VISUAL IMPACT ASSESSMENT REPORT

Mponeng Lower Compartment Tailings Storage Facility

February 2026

VISUAL IMPACT ASSESSMENT

PROPOSED MPONENG LOWER COMPATMENT TAILINGS STORAGE FACILITY GAUTENG, SOUTH AFRICA

Submitted to:

Environmental Impact Assessment Services

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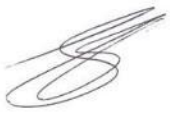
Report Revision No:	*ASSESSMENT FINAL*
Date Issued:	10 February 2026
Prepared By:	Graham Young PrLArch, FILASA
Reviewed By:	Graham Young PrLArch, FILASA

Signed:



Reference: 155_2024: Mponeng Lower Compartment TSF - VIA

EXPERTISE OF SPECIALIST

Name:	Graham A Young
Qualification:	BL (Toronto) ML (Pretoria)
Professional Registration:	South African Council for the Landscape Architectural Profession (SACLAP) Reg. No. 87001 Fellow Institute of Landscape Architects of South Africa (FILASA)
Experience in Years:	Over 40 years
Experience	Graham Young is a registered landscape architect with interest and experience in landscape architecture, urban design, and environmental planning. He holds a degree in landscape architecture from the Universities of Toronto (BL) and Pretoria (ML). He has conducted visual impact assessments in Canada and Africa, where he has spent most of his work. He has served as President of the Institute of Landscape Architects of South Africa (ILASA) and Vice President of the Board of Control for Landscape Architects. He is a Fellow of the ILASA and a professionally registered landscape architect in South Africa (SACLAP). He is President of the International Federation of Landscape Architects, Africa Region (IFLA Africa), and Vice President of IFLA World. He runs his practice, Graham A Young Landscape Architect (GYLA). Their speciality is Visual Impact Assessments, for which he has been cited with an Institute of Landscape Architects of South Africa (ILASA) Merit Award (1999). This work also includes landscape characterisation studies, end-use studies for quarries, and computer modelling and visualisation. He has completed over 300 specialist reports for projects and conducted several VIA reviews. He has been a specialist witness in legal cases involving visual impact issues. Mr Young helped develop the *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes* (Oberholzer 2005) and produced a research document for Eskom, *The Visual Impacts of Power Lines* (2009). In 2011, he produced '*Guidelines for involving visual and aesthetic specialists'* for the Aapravasi Ghat Trust Fund Technical Committee, which manages a World Heritage Site in Mauritius, along with the *Visual Impact Assessment Training Module Guideline Document* for the same client.

DECLARATION OF INDEPENDENCE

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Mponeng Tailings Storage Facilities Lower Compartment - Visual Impact Report

Specialist Company Name:	Graham Young Landscape Architect			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement Recognition	100%
Specialist name:	Graham Albert Young			
Specialist Qualifications:	BL (Toronto), ML (Pretoria)			
Professional affiliation/registration:	PrLArch Reg. No. 87001 FILASA			
Physical address:	608 Leyds Street, Muckleneuk, 0002			
Postal address:	PO Box 331, Groenkloof			
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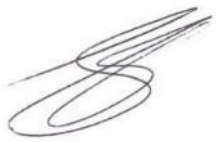
E-mail:	grahamyounglandarch@gmail.com			

I, Graham Albert Young declare that –

- I function as the 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.
- I declare that 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 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

Graham A. Young Landscape Architect

Name of Company:

10 February 2026

Date

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PROTECTION OF PERSONAL INFORMATION ACT

In compliance with the Protection of Personal Information Act, No. 37067 of 26 November 2013, please ensure the following:

- Any personal information provided herein has been provided exclusively for use as part of the public participation registration process and may, therefore, not be used for any purpose other than that for which it was provided.
- No additional copies of documents containing personal information may be made unless permission has been obtained from the owner of said information.
- All documentation containing personal information must be destroyed as soon as the purpose for which the data was collected has run its course.

SPECIALIST REPORTING REQUIREMENTS

Specialist Reporting Requirements According to Appendix 6 of the National Environmental Management Act (Act No. 107 of 1998), Environmental Impact Assessment (EIA) Regulation 2014 (as amended on 7 April 2017)	
Requirement	**Relevant section in report**
Details of the specialist who prepared the report	Pg iii and Appendix B
The expertise of that person to compile a specialist report including a curriculum vitae	Pg iii and Appendix B
A declaration that the person is independent in a form as may be specified by the competent authority	Pg iv
An indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3 and 1.4
An indication of the quality and age of base data used for the specialist report;	Section 1.5
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 8.4
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 1.4 and 3.2
A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure	Section 5
An identification of any areas to be avoided, including buffers	N/A
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figures 5 and 6
A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.5
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Sections 8 and12
Any mitigation measures for inclusion in the EMPr;	Section 9
Any conditions for inclusion in the environmental authorisation	N/A
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9

Specialist Reporting Requirements According to Appendix 6 of the National Environmental Management Act (Act No. 107 of 1998), Environmental Impact Assessment (EIA) Regulation 2014 (as amended on 7 April 2017)	
Requirement	**Relevant section in report**
A reasoned opinion whether the proposed activity, activities or portions thereof should be authorised regarding the acceptability of the proposed activity or activities; and	N/A
If the opinion is that the proposed activity, or activities or portions thereof should be authorised, any avoidance, management, and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 9
A description of any consultation process that was undertaken during the carrying out the study	N/A this activity is being carried out by EIMS
A summary and copies of any comments that were received during any consultation process	N/A
Any other information requested by the competent authority.	N/A

ACRONYMS, ABBREVIATIONS AND GLOSSARY

Acronyms & Abbreviations	
BAR	Basic Assessment Report
BFS	Bankable Feasibility Study
BID	Background Information Document
EIA	Environmental and Impact Assessment
EMPr	Environmental Management Programme
GYLA	Graham A. Young Landscape Architect (Sole Proprietor)
RWD	Return Water Dam
SACLAP	South African Council for the Landscape Architectural Profession
TSFs	Tailing Storage Facilities
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment

Glossary	
Aesthetic Value	Aesthetic value is the emotional response derived from the experience of the environment with its natural and cultural attributes. The response can be either to visual or non-visual elements and can embrace sound, smell, and any other factor having a strong impact on human thoughts, feelings, and attitudes (Ramsay, 1993). Thus, aesthetic value encompasses more than the seen view, visual quality, or scenery and includes atmosphere, landscape character, and sense of place (Schapper, 1993).
Aesthetically significant place	A formally designated place visited by recreationists and others for the express purpose of enjoying its beauty. For example, tens of thousands of people visit Table Mountain annually. They come from around the country and even from around the world. By these measurements, one can make the case that Table Mountain (a designated National Park) is an aesthetic resource of national significance. Similarly, a resource visited by large numbers from across the region probably has regional significance. A place visited primarily by people whose place of origin is local is generally of local significance. Unvisited places either have no significance or are "no trespass" places.

Glossary	
Aesthetic impact	Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Mere visibility, even the startling visibility of a project proposal, should not be a threshold for decision-making. Instead, a project, by its visibility, must interfere with or reduce (i.e. visual impact) the public's enjoyment and/or appreciation of the appearance of a valued resource, e.g. cooling tower blocks a view from a National Park overlook (after New York, Department of Environment 2000).
Cumulative Effects	The summation of effects that result from changes caused by development in conjunction with other past, present, or reasonably foreseeable actions.
Landscape Character	The individual elements that make up the landscape, including prominent or eye-catching features such as hills, woods, trees, water bodies, buildings, and roads, are quantifiable and can be easily described.
Landscape Impact	Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced (Institute of Environmental Assessment & The Landscape Institute 1996).
Study area	For this report, the study area refers to the proposed project footprint/project site as well as the 'zone of potential influence' (the area defined as the radius about the centre point of the project beyond which the visual impact of the most visible features will be insignificant), which is a 10,0km radius surrounding the proposed project footprint/site.
Project Footprint / Site	For this report, the Project *site*/*footprint* refers to the layout of the activities described.
Sense of Place (genius loci)	Sense of place is the unique value allocated to a specific place or area through the user's or viewer's cognitive experience. *A genius locus means* 'spirit of the place.'
Sensitive Receptors	Sensitivity of visual receptors (viewers) to a proposed development.
Viewshed analysis	The two-dimensional spatial pattern created by an analysis defines areas which contain all observation sites from which an object would be visible. The basic assumption for a viewshed analysis is that the observer's eye height is 1,8m above ground level.
Visibility	The area from which project components would potentially be visible. Visibility depends upon general topography, aspect, tree cover, or other visual obstruction, elevation, and distance.
Visual Envelope	A viewshed analysis establishes a visual envelope to define the extent of a project's visual influence.
Visual Exposure	Visibility and visual intrusion are qualified with a distance rating to indicate the degree of intrusion and visual acuity, which are also influenced by weather and light conditions.

Glossary	
Visual Impact	Visual effects relate to changes in the composition of available views caused by changes to the landscape, people's responses to the changes, and the overall effects concerning visual amenities.
Visual Intrusion	The nature of an object's intrusion on the environment's visual quality results in its compatibility (absorbed into the landscape elements) or discord (contrasts with the landscape elements) with the landscape and surrounding land uses.
Visual absorption capacity	Visual absorption capacity is the landscape's ability to absorb physical changes without transforming its visual character and quality. The landscape's ability to absorb change ranges from low-capacity areas, in which the location of the activity is likely to cause a visual change in the area's character, to high-capacity areas, in which the visual impact of the development will be minimal (Amir & Gidalizon, 1990).
Worst-case Scenario	This principle is applied where the environmental effects may vary, for example, seasonally, to ensure the most severe potential effect is assessed.
Zone of Potential Visual Influence	By determining the zone of potential visual influence, it is possible to identify the extent of potential visibility and views that could be affected by the proposed development. Its maximum extent is the radius around an object beyond which the visual impact of its most visible features will be insignificant, primarily due to distance.

EXECUTIVE SUMMARY

Project Overview and Background

Harmony Gold Mining Company Limited (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to undertake the necessary environmental authorisation and associated consultation processes for the Mponeng Lower Compartment Tailings Storage Facility (Mponeng Lower Compartment TSF). EIMS will compile and submit the required documentation in support of applications for:

- Environmental Authorisation (EA) under the NEMA- Listed activity/ies: GNR983 Listing Notice 1, Activities 10, 12, 19, 21D, 21F, 27, 31, and 46.
- GNR984 Listing Notice 2, Activity 6.
- GNR985 Listing Notice 3, Activities 12, 14, 23, and 26.

Graham Young Landscape Architect was commissioned by Environmental Impact Management Services (Pty) Ltd (EIMS) to conduct a Visual Impact Assessment (VIA) of the proposed Mponeng Lower Compartment TSF (the Project). Golden Core Trade and Invest (Pty) Ltd. - Mponeng Operations is the applicant.

Project site and study area

The Project site is in Gauteng, approximately 8,5 km south of Carletonville, in a predominantly mining area. It is immediately north of the N12, east of the Wedela residential area, and southwest of the Mponeng Gold Mine and Plant. The study area is defined as 5km[1] beyond the centre of the footprint of the TSF, and along the proposed pipeline and alternative pipeline routes

The Aim of the Study

- The study's main aim is to document the baseline and ensure that the visual/aesthetic consequences of the proposed Project are understood. The report, therefore, describes the study area's landscape characteristics, scenic resources, and the visually sensitive areas or receptors. It also identifies high-level impacts and potential mitigation measures. To this end, the report has identified key concerns or issues relating to potential visual impacts arising from the project, which must be addressed in the assessment phase. These are the likely visual impacts on farmsteads near the N12 and south east of the Project site and travellers along the N12 Provincial Road.

Terms of Reference

A specialist study is required to establish the visual baseline and identify potential impacts arising from the Project based on the general requirements of a VIA report. The following terms of reference were established:

- Data collected during a site visit (12 December 2024) allows for a description and characterisation of the receiving environment.
- Describe the landscape character and quality and assess the visual resource of the study area.
- Describe the visual characteristics of the components of the Project.
- Identify and rate the potential impacts of the Project.

[1] The extent of the study area is determined by the zone of potential influence, which in this study relates to a radius of 5,0km around the centre of the TSFs. At 5,0km and beyond, the development would recede into the background of views and be screened by existing mining activities, urban structures and vegetation.

- Proposed mitigation options to reduce the potential impact of the project.

Assumptions, Uncertainties, and Limitations

The following assumptions and limitations have been made in the study:

- The description of project components is derived from information the Environmental Assessment Practitioner (EAP) supplied.
- Site photos taken in early summer do not necessarily reflect the complete landscape character of the area as experienced through all seasons. During the winter months, the impact could increase slightly due to deciduous trees losing their leaves. However, due to the nature of the landscape of the study area, this is not of concern for this report. Also, it is noted that there is no stipulated season for visual assessments, unlike other assessments. The weather was partly cloudy, with slight haze conditions on both site visit occasions.
- At the time of drafting the report, the initial public participation process will be well underway.

Findings

The current visual state of the landscape that could be affected by the proposed project has been described. The scenic quality of the study area has been rated from low to high relative to the subregion. The project footprint is in a landscape type with low scenic quality. Sensitive receptors, viewing areas, and landscape types have been identified and mapped, suggesting a potentially low sensitivity to the project.

Impacts on views are most significant when receptors are identified as sensitive to landscape changes, and their views are focused on and dominated by these changes. The Project continues with an activity currently underway in the subregion, which would cause minimal cumulative change to the baseline's key features and characteristics during the operational phase. The pre-development landscape and views will not be significantly affected by this activity, which is typical for the mining subregion relative to the receiving landscape's attributes. The Project would primarily affect receptors travelling along the N12 south of the project site and farmsteads in the southeastern part of the study area.

The effect (worst-case scenario) on the visual environment during both phases of the project is assessed as LOW significance and would occur in the short term (up to 5 years). A LOW negative impact is when the impact does not directly influence the decision to develop in the area. The effect is reversible in all phases, although it may incur time and cost during the operational phase.

Implementing mitigation measures could reduce the predicted impact, and the effect would still be low in significance. Monitoring and mitigation are advised in both phases to ensure that the potential negative impact stays low.

Cumulative effect of the project

The cumulative effect of the Project is rated LOW.

Visual impact statement

GYLA believes that, in the worst-case scenario, the visual impacts associated with the proposed Mponeng TSF Project are of low significance, given the nature, scale, and duration of the project activities within the receiving environment. The impacts associated with the various phases of the Project can be mitigated to some extent; these measures should be implemented and effectively managed.

The proposed Mponeng TSF project is deemed acceptable from a visual perspective.

*** GYLA ***

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1. INTRODUCTION

1.1 Project Overview and Background

Harmony Gold Mining Company Limited (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to undertake the necessary environmental authorisation and associated consultation processes for the Mponeng Lower Compartment Tailings Storage Facility (Mponeng Lower Compartment TSF). EIMS will compile and submit the required documentation in support of applications for:

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The VIA focuses on the potential impact of the proposed Project's physical aspects (i.e., form, scale, and bulk) and its potential impact within the local landscape and receptor context. It forms part of the Environmental Impact Assessment (EIA). This Baseline report is part of the Visual Impact Assessment report, which is to follow.

1.2 Project site and study area

The Project site is in Gauteng, approximately 8,5 km south of Carletonville, in a predominantly mining area. It is immediately north of the N12, east of the Wedela residential area, and southwest of the Mponeng Gold Mine and Plant. The study area is defined as 5km[2] beyond the centre of the footprint of the TSF, and along the proposed pipeline and alternative pipeline routes as indicated in **Figure 1**.

1.3 Objective of the Specialist Study

The study's primary objective is to document the baseline and ensure that the visual and aesthetic consequences of the proposed Project are understood. The report, therefore, describes the landscape characteristics, scenic resources, and visually sensitive areas or receptors of the study area. The assessment phase will identify and rate potential visual impacts and propose mitigation measures. To this end, the baseline report has identified key concerns or issues relating to potential visual impacts arising from the project, which must be addressed in the assessment phase.

1.4 Terms of Reference

A specialist study is required to establish the visual baseline and identify potential impacts arising from the Project based on the general requirements of a VIA report. The following terms of reference were established:

- Data collected during a site visit (12 December 2024) allows for a description and characterisation of the receiving environment.
- Describe the landscape character and quality and assess the visual resource of the study area.

[2] The extent of the study area is determined by the zone of potential influence, which in this study relates to a radius of 5,0km around the centre of the TSFs. At 5,0km and beyond, the development would recede into the background of views and be screened by existing mining activities, urban structures and vegetation.

- Describe the visual characteristics of the components of the Project.
- Identify and rate (high-level) the potential impacts of the Project.
- Rate the potential cumulative effect of the Project.
- Propose mitigation measures to reduce the potential impact of the Project.

1.5 Assumptions, Uncertainties, and Limitations

The following assumptions and limitations have been made in the study:

- The description of project components is derived from information the Environmental Assessment Practitioner (EAP) supplied.
- Site photos taken in early summer do not necessarily reflect the complete landscape character of the area as experienced through all seasons. During winter months, the impact could increase slightly due to deciduous trees losing their leaves. However, due to the nature of the landscape of the study area, this is not of concern for this report. Also, it is noted that there is no stipulated season for visual assessments, unlike other assessments. The weather was partly cloudy, with slight haze conditions on both site visit occasions.

At the time of drafting the report, the initial public participation process will be well underway.

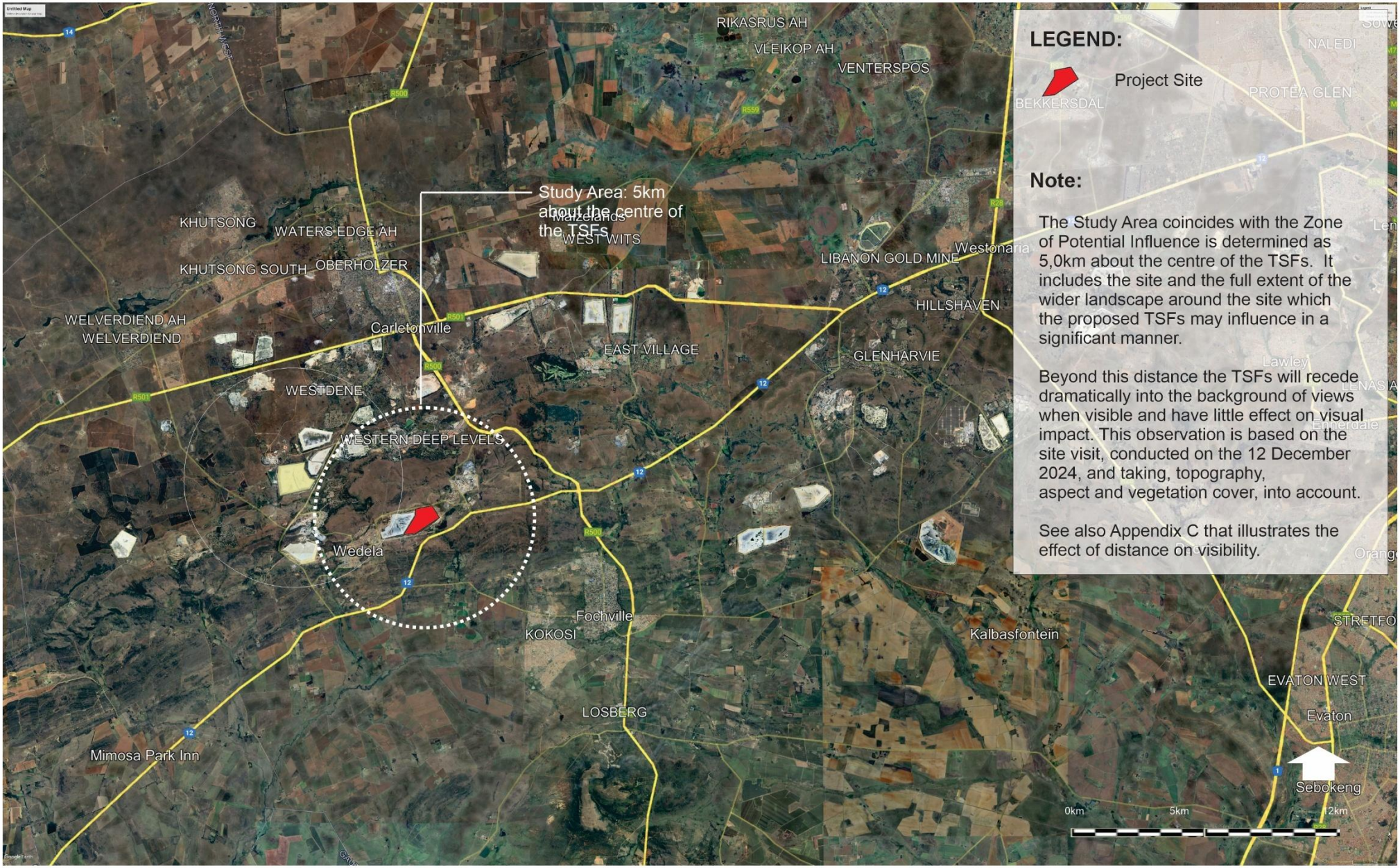


Figure 01: LOCALITY - Mopeng TSF

2. LEGAL REQUIREMENTS AND GUIDELINES

This report adheres to the following legal requirements and guideline documents.

2.1 National Legislation and Guidelines

National Environmental Management Act (Act 107 of 1998), EIA Regulations 2014 – as amended

The specialist report is in accordance with the specification on conducting specialist studies as per Government Gazette (GN) R 982 of the National Environmental Management Act (NEMA) Act 107 of 1998. The mitigation measures, as stipulated in the specialist report, can be used as part of the Environmental Management Programme (EMPr) and will be in support of the Environmental Impact Assessment (EIA) and Appendix 6 of the EIA Regulations 2014, as amended on 7 April 2017.

Western Cape Department of Environmental Affairs & Development Planning: Guideline for Involving Visual and Aesthetic Specialists in EIA Processes Edition 1 (CSIR, 2005)

Although the guidelines were specifically compiled for the Province of the Western Cape, they provide appropriate guidance for any EIA process. The Guideline document also seeks to clarify instances when a visual specialist should be involved in the EIA process.[3]

The National Heritage Resources Act (Act 25 of 1999) refers, under Part 1 General Principles, to the National Estate:

> 3.(2)(d) Landscapes and natural features of cultural significance

The Advertising on Roads and Ribbons Act (Act No. 21 of 1940) controls visual pollution to a limited extent, which deals mainly with signage on public roads.

The Protected Areas Act (NEMA) (Act 57 of 2003, Section 17) is also intended to protect natural landscapes.

[3] The Western Cape Guidelines are the only official guidelines for visual impact assessment reports in South Africa and can be regarded as best practice throughout the country.

3. APPROACH AND METHODOLOGY

3.1 Approach

The assessment of likely effects on a landscape resource and visual amenity is complex since it is determined through quantitative and qualitative evaluations. When assessing visual impact, the worst-case scenario is considered. Landscape and visual assessments are separate, although linked, procedures. The landscape, its analysis, and the assessment of impacts on the landscape all contribute to the visual impact assessment studies baseline. The potential impact on the landscape is assessed as an impact on an environmental resource, i.e. the physical landscape. On the other hand, visual impacts are assessed as one of the interrelated effects on people (i.e. the viewers and the result of an introduced object into a view or scene).

For a detailed description of the methodology to determine the value of a visual resource, refer to **Appendix A**. Appendices B and C list the criteria for determining the intensity and significance of visual impact. **Plate 1** below graphically illustrates the visual impact process used in this Project.

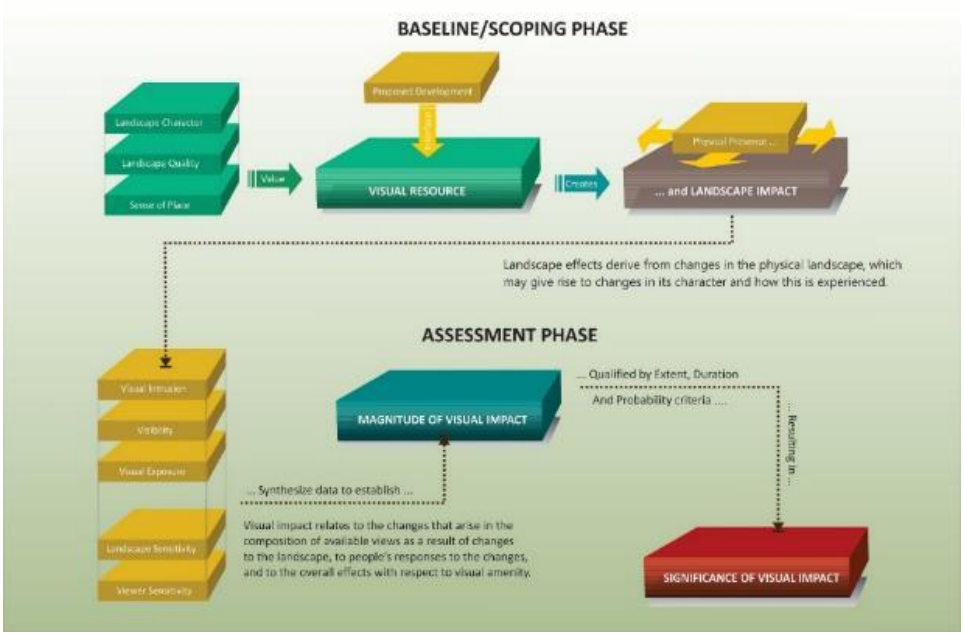


Plate 1: Visual Impact Process

3.2 Methodology

The following method was used:

- Site visit: A field survey was undertaken when the study area was visited to the extent that the receiving environment could be documented and adequately described. The climate conditions were mostly sunny, with some cloud cover. Refer to **Figure 3** for the route travelled during the site visit.
- Project components: The physical characteristics of the TSF and associated infrastructure were described and illustrated based on information supplied by the EAP.
- General landscape characterisation: The visual resource (i.e., the receiving environment) was mapped using the field survey, Google Earth imagery, and Mucina and Rutherford's (2006) reference book, The Vegetation of South Africa, Lesotho, and Swaziland. The landscape description focused on the nature of the land rather than the viewer's response.

- The landscape's character was described and rated in terms of its aesthetic appeal using recognised contemporary research in perceptual psychology as the basis and its sensitivity as a landscape receptor.
- The study area's sense of place was unique and distinctive. The primary informants of these qualities were the spatial form and character of the natural landscape, as well as the cultural transformations associated with the historical/current use of the land.
- The potential impact on the visual environment of the proposed Project was identified.
- Measures to mitigate the negative impacts of the proposed project were recommended.

4. DESCRIPTION OF THE PROJECT

The applicant owns and operates several gold mines and Plants in the West Wits region of the Gauteng Province. The Savuka Plant currently deposits tailings onto the Savuka 5a, 5b, 7a & 7b Tailings Storage Facilities (TSFs), approximately 5,2 km west of the Project site. However, these facilities are approaching their final and approved height, and the current planned Life of Mine (LOM) for the West Wits region exceeds the available deposition capacity of these TSFs. Accordingly, the applicant is undertaking a feasibility assessment to recommence deposition on the Mponeng Lower Compartment TSF.

The applicant proposes to recommence the deposition on the Mponeng Lower Compartment TSF, current height is 20m at its highest point (i.e. the south east corner of the facility). Mponeng Lower Compartment TSF is an existing TSF; however, it is no longer in operation and is currently used as a Holding Dam, and a portion of it is used as an authorised Landfill Facility. To redeposit on the Mponeng Lower Compartment TSF from the Savuka Plant, slurry pipelines will need to be constructed from the Savuka Plant to the TSF. The final height is proposed to be 60m, i.e. a 40m increase over the existing facility. The proposed slurry and return water pipes extend from the south of the Savuka Plant at the starting point, running southwards in parallel until they reach the northern extent of the Mponeng Lower Compartment TSF, where they split. Thereafter, the slurry pipeline extends west before connecting to Mponeng Lower Compartment TSF, while the return water pipeline extends east, then south around the TSF to the return water dam. There is an alternative slurry and return water pipeline route that extends east through Western Deep Levels, then south along the Mponeng Gold Mine, before heading west, where it connects to the Mponeng Lower Compartment TSF. Summary of the proposed activities are as follows:

Activity	Description / Auxiliary Activity
Recommencement of deposition on Mponeng Lower Compartment TSF	The Mponeng Lower Compartment TSF will be approximately 110ha wide and store approximately 43 megatonne (Mt). It is anticipated to accommodate tailings deposition for a period of 10 years at a rate of 350 kilotonnes per month (ktpm). The end of life limiting factors considered were a rate of rise below 4 meters per annum and a final facility height of 60 meters, ensuring safe and sustainable deposition over the operational life of the facility. An unlined facility is preferred by Harmony. Only if the licence application for an unlined facility is unsuccessful will the lined option be pursued. An inverted barrier system with equivalent performance to a Class C barrier can be motivated for implementation if the facility needs to be lined.
Construction of slurry and return water pipelines	In order to redeposit on the Mponeng Lower Compartment TSF from the Savuka Plant, slurry pipelines will need to be constructed from the Savuka Plant to the TSF. The proposed residue pipeline route is approximately 3.36km long while the proposed return water pipeline route is approximately 4.85km long. The pipelines will have a NB diameter of more than 360mm with a peak throughput of more than 120 ℓ/s. The pipelines will be flanged steel pipelines and installed above-ground on pre-cast concrete plinths.
Construction of pipeline bridge	In order for the pipes to connect Savuka Plant and the Mponeng Lower Compartment TSF, a new pipe bridge

Activity	Description / Auxiliary Activity
	approximately 100m long and 5m wide will be required to cross the channelled valley bottom wetland.
Construction of pipeline culvert	In order for the pipes to connect Savuka Plant and the Mponeng Lower Compartment TSF, a new pipeline culvert approximately 12m long and 10m wide will be required to cross the surfaced road immediately north of the Mponeng Lower Compartment TSF.
Upgrade of Return Water Dam (RWD)	The current RWD does not have sufficient capacity to accommodate both current and future operational demands. Therefore, the existing dam will need to be enlarged to provide adequate capacity to contain the 1:50-year, 24-hour storm event above the mean operating level The proposed Mponeng Lower Compartment TSF RWD will be of the earth fill embankment type, with an upstream and downstream slope of 1:3 (V:H). The RWD will have a footprint is approximately 8.20ha with a capacity of 327,000m^3. This capacity is sufficient to contain all dirty water inflows without the dam spilling more than once in 50 years. A Class C performance barrier system has been opted for the RWD.
Installation of Clean Water Diversion System - Spring Diversion	The spring water currently daylighting in the northern portion of the proposed footprint will also require diversion around the TSF. A dedicated spring capturing and diversion system will be required prior to the installation of sub-surface drains. This system must be implemented on the upstream side of the currently active spring located along the northern boundary of the proposed lower compartment footprint. The purpose of this spring capturing system is to intercept and manage any clean groundwater emerging from the surrounding higher-elevation areas before it enters the TSF footprint.
Installation of Dirty Water Systems	Regulations on Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources Government Notice 704 (GN704) requires that all dirty water collection and conveyance systems associated with mining-related activities be designed to prevent seepage of polluted water and promote the reuse of water. To achieve both regulatory compliance and cost efficiency, trapezoidal concrete-lined channels are planned to be installed within the existing, unlined paddocks. These channels will serve to collect and convey dirty water in a controlled manner, minimising seepage and preventing contamination of the surrounding environment. The channels will discharge into concrete silt traps before entering the RWD.
Installation of sub-surface drainage system	In addition to the inverted barrier, a sub-surface drainage network below the liner would need to be installed to prevent accumulation of pore water pressure beneath the liner. The sub-surface drainage network for the TSF has been designed as an integrated system aimed at effectively intercepting and conveying seepage. The system comprises a series of 110mm and 160mm perforated HDPE sub-soil drainage pipes installed within a graded gravel drainage layer, all enclosed in a geotextile separation fabric to prevent the migration of the tailings fines. The sub-surface

Activity	Description / Auxiliary Activity
	drains connect to a network of secondary and main branches.
Undertaking of ground improvement	In addition to the presence of a spring within the footprint and the proposed groundwater-intercepting sub-surface drainage network designed to manage seepage and maintain slope stability, there is also a landfill site located on the northern portion of the facility that poses a significant geotechnical and environmental risk. The landfill site contains heterogeneous and potentially compressible waste materials, which introduces the possibility of uneven settlement over time, especially under the loading conditions imposed by the overlying tailings. To mitigate this risk, long-term ground improvement measures are necessary. Ground improvement, such as dynamic compaction, is recommended to densify the underlying landfill material, reduce voids, and improve uniformity in stiffness and bearing capacity across the area. To further support the foundation and distribute applied loads evenly, a load-distribution platform should be constructed.

Refer to **Figure 2** for the layout of these facilities.

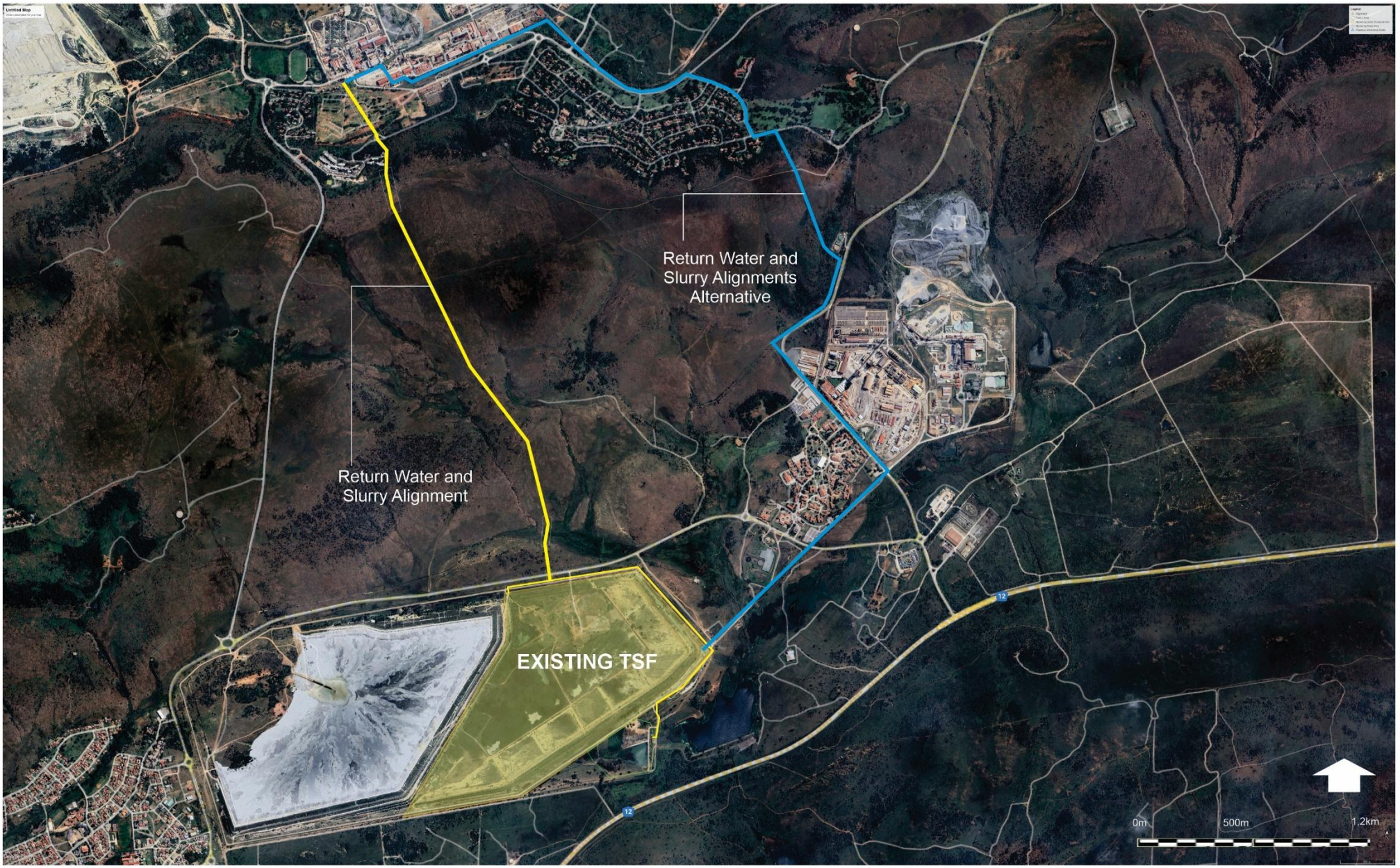


Figure 02: LAYOUT - Mponeng TSF

5. ENVIRONMENTAL SETTING

5.1 Landscape Character

The study area features a varied aesthetic and visual landscape, with mining activities predominating the western and northern sections of the study area and savannah-covered grassland and agriculture in the southern regions. The northwestern and western sections consist of gently undulating land that slopes westward and southward towards drainage lines that generally flow west and northwest. The topography rises in the central parts of the study area immediately north of the Project site, which is mostly undeveloped and composed of gentle rolling grassland. Residential areas, linked to the mines, are situated immediately west (Wedela), northwest (Harmony housing), and north of the Project site (Western Deep Levels housing). South of Wedela and the Project site is grassland with savannah-covered slopes. These areas are primarily used for grazing. The far southern sections of the study area comprise agricultural lands.

The panoramas in **Figures 4-1** to **4-2** (refer to **Figure 3** for the location of the viewing points) show these characteristics. **Figure 5** below indicates the spatial distribution of the landscape character types and their associated scenic quality and sensitivities as they occur today.

The study area can roughly be divided into the following landscape types:

- *Savannah-covered slopes* – high scenic quality – high visual sensitivity to change.
- *Open grassland on higher land* – moderate scenic quality – moderate visual sensitivity to change.
- *Agricultural lands* – moderate scenic quality – moderate visual sensitivity to change.
- *Urbanisation and settlements* – moderate to low scenic quality – moderate to low visual sensitivity to change
- *Mining and degraded land* - low scenic quality – low visual sensitivity to change (the project occurs in this landscape type).

The visual resource value of these landscape types is rated in **Table 1** in **Section 6** below.

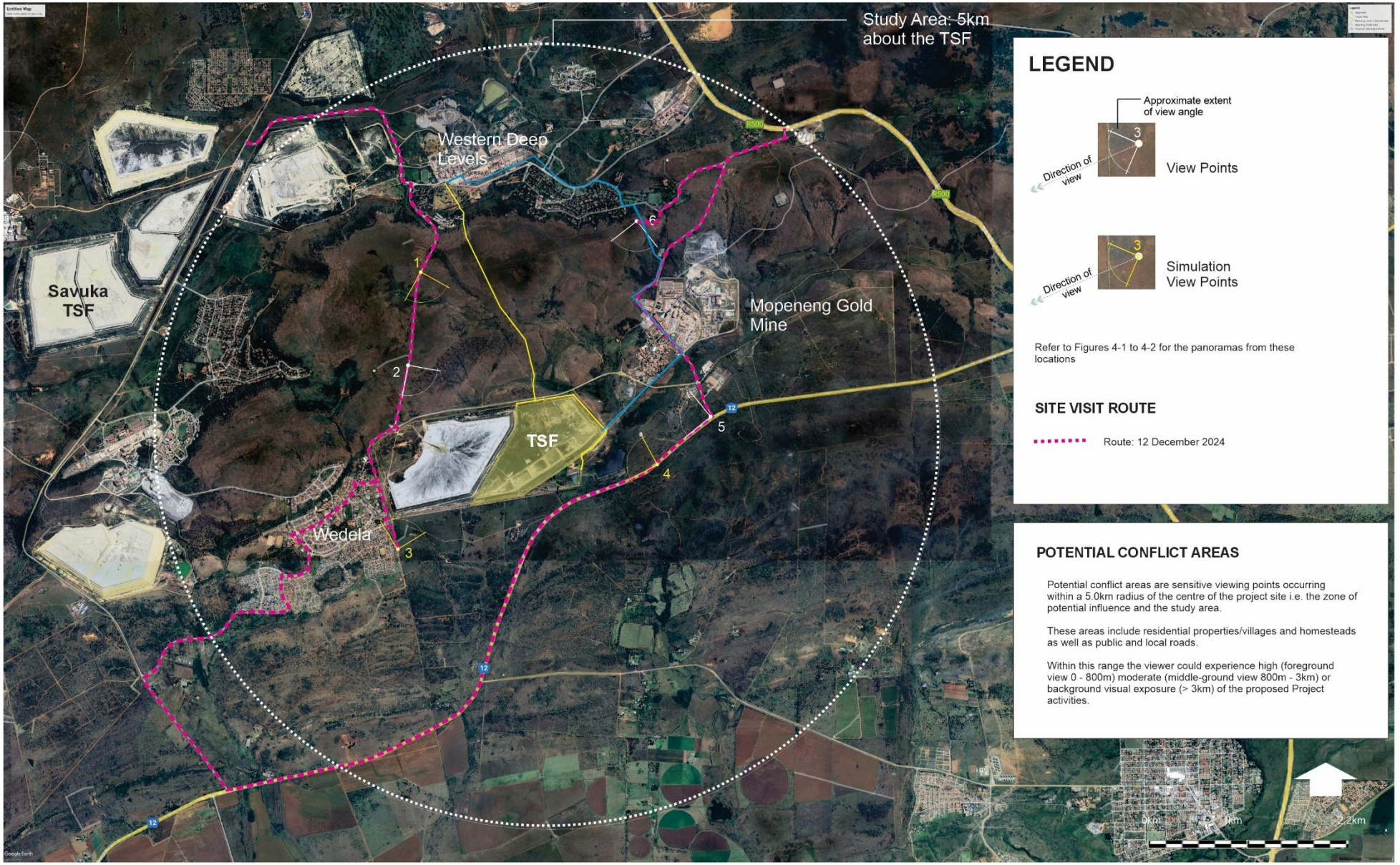
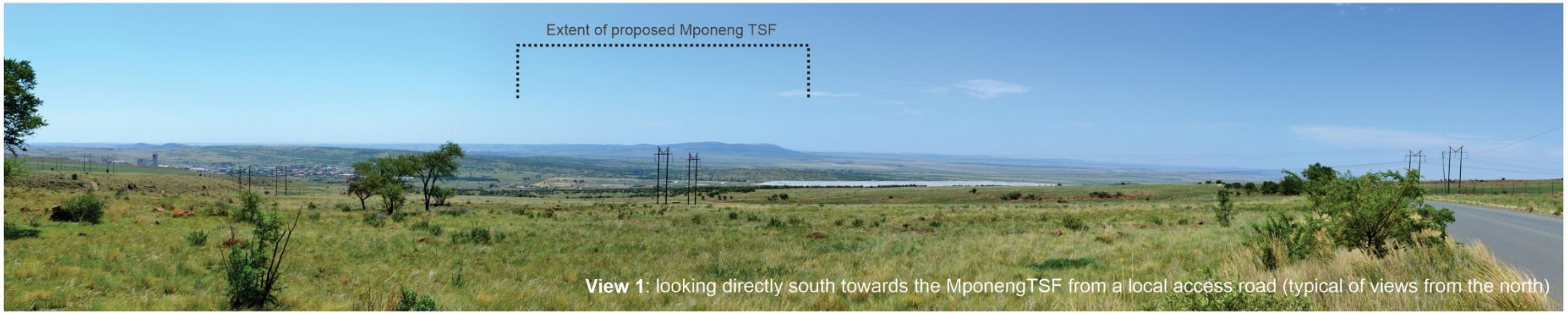
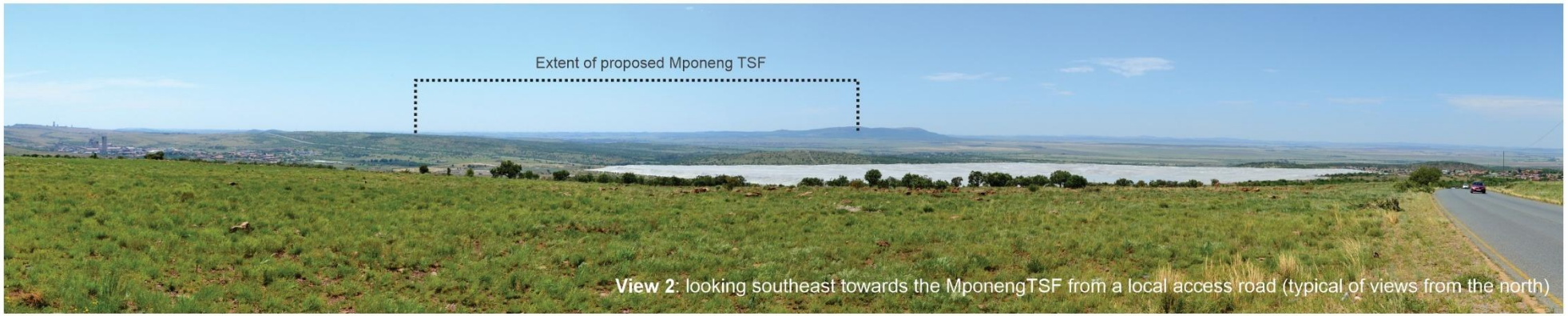


Figure 03: VIEW SITES - Mponeng TSF

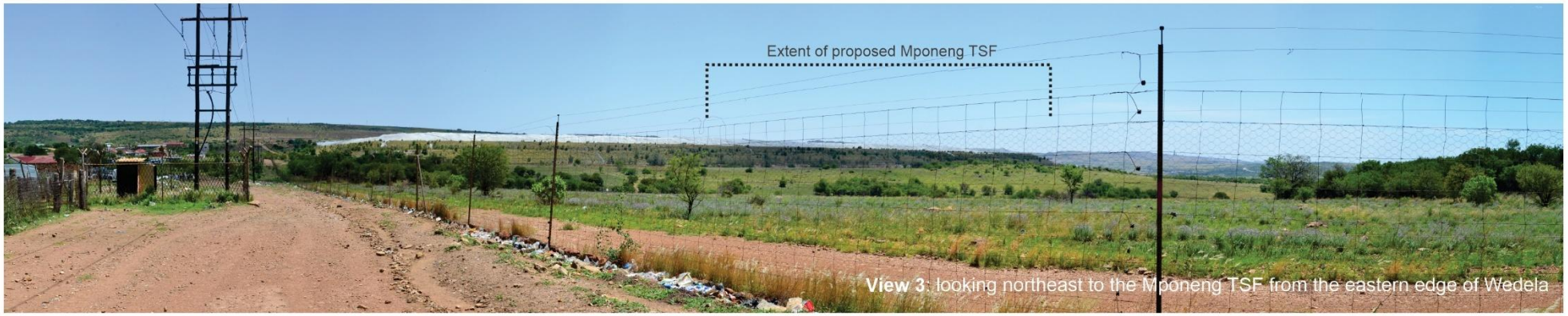
Refer to Figures 4-1 to 4-2 for panoramas taken from the viewing points



View 1: looking directly south towards the MponengTSF from a local access road (typical of views from the north)



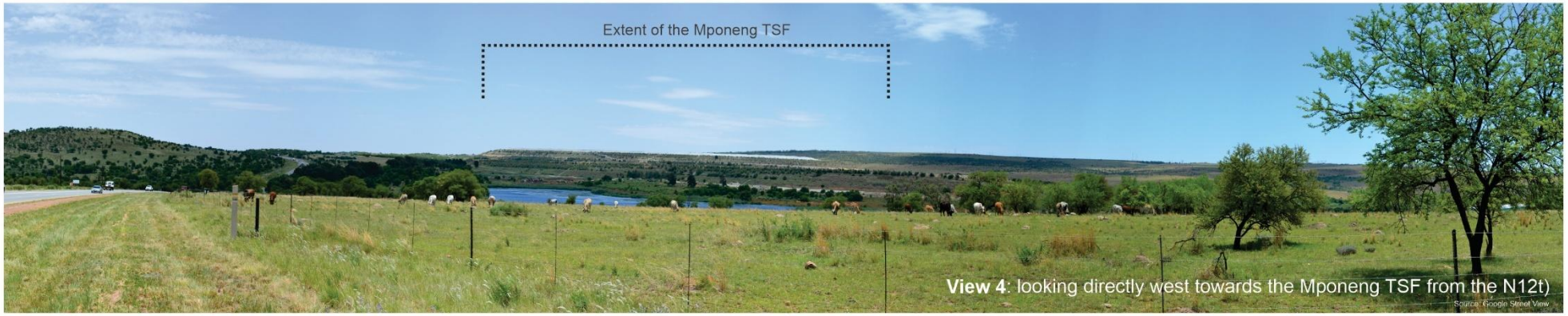
View 2: looking southeast towards the MponengTSF from a local access road (typical of views from the north)



View 3: looking northeast to the Mponeng TSF from the eastern edge of Wedela

Figure 04-1: LANDSCAPE CHARACTER - Views 1, 2 and 3

Refer to Figure 3 for location of viewing points and Figure 2 for Project Layout:



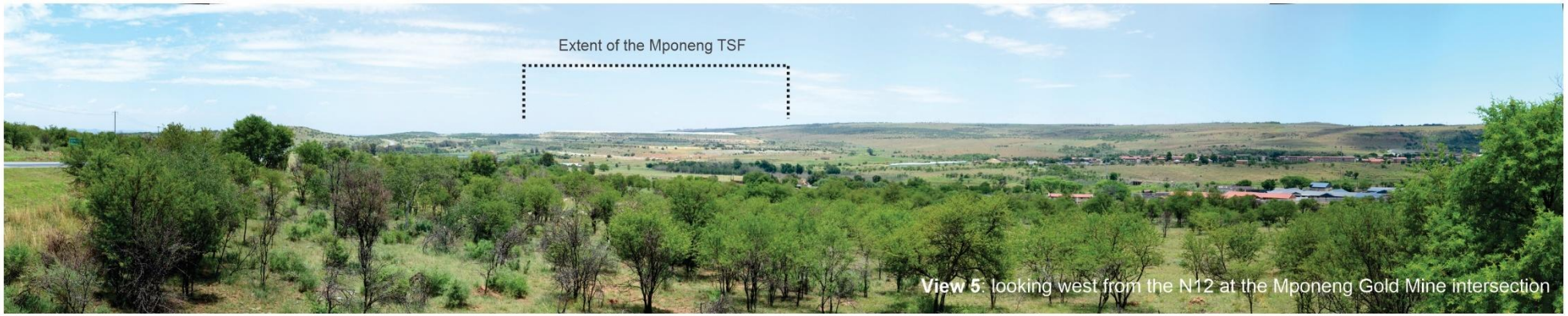


Figure 04-2: LANDSCAPE CHARACTER - Views 4, 5 and 6

Refer to Figure 3 for location of viewing points and Figure 2 for Project Layout:

6. VISUAL RESOURCE, LANDSCAPE SENSITIVITY AND SENSE OF PLACE

6.1 Visual Resource Value, Scenic Quality, and Landscape Sensitivity

The value of the visual resource and its associated scenic quality (using the scenic quality rating criteria described in **Appendix A**) assigned to the landscape character types described in **Section 5** is determined through the value of "individual contributors to landscape character, especially key characteristics, which may include individual elements of the landscape, particular landscape features, notable aesthetic, perceptual or experiential qualities, and combinations of these contributors" (LIEMA, 2013, p. 89). These primary features give the area typical characteristics and a sense of place. The sensitivity of the study area's various landscape types is defined as high, moderate or low (as indicated below and in **Figure 5**) and is dependent on the following four factors:

- Character (does it contribute to the area's sense of place and distinctiveness?)
- Quality – in what condition is the existing landscape?
- Value – is the landscape valued by people, the local community, and visitors, and is the landscape recognised locally, regionally, or nationally?
- Capacity – what scope is there for change (either negative or positive) in the existing landscape character? (LIEMA 2013).

When the criteria listed in **Appendix A** are considered and understood within the context of the subregion, the landscape types are assigned a visual resource value, as indicated in **Table 1** below.

Table 1: Value of the Visual Resource

High Savannah covered slopes	**Moderate** Open grassland and agricultural lands And Moderate to Low for areas of urbanisation.	**Low** Mines and associated infrastructure and degraded land
This landscape type is considered to have a *high* value because it is a: A distinct landscape that exhibits a positive character with valued features that combine to give the experience of unity, richness, and harmony. It is a landscape that may be important to conserve and has an intense sense of place. Sensitivity: It is extremely sensitive to change in general. It will be detrimentally affected because the key characteristics of the landscape, considering its existing character and quality, have limited ability to accommodate change without adverse effects.	These landscape types are considered to have a *moderate/low to moderate* scenic value because they are: Common landscape that exhibits some positive character, but which has evidence of alteration/degradation/erosion of features, resulting in areas of more mixed character. Sensitivity: It is moderately sensitive to change in general, and change may be detrimental because the key characteristics of the landscape have some ability to accommodate change, considering the existing character and quality of the landscape.	This landscape type is deemed to have a *low* scenic value because it is a: Minimal landscape negative in character with few, if any, valued features. Sensitivity: It is generally less susceptible to change because the relevant characteristics of the landscape can accommodate change without adverse effects, considering its existing character and quality.

6.2 Sense of Place

According to Lynch (1992), a sense of place is the extent to which a person can recognise or recall a place as distinct from other locations, as having a vivid, unique, or at least particular, character of its own. The sense of place for the study area derives from a combination of the local landscape character types described above, their relative 'intactness,' and their impact on the senses.

The activities and land uses indicated in **Figure 5** are common within the sub-region. The dominance of mining infrastructure defines the general sense of place in the northern half of the study area. The natural and agricultural areas create a sense of natural harmony in the southern regions. The proposed recommencement of deposition, which will increase the height extension of the Mponeng Lower Compartment TSFs, would not appear out of place in this mixed aesthetic environment. The proposed activities would seem to 'fit' (be visually contextual) into the scene, especially as they would be incorporated into the existing infrastructure that dominates much of the study area. The Project would, therefore, not appear at odds with the visual characteristics of the baseline landscape.

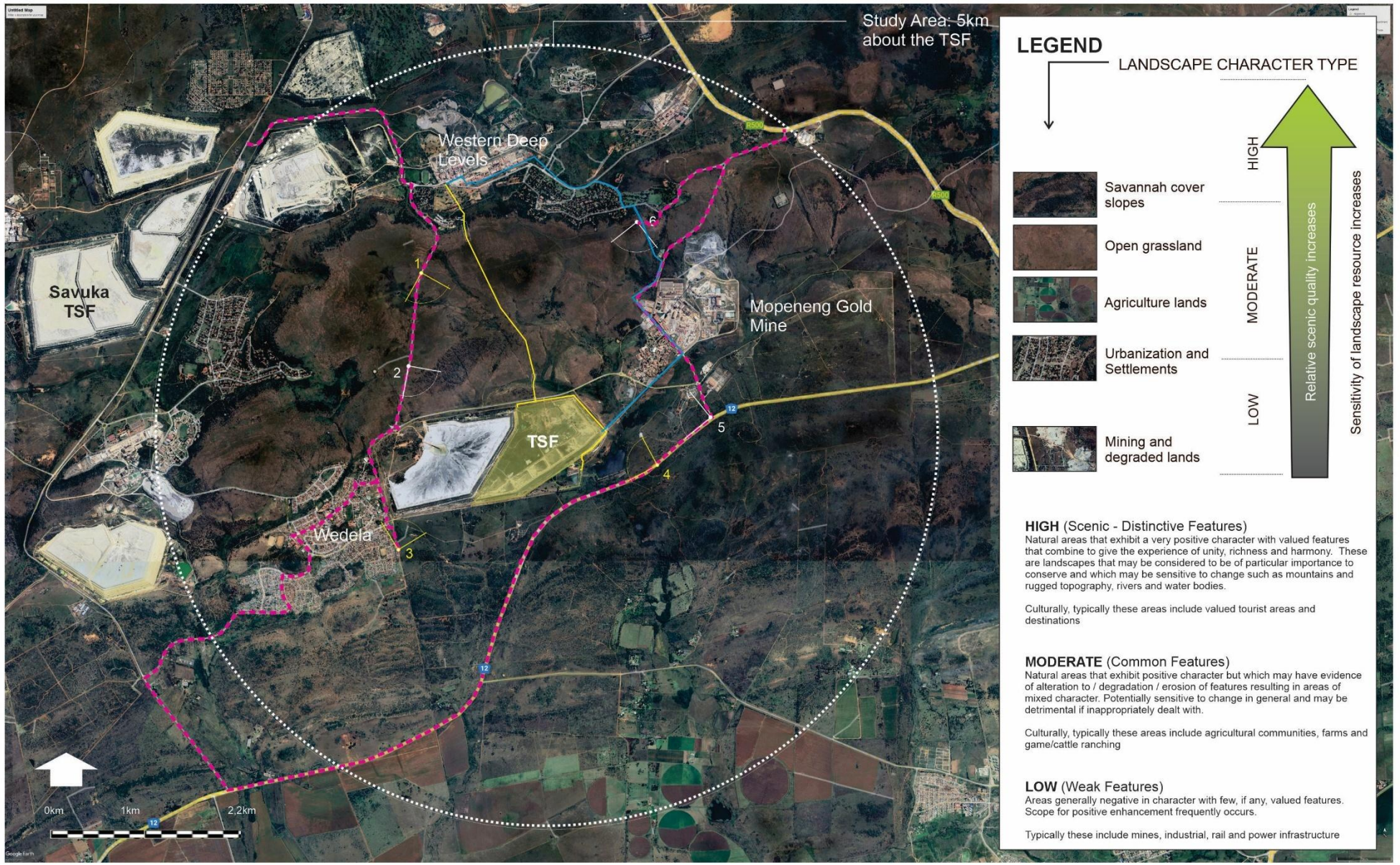


Figure 05: LANDSCAPE SENSITIVITIES - Mponeng TSF

Refer to Figures 4-1 to 4-2 for panoramas taken from the viewing points

7. LANDSCAPE IMPACT

The development of the Mponeng Lower Compartment TSFs is planned on an existing TSF, with some new support infrastructure being proposed, which includes:

- slurry pipelines originating from the Savuka Plant.
- Pipeline bridge and culvert
- Upgrade of the return water dam
- A clean water system and a spring diversion'
- A dirty water system
- Sub-surface drainage system
- Ground improvement and slope stability maintenance.

These activities will cause minimal visual changes, given the context of the current landscape, resulting in negligible loss of the elements, features, and visual aspects that contribute to the landscape's character. However, the activity might produce dust, primarily during the winter months.

The *landscape impact* (i.e., the change to the fabric and character of the landscape caused by the project's physical presence) is rated ***minor.***

8. MAGNITUDE OF VISUAL IMPACT

In addition to the minor landscape impacts described in **Section 7**, it is anticipated that visual impacts will result from the Mponeng TSF and associated infrastructure in all Project phases, i.e. operational and closure. Activities associated with the Project would be visible to varying degrees and from varying distances around the project site (refer to **Figure 7** below). During the operation phase, the TSF's visibility will result from the rising dam walls, ultimately reaching a height approximately 60m above natural ground level. Typical visual issues associated with TSF projects are:

- Who will be able to see the new development?
- What will it look like, and will it contrast with the receiving environment?
- Will the development affect sensitive views in the area, and if so, how?
- What will the development impact be during the day and at night?
- What will the cumulative impact be, if any?

8.1 Public Concerns

In addition to these general issues, the I&APs did not raise visual impact issues as a concern, most likely due to the facility being within the vicinity of existing mining operations.

8.2 Sensitive Viewers and Locations

Figure 6 identifies receptor locations where people would most likely be susceptible to adverse changes in the landscape caused by the physical presence of the Project. The prominent locations of concern might be:

- Farmsteads near the N12 and south east of the Project site
- Travellers along the N12 Provincial Road.

All other areas are deemed not sensitive to the proposed development because views from these locations would come from areas related to existing mining activities.

People living in or passing through these locations will experience only a minor change and negligible loss of the baseline landscape aesthetic due to the scale and extent of the proposed Mponeng Lower Compartment TSFs' height extension. The high visual absorption capacity (VAC) of the existing landscape, when viewed from these locations, combined with the fact that deposition will occur on an existing footprint, means that potentially sensitive receptors would see the new facilities within the context of the current mining infrastructure with very little change. This change would take place over the life of the mine and beyond, as the TSF would remain as residual structures in the landscape and represent the worst-case scenario for the project.

8.3 Visibility

As outlined above, visual sensitivities could stem from receptors located in the study area that observe changes to the aesthetic baseline. The rising walls of the Mponeng Lower Compartment TSF would largely blend into the visual landscape from these points, making the proposed Project moderately visible from parts of the N12 road and only minimally visible from the southeastern and southern edges of the study area, where a few farmsteads are situated. Refer to the viewshed analysis in **Figure 7**. The Mponeng extension would also be visible from the grassland plateau north of the site; however, there are no sensitive receptors in this area.

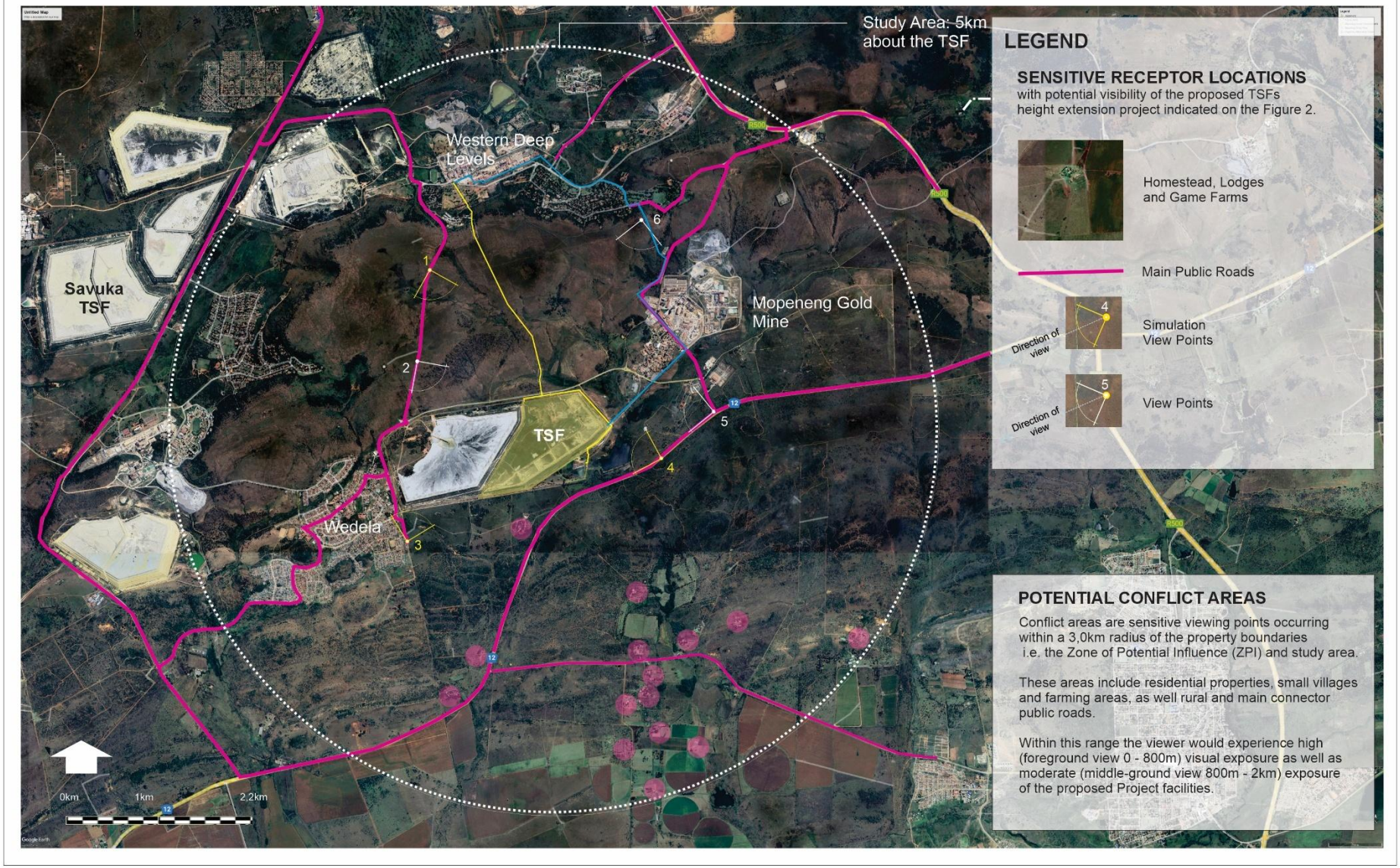


Figure 06: RECEPTOR SENSITIVITIES- Mponeng TSF

Refer to Figures 4-1 to 4-2 for panoramas taken from the viewing points

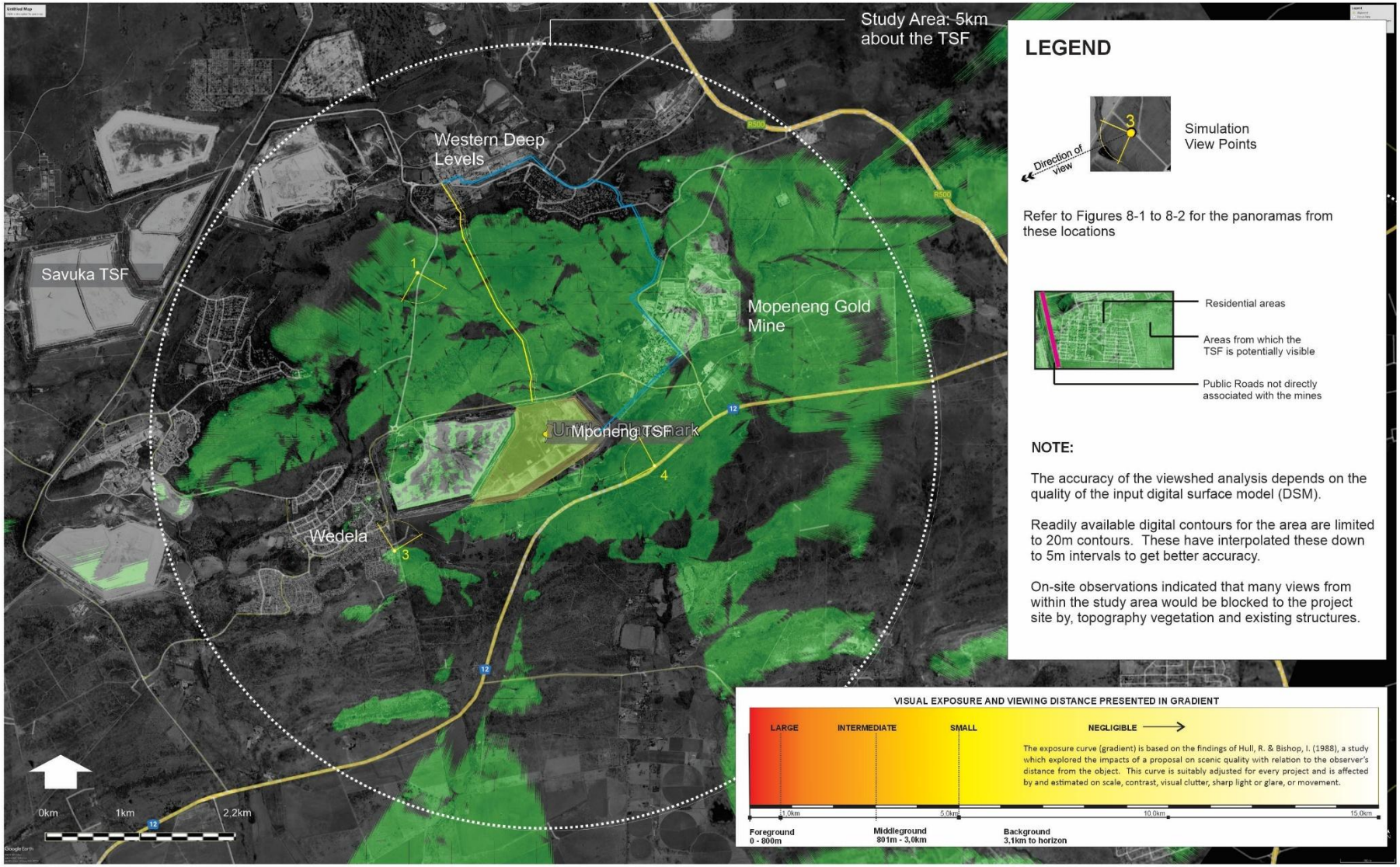


Figure 07: VIEWSHED ANALYSIS - Mponeng TSF

8.4 Visual Exposure and Intrusion

Visual exposure is assessed by determining an object's visibility, using a distance rating to indicate the level of intrusion and visual clarity. As the distance between the observer and the object increases, visual perception diminishes exponentially, and changes in form, line, colour, and texture in the landscape become less noticeable. Image 1 in Appendix B demonstrates this point. Therefore, visual exposure ranges from moderate (for travellers along the N12) to low (at farmsteads south of the Project site).

Visual intrusion concerns how well a Project activity fits with, or disrupts, the ecological and cultural aesthetic of the landscape as a whole, a concept known as contextualism. When visible, the TSF would appear in the middle ground (800m to 3,0km from the viewer) in views from the N12 (see the simulation in Figure 8-2) and primarily in the background (beyond 3,0km) of sensitive viewing areas south of the site. Additionally, the extension activities would always occur within a scene that includes existing mining infrastructure, thereby significantly reducing the potential for visual intrusion. The simulation in **Figure 8-1**, a view from Wedela township, illustrates this point.

8.5 Effects of Night-lighting

The impact of nighttime lighting is a sensitive issue associated with mining and disposal activities. I&APs consistently raise the issue of night lighting, particularly when it can be seen from tourist and/or residential sites and when its impact would persist for the mine’s life. However, existing light pollution generated by nearby mining and urban areas would negate any real effect they may have. However, the management measures proposed below should be implemented to limit light spillage beyond the TSF’s site boundaries and minimise cumulative light pollution.

Figure 8-1: SIMULATION VIEW 3 - Mponeng TSF

Figure 8-2: SIMULATION VIEW 4 - Mponeng TSF

8.6 Magnitude of Visual Impact

Visual impacts relate to changes in the composition of available views resulting from landscape alterations (as described in **Section 7**), to people's responses to those changes, and to the overall effects on visual amenity. Visual impact is therefore measured by the change to the existing visual environment (caused by the physical presence of a new development) and the extent to which that change either undermines (negative impact), enhances (positive impact), or maintains the visual quality of the area.

To assess the Project's potential visual impact, four main factors are considered.

Visual Intrusion: The nature of intrusion or contrast (physical characteristics) of a Project component on the visual quality of the surrounding environment and its compatibility/discord with the landscape and surrounding land use.

Visibility: The area/points from which Project components will be visible.

Visual exposure: Visibility and visual intrusion are rated by distance to indicate the degree of intrusion.

Sensitivity: Sensitivity of visual receptors to the proposed development

The potential impact ratings are based on the worst-case scenario across all aspects of the Project. Visual impacts are expected from activities and infrastructure across all Project phases, including operation and decommissioning. It is also noted that the Screening Report results for the Project did not identify visual and landscape impacts as sensitive, nor did it include a visual and landscape assessment in the assessment report. The I&APs also did not raise visual concerns for the project.

The method used to assess the potential effects is detailed in **Appendix C**. This assessment approach enables evaluation of environmental impacts, including cumulative effects. Based on the previous sections, the magnitude of visual impacts is rated.

Table 2 summarises the potential visual impact for all phases of the project. The full scope of these impacts (significance) is rated in Section 10 below.

Table 2: *Magnitude* of Visual Impact [4]

High	**Moderate**	**Low**	**Negligible**
None	None	For receptors travelling along the N12.	For receptors, southeast of the site at more than 3,0km from the closest edge of the TSF (i.e. background of a view)
Major loss of or alteration to the baseline's key elements/features/characteristics near the site. i.e., a pre-development landscape or view and/or introduction of elements	Partial loss of or alteration to the baseline's key elements/features/characteristics. i.e., a pre-development landscape or view and/or introduction of elements that	Minor loss of or alteration to the baseline's key elements/features/characteristics. i.e., a pre-development landscape or view and/or the introduction of elements that	Negligible loss or alteration to the baseline's key elements/features/characteristics. i.e., a pre-development landscape or view and/or the introduction of elements that

[4] Refer also to **Appendix C** – EIMS Impact Assessment Methodology

considered uncharacteristic when set within the attributes of the receiving landscape. High visual impacts would result.	may be prominent but not necessarily problematic when set within the attributes of the receiving landscape. Moderate visual impacts would result.	may not be problematic when set within the attributes of the receiving landscape. **Low visual impacts would result.**	are not problematic within the surrounding landscape - approximating the 'no change' situation. **Negligible scenic quality impacts would result.**

9. MITIGATION OPTIONS

When considering mitigation measures, three criteria are examined: feasibility (economically), effectiveness (including implementation time and provisions for management/maintenance), and acceptability (within the existing landscape and land-use policies for the area). To address these, the following principles have been established:

- Mitigation measures should be designed to suit the locality's existing landscape character and needs. They should respect and build on the landscape's distinctiveness.
- It should be recognised that many mitigation measures, especially the establishment of planted screens and rehabilitation, are not immediately effective.

9.1 Planning and Site Development

- Apply dust suppression methods to limit the dust generated during the establishment phase.
- Ensure the post-closure rehabilitation plan is geared toward acceptable topographic and ecological conditions.

9.2 Landscaping and Ecological Approach

- Where new vegetation is proposed to be introduced to the site (on the rising side slopes), an ecological approach to rehabilitation should be adopted. For example, communities of indigenous plants (primarily grasses) will enhance biodiversity, a desirable outcome for the area. This approach can significantly reduce long-term costs by requiring less maintenance than conventional landscaping methods and by making the landscape more sustainable.

9.3 Good housekeeping

- “Housekeeping” procedures should be developed for the project to ensure that the Project site and adjacent lands are kept clean of debris and that dust generation is limited.

9.4 Lighting

Light pollution is primarily the result of poor lighting design, which allows artificial light to shine outward and upward into the sky, where it is unwanted, rather than focusing it downward, where it is needed. Poorly designed lighting washes out the night sky's darkness and significantly alters light levels in rural areas, where light sources shine as ‘beacons’ against the dark sky and are generally not wanted. Simple changes in lighting design and installation yield immediate changes in the amount of light spilt into the atmosphere. The following are measures to minimise light pollution beyond the perimeter of the Project sites that must be considered in the lighting design of the Project:

- Should light fixtures be installed, ensure precisely directed illumination to reduce light “spillage” beyond the site's immediate surroundings.
- Avoid high pole-top security lighting along the periphery of the site and use only lights that are activated upon illegal entry.
- Minimise the number of light fixtures to the bare minimum, including security lighting.

10. SIGNIFICANCE OF VISUAL IMPACT

The current visual condition of the landscape, possibly impacted by the proposed Project, has been described. The scenic quality of the study area has been rated from low to high within the sub-region (**Figure 5**). The proposed Project is situated in a landscape type that is rated as low. Sensitive viewing areas and landscape types have been identified and mapped, showing a low sensitivity to the Project (**Figure 6**). The outcomes of the public participation process confirm this (EIMS 2025).

The requirements of the NEMA EIA Regulations will guide the impact assessment methodology. The broad approach to the significance rating methodology is to determine the significance of the environmental impact by considering the consequence of each effect and relating this to the probability or likelihood of the impact occurring. Consequence ("C") is determined through the consideration of the Duration ("D"), Extent ("E"), Magnitude ("M"), Reversibility ("R"), and the nature of the impact ("N") applicable to the specific impact.

$$\boldsymbol{C} = \frac{(\boldsymbol{E} + \boldsymbol{D} + \boldsymbol{M} + \boldsymbol{R}) * \boldsymbol{N}}{\mathbf{4}}$$

Once C has been determined, the impact significance ("IC") is determined by multiplying C and Probability ("P"). The result is a qualitative representation of the relative IC associated with the impact. The proposed activities have the potential to negatively affect the visual environment, particularly in the worst-case unmitigated scenario, which is rated below in **Tables 3** and **4** for each of the project phases.

Impacts on views are greatest when viewers are sensitive to landscape changes and focus on those changes. The visual impact of the Project will cause minor landscape alterations that are noticeable to viewers from the N12 and farmsteads south and southeast of the site. These visual impacts are likely in the short to medium term. Still, they will result in only a minor loss to the baseline landscape and visual resources, leading to a low to negligible impact. Mitigation measures would help maintain a low negative impact.

The cause of the anticipated visual impacts would be:

Operational Phase

- The physical presence of the rising sides of the TSF; and
- The potential light pollution along the boundary of the properties and the cause of spotlight effects.

Post-closure and rehabilitation

- Rehabilitation activities at the TSF's side slopes and surface area until the areas are self-sustaining.

The significance of these impacts is rated in the sections below.

10.1 Operational Phase

The worst-case effect on the visual environment during the operational phase is assessed to have a low magnitude (i.e. where the impact affects the environment so that natural, cultural, and social functions and processes are slightly affected). It would occur over the short term (a maximum of 5 years). The unmitigated impact would be localised but extend beyond the site to adjacent areas. The significance of the effect, pre-mitigation, is predicted to be LOW (i.e., the impact would not directly influence the decision to develop the area if it is mitigated). The project can be authorised but monitoring and mitigation are essential. Implementing mitigation measures could slightly reduce the anticipated impact, which would remain at LOW. Refer to **Table 3** below.

Table 3 Impact Summary:

Change of landscape characteristics and key views in the OPERATIONAL Phase

Issue: Change to the landscape characteristics and key views		
Phases: Operation Phase		
Criteria	Without Mitigation	With Mitigation
CONSEQUENCE		
Duration	Short term	Short term
Extent	Local (but beyond the site to adjacent areas)	Local
Magnitude	Low	Low
Reversibility	Reversible	Reversible
PROBABILITY	Medium	Low
IMPACT SIGNIFICANCE	- LOW	- LOW
Degree to which impact can be reversed	Reversible: without incurring significant time and cost	
Degree to which impact may cause irreplaceable loss of resources	Unlikely: The impact is unlikely to result in irreplaceable loss of resources	

Monitoring and Reporting

The mine's environmental officer should monitor or report on adherence to the proposed management measures monthly.

10.2 Closure and Rehabilitation Phase

The extent of the impact on the visual environment during the post-closure and rehabilitation phase is considered minor, meaning it affects the environment in a way that does not impact natural, cultural, or social functions and processes (with no associated consequences), and would occur over the short term. The unmitigated impact would be localised but could extend beyond the Project sites. The significance of the impact is predicted to be LOW.

Table 4 Impact Summary:

Change of landscape characteristics and key views in the CLOSURE AND REHABILITATION Phase

Issue: Change to the landscape characteristics and key views		
Phases: Post-closure and Rehabilitation Phase		
Criteria	Without Mitigation	With Mitigation
CONSEQUENCE		
Duration	Short-term (maximum 5 Years)	Short term
Extent	Local	Local
Magnitude	Low	Minor
Reversibility	Reversible	Reversible
PROBABILITY	Low (there is a possibility that the impact will occur)	Low
IMPACT SIGNIFICANCE	- LOW	- LOW
The degree to which impact can be reversed	Reversible: Impact is reversible without incurring considerable time and cost.	
The degree to which impact may cause irreplaceable loss of resources	Low: The impact is unlikely to result in irreplaceable loss of resources	

Monitoring and Reporting

The mine's environmental officer should monitor or report on adherence to the proposed management measures quarterly.

Table 5 below summarises all phases of the Project activities, rated according to the method and criteria in **Appendix C**.

Table 5 Impact Assessment Table

		Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Impact	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
	Operation	-1	3	2	2	2	3	-6,75	-1	3	2	1	2	2	-4	High	1	1	1,00	-4
	Rehab and closure	-1	3	2	1	1	2	-3,5	-1	3	2	1	2	1	-2	High	1	1	1,00	-2

11. CUMULATIVE IMPACTS

Cumulative landscape and visual effects (impacts) result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate from it) or actions that occurred in the past, present, or are likely to happen in the foreseeable future. They may also affect how the landscape is experienced, and cumulative effects may be positive or negative. They may be considered part of the mitigation measures, which provide a range of benefits.

Cumulative effects can also arise from the intervisibility of a range of developments and the combined effects of individual components of the proposed development occurring in different locations or over time. The individual effects of these components or developments may not be significant. However, they may create an unacceptable degree of adverse impact on visual receptors within their combined visual envelopes. Intervisibility depends on general topography, aspect, vegetative cover, and other visual obstructions; elevation; and distance, as these factors affect visual acuity, which is also influenced by weather and lighting conditions (LI-IEMA, 2013).

11.1 Cumulative

The Mponeng Lower Compartment TSF project would add to existing mining land-use activities prominent in the subregion. The current Mponeng Lower Compartment TSF has been in place for decades. The proposed project aims to resume deposition, thereby increasing the height of the existing TSF. Therefore, the overall effect of the project, which is also near existing mine activities, would be LOW. That is, given potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial or temporal cumulative change.

12. CONCLUSION

The current visual state of the landscape that could be affected by the proposed project has been described. The scenic quality of the study area has been rated from low to high relative to the subregion. The project footprint is in a landscape type with low scenic quality. Sensitive receptors, viewing areas, and landscape types have been identified and mapped, suggesting a potentially low sensitivity to the project.

Impacts on views are most significant when receptors are identified as sensitive to landscape changes, and their views are focused on and dominated by these changes. The Project continues with an activity currently underway in the subregion, which would cause minimal cumulative change to the baseline's key features and characteristics during the operational phase. The pre-development landscape and views will not be significantly affected by this activity, which is typical for the mining subregion relative to the receiving landscape's attributes. The Project would primarily affect receptors travelling along the N12 south of the project site and farmsteads in the southeastern part of the study area.

The effect (worst-case scenario) on the visual environment during both phases of the project is assessed as LOW significance and would occur in the short term (up to 5 years). A LOW negative impact is when the impact does not directly influence the decision to develop in the area. The effect is reversible in all phases, although it may incur time and cost during the operational phase.

Implementing mitigation measures could reduce the predicted impact, and the effect would still be low in significance. Monitoring and mitigation are advised in both phases to ensure that the potential negative impact stays low.

12.1 Cumulative effect of the project

The cumulative effect of the Project is rated LOW.

12.2 Visual impact statement

GYLA believes that, in the worst-case scenario, the visual impacts associated with the proposed Mponeng TSF Project are of low significance, given the nature, scale, and duration of the project activities within the receiving environment. The impacts associated with the various phases of the Project can be mitigated to some extent; these measures should be implemented and effectively managed.

The proposed Mponeng TSF project is deemed acceptable from a visual perspective.

***** GYLA *****

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APPENDIX A: DETERMINING THE VISUAL RESOURCE VALUE OF A LANDSCAPE

To reach an understanding of the effect of development on a landscape resource, it is necessary to consider the distinct aspects of the landscape as follows:

Landscape Elements and Character

The individual elements that make up the landscape, including prominent or eye-catching features such as hills, Brand As, savannah, trees, water bodies, buildings, and roads are quantifiable and can be easily described.

Landscape character is therefore the description of the pattern, resulting from combinations of natural (physical and biological) and cultural (land use) factors and how people perceive these. The visual dimension of the landscape reflects how these factors create repetitive groupings and interact to create areas that have a specific visual identity. The process of landscape character assessment can increase appreciation of what makes the landscape distinctive and what is important about an area. The description of landscape character thus focuses on the *nature of the land*, rather than the response of a viewer.

Landscape Value – all-encompassing (Aesthetic Value)

Aesthetic value is the emotional response derived from the experience of the environment with its natural and cultural attributes. The response can be either to visual or non-visual elements and can embrace the sound, smell and any other factor having a strong impact on human thoughts, feelings, and attitudes (Ramsay 1993). Thus, aesthetic value encompasses more than the seen view, visual quality, or scenery, and includes atmosphere, landscape character, and sense of place (Schapper 1993).

Aesthetic appeal (value) is considered high when the following are present (Ramsay 1993):

- *Abstract qualities*: such as the presence of vivid, distinguished, uncommon, or rare features or abstract attributes.
- *Evocative responses*: the ability of the landscape to evoke particularly strong responses in community members or visitors.
- *Meanings*: the existence of a long-standing special meaning to a particular group of people or the ability of the landscape to convey special meanings to viewers in general.
- *Landmark quality*: a particular feature that stands out and is recognised by the broader community.

Sense of Place

Central to the concept of a sense of place is that the place requires uniqueness and distinctiveness. The primary informant of these qualities is the spatial form and character of the natural landscape together with the cultural transformations and traditions associated with historic use and habitation. According to Lynch (1992) sense of place "is the extent to which a person can recognise or recall a place as being distinct from other places - as having a vivid, or unique, or at least particular, character of its own". Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or viewer. In some cases, these values allocated to the place are similar for a wide spectrum of users or viewers, giving the place a universally recognised and therefore, strong sense of place.

Scenic Quality

Assigning values to visual resources is a subjective process. The phrase, “beauty is in the eye of the beholder,” is often quoted to emphasise the subjectivity in determining scenic values. Yet, researchers have found consistent levels of agreement among individuals asked to evaluate visual quality.

Studies for perceptual psychology have shown human preference for landscapes with a higher visual

complexity particularly in scenes with water, over homogeneous areas. Based on contemporary research landscape quality increases when:

- Topographic ruggedness and relative relief increase.
- Where water forms are present.
- Where diverse patterns of grasslands and trees occur.
- Where natural landscape increases and manufactured landscape decreases.
- And where land use compatibility increases, and land use edge diversity decreases (Crawford 1994).

Scenic Quality - Explanation of Rating Criteria:

(After The Visual Resource Management System, Department of the Interior of the USA Government, Bureau of Land Management)

Landform: Topography becomes more interesting as it gets steeper or more massive, or more severely or universally sculptured. Outstanding landforms may be monumental, as the Fish River or Blyde River Canyon, the Drakensberg or other mountain ranges, or they may be exceedingly artistic and subtle as certain pinnacles, arches, and other extraordinary formations.

Vegetation: (Plant communities) Give primary consideration to the variety of patterns, forms, and textures created by plant life. Consider short-lived displays when they are known to be recurring or spectacular (wildflower displays in the Karoo regions). Consider also smaller scale vegetational features, which add striking and intriguing detail elements to the landscape (e.g., gnarled or wind beaten trees, and baobab trees).

Water: That ingredient which adds movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration in selecting the rating score.

Colour: Consider the overall colour(s) of the basic components of the landscape (e.g., soil, rock, vegetation, etc.) as they appear during seasons or periods of high use. Key factors to use when rating "colour" are variety, contrast, and harmony.

Adjacent Scenery: Degree to which scenery outside the scenery unit being rated enhances the overall impression of the scenery within the rating unit. The distance which adjacent scenery will influence scenery within the rating unit will normally range from 0-8 kilometres, depending upon the characteristics of the topography, the vegetative cover, and other such factors. This factor is applied to units which would normally rate very low in score, but the influence of the adjacent unit would enhance the visual quality and raise the score.

Scarcity: This factor provides an opportunity to give added importance to one or all the scenic features that are unique or rare within one physiographic region. There may also be cases where a separate evaluation of each of the key factors does not give a true picture of the overall scenic quality of an area. Often it is several not so spectacular elements in the proper combination that produces the most pleasing and memorable scenery - the scarcity factor can be used to recognise this type of area and give it the added emphasis it needs.

Cultural Modifications: Cultural modifications in the landform / water, vegetation, and addition of structures should be considered and may detract from the scenery in the form of a negative intrusion or complement or improve the scenic quality of a unit.

Scenic Quality Inventory and Evaluation Chart

(After The Visual Resource Management System, Department of the Interior of the USA Government, Bureau of Land Management)

Key factors	Rating Criteria and Score		
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major Badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. **5**	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional. **3**	Low rolling hills, foothills, or flat Brand A bottoms; or few or no interesting landscape features. **1**
Vegetation and landcover	A variety of vegetative types as expressed in interesting forms, textures, and patterns. **5**	Some variety of vegetation, but only one or two major types. **3**	Little or no variety or contrast in vegetation. **1**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. **5**	Flowing, or still, but not dominant in the landscape. **3**	Absent, or present, but not noticeable. **0**
Colour	Rich colour combinations, variety, or vivid colour; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields. **5**	Some intensity or variety in colours and contrast of the soil, rock, and vegetation, but not a dominant scenic element. **3**	Subtle colour variations, contrast, or interest; mute tones. **1**
Influence of adjacent scenery	Adjacent scenery enhances visual quality. **5**	Adjacent scenery moderately enhances overall visual quality. **3**	Adjacent scenery has little or no influence on overall visual quality. **0**
Scarcity	One of a kind; or unusually memorable, or exceedingly rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. National and provincial parks and conservation areas *** 5+**	Distinctive, though like others within the region. **3**	Interesting within its setting, but common within the region. **1**
Cultural modifications	Modifications add favourably to visual	Modifications add little or no visual variety to the	Modifications add variety but are very discordant

	variety while promoting visual harmony. **2**	area and introduce no discordant elements. **0**	and promote strong disharmony. **4**

Scenic Quality (i.e. value of the visual resource)

In determining the quality of the visual resource both the objective and the subjective or aesthetic factors associated with the landscape are considered. Many landscapes can be said to have a strong sense of place, regardless of whether they are scenically beautiful but where landscape quality, aesthetic value and a strong sense of place coincide - the visual resource or perceived value of the landscape is very high.

When considering both objective and subjective factors associated with the landscape there is a balance between landscape character and individual landscape features and elements, which would result in the values as follows:

Value of Visual Resource – expressed as Scenic Quality
(After The Landscape Institute with the Institute of Environmental Management and Assessment (2002))

High	Moderate	Low
Areas that exhibit an incredibly positive character with valued features that combine to give the experience of unity, richness, and harmony. These are landscapes that may be of particular importance to conserve, and which may be sensitive change in general, and which may be detrimental if change is inappropriately dealt with.	Areas that exhibit positive character, but which may have evidence of alteration to /degradation/erosion of features resulting in areas of more mixed character. Potentially sensitive to change in general; again, change may be detrimental if inappropriately dealt with, but it may not require special or particular attention to detail.	Areas negative in character with few, if any, valued features. Scope for positive enhancement frequently occurs.

APPENDIX B: METHOD FOR DETERMINING THE SEVERITY OF LANDSCAPE AND VISUAL IMPACT

A visual impact study analysis addresses the importance of the inherent aesthetics of the landscape, the public value of viewing the natural landscape, and the contrast or change in the landscape from the Project.

For some topics, such as water or air quality, it is possible to use measurable, technical international or national guidelines or legislative standards, against which potential effects can be assessed. The assessment of likely effects on a landscape resource and on visual amenity is more complex, since it is determined through a combination of quantitative and qualitative evaluations. (The Landscape Institute with the Institute of Environmental Management and Assessment (2002).

Landscape impact assessment includes a combination of objective and subjective judgements, and it is therefore important that a structured and consistent approach is used. It is necessary to differentiate between judgements that involve a degree of subjective opinion (as in the assessment of landscape value) from those that are normally more objective and quantifiable (as in the determination of magnitude of change). Judgement should always be based on training and experience and be supported by clear evidence and reasoned argument. Accordingly, suitably qualified and experienced landscape professionals carry out landscape and visual impact assessments (The Landscape Institute with the Institute of Environmental Management and Assessment (2002),

Landscape and visual assessments are separate, although linked, procedures. The landscape baseline, its analysis and the assessment of landscape effects all contribute to the baseline for visual assessment studies. The assessment of the potential effect on the landscape is carried our as an effect on an environmental resource, i.e. the landscape. Visual effects are assessed as one of the interrelated effects on population.

Landscape Impact

Landscape impacts derive from changes in the physical landscape, which may give rise to changes in its character and from effects to the scenic values of the landscape. This may in turn affect the perceived value ascribed to the landscape. The description and analysis of effects on a landscape resource relies on the adoption of certain basic principles about the positive (or beneficial) and negative (or adverse) effects of change in the landscape. Due to the inherently dynamic nature of the landscape, change arising from a development may not necessarily be significant (Institute of Environmental Assessment & The Landscape Institute (2002)).

Visual Impact

Visual impacts relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity. Visual impact is therefore measured as the change to the existing visual environment (caused by the physical presence of a new development) and the extent to which that change compromises (negative impact) or enhances (positive impact) or maintains the visual quality of the area.

To assess the magnitude of visual impact four main factors are considered.

Visual Intrusion:	The nature of intrusion or contrast (physical characteristics) of a Project component on the visual quality of the surrounding environment and its compatibility/discord with the landscape and surrounding land use.
Visibility:	The area/points from which Project components will be visible.
Visual exposure:	Visibility and visual intrusion qualified with a distance rating to indicate the degree of intrusion.
Sensitivity:	Sensitivity of visual receptors to the proposed development

Visual Intrusion / contrast

Visual intrusion deals with the notion of contextualism i.e. how well does a Project component fit into the ecological and cultural aesthetic of the landscape as a whole? Or conversely what is its contrast with the receiving environment. Combining landform / vegetation contrast with structure contrast derives overall visual intrusion/contrast levels of high, moderate, and low.

Landform / vegetation contrast is the change in vegetation cover and patterns that would result from construction activities. Landform contrast is the change in landforms, exposure of soils, potential for erosion scars, slumping, and other physical disturbances that would be noticed as uncharacteristic in the natural landscape. Structure contrast examines the compatibility of the proposed development with other structures in the landscape and the existing natural landscape. Structure contrast is typically strongest where there are no other structures (e.g., buildings, existing utilities) in the landscape setting.

Photographic panoramas from key viewpoints before and after development are presented to illustrate the nature and change (contrast) to the landscape created by the proposed development. A computer simulation technique is employed to superimpose a graphic of the development onto the panorama. The extent to which the component fits or contrasts with the landscape setting can then be assessed using the following criteria.

- Does the physical development concept have a negative, positive, or neutral effect on the quality of the landscape?
- Does the development enhance or contrast with the patterns or elements that define the structure of the landscape?
- Does the design of the Project enhance and promote cultural continuity, or does it disrupt it?

The consequence of the intrusion / contrast can then be measured in terms of the sensitivity of the affected landscape and visual resource given the criteria listed below. For instance, within an industrial area, a new sewage treatment works may have an insignificant landscape and visual impact; whereas in a *valued* landscape it might be considered to be an intrusive element. (Institute of Environmental Assessment & The landscape Institute (1996)).

Table 1: Visual Intrusion

High	Moderate	Low	Positive
If the Project: - Has a substantial negative effect on the visual quality of the landscape. - Contrasts dramatically with the patterns or elements that define the structure of the landscape. - Contrasts dramatically with land use, settlement, or enclosure patterns. - Is unable to be 'absorbed' into the landscape.	If the Project: - Has a moderate negative effect on the visual quality of the landscape. - Contrasts moderately with the patterns or elements that define the structure of the landscape. - Is partially compatible with land use, settlement, or enclosure patterns. - Is partially 'absorbed' into the landscape.	If the Project: - Has a minimal effect on the visual quality of the landscape. - Contrasts minimally with the patterns or elements that define the structure of the landscape. - Is mostly compatible with land use, settlement, or enclosure patterns. - Is 'absorbed' into the landscape.	If the Project: - Has a beneficial effect on the visual quality of the landscape. - Enhances the patterns or elements that define the structure of the landscape. - Is compatible with land use, settlement, or enclosure patterns.

Result Notable change in landscape characteristics over an extensive area and/or intensive change over a localised area resulting in major changes in key views.	*Result* Moderate change in landscape characteristics over localised area resulting in a moderate change to key views.	*Result* Imperceptible change resulting in a minor change to key views.	*Result* Positive change in key views.

Visual intrusion also diminishes with scenes of higher complexity, as distance increases, the object becomes less of a focal point (more visual distraction), and the observer's attention is diverted by the complexity of the scene (Hull and Bishop (1988)).

Visibility

A viewshed analysis was carried out to define areas, which contain all possible observation sites from which the development would be visible. The basic assumption for preparing a viewshed analysis is that the observer eye height is 1.8m above ground level. Topographic data was captured for the site and its environs at 10 m contour intervals to create the Digital Terrain Model (DTM). The DTM includes features such as vegetation, rivers, roads and nearby urban areas. These features were 'draped' over the topographic data to complete the model used to generate the viewshed analysis. It should be noted that viewshed analyses are not absolute indicators of the level of significance (magnitude) of the impact in the view, but merely a statement of the fact of potential visibility. The visibility of a development and its contribution to visual impact is predicted using the criteria listed below:

Table 2: Visibility

High	**Moderate**	**Low**
Visual Receptors If the development is visible from over half the zone of potential influence, and/or views are mostly unobstructed and/or most viewers are affected.	*Visual Receptors* If the development is visible from less than half the zone of potential influence, and/or views are partially obstructed and or many viewers are affected	*Visual Receptors* If the development is visible from less than a quarter of the zone of potential influence, and/or views are mostly obstructed and/or few viewers are affected.

Visual Exposure

Visual exposure relates directly to the distance of the view. It is a criterion used to account for the limiting effect of increased distance on visual impact. The impact of an object in the foreground (0 – 800m) is greater than the impact of that same object in the middle ground (800m – 5.0 km) which, in turn is greater than the impact of the object in the background (greater than 5.0 km) of a particular scene.

Distance from a viewer to a viewed object or area of the landscape influences how visual changes are perceived in the landscape. Generally, changes in form, line, colour, and texture in the landscape become less perceptible with increasing distance.

Areas seen from 0 to 800m are considered foreground; foliage and fine textural details of vegetation are normally perceptible within this zone.

Areas seen from 800m to 5.0km are considered middle ground; vegetation appears as outlines or patterns. Depending on topography and vegetation, middle ground is sometimes considered to be up to

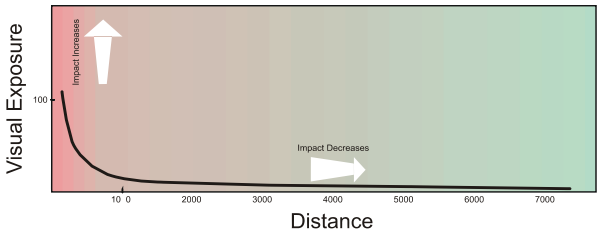
8.0km.

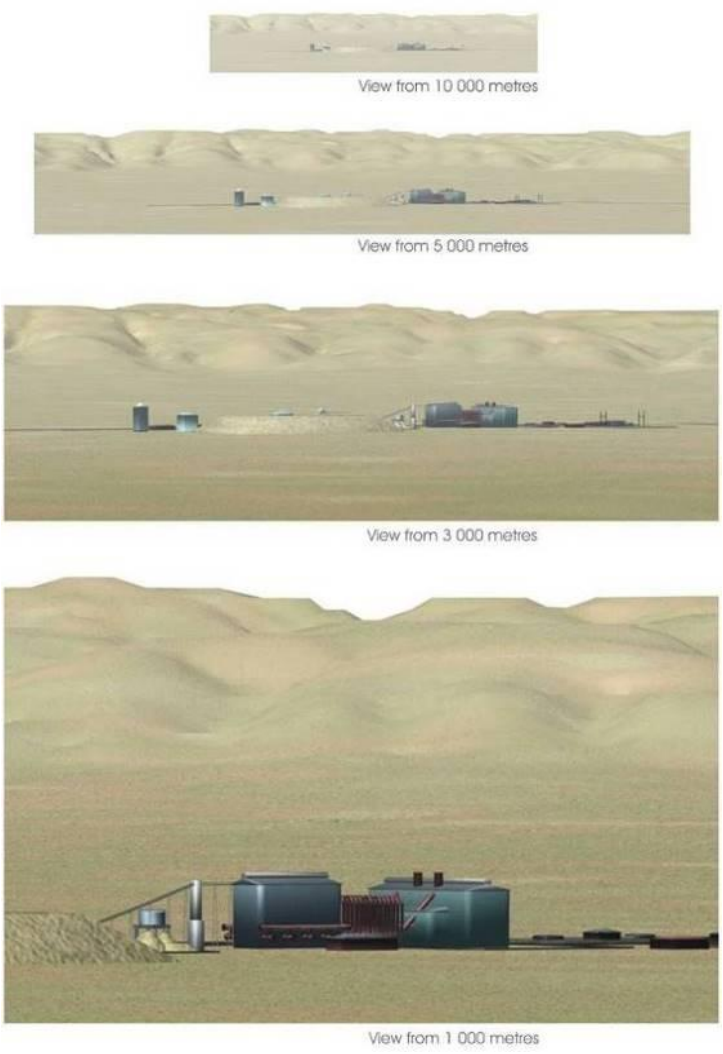
Areas seen from 5.0km to 8.0km and sometimes up to 16km and beyond are considered background. Landforms become the most dominant element at these distances.

Seldom seen areas are those portions of the landscape that, due to topographic relief or vegetation, are screened from the viewpoint or are beyond 16km from the viewpoint. Landforms become the most dominant element at these distances.

The impact of an object diminishes at an exponential rate as the distance between the observer and the object increases. Thus, the visual impact at 1000 m would be 25% of the impact as viewed from 500 m. At 2000 m it would be 10% of the impact at 500 m. The inverse relationship of distance and visual impact is well recognised in visual analysis literature (e.g.: Hull and Bishop (1988)) and is used as an important criteria for the study. This principle is illustrated in the Figures below.

Image 1: Effect of Distance on Visual Exposure





Sensitivity of Visual Receptors

When visual intrusion, visibility and visual exposure are incorporated, and qualified by sensitivity criteria (visual receptors) the magnitude of the impact of the development can be determined.

The sensitivity of visual receptors and views will be depended on:

- The location and context of the viewpoint.
- The expectations and occupation or activity of the receptor.
- The importance of the view (which may be determined with respect to is popularity or numbers of people affected, its appearance in guidebooks, on tourist maps, and in the facilities provided for its enjoyment and references to it in literature or art).

The most sensitive receptors may include:

- Users of all outdoor recreational facilities including public rights of way, whose intention or interest may be focused on the landscape.
- Communities where the development results in changes in the landscape setting or valued views enjoyed by the community.
- Occupiers of residential properties with views affected by the development.
- These would all be high.

Other receptors include:

- People engaged in outdoor sport or recreation (other than appreciation of the landscape, as in landscapes of acknowledged importance or value).
- People travelling through or past the affected landscape in cars, on trains or other transport routes.
- People at their place of work.

The least sensitive receptors are likely to be people at their place of work, or engaged in similar activities, whose attention may be focused on their work or activity and who therefore may be potentially less susceptible to changes in the view.

In this process more weight is usually given to changes in the view or visual amenity which are greater in scale, and visible over a wide area. In assessing the effect on views, consideration should be given to the effectiveness of mitigation measures, particularly where planting is proposed for screening purposes (Institute of Environmental Assessment & The Landscape Institute (1996).

Table 3: Sensitivity of Visual Receptors

High	Moderate	Low
Users of all outdoor recreational facilities including public rights of way, whose intention or interest may be focused on the landscape.	People engaged in outdoor sport or recreation (other than appreciation of the landscape, as in landscapes	The least sensitive receptors are likely to be people at their place of work, or engaged in similar activities, whose attention may be

Communities where the development results in changes in the landscape setting or valued views enjoyed by the community. Occupiers of residential properties with views affected by the development.	of acknowledged importance or value). People travelling through or past the affected landscape in cars, on trains or other transport routes.	focused on their work or activity and who therefore may be potentially less susceptible to changes in the view (i.e. office and industrial areas). Roads going through urban and industrial areas

Severity of the Visual Impact

Potential visual impacts are determined by analysing how the physical change in the landscape, resulting from the introduction of a Project, are viewed and perceived from sensitive viewpoints. Impacts to views are the highest when viewers are identified as being sensitive to change in the landscape, and their views are focused on and dominated by the change. Visual impacts occur when changes in the landscape are noticeable to viewers looking at the landscape from their homes or from parks, and conservation areas, highways and travel routes, and important cultural features and historic sites, especially in foreground views.

The magnitude of impact is assessed through a synthesis of visual intrusion, visibility, visual exposure and viewer sensitivity criteria. Once the magnitude of impact has been established this value is further qualified with spatial, duration and probability criteria to determine the *significance* of the visual impact.

For instance, the fact that visual intrusion and exposure diminishes significantly with distance does not necessarily imply that the relatively small impact that exists at greater distances is unimportant. The level of impact that people consider acceptable may be dependent upon the purpose they have in viewing the landscape. A particular development may be unacceptable to a hiker seeking a natural experience, or a household whose view is impaired, but may be barely noticed by a golfer concentrating on his game or a commuter trying to get to work on time (Ittleson *et al.,* 1974).

In synthesising these criteria a numerical or weighting system is avoided. Attempting to attach a precise numerical value to qualitative resources is rarely successful, and should not be used as a substitute for reasoned professional judgement. (Institute of Environmental Assessment and The landscape Institute (1996)).

Table 4: Severity of Visual Impact

High	Moderate	Low	Negligible
Total loss of or major alteration to key elements/features/characteristics of the baseline. I.e. Pre-development landscape or view and/or introduction of elements considered to be uncharacteristic when set within the	Partial loss of or alteration to key elements/features/characteristics of the baseline. I.e. Pre-development landscape or view and/or introduction of elements that may be prominent but may not necessarily be uncharacteristic when	Minor loss of or alteration to key elements/features/characteristics of the baseline. I.e. Pre-development landscape or view and/or introduction of elements that may not be uncharacteristic when set within the	Very minor loss or alteration to key elements/features/characteristics of the baseline. I.e. Pre-development landscape or view and/or introduction of elements that are characteristic with the surrounding landscape –

attributes of the receiving landscape. High scenic quality impacts would result.	set within the attributes of the receiving landscape. Moderate scenic quality impacts would result	attributes of the receiving landscape. Low scenic quality impacts would result.	approximating the 'no change' situation. Negligible scenic quality impacts would result.

Cumulative effects

Cumulative landscape and visual effects (impacts) result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future. They may also affect the way in which the landscape is experienced. Cumulative effects may be positive or negative. Where they comprise a range of benefits, they may be considered to form part of the mitigation measures.

Cumulative effects can also arise from the intervisibility (visibility) of a range of developments and /or the combined effects of individual components of the proposed development occurring in different locations or over a period of time. The separate effects of such individual components or developments may not be significant, but together they may create an unacceptable degree of adverse effect on visual receptors within their combined visual envelopes. Intervisibility depends upon general topography, aspect, tree cover or other visual obstruction, elevation and distance, as this affects visual acuity, which is also influenced by weather and light conditions. (Institute of Environmental Assessment and The landscape Institute (1996)).

APPENDIX C: METHOD FOR DETERMINING THE SIGNIFICANCE OF IMPACT (EIMS)

1. Purpose

The purpose of this procedure is to guide the undertaking of an impact and risk assessment process, as required under the regulations promulgated under the National Environmental Management Act (Act 107 of 1998 - NEMA).

2. Scope

This procedure provides the methodology to be applied to environmental impacts and risks identified during the Environmental Impact Assessment Process. The methodology ensures that consistent impact assessment rating is conducted that is legally compliant and aligned with EIMS's objective of providing a quality service.

3. References

GNR. 982 National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations, 2014 – hereafter referred to as the Regulations.

4. Additional Guidelines and References

Guidelines and Reference Docs (not exhaustive – please verify with the applicable competent authority).	
Compulsory Compliance: GNR. 982 National Environmental Management Act (Act No. 107 of 1998 - NEMA): Environmental Impact Assessment Regulations, 2014.	National
Companion Guideline for Implementation: Environmental Management Assessment Regulations, 2010 - GN 805/2012 (NEMA)	National
DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria	National

5. Definitions and Abbreviations

Refer to Chapter 1 of the Regulations.

6. Procedure

The impact significance rating methodology, as presented herein and used for all EIMS Impact Assessment Projects, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. The ER is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives.

a. Determination of Environmental Risk

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 1 below.

Table 1: Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary)
	3	Local (i.e. the area within 5 km of the site)
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 2.

Table 2: Probability Scoring

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 3: Determination of Environmental Risk

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 4.

Table 4: Environmental Risk Scores

ER Score	Description
<9	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
≥9 ≤17	Medium (i.e. where the impact could have a significant environmental risk/ reward),
>17	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

b. Impact Prioritisation

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post- mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 5: Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$\boldsymbol{Priority = CI + LR}$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 6).

Table 6: Determination of Prioritisation Factor

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

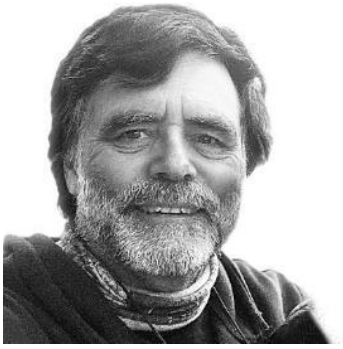
In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 7: Final Environmental Significance Rating

Significance Rating	Description
<-17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
≥-17, ≤-9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
>-9, < 0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
>0, <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥9, ≤17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
>17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

APPENDIX D: CURRICULUM VITAE



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Graham is a registered landscape architect with interest and experience in landscape architecture, urban design, and environmental planning. He holds a degree in landscape architecture from the University of Toronto and has practiced in Canada and Africa, where he has spent most of his working life. He has served as President of the Institute of Landscape Architects of South Africa (ILASA) and as Vice President of the Board of Control for Landscape Architects.

During his 30 years plus career he has received numerous ILASA and other industry awards. He has published widely on landscape architectural issues and has had projects published both locally and internationally in, scientific and design journals and books. He was a founding member of Newtown Landscape Architects and was also a senior lecturer, teaching landscape architecture and urban design at post and undergraduate levels, at the University of Pretoria (retired 2018). He has been a visiting studio critic at the Universities of the Witwatersrand and Cape Town and in 2011 was invited to the University of Rhode Island, USA as their Distinguished International Scholar. In 2022 he was awarded the ILASA Lifetime Achievement Award. Graham now practices as a Sole Proprietor: Graham Young Landscape Architect.

A niche specialty of his is Visual Impact Assessment for which he was cited with an ILASA Merit Award in 1999. He has completed over 250 specialist reports for projects in South Africa, Canada, and other African countries. He was on the panel that developed the *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes* (2005) and produced a research document for Eskom, *The Visual Impacts of Power Lines* (2009). In 2011, he produced '*Guidelines for involving visual and aesthetic specialists'* for the Aapravasi Ghat Trust Fund Technical Committee (they manage a World Heritage Site) along with the *Visual Impact Assessment Training Module Guideline Document.*

*** GYLA ***