Eskom Holdings SOC Limited

PROPOSED SALDANHA BAY NETWORK STRENGTHENING PROJECT, WESTERN CAPE PROVINCE

VISUAL IMPACT ASSESSMENT SCOPING REPORT

SEPTEMBER 2015

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ENVIRONMENTAL PLANNING AND DESIGN

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TABLE OF CONTENTS

APPENDICES

MAPS

PHOTOGRAPHIC PLATES

10 EXISTING 400KV DOUBLE OVERHEAD TRANSMISSION LINES.
11 EXISTING 400KV DOUBLE OVERHEAD TRANSMISSION LINES
12 EXISTING 400KV DOUBLE OVERHEAD TRANSMISSION LINES
13 EXISTING 400KV DOUBLE OVERHEAD TRANSMISSION LINES

1 INTRODUCTION

1.1 DOCUMENTATION

This visual impact assessment (VIA) study forms part of the Scoping and Environmental Impact Assessment that is being undertaken for the proposed Saldanha Bay Network Strengthening Project by Savannah Environmental (Pty) Ltd on behalf of Eskom Holdings SOC Limited.

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 facility will have on surrounding areas.

This desktop scoping report has been prepared for inclusion in the project Scoping Report following approval of which a VIA report will be prepared for inclusion in the Environmental Impact Assessment Report.

1.2 PROJECT TEAM AND EXPERIENCE

The project team consists of Jon Marshall, Andrew Batho and Craig Widdows.

Jon Marshall (CMLI, Pr. LArch, EAPSA, Dip LA) qualified as a Landscape Architect in 1978. He is also a certified Environmental Impact Assessment Practitioner 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 (zone of theoretical visibility) and three dimensional modelling to illustrate impact assessments. He has undertaken visual impact assessments for major buildings, mining, industrial development, mining and infrastructure projects and has been involved in the preparation of visual guidelines for large scale developments. Jon is responsible for report writing and visual impact assessment.

A brief Curriculum Vitae for Jon is attached as **Appendix I**.

Andrew Batho (MSocSci Geography and Environmental Management) is responsible for high level client liaison where required, general GIS input and review of all reports.

Craig Widdows (MSc Ecology) is assisting with all administration requirements and assists with report writing.

1.3 SITE LOCATION AND PROJECT DESCRIPTION

The proposed activity includes the construction of new dual 400kV power lines of approximately 35km as well as a new transmission substation (Tx) and a new distribution (Dx) substation in the Saldanha Bay area of the Western Cape.

The individual elements of the proposed project include;

a) Construction of a new 400/132kV Transmission Substation in the Saldanha Bay area with a planned capacity of 3 x 500 MVA transformers
b) Construction of a new 132/66kV Distribution Substation near the current Blouwater Substation in the Saldanha Bay area.

c) The construction of two 400kV Power lines (approximately 35 - 40 km) from the existing Aurora Substation to the new proposed Dx and Tx substations.
d) Replacing two of the four existing 250 MVA transformers with 2 x 500 MVA transformers, as well as new 400 / 132 kV transformers.
e) Establishing 2 x 132 kV feeder bays at Aurora Substation.

Refer to Map 1 for Site Location.

Refer to Map 2 for Development Proposal.

1.4 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 as far as is possible reflect the likely majority view regarding positive / negative aspect 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;

a) Numbers of people that might use the landscape,
b) The use of the landscape,
c) The level of protection afforded the landscape,
d) The rarity of the landscape.

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 is 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. However, 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 or local values.

1.5 GUIDELINES TO BE UTILISED AND THEIR RELEVANCE

There are numerous guideline documents for visual impact assessment, most of which have a common approach. This assessment will be undertaken in accordance with:

a) The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes(2005) (Western Cape Guidelines), which is the only relevant local guideline, setting levels of input subject to the likely sensitivity of a landscape as well as the scale and nature of a proposed development. It therefore provides a basis for justification and agreement of a required scope of work.
b) The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment (third edition, 2013) which provides detail of international best practice and technical methodology.

Together these documents provide a basis for the level and approach of a VIA as well as the necessary tools for assessment and making an assessment legible to stakeholders.

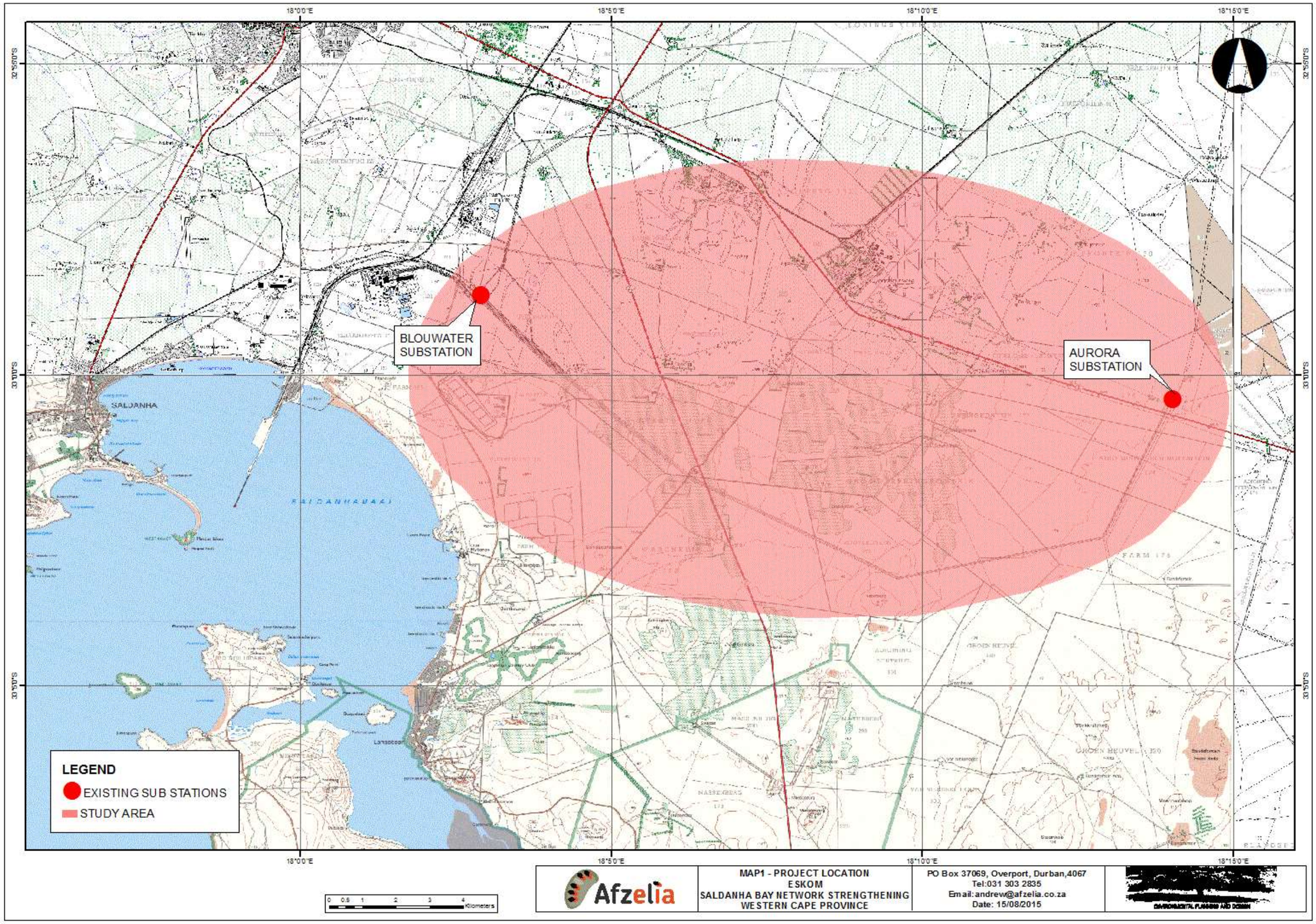
1.6 SCOPING OBJECTIVES

This Environmental 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.

Based on a brief assessment of the landscape and likely receptors and in accordance with the Western Cape Guidelines, this scoping study will identify key concerns or issues relating to potential visual impacts arising from the project, and to determine boundaries and parameters for visual input.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BLOUWATER SUBSTATION
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SALDANHA
LEGEND
EXISTING SUB STATIONS
STUDY AREA
0 0.5 1 2 3 4 Kilometers
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MAP1 - PROJECT LOCATION
ESKOM
SALDANHA BAY NETWORK STRENGTHENING
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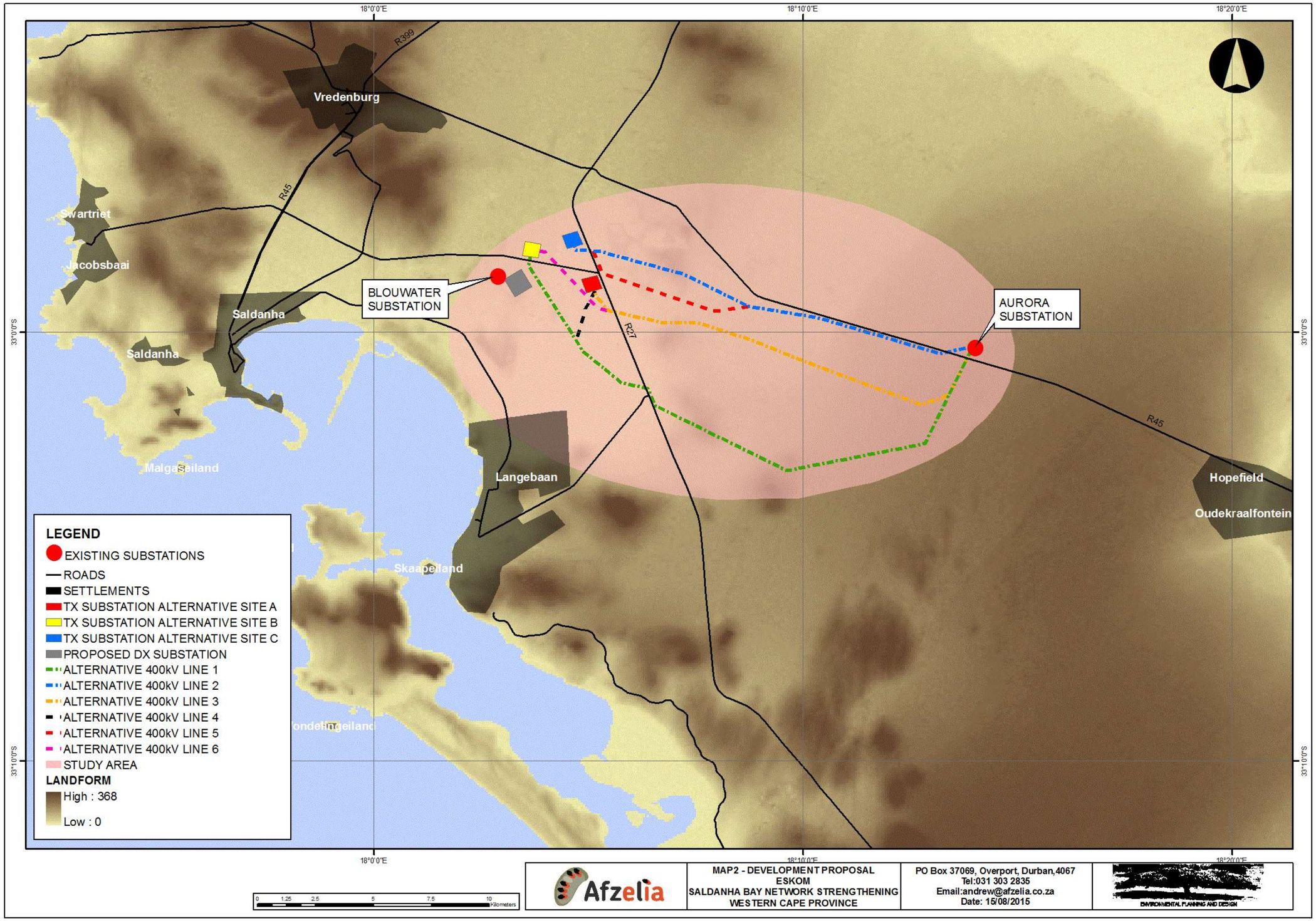
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Langebaan
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Hopefield
Oudekraalfontein
BLOUWATER SUBSTATION
AURORA SUBSTATION
LEGEND
EXISTING SUBSTATIONS
ROADS
SETTLEMENTS
TX SUBSTATION ALTERNATIVE SITE A
TX SUBSTATION ALTERNATIVE SITE B
TX SUBSTATION ALTERNATIVE SITE C
PROPOSED DX SUBSTATION
ALTERNATIVE 400kV LINE 1
ALTERNATIVE 400kV LINE 2
ALTERNATIVE 400kV LINE 3
ALTERNATIVE 400kV LINE 4
ALTERNATIVE 400kV LINE 5
ALTERNATIVE 400kV LINE 6
STUDY AREA
LANDFORM
High : 368
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MAP2 - DEVELOPMENT PROPOSAL
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2. EXISTING LANDSCAPE

It is possible that landscape change due to the proposed development could impact the character of an important landscape area.

Importance can be derived from specific features that can relate to urban or rural settings. They might include key natural, historic or culturally significant elements.

Importance might also relate to landscapes that are uncommon or under threat from development.

Generally the most significant natural areas are afforded a degree of legal protection such as National Parks and Reserves; however, they might also have local significance and not be protected.

This section describes the types of landscape that may be impacted, indicates likely degree of sensitivity and describes how the landscape areas are likely to be impacted.

2.1 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".

As indicated previously, this scoping assessment was undertaken without site visits. Landscape character has therefore been defined from the author's knowledge of the area and from reference to available online mapping and aerial photography. It is thought that the key character components have been identified but they will be subject to verification.

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

a) Landform and drainage
b) Nature and density of development
c) Land use
d) Vegetation patterns

2.1.1 Landform and Drainage

The study area is comprised of the west coast coastal plain. It is generally flat with limited undulations and ridgelines.

The landform rises relatively rapidly from the coastline to 60 - 70m amsl which is maintained to the foot of more mountainous area approximately 70km inland.

The elevation does rise to approximately 150m amsl in the north around the town of Vrenderburg and to the south of Langebaan.

The Berg River is the main drainage feature located towards the north of the study area. This river has cut a broad valley through the landform reducing levels in the vicinity of the river channel to below 10m amsl.

The extent of open, relatively flat land surrounding the proposed development is likely to mean that the proposed development may be visible over an extensive area.

The depressed Berg River Valley and the more rugged land around Vrenderburg and south of Langebaan are likely to be the only significant landform contribution to possible screening of the proposed development.

Map 3 indicates the landform and drainage of the study area.

2.1.2 Nature and Density of Development

Built development within the study area can be divided into the following;

- **Urban development** including the towns of Hopefield, Langebaan, Saldanha, Vredenburg, and Velddrift. These are relatively small rural towns with reasonably good infrastructure. Views of the broader landscape are probably only possible from the edges of urban development areas.

- **Agricultural development** in the study area includes maize and wheat crop production. This results in an open arable landscape within which the main elements that are likely to influence visibility of the proposed power line are the minor ridgelines located within the vicinity. Isolated farmsteads are located around the maize/wheat fields that include farmhouses, workers accommodation, storage and farm working areas. The farm houses and accommodation areas are often surrounded by trees that were possibly planted as wind breaks as well as for ornamental reasons.

- **Industrial Development** including oil storage, paper production and steel production have all been attracted to the area around the port of Saldanha Bay. The necessary infrastructure to supply power and support these heavy industries is also evident throughout the landscape.

Coastal areas to the west of the study area are also developed as tourist destinations. Mykonos, Langebaan and areas to the south particularly around the lagoon are tourism areas of possible national importance.

Two major conservation areas are located to the south east of the study area, these include;

- The West Coast National Park which is a formally protected area, and
- The Elandsfontein Private Nature Reserve which is a private nature reserve.

These areas are lagely covered with natural Fynbos which produces a very open landscape.

2.1.3 Vegetation Patterns

The land cover type of the region is dominated by *shrubland and low fynbos*, homogenous in appearance and is typical of the arid Karoo biome. The low growth form and stunted appearance is directly attributable to the low rainfall (less than 300mm per annum) and semi-desert climate within the region. The National Botanical Institute differentiates between seven major Vegetation types within the study area. Whilst botanically these may be differentiable, from a broader landscape perspective they all have very similar characteristics in that they are characterised as

low growing shrubland with little or no tall woody vegetation. This means that vegetation is generally not a limiting factor in terms of views and visibility.

The following vegetation types have modified areas of the natural vegetation cover

- Small plantations of alien invasive trees associated with small community settlements and farmsteads. In certain areas these invasive species have colonised areas that are not agriculturally productive such as boundary lines and adjacent to arterial roads (R45). Where they occur, these isolated patches of alien vegetation provide significant visual screening.
- Patches of ornamental vegetation associated with farmsteads.
- Urban vegetation primarily consists of street trees and ornamental garden vegetation and this does plat a role in limiting the visibility of the proposed development.

2.1.4 Landscape Character Areas, Visual Absorption Capacity (vac) and Significance

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

The overriding character differentiating factors within the subject landscape appear to be landform /drainage and development.

These factors appear to divide the landscape into three discrete areas including;

a) **Urban areas**. These are generally inward looking drawing little character influence from external areas. It is unlikely that the proposed development will have much influence on these areas other than perhaps the edges of the urban areas that face onto sections of the proposed development.
b) **The Coastal Plain**. This this area is relatively flat with generally low vegetation. This LCA is therefore unlikely to provide significant visual absorption capacity and the proposed development is likely to be highly visible. The visibility of the development may be slightly offset by the fact that there are numerous industrial elements that are obvious in the landscape including heavy industry and electrical and railway infrastructure. Mapping also indicates the presence of the West Coast National Park and the Elandsfontein Private Nature Reserve immediately to the south of the proposed development area. As they are relatively free of industrial elements, their presence may justify categorising this area as a separate LCA, although from previous site visits, it is known that electrical infrastructure does impact on the natural character of sections of these predominantly natural areas.
c) **The coastal strip**. This can be differentiated from the rest of the coastal plain due to its proximity to the sea and the fact that a large portion of the land use is tourism and recreation orientated. There are however also industrial elements present particularly orientated towards coastal activities such as oil and gas and fishing.
   The area immediately adjacent to the coast generally falls to the west towards the sea and is steeper than the remainder of the coastal plain. Because of this the general outlook is generally to the west over the sea although elements in

the immediate hinterland to the east are also likely to sit prominently in the periphery of views. It is likely however that development inland will not be prominent from coastal areas due to the landform and a general focus towards the sea.

Images of the identified LCAs sourced from google earth are presented in Plates 1 to 4 inclusive. These Landscape Character Areas need to be ground truthed and mapped during the assessment stage.

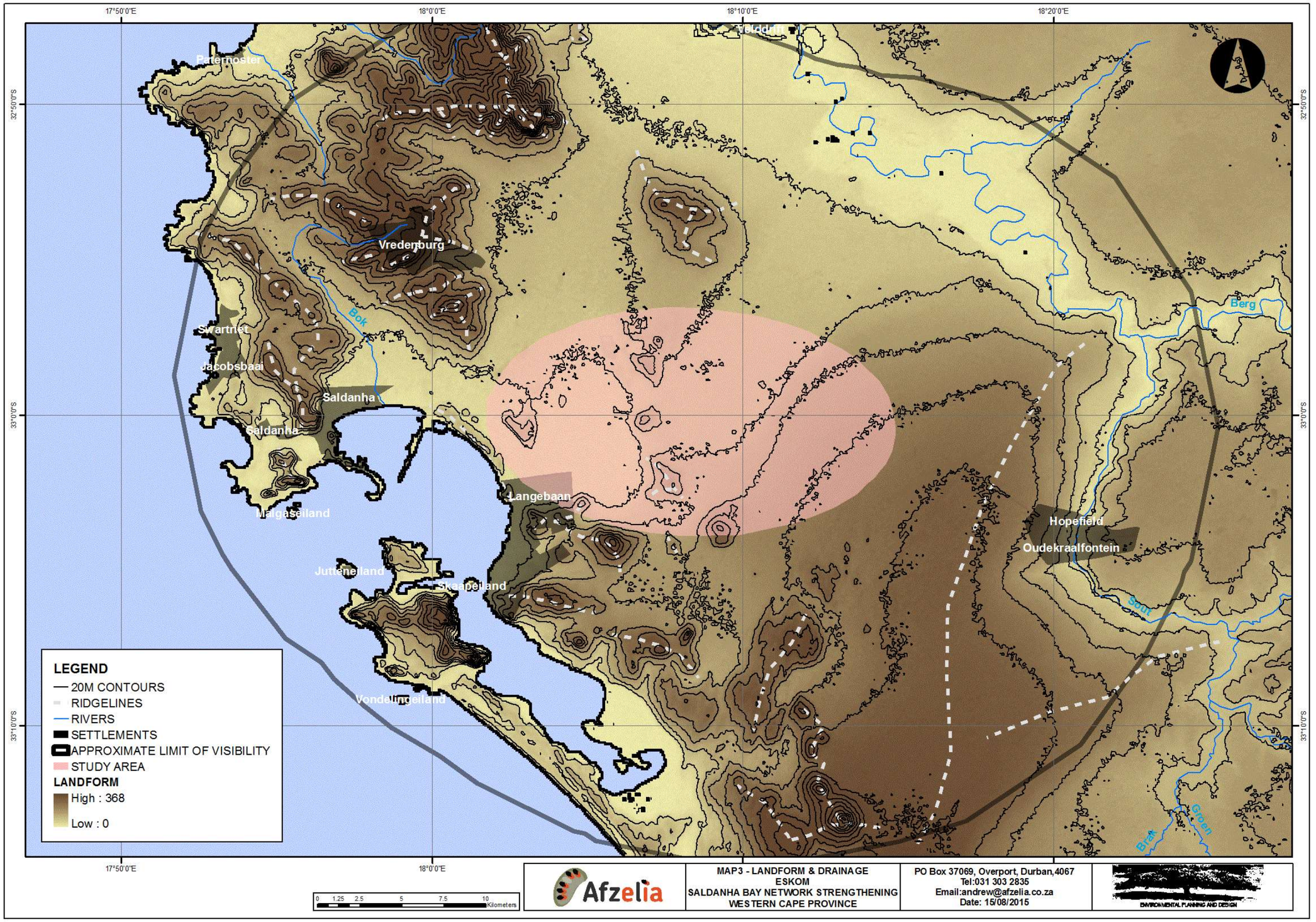
See Map 4 for the Initial LCA Analysis.

Plate 1 – Urban LCA.
View of the urban area of Vredenburg. Note, views are largely internal with little or no influence from areas outside the urban area.

Plate 2 – Coastal Plain LCA.
The coastal plain inland of Saldanha is a relatively flat landscape with numerous heavy industrial and service related elements.

Plate 3 – Coastal Plain LCA.
Despite service elements still being obvious, areas of the coastal plain are more natural particularly in the vicinity of the West Coast National Park to the south of the project area. These more natural areas may require a separate classification.

Plate 4 – Coastal Strip LCA.
The area immediately adjacent to the coast is important for tourism and recreation. The steeper slope immediately inland of the coast also helps to screen the hinterland from the coast.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RIDGELINES
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APPROXIMATE LIMIT OF VISIBILITY
STUDY AREA
LANDFORM
High : 368
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MAP3 - LANDFORM & DRAINAGE
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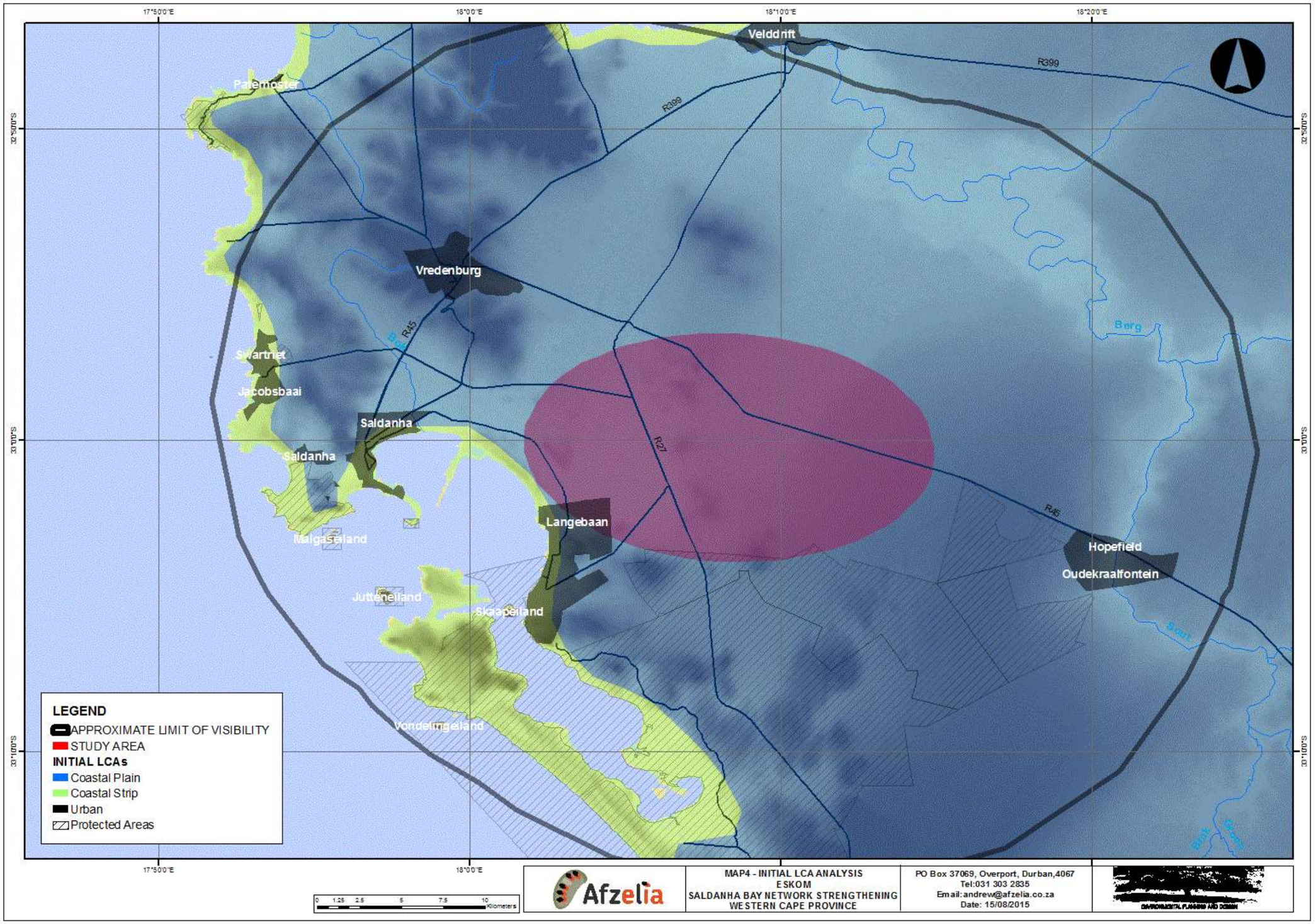
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STUDY AREA
INITIAL LCAs
Coastal Plain
Coastal Strip
Urban
Protected Areas
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MAP4 - INITIAL LCA ANALYSIS
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2 VISUAL RECEPTORS

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

2.1 IDENTIFIED VISUAL RECEPTORS

It is 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.

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

- Area Receptors include;
  - Urban areas and the protected areas of the West Coast National Park and the Elandsfontein Private Nature Reserve. These areas have some importance for tourism that is focused largely on the natural environment. Views of the surrounding natural landscape are therefore likely to be important.
  - Any other areas of the Coastal Strip LCA that have specific tourism related importance.
- Point Receptors that include;
  - Home / Farmsteads that are scattered throughout the area. It is likely that the focus for this area is agricultural production. Unless farms have diversified into the tourism market it is unlikely that this group of receptors will be overly sensitive to the likely landscape change as long as it does not impact on agricultural productivity.
- Linear Receptors or routes through the area that include
  - The R27 Coastal Route between Cape Town and Saldanha Bay which is a very important tourist route particularly during the spring when visitors travel the route specifically for the display of flowering plants.
  - The R45 which is the inland route between Cape Town and Saldanha. Tis route also carries a measure of tourism related traffic but is probably more important as a regional business route when compared to the R27.
  - The R399 which is the main route heading inland towards Calvinia. Like the R45 traffic using this route is likely to include a mixture of business and tourism related users.
  - A number of tertiary roads that form links between the regional routes indicated above. These also are likely to carry a mixture of traffic. They are however likely to carry more local traffic than the other routes.

2.2 LIKELY SIGNIFICANCE OF VISUAL RECEPTORS

The significance of a change in a view for a visual receptor is likely to relate to use.

Uses such as guest houses, recreation and tourism related areas are likely to rely on the maintenance of an outlook for successfully attracting guests and users. Residential areas could depend on outlook for the enjoyment of the area by residents and for maintaining property values. A route that is particularly important for tourism may also be dependent on outlook for the maintenance of a suitable experience for users.

The assessment indicates;

- Views from the identified roads could be impacted by the proposed development. As these routes are likely to have a proportion of tourism related traffic, the affected sections of these roads could be sensitive to change.
- There are a number of small home / farmsteads that could be impacted by the proposed development.
- It is possible that the natural, protected areas to the south of the project area could be sensitive to change.
- Areas of the Coastal Strip LCA particularly those important for tourism and recreation.

The sensitivity to the possible change in view associated with the proposed development will be addressed in detail during the assessment stage.

2.3 EXTENT OF LIKELY VISIBILITY

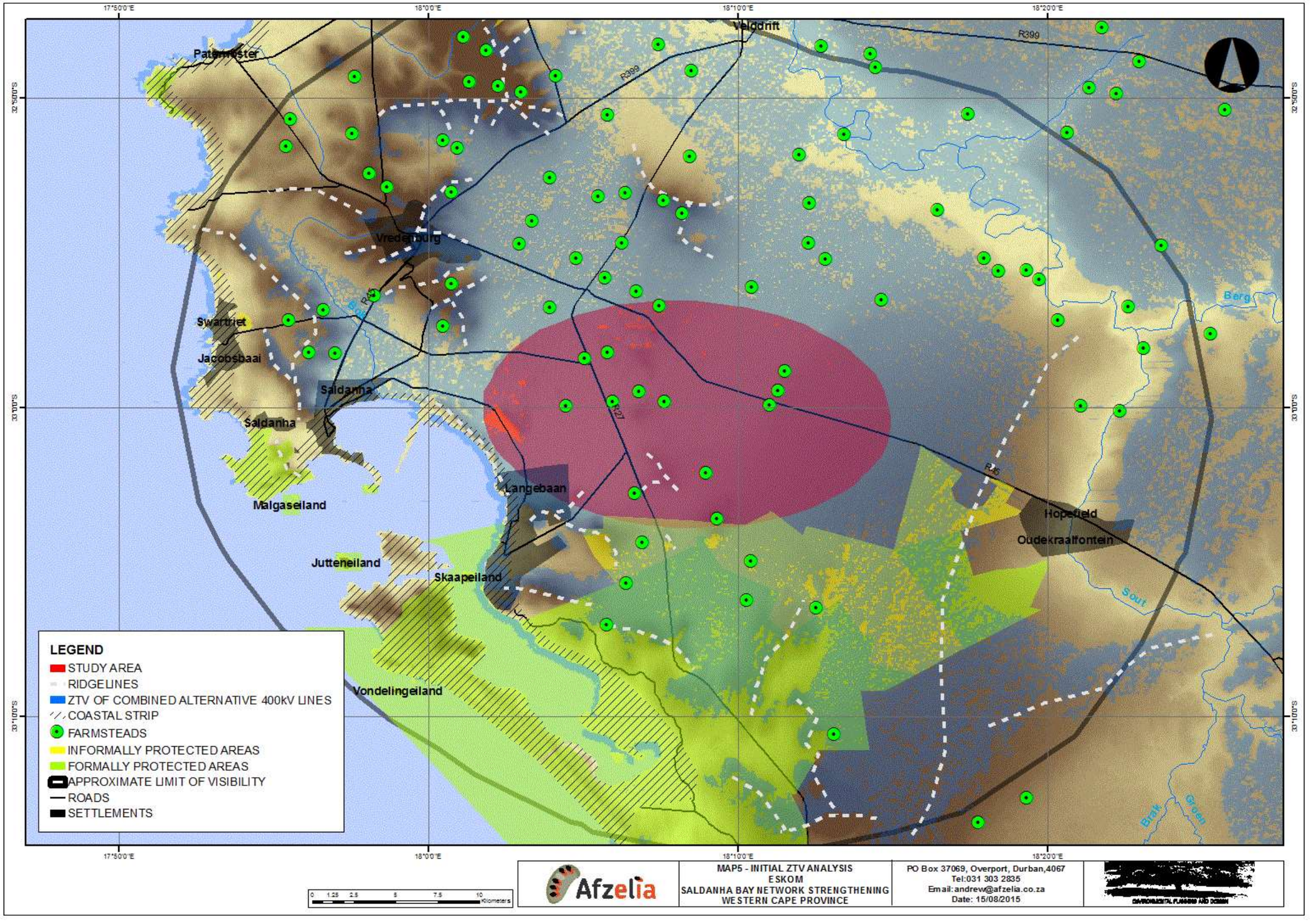
Possible visual receptors or areas, places and routes that may be sensitive to landscape change are indicated on **Map 5** which indicates a preliminary assessment of likely visibility or Zone of Theoretical Visibility (ZTV) of the proposed development**.**

The Initial ZTV has been prepared using the assumption that the proposed 400kV overhead transmission lines are likely to be the most visible elements of the project. Individual ZTVs for each of the alternative lines were prepared and the resulting areas combined into one shape file in order to indicate all areas that could be impacted by the proposed project.

This preliminary assessment indicates that;

a) Approximately 47 farmsteads could be impacted.
b) The northern sections of Langebaan and Saldanha as well as the eastern section of Vrendenburg could be impacted.
c) Inland sections of the West Coast National Park and Elandsfontein Private Nature Reserve could be impacted.
d) Sections of the R27, the R45, the R399 as well as local tertiary roads could be impacted.
e) It appears that the majority of the Coastal Strip LCA will be screened from views of the proposed development.

These impacts will be ground truthed during the assessment as will the degree to which these possible impacts will affect receptors.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FORMALLY PROTECTED AREAS
APPROXIMATE LIMIT OF VISIBILITY
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MAP5 - INITIAL ZTV ANALYSIS
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3 PROPOSED DEVELOPMENT AND GENERAL VISUAL IMPLICATIONS

The proposed project includes three areas of work including;

1. Development of new substations
2. Development of new 400kV overhead transmission lines.
3. Internal work within existing substations.

3.1 DEVELOPMENT OF NEW SUBSTATIONS

This includes;

a. Construction of a new 400/132kV Transmission Substation in the Saldanha Bay area with a planned capacity of 3 x 500 MVA transformers.
b. Construction of a new 132/66kV Distribution Substation near the current Blouwater Substation in the Saldanha Bay area.

The substation structures are likely to be obvious during daylight hours. Lighting could also be required for maintenance and security reasons.

3.1.1 Substations

Initial activities are only likely to be visible from the immediate vicinity of the site and particularly from adjacent roads. During the latter half of the construction period as larger steel structures are erected, the facilities will become obvious over a wider area.

Visual implications of development of the proposed sub-station can be gauged from viewing existing infrastructure.

Plates 5 to 8 inclusive indicate the nature of views of the various elements that are likely to fall within the substations from close range where detail is visible and industrial nature of the steel structures is obvious.

From a distance however, due to the transparency of a large proportion of the structures, the influence of a sub-station generally reduces. **Plate 9** indicates a view of the existing Hector Sub-Station in KwaZulu Natal. This indicates that from a distance of 1.5 – 2km the impact has reduced significantly. The detail of the majority of equipment is not obvious and the eye generally reads the stronger colours associated with vegetation and landform. Other than the extent of the compound, the most obvious elements are the pylons that support conductors linking into and out of the sub-station.

3.1.2 Substation Lighting

It is possible that floodlighting will be used in the HV Yards. Typically this is mounted on high masts.

When it is on it will provide a pool of bright within the yard. This will be obvious from a distance as a pool of bright light. It is possible that if the floodlighting is not designed appropriately that there will be light spillage outside the yard area. It is also possible if lighting is not orientated correctly that bulbs will be obvious from surrounding areas causing glare to affect sensitive receivers.

It is possible that floodlighting in the HV Yards may be turned off when there is no one present. Visibility at night could therefore depend on how often people are in the HV Yards.

Often the boundary of substations is lit with security lights mounted on poles. This lighting is often required to light a corridor between a perimeter and inner security fence that may run around a substation site. Security lighting may be a continual requirement during hours of darkness or can be turned on if there is an intruder alarm or during patrols.

Substations are also usually equipped with a communications tower which due to its height may require an aviation warning light.

The nature of the lighting will make the site obvious during hours of darkness when it is on.

Subject to the light fittings selected and the lighting design is also possible for glare from tall mast lighting and security lighting to spill into surrounding areas.

3.2 DEVELOPMENT OF NEW 400KV OVERHEAD TRANSMISSION LINES.

This includes the construction of two 400kV Power lines (approximately 35 - 40 km) from the existing Aurora Substation to the new proposed Dx and Tx substations.

Other than alignment information no detail has been provided regarding the height, spacing or type of towers that are to be used. Towers could be Cross Rope, Self Support or Guyed. Refer to **Appendix II** for images of possible tower types. Typically these towers range from approximately 32m to 40m high.

Overhead transmission lines are likely to appear in the landscape progressively.

Initial construction is unlikely to have a significant visual impact. Initially work will take place around each tower. Activities will be obvious over limited areas only. The most obvious elements are likely to include;

- Storage of poles / pylons for tower construction.
- Trucks and mobile cranes.

As work progresses, towers will become obvious in the landscape. Work is likely to take place on a limited number of towers at any one time which means that during construction, towers will gradually appear in the landscape on a progressive basis.

By the end of the construction process, when cables have been strung between towers, the full visual impact of the project will be experienced. The operational phase is highly unlikely to result in any significant additional impact. It is possible however, that crews will be visible from time to time undertaking maintenance on individual towers.

Overhead power lines are a familiar sight within the region. Typically, from a distance, the towers are more obvious than the overhead conductors. This is because the towers are reasonably substantial structures whereas the overhead conductors have a relatively small diameter. Whilst the overhead conductors are generally not highly visible from a distance, under certain conditions, they can be made more obvious by reflected sunlight.

Plates 6 to 9 inclusive are photographs of two existing overhead 400kV power lines, indicating the types of impact that might be expected when the system is in

operation, these generic pictures aim to illustrate approximate scales and distances. From these photographs the following conclusions can be drawn;

a) The lines are obvious in the landscape at a distance of 1km to 5km.
b) Set against the dark landscape backdrop the pylons are more obvious than when set against a lighter coloured sky
c) At a long distance of up to 5-7km the lines are not highly conspicuous but the servitudes are obvious due to clearance.
d) At a short distance (1-2km) the lines are highly conspicuous as they cross ridgelines.
e) The lines are not highly conspicuous as they cross the ridgelines at a distance of 5-6km.

3.3 INTERNAL WORK WITHIN EXISTING SUBSTATIONS.

This includes;

a) Replacing two of the four existing 250 MVA transformers with 2 x 500 MVA transformers, as well as new 400 / 132 kV transformers.
b) Establishing 2 x 132 kV feeder bays at Aurora Substation.

It is possible that this work could have a local visual impact, however, if it is within an existing substation compound and viewed against the backdrop of other substation plant this is unlikely to have significant visual impact. This will be reviewed when layout plans are available.

Plate 5 - Sub-station Bus Bars

Plate 6 – Transformer

Plate 7 - Transformer showing oil reservoir and fans for cooling**.**

Plate 8 - Sub-station & Communication Tower

Plate 9, Distance view (1.5-2.0km) of the existing Hector 400kV Sub Station. Note the 400kV pylons entering the site are the tallest most obvious elements from this distance.

Plate 10 - Existing 400kV double overhead transmission lines, obvious in the landscape at a distance of 1km to approximately 3-4km. Set against the dark backdrop the pylons are more obvious than when set against a lighter coloured sky

Plate 11 - Existing 400kV double overhead transmission lines. Clearance of the servitude is the most obvious landscape change at a distance (approximately 5-7km)

Plate 12 - **Existing 400kV double overhead transmission lines** are highly obvious as they cross ridgelines from short distance (approximately 1km).

Plate 13 - Existing 400kV double overhead transmission lines. Pylons are obvious in the mid distance (approximately 2-3km) but are not highly conspicuous at a distance (approximately 5-6km) as they cross the ridgeline.

4 RECOMMENDED METHODOLOGY FOR ASSESSMENT

4.1 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;

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.

From the assessment undertaken it is suggested that the proposed project falls into a category 4 development as medium scale infrastructure is listed under this heading.

From experience of the area, the project is proposed within a relatively degraded landscape due to the extent of heavy industrial development and associated services. However, areas of the surrounding landscape can be considered to have high scenic quality and even National importance.

It is noted that all the proposed substation development is located within 5km of extensive heavy industrial development including a steel works. The overhead transmission lines could however impact on more sensitive areas.

It is suggested that a Level 3 Assessment is undertaken and if it is found that the proposed development does have a significant impact on areas that can be considered to have high scenic quality then the level of assessment is elevated to Level 4 in order to finalise the assessment for those areas.

A Level 3 Assessment requires;

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

Elevation to a Level 4 Assessment will then require;

8. Complete 3D modelling and simulations, with and without mitigation.
9. Review by independent, experienced visual specialist (if required).

4.2 IMPACTS TO BE CONSIDERED

4.2.1 Likely Impacts Associated with the Proposed Development

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

a) The visibility of the facility to, and potential visual impact on farmsteads that have been identified as potentially being impacted.
b) The visibility of the facility to, and potential visual impact on sections of the R27, R45, R399 and local roads that have been identified as potentially being impacted.
c) The visibility of the facility to, and potential visual impact the towns of Langebaan, Saldanha and Vredenburg that have been identified as potentially being impacted.
d) The visibility of the facility to, and potential visual impact on the West Coast National Park, the Elandsfontein Private Nature Reserve and areas of high natural scenic quality.
e) The visibility of the facility to, and potential visual impact on the coastal strip and particularly areas that are important for tourism and recreational use.
f) The possible impact of lighting associated with the project.

These issues will be considered in the context of the Landscape Character Areas, visual effects identified and possible cumulative influence of other possible infrastructure projects that are planned in the vicinity.

Possible mitigation measures will also be identified.

4.2.2 Initial Assessment of Likely Impacts

Impact

a) The visibility of the facility to, and potential visual impact on farmsteads that have been identified as potentially being impacted.

Desktop Sensitivity Analysis of the Site:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Industrialisation of a natural landscape	This could impact negatively on uses such as guest houses and other tourism related activities	Local	A site visit is required to confirm this.

Gaps in knowledge & recommendations for further study

A site visit is required to confirm the likely sensitivity of farmsteads.

Impact

b) The visibility of the facility to, and potential visual impact on sections of the R27, R45, R399 and local roads that have been identified as potentially being impacted.

Desktop Sensitivity Analysis of the Site:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Industrialisation of a natural landscape	This could impact negatively on tourist routes. Routes running close to the coast and through the protected areas particularly the West Coast National Park are likely to be most sensitive. The Southernmost power line alignments are likely to have greatest impact on these areas.	Possibly national significance due to the attraction of spring flowers drawing tourists from many parts of the country.	Possibly substation and power line alignments close to the West Coast National Park and coastal routes, particularly the R27.

Gaps in knowledge & recommendations for further study

A site visit is required to confirm the likely sensitivity of areas highlighted.

Impact

c) The visibility of the facility to, and potential visual impact the towns of Langebaan, Saldanha and Vredenburg that have been identified as

potentially being impacted.

Desktop Sensitivity Analysis of the Site:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Industrialisation of a natural landscape	This could impact negatively on tourism related activities and residential uses within and surrounding these settlements. Given the density and inward looking nature of settlements, significant impact is not expected for the majority of urban areas. However, the quality of views could be impacted from the urban edges.	Possibly regional significance given the likelihood of many houses being second homes.	Possibly substation and power line construction close to settlements.

Gaps in knowledge & recommendations for further study

A site visit is required to confirm the likely sensitivity of areas highlighted.

Impact

d) The visibility of the facility to, and potential visual impact on the West Coast National Park, the Elandsfontein Private Nature Reserve and areas of high natural scenic quality.

Desktop Sensitivity Analysis of the Site:

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Industrialisation of a natural landscape	This could permanently change a protected natural landscape. It could also negatively impact on tourists that are attracted to these areas.	Possibly national significance due to the protected status and the attraction of spring flowers within these areas drawing tourists from many parts of the country.	Possibly substation and power line alignments close to the West Coast National Park and the Elandsfontein Private Nature Reserve.

Gaps in knowledge & recommendations for further study

A site visit is required to confirm the likely sensitivity of areas highlighted.

Impact

e) The visibility of the facility to, and potential visual impact on the coastal strip and particularly areas that are important for tourism and recreational use.

Desktop Sensitivity Analysis of the Site:			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
The introduction of industrial elements into views from tourism use areas on the coast	This could negatively impact on the attraction of these areas for tourism related uses. The initial assessment has indicated that most coastal areas are likely to be protected from such impacts by landform.	Possibly regional and national significance due to the attraction of the area for coastal tourism.	Possibly substation and power line alignments close to the coast.
Gaps in knowledge & recommendations for further study A site visit is required to confirm the likely sensitivity of areas highlighted.			

Impact **f)** The possible impact of lighting associated with the project. **Desktop Sensitivity Analysis of the Site:**			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
The introduction of light pollution into natural areas	This could permanently change the character of these areas and could negatively impact on the attraction of these areas for tourism related uses.	Possibly regional and national significance due to the attraction of the area for coastal tourism.	Possibly substation development close or within natural areas and particularly existing protected areas.
Gaps in knowledge & recommendations for further study A site visit is required to confirm the likely sensitivity of areas highlighted.			

4.3 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 methodology for the assessment of potential visual impacts to be used will be the method to be 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.

The methodology includes;

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
    - local extending only as far as the development site area – assigned a score of 1;

    - limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
    - will have an impact on the region – assigned a score of 3;
    - will have an impact on a national scale – assigned a score of 4; or
    - will have an impact across international borders – assigned a score of 5.
- The **duration**, wherein it will be indicated whether:
    - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
    - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
    - medium-term (5–15 years) – assigned a score of 3;
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
    - 0 is small and will have no effect on the environment;
    - 2 is minor and will not result in an impact on processes;
    - 4 is low and will cause a slight impact on processes;
    - 6 is moderate and will result in processes continuing but in a modified way;
    - 8 is high (processes are altered to the extent that they temporarily cease); and
    - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
    - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
    - Assigned a score of 2 is improbable (some possibility, but low likelihood);
    - Assigned a score of 3 is probable (distinct possibility);
    - Assigned a score of 4 is highly probable (most likely); and
    - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which will be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The *degree* to which the impact can be *mitigated.*
- The **significance** is determined by combining the criteria in the following formula:
    - S=(E+D+M)P; where S = Significance weighting, E = Extent, D = Duration, M = Magnitude, P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

5 CONCLUSIONS

The character of the area within which the project is proposed is varied, it includes;

- Natural areas of the coastal plain that are of national significance.
- Industrialised areas of the coastal plain in which heavy industry dominates.
- Scenic coastal areas that are important tourism resources.
- Industrialised coastal areas.
- Urban development.

The initial ZTV analysis indicates that due to relatively flat topography, the proposed development is likely to be visible from a broad area. However, the analysis of the various elements within the development plan indicates that due largely to the transparent nature of towers and other structures, the main impact on landscape character is likely to be limited in extent.

The initial ZTV analysis also indicates that much of the coastal strip is likely to be screened from the proposed development by existing landform.

In terms of potential impacts, the areas that are most likely to be sensitive to landscape change include;

- Natural areas of the Coastal Plain and particularly protected areas.
- Coastal routes that carry large volumes of tourism related traffic, particularly the R27.
- The edges of urban areas that face onto the various elements of the proposed development.
- Coastal areas that are not screened from the proposed development.

Initial conclusions that can be drawn from this analysis include;

- Power line alignments that are located to the north of the study area and particularly away from the coastline, protected areas of the landscape and the R27 are likely to have the least visual impact on sensitive areas.
- Substation locations that are closest to existing heavy industry, the existing Blouwater Substation and other large scale infrastructure are likely to have the least impact on sensitive areas.

The analysis undertaken as part of this scoping exercise and conclusions drawn need to be ground truthed prior to undertaking the final Visual Impact Assessment.

5. 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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APPENDIX I
VIA ASSESSOR'S BRIEF CV

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 (South Africa)
Chartered Member of the Landscape Institute (UK)
Certified Environmental Assessment Practitioner of South Africa.
Member of the International Association of Impact Assessment, South Africa

Languages

English	-	Speaking	-	Excellent
	-	Reading	-	Excellent
	-	Writing	-	Excellent

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Key Experience

Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He has also been a Certified Environmental Assessment Practitioner of South Africa since 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 a major supermarket chain and prepared CAD based visual impact assessments for public enquiries for new green field 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 Bill.

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 eighteen months includes assessments for proposed new mine developments in Ghana and Guinea, numerous solar plant projects for Eskom and private clients, proposed wind farm development and a proposed tourism development within the Isimangaliso Wetland Park World Heritage Site .

Jon has also had direct experience of working with UNESCO representatives on a candidate World Heritage Site and has undertaken VIAs within and adjacent to other World Heritage Sites.

Relevant Visual Impact Assessment Projects

1. **Isundu Sub- Station Development -** Visual impact assessment for a mnew major sub – station in KwaZulu Natal for Eskom.
2. **Bhangazi Lake Tourism Development** – Visual impact assessment for a proposed lodge development within the Isimangaliso Wetland Park World Heritage Site. This work is ongoing.
3. **Quarry Development for the Upgrade of Sani Pass –** Visual Impact Assessments for two proposed quarry developments on the edge of the uKhalamba-Drakensburg World Heritage Site.
4. **Mtubatuba to St Lucia Overhead Power Line** – Visual Impact Assessment for a proposed power line bordering on the Isimangaliiso Wetland Park World Heritage Site for Eskom.
5. **St Faiths 400/132 kV Sub-Station and Associated Power Lines** - Visual Impact Assessment for a proposed new major sub-station and approximately 15km of overhead power line for Eskom.
6. **Clocolan to Ficksburg Overhead Power Line** – Visual Impact Assessment for a proposed power line for Eskom.
7. **Solar Plant Projects including Photovoltaic and Concentrating Solar Power Plants** – Numerous projects for Eskom and private clients in the Northern Cape, Limpopo, Mpumalanga and the Free State.
8. **Moorreesburg Wind Farm.** Visual impact assessment for a proposed new wind farm in the Western Cape.
9. **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.
10. **Camperdown Industrial Development** - Visual Impact Assessment for proposed new light industrial area to the north o Camperdown for a private client.
11. **Wild Coast N2 Toll Highway** – Peer review of VIA undertaken by another consultant.
12. **Gamma to Grass Ridge 765kv transmission line** – Peer review of VIA undertaken by another consultant.
13. **Gateway Shopping Centre Extension (Durban)** – Visual Impact Assessment for a proposed shopping centre extension in Umhlanga, Durban.
14. **Kouroussa Gold Mine (Guinea)** – Visual impact assessment for a proposed new mine in Guinea working with SGS as part of their EIA team.
15. **Mampon Gold Mine (Ghana)** - Visual impact assessment for a proposed new mine in Ghana working with SGS as part of their EIA team.
16. **Telkom Towers** – Visual impact assessments for numerous Telkom masts in KwaZulu Natal
17. **Dube Trade Port, Durban International Airport** – Visual Impact Assessment for a new international airport.
18. **Sibaya Precinct Plan** – Visual Impact Assessment as part of Environmental Impact Assessment for a major new development area to the north of Durban.
19. **Umdloti Housing** – Visual Impact Assessment as part of Environmental Impact Assessment for a residential development beside the Umdloti Lagoon to the north of Durban.
20. **Tata Steel Ferrochrome Smelter** - Visual impact assessment of proposed new Ferrochrome Smelter in Richards Bay as part of EIA undertaken by the CSIR.
21. **Diamond Mine at Rooipoort Nature Reserve near Kimberley** – Visual impact assessment for a proposed diamond mine within an existing nature reserve for De Beers.
22. **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.
23. **Hillside Aluminium Smelter, Richards Bay -** Visual Impact Assessment of proposed extension of the existing smelter. The project utilised 3d computer visualisation techniques.

24. **Estuaries of KwaZulu Natal Phase 1 and Phase 2 –** 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.
25. **Signage Assessments** – Numerous impact assessments for proposed signage developments for Blast Media.
26. **Signage Strategy** – Preparation of an environmental strategy report for a national advertising campaign on National Roads for Visual Image Placements.
27. **Zeekoegatt, Durban** - Computer aided visual impact assessment. 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.
28. **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.
29. **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.
30. **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.
31. **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.
32. **Southgate Industrial Park, Durban** - Computer Aided Visual Impact Assessment and Landscape Design for AECI.
33. **Sainsbury's Bryn Rhos (UK)** - Computer Aided Visual Impact Assessment/ Planning Application for the development of a new store within the Green Wedge North of Swansea.
34. **Ynyston Farm Access (UK)** - Computer Aided Impact Assessment of visual intrusion of access road to proposed development in Cardiff for the Land Authority for Wales.
35. **Cardiff Bay Barrage (UK)** - Concept Design, Detail Design, Documentation, and Visual Input to Environmental Statement for consideration by Parliament in the debate prior to the passing of the Cardiff Bay Barrage Bill. The work was undertaken for Cardiff Bay Development Corporation.
36. **A470, Cefn Coed to Pentrebach (UK)** - Preparation of frameworks for the assessment of the impact of the proposed alignment on the landscape for The Welsh Office.
37. **Sparkford to Illchester Bye Pass (UK)** - The preparation of the landscape framework and the draft landscape plan for the Department of Transport.
38. **Green Island Reclamation Study (Hong Kong)** - Visual Impact Assessment of building massing, Urban Design Guidelines and Masterplanning for a New Town extension to Hong Kong Island.
39. **Route 3 (Hong Kong)** - Visual Impact Assessment for alternative road alignments between Hong Kong Island and the Chinese Border.
40. **China Border Link (Hong Kong)** - Visual Impact Assessment and initial Landscape Design for a new border crossing at Lok Ma Chau.
41. **Route 81, Aberdeen Tunnel to Stanley (Hong Kong)** - Visual Impact Assessment for alternative highway alignments on the South side of Hong Kong Island.

APPENDIX II
POSSIBLE TOWER TYPES TO BE USED WITH A 400KV OVERHEAD TRANSMISSION LINE
(extracted from Eskom Technical Memorandum on Particular Aspects Related to 400kV Transmission)

Figure A-2: Tower Type 524 (Cross Rope).

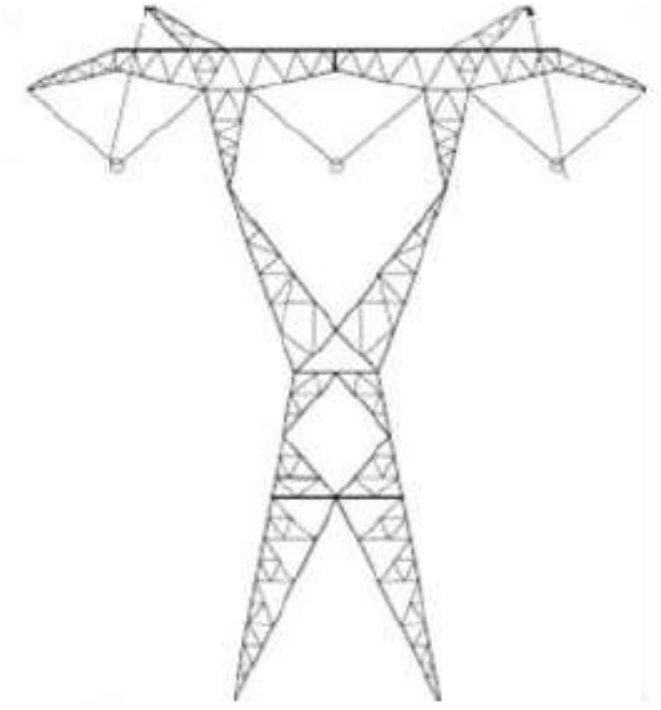

Figure A-3: Tower Type 515 (Self Support).

Figure A-5: Tower Type 520B (Guyed V).