HYPERION SOLAR DEVELOPMENT (Pty) Ltd

DEVELOPMENT OF A THERMAL POWER DUAL FUEL FACILITY TO FORM PART OF THE AUTHORISED HYPERION 1 & 2 SOLAR PV ENERGY FACILITIES, NEAR KATHU, NORTHERN CAPE PROVINCE

LANDSCAPE & VISUAL IMPACT SCOPING REPORT

October 2020

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1 INTRODUCTION

1.1 GENERAL

This Landscape and Visual Impact Scoping Report (LVISR) forms part of the Scoping and Environmental Impact Assessment that is being undertaken for the proposed development of a thermal power dual fuel facility that will form part of the authorised Hyperion 1 & 2 solar PV energy facilities by Savannah Environmental (Pty) Ltd on behalf Hyperion Solar Development (Pty) Ltd.

In terms of the amended National Environmental Management Act (NEMA) Act No. 107 of 1998, the proposed development requires environmental authorisation. A key impact to be assessed comprises the visual impact that the proposed facility will have on surrounding areas.

This LVISR has been prepared for inclusion in the Scoping Report compiled for the proposed project.

1.2 PROJECT LOCATION

The proposed project is located in the Gamagara Local Municipality and the John Taolo Gaetsewe District Municipality. (Map 1: Locality Map).

The following terminology should be noted:

a) The thermal power facility will be located on the Remainder of Farm Lyndoch 432; and
b) The proposed access road will be located on Portion 1 of Farm 464.

The approximate geographic coordinates for the centre of the proposed thermal power facility are;

South	27^0	33’	13.85”
East	23^0	03’	53.06”

The approximate geographic coordinates for either end of the proposed access road are;

Western End of the Road			
South	27^0	33’	10.48”
East	23^0	03’	49.57”
Eastern End of the Road			
South	27^0	36’	04.23”
East	23^0	01’	43.56”

1.3 BACKGROUND OF SPECIALIST

Jon Marshall qualified as a Landscape Architect in 1978. He is also a certified Environmental Assessment Practitioner (EAP) of South Africa. He has been involved in Visual Impact Assessment over a period of approximately 30 years. He has developed the necessary computer skills to prepare viewshed analysis and three dimensional modelling to illustrate impact assessments. He has undertaken visual impact assessments for major buildings,

industrial development, renewable energy, mining and infrastructure projects and has been involved in the preparation of visual guidelines for large scale developments.

A brief Curriculum Vitae outlining relevant projects is included as **Appendix I.**

1.4 TERMS OF REFERENCE AND RELEVANT GUIDELINES

The brief is to assess the visual impact that the proposed project will have on surrounding areas.

Work was undertaken in accordance with the following guideline documents:

a. The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Western Cape Guideline) (Oberholzer, 2005). This is the only local relevant guideline available in South Africa, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape **(Appendix II)**; and

b. The Landscape Institute and Institute of Environmental Management and Assessment (United Kingdom - UK) Guidelines for Landscape and Visual Impact Assessment (GVLIA) which provides detail of international best practice (UK Guidelines) (Landscape Institute and Institute of Environmental Assessment and Management, 2013).

1.4.1 Western Cape Guidelines

The Western Cape Guidelines provide a useful guide as to the level of impact necessary for various types of developments and in various types of landscape. It also provides guidance as to the necessary consideration and content of an assessment. This information is applied in Section 6, Methodology.

At this initial stage it is assumed that a Level 3 Assessment will be required in accordance with these guidelines. A Level 3 Assessment requires:

a) Identification of issues raised in scoping phase, and site visit;
b) Description of the receiving environment and the proposed development;
c) Establishment of view catchment area, view corridors, viewpoints and receptors;
d) Indication of potential visual impacts using established criteria;
e) Inclusion of potential lighting impacts at night;
f) Description of alternatives, mitigation measures and monitoring programmes; and
g) Review by independent, experienced visual specialist (if required).

This Scoping Assessment focuses on items a) to e) inclusive in order to provide stakeholders with relevant information to enable comment and in order to provide the necessary focus for the detailed assessment and compilation of the Landscape and Visual Impact Assessment report.

1.4.2 UK Guideline

This document provides the following criteria which, at least, should be borne in mind as it could help in carrying out the process of assessing the Landscape Effects as follows:

- Consider the physical state of the landscape. This includes the extent to which the typical character is represented in individual areas, the intactness of the landscape from visual, functional and ecological perspectives and the condition of individual elements of the landscape;

- Consider scenic quality which depends upon perception and reflects the particular combination and pattern of elements in the landscape, its aesthetic qualities, its more intangible sense of place or 'genius loci' and other more intangible qualities;
- Consider the rarity of the landscape, it might be valued because it is a rare type, or because it contains rare elements, features or attributes;
- Consider representativeness, as a landscape may be valued because it is considered to be a particularly good example of its type either in terms of its overall character or because of the elements or features it contains;
- Consider conservation interests, i.e. the presence of features of wildlife, earth science or archaeological or historical and cultural interest can add to the value of the landscape as well as having value in their own right.
- Consider perceptual aspects as a landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity; and
- If public opinion has been sought consider if there may be a consensus of opinion, expressed by the public, informed professionals, interest groups, and artists, writers and other media, on the importance of the landscape.

As regards the Visual Effects, the Guideline suggests the selection of the final viewpoints used for the assessment should take account of a range of factors including:

- Accessibility to the public;
- Potential number and sensitivity of viewers who may be affected;
- Viewing distance (i.e. short, medium and long distance views) and elevation
- View type (for example panoramas, vistas, glimpses);
- Nature of viewing experience (for example static views, views from settlements and points along sequential routes); and
- Potential for cumulative views of the proposed development in conjunction with other developments in the surrounding landscape.

1.5 THE NATURE OF VISUAL IMPACT

Visual impacts may relate to a general change in the character of an area or in the change in a specific view for a person or group of people.

Visual impacts can be positive or negative and a degree of subjectivity is required in deciding this point. The approach of any visual assessment should, as objectively as possible, describe a landscape and reflect the likely majority view regarding the positive / negative aspects of an impact. This can be difficult particularly in South Africa due to different values and cultures associated with various sectors of the population. For example, poorer and particularly rural based sectors of the population are possibly more concerned with the productive nature of a landscape than its appearance, whereas the wealthier sectors might be more concerned with scenic value particularly as it is associated with property values. If possible, the values and opinions of all impacted sectors of the community should be considered.

General change to a landscape might have greater or lesser significance subject to issues listed in Section 1.4.2.

In terms of change to a specific view, this might be defined as either visual intrusion or visual obstruction.

a) Visual intrusion is a change in a view of a landscape that reduces the quality of the view. This can be a highly subjective judgement. Subjectivity has been removed as far as possible in this assessment by classifying the landscape character of each area and providing a description of the change in the landscape that will occur due to the proposed development.
b) Visual obstruction is the blocking of views or foreshortening of views. This can generally be measured in terms of extent.

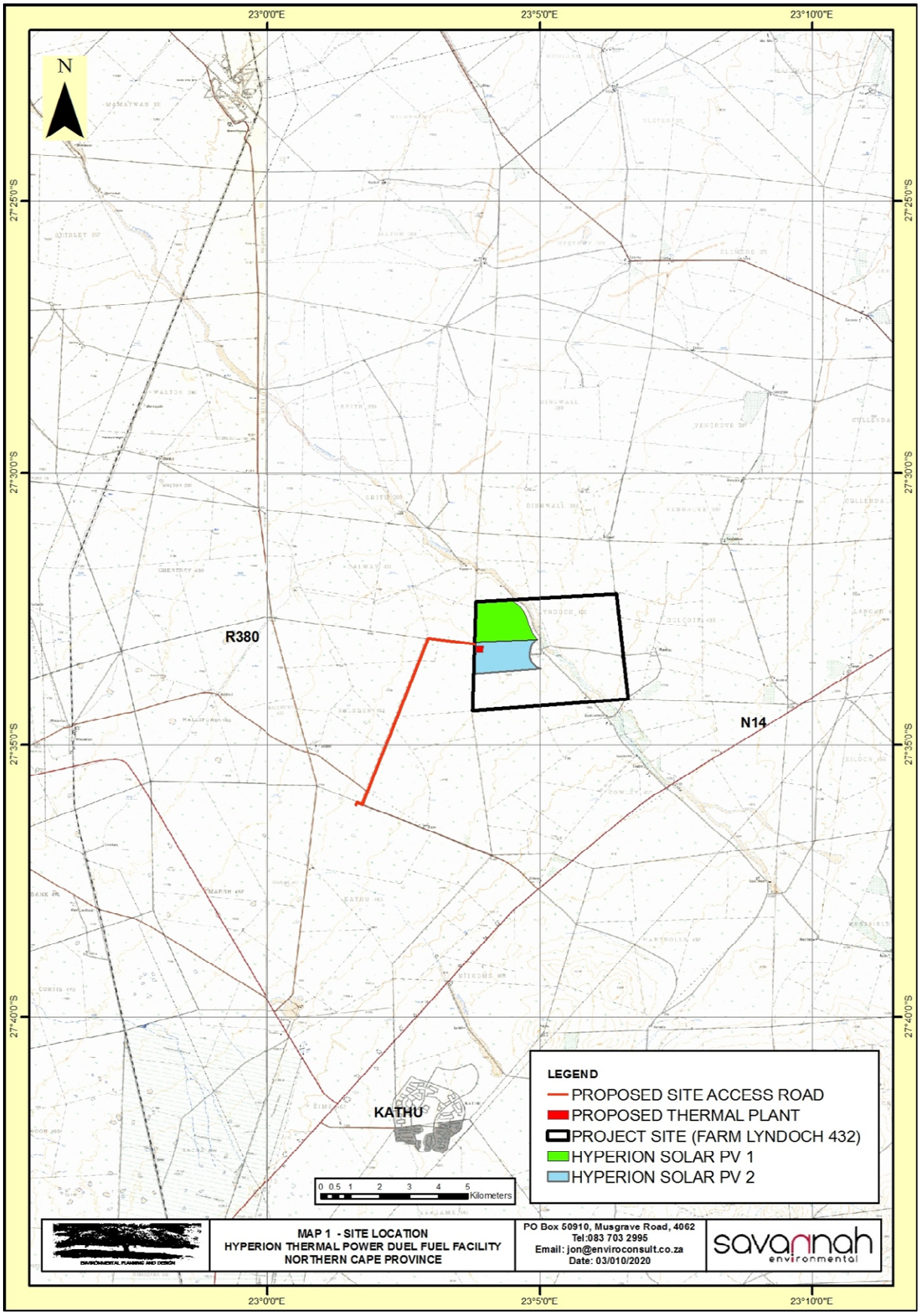
More often than not such an impact will be a combination of intrusion and obstruction. Obstruction can be measured in terms of the extent of an existing view that is screened by a development. Judging intrusion requires a degree of subjectivity. It is however possible to relate this judgement to the manner in which proposed change would impact on the use or enjoyment of an area, which again requires an understanding of local values.

1.6 GENERAL SCOPING OBJECTIVES

This Scoping Study identifies and evaluates potential environmental impacts associated with all aspects of the Proposed Project. In terms of the EIA Regulations, feasible and reasonable alternatives should be assessed within the Scoping Study. The scope of an environmental assessment is defined by the range of issues and feasible alternatives to be considered, and the approach towards the assessment that will follow.

The characteristics of a scoping exercise are as follows:

a) Feasible and reasonable alternatives are identified and selected for further assessment;
b) Important characteristics of the affected environment are identified;
c) Significant issues that are to be examined in the assessment procedure are identified; and
d) It provides the basis for determining terms of reference for the assessment procedure.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27°35'0"S
27°40'0"S
R380
N14
KATHU
LEGEND
PROPOSED SITE ACCESS ROAD
PROPOSED THERMAL PLANT
PROJECT SITE (FARM LYNDOCH 432)
HYPERION SOLAR PV 1
HYPERION SOLAR PV 2
0 0.5 1 2 3 4 5
Kilometers
MAP 1 - SITE LOCATION
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2. PROJECT DESCRIPTION

2.1 PROJECT DESCRIPTION

The proposed development is comprised of a 75MW thermal power dual fuel facility to form part of the already authorised Hyperion Solar PV 1 and 2 projects. It is intended that the proposed facility is combined with the Hyperion Solar PV 1 and 2 projects in order to provide hybrid power generation facilities.

The extent of the proposed thermal facility will be no more than 5ha.

- The main elements of the facility include:
- Access road
- Truck entrance and parking facility
- Fuel off-loading facility
- Fuel storage facility
- Re-gasification plant and fuel preparation plant
- Dry cooling system for operating oils/chemicals
- Gas turbines or Reciprocating Gas Engines
- Water demineralisation plant
- Substation, cabling, O&M building, fencing, warehouses and workshops

Power may be generated by up to ten (10) turbines that may be fuelled by either LPG or diesel. The turbines will have an approximate base dimensions of 20m x 6m and a maximum height excluding the necessary stack and condenser of 6m.

The maximum height of each stack (1 per turbine) will be 25m.

Fuel storage will be comprised of both diesel (4,000m^3) and LPG tanks (5,500m^3). At the time of reporting it was confirmed that diesel would either be stored in five vertical cylindrical tanks with a diameter of 15m and height of 15m or in five horizontal cylindrical tanks with a diameter of 8m and length of 30m.

In addition to the fuel storage, additional storage, workshop and office facilities will be required within minor buildings and storage tanks with a height not exceeding 6m .

2.2.2 Substation

An on-site substation is necessary required per thermal generating unit for the interface to the main on-site substation of the entire hybrid facility where the voltage is stepped up to 132kVproject to step up current to 132kV so that it can be fed into the National Grid. It is anticipated that this on-site substation will either be an outdoor or indoor solutiontype within a fenced compound. From experience it is expected that the tallest structure other than connecting power lines would be in the region of 20m to 30m15m.

2.2.4 Overhead Power Lines

It is assumed that power will be fed into the national grid via a 132kV overhead line[1].

2.2.5 Security Lighting

The facility will likely be lit by security lights to a level sufficient to ensure that security cameras can operate at night. This is likely to result in the plant being obvious at night from surrounding areas.

2.2.6 Road Access

It is proposed that the access road links to the unsurfaced local road to the south-west of the proposed plant. It will be approximately 8 km length and will be comprised of a tarred or gravelled dual carriageway with an approximate paved width of 8m. The entire width of the road reserve (road plus side drains) will be approximately 12m

The proposed alignment will follow the alignment of the grid connection power line.

[1] This is being assessed separately in a separate basic assessment application

3 DESCRIPTION OF RECEIVING ENVIRONMENT AND RECEPTORS

It is possible that landscape change due to the proposed development could impact the character of an important landscape. Landscape character can be derived from specific features relating to the urban or rural setting and may include key natural, historic or culturally significant elements. Importance might also relate to landscapes that are uncommon or under threat from development.

This section will:

- Provide an initial description of the types of landscape that may be impacted;
- Provide an initial Indication of the likely degree of sensitivity; and
- Provide an initial description of how the landscape areas may be impacted.

The study area is defined by the limit of visibility of the proposed project. As an initial guide, the limit has been set at 17.9km from the proposed site being the approximate limit of visibility of 25m high structures (stacks). Refer to Section 4 for the justification for this distance.

3.1 LANDSCAPE CHARACTER

Landscape character is defined as "a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another"[2].

Landscape Character is a composite of a number of influencing factors including:

- Landform and drainage;
- Nature and density of development; and
- Vegetation patterns.

3.1.1 Landform and Drainage

The proposed project is located on a broad valley floor that is drained by the Vlermuisleegte which is an intermittent stream that flows from south to north close to the proposed site area.

The valley floor falls from south east to northwest at a gentle gradient of approximately 1:200.

The visual implications of landform are;

Because the N14 is located approximately 7km to the south at an elevation approximately 30m higher than the proposed project, it is possible that the project will be visible from this road. The shallow gradient is likely to mean that if the project is visible it will be viewed largely in elevation with little or no extended overview and that intervening vegetation is likely to play a major screening role.

Refer to Map 3, Landform and Drainage.

3.1.2 Landcover

The population density of the area immediately surrounding the proposed development varies.

[2] UK Guideline

Kathu is the largest town of five towns within the Gamagara Local Municipality. However both are relatively small towns. At the 2011 census, the municipality had a total population of approximately 41,617 people approximately 71% of which are based in urban areas.

The area of the Municipality is 2,619km^2.

Rural homesteads were found to have an average occupancy of 3.5 people. This means that there is a rural homestead for approximately every 0.75km^2.

Given the province's dry conditions and dependence on irrigation, many Northern Cape farmers are branching out into value-added activities such as game farming.

Kathu is primarily a rural service centre. It is likely also that a proportion of its economy is derived from local mining operations as well as its position on the N14 as it acts as a transit stop for travellers including tourists.

Kathu has a regional airport that is located approximately 11.7km to the west of the proposed project site.

Apart from agriculture, mining is the largest industrial activity in the area. Kathu is the centre of this activity. Mines in the area include iron ore and manganese. The mine to the west of Kathu and south of the proposed project is the Mamatwan Manganese Mine that is operated by Anglo American.

In addition to Mamatwan, there are numerous areas of degraded land. It is possible that these areas have resulted from informal mining operations.

All major mining activities are a significant distance from the proposed development area and are unlikely to have a major influence on the character of the landscape surrounding the project site.

Visual implications of landcover include the potential that homesteads on adjacent farms could have tourism importance if they have been developed with bush lodges and are used for game viewing or hunting operations, in which case they could be sensitive to the potential change in view associated with the proposed development.

3.1.3 Vegetation Patterns

According to Mucina and Rutherford[3] (2006), the proposed project is located in a relatively natural area. The vegetation types include:

- Kuruman Thornveld;
- Kathu Bushveld; and
- Kuruman Mountain Bushveld.

All vegetation types are usually open tree and shrub cover with a sparse grass layer.

Visual implications include;

- Where the viewer is amongst natural vegetation, it is likely that there will be a high degree of screening provided by the natural vegetation.
- Where the viewer is set back from natural vegetation or where ground elevation provides a slightly elevated overview of the landscape, the extent of screening provided by natural vegetation is likely to be limited.

3.1.4 Future Development

From reference to the Department of Environmental Affairs web site that records the location of current renewable energy applications (https://dea.maps.arcgis.com), there are currently twenty one authorised projects or proposed energy generation projects on twelve properties within 30km of the proposed development. These are generally solar PV and CSP projects. It is also possible that a number of these projects could also have thermal power generation capacity.

These developments are likely to result in a degree of industrialisation of what is currently a largely rural landscape. The majority of the projects are located well away from main roads, so it is possible that the average person will not realise the extent of development. There are however six other projects that are located at a similar distance or closer to the N14 as the proposed project. Whilst no detailed work has been undertaken, this could mean that other projects will be visible from roads.

3.2 LANDSCAPE CHARACTER AREAS & VISUAL ABSORPTION CAPACITY

Landscape Character Areas (LCAs) are defined as "single unique areas which are the discrete geographical areas of a particular landscape type"[4].

Visual Absorption Capacity (VAC) is defined as the landscape's ability to absorb physical changes without transformation in its visual character and quality. Where elements that contrast with existing landscape character are proposed, VAC is dependent on elements such as landform, vegetation and other development to provide screening of a new element. The scale and texture of a landscape is also critical in providing VAC, for example; a new large scale industrial development located within a rural small scale field pattern is likely to be all the more obvious due to its scale.

The landscape within the Approximate Limit of Visibility appears relatively uniform.

Overlaying the landform, landcover and vegetation, all potentially affected areas appear to be a composite of relatively flat topography, natural landcover which is generally comprised

[3] Vegetation types of South Africa (including Prince Edward and Marion Islands), Lesotho and Swaziland, 2006
[4] UK Guidelines.

of Kathu Bushveld. This combination of characteristics could provide a significant degree of VAC due to the following factors:

- Because the project will be viewed in a relatively flat landscape it is likely to be seen largely in profile meaning that at any distance it will appear as a dark band within the authorised PV project. Due to the relative heights, the majority of the elements within the proposed plant are likely to extend above the height of the authorised solar PV projects. However, it needs to be borne in mind that the surrounding solar PV projects include elements such as storage and workshop areas that are likely to be similar in height to the lower elements within the proposed thermal project;
- The Kathu Bushveld includes woody vegetation extends above head height. This taller vegetation may not be very dense but the cumulative screening effect over distance is significant. Vegetation is therefore likely to at least visually break the impact of most of the elements within the proposed development from the majority of viewpoints.

Approximately 15km to the east of the project area is a north south running ridgeline that forms the eastern side of the valley. This ridgeline rises approximately 150m above the relatively flat valley floor. Due to distance it is unlikely that this ridgeline will be significant either in contributing to landscape character or providing an area from which an overview of the development is possible.

Approximately 12km to the south of the project area is the settlement of Kathu which is also located on the flat valley floor. Due to distance it is unlikely that this settlement will be significant either in contributing to landscape character or providing an area from which views of the development will be possible.

3.3 LANDSCAPE QUALITY AND IMPORTANCE

The affected landscape currently consists of relatively flat topography that is covered with natural bush veldt and low intensity grazing is likely to be the predominant agricultural activity. In areas, some landowners may have diversified into game farming, hunting and bush lodges. Sparsely scattered homesteads and small mining activities are apparent in the landscape.

From the site visit undertaken for the Hyperion Solar PV projects it was apparent that none of the affected homesteads include lodge development.

There are no protected areas within the affected area.

The landscape is primarily important for its productivity including agriculture and mining.

3.4 VISUAL RECEPTORS

3.4.1 Definition

Visual Receptors are defined as "individuals and / or groups of people who have the potential to be affected by the proposal"[5].

It is also possible that an area might be sensitive due to an existing use. The nature of an outlook is generally more critical to areas that are associated with recreation, tourism and in areas where outlook is critical to land values.

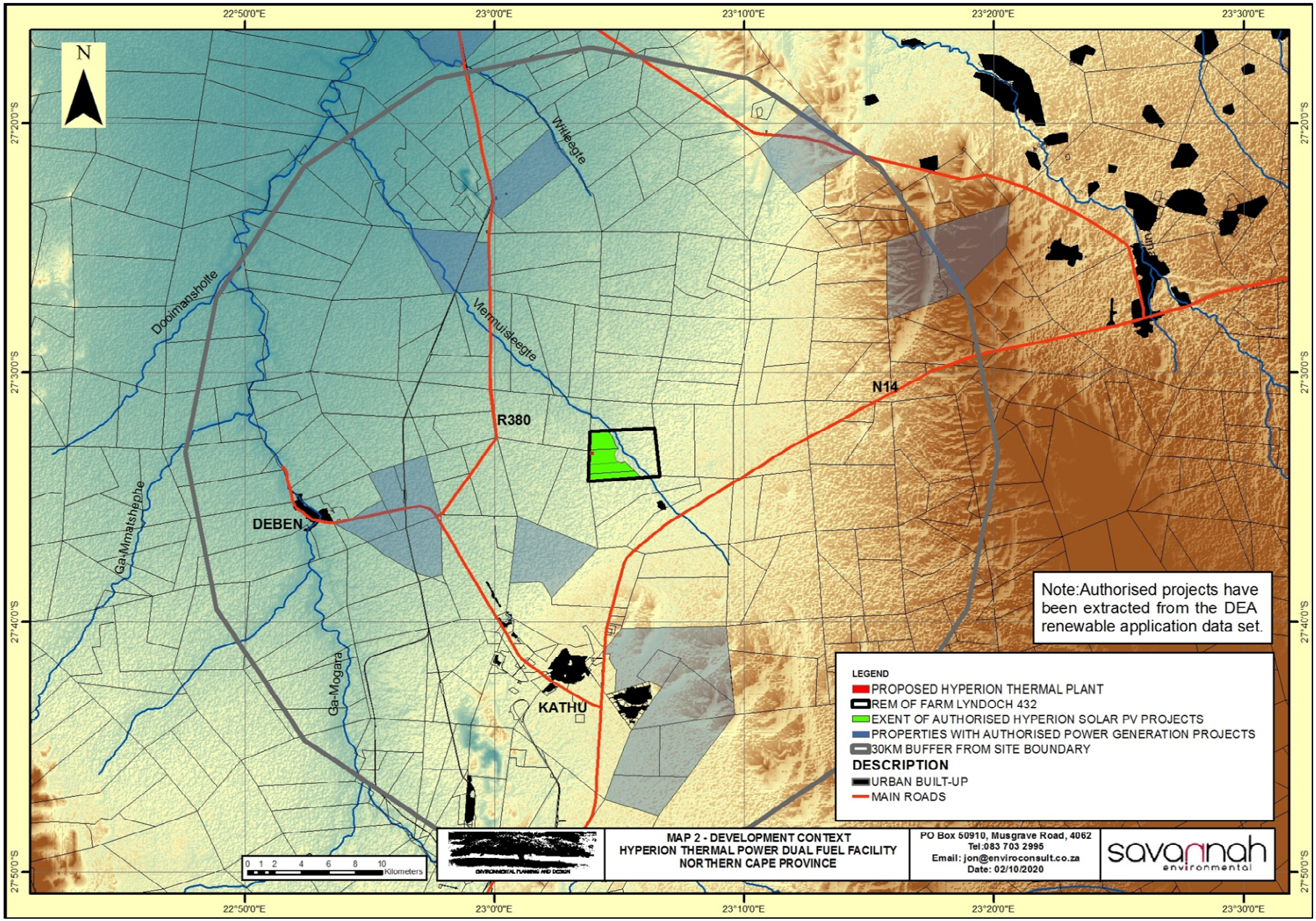
[5] UK Guidelines.

3.4.2 Visual receptors

This section is intended to highlight possible Receptors within the landscape which due to use could be sensitive to landscape change. They include;

- Point Receptors that include homesteads that are scattered throughout the area. From the site visit, it is understood that no affected homesteads are likely to have a tourism use. It is therefore likely that the focus for people residing in surrounding rural homesteads is likely to be agricultural production.
- Linear Receptors that include the N14, the R380 and local un-surfaced routes through the area:
    - The N14 is likely to be used by local people and business travellers. It is also a primary tourism route.
    - Local routes surrounding the development are likely to be mainly used by local people and relate to agricultural activities;
        - The R380 which provides access to mining areas around Hotazel which is approximately 50km to the north of the proposed site. The road also links to northern Namibia and because of this it probably carries a proportion of tourism traffic;
        - Local roads including a minor un-surfaced road that runs to the south and south west of the site that provides a link between the N14 and the R380;
- The Kathu (Sishen) Airport which is located approximately 11.7km to the southwest of the proposed plant. The airport is a regional airport with daily SA Airlink flights to and from O R Tambo.

Visual receptors were subject to verification during the EIA phase of the assessment processes for the authorised Hyperion PV Solar projects.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27°40'0"S
27°50'0"S
N
Witkleegte
Doornanshoffe
Vermuisleegte
R380
N14
DEBEN
KATHU
Ga-Mmatshephe
Ga-Mogara
Note:Authorised projects have been extracted from the DEA renewable application data set.
LEGEND
PROPOSED HYPERION THERMAL PLANT
REM OF FARM LYNDOCH 432
EXENT OF AUTHORISED HYPERION SOLAR PV PROJECTS
PROPERTIES WITH AUTHORISED POWER GENERATION PROJECTS
30KM BUFFER FROM SITE BOUNDARY
DESCRIPTION
URBAN BUILT-UP
MAIN ROADS
0 1 2 4 6 8 10 Kilometers
MAP 2 - DEVELOPMENT CONTEXT
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4 THE NATURE OF POTENTIAL VISUAL IMPACTS

4.1 GENERAL

Impacts could include general landscape change, due to the proposed development, as it could detract from the existing character as well as change of view for affected people and / or activities:

a. General landscape change or degradation. This is particularly important for protected areas where the landscape character might be deemed to be exceptional or rare. However, it can also be important in non-protected areas particularly where landscape character is critical to a specific broad scale use such as tourism or just for general enjoyment of an area. This is generally assessed by the breaking down of a landscape into components that make up the overall character and understanding how proposed elements may change the balance of the various elements. The height, mass, form and colour of new elements all help to make new elements more or less obvious as does the structure of an existing landscape which can provide screening ability or texture that helps to assimilate new elements. This effect is known as visual absorption capacity (VAC); and
b. Change in specific views within the affected area from which the character of a view may be important for a specific use or enjoyment of the area:
    - Visual intrusion is a change in a view of a landscape that reduces the quality of the view. This can be a highly subjective judgement. Subjectivity has however been removed as far as is possible by classifying the landscape character of each area and providing a description of the change in the landscape that will occur due to the proposed development. The subjective part of the assessment is to define whether the impact is negative or positive. Again to make the assessment as objective as possible, the judgement is based on the level of dependency of the use in question on existing landscape characteristics; and
    - Visual obstruction is the blocking of views or foreshortening of views. This can generally be measured in terms of extent.

Due to the nature of the proposed development, visual impacts are expected to relate largely to intrusion.

4.2 ZONES OF THEORETICAL VISIBILITY

Zones of Theoretical Visibility (ZTV) are defined by the UK Guidelines as "a map usually digitally produced showing areas of land within which a development is theoretically visible".

The ZTV analysis has been undertaken using Arc Spatial Analyst Geographic Information System (GIS). The assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by the National Aeronautics and Space Administration (NASA) and is freely available on the International Centre for Tropical Agriculture's- Climate Change, Agriculture and Food Security (CIAT-CCAFS) website (http://www.cgiar-csi.org).

The GIS Assessment does not take the curvature of the earth into account. In order to provide an indication of the likely limit of visibility (due to this effect), a universally accepted navigational formula has been used to calculate the likely distance that the proposed structures might be visible over (**Appendix III**). This indicates that in a flat landscape the proposed structures may be visible for the following distances;

Approximate limit of Visibility

ELEMENT	APPROXIMATE LIMIT OF VISIBILITY
Stacks 25m high	17.9 kilometres
Fuel Storage Tanks 15m high	13.8 kilometres
Turbines 6m high	8.7 kilometres

In reality these distances could be reduced by:

- Weather conditions that limit visibility including hazy conditions during fine weather as well as mist and rain; and
- Scale and colour of individual elements making it difficult to differentiate structures from background.
- The fact that as a viewer approaches the limit of visibility only a small portion of the development will be visible to the extent that it is likely to be indiscernible to the human eye.

4.2.1 Likely Visibility of the proposed elements

As at this initial stage the layout of the project is unknown, the ZTV analysis indicated on **Maps 3, 4 and 5** are based on a point located at the centre of the proposed development site. The analysis is therefore an indication of the areas to which the proposed project may be visible. Offset heights equal to the approximate height of the stacks, fuel storage and turbines respectively have been allocated in order to provide an indication of the likely visibility of these elements.

This analysis will be refined in the EIA phase when the layout of the project is known. The mapping indicates that key receptors are likely to include travellers on the N14, the R380, other minor local roads as well as inhabitants of local homesteads.

4.3 POSSIBLE IMPLICATIONS FOR VISUAL RECEPTORS

Visual implications of the proposed project for identified receptors are likely to include:

a) Views from Roads

The proposed development may be visible from the N14, the R308 and local roads which are located approximately 7km, 4.2km and 6.3km for the development respectively. The ZTV analysis indicates that;

- The proposed stacks could be visible to approximately 22km from the N14;
- The proposed fuel storage could be visible to approximately 15km from the N14; and
- The proposed turbines could be visible to approximately 7km from the N14.

In reality however, existing vegetation is likely to screen views of these elements from large sections of the road.

The N14 is the most important road in the vicinity of the project as it is likely to carry the greatest amount of traffic including tourism traffic. Given the distances involver, Similar intermittent views are likely to be possible form both the R308 and the closest local road.

Plate 1, View from the N14 looking towards the proposed development from approximately 7km to the south-east. Existing natural vegetation is likely to screen a large proportion of the proposed development although the 25m high stacks are likely to be visible from this viewpoint.

Plate 2, View looking towards the proposed site from the local road to the south west from an approximate distance of 4.2km. Existing natural vegetation is likely to screen a large proportion of the proposed development although the 25m high stacks are likely to be visible from this viewpoint.

Plate 3, View looking towards the proposed site from the R308 to the west from an approximate distance of 6.3km. Existing natural vegetation is likely to screen a large proportion of the proposed development although the 25m high stacks are likely to be visible from this viewpoint.

b) Homesteads

There are a number of homesteads from which the proposed development may be visible.

The closest homesteads are approximately 2.7km to the north, 4.4km to the south east, 5.16km to the east and 6.2km to the west of the proposed development.

Whilst various elements associated with the proposed development may be visible from the vicinity of these homesteads, they may not be visible from the homesteads themselves:

The homestead approximately 2.7km to the north is orientated east to west with relatively dense trees on its southern side. It is therefore unlikely that it will be possible to see the proposed development from the house.

The homestead to the southeast is surrounded by trees which are likely to provide a degree of screening. Any visual impact is also likely to be partly mitigated by distance.

The remaining homesteads are in excess of 4.4km from the proposed development. It is possible that glimpses of the proposed development may be possible from these, however, distance and intervening natural vegetation is likely to largely screen views.

Plate 4, View of the existing homestead within 2.7km of the proposed project to the north from the northern site boundary. Note, only the roof is visible meaning that the development will be screened from the lower floor of the house and surrounding area.

Plate 5, View of the existing homestead within 4.4km to the south east looking north west towards the proposed project. Existing vegetation is likely to partially screen the development.

c) Kathu

The ZTV analysis indicates that none of the elements associated with the proposed development are likely to be visible from the urban area.

d) Kathu (Sishen) Airport

Kathu Airport is approximately 11.7km from the proposed development. Due largely to distance, it is unlikely to be highly obvious from the airport.

e) Lighting Impacts

It is likely that security and operational lighting at night could make the proposed development obvious to receptors.

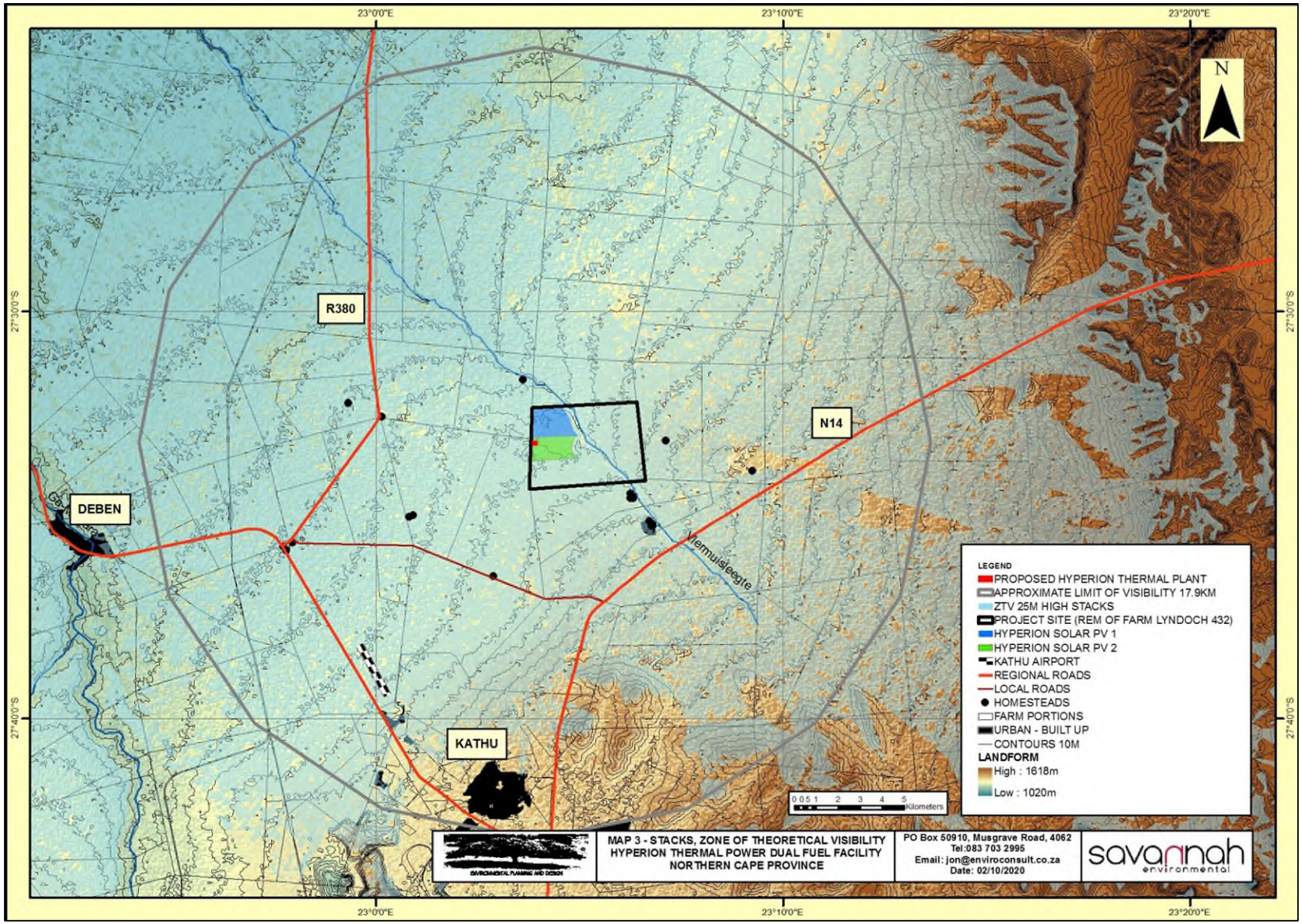
4.4 LIKELY IMPLICATIONS FOR LANDSCAPE CHARACTER

As indicated in Section 4.3, the visibility of the proposed development is likely to be limited with the proposed stacks being the most visible element. Views of the proposed development will however be screened / softened by a significant extent of natural vegetation between all receptors and the development. It is therefore unlikely to have a major influence on the character of the landscape as experienced by the majority of people.

However, it is possible that glimpses of the proposed plant may be possible through existing vegetation. It may therefore reinforce the general impression that the landscape is partly industrialised.

At night, lighting could make the proposed development obvious in the landscape. This will be seen against the backdrop of other projects in the area. The general area is not a pristine night time landscape as lighting is also likely to be obvious from mining operations as well as Kathu Airport.

In a flat landscape, road construction is likely to only have an impact on the area immediately surrounding it. Whilst a busy road might be obvious from a distance due to vehicles being obvious, for much of the time, a road that is lightly used where disturbance of surrounding vegetation has been minimised is unlikely to be obvious past 100m from the road edge.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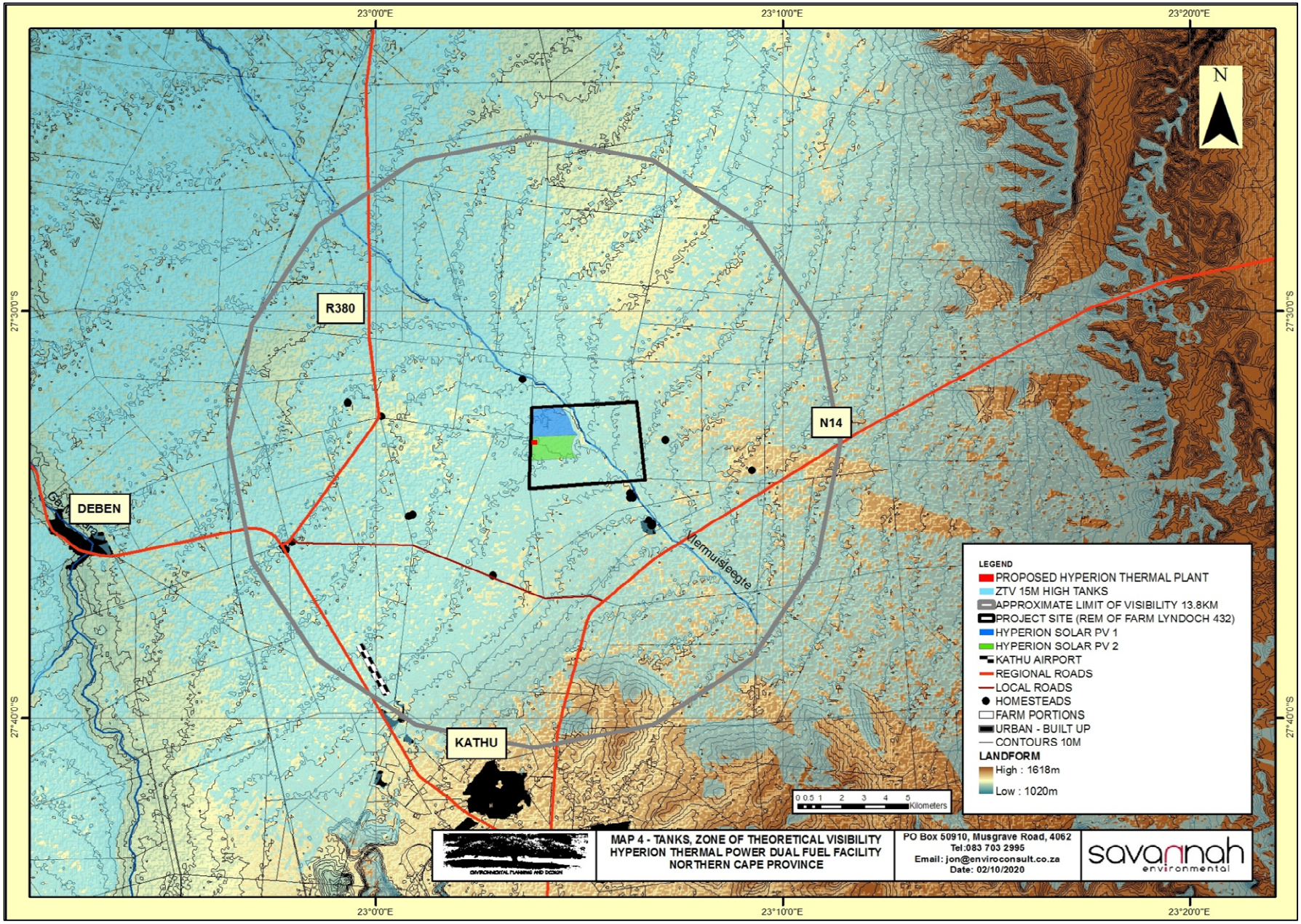
R380
N14
DEBEN
KATHU
Vermuisleegte
LEGEND
PROPOSED HYPERION THERMAL PLANT
APPROXIMATE LIMIT OF VISIBILITY 17.9KM
ZTV 25M HIGH STACKS
PROJECT SITE (REM OF FARM LYNDOCH 432)
HYPERION SOLAR PV 1
HYPERION SOLAR PV 2
KATHU AIRPORT
REGIONAL ROADS
LOCAL ROADS
HOMESTEADS
FARM PORTIONS
URBAN - BUILT UP
CONTOURS 10M
LANDFORM
High : 1618m
Low : 1020m
0 0.5 1 2 3 4 5 Kilometers
MAP 3 - STACKS, ZONE OF THEORETICAL VISIBILITY
HYPERION THERMAL POWER DUAL FUEL FACILITY
NORTHERN CAPE PROVINCE
PO Box 50910, Musgrave Road, 4062
Tel:083 703 2995
Email: jon@enviroconsult.co.za
Date: 02/10/2020
savannah environmental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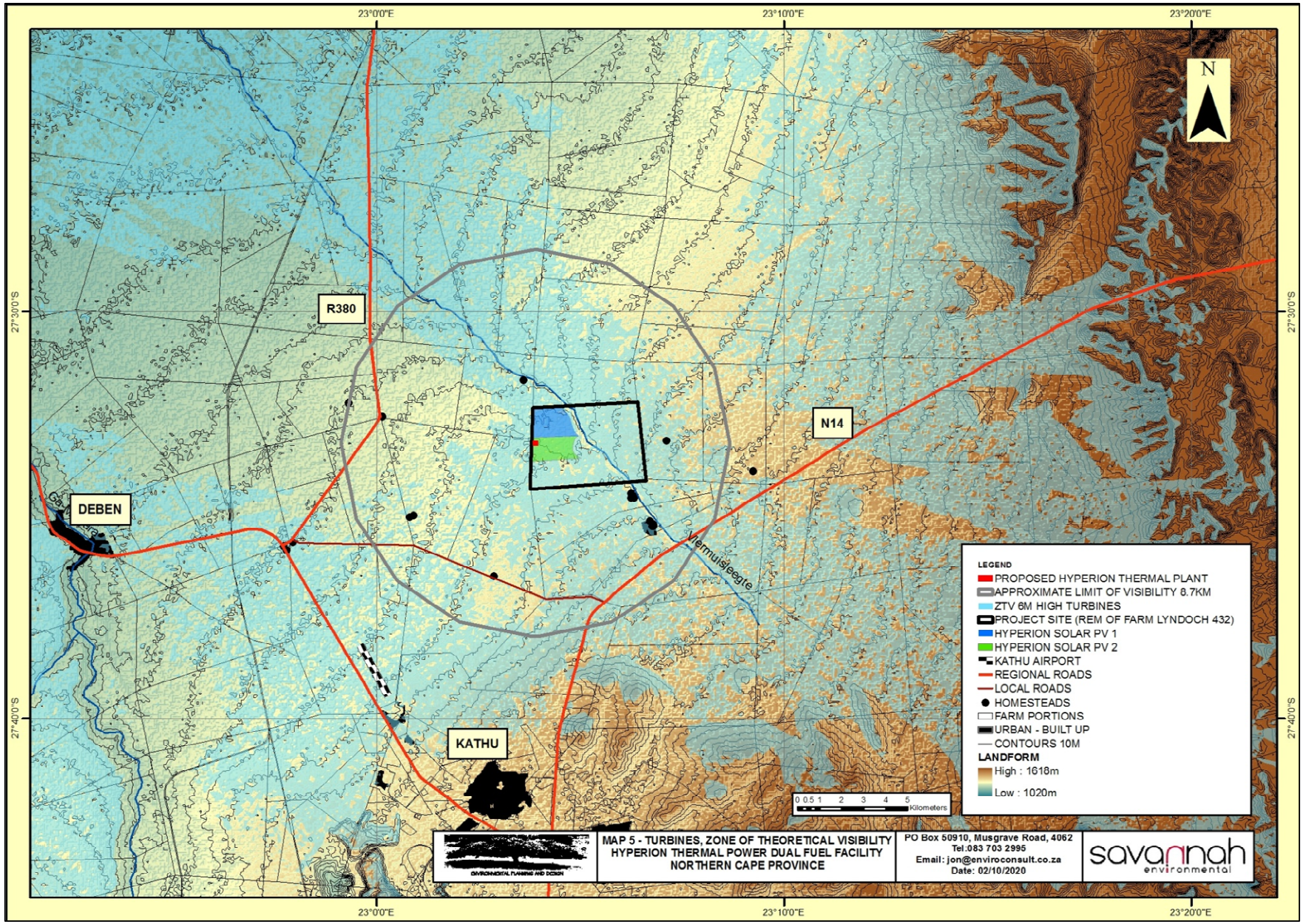
R380
N14
DEBEN
KATHU
Vermuisleegte
LEGEND
PROPOSED HYPERION THERMAL PLANT
ZTV 15M HIGH TANKS
APPROXIMATE LIMIT OF VISIBILITY 13.8KM
PROJECT SITE (REM OF FARM LYNDOCH 432)
HYPERION SOLAR PV 1
HYPERION SOLAR PV 2
KATHU AIRPORT
REGIONAL ROADS
LOCAL ROADS
HOMESTEADS
FARM PORTIONS
URBAN - BUILT UP
CONTOURS 10M
LANDFORM
High : 1618m
Low : 1020m
0 0.5 1 2 3 4 5 Kilometers
MAP 4 - TANKS, ZONE OF THEORETICAL VISIBILITY
HYPERION THERMAL POWER DUAL FUEL FACILITY
NORTHERN CAPE PROVINCE
PO Box 50910, Musgrave Road, 4062
Tel:083 703 2995
Email: jon@enviroconsult.co.za
Date: 02/10/2020
savannah environmental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27°40'0"S
N
R380
N14
DEBEN
KATHU
Vermuisleegte
LEGEND
PROPOSED HYPERION THERMAL PLANT
APPROXIMATE LIMIT OF VISIBILITY 8.7KM
ZTV 6M HIGH TURBINES
PROJECT SITE (REM OF FARM LYNDOCH 432)
HYPERION SOLAR PV 1
HYPERION SOLAR PV 2
KATHU AIRPORT
REGIONAL ROADS
LOCAL ROADS
HOMESTEADS
FARM PORTIONS
URBAN - BUILT UP
CONTOURS 10M
LANDFORM
High : 1618m
Low : 1020m
0 0.5 1 2 3 4 5
Kilometers
MAP 5 - TURBINES, ZONE OF THEORETICAL VISIBILITY
HYPERION THERMAL POWER DUAL FUEL FACILITY
NORTHERN CAPE PROVINCE
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Date: 02/10/2020
savannah
environmental

5 IDENTIFIED AREAS OF POTENTIAL IMPACT

5.1 POTENTIAL VISUAL IMPACTS TO BE CONSIDERED

From the review of the proposed project, it is proposed that the following issues should be addressed during the EIA phase;

a) The proposed development could impact on the general rural landscape character of the area;
b) The proposed development could impact on views from roads including the N14, the R308 and local roads;
c) The proposed development could impact on views from local homesteads; and

These issues will be considered in the context of the Landscape Character, visual effects identified and the possible cumulative influence of other development.

Possible mitigation measures are also identified.

5.2 TIMING OF POTENTIAL VISUAL IMPACTS

Impact levels are likely to gradually increase during the initial stage of development and when the proposed facility starts to appear in the landscape. At the end of construction, the proposed facility is likely to reach maximum visibility. Visual impacts are then likely to be consistent throughout the operational phase, and will reduce again as decommissioning occurs and the facility is dismantled.

5.3 INITIAL REVIEW OF POTENTIAL IMPACTS

The initial assessment is intended to provide an indication of the likely areas and severity of impacts as well as possible strategic mitigation measures that may be employed.

Terminology used in the initial assessment includes;

- Negligible impact - small but no obvious change in landscape character;
- Low impact – small and noticeable impact that will change views but will not modify the predominant landscape character;
- High impact – significant impact that will change the predominant landscape character;
- Negative Impact – a change in landscape character that is likely to negatively affect receptors;
- Positive Impact – a change in landscape character that is likely to positively affect receptors; and
- Neutral Impact – a change in landscape character that is likely to have negligible effect on receptors.

Impact

a) The proposed development could negatively impact on the landscape character of the affected area.

The issue relates to the degradation / industrialisation of the rural landscape character.

The proposed development area is located within an area that is perceived as being a semi-natural rural landscape. It is however being developed rapidly. However, the initial review indicates that whilst glimpses of these projects may be possible, the perception of a semi-natural landscape is likely to remain.

The stacks are likely to be the most obvious element from accessible public viewpoints, however they will be viewed at a distance with a significant extent of natural vegetation in the foreground.

The proposed development is not likely to significantly change this perception.

Desktop Sensitivity Analysis:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Industrialisation of the landscape	The proposed development is likely to have a low negative impact due to distance from public viewpoints and the extent of screening provided by intervening vegetation.	This is likely to affect the **immediately surrounding area**	No no-go areas have been identified from a visual perspective.

Discussion of expected significance:
There is likely to be minimal additional industrial influence on surrounding landscape character as experienced by the majority of receptors. This impact is therefore likely to have a low significance.

Possible mitigation:

- Maintain and augment existing screening vegetation;
- Avoid bright colours particularly for taller elements; and
- Minimise disturbance of surrounding natural vegetation.

Cumulative Impacts:
Due to the fact that the majority of power generation projects, including the proposed project, are located some distance from major routes and other public viewpoints Development of this site is likely to result in minimal cumulative impact.

Gaps in knowledge & recommendations for further study

- A development layout and details of structure height is needed to assess the impacts as well as the identification of possible mitigation measures in any detail.

Impact

b) The proposed development could negatively impact on views from roads.
The issue relates to the industrialisation of the rural landscape as viewed from roads.

Possible receptors include travellers on the N14, the R308 and a local road that runs to the south and south west between the N14 and the R308.

The affected sections of all roads are in excess of 4.2km from the proposed development. Due to the flat topography, the distance involved and the natural vegetation which is likely to provide a degree of screening, it is likely that the project will be largely screened from these roads although the taller elements, particularly the stacks will be visible. The extent of natural vegetation between the proposed development and roads is likely to soften views of these taller elements probably meaning that they are only visible intermittently from the roads.

Desktop Sensitivity Analysis:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Industrialisation of the landscape	The proposed development is likely to have low negative impact due to distance from public viewpoints and the extent	This is likely to affect the **immediately surrounding**	No no-go areas have been identified from a visual perspective.

	of screening provided by intervening vegetation.	**area**	

Discussion of expected significance:
Due to the fact that the majority of power generation projects, including the proposed project, are located some distance from major routes and other public viewpoints Development of this site is likely to result in minimal cumulative impact.

Possible mitigation:

- Maintain and augment existing screening vegetation;
- Avoid bright colours particularly for taller elements; and
- Minimise disturbance of surrounding natural vegetation.

Cumulative Impacts:
Due to the fact that the majority of power generation projects, including the proposed project, are located some distance from major routes and other public viewpoints Development of this site is likely to result in minimal cumulative impact.

Gaps in knowledge & recommendations for further study

- A development layout and details of structure height is needed to assess the impacts as well as the identification of possible mitigation measures in any detail.

Impact

c) The proposed development could negatively impact on views from local homesteads.

There is a homestead approximately 2.7km to the north of the proposed development. It is unlikely that it will be possible to see the proposed plant from the house due to existing trees around the building and its orientation. Views of the plant may be possible from the surrounding area. However, it is likely that existing vegetation will at least partly screen the proposed development.

There is also a homestead approximately 4.4km to the southeast of the proposed development. The buildings are also surrounded by trees which are likely to provide a degree of screening. Any visual impact is also likely to be part mitigated by distance as well as screening that is likely to be provided by existing natural vegetation.

The remaining homesteads are in excess of 4.4km from the proposed development. It is possible that glimpses of the proposed development may be possible from these, however, distance and intervening natural vegetation is likely to largely screen views.

Desktop Sensitivity Analysis:

Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Industrialisation of the landscape	The proposed development is likely to have low negative impact due to general limited visibility.	This is likely to affect the **immediately surrounding area**	No no-go areas have been identified from a visual perspective.

Discussion of expected significance:
There is likely to be limited change of surrounding landscape character as experienced from the majority of homesteads.

Possible mitigation:

- Maintain and augment existing screening vegetation;
- Avoid bright colours particularly for taller elements; and
- Minimise disturbance of surrounding natural vegetation.

Cumulative Impacts:
Due to the relative proximity of homesteads and the extent of surrounding natural vegetation, development of this site is likely to result in minimal cumulative impact.

Gaps in knowledge & recommendations for further study

- A development layout and details of structure height is needed to assess the impacts as well as the identification of possible mitigation measures in any detail.

Impact

d) Night time lighting impacts.

Security and operational lighting could make the project visible to receptors at night.

This will be seen in the context of other projects, lighting associated with mining and settlement.

Desktop Sensitivity Analysis:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Lighting impacts	The proposed development could be made obvious due to high levels of lighting. However with mitigation levels of lighting will be low during normal circumstances. The impact could be high negative but with mitigation is likely to be negligible.	This is likely to affect the **immediately surrounding area**	No no-go areas have been identified from a visual perspective.

Discussion of expected significance:
Due to the nature of the surrounding landscape which is likely to include lighting from mining operations and other power generation projects, the significance of this impact is likely to be low.

Possible mitigation:

- Infra red security system;
- Motion activated security system;
- Minimising operational lighting at night

Cumulative Impacts:
The development of this site is likely to result in a cumulative impact when added to other projects in the area, however the significance is likely to be low.

Gaps in knowledge & recommendations for further study

- Confirmation of proposed lighting s needed to assess the impact.

6 RECOMMENDED ASSESSMENT METHODOLOGY

6.1 REQUIREMENTS IN ACCORDANCE WITH THE WESTERN CAPE GUIDELINES

The criterion recommended by the Western Cape Guidelines for justification of level of input for a VIA is the expected level of visual impact. This categorisation is derived from the following matrix;

Table 13 – Categorisation of Impact Level, Western Cape Guideline

Type of environment	Type of development (see Box 3) 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

The categorisation of development is indicated below;

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.

The proposed development is a Category 5 development.

The necessary level of assessment will be subject to the quality of the existing landscape. The initial assessment indicates that the proposed development is likely to largely impact

areas that may be considered an area of medium scenic significance that is already impacted by solar projects and that scenic or protected areas are unlikely to be impacted.

The above tables indicate that the proposed development might generally be expected to have a high visual impact. However, the initial assessment indicates that all visual impacts are likely to be low and the proposed plant is located within an existing authorised development area.

It is therefore proposed that a Level 3 Assessment should be undertaken.

A Level 3 Assessment requires the following input;

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

Confirmation of the requirement for a specialist review is required.

6.2 DETAILED METHODOLOGY

As indicated above, a site visit is required in order to investigate and finalise the issues and impacts highlighted by this initial scoping exercise.

The following methodology will be used in preparation of the VIA report.

6.2.1 Identification of issues raised in scoping phase, and site visit

Likely issues have already been identified in this scoping analysis. The assessor has already visited the proposed site for the assessment process for the authorised Hyperion solar PV projects. It is intended to use the information gathered during this site visit for this assessment.

6.2.2 Description of the receiving environment and the proposed project

The receiving environment has been described and categorised as part of the assessment processes for the authorised Hyperion solar PV projects. It is intended to use the information gathered during this site visit to prepare a detailed description of the receiving environment.

6.2.3 Establishment of view catchment area, view corridors, viewpoints and receptors

Initial zones of theoretical visibility and visual receptors have been established from the GIS analysis included in this document. These will be verified when the detailed layout is available.

6.2.4 Indication of potential visual impacts using established criteria

Areas of likely visual impacts have been identified and described. This assessment will be developed further once a development layout is available.

It is possible that additional impacts might be identified from comments by stakeholders.

Impacts will be assessed using a numerical assessment system that has been adopted by Savannah Environmental for the overall assessment. This methodology is tried and tested, and its use will ensure that the Visual Impact Assessment can be easily incorporated into the Environmental Impact Assessment.

6.2.5 Inclusion of potential lighting impacts at night

The impact of lighting at night will be included in the assessment using the above criteria.

6.2.6 Description of alternatives, mitigation measures and monitoring programmes.

Currently no alternatives that have been identified for this project other than the "no-go" alternative which will be considered in the assessment.

Mitigation and monitoring measures will be developed during the preparation of the LVIA report during the EIA phase.

6.2.7 Review by independent, experienced visual specialist (if required).

Confirmation of this requirement is needed.

7 CONCLUSIONS

The brief scoping assessment indicates that the proposed development could have an impact on the rural landscape character of the area.

The affected landscape currently appears to be largely a semi-natural rural character. However, there is evidence that this character is being eroded by other energy generation developments. From the desktop assessment, it seems likely that the identified surrounding energy generation projects are unlikely to have a significant negative visual impact on this landscape character for the majority of sensitive receptors. This is due generally to the distances between receptors and the projects, the relatively flat topography and the fact that existing natural vegetation is likely to provide a high degree of screening.

The scoping assessment has indicated that the sensitive receptors for the proposed development are likely to include:

1) Roads in the vicinity including the N14, the R308 and a local road; and
2) Homesteads in the vicinity.

Potential impacts associated with roads and homesteads relate to visual intrusion and the general industrialisation of a semi-natural rural landscape.

The initial assessment has indicated that;

It is possible that glimpses of the proposed development could be visible from sections of the affected roads. However, these views are likely to be mitigated by distance, the fact that the project will be seen in a flat landscape meaning that there will be no overview and existing vegetation is likely to provide a high degree of screening. There is therefore only likely to be a low level of impact experienced by users of the identified roads.

The closest homestead is approximately 2.7km from the proposed development. The orientation of the building, existing mature vegetation around the homestead, the flat landscape and intervening vegetation are all likely to help mitigate impacts.

Other homesteads are at distances of 4.4km or greater from the proposed development. The distance as well as the cumulative screening effect provided by surrounding vegetation will largely screen the development from these viewpoints

From the site visit undertaken during the assessment process for the Hyperion Solar PV projects, none of the closest homesteads have secondary tourism importance.

The initial assessment therefore indicates that levels of visual impacts are likely to be low.

It is recommended that a Level 3 Assessment is undertaken.

REFERENCES

Guidelines for involving visual and aesthetic specialists in EIA processes,
Author; Bernard Oberhozer. Published by the Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning, 2005

Guidelines for landscape and visual impact assessment (third edition), authors; the Landscape Institute and Institute of Environmental Assessment and Management, published by E & FN Spon, 2013.

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The vegetation of South Africa, Lesotho and Swaziland (Strelitziaseries; no. 19), Mucina, L. & Rutherford, M.C. (eds.), 2006, South African National Biodiversity Institute, Pretoria

Mosaic Land Cover. SANBI, 2009.

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APPENDIX I
ASSESSROR'S BRIEF CURRICULUM VITAE

Name	JONATHAN MARSHALL
Nationality	British
Year of Birth	1956
Specialisation	Landscape Architecture / Landscape & Visual Impact Assessment / Environmental Planning / Environmental Impact Assessment.
Qualifications	
Education	Diploma in Landscape Architecture, Gloucestershire College of Art and Design, UK (1979) Environmental Law, University of KZN (1997)
Professional	Registered Professional Landscape Architect (SACLAP) Chartered Member of the Landscape Institute (UK) Certified Environmental Assessment Practitioner of South Africa (ICB) Member of the International Association of Impact Assessment, South Africa
Languages	English - Speaking - Excellent - Reading - Excellent - Writing - Excellent
Contact Details	Post: PO Box 2122 Westville 3630 Republic of South Africa Phone: +27 31 2668241, Cell: +27 83 7032995

General

Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He has been a chartered member of the Landscape Institute UK since 1986. He is also a Registered Landscape Architect and has had extensive experience working as an Environmental Assessment Practitioner in South Africa (2009).

During the early part of his career (1981 - 1990) He worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment (VIA) input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He has worked in the United Kingdom (1990 - 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiries for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Act (1993).

His more recent VIA work (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations in West Africa and numerous commercial and residential developments.

VIA work undertaken during the last twelve months includes VIA input for wind energy projects, numerous solar plant projects (CSP and PV), a new coal fired power station as well as electrical infrastructure.

Select List of Visual Impact Assessment Projects

- **Establishment of Upmarket Tourism Accommodation on the Selati Bridge, Kruger National Park** – Assessment of visual implications of providing tourism accommodation in 12 railway carriages on an existing railway bridge at the Skukuza Rest Camp in the Kruger Park.
- **Jozini TX Transmission Tower** – Assessment of visual implications of a proposed MTN transmission tower on the Lebombo ridgeline overlooking the Pongolapoort Nature reserve and dam.
- **Bhangazi Lake Development** – Visual Impact Assessment for a proposed tourism development within the iSimangaliso Wetlend Park World Heritage Site.
- **Palesa Power Station** - VIA for a new 600MW power station near Kwamhlanga in Mpumalanga for a private client.
- **Heuningklip PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Kruispad PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Doornfontein PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Olifantshoek Power Line and Substation** – VIA for a new 10MVA 132/11kV substation and 31km powerline, Northern Cape Province, for Eskom.
- **Noupoort Concentrating Solar Plants -** Scoping and Visual Impact Assessments for two proposed parabolic trough projects.
- **Drakensberg Cable Car –** Preliminary Visual Impact Assessment and draft terms of reference as part of the feasibility study.
- **Paulputs Concentrating Solar Plant (tower technology)** – Visual Impact Assessment for a new CSP project near Pofadder in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5** – Scoping and Visual Impact Assessments for the proposed extension of five authorised CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5 Shared Infrastructure** –Visual Impact Assessment for the necessary shared infrastructure including power lines, substation, water pipeline and roads for these projects.
- **Ilanga Concentrating Solar Plants 7, 8 & 9** - Scoping and Visual Impact Assessments for three new CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Sol Invictus Solar Plants** - Scoping and Visual Impact Assessments for three new Solar PV projects near Pofadder in the Northern Cape.
- **Gunstfontein Wind Energy Facility** – Scoping and Visual Impact Assessment for a proposed WEF near Sutherland in the Northern Cape.
- **Moorreeesburg Wind Energy Facility** – Visual Impact Assessment for a proposed WEF near Moorreeesburg in the Western Cape.
- **Semonkong Wind Energy Facility** - Visual Impact Assessment for a proposed WEF near Semonkong in Southern Lesotho.
- **Great Karoo Wind Energy Facility** – Addendum report to the Visual Impact Assessment Report for amendment to this authorised WEF that is located near Sutherland in the Northern Cape. Proposed amendments included layout as well as rotor diameter.
- **Perdekraal East Power Line** – Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Sutherland in the Northern Cape.
- **Tshivhaso Power Station** – Scoping and Visual Impact Assessment for a proposed new power station near Lephalale in Limpopo Province.
- **Saldanha Eskom Strengthening** – Scoping and Visual Impact Assessment for the upgrading of strategic Eskom infrastructure near Saldanha in the Western Cape.

- **Eskom Lethabo PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Lethabo Power Station in the Free State.
- **Eskom Tuthuka PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Thutuka Power Station in Mpumalanga.
- **Eskom Majuba PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Majuba Power Station in Mpumalanga.
- **Golden Valley Power Line** - Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Cookhouse in the Eastern Cape.
- **Mpophomeni Shopping Centre** – Visual impact assessment for a proposed new shopping centre close to the southern shore of Midmar Dam in KwaZulu Natal.
- **Rheeboksfontein Power Line** - Addendum report to the Visual Impact Assessment Report for amendment to this authorised power line alignment located near Darling in the Western Cape.
- **Woodhouse Solar Plants** – Scoping and Visual Impact Assessment for two proposed solar PV projects near Vryburg in the North West Province.
- **AngloGold Ashanti, Dokyiwa (Ghana)** – Visual Impact Assessment for proposed new Tailings Storage Facility at a mine site working with SGS as part of their EIA team.
- **Gateway Shopping Centre Extension (Durban)** – Visual Impact Assessment for a proposed shopping centre extension in Umhlanga, Durban.
- **Kouroussa Gold Mine (Guinea)** – Visual impact assessment for a proposed new mine in Guinea working with SGS as part of their EIA team.
- **Mampon Gold Mine (Ghana)** - Visual impact assessment for a proposed new mine in Ghana working with SGS as part of their EIA team.
- **Telkom Towers** – Visual impact assessments for numerous Telkom masts in KwaZulu Natal.
- **Eskom Isundu Substation** – Visual Impact Assessment for a proposed major new Eskom substation near Pietermaritzburg in KwaZulu Natal.
- **Eskom St Faiths Power Line and Substation** – Visual Impact Assessment for a major new substation and associated power lines near Port Shepstone in KwaZulu Natal.
- **Eskom Ficksburg Power Line** – Visual Impact Assessment for a proposed new power line between Ficksburg and Cocolan in the Free State.
- **Eskom Matubatuba to St Lucia Power Line** – Visual Impact Assessment for a proposed new power line between Mtubatuba and St Lucia in KwaZulu Natal.
- **Dube Trade Port, Durban International Airport** – Visual Impact Assessment
- **Sibaya Precinct Plan** – Visual Impact Assessment as part of Environmental Impact Assessment for a major new development area to the north of Durban.
- **Umdloti Housing** – Visual Impact Assessment as part of Environmental Impact Assessment for a residential development beside the Umdloti Lagoon to the north of Durban.
- **Tata Steel Ferrochrome Smelter** - Visual impact assessment of proposed new Ferrochrome Smelter in Richards Bay as part of EIA undertaken by the CSIR.
- **Durban Solid Waste Large Landfill Sites –** Visual Impact Assessment of proposed development sites to the North and South of the Durban Metropolitan Area. The project utilised 3d computer visualisation techniques.
- **Hillside Aluminium Smelter, Richards Bay -** Visual Impact Assessment of proposed extension of the existing smelter. The project utilised 3d computer visualisation techniques.
- **Estuaries of KwaZulu Natal Phase 1 –** Visual character assessment and GIS mapping as part of a review of the condition and development capacity of eight estuary landscapes for the Town and Regional Planning Commission. The project was extended to include all estuaries in KwaZulu Natal.
- **Signage Assessments** – Numerous impact assessments for proposed signage developments for Blast Media.
- **Signage Strategy** – Preparation of an environmental strategy report for a national

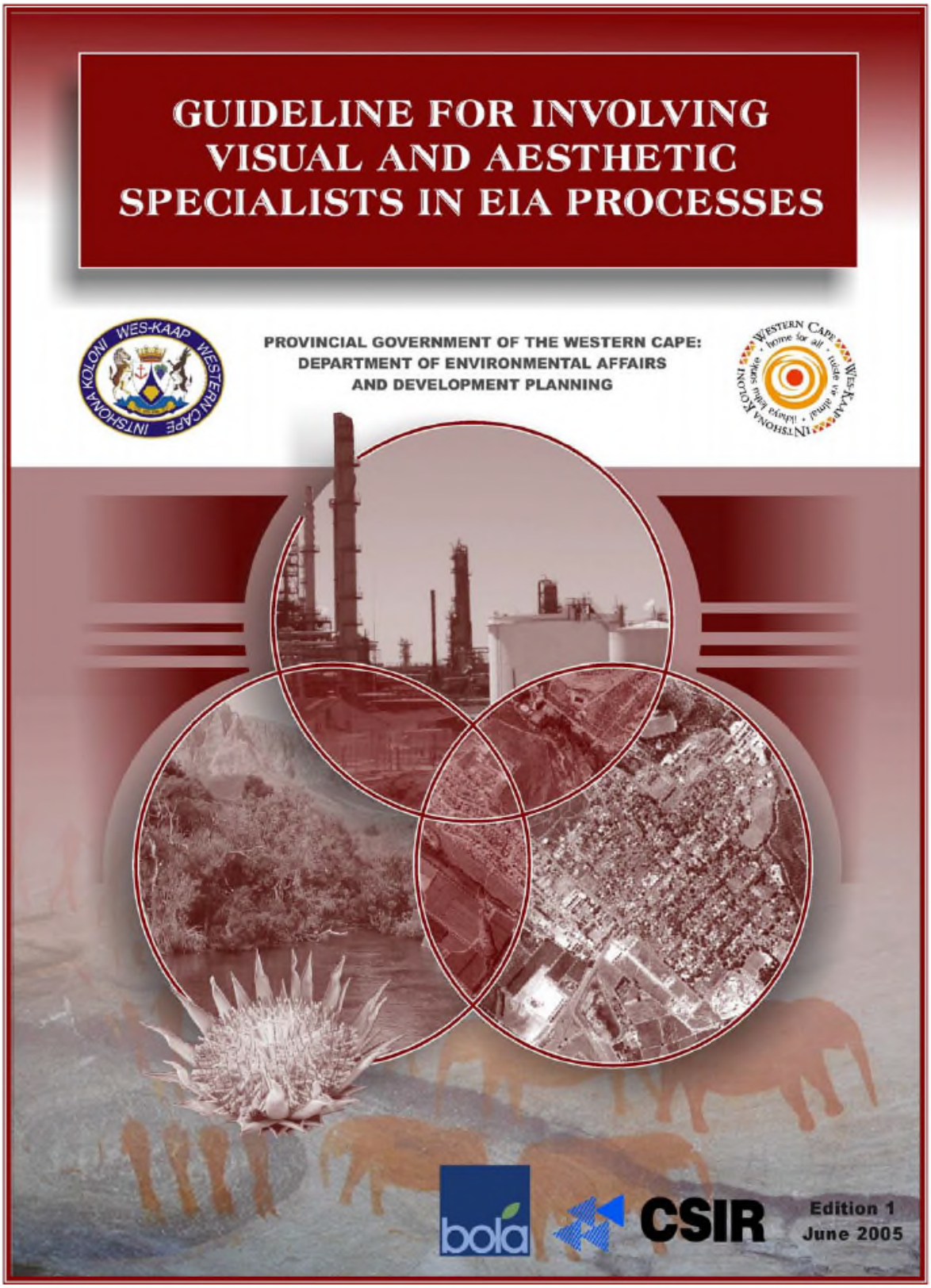
advertising campaign on National Roads for Visual Image Placements.

- **Zeekoegatt, Durban** - Computer aided visual impact assessment. EDP acted as advisor to the Province of KwaZulu Natal in an appeal brought about by a developer to extend a light industrial development within a 60 metre building line from the National N3 Highway.
- **La Lucia Mall Extension** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed extension to shopping mall for public consultation exercise.
- **Redhill Industrial Development** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed new industrial area for public consultation exercise.
- **Avondale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Hammersdale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Southgate Industrial Park, Durban** - Computer Aided Visual Impact Assessment and Landscape Design for AECI.
- **Sainsbury's Bryn Rhos** - Computer Aided Visual Impact Assessment/ Planning Application for the development of a new store within the Green Wedge North of Swansea.
- **Ynyston Farm Access** - Computer Aided Impact Assessment of visual intrusion of access road to proposed development of Cardiff for the Land Authority for Wales.
- **Cardiff Bay Barrage** – Preparation of the Visual Impact Statement for inclusion in the Impact Statement for debate by parliament (UK) prior to the passing of the Cardiff Bay Barrage Bill.
- **A470, Cefn Coed to Pentrebach** - Preparation of landscape frameworks for the assessment of the impact of the proposed alignment on the landscape for The Welsh Office.
- **Sparkford to Illchester Bye Pass** - The preparation of the landscape framework and the draft landscape plan for the Department of Transport.
- **Green Island Reclamation Study** - Visual Impact Assessment of building massing, Urban Design Guidelines and Masterplanning for a New Town extension to Hong Kong Island.
- **Route 3** - Visual Impact Assessment for alternative road alignments between Hong Kong Island and the Chinese Border.
- **China Border Link** - Visual Impact Assessment and initial Landscape Design for a new border crossing at Lok Ma Chau.
- **Route 81, Aberdeen Tunnel to Stanley** - Visual Impact Assessment for alternative highway alignments on the South side of Hong Kong Island.

APPENDIX II

GUIDELINES FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

(Preface, Summary and Contents for full document go to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning web site, http://eadp.westerncape.gov.za/your-resource-library/policies-guidelines)


GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES
PROVINCIAL GOVERNMENT OF THE WESTERN CAPE:
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
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GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

Edition 1

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Stakeholders engaged in the guideline development process:

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PREFACE

The purpose of an Environmental Impact Assessment (EIA) is to provide decision-makers (be they government authorities, the project proponent or financial institutions) with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain their role and usefulness in supporting decision-making, the involvement of specialists in EIA needs to be improved in order to:

- Add greater value to project planning and design;
- Adequately evaluate reasonable alternatives;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply enough relevant information at the most appropriate stage of the EIA process to address adequately the key issues and concerns, and effectively inform decision-making in support of sustainable development.

It is important to note that not all EIA processes require specialist input; broadly speaking, specialist involvement is needed when the environment could be significantly affected by the proposed activity, where that environment is valued by or important to society, and/or where there is insufficient information to determine whether or not unavoidable impacts would be significant.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. The guidelines aim to improve the capacity of roleplayers to anticipate, request, plan, review and discuss specialist involvement in EIA processes. Specifically, they aim to improve the capacity of EIA practitioners to draft appropriate terms of reference for specialist input and assist all roleplayers in evaluating whether or not specialist input to the EIA process is appropriate for the type of development and environmental context. Furthermore, they aim to ensure that specialist inputs support the development of effective, practical Environmental Management Plans where projects are authorised to proceed (refer to *Guideline for Environmental Management Plans*).

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist assessment" and "studies" to indicate that the scope of specialists' contribution (if required) depends on the nature of the project, the environmental context and the amount of available information and does not always entail detailed studies or assessment of impacts.

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist

assessment" and "studies" to indicate that the scope of specialists' contribution depends on the nature of the project, the environmental context and the amount of available information.

	ISSUES
TIMING	▪ When should specialists be involved in the EIA process; i.e. at what stage in the EIA process should specialists be involved (if at all) and what triggers the need for their input?
SCOPE	▪ Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement? ▪ What are appropriate approaches that specialists can employ? ▪ What qualifications, skills and experience are required?
QUALITY	▪ What triggers the review of specialist studies by different roleplayers? ▪ What are the review criteria against which specialist inputs can be evaluated to ensure that they meet minimum requirements, are reasonable, objective and professionally sound?

The following guidelines form part of this first series of guidelines for involving specialists in EIA processes:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input in EIA processes
- Guideline for involving biodiversity specialists in EIA processes
- Guideline for involving hydrogeologists in EIA processes
- Guideline for involving visual and aesthetic specialists in EIA processes
- Guideline for involving heritage specialists in EIA processes
- Guideline for involving economists in EIA processes

The *Guideline for determining the scope of specialist involvement in EIA processes* and the *Guideline for the review of specialist input in EIA processes* provide generic guidance applicable to any specialist input to the EIA process and clarify the roles and responsibilities of the different roleplayers involved in the scoping and review of specialist input. It is recommended that these two guidelines are read first to introduce the generic concepts underpinning the guidelines which are focused on specific specialist disciplines.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financial institutions and other interested and affected parties involved in EIA processes. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

What type of environmental assessment processes and developments are these guidelines applicable to?

The guidelines have been developed to support project-level EIA processes regardless of whether they are used during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning) or as part of a legally defined EIA process to obtain statutory approval for a proposed project (i.e. during screening, scoping and/or impact assessment). Where specialist input may be required the guidelines promote early, focused and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that negative impacts may be avoided or

effectively managed and benefits enhanced through due consideration of alternatives and changes to the project.

The guidelines aim to be applicable to a range of types and scales of development, as well as different biophysical, social, economic and governance contexts.

What will these guidelines not do?

In order to retain their relevance in the context of changing legislation, the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements. They therefore do not clarify the specific administrative, procedural or reporting requirements and timeframes for applications to obtain statutory approval. They should, therefore, be read in conjunction with the applicable legislation, regulations and procedural guidelines to ensure that mandatory requirements are met.

It is widely recognized that no amount of theoretical information on how best to plan and coordinate specialist inputs, or to provide or review specialist input, can replace the value of practical experience of coordinating, being responsible for and/or reviewing specialist inputs. Only such experience can develop sound judgment on such issues as the level of detail needed or expected from specialists to inform decision-makers adequately. For this reason, the guidelines should not be viewed as prescriptive and inflexible documents. Their intention is to provide best practice guidance to improve the quality of specialist input.

Furthermore, the guidelines do not intend to create experts out of non-specialists. Although the guidelines outline broad approaches that are available to the specialist discipline (e.g. field survey, desktop review, consultation, modeling), specific methods (e.g. the type of model or sampling technique to be used) cannot be prescribed. The guidelines should therefore not be used indiscriminately without due consideration of the particular context and circumstances within which an EIA is undertaken, as this influences both the approach and the methods available and used by specialists.

How are these guidelines structured?

The specialist guidelines have been structured to make them user-friendly. They are divided into six parts, as follows:

- **Part A**: Background;
- **Part B**: Triggers and key issues potentially requiring specialist input;
- **Part C**: Planning and coordination of specialist inputs (drawing up terms of reference);
- **Part D**: Providing specialist input;
- **Part E**: Review of specialist input; and
- **Part F**: References.

Part A provides grounding in the specialist subject matter for all users. It is expected that authorities and peer reviewers will make most use of Parts B and E; EIA practitioners and project proponents Parts B, C and E; specialists Part C and D; and other stakeholders Parts B, D and E. Part F gives useful sources of information for those who wish to explore the specialist topic.

SUMMARY

This guideline document, which deals with specialist visual input into the EIA process, is organised into a sequence of interleading sections. These follow a logical order covering the following:

- the background and context for specialist visual input;
- the triggers and issues that determine the need for visual input;
- the type of skills and scope of visual inputs required in the EIA process;
- the methodology, along with information and steps required for visual input;
- finally, the review or evaluation of the visual assessment process.

Part A is concerned with defining the visual and aesthetic component of the environment, and with principles and concepts relating to the visual assessment process. The importance of the process being logical, holistic, transparent and consistent is stressed in order for the input to be useful and credible.

The legal and planning context within which visual assessments take place indicate that there are already a number of laws and bylaws that protect visual and scenic resources. These resources within the Western Cape context have importance for the economy of the region, along with the proclaimed World Heritage Sites in the Province.

The role and timing of specialist visual inputs into the EIA process are outlined, with the emphasis being on timely, and on appropriate level of input, from the early planning stage of a project, through to detailed mitigation measures and management controls at the implementation stage.

Part B deals with typical factors that trigger the need for specialist visual input to a particular project. These factors typically relate to:

(a) the nature of the receiving environment, in particular its visual sensitivity or protection status;
(b) the nature of the project, in particular the scale or intensity of the project, which would result in change to the landscape or townscape.

The correlation between these two aspects are shown in a table, in order to determine the varying levels of visual impact that can be expected, i.e. from little or no impact, to very high visual impact potential.

Part C deals with the choice of an appropriate visual specialist, and the preparation of the terms of reference (TOR) for the visual input. Three types of visual assessment are put forward, each requiring different expertise, namely:

Type A: assessments involving large areas of natural or rural landscape;
Type B: assessments involving local areas of mainly built environment;
Type C: assessments involving smaller scale sites with buildings, or groups of buildings.

The scope of the visual input would in summary relate to the following:

- the issues raised during the scoping process;
- the time and space boundaries, i.e. the extent or zone of visual influence;

- the types of development alternatives that are to be considered;
- the variables and scenarios that could affect the visual assessment;
- the inclusion of direct, indirect and cumulative effects.

Approaches to the visual input relate to the level of potential impact and range from minimal specialist input, to a full visual impact assessment (VIA). A list of the typical components of a visual assessment is given, and the integration with other studies forming part of the EIA process is discussed.

Part D provides guidance for specialist visual input, and on the information required by specialists. Notes on predicting potential visual impacts are given, along with suggested criteria for describing and rating visual impacts. The assessment of the overall significance of impacts, as well as thresholds of significance are discussed.

Further aspects that need to be considered by visual specialists in EIA processes include:

- affected parties who stand to benefit or lose,
- risks and uncertainties related to the project,
- assumptions that have been made, and their justification,
- levels of confidence in providing the visual input or assessment,
- management actions that can be employed to avoid or mitigate adverse effects and enhance benefits, and
- the best practicable environental option from the perspective of the visual issues and impacts.

Finally, pointers for the effective communication of the findings are given.

Part E lists specific evaluation criteria for reviewing visual input by a specialist, where this becomes necessary. Further guidance on this is given in the document on *Guideline for the review of specialist input in EIA processes*.

CONTENTS

APPENDIX III
CALCULATION OF VISUAL HORIZON

The Mathematics behind this Calculation

This calculation should be taken as a guide only as it assumes the earth is a perfect ball 6378137 metres radius. It also assumes the horizon you are looking at is at sea level. A triangle is formed with the centre of the earth (C) as one point, the horizon point (H) is a right angle and the observer (O) the third corner. Using Pythagoras's theorem we can calculate the distance from the observer to the horizon (OH) knowing CH is the earth's radius (r) and CO is the earth's radius (r) plus observer's height (v) above sea level.

Sitting in a hotel room 10m above sea level a boat on the horizon will be 11.3km away. The reverse is also true, whilst rowing across the Atlantic, the very top of a mountain range 400m high could be seen on your horizon at a distance of 71.4 km assuming the air was clear enough.