Chapter 12: Visual Impact Assessment

Scoping and Environmental Impact Assessment: Sontule Citrus – Agricultural Expansion on Remainder of Farm 632, Sunland, Sundays River Valley Municipality

Draft EIA Report

September 2022

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Public Process Consultants
Environmental Impact Assessment and Public Participation Management

SONTULE CITRUS

Visual Impact Assessment Report

April 2022

VISUAL IMPACT ASSESSMENT REPORT

PROPOSED AGRICULTURAL EXPANSION ON REMAINDER OF FARM 632, KNOWN AS SONTULE CITRUS, SUNLANDS, SUNDAYS RIVER VALLEY MUNICIPALITY

EASTERN CAPE

Submitted to:

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Report Revision No:	*FINAL*
Date Issued:	23 June 2022
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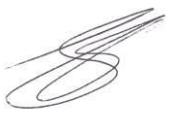
Signed:



Reference: 084_2022: Sontule Citrus - VIA

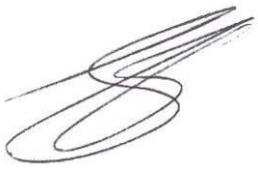
EXPERTISE OF SPECIALIST

Name:	Graham A Young
Qualification:	BL (Toronto); ML (Pretoria)
Professional Registration:	South African Council for the Landscape Architectural Profession (SACLAP) Fellow Institute of Landscape Architects of South Africa (FILASA)
Experience in Years:	40 years
Experience	Graham is a landscape architect with forty years' experience. He has worked in Southern Africa and Canada and has valuable expertise in the practice of landscape architecture, urban design, and environmental planning. He is also a senior lecturer, teaching urban design and landscape architecture at post and undergraduate levels at the University of Pretoria. A speciality of his is Visual Impact Assessment, for which he was cited with an ILASA Merit Award in 1999. He has completed over 280 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) and the *Visual Impact Assessment Training Module Guideline Document.*

DECLARATION OF INDEPENDENCE

I, Graham Young, declare that –

- I am contracted as the Visual Impact Assessment Report for the Sontule Citrus and associated infrastructure project.
- I will perform the work relating to the application objectively, 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 National Environmental Management Act (Act 107 of 1998), 2014 Environmental Impact Assessment Regulations (as amended on 7 April 2017), and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, regulations, and all other applicable legislation.
- I will consider, to the extent possible, the matters listed in Regulation 13.
- 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 concerning 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 16 (1)(b)(iii).



Graham A. Young FILASA PrLArch Reg. No. 87001
BL (Toronto), ML (Pretoria)

23 June 2022

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Specialist Reporting Requirements According to Appendix 6 of the National Environmental Management Act (Act 107 of 1998), Environmental Impact Assessment Regulation 2014 (as amended on 7 April 2017)	
Requirement	**Relevant section in report**
Details of the specialist who prepared the report;	Page 12ii, Appendix E
The expertise of that person to compile a specialist report including a curriculum vitae;	Page 12ii, Appendix E
A declaration that the person is independent in a form as may be specified by the competent authority;	Page 12iii
An indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3 – 1.4
An indication of the quality and age of base data used for the specialist report;	N/A
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Sections 12 and 13
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 1.5
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;	Sections 8 and 9
An identification of any areas to be avoided, including buffers;	Section 11
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 9 and 10
Any mitigation measures for inclusion in the EMPR;	Section 11
Any conditions for inclusion in the environmental authorisation;	Sections 11 and 14
Any monitoring requirements for inclusion in the EMPR or environmental authorisation;	N/A

A reasoned opinion whether the proposed activity, activities or portions thereof should be authorised regarding the acceptability of the proposed activity or activities;	Section 14
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 11
A description of any consultation process that was undertaken during carrying out the study;	N/A PPC (EAP) are busy with this process
A summary and copies if any of comments that were received during any consultation process;	N/A
Any other information requested by the competent authority.	N/A

Acronyms & Abbreviations	
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
GYLA	Graham A Young Landscape Architect
NEMA	National Environmental Management Act
PPC	Public Process Consultants
SACLAP	South African Council for the Landscape Architectural Profession
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 on an annual basis. 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 that is visited by large numbers who come 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. (After New York, Department of Environment 2000).
Aesthetic impact	Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Mere visibility, even startling visibility of a project proposal, should not be a threshold for decision making. Instead a project, by its visibility, must clearly 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 blocking 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 the 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, valleys, woods, trees, water bodies, buildings, and roads. They are generally 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 the purposes of this report the project 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 site beyond which the visual impact of the most visible features will be reduced to low to insignificant), which is a 5,0km radius from the approximate centre of the proposed project site footprint.
Project Footprint / Site	For the purposes of this report the Project *site* / *footprint* refers to the actual layout of the project as described.
Sense of Place (*genius locus*)	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. *A genius locus literally 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 that defines areas, which contain all possible observation sites from which an object would be visible. The basic assumption for preparing a viewshed analysis is that the observer 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 Exposure	Visibility and visual intrusion qualified with a distance rating to indicate the degree of intrusion and visual acuity, which is also influenced by weather and light conditions.
Visual Impact	Visual effects relate to the changes that arise in the composition of available views because of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.
Visual Intrusion	The nature of intrusion of an object on the visual quality of the environment resulting 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 defined as the landscape's ability to absorb physical changes without transformation in its visual character and quality. The landscape's ability to absorb change ranges from low-capacity areas, in which the location of an activity is likely to cause visual change in the character of the area, to high-capacity areas, in which the visual impact of development will be minimal (Amir & Gidalizon 1990).
Worst-case Scenario	Principle 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 which 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.

OVERVIEW AND BACKGROUND

Public Process Consultants commissioned Graham A Young Landscape Architect (GYLA), to conduct a visual impact assessment (VIA) for the proposed Sontule Citrus project near Addo, Sundays River Valley Municipality, Eastern Cape Province ("the Project"). This report forms part of a Full Scoping and Environmental Impact Assessment (EIA) process, that is being undertaken for the Project. The project applicant, Sun Orange Farms (Pty) Ltd, proposes to expand citrus production at their existing operations on Remainder of Farm 632 (referred to as Sontule) in the Sundays River Valley Municipality (SRVM). The VIA focuses on the potentially intrusive nature of physical aspects of the proposed Project (form, scale, bulk and sense of space) within its local context.

PROJECT SITE AND STUDY AREA

The farm Sontule is located approximately 11km south-east of Kirkwood and approximately 12km west of Addo. The farm can be directly accessed off the tarred R336 (Kirkwood/ Addo Road), which is adjacent to the northern boundary of the farm. The nearest boundary of the Addo Elephant National Park is located more than 11km east of the farm, and therefore, project activities proposed to take place on this property do not trigger listed activities which would require the assessment of impacts on the National Park. The study area comprises a visual envelope of 5,0km around the site[1].

AIM OF THE STUDY

The aim of the study is to determine the impact of the proposed project on the visual/aesthetic character of the landscape, and ensure that the consequences of the proposed Project are understood and adequately considered in the Environmental Impact Assessment (EIA) process in line with Appendix 6 of the EIA Regulations 2014 (as amended).

TERMS OF REFERENCE

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

- Undertake a site visit
- Describe the aesthetic value and visual context of the receiving environment (value of visual resource).
- Determine the zone of potential influence
- Determine any legislative requirements, if any
- Create digital surface models of project components (i.e., Shade cloth) in the landscape
- Undertake a view shed analysis of the area, including
- Identify potential direct and indirect impacts on the visual environment and sense of place within the study area.
- Assess the significance of the impacts.
- Assess the potential loss of scenic value of the landscape and impact on key views.

[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 Project sites. At 5,0km and beyond the development would recede into background views and or be screened by topography, vegetation or existing or proposed (approved) power infrastructure.

- Assess cumulative impacts of the study area as well subregion (SRVM)
- Provide appropriate mitigation and management measures to impacts identified

ASSUMPTION, UNCERTAINTIES, AND LIMITATIONS

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

- 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 Project site.
- The description of project components is limited to what has been supplied to the author prior to the date of completion of this report.
- The accuracy of the viewshed analysis depends on the quality of the input digital surface model (DSM). Readily available digital contours for the area are limited to 20m contours. To be more accurate at predicting absolute visibility, the analysis would require "a 3D model of a tree/plant and a layer indicating the spatial distribution and density of vegetation on the landscape" (Llobera 2007:799) and buffering all existing buildings, structures and infrastructure. The possibility of indicating both the spatial and density distribution of tree/plants, and the three-dimensional model representing vegetation and all structures, is currently not available to the author. Therefore, on-site observations were critical and indicated that many views of the project site would be screened by existing vegetation.
- Site photos taken in the summer (07 and 08 March 2022) do not necessarily reflect the complete landscape character of the area as experienced through all seasons. At the time of the site visit, the weather was partly cloudy, with moderate haze conditions on the first day and rain on the second day.

FINDINGS

Baseline

The existing visual condition of the landscape that may be affected by the proposed Project has been described in Sections 7 and 8 below. The study area is dominated by two main landscape character types, Sundays Thicket on an undulating plain and Citrus Orchards. The visual integrity of the orchards landscape type and the study area in general is being visually impacted by the shade cloth structures, which contrast with the existing dark green and brown hues of the environment.

The study area's scenic quality is of a mixed character rated *low* (orchards with shade cloth) to *high* (Sundays Thicket on undulating plains). The site, which straddles three of the four landscape character types identified, is also of mixed visual character and is potentially sensitive to change if the change is not effectively managed. Sensitive viewing areas and receptors have been identified and mapped, indicating sensitivity to the project.

Visual Impact

Visual impacts are highest when receptors are sensitive to change, and their view is focused on and dominated by the change. The Project's visual impact will cause changes in the landscape that are noticeable to receptors living in and visiting residences, tourist areas, and public roads to the south, north and east of the project site. It has been established that the most sensitive receptors are residents as well as visitors of the property

immediately to the south of the site. Tourism (hunting and a small guest lodge) and sporting (long-range target shooting) activities occur here. However, views from the property towards the project activities already contain features associated with citrus production and the ever-increasing establishment of shade cloth structure, thus reducing the significance of the potential visual impact of the proposed Sontule project.

The significance of the worst-case scenario impact on the various sensitive receptor areas during the CONSTRUCTION PHASE is a direct negative impact that is partially reversible (should the project not proceed to the Operational Phase). The impact is predicted to be Medium Negative (-), i.e. the impact/risk will result in a moderate alteration of the environment where the environment continues to function but in a modified manner. It will have an influence on decision-making if not mitigated. The impact can be reduced with the implementation of the appropriate mitigation measures, but the significance of the impact is likely to remain Medium (-).

During the OPERATIONAL PHASE, a direct, partially reversible (should the shade cloth structures be removed) negative impact is predicted. The long-term impact is assessed as Medium Negative (-), i.e. the impact/risk will result in a moderate alteration of the environment where the environment continues to function but in a modified manner. The impact would remain Medium (-) even with the effective implementation of mitigation measures, and it should influence decision-making.

Cumulative Effect

The separate effects of the Project have been rated of Medium Negative (-) significance. When taken together with the negative impacts of existing citrus orchards under shade cloth, which occur across the study area and the sub-region, the negative cumulative effect would remain Medium Negative (-). However, the proposed Sontule project would not appear uncharacteristic when set against the visual attributes of the site's immediate surroundings and the dominant land use of the sub-region.

AUTHOR'S OPINION

The author's opinion is that all aspects of the Sontule Citrus Project, from a potential visual impact perspective, should be approved, provided that the mitigation/management measures are effectively implemented, managed, and monitored in the long term.

*** GYLA ***

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

1.1 Project Overview and Background

Public Process Consultants commissioned Graham A Young Landscape Architect (GYLA), to conduct a visual impact assessment (VIA) for the proposed Sontule Citrus project near Addo, Sundays River Valley Municipality, Eastern Cape Province ("the Project"). This report forms part of a Full Scoping and Environmental Impact Assessment (EIA) process, that is being undertaken for the Project. The project applicant, Sun Orange Farms (Pty) Ltd, proposes to expand citrus production at their existing operations on Remainder of Farm 632 (referred to as Sontule) in the Sundays River Valley Municipality (SRVM) (see Figure 1 below). The VIA focuses on the potentially intrusive nature of physical aspects of the proposed Project (form, scale, bulk and sense of space) within its local context.

1.2 Project Site and Proposed Study area

The farm Sontule is located approximately 11km south-east of Kirkwood and approximately 12km west of Addo. The farm can be directly accessed off the tarred R336 (Kirkwood/ Addo Road), which is adjacent to the farm's northern boundary. The nearest boundary of the Addo Elephant National Park is located more than 11km east of the farm, and therefore, project activities proposed to take place on this property do not trigger listed activities which would require the assessment of impacts on the National Park. The study area comprises a visual envelope of 5,0km around the site[2]. The locality map (Figure 1) below provides an overview of the location of the proposed Project and the study area.

1.3 The objective of the Specialist Study

The aim of the study is to determine the impact of the proposed project on the visual/aesthetic character of the landscape, and ensure that the consequences of the proposed Project are understood and adequately considered in the Environmental Impact Assessment (EIA) process in line with Appendix 6 of the EIA Regulations 2014 (as amended).

1.4 Terms of Reference

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

- Review any relevant legislation, policies, guidelines and standards
- Conduct a site visit accompanied by a photographic survey of the site
- Describe the aesthetic value and visual context of the receiving environment (value of visual resource).
- Determine the zone of potential influence for the project
- Create digital surface models of project components (i.e., Shade cloth) in the landscape
- Determine visual exposure viewpoints
- Undertake a view shed analysis of the area – establish inherent visual sensitivity in terms of slope, landforms, vegetation, special features and land use. Identify potential direct and indirect

[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 Project sites. At 5,0km and beyond the development would recede into background views and or be screened by topography, vegetation or existing or proposed (approved) power infrastructure.

impacts on the visual environment and sense of place within the study area. Assess the significance of the impacts against visual criteria (i.e., visibility, sensitive receptors, and visual absorption).

- Assess the potential loss of scenic value of the landscape and impact on key views.
- Assess cumulative impacts of the study area as well as the subregion (SRVM)
- Provide appropriate mitigation and management measures to impacts identified.

1.5 Assumption, Uncertainties and Limitations

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

- 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 Project site.
- The description of project components is limited to what has been supplied to the author prior to the date of completion of this report.
- The accuracy of the viewshed analysis depends on the quality of the input digital surface model (DSM). Readily available digital contours for the area are limited to 20m contours. We have interpolated these down to 1m intervals to get better accuracy. However, these types of viewshed investigations (using readily available GIS software and terrain contours only) are limited in their accuracy due to their inability to incorporate vegetation information. To be more accurate at predicting absolute visibility, the analysis would require “a 3D model of a tree/plant and a layer indicating the spatial distribution and density of vegetation on the landscape” (Llobera 2007:799) and buffering all existing buildings, structures and infrastructure. The possibility of indicating both the spatial and density distribution of tree/plants, and the three-dimensional model representing vegetation and all structures, is currently not available to the author. Therefore, on-site observations are critical.
- Site photos taken in the summer (07 and 08 March 2022) do not necessarily reflect the complete landscape character of the area as experienced through all seasons. At the time of the site visit, the weather was partly cloudy, with moderate haze conditions on the first day and rain on the second day.

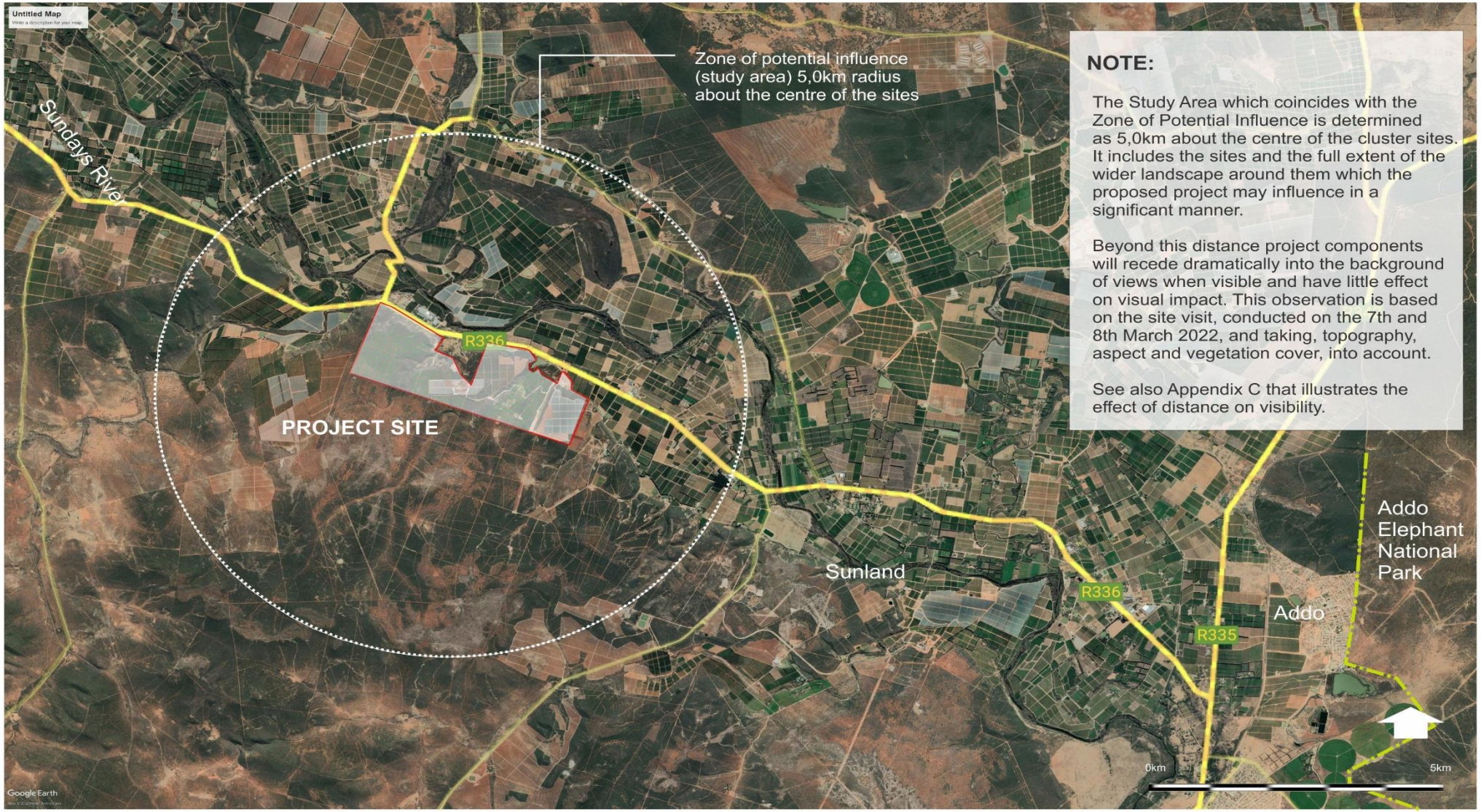

Figure 01: LOCALITY - Sontule Citrus

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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 prepared in accordance with the specification on conducting specialist studies as per Government Gazette (GN) R 982 (as amended) of the National Environmental Management Act (NEMA) Act 107 of 1998. The mitigation measures as stipulated in the specialist report must be used as part of the Environmental Management Programme Report (EMPr) in line with Appendix 6 of the EIA Regulations 2014 (as amended).

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 guidance that is deemed appropriate for any EIA process. The Guideline document also seeks to clarify instances when a visual specialist should become involved in the EIA process.[3]

2.2 Addo Elephant National Park – Park Management Plan 2015 – 2025 (AENP)

"The primary objective of a park zoning plan is to establish a coherent spatial framework in and around a park to guide and co-ordinate conservation, tourism and visitor experience initiatives and activities. A zoning plan plays a key role in minimising conflicts between different users of a park by separating potentially conflicting activities – such as game viewing and day-visitor picnic areas – whilst ensuring that activities which do not conflict with the park's values and objectives (especially the conservation of the protected area's natural systems and its biodiversity) can continue sustainably in appropriate areas.

The zoning of the park was based on an analysis and mapping of the sensitivity and value of a park's biophysical, heritage and scenic resources; an assessment of the regional context; an assessment of the park's current and planned infrastructure and tourist products; and an assessment of the expansion plan for the park and its implication for use zoning – all interpreted in the context of corporate values and park objectives" (SANParks 2015:39).

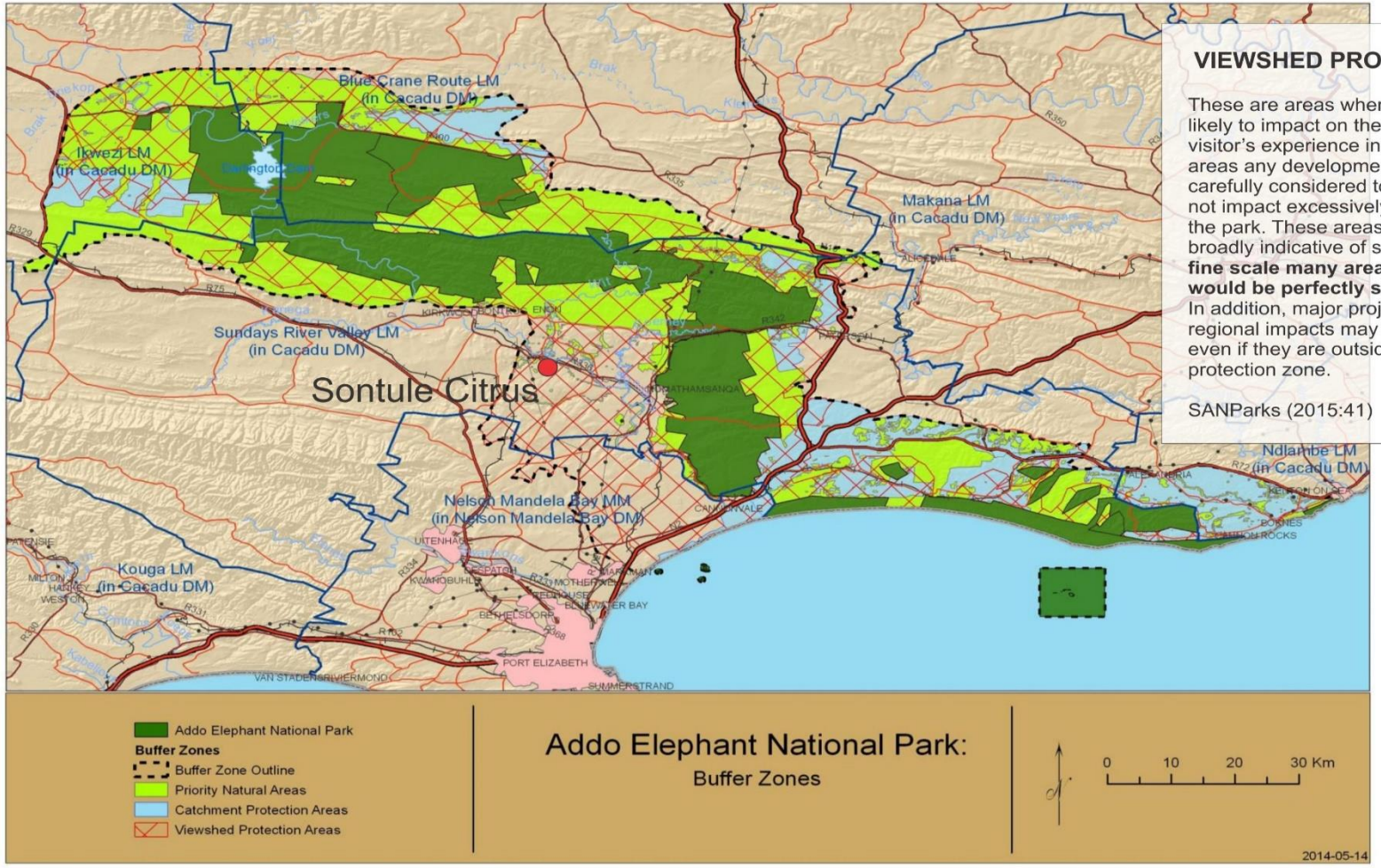
The site falls within the Addo Elephant National Park 'Buffer Zone' – Viewshed Protection Areas (refer to Figure 1-1). "These are areas where development is likely to impact the aesthetic quality of the visitor's experience in a park. Within these areas, any development proposals should be carefully screened to ensure that they do not excessively impact the Park's aesthetics. The areas identified are only broadly indicative of sensitive areas, as, at a fine scale, many areas within this zone would be perfectly suited for development. In addition, major projects with large scale regional impacts may have to be considered even if they are outside the viewshed

[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.

protection zone" (SANParks 2015:41). However, it should be noted that the proposed agricultural development footprint is approximately 11km west of the nearest boundary of the AENP.

Given that land use in the sub-region is dominated by citrus and other agricultural activities, Project activities would not be considered uncharacteristic within this context. Also, at approximately 16km from the nearest tourist road in the park, the Project is not anticipated to be visible. It should also be noted that the buffer zones with the AENP Management Plan have not yet been gazetted in terms of the National Environmental Management Protected Areas Act, Strategy on Buffer Zones for National Parks.[4] Therefore, it is the opinion of the author that the proposed development will not have a significant impact on the AENP Viewshed Protection Areas.

[4] Public Process Consultants. Chapter 3 Final Amendment Report: Intsomi Citrus. Unpublished Report July 2021.



Map 6: Buffer zone

SANParks. 2015. *Addo Elephant National Park: Management Plan for the period 2015 - 2025. SANParks. Pretoria. pp162*

Figure 01-1: ADDO ELEPHANT NATIONAL PARK: BUFFER ZONES - Sontule Citrus

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3. APPROACH AND METHODOLOGY

3.1 Approach

The assessment of likely effects on a landscape resource and on visual amenity is complex since it is determined through a combination of quantitative and qualitative evaluations. When assessing visual impacts, 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 baseline for visual impact assessment studies. The assessment of the potential impact on the landscape is conducted as an impact on an environmental resource, i.e. the physical landscape. Visual impacts, on the other hand, are assessed as one of the interrelated effects on the viewers and the impact of an introduced object into a view or scene.

3.1.1 The Visual Resource

Landscape character, landscape quality (Warnock & Brown 1998) and “sense of place” (Lynch 1992) are used to evaluate the visual resource, i.e. the receiving environment. A qualitative evaluation of the landscape is essentially a subjective matter. In this study, the aesthetic evaluation of the study area is determined by the professional opinion of the author based on on-site observations and the results of contemporary research in perceptual psychology.

Aesthetic value is the emotional response derived from the experience of the environment with its natural and cultural attributes. The response is usually to both visual and 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 is more than the combined factors of the seen view, visual quality, or scenery. It includes atmosphere, landscape character and sense of place (Schapper 1993).

Studies for perceptual psychology have shown a human preference for landscapes with higher visual complexity, for instance, scenes with water or topographic interest. Based on contemporary research, landscape quality increases where:

- Topographic ruggedness and relative relief increase.
- Water forms are present.
- Diverse patterns of grassland and trees occur.
- Natural landscape increases, and man-made landscape decreases.
- Where land use compatibility increases (Crawford 1994).

Aesthetic appeal (value) is therefore 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 group of people or the ability of the landscape to convey special meanings to viewers in general.
- Landmark quality: a feature that stands out and is recognized by the broader community.

And conversely, it would be low where:

- Limited patterns of grasslands and trees occur.
- Natural landscape decreases, and man-made landscape increases.
- And where land use compatibility decreases (Crawford 1994).

In determining the quality of the visual resource for the Sontule Project site, both the objective and the subjective or aesthetic factors associated with the landscape are considered. Many landscapes can be said to provide a keen sense of place, regardless of whether they are scenically beautiful. However, where landscape quality, aesthetic value and a powerful sense of place coincide, the visual resource or perceived value of the landscape is high.

3.1.2 Sensitivity of Visual Resource

The sensitivity of a landscape or visual resource is the degree to which a landscape type or area can accommodate change arising from development without detrimental effects on its character. Its determination is based upon an evaluation of each key element or characteristic of the landscape likely to be affected. The evaluation will reflect such factors as its “quality, value, contribution to landscape character, and the degree to which the particular element or characteristic can be replaced or substituted” (LI-IEMA 2013).

3.1.3 Sense of Place

Central to the concept of sense of place is that the landscape requires uniqueness and distinctiveness. The primary informant of these qualities is the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historical use and habitation of the area. According to Lynch (1992), sense of place is the extent to which a person can recognize or recall a place as being distinct from other places – as having a vivid, 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, the values allocated to the place are similar for a wide spectrum of users or viewers, giving the place a universally recognized and, therefore, keen sense of place.

The study area’s sense of place is derived from the emotional, aesthetic, and visual response to the environment, and therefore it cannot be experienced in isolation. The landscape context must be considered. The combination of the natural landscape together with the man-made structures (urban areas, roads, utilities etc.) contribute to the sense of place in the study area. It is this combination that defines the study area, and which establishes its visual and aesthetic identity.

3.1.4 Sensitive Viewer Locations

The sensitivity of visual receptors and views are dependent on the location and context of the viewpoint, the expectations and occupation or activity of the receptor or the importance of the view, which may be determined with respect to its 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. Typically, 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 development results in negative changes in the landscape setting or valued views enjoyed by the community.
- Occupiers of residential properties whose views are negatively affected by the development.

Views from residences and tourist facilities/routes are typically the most sensitive since they are frequent and of long duration.

Other less sensitive receptors include:

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

For a detailed description of the methodology to determine the value of a visual resource, refer to Appendix A. Image 1 below graphically illustrates the visual impact process used to determine the significance of the visual impact of the Project.

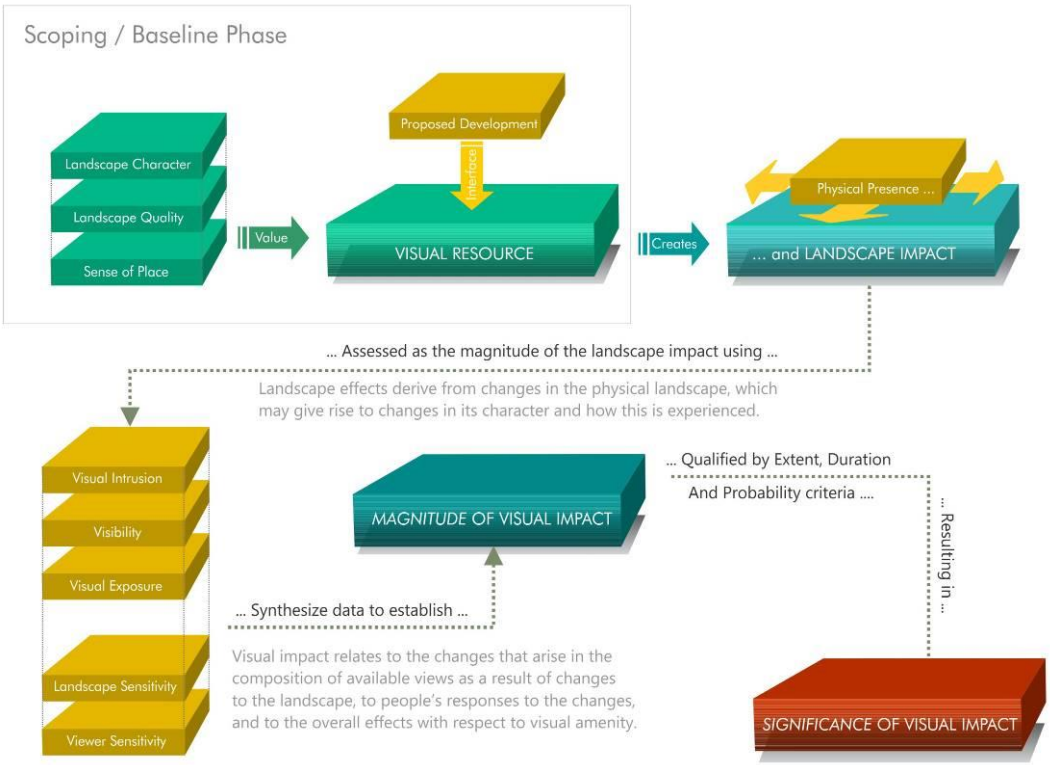

Image 1: Visual Impact Process

3.2 Methodology

The following method was used:

- Site visit: A field survey was undertaken on 07 and 08 March 2022 when the study area was scrutinized to the extent that the receiving environment could be documented and adequately described.
- Project components: The physical characteristics of the project components were described and illustrated based on information supplied by PPC.
- The landscape character of the study area was described. The description of the landscape focused on the nature and character of the landscape rather than the response of a viewer.
- Viewpoints were chosen based on the following criteria:
    - High visibility – sites from where the proposed development will be most visible
    - High visual exposure – view at various distances from the project
    - Sensitive areas and viewpoints (i.e., adjacent game farms)
- The quality of the landscape was described using recognized contemporary research in perceptual psychology as the basis.
- The sense of place of the study area was described as the uniqueness and distinctiveness of the landscape.
- Visibility and project components were modelled, and the anticipated impacts were rated based on criteria aligned with national best practices.

4. DESCRIPTION OF THE PROJECT

The project proponent, Sun Orange Farms (Pty) Ltd, proposes to expand citrus production at their existing operations on the Remainder of Farm 632, Sundays River Valley Municipality (SRVM), which measures approximately 459ha. To supply the proposed development with the required irrigation water, an irrigation dam is proposed to be constructed with a capacity to store approximately 49 000m^3 (3.18ha footprint) supplied from the Lower Sundays River Water User Association (LSRWUA) canal system. The farm is currently zoned Agriculture. Figure 2 below illustrates the proposed layout of the development.

To accommodate the proposed citrus orchard expansion, the total area to be cleared is currently proposed at ~147ha, including associated infrastructure (dam, internal roads, irrigation pipes). This area will, however, be confirmed after specialist and technical input, authority consultation, as well as consultation with I&APs. Irrigation water for the development is to be supplied from a new dam to be constructed on-site. Water will be pumped to this dam from an existing dam on site via a 315mm uPVC pipe. The existing dam is currently supplied with water from the LSRWUA canal system. The new dam proposed to be constructed on Sontule is anticipated to have a storage capacity of ~49 000m³ and a footprint of ~3.18ha.

It is further anticipated that the proposed development will entail the following activities on the site:

- Vegetation clearing
- Levelling and landscaping the site to provide runoff control and stormwater management
- Establishment of unpaved internal roads to provide internal access within the orchards
- Construction of a new dam
- Installation of irrigation infrastructure
- Planting orchards and windbreaks (if required)
- Erecting shade cloth over the orchards.

Once the necessary infrastructure has been established, the area will be used for the establishment of a variety of citrus. No additional logistical services area will be needed as the farm is currently a working citrus farm, and existing infrastructure will be used to provide technical and logistical support to the proposed expanded farming operation.

5. PROJECT ALTERNATIVES

The following alternatives have been identified:

- No-go alternative
- Layout/ footprint alternatives
- Alternatives as identified by I&APs

Reasonable and feasible alternatives as raised by I&APs, specialists and the technical team will be considered in the assessment process. However, at the time of drafting this report, the results of the I&AP process are not known. The no-go alternative will have no associated visual impacts, and fine-tuning of the layout/footprint will not significantly impact visual characteristic, as Project activities would be seen within the same view (assuming similar farm areas are developed). As described in Section 4 and illustrated in Figure 2 below, the draft proposed alternative is, therefore, an alternative that is assessed in this report and equates to the worst-case scenario.

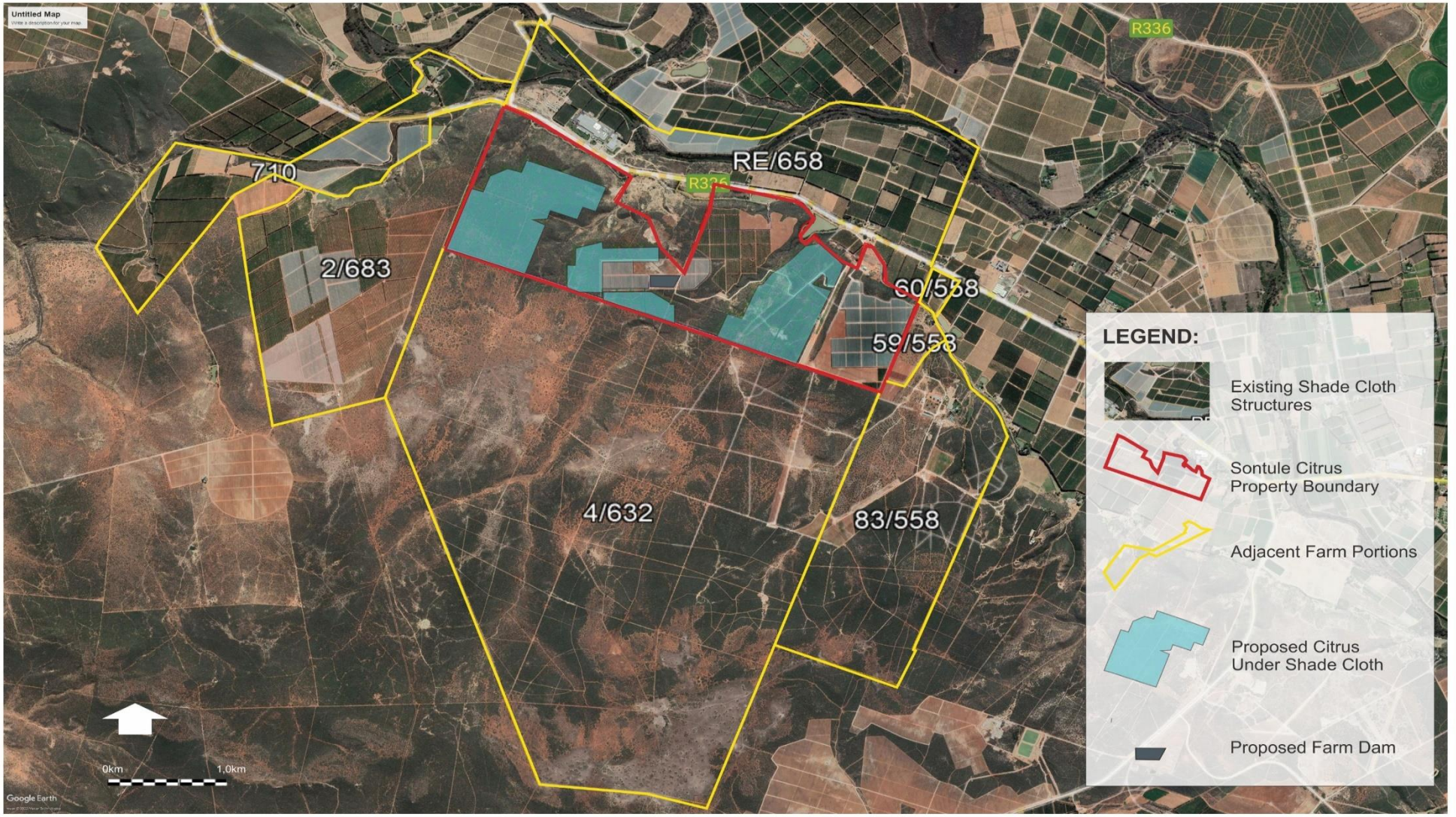

Figure 02: LAYOUT AND FARM PORTIONS- SONTULE CITRUS

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6. VISUAL ISSUES and PUBLIC CONCERN

Typical visual issues associated with agricultural projects and shade cloth:

- 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 be the impact of the development during the day and at night?
- What will the cumulative impact be?

The public participation process is being conducted by PPC. At the time of writing, the results were not known; however, it is anticipated that visual issues may be of concern to the public.

During the initial public participation conducted during the environmental assessment process, an adjacent landowner raised the following specific issue relating to visual and sense of place impacts:
Existing shade cloth structures on Sontule are an eyesore and have negatively impacted on his property because he has international hunters who visit his farm.
It has become common practise in the Sundays River Valley for farmers to erect shade cloth over citrus orchards. As a result, large sections of the region have now been covered in shade cloth. The issue pertaining to the potential visual impact caused by the erection of shade cloth as part of this proposed development on Sontule as well as the cumulative impact thereof for the subregion will be addressed in the report.

7. THE ENVIRONMENTAL SETTING

7.1 General Landscape Character

The study area can be divided into two main areas along a northwest to a southeast axis (Figure 5). The southern sector comprises mostly natural veld, and the northern areas are made up of agricultural lands planted primarily with citrus. The Sontule property is at the interface of these two general areas. The property's northern boundary coincides with a low ridgeline immediately south of the R336. It rises to approximately 60m above the R336 at the western end of the property and 18m above the road at the north-eastern corner of the property. The land south of this ridge flattens somewhat into an undulating plain which is where the citrus orchards and associated infrastructure are proposed. Two drainage lines cross the plain as they generally drain to the north and ultimately into the Sundays River. The plain slopes away from the ridge line and the project site to the south, resulting in an approximately 100m rise to the southern extremes of the study area.

Photographic panoramas are presented in Figures 4-1 to 4-4, which illustrate the nature and character of the study area's landscape. Figure 3 below shows the location of the viewing points of the panoramas, and Figure 5 illustrates the spatial distribution of the various landscape types discussed below and their related scenic quality and potential sensitivity to change.

7.2 Sundays River Valley with Albany Alluvial Thicket Vegetation

The Sundays River and its feeder streams cross the study area from west to east to the north of the R336. The riverine thicket tends to occur in the narrow floodplain zones of the river and is not as prominent as existing citrus orchards which have been planted up to the edge of the valley. Nevertheless, the topography, thicket vegetation, and the water give this landscape type the highest scenic quality rating within the study area. It is a vital landscape type and is sensitive to unmitigated change.

7.3 Sundays Thicket on undulating plains

Sundays Thicket on undulating plains occurs primarily in the southern section of the study area with a few patches north of the Sundays River amongst the citrus plantations. It also occurs on the undeveloped portions of the Project site. Across the study area, the density/openness and height of the thicket vary dependent on previous activities on the land (e.g. grazing). It is within this landscape type, south of the Project site, that hunting activities take place, and a guest lodge is located approximately 3km south of Sontule's southern boundary. This landscape type is potentially sensitive to unmitigated change.

7.4 Citrus Orchards

This landscape character type dominates the northern sector of the study area, mainly north of the R336, but also occurs east and west of the Project site, south of the R336. Citrus orchards have also been established in the centre and eastern portion of the farm Sontule. Its moderate scenic value is derived from its positive appearance and cultural value associated with the region.

7.5 Citrus Orchards with Shade Cloth

Shade cloth covering citrus orchards is a practice that has becoming increasingly utilised over the past five or so years. Typically, it comprises of a white 'roof' with green side sheets. This practice occurs across the country where citrus is being planted, presumably for its agronomical benefits, specifically to control humidity in the orchards and to prevent wind damage, among other benefits. It is assumed that the white colour of the cloth has qualities conducive to creating better conditions (than an open orchard) for the sustained and healthy

growth of the fruits[5]. Unfortunately, from a visual perspective, the prevalence of shade cloth structures creates a situation where the white contrasts with and stands out amongst surrounding areas which are generally dark green. The effect is evident in View 3 Figure 4-1, Views 4 and 5 Figure 4-2 and View 12 Figure 4-4. For these aesthetic reasons, this landscape type is rated as having the lowest scenic value, within the context of the study area.

[5] As the author is not an agronomist, he stands to be corrected on these assumptions.

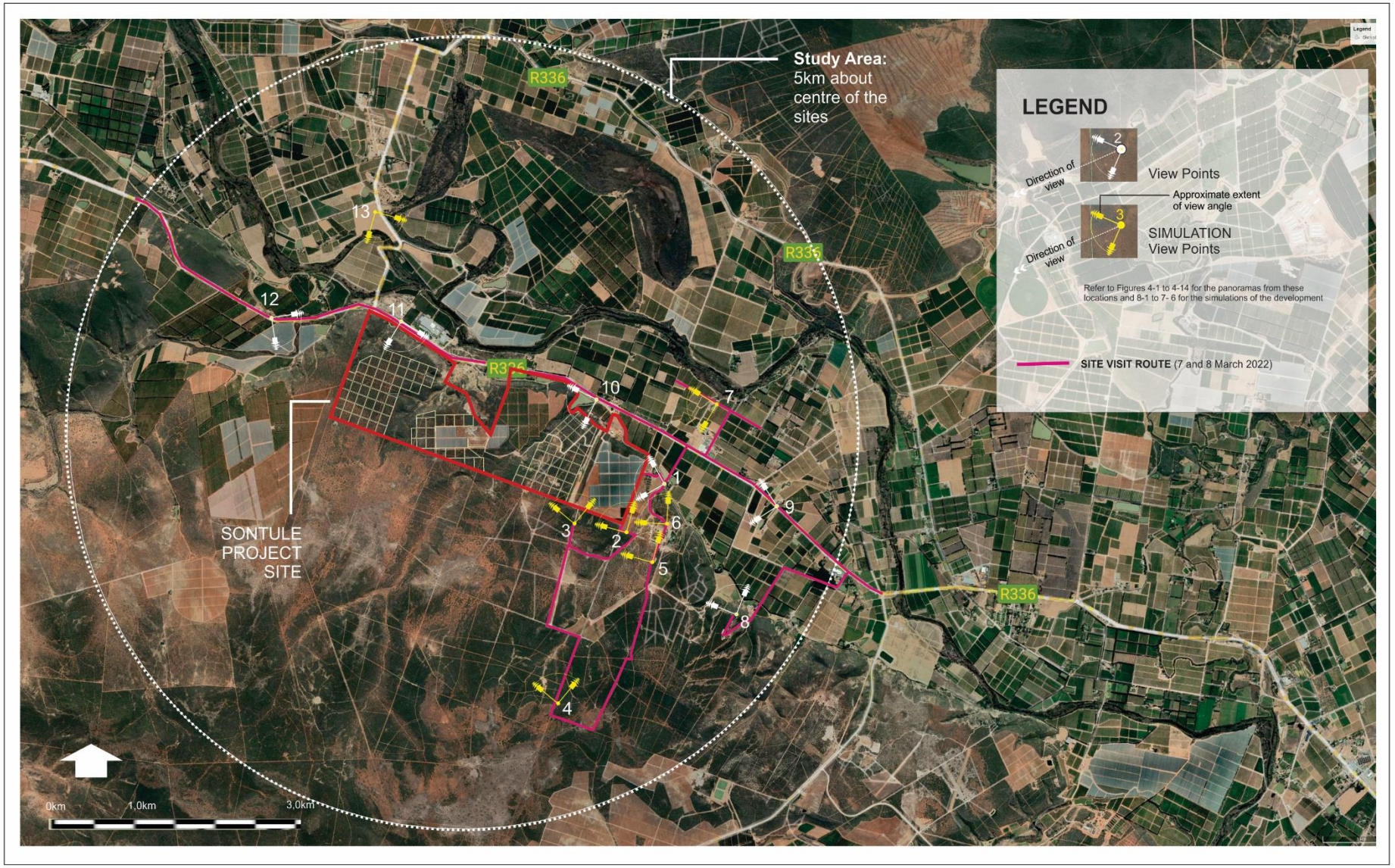

Figure 03: VIEW SITES - Sontule Citrus

Refer to Figures 4-1 to 4-4 for the panoramas and 8-1 to 8-6 for the simulations from these view points

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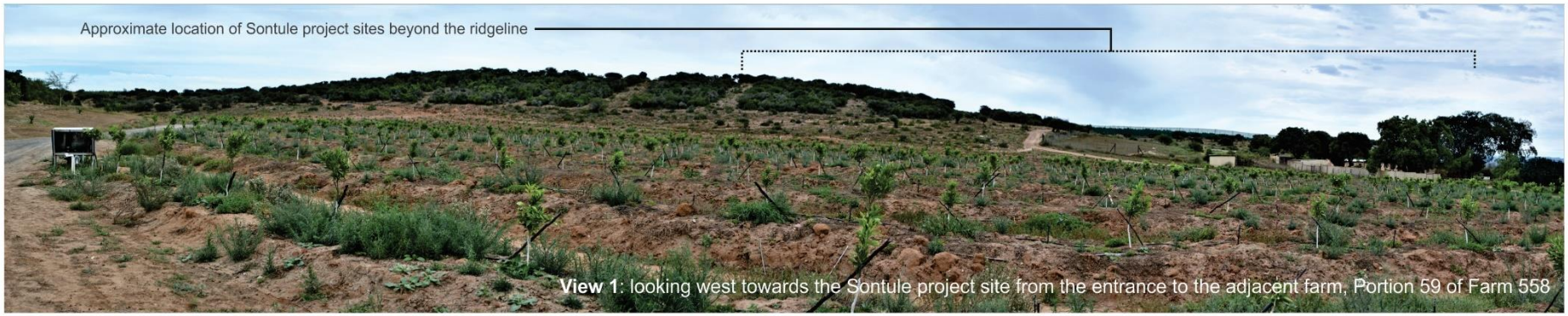

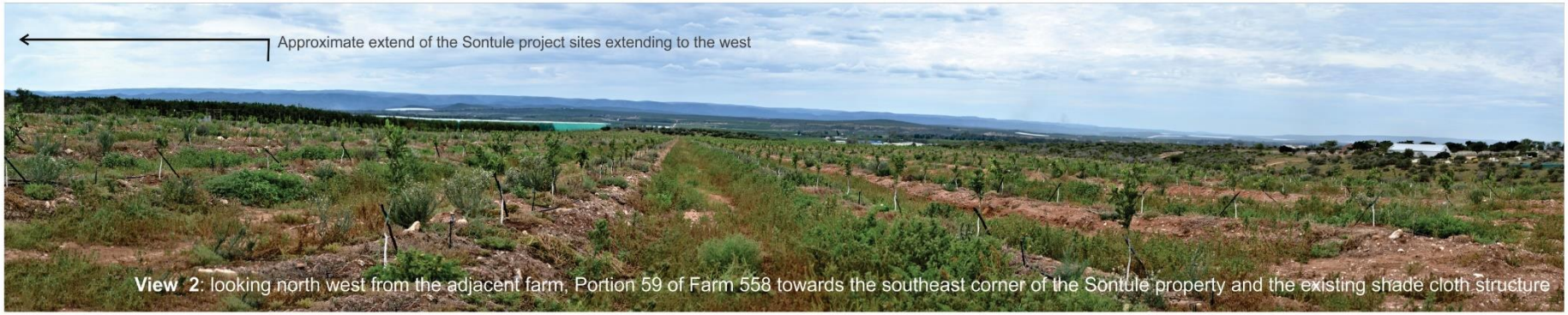

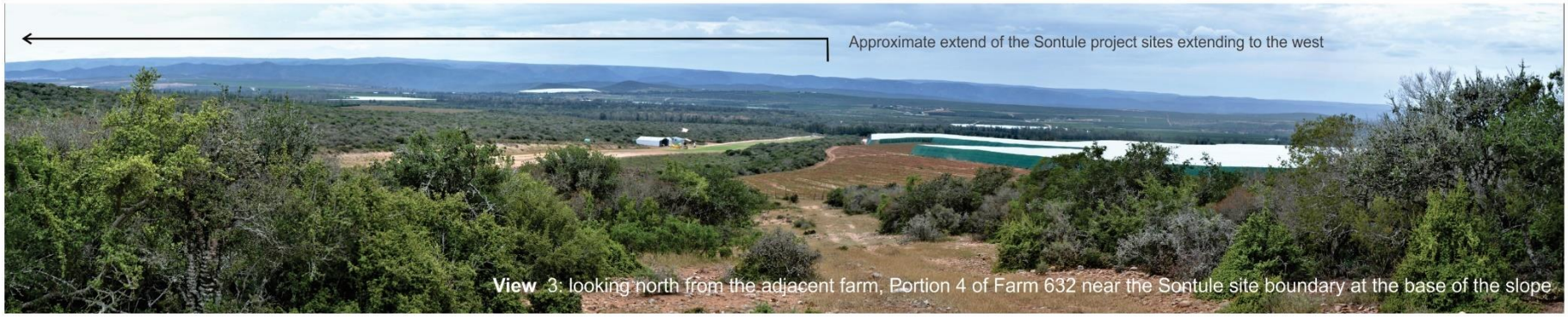

Figure 04-1: LANDSCAPE CHARACTER - Views 1, 2 and 3

Refer to Figure 3 for location of viewing points

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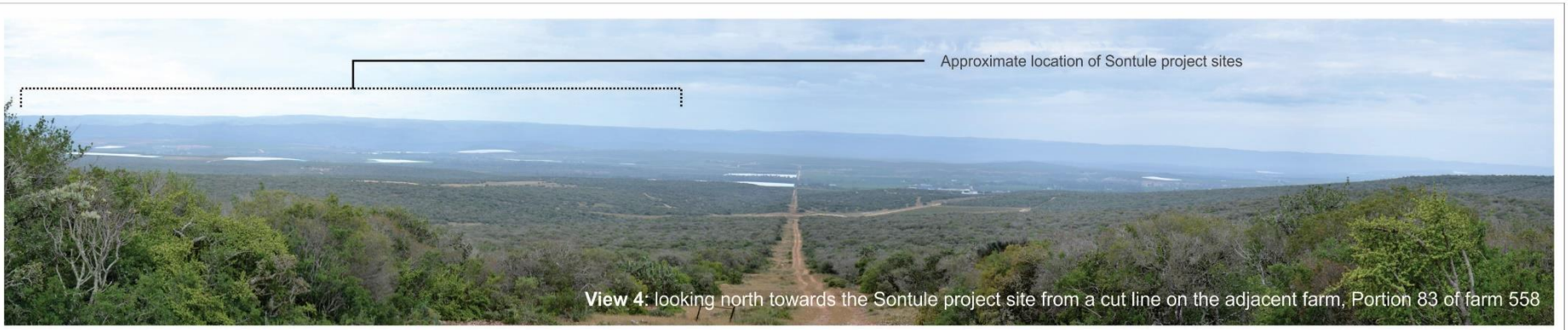

Figure 04-2: LANDSCAPE CHARACTER - Views 4, 5 and 6

Refer to Figure 3 for location of viewing points

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Figure 04-3: LANDSCAPE CHARACTER - Views 7, 8 and 9

Refer to Figure 3 for location of viewing points

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Figure 04-4: LANDSCAPE CHARACTER - Views 10, 11 and 12

Refer to Figure 3 for location of viewing points

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8. VISUAL RESOURCE

8.1 Visual Resource Value / Scenic Quality

The scenic quality of the study area is primarily derived from the combination of landscape types described above and as illustrated in Figures 4-1 to 4-4 above and Figure 5 below. The landscape is dominated by the character types discussed above, i.e. Sundays Thicket on an undulating plain and Citrus Orchards. Two landscape character types that are smaller by area are the Sundays River Valley and associated side streams with Albany Alluvial vegetation, and citrus orchard under shade cloth. A summary of their visual resource values is tabulated in Table 1 below. The Project site occurs within the Sundays Thicket landscape type and is immediately adjacent to existing orchards, both open and under shade cloth (refer to Figure 5). Immediately north of the site are citrus orchards (mostly open), and immediately south of the site is the Sundays Thicket plain, which rises topographically to the south. Refer to Appendix A for the scenic quality rating criteria that have been used to determine the value of the visual resource as indicated in table 1.

Table 1: Value of the Visual Resource

(After The Landscape Institute with the Institute of Environmental Management and Assessment, 2002)

Moderate to High Sundays River Valley with Albany Alluvial vegetation	**Moderate** Sundays Thicket on undulating plains and citrus orchards	**Low to moderate** Citrus under shade cloth
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 of importance to conserve, and which has a powerful sense of place. ***Sensitivity:*** *It is sensitive to change in general and will be detrimentally affected if the change is not appropriately mitigated.*	**This landscape type is considered to have a *moderate* value because it is a:** A 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 potentially sensitive to change in general, and change may be detrimental if not appropriately mitigated.*	**This landscape type is considered to have a *low* value because it is a:** A minimal landscape generally negative in character with few, if any, valued features. ***Sensitivity:*** *It is not sensitive to change in general.*

8.2 Sense of Place

According to Lynch (1992), the sense of place is the extent to which a person can recognize or recall a place as being distinct from other places - as having a vivid, unique, or at least particular, character of its own. The sense of place for the study area derives from combining all landscape types and their impact on the senses. Its sense of place will change depending on the viewer's location relative to these landscape types.

The study area comprises two primary landscape character types, each with its own distinct sense of place.

As illustrated in Views 7, 8 and 9 in Figure 4-3 above, the citrus orchards are culturally relevant to the region and indicative of the dominant aesthetic nature of the broader Sundays River valley. The southern portion of the study area illustrated in Views 4 and 5, Figure 4-2, is typical of the natural thicket landscape that occurs across the sub-region. Although, most of these areas have, to a greater or lesser degree, been impacted. This is true of the areas within and south of the Project site, which exhibit positive characteristics but show evidence of degradation.

The study area's sense of place is mixed, indicating what currently occurs on the site - a combination of natural and cultural elements.

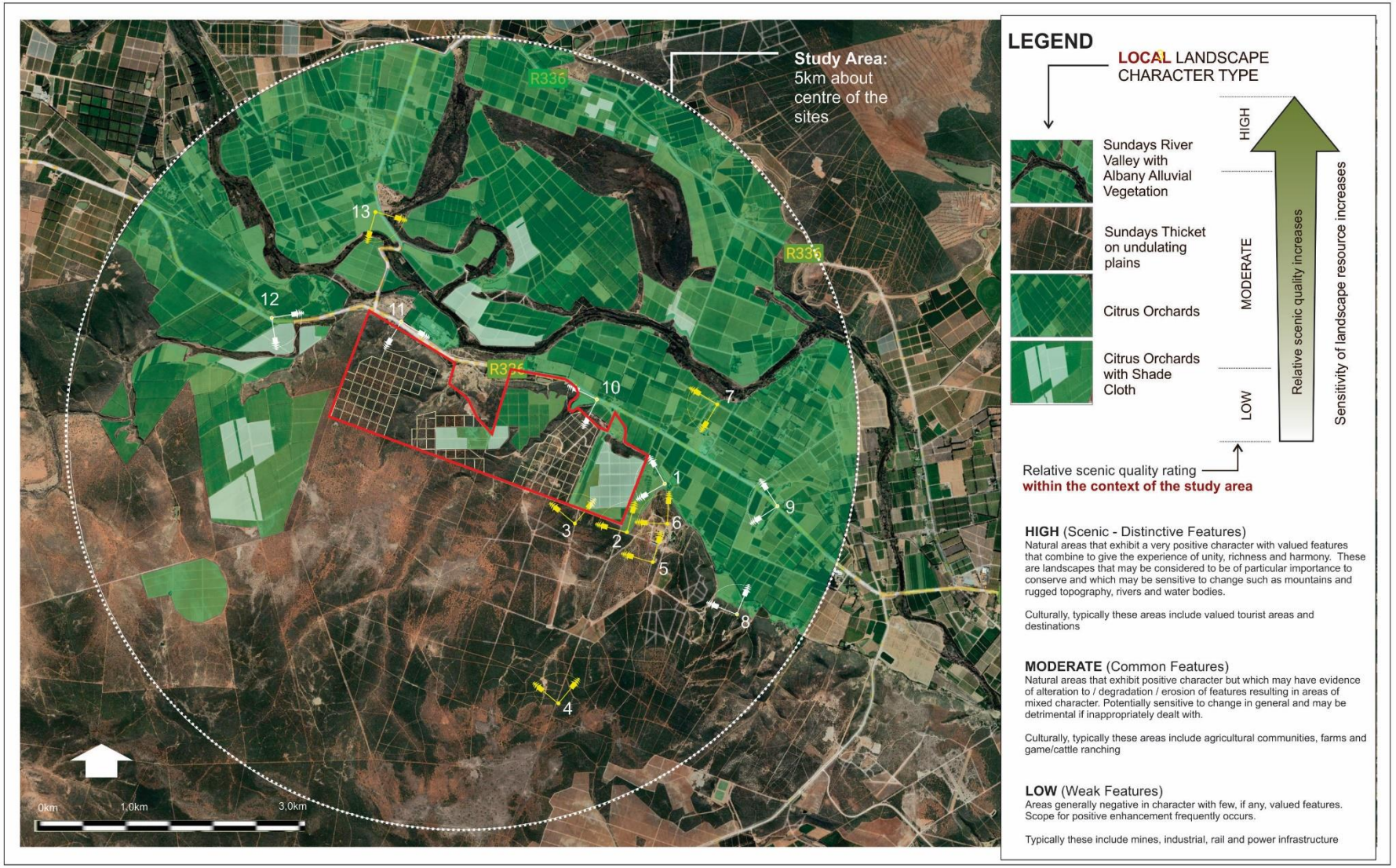

Figure 05: LANDSCAPE SENSITIVITIES - Sontule Citrus

Refer to Figures 4-1 to 4-4 for the panoramas and 8-1 to 8-6 for the simulations from these view points

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9. LANDSCAPE IMPACT

The *landscape impact* (i.e. the change to the fabric and character of the landscape caused by the physical presence of the intervention or development) of the Project is considered to be ***moderate*** and would be most prevalent during the construction phase. Activities associated with the establishment of the proposed citrus orchards will include:

- Vegetation clearing
- Levelling and landscaping the site to provide runoff control and stormwater management
- Establishment of unpaved internal roads to provide internal access within the orchards
- Construction of a new dam
- Installation of irrigation infrastructure
- Planting orchards and windbreaks (if required)
- Erecting shade cloth over the orchards.

The clearing of vegetation and levelling of the site and the building activities associated with the infrastructure will expose lighter-coloured soil during the construction period. These activities will contrast with the existing hues of the site and its immediate surroundings, resulting in a moderate change to the landscape characteristics of the Project site.

As stated in the approach section (Section 3 above), the physical change to the landscape at the Project site must be understood in terms of the Project's visibility and sensitivity (impact on sensitive viewers and viewing areas) and its effect on the visual aesthetics of the area (impact on the baseline visual resource). The following sections discuss the project's impact on the visual and aesthetic environment.

The worst-case scenario of the proposed development is that the entire area designated for citrus orchards will be covered with shade cloth. Therefore, the dominant feature would be the shade cloth structures (i.e., white top and green side sheets). The nature and brightness of these structures have generated concern for the visual impact that they potentially pose. The first inclination to reduce visual impact would be to change the colour of the shade cloth to a darker hue that would blend with existing baseline landscapes and reflect less light. However, this could negate the agronomic benefits that the white colour brings to the productive cultivation of citrus crops. Therefore, a limitation of this report is that further research is required to establish if the benefits from the white cloth can be achieved using a less intrusive colour. However, the worst-case scenario, being the structure with a white shade cloth roof and green sides, will be assessed in this report.

Visual impacts will be caused by activities and infrastructure in both Project phases, i.e., establishment (less than 1-year duration) and operational (long term – the impact will cease after the operational life of the activity). No decommissioning of the project is envisioned. Activities associated with the Project will be visible from varying distances around the site and to varying degrees. During both the establishment and operational phases, the Project's visibility will firstly be influenced by the construction activities described above (i.e., clearing) and ultimately by the physical presence of the citrus orchards under shade cloth.

The ***consequence/intensity*** of the visual impact is determined using visibility, visual intrusion, visual exposure, and viewer sensitivity criteria (moderate to high for this project). When the ***intensity*** of the impact is qualified with spatial, duration and probability criteria, the *significance* of the impact can be predicted (refer to Appendix C for PPC assessment methodology).

10.1 Sensitive 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). Please refer to Appendix B for more information regarding the identification of sensitive receptors.

Based on the above as well as discussions with adjacent landowners, sensitive visual receptors within the study area have been identified (refer to Figures 6 and 7 below). Sensitive visual receptors include people living in or visiting farmsteads and tourist destinations in the study area. These are primarily in the study area's northern and eastern sections, as indicated in Figure 6. Other potential receptors, but less sensitive, include people travelling along the R336 and the local gravel roads that pass through the study area, linking farms and tourist facilities to the R336.

A number of known tourist facilities and accommodations occur along the Sundays River in the far eastern section of the study area north of the R336. Their views are, however, focused on the river and away from the Project site. In addition, a tourist lodge is located in the far northern section of the study area.

The most sensitive areas and receptors within the study area are located immediately south and southeast of the project site. These properties[6] are used for farming, tourism and sports activities. The tourism activities predominantly revolve around hunting, and the use of a long-range shooting facility on the farm. A small guest lodge is in the southern section of the property, approximately 3,2km from the nearest boundary of the Project site. Refer to Figure 6.

Table 2 below summarises potentially sensitive receptors and their locations. Visual sensitivities would arise from these areas/locations by people who would observe changes to the visual and aesthetic baseline of the study area.

Table 2: Potential Sensitivity of Visual Receptors

High	Moderate	Low

[6] The properties are owned by the adjacent landowner, Mr van der Westhuizen who has raised issues regarding the visual impact of the existing shade cloth erected over orchards on Sontule.

People visiting or living in homesteads to the north and east of the project site and within the foreground (up to 800m) and middle-ground of views (i.e. up to a 3.0km from the site). And people/tourists visiting the farms to the south and east of the site.	Locals, visitors and tourists travelling through the study area on the R336 and other local connector roads.	People living and working on farms, travelling along the local roads whose attention may be focused on their work or activity and who, therefore, may be potentially less susceptible to changes in the view.

As indicated above, the two main sensitive viewing areas of concern which have been identified within the study area (~5km radius), are:

- The R336, a local gravel road and surrounding farmsteads/ farms, located north of the Project site
- The adjacent properties south and east of the Project site.

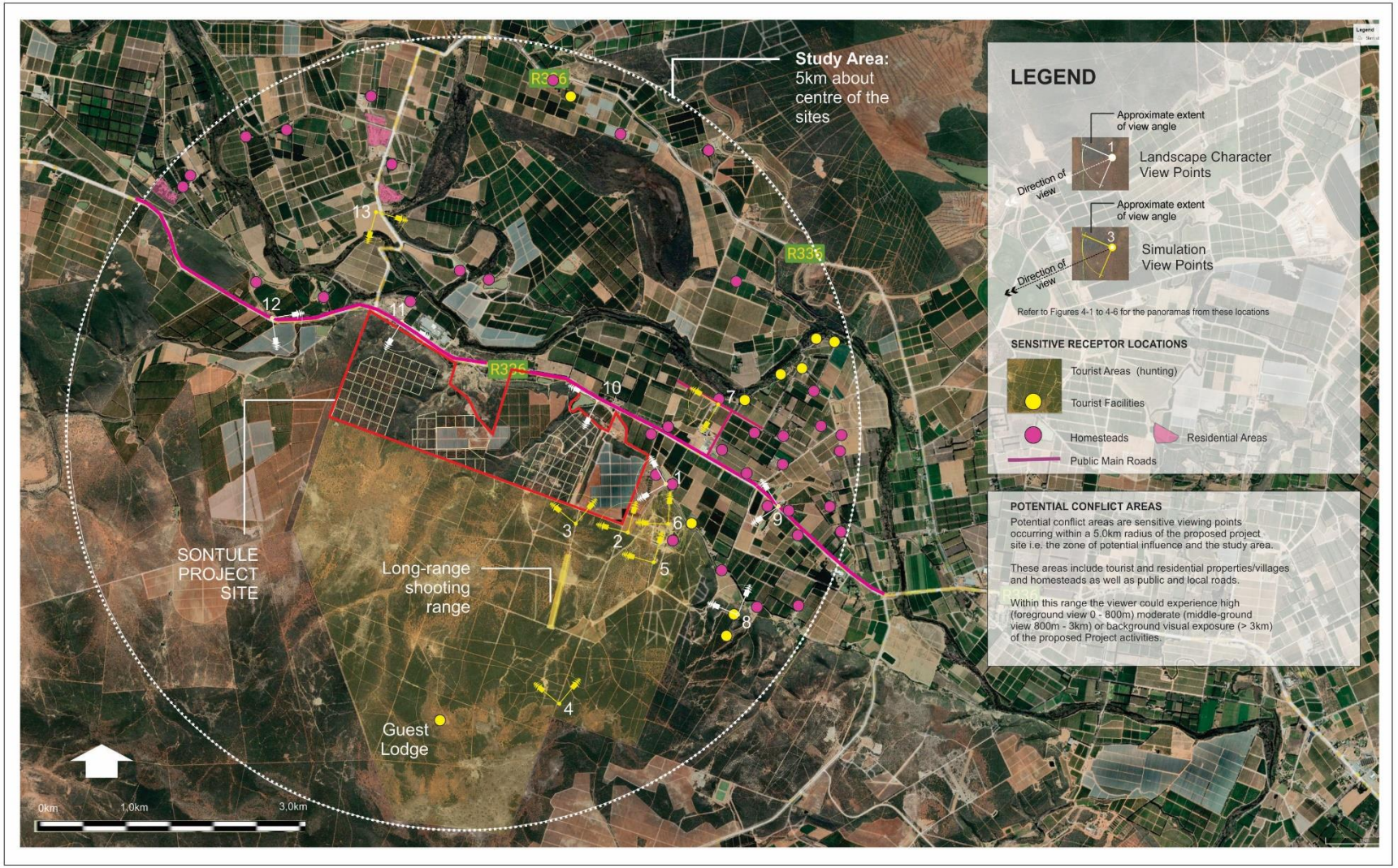

Figure 06: RECEPTOR SENSITIVITIES - Sontule Citrus

Refer to Figures 4-1 to 4-4 for the panoramas and 8-1 to 8-6 for the simulations from these view points

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10.2 Visibility

The 'zone of potential influence' for the Project was established to be a 5,0km radius around the centre of the Project site. Beyond this distance, the impact of the proposed project activities would diminish as they will recede into the background, and/or visibility would be reduced due to atmospheric conditions (haze on days when certain climatic conditions prevail, specifically inversions), topography and vegetative cover. In the form of a low ridge line, topographic relief effectively screens foreground views from the immediate north of the site and along sections of the R336, as indicated in Figure 7 below.

In determining the visibility of the Project, the proposed shade cloth infrastructure was modelled as illustrated in the viewshed analysis in Figure 7. The client has indicated that the shade cloth structure will be a maximum height of 6m, as is the industry standard. Therefore, a series of 6m high off-sets[7] across the development footprint were used to generate the viewshed analyses. The consolidated analysis is shown in Figure 7. This is a theoretical model as only contours were used to model potential visibility.

The screening effect of existing vegetation, citrus orchards, windbreaks and thicket, along with the low ridge line along the northern boundary of the site is relatively high across the study area. Although the viewshed indicates that large swathes of the study area, both north and south of the Project site, would be exposed to views of the development, the on-site observations indicate that many views of Project activities would be partly to completely blocked. This is shown in the simulations in Figures 8-5, 8-6 and 8-7 for views from east and north of the site. The areas south and east of the Project site would also experience partially screened views of the shade cloth structures, due to existing vegetation, orchards and topography. The simulations are in Figures 8-1, 8-3 and 8-4. At no point would all the shade cloth structures be experienced in one view.

[7] i.e. the analyses were generated using a variety of points at 6m above natural ground level.

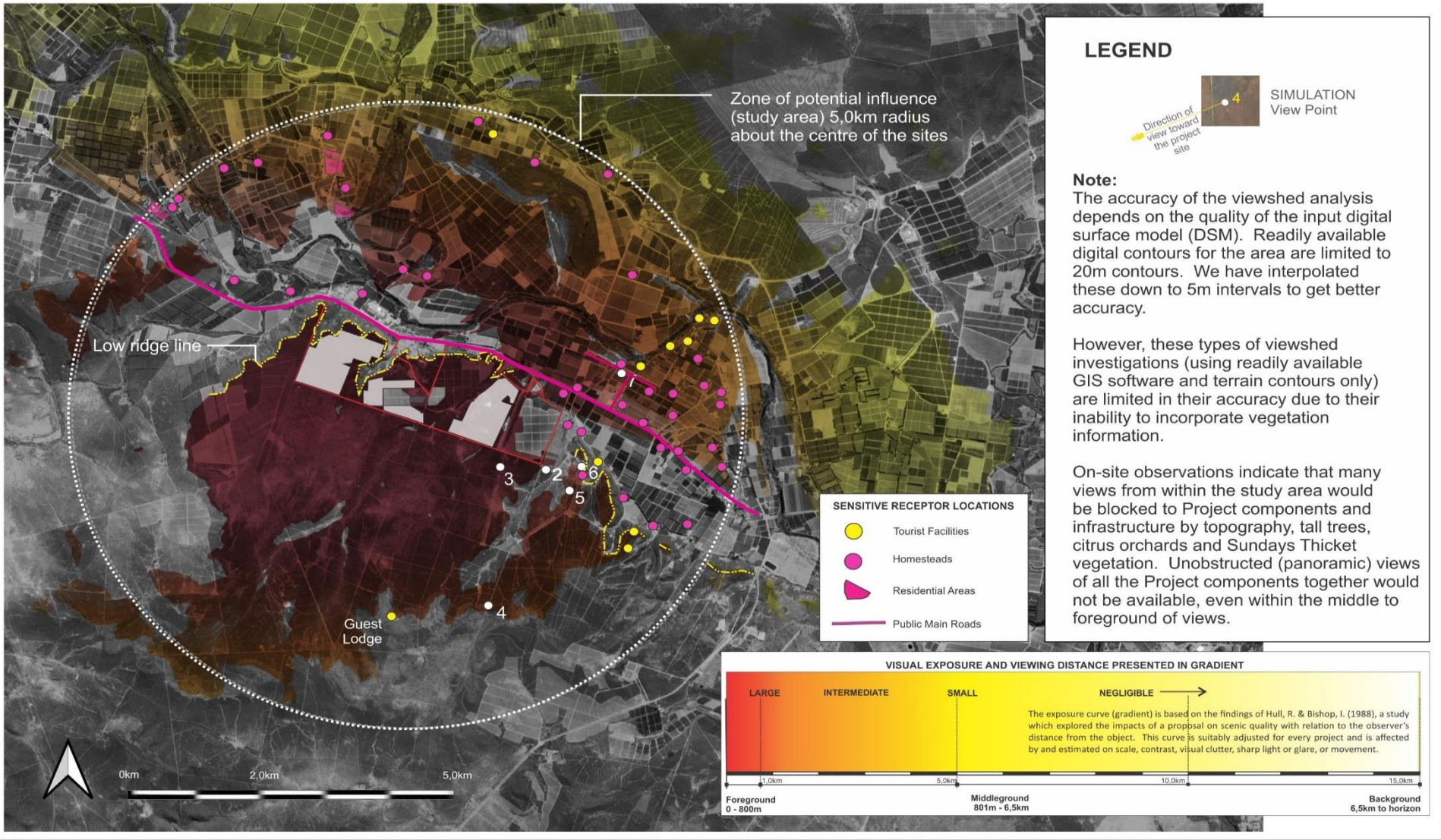

Figure 07: VIEWSHED ANALYSES - Sontule Citrus

Refer to Figures 8-1 to 8-6 for panorama simulations.

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10.3 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.

Visual exposure is determined by qualifying the visibility with a distance rating to indicate the degree of intrusion and visual acuity. Refer to Appendix B which illustrates the effect of distance on visual exposure.

Table 3 below indicates low to high visual exposure for the sensitive viewing areas identified within the study area, as discussed in Sections 10.1 and 10.2 above The table summarizes visual exposure of the proposed development. The worst-case scenario is rated *high* based on the summary results in Table 3.

Table 3: Visual Exposure

Sensitive Viewing Areas	**Distance**		
	Foreground view, i.e. 0 – 800m from Project Sites	Middle-ground view, i.e. 800m to – 3,0km from Project Sites	Background view i.e. > 3,0km from Project Sites
The R336, local gravel road and farmsteads/ farms generally north of the Project site		**X** mostly partially screened by vegetation and/or topography	**X** mostly screened or no exposure
The adjacent properties south and east of the Project site.	**X** some open to partially obstructed views in the foreground as in View 3 Figure 8-2	**X** mostly partially screened by vegetation and/or topography	**X** mostly screened or no exposure

10.4 Visual Intrusion

Visual intrusion deals with contextualism, i.e. how well does a project component fit with or disrupt/ enhance the ecological and cultural aesthetic of the landscape as a whole? It ties in with the concept of visual absorption capacity (VAC), which, in this instance, is ***moderate***, for the project study area, due to the screening effect of topographic relief and existing vegetation. With regards to the shade cloth structures, which will be prominent in the landscape, from certain viewpoints, the colour of the cloth will vary from bright white (when the sun is directly behind the viewer) to greyish white (during cloudy conditions or when the viewer is looking towards the sun with the structures in the view). It should also be noted that Sontule is currently a working Citrus farm with a mixture of existing citrus orchards, some of which are open and others are under shade cloth, and open, undeveloped land covered with Sundays Thicket vegetation. Thus, the proposed development: citrus orchards under shade cloth and associated infrastructure, would contextually not appear completely out of context within the site's boundaries nor for the sub-region, which is culturally renowned for its citrus orchards.

The simulations in Figures 8-1 to 8-7 illustrate the effect that the shade cloth structures would have on sensitive views when observed from the two primary sensitive viewing areas identified earlier, i.e.

- The R336, a local gravel road and surrounding farmsteads/ farms, located north of the Project site
- The adjacent properties south and east of the Project site.

These modelled depictions represent the worst-case scenario during the operational phase when the shade cloth structures are in place, covering the proposed citrus orchards. They occur in a landscape of mixed visual character with a moderate VAC. The result is a potentially ***high*** visual intrusion for viewpoints located close to the Project site, as the bright structures would negatively affect the baseline's visual quality and sense of place.

Views that would experience the highest intrusion are those from the adjacent property immediately south of the site, as illustrated in Figure 8-2 (typical of a foreground view) and Figures 8-3 and 8-4 (typical of middle-ground views). Moderate to lowest intrusion would be experienced from areas north of the site, as illustrated in Figures 8-6 and 8-7. The western cluster of orchards would be the most exposed as they would be established on the property's highest elevation. Table 4 summarizes these ratings.

Table 4: Visual Intrusion

High	**Moderate**	**Low to none**
The adjacent property south of the Project site within 800m of the Sontule property boundary	The adjacent properties south and east of the Project site beyond 800m of the Sontule property boundary The R336, local gravel road and farmsteads/ farms north of the Project site.	The remainder of the study area
The Project would have a substantial adverse effect on the visual quality (sense of place) of the landscape relative to the landscape because it would: • Contrast dramatically with the patterns or elements that define the structure of the baseline landscape.	The Project would have a moderate negative effect on the visual quality (sense of place) of the landscape: • Contrast with the current patterns or elements that define the structure of the landscape. • Be partially compatible with land use (industrial), settlement or enclosure patterns of the general area;	The Project would have a minimal effect on the visual quality (sense of place) of the landscape: • Contrasts minimally with the patterns or cultural elements that define the structure of the landscape. • Is compatible primarily with land use, settlement, or enclosure patterns;
RESULT: A notable change in landscape characteristics over an extensive area and an intensive change over a localized area resulted in major key views changes.	*RESULT:* A moderate change in landscape characteristics over a localized area resulting in a moderate change in key views.	*RESULT:* A minimal change resulting in a minor change to key views / sensitive viewing areas.

10.5 The effects of night lighting

The impact of lights at night is a sensitive issue associated with development projects. I&APs consistently raise the impact of night lighting, specifically if they can be seen from tourist and residential sites and when the effect

would continue for the life of the Project. However, it is assumed that there will be no night-time activities associated with the proposed agricultural expansion on Sontule.

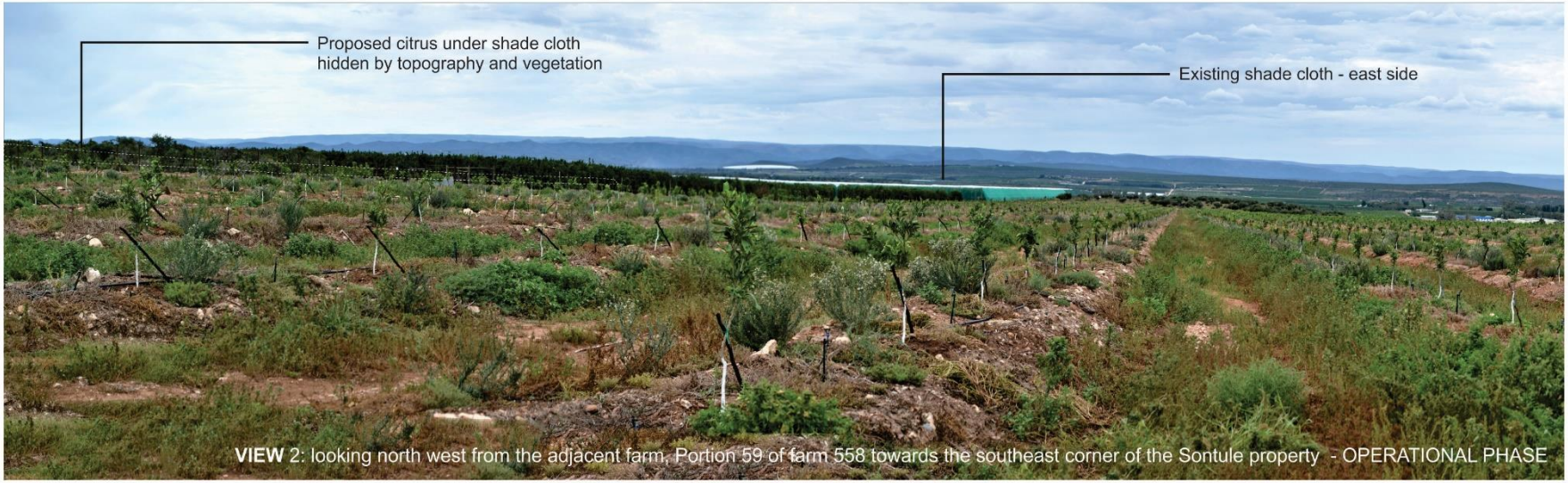

Figure 8-1: SIMULATION VIEW 2 - Sontule Citrus

Refer to Figure for the location of the view points

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Figure 8-2: SIMULATION VIEW 3 - Sontule Citrus

Refer to Figure for the location of the view points

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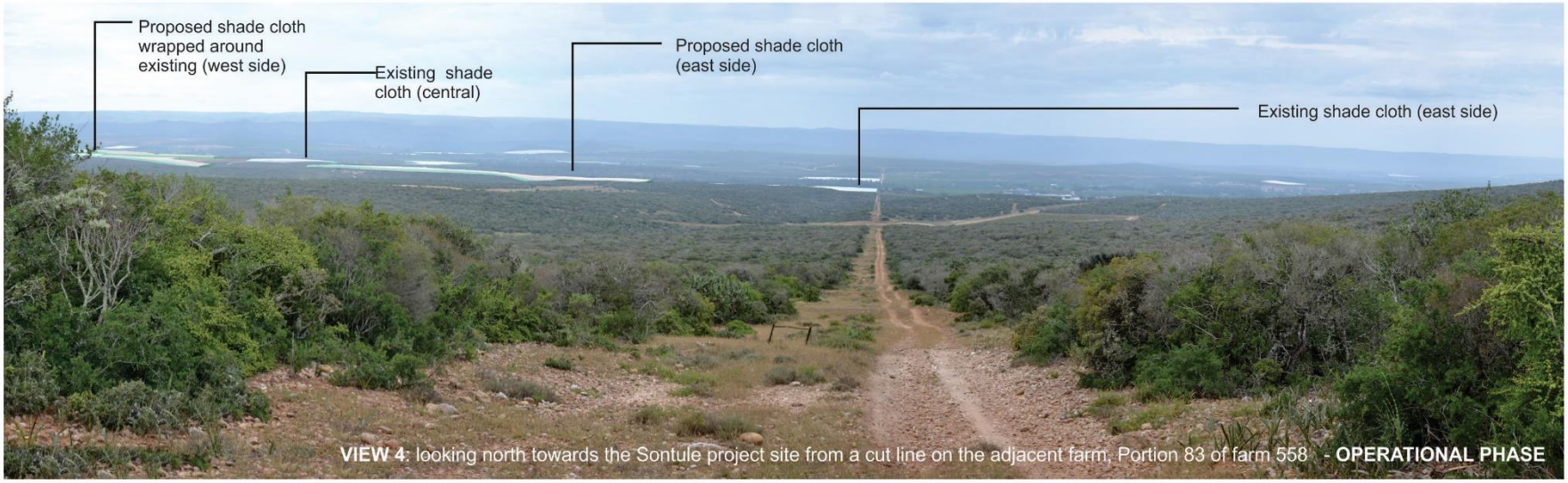

Figure 8-3: SIMULATION VIEW 4 - Sontule Citrus

Refer to Figure for the location of the view points

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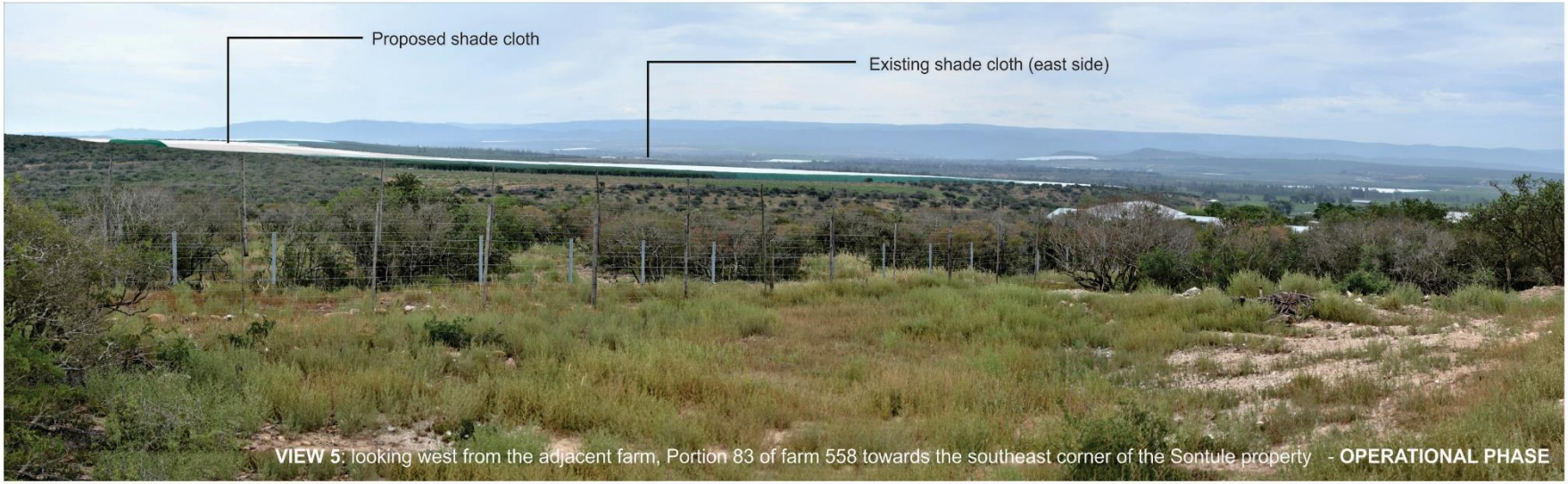

Figure 8-4: SIMULATION VIEW 5 - Sontule Citrus

Refer to Figure for the location of the view points

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Figure 8-5: SIMULATION VIEW 6 - Sontule Citrus

Refer to Figure for the location of the view points

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Figure 8-6: SIMULATION VIEW 7 - Sontule Citrus

Refer to Figure for the location of the view points

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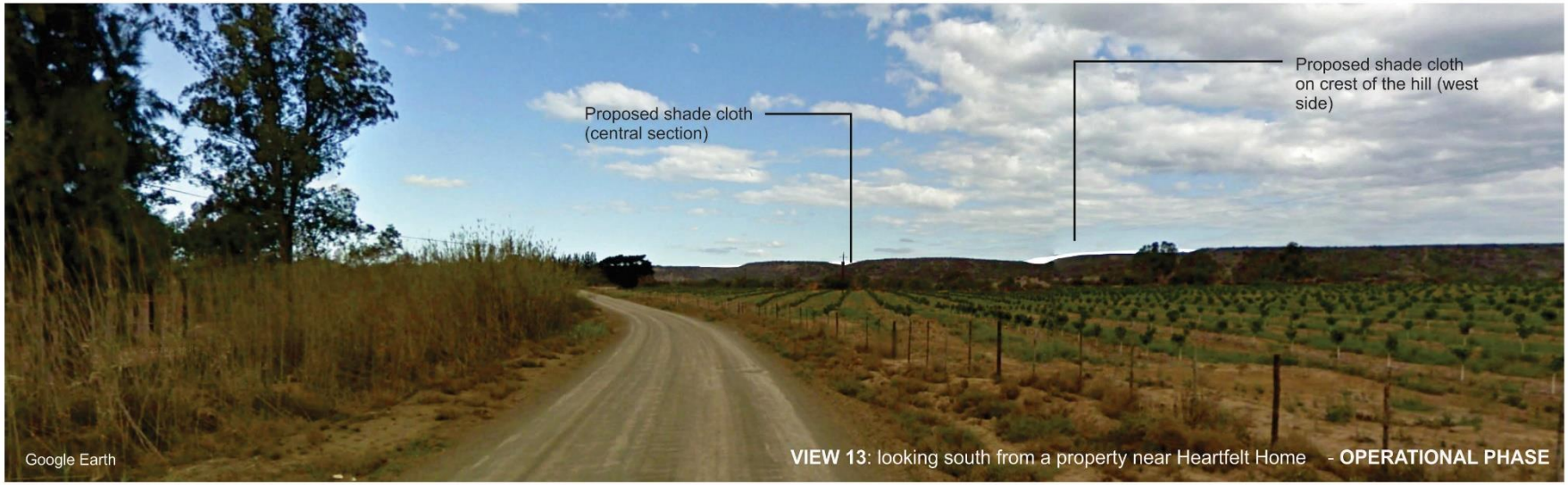

Figure 8-7: SIMULATION VIEW 13 - Sontule Citrus

Refer to Figure for the location of the view points

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10.6 The intensity of Visual Impact

Referring to the discussions above and using the criteria listed in Appendix B, the *intensity* of the visual impact of the Project is rated in Table 5 below for all phases of the project. To assess the *intensity* of impacts, 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 within the context of the landscape's VAC.
- *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.

In synthesizing the 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 (LI-IEMA 2013). ***Visual exposure is rated high for sensitive viewing areas within 800m south of the Sontule property boundary***. However, it should be noted that the primary tourist activity (hunting) on the adjacent property (4/632) would most likely take place further away from the Sontule property boundary, and more than 800m, thus reducing a receptor's visual exposure to the shade cloth structures. Hunting activities would likely be directed generally to the southern and western section of the farm, away from Sontule likely due to elevation sloping down in a northern direction, eliminating the chance of stray bullets entering populated areas. The long-range shooting range (of international standard) on the 4/632 property is orientated to shoot from the south to the north; again, away from Sontule. Whilst these activities benefit from the general natural aesthetic of the adjacent property, the focus of the activities is on the prey and the shooting range target, and the property is situated in a sub-region dominated by citrus orchard and associated infrastructural activities.

Therefore, moderate intensity is predicted for sensitive areas beyond 800m, north, south and east of the Project site. The western and south-eastern extremities of the study area will have no visual impact as views from these areas are screened by local topography (Figure 7).

Table 5: *Intensity* of impacts of the proposed Project (without mitigation)

HIGH	MODERATE	LOW	NEGLIGIBLE TO NONE
Areas on the adjacent property south of the Project site for foreground views (i.e. within 800m of the property boundary).	Areas on the adjacent properties south and east of the Project site for middle ground views (beyond 800m of the property boundary). The R336, local gravel road and farmsteads/ farms generally north of the Project site.	Areas at the far northern extremes of the study area from northwest to north-east of the site.	Remainder of the study area specifically the western, southern and eastern extremes of the study area
Major loss of or alteration to key elements / features / characteristics of the baseline landscape.	Partial loss of or alteration to key elements / features / characteristics of the baseline landscape.	Minor loss of or alteration to key elements / features / characteristics of the baseline landscape.	Very minor loss or alteration to key elements/features/charact

i.e. Pre-development landscape or view and / or introduction of elements considered to be uncharacteristic when set within the attributes of the receiving landscape. ***High scenic quality impacts would result.***	i.e. Pre-development landscape or view and / or introduction of elements that may be prominent but may not necessarily be substantially uncharacteristic when set within the attributes of the receiving landscape. ***Moderate scenic quality impacts would result***	i.e. Pre-development landscape or view and / or introduction of elements that may not be uncharacteristic when set within the attributes of the receiving landscape. ***Low scenic quality impacts would result.***	eristics of the baseline landscape i.e. Pre-development landscape or view and / or introduction of elements that is not uncharacteristic with the surrounding landscape – approximating the 'no change' situation. ***Negligible scenic quality impacts would result.***

11. MANAGEMENT MEASURES

In considering mitigating measures, three rules are considered - the standards should be feasible (economically), effective (how long will it take to implement), and what provision is made for management/maintenance) and acceptable (within the framework of 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 existing landscape character and the needs of the locality. They should respect and build upon landscape distinctiveness.
- It should be recognized that many mitigation measures, especially the establishment of planted/ vegetation screens and rehabilitation, are not immediately effective.

The following mitigation measures are recommended for the Project and should be included as part of the Environmental Management Programme Report (EMPR).

11.1 Planning and site development

- With the preparation of the land onto which infrastructural activities (dam and other support infrastructure) will take place, clearance of existing vegetation and topsoil should be avoided outside of the development footprint (infrastructure and orchards).
- Ensure, wherever possible, that all the natural indigenous vegetation is retained and incorporated into the site rehabilitation.
- Retain a 20m vegetative buffer zone along the southern boundary and a 10m buffer along the western boundary.
- Construction activities should be limited to reasonable daylight working hours, so as to avoid light pollution
- Adopt responsible construction practices aimed at containing the establishment activities to specifically demarcated areas.

11.2 Landscaping and ecological approach to rehabilitation

- Re-vegetation should be undertaken, where needed (rehabilitation of disturbed areas during construction activities), based on an ecological approach and should include indigenous plants species. Indigenous vegetation will also limit visual impact, as it is synonymous with the current landscape, and maintains biodiversity. This approach can also significantly reduce long term costs as less maintenance would be required over conventional landscaping methods as well as the introduced landscape is more sustainable.

11.3 Shade Cloth Structures

Notwithstanding the comment in Section 10 regarding the purpose of shade cloth over citrus orchards, consider another less intrusive colour that would blend with the existing hues of the baseline landscape.

11.4 Good housekeeping

- During operation, all roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the

road surface.

- Dust suppression techniques must also be applied to all areas prone to produce dust other than working areas.

11.5 Light Pollution

Light pollution is primarily the result of bad lighting design, which allows artificial light to shine outward and upward into the sky, where it is not wanted, instead of focusing the light downward, where it is needed. Ill-designed lighting washes out the night sky's darkness and radically alters the light levels in rural areas where light sources shine as ‘beacons’ against the dark sky and are generally not wanted.

Light pollution is perhaps the most easily remedied of all the visual pollution faced. Simple changes in lighting design and installation yield immediate changes in the amount of light spilt into the atmosphere. In areas where daylight working hours cannot be enforced, lights are needed. It is assumed that there will be limited to no night-time activities required for the proposed agricultural expansion. However, the following measures must be considered should the Project require lighting design:

- Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the site, i.e. lights are to be aimed away from adjacent residential areas.
- Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on illegal entry to the site.
- Minimise the number of light fixtures to the bare minimum, including security lighting.

12. SIGNIFICANCE OF VISUAL IMPACT

The *Intensity* of the impacts, rated in Table 5 above, is further qualified with *scale (extent)*, *duration* and *probability* criteria to determine the *significance* of the visual impact. Tables 6 and 7 below summarise in detail the *significance* of the visual impacts during all phases of the project. These results are based on the worst-case scenario when the impacts of all aspects of the Project are taken together using the impact criteria in Appendix C. The primary receptor areas of concern are:

- From the adjacent properties south and east of the Project site, and
- The R336, local gravel road and farmsteads/ farms north of the Project site.

12.1 Construction Phase

The following Construction phase activities would cause visual and sense of places impacts and include:

- Vegetation clearing
- Levelling and landscaping the site to provide runoff control and stormwater management
- Establishment of unpaved internal roads to provide internal access within the orchards
- Construction of a new dam
- Installation of irrigation infrastructure
- Planting orchards
- Erecting shade cloth over the orchards.

CONSTRUCTION PHASE IMPACTS

Direct impacts

Vegetation Clearing – Change in the Landscape

Nature of Impact	Impact on the visual environment and sense of place as a result of the clearing of indigenous vegetation – change in landscape character
Extent	Local (**Medium**)
Duration	Temporary (less than 1 year) (**Low**)
Intensity	Moderate (**Medium**)
Probability	Highly probable
Degree of Confidence	**High**
Reversibility	**Partially reversible** (if the project does not proceed to the Operational Phase)
Irreplaceable Loss of Resources	**Partially replaceable** (if the project does not proceed to the Operational Phase)
Status and Significance (Without mitigation)	**Medium Negative** (-) The impact/risk will result in moderate alteration of the environment and will have an influence on decision-making if not mitigated. The impact will reduce moderately with the implementation of the appropriate mitigation measures, but the significance of the impact is expected to remain Medium.
Mitigation	• Development footprints should be demarcated and clearing to occur within demarcated areas • Ensure, wherever possible, that natural indigenous vegetation is retained and incorporated into the site rehabilitation – in order to retain landscape characteristics • Establish a 50m buffer zone of indigenous vegetation along the southern boundary and a 10m buffer along the site's western edge.

Status and Significance (After mitigation)	**Medium Negative** (-)

Vegetation Clearing – Dust Generation

Nature of Impact	Dust generation because of clearing may cause a visual impact.
Extent	Local (**Medium**)
Duration	Temporary (less than 1 year) (**Low**)
Intensity	**Low**
Probability	Highly probable
Degree of Confidence	**High**
Reversibility	**Partially reversible** (if the project does not proceed to the Operational Phase)
Irreplaceable Loss of Resources	**Partially replaceable** (if the project does not proceed to the Operational Phase)
Status and Significance (Without mitigation)	**Low Negative** (-) Vegetation clearing may result in dust generation, causing undesirable impact on visual receptors. The impact can be avoided with the implementation of the appropriate mitigation measures.
Mitigation	• Development footprints should be demarcated and clearing to occur within demarcated areas • Ensure, wherever possible, that natural indigenous vegetation is retained and incorporated into the site rehabilitation. • Establish a 50m buffer zone of indigenous vegetation along the southern boundary and a 10m buffer along the site's western edge. Dust suppression techniques must also be applied to all areas prone to produce dust other than working areas i.e., wetting where needed.
Status and Significance (After mitigation)	**Very Low** Negative (-)

Erecting of Shade Cloth over Orchards

Nature of Impact	Direct impact on the visual environment and sense of place as a result of the proposed shade cloth and installation thereof. This impact refers to the construction of the shade cloth structures and will include 6 meters high poles spaced at regular intervals and metal wire anchors across the footprint.
Extent	Local (**Medium**)
Duration	Temporary (less than 1 year) (**Low**)
Intensity	Moderate (**Medium**)
Probability	Highly probable
Degree of Confidence	High
Reversibility	Partially reversible (if the project does not proceed to the Operational Phase)
Irreplaceable Loss of Resources	Partially replaceable (if the project does not proceed to the Operational Phase)
Status and Significance (Without mitigation)	**Medium Negative** (-) The impact/risk will result in moderate alteration of the environment and will have an influence on decision-making if not mitigated. The impact will reduce moderately with the implementation of the appropriate mitigation measures, but the significance of the impact is expected to remain moderate.
Mitigation	• Clearance of existing natural vegetation and topsoil should not be removed outside of the development footprint of infrastructural areas.

	• Ensure, wherever possible, that natural indigenous vegetation is retained and incorporated into the site rehabilitation. • Establish a 20m buffer zone of indigenous vegetation along the southern boundary and a 10m buffer along the site's western edge. • Construction activities should be limited to reasonable daylight working hours • Dust suppression techniques must also be applied to all areas prone to produce dust other than working areas. • If lighting is required, appropriate lighting design and installation to eliminate light being spilt into the atmosphere and beyond the site is required.
Status and Significance (After mitigation)	**Medium Negative** (-)

Light Pollution Impacts

Nature of Impact	Light pollution - This impact refers to the use of flood lights at night during construction, if needed
Extent	Local (**Medium**)
Duration	Temporary (less than 1 year) (**Low**)
Intensity	**Medium**
Probability	Unlikely
Degree of Confidence	**High**
Reversibility	**Reversible**
Irreplaceable Loss of Resources	**N/A**
Status and Significance (Without mitigation)	**Medium Negative** (-) Light pollution is primarily the result of bad lighting design, which allows artificial light to shine outward and upward into the sky, where it is not wanted or where it does not naturally occur. It has a significant impact on the night light character associated with the area. The impact will reduce significantly with the implementation of the appropriate mitigation measures.
Mitigation	• Construction should be limited to normal daylight working hours (8am to 5pm) • Establish a 50m buffer zone of indigenous vegetation along the southern boundary and a 10m buffer along the site's western edge. • Should lighting be required, it should be angled appropriately (downward) and appropriate lumen strength should be used. • If lighting is required, appropriate lighting design and installation to eliminate light being spilt into the atmosphere and beyond the site is required.
Status and Significance (After mitigation)	**Low Negative** (-)

12.2 Operational Phase

Operational activities which would cause direct visual and sense of place impacts are:

- The physical presence of the orchards and shade cloth structures and associated infrastructure.

DIRECT IMPACTS

Visual Impact of Shade Cloth Over Citrus Orchards

Nature of Impact	The impact of the shade cloth on the visual environment and sense of place of the study area caused by the physical presence of shade cloth structures that appears in contrast with the landscape character.
Extent	Local (**Medium**)
Duration	Long Term – Permanent (**High**)
Intensity	**Moderate**
Probability	**Highly Probable**
Degree of Confidence	**High**
Reversibility	Reversible if shade cloth structures are removed or not erected
Irreplaceable Loss of Resources	Partially replaceable if shade cloth structures are removed
Status and Significance (Without mitigation)	**Medium Negative** (-) The impact/risk will result in moderate alteration of the environment and will have an influence on decision-making if not mitigated. The impact will reduce moderately with the implementation of the appropriate mitigation measures, but the significance of the impact is expected to remain Medium.
Mitigation	• Maintain the proposed 50m vegetative buffer zone around the development footprint • Natural colours (i.e., green or brown) to be used for side walls • Maintain shade cloth in a good condition ○ Regular checks should be undertaken for damaged, tears or flapping shade cloth and must be repaired as soon as possible. • Should operations (i.e., picking season) occur outside of normal daylight working hours, appropriate lighting (of appropriate lumen and downward angles) should be ensured.
Status and Significance (After mitigation)	**Medium Negative** (-)

INDIRECT IMPACTS

Impacts on Tourism

Nature of Impact	Although the area is characterised by citrus orchards and some shade cloth there could be an indirect impact on tourism, especially traveling on the main R336 and hunting operations on adjacent farms. The presence of the development, including shade cloth, may alter the sense of place for visitors.
Extent	Local (**Low**)
Duration	Long Term – Indefinite (**High**)
Intensity	**Low**
Probability	**Possibly**
Degree of Confidence	**Medium**
Reversibility	**Reversible** if shade cloth structures are removed or not erected
Irreplaceable Loss of Resources	N/A
Status and Significance (Without mitigation)	**Low Negative** (-) The impact/risk will result in an alteration of the environment and will have an impact on tourism in the area. The impact will reduce slightly with the implementation of the appropriate mitigation measures.
Mitigation	• Maintain the proposed 50m vegetative buffer zone around the development footprint, especially along the southern boundary.

	• Natural colours (i.e., green or brown) to be used for side walls • Maintain shade cloth in a good condition ○ Regular checks should be undertaken for damaged, tears or flapping shade cloth and must be repaired as soon as possible. • Should operations (i.e., picking season) occur outside of normal daylight working hours, appropriate lighting (of appropriate lumen and downward angles) should be ensured.
Status and Significance (After mitigation)	**Low Negative** (-)

13. CUMULATIVE IMPACTS

Cumulative landscape and visual impacts result from 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 occur in the foreseeable future. They may also affect the way in which the landscape is experienced. Cumulative effects may be positive or negative.

Should the Project go ahead, it would be operational in the long term. It is proposed at the interface of the two prominent landscape character types in the study area, Citrus Orchards (with some shade cloth structures) and natural land covered with Sundays Thicket vegetation. The site is a microcosm of this interface as it contains both natural and developed citrus areas.

The effects of the Project alone have been rated of **Medium Negative** (-) significance. When taken together with the negative effects of existing citrus orchards under shade cloth, which occur across the study area and the sub-region, the negative cumulative effect would remain **Medium Negative**. The proposed Sontule project would not appear uncharacteristic when set against the visual attributes of the site's immediate surroundings and the dominant land use of the sub-region.

14. CONCLUSION

14.1 Baseline

The existing visual condition of the landscape that may be affected by the proposed Project has been described. The study area is dominated by two main landscape character types, namely, Sundays Thicket on an undulating plain and Citrus Orchards. The visual integrity of the orchards landscape type and the study area generally is being visually impacted by the shade cloth structures, which contrast with the existing dark green and brown hues of the environment.

The study area's scenic quality is of a mixed character rated *low* (orchards with shade cloth) to *high* (Sundays Thicket on undulating plains). The site, which straddles three of the landscape character types, is also of mixed visual character and is potentially sensitive to change if the change is not effectively mitigated. Sensitive viewing areas and receptors have been identified and mapped, indicating sensitivity to the project.

14.2 Visual Impacts

Visual impacts are highest when receptors are sensitive to change, and their view is focused on and dominated by the change. The Project's visual impact will cause changes in the landscape that are noticeable to receptors living in and visiting residences, tourist areas, and public roads to the south, north and east of the project site. It has been established that the most sensitive receptors are visitors to and residents of the property immediately to the south of the site. Tourism (hunting and a small guest lodge) and sporting (long-range target shooting) activities occur here. However, views from the property towards the project activities already contain features associated with citrus production and the ever-increasing establishment of shade cloth structure, thus mitigating the potential impact of the proposed Sontule project.

The significance of the worst-case scenario impact on the various sensitive receptor areas during the CONSTRUCTION PHASE is a direct negative impact that is partially reversible. The overall impact is predicted to be **Medium Negative** (-), i.e. the impact/risk will result in a notable alteration of the environment where the environment continues to function but in a modified manner. It will have an influence on decision-making if not mitigated. The impact will reduce moderately with the implementation of the appropriate mitigation measures, but the significance of the impact is likely to remain Medium Negative.

During the OPERATIONAL PHASE, a direct, partially reversible (should the shade cloth structures be removed) negative impact is predicted. The long-term impact is assessed as **Medium Negative** (-), i.e. the impact/risk will result in a notable alteration of the environment where the environment continues to function but in a modified manner. The impact would remain Medium Negative even with the effective implementation of mitigation measures, and it will have an influence on decision-making.

14.3 Cumulative Impact

The effects of the Project alone have been rated of **Medium Negative** (-) significance. When taken together with the negative impacts of existing citrus orchards under shade cloth, which occur across the study area and the sub-region, the negative cumulative effect would remain **Medium Negative** (-). The proposed Sontule project would not appear uncharacteristic when set against the visual attributes of the site’s immediate surroundings and the dominant land use of the sub-region.

14.4 Authors Opinion

From a potential visual impact perspective, the author's opinion is that all aspects of the Sontule Citrus Project should be approved, provided that the mitigation/management measures are effectively implemented, managed, and monitored in the long term.

*** GYLA ***

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To reach an understanding of the effect of development on a landscape resource, it is necessary to consider the various 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, valleys, savannah, trees, water bodies, buildings and roads are generally quantifiable and can be easily described.

Landscape character is therefore the description of 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 the way in which 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 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 group of people or the ability of the landscape to convey special meanings to viewers in general.
- *Landmark quality*: a 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 recognize 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 recognized and therefore, keen 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 emphasize 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 man-made 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 generally applied to units which would normally rate extremely 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 appear to be relatively 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 recognize 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 valley 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; generally mute tones. **1**
Influence of adjacent scenery	Adjacent scenery greatly 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 rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. National and provincial parks and conservation areas *** 5+**	Distinctive, though somewhat like others within the region. **3**	Interesting within its setting, but common within the region. **1**
Cultural modifications	Modifications add favourably to visual variety while promoting visual harmony. **2**	Modifications add little or no visual variety to the area and introduce no discordant elements. **0**	Modifications add variety but are very discordant 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 considered to be 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 considered to be 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 (2013))

High	Moderate	Low
Areas that exhibit a 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 generally negative in character with few, if any, valued features. Scope for positive enhancement frequently occurs.

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)).

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 localized area resulting in major changes in key views.	*Result* Moderate change in landscape characteristics over localized 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:

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

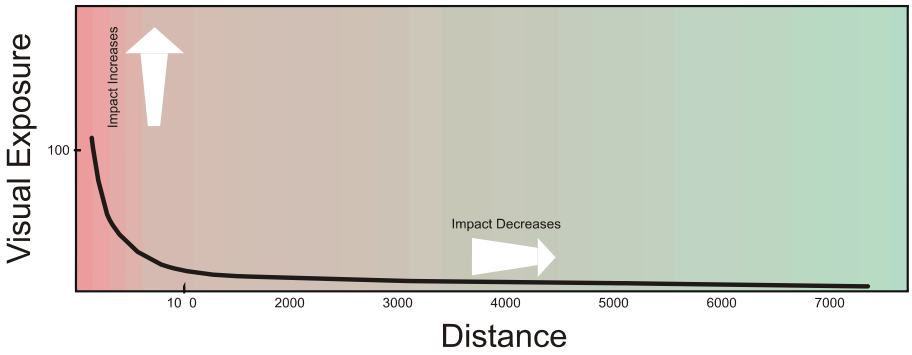
8.0km.

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.

Effect of Distance on Visual Exposure



View from 10 000 metres

View from 5 000 metres

View from 3 000 metres

View from 1 000 metres

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).

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. Communities where the development results in changes in the landscape setting or valued views enjoyed by the community.	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.	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 (i.e. office and industrial areas). Roads going through urban and industrial areas

Occupiers of residential properties with views affected by the development.		

Intensity 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)).

Intensity (Intensity) of Visual Impact

High	Moderate	Low	Negligible
Total loss of or major alteration to key elements/features/characteristics of the baseline.	Partial loss of or alteration to key elements/features/characteristics of the baseline.	Minor loss of or alteration to key elements/features/characteristics of the baseline.	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 considered to be totally uncharacteristic when set within the attributes of the receiving landscape.	I.e. Pre-development landscape or view and/or introduction of elements that may be prominent but may not necessarily be substantially uncharacteristic when set within the attributes of the receiving landscape.	I.e. Pre-development landscape or view an/or introduction of elements that may not be uncharacteristic when set within the attributes of the receiving landscape.	I.e. Pre-development landscape or view and/or introduction of elements that are not uncharacteristic with the surrounding landscape – approximating the 'no change' situation.

High scenic quality impacts would result.	Moderate scenic quality impacts would result	Low scenic quality impacts would result.	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: SIGNIFICANCE OF IMPACT RATING

As per Guideline Document 5: Assessment of Alternatives and Impacts, the following methodology[8] is to be applied to the prediction and assessment of impacts and risks. Potential impacts should be rated in terms of the direct, indirect and cumulative.

- **Direct** impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect** impacts of an activity are indirect or induced changes that may occur because of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.
- **Cumulative** impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over time and can include both direct and indirect impacts.
- **Spatial extent** – The size of the area that will be affected by the impact/risk
  - Site specific
  - Local (<2 km from site)
  - Regional (within 30 km of site)
  - National
- **Consequence/Intensity** –The anticipated severity of the impact/risk
  - Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease)
  - High (severe alteration of natural systems, patterns or processes i.e. where environmental functions and processes are altered such that they temporarily or permanently cease)
  - Medium (notable alteration of natural systems, patterns or processes i.e. where the environment continues to function but in a modified manner)
  - Low (negligible alteration of natural systems, patterns or processes i.e. where no natural systems/environmental functions, patterns, or processes are affected)
- **Duration** –The timeframe during which the impact/risk will be experienced
  - Temporary (less than 1 year)
  - Short term (1 to 6 years)
  - Medium term (6 to 15 years)
  - Long term (the impact will cease after the operational life of the activity)
  - Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient)
- **Reversibility** – The degree to which the potential impacts/risks can be reversed
  - Reversible
  - Partially Reversible
  - Irreversible
- **Irreplaceable loss of Resources** - The degree to which the impact/risk may cause irreplaceable loss of resources
  - Replaceable
  - Partially Replaceable
  - Irreplaceable

Using the criteria above, the impacts will further be assessed in terms of the following:

[8] Supplied by Public Process Consultants, Gqeberha

- **Probability** –The probability of the impact/risk occurring
  - Improbable (little or no chance of occurring)
  - Probable (<50% chance of occurring)
  - Highly probable (50 – 90% chance of occurring)
  - Definite (>90% chance of occurring)

- **Significance** – Will the impact/ risk cause a notable alteration of the environment?
  - Low to very low (the impact/risk may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making)
  - Medium (the impact /risk will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures and will only have an influence on the decision-making if not mitigated).
  - High (the impact/risk will result in major alteration to the environment even with the implementation of the appropriate mitigation measures and will have an influence on decision-making)
  - Very high (the impact/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating).

- **Status** - Whether the impact/risk on the overall environment will be positive, negative or neutral
  - "+" (positive - environment overall will benefit from the impact/risk).
  - "-" (negative - environment overall will be adversely affected by the impact/risk).
  - "o" (neutral - environment overall will not be affected).

- **Confidence** – The degree of confidence in predictions based on available information and specialist knowledge
  - Low
  - Medium
  - High

Impacts, mitigatory measures and the monitoring of impacts will then be collated into the EMPr and these will include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Positive impacts will be identified, and mitigation measures will be identified to potentially enhance positive impacts where possible.

Management Actions and Monitoring of the Impacts:

- Where negative impacts are identified, mitigatory measures will be identified to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Where positive impacts are identified, mitigatory measures will be identified to potentially enhance positive impacts.

The table below is to be used by specialists for the rating of impacts:

Table 6.3: Rating of impacts.

Nature of the Impact	**This should include a description of the proposed impact to indicate if the impact is a direct, indirect or a cumulative impact.**
Extent	Site specific, local, regional, or national
Duration	Temporary, short term, medium term, long term or permanent
Consequence /Intensity	Extreme, High, medium, or low
Probability	Improbable, probable, highly probable, definite
Degree of Confidence	Low, medium, or High
Reversibility	Reversible, Partially Reversible, Irreversible
Irreplaceable Loss of Resources	Replaceable, Partially Replaceable, Irreplaceable
Status and Significance (without mitigation)	Low, Medium, or High indicating whether Positive (+), Negative (-) or Neutral (o)
Mitigation	Overview of mitigatory measures to mitigate potentially negative impacts or enhance potential positive impacts indicating how this mitigatory measure impacts on the significance of the impact
Status and Significance (after mitigation)	Low, Medium, or High indicating whether the status of the impact is Positive (+), Negative (-) or Neutral (o)

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts will be evaluated for the construction and operational phases of the project:
  - **NOTE**: No assessment of impacts during the decommissioning phase of the project is proposed. The relevant guidelines and rehabilitation requirements applicable at that time will need to be applied.
- Impacts will be evaluated with and without mitigation to determine the effectiveness of mitigation measures on reducing the significance of a particular impact; and
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area.

The impact assessment will attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

To characterize the nature and magnitude of visual intrusion of the proposed project, a photographic simulation technique was used. This method was used according to Sheppard (in Lange 1994), where a visual simulation is good quality when the following five criteria are met.

Representativeness:	A simulation should represent important and typical views of a project.
Accuracy:	The similarity between a simulation and the reality after the project has been realized.
Visual clarity:	Detail, parts and overall contents have to be clearly recognizable.
Interest:	A simulation should hold the attention of the viewer.
Legitimacy:	A simulation is defensible if it can be shown how it was produced and to what degree it is accurate.

To comply with this standard it was decided to produce a stationary or static simulation (Van Dortmont in Lange, 1994), which shows the proposed development from a typical static observation points (Critical View Points).

Photographs are taken on site during a site visit with a manual focus, 50mm focal depth digital camera. All camera settings are recorded and the position of each panoramic view is recorded by means of a GPS. These positions, coordinates are then placed on the virtual landscape (see below).

A scale model of the proposal is built in virtual space, scale 1:1, based on CAD (vector) information as supplied by the architect / designers. This model is then placed on a virtual landscape, scale 1:1, as produced by means of GIS software. The accuracy of this depends on the contour intervals.

The camera views are placed on the points as recorded on the virtual landscape. The respective photographs are overlaid onto the camera views, and the orientation of the cameras adjusted accordingly. The light source is adjusted to suit the view. Each view is then rendered as per the process above.

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Visual Impact Assessments

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. He is a Fellow of ILASA.

During his 40 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 being a founding member of Newtown Landscape Architects and is also a senior lecturer, teaching landscape architecture and urban design at post and undergraduate levels, at the University of Pretoria. He has been a visiting studio critic at the University of Witwatersrand and University of Cape Town and in 2011 was invited to the University of Rhode Island, USA as their Distinguished International Scholar for that year. He currently practices as a Sole Proprietor.

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 ***

CHAPTER THIRTEEN: CONCLUSIONS AND RECOMMENDATIONS

13.1 INTRODUCTION

As per section 3. (1) l of Appendix 3 of the NEMA EIA Regulations, 2014 (as amended) this section of the report provides an environmental impact statement which contains a summary of the key findings of the environmental impact assessment including:

- *"a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives"*
- *"recording of proposed impact management outcomes for the development for inclusion in conditions of authorization"*
- *"any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorization"*
- *"a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorization"*

This section presents the conclusion on the most significant impacts identified through the EIA Process, together with management actions required to avoid or mitigate the negative impacts; or to enhance the positive benefits.

The assessment of impacts is presented in the following sections:

- Terrestrial Biodiversity – potential impacts on vegetation, biodiversity patterns and processes, as well as fauna (Chapter Six)
- Aquatic Biodiversity – potential impacts on aquatic resources within the development footprint, as well as within a 500m radius (Chapter Seven)
- Soil Suitability - agricultural potential of the site and slope analysis (Chapter Eight)
- Heritage – potential impacts on heritage resources (Chapters Nine (Archaeological) and Ten (Palaeontological))
- Traffic – potential impacts on condition and operation of the roads in the vicinity, as well as suitability of the access point (Chapter Eleven)
- Visual – potential impacts on the visual environment and sense of place of the study area (Chapter Twelve).

The monitoring of impacts is outlined in the Draft Environmental Management Programme (EMPr) included as Part B of this report. The key issues identified during the Scoping Process, which have been the subject of separate specialist assessments during the EIA, are outlined below:

- Biophysical (Biological and Physical) site assessment including:
  - Potential project related impacts on natural vegetation and faunal habitat associated with the area under assessment, need to be considered.
  - An aquatic survey to identify and map aquatic features associated with the area under assessment, if any.
  - Assign suitable buffers for aquatic features identified, if any.
  - Provide comment on the potential impact of the proposed development on Aquatic and Terrestrial CBAs, as identified in the ECBCP.
  - The determination of suitable buffers associated with meeting biodiversity conservation targets specific to the vegetation types associated with the area under assessment, and in line with those targets indicated by the relevant planning frameworks for the area.
- The undertaking of a Phase 1 Palaeontological and Phase 1 Archaeological Impact Assessment to identify heritage resources, materials and artefacts that occur within the area under assessment and recommendations regarding the conservation thereof.

- The undertaking of a Traffic Impact Assessment to determine the impact of the additional trip generation and the suitability of the access point to ensure safe access and egress from the site.
- The undertaking of a Soil Suitability Assessment in the form of a Land Capability Study, to determine the suitability of the soil for the establishment of citrus orchards, including slope analysis of the site, to inform the proposed layout.
- The undertaking of a Visual Impact Assessment to determine the potential effect on the visual environment and sense of place of the study area.

13.2 IMPACTS ON TERRESTRIAL BIODIVERSITY AND RECOMMENDED MITIGATORY MEASURES

The vegetation specialist has confirmed that the vegetation on Sontule is predominantly Sundays Valley Thicket. The vegetation on site is a mix of intact solid thicket with no to low degradation, moderately to highly degraded thicket, transitional vegetation and karroid vegetation as well as transformed areas (dwellings, roads, cutlines & fence-lines). Alien invasion is presently low with occasional Prickly Pear and Jointed Cactus, as well as various ruderal weeds often proliferating in disturbed areas.

Based on the outcome of the detailed specialist assessments, technical input and consultation process, it is proposed to clear an area of ~147ha in order to facilitate the establishment of ~127ha of citrus orchards and associated infrastructure (~17ha) as well as the proposed new dam (~3.7ha).

Given that an area of ~137ha has been transformed on the farm for orchards and associated infrastructure (~133ha), as well as an airstrip with hangars (~4ha), and an additional area of ~147ha is proposed to be cleared, it is anticipated that an area measuring ~175ha will remain untransformed within the No-Go areas on Sontule. This represents ~38% of the original extent of the natural vegetation (Sundays Thicket) that will be retained on the farm, which exceeds the assigned conservation target for Sundays Thicket, of 19%.

13.2.1 Flora

Sundays Valley Thicket tends to have a relatively high flora diversity and is also quite uniform in terms of species composition in terms of dominant and common species, with occasional individuals or clumps of less common species, including those listed as being of conservation concern. Several endemic and range restricted species are known from the surrounding area. **None of the sensitive species listed as per the National Screening Tool, nor any Critically Endangered or Endangered floral species were found to be present within the affected area.** There is a residual possibility that representatives of these species could be present. Sampling has been undertaken as far as possible to investigate species composition but is generally limited to using existing tracks and cutlines and accessing internal areas of solid thicket where possible. Due to the localised nature of the impact, as well as the level of degradation of the site, the risk of a species suffering any significant loss is **low**. Floral Species of Conservation Concern that were confirmed to be present within the study area are presented in table 13.1 below. A floral search and rescue should be undertaken for species of conservation concern, before clearing commences.

Table 13.1: Floral Species of Conservation Concern confirmed on site.

SCIENTIFIC NAME	FAMILY	STATUS[1, 2]	LIKELIHOOD OF PRESENCE
Acrolophia micrantha	Orchidaceae	LC, PNCO[3]	Possibly present
Aloe africana	Asphodelaceae	LC, PNCO	SVT[4], Present
Aloe ferox	Asphodelaceae	LC, PNCO	SVT, Present
Aloe speciosa	Asphodelaceae	LC, PNCO	SVT, Present
Bulbine frutescens	Asphodelaceae	LC, PNCO	SVT, Present
Carpobrotus edulis	Aizoaceae	LC, PNCO	SVT, Present
Cotyledon orbiculata	Crassulaceae	LC, PNCO	SVT, Present
Delosperma echinatum	Aizoaceae	LC, PNCO	SVT, Present
Delosperma uniflorum	Aizoaceae	LC, PNCO	SVT, Present
Drimia altissima	Hyacinthaceae	LC, PNCO	SVT, Present
Gasteria bicolor	Asphodelaceae	LC, PNCO	SVT, Present, Common
Hypoxis argentea	Hypoxidaceae	LC, PNCO	SVT, Present
Sideroxylon inerme	Sapotaceae	NFA[5]	SVT, Present
Tritonia securigera	Iridaceae	LC, PNCO	SVT, Present

13.2.2 Fauna

The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact on faunal habitat, associated with the proposed footprint, would be of **low significance** if mitigation measures are adhered to. **No sensitive species, as identified by the screening tool, were found on the site and the likelihood of presence is likely also low. No other species of conservation concern were confirmed on site, however there is a residual possibility that representatives of these species could be present or may be transient to the site**. For this reason, it is recommended that a faunal search and rescue be undertaken before clearing commences.

[1] Conservation Status as per SANBI Threatened Species Programme (http://redlist.sanbi.org/index.php, accessed 20 March 2021).
[2] IUCN: Lease Concern (LC), Near Threatened (NT), Vulnerable (VU), Critically Endangered (CR), Endangered (EN); NEST – National Environmental Screening Tool.
[3] PNCO: Protected in terms of the Provincial Nature Conservation Ordinance (Act 19 of 1974)
[4] SVT: Sundays Valley Thicket
[5] NFA: National Forests Act (Act No. 84 of 1998)

Ecological connectivity is currently maintained to the west, east and south of the farm portion, primarily following drainage lines which are not significantly transformed. The farm is functionally disconnected from intact habitat to the north, and faunal movement is likely limited to a few species. The farm portion is fenced off with security fencing, thus movement of larger mammals is likely significantly restricted. Birds would be unaffected as well as reptiles and smaller mammals. Larger tortoises would likely be confined by the fencing type and movement would be restricted.

Thus, it is recommended that the areas surrounding watercourses and slopes are retained to ensure connectivity. These areas follow four watercourses that traverse the property (north-south). In addition, in order to allow free movement (west-east) of fauna and provide connectivity between the north-south watercourse corridors it is recommended that a corridor (~50 m wide) of vegetation is retained along the southern and western boundaries.

13.2.3 Impacts and Management of Terrestrial Biodiversity

The following table provides a summary of the key direct and indirect impacts associated with the development. Only impacts that are rated as having a potential *Medium to High or Very High* negative impact (before mitigation) are listed below:

Table 13.2: Key direct and indirect impacts on vegetation and biodiversity (Medium to High Negative pre-mitigation only).

Development phase	**Impact type**	**Impact**	**Rating**	
			Without mitigation	**With mitigation**
Construction:	**Direct:**	Loss of vegetation due to clearing	Medium (-)	Low (-)
		Loss of ESA due to clearing	Medium (-)	Low (-)
		Loss of flora and fauna species of special concern during vegetation clearing	Medium (-)	Low (-)
		Fragmentation of natural habitat due to clearing	Medium (-)	Low (-)
		Loss of flora and faunal habitat due to clearing	Medium (-)	Low (-)
Operational:	**Direct:**	Fragmentation of natural habitat	Medium (-)	Low (-)
		Loss of flora & fauna habitat	Medium (-)	Low (-)
	Indirect	Loss of flora and fauna SCC due to poaching / illegal harvesting	Medium (-)	Low (-)

The following recommendations are made with regards to the mitigation and management of impacts on vegetation:

- Connectivity must be maintained along the watercourses and adjacent slopes, neither of which are suited to citrus orchards.

- Ecological connectivity will be partly retained between the recommended ecological corridors and the surrounding undeveloped farms to the east, west and south; however, perimeter security fencing will restrict free movement of certain faunal groups (larger mammals and tortoises). Faunal movement between corridors on the east and west side of the farm portion will also be impeded by citrus orchards (existing and proposed). Recommended solutions would be to retain a vegetated strip (± 50 m wide) along the western and southern boundary.
- No species of conservation concern having an Endangered, Critically Endangered or Vulnerable status were recorded during the site visit.
- Faunal sensitive species 7, although potentially a transient visitor is unlikely to be present, as the fencing around the site would likely exclude free movement of this species.
- Permits are required to be obtained from DFFE for the removal / damage to tree species protected in terms of the National Forests Act (Act No. 84 of 1998).
- Several flora species are present that are generally more widespread and not under threat but are protected in terms of the Provincial Nature Conservation Ordinance. Similarly, several protected faunal species are also likely present including tortoises and other reptiles. A flora and fauna search and rescue will enable these species to be identified and relocated before any vegetation clearing commences.

It is the conclusion of the terrestrial biodiversity assessment that the proposed clearing of vegetation for citrus orchards is unlikely to have any significant terrestrial biodiversity impact as long as connectivity issues are mitigated by retaining the natural vegetation as indicated in the proposed layout plans.

13.3 AQUATIC BIODIVERSITY FEATURES (ARTIFICIAL AND NATURAL)

13.3.1 Rivers within and surrounding the study area

The site assessment confirmed that there are a number of non-perennial tributaries falling with the project area. These non-perennial tributaries likely historically drained into the perennial Sundays River system, however, there has been complete alteration/disconnection of the non-perennial tributaries falling within the project footprint and the Sundays River. These rivers would be termed non-perennial with intermittent flow in terms of SANBI Classification guidelines (2013). However, given the nature of this assessment and requirement for delineation and recommendation of buffer zones of the rivers within the study area, they have been described as follows:

- Non-perennial rivers

The non-perennial streams have no clear or well-defined active channel but rather vegetated channels with more pronounced drainage pathways compared to the drainage lines. These non-perennial rivers would likely rarely see any flows, only during rainfall or flood events. A large majority of these non-perennial rivers are in a modified state from existing activities on the farm portions (gravel roads, tracks, animal pathways, historical and current cultivation). These non-perennial rivers appear completely disconnected from the Sundays River system and are considered to be of relatively low ecological importance.

- Drainage lines

The drainage lines are mostly inconsistent, with no exact flow path and location. No well-developed channels or riparian zone is evident. These drainage lines typically act as flow paths for water and would only likely see surface flows during heavy rainfall or flooding events.

Drainage lines appear more pronounced at their source where they are at a steeper gradient (and erosion is also present) and become less pronounced further downslope where the gradient

becomes gentler, with the dispersion of potential flow more extensive and uneven making definite drainage paths difficult to detail. The large majority of drainage lines identified appear to have formed as a result of erosion due to historical gravel roads, pathways, small-scale excavation and borrowing activities.

- Riparian vegetation

Vegetation within and surrounding the non-perennial rivers and drainage lines appeared to be predominantly terrestrial in nature and typical of the vegetation types identified by SANBI (2019), namely Sundays Valley Thicket (refer to Chapter 6 of the EIA Report).

Typically terrestrial species, *Acacia natalitia, Euphorbia mauritanica, Portulacaria afra, Lampranthus productus* and *Azima tetracantha* were some prominent species identified within riparian areas associated with the non-perennial rivers.

13.3.2 Wetlands within and surrounding the study area

No natural wetlands were identified on the property under assessment, based on desktop analysis and site investigation. NWM5 (NBA, 2018) identified one natural riverine wetland associated with the Sundays River within 500m of the development footprint. This river was noted to have prominent reed beds. It is worth noting, that this river will not be affected by the project development, given its distance from the site and existing road, canal and cultivated/developed areas acting as a buffer between the property and the Sundays River.

13.3.3 Water storage/stock dams

A number of water storage dams occur within and surrounding the project footprint. One off-channel water storage dam occurs within the property and two instream water storage dams occur adjacent to the border of the property. The remaining water storage dams occur on neighbouring properties within 500m of the development footprint and will not be affected by the development proposal.

Wetland vegetation was only observed within the two water storage dams adjacent to the property boundary and included *Typha capensis* and *Phragmites* species. The remainder of the water storage dams and along their perimeter was dominated by terrestrial vegetation with the same composition as that mentioned under the riparian vegetation section above.

13.3.4 Impact Assessment

Table 13.3: Key direct and indirect impacts on aquatic features (Medium to High Negative pre-mitigation only).

Development phase	**Impact type**	**Impact**	**Rating**	
			Without mitigation	**With mitigation**
Planning and Design:	**Direct:**	Loss of riparian habitat at watercourse crossings and habitat around the dams.	Medium (-)	Low (-)
	Indirect:	Potential pollution of ground and surface water.	Medium (-)	Low or Very Low (-)
Construction	**Direct:**	Loss of riparian habitat at watercourse crossings and habitat around the dams	Medium to Low (-)	Low (-)

	Indirect:	Changes to hydrological regimes of the non-perennial rivers and drainage lines.	Medium (-)	Low (-)
	Indirect:	Potential pollution of all water resources within and surrounding the development footprint.	Medium (-)	Low or Very Low (-)
	Indirect:	Increase in sedimentation and turbidity levels of instream habitats (non-perennial rivers and drainage lines).	Medium (-)	Low (-)
Operational:	**Direct:**	Loss of and alteration of riparian habitat	Medium (-)	Low (-)
	Indirect:	Changes to the hydrological regime of the watercourses affected by the development proposals.	Medium (-)	Low (-)
	Indirect:	Increase in sedimentation and turbidity levels of surrounding watercourses and increase in the potential for erosion.	Medium (-)	Very Low (-)
	Indirect:	Potential pollution of all water resources within and surrounding the development footprint.	Medium (-)	Low (-)

- Cumulative Impacts

Construction Phase:

Cumulative construction impacts are anticipated to occur, given the area (an area of large-scale agricultural developments). Cumulative impacts are likely to relate to the loss and alteration of riparian habitat and alteration of hydrological flow regimes associated with watercourse crossings, although, in the case of this project, this is expected to be relatively small. While, these cumulative impacts are anticipated, through the implementation of the mitigation measures in this report the overall significance of these cumulative impacts can be reduced to low negative significance.

Operational Phase:

It is anticipated that there will be cumulative operation impacts associated with the project. These relate to the change in the catchment hydrology through alteration and change in land use of the catchment of small non-perennial rivers and drainage lines occurring within and surrounding the project footprint. The layout and design of the proposed citrus expansion has taken into account appropriate buffers from the non-perennial rivers and drainage lines occurring within and surrounding the project footprint as far as possible. This approach to layout and design, coupled with the implementation of the mitigation measures provided in the operational impacts section will reduce the significance of these cumulative impacts.

Recommended buffer widths are as follows:

- 100m buffer from the centre line of the non-perennial rivers
- 40m buffer from the centre line of drainage lines
- 40m buffer from border of water storage dams

13.3.5 Recommendations and Mitigation

The following recommendations are made with regards to the mitigation and management of impacts on Aquatic features:

- Appropriate stormwater protection measures should be incorporated around structures crossing watercourses
- Stormwater management and management of potential runoff as a result of irrigation must be in place. This could be in the form of berms or swales to capture and attenuate the runoff.
- A rehabilitation and alien vegetation management plan must be developed for implementation
- Construction work within areas associated with the pipeline crossings should be short-term with disturbed areas rehabilitated as soon as construction is complete to reduce the possibility of erosion of the areas and resultant sedimentation of the watercourses
- The proposed water storage dam and any other storage facilities should be lined and designed in such a way that prevents contamination of surrounding ground and surface water
- Prevent clearing to no more than the minimum width required
- All hazardous substances and hazardous waste (if any) must be stored in existing impermeable structures placed at the logistical services area
- Temporary stormwater and erosion control infrastructure must be put in place and monitored during the construction phase

13.4 ARCHAEOLOGICAL ASSESSMENT

13.4.1 Archaeological Results and Findings

Access to the study area was easy, but dense vegetation and grass in certain areas made it difficult to find *in situ* archaeological sites/materials. Nonetheless, occasional Middle Stone Age (MSA) stone tools were observed in a vehicle track along the southern boundary fence. These stone tools were in secondary context and not associated with any other archaeological material and no further action is needed. There is a dilapidated old building next to a quarry on the property. There are no known graves older than 60 years on the property.

The proposed development will take place near the Sundays River, in an area where one would expect to find freshwater mussel middens. It is recommended that if such features or any other concentrations of archaeological material are exposed, it must be reported to the archaeologist at the Albany Museum in Makhanda (Grahamstown) or to the Eastern Cape Provincial Heritage Resources Authority so that a systematic and professional investigation can be undertaken. Furthermore, all clearing activities must be monitored and managers/foremen should be informed before clearing/construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. The ECO can be trained to monitor the clearing of the vegetation and to report finds. In general, the proposed areas for development appears to be of **low archaeological sensitivity** and the development may proceed as planned.

13.4.2 Archaeological Impacts and Recommendations

The main impact on archaeological sites/remains (if any) will be the physical disturbance of the material and its context. The clearing of the vegetation may expose, disturb and displace archaeological sites/material. However, from the investigation it would appear that the proposed areas earmarked for development are of **low archaeological sensitivity**. The Middle Stone Age stone tools observed in the area to be developed are considered to be of **low cultural significance**, because they are in secondary context and not associated with any other archaeological remains. Notwithstanding, important materials may be covered by soil and vegetation. There are no known graves or buildings older than 60 years on the area surveyed. The potential impact on buried pre-colonial archaeology sites/remains during the proposed development has been rated **as Low Negative (-)** before mitigation and Neutral (0) after mitigation.

The cumulative impacts on above and below ground heritage will increase when further developments take place in adjoining areas, such as the proposed development of approximately 250 hectares of citrus orchards and associated infrastructure on Portion 4 of the Farm Klein Rooipoort No. 632 (located to the south and adjacent to the proposed Sontule Citrus development) and the development of a storage dam on Portion 2 of Farm 658 (located to the north and adjacent to the proposed Sontule Citrus development). It is anticipated that archaeological material uncovered or found during the development will be of low cultural significance similar to those observed during this survey. The cumulative impact of the developments therefore does not change the overall impact rating of **Low Negative (-).**

The following actions are recommended:

- Although it would seem unlikely that any significant archaeological remains will be exposed during the development, there is always a possibility that human remains and/or other archaeological remains such as freshwater shell middens and historical material may be uncovered during the development. Should such material be exposed during construction, all work must cease in the immediate area (depending on the type of find) and it must be reported to the archaeologist at the Albany Museum in Makhanda (Grahamstown) (Tel: 046 6222 312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel: 043 7450 888), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation (See appendix B of Chapter Nine for a list of possible archaeological sites that maybe found in the area).
- All clearing activities and other developments must be monitored. Managers/foremen should be informed before clearing/construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. Alternatively, it is suggested that a person must be trained (ECO) as a site monitor to report to the foreman when heritage sites/materials are found.

13.5 PALAEONTOLOGICAL ASSESSMENT

13.5.1 Palaeontological Results and Findings

The Sontule Citrus agricultural project area is underlain at depth by fossiliferous marine sediments of the Sundays River Formation (Uitenhage Group) of Early Cretaceous age. Shelly invertebrate fossils have been previously recorded from the Cretaceous beds here in the scientific literature (e.g. McLachlan & McMillan 1976). During a recent one-day site visit several rich fossil sites yielding well-preserved bivalve molluscs as well as storm-generated coquinas (shell beds) of broken shelly remains and a few blocks of well-preserved petrified wood were recorded from small exposures of marine siltstones and calcareous sandstones along the low escarpment on the northern borders of the project area. However, none of these fossil sites lie within the project footprint and therefore no mitigation measures are recommended in their regard.

The proposed agricultural expansion will be situated in an undulating, gently sloping plateau area which has already been partly disturbed by agriculture, farm tracks and quarrying and is largely vegetated by dense subtropical thicket. The Cretaceous bedrocks here are entirely mantled by deep (several meters) alluvial deposits of the Late Caenozoic Kudus Kloof Formation. These sandy to gravelly sediments of inferred Pliocene age are often calcretised in the subsurface and are generally unfossiliferous. No fossil remains, apart from possible calcretised plant root traces of low scientific interest, were recorded within them.

13.5.2 Palaeontological Impacts and Recommendations

Given (1) the small (partially disturbed) footprint of the proposed agricultural expansion, (2) the likely deeply weathered condition of the underlying Mesozoic bedrocks near-surface, as well as (3) the low palaeontological sensitivity of the overlying superficial sediments, the palaeontological heritage impact significance of all components of the proposed agricultural expansion (i.e. new blocks of citrus plantation, new dam, internal roads, irrigation pipeline etc) is assessed as **LOW (negative)** without mitigation. Current impacts on palaeontological heritage within the wider project area involve on-going destruction of newly exposed fossils by natural weathering and erosion processes (Impacts due to farming activities or illegal fossil collection here are likely to be negligible). This assessment applies to the individual project components as well as their anticipated cumulative impact.

There are no objections on palaeontological heritage grounds to authorisation of the proposed Sontule Citrus agricultural development. No further palaeontological heritage studies or specialist mitigation are required for the proposed developments, pending the potential discovery or exposure of any significant fossil remains (e.g. vertebrate bones and teeth, large blocks of petrified wood, shelly fossil horizons) during the construction phase. The ECO responsible for these developments should be alerted to the possibility of important fossil remains being found either on the surface or exposed by fresh excavations during construction.

Should fossil remains such as bones, shells or petrified wood be discovered during construction, these should be safeguarded (preferably in situ) and the ECO should alert the Eastern Cape Provincial Heritage Resources Authority (ECPHRA. Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za). This is so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist (See tabulated Chance Fossil Finds Procedure in Appendix 2 to this report). The specialist involved would require a collection permit from ECPHRA. Fossil material must be curated in an approved repository (e.g. museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA (2013).

13.6 TRAFFIC ASSESSMENT

The following conclusions can be drawn from the traffic specialist study:

- Access to the proposed orchard expansion can be provided directly from MR00471 (R336) via the existing access point at km 34.700; and
- A total of 604 trips per picking season (302 in and 302 out) equating to 6 per day generated at full development will have minimal impact on the operational capacity of the adjacent road network should regular maintenance be conducted.

Table 13.4 below provides a summary of the key direct and indirect impacts associated with the development that have been identified by the traffic specialist. Only impacts that are rated as having a potential *Medium to High or Very High* negative impact (before mitigation) are listed below:

Table 13.4: Key direct and indirect traffic impacts (Medium to High Negative pre-mitigation only).

Development Phase	Impact	Rating	
		Without mitigation	With mitigation
Construction	Additional traffic volumes	Medium (-)	Low (-)
Construction	Traffic Safety Impact due to slow moving traffic	High (-)	Medium (-)
Operational	Traffic safety due to additional traffic	High (-)	Medium (-)
Operational	Deterioration of Public Road Network	Medium (-)	Low (-)
Operational	Generation of Dust on Gravel Access Road	Medium (-)	Neutral (o)

In view of the findings of this study, it is recommended that:

- This TIA be approved by SANRAL SOC;
- Access to the proposed development be gained via the existing access point at km 34.700 on MR00471 (R336) as indicated on Figure 2 (in Chapter Eleven); and
- Suitable warning signage be erected on the approaches to the access point as indicated on Figure 2 (in Chapter Eleven).

13.7 VISUAL ASSESSMENT

13.7.1 Visual Results and Findings

The study area is dominated by two main landscape character types, Sundays Thicket on an undulating plain and Citrus Orchards. The visual integrity of the orchards landscape type and the study area in general is being visually impacted by the shade cloth structures, which contrast with the existing dark green and brown hues of the environment.

The study area's scenic quality is of a mixed character rated *low* (orchards with shade cloth) to *high* (Sundays Thicket on undulating plains). The site, which straddles three of the four landscape character types identified, is also of mixed visual character and is potentially sensitive to change if the change is not effectively managed. Sensitive viewing areas and receptors have been identified and mapped, indicating sensitivity to the project.

13.7.2 Visual Impacts and Recommendations

Visual impacts are highest when receptors are sensitive to change, and their view is focused on and dominated by the change. The Project's visual impact will cause changes in the landscape that are noticeable to receptors living in and visiting residences, tourist areas, and public roads to the south, north and east of the project site. It has been established that the most sensitive receptors are visitors to and residents of the property immediately to the south of the site. Tourism (hunting and a small guest lodge) and sporting (long-range target shooting) activities occur here. However, views from the property towards the project activities already contain features associated with citrus production and the ever-increasing establishment of shade cloth structure, thus reducing the significance of the potential visual impact of the proposed Sontule project.

The significance of the worst-case scenario impact on the various sensitive receptor areas during the CONSTRUCTION PHASE is a direct negative impact that is partially reversible (should the

project not proceed to the Operational Phase). The impact is predicted to be **Medium Negative** (-), i.e. the impact/risk will result in a moderate alteration of the environment where the environment continues to function but in a modified manner. It will have an influence on decision-making if not mitigated. The impact can be reduced with the implementation of the appropriate mitigation measures, but the significance of the impact is likely to remain Medium (-).

During the OPERATIONAL PHASE, a direct, partially reversible (should the shade cloth structures be removed) negative impact is predicted. The long-term impact is assessed as **Medium Negative** (-), i.e. the impact/risk will result in a moderate alteration of the environment where the environment continues to function but in a modified manner. The impact would remain Medium (-) even with the effective implementation of mitigation measures.

When taken together with the negative impacts of existing citrus orchards under shade cloth, which occur across the study area and the sub-region, the negative cumulative effect would remain **Medium Negative** (-). However, the proposed Sontule project would not appear uncharacteristic when set against the visual attributes of the site's immediate surroundings and the dominant land use of the sub-region.

The following recommendations of significance have been provided by the visual specialist:

- Establish a 50m buffer zone of indigenous vegetation along the southern boundary and a 10m buffer along the site's western edge.
- Natural colours (i.e., green or brown) to be used for side walls.
- Maintain shade cloth in a good condition .
    - Regular checks should be undertaken for damaged, tears or flapping shade cloth and must be repaired as soon as possible.
- Should operations (i.e., picking season) occur outside of normal daylight working hours, appropriate lighting (of appropriate lumen and downward angles) should be ensured.

13.8 ASSESSMENT OF ALTERNATIVES

The following alternatives were identified for consideration in this assessment:

- No-Go alternative
- Property/ Location alternatives
- Land-Use alternatives
    - Grazing/ game
    - Citrus orchard establishment
- Layout alternatives (development footprints)

The preferred alternatives from the list above as contemplated in detail in Chapter Five are summarized below.

13.8.1 No-Go Option

The No-Go option would entail not clearing the site for the proposed expansion of citrus orchards and a new off-stream farm dam, whilst retaining the remainder of the Sundays Valley Thicket. This will include the continued encroachment of exotic and invasive vegetation, if not actively controlled, and the resultant continued degradation of the vegetation over time. Conversely the No-Go option would result in the loss of potentially productive agricultural land in an area known for citrus production and at a site that forms part of an existing working citrus farm. The no-go option would result in the loss of a capital investment estimated to be approximately R25 million. The operational

phase of the project will result in the creation of 97 employment opportunities with an annual income of approximately ~R3 million. In addition, since the applicant, Sun Orange Farms (Pty) Ltd forms part of a broad-based black ownership scheme, the no-go option would mean that several historically disadvantaged individuals (HDIs) do not receive the benefits of the proposed expansion. The no-go option would result in a loss of these economic opportunities, as well as the increased production of food for local and international markets, which is considered to be a negative impact.

While the No-Go option will have no significant negative biophysical environmental impacts, it will result in the loss of positive social and economic benefits which are associated with the Go option. Finally, the No-Go option will result in the farm not being optimally utilized for agriculture, for which it is zoned and well positioned. Therefore, the **No-Go option is not the preferred alternative**.

13.8.2 Property/ Location Alternatives

Regarding the content of the Scoping Report, Appendix 2, Section 2 (1) (g) (x) requires that, if an alternative is not considered, the reasoning/ motivation for such is provided. In line with this regulation the following reasoning was provided for not including the assessment of property alternatives in the approved Scoping Report, however, layout development footprints have been considered, as contained in section 13.8.4 below.

Reasoning/ Motivation for the Elimination of an Alternative

Chapter One of the EIA Regulations 2014 (as amended), provides for the interpretation and purpose of the regulations, including, amongst others the assessment of alternatives, which may include the property or location upon which an activity is proposed to take place. This should not be confused with layout/ development footprint alternatives within a specific site, which will be included in this assessment process (see section 13.8.4 below). As a baseline, the No-Go alternative will be assessed.

Sontule was considered suitable for the agricultural expansion of this nature due to amongst others, the fact that there is existing citrus and associated infrastructure on the farm, the availability of the land, soil suitability, and biophysical attributes (vegetation and aquatic) which would allow for cultivation, as well as conservation. In addition, the proposed site was identified due to its close proximity to existing irrigation infrastructure, access to irrigation water (LSRWUA canal system) and the logistical services area on the same farm which will be required to service the additional orchards.

The farm known as Sontule is zoned Agriculture I and ~133ha of the farm has been transformed for citrus orchards and associated infrastructure (dam, logistical services area, roads and lay down areas). Based on the recommendations by the various specialists (e.g., aquatic features and associated buffers, biodiversity conservation target areas, soil suitability, slope etc.), as well as technical input, a portion of Sontule measuring ~175ha (38% of the original extent) is not suitable for development.

Given that the proposed agricultural development will tie into existing agricultural activities on Sontule, it is not deemed feasible to assess other property alternatives.

Based on the experience of the EAP, land available for cultivation and which is zoned Agriculture I, which is situated adjacent to existing agricultural areas, have existing water use rights, suitable soils, and is near the LSRWUA canal system, is becoming increasingly scarce in the Sundays

River Valley. Sontule meets the abovementioned requirements and thus, **no other reasonable or feasible property/ location alternatives are proposed to be assessed.** Layout/ development footprint alternatives within the farm, however, have been assessed (see Section 13.8.4 below).

13.8.3 Land Use Alternatives: Citrus Orchard Establishment

As outlined in Chapter One of this report, the area under assessment is located in the SRVM, is zoned Agriculture I and located on a working citrus Farm. In terms of the Section 8 Zoning Scheme Regulations this "*means the cultivation of land for crops and plants or the breeding of animals, or the operation of a game farm on an extensive basis on the natural veld or land, and includes only such activities and buildings as are reasonably connected with the main farming activities of the farm, but does not include the consent uses applicable to agriculture zone 1."*

The project applicant, Sun Orange Farms (Pty) Ltd, proposes to clear approximately 147ha for the expansion of the existing agricultural development on Remainder of Farm 632 (~459ha), Sundays River Valley Municipality (SRVM), for the establishment of additional citrus orchards and associated infrastructure (internal roads, lay down areas, internal irrigation pipes), hereafter referred to as Sontule. No logistical services area is required as the applicant will make use of existing support infrastructure (offices, stores, workshops) on the farm to provide technical and logistical support.

In order to supply the proposed development with the required irrigation water, an irrigation dam is proposed to be constructed with a capacity to store approximately 49 000m³ and a footprint of 3.7ha, which will be supplied from the LSRWUA canal system. Irrigation water will be reticulated to the proposed orchards via uPVC internal pipelines of varying diameters. The applicant has confirmed that they have 96ha of existing water use entitlements which are not currently in use on Sontule. Therefore, the applicant intends to utilise the spare water rights to irrigate the additional proposed orchards (~127ha effective irrigation area).

Sontule is located adjacent to existing agricultural activities on its northern, eastern and western boundaries (Chapter Three). The farm is currently being utilised as a working citrus farm (~133ha are transformed). The vegetation on the properties located towards the southern boundary seems to be near natural, although evidence of modification (cutlines and vehicle tracts) is evident. In addition, the property shows varying levels of degradation presumably associated with game grazing.

Based on the surrounding land uses, the proposed agricultural expansion on Sontule is not likely to cause a significant change in character within the surrounding landscape, as the areas north, west and east of the area under assessment are agricultural in nature. The highest impact on sense of place is anticipated during the construction phase, when soils are laid bare for planting.

Some of the key elements contributing to the sustainability of the agricultural expansion of Sontule is, the fact that it is an existing citrus farm, access to arable land, the site is zoned as Agriculture I, suitable soils, the topography of the site and access to as well as the availability of water. Based on the experience of the independent EAP in the area, access to such land in the Sundays River Valley, which meet the abovementioned requirements, is becoming increasingly scarce. The reason being that suitable land with sufficient access to water is already being utilized for commercial citrus and crop production. Potentially suitable land parcels do not always have ready access to canal water from the LSRWUA. Because of the distance to water, developments often require a larger capital investment, to ensure a reliable irrigation water supply. At present, Sontule

meets the abovementioned criteria and is, therefore, considered to have a high agricultural potential and is potentially suitable for the proposed development.

The proposed agricultural expansion on Sontule will create several additional temporary construction phase, as well as permanent, operational and seasonal employment opportunities. In addition, a number of indirect employment opportunities associated with the fruit packing and processing industry, transportation and logistical companies, purchasing, as well as hiring of various products (chemicals, pallets, cartons), are anticipated to be created.

Based on market conditions, as well as fruit quality, the fruit produced as a result of the proposed agricultural development will be predominantly sold as fresh fruit to international markets (export), with poorer quality fruit being sold locally or processed at a local juicing factory. International markets generate income from foreign currency, thus, contributing to local economic growth.

For the reasons outlined above, **this is the preferred alternative**, which has been assessed in detail during the EIA phase of the assessment, and which includes preferred layout/ development footprint alternatives within the preferred site. Chapter Four of this report provides an overview of the methodology for the identification, rating, and assessment of impacts (both positive and negative) and the specialist studies undertaken during the EIA phase of the assessment.

13.8.4 Layout Alternatives

The EIA phase of the assessment has assessed layout/ development footprint, alternatives on Sontule, based on the detailed specialist studies, as well as technical input.

Specialist studies which formed part of this assessment are:

- Soil suitability - potential of soils for the establishment of citrus orchards
- Slope analysis - slopes in excess of 25% are not suitable
- Terrestrial Biodiversity – species of special concern, ecological corridors, biodiversity conservation targets
- Aquatic Biodiversity – aquatic sensitivity and buffer zones
- Heritage – Archaeological and Paleontological features on the farm
- Traffic – additional trip generation and access
- Irrigation - irrigation infrastructure layout
- Visual – potential alteration of the sense of place and visual impacts of the shade netting, in particular

The Alternative 2 layout (preferred development footprint within the site) for the project has been determined by the specialists and technical input in the EIA phase of the assessment as well as public consultation and proposes to clear ~147ha to accommodate the proposed agricultural development, including associated infrastructure (See Chapter Two). It is anticipated that an area measuring ~175ha will remain untransformed within the No-Go areas on Sontule.

For more detail regarding the alternatives that were not considered further in the assessment process due to them not being preferred, see Chapter Five of this report. For more detail on the preferred alternative assessed in detail in this assessment process, see Chapter Two of this report.

13.9 PERMIT REQUIREMENTS

Permission will be required from various provincial authorities prior to the clearance of vegetation as follows:

- Permits from the relevant authority (Department of Economic Development Environmental Affairs and Tourism) are required for the removal, translocation or destruction of all plants and animals listed as endangered or protected in terms of the Cape Nature and Provincial Conservation Ordinance (No. 19 of 1974), as well as those listed as Threatened or Protected Species in terms of NEMBA.
- Permits are required to be obtained from Department of Forestry, Fisheries and Environment (DFFE) for the removal / damage to tree species protected in terms of the National Forests Act (Act No. 84 of 1998).
- The applicant will need to apply for a permit for the Cultivation of Virgin Soil in terms of Regulation 2 of CARA prior to the commencement of any activities on site.
- The Traffic Impact Assessment is to be submitted to the SANRAL SOC for approval prior to commencement of the construction phase.
- A Water Use Licence or General Authorisation in terms of Section 21 (c) and (i) of NWA is required for all watercourse crossings (pipelines and internal access roads) associated with this project.

13.10 OVERALL EVALUATION OF IMPACTS

In 2015, the 2030 Agenda for Sustainable Development was adopted by South Africa and 192 other countries at the Sustainable Development Summit. The new agenda, entitled “Transforming Our World: The 2030 Agenda for Sustainable Development”, was agreed upon by the 193 member states of the United Nations, and includes 17 **Sustainable Development Goals** (SDGs) and 169 targets.

In addition, agriculture was highlighted in President Ramaphosa’s State of the Nation Address in 2020 as one of the areas with the highest growth potential. Similarly, the 2019 South African SDG Country Report identified targets addressing SDG objectives in the food and beverage sector as having the most enabling conditions. Investments in this sector – particularly agriculture – are strongly linked with ending poverty, living dignified lives, and the ability to make the most of educational and economic opportunities. The following extracts from the South Africa SDG Investor Map (UNDP, 2020[6]) have reference:

- *“The sector is also fairly resilient to economic shocks, has high potential for job creation and is important for export-led growth.”*
- *“The sector has remained relatively protected during COVID-19, with limited job losses.”*
- *“As a key link between people and planet, investments in agriculture can help achieve multiple SDGs. Although primary agriculture only constitutes 2.9% of GDP (2018), the broader value chain is estimated to contribute 12% to GDP. Furthermore, it is significant to the broader development agenda as a driver of employment (9% of the total workforce works in this sector) and future job creation.”*

Although the National Development Plan (NDP) pre-dates the adoption of the 2030 Sustainable Development Agenda, there is alignment between the development priorities highlighted in the NDP and the SDGs. As such, the NDP provides a roadmap for South Africa’s efforts to achieve the SDGs, as well as the development priorities identified in the NDP itself.

South Africa has made progress in addressing SDG 2, which aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture by 2030. A 2017 study conducted

[6] UNDP South Africa Country Office (2020) The South Africa SDG Investor Map, Pg 47, 49.

by StatsSA indicates that there was a decline in the number of households that were vulnerable to hunger from 24.2% in 2002 to 10.4% in 2017.[7] The proposed agricultural project is in line with SDG 1 (No Poverty), 2 (Zero Hunger) and 8 (Decent Work and Economic Growth). In addition, the proposed development must take into account SDG 12 (Responsible Consumption and Production) and 15 (Life on Land).

South Africa's National Development Plan (NDP, 2030), has as one of its focal points, the expansion of agriculture in order to facilitate job creation. The NDP (2030; page 222), notes the following:

"Expanding commercial agriculture has the potential to create 250 000 direct jobs and a further 130 000 indirect jobs. This can be achieved by picking winning agricultural sub-sectors where the expansion in production and further value-adding processes are sustainable over the long term. Expansion is not only driven by higher levels of productivity, but also supported by foreign and domestic demand. Without boosted demand, increased production will depress domestic price, which is bad for employment creation in the sector.".

With regards to citrus as a subsector of labour-intensive agriculture, The NDP (2030; Page 222), states the following:

"There are about 60 000 hectares of citrus trees in South Africa. The employment requirement to produce citrus fruit is estimated at one worker per hectare, about 60 000 workers are employed on citrus farms. Direct downstream labour requirements for citrus are estimated at one labourer per 2 500 cartons packed: with about 100 million cartons packed per year, some 40 000 jobs are created in packing plants for a period of six months, or 20 000 full-time equivalents. In addition, there are labour requirements for transportation, warehousing, port handling, research and development, and processing. From 2000 to 2010, the citrus-farming area increased by 28 percent, from 47 000 to 60 000 hectares."

The Final Integrated Development Plan for the SRVM (SRVM IDP 2016/ 2017), indicates that the current unemployment rate in the municipal area may be as high as 38.54%. The Agricultural sector provides room for growth in terms of employment opportunities, as it currently represents ~11% of the employment for the SRVM area (Final SRVM IDP 2015/ 2016). Additionally, the SRVM IDP (2015/ 2016; Page 36) states that: *"The municipality can boast its ecotourism and agricultural potential."* Finally, the following statement is given by the SRVM Spatial Development Framework (SRVM SDF 2013; Page 8): *"The agricultural sector is one of the key economic drivers of the Sundays River Valley Municipality*."

It is the applicant's intention to build on this economic base in the SRVM, by making optimum use of the available resources in the area, i.e. available land zoned as agriculture, the availability of a sustainable supply of irrigation water from the LSRWUA canal system, the suitability/ fertility of the soils, as well as the available work force from local communities. By making use of this labour market, the proposed development would also support the vision of the Sundays River Valley Local Economic Strategy as outlined in the SRVM SDF (2013) which indicates agriculture, as a Local Economic Development Priority and identifies the need *to "…expand the agricultural section in the region."*, as an Economic Development Objective.

[7] UNDP South Africa Country Office (2020) The South Africa SDG Investor Map, pg 47.

The proposed agricultural expansion will require the capital investment of approximately R25 million and will create additional direct permanent, as well as seasonal employment opportunities. In addition, a number of indirect, employment opportunities associated with the fruit packing industry, transportation and logistical companies, purchasing, as well as hiring of various products (chemicals, pallets, cartons), are anticipated to be created. In addition, since the applicant, Sun Orange Farms (Pty) Ltd forms part of a broad-based black ownership scheme, the proposed agricultural expansion on Sontule will result in benefits for historically disadvantaged individuals (HDIs).

During the operational phase of the development, it is estimated that 12 new skilled and 85 unskilled employment opportunities will be created at a value of ~R3 million per annum. Labour will be sourced locally from communities in the SRVM and Nelson Mandela Bay Municipality (NMBM).

Based on the experience of the EAP, land available for cultivation, which is situated adjacent to existing agricultural areas, is zoned for agricultural use, has existing water use rights, suitable soils, and is near the LSRWUA canal system, is becoming scarce in the Sundays River Valley.

The additional clearance of ~147ha will result in **~38%** (175ha) of the original extent of the near-natural and degraded vegetation on the farm being retained. By adopting the proposed no-go areas and all mitigation measures recommended by the Biodiversity Specialists, the biodiversity pattern target area for the various vegetation types, and the ecological and hydrological process areas on the farm will be safeguarded.

By applying the mitigatory measures proposed *Construction Phase* direct and indirect impacts of medium to high significance can be reduced to impacts of *medium to low negative impacts*. The key direct and indirect impacts associated with the *Operational Phase* of the development can, by applying the mitigatory measures proposed be reduced from negative impacts of high to medium significance to impacts of *medium to low negative or neutral impacts*.

The Environmental Assessment process has not identified any negative impacts that should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. Taking into consideration the findings of the EIA process, it is the opinion of the Environmental Assessment Practitioner that the project benefits outweigh the negative residual environmental impacts, provided that the specified mitigation measures are applied effectively, it is proposed that the project receive environmental authorization in terms of the EIA process.