



## DARLING SOLAR STORAGE FACILITY

### VISUAL IMPACT ASSESSMENT

PORTION OF ERF 551, DARLING WC

SEPTEMBER 2023, MARCH 2024 ☞ PHOTOGRAPH 1: VIEW OF THE SITE DESCENDING THE R307 INTO DARLING

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researched and produced by

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## Reflection

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“The term **‘visual and aesthetic’** is intended to cover the broad range of visual, scenic, cultural, and spiritual aspects of the landscape. However, for the purpose of brevity, the term **‘visual’** is used in the text’ (p 1). **Thus it includes aspects of “the area’s sense of place, ... natural and cultural landscapes, ... the identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region, ... the need to include both quantitative criteria, such as ‘visibility’, and qualitative criteria, such as landscape or townscape ‘character’** (pp 1-2).”

This report (p 20) from the *PGWC Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (November 2005)*

“**Visual impact. The value of the environment is often under-estimated from a visual perspective.** It is the visual quality of the environment that, to a large degree, generates the attraction for the tourism industry and draws people to certain areas as desired locations for living a lifestyle outside of the large cities and densely developed urban areas. **The visual resources of rural areas, such as scenic landscapes and the cultural streetscapes and farmsteads,** and environments such as the Garden Route [Swartland], constitute major tourist attractions. ...

Each area has its own unique visual character and atmosphere, which plays an important role in the quality of any tourist experience. The diversity of the landscapes makes it essential to consider all development **and more particularly the expansion of urban areas, an issue that requires special consideration.** The intention is to manage urban development in such a way that no development would detract from the visual quality of the environment **and that all development conform to a characteristic style and urban form that suits the character of the area.”**

This report (p 22) from the *PGWC Urban Edge Guideline (December 2005)*

☞ Beauty is in the eye of the beholder.

What the eye doesn't see, the heart doesn't grieve over.

*English Proverbs*

☞ Do not seek revenge or bear a grudge against one of your people,

**but love your neighbour as yourself.** I am the LORD.

*Mosaic Law, Leviticus 19.18, The Holy Bible (NIV)*

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# 1 Executive Summary

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## 1.1 Summary

The proposed solar storage facility for Darling covers 73.2 hectares of land northwest of Darling on the R307. Details of the proposed development are not known so we have used our knowledge of another solar farm for the exercise. The visual and aesthetic sensitivity of the area is moderate–high while the anticipated impact on the landscape is high. Recommendations are made to minimise visual and aesthetic impacts with particular reference to screening the site with endemic vegetation and the use of natural colouration of the fencing and structures. However, site choice may provide the best mitigation by moving the site closer to the existing town and railway line to contain urban–infrastructural sprawl.

## 1.2 Project Description (see page 13)

1. Swartland Municipality wish to develop a solar storage facility of 19.5MW to provide up to 3 days of Stage 4 Load Shedding protection for the town of Darling.
2. The proposed site is a 73.2-hectare portion of Erf Remainder 551, Darling located to the northwest of the town.
3. The southern end of the site lies adjacent to the R315/Darling–Yzerfontein Road.
4. The project will comprise various infrastructural facilities besides the solar panels, including containers to house the inverters, mini-substations to step up the voltage to 11kV, underground cables and a Ring Main Unit (RMU).
5. The entire site would be fenced by a suitable see-through security fence some 2.4m high with a 4-strand electric fence on top and access gates.

## 1.3 Legal and Administrative Requirements (see page 19)

1. Provision is made for scenic, visual and aesthetic protection in the NHRA (1999), WC Provincial Urban Edge Guideline (2005), WC Provincial SDF (2014) and the Swartland SDF (2017-2022) inter alia.

2. The Provincial Government of the Western Cape *Guideline for Visual and Aesthetic Specialists in EIA processes* defines the scope and preparation of VIAs. VIA is integral to assessing environmental and heritage impact in scenic heritage areas like the Swartland.
3. The site falls alongside the northern portion of Grade 3B *Alexanderfontein* to the west and south.
4. There are no graded scenic landscapes in the area while the site occurs outside the Urban Edge on the approach to the town.

#### 1.4 Visual Environment Description (see page 29)

1. The area of the proposed solar storage facility is a flat to gently undulating field situated over on the northwestern outskirts of Darling.
2. The site is currently used for grazing of sheep and horses and also allowed a beautiful wildflower display in spring. Parts of the site are also a wetland.
3. The area is located on the edge of the foothills west of Darling and can be easily seen when driving into the town from the west/Yzerfontein side.
4. There are no significant historic homesteads overlooking the site with *Alexanderfontein* being the nearest.
5. An old double avenue of gum trees lines the southern boundary along the R307 partially obscuring the view from this major road.

#### 1.5 Visual Impact Assessment (see page 57)

1. VISUAL IMPACT: The proposed development will have a high impact on the landscape causing noticeable change to the visual environment.
2. VISIBILITY: The development has moderate–high visual exposure; moderate–high visual absorption capacity; low compatibility; and moderate–high visibility.
3. NATURE OF IMPACT: The development’s visual impact has district extent, long-term duration, medium intensity, definite probability, and medium significance on the landscape.
4. RECOMMENDATIONS are made around the need for planting screening with endemic species, natural colouration of fencing and structures, and good planting maintenance.
5. SITE CHOICE is questionable, however, as the land between the site and Nuwedorp is similar and would contain urban–infrastructural sprawl while retaining the moderate–high value landscape and scenic value of the proposed site.

#### 1.6 Visual Management and Monitoring Plan (see page 73)

1. Sound Visual Management is the ultimate aim of the VIA process. The Mitigation Recommendations developed in the report need to be implemented.

2. This process of implementation will occur throughout the lifetime of the project, hence, the need for a Monitoring Plan. Institutions, individuals and organisations referred in the Monitoring Plan must develop a means of achieving the monitoring otherwise this report serves no purpose.
3. Once the VIA Report has been approved, the Developers must seek the implementation of the recommendations as soon as possible.

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## 2 Project Description

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### 2.1 Summary

Swartland Municipality wish to develop a solar storage facility of 19.5MW to provide up to 3 days of Stage 4 Load Shedding protection for the town of Darling. The proposed site is a 73.2-hectare portion of Erf Remainder 551, Darling located to the northwest of the town. The southern end of the site lies adjacent to the R315/Darling–Yzerfontein Road. The project will comprise various infrastructural facilities besides the solar panels, including containers to house the inverters, mini-substations to step up the voltage to 11kV, underground cables and a Ring Main Unit (RMU). The entire site would be fenced by a suitable see-through security fence some 2.4m high with a 4-strand electric fence on top and access gates.

### 2.2 Introduction

Combined with Section 3, this chapter presents the relevant project information required to develop a Visual Impact Assessment (VIA) of the development for Environmental Impact Assessment (EIA) and Heritage Impact Assessment (HIA) purposes. This chapter reviews the relevant basic aspects of the proposed development and includes plans and diagrams as appropriate to this end.

#### 2.2.1 Background

New World Associates was commissioned by the EnviroAfrica to prepare the Visual Impact Assessment (VIA) for this project. EnviroAfrica will be undertaking the environmental application. Developments of this scale and nature in scenic and historic environments, within or without the Urban Edge, require Visual Assessments in accordance with the PGWC *Guideline for Specialist Visual Studies* (pp 11-12).

#### 2.2.2 Accreditation

Bruce Eitzen ML BSc PrLArch MEMBER ILASA APHP conducted this assessment. He is a registered Landscape Architect and Environmental Planner with the South African Council of Land-

scape Architecture Professionals (SACLAP), and Specialist Practitioner in Visual and Landscape Heritage. He has thirty years experience across the board of Landscape Architecture and Environmental Planning and has practised in South Africa, Central Africa and East Africa. He holds a BSc (Botany) from the University of Cape Town and a Masters in Landscape Architecture from the University of Pretoria.

His public service includes serving for three years on the Association of Heritage Assessment Practitioners Executive Committee chairing Professional Practice. He also served on the National Executive Committee of the Institute for Landscape Architects in South Africa and was the Chair of ILASA Cape for four years. He also chaired the Local Organising Committee (LOC) of the International Federation of Landscape Architects (IFLA) World Congress 2012 that was held in Cape Town. He is the founder of Landscape Heritage SA, a new heritage organisation focussing on Southern African Landscape Heritage.

### **2.2.3 Statement of Independence**

New World Associates is an independent consulting firm practising in the abovementioned fields. None of its members have any financial interest in the proposed development nor are involved in any other projects being undertaken by the developer.

### **2.2.4 Reporting Requirements**

This report is generally based on South African environmental management procedures and, more specifically, on the provincial guideline endorsed by the Provincial Government of the Western Cape (PGWC) on 3 November 2005: *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes* (November 2005, PGWC).

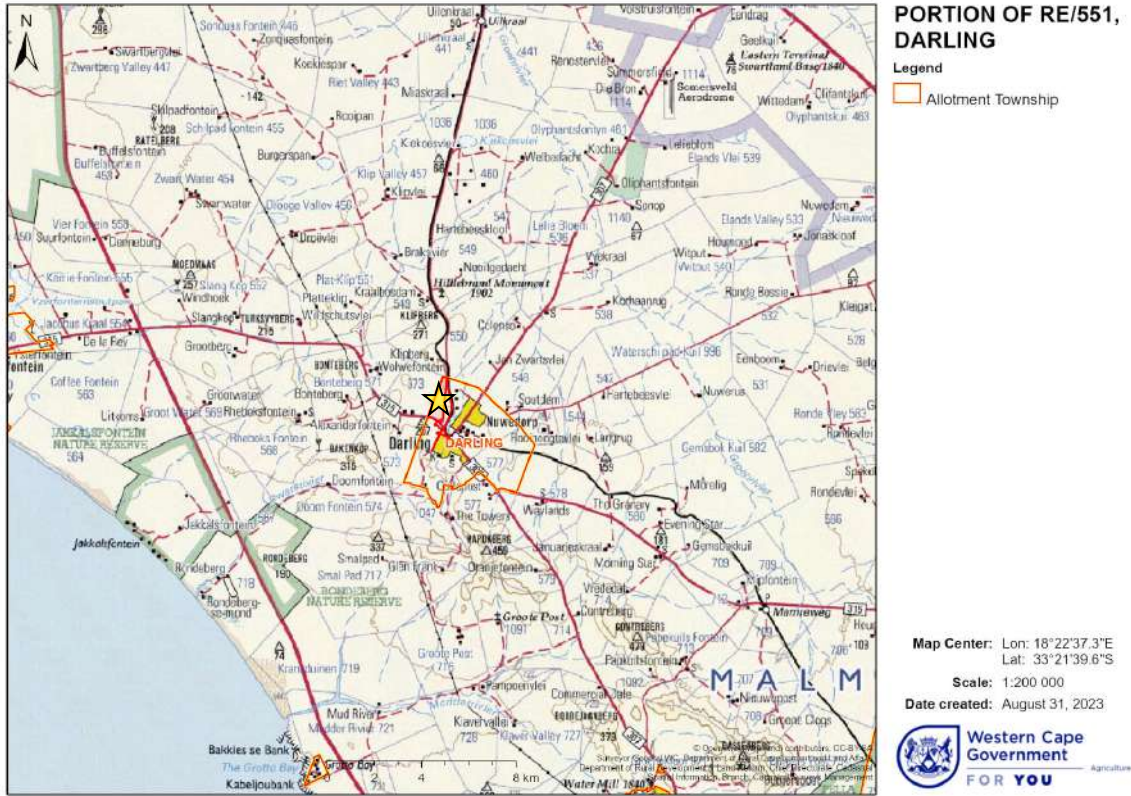
### **2.2.5 Assumptions and Limitations**

This assessment has been conducted based on the information presented in the report as received from the development team at the time of the report's preparation. While the information provided is limited to these plans, a comprehensive site inspection and impact analysis allowed mitigation recommendations to be made. We assume that the information provided was accurate and complete, and there are no gaps in our knowledge of the project proposal for this level of assessment.

## **2.3 Project Proposal**

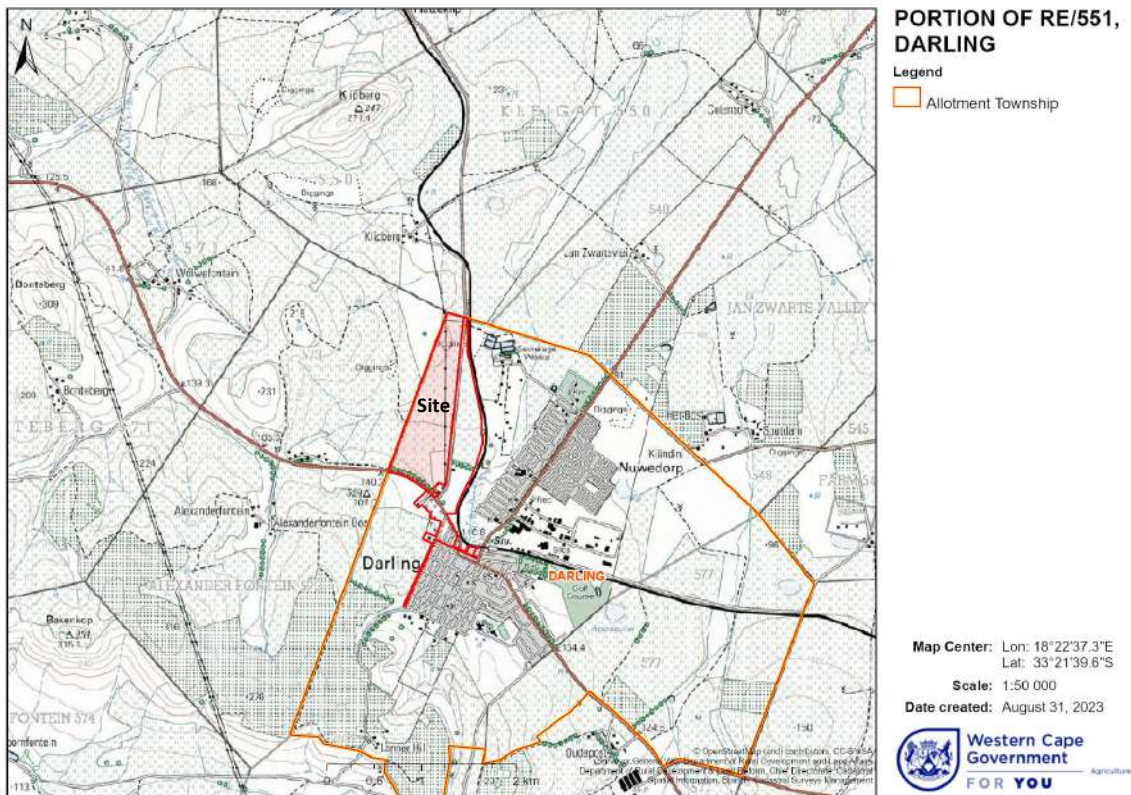
### **2.3.1 Location**

The development is situated on a proposed 73.2-hectare portion of Erf 551, Darling to the northwest of the town, adjacent to the Darling–Yzerfontein Road R315 (see Figure 2-1).



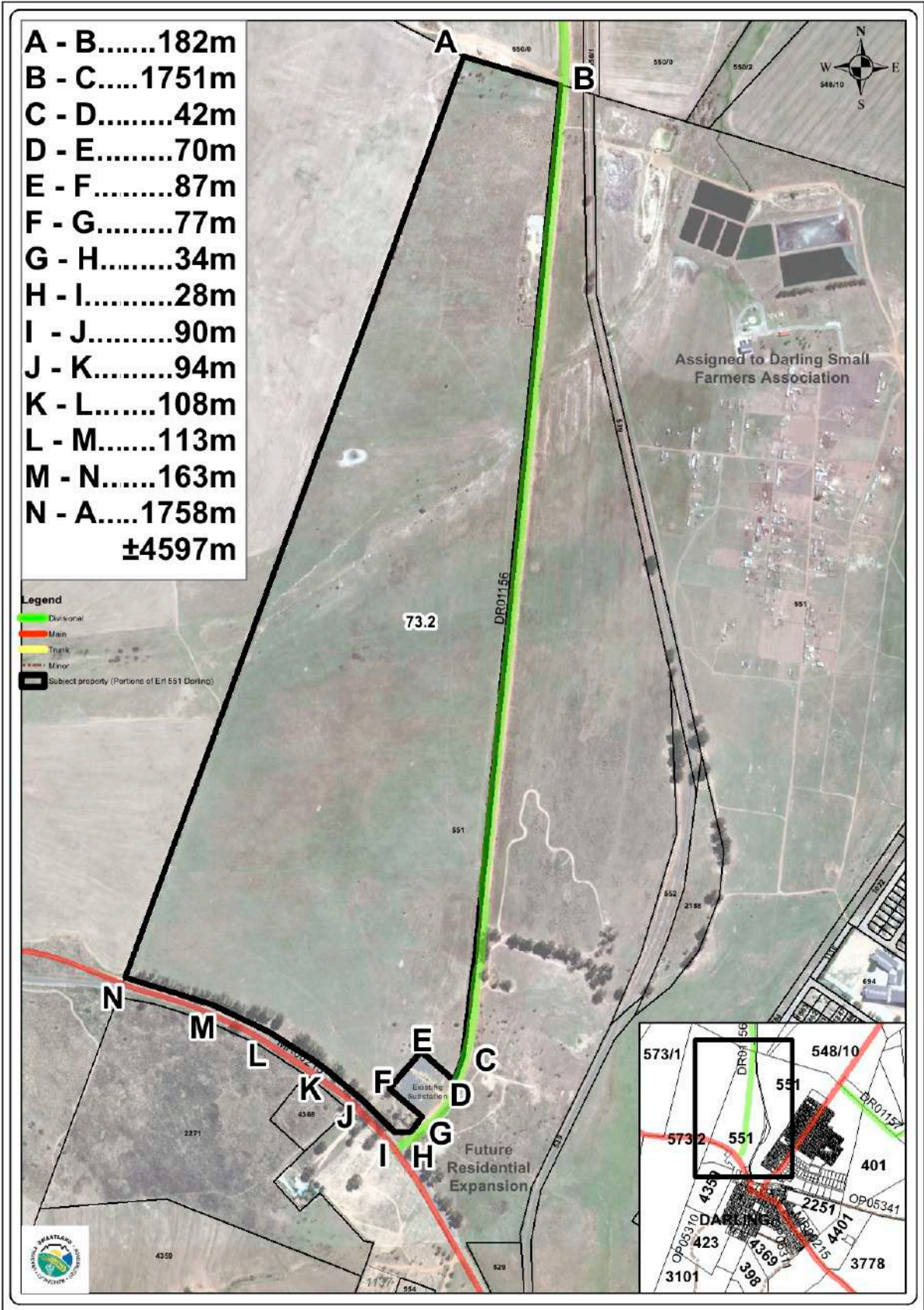
Source: Cape Farm Mapper | NWA.

Figure 2-1: Regional Location of the Proposed Development (June 2021).



Source: Cape Farm Mapper | NWA.

Figure 2-2: District Location of the Proposed Development (June 2021).



Source: Swartland Municipality.

Figure 2-3: Proposed Development Dimensions (July 2023).



### 2.3.2 Planning Application

The applicant wishes to develop a Photovoltaic Solar Storage Facility of 19.5MW that will provide load shedding battery backup power for up to 3 days of Stage 4 Load Shedding to Darling (see Figure 2-3). The site is zoned Agricultural Zone 1.

### 2.3.3 Site Development Plan (see Appendix A)

There is no Site Development Plan as yet, only the proposed site for tendering purposes by service providers of the solar storage facility (Figure 2-3). The total site area is 73.2 hectares with further internal details unknown.

See Appendix A on page 79 for full size plans if necessary.

### 2.3.4 Activity Description

The following project information was provided by Swartland Municipality (July 2023) as part of Environmental Assessment Practitioner briefing for the NEMA process (**bold added**):

Swartland Municipality is in the process to make identified land (map included) at Darling for prospective service providers available to provide the municipality with the following:

**The prospective Developer is to provide the Swartland Municipality with 6.5 MWp Battery Energy Storage capacity at 11 kV, to provide standby power during stage 4 load shedding for a maximum of 3 consecutive days. A maximum of 19.5 MW (<20 MW) Solar plant to be used to charge the batteries.**

The solar panels making up the solar plant could be ground mounted or mounted on top of a container (typical shipping containers) and be fixed and/or tracking the sun for optimal performance.

The **solar panels and batteries** will be connected to a number of **inverters** (typically **housed in the containers**) to convert the generated electricity from DC (Direct Current) to AC (Alternating Current) via **cable networks buried in the ground**. A number of **mini-substations** could be provided to step the voltage up to 11 kV. The mini-substations in turn could be connected with **underground cables, via a RMU (Ring Main Unit)**, which would ultimately be connected to the **Municipal Substation via an 11 kV underground cable**. **The total area is to be fenced with a suitable security fence (see through) +/- 2.4 meter high with a 4 wire electric fence on top and suitable access gates.**

Provision is to be made by the developer for the following: **Water and sanitation connection** (at least during the construction period) and storm water management during the lease period.

It is to be noted that the facility will belong to the successful tenderer and the municipality would then rent/lease the output of the plant (MW) from the owner/operators of the facility for a minimum period of three (3) years.

At the end of the period further decisions would need to be made regarding the extension/expansion or termination of the agreement. In the cases of complete termination the Owner of the facility would have to remove the equipment from the land or enter into a separate lease agreement for the use of the land with the Swartland Municipality.

**Thus, Swartland Municipality needs the services (1) to prepare the relevant land use application in terms of Swartland Municipality: Land Use Planning By-Law – 2020 and (2) to conduct a basic environment assessment in terms of NEMA for the relevant project.**

Thus the Visual Impact Assessment (VIA) was required by the EAP for this project.

### **2.3.5 Landscape and Environment**

A Clear-View fence will be used around the site, while planting between the PV Panel rows is intended.

## **2.4 Alternatives**

At this stage there are no alternatives under consideration.

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## 3 Legal and Administrative Requirements

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### 3.1 Summary

Provision is made for scenic, visual and aesthetic protection in the NHRA (1999), WC Provincial Urban Edge Guideline (2005), WC Provincial SDF (2014) and the Swartland SDF (2017-2022) inter alia. The Provincial Government of the Western Cape *Guideline for Visual and Aesthetic Specialists in EIA processes* defines the scope and preparation of VIAs. VIA is integral to assessing environmental and heritage impact in scenic heritage areas like the Swartland. The site falls alongside the northern portion of Grade 3B *Alexanderfontein* to the west and south. There are no graded scenic landscapes in the area while the site occurs outside the Urban Edge on the approach to the town.

### 3.2 Introduction

This chapter provides the important and necessary policy, legal and administrative background for the visual impact study. A general overview of the relevant documents with specific reference to those applicable to visual planning is included. Particular mention is made of local planning guidelines that have the most direct bearing on the project such as the Spatial Development Framework (SDF) for the given area.

#### 3.2.1 Background

The policy, legal and administrative framework for conservation, EIA and development in South Africa has long roots. Visual Impact Assessment (VIA) is mentioned in the national requirements for EIA under the National Environmental Management Act (NEMA) and the Environmental Conservation Act. Furthermore, the provincial government now endorsed its own guidelines for various EIA processes including VIA (PGWC, November 2005). Specific requirements for VIA may also included in local Spatial Development Frameworks (SDF) and Integrated development Plans (IDP).

### 3.3 Legal Framework

This review of current documentation is made with specific reference to requirements for VIA in the Law and by National Guidelines.

#### 3.3.1 National Environmental Management Act No. 107 of 1998 (NEMA)

This Act is “To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.”

*Chapter 5: Integrated Environmental Management* has among its general objectives: **(b) “identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2” (p 34).**

#### 3.3.2 South African National Heritage Resources Act, 1999 (NHRA)

NHRA regulations cover the protection of **historic sites, objects, buildings and landscapes**. It covers (ii) “archaeological items,” namely, “material remains resulting from human activity... older than 100 years;” rock art, wrecks and “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found (2 Definitions). **The Definitions also include the term “(vi) ‘cultural significance’ [which] means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.”**

The NHRA makes provision for two forms of protection, formal and informal, and sets up a three tier system of formal protection as:

1. Grade 1 or National Heritage Sites managed by SAHRA.
2. Grade 2 or Provincial Heritage Sites managed by HWC.
3. Grade 3 or Local Heritage Sites managed by the Local Authority.

#### 3.3.3 PGWC Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Edition 1, June 2005)

This long since endorsed guideline (November 2005) is the most relevant document that now guides VIA in the Western Cape.<sup>1</sup> It is a highly useful document and has been used to guide this report. While lacking a definition of VIA, it states in the Introduction: “This visual guideline

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<sup>1</sup> Oberholzer, B (2005) by CSIR Environmentek. *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes: Edition 1*. CSIR Report No. ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

document is therefore an attempt to develop a ‘best practice’ approach for visual specialists, EIA practitioners and authorities involved in the EIA process.

The term ‘**visual and aesthetic**’ is intended to cover the broad range of visual, scenic, cultural, and spiritual aspects of the landscape; however, for the purpose of brevity, the term ‘**visual**’ is used in the text’ (p 1).

**Thus it includes aspects of “the area’s sense of place, ... natural and cultural landscapes, ... the identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region, ... the need to include both quantitative criteria, such as ‘visibility’, and qualitative criteria, such as landscape or townscape ‘character’ (pp 1-2).**

### 3.3.4 PGWC Guideline for Involving Heritage Specialists in EIA Processes (Edition 1, June 2005)

Continuing on from the NHRA (1999), this now legally adopted Provincial Guideline further records (p 3): “Types of heritage resources as defined in the relevant legislation may include the following:

- Places, buildings, structures and equipment of cultural significance
- Places to which oral traditions are attached or are associated with living heritage
- Historical settlements or townscapes
- Landscape and natural features of cultural significance
- Geological sites of scientific or cultural importance
- Archaeological and palaeontological sites
- Graves and burial grounds
- Sites related to the history of slavery (NHRA).”

These are the so-called “tangibles” of the heritage concept (p 5). Thus the “cultural landscape” is seen as having a range from Archaeology to Palaeontology to Historical Architecture to Social History to Public Memory and Natural Landscape (p 6). Two categories of heritage significance/sensitivity are used: **Category 1:** Formally protected heritage sites and **Category 2:** Landscapes of recognised or potential significance or sensitivity (not yet formally protected) (p 18).

This extensive list of sites include Grade I-III, National and Provincial Heritage Sites and Protected Areas, as well as Provisionally Protected Sites, Urban Conservation Areas, Nature Reserves, proclaimed Scenic Routes, etc as well as World Heritage Sites e.g. Robben Island and Cradle of Humankind (Sterkfontein). A very large list of landscapes is also included starting with **Scenic/Historical Routes or Landscapes, Pristine Natural Areas e.g. Cedarberg and many**

**other types of landscapes including Historic Farm Werfs e.g. Boschendal, Morgenster, Alphen, and historical farmlands e.g. Winelands, Swartland, Karoolands, and many more.**

This long list has been ordered into twelve types of Heritage Context in Table 1 (pp 21-27), namely:

- |                                     |   |
|-------------------------------------|---|
| 1. Palaeontological Landscape       | 7. Relic Landscape                          |
| 2. Archaeological Landscape         | 8. Burial Ground and Grave Site             |
| 3. Historical Built Urban Landscape | 9. Associated Landscape                     |
| 4. Historical Farmland              | 10. Historical Farm Werf                    |
| 5. Historical Rural Town            | 11. Historical Institutional Landscape      |
| 6. Pristine/Natural Landscape       | <b>12. Scenic/Visual Amenity Landscape.</b> |

Many of these could be grouped under the broad term Regional Cultural Landscapes (p 31). Thus various types of landscape form a vital part or domain of Heritage Resources. As a visual resource, landscape is very much seen and perceived in every human sense.

### 3.4 Administrative Framework

#### 3.4.1 Western Cape Provincial Urban Edge Guideline (DEA&DP December 2005)

This document notes the following on visual impact that has special reference to this and all similar types of development, bold added (p 30):

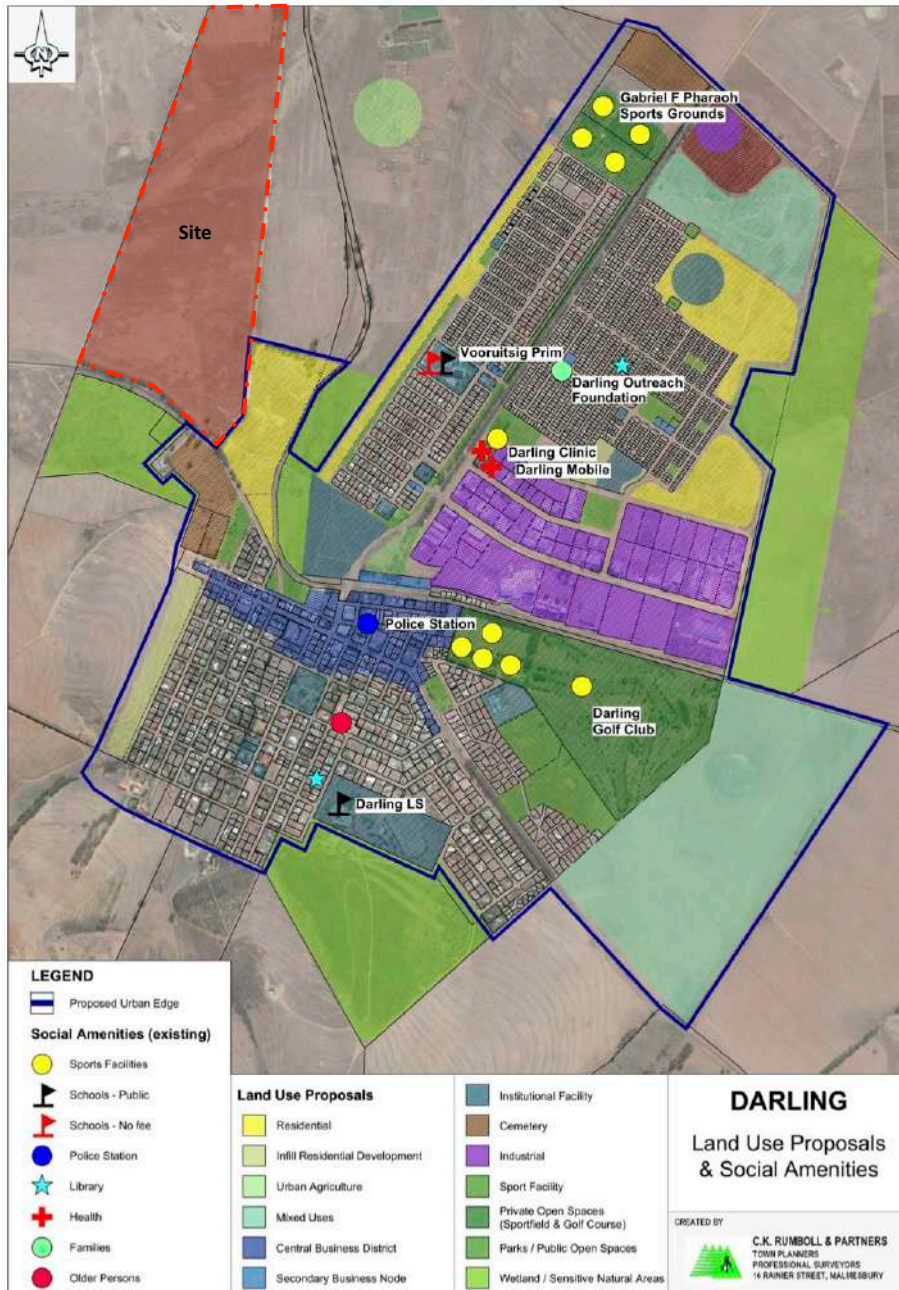
**“Visual impact. The value of the environment is often under-estimated from a visual perspective. It is the visual quality of the environment that, to a large degree, generates the attraction for the tourism industry and draws people to certain areas as desired locations for living a lifestyle outside of the large cities and densely developed urban areas. The visual resources of rural areas, such as scenic landscapes and the cultural streetscapes and farmsteads, and environments such as the Garden Route, constitute major tourist attractions.** Visual qualities of the environment also forms the backdrop to most other tourist activities, such as 4 x 4 routes, hiking trails, camping and recreational activities and even sporting facilities that sustain local economic activity. The growth of golf resorts in the Garden Route serve as examples of the attraction of the environment and more particularly the visual environment for interest in sporting facilities. Added thereto, the experience of reserves and resorts in the Cedarberg and Karoo are as much in the visual quality of the environment as it is in the attraction of the facilities.

**Each area has its own unique visual character and atmosphere, which plays an important role in the quality of any tourist experience. The diversity of the landscapes makes it essential to consider all development and more particularly the expansion of urban areas, an issue that requires special consideration.** The intention is to manage urban development in such a way that no development would detract from the visual quality of the environment **and that all development conforms to a characteristic style and urban form that suits the character of the area.”**

This implies that edge development should not only be limited to certain areas through inclusion or exclusion, **but that edge development should also be subject to urban design guidelines, architectural consideration and general aesthetic treatment.** The visual quality of the environment is not limited to the natural environment. **The built environment has as much of an effect on the aesthetic appeal of an area as has the natural environment.”**

### 3.4.2 Swartland SDF (2017-2022): Darling

#### Spatial Context

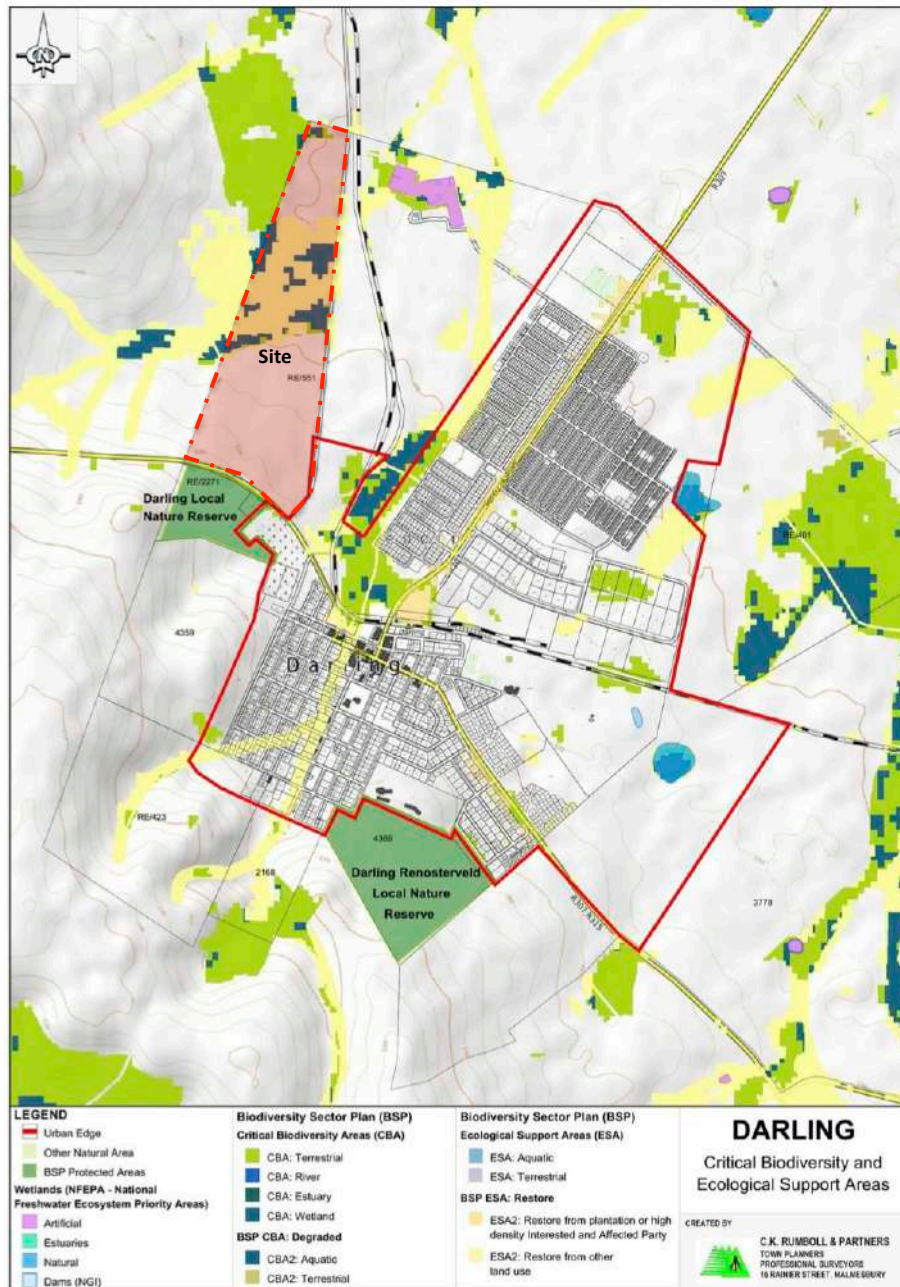


Source: Swartland SDF (2017).

Figure 3-1: Darling Land Use Proposals & Social Amenities (May 2019).

The development falls **outside the Urban Edge** (see Figure 3-1). The site area falls outside the current developed urban area but mostly to the west of the township and to the north of a **Wetland**. Nothing else is indicated in this farming area known for wheat production.

The site includes some area of **Biodiversity Sector Plan (BSP) Critical Biodiversity Areas (CBA)** that are **Degraded** and some **BSP Ecological Support Areas (ESA)** to be **Restored** (see Figure 3-2).



Source: Swartland SDF (2017).

Figure 3-2: Darling Critical Biodiversity and Ecological Support Areas (May 2019).

### Heritage

The Swartland SDF for Darling has a broad range of heritage and cultural objectives for the town and area as can be seen in Figure 3-3. There is concern inter alia for the agricultural land-



scape, critical biodiversity, unique town character, scenic routes and vistas, heritage features and landscapes, town gateways, etc.

<b>Objective 4: Protect and grow place identity and cultural integrity</b>	
<b>Protect and develop Cultural and Heritage significant features</b>	
<p><b>To Protect:</b></p> <ul style="list-style-type: none"> <li>• Protect the agricultural landscape when developing transport corridors i.e. infrastructure or facilities that blend in with the environment. Develop design guidelines.</li> <li>• Protect and promote the agricultural landscape by growing appropriate crops according to the seasons, promoting independence from mainstream crops and livestock production through smaller farm units, alternative land uses promoting conservation of natural and endangered vegetation and alternative income for farmers i.e. resorts and agri-tourism.</li> <li>• Protect critical biodiversity through promoting alternative, but supportive uses in critical biodiversity areas which can promote conservation of the natural areas. Develop appropriate development guidelines.</li> <li>• Unique character of the towns.</li> <li>• Natural areas within towns.</li> <li>• Critical Biodiversity Areas, ecological corridors and ecosystems.</li> <li>• Unique natural and manmade landscape features and structures.</li> <li>• Scenic Routes and vistas.</li> <li>• Heritage features and landscapes.</li> </ul> <p><b>To change:</b></p> <ul style="list-style-type: none"> <li>• Limit water erosion through protective preparation methods and the planting of perennial crops, i.e. legumes and establish and maintain contours.</li> <li>• Address loss of, and impact on cultural &amp; heritage resources and improve information about assets.</li> <li>• Improve roadside signage and buildings in sensitive landscapes.</li> <li>• Promote the landscape features of the Swartland as part of the tourism attraction.</li> <li>• Utilise heritage resources as assets that need protection and can be utilised as a tourism attraction.</li> </ul>	<p><b>To Develop:</b></p> <ul style="list-style-type: none"> <li>• Develop a heritage resource route for rural heritage site.</li> <li>• Develop support infrastructure and spaces for Festivals, Events (sport and other) and celebrations.</li> <li>• Support the development of integrated towns with accessible social and economic services.</li> <li>• Limit the impact of development and urban growth on the significant landscape features.</li> <li>• Identify scenic routes with special management guidelines.</li> <li>• Develop unique gateways/entry point features to towns.</li> <li>• Utilize cultural and heritage resources as part of the eco and agri-tourism attractions in the Swartland.</li> <li>• Identify Heritage precincts on farms and in towns to ensure the appropriate development in and around these areas.</li> </ul>

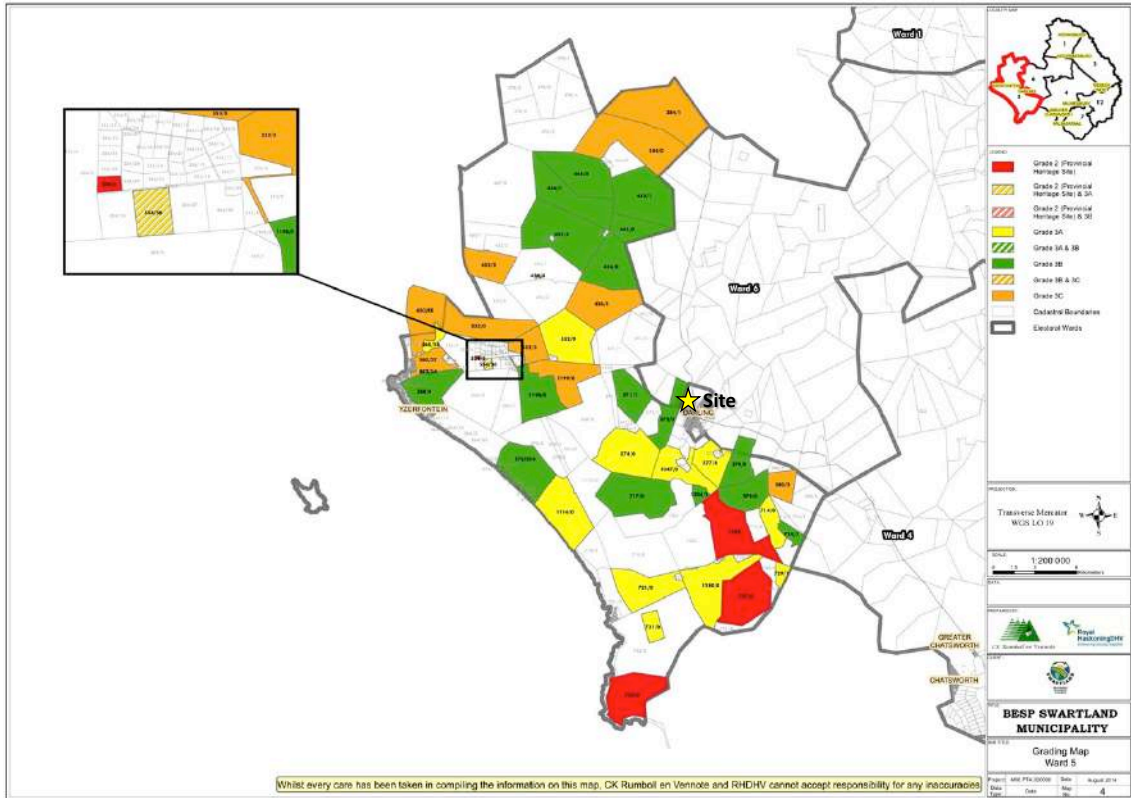
Source: Swartland SDF (2017).

**Figure 3-3: Swartland SDF Objective 4 (May 2019).**

### 3.4.3 The Swartland Rural Heritage Survey (2014)

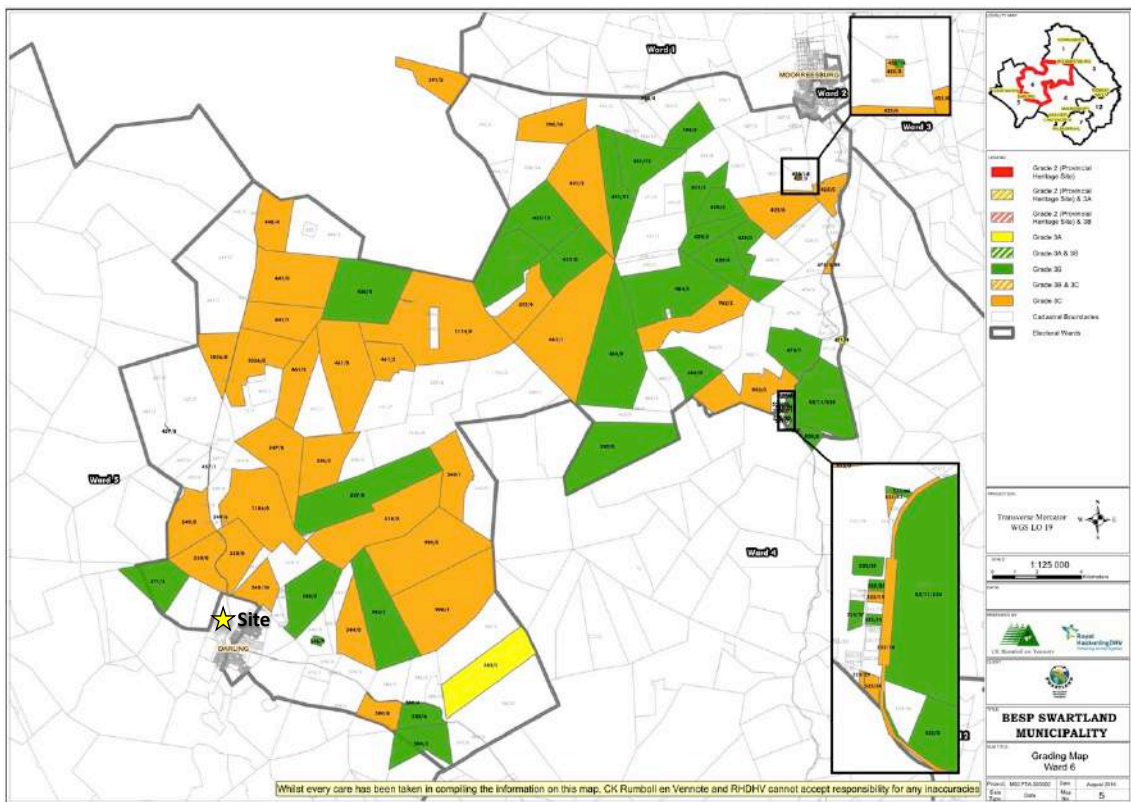
The *Swartland Rural Heritage Survey* of 2014<sup>2</sup> (SRHS) mapped the heritage resources of rural Wards in contrast to the *Swartland Heritage Survey* (2009), which focussed on urban heritage resources. The site falls on the north central boundary of Ward 5 near its boundary with Ward 6 (see Figure 3-4 and Figure 3-5 respectively). Thus to the west is the **Grade 3B** farm *Al-alexanderfontein*, Farm 2/573. Only Grade 3A properties were considered of further significance in the survey.

<sup>2</sup> Urban Design Services (September 2014) in conjunction with PGWC, Swartland Municipality and CK Rumboll & Vennote. *Swartland Rural Heritage Survey Wards 1, 3, 4, 5, 6, 7 & 12 Overview Report* (September 2014): BESP Round 3 Phase 2 Addendums to Swartland SDF.



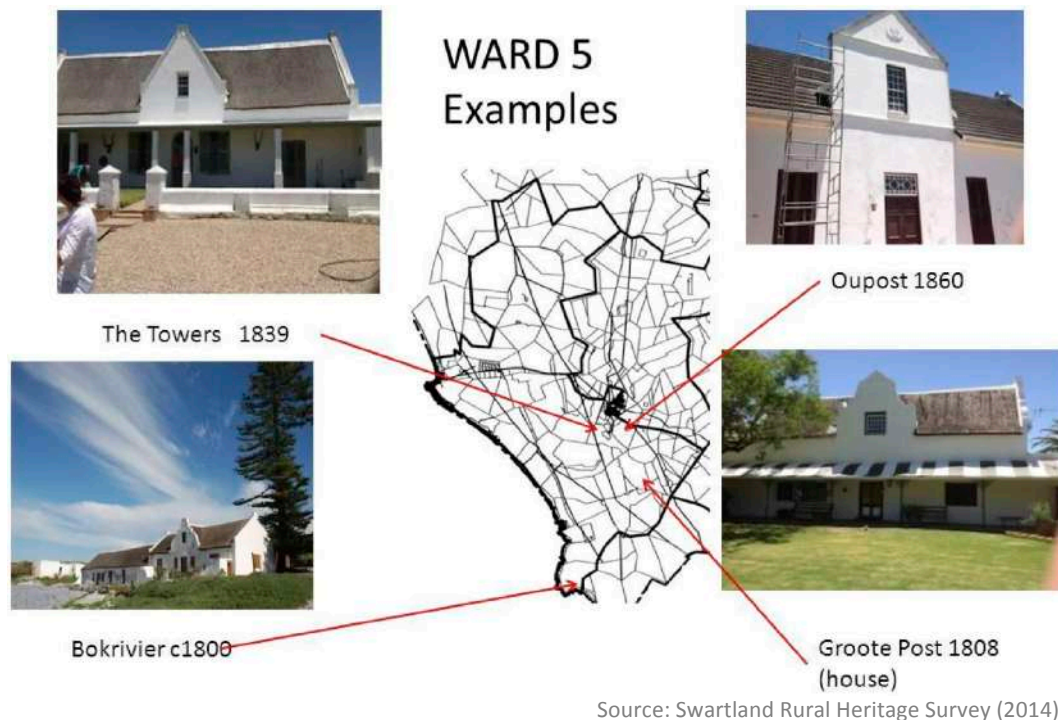
Source: Swartland Rural Heritage Survey (2014).

Figure 3-4: Swartland Rural Heritage Survey: Grading Map Ward 5 (2014).



Source: Swartland Rural Heritage Survey (2014).

Figure 3-5: Swartland Rural Heritage Survey: Grading Map Ward 6 (2014).



**Figure 3-6: Swartland Rural Heritage Survey: Ward 5 Examples (2014).**

Significant additions to the SAHRIS list include Oupost (1860) just south of the site and The Towers (ca 1839) to the west of Oupost (see Figure 3-6). The following information on these historic farms is provided in the SRHS (pages 50-51):

OUDE POST (Fransen p 339) “Just south of Darling, a rectangular house, two rooms deep, with a square and pedimented gable dated 1860 and carrying the initials NJB. Its windows and six-panelled door date from the same time. The house has been well restored.”

THE TOWERS (Fransen p 339-340) “This house, strikingly situated on the slopes of Kapokberg a few km from Darling stands on land that was once called Driepapfontein, granted to Jacob van Reenen on a leasehold which expired in 1838. Its name probably refers to a clump of three large boulders nearby that could be thought to resemble ‘papias’ or chrysalides. It is TT-shaped and certainly older than its mid- 19th-century doors, windows and triangular gable. The end walls of its front section are about 12 degrees out of perpendicular. In the two stubby back wings this angle has only been partly rectified. (An apocryphal story has it that Van Reenen had boasted that it would take him a hundred days to build the house, which he managed to do but not without it showing in the workmanship!) There are additions at the back. Van Reenen was probably the builder of the house sometime early in the 19th century, with its front part perhaps much older. Both the triangular front-gable and the facade woodwork are mid 19th- century and probably the work of Charles John Duckitt, c1870. The farm remained in the possession of the Duckitt family until 1990. The new name they gave it must relate to its elevated position, overlooking vast stretches of undulating Swartland country, or might else simply be a translation of the original name. The present owner has rethatched the house and laid down a brandsolder. IC-TPS. N van der Westhuizen.]”

## 3.5 Strategic Issues

### 3.5.1 Strategic Assessment

One of the difficulties of assessing visual impact at present is the lack of strategic Provincial or Municipal EIA, VIA or HIA studies which provide guidance on how the individual project fits into the overall context of development in any region. While an individual project seems to have an acceptable level of mitigatable impact, when viewed collectively, their sum total can well exceed the sum of the parts. That is, the impact of a single scheme such as this development may seem to be minimal when considered in isolation; however, when seen collectively with other developments also proposed in the area or region but as unknown to the assessor, or as not considered over the long term, the overall impact can become unsustainable. These are cumulative impacts.

There are no strategic visual studies done of the area that we are aware of with the heritage surveys focussing on the built environment as opposed to landscape character. Therefore, it is not possible to consider strategic issues in detail at the project level as the information is generally not available and it is outside the scope of project assessments to do so.

NWA

## 4 Visual Environment Description

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### 4.1 Summary

The area of the proposed solar storage facility is a flat to gently undulating field situated over on the northwestern outskirts of Darling. The site is currently used for grazing of sheep and horses and also allowed a beautiful wildflower display in spring. Parts of the site are also a wetland. The area is located on the edge of the foothills west of Darling and can be easily seen when driving into the town from the west/Yzerfontein side. There are no significant historic homesteads overlooking the site with *Alexanderfontein* being the nearest. An old double avenue of gum trees lines the southern boundary along the R307 partially obscuring the view from this major road.

### 4.2 Introduction

Combined with Section 2, this chapter presents the relevant visual data required to develop a Visual Impact Assessment. This is a strongly visual chapter well illustrated with site and regional photographs. Visual impact is all about what can we see and how this affects us. This chapter shows us what we can see.

#### 4.2.1 Background

The description of the environment is undertaken with a view to presenting basic data for the VIA. A full presentation is made of the visual information collected and analysed as required for a Level 3 VIA.

#### 4.2.2 Key Issues

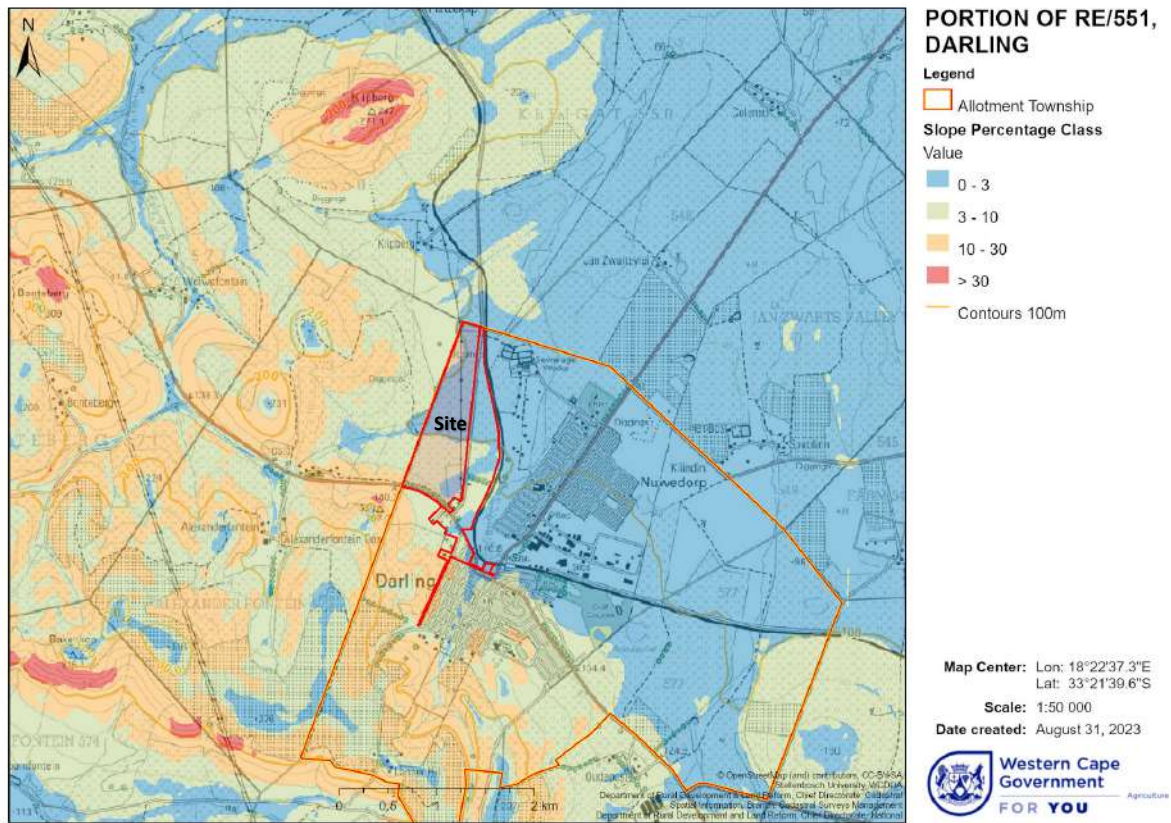
1. The site of the proposed farm is highly visible from local roads, particularly the back road to Mooresburg.
2. The site is apparently natural and was full of spring flowers during our visit and used by grazing sheep and horses to the south.
3. The site is very beautiful in spring and gently undulates northwards towards Klipberg, lying on the edge of the hills west of Darling.

4. The site lies on its narrow southern border along R307/Darling–Yzerfontein Road partially screen by the impressive old double gum avenue on its southern boundary.
5. The area is peri-urban lying on the edge of old and new Darling, currently integrated into the open spaces around the town but containing a substation and power line.

### 4.3 Natural Environment

#### 4.3.1 Landform

The site lies on land that is **relatively flat (<3%)** for more than half of its area to the north and **gently sloping (3-10%)** so the south. Land to the west becomes rolling hills with **hilly slopes (10-30%)** and occasional hilltop **steep hills (>30%)**, while land to the east is also relatively flat (see Figure 4-1).

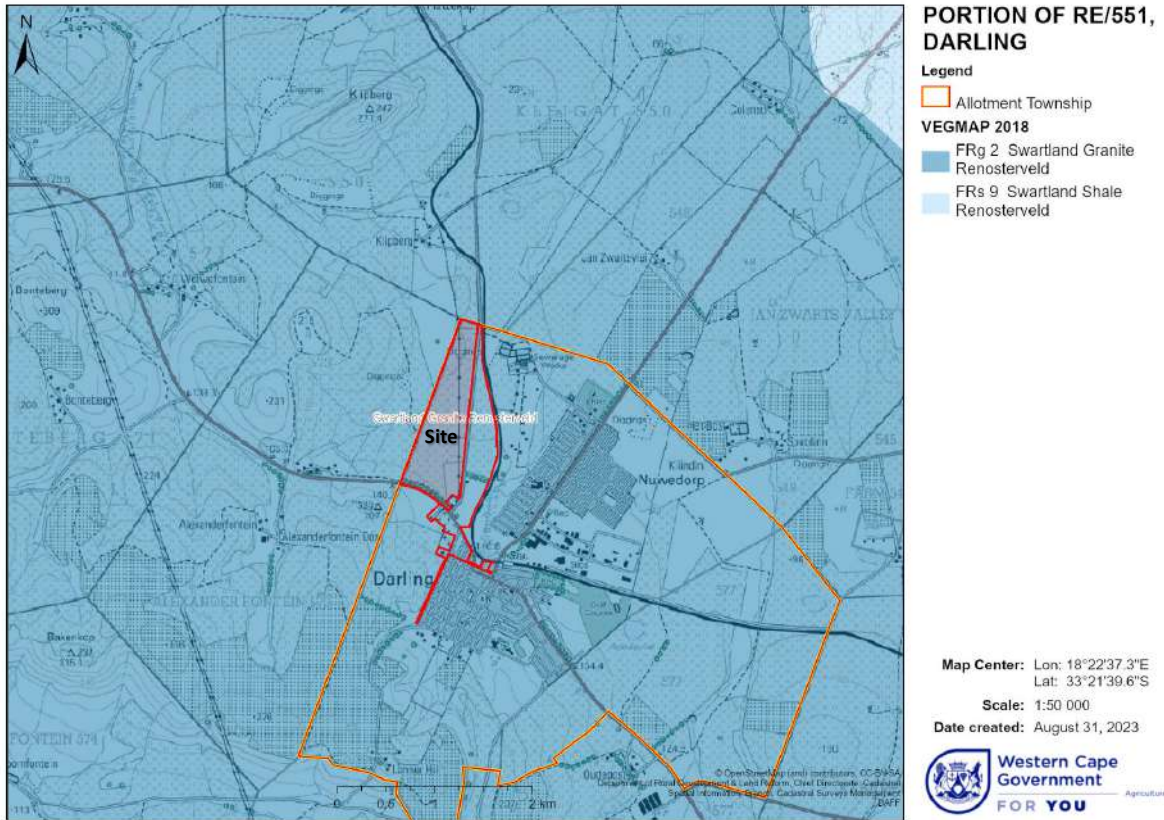


Source: Cape Farm Mapper | New World Associates.

Figure 4-1: Slope Class Map of the Area.

#### 4.3.2 Vegetation

The area is extensively used for wheat and grape farming. The site and general area was originally covered with **Swartland Granite Renosterveld** (see Figure 4-2). Other vegetation types occur further afield. The site is largely currently used for pasture and may be modified from pure natural vegetation but appears largely natural. It was full of spring flowers at the time of our visit.



Source: VegMap 2018 on Cape Farm Mapper (CFM/SANBI, 2006–) | New World Associates.

**Figure 4-2: Vegetation Map of the Area.**

The conservation status of the natural vegetation is provided below in order to inform the site’s landscape value with respect to the significance of the vegetation. Sometimes a site is covered with exotic aliens and these too have a significant impact on the visual and aesthetic value of a site. It also informs the landscaping and planting mitigation recommendations.

### Conservation and Management<sup>3</sup>

Most of the Site’s area’s vegetation type **FRg 2:**

- **FRg 2 Swartland Granite Renosterveld** is a rich vegetation type ranked as **Critically Endangered**.<sup>4</sup>

## 4.4 Cultural Environment

### 4.4.1 History

Darling lies west of Malmesbury and was first known as *Groene Kloof*. The town was laid out in 1853 and named after Sir Charles Henry Darling, the Lieutenant Governor of the Cape

<sup>3</sup> South African National Biodiversity Institute (2006–). *The Vegetation Map of South Africa, Lesotho and Swaziland*, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), online <http://bgis.sanbi.org/SpatialDataset/Detail/18>, Version 2012.

<sup>4</sup> **Conservation:** This is a **critically endangered** vegetation unit of which almost 80% has already been transformed due to prime quality of the land for agriculture (vineyards, olive orchards, pastures) and also by urban sprawl. Hence the conservation target of 26% remains unattainable. Only very small portions (0.5%) enjoy statutory protection in the Paarl Mountain Nature Reserve and Pella Research Site, and also (2%) in the Paardenberg, Tienie Versveld Flower Reserve near Darling and in the Duthie Nature Reserve in Stellenbosch. Alien grasses are particularly pervasive, the most important being *Lolium multiflorum*, *Avena fatua* and *Bromus diandrus* (Musil et al. 2005). Alien woody species include *Acacia saligna*, *Pinus pinaster* as well as various species of *Eucalyptus*. Erosion very low, low and moderate.

from 1851-1854. A village management board administered it from 1901 until it achieved municipal status in 1955.<sup>5</sup>

The town was laid on the farm *Langefontein* in 1853 at the same time as the new Dutch Reformed parish was founded.<sup>6</sup>

The *Swartland Rural Heritage Survey* notes the following on Darling (page 12):

**Darling** is named after Governor Charles Henry Darling who arrived at the Cape in 1851. The town was established in a shallow valley on land subdivided from the farm Langfontein in 1853 (the date when its first erven went on public auction and the first house built).

*Historical Significance:* Darling is of some local historical significance as a rural centre associated with the dairy industry, and as an historic townscape containing significant numbers of substantially surviving 19th and early 20th Century period buildings and plantings.

*Social Significance:* Darling is of some local social significance relating to its historic role as spiritual and commercial centre, as well as place of general social interaction for communities from outlying rural areas.

## 4.4.2 Heritage

### The Swartland

The Swartland is a significant agricultural landscape with its earliest origins in Khoi cattle grazing, and in the later planting of wheat crops on the rich Malmesbury Clays by Cape colonists. The name *Swartland* (Black Country) is thought to derive from the grey renosterveld vegetation being first recorded by Jan van Riebeeck, the first Governor of the newly founded colony.<sup>7</sup> The extensive wheat fields were established by the mid-eighteenth century making the region famous. Other important crops include fruit and flowers for export, tobacco and, importantly, grape vines (Erasmus, p40).

There are various wine farms in the region and local area, the nearest being to the southwest. The Swartland Wine Route is known for its fine pinotage and hanepoot wines with the largest dryland vineyard in the Southern Hemisphere found at *Rooidraai* (Redbend) farm (ibid, page 42).

### Darling

Darling is known as a Flower Town and lies on the R315 from Yzerfontein to Malmesbury. The district is renowned for its tremendous fynbos vegetation and spring flowers (over 1,000 species) and a flower show has been held there annually for over a century since 1917. There

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<sup>5</sup> Peter E Raper and the Human Sciences Resource Council (2004). *New Dictionary of South African Place Names*. Jonathan Ball Publishers, Johannesburg & Cape Town. **Darling** entry, page 66.

<sup>6</sup> BPJ Erasmus (2nd Ed, 2008). *On Route in South Africa*. Jonathan Ball Publishers, Johannesburg & Cape Town.

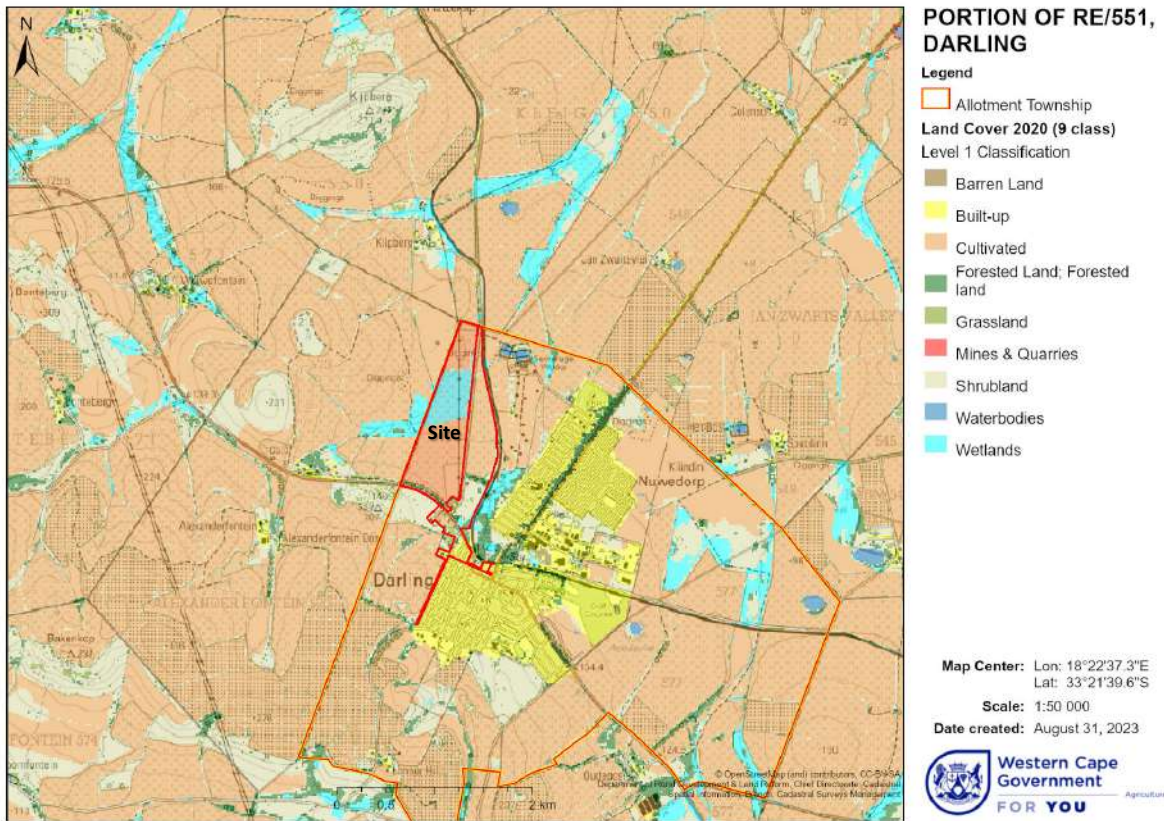
<sup>7</sup> Raper notes in the entry **Swartland** (page 360) that the Afrikaans name does not refer to the colour of the soil, which is generally yellow, but to the *renosterbossies* (*Elytropappus rhinocerotis*) and *bakkerbossies* (*Passerina filiformis*) growing there; these shrubs are greyish-black [when dry], and pitch black when wet."



are various floral reserves including at Oude Post, home also to the large orchid nursery of the Duckitt family. District farms cater to dairy products, wheat, lupins, wine and wool, while the town is home to the famous South African satirist, Pieter-Dirk Uys. Other local heritage sites include: the local museum, the obelisk on Kraalbosdam farm, the canon at the Civic Centre originally installed on Klipberg in 1734 that signalled the arrival of ships in Table Bay (Erasmus, page 50).

#### 4.4.3 Land Use

The site falls on **Cultivated** land as does much of the area but there is also an area of **Wetlands** over the north-central portion (see Figure 4-3). The land was largely natural in good condition when we visited on 3 September 2023 and is currently used for grazing. The town of Darling is classified as **Built-up** while areas of **Grassland** or grazed renosterveld occur in fragments amongst the farms. **Wetlands** are common throughout the area. There are also numerous **Forested** area/avenues indicated that are often **Gum Tree avenues and woodlots**.



Source: Cape Farm Mapper | New World Associates.

Figure 4-3: Land Cover of the Area.

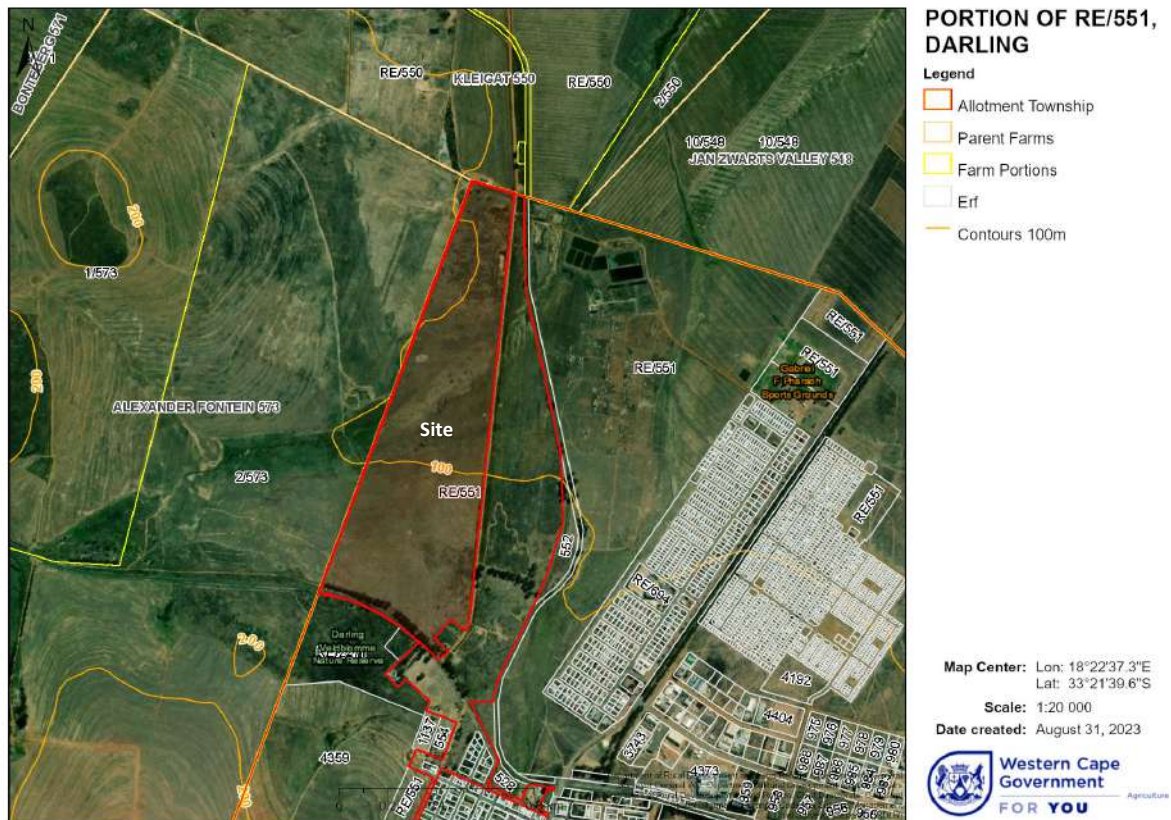
#### 4.4.4 Urban Edge

The site occurs outside the Urban Edge but within the area planned for Darling's wider extent (see Figure 3-1).

#### 4.4.5 Aesthetics

The area's aesthetic is one of rolling hills and wheatlands with flatter land to the north (see Figure 4-4). The hills of the Kapokberg rise to the south behind the town of Darling. The area around Darling is generally flat with minor undulations such as where the site occurs. These flatter areas are intensively farmed for wheat in winter or used for grazing as in this case. In spring, as during our site visit, there were fine floral displays that occur naturally in this natural vegetation type.

The town of Darling is built on the edge of the Kapokberg. Natural renosterveld occurs on the steeper hills while any land that is not too steep to be arable is wheat farming. Darling is a small historic farming town with an historic area and suburbs lying to the south, while a newer rectangular industrial and township area lies to the north of the railway line. The Darling Golf Club with its large trees lies between the proposed site and the historic town.



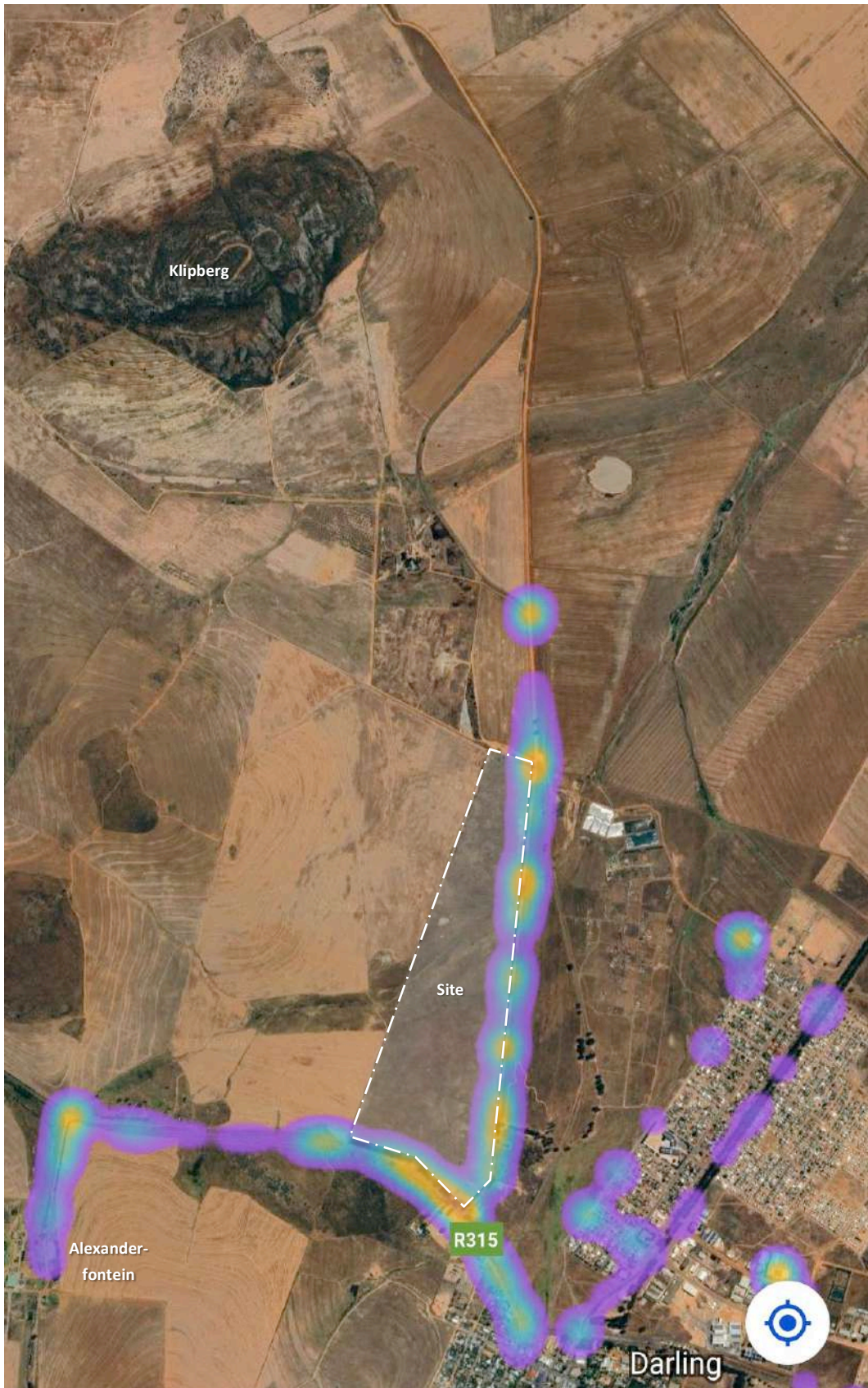
Source: Cape Farm Mapper | New World Associates.

Figure 4-4: Satellite Image of the Area during winter.

### 4.5 Visual Environment

#### 4.5.1 Visual

The site has been the subject of a photographic survey that looks at the site itself, the local area and views from local roads (see Figure 4-5). The bulk of the visual description is to be found in the photographs that are self explanatory and accompanied by descriptions.



Source: Google Photos | New World Associates.

Figure 4-5: Site and photographic locations on satellite image.

## 4.5.2 Views from the Road

### Views from the R307 Darling–Yzerfontein Westbound

The site lies on the boundary of the R307/Darling–Yzerfontein road. Travelling westward one encounters the site on the right as you exit the town. The site begins at the Klipberg Road intersection and is marked by a fine avenue of old gum trees on its southern boundary that extends the entire length with occasional gaps. As the road rises into the hills, it climbs upwards above the site but sideways views into the site are typically partially obscured by the heavy gum tree trunks and branches. One can mainly see the southern end of the site from the R307 with the bulk of the site stretching into the distance to the north.



Photograph 4-1: R307/Darling–Yzerfontein Road view series approaching the site.



Photograph 4-2: R307/Darling–Yzerfontein Road view series approaching the site.



Photograph 4-3: R307/Darling–Yzerfontein Road view series approaching the site.



Photograph 4-4: R307/Darling–Yzerfontein Road view series approaching the site.



Photograph 4-5: R307/Darling–Yzerfontein Road view series: Klipberg Road turnoff.



Photograph 4-6: R307/Darling–Yzerfontein Road view series: substation on site corner.

Besides the long avenue of roadside gum trees that marks the beginning of the site on its southern boundary along the R307, there is also a substation in the southeast corner of the site, which the proposed site wraps around and connects into. From this point onwards there are numerous framed glimpses into the site showing most clearly its southern end between the gum trees.



Photograph 4-7: R307/Darling–Yzerfontein Road view series: grazing pasture.



Photograph 4-8: R307/Darling–Yzerfontein Road view series: pasture and power line in the site.



Photograph 4-9: R307/Darling–Yzerfontein Road view series: panorama of the picturesque gum tree avenue that runs on the southern boundary.

The site forms part of a wider landscape that is both agricultural and conservatory with both aspects having a high-perceived social value. The agricultural landscape is part of the attraction of this type of agricultural landscape heritage, while conserved areas such as the remaining natural hills and wetlands have high botanical, ecological and recreational value such as the neighbouring Darling Wildflowers Renosterveld Reserve 8 over the road to the south.



**Photograph 4-10: R307/Darling–Yzerfontein Road view series: panorama of the pasture on the southern boundary.**



**Photograph 4-11: R307/Darling–Yzerfontein Road view series: pasture and sub-station.**



**Photograph 4-12: R307/Darling–Yzerfontein Road view series: Darling Renosterveld Reserve 8 over the road to the south.**



**Photograph 4-13: R307/Darling–Yzerfontein Road view series: showing the southern pasture.**



Photograph 4-14: R307/Darling–Yzerfontein Road view series: showing the gum trees.

Horses and sheep grazing reveal the picturesque rural or country feel of the farmland around Darling, which is mostly either wheat fields or wetlands and grazing.

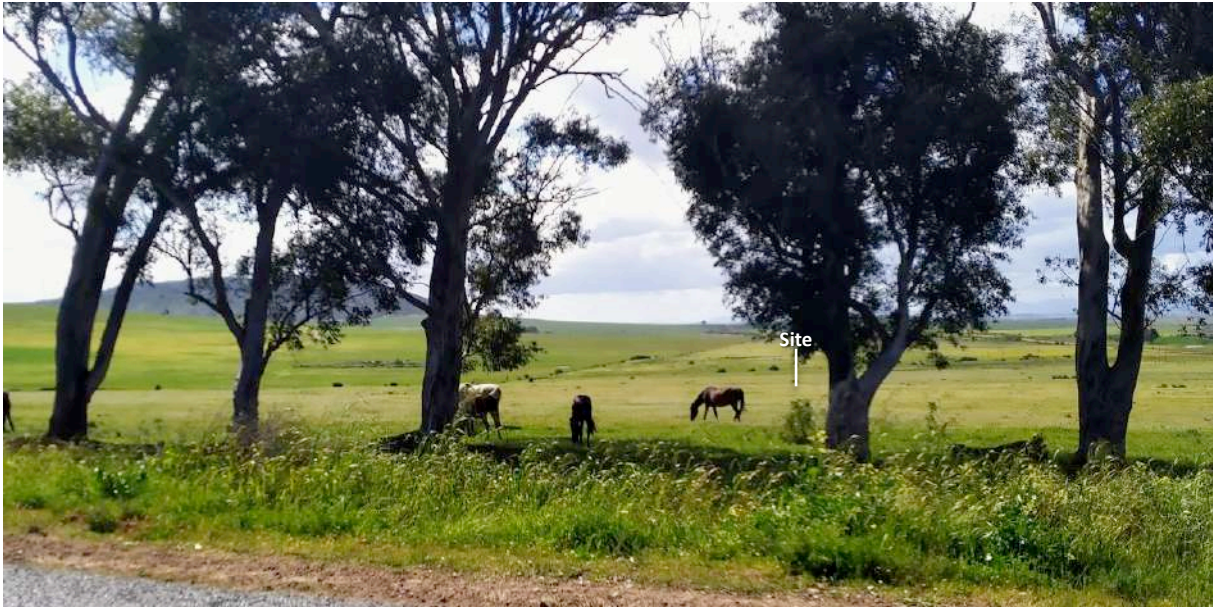


Photograph 4-15: R307/Darling–Yzerfontein Road view series: showing boundary gums.

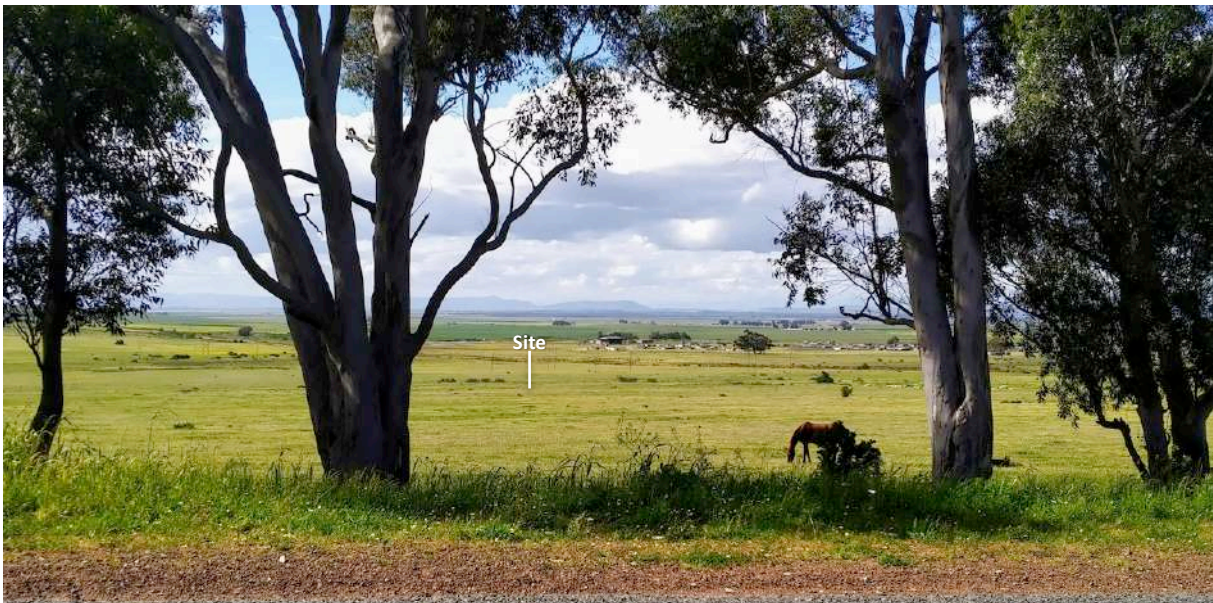


Photograph 4-16: R307/Darling–Yzerfontein Road view series: overlooking the pasture on site.





**Photograph 4-17: R307/Darling–Yzerfontein Road view series: horses grazing on site.**



**Photograph 4-18: R307/Darling–Yzerfontein Road view series: horses grazing on pasture.**



**Photograph 4-19: R307/Darling–Yzerfontein Road view series: leaving the site behind.**



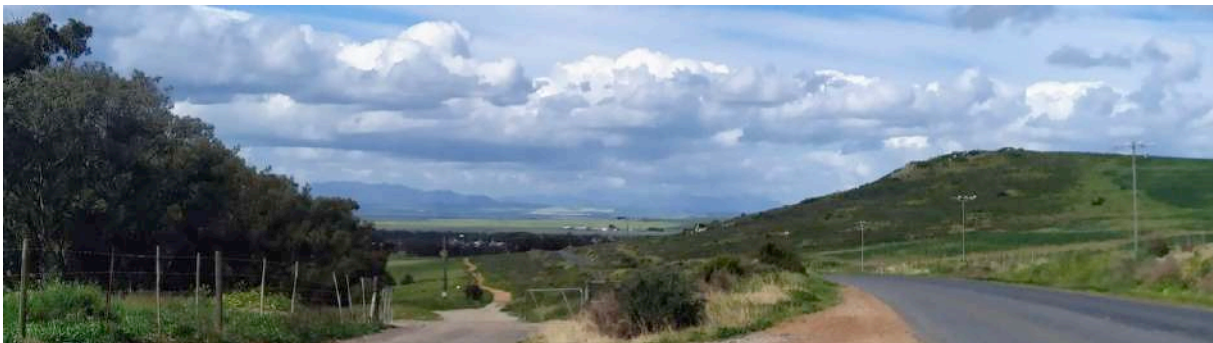
**Photograph 4-20: R307/Darling–Yzerfontein Road view series: approaching *Alexanderfontein*.**

#### **Views from the R307/Yzerfontein–Darling Eastbound**

Travelling eastward one encounters the site on the left as you approach the town. The site begins at the bottom of the descent into the town and is marked by a fine avenue of old gum trees on its southern boundary that extends the entire length with occasional gaps. From this side one has a broadside view of the site from above as it lies directly in the field of view as you drive towards Darling.



**Photograph 4-21: Yzerfontein–Darling view series near *Alexanderfontein* entrance.**



**Photograph 4-22: Yzerfontein–Darling view series looking down towards the site.**



**Photograph 4-23: Yzerfontein–Darling view series with the site coming fully into view.**

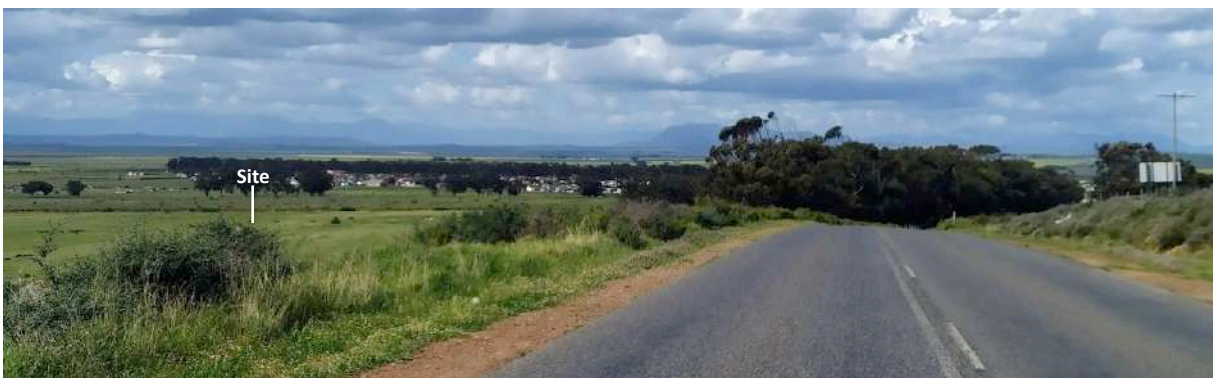


Photograph 4-24: Yzerfontein–Darling view series with the site opening up to the left.

Views of the site begin after passing *Alexanderfontein* on the right and are briefly interrupted by a small group of trees and houses on the start of the descent. The rolling hills of the highlands give way to a vast view of the plain on which the site sits at its edge. The distant mountains of Kasteelberg stand above the plain.



Photograph 4-25: Yzerfontein–Darling view series approaching a corner ridge.



Photograph 4-26: Yzerfontein–Darling view series final descent to site at gum trees.



Photograph 4-27: Yzerfontein–Darling view series near the site.



Photograph 4-28: Yzerfontein–Darling view series overlooking the southern site.

As the road descends into the town, there are excellent views across the site that gives a broadside view of its linear extent.



Photograph 4-29: Yzerfontein–Darling view series: panorama from Klipberg to the R307.



Photograph 4-30: Yzerfontein–Darling view series: panorama across the site.



**Photograph 4-31: Yzerfontein–Darling view series: driving past the site’s boundary gums.**

After the broadside views of the site from the west, the heavy double gum avenue is a major visual feature along the site’s southern boundary with the R307. This largely obscures open views of the site, now seen on its narrow side through glimpses between the trees. This impressive double avenue effectively marks the entranceway into the town.



**Photograph 4-32: Yzerfontein–Darling view series: overlooking the western boundary.**



Photograph 4-33: Yzerfontein–Darling view series entering the town and passing the site.



Photograph 4-34: Yzerfontein–Darling view series entering the town and passing the site.

There are good views into the site should you choose to stop, otherwise, you see them as passing vistas of a rural peri-urban landscape.



Photograph 4-35: Yzerfontein–Darling view series: breaks in the gums open views in places.



Photograph 4-36: Yzerfontein–Darling view series with the old double gum tree avenue.

The old double gum tree avenue is a significant landscape feature that both marks and obscures the southern boundary views into the site.



Photograph 4-37: Yzerfontein–Darling view series: site behind, boundary road to left.

The old gum avenue continues for a stretch before being replaced by a more recent Canary Island Date Palm avenue. There are various other gum tree plantings around Darling that are important features of the towns landscape heritage.

### 4.5.3 Views from Neighbouring Areas

#### Views from Nuwedorp

The following views are taken the nearest/western edge of Nuwedorp, which has marginal views of the site due to being on lower ground and at some distance.



**Photograph 4-38: View from Nuwedorp near the main road towards the site.**



**Photograph 4-39: View from Nuwedorp with housing/walls blocking the view.**



**Photograph 4-40: View from Nuwedorp northwards up Durban Street.**



**Photograph 4-41: View series from Nuwedorp up 1st Avenue towards the site.**





Photograph 4-42: Panorama from Nuwedorp over dumping on Maitland Street towards site.



Photograph 4-43: View series from Nuwedorp over dumping on Maitland Street towards site.

Views from Maitland Street of the site are largely blocked by the change in elevation of the road south of the site along its eastern boundary, or by the railway in the south.



Photograph 4-44: View series from Nuwedorp on Maitland Street towards site.



Photograph 4-45: View from Nuwedorp on Maitland Street towards site.



Photograph 4-46: View from Nuwedorp on Maitland Street towards the north.



Photograph 4-47: View from Nuwedorp on Maitland Street towards the north.

**There is dumping of waste and building materials at the end of every Avenue off Maitland Street as locals ruin their rural edge, views and landscape.**



Photograph 4-48: View from Nuwedorp on Maitland Street towards the site.



Photograph 4-49: Panorama from Nuwedorp on Maitland Street towards the site.



Photograph 4-50: Panorama from Nuwedorp on Maitland Street towards the site.



Photograph 4-51: Panorama from Nuwedorp on Maitland Street towards the site



Photograph 4-52: View from Nuwedorp on Maitland Street towards the site.

**Open views along Maitland are marred by dumping and do not show the site clearly.**

**View Series from 17th Avenue to the Sewage Farm**

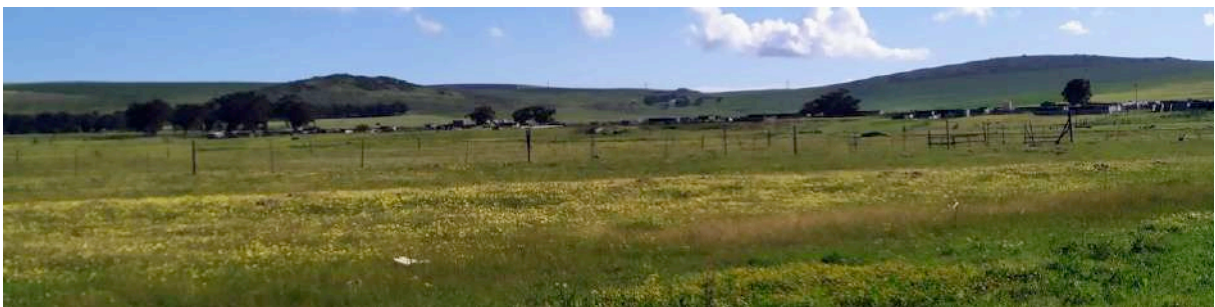
17th Avenue leads to the sewage farm and gets closer to the northern end of the site.



**Photograph 4-53: View towards the southern side of the site from 17th Avenue.**



**Photograph 4-54: View towards the northern side of the site from 17th Avenue.**



**Photograph 4-55: View towards the southern side of the site from 17th Avenue.**



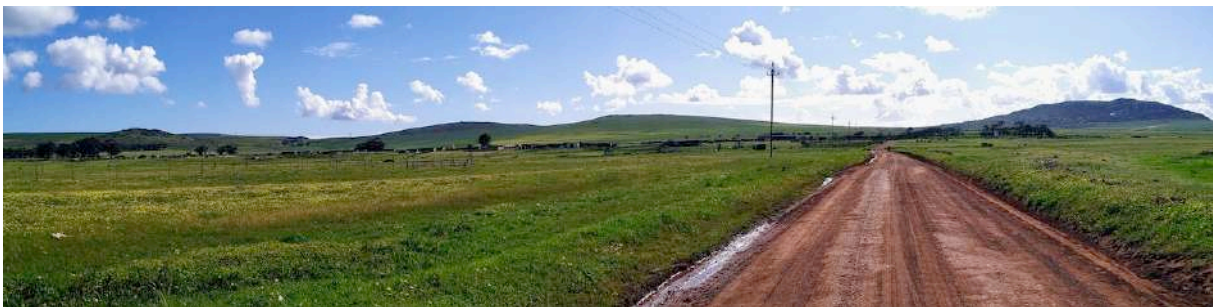
**Photograph 4-56: View towards the northern side of the site from 17th Avenue.**



Photograph 4-57: View towards the northern side of the site from 17th Avenue.



Photograph 4-58: Panorama from Nuwedorp across the site from 17th Avenue.



Photograph 4-59: View towards the northern side of the site from 17th Avenue.



Photograph 4-60: Panorama of Nuwedorp along 17th Avenue, which look towards the site.

Views from 17th Avenue, while getting closer to the northern end of the site, do not have very clear views due to the low elevation across flat ground and intervening land-forms, the railway and road.

#### 4.5.4 Views from Heritage Sites

##### *Alexanderfontein*

The nearest heritage site is *Alexanderfontein* but the homestead occupies a sheltered valley to the southwest that has no views towards the site. Nevertheless, it is a substantial and picturesque local farm.



Photograph 4-61: View of the historic *Alexanderfontein*, which has no views of the site.



Photograph 4-62: View of the picturesque spring valley of historic *Alexanderfontein*.

### The Impressive R307 Gum Avenue through Nuwedorp

Besides the general scenic and agricultural landscape of Darling, the urban landscape has its own landscape features that are equally impressive, particularly the massive historic gum tree avenue along the R307 that runs north/south through the Nuwedorp to the north of historic Darling. While this central road and avenue in Nuwedorp has no views of the site at all, it demonstrates the high value of the old gum tree avenues that are so prominent from south of Atlantis all the way to Darling.

**Gum trees are invaluable in providing shade, height, shelter, screening and scenic value in the landscape. They also provide an historic quality to the cultural landscape that is more planted than built and probably the most substantial feature of the planted environment.**



**Photograph 4-63: Views from Nuwedorp**

#### 4.5.5 Views of the Site

Views of the site can be found in the previous section **4.5.2 Views from the Road**.

This concludes the visual description of the study area. A visual assessment of the site follows in the next chapter.

NWA





# 5 Visual Impact Assessment

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## 5.1 Summary

**VISUAL IMPACT:** The proposed development will have a high impact on the landscape causing noticeable change to the visual environment. **VISIBILITY:** The development has moderate–high visual exposure; moderate–high visual absorption capacity; low compatibility; and moderate–high visibility. **NATURE OF IMPACT:** The development’s visual impact has district extent, long-term duration, medium intensity, definite probability, and medium significance on the landscape. **RECOMMENDATIONS** are made around the need for planting screening with endemic species, natural colouration of fencing and structures, and good planting maintenance. **SITE CHOICE** is, however, questionable as the land between the site and Nuwedorp is similar and would contain urban–infrastructural sprawl while retaining the moderate–high value landscape and scenic value of the proposed site.

## 5.2 Introduction

This chapter uses the information collected in the previous chapters in an analysis that identifies and then describes the preliminary visual and aesthetic impacts of the project on the environment presented in tabular form due to the extent of the project.

**DEFINITION:** “Visual impact is defined as a change in the appearance of the landscape as a result of development which can be positive (improvement) or negative (detraction)” (IEA and the Landscape Institute, 1995).

### 5.2.1 Key Issues

1. The proposed solar storage facility lies outside the Darling Urban Edge on a long field used for pasture.
2. The character of the area is rural around Darling with wheat farms stretching to the north and east, and more wheat farms in the hills to the west.
3. The site is large covering with a total area of some 73.2 hectares and will be used for solar power generation and storage for the town.

4. Besides the solar panels, details of which are unknown — it is presumed that they will be positioned low on the ground and face northwards — there will also be containers housing the inverters and batteries.
5. The area is well visible from the road, particularly westbound on the R307 into Darling, and along the dirt road to Mooresburg. It is less visible from the old town or Nuwedorp itself however.
6. An old double avenue of gum trees lines the southern boundary partially obscuring views from the R307 when travelling alongside the site, otherwise it is open to view particularly from overlooking hills nearby.

### 5.3 Methodology

A table is being used to scope the issues relating to visual and aesthetic impact of the wind turbines on the landscape.

#### 5.3.1 The Visual Assessment

The visual environment can be structured into the following components:

1. **Natural Environment:** comprising the *Geomorphology* (geology, soil, land form), *Climate* (atmosphere and water), and *Nature* (vegetation and wildlife).
2. **Cultural Environment:** comprising *Land Use* (urban, rural, agricultural, recreational, etc), the *Structures* (architecture, engineering, lighting, services), and *History* (ancient, colonial, modern, contemporary).
3. **Visual Environment:** comprising *Views* (aesthetics, visibility), *Routes* (scenic, transport), and *Landscapes* (town, country, cultural, natural, mountainous, coastal, etc).

#### 5.3.2 Triggers for Visual Assessment

These have been extracted from the PGWC (November 2005) list of triggers (p 9) with potential aspects relevant to this project noted in **bold**:

**The nature of the receiving environment:**

1. Areas with protection status, such as national parks or nature reserves;
2. Areas with proclaimed heritage sites or scenic routes;
3. Areas with intact wilderness qualities, or pristine ecosystems;
4. Areas with intact or outstanding rural or townscape qualities;
5. **Areas with a recognized special character or sense of place;**
6. **Areas lying outside a defined urban edge line;**
7. Areas with sites of cultural or religious significance;
8. Areas of important tourism or recreation value;

- 9. Areas with important vistas or scenic corridors;
- 10. Areas with visually prominent ridgelines or skylines.

**The nature of the project:**

- 1. High intensity type projects including large-scale infrastructure;
- 2. A change in land use from the prevailing use;
- 3. A use that is in conflict with an adopted plan or vision for the area;
- 4. A significant change to the fabric and character of the area;
- 5. A significant change to the townscape or streetscape;
- 6. Possible visual intrusion in the landscape;
- 7. Obstruction of views of others in the area.

As can be seen, the various sites could be described as falling within at least 3 of the 10 listed receiving environments (30%), and 4 out of 7 project types (57%) that may cause visual impact giving a combined total of 48.5%; the receiving environment has *moderate-low* sensitivity while the project character has *moderate* impact. **Thus the factors triggering potential impact suggest that impact will be moderate.** Regarding “the nature of the receiving environment,” categories apply to both the site and the area generally.

**5.3.3 Key Issues Requiring Specialist Input**

The following table helps identify the likely level of impact:

TYPE OF ENVIRONMENT: High to Low Sensitivity	TYPE OF DEVELOPMENT: Low to High Intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high scenic, cultural, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

Figure 5-1: Table of Visual Impacts ex DEA&DP Guidelines.

Furthermore, the PGWC “Categorisation of issues to be addressed by the visual assessment” (Table 1, p 6) identifies the project as **Category 5 development:** large-scale infrastructure generally.

Terms are defined as follows (p 7):<sup>8</sup> **Category 5 development** e.g. *high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.*<sup>9</sup> In the list of “Type of environment” this would be defined as a mix of “**areas or routes of medium scenic, cultural, historical significance.**” This would result in a theoretical possible outcome: **high visual impact** expected. When considering the following descriptions, we find that the visual impact is also described as **High**:

**“High visual impact expected:**

1. **Potential intrusion on protected landscapes or scenic resources;**
2. **Noticeable change in visual character of the area;**
3. **Establishes a new precedent for development in the area.**

**“Moderate visual impact expected:**

1. Potentially some affect on protected landscapes or scenic resources;
2. Some change in the visual character of the area;
3. Introduces new development or adds to existing development in the area.

**“Minimal visual impact expected:**

1. Potentially low level of intrusion on landscapes or scenic resources;
2. Limited change in the visual character of the area;
3. Low-key development, similar in nature to existing development.”

**“Little or no visual impact expected:**

1. Potentially little influence on scenic resources or visual character of the area;

---

<sup>8</sup> **Category 1 development:** e.g. nature reserves, nature-related recreation, camping, picnicking, trails and minimal visitor facilities.  
**Category 2 development:** e.g. low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.

**Category 3 development:** e.g. low density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.

**Category 4 development:** e.g. medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.

**Category 5 development** e.g. high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

<sup>9</sup> *Low-key development* – generally small-scale, single-storey domestic structures, usually with more than 75% of the area retained as natural (undisturbed) open space.

*Low density development* – generally single or double-storey domestic structures, usually with more than 50% of the area retained as natural (undisturbed) open space.

*Medium density development* – generally 1 to 3-storey structures, including cluster development, usually with more than 25% of the area retained as green open space.

*High density development* – generally multi-storey structures, or low-rise high density residential development.

2. Generally compatible with existing development in the area;
3. Possible scope for enhancement of the area.”

The following terms are used in the above assessments (p 8):

1. *“Fundamental change* – dominates the view frame and experience of the receptor;
2. ***Noticeable change*** – clearly visible within the view frame and experience of the receptor;
3. *Some change* – recognisable feature within the view frame and experience of the receptor;
4. *Limited change* – not particularly noticeable within the view frame and experience of the receptor;
5. *Generally compatible* – Practically not visible, or blends in with the surroundings.”

**SUMMARY ASSESSMENT—VISUAL IMPACT: The proposed development will have a high impact on the landscape causing noticeable change to the visual environment.**

This assessment of the impact is confirmed by the following descriptions of the categories of issues:

#### 5.3.4 Level of Assessment

PGWC (November 2005) defines the selection of the appropriate approach to VIA for a moderate visual impact expected as a **Level 3** Visual Assessment (p 13). This is defined as follows:

*Approach Type A Assessment: which are relatively large in extent, and involve natural or rural landscapes.*

**Visual impact assessment report by visual specialist qualified in landscape architecture or environmental planning; preferably affiliated to SACLAP.**

*Method:*

1. Identification of issues raised in scoping phase, and site visit;
2. Description of the receiving environment and the proposed project;
3. Establishment of view catchment area, view corridors, viewpoints and receptors;
4. Indication of potential visual impacts using established criteria;
5. Inclusion of potential lighting impacts at night;
6. Description of alternatives, mitigation measures and monitoring programmes;
7. Review by independent, experienced visual specialist (if required);

**A Level 4 VIA for High Impact** requires “Complete 3D modelling and simulations, with and without mitigation” in addition to the above.<sup>10</sup>

## 5.4 Visual Analysis

### 5.4.1 Visual Mapping

This has been mapped in Figure 5-2 and shows the site’s visibility as defined by its Viewshed, Zones of Visual Influence and Viewpoint Analysis. Visual Absorption Capacity (or Visual Sensitivity) is not mapped but discussed below. The mapping technique is a traditional, *reflective* mapping or viewshed mapping, which shows where, and to what extent, the site is visible from its surroundings. *Projective* mapping, that is, from viewpoints within the site (inside out) is not required but site views can be seen in the photographs.

### 5.4.2 Key to the Visual Analysis Map

The **Visual Catchment** is shown as **thick brown lines** and approximately follows the ridgelines of the mountains and hills (see Figure 5-2). Areas *theoretically* visible to the site (Zone of Visual Influence or ZVI) are indicated in **yellow** overlain on a radiating circle centred on the site graded from **solid blue** on the site being most visible to no shading beyond 5km visibility. Combined with the yellow ZVI this produces a **green** to **yellow** colour where the site is visible. Areas with no yellow colouring are those where the site is not visible (the view shadow).

**It should be noted that the term *theoretically* is significant as it is neither possible nor necessary to physically check all these locations. However, strategic views have been checked according to site inspection and analysis.** Some views that would theoretically be possible are not possible due to ground level screening and the hilly terrain. Urban and suburban buildings and orientation are also important factors in visibility. Radiating circles of concentric rings encompass the site at 1km intervals but including a 250m and 500m circle.

### 5.4.3 Viewshed

The **viewshed** is indicated by the edge of the yellow zones on the map and either is terminated by **ridgelines** shown in brown or diminishes with distance (see Figure 5-2). The viewshed of the site is contained mostly by the local topography. Various ridgelines of the surrounding hills, even quite subtle ones, can block the view much closer than you might anticipate looking at the map. This is the case to the immediate west and at low levels to the east due to the raised N7.

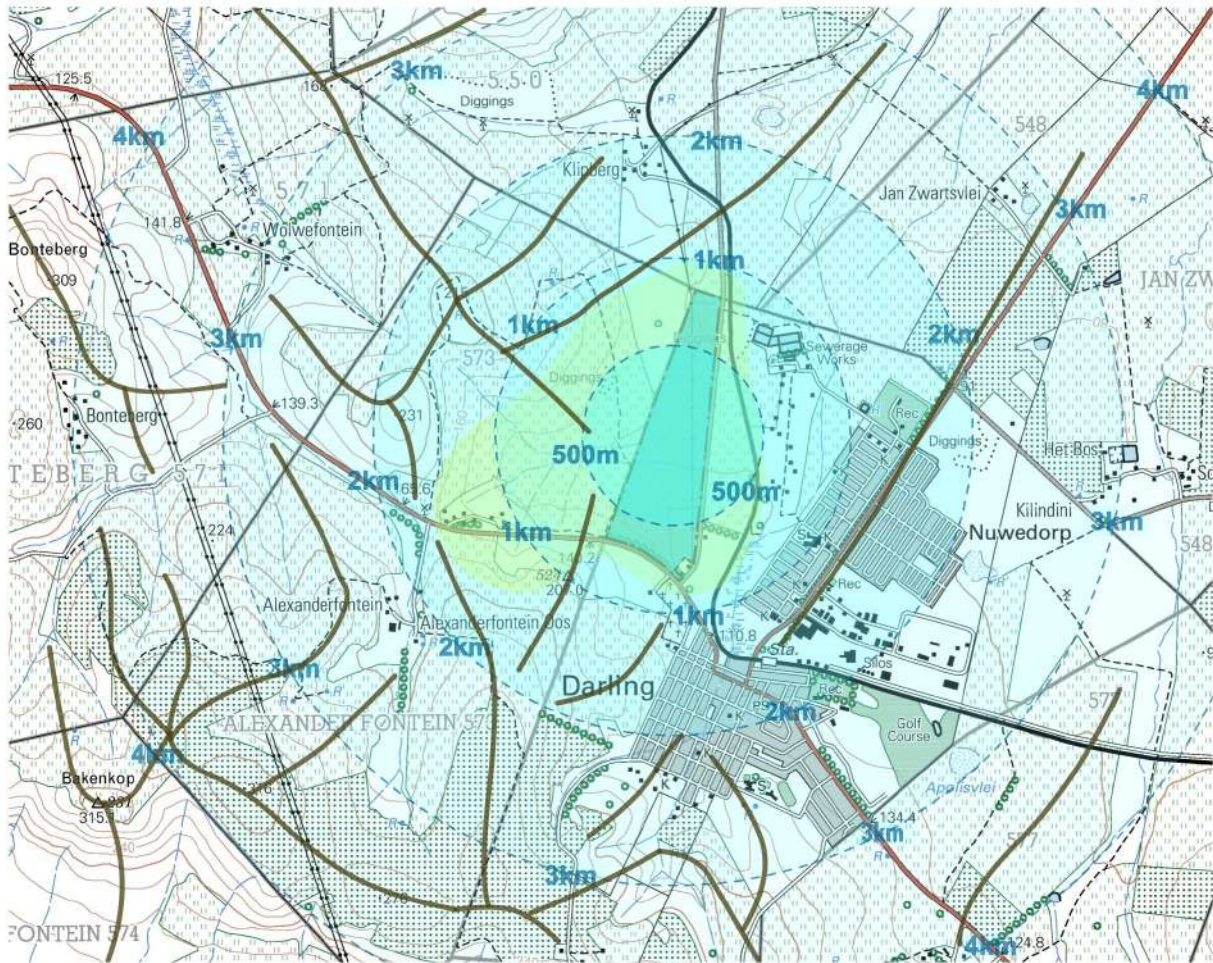
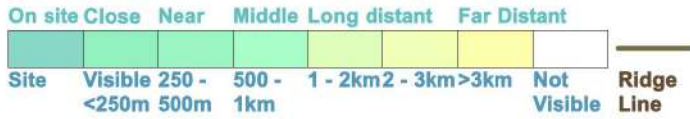
### 5.4.4 Zone of Visual Influence

The **Zone of Visual Influence (ZVI)** is shown in various shades of **green** has a moderately small visual influence mostly within the 1km radius and less, except to the southwest where it critically expands up the R307 (see Figure 5-2). The most significant views are either within

<sup>10</sup> This is not always possible depending on the planning information available or necessary where development types are known.

1km of the site on the R307 or right next to it on the dirt road to Mooresburg or from the railway line.

**Darling Solar Storage Facility: Zones of Visual Influence (1:50,000)**



Source: New World Associates.

**Figure 5-2: Zone of Visual Influence.**

Portion of a 1:50,000 map of South Africa (3318AD 2010 ED5 GEO DARLING) showing the approximate Zone of Visual Influence (ZVI).

**5.4.5 Visual Absorption Capacity**

The Visual Absorption Capacity (VAC) of the landscape is typically defined by landform, land use and vegetation. In this case, landform, land use and vegetation such as trees are all factors.

### VAC of the Land Form

Landform is partially significant in containing views creating a distinct edge to the ZVI in the hills to the west at the same time as allowing critical overlooking views within the 1km range from the R307.

### VAC of the Land Use

Land Use VAC is always a factor in urban areas with ground level structures usually blocking off views near buildings and walls. The raised railway line to the east of the site also screens off low-level views from nearby Nuwedorp.

### VAC of the Vegetation

The area has significant strategic vegetation VAC in the south due to the old double gum avenue on its southern boundary with the R307. Otherwise, the natural vegetation provides little coverage.

### 5.4.6 Visual Sensitivity

The area has moderate–high sensitivity in the Darling landscape in that the site is situated just on the outskirts of town on the prominent R307. At present there are no solar farms in the area but at least one is planned further east that the author knows about and more are likely given the electrical power crisis.

### 5.4.7 VIA Criteria and Assessment

The PGWC Guideline (June 2005, pp 18-19) defines Visual Impact Assessment Criteria as outlined following. We have included our assessment of the visual impact here along with the assessment criteria for ease of relating to the complex of terminology:

#### Specific Criteria for VIAs<sup>11</sup>—Visibility

The following analysis presents the specific criteria findings in bold for the project.

**Visual exposure of the area:** the geographic area from which the project will be visible, or view catchment area.

1. **High visual exposure** – covers a large area (e.g. several square kilometres).
2. **Moderate visual exposure** – covers an intermediate area (e.g. several hectares).
3. **Low visual exposure** – covers a small area around the project site.

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<sup>11</sup> *Note 1:* These, as well as any additional criteria, need to be customised for different project assessments. *Note 2:* Various components of the project, such as the structures, lighting or power lines, may have to be rated separately, as one component may have fewer visual impacts than another. This could have implications when formulating alternatives and mitigations.



**Visual absorption capacity (VAC):** the potential of the landscape to conceal the proposed project, i.e.

1. **High VAC – e.g. effective screening by topography and vegetation;**
2. **Moderate VAC – e.g. partial screening by topography (and vegetation);**
3. *Low VAC – e.g. little screening by topography (or vegetation).*

**Landscape integrity:** the compatibility or congruence of the project with the qualities of the existing landscape or townscape, or the ‘sense of place.’

1. **Low compatibility – visually intrudes, or is discordant with the surroundings;**
2. *Medium compatibility – partially fits into the surroundings, but clearly noticeable;*
3. *High compatibility – blends in well with the surroundings.*

**Visibility of the project:** based on distance from the project to selected viewpoints i.e.:

1. **Highly visible – dominant or clearly noticeable (e.g. 0 to 1km);**
2. **Moderately visible – recognisable to the viewer (e.g. 1 to 2km);**
3. *Marginally visible – not particularly noticeable to the viewer (e.g. 2km+).*

**SUMMARY ASSESSMENT—VISIBILITY: The development has moderate–high visual exposure; moderate–high visual absorption capacity; low compatibility; and moderate–high visibility.**

The PGWC Guideline further notes: “To aid decision-making, the assessment and reporting of possible impacts requires consistency in the interpretation of impact assessment criteria. Various criteria are defined in the EIA Regulations, such as ‘nature’, ‘extent’, ‘duration’, etc. The interpretation of these criteria for visual assessments is given in Box 11” repeated below:

#### **Criteria Used for the Assessment of Visual Impacts—Visual Impact Assessment**

The following analysis presents the specific criteria findings in bold for the project.

**Nature of the impact:** an appraisal of the visual effect the activity would have on the receiving environment. This description should include visual and scenic resources that are affected, and the manner in which they are affected, (both positive and negative effects).

**Extent:** the spatial or geographic area of influence of the visual impact, i.e.:

1. *site-related:* extending only as far as the activity;
2. *local:* limited to the immediate surroundings;
3. **district:** affecting a smaller urban/rural area;
4. *regional:* affecting a larger metropolitan or regional area;
5. *national:* affecting large parts of the country;
6. *international:* affecting areas across international boundaries.

**Duration:** the predicted life-span of the visual impact:

1. *short term*, (e.g. duration of the construction phase);
2. *medium term*, (e.g. duration for screening vegetation to mature);
3. ***long term*, (e.g. lifespan of the project);**
4. *permanent*, where time will not mitigate the visual impact.

**Intensity:** the magnitude of the impact on views, scenic or cultural resources.

1. *low*, where visual and scenic resources are not affected;
2. ***medium*, where visual and scenic resources are affected to a limited extent;**
3. *high*, where scenic and cultural resources are significantly affected.

**Probability:** the degree of possibility of the visual impact occurring:

1. *improbable*, where the possibility of the impact occurring is very low;
2. *probable*, where there is a distinct possibility that the impact will occur;
3. *highly probable*, where it is most likely that the impact will occur; or
4. ***definite*, where the impact will occur regardless of any prevention measures.**

**Significance:** The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, extent, duration, intensity and probability, and be described as:

1. *low*, where it will not have an influence on the decision;
2. ***medium*, where it should have an influence on the decision unless it is mitigated; or**
3. *high*, where it would influence the decision regardless of any possible mitigation.

**SUMMARY ASSESSMENT—NATURE OF IMPACT:** The development's visual impact has district extent, long-term duration, medium intensity, definite probability, and medium significance on the landscape.

	<b>Site</b>
<b>VISUAL IMPACT</b>	
<b>Impact</b>	High
<b>Change</b>	Noticeable
<b>VISIBILITY</b>	
<b>Visual Exposure</b>	Med-High
<b>Visual Absorption Capacity</b>	Med-High
<b>Compatibility</b>	Low
<b>Visibility</b>	Med-High
<b>NATURE OF IMPACT</b>	
<b>Extent</b>	District
<b>Duration</b>	Long Term
<b>Intensity</b>	Medium
<b>Probability</b>	Definite
<b>Significance</b>	Medium

Figure 5-3: Table of Site Assessment.

### Plomp Methodology

Visual impact assessment using the Plomp (2004) methodology (see Appendix A for key):

Activity	Impact	Phase	Probability		Duration		Scale		Magnitude / Severity		Significance <sup>12</sup>				
			Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	WOM	WM		
<b>Visual Significance Score Calculation = Probability x (Duration + Scale + Magnitude) = 5 x (4 + 2.5 + 6) = 5 x 12.5 = 62.5</b>															
Construction activities, operational infrastructure and lighting, decommissioning of infrastructure	Visual impact of development on surrounding landscape	Construction, operations and closure	5	Definite	4	Long-term	2.5	District	6	Medium	62.5	High	Moderate-High		

Figure 5-4: Plomp Methodology Assessment.

### 5.4.8 Glint and Glare

Glint and glare refers to the visual effect of glinting and glare coming off the solar panels. This effect is seen on other glass surfaces such as building windows, vehicle windows and reflective surfaces with a shiny finish such as brushed steel. In an urban area, glint is normally experienced as a flash coming off a moving object or when seen on a static object as one moves by and it ‘catches the light/sun’.

An array of reflective glass as in a high-rise building or reflective glass building can cause periods of glare depending on the angle of the viewer causing city buildings or big sheets of reflective glass to shine brightly into a nearby area but at a distance such effects are usually insignificant and relatively temporary.

<sup>12</sup> **Significance:** Score calculation = Probability x (Duration + Scale + Magnitude); WOM Without Mitigation; WM With Mitigation.

As a solar system's photovoltaic panels are oriented to the north to receive maximum insolation, it follows that it is possible that at certain times of day and year, there will be reflection coming off the panels. However, the extent of this reflection depends on the Anti-Reflective Coating (ARC) that is often used to improve efficiency of the panels. Overall, solar panels are not on the higher end of the spectrum of reflective surfaces by comparison with water or snow.

Generally speaking because the photovoltaic panels are oriented northwards at varying angles you would have to be higher than the reflected light in order to see it. High level views such as aircraft are usually too high/far away for such views to be anything other than fleeting. It is possible that a low flying aircraft such as a crop-duster could be blinded at times if they were in the line of reflection.

### Local Impact

As there is a road along the east side of the property and arrays, it is possible that some glint/glare might occur, especially where/if it falls onto the path of the road that comes into town (DR1156) but it would almost certainly not be seen from the R315 to the south. Any potential glare might occur just immediately north of the site on the DR1156 as it descends to pass the site. The nearby Klipberg to the north might also receive some glare at certain times of day depending on the ARC of the panels.

This could be partially offset by boundary planting to the east but to the north, unless it is very tall, such as Gum Trees, it is unlikely to be effective and would have to be at a certain distance from the northern panels to prevent overshadowing them. A detailed angle study would have to be prepared to quantify this and remedy/mitigate the situation if necessary. However, the expansive openness of the fields as they currently are, are part of the area's aesthetic appeal and low-level boundary hedging should be enough to screen off the panels from general view without imposing itself on this bucolic agricultural landscape.

If the ARC could be produced in a subtle green colour it would go a long way to reducing the visual impact of solar panels in the landscape generally.

### 5.4.9 Distribution of Impacts

"Beneficiaries and losers"<sup>13</sup> (PGWC, p 21) of the project's visual impacts are mainly local as the development will only have high visual impact to the local environment.

The people most affected by the development will be the surrounding farmers with the nearest views of the PV Plant.

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<sup>13</sup> Possible better designations are "winners and losers" or "beneficiaries and adversaries" as, so often objectors become opponents in environmental and visual impact.

#### 5.4.10 Photomontages

Photomontages were not prepared, as the level of impact does not warrant it. Our knowledge of the development types suffices in understanding the proposed development and how to mitigate the likely impacts.

### 5.5 Analysis of Alternatives

At this time there are no significant alternatives to consider beyond the minor revisions shown previously.

### 5.6 Planning Phase Impacts

This is potentially the most significant phase of a Project as it is here that crucial planning and design decisions are taken. **Critical Mitigation Recommendations are noted in bold.**

#### 5.6.1 Planning and Design

While there is a conflict between the need to densify urban areas within the urban edge at the same time as maintaining rural character along the urban edge, there is a similar conflict in rural areas in the need to locate industrial type activities that are often unsightly. This has to be managed and mitigated.

As the WC Provincial Urban Edge Guideline has referred to the need “**to manage urban development in such a way that no development would detract from the visual quality of the environment and that all development conform to a characteristic style and urban form that suits the character of the area,**” further stating that “**this implies that edge development should not only be limited to certain areas through inclusion or exclusion, but that edge development should also be subject to urban design guidelines, architectural consideration and general aesthetic treatment**” for both natural and built environment (see section 3.4.1).

Furthermore, the WC Provincial SDF noted *inter alia* the following:

- It also proposes “to ensure effective management of all municipal functions and facets to ensure equitable and affordable services and amenities and a safe **and aesthetically pleasing urban environment....**”.
- **Cultural resources acknowledged and protected as the fundamental link with the historical past and a basis for planning and shaping of future urban and rural environments.**
- **A safe, healthy and aesthetically pleasing urban environment, with the architectural and spatial character depicting the historical and cultural background of the habitat community.**

**Many of these components such as the mountains, farms and historical structures are irreplaceable national assets and accentuate the region's unique character.** For this reason, policy guidelines and actions must be formulated to emphasize, protect and promote these components. **The character, the detail of the towns and any planned changes should thus be carefully considered."**

It is the guidelines resulting from the visual-aesthetic-landscape analysis that will achieve the balance as best as possible along with their implementation.

### Site Development Plan Assessment

In the absence of any substantive project details, we could assume and/or advise the following based on a similar scheme in the area:

The design of the photovoltaic panels [would be] fairly fixed on orientation, spacing and maximum lengths. However, the relatively low height of 2.5m when maximally extended, their variable height and angle, and the non-reflective dull black surface in themselves limit visual impact, which is highest for vertical white/light/bright objects like buildings and wind turbines. Therefore photovoltaic plants such as that [described above], with agro-voltaics combining vegetation between, have a relatively low impact on the landscape. The potential for ground level screening is good [on the eastern boundary].

However, the site location is possible of more concern than the project details as it is on land with a moderately high visual and aesthetic sensitivity and could possibly be located in the field nearer the railway or on the other side east of the railway or both? The land outside Darling to the west is of higher sensitivity than that within the urban edge, which is already degraded, and deteriorating.

### Mitigation Recommendations

1. **Site Location:** as there seems to be no allowance for this application in the town plan being outside the urban edge and not zoned for this usage, and there being similar but lower value flat sites alongside the railway and nearer Nuwedorp, these sites would have a lower overall impact on the scenic landscape by containing urban/infrastructural sprawl. The land between the dirt road to Mooresburg and Nuwedorp as far as the sewage farm should be considered.
2. **Screening:** where possible, the scheme should be screened at ground level with shrubs that will screen off views of the 2.5m high PV panel rows. These should preferably be endemic from the natural vegetation occurring on site or in the area (FRg 2 Swartland Granite Renosterveld). This screening can either be done on site or on the boundary using natural hedging species like *Searsia spp.* and others.

3. **Planting:** as the scheme intention is to maintain the natural vegetation and/or underplanted with *Carpobrotus* species (*suurvy*), the range of plants could be broadened to include endemic FRg 2 Swartland Granite Renosterveld species as well. Alternatively, the agro-photovoltaic option of interplanting with some crop species is also good. The planting of small trees in the any leftover areas will help break the monotony of the facility and provide shade to any associated buildings.
4. **Fencing:** the intention of using Clear-View to secure the site perimeter is good as it is neat, strong and semi-permeable. Colouration should be a dull natural colour like a sage/khaki that will blend into both the summer and winter landscape.
5. **Structures:** the likely container style facility structures is low key and should likewise be coloured a dull natural colour like a sage/khaki that will blend into both the summer and winter landscape. The support structures of the PV panels could likewise be coloured naturally.
6. **Maintenance:** Planting maintenance covering the proposed screening and underplanting or intercropping will be needed to ensure the establishment of the screening vegetation and an ongoing maintenance programme for any other vegetation.

## 5.7 Construction Phase Impacts

Construction Phase visual impacts are no more than normal for an urban site although they will be extensive.

### 5.7.1 Construction

Construction inevitably gives rise to noise, disruption and dust, amongst others. These are well covered by Municipal Bylaws. Site destruction and damage is also coincident with quarrying especially to water, soil and vegetation. Changes to the water table by excavations can also have a heavy impact on the trees with deaths occurring a few years later.

#### Mitigation Recommendation: Construction

1. **Damage Control:** All parties must make every effort to control the destruction of soils and vegetation on site, especially any remnants of natural vegetation. These must not be damaged under any circumstances.
2. **Pollution:** Chemical damage by cement mixing directly on the ground and by diesel, etc spills must also be prevented at all costs, as should vandalism of the plants and accidental damage to limbs by workers and machinery. Fires must be prevented also at all costs in all areas. Penalties and incentives should be implemented as can fencing off areas.
3. **Monitoring:** Monitoring of the landscape, soils and vegetation during construction is very important and must be attended to regularly. Damage to some is all too inevitable and often irreversible. Adequate indigenous (preferably endemic) vegetation must be planted.

## 5.8 Operation Phase Impacts

Lighting, landscape maintenance and conservation management are discussed.

### 5.8.1 Lighting

The Architectural and Landscape Guidelines need to consider lighting in their specific guidelines. Security lighting, while necessary, can be handled with care.

#### Mitigation Recommendation: Lighting

1. **Lighting:** Lighting should be minimised and carefully controlled as part of the project's management plan. The use of green energy fittings and concepts should be encouraged and lighting developed with sensitivity to the rural landscape.

### 5.8.1 Conservation Management and Landscape Maintenance

Waterwise landscaping should be used wherever possible and green star building practices.

#### Mitigation Recommendation: Conservation Management and Landscape Maintenance

1. **Landscape Maintenance:** must be carried out at all times in line with these recommendations to help keep the scheme green and encouraging local biodiversity.

## 5.9 Decommissioning Phase Impacts

On-going landscape maintenance and conservation management remains necessary.

### 5.9.1 Refurbishment and Resale

This is a continuing aspect of the property ownership cycle.

#### Mitigation Recommendation: Refurbishment and Resale

1. **Refurbishment and Resale:** The previous recommendations regarding Planning, Construction and Operation all apply to this process. The entire site can be dismantled and rehabilitated if no longer needed and restored to an appropriate land use.

This concludes the analysis of impacts and detailed recommendations for their mitigation. The chapter, Visual Management and Monitoring Plan follows. It gives recommendations for the management and monitoring of the environment and the given VIA recommendations.

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## 6 Visual Management and Monitoring Plan

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Sound Visual Management is the ultimate aim of the VIA process. The Mitigation Recommendations developed in the report need to be implemented. This process of implementation will occur throughout the lifetime of the project, hence, the need for a Monitoring Plan. Institutions, individuals and organisations referred in the Monitoring Plan must develop a means of achieving the monitoring otherwise this report serves no purpose. Once the VIA Report has been approved, the Developers must seek the implementation of the recommendations as soon as possible.

### 6.1 Introduction

This chapter uses the information developed in the previous section. It sets out a basic plan for the implementation of both site management and the VIA recommendations.

#### 6.1.1 Background

Site management in this case refers to that aspect of project management needed to control visual impact. The tools for visual management developed in the VIA Report are the *Mitigation Recommendations*. Their implementation also needs to be managed as part of the on-going site and impact management. A particular aspect of site management is monitoring. Monitoring is the routine inspection, recording and reporting of visual issues pertaining to visual impact aimed at mitigating impact by timely correction of problems as they arise.

#### 6.1.2 Key Issues

1. Monitoring is typically routine inspection with physical analysis and recommendation, or routine reporting by various combinations of parties as outlined. The on-going monitoring of various aspects of the project are critical to its success. Long term management of visual issues is a more challenging issue that comes down to what individuals do over time as allowed to by their local authority.

2. With the identification of monitoring method, analysis and reporting, is the identification of the responsible party as indicated in Figure 6-1: Visual Monitoring Plan. This figure is crucial in the successful implementation of the Mitigation Recommendations and consequently, a visually-friendly (or visually responsible) project. The key parties referred to in the Monitoring Plan are largely the Developers/Owners, the Designers, and the Planning Authorities.
3. **Once the VIA Report has been approved, the Developer/s must seek the implementation of the recommendations as soon as possible. The Developer/s and Designers need to take this document and embody it in their day-to-day operations and long-term plans. Mitigation Recommendations are all written specifically around the subject of project and site management for impact mitigation; it is their incorporation into overall project management policy and practice that is required.**

## 6.2 Visual Management

### 6.2.1 Project and Site Management

The management of the project and site with particular reference to visual concerns is the subject of the Mitigation Recommendations and, indeed, the whole VIA study. As the Mitigation Recommendations are all written specifically around the subject of project and site management for impact mitigation; it is their incorporation into overall project management policy and practice that is required. The information contained in the VIA Report effectively provides the necessary information for the project management to implement their project in a visually responsible manner.

### 6.2.2 Implementing the VIA Recommendations

The Mitigation Recommendations have been written as broad guidelines to identify principles for minimising visual impact. The recommendations are by no means specifications. **There is a tendency in the construction industry to damage and repair later, which, while possible in construction, is not always possible in the environment. A need for care towards the environment should be developed by the Contractors.** The Development Team needs to take this document and embody it in their planning and design, day-to-day operations and long-term plans.

## 6.3 Environmental Monitoring

### 6.3.1 Monitoring Methodology

The framework for administering the implementation of mitigation guidelines is presented in the monitoring plan on the following page (see Figure 6-1: Visual Monitoring Plan). The table comprises the list of project activities numbered in the same sequence as those in the Miti-

gation Plan. For each project activity, recommendations are made from the following standardised monitoring activities:

### 6.3.2 Monitoring

The following types and timing of monitoring are suggested:

1. **Inspection:** site inspection (random, at completion), routine inspection (possibly annually), clean-up inspection (after completion of clean up of the accident incident).
2. **Monitoring:** observation (and photography).
3. **Review:** review of reports, plans and design.

### 6.3.3 Monitoring Plan

The Monitoring Plan has been tabulated for easy reference in the figure below.

Item	Project Component and Activity	Monitoring	Investigation	Reporting	Responsible Party
<b>5.6</b>	<b>PLANNING PHASE</b>				
5.6.0	VIA Report	Review	Physical and Recommendation	Recommendation	Planning Authorities
5.6.1	Planning and Design	Review	Physical and Recommendation	Recommendation	Authorities, Developers and Designers
<b>5.7</b>	<b>CONSTRUCTION PHASE</b>				
5.7.1	Construction	Site and Routine Inspection	Physical and Recommendation	Recommendation	ALL
<b>5.8</b>	<b>OPERATION PHASE</b>				
5.8.1	Lighting	Routine Inspection	Physical and Recommendation	Routine, <i>Ad hoc</i> Meeting	Owners, Authorities
5.8.2	Conservation Management and Landscape Maintenance	Routine Inspection	Physical and Recommendation	Routine, <i>Ad hoc</i> Meeting	Owners, Authorities
<b>5.9</b>	<b>DECOMMISSIONING</b>				
5.9.1	Refurbishment	Site Inspection	Physical and Recommendation	Routine, <i>Ad hoc</i>	Owner, Authorities

Figure 6-1: Visual Monitoring Plan.

### 6.3.4 Analysis

The following types of analyses are recommended:

1. **Physical:** on site and by photography.
2. **Recommendation:** check against VIA recommendation.

### 6.3.5 Reporting

The following methods of recording and reporting are recommended:

1. **Recommendation:** report or design recommendation.
2. **Routine:** log (daily, monthly, activity), report (quarterly), certificate, minutes.
3. **Ad hoc:** report (incident, closing).
4. **Meetings:** routine meeting (weekly), follow-up (incident), pro-active meeting (*ad hoc*).

### 6.3.6 Responsible Party

The following principal responsible parties have been identified as key during the monitoring process:

1. The Planning Authorities
2. The Developers and Owners
3. The Designers: Architects and Landscape Architects
4. The Contractors.

The above monitoring plan identifies who is conducting the prescribed monitoring activities. In cases where certification for compliance or approval are indicated the responsible certifying or approving authority is noted. Many building activities are strictly controlled by local by-laws.

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# Appendices

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## Appendix A Plomp Assessment Methodology

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

<b>Probability</b>	<b>This describes the likelihood of the impact actually occurring.</b>
Improbable	The possibility of the impact occurring is very low, due to the circumstances, design or experience.
Probable	There is a probability that the impact will occur to the extent that provision must be made therefore.
Highly Probable	It is most likely that the impact will occur at some stage of the development.
Definite	The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.
<b>Duration</b>	<b>The lifetime of the impact.</b>
Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
Medium term	The impact will last up to the end of the phases, where after it will be negated.
Long term	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
Permanent	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.
<b>Scale</b>	<b>The physical and spatial size of the impact.</b>
Local	The impacted area extends only as far as the activity, e.g. footprint.
Site	The impact could affect the whole, or a measurable portion of the above-mentioned properties.
Regional	The impact could affect the area including the neighbouring residential areas.
<b>Magnitude/ Severity</b>	<b>Does the impact destroy the environment, or alter its function.</b>
Low	The impact alters the affected environment in such a way that natural processes are not affected.
Medium	The affected environment is altered, but functions and processes continue in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
<b>Significance</b>	<b>This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.</b>
Negligible	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
Low	The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
Moderate	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

Figure A-1: Impact Significance Criteria.

The significance of the aspects/impacts of the process was rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process.<sup>14</sup> These matrices use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significances of the impacts were determined through a synthesis of the criteria below in Figure A-1 above.

The following weights were assigned to each attribute:

Aspect	Description	Weight
<b>Probability</b>	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
<b>Duration</b>	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
<b>Scale</b>	Local	1
	Site	2
	Regional	3
<b>Magnitude/Severity</b>	Low	2
	Medium	6
	High	8
<b>Significance</b>	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

**Figure A-2: Attribute Weighting.**

The significance of each activity is rated without mitigation measures and with mitigation measures for both construction and operational phases of the development.

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<sup>14</sup> Plomp, H. (2004). *A Process for Assessing and Evaluating Environmental Management Risk and Significance in a Gold Mining Company*. Conference Papers – Annual National Conference of the International Association for Impact Assessment: South African Affiliate.

## Appendix B Project Plans

NWA