Annex H

Visual Specialist Report

Proposed Graspan Solar Photovoltaic Power Plant
Northern Cape

Visual Impact Assessment

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Prepared by
Bernard Oberholzer
Landscape Architect and Environmental Planner

In association with
Quinton Lawson, MLB Architects and Urban Designers

Prepared for
ERM Southern Africa (Pty) Ltd

on behalf of
Solaire Direct Southern Africa

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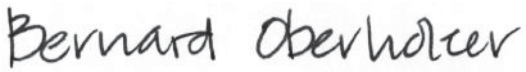
Statement of Independence

The authors declare that they are independent practitioners with expertise and wide experience in visual impact assessments, that the study has been carried out in an objective manner and complies with the relevant EIA regulations, and that all material information in their possession, which may influence a decision by the competent authority and the objectivity of the study, has been disclosed.



Bernard Oberholzer Landscape Architect
Professional Member South African Council of the Landscape Architects Profession (SACLAP)

Quinton Lawson, MLB Architects and Urban Designers
Professional Member South African Council of the Architects Profession (SACAP)

Expertise

Bernard Oberholzer has a Bachelor of Architecture (UCT) and Master of Landscape Architecture (U. of Pennsylvania), and has more than 20 years experience in undertaking visual impact assessments. He has presented papers on *Visual and Aesthetic Assessment Techniques*, and is the author of *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes,* prepared for the Dept. of Environmental and Development Planning, Provincial Government of the Western Cape, 2005.

Quinton Lawson has a Bachelor of Architecture Degree (Natal) and has more than 10 years experience in visual assessments. Bernard and Quinton have both been involved in visual assessments for numerous alternative energy projects.

SECTION 1: INTRODUCTION

1.1 SCOPE OF THE STUDY

The visual impact assessment (VIA) builds on the Phase 1 Visual Baseline study, which provided visual constraints and possible mitigations for the preliminary Graspan power plant proposals. The scope of the VIA is outlined below, as determined by ERM, (2012).

- Quantify and assess the existing scenic resources / visual characteristics on and around the proposed site.
- Evaluate and classify the landscape in terms of its sensitivity to a changing land use.
- Determine viewsheds, view corridors and important viewpoints in order to assess the visual impacts of the proposed project.
- Determine visual issues, including those identified in the public participation process.
- Review the legal framework that may have implications for visual / scenic resources.
- Assess the significance of potential visual impacts resulting from the proposed project for the construction, operational and decommissioning phases of the project.
- Identify possible mitigation measures to reduce negative visual impacts for inclusion into the project design, including input into the Environmental Management Plan (EMP).

1.2 LIMITATIONS AND ASSUMPTIONS

Detailed information on the design of the gatehouses and substations is not available at this stage, but is unlikely to affect visual impact ratings because of their relatively small scale.

1.3 LOCATION OF THE SITE

The site location is indicated on Figure 2. The proposed site is in the Northern Cape, approximately 40km north east of Hopetown and about 70km south west of Kimberley on the N12 National Road.

SECTION 2: METHODOLOGY

The methodology used for the VIA is similar to the that of the Visual Baseline study and included the following steps:

- Photographic survey of the site and surroundings during a field trip undertaken in February 2012;
- Mapping of the proposed energy facilities, including distance circles and critical viewpoints;
- Mapping of the viewshed, using a digital terrain model (DTM) to determine the area that would be visually affected;
- Identification of landscape features and receptors in the area.

- Identification and rating of potential visual impacts using a number of quantitative and qualitative criteria.
- Determination of the significance of the potential visual impacts using the standard environmental assessment indicators.

SECTION 3: DESCRIPTION OF THE PROJECT IN TERMS OF VISUAL CONSIDERATIONS

Key aspects of the proposed 10MW and 80MW solar energy parks that have visual implications are summarised in Table 1 below. It is intended that the proposed development would consist of photovoltaic solar panels, transformers, and new grid connection substations connected to the existing Graspan Substation, (see Figures 4 and 5).

Table 1: List of Energy Facilities at the Graspan Site

Facility	*Footprint*	*Height*	*Comments*
Site area 10MW solar park Site area 80MW solar park	61.86ha 211.73ha	n/a n/a	
Solar park area 10MW 80MW	 19.9ha 117.63ha	 n/a n/a	
Photovoltaic (PV) device	PV panels 1.66 x 1.00m		Polycrystalline silicon PV cells producing direct current (DC). The cells are assembled into a module or panel producing 250W.
Solar arrays: 10MW 80MW	Array enclosure 1m^2 43 200 PV modules 273 600 PV modules	3.3m	Groups of arrays. Modules assembled into arrays with aluminium support structure mounted on steel screw piles. Modules are antireflective. Each array comprises approx. 12 500 panels producing 1 MW.
Electrical inverter enclosure 10MW solar park 80MW solar park	7 x 3 x 3.5m enclosure. 16 inverters 57 inverters	3.5m	Inverters transform DC from the PV array into alternating current (AC) to feed into the grid. Located beneath array structure.
Electrical substation.	Existing Graspan Eskom substation		There is an existing132kV Eskom substation on the site available for connection to the grid. Substation would be upgraded once the 80MW solar park is built.
New connection substation: 10MW solar park 80MW solar park	 400m^2 2500m^2	±5m	Plastered and painted masonry buildings. External transformer and switchgear yard.
Electrical power lines	270m length	± 10m ht.	132kV power line with mono-poles.
Access roads Perimeter road	6m wide 5m wide	n/a	Gravel (unpaved).
Parking area	250m^2	n/a	Approx. 10 parking bays. Gravel permeable surfaces.
Security fencing: 10MW solar park 80MW solar park	perimeter 2 046m 5 764m	2.4m ht.	'ClearVu' mesh fencing with steel posts at 3m centres.
Guard houses for 10MW and 80MW solar parks	4 x 6 x 3m	3.0m ht.	A guard house for each solar park.
Security lighting	undetermined	5m ht.	Lighting at entrances and substation.

Construction Stage:			
Lay down area: 10MW solar park 80MW solar park	 4 800m^2 14 400m^2	n / a	Temporary gravel hard standing, fenced.
Topsoil stockpile: 10MW solar park 80MW solar park	 6 000m^2 18 000m^2		Temporary during the construction period.
Construction camp	1ha	Single storey	Temporary prefab structures, fenced.

SECTION 4: DESCRIPTION OF THE AFFECTED ENVIRONMENT

Using information from the Visual baseline study, the site is briefly described in Table 2 below, including visual / scenic significance, and visual opportunities and constraints in relation to the siting of the proposed solar energy facilities. Viewpoints and viewsheds are indicated on Figure 3.

Table 2: Landscape Description of the Graspan Site

Location	The site is situated on the remaining extent of Farm Graspan (No. 172), approximately 40km north east of Hopetown in the Northern Cape. Road access is via the N12 National Road and gravel farm roads. The site is about 1.5km south of the Graspan railway siding.
Geology	The area is covered by reddish soils and scattered boulders derived from the Karoo dolerites, with lighter coloured soils of the Ecca shales to the west. There are a number of open calcrete borrow pits near the Graspan railway siding and along the N12 National Road. These give an indication of the substrate in the area.
Physical landscape	The topography is generally flat with a gentle slope up towards the dolerite hills (referred to as 'koppies') around Klein Kareelaagte to the southeast. A small boulder-strewn dolerite koppie, typical of the region, lies on the northern edge of the site adjacent to the N12. No major drainage features were noted on the site. The Driekops Pan about 1km southeast of the site is, however, a major feature in the area.
Vegetation cover and land use	The vegetation of the area typically consists of grassland with a few scattered trees. During the site visit in February the veld was reasonably green as a result of recent rains. The farm immediately to the east is grazed by sheep, and citrus fruit groves occur around the Klein Kareelaagte homestead. The grassland results in the site being visually exposed in terms of vegetation cover.
Visual significance of the area	The study area has a rural character consisting mainly of open grassland, with clumps of trees around farmsteads, such as the Graspan homestead to the west. Farmsteads in the area tend to be 2km or more apart. The Graspan and Enslin Battle Site, dating to the Boer War (1899), lies some 7km to the north of the site. The rail line also has some heritage significance.
Opportunities and constraints	The N12 is an important visual corridor along the western boundary of the site, and the parallel rail line runs the length of the site. Except for scattered calcrete borrow pits, the rural character of the area is generally intact. Several homesteads, such as Graspan, Spes Bona West and Klein Kareelaagte are within the viewshed, although distance is a mitigating factor. Railway sidings, such as Enslin and Graspan, have been neglected and are visually run-down.

Spes Bona West farmstead 2.9km from the proposed solar park. The house is partly screened by trees and oriented to the east.

Klein Kareelaagte farmstead is 1.9km from the proposed solar park. The homestead is partly screened by citrus orchards and trees.

Sheep farming and red termite mounds to the east of the site. The proposed energy facility would be in the middle distance.

Graspan farmstead is 0.5km west of the N12 and about 2km from the proposed solar park. The homestead is screened by trees.

Old calcrete borrow pit near Graspan railway siding. A number of these calcrete diggings occur along the N12 to the west of the site.

Fig. 1 Landscape Characteristics of the Graspan Site

SECTION 5: IDENTIFICATION OF APPLICABLE POLICIES, LEGISLATION, STANDARDS AND GUIDELINES

At the national level the following legislation could apply to visual assessments:

The National Environmental Management Act (NEMA) and the Regulations in terms of Chapter 5 of NEMA. (Act No. 107 of 1998).

The Protected Areas Act (PAA) (Act 57 of 2003, Section 17), intended to, inter alia, protect natural landscapes.

The National Heritage Resources Act (NHRA) (Act No. 25 of 1999) and associated provincial regulations provide protection for listed or proclaimed sites, such as urban conservation areas, nature reserves and proclaimed scenic routes.

Although the proposed photovoltaic power plant is in the Northern Cape, A draft report prepared by the Provincial Government of the W. Cape (PGWC), of 2006, called *A Strategic Initiative to Introduce Commercial and Land Based Wind Energy Development to the Western Cape*, may be helpful in providing some indicators for solar energy facilities.

The PGWC Report of 2006 provides a broad guiding framework for the location of wind energy facilities based on the sensitivity and capacity of landscape types and the scale of the project. The Report indicates that, in the rural context, where most energy facilities will be located, large scale 'open' landscapes and/or 'disturbed' rural landscapes are preferred for the siting of wind farms. The Report further states the following in the Executive Summary:

A. Commercial Wind Energy development should be **excluded** from:
- Areas of high aesthetic landscape value, particularly national parks and provincial nature reserves and other wilderness areas.
- Areas where technical and safety considerations apply.

B. Wind energy should be **encouraged**:
- At strategic locations identified in a Regional Wind Plan (RWP) to be prepared by the relevant planning authority.
- Where they are well located in terms of visual impact, technical and safety criteria and landscape, environmental and planning criteria.
- In appropriate urban and industrial "brownfield" sites.
- Where visual disturbance to the landscape has already occurred (e.g. power transmission lines).
- At the local scale where energy facilities could provide power to small users.

No formal guidelines have been published for solar energy to assist in the design and assessment of solar energy development at the local scale. However, using the guidelines for wind farms as a yardstick, the proposed solar energy facility meets the following criteria:

- The facility is not located in an area of high aesthetic landscape value, protected or wilderness area;
- The facility is not located in an area where technical and safety considerations apply.
- The facility is undergoing an assessment in relation to visual impact and other criteria.

- The facility is in large concentrated clusters of solar arrays rather than small, dispersed locations.
- The facility is located in an area where some visual disturbance to the landscape has already occurred, including farm settlements, quarries, rail lines and power lines.

Table 3 provides a list of regional criteria, including key criteria to be mapped at a local project level, for proposed wind farms, together with suggested criteria for the proposed solar energy development at Graspan. These criteria have not been legislated, and only serve as guidelines, or as possible site constraints.

Table 3 : Criteria for Visual Buffers

Criteria	**PGWC Recommended Buffers for Wind Farms (2006)**	**Local Project Level Mapping: Graspan solar energy site (The smaller scale of solar energy arrays are taken into account)**
Urban Areas	800m	n/a at the Graspan site.
Residential Areas, including rural dwellings	400m	100m buffer recommended from homesteads, except where indicated.
National Roads	13km buffer. Depends on scenic value.	1km buffer, depending on topography. (The N12 runs along the western boundary of the farm about 1.2km from the proposed project).
Main Arterial Roads	No indication	n/a at Graspan
Local District Roads	500m. (Review if high scenic value).	100m buffer.
Provincial Tourist Route	4km buffer. Statutory scenic drives.	n/a at Graspan
Local Tourist Route	2.5km (Can be reduced).	n/a at Graspan
Railway lines	250m	100m buffer. A goods railway line runs the length of the site.
Local airfield	To be confirmed with agency.	A landing strip at Hope Town 45km away, as well as at Oranja, Luckoff and koffiefontein, all 50km or more away.
National Parks, Provincial Nature Reserves	2km Should be eliminated at regional level.	n/a at Graspan. (Mokala National Park is about 14km to the northwest).
Private Nature Reserves	500m. To be negotiated at local level.	n/a at Graspan.
Rivers	500m For perennial rivers.	Hydrologist or ecologist to determine buffers for drainage courses and wetlands. (The Driekops Pan is about 1km away).
External farm boundaries	No indication	50m visual buffer recommended. (A 30m building line usually applies).

SECTION 6: SPECIFICATION OF RELEVANT VISUAL THRESHOLDS

A visual assessment involves both qualitative, as well as quantitative criteria, to determine changes and possible adverse effects on the environment and the sense of place of the particular location. There are no prescribed thresholds for visual impacts relating to solar energy facilities at the present time. It is therefore suggested that the criteria given in Table 3 be used as a guide.

SECTION 7: IDENTIFICATION OF KEY VISUAL ISSUES

A public participation process has been followed and comments have been documented in Annexure D of the Final Scoping Report (ERM, May 2012). No visual issues have been recorded as part of this process. Possible issues identified by the visual specialists are summarised in Table 4 below. The issues are not seen as impacts, but merely as concerns that should be addressed in the visual impact assessment.

Table 4: Key Visual Issues

Potential visual intrusion on sense of place	The rural character, typical of the Northern Cape landscape, would potentially be altered by industrial-type energy facilities, such as the proposed solar arrays and substations.
Potential effect on landscape features and scenic resources	Dolerite koppies stand out in the landscape and are therefore visually sensitive, but would not be directly affected by the proposed project. The Graspan and Enslin Battle Site, 7km away, would not be visually affected because of distance.
Potential effect on local inhabitants, visitors to the area and on tourism	The proposed solar facility would be potentially visible in the distance to users of the N12. A few farmsteads within the viewshed could be visually affected, although distance would be a mitigating factor. There are no known tourist facilities or nature reserves in the immediate area.
Potential effect of the scale of the project	The scale of the proposed energy facilities, along with substations and maintenance buildings, could have some visual implications for the immediate surrounding area.
Potential effect of lights at night	There would be an increase in the amount of lights in the area required by the project for safety and security. These would, however be localised around the substations and gatehouses.
Potential effect of construction and de-commissioning	The scale of the proposed project could result in visual effects relating to the construction of the solar facilities, buildings and access roads. At the end of the life of the project, many of the foundations and roads may remain visible in the relatively open landscape.

SECTION 8: ALTERNATIVES CONSIDERED IN THE IMPACT ASSESSMENT

Only the Graspan site for Solaire Direct is being considered in this assessment. Alternative site layouts have been developed, based on the findings of the specialist baseline studies, including the visual assessment, and the preferred layout is currently being assessed.

SECTION 9: VISUAL ASSESSMENT CRITERIA

A series of both quantitative and qualitative criteria are used to determine potential visual impacts.

(1) Viewpoints (Fig. 3 and Table 5)

Viewpoints were selected based on potentially prominent or sensitive viewing positions in the area, where views of the proposed energy facilities may be obtained. The proposed facilities would be potentially visible from the N12, the rail line and a number of farmsteads.

(2) Visibility

Visibility tends to be determined by distance between the proposed energy facilities and the viewer, as well as by the topography. Given the height and footprint of the proposed solar arrays and related infrastructure, visibility tends to be insignificant beyond 2km. Distance radii shown in Fig. 3 assist in quantifying visibility of the proposed facilities. Degrees of visibility in relation to distance are based on field observations and previous studies, (see Table 5):

Highly visible:	Clearly noticeable within the observer's view frame 0 to 1km
Moderately visible:	Recognisable feature within observer's view frame 1 to 2km
Marginally visible:	Not particularly noticeable within observer's view frame 2 to 4km
Hardly visible:	Practically not visible unless pointed out to observer 4km+

(3) Visual Exposure (Fig. 3)

Visual exposure is determined by the viewshed or view catchment, being the geographic area within which the proposed project would be visible. The viewshed boundary tends to follow ridgelines and high points in the landscape. Some areas within the view catchment area fall within a view shadow, and would therefore not be affected by the proposed energy facilities. The zone of visual influence of the solar arrays at Graspan tends to fall away beyond a 2km radius and the visual exposure of the project would therefore be fairly localised.

(4) Visual Sensitivity

Visual sensitivity is determined by topographic features, steep slopes, protected areas, rivers or scenic routes. At Graspan the dolerite koppies can be seen as landscape features of importance, while the flattish, low-lying area identified for the proposed solar park would not be visually sensitive. The Driekops Pan is 1km away in a view shadow

and would therefore not be visually affected. The N12 is an important National Road and view corridor, but is about 1.2km away. The Graspan / Enslin battle site is about 7km away, and the Mokala National Park about 14km away, and would therefore not be visually affected.

(5) Landscape Integrity

Visual quality is enhanced by intactness of the landscape, and lack of other visual intrusions. The Graspan site has a number of existing visual intrusions, including a rail line, power lines and calcrete borrow pits, which reduce the rural intactness of the area. The proposed solar energy project would further add to the industrialisation of the rural landscape, but over a fairly limited area within a 1 to 2km radius.

(6) Visual Absorption Capacity

This is the potential to screen the proposed project. The landscape is visually exposed, but given the modest height of the solar arrays (3.3m), some screening by the topography and trees would occur. The proposed solar park would also be partly obscured by existing railway and power line infrastructure.

Table 5 : Potential Visibility (see Figures 6 to 10)

View Pt	Location	Distance	Comments (Relates to the combined 90MW solar park)
G1	Graspan rail siding	2.5km	The energy facility would be marginally visible to the southwest across open grassland. Existing Eskom power lines across the site are in the middle foreground.
G2	Spes Bona West farmstead	2.9km	The energy facility would be marginally visible to the southwest across open grassland. The farm house tends to be orientated towards the east, and is surrounded by trees. The existing rail line is 2.2km from the farmstead.
G3	Klein Kareelaagte farmstead	1.9km (80MW) 3.3km (10MW)	The energy facility would be moderately to marginally visible to the northwest across open grassland. The farmstead is partly screened by trees and orchards.
G4	N12 near low koppie on the western edge of the site	1.2km	The energy facility would be moderately visible to the east across open grassland. The rail line and power line in the middle distance would partly obscure the proposed solar park.
G5	N12 on the western corner of the site	3.2km (80MW) 4.1km (10MW)	The energy facility would be hardly visible in the distance to the northeast. The rail line and power line are in the middle distance would partly obscure the proposed solar park.

Table 6 : Visual Assessment Criteria and Potential Visual Impacts

Criteria	Comments	90MW Solar Park	Substations	Connecting power line
Visibility of facilities Distance from selected viewpoints	The proposed energy facilities would be marginally to moderately visible from a number of viewpoints, including the N12 and surrounding farmsteads. The photomontages reveal that the visibility will however not be significant. Proposed substations are relatively small in scale, and the proposed power line is relatively short in distance, (see Figures 6 to 10).	Moderate-low	Low	Low
Visibility of lights at night	Some lighting related to the solar facility infrastructure could potentially be visible from the N12 and farmsteads, but would be restricted to substations and maintenance areas and therefore very localised.	Low	Moderate-low	Low
Visual exposure Zone of visual influence or view catchment	The viewshed is fairly extensive in the flat and open landscape, except for areas to the southeast, which are in a view shadow created by the dolerite koppies. The viewshed however fades out beyond about 2km.	Moderate	Low	Low
Visual sensitivity Landscape features	The landscape is not particularly visually sensitive, except for the dolerite koppies and rural ambience. The Graspan and Enslin Battle Site lies some 7km to the north of the site, and would not be visually affected.	Low	Low	Low
Landscape Integrity Effect on character of the area	The proposed solar facilities and related infrastructure would contrast with the rural landscape. There are however existing power lines and a rail line crossing the site.	Moderate	Moderate-low	Moderate-low
Visual absorption capacity (VAC) Lack of concealment	There is little potential for concealment of the proposed solar facilities, except through setbacks and mitigation planting or berms along the N12 National Road.	Moderate-low	Moderate-low	Moderate-low
Cumulative visual impact	There are no other known energy facilities, existing or proposed, within 30km. (Another solar energy facility is proposed 55km away at Ruimte on the R705 near Koffiefontein). The proposed solar park will add further industrial type facilities and power lines to the existing rail and power line infrastructure.	Moderate	Moderate-low	Moderate-low
Overall intensity	Consideration of the above criteria taken as a whole.	**Moderate**	**Moderate-low**	**Moderate-low**

Table 7 : Synthesis of Visual Impacts / Benefits

Criteria	Comments	90MW solar park	Substations	Connecting power line
Intensity or magnitude of impact Degree of visual impact.	See ratings in Table 6.	Medium	Medium-low	Medium-low
Spatial extent Degree of influence over a geographic area - local, district, regional or national.	Marginal visual effect beyond 2km.	Local	Local	Local
Duration Projected life-span of the proposed project.	Potentially longer than 15 years.	Long-term	Long term	Long term
Probability Degree of possibility of the impact occurring.	Some opportunity to screen solar facilities with berms and tree planting.	Highly probable	Highly probable	Highly probable
Confidence Degree of confidence in predictions.	Based on available information and photomontages.	High	High	High
Overall significance	Synthesis of criteria	Medium	Medium-low	Medium-low

SECTION 10: VISUAL MITIGATION MEASURES

The purpose of this section is to recommend practical management actions and alternatives to the project design, which will avoid, minimise, mitigate or compensate for potential negative impacts and enhance benefits. A number of mitigation guidelines were recommended in the earlier Visual Baseline Study, and some of these have already been incorporated into the current proposals.

10.1 DESIGN PHASE MITIGATIONS

1) Visual buffer zones from the N12, district roads, the rail line and farm boundaries have been recommended in Table 3, and applied to the current layout (June 2012).
2) All cables and power lines should be located underground as far as possible.
3) The substations, gatehouses and maintenance and storage buildings should be grouped as far as possible to avoid the scatter of buildings in the open landscape.
4) The design of the buildings should be compatible in scale and form with rural buildings, such as farm barns, in the surrounding area.
5) All yards and storage areas to be enclosed by masonry walls or screens.
6) The colour of the solar array structures, such as the supports and the rear of the panels, should be carefully selected, and to be in the dark grey or green range, to minimise visibility and avoid reflectivity.
7) External lighting should be confined to the substation and maintenance areas. Lights should be low-level and fitted with reflectors to avoid light spillage.
8) Signage related to the enterprise to be discrete and confined to the entrance gates. No other corporate or advertising signage, particularly billboards, or flags to be permitted.

10.2 CONSTRUCTION PHASE MITIGATIONS

1) The construction camp, material stores and lay-down area should be kept tidy.
2) The extent of the construction camp and stores should be limited in area to only that which is essential.
3) Disturbed areas rather than pristine or intact landscape areas should preferably be used for the construction camp.
4) The construction area should be cordoned off to avoid unnecessary damage to the surrounding veld, and penalties applied for unauthorised disturbance or damage.
5) Measures to control wastes and litter should be included in the contract specification documents.
6) Provision should be made for rehabilitation / re-vegetation of areas damaged by construction activities, according to the botanist's recommendations or the Environmental Management Plan (EMP).

10.3 Operational Phase Mitigations

1) The footprint of the operations and maintenance facilities, as well as parking and vehicular circulation, should be clearly defined, and not be allowed to spill over into other areas of the site.
2) The operations and maintenance areas should be screened by buildings, walls or tree planting where possible, and should be kept in a tidy state to minimise further visual impact.

10.4 Decommissioning Phase Mitigations

1) At the end of the life of the project, unneeded structures should be demolished and removed from the site. Materials should be recycled where possible.
2) Unneeded roads, parking and other paved or unpaved areas should be grubbed and the area rehabilitated as specified by a restoration ecologist or landscape architect.

Table 8 : Significance of Visual Impacts before and after Mitigation

	Comments	Significance before mitigation	Significance after mitigation
Significance: Solar arrays	Significance is increased by the industrial nature of the project in a rural area. Significance is decreased by the moderate size of the power plant, and existing rail and power line infrastructure.	Medium significance (based on intensity in Table 7 above)	Medium significance Mitigation measures already applied.
Significance: substations	Significance is increased by the need for numerous inverters and 2 proposed substations. Significance is decreased by the relatively small scale of the inverters and substations, and the existing Graspan substation.	Medium-low significance	Medium-low significance Little opportunity for additional mitigation.
Significance: power lines	Significance is not high because of the relatively short distance of the proposed power line (270m), and the fact that there is an existing power line across the site.	Medium-low significance	Medium-low significance Little opportunity for additional mitigation.
Significance: Construction phase	Significance is not high because of the low-lying position of the proposed solar park.	Medium significance	Medium significance Little opportunity for additional mitigation.
Status		Negative	Negative

SECTION 11: CONCLUSION AND RECOMMENDATION

The site lies adjacent to the N12 National Road and a main rail route, while the proposed solar park will be some 1.2km from the N12. A number of surrounding farmsteads may be visually affected, although distance would be a mitigating factor in most cases. The Graspan and Enslin Battle Site (1899) would not be visually affected at 7km distance, nor the Mokala National Park at 14km.

The actual footprint of the proposed solar park and related infrastructure would be confined to a low-lying flattish area in the northern portion of the site. Depending on the viewpoint selected, the solar facilities would be moderately to marginally visible from 2 farmsteads and from the N12, from where it would also be partly obscured by the existing railway infrastructure.

Based on the visual survey and photomontages prepared for the proposed solar park at Graspan, the overall potential visual impact is expected to be of medium significance for the solar arrays and medium to low for the substations and power lines.

The currently proposed layout, (June 2012), has included most of the mitigation measures recommended during the earlier Visual Baseline study. However additional mitigations outlined in Section 10 should be considered. Given the implementation of the mitigation measures, no fatal flaws with respect to visual resources are anticipated.

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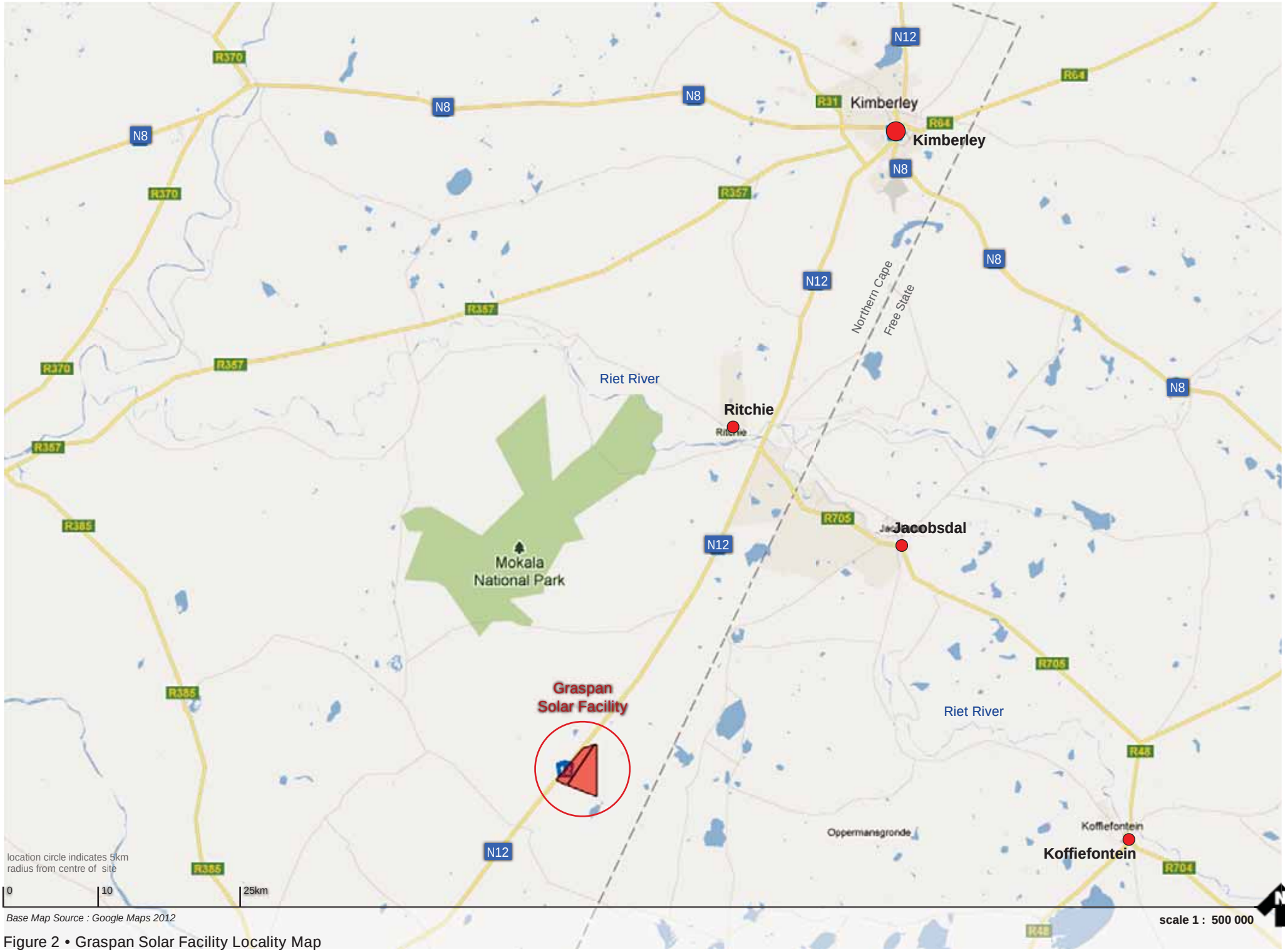
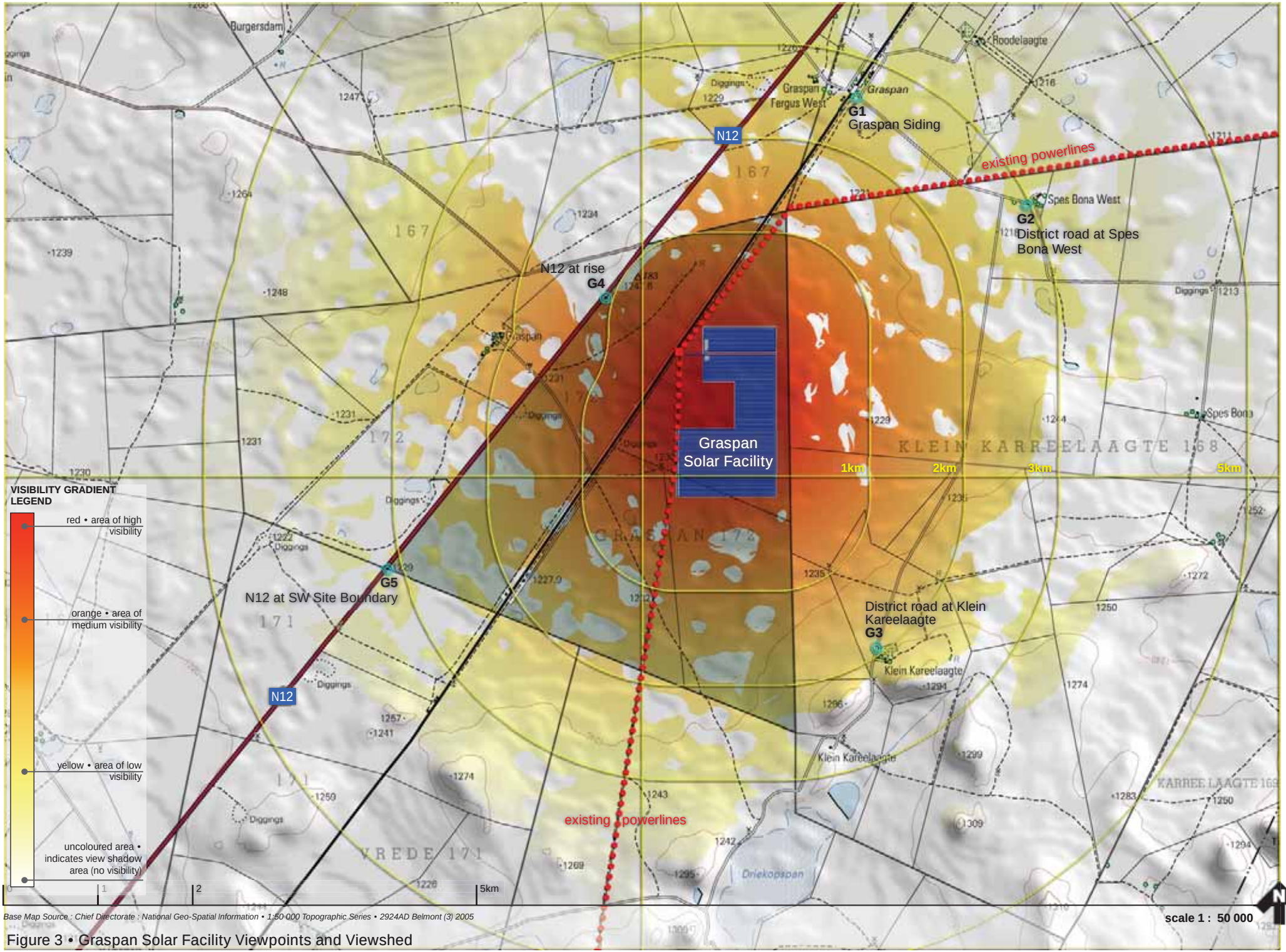


Base Map Source : Google Maps 2012

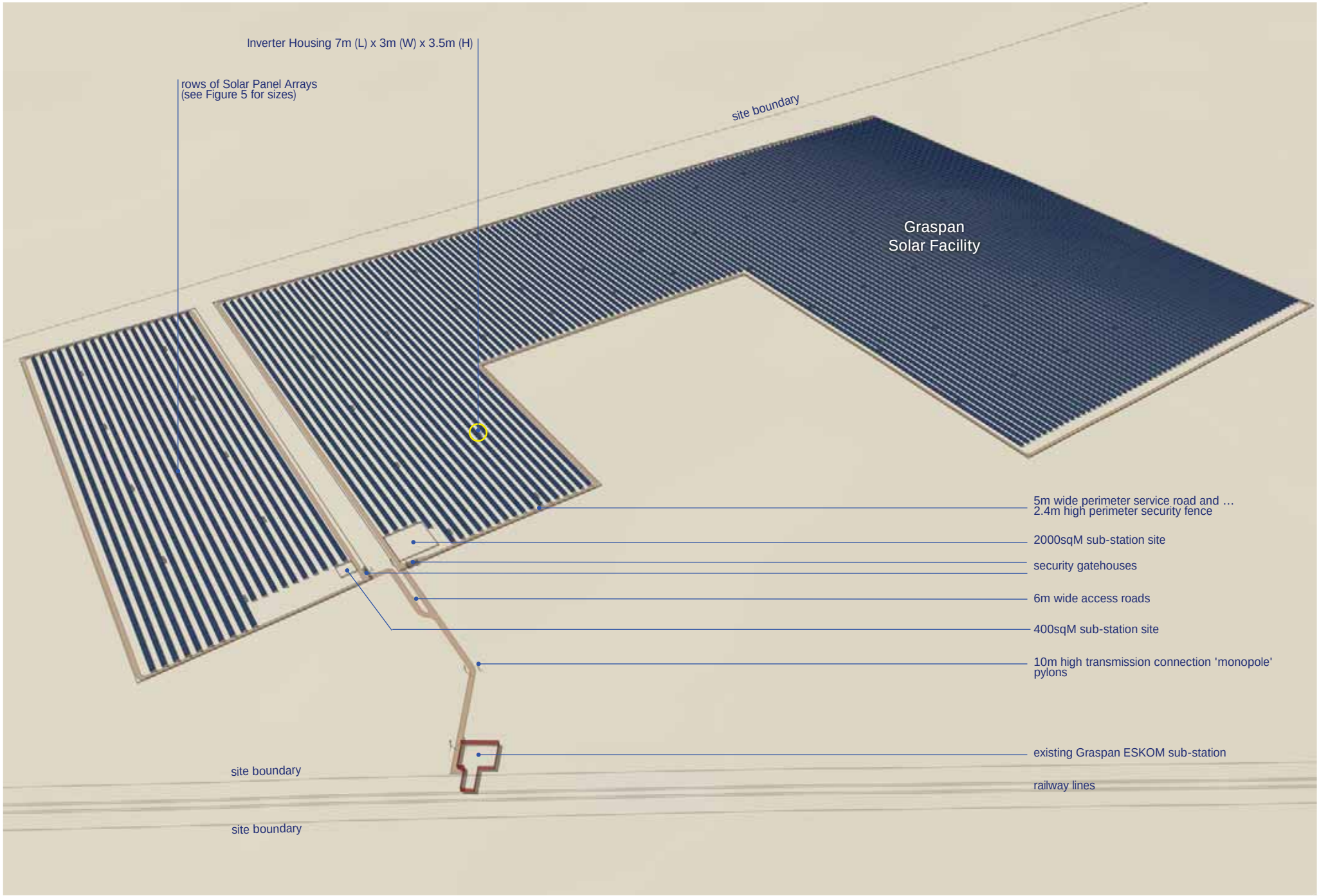
Figure 2 • Graspan Solar Facility Locality Map



Base Map Source : Chief Directorate : National Geo-Spatial Information • 1:50 000 Topographic Series • 2924AD Belmont (3) 2005

scale 1 : 50 000

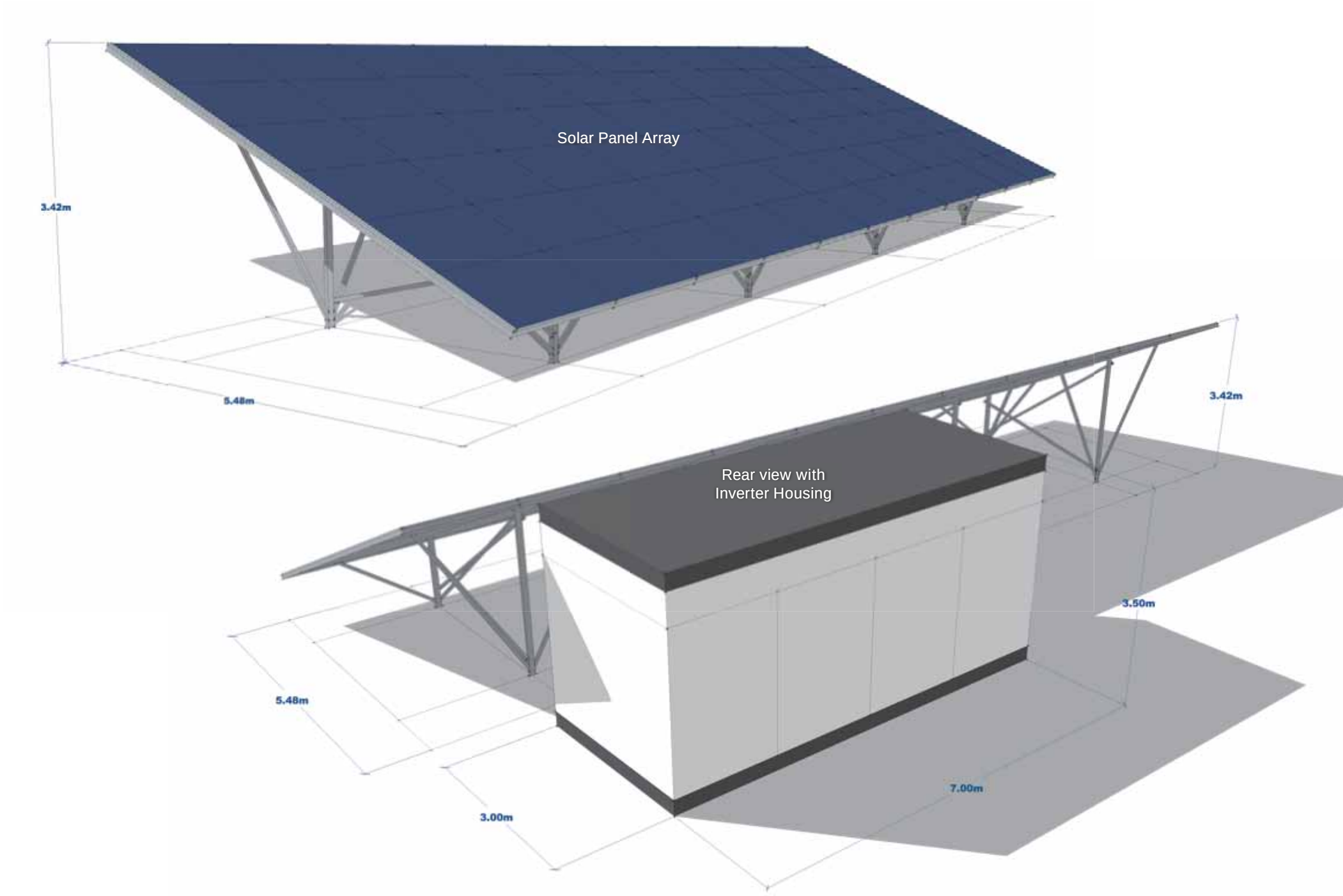
Figure 3 • Graspan Solar Facility Viewpoints and Viewshed



3D models by mlb / BOLA - June 2012 : based on Solaire Direct Layouts SD 12-B-002-1007 A and 1008 A

not to scale

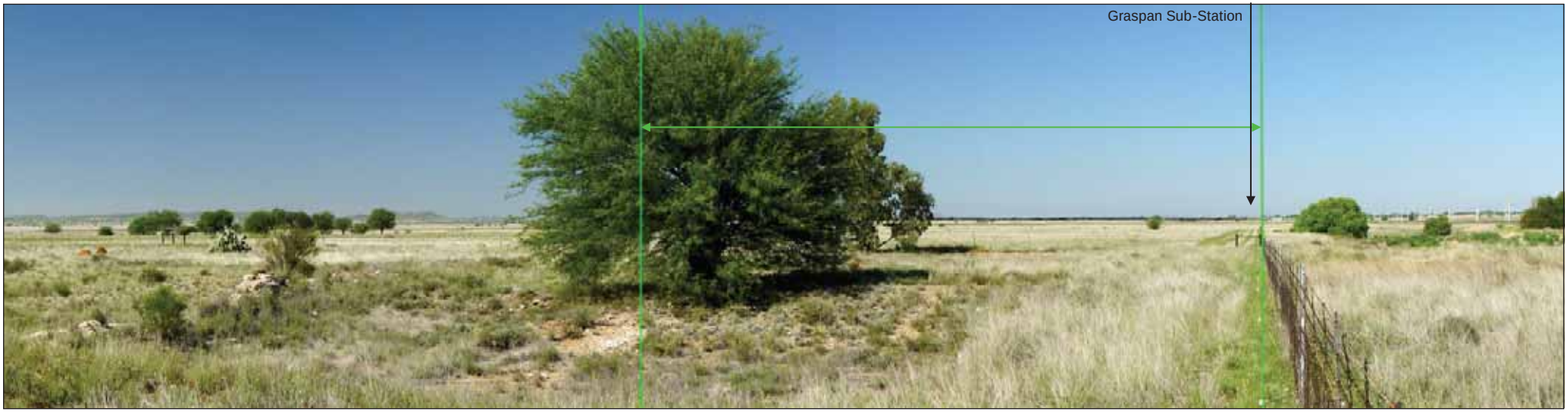
Figure 4 • Graspan Solar Facility • Layout of Components



3D models by mlb / BOLA - June 2012 : based on Solaire Direct 'PV Frames - General Layout' Plan Nº KE01

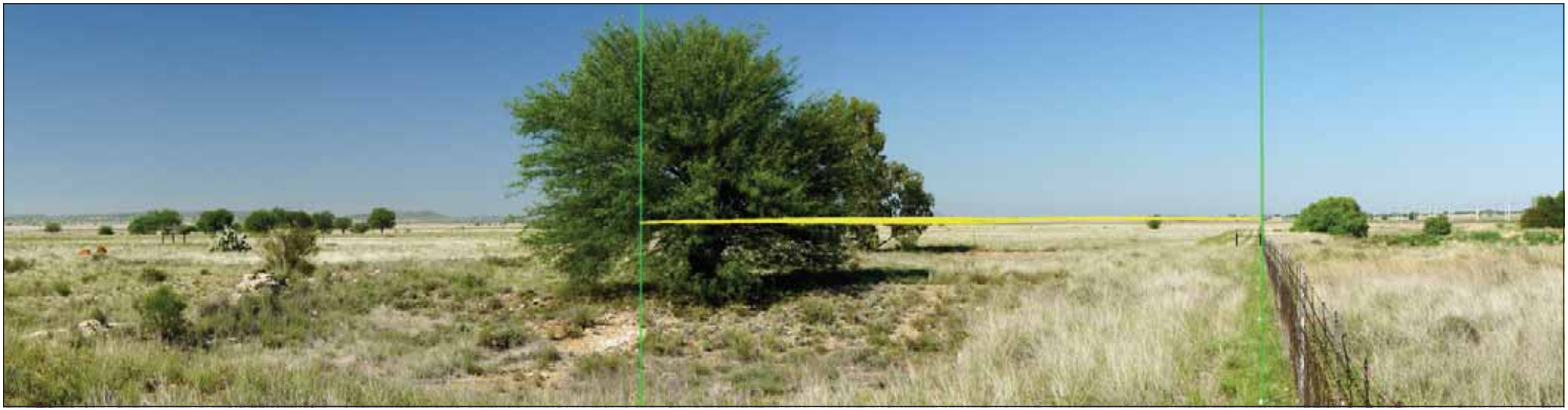
not to scale

Figure 5 • Graspan Solar Facility • Solar Panel Arrays



Viewpoint G1 • looking south-west from Graspan railway siding

29.3186S, 24.4490E • 24/02/2012 • 09h50



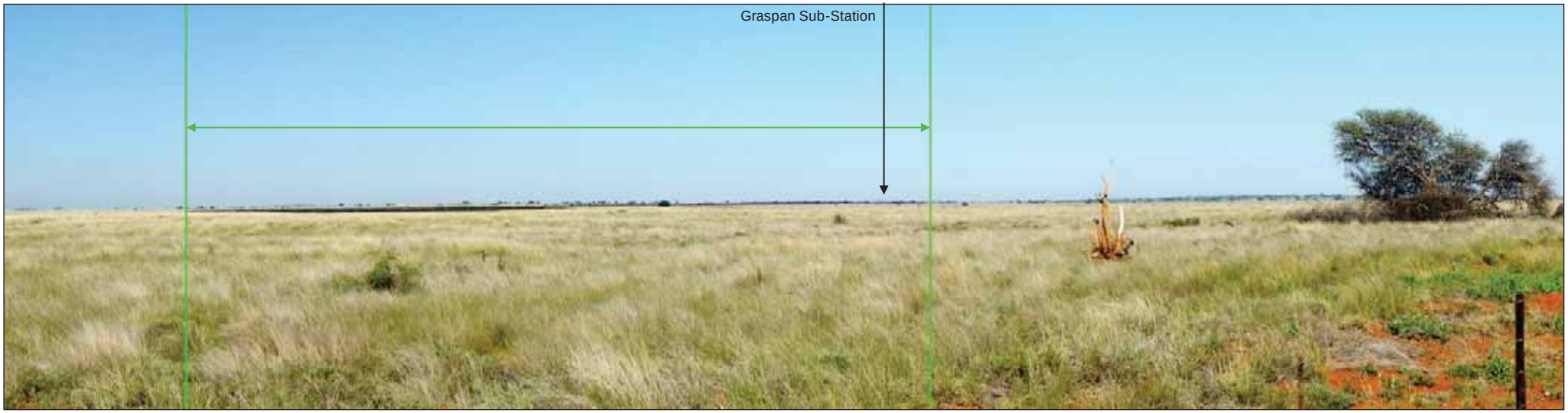
Viewpoint G1 • with solar arrays highlighted in yellow to indicate position

2.5km to closest arrays

Photomontages by mlb/BOLA : June 2012

no scale

Figure 6 • Graspan Solar Facility Viewpoint Panoramas



Viewpoint G2 • looking south-west from district road at Spes Bona West

29.3285S, 24.4669E • 24/02/2012 • 09h59

Viewpoint G2 • with solar arrays highlighted in yellow to indicate position

2.9km to closest arrays

Photomontages by mlb/BOLA : June 2012

no scale

Figure 7 • Graspan Solar Facility Viewpoint Panoramas

Viewpoint G3 • looking north-west from district road at Klein Kareelaagte

29.3695S, 24.4515E • 24/02/2012 • 10h12

Viewpoint G3 • with solar arrays highlighted in yellow to indicate position

1.9km to closest arrays

Photomontages by mlb/BOLA : June 2012

no scale

Figure 8 • Graspan Solar Facility Viewpoint Panoramas

Viewpoint G4 • looking east from N12 toward Sub-Station

29.3378S, 24.4211E • 24/02/2012 • 10h40

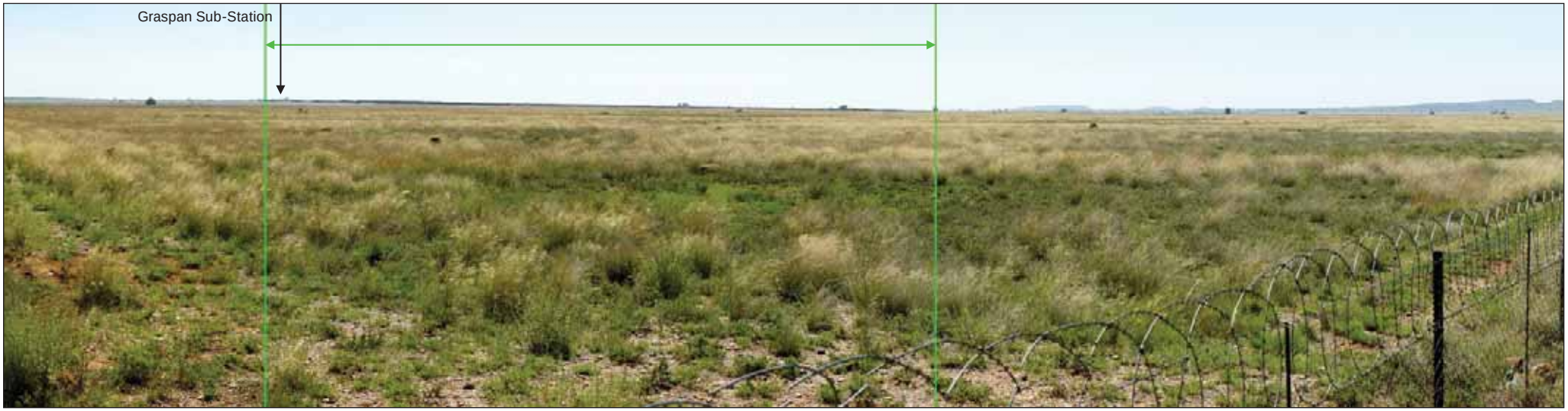
Viewpoint G4 • with solar arrays highlighted in yellow to indicate position

1.2km to closest arrays

Photomontages by mlb/BOLA : June 2012

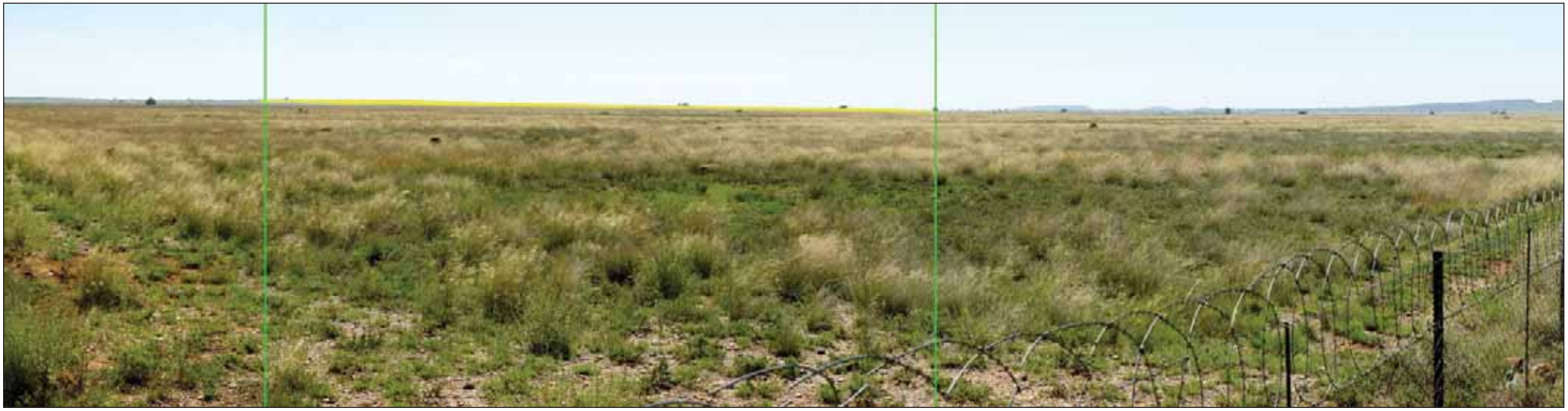
no scale

Figure 9 • Graspan Solar Facility Viewpoint Panoramas



Viewpoint G5 • looking north-east from N10 at SW boundary

29.3632S, 24.3976E • 24/02/2012 • 10h47



Viewpoint G5 • with solar arrays highlighted in yellow to indicate position

3.2km to closest arrays

Photomontages by mlb/BOLA : June 2012

no scale

Figure 10 • Graspan Solar Facility Viewpoint Panoramas