CONSTRUCTION OF THE PROPOSED HYDRA – KRONOS 2ND 400KV LINE, AND ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE PROVINCE

VISUAL IMPACT ASSESSMENT

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EXECUTIVE SUMMARY

The DIGES Group was appointed by Eskom Holdings SOC Limited, as the independent environmental consultant to undertake the Environmental Impact Assessment for the proposed construction of a 187km, second, 400kV power line from the Hydra Substation, south-east of De Aar, Northern Cape Province to the Kronos Substation to be established south of Copperton, Northern Cape Province.

Outline Landscape Architects compiled the Visual Impact Assessment (VIA), which is a specialist study that addresses the visual effects of the proposed development line on the receiving environment.

The project components that may cause a potential landscape and/or visual impact are construction camps, access roads, and transmission lines. The transmission lines cause the greatest visual impact. The proposed new line runs along an existing transmission line reducing the impact on the landscape.

The study area consists mainly of shrubland, pristine undeveloped land, and land used for agriculture, and game farms. Major production activities of the area include wool production and livestock farming.

De Aar is between Cape Town and Kimberley and a primary commercial distribution centre for the central Great Karoo. Coppertown is a small town, now mostly derelict but once had a copper and zinc mine. Several new renewable energy projects have been established in the area.

The proposed 400kV power line and the upgrades of the substations were evaluated against internationally accepted criteria to determine the impact they will have on the landscape character and the viewers identified in the study area.

During the construction phase, unsightly views may be created by the presence of the construction camps and the lay-down yards. The duration of the potential visual impact will be temporary.

The impact of the proposed activities on visual receptors varies between residents, tourists, and motorists. The proposed new power line traverses the mundane landscape with little ability to absorb the visual impact.

The landscape has very few residents that will be impacted as the majority of the line follows through agricultural land and open, unpopulated areas. Very few tourists visit the area and motorists mainly pass through.

Both substations already exist and there is an existing power line. Viewers are accustomed to their presence and the visual impact.

If the mitigation measures are implemented and the recommendations are adhered to, the visual impact can be minimised.

Evaluation of proposed activities for the Hydra to Kronos 400kV Power Line & Substations

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The visibility analyses consider worst-case scenarios, using line-of-sight, based on topography alone. The impacts for the construction phase are insignificant, while impacts for the operational phase are rated below.							
Visual Impact of proposed Activities							
Hydra-Kronos 2nd 400kV Line	No	Negative	3 (Regional)	5 Permanent	4 Low	3 Medium	36 Medium
	Yes	Negative	3 (Regional)	5 Permanent	2 Minor	2 Low	20 Low
Extend and Equip Kronos Substation	No	Negative	2 (Local)	5 Permanent	4 Low	3 Medium	33 Medium
	Yes	Negative	2 (Local)	5 Permanent	2 Minor	2 Low	18 Low
Equip Hydra Substation	No	Negative	2 (Local)	5 Permanent	4 Low	3 Medium	33 Medium
	Yes	Negative	2 (Local)	5 Permanent	2 Minor	2 Low	18 Low

The Visual Impact Assessment Criteria for all activities as indicated in Table 11 applies and is rated as per below:

Status of Impact:
The visual impact is assessed as either having a:

- Negative effect (i.e. at a cost to the environment),
- Positive effect (i.e. a benefit to the environment), or
- Neutral effect on the environment.

Extent of the Impact:

(1) Site (site only),
(2) Local (site boundary and immediate surrounds),
(3) Regional,
(4) National, or
(5) International.

Duration of the Impact:
The length that the impact will last for is described as either:

(1) Immediate (<1 year)
(2) Short term (1-5 years),
(3) Medium term (5-15 years),
(4) Long term (ceases after the operational life span of the project),
(5) Permanent.

Magnitude of the Impact:
The intensity or severity of the impacts is indicated as either:

(0) none,
(2) Minor,
(4) Low,
(6) Moderate (environmental functions altered but continue),
(8) High (environmental functions temporarily cease), or
(10) Very high/unsure (environmental functions permanently cease).

Probability of Occurrence:
The likelihood of the impact actually occurring is indicated as either:

(0) None (the impact will not occur),
(1) Improbable (probability very low due to design or experience)
(2) Low probability (unlikely to occur),
(3) Medium probability (distinct probability that the impact will occur),
(4) High probability (most likely to occur), or
(5) Definite.

Significance of the Impact:
Based on the information contained in the points above, the potential impacts are assigned a significance rating (S). This rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact.
S= (E+D+M) P

The significance ratings are given below:

- (<30) low (i.e. where this impact would not have a direct influence on the decision to develop in the area).
- (30-60) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated).
- (>60) high (i.e. where the impact must have an influence on the decision process to develop in the area).

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LIST OF ABBREVIATIONS

EIA	Environmental Impact Assessment.
FHWA	Federal Highway Administration of the United States Department of Transportation. The publishers of the guide "*Visual Impact Assessment for High Projects*" 1981.
LCA	Landscape Character Assessment.
LT	Landscape Type
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment.
ULI	Urban Land Institute
ZVI	Zone of Visual Influence.

1. INTRODUCTION

The DIGES Group was appointed by Eskom Holdings SOC Limited, as the independent environmental consultant to undertake the Environmental Impact Assessment process for the proposed construction of a 187km, second, 400kV power line from the Hydra Substation, south-east of De Aar, Northern Cape Province to the Kronos Substation to be established south of Copperton, Northern Cape Province.

Outline Landscape Architects was appointed by the DIGES Group as an independent sub-consultant to complete a Visual Impact Assessment.

Kathrin Hammel, the principal Landscape Architect and Visual Specialist from Outline Landscape Architects undertook this Visual Impact Assessment. She is a registered Professional Landscape Architect at the South African Council of Landscape Architects, SACLAP no 20162. Kathrin has been involved as Visual Impact Specialist since 2009.

Neither the author, nor Outline Landscape Architects will benefit from the outcome of the project decision-making.

This Visual Impact Assessment (VIA) is a specialist study that forms part of the EIA and addresses the visual effects of the proposed line on the receiving environment.

1.1. BACKGROUND AND BRIEF

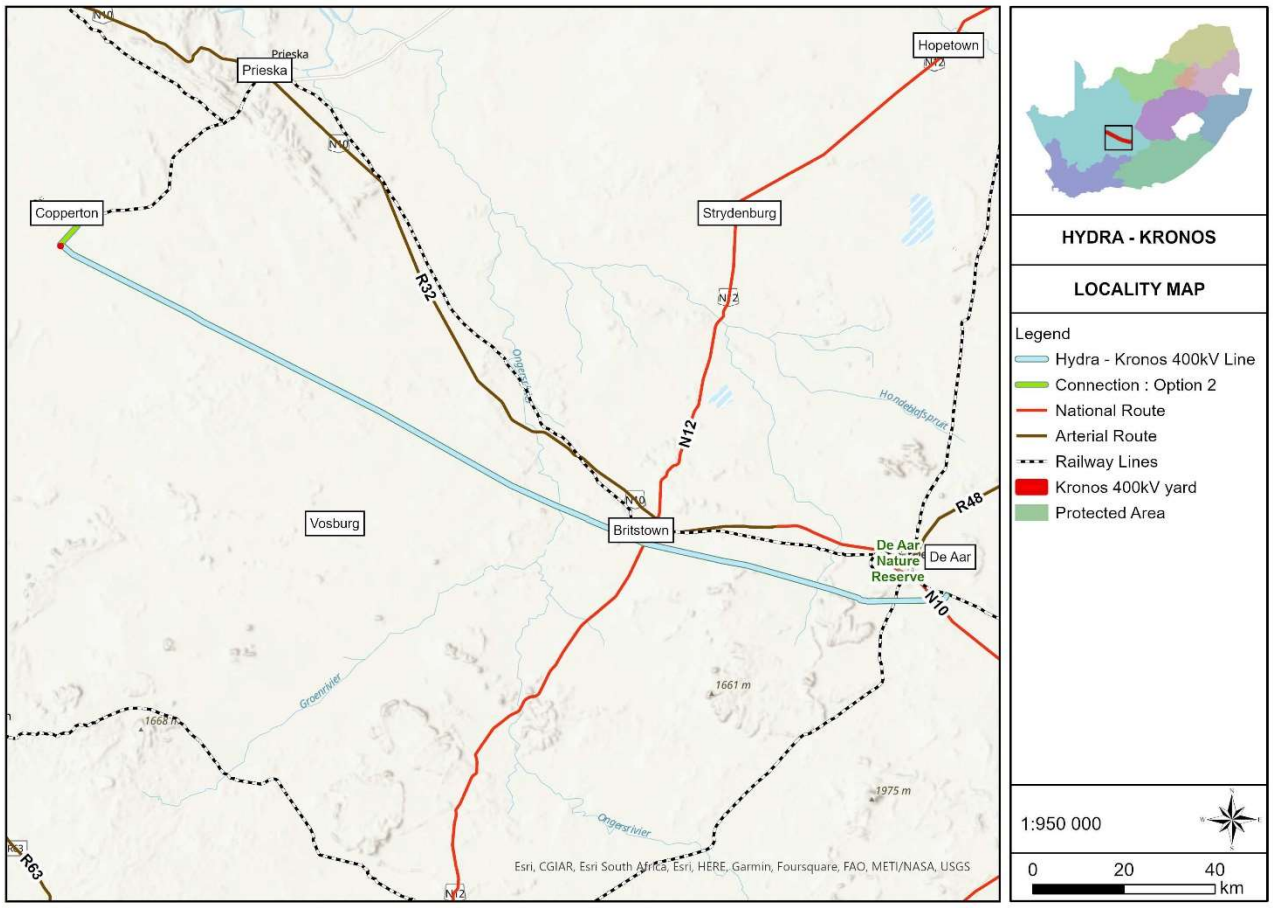
This VIA will conform to the requirements of a Level Three assessment which requires the realisation of the following objectives (Adapted from Oberholzer (2005)):

- Determination of the extent of the study area.
- Description of the proposed project and the receiving environment.
- Identification and description of the landscape character of the study area.
- Identification of the elements of particular visual value and -quality that could be affected by the proposed project.
- Identification of landscape- and visual receptors in the study area that will be affected by the proposed project and assess their sensitivity.
- Indication of potential landscape- and visual impacts.
- Assessment of the significance of the landscape- and visual impacts.
- Recommendations of mitigation measures to reduce and/or alleviate the potential adverse landscape- and visual impacts.

1.2. STUDY AREA

The project area for the proposed Hydra – Kronos Transmission Line is extensive due to the linear nature of the project and includes two operation and maintenance substations. The proposed transmission line traverses approximately ±187 km of land from De Aar to Copperton in the Northern Cape. The line, therefore, traverses three local municipalities [(Siyathemba Local Municipality (NC077), Kareeberg Local Municipality (NC074) and Emthanjeni Local Municipality (NC073) within the Pixley ka Seme District Municipality (DC7)]. The proposed transmission line is aligned with an existing transmission line between the Hydra and Kronos Substations and, therefore, has an existing service road along the transmission line, which can be accessed at multiple points from main roads such as the N10 in De Aar. The proposed transmission line begins at the Hydra Substation (30°42'52.02"S 24° 5'5.24"E), heading in a northwesterly direction towards the Kronos Substation (30° 1'29.58"S 22°20'20.63"E).

Figure 1: Locality Plan



2. STUDY APPROACH

2.1. INFORMATION BASE

This assessment was based on information from the following sources:

- Topographical maps and GIS generated data were sourced from the Surveyor General, and EcoGIS (2023) respectively.
- A site visit was conducted in June 2023 in the winter season.
- Professional judgement based on experience gained from similar projects.
- Literature research on similar projects.

2.2. ASSUMPTIONS AND LIMITATIONS

This assessment was undertaken during the conceptual stage of the project and is based on information available at the time.

- A corridor of 300m wide is being assessed. The visibility results have been generated from the anticipated alignment and may deviate from the route for the final approved alignment. The differences are considered omissible.
- This level of assessment excludes surveys to establish viewer preference and thereby their sensitivity. Viewer sensitivity is determined by means of a commonly used rating system (Table 14).

2.3. LEVEL OF CONFIDENCE

The level of confidence assigned to the findings of this assessment is based on:

- The level of information available and/or understanding of the study area (rated 2); and
- The information available and/or knowledge and experience of the project (rated 3).

This visual impact assessment is rated with a general confidence level of 9 out of 9. This rating indicates that the author's general confidence in the accuracy of the findings is *high* (Table 13). Where the confidence level of specific findings is not regarded as high, it is noted in the last column of each impact assessment table.

2.4. METHOD

A broad overview of the approach and methodology used in this assessment is provided below:

- The extent of the study area is determined and indicated in Figure 1 indicating the route and substations.
- The project components and activities are described and assessed as potential elements of visual and landscape impacts.
- The receiving environment is described in terms of its prevailing landscape- and visual character.
- Landscape- and visual receptors that may be affected by the proposed project are identified and described.
- Mitigation measures are proposed to reduce adverse impacts.
- The findings of the study are documented in this Visual Impact Assessment.

3. PROJECT DESCRIPTION

3.1. OVERVIEW OF DEVELOPMENT

The project involves the following activities:

Hydra – Kronos 2nd 400 kV line

- Construct a second ±187 km 400 kV line from Hydra to Kronos Substation
- Bypass series compensation on the 1st Hydra – Kronos 400 kV line

Kronos Substation

- Extend 400 kV busbar at Kronos Substation
- Establish and equip a new 400 kV feeder bay at Kronos Substation

Hydra Substation

- Equip existing 400 kV feeder bay at Hydra Substation

Table 1: Description of activities

ACTIVITY	DESCRIPTION (Refer to Figure 1)
Hydra-Kronos 2nd 400kV Line	Construct a second ± 187km 400kV line from Hydra to Kronos Substation Bypass series compensation on the 1st Hydra-Kronos 400kV line.
Kronos Substation	Extend 400kV busbar at Kronos Substation Establish and equip a new 400kV feeder bay at Kronos Substation
Hydra Substation	Equip existing 400kV feeder bay at Hydra Substation

3.2. PROJECT COMPONENTS AND ACTIVITIES

Each project component and activity will affect the receiving environment differently and is therefore discussed separately. The following project components will occur during the construction and operational phases of the project and are identified as elements that may cause a potential landscape and/or visual impact:

3.2.1. CONSTRUCTION CAMPS AND LAY-DOWN YARDS

Temporary construction camps will be present for the duration of the construction period. The appointed contractor will set up construction camps along the alignment where practical while observing Duty of Care principles. The material lay-down yards are expected to be located adjacent to the construction camps and will serve as storage areas for the construction material and equipment (Figure 2). Typical construction equipment could include items as shown in Figure 3.

3.2.2. SUBSTATIONS

The Kronos substation at Copperton, will be extended and a new 400kV feeder bay will be established and equipped. The existing 400kV feeder bay at the Hydra substation will be equipped. These structures will be approximately 26 meters tall.

3.2.3. ACCESS ROADS

Existing access roads will be used as far as possible. Roads may have to be extended and widened where necessary. It is expected that roads will be rehabilitated after the construction phase or maintained to facilitate access during periodic maintenance visits.

3.2.4. TRANSMISSION LINE

The completed transmission line will connect the Hydra and Kronos Substations. The direct linear distance between the substations is approximately 187km (Figure 1).

Five types of towers might be used depending on the terrain being crossed. The towers will consist of a lattice steel framework reaching a maximum height of 42m with electrical cables suspended between them. The average spacing between the towers will be approximately 500m. A servitude width of 55m will be cleared for each of the proposed towers. The cross-rope suspension tower will be the preferred tower and the self-supporting strain tower will only be used where the alignment changes direction.

Table 2: Types and typical characteristics of proposed towers

Type	Guyed "Vee" Suspension Tower	Cross Rope Suspension Tower	Self-Supporting Suspension Tower	Self-Supporting Strain Tower	Angle Strain Tower
Maximum Height	38.4m	45m	31m	33m	30m
Span	500m	550m	500m	500m	450m
Servitude Width	55m	55m	55m	55m	55m

3.3. VISUAL CHARACTERISTICS OF PROJECT COMPONENTS

Visual character is based on human perception and the observer's response to the relationships between and composition of the visible project components. The transmission line, i.e., the towers and the cables suspended between each tower, is the most visible and permanent project component and is discussed in this section.

The transmission towers have an industrial character enforced by the double steel pole and the electrical cables between the towers. The entire transmission line will be perceived as a rhythmic arrangement of vertical towers forming a linear element through the landscape. The electrical cables emphasise the linear character of the transmission line but are easily absorbed in the background when viewed from distances greater than 1km.

Figure 2: Example of construction camps

Typical example of site office

Typical example of bush clearing

Typical example of construction camp

Figure 3: Typical construction equipment

Typical example of helicopter

Typical example of crane

Typical example of tensioner station

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

Landscape and visual impacts may result from changes to the landscape. A distinction should be made between impacts on the visual resource (landscape) and on the viewers. The former are impacts on the physical landscape that may result in changes to landscape character while the latter are impacts on the viewers themselves and the views they experience.

4.1. VISUAL RESOURCE

Visual resource is an encompassing term relating to the visible landscape and its recognisable elements, which through their co-existence, result in a particular landscape character.

4.1.1. LANDSCAPE CHARACTER

The study area consists mainly of shrubland and barren undeveloped land, as well as land used for agriculture, residential, and game farms. Major production activities of the area include wool production and livestock farming.

De Aar is situated between Cape Town and Kimberley and is a primary commercial distribution centre for the central Great Karoo. Coppertown is a small town, now mostly derelict but once had a copper and zinc mine. Several new renewable energy projects have been established in the area. (Figure 5).

The landscape character does not change considerably through the study area. The study area is divided into distinct landscape types, which are areas within the study area that are relatively homogenous in character (Swanwick, 2002). Landscape types are distinguished by differences in topographical features, vegetation communities and patterns, land use and human settlement patterns.

Broad scale vegetation types have been identified in the study area and the route (Figure 4) crosses through the following six dominant vegetation types:

- Northern Upper Karoo
- Upper Karoo Hardeveld
- Eastern Upper Karoo
- Bushmanland Arid Grassland
- Bushmanland Vloere
- Bushmanland Basin Shrubland

4.1.2. VISUAL CHARACTER

Visual character is based on human perception and the observer's response to the relationships between and composition of the landscape, the land uses and identifiable elements in the landscape. The description of the visual character includes an assessment of the scenic attractiveness regarding those landscape attributes that have aesthetic value and contribute significantly to the visual quality of the views, vistas and/or viewpoints of the study area.

The overall landscape varies between pristine natural landscape, to degraded landscapes around settlements and towns.

4.1.2.1 Visual Value

Visual value relates to those attributes of the landscape or elements in the landscape to which people attach values that, though not visually perceivable, still contribute to the value of the visual resource. These visual values are derived from ecological, historical, social and/or cultural importance and are described in terms of their uniqueness, scarcity, and naturalness and/or conservation status. The importance of visual value of a landscape or element in the landscape is measured against its value on an international, national and local level.

The region is known for the shrubland vegetation and relatively flat landscape.

Great parts of the study area have undergone little or no change due to human intervention and can be generally described as an unspoilt, pristine landscape.

4.1.2.2 Visual Quality

Visual quality is a qualitative evaluation of the composition of landscape components and their excellence in scenic attractiveness. Many factors contribute to the visual quality of the landscape and are grouped under the following main categories (Table 3) that are internationally accepted indicators of visual quality (FHWA, 1981):

Table 3: Criteria of Visual Quality (FHWA, 1981)

INDICATOR	CRITERIA
Vividness	The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
Intactness	The integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment.
Unity	The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony of inter-compatibility between landscape elements.

The landscape is allocated a rating from an evaluation scale of 1 to 7 and divided by 3 to get an average. The evaluation scale is as follows: Very Low =1; Low =2; Moderately Low =3; Moderate =4; Moderately High =5; High =6; Very High =7;

The regional landscape is assessed against each indicator separately. All three indicators should be *high* to obtain a *high* visual quality. The evaluation is summarised in Table 4.

Table 4: Visual Quality of the regional landscape

VIVIDNESS	INTACTNESS	UNITY	VISUAL QUALITY
5	5	4	Moderately High

The moderately high visual quality can be attributed to the mostly un-spoilt landscape, with degraded landscapes only around settlements and towns.

4.1.2.3 Visual absorption capacity

Visual Absorption Capacity (VAC) signifies the ability of the landscape to accept additional human intervention without serious loss of character and visual quality or value. VAC is founded on the characteristics of the physical environment such as:

- Degree of visual screening:

  A degree of visual screening is provided by landforms, vegetation cover and/or structures such as buildings. For example, a high degree of visual screening is present in an area that is mountainous and is covered with a forest compared to an undulating and mundane landscape covered in grass.

- Terrain variability:
  Terrain variability reflects the magnitude of topographic elevation and diversity in slope variation. A highly variable terrain will be recognised as one with great elevation differences and a diversity of slope variation creating talus slopes, cliffs and valleys. An undulating landscape with a monotonous and repetitive landform will be an example of a low terrain variability.
- Land cover:
  Land cover refers to the perceivable surface of the landscape and the diversity of patterns, colours and textures that are presented by the particular land cover (i.e., urbanised, cultivated, forested, etc.)

A basic rating system is used to evaluate the three VAC parameters. The values are relative and relate to the type of project that is proposed and how it may be absorbed in the landscape (Table 5). A three-value range is used; three (3) being the highest potential to absorb an element in the landscape and one (1) being the lowest potential. The values are counted together and categorised in a *high*, *medium* or *low* VAC rating.

Table 5: Regional Visual Absorption Capacity evaluation

VISUAL SCREENING	TERRAIN VARIABILITY	LAND COVER	VAC
1	2	1	Low

The VAC of the study area is considered low and does not provide good overall screening capacity for this project. The low VAC relates to the slightly undulating, mundane topography with low-growing vegetation. The regular forms and associated vertical posture of the proposed power line will not be easily absorbed into the landscape and topography.

The less prominent project components such as access roads are expected to be visually absorbed to a large degree in the landscape.

Figure 4: Vegetation Map

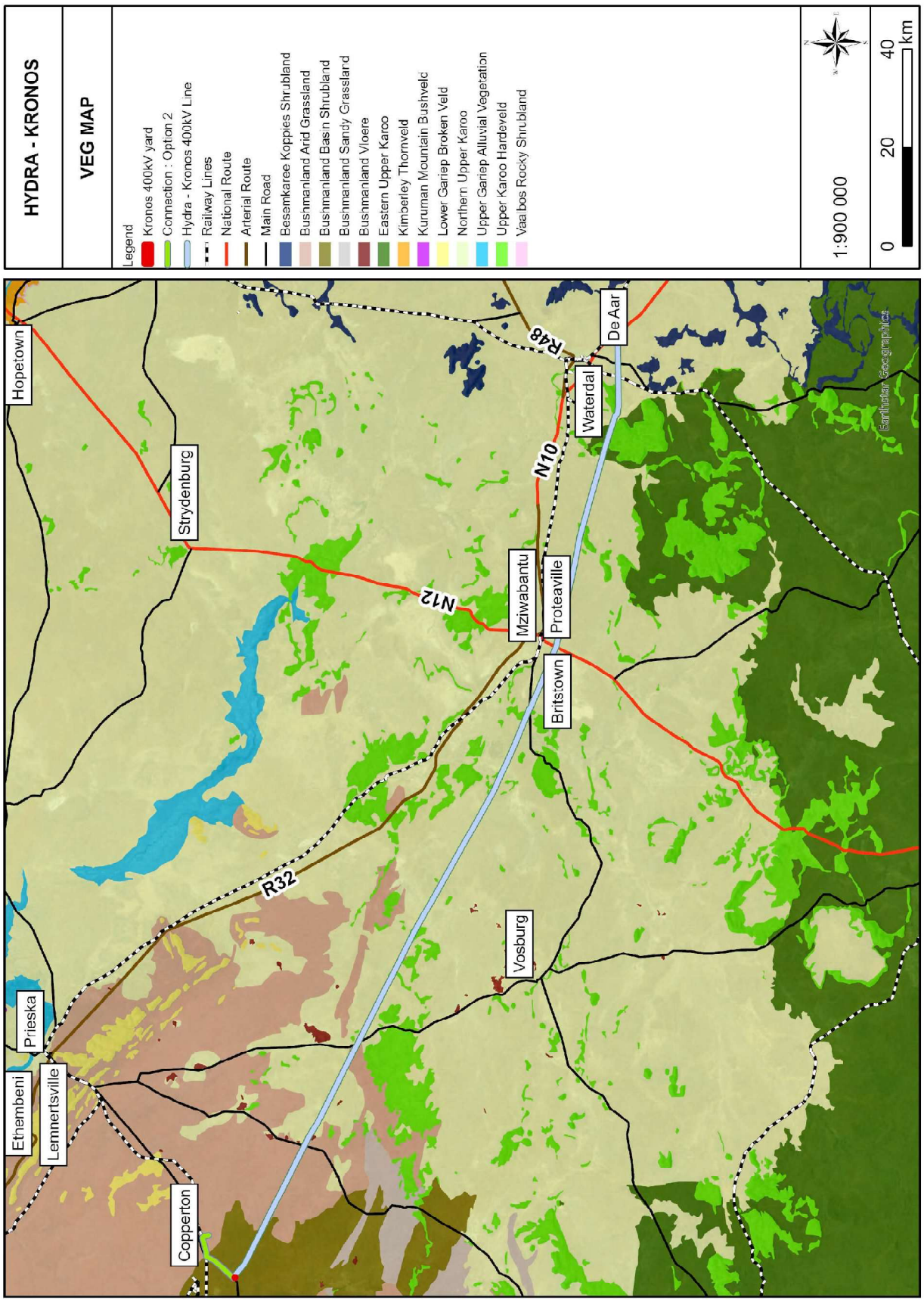


Figure 5: Land Cover Map

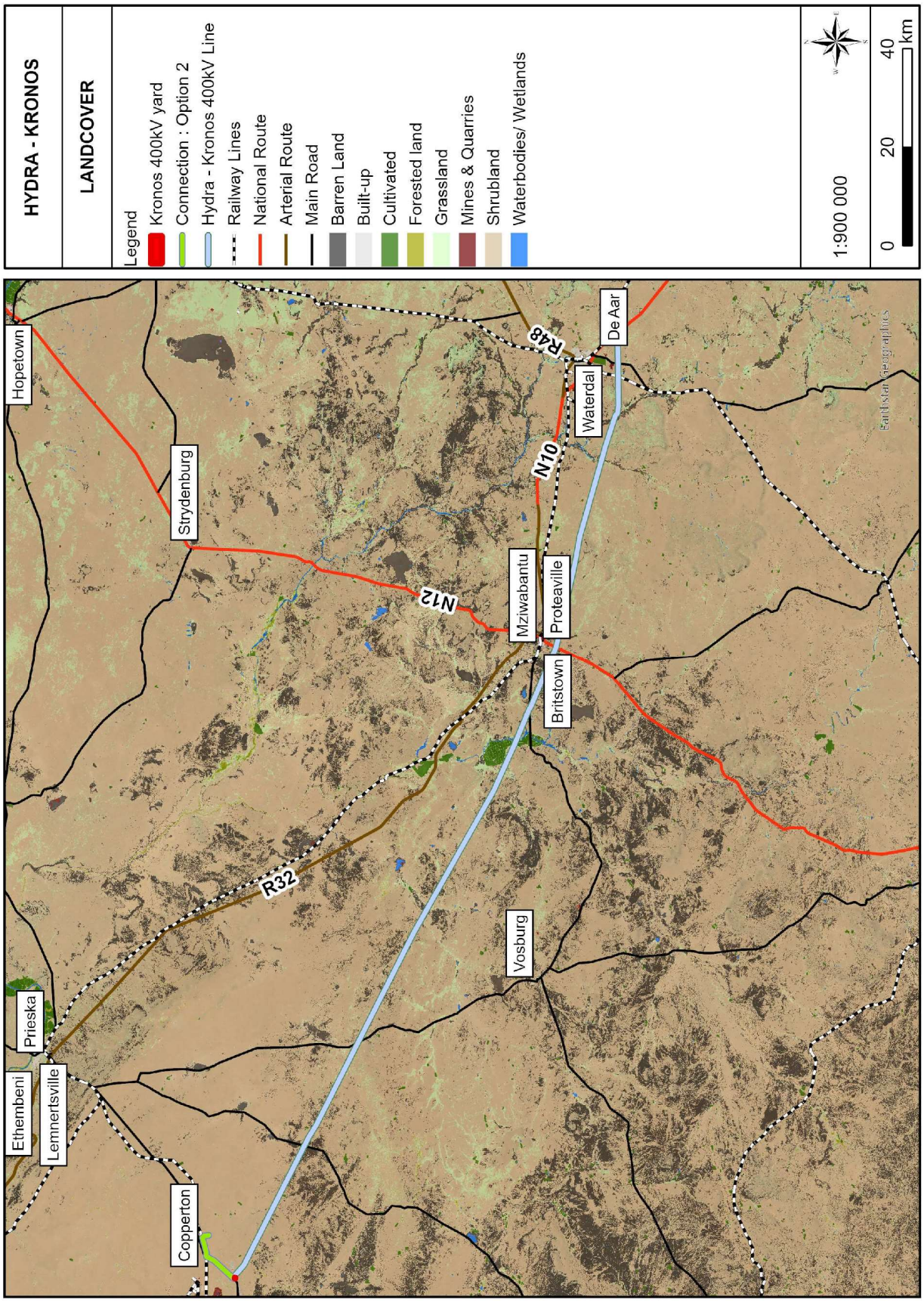


Figure 6: Elevation Map

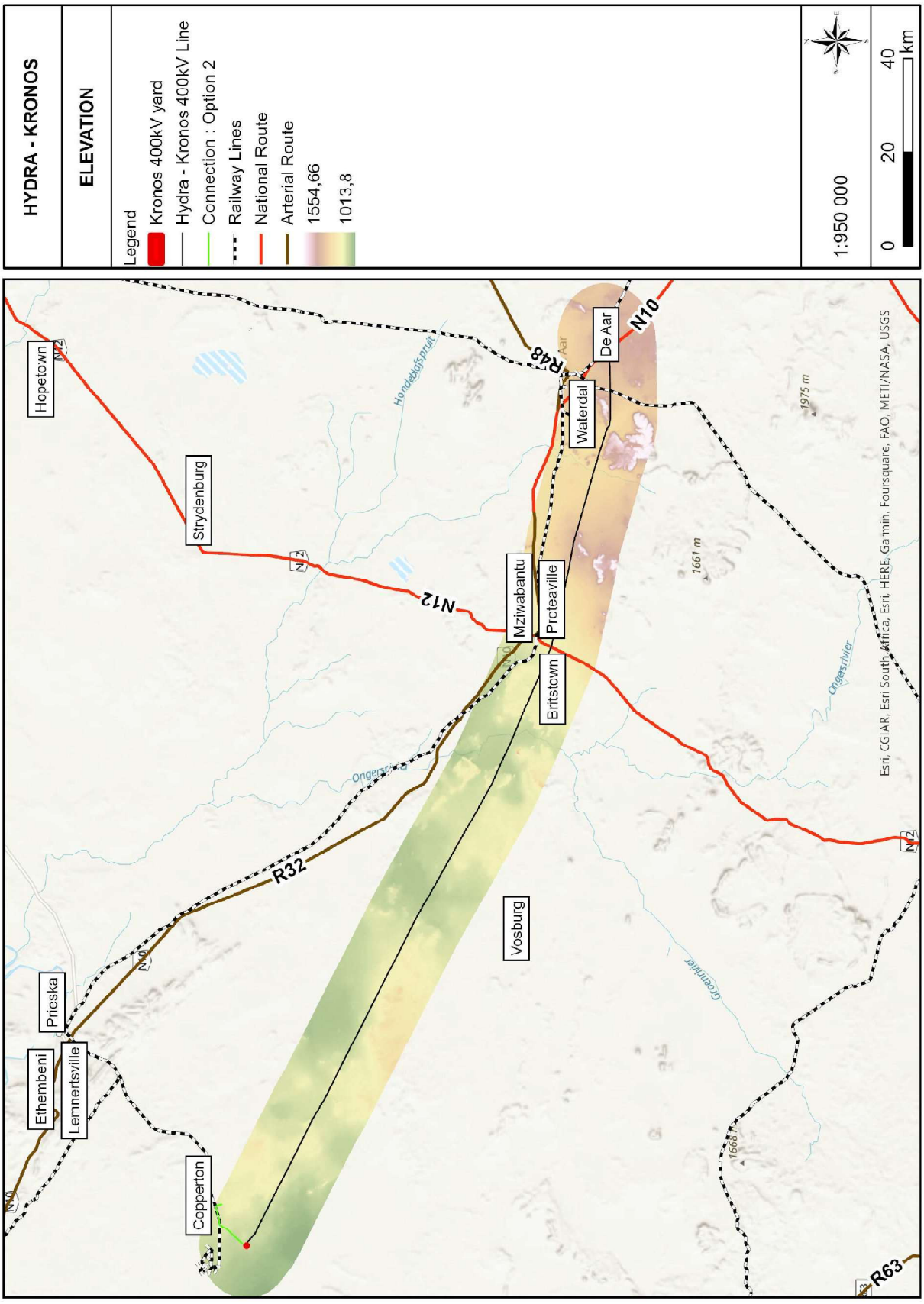


Figure 7: Landscape Character around Hydra Substation

Figure 8: Hydra Substation

Figure 9: Landscape Character between De Aar and Britstown

Figure 10: Existing Power Line between De Aar and Britstown

Figure 11: Existing Power Line Crossing over N12 at Britstown

Figure 12: Existing Power Line towards De Aar along N12

Figure 13: Existing Power Line along R384 to Giesenkraal

Figure 14: Small settlement at Giesenkraal

Figure 15: Small Settlement at Giesenkraal

Figure 16: Landscape Character along N10

Figure 17: Landscape Character along N10 towards Copperton

Figure 18: Kronos Substation R357 Copperton

5. IMPACT ASSESSMENT

The significance of impacts is a comparative function relating to the severity of the identified impacts on the respective receptors. The significance of an impact is considered *high* should a *highly* sensitive receptor be exposed to a *highly* severe impact (Table 6).

Table 6: Significance of impacts

RECEPTOR SENSITIVITY	IMPACT SEVERITY		
	LOW	MEDIUM	HIGH
LOW	No significance	Low	Low
MEDIUM	Low	Medium	Medium
HIGH	Low	Medium	High

5.1. SIGNIFICANCE OF LANDSCAPE IMPACT

5.1.1. LANDSCAPE CHARACTER SENSITIVITY

The sensitivity of the landscape character is an indication of "…the degree to which a particular landscape can accommodate change from a particular development, without detrimental effects on its character" (GLVIA, 2002). A landscape with a *high* sensitivity would be one that is greatly valued for its aesthetic attractiveness and/or have ecological, cultural or social importance through which it contributes to the inherent character of the visual resource.

The majority of the study area is considered to have moderate landscape character sensitivity due to the monotonous shrubland landscape, the small settlements in the landscape, the generally low visual quality and low tourism value. There is low terrain variability in the study area and thus a low VAC can be expected. Generally, the vegetation cover is mundane and of low height shrubs and grassland, and barren areas, which will provide low visual screening for the proposed transmission line.

Previous human induced activities and interventions have impacted on the original landscape character. In this case, mining and existing infrastructure, including power lines, roads, etc., can be classified as landscape disturbances and elements that cause a reduction in the condition of the affected landscape type and negatively affect the quality of the visual resource.

The assessment of the landscape is substantiated through the site visit, professional judgement and informed reasoning which is based on the landscape character assessment in Section 4. A landscape sensitivity rating was adapted from GOSW (2006) (Table 7) and applied in the classification of the study area into different sensitivity zones.

Table 7: Landscape character sensitivity rating (Adapted from GOSW, 2006)

	DESCRIPTION
Low sensitivity	These landscapes are likely to: ° Have distinct and well-defined landforms; ° Have a strong sense of enclosure; ° Provide a high degree of screening; ° Have been affected by extensive development or man-made features; ° Have reduced tranquillity; ° Are likely to have little inter-visibility with adjacent landscapes; and ° Exhibit no or a low density of sensitive landscape features that bare visual value.
Moderate sensitivity	These landscapes are likely to: ° Have a moderately elevated topography with reasonably distinct landforms that provides some sense of enclosure; ° Have been affected by several man-made features; ° Have limited inter-visibility with adjacent landscapes; and ° Exhibit a moderate density of sensitive landscape features that bare visual value.
High sensitivity	These landscapes are likely to: ° Consist mainly of undulating plains and poorly defined landforms; ° Be open or exposed with a remote character and an absence of man-made features; ° Are often highly visible from adjacent landscapes; and ° Exhibit a high density of sensitive landscape features that bare visual value.

5.1.2. SEVERITY OF POTENTIAL LANDSCAPE IMPACTS

Landscape impacts are alterations to the fabric, character, visual quality and/or visual value which will either positively or negatively affect the landscape character. During the construction and operational phases, the project components are expected to impact on the landscape character of the landscape types it traverses. The magnitude/severity of this intrusion is measured against the scale of the project, the permanence of the intrusion and the loss in visual quality, -value and/or VAC.

The below table (Table 8) indicates the significance of the impact on the landscape with and without mitigation.

Table 8: Landscape impact – Altering the landscape character

LANDSCAPE IMPACT								
Activity	**Nature of Impact**	**Extent of Impact**	**Duration of Impact**	**Severity of Impact**	**Probability of Impact**	**Significance without Mitigation**	**Significance with Mitigation**	**Level of Confidence**
Construction phase								
Hydra-Kronos 2nd 400kV Line	Negative Impact on the visual quality of the landscape due to the presence of foreign elements and a loss of vegetation cover	Localised impacts over an extensive area	Permanent if not mitigated	Moderate	Definite	Moderate	Low	High
Extend and Equip Kronos Substation				Moderate	Definite	Moderate	Low	High
Equip Hydra Substation				Moderate	Definite	Moderate	Low	High
Operational phase								
Hydra-Kronos 2nd 400kV Line	Negative Impact on the visual quality of the landscape due the presence of a transmission line.	Regional	Permanent	High	Definite	Moderate	Low	High
Extend and Equip Kronos Substation				High	Definite	Moderate	Low	High
Equip Hydra Substation				High	Definite	Moderate	Low	High

Construction phase

The activities that are expected to cause landscape impacts and that are associated with the construction phase, are the establishment of construction camps, the extension or widening of existing access roads and the clearance of the servitude. These activities will create surface disturbances which will result in the removal of vegetation and the exposure of the underlying soil.

The proposed new line is along an existing transmission line. Existing access routes should be used to create minimum disturbance. During construction, the area around the individual towers will be disturbed.

The size and location of the construction camps will play a major role in the severity of the landscape impact. Due to a lack of technical information, two options are considered namely, the location of construction camps in remote, virgin land, or in existing settlements. The initial presence of a construction camp in an undeveloped landscape will cause a temporary and localised alteration to the landscape character. A construction

camp located in or adjacent to an existing town or settlement will be easily associated with the town and therefore the presence of the town, mitigates the impact.

The complete removal of vegetation will result in disturbed areas of exposed soil and difference in texture. The exposed soil and change in texture will contrast severely with the intact vegetation around the disturbance footprint and servitudes.

Considering the low VAC throughout most of the study area, the undeveloped condition of great parts of the landscape and the moderate recovery rate of the endemic vegetation, the *severity of landscape impact* during the construction stage is expected to be *moderate* for the proposed route. The impact will extend over the entire length of the alignment and may vary in degrees of severity along the linear length as it transects landscape types of varying VAC. Surface disturbances are also minimised through, for example, utilising existing roads.

The *severity of the landscape impact* can however be mitigated to a low severity for the proposed route. Sensitive placement of the construction camps, limited surface disturbance and prompt rehabilitation are prerequisite conditions if the severity of impact is to be reduced.

Operational phase

Residual effects of the surface disturbances created during construction may remain for an extended period during the operational phase.

The presence of the existing line minimises the visual impact of the proposed new line as viewers are already accustomed to a transmission line. The industrial character and the large vertical scale of the towers (approximately 36m for the proposed 400kV transmission lines) will not easily be absorbed into the relatively flat landscape character that prevails through most of the study area.

The mundane character and relatively low vegetation allow for little absorption of the towers into the landscape. The pristine character of a large portion of the study area will need to be protected as it is vulnerable to human intervention. It is considered as a landscape amenity that provides the study area with a unique and valued sense of place.

This quality of the landscape will be moderately affected with the presence of a transmission line of this scale and extent, mainly because this is a second line running parallel to an existing line. The substations are existing, and viewers are already accustomed to their visual presence. The impact can further be mitigated due to the buffer zones around alignments, which allows for placement of the power lines in an area that will cause the least impact.

5.2. SIGNIFICANCE OF VISUAL IMPACTS

5.2.1. VIEWER SENSITIVITY

Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed project. The visual receptors are grouped according to their similarities. The visual receptors included in this study are:

- Residents
- Tourists
- Motorists

To determine visual receptor sensitivity a commonly used rating system is utilised. This is a generic classification of visual receptors and enables the visual impact specialist to establish a logical and consistent visual receptor sensitivity rating for viewers who are involved in different activities without engaging in extensive public surveys.

5.2.1.1 Residents

Residents of the affected environment are classified as visual receptors of *high* sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.

5.2.1.2 Tourists

Tourists are regarded as visual receptors of exceptional *high* sensitivity. Their attention is focused on the landscape which they essentially utilise for enjoyment purposes and appreciation of the quality of the landscape.

5.2.1.3 Motorists

Motorists are generally classified as visual receptors of *low* sensitivity due to their momentary view and experience of the proposed development. As a motorist's speed increases, the sharpness of lateral vision declines, and the motorist tends to focus on the line of travel (USDOT, 1981). This adds weight to the assumption that under normal conditions, motorists will show *low* levels of sensitivity as their attention is focused on the road and their exposure to roadside objects is brief.

Motorists on the scenic routes in the study area will present a higher sensitivity. Their reason for being in the landscape is similar to that of the tourists and they will therefore be categorised as part of the tourist viewer group.

5.2.2. SEVERITY OF POTENTIAL VISUAL IMPACTS

Severity of visual impact refers to the magnitude of change to specific visual receptor's views and/or experience of the landscape. Severity of visual impact is influenced by the following factors:

- The **viewer's exposure** to the project:
  - Distance of observers from the proposed project.
  - The visibility of the proposed project (ZVI).
  - Number of affected viewers.
  - Duration of views to the development experienced by affected viewers.
- Degree of **visual intrusion** created by the project.

Empirical research indicates that the visibility of a transmission tower and hence the severity of visual impact, decreases as the distance between the observer and the tower increases. The landscape type, through which the distribution line crosses, can mitigate the severity of visual impact through topographical or vegetative screening. Bishop *et al* (1988) noted that in some cases the tower may dominate the view for example, silhouetted against the skyline, or in some cases be absorbed in the landscape. A complex landscape setting with a diverse land cover and topographical variation has the ability to decrease the severity of visual impact more than a mundane landscape (Bishop *et al*, 1985).

The Zone of Visual Influence (ZVI) is determined through a Geographical Information System (GIS). The result reflects a shaded pattern which identifies the areas that are expected to experience views of the proposed alignments. The ZVI is limited to 5 km from the proposed alignments.

Visibility analysis and viewer sensitivity has been completed for the proposed alignment. According to Bishop *et al* (1988), visual receptors within 1 km from the alignments are most likely to experience the highest degree of visual intrusion, hence contributing to the severity of the visual impact. This is considered as the zone of highest visibility after which the degree of visual intrusion decreases rapidly at distances further away.

In order to assess the extent and degree of visibility in the visual envelope, a Geographical Information System (GIS) was utilized. A visibility analysis was performed which provides the following information (Figure 19 and 20):

- The areas within the visual envelope that may experience views of the proposed project; and
- The degree of visibility in terms of the percentage of the proposed project that will be visible from a specific location.

The GIS performs an analysis for a series of elevated observer points which represents the height of the entire power line in a digital elevation model (DEM). This results in a visibility map with the degree of visibility illustrated by a colour.

The visibility analyses consider worst-case scenarios, using line-of-sight, based on topography alone. The screening capability of vegetation is not captured in the base model of the DEM and is therefore not considered in these results.

A viewer sensitivity map was generated for the route and the two alternatives (Figure 19 and 20).

5.2.2.1 Potential visual impacts on Residents

Table 9: Potential visual impacts on residents

VISUAL IMPACT ON RESIDENTS								
Activity	**Nature of Impact**	**Extent of Impact**	**Duration of Impact**	**Severity of Impact**	**Probability of Impact**	**Significance without Mitigation**	**Significance with Mitigation**	**Level of Confidence**
Construction phase								
Hydra-Kronos 2nd 400kV Line	Negative – Construction camp and lay-down yard may cause unsightly views	Local	Temporary	Moderate	Probable	Moderate	Low	High
Extend and Equip Kronos Substation				Moderate	Probable	Moderate	Low	High
Equip Hydra Substation				Moderate	Probable	Moderate	Low	High
Operational phase								
Hydra-Kronos 2nd 400kV Line	Negative – The presence of a power line intrudes on existing views and spoils the open panoramic views of the landscape.	Regional	Permanent	High	Definite	High	Moderate	High
Extend and Equip Kronos Substation				Moderate	Definite	Moderate	Low	High
Equip Hydra Substation				Moderate	Definite	Moderate	Low	High

The study area has a sparse population in the rural settlements and farming communities, and higher populations in the towns. The towns and surrounding areas vary from degraded and not very scenic to quaint and neat. The rural settlements and farming communities are normally situated along main transportation routes, near agricultural areas or adjacent rivers or water resources. There will be a moderately low number of affected viewers across the study areas.

Construction phase

During the construction phase, unsightly views may be created by the presence of the construction camp and the lay-down yards. The duration of the potential visual impact will be temporary which will result in an anticipated *low* significance of visual impact. The visual exposure to the construction activity will be limited.

The uncertainty pertaining to the number, location and size of the construction camps relates to a low level of confidence in the assessment of the visual impact. The cleared site, construction camp and material lay-down yards will appear unsightly and out of character. Large scale construction elements, such as cranes, will be highly visible and increase awareness of the construction activity over a considerable area. The visual intrusion caused during the construction stage will be moderate but will be temporary in nature and very few residents will be affected.

Operational phase

A low number of residents of the small settlements and farming communities along the existing servitudes and power line may experience a low degree of visual intrusion.

The Visual Absorption Capacity (VAC) of the landscape of the proposed transmission line is low and does not significantly decrease the severity of the visual impact (*Bishop et al, 1985*) by creating a backdrop. The steel frames of the towers (especially the cross-rope suspension type) present a degree of visual permeability, and hence a low degree of visual obstruction. This characteristic of the towers allows it to readily blend into the background colours and patterns of the landscape. This results in a reduced ZVI because the visibility of the individual towers is limited to a smaller distance.

The majority of the topography of the study area is mundane. The vegetation consists of grassland and shrubland. It is apparent from the existing power line that one is visually exposed to the line in close proximity of the line, but the impact is absorbed into the distance by the landscape. Therefore, the significance of the impact can be regarded as moderately-low.

5.2.2.2 Potential visual impacts on tourists

Table 10: Potential visual impacts on tourists

VISUAL IMPACT ON TOURISTS								
Activity	**Nature of Impact**	**Extent of Impact**	**Duration of Impact**	**Severity of Impact**	**Probability of Impact**	**Significance without Mitigation**	**Significance with Mitigation**	**Level of Confidence**
Construction phase								
Hydra-Kronos 2nd 400kV Line	Negative – Construction camp and lay-down yard may cause unsightly views	Local	Temporary	Low	Probable	Low	Low	High
Extend and Equip Kronos Substation				Low	Probable	Low	Low	High
Equip Hydra Substation				Low	Probable	Low	Low	High
Operational phase								
Hydra-Kronos 2nd 400kV Line	Negative – The presence of a power line intrudes on existing views and spoils the open panoramic views of the landscape.	Regional	Permanent	Moderate	Probable	Moderate	Low	High
Extend and Equip Kronos Substation				Low	Probable	Low	Low	High
Equip Hydra Substation				Low	Probable	Low	Low	High

The entire study area is considered to have a low tourism potential. The proposed power line runs south of the N10 and crosses the N12 that can be considered as thoroughfare roads to the Eastern and Western Cape holiday destinations. A few holiday farms, overnight stopovers and private game and hunting farms are found within the study area.

Construction phase

The temporary duration of the construction phase is not expected to cause major visual impacts. The location, number and size of the construction camps and lay-down yards will be crucial in regulating the impact. Detailed information is not available, and it is anticipated that the visual impact will be localised and that a small number of tourists will be adversely affected by these project components during construction.

Their exposure to possible unsightly views of the construction camps and the associated activity will however be minimal and localised.

The potential visual impact on tourists during the construction phase of the proposed project can be mitigated with relative ease. The greatest factor to consider is the location of the construction camps.

Operational phase

Very few tourists may be affected during their visit to the study area. The proposed line is not close to the main roads and tourists will not be in close proximity to the power lines. The presence of the existing power line mitigates the visual impact.

The new line will only have a high significance on tourists in near proximity to the power line, which will be along main transportation routes and at destinations such as guest houses and lodges.

The severity of the visual impact of the power lines on tourists will be low, causing a low visual impact.

5.2.2.3 Potential visual impacts on motorists

Table 11: Potential visual impacts on motorists

VISUAL IMPACT ON MOTORISTS								
Activity	**Nature of Impact**	**Extent of Impact**	**Duration of Impact**	**Severity of Impact**	**Probability of Impact**	**Significance without Mitigation**	**Significance with Mitigation**	**Level of Confidence**
Construction phase								
Hydra-Kronos 2nd 400kV Line	Negative – Construction camp and lay-down yard may cause unsightly views	Local	Temporary	Low	Probable	Low	Low	High
Extend and Equip Kronos Substation				Low	Probable	Low	Low	High
Equip Hydra Substation				Low	Probable	Low	Low	High
Operational phase								
Hydra-Kronos 2nd 400kV Line	Negative – The presence of a power line intrudes on existing views and spoils the open panoramic views of the landscape.	Regional	Permanent	Moderate	Definite	Moderate	Low	High
Extend and Equip Kronos Substation				Low	Definite	Low	Low	High
Equip Hydra Substation				Low	Definite	Low	Low	High

The major routes in the study area are the N10, N12, R384, R386 and the R403 connecting the towns, settlements and farms. The secondary road network in the study area carries a much lower volume of motorists. Their duration of views will be temporary, and it is expected that the visual intrusion that they will experience will be low.

Construction phase

The potential visual impact that may be experienced by motorists during the construction phase is considered to be minimal.

The presence of the construction camps and lay-down yards may create unsightly views. The visual exposure of motorists to the impact will be brief and the severity of the visual impact will be *low*. The significance of the potential visual impact is expected to be *low*.

Operational phase

The proposed line is not close to the main roads and motorists will not be in close proximity to the power lines. The presence of the existing power line mitigates the visual impact.

The severity and significance of the visual impact for the proposed power line on motorists will be *low*. The speed at which motorists travel also has a moderating effect on the severity of the visual impact and further reduces visual exposure.

6. RECOMMENDED MITIGATION MEASURES

The aim of mitigation is to reduce or alleviate the intrusive contrast between the proposed project components and activities, and the receiving landscape to a point where it is acceptable to visual and landscape receptors.

6.1. GENERAL

- Endemic plants should be salvaged where areas are going to be disturbed through the destruction of vegetation, for example the establishment of the construction camp, and kept in a controlled environment such as a nursery, for future re-planting in the disturbed areas as a measure of rehabilitation.

6.2. TRANSMISSION TOWERS

- It is recommended that the most permeable tower type with the least degree of visual obstruction be used, as far as possible.
- Avoid, as much as possible, changing the alignment's direction too often in order to minimise the use of the self-supporting strain tower. This tower type is the most visually intrusive as the steel lattice structure is denser than the other two tower types, hence creating more visual obstruction.
- Rehabilitate disturbed areas around pylons as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil.

6.3. ACCESS ROUTES

- Make use of existing access roads where possible.
- Where new access roads are required, the disturbance area should be kept to a minimum. A two-track dirt road will be the most preferred option.
- Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation.
- Avoid, as much as possible, crossing over or through ridges, rivers, pans or any natural features that have visual value. This also includes centres of floral endemism and areas where vegetation is not resilient and takes extended periods to recover.
- Maintain no or minimum cleared road verges.
- Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands as not to fragment intact vegetated areas, as much as possible.

- If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line, as much as possible. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor.

6.4. CLEARED SERVITUDES

- Locate the alignment and the associated cleared servitude so as to avoid the removal of established vegetation.
- Avoid, as much as possible, a continuous linear path of cleared vegetation that would strongly contrast with the surrounding landscape character. Feather the edges of the cleared corridor to avoid a clearly defined line through the landscape, as much as possible.

6.5. CONSTRUCTION CAMPS AND LAY DOWN YARDS

- If practically possible, locate construction camps in areas that are already disturbed or where it is not necessary to remove established vegetation like for example naturally bare areas.
- Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors.
- Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance.
- Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth or an appropriate landscape smoothening cloth.
- Keep the construction camps away from existing residents and especially lodges and tourist venues, as much as possible.

7. CONCLUSION

The proposed new 400kV power line and upgrades to the substations were evaluated against internationally accepted criteria to determine the impact they will have on the landscape character and the viewers that have been identified in the study area.

The impact of the proposed activities on visual receptors varies between residents, tourists and motorists. The proposed new power line traverses' mundane landscape with little ability to absorb the visual impact. The landscape has relatively few residents that will be impacted as the majority of the line follows through agricultural land and open areas. Very few tourists visit the area and motorists mainly pass through.

If the mitigation measures are implemented and the recommendations are adhered to, the visual impact can be minimised.

Table 12: Evaluation of proposed activities for the Hydra to Kronos Power Line & Substations

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The visibility analyses consider worst-case scenarios, using line-of-sight, based on topography alone. The impacts for the construction phase are insignificant, while impacts for the operational phase are rated below.							
Visual Impact of proposed Activities							
Hydra-Kronos 2nd 400kV Line	No	Negative	3 (Regional)	5 Permanent	4 Low	3 Medium	36 Medium
	Yes	Negative	3 (Regional)	5 Permanent	2 Minor	2 Low	20 Low
Extend and Equip Kronos Substation	No	Negative	2 (Local)	5 Permanent	4 Low	3 Medium	33 Medium
	Yes	Negative	2 (Local)	5 Permanent	2 Minor	2 Low	18 Low
Equip Hydra Substation	No	Negative	2 (Local)	5 Permanent	4 Low	3 Medium	33 Medium
	Yes	Negative	2 (Local)	5 Permanent	2 Minor	2 Low	18 Low

The Visual Impact Assessment Criteria for all activities as indicated in Table 11 applies and is rated as per below:

Status of Impact:
The visual impact is assessed as either having a:

- Negative effect (i.e. at a cost to the environment),
- Positive effect (i.e. a benefit to the environment), or
- Neutral effect on the environment.

Extent of the Impact:

(1) Site (site only),
(2) Local (site boundary and immediate surrounds),
(3) Regional,
(4) National, or
(5) International.

Duration of the Impact:
The length that the impact will last for is described as either:

(1) Immediate (<1 year)
(2) Short term (1-5 years),
(3) Medium term (5-15 years),
(4) Long term (ceases after the operational life span of the project),
(5) Permanent.

Magnitude of the Impact:
The intensity or severity of the impacts is indicated as either:

(0) none,
(2) Minor,
(4) Low,

(6) Moderate (environmental functions altered but continue),
(8) High (environmental functions temporarily cease), or
(10) Very high / unsure (environmental functions permanently cease).

Probability of Occurrence:
The likelihood of the impact actually occurring is indicated as either:

(0) None (the impact will not occur),
(1) Improbable (probability very low due to design or experience)
(2) Low probability (unlikely to occur),
(3) Medium probability (distinct probability that the impact will occur),
(4) High probability (most likely to occur), or
(5) Definite.

Significance of the Impact:
Based on the information contained in the points above, the potential impacts are assigned a significance rating (S). This rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact.
S= (E+D+M) P

The significance ratings are given below

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

APPENDIX 1

Figure 19 and Figure 20 reflects the results of a viewer sensitivity visibility assessment, carried out using GIS software. The results provide a clear interpretation of the extent of the visual influence and also provide an indication of the land use that can be expected in the affected areas.

Figure 19: Visibility Analysis of the Hydra to Kronos 2nd 400kV Line

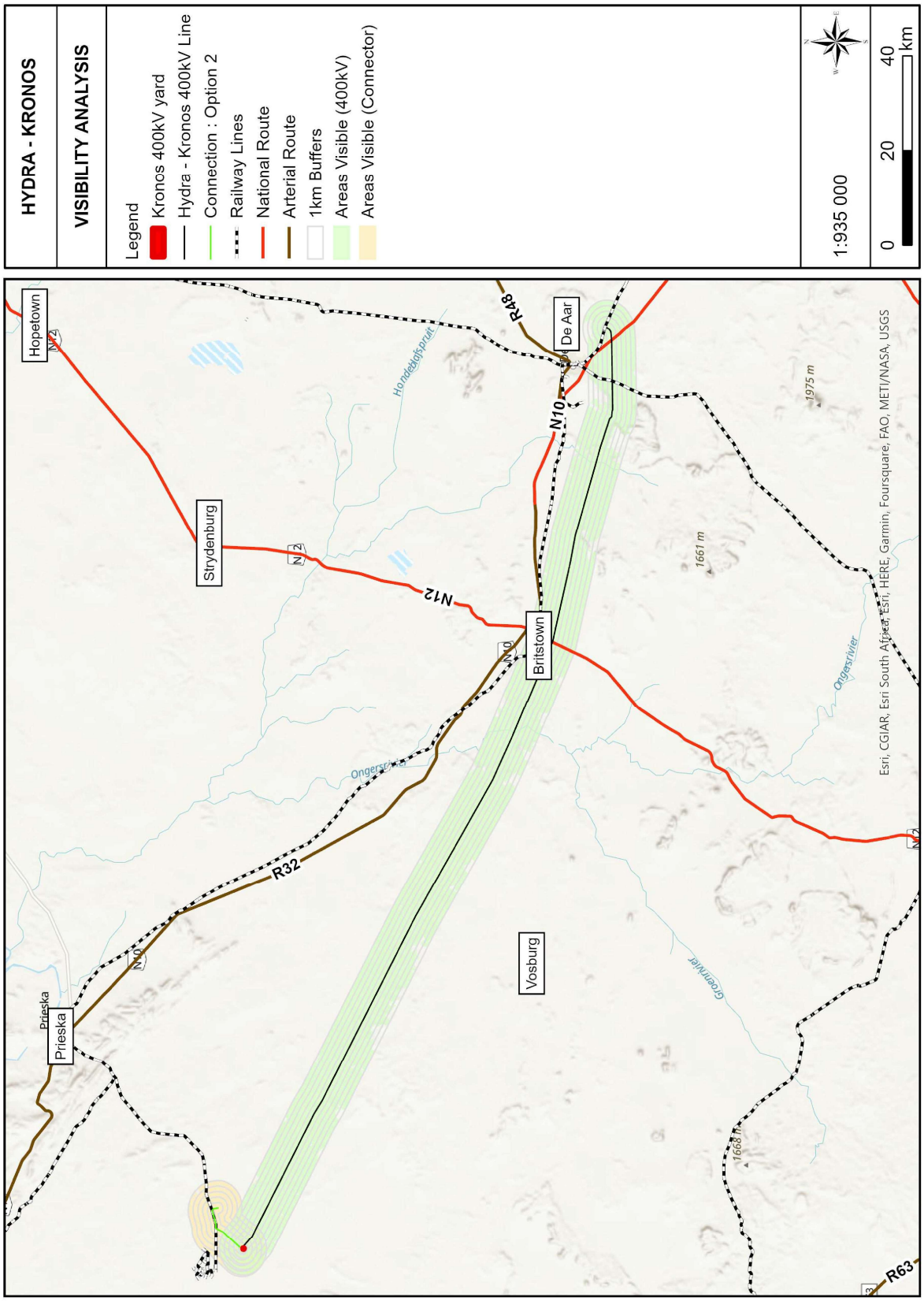
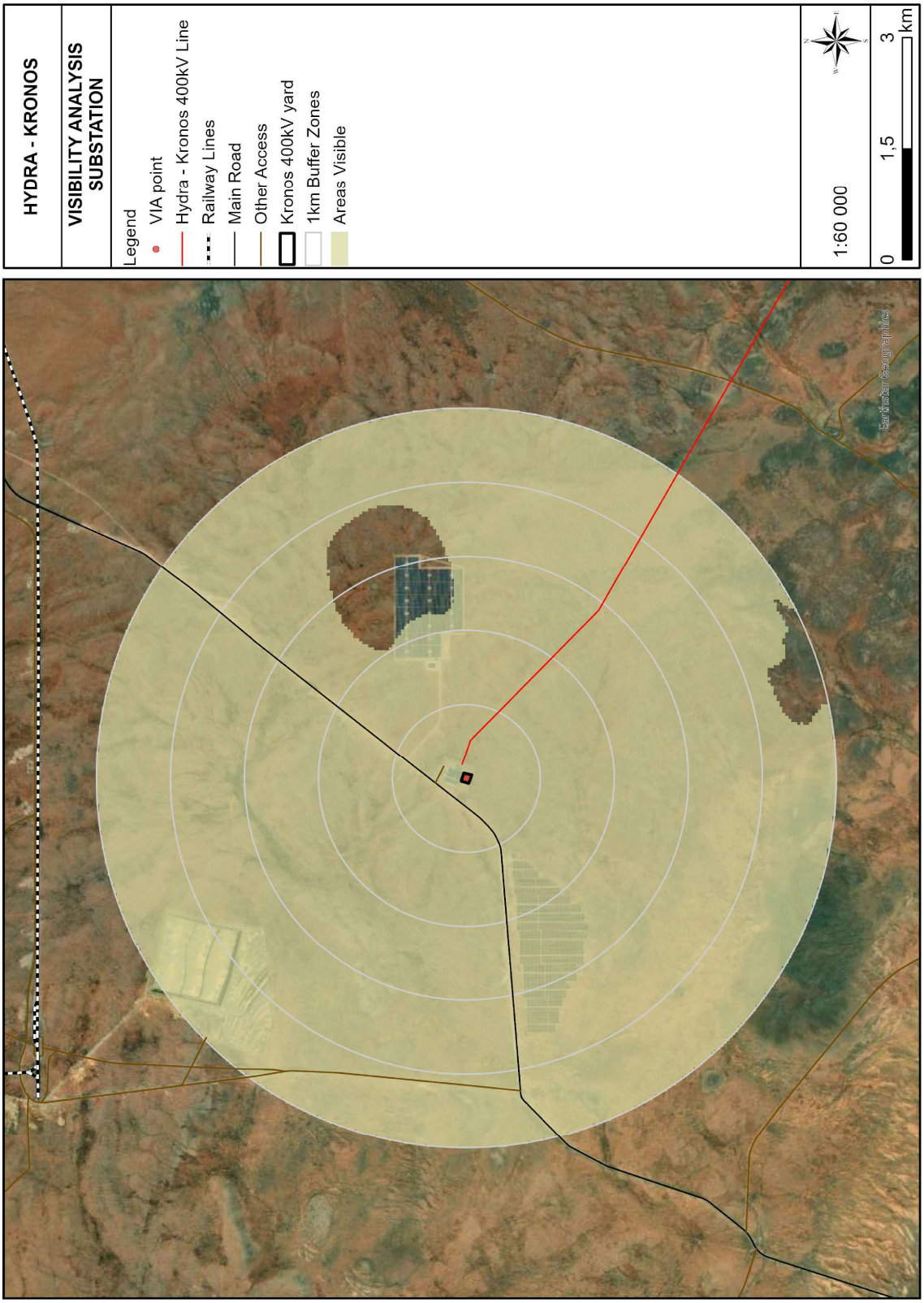


Figure 20: Visibility Analysis Kronos Substation Extension



GLOSSARY OF TERMS

Aesthetics	The science or philosophy concerned with the quality of sensory experience. (ULI, 1980)
Horizon contour	A line that encircles a development site and that follows ridgelines where the sky forms the backdrop and no landform is visible as a background. This is essentially the skyline that when followed through the full 360-degree arc as viewed from a representative point on the site defines the visual envelope of the development. This defines the boundary outside which the development would not be visible.
Landscape characterisation/ character	This covers the gathering of information during the desktop study and field survey work relating to the existing elements, features, and extent of the landscape (character). It includes the analysis and evaluation of the above and the supporting illustration and documentary evidence.
Landscape condition	Refers to the state of the landscape of the area making up the site and that of the study area in general. Factors affecting the condition of the landscape can include the level maintenance and management of individual landscape elements such as buildings, woodlands etc and the degree of disturbance of landscape elements by non-characteristics elements such as invasive tree species in grassland or car wrecks in a field.
Landscape impact	Changes to the physical landscape resulting from the development that include; the removal of existing landscape elements and features, the addition of new elements associated with the development and altering of existing landscape elements or features in such as way as to have a detrimental effect on the value of the landscape.
Landscape unit	A landscape unit can be interpreted as an “outdoor room” which are enclosed by clearly defined landforms or vegetation. Views within a landscape unit are contained and face inward.
Sense of place	That distinctive quality that makes a particular place memorable to the visitor, which can be interpreted in terms of the visual character of the landscape. A more emotive sense of place is that of local identity and attachment for a place “*which begins as undifferentiated space* [and] *becomes place as we get to know it better and endow it with value*” (Tuan 1977)[1].
Viewer exposure	The extent to which viewers are exposed to views of the landscape in which the proposed development will be located. Viewer exposure considers the visibility of the site, the viewing conditions, the viewing distance, the number of viewers affected the activity of the viewers (tourists or workers) and the duration of the views.
Viewer sensitivity	The assessment of the receptivity of viewer groups to the visible landscape elements and visual character and their perception of visual quality and value. The sensitivity of viewer groups depends on their activity and awareness within the affected landscape, their preferences, preconceptions and their opinions.
Visual absorption capacity (VAC)	The inherent ability of a landscape to accept change or modification to the landscape character and/or visual character without diminishment of the visual quality or value, or the loss of visual amenity. A high VAC rating implies a high ability to absorb visual impacts while a low VAC implies a low ability to absorb or conceal visual impacts.

[1] Cited in Climate Change and Our 'Sense of Place', http://www.ucsusa.org/greatlakes/glimpactplace.html

Visual amenity The notable features such as hills or mountains or distinctive vegetation cover such as forests and fields of colour that can be identified in the landscape and described. Also included are recognised views and viewpoints, vistas, areas of scenic beauty and areas that are protected in part for their visual value.

Visual character This addresses the viewer response to the landscape elements and the relationship between these elements that can be interpreted in terms of aesthetic characteristics such as pattern, scale, diversity, continuity and dominance.

Visual contour The outer perimeter of the visual envelope determined from the site of the development. The two dimensional representation on plan of the horizon contour.

Visual contrast The degree to which the physical characteristics of the proposed development differ from that of the landscape elements and the visual character. The characteristics affected typically include:

- Volumetric aspects such as size, form, outline and perceived density;
- Characteristics associated with balance and proportion such scale, diversity, dominance, continuity;
- Surface characteristics such as colour, texture, reflectivity; and
- Luminescence or lighting.

Visual envelope The approximate extent within which the development can be seen. The extent is often limited to a distance from the development within which views of the development are expected to be of concern.

Visual impact Changes to the visual character of available views resulting from the development that include: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the view shed experienced by visual receptors and intrusion of foreign elements into the view shed of landscape features thereby detracting from the visual amenity of the area.

Visual impact assessment A specialist study to determine the visual effects of a proposed development on the surrounding environment. The primary goal of this specialist study is to identify potential risk sources resulting from the project that may impact on the visual environment of the study area, and to assess their significance. These impacts include landscape impacts and visual impacts.

Visual quality An assessment of the aesthetic excellence of the visual resources of an area. This should not be confused with the value of these resources where an area of low visual quality may still be accorded a high value. Typical indicators used to assess visual quality are vividness, intactness and unity. For more descriptive assessments of visual quality attributes such as variety, coherence, uniqueness, harmony, and pattern can be referred to.

Visual receptors Includes viewer groups such as the local community, residents, workers, the broader public and visitors to the area, as well as public or community areas from which the development is visible. The existing visual amenity enjoyed by the viewers can be considered a visual receptor such that changes to the visual amenity would affect the viewers.

Zone of visual influence The extent of the area from which the most elevated structures of the proposed development could be seen and may be considered to be of interest (see visual envelope).

LEVEL OF CONFIDENCE

Table 13: Confidence level chart and description

CONFIDENCE LEVEL CHART				
	Information, knowledge and experience of the **project**			
Information, and knowledge of the **study area**		3b	2b	1b
	3a	9	6	3
	2a	6	4	2
	1a	3	2	1

3a – A *high* level of information is available of the **study area** in the form of recent aerial photographs, GIS data, documented background information and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.

2a – A *moderate* level of information is available of the **study area** in the form of aerial photographs GIS data and documented background information and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.

1a – *Limited* information is available of the **study area** and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

3b – A *high* level of information and knowledge is available of the **project** in the form of up-to-date and detailed engineering/architectural drawings, site layout plans etc. and the visual impact assessor is well experienced in this type of project and level of assessment.

2b – A *moderate* level of information and knowledge is available of the **project** in the form of conceptual engineering/architectural drawings, site layout plans etc. and/or the visual impact assessor is moderately experienced in this type of project and level of assessment.

1b – *Limited* information and knowledge is available of the **project** in the form of conceptual engineering/architectural drawings, site layout plans etc. and/or the visual impact assessor has a low experience level in this type of project and level of assessment. (Adapted from Oberholzer. B, 2005)

VISUAL RECEPTOR SENSITIVITY

Table 14: Visual receptor sensitivity

VISUAL RECEPTOR SENSITIVITY	DEFINITION (BASED ON THE GLVIA 2ND ED PP90-91)
Exceptional	Views from major tourist or recreational attractions or viewpoints promoted for or related to appreciation of the landscape, or from important landscape features.
High	Users of all outdoor recreational facilities including public and local roads or tourist routes whose attention or interest may be focussed on the landscape; Communities where the development results in changes in the landscape setting or valued views enjoyed by the community; Residents with views affected by the development.
Moderate	People engaged in outdoor sport or recreation (other than appreciation of the landscape);
Low	People at their place of work or focussed on other work or activity; Views from urbanised areas, commercial buildings or industrial zones; People travelling through or passing the affected landscape on transport routes.
Negligible (Uncommon)	Views from heavily industrialised or blighted areas

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