Terra Logix
CONSULTING

Environmental Management Plan

TITLE: Visual Impact: Eskom Ngwedi (Mogwase) Substation

REQUESTED BY: Baagi Environmental Consultancy cc

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Table of Contents

Tables

Figures

1 Introduction

The area of the proposed Ngwedi (Mogwase) substation is the subject of this environmental management plan in terms of visual impact.

2 Study area

The study area is located approximately 6 km south (± 190°) of Sun City. (See Figure 2)

3 Methods

The area was visited during August 2012. No serious issued were highlighted in the visual impact assessment during the EIA study [1] (see Figure 3). During the site visit representative photographs were taken, see Figures 4 to 6.

General visual impact mitigation measures are given. Furthermore, specific visual impact mitigation measures concentrating on certain parts were determined.

4 General mitigation measures

The planned substation is located in the North West province. The topography consists predominantly of plains. At a distance of approximately 250m to the east a subsidiary of the Elandsrivier passes the planned position of the substation.

Placing a substation in the above mentioned landscape will be a visual intrusion that will change the view of the landscape permanently. Furthermore, the vegetation is fairly

sparse, providing no effective screen. However, there are existing lines reducing the overall impact of this particular substation.

As the vegetation cover is generally sparse, clearing of vegetation should be restricted to an absolute minimum in aim to retain the little vegetation cover that is present.

The most important mitigation measure is planning and design in such a manner that the substation is placed is such a manner that the visual intrusion is either avoided or limited as far as possible.

Secondarily, it is important that during the construction phase the short term visual disturbance is kept to a minimum that any such disturbance is adequately rehabilitated such that no long term disturbance remains.

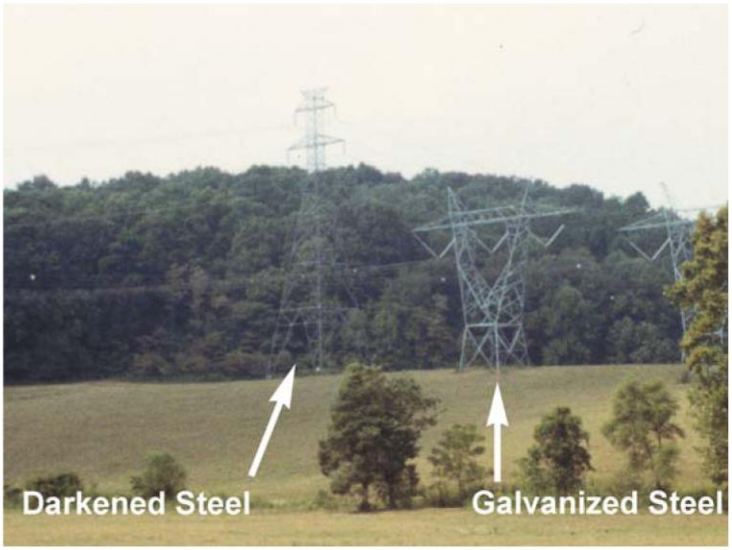

Figure 1 Darkened steel vs. galvanized steel (after AEP [2])

The visibility of especially the steel parts of the substation can be significantly reduced by using a coating on the steel that is darker than the galvanized steel [2] (See Figure 1). Using building material for the substation buildings with colours similar to the surroundings will make the buildings less intrusive. The structural design of the substation components is a further key factor as some designs are more visible than others.

Visual aspects are closely related to landscape management - damage to the landscape directly causes visual scars. Certain damage like compaction and erosion of soil can be minimised by restricting construction to the dryer winter month [3]. The general mitigation measures are given in Table 1.

5 Specific Mitigation measures

Certain visual aspects a substation are specific to this location and are thus not covered by the generic mitigation measures.

These visual aspects are highlighted, mitigation measure proposed, responsibility given and performance measures indicated [4]. The significance of the visual aspects is rated as shown in Table 2. The specific mitigation measures are given in Table 3

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Table 1 General mitigation measures

CONSTRUCTION PHASE	VISUAL ASPECT	MITIGATION
1. Access roads to substations	• Access roads on sloping landforms form long term visual scars in the landscape • Paint markings on rocks or trees disfigure the natural setting • Clearing vegetation produces visible scars in the landscape	• Use existing roads and tracks as far as possible • Select road alignments that minimise the need for cut and fill sections. • Construct cut and fill slopes to blend in with surrounding landforms. • Use material from the foundation excavations to construct water runoff diversions to minimise erosion • Use steel rods with tags for any required markings. • Clear vegetation by minimal cutting only – do not use any earth moving equipment.
2. Construction camp for substations	• Clearing vegetation for a camp site produces a visible scar in the landscape	• Clear vegetation by cutting only – do not use any earth moving equipment • All waste shall be disposed of in an adequate manner • Use vegetation as screen as far as possible.
3. Foundations for substations	• The concrete foundations, especially on sloping landforms, appear as visual marks.	• Stockpile excavated material on the upslope of the excavation • After construction, spread the excavated material such as to prevent erosion. Shape the placed material to blend in with surrounding landforms (e.g. no sharp edges) • Remove all surplus concrete. Surplus excavated material to be used for erosion diversion in the access roads and for filling

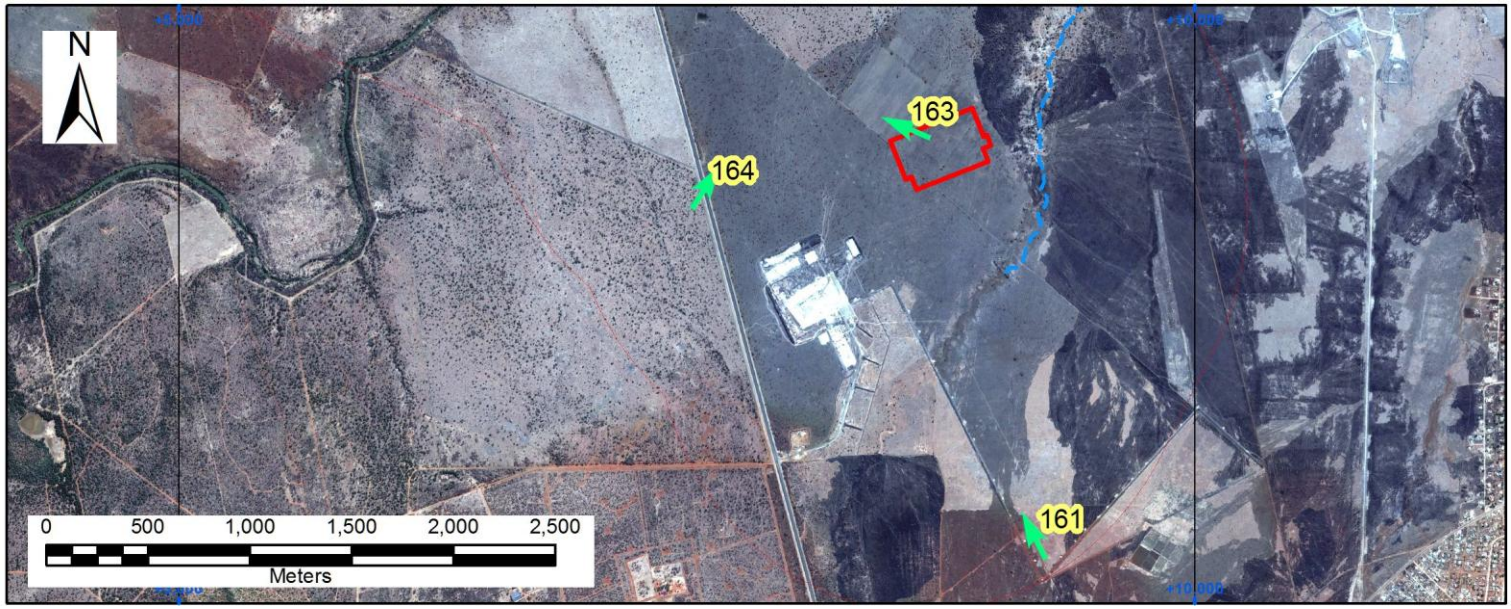
CONSTRUCTION PHASE	VISUAL ASPECT	MITIGATION
		borrow pits
4. Delivery of material for substations	• Visual degradation due to clearing vegetation for storing of components	• Select available flat areas with few large bushes or trees. • Clearing of vegetation by cutting only – do not use any earthmoving machinery
5. Construction of substations	• Disturbance to vegetation by cranes and associated machinery during the construction of the substation	• Select available flat areas with few large bushes or trees. • Clearing of vegetation by cutting only – do not use any earthmoving machinery • Repair damaged areas as soon as operation is complete.
6. Borrow pits for substations	• Excavation of burrow pits causes visual scars in the landscape, especially on sloping landforms	• Use suitable flat areas • Remove 500mm of topsoil and stockpile • Use vegetation as screen as far as possible • Use surplus material from foundation excavations as filling material.
7. Rehabilitation for substations	• General damage to the land surface will increase with erosion, resulting in long term visual scars.	• Break-up the soil in all areas compacted by machinery and use stockpiled material to reshape disturbed areas to blend into the respective surrounding landscape • Seed with approved indigenous species • In agreement with the landowner, fence of rehabilitated areas on sloping landforms for at least two years to prevent access of game and/or livestock.

OPEARTIONAL PHASE	VISUAL ASPECT	MITIGATION
1. Maintenance of mitigation measures	• Effectiveness of mitigation measures applied during and after construction • Closely linked to landscape management – failure has a negative visual implication (e.g. erosion)	• Quarterly inspection of all rehabilitated areas • Immediate remedial action in areas that show ineffective rehabilitation • Monitor the progress of the rehabilitation measures and apply different techniques were necessary until acceptable rehabilitation has been achieved

Table 2 Significance rating

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

Table 3 Specific mitigation measures



VISUAL ASPECT	MITIGATION	RESPONSIBILITY	PERFORMANCE MEASURE
• Nearby drainage lines P4 x (D4+S1+M2) = 28 (Low) (see Table 2)	• Special attention to erosion protection	Contractor, ECO	• No long term visual scars due to increased erosion

6 References

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FIGURES

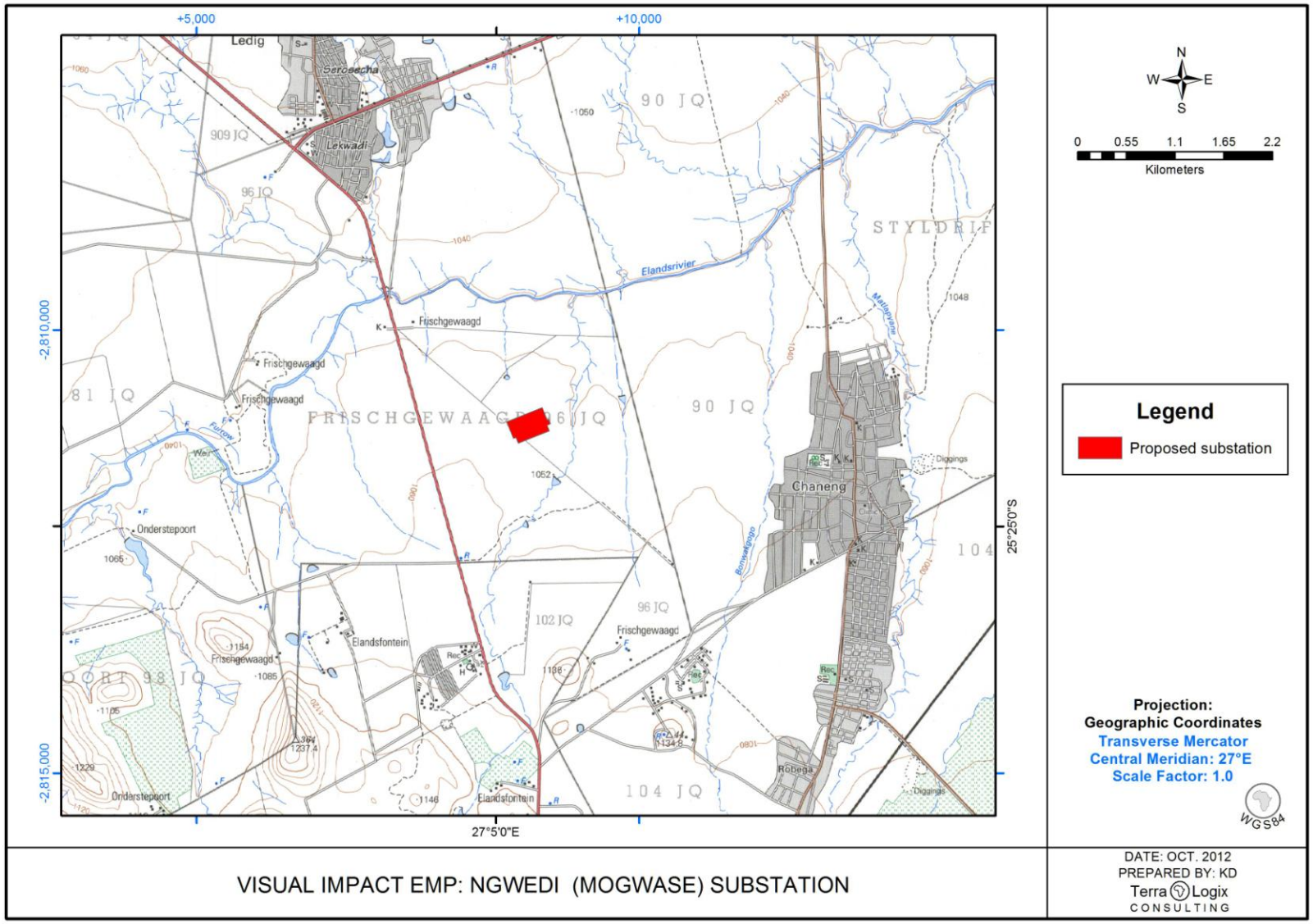

Figure 2 Locality map

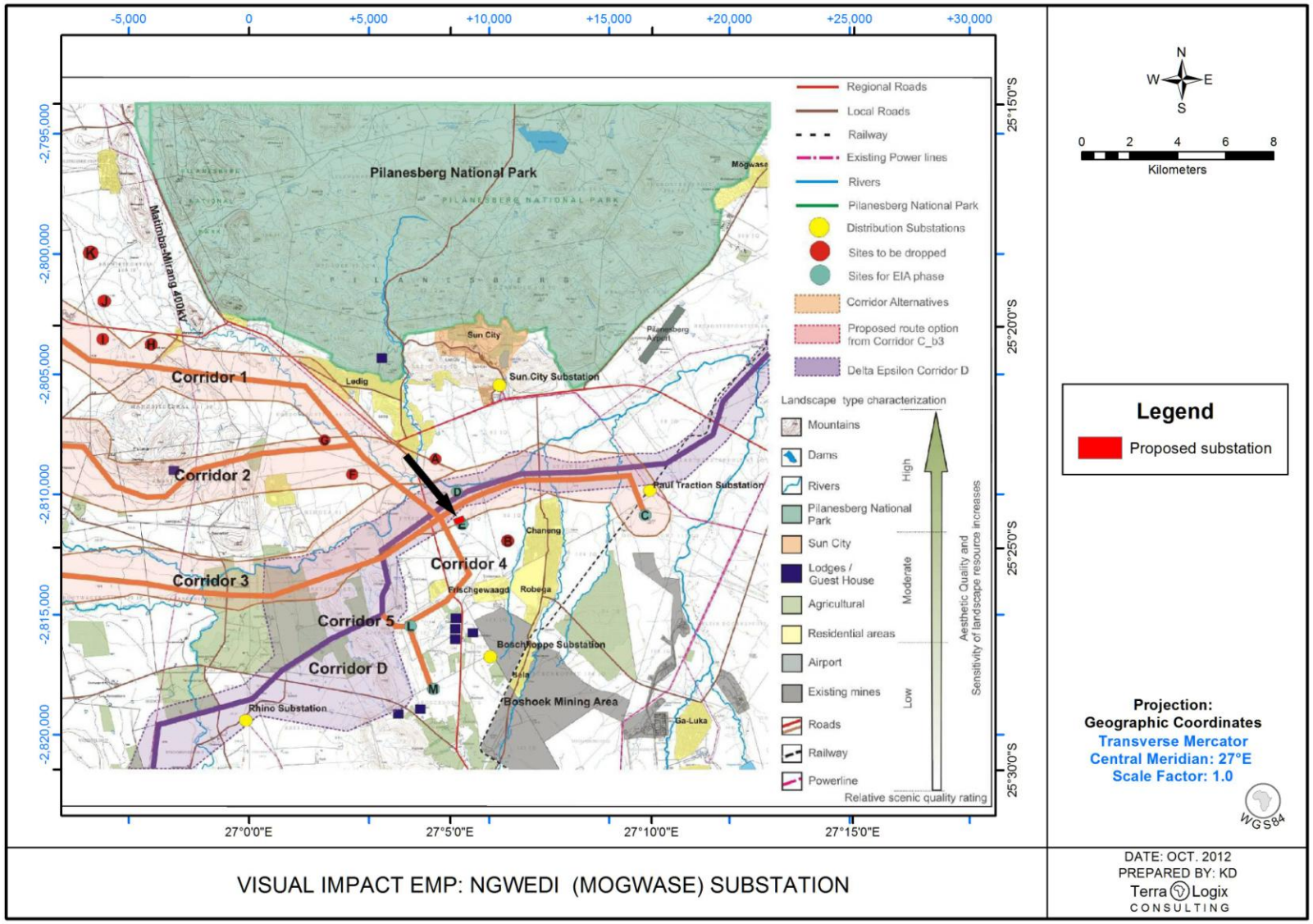

Figure 3 Visual resource (EIA [1])

Figure 4 Photo 161

Figure 5 Photo 163

Figure 6 Photo 164