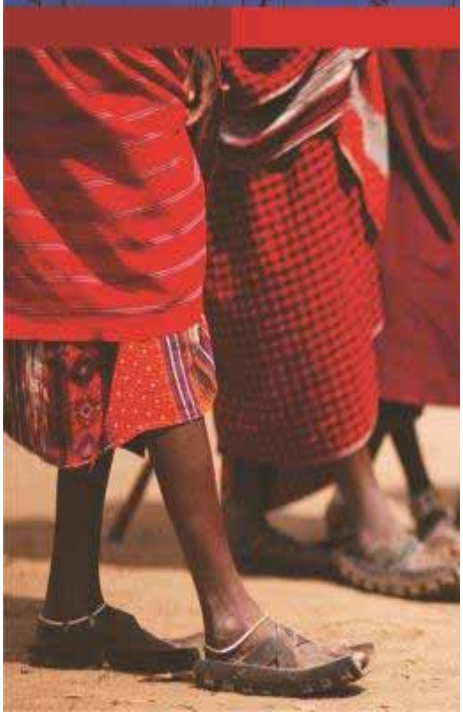

DIGBY WELLS
ENVIRONMENTAL

Integrated Environmental Impact Assessment for the Proposed Palmietkuilen Mining Project near Springs, Gauteng

Visual Impact Assessment Report

Project Number:

CNC4065

Prepared for:

Canyon Coal (Pty) Ltd

January 2017

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Visual Impact Assessment Report**
Project Name:	**Integrated Environmental Impact Assessment for the Proposed Palmietkuilen Mining Project near Springs, Gauteng**
Project Code:	**CNC4065**

Name	Responsibility	Signature	Date
Stephanie Mulder	Report Writer		January 2017
Renée van Aardt	Reviewer		January 2017

DECLARATION OF INDEPENDENCE

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I, Stephanie Claire Mulder as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Canyon Coal (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the proposed development of an open pit coal mine and supporting infrastructure, located near Springs, Gauteng Province.

_____

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Title/ Position:	Unit Manager: GIS
Qualification(s):	BSc Honours in Geography
Experience (Years):	10 years
Registration(s):	GISSA

EXECUTIVE SUMMARY

Digby Wells Environmental (Digby Wells) has been appointed by Canyon Coal as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment (EIA) for the proposed Palmietkuilen Mining Project (the Project). This includes the associated specialist studies and the required Public Participation Process (PPP). The environmental considerations for the impact assessment phase of the EIA included a Visual Impact Assessment (VIA) for the Project.

Canyon Coal (Pty) Ltd (Canyon Coal) is proposing the development of a new open pit coal mine and supporting infrastructure located on portions 1, 2, 4, 9, 13 and 19 of the farm Palmietkuilen 124 IR located in the Lesedi Local Municipality and the Sedibeng District Municipality of the Gauteng Province, South Africa.

The current resource is estimated at 125.98 Mt. The life of mine (LoM) for the Project is 53 years including a 2 year ramp-up period. Once the mine has been established a full production rate of 200 000 t/month will be maintained for 51 years.

The Project is located 7.4 km east of the town of Springs. The Project area and surrounds are characterised by residential settlements, small holdings, agriculture and open land interspersed with areas disturbed by mining activities. The Project area falls within the Lesedi Local Municipality and the Sedibeng District Municipality of the Gauteng Province, South Africa. The settlements of Aston Lake and Largo are situated on the western and south-western boundaries of the Project area respectively. The residential areas in the Project area and surrounds are all potential visual receptors of the Project.

Road users in the Project areas and surrounds are also potential visual receptors of the Project. The R29 regional roads run through Largo settlement and the south-western part of the Project area. The N12 and N17 national routes are situated approximately 6.8 km north and 260 m south of the Project area respectively. The R42 regional road is situated approximately 1.1 km east, the R51 is situated approximately 6.5 km west and the R555 is situated approximately 3.8 km north of the Project area.

With the exception of the urban areas to the west of the Project area, the Project area and surrounds have a largely agricultural sense of place interspersed with isolated mining activities. There are numerous small holdings, farm residences and farm workers houses scattered throughout the Project area and surrounds. The people living and working in these agricultural areas are potential visual receptors of the Project.

Several mines and mining activities occur in the vicinity of the Project. These include the Ergo Mining Proprietary Limited (Ergo) Grootvlei and Marievale old dump clusters as well as the Daggafontein gold tailings deposition site to the west and south-west of the Project area. There are three operational open pit coal mines near the Project. The Manungu Colliery is located 5.7 km east of the Project area and the Universal Coal Plc Kangala Coal Mine and the Exxaro Leeuwpan Coal Mine are located 6 km and 12 km north-east of the Project area

respectively. The nearest power station is the Kendal power station located 39.4 km north-east of the Project area. Plan 2 (Appendix B) illustrates the local setting of the Project.

The Project area and surrounds have numerous heritage sites including archaeological sites, burial grounds and graves, and historical buildings. The Palmietkuil South War Cemetery Memorial is situated on a hill overlooking the Aston Lake settlement and adjacent to the boundary of the Project area (Digby Wells, 2016b). Visitors to these heritage sites are potential visual receptors of the Project.

People visiting the area for birdwatching and fishing are potential visual receptors of the Project. Protected areas such as nature reserves, and recreational and tourism areas are also considered sensitive visual receptors. The Blesbokspruit Important Bird Area (IBA) is located on the Blesbokspruit River and includes the tributary with the Dwars-in-die-wegvlei and Aston Lake that flows through the Project area. The Devon Grasslands IBA is located 9.5 km south-east of the Project area. The Marievale Bird Sanctuary is situated on the Blesbokspruit River and the Benoni Angling Society is based at Aston Lake. The Blesbokspruit River flows in a southerly direction approximately 1.2 km west of the Project area. The Blesbokspruit River in this area is internationally recognised as a Ramsar Wetland Site.

The Project area and surrounds are gently undulating with numerous hills and valleys. The topographical model indicates that the elevation of the Project area increases from 1 567 metres above mean sea level (m.a.m.s.l.) at Aston Lake in the west to 1 636 m.a.m.s.l in the eastern corner of the Project area. The undulating topography is expected to provide moderate screening of the proposed development.

According to Mucina and Rutherford (2012) the dominant vegetation types of the Project area and surrounds are Eastern Highveld Grassland, Soweto Highveld Grassland and Tsakane Clay Grassland interspersed with Eastern Temparate Freshwater Wetlands and Andesite Mountain Bushveld along the Blesbokspruit River and its tributaries (Digby Wells, 2016a). Much of the area has been transformed by residential areas, small holdings, agriculture and mining and little natural vegetation remains. The agricultural and remaining natural Grassland vegetation will only provide minimal screening of the Project. There are existing rows of trees planted near some farm residences as windbreaks/vegetation screens. It is anticipated that these trees will have a screening effect and will reduce the visual impact of the Project on these farm residences.

A viewshed is a geographical area, defined by the topography, within which a particular feature will be visible (Oberholzer, 2005). Theoretical and practical viewshed models were created for the Project. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models show the areas from which the Project may potentially be visible.

The theoretical viewshed model was refined to daytime and night time practical viewshed models with a buffer of 10 km around the proposed infrastructure and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure and associated night time

lighting will be noticeable beyond this 10 km buffer. The practical viewshed models cover an area of approximately 275.79 km².

The potential visual receptors identified within the daytime and night time practical viewshed areas include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.

The receiving environment of the Project has a high visual sensitivity due to the proximity of the Blesbokspruit Ramsar Site and IBA and the Marievale Nature Reserve and Bird Sanctuary (Digby Wells, 2016a). The Project has a high visibility and a high visual exposure as it will be visible from a large area, dominant in the landscape and clearly noticeable to receptors within the viewshed area. The Project has a high visual intrusion as it results in a noticeable change and is discordant with the surroundings.

The identified receptors (residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings, road users and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial) of the Project have a moderate sensitivity as they include residential, industrial, agricultural and natural areas. The receiving environment of the Project has a low Visual Absorption Capacity (VAC) because there is little screening provided by the topography and vegetation.

The “guideline for involving visual and aesthetic specialists in EIA processes” document by Oberholzer (2005) identifies quarrying and mining activities as a Category 5 development. The receiving environment of the Project is classified as a protected area of international significance due to the proximity of the Blesbokspruit Ramsar Site to the Project and a Category 5 development in this area is expected to have a very high visual impact. The findings of this VIA concur with this categorisation.

Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain (Digby Wells, 2016c). This will result in a permanent and irreversible negative visual impact on the receiving environment. This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography.

Based on the findings of this VIA only (not taking into account the findings of any other studies), it is recommended that the Project can proceed together with the implementation of all the mitigation/management actions stipulated (including re-contouring and profiling the Project area to create a free-draining topography).

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LIST OF ACRONYMS & ABBREVIATIONS

3D	Three-dimensional
Canyon Coal	Canyon Coal (Pty) Ltd
CD:NGI	Chief Directorate: National Geospatial Information
CV	Curriculum Vitae
Digby Wells	Digby Wells Environmental
DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EMP	Environmental Management Plan
Ergo	Ergo Mining Proprietary Limited
GHG	Greenhouse Gas
GIMP	GNU Image Manipulation Program
GIS	Geographic Information System
GP	Gauteng Province
ha	hectares
IFC	International Finance Corporation
km	kilometres
LoM	Life of Mine
m	metres
m.a.m.s.l.	metres above mean sea level
mm	millimetres
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
Mt	Million tonnes
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:PAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
Pandospan	Pandospan (Pty) Ltd
PCD	Pollution Control Dam
PPP	Public Participation Process

PR	Prospecting Right
RoM	Run of Mine
SAPAD	South African Protected Areas Database
t/month	Tonnes per month
T&VIA	Topography and Visual Impact Assessment
TSF	Tailings Storage Facility
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment

1 Introduction

“Visual, scenic and cultural components of the environment can be seen as a resource, much like any other resource, which has a value to individuals, to society and to the economy of the region. In addition, this resource may have a scarcity value, be easily degraded, and is usually not replaceable” (Oberholzer, 2005).

The significance of the long term visual impacts of a proposed development will determine the acceptability of the development to receptors. An understanding of the visual/aesthetic character of a landscape allows the sensitivity of the landscape to be determined. This in turn indicates the ability of the landscape to accommodate visual change. A Visual Impact Assessment (VIA) is performed to identify the potential visual impacts of a proposed project on the receiving environment.

This report describes the visual/aesthetic character of the receiving environment and the expected visual impacts of the proposed Palmietkuilen Mining Project (the Project). The impacts are described and rated, and mitigation/management actions proposed to reduce the negative impacts of the Project.

2 Project Description

2.1 Project Background

In June 2016, Pandospan (Pty) Ltd (Pandospan) concluded a contract with Anglo Operations Limited in support of the acquisition of a Prospecting Right (PR) for coal (Department of Mineral Resources (DMR) reference number GP 30/5/1/1/2 (201/10026) PR). The Prospecting Right includes portions 1, 2, 4, 9, 13 and 19 of the farm Palmietkuilen 241 IR located in Springs, Sedibeng District, Gauteng Province. The mine, and mining-related infrastructure, will be placed on portion 2.

The integrated environmental regulatory processes for the Project will be managed by Pandospan on behalf of Anglo Operations Limited, the Project applicant. Pandospan forms part of the Canyon Group of Companies for which Canyon Coal functions as the operational division. Canyon Coal is a well-established South African mining company. Since the inception of their first operating mine in 2009, Canyon Coal has brought two additional mines online. The Palmietkuilen Mining Project constitutes one of four future mining projects, pending environmental and other authorisations.

This Project involves the development of a new open pit coal mine and supporting infrastructure. The raw coal, once extracted, will be transported to a processing plant for crushing, screening and washing. The coal product will either be transported via haul roads from the product stockpile area to the existing Welgedacht siding for distribution by rail or directly to prospective clients by road. The proposed mine will require supporting infrastructure such as water storage, sewage treatment, power supply, fuel storage, hauls roads etc.

The current resource is estimated at 125.98 Mt. The life of mine (LoM) for the Project is 53 years including a 2 year ramp-up period. Once the mine has been established a full production rate of 200 000 t/month will be maintained for 51 years.

2.2 Activities per Project Phase

The following activities are envisioned for each of the Project phases:

2.2.1 Construction

- Site establishment;
- Site clearing, including the removal of topsoil and vegetation;
- Construction of mine related infrastructure, including haul roads, pipes and dams;
- Construction of washing plant;
- Relocation of Infrastructure;
- Blasting and development of initial box-cut for mining, including stockpiling from initial box-cut; and
- Temporary storage of hazardous products, including fuel and explosives, as well as waste and sewage.

2.2.2 Operational

- Stripping topsoil and soft overburden;
- Removal of overburden, including drilling and blasting of hard overburden;
- Loading, hauling and stockpiling of overburden;
- Drilling and blasting of coal;
- Loading, hauling and stockpiling of Run of Mine (RoM) coal;
- Use and maintenance of haul roads for the transportation of coal to the washing plant;
- Operation of washing plant and discard dump;
- Water use and storage on-site; and
- Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste.

2.2.3 Decommissioning and Closure

- Demolition and removal of all infrastructure, including transporting materials off site;
- Rehabilitation, including spreading of soil, re-vegetation and profiling or contouring;
- Environmental monitoring of decommissioning activities; and

- Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste.

2.2.4 Post-Closure

- Post-closure monitoring and rehabilitation.

2.3 Terms of Reference

Digby Wells Environmental (Digby Wells) has been appointed by Canyon Coal as the independent Environmental Assessment practitioner (EAP) to conduct the Environmental Impact Assessment (EIA) for the Project. This includes the associated specialist studies and the required Public Participation Process (PPP). The environmental considerations for the impact assessment phase of the EIA included a VIA for the Project.

3 Details of Specialist

A Curriculum Vitae (CV) is attached in Appendix A.

Stephanie Mulder is Unit Manager of the Geographical Information System (GIS) Unit at Digby Wells. She obtained a BSc Geography and Informatics with Financial Orientation degree and a BSc (Hons) degree in Geography from the University of Johannesburg. Stephanie joined Digby Wells as a GIS Specialist in September 2009 and became Unit Manager of the GIS Unit in July 2012. She is responsible for managing the GIS staff and overseeing all GIS work. Stephanie has experience writing Topography and Visual Impact Assessment (T&VIA) specialist reports. She has experience managing GIS specific projects and has also managed several social survey projects. Stephanie has a strong technical GIS background and has experience using GIS as a digital cartographic and spatial analytical tool. She also has experience with interactive mapping, sensitivity analysis, site selection and remote sensing projects.

4 Relevant Legislation

The following international, national and regional documents form part of the legislative and policy framework of the visual assessment.

4.1 International Conventions

The European Landscape Convention (ELC) created by the Council of Europe, was the first international convention to focus exclusively on landscapes. The purpose of this convention is to promote effective management and planning of landscapes. It was signed by the United Kingdom government in 2006 and became binding from 2007. Public documents that explore the impacts of large scale developments, as defined in the ELC, on any landscape should take into account the effects of these developments. A landscape means “an area, as perceived by people, whose character is the result of the action and interaction of natural

and/or human factors" i.e. the natural, visual and subjectively perceived landscape, (Contesse, 2011; European Landscape Convention, 2007).

There is no regional or local scale legislation pertaining to mining activities and visual assessments exclusively but visual assessments are relevant to the International Finance Corporation's (IFC) Performance Standards and this will be treated as a best practice guideline.

IFC Performance Standard 3: Resource Efficiency and Pollution Prevention is applicable to the visual assessment. Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional and global levels. For the purposes of this Performance Standard, the term 'pollution' is used to refer to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases, and includes other components such as pests, pathogens, thermal discharge to water, Greenhouse Gas (GHG) emissions, nuisance odours, noise, vibration, radiation, electromagnetic energy and the creation of potential visual impacts including light (IFC, 2012).

The Environmental, Health and Safety Guidelines for Mining therefore need to be considered (World Bank, 2007):

"Mining operations, and in particular surface mining activities, may result in negative visual impacts to resources associated with other landscape uses such as recreation or tourism. Potential contributors to visual impacts include high walls, erosion, discoloured water, haul roads, waste dumps, slurry ponds, abandoned mining equipment and structures, garbage and refuse dumps, open pits, and deforestation. Mining operations should prevent and minimise negative visual impacts through consultation with local communities about potential post-closure land-use, incorporating visual impact assessment into the mine reclamation process. Reclaimed lands should, to the extent feasible, conform to the visual aspects of the surrounding landscape. The reclamation design and procedures should take into consideration the proximity to public viewpoints and the visual impact within the context of the viewing distance. Mitigation measures may include strategic placement of screening materials including trees and use of appropriate plant species in the reclamation phase as well as modification of the placement of ancillary and access roads."

4.2 National Legislation and Policy

At a national level, the following legislative documents potentially apply to the topography and visual assessment:

- Regulations in Chapter 5 (Integrated Environmental Management) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Act in its entirety. The Act states that "the State must respect, protect, promote and fulfil the social, economic and environmental right of everyone…" Landscape is both moulded by, and moulds, social and environmental features;

- Section 23(1)(d) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), where it is mentioned that a mining right will be granted if "the mining will not result in unacceptable pollution, ecological degradation or damage to the environment". Visual pollution is a form of environmental pollution and therefore needs to be considered under this section. Holders of rights granted in terms of the MPRDA must at all times give effect to the general objectives of integrated environmental management laid down in Chapter 5 of the NEMA. The Regulations promulgated in terms of the NEMA, with which holders of rights must comply, provide for the assessment and evaluation of potential impacts, and the setting of management plans to mitigate such impacts.
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and related provincial regulations – in some instances there are policies or legislative documents that give rise to the protection of listed sites. The NHRA states that it aims to promote "good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed for future generations". A holistic landscape whose character is a result of the action and interaction and/or human factors has strong cultural associations as societies and the landscape in which they live are affected by one another in many ways; and
- Section 17 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA) sets out the purposes of the declaration of areas as protected areas which includes the protection of natural landscapes. Landscapes are defined by the natural, visual and subjectively perceived landscape; these aspects of a landscape are intertwined to form a holistic landscape context.

5 Aim and Objectives

The aim of this VIA is to determine the nature of the Project area and the impact of the Project on the visual/aesthetic character of the surrounding landscape. The following objectives have been identified to achieve this aim:

- Examine aerial photography available for the Project area from the Chief Directorate: National Geo-Spatial Information (CD:NGI), 2012;
- Create and analyse topographical, slope intensity and slope aspect models in ArcGIS 3D Analyst Extension;
- Create and analyse viewshed models in ArcGIS 3D Analyst Extension for daytime and night-time scenarios;
- Visit the Project area to verify these models;
- Describe the topography and visual/aesthetic character of the receiving environment;
- Describe the current and post development visual aspects of the Project area;
- Create photomontages to illustrate the current and potential future views of the Project area;

- Identify sensitive visual receptors and key public viewpoints that will be impacted on by the proposed, taking into account visibility aspects;
- Identify the impacts, pre- and post-mitigation that the proposed infrastructure will have on the topographical and visual landscape, by rating the scale, duration, severity and probability of the impacts occurring; and
- Provide mitigation/management actions and recommendations in an attempt to reduce the potential visual impacts.

6 Assumptions and Limitations

A VIA is open to subjectivity. This subjectivity is due to the different opinions receptors may have of a proposed project. Oberholzer (2005) defines receptors as “individuals, groups or communities who are subject to the visual influence of a particular project”. A receptor may be partial to the fact that a proposed project is occurring in an area, which becomes a source of economic upliftment for a community, whereas another receptor may view a proposed project as a negative factor which could hamper tourism or recreational activities.

Many factors can enhance or reduce the visual impact of a proposed project. Vegetation near a receptor’s viewpoint can greatly reduce that receptor’s view of a proposed project. Other factors such as weather/climatic conditions and seasonal change can also affect a receptor’s view of a proposed project.

It is, therefore, difficult to determine the visual impact of the Project from the viewpoint, as well as perspective, of each individual receptor. Consequently, this report focuses on the size of the viewshed area as an indication of the significance of the visual impacts of the Project. Four (4) key viewpoints were selected for the photomontages to provide an example of the expected views of the Project (refer to Section 9.4 below).

The 5 metre contour relief data from CD:NGI does not include contours for any of the mining activities (dumps and tailings storage facilities (TSFs)) for the Project area and surrounds. These dumps and TSFs could potentially provide some screening of the Project. To produce a more representative topographical model, the contour data was edited and contours added for these mining activities. This will increase the accuracy of the viewshed modelling to be conducted during the impact assessment phase.

Some infrastructure heights were not available for this study and assumptions were made. These assumptions were based on the heights of infrastructure from similar projects and confirmed by the client.

The site visit took place on 18th October 2016. The weather conditions were mainly sunny skies with some small clouds and haze at times. Hazy conditions are not optimal conditions to take photographs for use in a VIA but sufficient visual observations and photographs were obtained for this study.

The local study area for the Heritage Impact Assessment was defined as the Lesedi Local Municipality and heritage resources were only identified within this local study area (Digby

Wells, 2016b). Due to the location of the Project area in the northern corner of the Lesedi Local Municipality, the viewshed area extends into parts of three local municipalities (Ekurhuleni, Lesedi and Victor Khanye Local Municipalities). It was therefore not possible to accurately determine how many heritage sites would be potential visual receptors of the Project.

7 Project Area

The Project is located 7.4 km east of the town of Springs. The Project area and surrounds are characterised by residential settlements, small holdings, agriculture and open land interspersed with areas disturbed by mining activities. Plan 1 (Appendix B) illustrates the regional setting of the Project.

The Project covers an area of approximately 3 422 ha. The coordinates of the centre of the Project area 26° 15’ 07.073” S and 28° 33’ 39.643” E. The Project area is situated on portions 1, 2, 4, 9, 13 and 19 of the farm Palmietkuilen 241 IR.

The Project area falls within the Lesedi Local Municipality and the Sedibeng District Municipality of the Gauteng Province, South Africa. The settlements of Aston Lake and Largo are situated on the western and south-western boundaries of the Project area respectively.

The residential areas in the Project area and surrounds are all potential visual receptors of the Project. The closest towns and settlements, as well as their direct distance and direction from the Project area are summarised in Table 1. All distances are straight line distances measured from the edge of the Project area to the centre of the towns/settlements.

Table 1: Closest Towns and Settlements

Name	Type	Direct Distance	Direction
Aston Lake	Settlement	0km	W
Largo	Settlement	0 km	SW
Vischkuil	Settlement	1.9 km	SW
Welgedacht	Other Town	2.8 km	NW
Endicott	Settlement	3.8 km	SSW
Strubenvale	Other Town	3.8 km	W
Sundra	Settlement	4.8 km	N
Daggafontein	Other Town	4.9 km	WSW
Springs	Major Town	7.4 km	W
Geduld	Other Town	8 km	WNW
Eloff	Other Town	8.4 km	NNE
Marievale	Settlement	9.5 km	SSW

Road users in the Project areas and surrounds are potential visual receptors of the Project. The R29 regional roads run through Largo settlement and the south-western part of the Project area. The N12 and N17 national routes are situated approximately 6.8 km north and 260 m south of the Project area respectively. The R42 regional road is situated approximately 1.1 km east, the R51 is situated approximately 6.5 km west and the R555 is situated approximately 3.8 km north of the Project area.

With the exception of the urban areas to the west of the Project area, the Project area and surrounds have a largely agricultural sense of place interspersed with isolated mining activities. There are numerous small holdings, farm residences and farm workers houses scattered throughout the Project area and surrounds. The people living and working in these agricultural areas are potential visual receptors of the Project.

Several mines and mining activities occur in the vicinity of the Project. These include the Ergo Mining Proprietary Limited (Ergo) Grootvlei and Marievale old dump clusters as well as the Daggafontein gold tailings deposition site to the west and south-west of the Project area. There are three operational open pit coal mines near the Project. The Manungu Colliery is located 5.7 km east of the Project area and the Universal Coal Plc Kangala Coal Mine and the Exxaro Leeuwpan Coal Mine are located 6 km and 12 km north-east of the Project area respectively. The nearest power station is the Kendal power station located 39.4 km north-east of the Project area. Plan 2 (Appendix B) illustrates the local setting of the Project.

The Project area and surrounds have numerous heritage sites including archaeological sites, burial grounds and graves, and historical buildings. The Palmietkuil South War Cemetery Memorial is situated on a hill overlooking the Aston Lake settlement and adjacent to the boundary of the Project area. This site comprises 217 Commonwealth war graves affiliated with soldiers who died during the Second World War and a monument in their honour (Digby Wells, 2016b). Visitors to these heritage sites are potential visual receptors of the Project.

People visiting the area for birdwatching and fishing are potential visual receptors of the Project. The Marievale Bird Sanctuary is situated on the Blesbokspruit River and the Benoni Angling Society is based at Aston Lake. The Project area falls within the Upper Vaal River Catchment and is bordered by the Olifants River Catchment on the east. The Blesbokspruit River flows in a southerly direction approximately 1.2 km west of the Project area. Several tributaries of the Blesbokspruit River run through the Project area. One of these tributaries includes the Dwars-in-die-wegvlei and Aston Lake. The Project area and surrounds are interspersed with streams, wetlands and pans. The Blesbokspruit River in this area is internationally recognised as a Ramsar Wetland Site.

Protected areas such as nature reserves, and recreational and tourism areas are considered sensitive visual receptors. The Blesbokspruit Important Bird Area (IBA) is located on the Blesbokspruit River and includes the tributary with the Dwars-in-die-wegvlei and Aston Lake that flows through the Project area. The Devon Grasslands IBA is located 9.5 km south-east of the Project area.

The closest protected areas identified from the South African Protected Areas Database (SAPAD) (Department of Environmental Affairs, 2016), as well as their direct distance and direction from the Project area are summarised in Table 2. All distances are straight line distances measured from the edge of the Project area to the edge of the protected area. The IBAs and protected areas are illustrated on Plan 3 (Appendix B).

Table 2: Protected Areas

Name	Type	Direct Distance	Direction
Blesbokspruit Ramsar Site	Ramsar Site	870 m	W
Marievale Nature Reserve	Nature Reserve	1.1 km	W
Nicolaas Private Nature Reserve	Nature Reserve	13.6 km	SSE
Voortrekker Private Nature Reserve	Nature Reserve	15.2 km	S
Ian P. Coetzer Private Nature Reserve	Nature Reserve	18.5 km	WSW
Avalon Private Nature Reserve	Nature Reserve	18.8 km	WSW
Andros Private Nature Reserve	Nature Reserve	18.9 km	WSW
Westdene Pan Nature Reserve	Nature Reserve	22 km	NW
Daisy Private Nature Reserve	Nature Reserve	23 km	SSW

8 Methodology

The VIA was performed using surveyed geographically referenced information and aerial photography, together with the professional opinion of an experienced visual impact assessor.

A study was conducted to identify and evaluate the surface features using ArcGIS 3D Analyst Extension to create a topographical model, and the resultant slope intensity, slope aspect and viewshed models.

8.1 Characterisation of Visual Impacts

The expected visual impact of the Project was categorised based on the type of receiving environment and the type of development as detailed in Table 3 (Oberholzer, 2005). This table provides an indication of the visual impacts that can be expected for different types of developments in relation to the nature of the receiving environment. Following the classification system of Oberholzer (2005), the Project is classed as a **Category 5 development** (Table 4). The receiving environment can be described as a **protected area of international significance** due to the proximity of the Blesbokspruit Ramsar Site to the Project. It is therefore expected that the Project will have a **very high visual impact** on the receiving environment. This will be verified in the investigation to follow.

Table 3: Categorisation of Expected Visual Impact (adapted from Oberholzer, 2005)

Type of Environment	Type of Development (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 or 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 or historical significance	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

Table 4: Key to Categorisation of Development (adapted from Oberholzer, 2005)

Type of Development	Examples of Development
Category 1	Nature reserves, nature related recreation, camping, picnicking, trails and minimal visitor facilities.
Category 2	Low-key recreation/resort/residential type development, small-scale agriculture/nurseries, narrow roads and small-scale infrastructure.

Type of Development	Examples of Development
Category 3	Low density resort/residential type development, golf or polo estates, low to medium-scale infrastructure.
Category 4	Medium density residential development, sports facilities, small-scale commercial facilities/office parks, one-stop petrol stations, light industry, medium-scale infrastructure.
Category 5	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.**

8.2 Visual/Aesthetic Character and Topography

A desktop study was conducted to evaluate the topography of the receiving environment and CD:NGI aerial photography (flown in 2012) of the area was examined to determine the surface features. Available vector GIS data was used to determine the relative location of the features surrounding the Project area.

A topographical model (Plan 4, Appendix B) was created using ArcGIS 3D Analyst Extension. The model was created using the 5 metre contour relief data available from CD:NGI.

The resultant topographical model was then used to create slope intensity (Plan 5, Appendix B) and slope aspect (Plan 6, Appendix B) models using the Slope and Aspect tools of ArcGIS 3D Analyst Extension. The slope model indicates the slope degree and was classified using the Natural Breaks (Jenks)[1] classification method.

The information gathered from the above desktop study was verified with a site visit. The combined information from the desktop study and the site visit forms the basis of this report.

8.3 Viewshed Analysis

The resultant topographical model was used to create a viewshed model using the Viewshed Tool of the ArcGIS 3D Analyst Extension. This viewshed model illustrates the areas from which the Project will potentially be visible, taking into account the estimated height of the proposed infrastructure (Table 5). Some infrastructure heights were not available for this study and assumptions were made. These assumptions were based on the heights of

[1] The Natural Breaks (Jenks) classification method splits data into classes based on natural groupings within the data. Natural breaks occur at low points on the histogram and are used to identify classes that group similar values together while maximising the differences between classes. This method accurately depicts trends in the data (Cartographica, 2010 and ESRI, 2016).

infrastructure from similar mining projects and confirmed by the client. The infrastructure heights are indicated in Table 5 and the infrastructure is illustrated on Plan 7 (Appendix B).

Table 5: Infrastructure Heights for Viewshed Modelling

Infrastructure	Height	Source
Conveyor	20 m	Assumption confirmed by the client
Discard Dump	20 m	Provided by the client
Hard overburden dump	20 m	Provided by the client
Plant infrastructure	20 m	Assumption confirmed by the client
Soft overburden dump	20 m	Provided by the client
Topsoil dump	20 m	Provided by the client
Workshops	20 m	Assumption confirmed by the client
Discard Bin	10 m	Assumption confirmed by the client
Product stockpile	10 m	Assumption confirmed by the client
RoM stockpile	10 m	Assumption confirmed by the client
Tip	10 m	Assumption confirmed by the client
Offices and other buildings	5 m	Assumption confirmed by the client
Water tank	3 m	Assumption confirmed by the client
Berm	2 m	Assumption confirmed by the client
Diesel storage	2 m	Assumption confirmed by the client
Slurry dam	2 m	Assumption confirmed by the client
Pollution control dam (PCD)	1 m	Assumption confirmed by the client
Access road	0 m	Ground level
Haul road	0 m	Ground level
Mining contractors yard	0 m	Ground level
Parking	0 m	Ground level
Tarpaulin area	0 m	Ground level
Weighbridge	0 m	Ground level
Ramp	0 m	Ground level and below ground level
Box-cut	0 m	Below ground level
Open pit	0 m	Below ground level

The concept of viewshed modelling is depicted in Figure 1. The topography denotes whether or not a development will be visible from a receptor. In Figure 1 the development is only

visible from the receptors within the valley and on the slopes of the hills facing it. The development will be hidden from all receptors beyond the first hills.

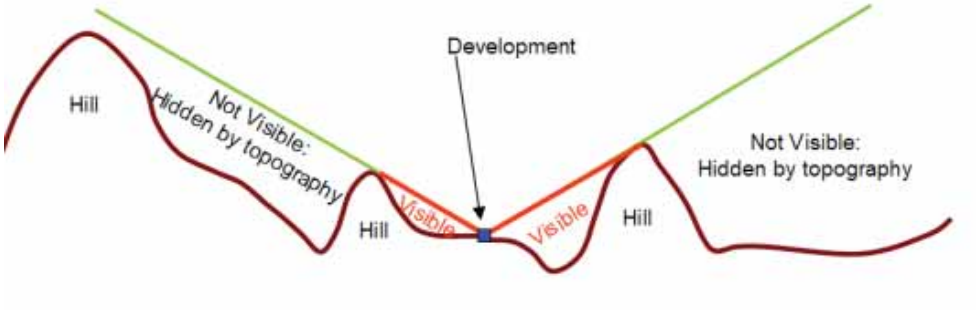

Figure 1: Theoretical Background of Viewshed Modelling

Both theoretical and practical viewshed models were created. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models show the areas from which the Project may potentially be visible. The natural Grassland vegetation has been transformed by agricultural activities and little natural vegetation remains. The vegetation of the Project area and surrounds is expected to provide minimal screening of the Project.

The theoretical viewshed model was refined to a practical viewshed model by dividing the viewshed area into areas that are likely to experience different categories of visual exposure. Visual exposure and the visual impact of a development diminish exponentially with distance (Oberholzer, 2005).

The findings of the site visit on 18th October 2016 were used to determine these categories. This site visit took place during the day and evening in spring and the weather conditions were mainly sunny skies with some small clouds and haze at times.

The visibility of a nearby operational open pit coal mine was used as a reference to determine the expected visibility of the Project. The reference mine is situated in a similar receiving environment to the Project and has dumps of approximately 20 m high which is the proposed height for the Project dumps.

8.3.1 Daytime

The visibility of the reference mine was used to determine the expected visibility of the Project. Due to the hazy conditions the infrastructure was sometimes more visible to the naked eye than in the photographs. The photographs were taken with a focal length of 50 mm.

Figure 2 illustrates the daytime view of the reference mine from a distance of 6.1 km. This photograph was taken from an unnamed road looking in a north-easterly direction towards the reference mine. In this photograph the following mine infrastructure is visible from left to right: softs dump (6.1 km), topsoil (6.9 km), softs dump (6.6 km), hards dumps (hidden

behind the trees) and softs dump (6.6 km). The mine almost fills the view in this photograph. The reference mine is noticeable from a distance of up to 10 km and it is noted that after 10 km the visual exposure is negligible.

Based on the findings of the site visit it is likely that the Project will be visible from a distance of up to 10 km. It is noted that after 10 km the visual exposure is expected to be negligible.

Figure 3 illustrates the daytime view of the reference mine from a distance of 3.2 km. This photograph was taken from the R42 regional road looking in a north-north-easterly direction towards the reference mine. In this photograph the following mine infrastructure is visible from left to right: softs dump (4.3 km), softs dump (3.2 km) and topsoil dump (3.6 km). The softs dump in the centre dominates the view in this photograph.

Figure 4 illustrates the daytime view of the reference mine from a distance of 1.9 km. This photograph was taken from the R42 regional road looking in a north-westerly direction towards the reference mine. In this photograph the following mine infrastructure is visible from left to right: RoM stockpile (2.2 km), plant (2.3 km) and new product stockpiles (2.3 km). Although this is relatively small scale infrastructure it still stands out in the view in this photograph.

Figure 2: Daytime View of Reference Mine in a NE Direction from 6.1 km

Figure 3: Daytime View of Reference Mine in a NNE Direction from 3.2 km

Figure 4: Daytime View of Reference Mine in a NW Direction from 1.9 km

Based on the findings of the site visit the following categories were used for the daytime practical viewshed model:

- 0 – 2 km: Potentially very high visual exposure;
- 2 – 4 km: Potentially high visual exposure;
- 4 – 6 km: Potentially moderate visual exposure;
- 6 – 8 km: Potentially low visual exposure; and
- 8 – 10 km: Potentially very low visual exposure.

8.3.2 Night Time

The visibility of the night time lighting of the reference mine was used to determine the expected visibility of the mine infrastructure at night. Only the plant area of the mine is lit at night. The photographs were taken with a focal length of 50 mm. A longer exposure time was used to capture the night time photographs.

There are numerous urban areas in close proximity to the Project and the reference mine. These urban areas result in a night time glow in the sky. Figure 5 illustrates the night time view of Delmas town from a distance of 3.8 km. This photograph was taken from the R50 regional road looking in a north-westerly direction. The reference mine does not noticeably add to this night time glow but the individual lights from the reference mine are clearly visible.

Figure 5: Night Time View of Delmas Town in a NW Direction from 3.8 km

Figure 6 illustrates the night time view of the reference mine from a distance of 7.8 km. This photograph was taken from the R50 regional road looking in a west-south-westerly direction towards the reference mine. There are other lights visible in this photograph but the lights from the reference mine stand out as they are brighter. The individual lights of the reference mine are distinguishable from the surrounding lights from a distance of up to 10 km.

Based on the findings of the site visit it is likely that the night time lights of the Project will be visible from a distance of up to 10 km. It is noted that after 10 km the visual exposure is expected to be negligible.

Figure 7 illustrates the night time view of the reference mine from a distance of 3.4 km. This photograph was taken from the R50 regional road looking in a south-westerly direction towards the reference mine. There are no other lights in the background of this photograph and this illustrates the intensity of lights from the reference mine.

Figure 8 illustrates the night time view of the reference mine from a distance of 2.9 km. This photograph was taken from the R42 regional road looking in a north-north-westerly direction towards the reference mine. The lights from the reference mine dominate this view.

Figure 6: Night Time View of Reference Mine in a WSW Direction from 7.8 km

Figure 7: Night Time View of Reference Mine in a SW Direction from 3.4 km

Figure 8: Night Time View of Reference Mine in a NNW Direction from 2.9 km

Based on the findings of the site visit the following categories were used for the night time practical viewshed model:

- 0 – 4 km: Potentially high visual exposure;
- 4 – 8 km: Potentially moderate visual exposure; and
- 8 – 10 km: Potentially low visual exposure.

Only three categories were used for the night time practical viewshed model as there is less distinction in visual exposure at night.

9 Findings

9.1 Visual/Aesthetic Character and Topography

This section provides the results obtained from the analysis of the topographical, slope and aspect models created in ArcGIS.

The Project area and surrounds are gently undulating with numerous hills and valleys. Hills are known to create a multitude of unique habitats for both faunal and floral species increasing the expected biodiversity of the area. Hills also have significant cultural value as historical settlements were located on higher-lying areas for safety and strategic advantage.

The topographical model indicates that the elevation of the Project area increases from 1 567 metres above mean sea level (m.a.m.s.l.) at Aston Lake in the west to 1 636 m.a.m.s.l in the eastern corner of the Project area. Plan 4 (Appendix B) illustrates the topographical model and features of the Project area.

The majority of the Project area has gentle slopes of between 0° and 2.5°. Isolated steeper slopes of between 2.6° and 10.6° occur along the sides of the hills and river valleys. Plan 5 (Appendix B) illustrates the slope model of the Project area.

Due to the undulating topography, the slope aspect/direction of the Project area is not in any specific direction. The sides of the hills and valleys slope in various different directions as illustrated by the aspect model of the Project area (Plan 6, Appendix B).

The undulating topography is expected to provide moderate screening of the proposed development; however, if the mining activities are located on a hill they will be more visible than if they are located on a lower-lying area.

Figure 9, Figure 10 and Figure 11 illustrate the topography and vegetation of the Project area. Figure 9 was taken from the northern boundary of the Project area looking in a south-easterly direction across the Project area. The farm buildings in the centre of the Project area are visible in this photograph. Figure 10 was also taken from the northern boundary of the Project area. This photograph was taken looking in a south-westerly direction across the Project area. The Dwarsindiewegvlei is visible in the background of the photograph. Figure 11 was taken from within the proposed pit looking in a north-westerly direction.

Figure 9: View of the Project Area

Figure 10: View of the Project Area and the Dwarsindiewegvlei

Figure 11: View from Within the Proposed Pit

According to Mucina and Rutherford (2012) the dominant vegetation types of the Project area and surrounds are Eastern Highveld Grassland, Soweto Highveld Grassland and Tsakane Clay Grassland interspersed with Eastern Temparate Freshwater Wetlands and Andesite Mountain Bushveld along the Blesbokspruit River and its tributaries (Digby Wells, 2016a). Much of the area has been transformed by residential areas, small holdings, agriculture and mining and little natural vegetation remains. The agricultural and remaining natural Grassland vegetation will only provide minimal screening of the Project. There are existing rows of trees planted near some farm residences as windbreaks/vegetation screens. It is anticipated that these trees will have a screening effect and will reduce the visual impact of the Project on these farm residences.

9.2 Viewshed Model

The theoretical viewshed model is illustrated in Plan 8 (Appendix B).

9.2.1 Daytime

The theoretical viewshed model was refined to a daytime practical viewshed model (Plan 9, Appendix B) with a buffer of 10 km around the proposed infrastructure and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be noticeable beyond this 10 km buffer. The daytime practical viewshed model depicts the area from which the Project may potentially be visible during the day. This daytime practical viewshed model

covers an area of approximately 275.79 km². The viewshed areas for the categories are listed in Table 6 below.

Table 6: Daytime Viewshed Area per Category

Category	Impact	Viewshed Area
0 – 2 km	Potentially Very High Visual Exposure	47.82 km²
2 – 4 km	Potentially High Visual Exposure	56.60 km²
4 – 6 km	Potentially Moderate Visual Exposure	66.60 km²
6 – 8 km	Potentially Low Visual Exposure	56.35 km²
8 – 10 km	Potentially Very Low Visual Exposure	48.43 km²

9.2.2 Night Time

The theoretical viewshed model was refined to a night time practical viewshed model (Plan 10, Appendix B) with a buffer of 10 km around the proposed infrastructure and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the night time lighting of the proposed infrastructure will be noticeable beyond this 10 km buffer. The night time practical viewshed model depicts the area from which the Project may potentially be visible at night. This night time practical viewshed model covers an area of approximately 275.79 km². The viewshed areas for the categories are listed in Table 7 below.

Table 7: Night Time Viewshed Area per Category

Category	Impact	Viewshed Area
0 – 4 km	Potentially High Visual Exposure	104.42 km²
4 – 8 km	Potentially Moderate Visual Exposure	122.95 km²
8 – 10 km	Potentially Low Visual Exposure	48.43 km²

9.3 Sensitive Receptors

9.3.1 Daytime

The potential visual receptors identified within the daytime practical viewshed of the Project include residents of the towns and settlements within 10 km of the proposed infrastructure, residents of the surrounding farms and small holdings and road users. The daytime visual receptors are indicated on Plan 9 (Appendix B).

The towns and settlements in each category of the daytime viewshed model are listed in Table 8 below. These urban areas are indicated as receptor polygons on Plan 9 (Appendix B).

Table 8: Towns and Settlements per Category (Daytime)

Category	Impact	Towns and Settlements
0 – 2 km	Potentially Very High Visual Exposure	None
2 – 4 km	Potentially High Visual Exposure	Vischkuil
4 – 6 km	Potentially Moderate Visual Exposure	Endicott Largo Sundra
6 – 8 km	Potentially Low Visual Exposure	Strubenvale Welgedacht
8 – 10 km	Potentially Very Low Visual Exposure	Daggafontein Eloff

A total of 2 022 receptor points (farm residences including farm workers houses and residences on small holdings) were identified within the daytime practical viewshed area. The number of receptor points within each category is shown in Table 9 below.

Table 9: Number of Receptor Points per Category (Daytime)

Category	Impact	Number of Receptor Points
0 – 2 km	Potentially Very High Visual Exposure	57
2 – 4 km	Potentially High Visual Exposure	497
4 – 6 km	Potentially Moderate Visual Exposure	944
6 – 8 km	Potentially Low Visual Exposure	344
8 – 10 km	Potentially Very Low Visual Exposure	180

Road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads within the daytime practical viewshed area are potential visual receptors of the Project. The main roads within each category are shown in Table 10 below.

Table 10: Main Roads per Category (Daytime)

Category	Impact	Main Roads
0 – 2 km	Potentially Very High Visual Exposure	None
2 – 4 km	Potentially High Visual Exposure	R29 R42
4 – 6 km	Potentially Moderate Visual Exposure	N17 R29 R42 R555

Category	Impact	Main Roads
6 – 8 km	Potentially Low Visual Exposure	N17 R29 R42 R555
8 – 10 km	Potentially Very Low Visual Exposure	N17 R29 R42 R555

Visitors to the Benoni Angling Society at Aston Lake are potential visual receptors of the Project. The Blesbokspruit Ramsar Site, the Marievale Nature Reserve and Bird Sanctuary and the Blesbokspruit IBA are all potential visual receptors of the Project as they fall within the daytime practical viewshed area. The Palmietkuil South War Cemetery Memorial is also within the daytime practical viewshed area of the Project.

9.3.2 Night Time

The potential visual receptors identified within the night time practical viewshed of the Project include residents of the towns and settlements within 10 km of the proposed infrastructure, residents of the surrounding farms and small holdings and road users. The night time visual receptors are indicated on Plan 10 (Appendix B).

The towns and settlements in each category of the night time viewshed model are listed in Table 11 below. These urban areas are indicated as receptor polygons on Plan 10 (Appendix B).

Table 11: Towns and Settlements per Category (Night Time)

Category	Impact	Towns and Settlements
0 – 4 km	Potentially High Visual Exposure	Vischkuil
4 – 8 km	Potentially Moderate Visual Exposure	Endicott Largo Strubenvale Sundra Welgedacht
8 – 10 km	Potentially Low Visual Exposure	Daggafontein Eloff

A total of 2 022 receptor points (farm residences including farm workers houses and residences on small holdings) were identified within the night time practical viewshed area. The number of receptor points within each category is shown in Table 12 below.

Table 12: Number of Receptor Points per Category (Night Time)

Category	Impact	Number of Receptor Points
0 – 4 km	Potentially High Visual Exposure	554
4 – 8 km	Potentially Moderate Visual Exposure	1288
8 – 10 km	Potentially Low Visual Exposure	180

Road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads within the night time practical viewshed area are potential visual receptors of the Project. The main roads within each category are shown in Table 13 below.

Table 13: Main Roads per Category (Night Time)

Category	Impact	Main Roads
0 – 4 km	Potentially High Visual Exposure	R29 R42
4 – 8 km	Potentially Moderate Visual Exposure	N17 R29 R42 R555
8 – 10 km	Potentially Low Visual Exposure	N17 R29 R42 R555

Visitors to the Benoni Angling Society at Aston Lake are potential visual receptors of the Project. The Blesbokspruit Ramsar Site, the Marievale Nature Reserve and Bird Sanctuary and the Blesbokspruit IBA are all potential visual receptors of the Project as they fall within the night time practical viewshed area. The Palmietkuil South War Cemetery Memorial is also within the night time practical viewshed area of the Project.

9.4 Photomontages

This section presents the photomontages created from photographs taken during the site visit on 18th October 2016. Plan 11 (Appendix B) indicates the viewpoint (position) and view direction in which the photographs were taken. The photomontages were created using GIMP version 2 software.

The photomontages were created by adding the proposed infrastructure to photographs of the current views. The scale of the images was measured by comparing the length of an object in the photo to the length of the object in reality. This scale was then used to calculate the size of the proposed infrastructure based on the estimated heights of the proposed infrastructure (Table 5).

The infrastructure is then overlaid onto the original photograph in their respective locations (based on the line of sight from the point the photograph was taken) to give an approximation of what the view will look like before and during the operation of the Project. The foreground of the photograph was extracted from the original photograph and replaced on top of the infrastructure to give a realistic representation of the view from the viewpoint.

The infrastructure overlaid on the photographs is an example and does not reflect accurate depictions of the proposed infrastructure, i.e. the plant depicted is not the actual proposed plant but an example of a similar plant and the proposed plant will be of equivalent height and footprint area. The photomontages provide an indication of what the landscape might potentially look like in the future.

9.4.1 Viewpoint 1

Viewpoint 1 is located on the western edge of the Vischkuil Small Holdings on First Avenue just north of the R29 regional road. The photograph was taken looking in a north-north-westerly direction towards the Project. Figure 12 illustrates the current view from Viewpoint 1. Figure 13 illustrates the potential future view from Viewpoint 1. In this photomontage the infrastructure visible from left to right is as follows: product stockpile (4.1 km), washing plant (4 km), RoM stockpile (3.9 km), soft overburden dump in the background (4.4 km), topsoil dump (3.2 km) and berm around the pit (2.2 km). The proposed infrastructure will dominate the view from Viewpoint 1 and the Project is expected to have a negative visual impact on the residents of the Vischkuil Small Holdings.

Figure 12: Current View from Viewpoint 1 in a North-North-Westerly Direction towards the Project

Figure 13: Potential Future View from Viewpoint 1 in a North-North-Westerly Direction towards the Project

9.4.2 Viewpoint 2

Viewpoint 2 is located on the eastern edge of the Aston Lake town on Soetdoring Drive overlooking the lake. The photography was taken looking in an easterly direction towards the Project. Figure 14 illustrates the current view from Viewpoint 2. Figure 15 illustrates the potential future view from Viewpoint 2. In this photomontage the infrastructure visible from left to right is as follows: discard dump (2.9 km), product stockpile (2.9 km), washing plant (3.4 km), RoM stockpile (3.4 km) and topsoil dump (3.6 km). The proposed infrastructure will be clearly visible from Viewpoint 2 and the Project is expected to have a negative visual impact on the residents of the Aston Lake town and the members of the Benoni Angling Society based at Aston Lake.

Figure 14: Current View from Viewpoint 2 in an Easterly Direction towards the Project

Figure 15: Potential Future View from Viewpoint 2 in an Easterly Direction towards the Project

9.4.3 Viewpoint 3

View point 3 is located on the south-western corner of the Prosperity Agricultural Holdings on an unnamed road. The photography was taken looking in a south-easterly direction towards the Project. Figure 16 illustrates the current view from Viewpoint 3. Figure 17 illustrates the potential future view from Viewpoint 3. In this photomontage the infrastructure visible from left to right is as follows: hard overburden dump (3.2 km), soft overburden dump (3.2 km), main offices (3 km) and discard dump (2.9 km). The proposed infrastructure will dominate the view from Viewpoint 3 and the Project is expected to have a negative visual impact on the residents of the Prosperity Agricultural Holdings.

Figure 16: Current View from Viewpoint 3 in a South-Easterly Direction towards the Project

Figure 17: Potential Future View from Viewpoint 3 in a South-Easterly Direction towards the Project

9.4.4 Viewpoint 4

Viewpoint 4 is located on the south-eastern edge of the Sundra town on the R555 regional road. The photography was taken looking in a southerly direction towards the Project. The Project is at a lower elevation than Viewpoint 4. Figure 18 illustrates the current view from Viewpoint 4. Figure 19 illustrates the potential future view from Viewpoint 4. In this photomontage the infrastructure visible from left to right is as follows: hard overburden dump (5.8 km), soft overburden dump (6.3 km) and discard dump (6.7 km). The proposed infrastructure will be noticeable from Viewpoint 4 and the Project is expected to have a negative visual impact on the residents of the Sundra town.

Figure 18: Current View from Viewpoint 4 in a Southerly Direction towards the Project

Figure 19: Potential Future View from Viewpoint 4 in a Southerly Direction towards the Project

10 Discussion

The Project will have a negative visual impact on the receiving environment. The most significant visual impact will be from the dumps, stockpiles and washing plant. This is due to the height and/or large footprint area of these components of the infrastructure. The construction of other smaller surface infrastructure will have a lesser visual impact.

10.1 Visibility of the Project

The visibility of the project refers to the viewshed area and is also related to the number of receptors affected (Oberholzer, 2005). The Project has a **high visibility** as it is visible from a large area (defined by Oberholzer (2005) as several square kilometres) with numerous visual receptors.

The daytime and night time practical viewshed models cover an area of approximately 275.79 km². The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.

10.2 Visual Exposure

Visual exposure is “based on the distance from the infrastructure area to selected viewpoints” and “tends to diminish exponentially with distance” (Oberholzer, 2005). The Project has a **high exposure** as it will be dominant in the landscape and clearly noticeable to receptors within the viewshed area. This is illustrated by the photomontages in Section 9.4 above.

10.3 Visual Sensitivity of the Area

The visual sensitivity of the area refers to “the inherent visibility of the landscape, usually determined by a combination of topography, landform, vegetation cover and settlement pattern” (Oberholzer, 2005). The receiving environment of the Project has a **high visual sensitivity** as there are highly visible and potentially sensitive areas in the landscape. This is due to the proximity of the Project to the Blesbokspruit Ramsar Site and IBA and the Marievale Nature Reserve and Bird Sanctuary (Digby Wells, 2016a).

10.4 Visual Sensitivity of Receptors

The visual sensitivity of receptors is dependent on the nature of the receptors (Oberholzer, 2005). Receptors in residential areas or nature reserves have a high sensitivity while receptors in industrial or mining areas have a low sensitivity. The identified receptors (residents of the towns and settlements within 10 km of the proposed infrastructure,

residents of the surrounding farms and small holdings, road users and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial) of the Project have a **moderate sensitivity** as they include residential, industrial, agricultural and natural areas.

10.5 Visual Absorption Capacity

The visual absorption capacity (VAC) refers to "the potential of the landscape to conceal the proposed project" (Oberholzer, 2005). The receiving environment of the Project has a **low VAC** because there is little screening provided by the topography and vegetation.

10.6 Visual Intrusion

The visual intrusion of the project refers to "the level of compatibility or congruence of the project with the particular qualities of the area, or its sense of place". Visual intrusion is "related to the idea of context and maintaining the integrity of the landscape or townscape" (Oberholzer, 2005). The Project has a **high visual intrusion** as it results in a noticeable change and is discordant with the surroundings.

11 Impact Assessment

11.1 Assessment Methodology

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability x Nature

Where

Consequence = Intensity + Extent + Duration

And

Probability = Likelihood of an impact occurring

And

Nature = Positive (+1) or negative (-1) impact

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts.

The matrix calculates the rating out of 147, whereby Intensity, Extent, Duration and Probability are each rated out of seven as indicated in Table 14. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation/management action proposed in this specialist report. The significance of an impact is then determined and categorised into one of eight categories (Table 15). The description of the significance ratings is discussed in Table 16.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, i.e. there may already be certain types of mitigation/management actions included in the design (for example due to legal requirements). If the potential impact is still considered too high, additional mitigation/management actions are proposed.

Table 14: Impact Assessment Parameter Ratings

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
7	Irreplaceable loss or damage to biological or physical resources or highly sensitive environments. Irreplaceable damage to highly sensitive cultural/social resources.	Noticeable, on-going natural and/or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent The impact is irreversible, even with management, and will remain after the life of the project.	Definite There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability
6	Irreplaceable loss or damage to biological or physical resources or moderate to highly sensitive environments. Irreplaceable damage to cultural/social resources of moderate to high sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond Project Life The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost Certain/Highly Probable It is most likely that the impact will occur. < 80% probability

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
5	Serious loss and/or damage to biological or physical resources or highly sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/Region Will affect the entire province of region.	Project Life (> 15 years) The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely The impact may occur. < 65% probability
4	Serious loss and/or damage to biological or physical resources or moderately sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures/items of cultural significance.	Average to intense natural and/or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long Term 6-15 years and the impact can be reversed with management.	Probable Has occurred here or elsewhere and could therefore occur. < 50% probability

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
3	Moderate loss and/or damage to biological or physical resources or low to moderately sensitive environments, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local extending only as far as the development site area.	Medium Term 1-5 years and the impact can be reversed with minimal management.	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. < 25% probability
2	Minor loss and/or effects to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experienced by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	Short Term Less than 1 year and is reversible.	Rare/Improbable Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. < 10% probability

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
1	Minimal to no loss and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to common place structures.	Some low-level natural and/or social benefits felt by a very small percentage of the baseline.	Very Limited/Isolated Limited to specific isolated parts of the site.	Immediate Less than 1 month and is completely reversible without management.	Highly Unlikely/None Expected never to happen. < 1% probability

Table 15: Probability/Consequence Matrix

Probability	Significance																																						
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Consequence																																						

Table 16: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive) (+)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long term positive change to the (natural and/or social) environment.	Major (positive) (+)
36 to 72	A positive impact. These impacts will usually result in positive medium to long term effects on the natural and/or social environment.	Minor (positive) (+)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and/or social environment.	Negligible (positive) (+)
-3 to -35	An acceptable negative impact for which mitigation is desirable. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and/or social environment.	Negligible (negative) (-)
-36 to -72	A minor negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long term effects on the natural and/or social environment.	Minor (negative) (-)
-73 to -108	A moderate negative impact which may prevent the implementation of the project. These impacts would be considered as constituting a major and usually a long term change to the (natural and/or social) environment and result in severe changes.	Moderate (negative) (-)
-109 to -147	A major negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative) (-)

11.2 Project Activities

The activities associated with the Project are listed in Table 17 below. The activities highlighted in red are applicable to this VIA.

Table 17: Project Activities

Phase	No.	Activity
Construction	1	Site establishment
	2	Site clearing, including the removal of topsoil and vegetation
	3	Construction of mine related infrastructure, including haul roads, pipes and dams
	4	Construction of washing plant
	5	Relocation of infrastructure
	6	Blasting and development of initial box-cut for mining, including stockpiling from initial box-cut
	7	Temporary storage of hazardous products, including fuel and explosives, as well as waste and sewage
Operational	8	Stripping topsoil and soft overburden
	9	Removal of overburden, including drilling and blasting of hard overburden
	10	Loading, hauling and stockpiling of overburden
	11	Drilling and blasting of coal
	12	Loading, hauling and stockpiling of RoM coal
	13	Use and maintenance of haul roads for the transportation of coal to the washing plant
	14	Operation of washing plant and discard dump
	15	Water use and storage on-site
	16	Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste
Decommissioning and Closure	17	Demolition and removal of all infrastructure, including transporting the materials off site
	18	Rehabilitation, including spreading of soil, re-vegetation and profiling or contouring
	19	Environmental monitoring of decommissioning activities
	20	Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste
Post-Closure	21	Post-closure monitoring and rehabilitation

11.3 Visual Impact Assessment

The Project activities listed in Table 17 will be rated according to the visual impact they will have on the receiving environment, i.e. the environment before development. Negative visual impacts decrease the visual character of the pre-development environment. Neutral visual impacts assist to minimise the negative visual impacts of a development but do not result in a positive visual impact. A positive visual impact only occurs when an area is rehabilitated to a state that is better than the state of the pre-development environment, e.g. a mining area on previously agricultural land is rehabilitated to an area of natural vegetation and all visible signs of agriculture and mining are removed. Positive visual impacts rarely occur.

11.3.1 Construction Phase

The construction phase is characterised by site development and infrastructure construction. This includes site establishment, site clearing, vegetation removal, topsoil removal and stockpiling, surface infrastructure development, blasting and development of the initial box-cut and stockpiling of the overburden from this initial box-cut. The establishment of infrastructure and related site clearing and construction activities will draw attention to the Project area making receptors aware of the Project. The construction phase is expected to have negative visual impacts on the receiving environment.

11.3.1.1 Activity 1: Site Establishment

Site establishment includes securing the site with fencing and constructing temporary laydown areas and facilities for the construction workers. Site establishment is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of site establishment are indicated in Table 18.

Table 18: Interactions and Impacts of Site Establishment on the Visual Aspects

Interaction	Impact
Site establishment	Site establishment will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors due to the increased levels of activity on the site.

11.3.1.1.1 Impact Description

Site establishment will have a minor negative visual impact on the receiving environment.

11.3.1.1.2 Management Objective

The management objective is to minimise the negative visual impacts caused by site establishment.

11.3.1.1.3 Management Actions

The following management actions are required for site establishment:

- Where possible use fencing that will screen the Project area from nearby receptors; and
- Limit the height and footprint area of temporary laydown areas and facilities for the construction workers.

11.3.1.1.4 Impact Ratings

The impact ratings and mitigation/management actions for site establishment are summarised in Table 19.

Table 19: Potential Impacts of Site Establishment on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Site Establishment)			
Impact Description: Site establishment will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors due to the increased levels of activity on the site.			
Prior to Mitigation/Management			
Duration	Short Term (2)	The impact will occur during the construction phase which is expected to last approximately 1 year.	Minor negative (-49)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Minor (2)	Site establishment is expected to cause a minor visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Where possible use fencing that will screen the Project area from nearby receptors; and ▪ Limit the height and footprint area of temporary laydown areas and facilities for construction workers.			
Post-Mitigation			
Duration	Short Term (2)	The impact will occur during the construction phase which is expected to last approximately 1 year.	Negligible negative (-30)

Dimension	Rating	Motivation	Significance
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minimal (1)	The visual disturbance will be reduced by implementing the mitigation/management actions listed above.	
Probability	Almost Certain/ Highly Probable (6)	The impact will almost certainly occur.	
Nature	Negative		

11.3.1.2 Activity 2: Site Clearing

Site clearing including the removal of topsoil and vegetation is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of site clearing are indicated in Table 20.

Table 20: Interactions and Impacts of Site Clearing on the Visual Aspects

Interaction	Impact
Site clearing and vegetation removal	Site clearing and vegetation removal will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors as it will contrast the surrounding areas.
Topsoil removal and stockpiling	Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.

11.3.1.2.1 Impact Description

Site clearing will have a moderate negative visual impact on the receiving environment.

11.3.1.2.2 Management Objective

The management objective is to minimise the negative visual impacts caused by site clearing and topsoil removal and stockpiling.

11.3.1.2.3 Management Actions

The following management actions are required for site clearing:

- Vegetation should only be removed when and where necessary;
- Topsoil should only be removed when and where necessary;
- Topsoil stockpiles should be vegetated with grasses (*Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula,*

Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix) where possible so as to blend into the surrounding landscape and reduce dust generation;

- Limit the footprint area of topsoil stockpiles where possible;
- Limit the height of the topsoil stockpile to 20 m (Table 5); and
- Apply dust suppression techniques to limit dust generated from topsoil stockpiles.

11.3.1.2.4 Impact Ratings

The impact ratings and mitigation/management actions for site clearing are summarised in Table 21.

Table 21: Potential Impacts of Site Clearing on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Site Clearing)			
Impact Description: Site clearing and vegetation removal will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur during the construction phase which is expected to last approximately 1 year and remain for the duration of the Project.	Moderate negative (-84)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Serious (4)	Site clearing is expected to cause a serious negative visual disturbance. The Project area will become noticeable to the nearby receptors as it will contrast the surrounding areas. Dust from the stockpiles will have a negative visual impact on the receiving environment.	

Dimension	Rating	Motivation	Significance
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary; ▪ Topsoil stockpiles should be vegetated with grasses (*Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix*) where possible so as to blend into the surrounding landscape and reduce dust generation; ▪ Limit the footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 20 m (Table 5); and ▪ Apply dust suppression techniques to limit dust generated from topsoil stockpiles.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur during the construction phase which is expected to last approximately 1 year and remain for the duration of the Project.	Minor negative (-70)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Moderate (3)	The visual disturbance will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.1.3 Activity 3: Construction of Mine Related Infrastructure

Construction of mine related infrastructure is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of construction of mine related infrastructure are indicated in Table 22.

Table 22: Interactions and Impacts of Construction of Mine Related Infrastructure on the Visual Aspects

Interaction	Impact
Construction of surface infrastructure	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the Project area from an agricultural sense of place to an industrial/mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from a distance of up to 10 km and will draw attention to the Project area. This will also have a negative impact on the sense of place.

11.3.1.3.1 Impact Description

Construction of mine related infrastructure will have a moderate negative visual impact on the receiving environment.

11.3.1.3.2 Management Objective

The management objective is to minimise the negative visual impacts caused by construction of mine related infrastructure.

11.3.1.3.3 Management Actions

The following management actions are required for construction of mine related infrastructure:

- Ensure screening vegetation is left intact around the Project area and near receptors;
- Ensure the surface infrastructure does not exceed the proposed heights in Table 5 above;
- Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible;
- Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; and
- Where possible avoid construction activities at night. If construction activities take place at night then down lighting must be implemented to minimise light pollution.

11.3.1.3.4 Impact Ratings

The impact ratings and mitigation/management actions for construction of mine related infrastructure are summarised in Table 23.

Table 23: Potential Impacts of Construction of Mine Related Infrastructure on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Construction of Mine Related Infrastructure)			
Impact Description: The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the Project area from an agricultural sense of place to an industrial/mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from a distance of up to 10 km and will draw attention to the Project area. This will also have a negative impact on the sense of place.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-84)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Serious (4)	Construction of mine related infrastructure is expected to cause a serious visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Ensure screening vegetation is left intact around the Project area and near receptors; ▪ Ensure the surface infrastructure does not exceed the proposed heights in Table 5 above; ▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; and ▪ Where possible avoid construction activities at night. If construction activities take place at night then down lighting must be implemented to minimise light pollution.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-70)

Dimension	Rating	Motivation	Significance
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Moderate (3)	The visual disturbance will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.1.4 Activity 4: Construction of Washing Plant

Construction of the washing plant will take place within the mine infrastructure area. The negative visual impact of the mine infrastructure area was assessed in Activity 3 above (Section 11.3.1.3) and construction of the washing plant is not expected to result in any additional visual impacts.

11.3.1.5 Activity 5: Relocation of Infrastructure

Relocation of infrastructure includes moving the existing unnamed public road that currently runs through the open pit of the Project. This road runs in a north-easterly direction from the R29 regional route through the western side of the Project area before joining another unnamed road that runs to the R42 regional road. Relocation of infrastructure is expected to have a negative visual impact on the receiving environment. The location for the relocation of the road is not currently known and for the purposes of this impact assessment it has been assumed that the road will be diverted to the farm road running along the south-eastern boundary of the Project area and that this farm road will be upgraded as required. Should this not be the case, this impact may need to be re-assessed. The interactions and resultant impacts of relocation of infrastructure are indicated in Table 24.

Table 24: Interactions and Impacts of Relocation of Infrastructure on the Visual Aspects

Interaction	Impact
Relocation of infrastructure	Relocation of infrastructure will have a negative visual impact on the receiving environment.

11.3.1.5.1 Impact Description

Relocation of infrastructure will have a minor negative visual impact on the receiving environment.

11.3.1.5.2 Management Objective

The management objective is to minimise the negative visual impacts caused by relocation of infrastructure.

11.3.1.5.3 Management Actions

The following management actions are required for the relocation of infrastructure:

- Limit the footprint area of the road where possible by utilising existing roads for the relocation;
- The road should be wetted frequently by means of a water bowser to suppress dust; and
- Ensure screening vegetation is left intact along the sides of the road.

11.3.1.5.4 Impact Ratings

The impact ratings and mitigation/management actions for relocation of infrastructure are summarised in Table 25.

Table 25: Potential Impacts of Relocation of Infrastructure on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Relocation of Infrastructure)			
Impact Description: Relocation of infrastructure will have a negative visual impact on the receiving environment.			
Prior to Mitigation/Management			
Duration	Short Term (2)	The impact will occur during the construction phase which is expected to last approximately 1 year.	Minor negative (-49)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Minor (2)	Relocation of infrastructure is expected to cause a minor visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Limit the footprint area of the road where possible by utilising existing roads for the relocation; ▪ The road should be wetted frequently by means of a water bowser to suppress dust; and ▪ Ensure screening vegetation is left intact along the sides of the road.			

Dimension	Rating	Motivation	Significance
Post-Mitigation			
Duration	Short Term (2)	The impact will occur during the construction phase which is expected to last approximately 1 year.	Negligible negative (-30)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minimal (1)	The visual disturbance will be reduced by implementing the mitigation/management actions listed above.	
Probability	Almost Certain/Highly Probable (6)	The impact will almost certainly occur.	
Nature	Negative		

11.3.1.6 Activity 6: Blasting and Development of Initial Box-Cut for Mining

Blasting and development of the initial box-cut for mining (including stockpiling from the initial box-cut) is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of blasting and development of the initial box-cut for mining are indicated in Table 26.

Table 26: Interactions and Impacts of Blasting and Development of Initial Box-Cut for Mining on the Visual Aspects

Interaction	Impact
Change of land use from agriculture to mining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change of land use will change the sense of place of the Project area and surrounds from an agricultural sense of place to an industrial/mining sense of place resulting in a loss of scenic character and increased visual disturbance. The change of land use will contribute to the cumulative impacts of mining on the regional environment.
Blasting and development of the initial box-cut for mining	Blasting and development of the initial box-cut for mining will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The box-cut will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.
Stockpiling from the initial box-cut	Stockpiling from the initial box-cut will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit during the decommissioning and closure phase.

11.3.1.6.1 Impact Description

Change of land use from agriculture to mining will have a major negative visual impact on the receiving environment. Blasting and development of the initial box-cut for mining (including stockpiling from the initial box-cut) will have a moderate negative visual impact on the receiving environment.

11.3.1.6.2 Management Objective

The management objective is to minimise the negative visual impacts caused by the change of land use from agriculture to mining and blasting and development of the initial box-cut for mining (including stockpiling from the initial box-cut).

11.3.1.6.3 Management Actions

The following management actions are required for change of land use from agriculture to mining:

- Apply dust suppression techniques to limit the dust from the demolition area;
- Use shade cloth/netting to screen the demolition area;
- Ensure all infrastructure is demolished and removed from the site;
- Limit the quantity and time of rubble stored on site;
- Ensure that the open pit is backfilled with material from the overburden stockpiles;
- Rehabilitate all disturbed areas;
- Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography;
- Spread topsoil over the rehabilitated area;
- Ensure that surface water and drainage lines are rehabilitated;
- Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and
- Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.

The following management actions are required for blasting and development of the initial box-cut for mining (including stockpiling from the initial box-cut):

- Only remove overburden when and where necessary;

- Ensure the soft overburden and hard overburden stockpiles do not exceed the proposed height of 20 m (Table 5); and
- Apply dust suppression techniques to limit the dust generated from the blasting and stockpiles.

11.3.1.6.4 Impact Ratings

The impact ratings and mitigation/management actions for change of land use from agriculture to mining and blasting and development of the initial box-cut for mining are summarised in Table 27 and Table 28.

Table 27: Potential Impacts of Change of Land Use on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Change of Land Use from Agriculture to Mining)			
Impact Description: Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change of land use will change the sense of place of the Project area and surrounds from an agricultural sense of place to an industrial/mining sense of place resulting in a loss of scenic character and increased visual disturbance. The change of land use will contribute to the cumulative impacts of mining on the regional environment.			
Prior to Mitigation/Management			
Duration	Permanent (7)	There will be a permanent and irreversible negative visual impact on the receiving environment. There will be insufficient material to backfill the open pit completely and a void will remain.	Major negative (-119)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Highly Irreplaceable (7)	Change of land use will result in a permanent change in the sense of place of the Project area and surrounds.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Apply dust suppression techniques to limit the dust from the demolition area;			

Dimension	Rating	Motivation	Significance
▪ Use shade cloth/netting to screen the demolition area; ▪ Ensure all infrastructure is demolished and removed from the site; ▪ Limit the quantity and time of rubble stored on site; ▪ Ensure that the open pit is backfilled with material from the overburden stockpiles; ▪ Rehabilitate all disturbed areas; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated; ▪ Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and ▪ Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.			
Post-Mitigation			
Duration	Permanent (7)	There will be a permanent and irreversible negative visual impact on the receiving environment. There will be insufficient material to backfill the open pit completely and a void will remain.	Moderate negative (-98)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Very Serious (5)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

Table 28: Potential Impacts of Blasting and Development of Initial Box-Cut for Mining on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Blasting and Development of the Initial Box-Cut for Mining)			
Impact Description: Blasting and development of the initial box-cut for mining will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The box-cut will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape. Stockpiling from the initial box-cut will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit during the decommissioning and closure phase.			
Prior to Mitigation/Management			

Dimension	Rating	Motivation	Significance
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-91)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Very Serious (5)	Blasting and development of the initial box-cut for mining (including stockpiling from the initial box-cut) and the associated dust from the blasting and stockpiles is expected to cause a very serious visual impact.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Only remove overburden when and where necessary; ▪ Ensure the soft overburden and hard overburden stockpiles do not exceed the proposed height of 20 m (Table 5); and ▪ Apply dust suppression techniques to limit the dust generated from the blasting and stockpiles.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-77)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Serious (4)	The impact will be reduced by implementing mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.1.7 Activity 7: Temporary Storage of Hazardous Products

Temporary storage of hazardous products, including fuel and explosives, as well as waste and sewage will take place within the mine infrastructure area. The negative visual impact of the mine infrastructure area was assessed in Activity 3 above (Section 11.3.1.3) and the temporary storage of hazardous products, including fuel and explosives, as well as waste and sewage is not expected to result in any additional visual impacts.

11.3.2 Operational Phase

The operational phase is characterised by removal and stockpiling of topsoil and overburden, mining and stockpiling of RoM coal and operation of the washing plant and discard dump to process the coal. The operational phase is expected to have negative visual impacts on the receiving environment.

11.3.2.1 Activity 8: Stripping Topsoil and Soft Overburden

Stripping topsoil and soft overburden is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of stripping topsoil and soft overburden are indicated in Table 29.

Table 29: Interactions and Impacts of Stripping Topsoil and Soft Overburden on the Visual Aspects

Interaction	Impact
Stripping of topsoil and soft overburden	Stripping of topsoil and soft overburden will have a negative visual impact on the receiving environment. As the Project area is stripped it will become noticeable to nearby receptors as it will contrast the surrounding area.

11.3.2.1.1 Impact Description

Stripping of topsoil and soft overburden will have a moderate negative visual impact on the receiving environment.

11.3.2.1.2 Management Objective

The management objective is to minimise the negative visual impacts caused by stripping of topsoil and soft overburden.

11.3.2.1.3 Management Actions

The following management actions are required for stripping of topsoil and soft overburden:

- Topsoil should only be removed when and where necessary; and
- Only remove soft overburden when and where necessary.

11.3.2.1.4 Impact Ratings

The impact ratings and mitigation/management actions for stripping of topsoil and soft overburden are summarised in Table 30.

Table 30: Potential Impacts of Stripping Topsoil and Soft Overburden on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Stripping Topsoil and Soft Overburden)			
Impact Description: Stripping of topsoil and soft overburden will have a negative visual impact on the receiving environment. As the Project area is stripped it will become noticeable to nearby receptors as it will contrast the surrounding area.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-84)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Serious (4)	Stripping of topsoil and soft overburden is expected to cause a serious negative visual disturbance. As the Project area is stripped it will become noticeable to the nearby receptors as it will contrast the surrounding areas.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Topsoil should only be removed when and where necessary; and ▪ Soft overburden should only be removed when and where necessary.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-70)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Moderate (3)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.2.2 Activity 9: Removal of Overburden

Removal of overburden (including drilling and blasting of hard overburden) is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of removal of overburden are indicated in Table 31.

Table 31: Interactions and Impacts of Removal of Overburden on the Visual Aspects

Interaction	Impact
Removal of overburden	Removal of overburden (including drilling and blasting of hard overburden) will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.

11.3.2.2.1 Impact Description

Removal of overburden (including drilling and blasting of hard overburden) will have a moderate negative visual impact on the receiving environment.

11.3.2.2.2 Management Objective

The management objective is to minimise the negative visual impacts caused by the removal of overburden (including drilling and blasting of hard overburden).

11.3.2.2.3 Management Actions

The following management actions are required for removal of overburden (including drilling and blasting of hard overburden):

- Only remove overburden when and where necessary; and
- Apply dust suppression techniques to limit the dust generated from the blasting.

11.3.2.2.4 Impact Ratings

The impact ratings and mitigation/management actions for removal of overburden are summarised in Table 32.

Table 32: Potential Impacts of Removal of Overburden on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Removal of Overburden)			
Impact Description: Removal of overburden (including drilling and blasting of hard overburden) will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.			
Prior to Mitigation/Management			

Dimension	Rating	Motivation	Significance
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-91)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Very Serious (5)	Removal of overburden (including drilling and blasting of hard overburden) and the associated dust from the blasting is expected to cause a very serious visual impact.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Only remove overburden when and where necessary; and ▪ Apply dust suppression techniques to limit the dust generated from the blasting.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-77)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Serious (4)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.2.3 Activity 10: Loading, Hauling and Stockpiling of Overburden

Loading, hauling and stockpiling of overburden (including topsoil, soft overburden and hard overburden) is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of loading, hauling and stockpiling of overburden are indicated in Table 33.

Table 33: Interactions and Impacts of Loading, Hauling and Stockpiling of Overburden on the Visual Aspects

Interaction	Impact
Loading and hauling of overburden	Vehicular activity to load and haul overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.
Stockpiling of overburden	Stockpiling of overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit (soft overburden and hard overburden) and rehabilitate the Project area (topsoil) during the decommissioning and closure phase.

11.3.2.3.1 Impact Description

Loading and hauling of overburden (including topsoil, soft overburden and hard overburden) will have a minor negative visual impact on the receiving environment. Stockpiling of overburden (including topsoil, soft overburden and hard overburden) will have a moderate negative visual impact on the receiving environment. The stockpiles will become visible from a greater distance as they increase in height and will begin to dominate the landscape for nearby receptors.

11.3.2.3.2 Management Objective

The management objective is to minimise the negative visual impacts caused by loading, hauling and stockpiling overburden (including topsoil, soft overburden and hard overburden).

11.3.2.3.3 Management Actions

The following management actions are required for loading and hauling of overburden (including topsoil, soft overburden and hard overburden):

- Limit the speed of vehicles on the haul roads to reduce dust; and
- Haul roads should be wetted frequently by means of a water bowser to suppress dust.

The following management actions are required for stockpiling of overburden (including topsoil, soft overburden and hard overburden):

- Topsoil stockpiles should be vegetated with grasses (*Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria*

sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix) where possible so as to blend in with the surrounding landscape and reduce dust generation;

- Limit the footprint area of topsoil stockpiles where possible;
- Limit the height of the topsoil stockpile to 20 m (Table 5);
- Ensure the soft overburden and hard overburden stockpiles do not exceed the proposed height of 20 m (Table 5); and
- Apply dust suppression techniques to limit dust generated from stockpiles.

11.3.2.3.4 Impact Ratings

The impact ratings and mitigation/management actions for loading, hauling and stockpiling overburden are summarised in Table 34 and Table 35.

Table 34: Potential Impacts of Loading and Hauling of Overburden on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Loading and Hauling of Overburden)			
Impact Description: Vehicular activity to load and haul overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-70)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Minor (2)	Loading and hauling of overburden (including topsoil, soft overburden and hard overburden) and the associated dust is expected to cause a minor visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

Dimension	Rating	Motivation	Significance
Mitigation/Management Actions			
▪ Limit the speed of vehicles on the haul roads to reduce dust; and ▪ Haul roads should be wetted frequently by means of a water bowser to suppress dust.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-48)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minimal (1)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Almost Certain/ Highly Probable (6)	The impact will almost certainly occur.	
Nature	Negative		

Table 35: Potential Impacts of Stockpiling of Overburden on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Stockpiling of Overburden)			
Impact Description: Stockpiling of overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit (soft overburden and hard overburden) and rehabilitate the Project area (topsoil) during the decommissioning and closure phase.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-91)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	

Dimension	Rating	Motivation	Significance
Intensity	Very Serious (5)	Stockpiling of overburden (including topsoil, soft overburden and hard overburden) and the associated dust is expected to cause a very serious visual disturbance. The stockpiles will become visible from a greater distance as they increase in height and will begin to dominate the landscape for nearby receptors.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Topsoil stockpiles should be vegetated with grasses (*Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix*) where possible so as to blend in with the surrounding landscape and reduce dust generation; ▪ Limit the footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 20 m (Table 5); ▪ Ensure the soft overburden and hard overburden stockpiles do not exceed the proposed height of 20 m (Table 5); and ▪ Apply dust suppression techniques to limit dust generated from stockpiles.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-77)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Serious (4)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.2.4 Activity 11: Drilling and Blasting of Coal

Drilling and blasting of coal is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of drilling and blasting of coal are indicated in Table 36.

Table 36: Interactions and Impacts of Drilling and Blasting of Coal on the Visual Aspects

Interaction	Impact
Drilling and blasting of coal	Drilling and blasting of coal will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment.

11.3.2.4.1 Impact Description

Drilling and blasting of coal will have a major negative visual impact on the receiving environment.

11.3.2.4.2 Management Objective

The management objective is to minimise the negative visual impacts caused by drilling and blasting of coal.

11.3.2.4.3 Management Actions

The following management actions are required for drilling and blasting of coal:

- Apply dust suppression techniques to limit the dust generated from the blasting;
- Ensure that the open pit is backfilled with material from the overburden stockpiles;
- Rehabilitate all disturbed areas;
- Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography;
- Spread topsoil over the rehabilitated area;
- Ensure that surface water and drainage lines are rehabilitated;
- Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and
- Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.

11.3.2.4.4 Impact Ratings

The impact ratings and mitigation/management actions for drilling and blasting of coal are summarised in Table 37.

Table 37: Potential Impacts of Drilling and Blasting of Coal on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Drilling and Blasting of Coal)			
Impact Description: Drilling and blasting of coal will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment.			
Prior to Mitigation/Management			
Duration	Permanent (7)	There will be a permanent and irreversible negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain.	Major negative (-119)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Highly Irreplaceable (7)	Drilling and blasting of coal will result in a permanent and irreversible negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			

Dimension	Rating	Motivation	Significance
▪ Apply dust suppression techniques to limit the dust generated from the blasting; ▪ Ensure that the open pit is backfilled with material from the overburden stockpiles; ▪ Rehabilitate all disturbed areas; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated; ▪ Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and ▪ Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.			
Post-Mitigation			
Duration	Permanent (7)	There will be a permanent and irreversible negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain.	Moderate negative (-98)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Very Serious (5)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.2.5 Activity 12: Loading, Hauling and Stockpiling of RoM Coal

Loading, hauling and stockpiling of RoM coal is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of loading, hauling and stockpiling of RoM coal are indicated in Table 38.

Table 38: Interactions and Impacts of Loading, Hauling and Stockpiling of RoM Coal on the Visual Aspects

Interaction	Impact
Loading and hauling of RoM coal	Vehicular activity to load and haul RoM coal will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.
Stockpiling of RoM coal	Stockpiling of RoM coal will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.

11.3.2.5.1 Impact Description

Loading and hauling of RoM coal will have a minor negative visual impact on the receiving environment. Stockpiling of RoM coal will have a moderate negative visual impact on the receiving environment.

11.3.2.5.2 Management Objective

The management objective is to minimise the negative visual impacts caused by loading, hauling and stockpiling of RoM coal.

11.3.2.5.3 Management Actions

The following management actions are required for loading and hauling of RoM coal:

- Limit the speed of vehicles on the haul roads to reduce dust; and
- Haul roads should be wetted frequently by means of a water bowser to suppress dust.

The following management actions are required for stockpiling of RoM coal:

- Limit the footprint area of the RoM coal stockpile where possible;
- Ensure the RoM coal stockpile does not exceed the proposed height of 10 m (Table 5);
- Limit the quantity and time of RoM coal stored on site; and
- Apply dust suppression techniques to limit dust generated from the RoM coal stockpile.

11.3.2.5.4 Impact Ratings

The impact ratings and mitigation/management actions for loading, hauling and stockpiling of RoM coal are summarised in Table 39 and Table 40.

Table 39: Potential Impacts of Loading and Hauling of RoM Coal on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Loading and Hauling of RoM Coal)			
Impact Description: Vehicular activity to load and haul RoM coal will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-70)

Dimension	Rating	Motivation	Significance
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Minor (2)	Loading and hauling of RoM coal and the associated dust is expected to cause a minor visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Limit the speed of vehicles on the haul roads to reduce dust; and ▪ Haul roads should be wetted frequently by means of a water bowser to suppress dust.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-48)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minimal (1)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Almost Certain/ Highly Probable (6)	The impact will almost certainly occur.	
Nature	Negative		

Table 40: Potential Impacts of Stockpiling of RoM Coal on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Stockpiling of RoM Coal)			
Impact Description: Stockpiling of RoM coal will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.			
Prior to Mitigation/Management			

Dimension	Rating	Motivation	Significance
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-77)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Moderate (3)	Stockpiling of RoM coal and the associated dust is expected to cause a moderate visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Limit the footprint area of the RoM coal stockpile where possible; ▪ Ensure the RoM coal stockpile does not exceed the proposed height of 10 m (Table 5); ▪ Limit the quantity and time of RoM coal stored on site; and ▪ Apply dust suppression techniques to limit dust generated from the RoM coal stockpile.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-63)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minor (2)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.2.6 Activity 13: Use and Maintenance of Haul Roads

Use and maintenance of the haul roads is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of use and maintenance of the haul roads are indicated in Table 41.

Table 41: Interactions and Impacts of Use and Maintenance of Haul Roads on the Visual Aspects

Interaction	Impact
Use of haul roads	Vehicular activity on the haul roads will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.

11.3.2.6.1 Impact Description

Use and maintenance of the haul roads will have a minor negative visual impact on the receiving environment.

11.3.2.6.2 Management Objective

The management objective is to minimise the negative visual impacts caused by use and maintenance of the haul roads.

11.3.2.6.3 Management Actions

The following management actions are required for use of the haul roads:

- Limit the speed of vehicles on the haul roads to reduce dust; and
- Haul roads should be wetted frequently by means of a water bowser to suppress dust.

11.3.2.6.4 Impact Ratings

The impact ratings and mitigation/management actions for use and maintenance of the haul roads are summarised in Table 42.

Table 42: Potential Impacts of Use and Maintenance of Haul Roads on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Use and Maintenance of Haul Roads)			
Impact Description: Vehicular activity on the haul roads will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-70)

Dimension	Rating	Motivation	Significance
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Minor (2)	Vehicular activity on the haul roads and the associated dust is expected to cause a minor visual disturbance. Maintenance of the haul roads is expected to cause a minor visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Limit the speed of vehicles on the haul roads to reduce dust; and ▪ Haul roads should be wetted frequently by means of a water bowser to suppress dust.			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Minor negative (-48)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minimal (1)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Almost Certain/ Highly Probable (6)	The impact will almost certainly occur.	
Nature	Negative		

11.3.2.7 Activity 14: Operation of Washing Plant and Discard Dump

Operation of the washing plant and discard dump is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of operation of the washing plant and discard dump are indicated in Table 43.

Table 43: Interactions and Impacts of Operation of Washing Plant and Discard Dump on the Visual Aspects

Interaction	Impact
Operation of washing plant	Plant area lighting at night will have a negative visual impact on the receiving environment. The plant area lighting will be visible from a distance of up to 10 km and will draw attention to the Project area. This will also have a negative impact on the sense of place.
Operation of discard dump	Disposal of discard from the washing plant on the discard dump will have a negative visual impact on the receiving environment. The impact of the discard dump will occur for the life of the Project. This impact will be reversed if the material from the discard dump is re-washed or used to backfill the open pit during the decommissioning and closure phase.

11.3.2.7.1 Impact Description

Operation of the washing plant will have a moderate negative visual impact on the receiving environment at night. The washing plant is the only area of the mine that is lit at night with the exception of security lighting. Operation of the discard dump will have a moderate visual impact on the receiving environment.

11.3.2.7.2 Management Objective

The management objective is to minimise the negative visual impacts caused by operation of the washing plant and discard dump.

11.3.2.7.3 Management Actions

The following management actions are required for use of the washing plant and discard dump:

- Down lighting must be implemented for operational activities taking place at night to minimise light pollution;
- Ensure the product stockpile does not exceed the proposed height of 10 m (Table 5); and
- Ensure the discard dump does not exceed the proposed height of 20 m (Table 5).

11.3.2.7.4 Impact Ratings

The impact ratings and mitigation/management actions for operation of the washing plant and discard dump are summarised in Table 44 and

Table 45.

Table 44: Potential Impacts of Operation of Washing Plant on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Operation of Washing Plant)			
Impact Description: Plant area lighting at night will have a negative visual impact on the receiving environment. The plant area lighting will be visible from a distance of up to 10 km and will draw attention to the Project area. This will also have a negative impact on the sense of place.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-91)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Very Serious (5)	Plant area lighting at night is expected to cause a very serious visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Down lighting must be implemented for operational activities taking place at night to minimise light pollution; and ▪ Ensure the product stockpile does not exceed the proposed height of 10 m (Table 5).			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-77)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Serious (4)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

Table 45: Potential Impacts of Operation of Discard Dump on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Operation of Discard Dump)			
Impact Description: Disposal of discard from the washing plant on the discard dump will have a negative visual impact on the receiving environment. The impact of the discard dump will occur for the life of the Project. This impact will be reversed if the material from the discard dump is re-washed or used to backfill the open pit during the decommissioning and closure phase.			
Prior to Mitigation/Management			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-91)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Very Serious (5)	Operation of the discard dump is expected to cause a very serious visual disturbance. The discard dump will become visible from a greater distance as it increases in height and will begin to dominate the landscape for nearby receptors.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Ensure the discard dump does not exceed the proposed height of 20 m (Table 5).			
Post-Mitigation			
Duration	Project Life (5)	The impact will occur for the duration of the Project. The LoM is approximately 53 years.	Moderate negative (-77)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Serious (4)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.2.8 Activity 15: Water Use and Storage On-Site

Water use and storage on-site will take place within the mine infrastructure area. The negative visual impact of the mine infrastructure area was assessed in Activity 3 above (Section 11.3.1.3) and the water use and storage on-site is not expected to result in any additional visual impacts.

11.3.2.9 Activity 16: Storage, Handling and Treatment of Hazardous Products and Waste

Storage, handing and treatment of hazardous products (including fuel, explosives and oil) and waste will take place within the mine infrastructure area. The negative visual impact of the mine infrastructure area was assessed in Activity 3 above (Section 11.3.1.3) and the storage, handing and treatment of hazardous products (including fuel, explosives and oil) and waste is not expected to result in any additional visual impacts.

11.3.3 Decommissioning and Closure Phase

The decommissioning and closure phase is characterised by demolition and removal of infrastructure and rehabilitation of the Project area (including spreading of soil, re-vegetation and profiling or contouring). The decommissioning and closure phase is expected to have negative visual impacts on the receiving environment.

Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment (Digby Wells, 2016c). This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography.

Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.

11.3.3.1 Activity 17: Demolition and Removal of all Infrastructure

Demolition and removal of all infrastructure is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of demolition and removal of all infrastructure are indicated in Table 46.

Table 46: Interactions and Impacts of Demolition and Removal of All Infrastructure on the Visual Aspects

Interaction	Impact
Demolition and removal of all infrastructure	Demolition and removal of all infrastructure will have a negative visual impact on the receiving environment. Dust from the demolition process will also have a negative visual impact. Once the infrastructure is removed and rehabilitation of the disturbed areas is complete, there will be an overall neutral visual impact on the receiving environment.

11.3.3.1.1 Impact Description

Demolition and removal of all infrastructure will have a minor negative visual impact on the receiving environment. Once the infrastructure is removed and rehabilitation of the disturbed areas is complete, there will be an overall neutral visual impact on the receiving environment.

11.3.3.1.2 Management Objective

The management objective is to increase the neutral visual impacts caused by demolition and removal of all infrastructure.

11.3.3.1.3 Management Actions

The following management actions are required for demolition and removal of all infrastructure:

- Apply dust suppression techniques to limit the dust from the demolition area;
- Use shade cloth/netting to screen the demolition area;
- Ensure all infrastructure is demolished and removed from the site;
- Limit the quantity and time of rubble stored on site; and
- Rehabilitate all disturbed areas.

11.3.3.1.4 Impact Ratings

The impact ratings and mitigation/management actions for demolition and removal of all infrastructure are summarised in Table 47.

Table 47: Potential Impacts of Demolition and Removal of All Infrastructure on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Demolition and Removal of All Infrastructure)			
Impact Description: Demolition and removal of all infrastructure will have a negative visual impact on the receiving environment. Dust from the demolition process will also have a negative visual impact. Once the infrastructure is removed and rehabilitation of the disturbed areas is complete, there will be an overall neutral visual impact on the receiving environment.			
Prior to Mitigation/Management			
Duration	Medium Term (3)	The impact will occur during the decommissioning and closure phase which is expected to last for 2-5 years.	Minor negative (-56)

Dimension	Rating	Motivation	Significance
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Minor (2)	Demolition and removal of all infrastructure is expected to cause a minor visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			
▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Use shade cloth/netting to screen the demolition area; ▪ Ensure all infrastructure is demolished and removed from the site; ▪ Limit the quantity and time of rubble stored on site; and ▪ Rehabilitate all disturbed areas.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur during the decommissioning and closure phase which is expected to last for 2-5 years.	Minor negative (-36)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Minimal (1)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Almost Certain/ Highly Probable (6)	The impact will almost certainly occur.	
Nature	Negative		

11.3.3.2 Activity 18: Rehabilitation

Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) are indicated in Table 48.

Table 48: Interactions and Impacts of Rehabilitation on the Visual Aspects

Interaction	Impact
Rehabilitation	Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) will have a negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment. This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography. Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.

11.3.3.2.1 Impact Description

Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) will have a moderate negative visual impact on the receiving environment. Once rehabilitation is complete, there will be an overall neutral visual impact on the receiving environment.

11.3.3.2.2 Management Objective

The management objective is to increase the neutral visual impacts caused by rehabilitation (including spreading of soil, re-vegetation and profiling or contouring).

11.3.3.2.3 Management Actions

The following management actions are required for rehabilitation (including spreading of soil, re-vegetation and profiling or contouring):

- Ensure that the open pit is backfilled with material from the overburden stockpiles;
- Rehabilitate all disturbed areas;
- Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography;
- Spread topsoil over the rehabilitated area;
- Ensure that surface water and drainage lines are rehabilitated;
- Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and

- Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.

11.3.3.2.4 Impact Ratings

The impact ratings and mitigation/management actions for rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) are summarised in Table 49.

Table 49: Potential Impacts of Rehabilitation on the Visual Aspects

Dimension	Rating	Motivation	Significance
Activity and Interaction (Rehabilitation)			
Impact Description: Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) will have a negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment. This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography. Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.			
Prior to Mitigation/Management			
Duration	Medium Term (3)	The impact will occur during the decommissioning and closure phase which is expected to last for 2-5 years.	Minor negative (-70)
Extent	Local (3)	The daytime and night time practical viewshed models indicate that the Project will be visible from a distance of up to 10 km. The potential visual receptors include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.	
Intensity	Serious (4)	Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) is expected to cause a serious visual disturbance.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		
Mitigation/Management Actions			

Dimension	Rating	Motivation	Significance
▪ Ensure that the open pit is backfilled with material from the overburden stockpiles; ▪ Rehabilitate all disturbed areas; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated; ▪ Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and ▪ Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur during the decommissioning and closure phase which is expected to last for 2-5 years.	Minor negative (-56)
Extent	Limited (2)	The extent of the impact will be reduced by implementing the mitigation/management actions listed above.	
Intensity	Moderate (3)	The impact will be reduced by implementing the mitigation/management actions listed above.	
Probability	Definite (7)	The impact will definitely occur.	
Nature	Negative		

11.3.3.3 *Activity 19: Environmental Monitoring of Decommissioning Activities*

No visual impact is expected from the environmental monitoring of the decommissioning activities.

11.3.3.4 *Activity 20: Storage, Handling and Treatment of Hazardous Products and Waste*

Storage, handing and treatment of hazardous products (including fuel, explosives and oil) and waste will take place within the mine infrastructure area. The negative visual impact of the demolition of infrastructure was assessed in Activity 18 above (Section 11.3.3.1) and the storage, handing and treatment of hazardous products (including fuel, explosives and oil) and waste is not expected to result in any additional visual impacts.

11.3.4 Post-Closure Phase

The post-closure phase is characterised by post-closure monitoring and rehabilitation. The monitoring will not have an impact on the visual/aesthetic character of the receiving environment. The rehabilitation activities are expected to have a negative visual impact on the receiving environment.

Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment (Digby Wells, 2016c). This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography.

Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.

11.3.4.1 Activity 21: Post-Closure Monitoring and Rehabilitation

Post-closure rehabilitation will take place in the same area as the rehabilitation during the decommissioning and closure phase of the Project. The negative visual impact of rehabilitation assessed in Activity 18 above (Section 11.3.3.2) and the post-closure rehabilitation is not expected to result in any additional visual impacts.

12 Cumulative Impacts

The Project area and surrounds are characterised by residential settlements, small holdings, agriculture and open land interspersed with areas disturbed by mining activities and little of the natural Grassland vegetation remains. The receiving environment consists agricultural land interspersed with farm residences, farm workers houses and the Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht towns.

Several mines and mining activities occur in the vicinity of the Project area. These include the Ergo Grootvlei and Marievale old dump clusters as well as the Daggafontein gold tailings deposition site to the west and south-west of the Project area. There are three operational open pit coal mines near the Project. The Manungu Colliery is located 5.7 km east of the Project area and the Universal Coal Plc Kangala Coal Mine and the Exxaro Leeuwpan Coal Mine are located 6 km and 12 km north-east of the Project area respectively. The nearest power station is the Kendal power station located 39.4 km north-east of the Project area.

12.1 Sense of Place

With the exception of the urban areas to the west of the Project area, the Project area and surrounds have a largely agricultural sense of place interspersed with isolated mining activities. Land uses in the region include agriculture, residential areas, businesses, industries and recreational areas. The Project is expected to have a visual impact on the less industrial activities, i.e. agriculture, residential and recreational areas. As more mining projects are developed in the region the sense of place will change from agricultural to industrial/mining. This will result in a loss of scenic character and increased visual disturbance. Over time the receiving environment will change from one dominated by agriculture and residential areas to one dominated by mining and industry.

13 Unplanned Events and Low Risks

There are no unplanned events and low risks expected for the Project that will result in visual impacts.

14 Environmental Management Plan

The objective of an Environmental Management Plan (EMP) is to present mitigation (a) to manage undue or reasonably avoidable adverse impacts associated with the development of a project and (b) to enhance potential positives.

Mitigation/management actions will sometimes be built into the base of a project and should be considered as part of the "pre-mitigation" scenario; additional mitigation must be recommended if the impact assessment indicates it is necessary.

The EMP must consider each activity and its potential (significant) impacts during the construction, operational, decommissioning and closure, and post-closure phases.

14.1 Project Activities with Potentially Significant Impacts

The Project activities with potentially significant visual impacts on the receiving environment are listed in Table 50.

Table 50: Potentially Significant Project Impacts

Phase	Activity	Interaction	Potentially Significant Impacts
Construction	Activity 1: Site Establishment	Site establishment	Site establishment will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors due to the increased levels of activity on the site.
	Activity 2: Site Clearing	Site clearing and vegetation removal	Site clearing and vegetation removal will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors as it will contrast the surrounding areas.
		Topsoil removal and stockpiling	Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.

Phase	Activity	Interaction	Potentially Significant Impacts
	Activity 3: Construction of Mine Related Infrastructure	Construction of surface infrastructure	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the Project area from an agricultural sense of place to an industrial/mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from a distance of up to 10 km and will draw attention to the Project area. This will also have a negative impact on the sense of place.
	Activity 5: Relocation of Infrastructure	Relocation of infrastructure	Relocation of infrastructure will have a negative visual impact on the receiving environment.
	Activity 6: Blasting and Development of Initial Box-Cut for Mining	Change of land use from agriculture to mining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change of land use will change the sense of place of the Project area and surrounds from an agricultural sense of place to an industrial/mining sense of place resulting in a loss of scenic character and increased visual disturbance. The change of land use will contribute to the cumulative impacts of mining on the regional environment.
		Blasting and development of the initial box-cut for mining	Blasting and development of the initial box-cut for mining will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The box-cut will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.

Phase	Activity	Interaction	Potentially Significant Impacts
		Stockpiling from the initial box-cut	Stockpiling from the initial box-cut will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit during the decommissioning and closure phase.
Operational	Activity 8: Stripping Topsoil and Soft Overburden	Stripping of topsoil and soft overburden	Stripping of topsoil and soft overburden will have a negative visual impact on the receiving environment. As the Project area is stripped it will become noticeable to nearby receptors as it will contrast the surrounding area.
	Activity 9: Removal of Overburden	Removal of overburden	Removal of overburden (including drilling and blasting of hard overburden) will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.
	Activity 10: Loading, Hauling and Stockpiling of Overburden	Loading and hauling of overburden	Vehicular activity to load and haul overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.

Phase	Activity	Interaction	Potentially Significant Impacts
		Stockpiling of overburden	Stockpiling of overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit (soft overburden and hard overburden) and rehabilitate the Project area (topsoil) during the decommissioning and closure phase.
	Activity 11: Drilling and Blasting of Coal	Drilling and blasting of coal	Drilling and blasting of coal will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment.
	Activity 12: Loading, Hauling and Stockpiling of RoM Coal	Loading and hauling of RoM coal	Vehicular activity to load and haul RoM coal will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.
		Stockpiling of RoM coal	Stockpiling of RoM coal will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.

Phase	Activity	Interaction	Potentially Significant Impacts
	Activity 13: Use and Maintenance of Haul Roads	Use of haul roads	Vehicular activity on the haul roads will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.
	Activity 14: Operation of Washing Plant and Discard Dump	Operation of washing plant	Plant area lighting at night will have a negative visual impact on the receiving environment. The plant area lighting will be visible at night and will draw attention to the Project area. This will also have a negative impact on the sense of place.
		Operation of discard dump	Disposal of discard from the washing plant on the discard dump will have a negative visual impact on the receiving environment. The impact of the discard dump will occur for the life of the Project. This impact will be reversed if the material from the discard dump is re-washed or used to backfill the open pit during the decommissioning and closure phase.
Decommissioning and Closure	Activity 17: Demolition and Removal of all Infrastructure	Demolition and removal of all infrastructure	Demolition and removal of all infrastructure will have a negative visual impact on the receiving environment. Dust from the demolition process will also have a negative visual impact. Once the infrastructure is removed and rehabilitation of the disturbed areas is complete, there will be an overall neutral visual impact on the receiving environment.

Phase	Activity	Interaction	Potentially Significant Impacts
	Activity 18: Rehabilitation	Rehabilitation	Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) will have a negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment. This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography. Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.

14.2 Summary of Mitigation and Management

Table 51 provides a description of the mitigation and management options for the environmental impacts anticipated during the construction, operational, decommissioning and closure, and post-closure phases. The table provides a summary of the proposed Project activities, environmental aspects and visual impacts on the receiving environment. Information on the frequency of mitigation, relevant legal requirements, recommended management plans, timing of implementation, and roles/responsibilities of persons implementing the EMP are also included.

Table 31: Mitigation and Management Plan

ctivity	Potential Impacts	Size and Scale of Disturbance	Aspects Affected	Mitigation/Management Actions	Compliance with Standards/Standard to be Achieved	Time Period f Implementati
ctivity 1: Site stablishment	Site establishment will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors due to the increased levels of activity on the site.	Local	Visual	▪ Where possible use fencing that will screen the Project area from nearby receptors; and ▪ Limit the height and footprint area of temporary laydown areas and facilities for the construction workers.	To minimise the negative visual impacts caused by site establishment.	Construction Phase
ctivity 2: Site learing	Site clearing and vegetation removal will have a negative visual impact on the receiving environment. The Project area will become noticeable to nearby receptors as it will contrast the surrounding areas.	Local		▪ Vegetation should only be removed when and where necessary.	To minimise the negative visual impacts caused by site clearing.	Construction Phase
	Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.	Local		▪ Topsoil should only be removed when and where necessary; ▪ Topsoil stockpiles should be vegetated with grasses (*Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix*) where possible so as to blend into the surrounding landscape and reduce dust generation; ▪ Limit the footprint area of topsoil stockpiles where possible; ▪ Limit the height of the topsoil stockpile to 20 m (Table 5); and ▪ Apply dust suppression techniques to limit dust generated from topsoil stockpiles.	To minimise the negative visual impacts caused by topsoil removal and stockpiling.	Construction Phase
ctivity 3: onstruction of ine Related	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the Project area from an agricultural sense of place to an industrial/mining sense	Local		▪ Ensure screening vegetation is left intact around the Project area and near receptors; ▪ Ensure the surface infrastructure does not exceed the proposed heights in Table 5 above; ▪ Surface infrastructure should be painted	To minimise the negative visual impacts caused by construction of mine related	Construction Phase

ctivity	Potential Impacts	Size and Scale of Disturbance	Aspects Affected	Mitigation/Management Actions	Compliance with Standards/Standard to be Achieved	Time Period f Implementati
	will be visible from a distance of up to 10 km and will draw attention to the Project area. This will also have a negative impact on the sense of place.			finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; and ▪ Where possible avoid construction activities at night. If construction activities take place at night then down lighting must be implemented to minimise light pollution.		
ctivity 5: elocation of frastructure	Relocation of infrastructure will have a negative visual impact on the receiving environment.	Local		▪ Limit the footprint area of the road where possible by utilising existing roads for the relocation; ▪ The road should be wetted frequently by means of a water bowser to suppress dust; and ▪ Ensure screening vegetation is left intact along the sides of the road.	To minimise the negative visual impacts caused by relocation of infrastructure.	Construction Phase
ctivity 6: lasting and evelopment of itial Box-Cut for ining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change of land use will change the sense of place of the Project area and surrounds from an agricultural sense of place to an industrial/mining sense of place resulting in a loss of scenic character and increased visual disturbance. The change of land use will contribute to the cumulative impacts of mining on the regional environment.	Local		▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Use shade cloth/netting to screen the demolition area; ▪ Ensure all infrastructure is demolished and removed from the site; ▪ Limit the quantity and time of rubble stored on site; ▪ Ensure that the open pit is backfilled with material from the overburden stockpiles; ▪ Rehabilitate all disturbed areas; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated; ▪ Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata	To minimise the negative visual impacts caused by the change of land use from agriculture to mining.	Decommissio and Closure P

ctivity	Potential Impacts	Size and Scale of Disturbance	Aspects Affected	Mitigation/Management Actions	Compliance with Standards/Standard to be Achieved	Time Period f Implementati
				▪ Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.		
	Blasting and development of the initial box-cut for mining will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The box-cut will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.	Local			To minimise the negative visual impacts caused by blasting and development of the initial box-cut for mining.	Construction Phase
	Stockpiling from the initial box-cut will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit during the decommissioning and closure phase.	Local			To minimise the negative visual impacts caused stockpiling from the initial box-cut.	Construction Phase
ctivity 8: tripping Topsoil nd Soft verburden	Stripping of topsoil and soft overburden will have a negative visual impact on the receiving environment. As the Project area is stripped it will become noticeable to nearby receptors as it will contrast the surrounding area.	Local		▪ Topsoil should only be removed when and where necessary; and ▪ Only remove soft overburden when and where necessary.	To minimise the negative visual impacts caused by stripping of topsoil and soft overburden.	Operational P
ctivity 9: emoval of verburden	Removal of overburden (including drilling and blasting of hard overburden) will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape.	Local		▪ Only remove overburden when and where necessary; and ▪ Apply dust suppression techniques to limit the dust generated from the blasting.	To minimise the negative visual impacts caused by the removal of overburden (including drilling and blasting of hard overburden).	Operational P
ctivity 10: oading, Hauling nd Stockpiling of verburden	Vehicular activity to load and haul overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the vehicular activity	Local		▪ Limit the speed of vehicles on the haul roads to reduce dust; and ▪ Haul roads should be wetted frequently by means of a water bowser to suppress dust.	To minimise the negative visual impacts caused by loading and hauling overburden (including topsoil, soft overburden and hard	Operational P

ctivity	Potential Impacts	Size and Scale of Disturbance	Aspects Affected	Mitigation/Management Actions	Compliance with Standards/Standard to be Achieved	Time Period f Implementati
	Stockpiling of overburden (including topsoil, soft overburden and hard overburden) will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the stockpiles will occur for the life of the Project. This impact will be reversed when the material from the stockpiles is used to backfill the open pit (soft overburden and hard overburden) and rehabilitate the Project area (topsoil) during the decommissioning and closure phase.	Local		▪ Topsoil stockpiles should be vegetated with grasses (*Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix*) where possible so as to blend in with the surrounding landscape and reduce dust generation; ▪ Limit the footprint area of topsoil stockpiles where possible; ▪ Limit the height of the topsoil stockpile to 20 m (Table 5); ▪ Ensure the soft overburden and hard overburden stockpiles do not exceed the proposed height of 20 m (Table 5); and ▪ Apply dust suppression techniques to limit dust generated from stockpiles.	To minimise the negative visual impacts caused by stockpiling overburden (including topsoil, soft overburden and hard overburden).	Operational P
ctivity 11: rilling and lasting of Coal	Drilling and blasting of coal will have a negative visual impact on the receiving environment. Drilling and blasting will result in noise and dust thereby attracting attention to the Project area. Dust from blasting will have a negative visual impact. The open pit will dramatically contrast the surrounding agricultural area as it will result in a scar on the landscape. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment.	Local		▪ Apply dust suppression techniques to limit the dust generated from the blasting; ▪ Ensure that the open pit is backfilled with material from the overburden stockpiles; ▪ Rehabilitate all disturbed areas; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated; ▪ Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis	To minimise the negative visual impacts caused by drilling and blasting of coal.	Operational P Decommissio and Closure P

ctivity	Potential Impacts	Size and Scale of Disturbance	Aspects Affected	Mitigation/Management Actions	Compliance with Standards/Standard to be Achieved	Time Period f Implementati
				Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and ▪ Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.		
ctivity 12: oading, Hauling nd Stockpiling of oM Coal	Vehicular activity to load and haul RoM coal will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.	Local		▪ Limit the speed of vehicles on the haul roads to reduce dust; and ▪ Haul roads should be wetted frequently by means of a water bowser to suppress dust.	To minimise the negative visual impacts caused by loading and hauling of RoM coal.	Operational P
	Stockpiling of RoM coal will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.	Local		▪ Limit the footprint area of the RoM coal stockpile where possible; ▪ Ensure the RoM coal stockpile does not exceed the proposed height of 10 m (Table 5); ▪ Limit the quantity and time of RoM coal stored on site; and ▪ Apply dust suppression techniques to limit dust generated from the RoM coal stockpile.	To minimise the negative visual impacts caused by stockpiling of RoM coal.	Operational P
ctivity 13: Use nd Maintenance f Haul Roads	Vehicular activity on the haul roads will have a negative visual impact on the receiving environment. Dust from the vehicular activity will also have a negative visual impact.	Local		▪ Limit the speed of vehicles on the haul roads to reduce dust; and ▪ Haul roads should be wetted frequently by means of a water bowser to suppress dust.	To minimise the negative visual impacts caused by use and maintenance of the haul roads.	Operational P
ctivity 14: peration of Washing Plant nd Discard ump	Plant area lighting at night will have a negative visual impact on the receiving environment. The plant area lighting will be visible at night and will draw attention to the Project area. This will also have a negative impact on the sense of place.	Local		▪ Down lighting must be implemented for operational activities taking place at night to minimise light pollution; and ▪ Ensure the product stockpile does not exceed the proposed height of 10 m (Table 5).	To minimise the negative visual impacts caused by operation of the washing plant.	Operational P
	Disposal of discard from the washing plant on the discard dump will have a negative visual impact on the receiving environment. The impact of the discard dump will occur for the life of the Project. This impact will be reversed if the material from the discard dump is re-washed or used to backfill the open pit during the decommissioning and closure phase.	Local		▪ Ensure the discard dump does not exceed the proposed height of 20 m (Table 5).	To minimise the negative visual impacts caused by operation of the discard dump.	Operational P

ctivity	Potential Impacts	Size and Scale of Disturbance	Aspects Affected	Mitigation/Management Actions	Compliance with Standards/Standard to be Achieved	Time Period f Implementati
ctivity 17: emolition and emoval of all frastructure	Demolition and removal of all infrastructure will have a negative visual impact on the receiving environment. Dust from the demolition process will also have a negative visual impact. Once the infrastructure is removed and rehabilitation of the disturbed areas is complete, there will be an overall neutral visual impact on the receiving environment.	Local		▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Use shade cloth/netting to screen the demolition area; ▪ Ensure all infrastructure is demolished and removed from the site; ▪ Limit the quantity and time of rubble stored on site; and ▪ Rehabilitate all disturbed areas.	To increase the neutral visual impacts caused by demolition and removal of all infrastructure.	Decommissio and Closure P
ctivity 18: ehabilitation	Rehabilitation (including spreading of soil, re-vegetation and profiling or contouring) will have a negative visual impact on the receiving environment. Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment. This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography. Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.	Local		▪ Ensure that the open pit is backfilled with material from the overburden stockpiles; ▪ Rehabilitate all disturbed areas; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated; ▪ Re-vegetate the rehabilitated areas with grasses (Andropogon appendiculatus, Andropogon eucomus, Andropogon huillensis, Aristida congesta subsp. Barbicollis, Arundinella nepalensis, Cynodon dactylon, Eragrostis capensis, Eragrostis curvula, Eragrostis gummiflua, Eragrostis racemose, Fingerhuthia Africana, Hyparrhenia hirta, Hyparrhenia tamba, Imperata cylindrical, Melinis repens, Paspalum dilatatum, Setaria sphacelata, Sporobolus africanus, Sporobolus pyramidalis, Themeda triandra, Trichoneura grandiglumis and Tristachya leucothrix); and ▪ Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	To increase the neutral visual impacts caused by rehabilitation (including spreading of soil, re-vegetation and profiling or contouring).	Decommissio and Closure P

14.3 Monitoring Plan

Canyon Coal will be responsible for the implementation of all monitoring actions. The recommended monitoring actions for the identified impacts are detailed below. Canyon Coal will also be responsible for keeping a record of all environmental monitoring undertaken for the Project.

The following monitoring activities should be undertaken on a monthly basis for the life of the Project:

- Dust monitoring and management as per the Air Quality Monitoring Plan (reducing the dust on site will reduce the visual impact of dust);
- The existing rows of trees planted near some farm residences as windbreaks/ vegetation screens need to be maintained and protected against fire and utilisation of the vegetation for fire wood, etc.; and
- Grievances from visual receptors must be monitored and addressed through a Grievance Mechanism.

14.4 General Mitigation/Management

According to Brush et al (1979), vegetation screening is the best mitigation/management action to conceal a development. Figure 20 illustrates the screening effect of vegetation. It is recommended that any vegetation which may potentially conceal the proposed development be left undisturbed, especially on the Project boundary. This includes the existing rows of trees planted near some farm residences as windbreaks/vegetation screens. Figure 21 illustrates the effect of cleared vegetation allowing direct views of the proposed infrastructure.

The natural vegetation of the Project area and surrounds is Grassland and does not contain tree species. The existing rows of trees planted near some farm residences as windbreaks/vegetation screens are alien invasive species. It is therefore not possible to recommend tree species for vegetation screens as there are no indigenous trees in the Grassland vegetation.

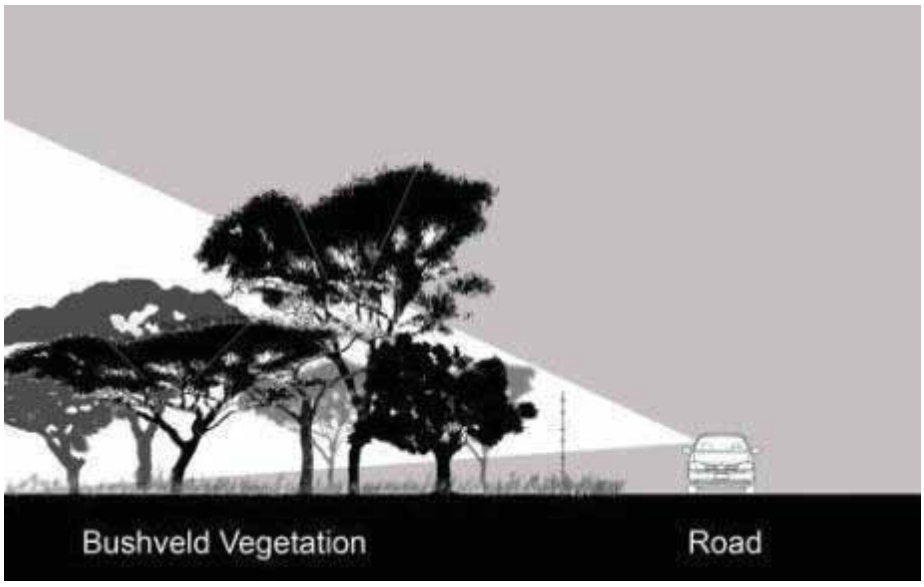

Figure 20: Screening Effect of Vegetation

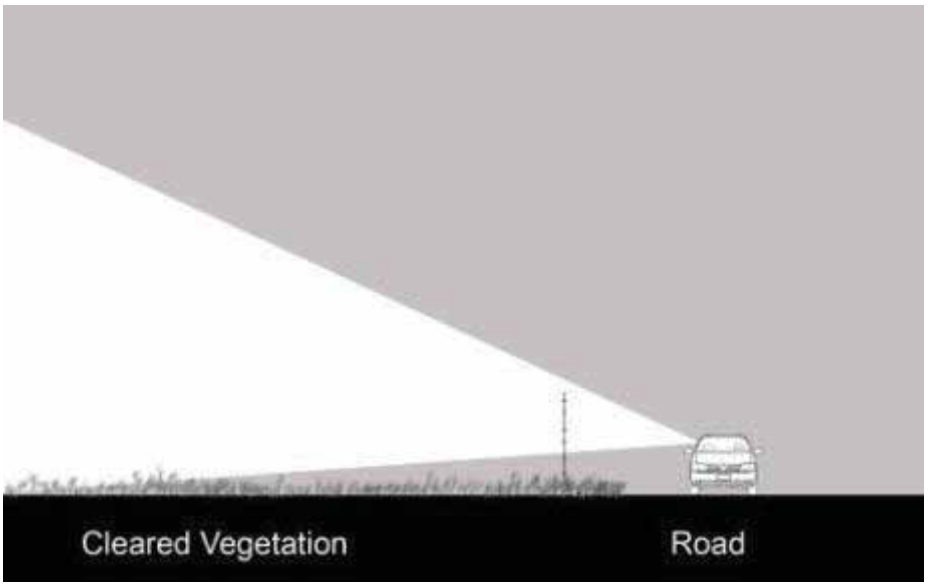

Figure 21: Effect of Cleared Vegetation

Other general mitigation/management actions that should be implemented where possible include:

- As much existing vegetation as possible should be retained, specifically bushes and trees if present. This will assist to conceal the development;
- Areas susceptible to dust should be frequently wetted by means of a water bowser. It is extremely important to suppress the visual aspects of dust to avoid creating the impression of a polluting industry;
- Down lighting must be implemented to minimise light pollution at night; and

- An appropriate grievance mechanism should be developed to respond to grievances from receptors that relate to visual aspects.

15 Consultation Undertaken

It was not necessary to contact individual landowners as all fieldwork for the VIA was undertaken from publically accessible roads.

15.1 Comments and Responses

This is a draft VIA report. Once this report has been made available for public review, the comments and responses section will be populated with any comments received.

16 Recommendations

It is recommended that the mitigation/management actions in Section 14 above are implemented to reduce the impact that the Project will have on the visual character of the receiving environment. The Project will have a very high visual impact on the receiving environment and will be visible from a distance of up to 10 km. This visual impact will occur for the life of the Project but can be reversed with sufficient rehabilitation.

Once coal is removed from the open pit there will be insufficient material to backfill the open pit completely and a void will remain. This will result in a permanent and irreversible negative visual impact on the receiving environment (Digby Wells, 2016c). This impact will be reduced if the Project area is re-contoured and profiled to create a free-draining topography.

During the decommissioning and closure phase all surface infrastructure must be demolished and removed from the site. The open pit must be backfilled with material from the overburden stockpiles. The Project area must be re-contoured and profiled to create a free-draining topography to reduce the negative visual impact of mining on the receiving environment. The topsoil stockpiles must be spread over the disturbed areas and these areas must be vegetated to complete the rehabilitation process. Once rehabilitation is complete and the Project area has re-contoured and profiled to create a free-draining topography there will be an overall neutral visual impact on the receiving environment.

Based on the findings of this VIA only (not taking into account the findings of any other studies), it is recommended that the Project can proceed together with the implementation of all the mitigation/management actions stipulated.

17 Conclusion

Canyon Coal is proposing the development of a new open pit coal mine and supporting infrastructure located on portions 1, 2, 4, 9, 13 and 19 of the farm Palmietkuilen 124 IR located in the Lesedi Local Municipality and the Sedibeng District Municipality of the Gauteng Province, South Africa.

The current resource is estimated at 125.98 Mt. The life of mine (LoM) for the Project is 53 years including a 2 year ramp-up period. Once the mine has been established a full production rate of 200 000 t/month will be maintained for 51 years.

Theoretical and practical viewshed models were created for the Project. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models show the areas from which the Project may potentially be visible.

The theoretical viewshed model was refined to daytime and night time practical viewshed models with a buffer of 10 km around the proposed infrastructure and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure and associated night time lighting will be noticeable beyond this 10 km buffer. The practical viewshed models cover an area of approximately 275.79 km².

The potential visual receptors identified within the daytime and night time practical viewshed areas include residents of the towns and settlements within 10 km of the proposed infrastructure (Daggafontein, Eloff, Endicott, Largo, Strubenvale, Sundra, Vischkuil and Welgedacht), residents of the surrounding farms and small holdings (2 022 receptor points), road users of the N17 national route, the R29, R42 and R555 regional roads, secondary roads and farm roads and visitors to the Benoni Angling Society at Aston Lake, the Blesbokspruit Ramsar Site and IBA, the Marievale Nature Reserve and Bird Sanctuary and the Palmietkuil South War Cemetery Memorial.

The “guideline for involving visual and aesthetic specialists in EIA processes” document by Oberholzer (2005) identifies quarrying and mining activities as a Category 5 development. The receiving environment of the Project is classified as a protected area of international significance due to the proximity of the Blesbokspruit Ramsar Site to the Project and a Category 5 development in this area is expected to have a very high visual impact. The findings of this VIA concur with this categorisation.

18 References

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Appendix A: Specialist CV

Mrs. Stephanie Mulder

Unit Manager: GIS

GIS, Remote Sensing & Noise

Digby Wells Environmental

1 Education

Year	Qualification
2006	BSc (Hons) Geography (cum laude) at University of Johannesburg Major subjects: Philosophy and Research Methodology; Strategic Environmental Planning; Geographic Information Systems (GIS); Urban Geography and Geomorphology
2003 to 2005	BSc Geography and Informatics with Financial Orientation at University of Johannesburg Major subjects: Geography and Informatics Ancillary subjects: Mathematics; Analytical Techniques; Financial Management; Accounting and Business Management

2 Training

Year	Course
2012	Diplôme D'Études en Langue Française – DELF A1 (La Commission Nationale du DELF et du DALF)
2011	ArcPad for ArcGIS (ESRI)
2011	Mining for Non-Miners (Snowden)
2009	Emerging Management Development Programme (EMDP) (University of Pretoria in association with the Public Administration Leadership and Management academy (PALAMA) and the School of Public Management and Administration)
2008	Building Geodatabases (ESRI)
2008	Geodatabase Design Concepts (ESRI)
2007	Introduction to ArcGIS I (ESRI)

3 Language Skills

Language	Level
English	Excellent
Afrikaans	Good
French	Intermediate

4 Employment

Date	Company	Position
1 July 2012 to Present	Digby Wells Environmental	Unit Manager: GIS
1 September 2009 to 30 June 2012	Digby Wells Environmental	Environmental GIS Specialist
1 January 2008 to 31 August 2009	Statistics South Africa, Geography Division	GIS Specialist – Geo-Database and Application Development
1 January 2007 to 31 December 2007	Statistics South Africa, Geography Division	Intern Professional
February 2006 to October 2006	Department of Geography, Environmental Management and Energy Studies, University of Johannesburg	Demonstrator for the First Year Geography Practical Lectures

5 Experience

I have experience in using Geographic Information Systems (GIS) as a digital cartographic and spatial analytical tool. As a GIS Specialist at Statistics South Africa I was responsible for maintaining the geodatabase and I gained experience working with vector data, aerial photography and satellite imagery. I was responsible for the data preparation and mapping for the Community Survey 2007 Digital Atlas CD. I assisted with map production for surveys and user requests for spatial data. I also worked on the Dwelling Frame Project, Placename and Enumerator Area Demarcation.

My responsibilities at Digby Wells currently include but are not limited to:

- Management of the GIS unit;

- Generation of maps for projects;
- Conducting Topography and Visual Impact Assessments (T&VIAs);
- Review of GIS maps and T&VIA Reports;
- Assisting with the maintenance of the GIS databases by storing all electronic files in a well organised structure;
- Expanding and improving the GIS databases by identifying gaps and sources of additional mapping data;
- The production of spatial information in map format;
- Application of GPS technology, aerial photo and satellite images.
- Assessing digital databases to ensure a high level of accuracy of data available at all times; and
- Spatial analyses relating to environmental projects.

6 Project Experience

My project experience at Digby Wells includes but is not limited to:

Year	Client	Project	Responsibility	Location
2016	Ergo	Grootvlei TSF Cluster EIA	Topography and Visual Baseline Report Supervise mapping	Gauteng, South Africa
2016	Glencore	Hendrina Reserve Mine EIA	Topography and Visual Baseline Report Supervise mapping	Mpumalanga, South Africa
2016	Ivanplats	Addendum to Platreef EIA	Visual Impact Assessment Mapping	Limpopo, South Africa
2016	Namane Generation	Namane Generation IPP and Transmission Line Project	Topography and Visual Impact Assessment Supervise mapping	Limpopo, South Africa
2016	Sasol Mining	Brandspruit Interactive Map and Document Management System	Project Manager	Mpumalanga, South Africa

Year	Client	Project	Responsibility	Location
2016	Sasol Mining	Middelbult Interactive Map and Document Management System	Project Manager	Mpumalanga, South Africa
2016	Sasol Mining	Mooikraal Interactive Map and Document Management System	Project Manager	Mpumalanga, South Africa
2015	Anker Coal	Elandsfontein and Golfview Baseline Studies	Mapping	Mpumalanga, South Africa
2015	Anker Coal	Elandsfontein and Golfview Closure Cost Assessments	3D modelling and closure calculations Mapping	Mpumalanga, South Africa
2015	Anker Coal	Elandsfontein and Golfview IWULAs	Mapping	Mpumalanga, South Africa
2015	Anker Coal	Golfview Rehabilitation Plan	3D modelling and volume calculations Mapping	Mpumalanga, South Africa
2015	BECSA (South 32)	KPSX: Weltevreden EIA	Topography and Visual Impact Assessment Supervise mapping	Mpumalanga, South Africa
2015	CDC Group	Fauna and Flora, and Social Studies	Data compilation Mapping	DRC
2015	Fountain Capital	Oakleaf Open Pit Coal Mine EIA	Assist with Topography and Visual Impact Assessment Supervise mapping	Gauteng, South Africa
2015	Gold One	Sibanye WRTRP EIA	Topography and Visual Impact Assessment Supervise mapping	Gauteng, South Africa

Year	Client	Project	Responsibility	Location
2015	Harmony Gold	Closure Cost Assessment 2015	3D modelling and closure calculations Supervise mapping	Free State, Gauteng and North West, South Africa
2015	Lanxess Mining	Lanxess Chrome Mine Section 102 EMP Amendment	Topography and Visual Impact Assessment Mapping	North West, South Africa
2015	Pamish Investments	Magnetite EIA	Topography and Visual Impact Assessment Mapping	Limpopo, South Africa
2015	Sasol Mining	Sigma Interactive Map and Document Management System	Project Manager	Mpumalanga, South Africa
2015	Sasol Mining	Twistdraai Interactive Map and Document Management System	Project Manager	Mpumalanga, South Africa
2014	AECOM	EIA for Management of AMD from the Eastern Basin	Assist with Topography and Visual Impact Assessment Supervise mapping	Gauteng, South Africa
2014	BECSA (South 32)	KPSX: South EIA	Topography and Visual Impact Assessment Supervise mapping	Mpumalanga, South Africa
2014	Ergo	Pipeline GIS Audit	Project Manager	Gauteng, South Africa
2014	Exxaro	Tshikondeni Closure Plan	Mapping	Limpopo, South Africa
2014	Genesis Analytics	Evaluation of Environmental Governance	Interviews, Research and Report Compilation	South Africa
2014	Glencore Xstrata	Tavistock EMP	Mapping	Mpumalanga, South Africa

Year	Client	Project	Responsibility	Location
2014	Harmony Gold	Closure Cost Assessment 2014	3D modelling and closure calculations Supervise mapping	Free State, Gauteng and North West, South Africa
2013	Amara Sega	Cluff Sega RAP	Data compilation Mapping	Burkina Faso
2013	Anglo American Thermal Coal	Dalyshope Coal Mine EIA	Topography and Visual Impact Assessment Mapping	Limpopo, South Africa
2013	Aureus Mining Inc	New Liberty Gold Mine RAP	Questionnaire design Data compilation and analysis Mapping	Liberia
2013	Glencore Xstrata	GIS Phase 2 Project	Project Manager	Mpumalanga, South Africa
2013	Glencore Xstrata	Closure Cost Assessment 2013	3D modelling and closure calculations Supervise mapping	Mpumalanga, South Africa
2013	Harmony Gold	Closure Cost Assessment 2013	3D modelling and closure calculations Supervise mapping	Free State, Gauteng and North West, South Africa
2013	Platreef Resources	Platreef EIA	Topography and Visual Impact Assessment Mapping	Limpopo, South Africa
2013	Rhodium Reefs	Rhodium Reefs EIA	Topography and Visual Impact Assessment	Limpopo, South Africa
2013	Vedanta	Vedanta IPP EIA	Topography and Visual Scoping Study Mapping	Limpopo, South Africa
2012	Bokoni Platinum Mine	Bokoni Water Balance	Mapping	Limpopo, South Africa

Year	Client	Project	Responsibility	Location
2012	Platreef Resources	Platreef Agricultural Survey	Project Manager Data compilation Mapping	Limpopo, South Africa
2012	Platreef Resources	Platreef Skills and Business Survey	Project Manager Digital survey methodology Data compilation and analysis	Limpopo, South Africa
2012	Xstrata Coal	Closure Cost Assessment 2012	3D modelling and closure calculations Supervise mapping	Mpumalanga, South Africa
2012	Xstrata Coal	Consolidated EIA EMP for Tavistock	Mapping	Mpumalanga, South Africa
2011	DRD Gold	Crown Knights Reclamation of Sand Dump 4/A/6 (Lycaste)	Topography and Visual Impact Assessment Mapping	Gauteng, South Africa
2011	DRD Gold	Crown Pipeline Audit	Mapping	Gauteng South Africa
2011	DRD Gold	Crown Consolidated EMP	Mapping	Gauteng, South Africa
2011	Koidu	Koidu RAP	Questionnaire design Data compilation and analysis	Sierra Leone
2011	Rand Gold	Gounkoto RAP	Fieldwork Mapping	Mali
2011	ResGen	Boikarabelo Railway EIA	Topography and Visual Impact Assessments	Limpopo, South Africa
2011	ResGen	Boikarabelo Power Station EIA	Topography Impact Assessment Mapping	Limpopo, South Africa

Year	Client	Project	Responsibility	Location
2011	Temo Coal	Temo Coal Mine EIA	Topography and Visual Impact Assessments	Limpopo, South Africa
2011	Universal Coal	Brakfontein Social and Environmental Screening Study	Mapping	Mpumalanga, South Africa
2011	Universal Coal	Roodekop EIA	Mapping	Mpumalanga, South Africa
2011	Xstrata Coal	Closure Cost Assessment 2011	3D modelling and closure calculations Mapping	Mpumalanga, South Africa
2011	Xstrata Alloys	Lesedi Power Station EIA	Topography Impact Assessment Mapping	Mpumalanga, South Africa
2010	DRD Gold	Crown Pipeline EIA	Mapping	Gauteng, South Africa
2010	DRD Gold	Crown City Deep Reclamation of Slimes Dam 4/L/2	Mapping	Gauteng, South Africa
2010	DRD Gold	Crown City Deep Reclamation of Slimes Dams 3/L/40 & 3/L/42	Mapping	Gauteng, South Africa
2010	Galaxy Gold	Galaxy Gold Mine EIA	Topography and Visual Impact Assessments Mapping	Mpumalanga, South Africa
2010	HCI Coal	Nokuhle Colliery EIA	Topography Impact Assessment Mapping	Mpumalanga, South Africa
2010	HCI Coal	Palesa Extension EIA	Topography and Visual Impact Assessments Mapping	Mpumalanga, South Africa

Year	Client	Project	Responsibility	Location
2010	Mmamabula	Mookane Domestic Power Project	Mapping	Botswana
2010	ResGen	Boikarabelo Coal Mine EIA	Mapping	Limpopo South Africa
2010	Xstrata Coal	Closure Cost Assessment 2010	3D modelling and closure calculations Mapping	Mpumalanga, South Africa
2010	Xstrata Coal	Zonnebloem Colliery EIA	Mapping	Mpumalanga, South Africa
2009	BHP Billiton	Naudesbank & Vaalbank Baseline Studies	Mapping	Mpumalanga, South Africa
2009	MSA	Nkwe Social Survey	Mapping	Limpopo, South Africa
2009	Sasol Mining	Syferfontein Colliery EIA	Mapping	Mpumalanga, South Africa
2009	Universal Coal	Kangala Coal Mine EIA	Mapping	Mpumalanga, South Africa
2009	Xstrata Coal	Community Baseline Survey	Data analysis Mapping	Mpumalanga, South Africa
2009	Xstrata Coal	Tavistock EMPR	Mapping	Mpumalanga, South Africa

7 Professional Affiliations

Geographic Information Society of South Africa (GISSA)

Appendix B: Plans

Plan 1: Regional Setting

Plan 2: Local Setting

Plan 3: Protected Areas

Plan 4: Topographical Model

Plan 5: Slope Model

Plan 6: Aspect Model

Plan 7: Proposed Infrastructure Layout

Plan 8: Theoretical Viewshed Model

Plan 9: Daytime Practical Viewshed Model

Plan 10: Night Time Practical Viewshed Model

Plan 11: Viewpoints for Photomontages

Plan 1

Palmietkuilen Project EIA

Regional Setting

Legend

- Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Main Road
- Arterial / National Route
- Railway Line
- Perennial Stream
- Dam
- Provincial Boundary (2016)
- District Municipal Boundary (2016)

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Projection: Transverse Mercator	Ref #: meg.CNC4065.201607.008
Datum: WGS 1984	Revision Number: 3
Central Meridian: 29°E	Date: 13/10/2016

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Kilometres

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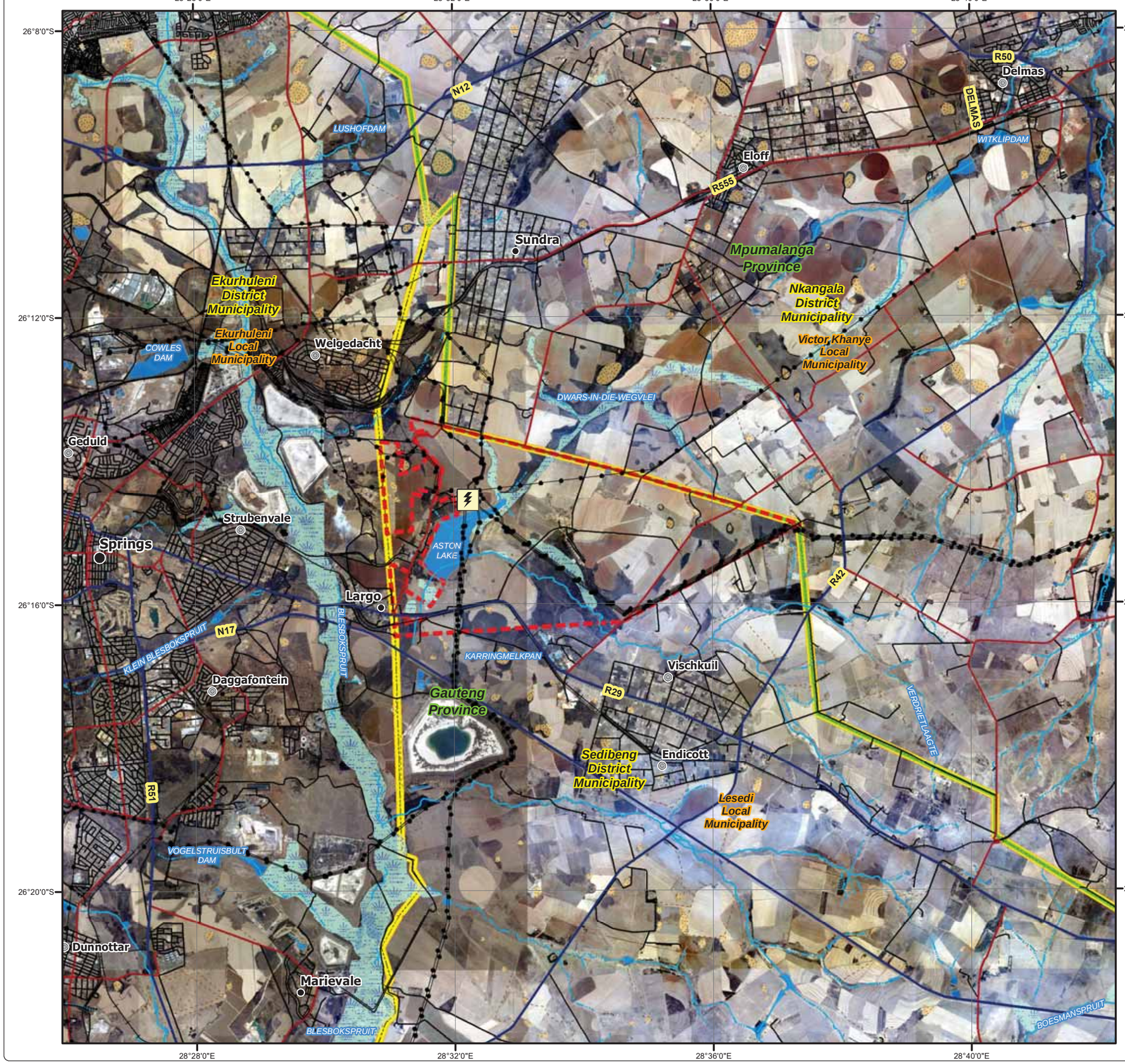
Plan 2

Palmietkuilen Project EIA

Local Setting



Legend

- Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream
- Provincial Boundary (2016)
- District Municipal Boundary (2016)
- Local Municipal Boundary (2016)

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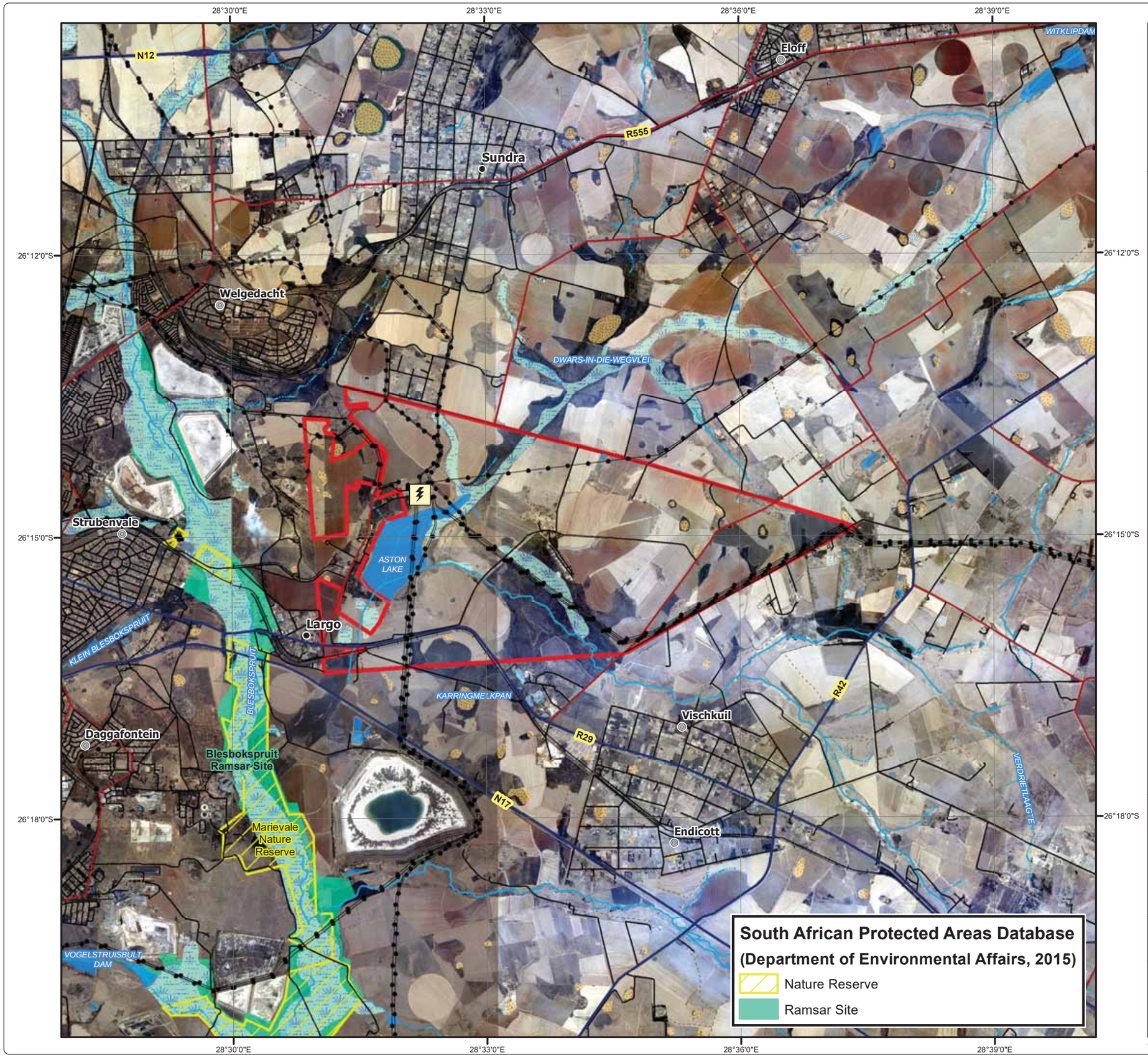
Plan 3

Palmietkuilen Project EIA

Protected Areas



Legend

- Mining Right Boundary
- Other Town
- Settlement
- Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

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Projection: Transverse Mercator	Ref #: meg.CNC4065.201607.053
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Central Meridian: 29°E	Date: 21/10/2016

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Kilometres

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Plan 4

Palmietkuilen Project EIA

Topographical Model

28°24'0"E 28°30'0"E 28°36'0"E 28°42'0"E

26°6'0"S 26°12'0"S 26°18'0"S 26°24'0"S

Petit
Putfontein
Daveyton
Eloff
Delmas
Sundra
Welgedacht
Geduld
Springs
Strubenvale
Largo
Daggafontein
Vischkuil
Kwa-Thema
Endicott
Geluksdal
Dunnottar
Marievale
Tsakane
Duduza
Vorsterkroon
Nigel

N12 R50 R555 R554 R548 R42 R29 N17 R51 R550 R41

LUSHOFDAM COWLES DAM ALEXANDER DAM JAN SMUTS DAM DWARS-IN-DIE-WEGVLEI ASTON LAKE KARRINGMELKPAN KLEIN BLESBOKSPRUIT WITHOKSPRUIT VOGELSTRUISBULT DAM BLESBOKSPRUIT NIGEL DAM SPAARWATERPAN DELMAS WITKLIPDAM BRONKHORSTSPRUIT VERDRIETLAAGTE BOESMANSPRUIT DIE LEEUFONTEIN LEEUPAN

1627.8 1638.8 1645.1 1630.5 1629.8 1624.6 1595.5 1625.9 1617.1 1621.6 1611.7 1601.9 1600 1620 1540 1571 1588.1 1594.3 1612.3 1630.7 1630.7 1599.9 1611.5 1586.4 1641.4 1594.1 1612.4 1617.2 1589.4 1579 1638 1622 1632.2 1587.6 1576.1 1663.2 1689.5 1580 1593.4 1560 1615.4 1615.4 1620.5 1595.7 1679.2 1613.8 1603.4 1598.5 1600 1602.5 1594.3 1608.2 1623.1 1604.6 1637 1623.7 1611.6 1620.3 1667.8 1616.5 1582.1 1590.1 1617.4 1642.3 1622.4 1650.6 1623.9 1617.6 1612.1 1620 1651.8 1657.5 1654 1640.3 1646.1 1676.1 1579.3 1585.9 1607.7 1631.7 1598 1592.2 1662.1 1666.5 1662.4 1640 1598.9 1650.3 1645.2 1581.8 1637.5 1600.2 1629.9 1651.6 1567.5 1662.3

Legend

- Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Trig. Beacon
- Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Contour (20 m)
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

Topography Model
(Elevation m.a.m.s.l.)
High : 1686
Low : 1489

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Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 29°E

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Revision Number: 2
Date: 13/10/2016

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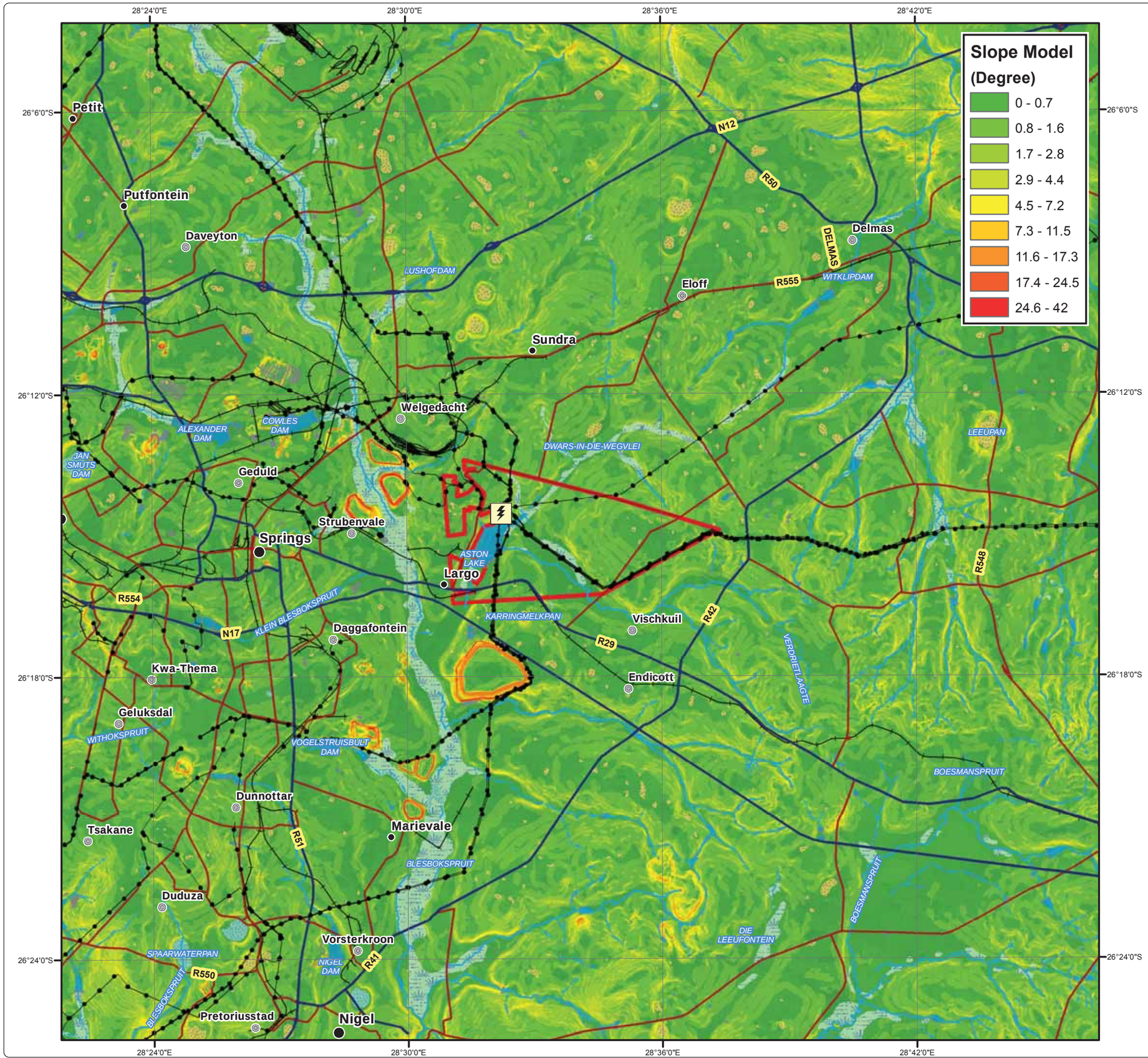
Plan 5

Palmietkuilen Project EIA

Slope Model



Legend

- Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

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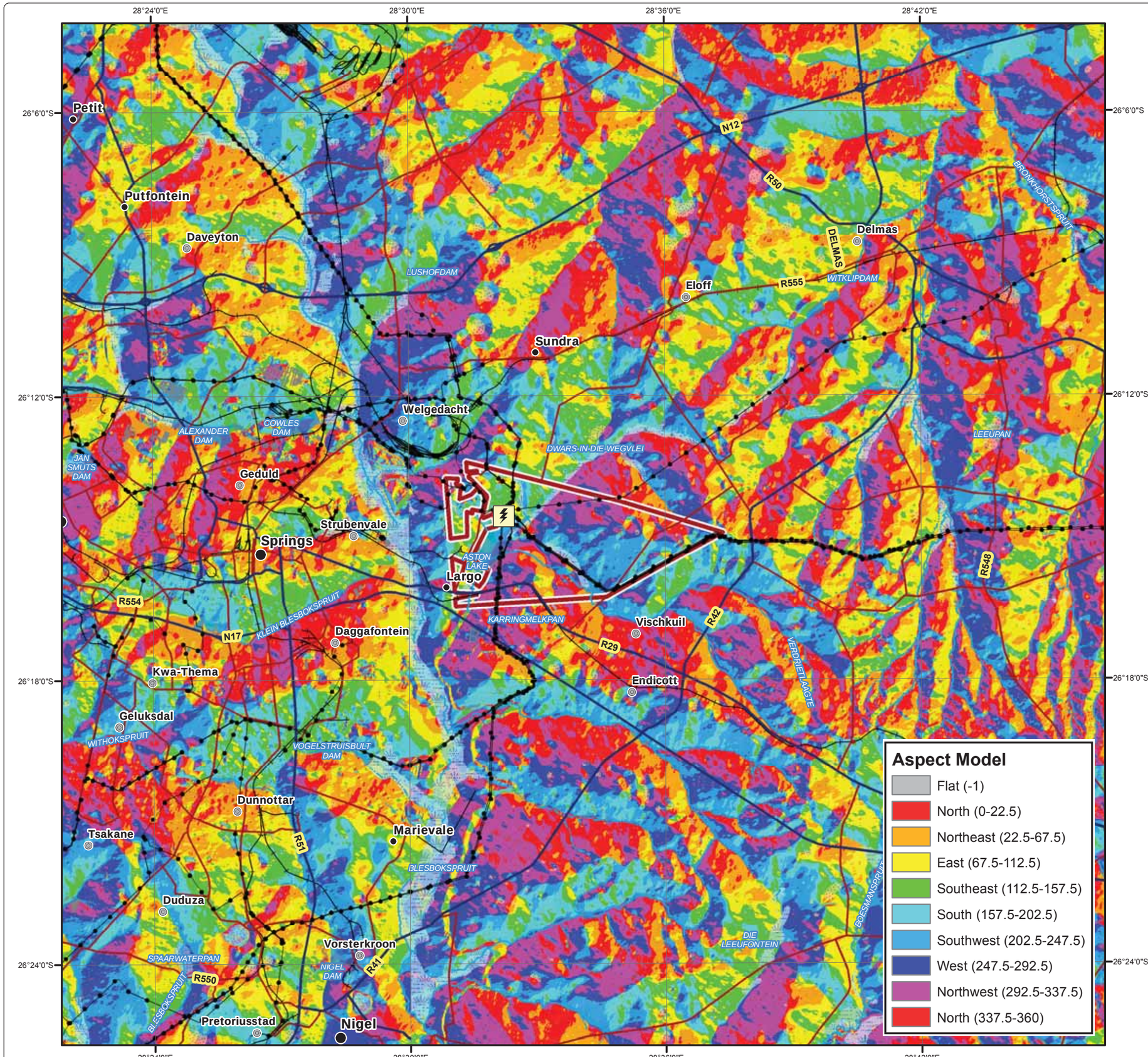
Plan 6

Palmietkuilen Project EIA

Aspect Model



Aspect Model

- Flat (-1)
- North (0-22.5)
- Northeast (22.5-67.5)
- East (67.5-112.5)
- Southeast (112.5-157.5)
- South (157.5-202.5)
- Southwest (202.5-247.5)
- West (247.5-292.5)
- Northwest (292.5-337.5)
- North (337.5-360)

Legend

- Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

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• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 29°E

Ref #: meg.CNC4065.201607.057
Revision Number: 2
Date: 13/10/2016

N

0 1.5 3 6 9

Kilometres

1:150 000

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Plan 7

Palmietkuilen Project EIA

Proposed Infrastructure

28°32'0"E 28°34'0"E 28°36'0"E 28°38'0"E

26°12'0"S 26°14'0"S 26°16'0"S 26°18'0"S

R555 Welgedacht Ukufisa Sub-Station DWARS-IN-DIE-WEGVLEI ASTON LAKE Largo BLESBOKSPRUIT KARRINGMELKPAN R42 N17

Legend

- Mining Right Boundary
- Other Town
- Settlement
- Sub-Station
- Ukufisa Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

Proposed Infrastructure

- Preferred Power Line Route
- Preferred Access Road Route
- Open Pit
- Box Cut
- Hard Overburden Dump
- Soft Overburden Dump
- Top Soil Dump
- RoM Stockpile
- Product Stockpile
- Discard Dump
- Discard Bin
- Pollution Control Dam
- Slurry Dam
- Plant Office Area
- Plant Infrastructure
- Main Office Area
- Mining Contractors Yard Workshop Area
- Mining Cantractors Yard Hard Park Area
- Access Road
- Haul Road
- Ramp
- Conveyor
- Tip
- Berm
- Building
- Parking
- Tarpaulin Area
- Weigh Bridge
- Diesel Storage
- Water Tank

DIGBY WELLS ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 29°E

Ref #: meg.CNC4065.201607.107
Revision Number: 5
Date: 24/03/2017

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Kilometres
1:50 000

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Plan 8

Palmietkuilen Project EIA

Theoretical Viewshed Model

28°30'0"E 28°36'0"E 28°42'0"E

26°12'0"S 26°18'0"S

Delmas
Eloff
Sundra
Welgedacht
Strubenvale
Largo
Daggafontein
Vischkuil
Endicott
Marievale
Ukufisa Sub-Station
Blesbokspruit Ramsar Site
Marievale Nature Reserve

N12 R50 R555 R42 N17 R29 R51

LUSHOFDAM WITKLIPDAM COWLES DAM DWARS-IN-DIE-WEGVLEI ASTON LAKE KLEIN BLESBOKSPRUIT BLESBOKSPRUIT KARRINGMELKPAN VERDRIETLAAGTE VOGELSTRUISBULT DAM BLESBOKSPRUIT

Legend

- Mining Right Boundary
- Preferred Power Line Route
- Preferred Access Road Route
- Proposed Infrastructure
- 10km Buffer of Proposed Infrastructure
- Other Town
- Settlement
- Sub-Station
- Ukufisa Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

Theoretical Viewshed Model

- Not Visible
- Potentially Visible

South African Protected Areas Database
(Department of Environmental Affairs, 2015)

- Nature Reserve
- Ramsar Site

DIGBY WELLS ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 29°E

Ref #: meg.CNC4065.201612.089
Revision Number: 2
Date: 27/03/2017

N

0 1 2 4

Kilometres

1:100 000

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Plan 9

Palmietkuilen Project EIA

Daytime Practical Viewshed Model

28°30'0"E 28°36'0"E 28°42'0"E

26°12'0"S

26°18'0"S

Receptor Points
- Very High (57)
- High (497)
- Moderate (944)
- Low (344)
- Very Low (180)
- Palmietkuil South War Cemetery Memorial

Receptor Polygons
- Very High
- High
- Moderate
- Low
- Very Low

South African Protected Areas Database (Department of Environmental Affairs, 2015)
- Nature Reserve
- Ramsar Site

Legend
- Mining Right Boundary
- Preferred Power Line Route
- Preferred Access Road Route
- Proposed Infrastructure
- 10km Buffer of Proposed Infrastructure
- Other Town
- Settlement
- Sub-Station
- Ukufisa Sub-Station
- Power Line
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

Daytime Practical Viewshed Model
- 0 - 2 km: Potentially Very High Visual Exposure
- 2 - 4 km: Potentially High Visual Exposure
- 4 - 6 km: Potentially Moderate Visual Exposure
- 6 - 8 km: Potentially Low Visual Exposure
- 8 - 10 km: Potentially Very Low Visual Exposure

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Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 29°E

Ref #: meg.CNC4065.201612.090
Revision Number: 2
Date: 27/03/2017

N

0 1 2 4

Kilometres

1:100 000

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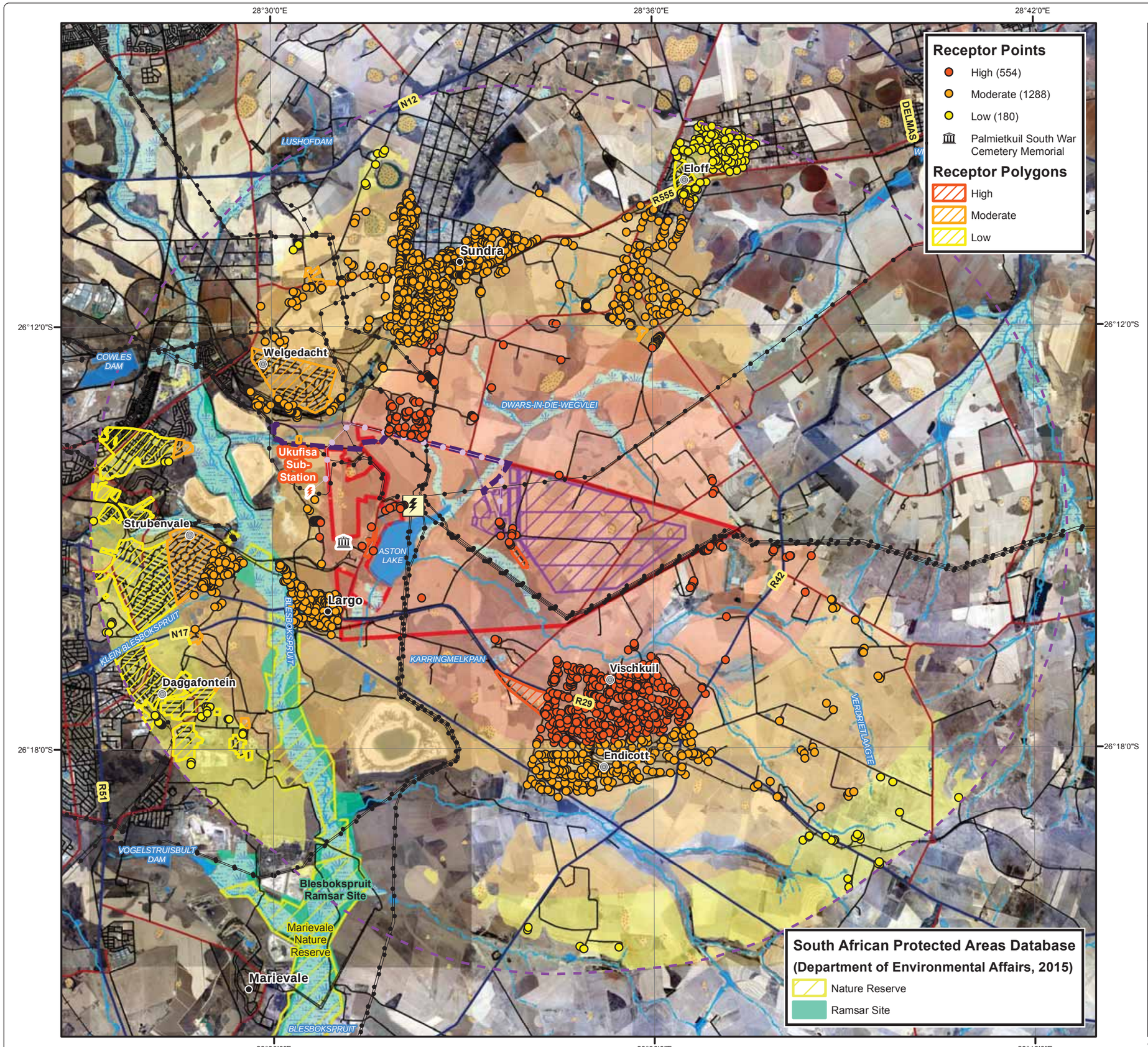
Plan 10

Palmietkuilen Project EIA

Night Time Practical Viewshed Model



Legend

- Mining Right Boundary
- Preferred Power Line Route
- Preferred Access Road Route
- Proposed Infrastructure
- 10km Buffer of Proposed Infrastructure
- Other Town
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- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Perennial Pan
- Non-Perennial Pan / Stream

Night Time Practical Viewshed Model

- 0 - 4 km: Potentially High Visual Exposure
- 4 - 8 km: Potentially Moderate Visual Exposure
- 8 - 10 km: Potentially Low Visual Exposure

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Projection: Transverse Mercator	Ref #: meg.CNC4065.201612.126
Datum: WGS 1984	Revision Number: 2
Central Meridian: 29°E	Date: 27/03/2017

N

0 1 2 4

Kilometres

1:100 000

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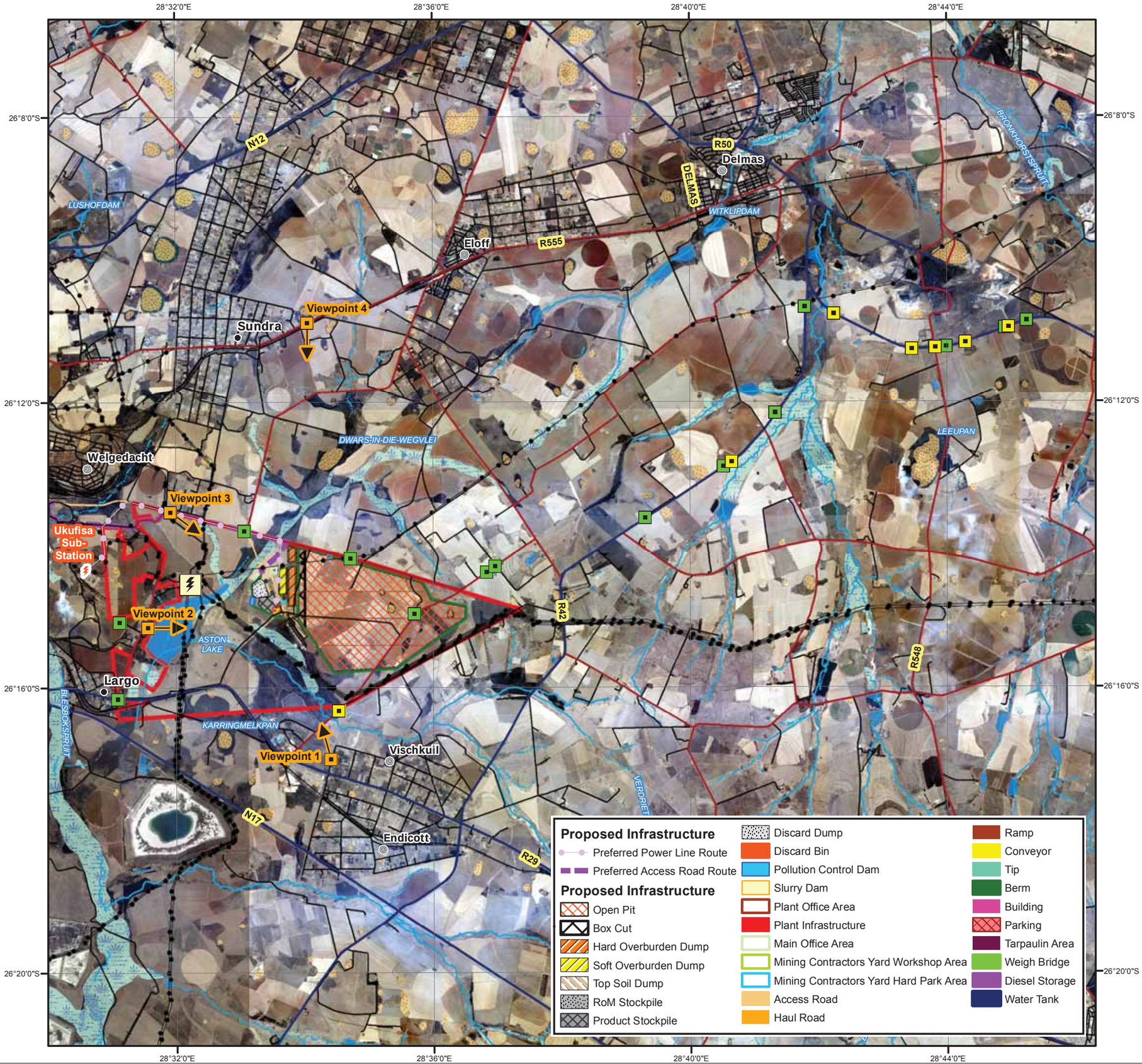
Plan 11

Palmietkuilen Project EIA

Viewpoints for Photomontages



Legend

- Mining Right Boundary
- Other Town
- Settlement
- Sub-Station
- Ukufisa Sub-Station
- Power Line
- Arterial / National Route
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Site Visit Points

- Daytime Photograph
- Night Time Photograph
- Photomontage Viewpoint
- Photomontage View Direction

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Projection: Transverse Mercator	Ref #: meg.CNC4065.201612.091
Datum: WGS 1984	Revision Number: 2
Central Meridian: 29°E	Date: 27/03/2017

N

0 1 2 4

Kilometres

1:100 000