VISUAL IMPACT ASSESSMENT

FOR THE PROPOSED RIETVLEI OPEN CAST MINE, MPUMALANGA

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DECLARATION BY SPECIALIST

I, **Mandy van der Westhuizen**, declare that:

- I act as an independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- There are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing
    - any decision to be taken with respect to the application by the competent authority; and
    - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

For and on behalf of Outline Landscape Architects CC

3 OCTOBER 2013

Date:

EXECUTIVE SUMMARY

Approach and Project Description:

Anglo American is proposing the development of an open cast coal mine on a site located approximately 17km east of Middelburg within the Steve Tshwete Local Municipality of the Nkangala District Municipality, in the Mpumalanga Province.

WSP Environmental (Pty) Ltd appointed Outline Landscape Architects (cc) to undertake a Visual Impact Assessment for the mine in partial fulfilment of the EIA regulations.

This assessment has been undertaken during the construction stage of the project and is based on information available at the time.

The level of confidence for this assessment is high and indicates that the author's confidence in the accuracy of the findings is high.

The following methodology has been followed for the assessment of visual impact:

- Describe the receiving environment and project scope;
- Determine potential visual impacts of the proposed facility in terms of potential visual exposure and the magnitude of the potential landscape and visual impacts;
- Assess the significance of the potential landscape and visual impacts;
- Propose mitigation to reduce or alleviate potential adverse visual impacts.

The proposed site encompasses an area of 2 225 Ha. The surface area ultimately utilised for the mine and associated infrastructure may be smaller, depending on the final layout of the facility. At present, the western half of the site is earmarked for the development of the mine.

The study area for the visual assessment encompasses a geographical area of approximately 1120km² and includes a minimum 10km buffer zone from the proposed site.

The proposed Rietvlei Mine will make use of conventional strip mining and roll-over mining, with rehabilitation as an ongoing process.

The mine development process will be divided up into three stages, the construction stage, the operational stage and the closure stage. These three stages are characterised by specific activities, components and time frames.

The Receiving Environment:

The topography is classed as *moderately undulating plains and pans* and the landscape is characterised by relatively little topographic variation. Small drainage lines meander through the landscape.

Land use in the study area is dominated by cultivation and grazing and large parts of the site are utilised as a eucalyptus plantation.

Some mining activity is evident along the railway line (to the east of the site), the R555 (to the west and north east of the site) and the R104 (to the south west of the site). The Vuna Colliery lies less that 2,5km east of the proposed site. This mining is predominantly open cast coal mining similar to that proposed for the site.

The visual character of the landscape is undisputedly undeveloped and rural. The dominance of agricultural practices and the encroachment of the mining activity impact on the regional visual quality, which is classified as moderately high.

The Visual Absorption Capacity for the study area is considered to be low and provides very limited screening capacity for this project.

The landscape character can generally be classified as a disturbed rural landscape which is moderately sensitive with a moderate tolerance to change.

The incidence of visual receptors is expected to be the highest along the national road, (i.e. the N4) and to a lesser extent along the arterial roads (i.e. the R555 and R105) and secondary roads within the study area. Commuters and tourists using these roads could be negatively impacted upon by visual exposure to the proposed mine.

Other than along the above roads, viewer incidence within a 10 km radius of the proposed mine is concentrated in the relatively high number of rural and agricultural homesteads and settlements.

- Residents of rural and agricultural settlements and homesteads within the affected environment are classified as visual receptors of **high** sensitivity;
- Commuters (by vehicle and foot) are generally classified as visual receptors of **moderate** sensitivity;
- Recreational users of outdoor recreational facilities (such as the Middelburg Dam) and tourists visiting or passing through the area are classified as visual receptors of **high** sensitivity.

Potential Visual Impacts:

Potential visual exposure appears to be most concentrated on the site itself, to the immediate east and to a lesser extent to the north west and north of the site. The area to the south and south west of the site will most likely be visually unaffected. Within the visually exposed areas, the undulating topography results in a patchwork of visually screened and visually exposed areas.

Land uses in the visually exposed areas include primarily farms, and visual receptors are likely to be residents of rural and agricultural homesteads and settlements and users of the roads (i.e. specifically the R555 and secondary roads).

Due to the nature and scale of the proposed mine, potential visual exposure beyond the 10km radius is considered negligible. The town of Middelburg, the R104 and the N4 fall outside of the 10km radius, and are therefore not likely to experience any visual impact.

- The magnitude of potential visual impacts on the landscape character will be **moderate** in close proximity (i.e. within 5km) of the proposed mine, and **low** within the region (i.e. beyond the 5km radius).
- Magnitude of visual impact on residents of rural and agricultural settlements and homesteads will be **very high** in close proximity (i.e. within 5km) of the proposed mine.
- Magnitude of visual impact on residents of rural and agricultural settlements and homesteads will be **high** within the region (i.e. beyond the 5km radius).
- Magnitude of visual impact on commuters travelling along national, arterial and secondary routes will be **high** in close proximity (i.e. within 5km) of the proposed mine;
- Magnitude of visual impact on commuters travelling along national, arterial and secondary routes will be **moderate** within the region (i.e. beyond the 5km radius).
- Magnitude of visual impact on recreational users, tourists and sightseers will be **moderate** in close proximity (i.e. within 5km) of the proposed mine;
- Magnitude of visual impact on recreational users, tourists and sightseers will be **low** within the region (i.e. beyond the 5km radius).
- The magnitude of potential visual impact of lighting at night will be **high** in close proximity (i.e. within 5km) of the proposed mine
- The magnitude of potential visual impact of construction will be **moderate** in close proximity (i.e. within 5km) of the proposed mine

Visual Impact Assessment:

The assessment of potential visual impacts includes the quantification of a number of criteria, which when processed, reveal the Significance of the Potential Visual Impact.

- The anticipated visual impact of the proposed mine on the landscape character is expected to be of **moderate** significance in close proximity to the proposed mine and of **low** significance within the region.
- The anticipated visual impact of the proposed mine on the residents of rural and agricultural settlements and homesteads is expected to be of **moderate** significance in close proximity to the proposed mine and of **low** significance within the region.
- The anticipated visual impact of the proposed mine on commuters travelling on arterial and secondary roads is expected to be of **moderate** significance in close proximity to the proposed mine and of **low** significance within the region.
- The anticipated visual impact of the proposed mine on recreational users, tourists and sightseers is expected to be of **low** significance in close proximity to the proposed mine and within the region.
- Anticipated visual impacts related to lighting will be of **moderate** significance for visual receptors in close proximity to the proposed mine.
- The visual impact of construction is expected to be of **moderate** significance, but may be mitigated to **low** significance.

Mitigation:

The aim of mitigation is to reduce or alleviate the intrusive contrast between the proposed mining components and activities, and the receiving landscape to a point where it is acceptable to visual and landscape receptors.

A number of recommended Mitigation Measures are detailed for the Planning, Construction, Operational and Closure Phases of the proposed mine.

Conclusions, Recommendations and Impact Statement:

The proposed Rietvlei Mine is expected to visually impact on the landscape character and on various sensitive visual receptors who would consider visual exposure to this type of infrastructure to be intrusive.

Furthermore, in light of the existing mining operations within the study area and in fact adjacent to the proposed site, these visual receptors would be subject to a cumulative visual impact in terms of the mine, its ancillary infrastructure, and lighting at night.

There also are not many options as to the mitigation of visual impacts.

Notwithstanding, the anticipated visual impacts are not considered to be a fatal flaw for this project. Factors contributing to this conclusion include the following:

- The relatively low incidence of visual receptors in the study area;
- The relatively contained area of potential visual exposure, even within the 5km radius;
- The accepted context of mining activities already present in the region, and specifically the Vuna Colliery located on the adjacent farm to the east of the site;
- The relatively short anticipated lifespan of the proposed mine;
- The unlikelihood of recreational users, tourists and sightseers likely to enter the area within 5km of the proposed mine.

It is therefore recommended that the development of the mine as proposed be supported, subject to the implementation of the recommended mitigation measures (chapter 7).

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LIST OF ABBREVIATIONS

DTM:	Digital Terrain Model
EIA:	Environmental Impact Assessment.
GIS:	Geographical Information System
I&AP:	Interested and Affected Party
VAC:	Visual Absorption Capacity
VIA:	Visual Impact Assessment.

1. STUDY APPROACH

1.1 Qualification and Experience of the Practitioner

WSP Environmental (Pty) Ltd appointed Outline Landscape Architects (cc) to undertake a Visual Impact Assessment for the Proposed Rietvlei Open Cast Coal Mine.

Mandy van der Westhuizen, the lead practitioner undertaking the visual assessment on behalf of Outline Landscape Architects has been involved in Environmental Planning, Environmental Management and Impact Assessment for more than 10 years, and has been specialising in Visual impact Assessment for more than a year. Mandy is a registered Professional Landscape Architect at the South African Council for the Landscape Architectural Profession.

The visual assessor has applied the principles of Oberholzer's "Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes" (Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning: 2005) to undertake this assessment. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, the core elements are more widely applicable.

This Visual Impact Assessment (VIA) is a specialist study to determine the potential visual affects of the proposed development on the receiving environment. Neither the author nor Outline Landscape Architects will benefit from the outcome of the project decision-making.

1.2 Assumptions and Limitations

This assessment has been undertaken during the construction stage of the project and is based on information available at the time.

- The commencement date for project is unknown. It is assumed that mining will commence after the public participation process is completed and the relevant authorities have approved the application;
- The height of a typical topsoil stockpile is estimated at 5m and a typical coal stockpile is estimated at 15m;
- Due to the scale of the proposed facility, the extent of the study area is limited to a radius of 10km;
- A site visit was undertaken to the study area on 8 August 2011, and the included photos were taken on that date;
- This level of assessment excludes surveys to establish viewer preference and thereby their sensitivity. Viewer sensitivity is determined by means of a commonly used rating system.

1.3 Level of Confidence

Level of confidence[1] is determined as a function of:

- The information available, and understanding of the study area by the practitioner:
    - 3: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
    - 2: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.

[1] Adapted from Oberholzer (2005).

- 1: 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.

- The information available, understanding of the study area and experience of this type of project by the practitioner:

  - 3: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
  - 2: A moderate level of information and knowledge is available of the project and/or the visual impact assessor is moderately experienced in this type of project and level of assessment.
  - 1: Limited information and knowledge is available of the project and/or the visual impact assessor has a low experience level in this type of project and level of assessment.

These values are applied as follows:

	Information on the project & experience of the practitioner			
Information on the study area		**3**	**2**	**1**
	3	**9**	**6**	**3**
	2	**6**	**4**	**2**
	1	**3**	**2**	**1**

*The level of confidence for this assessment is determined to be **9** and indicates that the author's confidence in the accuracy of the findings is high:*

- The information available, and understanding of the study area by the practitioner is rated as **3** and
- The information available, understanding of the study area and experience of this type of project by the practitioner is rated as **3**.

1.4 Approach and Methodology

The approach utilised to identify issues related to the visual impact included the following activities:

- The creation of a digital terrain model (DTM) of the potentially affected environment;
- The sourcing of relevant spatial data. This included cadastral features, vegetation types, land use activities, topographical features, site placement, etc;
- The identification of sensitive environments upon which the proposed facility could have a potential impact;
- The creation of viewshed analyses from the proposed development area in order to determine the visual exposure and the topography's potential to absorb the potential visual impact. The viewshed analyses take into account the dimensions of the proposed structures.

Site visits were undertaken to establish a photographic record of the receiving environment, the site, views and areas of particular visual quality. The site visit further serves the purpose of identifying other possible mitigating/aggravating circumstances related to the potential visual impact.

This report (visual impact assessment) sets out to identify and quantify the possible visual impacts related to the proposed development, as well as offer potential mitigation measures, where required.

The following methodology has been followed for the assessment of visual impact:

- Describe the receiving environment and project scope;
- Determine potential visual impacts of the proposed facility in terms of potential visual exposure and the magnitude of the potential landscape and visual impacts;
- Assess the significance of the potential landscape and visual impacts;
- Propose mitigation to reduce or alleviate potential adverse visual impacts.

This VIA conforms to the requirements of a level three assessment (Oberholzer (2005)).

1.5 Information Base

This assessment was based on information from the following sources:

- Topographical maps and GIS generated data were sourced from the Surveyor General, Surveys and Mapping in Mowbray, Cape Town and SEFGIS (2011) respectively;
- Observations made and photographs taken during site visits;
- Conceptual layout plan received from the main Environmental Assessment Practitioner;
- Professional judgement based on experience gained from similar projects; and
- Literature research on similar projects.

1.6 Legal Framework

The following legislation and guidelines have been considered in the preparation of this report:

- The Environmental Impact Assessment Amendment Regulations, 2010;
- Guideline on Generic Terms of Reference for EAPs and Project Schedules (DEADP, Provincial Government of the Western Cape, 2011).
- Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (DEADP, Provincial Government of the Western Cape, 2005).

2. SCOPE OF WORK

Anglo American is proposing the development of an open cast coal mine on a site located approximately 17km east of Middelburg within the Steve Tshwete Local Municipality of the Nkangala District Municipality, in the Mpumalanga Province.

The site consists of the following farm portions:

- Remaining Portion of Rietvlei 397 JS and
- Portion 1 of Rietvlei 397 JS.

The proposed site encompasses an area of 2 225 Ha. The surface area ultimately utilised for the mine and associated infrastructure will be smaller, depending on the final layout of the facility. At present, the western half of the site is earmarked for the development of the mine.

The study area for the visual assessment encompasses a geographical area of approximately 1120km² (the extent of the maps displayed below) and includes a minimum 10km buffer zone from the proposed site.

The scope of work for this assessment includes the determination of the potential visual impacts in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation of the proposed infrastructure.

Potential visual issues related to the proposed Rietvlei Mine include:

- The potential visual impact of the proposed mine and ancillary infrastructure on the landscape character of the area in close proximity[2] to the proposed mine and within the region[3].
- The potential visual impact of the proposed mine and ancillary infrastructure on sensitive visual receptors in close proximity to the proposed mine and within the region. These sensitive visual receptors include the following:
  - Residents of rural and agricultural settlements and homesteads;
  - Commuters travelling along national, arterial and secondary routes and
  - Recreational users, tourists and sightseers.
- The potential visual impact of lighting at night on observers in close proximity to the facility.
- The potential visual impact of construction on visual receptors in close proximity to the facility.
- The potential cumulative visual impact of the proposed mine and associated infrastructure within the region.
- Potential residual visual impacts after the decommissioning of the proposed mine.

3. PROJECT DESCRIPTION

The proposed Rietvlei mine will make use of conventional strip mining and roll-over mining, with rehabilitation as an ongoing process.

The mine development process will be divided up into three stages, the construction stage, the operational stage and the closure stage. These three stages are characterised by specific activities, components and time frames as follows:

3.1 Construction Stage

This is the infrastructural development stage, which is expected to last approximately 2 months. Construction activity will fluctuate in intensity during the construction stage of the mine. The following construction activities are anticipated:

- Establishment of the construction camp;
- Stripping of vegetation;
- Removal of topsoil and stockpiling for re-use at closure;
- Removal of overburden and stockpiling for replacement into final void at closure;
- Construction of security and maintenance area, pollution control measures, storm water control measures and access and haul roads;
- Installation of ancillary infrastructure such as diesel tanks, coal stockpile pads, security control point, toilets etc and
- Removing rubble and cleaning the remainder of the site.

Visual character of construction stage:

Parcels of exposed soil will define the construction areas and will be a dominant feature during the construction stage. The construction site will appear disorganised and dispersed with construction equipment, material stockpiles and supporting facilities.

Large construction equipment may be used. Extensive earthworks will be necessary to grade the sites and possible dust clouds may be generated by the activities.

[2] For the purpose of this study, close proximity is considered to be within 5km of the proposed mine.

[3] For the purpose of this study, the region is considered to be beyond the 5km radius of the proposed mine.

3.2 Operational Stage

This is the mining stage, which is expected to last between 2 and 5 years. The following mining activities are anticipated:

- Opencast mining (using back-actors, bulldozers etc)
- Blasting;
- Crushing and screening (screening plant);
- Haulage and transportation (large haulage trucks and tippers).

The following mining components are anticipated:

- Box cuts and voids;
- Pollution control dams;
- Crushing / Screening Plant;
- Temporary offices;
- Topsoil stockpiles;
- Overhaul stockpiles;
- ROM and outgoing material stockpiles and
- The coal haulage route.

It is expected that from a visual perspective, the stockpiles (ROM and outgoing material) will be the most visually prominent aspect of the proposed mine (250x250m footprint with an average height of 15m).

A preliminary layout of the mine is shown on **Figure 1** below. The above stockpiles will be located at the Crushing / Screening Plant site as indicated.

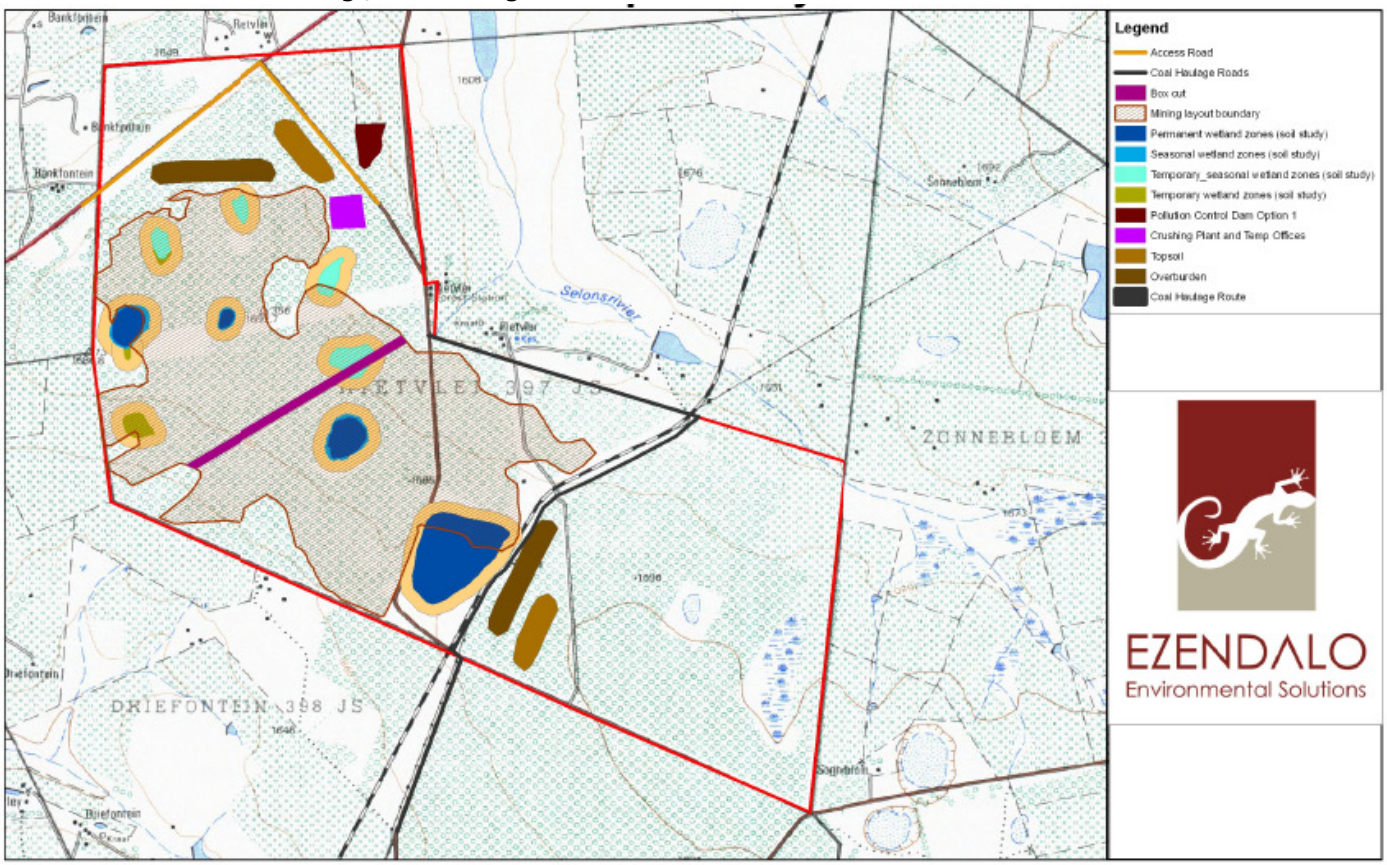


Figure 1: Provisional concept layout of the proposed Rietvlei Mine.

Visual character of operational stage:

The mining activities will present similar visual characteristics as is found in the neighbouring coal mines. Refer to **Figures 2-5** below. There will be increased frequency of large haulage trucks on the roads and onsite that will make the mining activities more visible. These trucks will also generate dust plumes that contribute to the visibility of the mining activities.

The site will be stripped of the original land cover and subsoil exposing the black colour of the coal. This will be highly visible because of the colour contrast between the existing grassland/soil and that of the coal.

Figure 2: Typical mining equipment.

Figure 3: A typical haulage truck.

Figure 4: A typical overburden stockpile.

Figure 5: A typical box cut.

3.3 Closure Stage

Closure will commence once all the coal has been depleted and will include the following activities:

- Filling of the final void with stockpiled overburden, covering it with topsoil and facilitating re-vegetation of the area;
- Ripping and rehabilitation of access and haul roads;
- Removal of ancillary infrastructure such as diesel tanks, toilets etc.
- Removal of storm water control measures and the construction of cut-off berms and trenches; and
- Fencing off of the mining area.

Visual character of closure stage:

Closure activity will fluctuate in intensity during the closure stage of the entire site. Closure is expected to continue for approximately 5 months. Closure activity will present the same visual character as in construction stage till everything is removed and rehabilitated.

4. THE RECEIVING ENVIRONMENT

4.1 Landscape Character

Landscape character is concerned primarily with the observable elements, components or features within a landscape that individually and collectively define the landscape characteristics. Refer to **Map 1**.

The study area occurs on land that ranges in elevation from approximately 1170 m a.s.l (in the west of the study area along the drainage lines) to about 1900 m a.s.l in the east.

The topography is classed as *moderately undulating plains and pans* and the landscape is characterised by relatively little topographic variation. Small drainage lines meander through the landscape and cause shallow incisions.

Numerous farm dams and wetlands are situated along the drainage lines. Different sized pans are irregularly spaced on the higher lying areas. During the rainy seasons, the pans hold water, but are usually dry in winter.

Land use in the study area is dominated by cultivation and grazing and large parts of the site are utilised as a eucalyptus plantation.

Pockets of natural vegetation occur, especially in the far north, west and east of the study area along the drainage lines. The farms comprising the proposed mine lie within the *Bankenveld* vegetation type and consist of grassland. Refer to **Maps 2 and 3.**

The eastern outskirts of Middelburg are evident in the far south west of the study area, and farming homesteads and settlements are widely distributed across the landscape. These are usually associated with a group of Eucalyptus trees. The average population density within the region is approximately 46 people per km^2, concentrated in the urban areas.

Some mining activity is evident along the railway line (to the east of the site), the R555 (to the west and north east of the site) and the R104 (to the south west of the site). The Vuna Colliery lies less that 2,5km east of the proposed site. This mining is predominantly open cast coal mining similar to that proposed for the site.

Other industrial land uses within the study area includes railway lines and power lines.

Figure 6: Plantation land use on part of the site.

Figure 7: Ploughed farmland in the foreground with natural pans and grassland beyond.

Figure 8: Cultivated farmland with agricultural buildings.

Figure 9: The nearby Vuna Colliery.

4.1.1 Visual Character

Visual character is based on 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 area.

Gentle undulating plains and valleys dominate the regional topography. The lines are smooth, extending into the horizon. The smoothly textured and uniform grassland vegetation is interrupted with cultivated fields and plantations.

The colour of the landscape is dictated by seasonal change. It cycles between lush green and rich colours during summer and dull yellow and browns during winter.

The region has an agricultural character, and remains largely undeveloped. Exceptions are the existing coal mines, which are visually apparent when in close proximity.

Roads include the N4 national road in the far south of the study area, the R555, which bisects the north western corner of the site, and the R104, some 7km to the south of the site. The latter arterial roads are unmaintained and very little traffic makes use of them. A number of gravel secondary roads also occur, giving access to the farms and mines.

Two railway lines traverse the study area, one running east to west, and a second crossing over the site, and running in a north east direction.

The visual character of the landscape is undisputedly undeveloped and rural.

Figure 10: The undeveloped and rural visual quality of the landscape.

Figure 11: Typical secondary road at a railway crossing on the southern boundary of the site.

4.1.2 Visual quality

Visual quality is a qualitative evaluation of the composition of landscape components and their influence on scenic attractiveness. Many factors contribute to the visual quality of the landscape and are grouped under the following three main categories (Table 1) that are internationally accepted indicators of visual quality (FHWA, 1981):

Table 1: Criteria of Visual Quality

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.

Each criterion is allocated a rating from 1 (poor) to 7 (high). The ratings are added together and divided by 3 to get an average. This average indicated visual quality.

The evaluation of visual quality is as follows:

- Very Low =1;
- Low =2;
- Moderately Low =3;
- Moderate =4;
- Moderately High =5;
- High =6;
- Very High =7.

The evaluation of the receiving environment is summarised in Table 2 below.

Table 2: Visual Quality of the regional landscape of the study area

VIVIDNESS	INTACTNESS	UNITY	VISUAL QUALITY
4	4	5	Moderately High

A higher visual quality can be attributed to areas with less human intervention and with natural features. However, the dominance of agricultural practices and the encroachment of the mining activity impact on the regional visual quality, which is classified as **moderately high**.

4.1.3 Visual absorption capacity

Visual Absorption Capacity (VAC) signifies the ability of the landscape to accept additional human intervention without serious loss of character and visual quality or value. VAC is founded on the characteristics of the physical environment such as:

- Degree of visual screening:

  A degree of visual screening is provided by landforms, vegetation cover and/or structures such as buildings. For example, a high degree of visual screening is present in an area that is mountainous and is covered with a forest compared to an undulating and mundane landscape covered in grass;

- Terrain variability:

  Terrain variability reflects the magnitude of topographic elevation and diversity in slope variation. A highly variable terrain will be recognised as one with great elevation differences and a diversity of slope variation creating talus slopes, cliffs and valleys. An undulating landscape with a monotonous and repetitive landform will be an example of low terrain variability;

- Land cover:

  Land cover refers to the perceivable surface of the landscape and the diversity of patterns, colours and textures that are presented by the particular land cover (i.e. urbanised, cultivated, forested, etc.);

A basic rating system is used to evaluate the three VAC parameters. The values are relative and relate to the type of project that is proposed and how it may be absorbed in the landscape (Table 3).

A range of 1 (lowest) to 3 (highest) is used to describe the potential of the landscape to visually absorb an element in the landscape. These values added together and categorised in a high, medium or low VAC rating.

Table 3: Regional Visual Absorption Capacity evaluation

VISUAL SCREENING	TERRAIN VARIABILITY	LAND COVER	VAC
1	2	1	Low

Although the proposed site is partly under plantation (with a high VAC), it is assumed that much of this land cover will be removed to make way for the proposed mine.

In terms of the greater study area, the VAC is considered **low** and provides very limited screening capacity for this project. The low VAC relates to the unvaried topography and predominantly low vegetation.

In this context, the anticipated exposed areas, voids and associated vertical and horizontal infrastructure of the proposed mine are unlike the undulating and horizontal appearance of the topography, and will be highly noticeable.

The less prominent project components such as access roads, are expected to be visually absorbed to a greater degree in the landscape and are not likely to create major alterations to the landscape character.

4.1.4 Landscape character sensitivity

The sensitivity of the landscape character is an indication of "…the degree to which a particular landscape can accommodate change from a particular development, without detrimental effects on its character" (GLVIA, 2002). The table below indicates the rating system used to determine landscape sensitivity.

Table 4: Landscape character sensitivity rating (Adapted from GOSW, 2006)

	DESCRIPTION
Low sensitivity	These landscapes are likely to: o Have distinct and well-defined landforms; o Have a strong sense of enclosure; o Provide a high degree of screening; o Have been affected by extensive development or man-made features; o Have reduced tranquillity; o Are likely to have little inter-visibility with adjacent landscapes; and o Exhibit no or a low density of sensitive landscape features that bare visual value.
Moderately sensitivity	These landscapes are likely to: o Have a moderately elevated topography with reasonably distinct landforms that provides some sense of enclosure; o Have been affected by several man-made features; o Have limited inter-visibility with adjacent landscapes; and o Exhibit a moderate density of sensitive landscape features that bare visual value.
Highly sensitivity	These landscapes are likely to: o Consist mainly of undulating plains and poorly defined landforms; o Be open or exposed with a remote character and an absence of man-made features; o Are often highly visible from adjacent landscapes; and o Exhibit a high density of sensitive landscape features that bare visual value.

A landscape with a high sensitivity would be one that is greatly valued for its aesthetic attractiveness and/or have ecological, cultural or social importance through which it contributes to the inherent character of the visual resource.

The study area is characterised mainly by undulating grasslands and agricultural fields. A number of power lines transect the landscape and mining activities steadily encroach on the study area. These elements degrade the visual quality of the regional landscape.

The landscape character can generally be classified as a disturbed rural landscape and is **moderately sensitive with a moderate tolerance to change**. This is applicable over an extensive area or intensive change over a limited area, which may cause limited alterations to the landscape character.

The assessment of the landscape is substantiated through professional judgement and informed reasoning. A landscape sensitivity rating was adapted from GOSW (2006) (Table 3) and applied in the classification of the study area.

4.2 Visual Receptors

4.2.1 Viewer incidence

Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. The visual receptors included in this study are:

- Residents of rural and agricultural settlements and homesteads;
- Commuters travelling along national, arterial and secondary routes and
- Recreational users, tourists and sightseers.

The incidence of visual receptors is expected to be the highest along the national road, (i.e. the N4) and to a lesser extent along the arterial roads (i.e. the R555 and R105) and secondary roads within the study area. Commuters and tourists using these roads could be negatively impacted upon by visual exposure to the proposed mine.

Other than along the above roads, viewer incidence within a 10 km radius of the proposed mine is concentrated in the relatively high number of rural and agricultural homesteads and settlements.

It is uncertain whether all of the potentially affected settlements are inhabited or not, so the author of this document operates under the assumption that they are all inhabited.

4.2.1 Viewer sensitivity

To determine 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 and consistent visual receptor sensitivity rating for viewers who are involved in different activities without engaging in extensive public surveys.

- Residents of rural and agricultural settlements and homesteads within the affected environment are classified as visual receptors of **high** sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.

- Commuters (by vehicle and foot) are generally classified as visual receptors of **moderate** sensitivity due to their temporary view and experience of the proposed development. As a commuter's speed increases (e.g. motorists), the sharpness of lateral vision declines and the commuter tends to focus on the line of travel (USDOT, 1981).

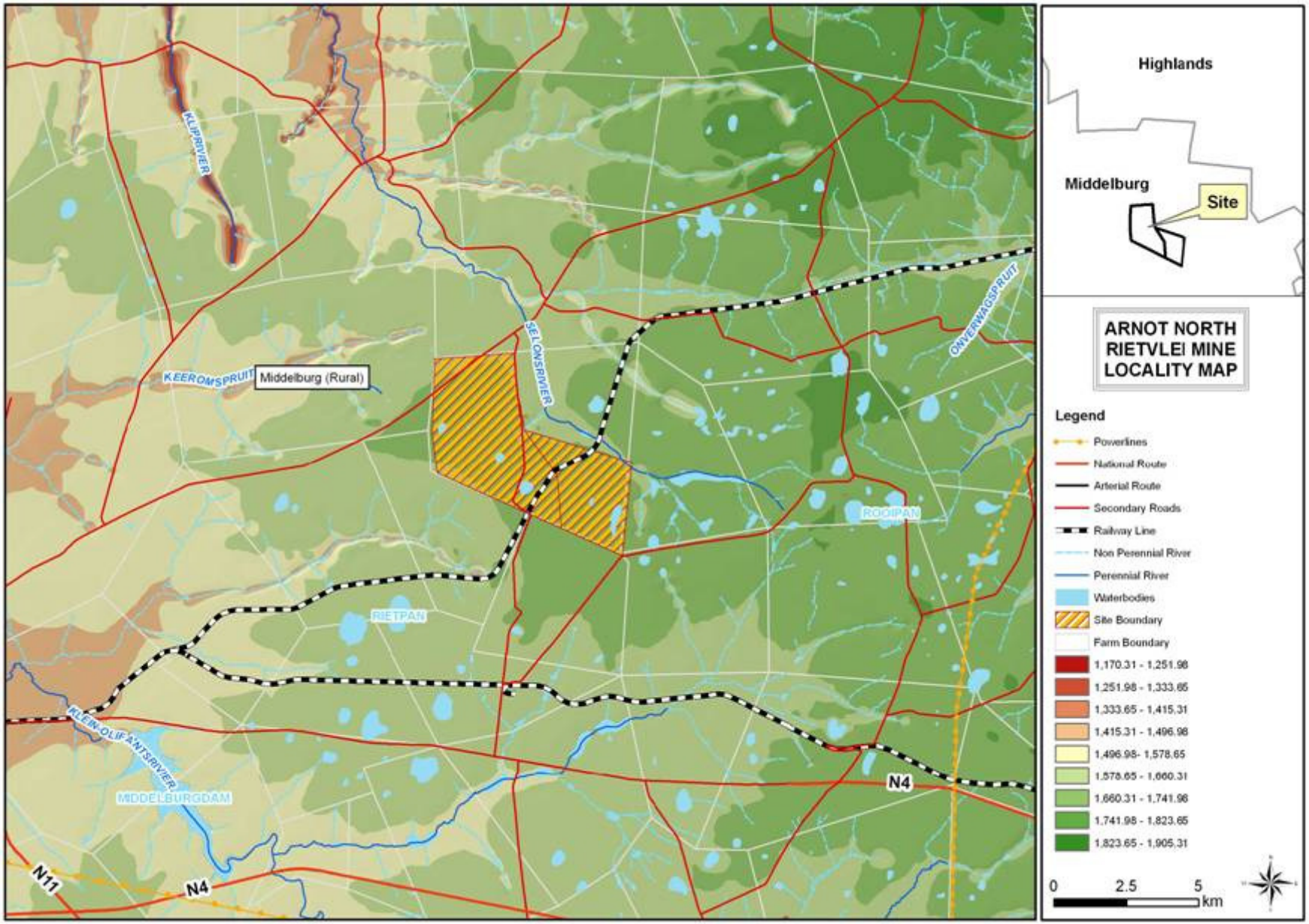
- Recreational users of outdoor recreational facilities (such as the Middelburg Dam) and tourists visiting or passing through the area are classified as visual receptors of **high** sensitivity.

  Their attention is focused towards the landscape and essentially utilise it for enjoyment purposes and appreciation of the quality of the landscape. The incidence of tourists and sightseers off the N4 in close proximity to the proposed mine is expected to be relatively low, however.

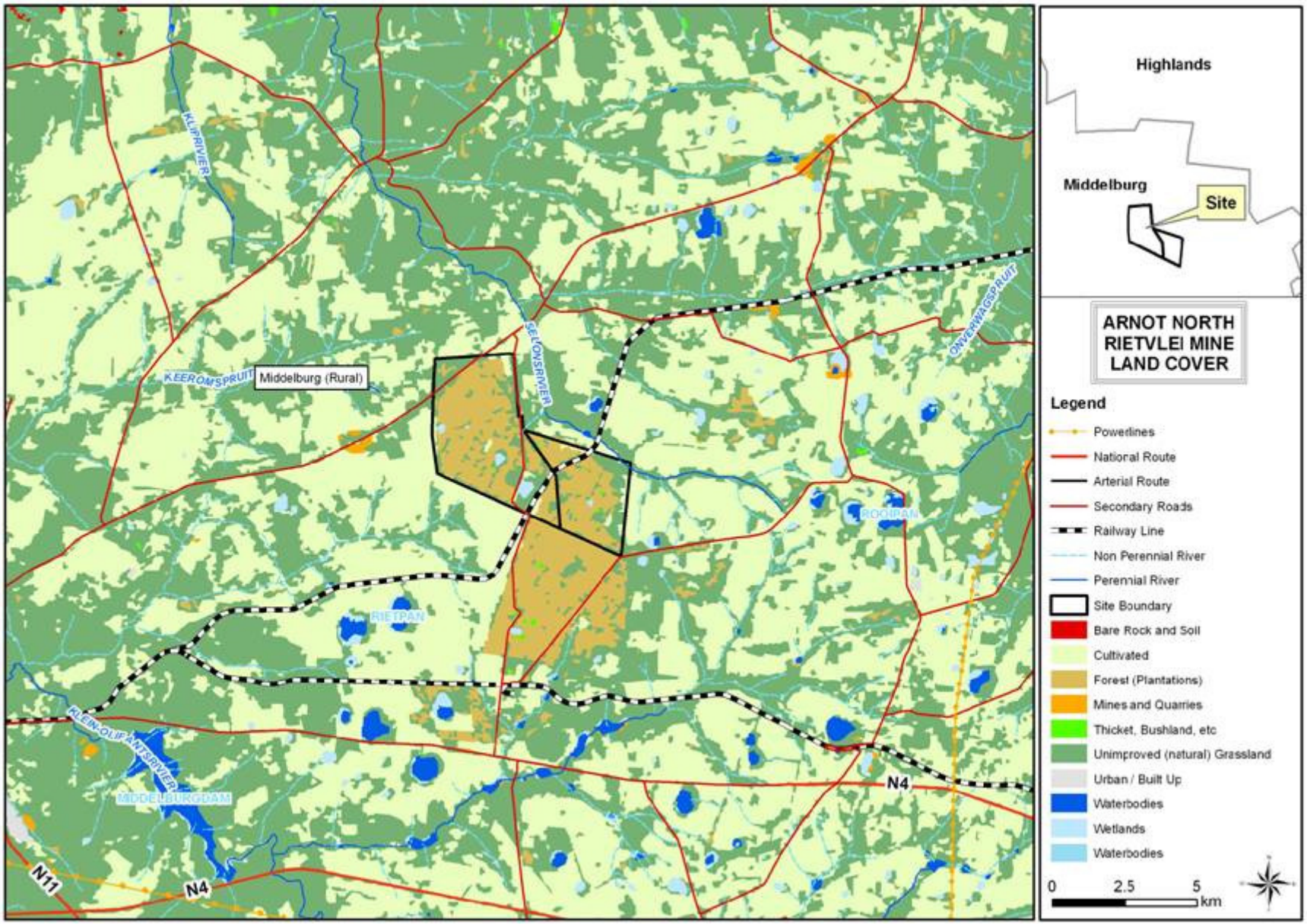
Figure 12: Typical homestead, a residential receptor.

Figure 13: The R555, host to commuters.

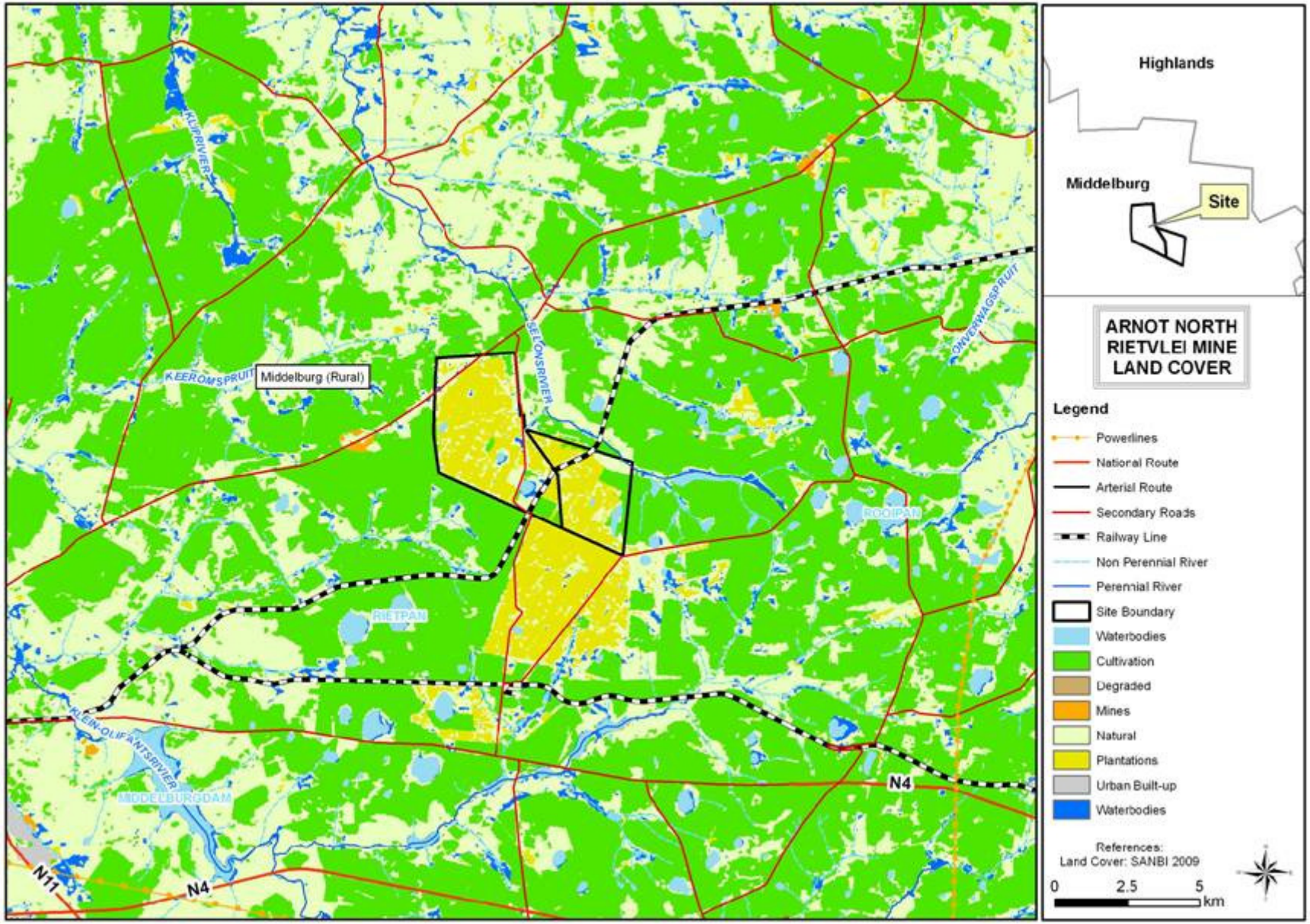
Figure 14: The Middelburg Dam, host to potential recreational receptors.



Map 1: Locality Plan



Map 2: Land Cover Map



Map 3: Land use Map

5. POTENTIAL VISUAL IMPACTS

5.1 Potential visual exposure

The result of the viewshed analyses for the proposed mine is shown on the map overleaf (**Map 4**). The visibility analysis was undertaken from the anticipated position of the ROM stockpile (i.e. the most visually prominent element of the proposed mine) at an offset of 15m above average ground level (i.e. the approximate height of the stockpile).

The visibility analysis indicates a worst-case scenario, using line-of-sight, based on topography alone. The VAC of the landscape is not captured[4] and is therefore not considered in these results.

The viewshed demarcates the extent of visual influence and includes the area within which views of the proposed mine are expected to be of concern. Proximity radii have been selected based on the anticipated visual experience of the observer over varying distances. The distances are adjusted upwards for larger facilities and downwards for smaller facilities (i.e. depending on the size and nature of the proposed infrastructure).

The proximity radii (calculated from the provision position of the ROM stockpile) are shown on **Map 4** and are as follows:

- 0 – 3km - Short distance view where the facility would dominate the frame of vision and constitute a very high visual prominence.
- 3 - 5km - Medium distance views where the facility would be easily and comfortably visible and constitute a high visual prominence.
- 5 - 10km - Medium to longer distance view where the facility would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a medium visual prominence.
- Greater than 10 km - Long distance view where the facility would still be visible though not as easily recognisable. This zone constitutes a low visual prominence for.

The viewshed analysis indicates areas from which the proposed mine will be visible (i.e. shaded in yellow).

Potential visual exposure appears to be most concentrated on the site itself, to the immediate east and to a lesser extent to the north west and north of the site. The area to the south and south west of the site will most likely be visually unaffected. Within the visually exposed areas, the undulating topography results in a patchwork of visually screened and visually exposed areas.

Land uses in the visually exposed areas include primarily farms, and visual receptors are likely to be residents of rural and agricultural homesteads and settlements and users of the roads (i.e. specifically the R555 and secondary roads).

Due to the nature and scale of the proposed mine, potential visual exposure beyond the 10km radius is considered negligible. The town of Middelburg, the R104 and the N4 fall outside of the 10km radius, and are therefore not likely to experience any visual impact.

It is envisaged that the proposed mine will be easily and comfortably visible to observers (i.e. travelling along roads and residing in settlements and homesteads), in close proximity to the proposed mine, and will constitute a high visual prominence, potentially resulting in visual impact.

[4] In order to accurately incorporate the VAC into the viewshed, every structure, tree and shrub would need to be mapped and modelled. This exercise would be both time consuming and expensive, and would not yield results that would be reliable over time (i.e. trees may be felled, other trees grow etc). In this respect, the topography yields the most reliable and most constant base for visual impact assessment.

5.2 Potential visual impact on landscape character

Landscape components that contribute to the landscape character and which will be affected by the proposed project include:

- The plantation on parts of the site;
- The grassland and vegetation patterns of the adjacent environment and
- The rural agricultural patterns of the study area.

Potential visual impacts on the landscape character are alterations to the fabric, character and visual quality which will either positively or negatively affect the landscape character.

Surface disturbances created during construction may remain for an extended period during the operational phase. These are seen as residual affects carried forward from the construction phase.

The operational phase will introduce alternative land uses to the site that will alter the existing plantation / agricultural character of the site, and the rural character of the region. Exposed soil, roads, stockpiles and mining infrastructure will replace the existing land use.

The undulating grassveld and the associated openness of the study area contribute to a unique and valued sense of place. This unique quality of the landscape will be affected as a result of the proposed development.

The magnitude or severity of this anticipated impact is measured in terms of the following:

- The existing visual character of the receiving environment (undeveloped and rural);
- The visual quality of the receiving environment (moderately high);
- The applicable visual absorption capacity (low) and
- The sensitivity of the landscape character (moderately sensitive with a moderate tolerance to change).

Figure 15: Viewpoint along the visually exposed secondary road directly east of the proposed ROM stockpile.

Figure 16: Viewpoint along a visually exposed secondary road 5km north of the site.

The magnitude of this potential impact will be **moderate** in close proximity (i.e. within 5km) of the proposed mine, and **low** within the region (i.e. beyond the 5km radius).

5.4 Potential visual impact on visual receptors

The magnitude or severity of anticipated impacts on visual receptors refer to the magnitude of change to specific visual receptor's views and/or their experience of the landscape. The severity of visual impact is influenced by the following factors:

- The extent of visual exposure by the receptor to the project;
- The applicable visual absorption capacity (low);
- The sensitivity of the relevant visual receptor and
- The distance of the receptor from the proposed mine.

Empirical research indicates that the visibility of a development and hence the severity of visual impact, decreases as the distance between the observer and the development increases.

In this respect, the magnitude of this potential impact will be as follows:

- Residents of rural and agricultural settlements and homesteads:
  - High extent of exposure in close proximity and within the region;
  - Low VAC;
  - High sensitivity;
  - Magnitude of visual impact will be **very high** in close proximity (i.e. within 5km) of the proposed mine;
  - Magnitude of visual impact will be **high** within the region (i.e. beyond the 5km radius).
- Commuters travelling along national, arterial and secondary routes:
  - High extent of exposure in close proximity and within the region;
  - Low VAC;
  - Moderate sensitivity.

    - Magnitude of visual impact will be **high** in close proximity (i.e. within 5km) of the proposed mine;
    - Magnitude of visual impact will be **moderate** within the region (i.e. beyond the 5km radius).
- Recreational users, tourists and sightseers
    - Low extent of exposure in close proximity and within the region;
    - Low VAC;
    - High sensitivity.
    - Magnitude of visual impact will be **moderate** in close proximity (i.e. within 5km) of the proposed mine;
    - Magnitude of visual impact will be **low** within the region (i.e. beyond the 5km radius).

5.5 Potential visual impact of lighting at night

The receiving environment in close proximity to the proposed mine has a relatively small number of populated places (i.e. mostly settlements and homesteads) and it can be expected that the light trespass and glare from the security and operational lighting of the mine will have some significance.

Furthermore, the sense of place and rural ambiance of the local area increases its sensitivity to such lighting intrusions.

Last is the potential lighting impact known as sky glow. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the amount of light sources. Each new light source, especially upwardly directed lighting, contributes to the increase in sky glow.

The magnitude of this potential impact will be **high** in close proximity (i.e. within 5km) of the proposed mine.

5.6 Potential visual impact of construction

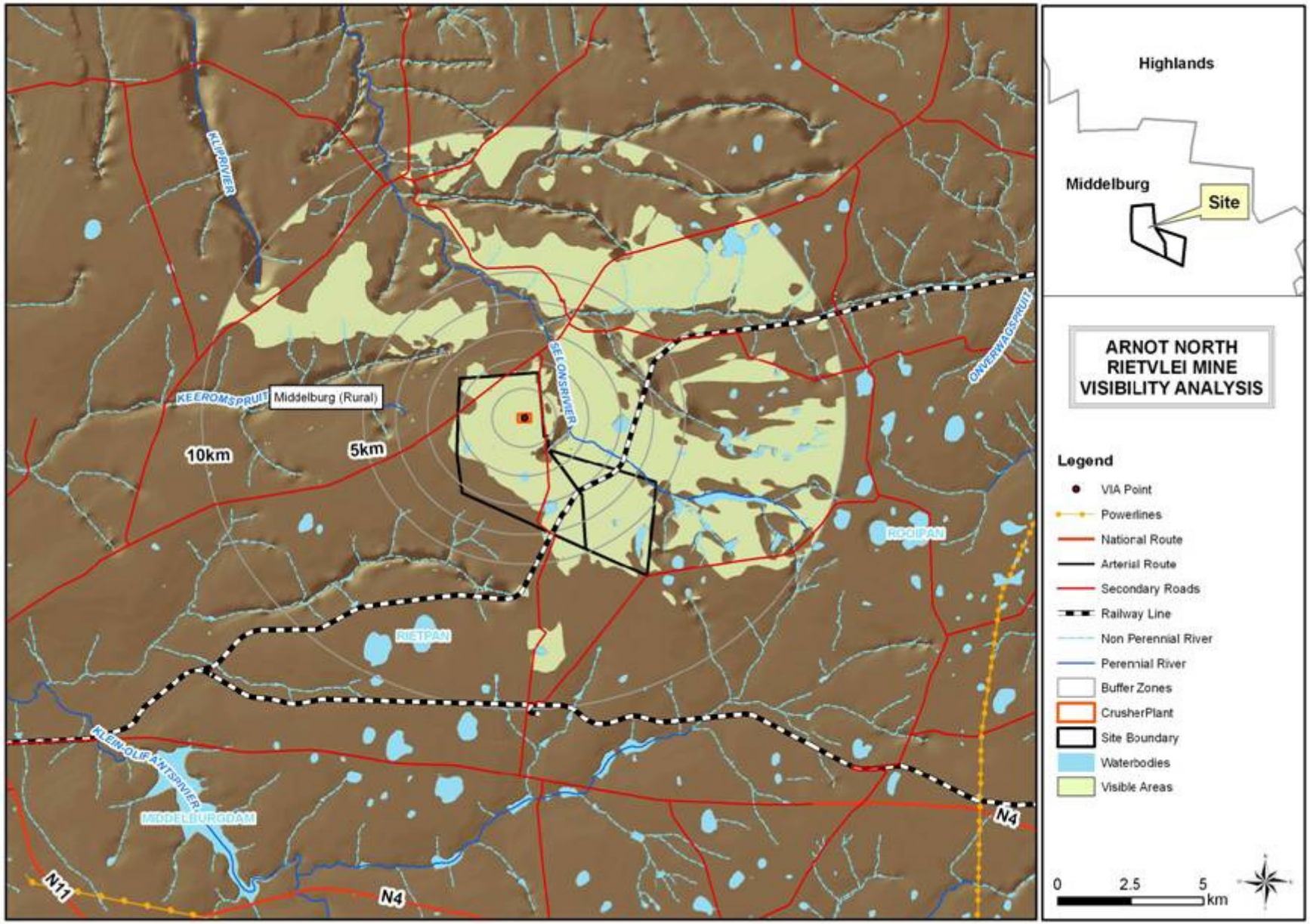
The activities that are expected to cause visual impacts during the construction phase are the establishment of the construction camps, construction of roads and the clearance of large areas of plantation.

These activities will create surface disturbances which will result in the removal of vegetation and the exposure of the underlying soil.

The operation of construction equipment may generate dust clouds that will increase resident's awareness of the operation. The construction activity will cause unsightly views as soil is exposed, stockpiles are created and ancillary infrastructure is erected.

There will also be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and land owners in the area.

The removal of parts of the plantation during the construction stage as well as the low VAC of the adjacent area will result in an impact of **moderate** magnitude in close proximity (i.e. within 5km) of the proposed mine.



Map 4: Visibility Analysis Rom Stockpile

6. VISUAL IMPACT ASSESSMENT

6.1 Visual impact assessment: methodology

The previous section of the report identified areas where likely visual impacts would occur. This section will attempt to quantify these potential visual impacts.

The assessment of potential visual impacts includes the quantification of a number of criteria, which when processed, reveal the Significance of the Potential Visual Impact. The following criteria are considered in this regard[5]:

- **Extent** - site only (very high = 5), local (high = 4), regional (medium = 3), national (low = 2) or international (very low = 1).
- **Duration** - very short (0-1 yrs = 1), short (2-5 yrs = 2), medium (5-15 yrs = 3), long (>15 yrs = 4), and permanent (= 5).
- **Magnitude** - None (= 0), minor (= 2), low (= 4), medium/moderate (= 6), high (= 8) and very high (= 10).
- **Probability** – very improbable (= 1), improbable (= 2), probable (= 3), highly probable (= 4) and definite (= 5).
- **Status** (positive, negative or neutral).
- **Reversibility** - reversible (= 1), recoverable (= 3) and irreversible (= 5).
- **Significance** - low, medium or high.

The **significance** of the potential visual impact is equal to the **consequence** multiplied by the **probability** of the impact occurring, where the consequence is determined by the sum of the individual scores for magnitude, duration and extent (i.e. **significance = consequence (magnitude + duration + extent) x probability**).

The significance weighting for each potential visual impact (as calculated above) is as follows:

- <30 points: Low (where the impact would not have a direct influence on the decision to develop in the area)
- 31-60 points: Medium/moderate (where the impact could influence the decision to develop in the area)
- >60: High (where the impact must have an influence on the decision to develop in the area)

*Please note that due to the declining visual impact over distance, the **extent** (or spatial scale) rating is reversed (i.e. a localised visual impact has a higher value rating than a national or regional value rating). This implies that the visual impact is highly unlikely to have a national or international extent, but that the local or site-specific impact could be of high significance.*

[5] Adapted from a methodology developed by Savannah Environmental Pty Ltd for use in Visual impact assessment by MetroGIS Pty Ltd.

6.2 Visual impact assessment: impacts on landscape character

Potential visual impact on the landscape character of the area in close proximity to the proposed mine.

The anticipated visual impact of the proposed mine on the landscape character of the area in close proximity to the proposed mine (i.e. within 5km) is expected to be of **moderate** significance both before and after mitigation.

The table below illustrates the assessment of this anticipated impact.

Table 5: Impact table summarising the significance of visual impacts on the landscape character of the area in close proximity to the proposed mine.

Nature of Impact: Potential visual impact on the landscape character of the area in close proximity to the proposed mine.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Short **(2)**	Short **(2)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	High **(4)**	High **(4)**
Significance	Moderate **(48)**	Moderate **(48)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

Potential visual impact on the landscape character of the region.

The anticipated visual impact of the proposed mine on the landscape character of the area beyond the 5km radius is expected to be of **low** significance both before and after mitigation.

The table below illustrates the assessment of this anticipated impact.

Table 6: Impact table summarising the significance of visual impacts on the landscape character of the region.

Nature of Impact: Potential visual impact on the landscape character of the region.		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Short **(2)**	Short **(2)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(18)**	Low **(18)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

6.3 Visual impact assessment: impacts on visual receptors

Potential visual impact on residents of rural and agricultural settlements and homesteads in close proximity to the proposed mine.

The anticipated visual impact of the proposed mine on the residents of rural and agricultural settlements and homesteads in close proximity to the proposed mine (i.e. within 5km) is expected to be of **moderate** significance both before and after mitigation.

It should be noted that the study area is relatively sparsely populated. In addition, homesteads are likely to include trees and domestic scale structures, which would both contribute to localised absorption of the visual impact. As such, the probability of this impact occurring is somewhat reduced.

The table below illustrates the assessment of this anticipated impact.

Table 7: Impact table summarising the significance of visual impacts on residents of settlements and homesteads in close proximity to the proposed mine.

Nature of Impact: Potential visual impact on residents of settlements and homesteads in close proximity to the proposed mine		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Short **(2)**	Short **(2)**
Magnitude	Very high **(10)**	Very high **(10)**
Probability	Probable **(3)**	Probable **(3)**
Significance	Moderate **(48)**	Moderate **(48)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

Potential visual impact on residents of rural and agricultural settlements and homesteads within the region.

The anticipated visual impact of the proposed mine on the residents of rural and agricultural settlements and homesteads beyond the 5km radius is expected to be of **low** significance both before and after mitigation.

It should be noted that the study area is relatively sparsely populated. In addition, homesteads are likely to include trees and domestic scale structures, which would both contribute to localised absorption of the visual impact. As such, the probability of this impact occurring is somewhat reduced.

The table below illustrates the assessment of this anticipated impact.

Table 8: Impact table summarising the significance of visual impacts on residents of settlements and homesteads within the region.

Nature of Impact: Potential visual impact on residents of settlements and homesteads within the region		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Short **(2)**	Short **(2)**
Magnitude	High **(8)**	High **(8)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(26)**	Low **(26)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

Potential visual impact on commuters travelling on arterial and secondary roads in close proximity to the proposed mine.

The anticipated visual impact of the proposed mine on commuters travelling on the R555 and secondary roads in close proximity to the proposed mine (i.e. within 5km) is expected to be of **moderate** significance both before and after mitigation.

The table below illustrates the assessment of this anticipated impact.

Table 9: Impact table summarising the significance of visual impacts on users of major and secondary roads in close proximity to the proposed mine.

Nature of Impact: Potential visual impact on commuters travelling on arterial and secondary roads in close proximity to the proposed mine		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Short **(2)**	Short **(2)**
Magnitude	High **(8)**	High **(8)**
Probability	Probable **(3)**	Probable **(3)**
Significance	Moderate **(42)**	Moderate **(42)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

Potential visual impact on commuters travelling on arterial and secondary roads within the region.

The anticipated visual impact of the proposed mine on commuters travelling on the R104, the R555 and secondary roads beyond the 5km radius is expected to be of **low** significance both before and after mitigation.

The table below illustrates the assessment of this anticipated impact.

Table 10: Impact table summarising the significance of visual impacts on users of major and secondary roads within the region.

Nature of Impact: Potential visual impact on commuters travelling on arterial and secondary roads within the region		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Short **(2)**	Short **(2)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(22)**	Low **(22)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

Potential visual impact on recreational users, tourists and sightseers in close proximity to the proposed mine.

The anticipated visual impact of the proposed mine on recreational users, tourists and sightseers in close proximity to the proposed mine (i.e. within 5km) is expected to be of **low** significance both before and after mitigation.

It should be noted that the study area is relatively sparsely populated, and is not known as a tourist destination. As such, the probability of this impact occurring is reduced.

The table below illustrates the assessment of this anticipated impact.

Table 11: Impact table summarising the significance of visual impacts on recreational users, tourists and sightseers in close proximity to the proposed mine.

Nature of Impact: Potential visual impact on recreational users, tourists and sightseers in close proximity to the proposed mine		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Short **(2)**	Short **(2)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(24)**	Low **(24)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

Potential visual impact on recreational users, tourists and sightseers within the region.

The anticipated visual impact of the proposed mine on recreational users, tourists and sightseers beyond the 5km radius is expected to be of **low** significance both before and after mitigation.

It should be noted that the study area is relatively sparsely populated, and is not known as a tourist destination. As such, the probability of this impact occurring is reduced.

The table below illustrates the assessment of this anticipated impact.

Table 12: Impact table summarising the significance of visual impacts on recreational users, tourists and sightseers within the region.

Nature of Impact: Potential visual impact on recreational users, tourists and sightseers within the region.		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Short **(2)**	Short **(2)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(18)**	Low **(18)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	N/a
Mitigation: • Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine. • Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms. • Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. • Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography. • Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation. • Ensure that all surface treatments are non-reflective. • Pro actively plan the lighting requirements for the mine. • Maintain the general appearance of the facility in an aesthetically pleasing way. • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Refrain from using the coal as infill material in road works. • Monitor rehabilitated areas, and implement remedial action as and when required.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of mining and related infrastructure within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

6.4 Visual impact assessment: impacts of lighting at night

Potential visual impact of lighting at night on visual receptors in close proximity to the proposed mine.

The anticipated visual impact of security and operational lighting of the mine on visual receptors in close proximity to the proposed mine (i.e. within 5km) is expected to be of **moderate** significance both before and after mitigation.

Receptors (residents, commuters and recreational users) beyond the 5km radius are not likely to experience the direct impact of lighting, but may well be exposed to the effects of sky glow.

It should be noted that the study area is relatively sparsely populated, and as such, the probability of this impact occurring is somewhat reduced.

The table below illustrates the assessment of this anticipated impact.

Table 13: Impact table summarising the significance of visual impact of lighting at night on visual receptors in close proximity to the proposed mine.

Nature of Impact: Potential visual impact on of lighting at night on visual receptors in close proximity to the proposed mine.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Short **(2)**	Short **(2)**
Magnitude	High **(8)**	High **(8)**
Probability	Probable **(3)**	Probable **(3)**
Significance	Moderate **(42)**	Moderate **(42)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	N/a
Mitigation: • Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself); • Directing light sources away from residential units and roads; • Limiting mounting heights of lighting fixtures; • Making use of minimum lumen or wattage in fixtures; • Making use of down-lighters, or shielded fixtures; • Making use of Low Pressure Sodium lighting or other types of low impact lighting. • Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.		
Cumulative impacts: The development of the proposed mine will increase the cumulative visual impact of lighting as a result of mining activity within the region.		
Residual impacts: None. The visual impact of the mine will be removed after decommissioning.		

6.5 Visual impact assessment: impacts of construction

Potential visual impact of construction on visual receptors in close proximity to the proposed mine.

The anticipated visual impact of construction of the mine on visual receptors in close proximity to the proposed mine (i.e. within 5km) is expected to be of **moderate** significance, but may be mitigated to **low** significance.

Receptors (residents, commuters and recreational users) beyond the 5km radius zone are not likely to experience the impact of construction activities.

It should be noted that the study area is relatively sparsely populated, and as such, the probability of this impact occurring is somewhat reduced.

The table below illustrates the assessment of this anticipated impact.

Table 14: Impact table summarising the significance of visual impacts of construction on visual receptors in close proximity to the proposed mine.

Nature of Impact: Potential visual impact visual impacts of construction on visual receptors in close proximity to the proposed mine.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Very short term **(1)**	Very short term **(1)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	Moderate **(33)**	Low **(22)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	N/a
Mitigation: • Reduce the construction period through careful planning and productive implementation of resources. • Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing. • Avoid or minimise the clearing of existing vegetation wherever possible. • Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height. • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. • Ensure that rubble, litter and disused construction materials are managed and removed regularly. • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way • Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days. • Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting. • Rehabilitate all disturbed areas, construction areas, road servitudes and cut and fill slopes as soon as possible to acceptable visual standards.		
Cumulative impacts: None.		
Residual impacts: None.		

7. RECOMMENDED MITIGATION

The aim of mitigation is to reduce or alleviate the intrusive contrast between the proposed mining components and activities, and the receiving landscape to a point where it is acceptable to visual and landscape receptors.

Mitigation should be implemented as an iterative process, accompanying the design phase to mitigate potential impacts before construction commences. This approach generates preventative measures that will influence planning decisions instead of relying on cosmetic landscape remediation of a completed project.

Note: The mitigation listed below is a consolidation of the mitigation measures listed in the Impact Assessment tables above.

7.1 Planning Stage

- Make use of existing roads wherever possible, and minimise the requirement for roads around the perimeter of the mine.
- Where grading and earth moving is required adjacent to public roads, make use of the spoil to create berms along the road to shield visual impact. Vegetate and monitor erosion on these berms.
- Where new roads are required, these should be planned taking due cognisance of the topography. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Implement an environmentally responsive planning approach to roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography.
- Paint all project facilities, fences and sign boards with muted earth-toned colours that will blend with the background colour of the vegetation.
- Ensure that all surface treatments are non-reflective.
- Pro actively plan the lighting requirements for the mine, both for construction and operations. Possible measures include the following:
    - Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself);
    - Directing light sources away from residential units and roads;
    - Limiting mounting heights of lighting fixtures;
    - Making use of minimum lumen or wattage in fixtures;
    - Making use of down-lighters, or shielded fixtures;
    - Making use of Low Pressure Sodium lighting or other types of low impact lighting.
    - Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

7.2 Construction Stage

- Reduce the construction period through careful planning and productive implementation of resources.
- Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing.
- Avoid or minimise the clearing of existing vegetation wherever possible.
- Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter and disused construction materials are managed and removed regularly.

- Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way
- Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days.
- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Rehabilitate all disturbed areas, construction areas, road servitudes and cut and fill slopes as soon as possible to acceptable visual standards.

7.3 Operational Stage

- Maintain the general appearance of the facility in an aesthetically pleasing way.
- Reduce and control construction dust through the use of approved dust suppression techniques, especially on windy days.
- Refrain from using the coal as infill material in road works.
- Monitor rehabilitated areas, and implement remedial action as and when required.

7.4 Closure Stage

- Remove infrastructure and buildings not required for the post-decommissioning use of the site.
- Backfill and rehabilitate all voids and unnatural landforms to resemble local topography.
- Rip and rehabilitate all access roads not required for the post-decommissioning use of the site.
- Monitor rehabilitated areas, and implement remedial action as and when required.

8. CONCLUSION AND RECOMMENDATIONS

The construction and operation of the proposed Rietvlei Mine and its associated infrastructure will have a visual impact on the undeveloped and rural visual character of this study area.

The proposed mine would be visible within an area that is seen as having a moderately high visual quality and a moderate sensitivity and tolerance to change.

Within this context, sensitive visual receptors include of rural and agricultural settlements and homesteads, commuters making use of arterial and secondary roads and recreational users of the area.

The assessment of the various landscape impacts has indicated that the most significant impacts will come about as a result of site clearing, and the removal of the plantation. This land use will be cleared to make way for mining areas, roads and stock piles.

The change in surface cover to exposed soil will diminish the existing landscape character of the area, resulting in significant visual impact, especially with 5km of the proposed mine.

Anticipated visual impacts will abate as the mining reaches completion and the disturbed areas are rehabilitated.

9. IMPACT STATEMENT

The proposed Rietvlei Mine is expected to visually impact on the landscape character and on various sensitive visual receptors who would consider visual exposure to this type of infrastructure to be intrusive.

Furthermore, in light of the existing mining operations within the study area and in fact adjacent to the proposed site, these visual receptors would be subject to a cumulative visual impact in terms of the mine, its ancillary infrastructure, and lighting at night.

There also are not many options as to the mitigation of visual impacts. The following is a summary of impacts remaining, assuming mitigation as recommended is exercised:

- The anticipated visual impact of the proposed mine on the landscape character is expected to be of **moderate** significance in close proximity to the proposed mine and of **low** significance within the region.
- The anticipated visual impact of the proposed mine on the residents of rural and agricultural settlements and homesteads is expected to be of **moderate** significance in close proximity to the proposed mine and of **low** significance within the region.
- The anticipated visual impact of the proposed mine on commuters travelling on arterial and secondary roads is expected to be of **moderate** significance in close proximity to the proposed mine and of **low** significance within the region.
- The anticipated visual impact of the proposed mine on recreational users, tourists and sightseers is expected to be of **low** significance in close proximity to the proposed mine and within the region.
- Anticipated visual impacts related to lighting will be of **moderate** significance for visual receptors in close proximity to the proposed mine.
- The visual impact of construction is expected to be of **low** significance.

The above visual impacts are not, however, considered to be a fatal flaw for this project. Visual considerations contributing to this conclusion include the following:

- The relatively low incidence of visual receptors in the study area;
- The relatively contained area of potential visual exposure, even within the 5km radius;
- The accepted context of mining activities already present in the region, and specifically the Vuna Colliery located on the adjacent farm to the east of the site;
- The relatively short anticipated lifespan of the proposed mine;
- The unlikelihood of recreational users, tourists and sightseers likely to enter the area within 5km of the proposed mine.

It is therefore recommended that the development of the mine as proposed be supported, subject to the implementation of the recommended mitigation measures (chapter 7).

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GLOSSARY OF TERMS

Landscape 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-characteristics 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 as way as to have a detrimental affect on the value of the landscape.
Light trespass	Light trespass can be described as the effects of light or illuminance that strays from its intended purpose (Shaflik, 1997)
Night glow	Night glow (sky glow) is the brightening of the night sky above towns, cities and countryside (ILE, 2005).
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)6.
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.

[6] Cited in Climate Change and Our 'Sense of Place', http://www.ucsusa.org/greatlakes/glimpactplace.html

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 character	Visual character is based on human perception and addresses the viewer's 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 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; 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 viewshed experienced by visual receptors and intrusion of foreign elements into the viewshed of landscape features thereby detracting from the visual quality.
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	Visual intrusion occurs when the viewer becomes aware, usually with negative associations, to a new element, or the removal of a familiar feature in a familiar view. The likelihood that a viewer will become aware of change is dependent on the compatibility of the element added, or the importance of the feature removed. This awareness is directly related to the perceived visual contrast between the existing and new scene, or between the new element and the existing landscape. In order to understand visual intrusion, the existing quality of views of the site must be compared to the views that will be experienced during the project phases.
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. For more descriptive assessments of visual quality attributes such as variety, coherence, uniqueness, harmony, and pattern can be referred to.
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 and visual character
Zone of visual influence	The extent of the area from which the most elevated structures of the proposed development could be seen and may be considered to be of interest (see visual envelope).