is not necessary to remove established vegetation;

- Utilise the existing screening capacity of the site and improve it by enclosing the construction site and stockyards with a dark green or khaki brown shade cloth of at least 20% density and at least 3 metres high, as an additional screen;
- Exposed soil (carpark area) must be covered or 'camouflaged' using a biodegradable soil mat and vegetation cover to reduce the duration of visible scarring of the landscape;
- Retain the existing vegetation cover of the site through selective clearing, where practical;
- Dust suppression techniques should be implemented especially on windy days, preferably using biodegradable binding agent;
- Remove rubble and other construction rubbish off site as soon as possible or place it in containers in order to keep the construction site free from additional unsightly elements;
- Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and
- Monitor all areas for rehabilitation failure and implement remedial action immediately.

Significance of the impact

The construction activities (as discussed above) will have high VC with the landscape character which will cause negative visual impacts on tourists, residents, recreational users and motorists. The VAC of the landscape – especially the dense vegetation will however reduce the significance of the impact by construction activities to medium. The implementation of the mitigation measures (as discussed above) will further decrease the ***significance*** of the impact to ***low-medium*****.**

7.1.2. Operational Phase Impacts

Views of the Skywalk structure, the new building and upgraded infrastructure will have a high visual contrast (VC) with the landscape character in comparison to the existing low-key development. The abovementioned elements will be visible to all new visitors (tourists) which will change the existing and sense of place of God's Window as we know it. The intensity of this impact on tourists would be ***very high*** based on their exceptional sensitivity rating.

The proposed Skywalk structure will extend out of the cliff for 12 meters which may make it visible to motorists traveling along the R533 and R 534 provincial roads as well as to Residents (forestry workers) in the plantations below and on the outskirts of Graskop. Recreational Users utilising the plantation roads and hiking routes in the area may also experience a glimpse of the structure. The intensity of the impact on these views, however, is considered to be ***low*** based on the VAC of the landscape (especially through the dense vegetation) and the sheer viewing distance (between 4 and 10km).

Table 6: Visual impact of the Operational Phase on visual receptors

Impact source(s)	The Skywalk Structure, new building and associated infrastructure.
Nature of impact	Views of the above mentioned elements which are out of character with the surrounding landscape (high VC). Changing the God's Window sense of place as we know it.
Reversibility of impact	The impact is permanent
Degree of irreplaceable loss of resource	High
Affected stakeholders	- Tourists visiting the God's Window viewpoint - Motorists traveling along the R533 and R534 provincial roads - Residents in the plantations below as well as on the outskirts of Graskop - Recreational Users utilising the plantation roads and hiking trails in the area

Magnitude	*Extent*	International - 5	
	Intensity	Medium - 3	
	Duration	Permanent - 5	
	Probability	Highly Likely - 4	
Significance	*Without mitigation*	*(Extent + Intensity + Duration + Probability) x WF* (5+3+5+4) x 3 = 51 Medium	**M**
	With mitigation	*WOM x ME = WM* 51 x 0.6 = 30.6 Low to Medium	**L-M**

Mitigation measures

- Restrict the new building to one storey.
- Where possible the proposed Skywalk structure must be orientated in such a way that it is not visible from other viewpoints at God's Window;
- Treat all steelwork with a matt paint to limit reflection;
- Be sensitive towards the use of glass or materials with a high reflectivity to avoid glare from the shiny surfaces and to avoid visual discomfort for viewers during the day; and
- Repair damage and do not allow the facility to fall into disrepair.

Significance of the impact

The operational activities (as discussed above) will have high VC with the landscape character which will cause visual impacts on Tourists, Residents, Recreational Users and Motorists. The VAC of the landscape – especially the dense vegetation will however reduce the significance of the impact by operational activities to medium. The implementation of the mitigation measures (as discussed above) will further decrease the ***significance*** of the impact to ***low-medium*****.**

As discussed above the proposed Skywalk Project will have strong VC with the existing natural environment, which will change the existing sense of place. In the same sense the proposed project will also enhance the Tourist's viewing experience. Tourists will be able to experience the feeling of weightlessness when walking over 12 meter glass walkway – offering spectacular views in all directions. Better facilities (cafeteria and ablution) will also make the visit more convenient and pleasant. The visual impact of the improved facilities and the visual experience it will offer the Tourist will be ***high*** in a ***positive*** sense.

7.2. Cumulative impact

7.2.1. Loss of visual resources (natural open space)

The main element that provides the study site (visual resource) with a unique landscape character and strong sense of place is the rural feeling of being under-exploited. Although the site is already disturbed to an extent, this type of development is sensitive to the landscape in the sense that it does not impose itself on the landscape and are mainly constructed of natural materials (stone and timber). The proposed development, which will be mostly constructed of steel and glass, will dominate its surroundings and stand out as an architectural marvel which will even challenge gravity.

This development will also act as a gateway for other similar projects to emerge along the Panorama Route. The intensity of the cumulative impact that development of attractions will have on visual resources (natural open space) and the rural landscape character of the Panorama Route in Mpumalanga is considered to be ***high***.

Table 7: Loss of visual resources

Impact source(s)	The Skywalk Structure, new building and associated infrastructure.		
Nature of impact	A cumulative impact by development on the natural open space and rural landscape character of the Panorama Route in Mpumalanga.		
Reversibility of impact	The impact is partially reversible through the implementation of adequate mitigation measures.		
Degree of irreplaceable loss of resource	High		
Affected stakeholders	All observers		
Magnitude	*Extent*	International - 5	
	Intensity	High- 5	
	Duration	Permanent - 5	
	Probability	Highly Likely - 4	
Significance	*Without mitigation*	*(Extent + Intensity + Duration + Probability) x WF* (5+5+5+4) x 4 = 76 Medium to High	**M - H**
	With mitigation	*WOM x ME = WM* 76 x 0.6 =45.6 Medium	**M**

Mitigation measures

- See mitigation measures under sections 7.1.1 and 7.1.2.

Significance of the impact

Due to the high visual quality associated with rural landscapes as well as the proposed project acting as a gateway for other similar developments a possible cumulative impact on visual resources along the Panorama Route in Mpumalanga was identified. Therefore, the significance of the cumulative impact that the proposed development will have in conjunction with other tourism-driving developments in the region, without any mitigation, is regarded to be medium to high. Implementation of appropriate mitigation measures (as discussed in Section 7.1.1 and 7.1.2) will decrease the ***significance*** of the impact to ***medium.***

7.3. Indirect Impact

The proposed Skywalk Project will set a president that development of a sensitive location of international significance (i.e. on the escarpment of the world's largest green canyon) is acceptable. This may trigger a trend to exploit other sensitive areas – not only along the Panorama Route but also in the rest of the country.

Table 8: Setting a president for development in sensitive areas

Impact source(s)	The Skywalk Project		
Nature of impact	An indirect impact on sensitive locations in the rest of South Africa.		
Reversibility of impact	The impact is permanent		
Degree of irreplaceable loss of resource	High		
Affected stakeholders	All observers		
Magnitude	*Extent*	National - 5	
	Intensity	High- 5	
	Duration	Permanent - 5	
	Probability	Highly Likely - 4	
Significance	*Without mitigation*	*(Extent + Intensity + Duration + Probability) x WF* (5+5+5+4) x 4 = 76 Medium to High	**M - H**
	With mitigation	*WOM x ME = WM* 76 x 0 =76 Medium to High	**M - H**

Mitigation measures

The only way of mitigating this impact would be not to create such a president and therefore not to implement the proposed project.

Significance of the impact

Due to the international significance and the sensitivity of the proposed study site, in an environmental, cultural and visual sense, the development of a project of such grandeur in a location such a this may act as a president (example) for future projects to be developed in sensitive areas as well. The significance of the impact that the Skywalk project will have on the future exploitation of sensitive areas is ***medium to high***.

8. CONCLUSION

The site identified for the Skywalk Project is situated on the edge of the Blyde River Canyon escarpment at a well-known viewpoint of God's Window. The site is fairly level right up to the escarpment edge where it drops at a perpendicular angle into a cliff, of approximately 700m, into a forest below.

The following visual receptors, that may experience views of the proposed development, were identified:

- Tourists visiting the God's Window viewpoint;
- Forestry workers (residents) living and working at the foot of the escarpment;
- Residents on the outskirts of Graskop;
- Recreational Users utilising the plantation roads and hiking routes in the area; and
- Motorist traveling along the R533 road between Graskop and Bushbuckridge, as well as along the R534 that runs past the study site. Both these provincial roads form part of the scenic Panorama Route.

Vegetation within and around the study site is extremely dense which will shelter development to an extent. Another aspect that will reduce the impact is the sheer viewing distance (between 4 and 10km) at which Residents, Recreational Users and Motorists would experience views of the development.

Tourists, however, would be directly exposed to the impacts and are also classified as the most sensitive of all receptors. Observers develop a sense of place through knowledge and experience of a particular area. The uniqueness of the landscape, simplicity and visual character of God's Window is already widely known. Many tourists (especially South Africans) therefore have a preconceived perception of the character of God's Window. Like other attractions along the Panorama route – the existing infrastructure is low-key, yet sensitive and doesn't impose itself on the natural environment. The fact that you are able to quickly pull over and admire the view (often alone or with 2 or 3 other groups) gives God's Window a unique and therefore strong sense of place (identity). It was therefore established that the impact of the proposed project on tourists would be much higher in comparison with the impact on other visual receptors.

It was also established that the proposed project will act as a gateway for other tourism-driven developments to establish along the Panorama Route. This could lead to the cumulative impact of the depletion of visual resources (rural character) in the region. This impact was considered to be medium to high without mitigation. Implementation of appropriate mitigation measures will, however, decrease the significance of the impact to medium.

Another impact to consider is creating an example (president) of developing a sensitive site of international significance (i.e. on the escarpment of the world's largest green canyon). This could lead to other projects being initiated in similar sensitive areas – not only along the Panorama Route but throughout the rest of the country. The significance of this impact is considered to be medium to high and the only mitigation would be to follow the No-go option.

On the other hand the proposed project will also enhance the Tourist's viewing experience. Tourists will be able to experience the feeling of weightlessness when walking over 12 meter glass walkway – offering spectacular views in all directions. Better facilities (cafeteria and ablution) will also make the visit more convenient and pleasant. The visual impact of the improved facilities and the visual experience it will offer the Tourist will be high in a positive sense.

A summary of the significance of anticipated visual impacts, before and after mitigation is outlined below:

Table 9: Summary of the significance of anticipated visual impacts

Impact	Significance before mitigation	Significance after mitigation
Direct Impact – Construction Phase		
Views experienced by visual receptors, of vegetation clearance, construction activities including construction camps, material lay-down yards, stockpiles, cranes, scaffolding, delivery vehicles and general construction operations.	Medium	Low - Medium
Direct Impacts – Operational Phase		
Views, experienced by visual receptors, of the skywalk structure, new building and associated upgraded infrastructure.	Medium	Low - Medium
Enhancement of the visitor's viewing experience.		Positive High
Cumulative Impact:		
Depleting natural visual resources by changing the natural landscape character through development.	Medium - High	Medium
Indirect Impact:		
Setting a president of developing an area located in a visually sensitive setting of international significance (i.e. on the escarpment of the world's largest green canyon).	Medium - High	Medium - High

9. IMPACT STATEMENT

The finding of the VIA, undertaken for the proposed Skywalk Project and associated infrastructure upgrades, is that the study site will have an impact Tourists, Residents, Recreational Users and Motorists. The impact on the latter three visual receptors will be low to medium based on the VAC of the landscape (dense vegetation) as well as the sheer viewing distance these receptors will experience views at (4 – 10km away).

Tourists will be greatly impacted on; however, the impact will be twofold. On the one hand the existing strong sense of place (identity) will be altered and the God's Window viewpoint, as it has become known, will never be the same again. On the other hand the new Skywalk structure will improve the viewing experience and offer 360° views to visitors as well as the exhilarating experience of "walking over the edge".

Two other factors to consider is creating a president of development in sensitive locations (of international significance) as well as depletion of visual resources (rural character) in the region and also the rest of South Africa.

In light of the above and considering all factors, including the anticipated post mitigation impact significance ratings (mostly medium), it is the opinion of the author that that although the proposed Skywalk Project will have a large impact on Tourists and change the visual character and quality of the landscape in the long term, that the implementation of this project will not be unacceptable from a visual point of view.

Whether or not the project is appropriate within this context (i.e. on the escarpment of the world's largest green canyon) is to be questioned. It is therefore recommended that the development, as proposed, be supported, pending documented reference of the Public Participation Process, indicating that public perception of the development is not negative.

10. REFERENCES

AECOM. 2013. Project Report: Skywalk at God's Window. London.

Bredenkamp, G., Granger, J.E. & van Rooyen, N. 1996. Rocky Highveld Grassland. In: Low, A.B. & Rebelo, and A.G. (Eds) Vegetation of South Africa, Lesotho and Swaziland. Departmental Affairs & Tourism, Pretoria.

Department of Rural Development and Land Reform. Chief Directorate: Surveys and Mapping, Cape Town: CDSM.

Landscape Institute and the Institute of Environmental Assessment and Management. (2002). Guidelines for Landscape and Visual Impact Assessment (GLVIA).Second Edition, E &FNSpon Press.

Mpumalanga Tourism and Parks Agency (MTPA). 2013. Integrated Management Plan: Blyde Canyon Nature Reserve, South Africa.

Mucina, L. and Rutherford, M.C. (2006): The vegetation of South Africa, Lesotho and Swaziland, Strelitzia 19, Pretoria: South African National Biodiversity Institute.

Oberholzer, B. 2005. Guideline for involving visual and aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 R. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

Scott, C. and Snait Q. (2009). Proposal for the development of a Skywalk on the edge of the Mpumalanga escarpment.