Kangra Coal - Proposed Expansion of Mining Works to Include the Kusipongo Resource – Social and Environmental Management Programme

September 2013

Delivering sustainable solutions in a more competitive world

Kangra Coal (Pty) Ltd.

Proposed Expansion of Mining Works to Include the Kusipongo Resource – Social and Environmental Management Programme

September 2013

Reference 0120258

Prepared by: ERM Southern Africa

For and on behalf of
Environmental Resources Management

Approved by: Mike Everett

Signed:

Position: Partner

Date: September 2013

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LIST OF ACRONYMS

Abbreviation	Full Definition
ADMS	Atmospheric Dispersion Modelling System
AEL	Atmospheric Emission License
AIR	Atmospheric Impact Report
BID	Background Information Document
BOD	Biochemical Oxygen Demand
CARA	Conservation of Agricultural Resources Act
CBOs	Community Based Organisations
CI	Conservation Important
CITES	Convention on the International Trade in Endangered Species
CLO	Community Liaison Officer
CO	Catchment Objectives
CPA's	Community Property Associations
CPF	Community Policing Forum
CSIR	Council for Scientific and Industrial Research
DAFF	National Department of Agriculture, Forestry and Fisheries
DEA	National Department of Environmental Affairs
DEDET	Mpumalanga Department of Economic Development, Environment and Tourism
DMR	Department of Minerals Resources
DSR	Draft Scoping Report
DWA	National Department of Water Affairs
DWEA	National Ministry of Water and Environmental Affairs
EA	Explosives Act
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EHG	Eastern Highveld Grassland
EMP	Environmental Management Programmes
EPL	Ecologically Preferred Location
ERM	Environmental Resources Management
ESA	Early Stone Age
ESIA	Environmental and Social Impact Assessment
FEPAs	Freshwater Ecosystem Priority Areas
FSR	Final Scoping Report
GCS	Groundwater Consulting Services (Pty) Ltd.
GRP	Grave Relocation Process
HGM	Hydro-geomorphic Method
HIA	Heritage Impact Assessment
IAP	Impact Assessment and Planning
IFC	International Finance Corporation
I&APS	Interested and Affected Parties
ICMM	International Council on Mining and Metals
ICP-MS	Inductively Coupled Plasma Mass-spectrometer
IDP'S	Integrated Development Plans
IMCP	Integrated Mine Closure Plan
IPP	Independent Power Provider
IRP	Integrated Resource Plan
IUCN	International Union for the Conservation of Nature
JPOI	Johannesburg Plan of Implementation
KPI's	Key Performance Indicators
LED	Local Economic Development
LM	Local Municipality
LOM	Life of Mine
LSA	Late Stone Age

Abbreviation	Full Definition
MAP	Mean Annual Precipitation
MBCP	Mpumalanga Biodiversity Conservation Plan (Version 2) (CPlan)
MEGDP	Mpumalanga Economic Growth and Development Path
MLM	Mkhondo Local Municipality
MPRDA	Mining and Petroleum Resources Development Act
MRA	Mining Right Application
MSA	Middle Stone Age
MTPA	Mpumalanga Tourism and Parks Agency
MTSF	Medium Term Strategic Framework
NAAQS	National Ambient Air Quality Standards
NDP	National Development Plan
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEPAD	New Partnership for Africa's Development
NEM:PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
NEMWA	National Environmental Management Waste Act (Act No. 59 of 2008)
NIA	Noise Impact Assessment
NFA	National Forests Act (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NGOs	Non-governmental Organizations
NHRA	National Heritage Resources Act (Act No. 43 of 1983)
NSBA	National Spatial Biodiversity Assessment
NSDP	National Spatial Development Perspective
NO_x	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
NPI	National Pollution Inventory
NP	Neutralising Potential
NSBA	National Spatial Biodiversity Assessment
NSS	Natural Scientific Services CC
NWA	National Water Act (Act No. 36 of 1998)
OHTL	Overhead Transmission Line
OES	Ostrich Eggshell
PEL	Preferred Ecological Location
PES	Present Ecological State
PS	Protected Species
PKSLM	Dr. Pixley Kalsaka Seme Local Municipality
PPE	Personal Protection Equipment
PPP	Public Participation Process
PM_{10}	Particulate Matter with an aerodynamic diameter of less than 10 micron
RAP	Resettlement Action Plan
RBCT	Richards Bay Coal Terminal
RDP	Reconstruction and Development Plan
RI&APS	Registered Interested and Affected Parties
ROM	Run of Mine
SAHRA	South African Heritage Resources Agency
SALA	Subdivision of Agricultural Land Act (Act No. 70 of 1970)
SDF	Spatial Development Frameworks
SEMP	Social and Environmental Management Programme
SACSIS	South African Civil Society Information Service
SANS	South African National Standard
SABS	South African Bureau of Standards
SAMBF	South African Mining and Biodiversity Forum
SO_2	Sulphur Dioxide
SANBI	South African National Biodiversity Institute
SAIAB	South African Institute of Aquatic Biodiversity

Abbreviation	Full Definition
SANParks	South African National Parks
SLP	Social and Labour Plan
S&EAP	Social and Environmental Awareness Plan
SA&ERP	Social and Environmental Emergency Response Plan
SACNASP	South African Council of Natural Scientific Professions
SADC	Southern Africa Development Community
SAWS	South African Weather Service
SIA	Socio-economic Impact Assessment
STP	Sewage Treatment Plant
TDS	Total Dissolved Solids
TEOM	Tapered Element Oscillating Microbalance
TWQR	Target Water Quality Range
ToR	Terms of Reference
TSS	Total Suspended Solids
tpa	Tonne per annum
US EPA	United States Environmental Protection Agency
VU	Vulnerable species – IUCN Red List status
WRC	Water Research Commission
WULA	Water Use License Application
WWF	World Wide Fund for Nature
WMG	Wakkerstroom Montane Grassland
WS	Wakkerstroom
WWTP	Waste Water Treatment Plant
WHCA	World Heritage Convention Act (Act No. 49 of 1999)

Social and Environmental Management Programme **PART I**

Impact Assessment Report

1 INTRODUCTION

1.1 ORIENTATION AND CONTEXT SETTING

1.1.1 Current Operations

Kangra Coal (Pty) Ltd. (Kangra Coal) has been extracting coal from the Savmore Colliery and operating the current washing plant at Maquasa East since the late 1990's. The Savmore Colliery currently operates on the Maquasa East (27^0 01' 22.61"S and 30^0 24' 55.91"E), Maquasa West and Maquasa West Extension (27^0 00' 33.90"S and 30^0 21' 18.17"E) properties. The Colliery is situated in the Gert Sibande District Municipality, Mpumalanga, and is located approximately 51km west-south-west from Piet Retief and 64km south east from Ermelo (*Figure 1.1*).

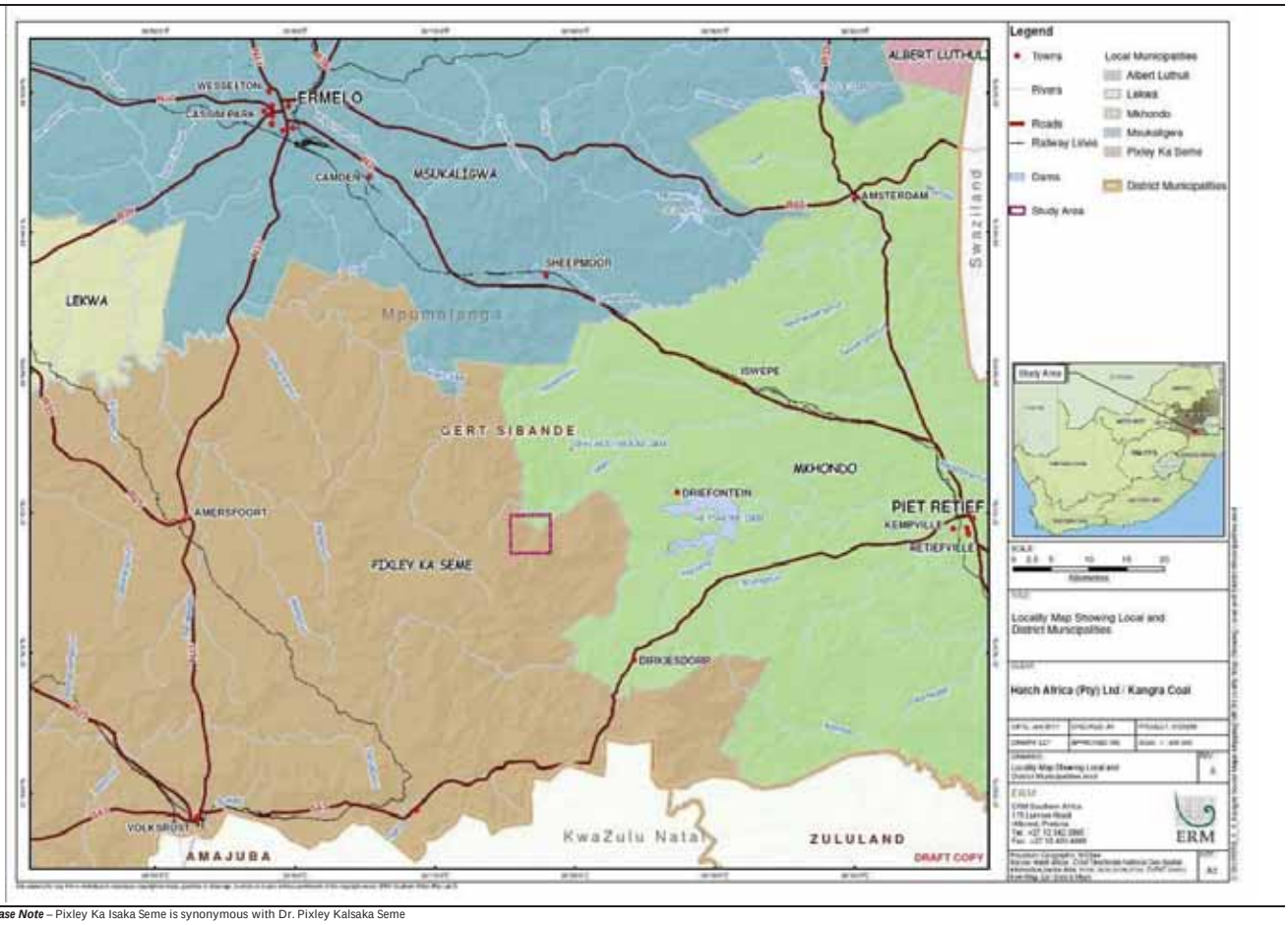
Current operations entail both underground and open cast mining methods, which produce just under five million tons per annum (Mpta) run-of-mine (ROM) of which 70% is product and 30% is discard. The current mining operations produce approximately 3Mtpa of product, of which around 2 Mpta are exported through Richards Bay Coal Terminal (RBCT) and the remainder is sold to the local market. Domestic clients are predominately coal traders, cement and timber factories and sugar mills; one of their largest local clients is Mondi, where coal is used in their paper mills. Currently, coal mined at Maquasa East, Maquasa West and Maquasa West Extension is directed to a washing plant located at Maquasa East by means of an overland conveyor. The current life of these existing mining operations is estimated to be approximately another 3 to 5 years.

1.1.2 Proposed Extensions to the Current Mine Workings

Kangra Coal is working intensively on the development of new mining areas as a natural extension of the current mine workings. The development of new mining areas will enable an extension to the life span of the mine.

One such proposed expansion is into the Kusipongo Resource, which is situated to the west of existing operations. The other is an expansion of the proposed Maquasa workings, which will entail the expansion of existing opencast pits as well as the addition of eight new opencast pits.

Figure 1.1 ***Project Locality***



Please Note – Pixley Ka Isaka Seme is synonymous with Dr. Pixley Kalsaka Seme

1.2 THE PROPOSED KUSIPONGO RESOURCE EXPANSION PROJECT

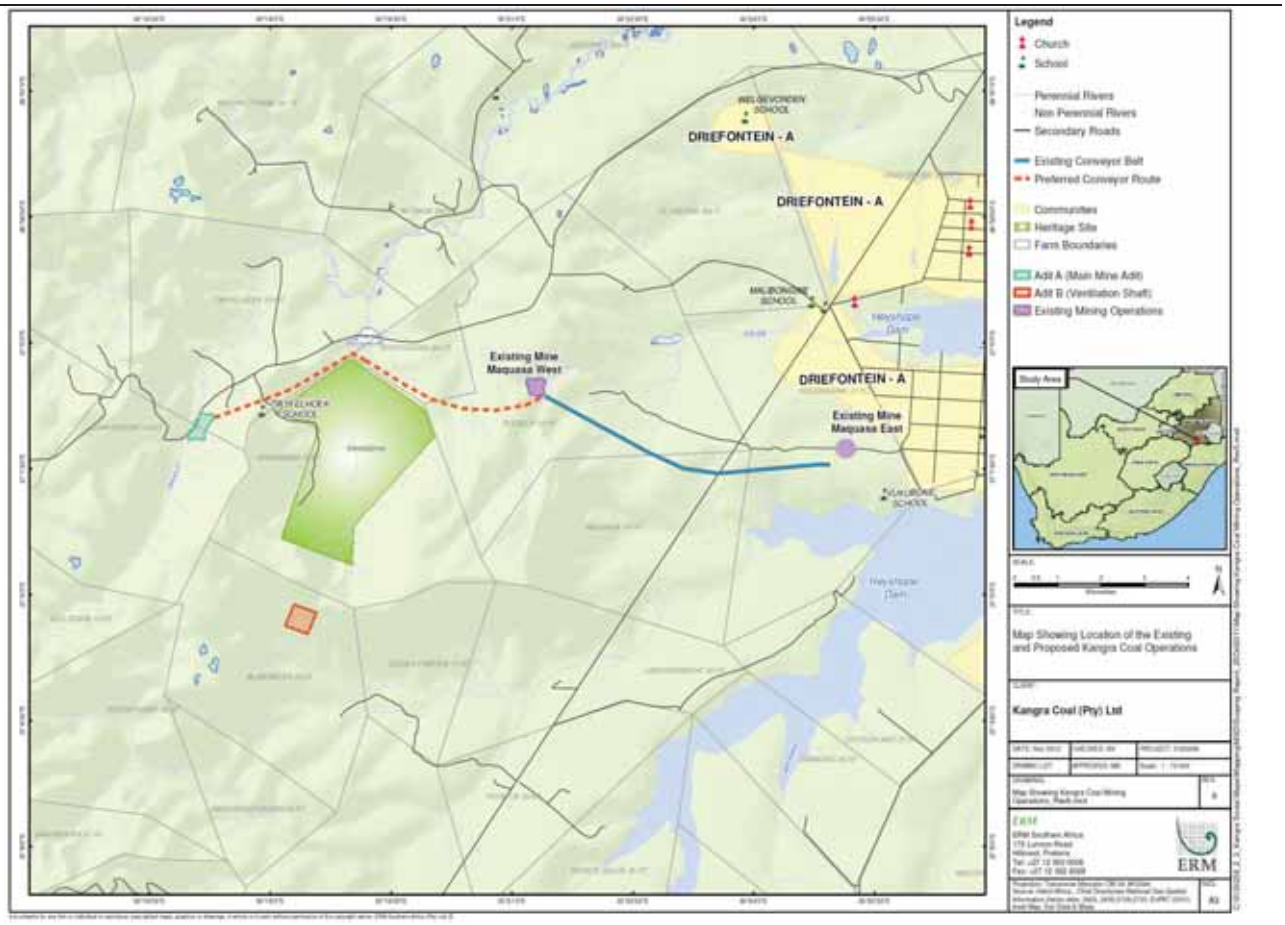
Kangra Coal is considering expanding their coal mining operations at the Savmore Colliery, to include the Kusipongo Coal Resource, situated to the west of existing operations (*Figure 1.2).*

The proposed Project will be restricted to underground mining; however, surface infrastructure to support this underground expansion will include:

- An Adit (entrance to the underground mine which is inclined and through which people, equipment and coal will pass), (referred to as Adit A);
- Associated Adit infrastructure (offices, workshops, stores, change house, crushing circuit, silos, etc.);
- A ventilation shaft, (referred to as Adit B);
- A conveyor belt of approximately 7km in length, to transport coal from the underground operations to the existing Maquasa West Adit and conveyor system, which will transport the coal to the existing plant facilities at the Savmore Colliery; and
- A temporary construction camp (to provide accommodation for semi-skilled and skilled/artisanal and supervisory workers) during the construction phase of the Project, provisionally located 6km away (towards the east) from the proposed site for the Main Mine Adit A along the extension of the D2548.

The management of coal discard is a fundamental part of the proposed Project. All discard produced by the proposed Project will be handled at the existing Maquasa Plant and associated discard facility, and is thus included under the scope of the proposed Maquasa expansion project, described in *Section 1.3*.

Figure 1.2 Location of the proposed Kusipongo Expansion Project



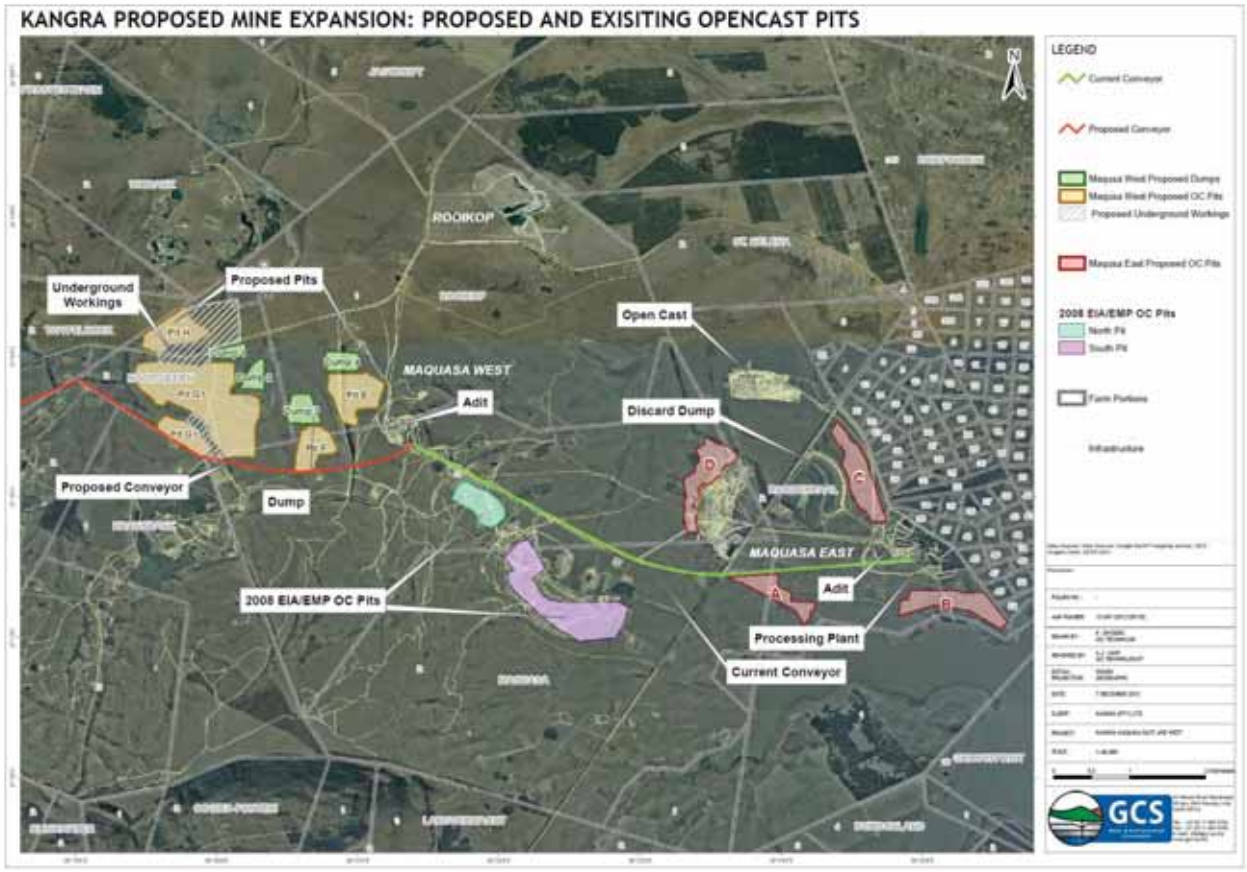
1.3 THE PROPOSED MAQUASA EXPANSION PROJECT

The proposed Maquasa expansion project will entail the expansion of existing opencast pits as well as the addition of eight new opencast pits (*Figure 1.3*).

The mine will utilize all existing ancillary infrastructure such as workshops, offices, sewage facilities, power supply and water supply; however, additional dewatering may take place on the site in the vicinity of the proposed opencast areas. Diesel storage will be required as well as access roads and an extended conveyor line between the proposed opencast and existing mining blocks / infrastructure.

The underground resource areas identified for proposed underground mining are located at the Maquasa West section. These resources will be accessed through the highwall of the opencast pit and the extracted coal will be transported along the conveyor system to the Maquasa East coal washing plant. With the proposed pits and underground areas it is envisaged that additional access routes will be required in order to access the Maquasa West proposed opencast and underground areas.

Figure 1.3 ***Proposed Mine Expansion Projects at Maquasa***



1.4 PROJECT MOTIVATION

Coal is the largest source of energy, providing 27% of the global primary energy needs and generating 41% of the world's electricity (World Coal Association, 2011) (1). South Africa possesses Africa's only significant coal reserves; over 70% of Africa's coal reserves are found in South Africa (Snyman and Botha, 1993) (2), with coal reserves of 30,408 million tonnes at the end of 2009, which represents 3.68% of the world's total coal production. Coal production in South Africa was valued at approximately ZAR 59.9 billion in 2009 (BP Statistical Energy Survey, 2010) (3). South Africa is the world's sixth largest coal producer, and produced 4.3% of the world's coal in 2009 (247 million tonnes) (World Coal Association, 2011).

Conversely, South Africa is Africa's only significant coal consuming country, with a coal consumption of 99.43 million tonnes in 2009, which represents 3.3% of the world's total (Mbeni Information Services, 2011). In 2008, South Africa used coal for 93% of its electricity generation needs, and was the most dependent coal-to-electricity country in the world (World Coal Association, 2011). Apart from its domestic needs, South Africa is still the world's fifth largest coal exporting country, with exports in excess of 60 million tonnes of coal in 2009 (World Coal Association, 2011).

Coal plays a crucial role in the South African energy-economy and is fuelling local industry (Eberhard, 2010). The consumption of coal in South African coal-fired power stations will continue in the near future (Eberhard, 2010) (4). Increased demand in Eastern countries (driven by rapid economic growth rates) will result in an increased demand for South African coal exports (Eberhard, 2010). As such, exports are expected to increase to 105 million tonnes per annum by the year 2020. This will increase the country's export earnings, which in turn will reduce the country's negative trade balance and current account deficit (Eberhard, 2010).

Both local and international markets are, at present, highly dependant on South Africa being a main provider of coal, now and in the future. The identification and exploitation of new coal reserves in South Africa is thus a prerequisite in meeting this demand.

In addition to the national economy, coal plays a crucial role in the provincial economy of Mpumalanga, where the proposed Project is located. Coal mining is a key economic sector in this Province. According to the Mpumalanga Provincial Growth and Development Strategy (PGDS; 2004 – 2014),

(1) WORLD COAL ASSOCIATION. (2011). *Coal Statistics*. <http://www.worldcoal.org/resources/coal-statistics/>. Accessed on 2011-03-17

(2) SNYMAN C.P. & BOTHA W.J. (1993). *Coal in South Africa*. Geology and Development in South Africa (V.16 - Issues 1-2, pages 171-180).

(3) MBENDI INFORMATION SERVICES. (2011). *Coal Mining in South Africa*. <http://www.mbendi.com/indy/ming/coal/af/sa/p0005.htm>. Accessed on 2011-03-17

(4) EBERHARD A. (2010). South African Coal: Market, Investment and Policy Challenges. <http://gsbnet.uct.ac.za/MIR/admin/documents/South%20African%20Coal%20Paper_15_12_2010_17821.pdf>. Accessed on 2011-03-17

Mpumalanga contributed 7.7% to the national GDP in 2001. The majority of the contribution to the provincial economy is made up by the manufacturing sector (28.0%) followed by the mining sector (18.0%). To provide growth and development within the Province, the PGDS has prioritised economic development comprising *inter alia*, job creation, SMMEs, BEE, mining, manufacturing, tourism and agriculture

The economy of the Gert Sibande District Municipality, is made up predominantly of mining and manufacturing. Other key sectors that drive the economy of the District include energy supply and agriculture (Gert Sibande District Municipality IDP: 2009 – 2010). The manufacturing and mining sectors are, however the dominant sectors, contributing 32.1% and 18.4% respectively to the economy of the District Municipality. In terms of employment within the District, the leading sectors include agriculture and mining, contributing 19.2% and 16.9% respectively.

In support of the Mpumalanga PGDS (2004 – 2014), the Gert Sibande District, in its IDP (2009 – 2010) has noted that in order to enhance its local economic development, the agricultural, mining, manufacturing and tourism sectors should be promoted and supported.

Both the Mkhondo Local Municipality IDP (2010/2011) and the Dr. Pixley Kalsaka Seme IDP (2009 – 2012), recognise the importance of mining as a key economic sector within these two Municipalities. Both the Local Municipality's IDPs do, however recognise the significant challenge they are faced with, in balancing the needs of environmental protection with the the economic, and developmental needs of the Region.

The proposed Project is a key factor from a strategic point of view for Kangra Coal. Given that the existing operation which currently exploits the Maquasa West and Maquasa West Extension Mining Rights is approaching depletion (in 3 to 5 years' time), a new resource is required to maintain the current levels of production. The Kusipongo resource and Maquasa East extensions have been identified as feasible options to extend the life of the Colliery.

1.5 TERMS OF REFERENCE AND PROJECT SCOPE

In terms of Section 22 (4a) of the Mining and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA), the proposed Project requires a mining right from the National Department of Minerals Resources (DMR) and must conduct an environmental impact assessment and submit and environmental programme for approval in terms of Section 39 of the MPRDA. In addition, certain aspects of the proposed Project constitute scheduled activities in terms of the National Environmental Management Act 107 of 1998 (NEMA) (as amended by Act No. 62 of 2008; Environmental Impact Assessment Regulations GN.R543, R544 and R545; the National Environmental Management Waste Act (Act No. 59 of 2008) (NEMWA)

Regulations GN.R718; and the National Water Act (Act No. 36 of 1998) (NWA).

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) was appointed by Kangra Coal to undertake the function of independent Environmental Assessment Practitioner (EAP) to undertake an Environmental and Social Impact Assessment (ESIA) for the proposed Project, and to facilitate the Mining Rights Application, Waste Management Activity License Application, Environmental Authorisation Application and Water Use License Application (WULA) processes in accordance with the NEMA Regulations.

Please Note:

This document represents the ESIA for the proposed Kusipongo Resource Expansion Project only.

Kangra Coal has approved Environmental Management Programmes (EMPs) for its Maquasa West, Maquasa East, Rooikop and Nooitgezien mining areas. Kangra Coal submitted a Section 102 application in terms of the MPRDA to the DMR in March 2012 to apply for a consolidation of all existing EMPs into a single EMP.

Since submission of the Section 102 application, Kangra Coal have proposed expanding their existing mining operations with the addition of eight new opencast pits, two new underground mining areas (1) (accessed from the opencast pits) and the provision of an expanded or new discard dump(s) (refer to *Figure 1.3*). As such, Kangra Coal needs to amend their existing Section 102 application to include the aforementioned proposed mining projects.

Kangra Coal have contracted Groundwater Consulting Services (Pty) Ltd. (GCS) to amend the Section 102 application to include the abovementioned opencast mines, underground mines, provision of an expanded or new discard dump and consolidation of all Maquasa operations into a single EMP. In addition, GCS will be carrying authorization processes in terms of the MPRDA and the NEMA. Authorizations in terms of the NEM:AQA, NEM:WA and the NWA will be undertaken by GCS for the Maquasa east expansion project as separate processes.

(1) these two new underground mining areas do not include the proposed Kusipongo Expansion Project

1.6 PURPOSE OF THIS REPORT

The purpose of this Final Social and Environmental Management Programme (SEMP) (1) is to present the following:

- A detailed description of the proposed Project and relevant Project alternatives;
- The ESIA process and a detailed legal review of legislation, guidelines and strategies pertinent to the proposed Project and associated ESIA;
- The outcomes associated with stakeholder engagement activities carried out during the ESIA process;
- A detailed baseline review of the physical, biological and socio-economic characteristics of the Study Area;
- An assessment of impacts to the physical, biological and socio-economical environments related with the different phases (construction, operational and decommissioning and closure phases) of the proposed Project;
- Mitigation measures that aim to avoid / minimise / manage the severity of identified impacts; and
- An assessment of cumulative impacts associated with other planned, existing or project-related developments in the Study Area.

1.7 APPROACH AND METHODOLOGY FOR THE KUSIPONGO EXPANSION PROJECT

This ESIA process is being conducted in accordance with the methodology and processes described in the NEMA Environmental Impact Assessment Regulations GN.R543 (2010). This process includes both Scoping and detailed Environmental and Social Impact Assessment. The execution of these steps to date is as follows:

1. **Scoping** – the objective of this phase was to present a description of the proposed Project, the ESIA process, relevant legislation, the physical, biological and socio-economic characteristics of the Study Area, perceived issues and an outline of the Terms of Reference (ToR) for the various specialist studies that were used to assess the identified environmental and social issues. During this phase, interested and affected parties and key stakeholders were identified and provided with an opportunity to review the Draft Scoping Report (under NEMA) and the Scoping Report

(1) The use of the title "Social and Environmental Management Programme" as opposed to "Environmental Management Programme" (as defined in Section 39 of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)) has been used for this Project. The purpose of this is to emphasise that the process will not only assess environmental impacts but will also assess potential socio-economic impacts of the proposed Project.

(under the MPRDA) and to raise any interim comments / concerns / queries that they may have with the proposed Project.

The final scoping report (under the MPRDA) was lodged with the Regional DMR on 19 December 2012 and with the National and Regional DEA (under NEMA) on 10 April 2013.

2. **Environmental and Social Impact Assessment** – the objective of this phase of the ESIA is to provide a detailed analysis of the potential physical, biophysical and social impacts associated with the planning, construction, operation and decommissioning phases of the proposed Project. Another objective of the ESIA process is to provide a suite of management / mitigation measures to address identified issues.

   The ESIA process is supported by objective and defendable scientific studies and is presented in the form of a SEMP.

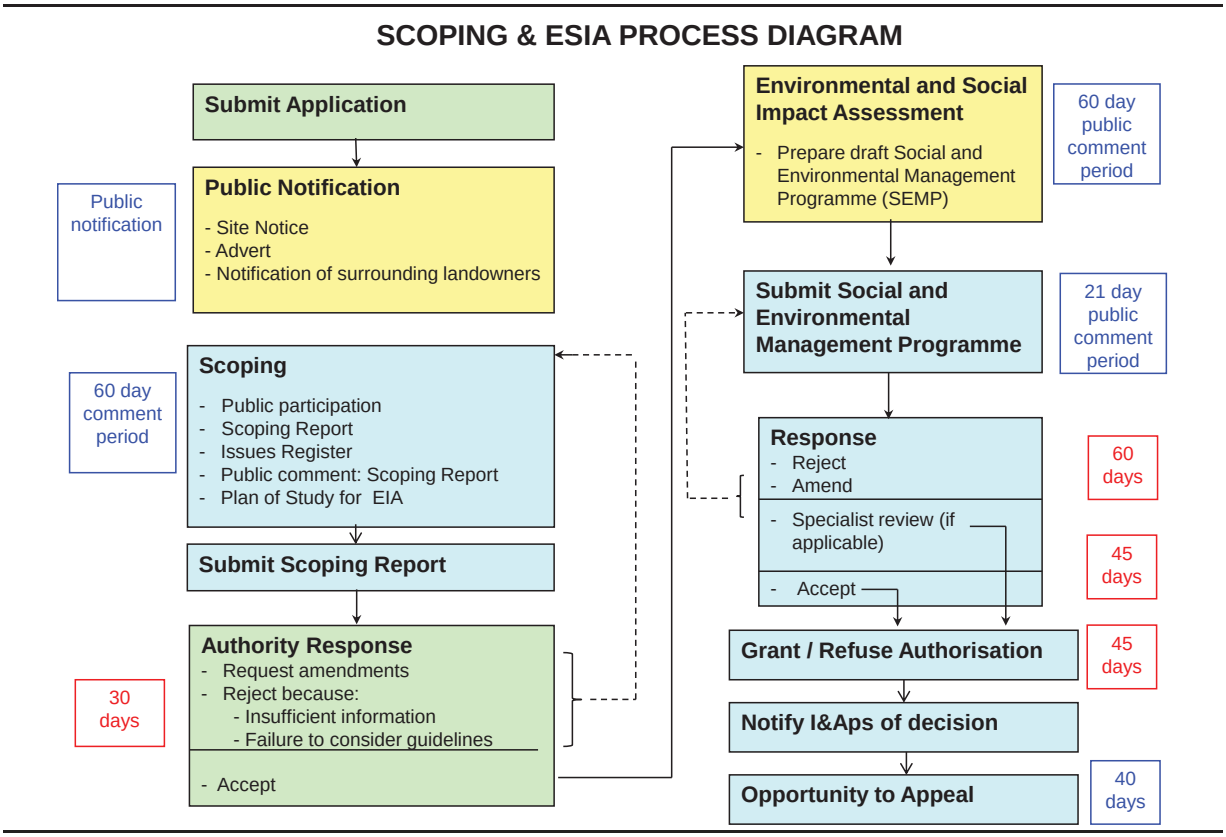
   Furthermore, the ESIA forms the basis on which the environmental licenses / approvals are issued.

   A draft version of the SEMP was made available to registered Interested and Affected Parties for the mandatory 60 day review and comment period between 24 June to 14 August 2013. Furthermore, Interested and Affected Parties (including Traditional Authorities, Community Property Associations, the Driefontein Community Forum, Municipal Officials and Councillors, Landowners and Non-governmental Organisations and National and Provincial Authorities) were actively engaged and the outcomes of the ESIA study were presented. Face-to-face engagement took place during the period 26 to 31 July 2013. It must however be noted that full feedback could not be provided at the Municipal Councillors Meeting as municipal representatives had scheduled a councillors meeting at the same time as the ESIA feedback meeting. Furthermore, there was no attendance for the National and Provincial Authorities meeting.

   In addition to the above, a formal meeting was held on 17 July 2013 with the Regional DMR in which a visit to site was undertaken and following this a meeting to discuss the DMR comments on the SEMP. These comments have been subsequently addressed in this amended and final version of the SEMP.

The South African Environmental Impact Assessment (EIA) procedure according to the NEMA regulations is outlined below in *Figure 1.4*.

Figure 1.4 *ESIA Process*



1.8 PROJECT PROPONENT

The project proponent is Kangra Coal (Pty) Ltd. Kangra Coal was previously a privately owned company called Zinzan Property Holdings Incorporated, and the name was changed to Kangra Coal (Pty) Ltd on 21 January 2003. In 2004, the South African investment company Shanduka Group entered into the company. In 2007, the Spanish utility Union Fenosa (now known as Gas Natural Fenosa) acquired the majority stake, with Kangra Coal becoming a subsidiary of Union Fenosa Mineria (mining brand of the main group). The current share allocation is 30 percent Shanduka Group and 70 percent Gas Natural Fenosa.

The proponent in the application is:

Kangra Coal (Pty) Ltd
P O Box 745
Piet Retief
2380

Contact Person:
Mr Marcos Moledo
5 De Wet Street
Piet Retief

Tel: +27 (0)11 684 0149
Mobile: +27 (0)82 861 1331
Email: marcos@kangracoal.co.za

1.9 DETAILS OF THE ESIA TEAM

In 2010, Kangra Coal appointed ERM as independent environmental assessment practitioners (EAP) to undertake the ESIA process for the proposed Kusipongo Resource Expansion Mining Project.

1.9.1 Environmental Resources Management

Sub-regulation 17 of the Environmental Impact Assessment (EIA) Regulations (GN.R543) promulgated in terms of the NEMA (Act No. 107 of 1998, as amended), states that, - *An EAP appointed in terms of regulation 16 (1) must be independent, have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity.*

The EAP for the applicant is:

Environmental Resources Management Southern Africa (Pty) Ltd.
Postnet Suite 10301
Private Bag X1005
Hillcrest
3650

Contact Person:
Mr. Mike Everett
Unit 6, St Heliers Office Park
Cnr. St Helier Road and Forbes Drive
Gillitts, KwaZulu-Natal
3610

Tel: +27 (0)31 767 2080
Fax: +27 (0)31 764 3643
Email: Mike.everett@erm.com

ERM has been providing businesses and governments with specialist advice on all aspects of the environment since 1971. ERM is the worlds' leading provider of environmental, health and safety (EHS), risk and social services, delivering independent advice to clients from 137 offices in 39 countries. More specifically, the project team selected for this project possesses all the relevant expertise and experience to undertake this EIA. As such, ERM has signed the legally required declaration of independence to function as an objective EAP in the Application for Environmental Authorisation that was lodged to the Mpumalanga Department of Economic Development, Environment and Tourism (DEDET) in August 2011.

The specialists that form part of the ESIA team are provided in *Table 1.1* and their respective CV's are attached to each specialist Impact Assessment report (*Annex C).*

Table 1.1 The ESIA Team

Activity	Person and Company
Project Management Team and Compilation of SEMP	- Mike Everett (ERM) - Dieter Rodewald (ERM)
Air Quality	- Lucian Burger (Airshed Planning Professionals (Pty) Ltd)
Biodiversity	- Susan Abell (Natural Scientific Services cc) - Andrew Cauldwell (ERM)
Groundwater	- Stefan Muller (ERM) - Andreas Stoll (ERM) - Meris Mills (ERM)
Heritage	- Johan Nel (Digby Wells Environmental) - Shahzaadee Karodia (Digby Wells Environmental)
Noise	- Morné de Jager (M2 Environmental Connections)
Public Participation Process	- Nadia Mol (GAIA Environmental Consulting)
Socio-economic	- Andy Spitz (Left Eye Productions (Pty) Ltd.)
Soils and Agricultural Potential	- Garry Patterson (Agricultural Research Council)
Surface Water	- Anna van Vuuren (WSM Leshika Consulting (Pty) Ltd.)
Visual	- Yonanda Martin (Newtown Landscape Architects cc)

1.10 RELEVANT AUTHORITIES

The proposed Project will require Environmental Authorisation from the Mpumalanga Department of Economic Development, Environment and Tourism (DEDET), a Waste Management Activity License from the National Department of Environmental Affairs (DEA), a Water Use License from the Department of Water Affairs (DWA), and a Mining Right from the Mpumalanga Department of Minerals and Resources (MPRDA):

The Mpumalanga Department of Economic Development, Environment and Tourism (DEDET)
13 Dejager Street,
Ermelo,
2350

Contact Person:
Mr. ST Marebane
Tel (w): +27 (0)17 811 3944
Mobile: +27 (0)79 841 9582
Email: stmarebane@mpg.gov.za

Application for Environmental Authorisation Reference Number:
17/2/3 GS-52

National Department of Environmental Affairs (DEA)
Fedsure Building
315 Pretorius Street

Pretoria
0002

Contact Person:
Malepo Phoshoko or Lucas Mahlangu
Tel (w): +27 (0)12 310 3741
Email: lmahlangu@environment.gov.za
msphoshoko@environment.gov.za
Application for Waste Management License Reference Number:
12/9/11/L719/6

Mpumalanga Department of Minerals and Resources (MDMR)
Private Bag X7279
eMalahleni (Witbank)
1035

Contact Person:
Mrs. J du Plessis
Tel (w): +27 (0)13 653 0500
Fax: +27 (0)13 690 3288
Application for Mining Rights Reference Number:
MP30/5/1/2/2/10046MR

In addition to the above mentioned, Water Use Licenses for a variety of water uses will be lodged with the National Department of Water Affairs (DWA). Once these have been lodged the details of the authority contacts will be communicated to Registered Interested and Affected Parties (RI&APs).

1.11 *STRUCTURE OF THE SOCIAL AND ENVIRONMENTAL MANAGEMENT PROGRAMME*

This report fulfils the requirements of Section 39 and 41 of the MPRDA, Sections 50 and 51 of the MPRDA Regulations and Section 33 of the NEMA EIA Regulation GN.R543.

This SEMP will be presented in ***Two (2x) Parts*** as follows:

Chapter	Contents
SEMP Part I – Impact Assessment Report	
Chapter 1 - Introduction	Presents a brief background to the proposed Project, the project motivation, the project Terms of Reference, the project proponent and ESIA team, and the purpose and structure of the report
Chapter 2 – Project Alternatives	Discusses the Project alternatives that have been considered in the ESIA process
Chapter 3 – Project Description	Describes the Project Area and the proposed Project components
Chapter 4 – Regulatory Governance Framework	Describes the legislative, policy and administrative requirements, as well as international good practise and standards/guidelines applicable to the proposed Project

Chapter	Contents
Chapter 5 – Environmental and Social Impact Assessment Process	Describes the ESIA Process followed for the Project and the associated impact assessment methodology employed
Chapter 6 – Public Participation Process	Summarises engagement activities with Interested and Affected Parties for the ESIA Project
Chapter 7 – Receiving Environment – Physical and Biological Characteristics of the Study Area	Provides a detailed baseline assessment of the receiving physical and biological environment in the Study Area
Chapter 8 – Receiving Environment – Socio-economic Characteristics of the Study Area	Provides a detailed baseline assessment of the receiving socio-economic environment in the Study Area
Chapter 9 – Assessment of Physical and Biological Impacts and Mitigation	Presents the predicted impacts to the physical and biological environment as a result of the proposed Project and associated mitigation
Chapter 10 – Assessment of Socio-economic Impacts and Mitigation	Presents the predicted impacts to the socio-economic environment as a result of the proposed Project and associated mitigation
Chapter 11 – Assessment of Cumulative Impacts and Mitigation	Presents the cumulative impacts that are as a result of existing and further planned developments in the Study Area and other Project related developments
Chapter 12 – Conclusion	Summarises the key findings of the ESIA Study
SEMP Part II – Management Programme	
Chapter 13 – Environmental and Social Mitigation and Monitoring Management Plan	Provides a summary of the environmental and social mitigation / management and monitoring conditions applicable for the proposed Kusipongo Resource Expansion Mining Project.
Chapter 14 – Monitoring Management Programme	Outlines procedures essential for effectively monitoring social and environmental mitigation / management measures
Chapter 15 – Social and Environmental Awareness Plan	Outlines procedures for effective education of employees, contractors and their sub-contractors on social and environmental matters and responsibilities
Chapter 16 – Social and Environmental Emergency Response Plan	Outlines procedures essential for effectively containing emergency situations for the proposed Project
Chapter 17 – Environmental Rehabilitation Plan	Details the framework which aims to address environmental issues related to rehabilitation, decommissioning and closure of the proposed Project
Chapter 18 – Financial Provision	Presents a cost estimate for environmental rehabilitation and closure of the proposed Project
Chapter 19 – Undertaking by the Client	A written undertaking by the Applicant for the proposed Project

The following will be appended to the SEMP:

Annexure	Contents
Annex A – Signed Independence of the EAP	Signed independence of the EAP for the ESIA process.

Annexure	Contents
Annex B – Public Participation Process Report	Presents a detailed overview of all I&AP engagement materials during the course of the ESIA process, I&AP database and comments and response report.
***Annex C* – Specialist Reports**	
Annex C.1 – Air Quality Impact Assessment Report	Studies presenting potential impacts on the physical, biophysical and socio-economic environments and recommended mitigation / management measures to address these impacts.
Annex C.2 – Biodiversity Impact Assessment Report	
Annex C.3 – Groundwater Impact Assessment Report	
Annex C.4 – Heritage Impact Assessment Report	
Annex C.5 – Noise Impact Assessment Report	
Annex C.6 – Socio-economic Impact Assessment Report	
Annex C.7 – Soils and Agricultural Potential Impact Assessment Report	
Annex C.8 – Surface Water Impact Assessment Report	
Annex C.9 – Visual Impact Assessment Report	

2 IDENTIFICATION OF PROJECT ALTERNATIVES

In accordance with Section 31 (2) g of the NEMA EIA regulations (GN.R543 of 2010), and in accordance with Section 2 (4) b of NEMA (Act No. 107 of 1998), as amended by Act 62 of 2008 (the NEMA principle of best practicable environmental option), this *Chapter* contains a description of the alternatives that have been identified for the proposed Project. The identification of alternatives provides the rationale for the proposed (preferred) option(s) to the decision making authority, and is a requirement of the aforementioned EIA Regulations. Project alternatives considered include alternative adit locations, adit configurations across three sites, alternative product transportation routes and conveyor corridor routes, and alternative locations for a temporary construction staff village.

In 2009, Hatch was appointed to carry out a Concept Study with a goal of evaluating business opportunities associated with expanding or extending Kangra Coal's current mining operations into the adjacent Kusipongo resource.

Following the Concept Study, the Hatch technical team began the Pre-Feasibility Study during which time the Project team also identified potential points to access the coal. This study was based on variables such as geotechnical stability, access to the coal seam, coal quality, environmental and social sensitivities, health and safety requirements, site accessibility, etc. Shortly thereafter ERM carried out an ecological and social site screening assessment for the area proposed for the development of the main mine adit and associated ventilation adits. The assessment identified environmental and social sensitivities associated with the proposed development locations and a preferred location for the main mine adit was recommended. Furthermore, the assessment highlighted the existence of the Kransbank Private Reserve (refer to *section 4.1.11* of *Chapter 4*) as an area to be avoided.

Information collected during the aforementioned site screening assessment was used to inform the Pre-Feasibility Study carried out by Hatch. The Pre-Feasibility Study aimed at selecting the best Project options for exploiting the coal extracted from the Kusipongo resource, by taking into account engineering, environmental, social and economic considerations. Based on this study, Hatch identified the main mine adit at site A as the preferred option.

This *Chapter* discusses the findings of these preliminary studies.

2.1 HATCH CONCEPT STUDY

During 2009 Kangra Coal commissioned a Concept Study to determine whether there was a business case for implementing an underground

expansion of their existing operations at Maquasa West into the adjacent Kusipongo resource.

During the Concept Study, consideration was given to various alternatives for transporting the coal product from the mine works to the existing siding at Panbult and another potential site for siding relocation at Ishwepe. These considerations included building a conveyor to the existing siding; extending rail spurs from either the existing siding or from the nearby Ishwepe rail siding; and various configurations of haul roads. An evaluation was also conducted to determine whether the coal washing facilities should be re-located from the existing Maquasa East location to the proposed new Kusipongo development area. These concepts were rejected by the Concept Study as not being technically or financially feasible. In addition, it was determined that the mine would not be able to expand production above current levels due to both the limited space available at the Panbult siding, which severely restricts the opportunities to upgrade the siding or automate the train loading process, as well as due to volume constraints on the Richard's Bay coal rail line. A proposed coal fired, Independent Power Provider (IPP) scheme was also not supported by the Department of Energy's Integrated Resource Plan (IRP, 2010) and as such, this initiative could not be further considered.

The key objectives of the study were to:

- Determine if the following corporate objectives could be met with the proposed expansion:

    - Meet corporate financial growth goals;
    - Expand ROM production to 5.5 Mtpa of product (from the current 3.0 Mtpa);
    - Build a coal fired power plant and operate as an IPP; and
    - Provide safe and environmentally friendly transport alternatives for its product coal.

- Assess what the potential environmental and social impacts would be of the expansion.

- Determine if a viable market existed for saleable coal product that could be produced from the *in-situ* coal.

As part of the study, technical assessments were carried out. The purpose of these technical assessments was to determine the following:

- The viability of alternative infrastructure systems for transporting coal product from the mine to the distribution point (rail siding), including:

    - Conveyor belt systems;
    - Rail extension from the existing or new siding to the mine's current location; and

- Construction of new, dedicated coal product haul roads.

- The viability of upgrading the existing Panbult Siding or alternative construction of a new siding at Ishwepe.

- A preferred mine size (capacity – tonnes per annum of product to be produced) of either 3 or 5.5 Mtpa of product.

- The viability of the following product blending capabilities:

    - Export only one type of coal product in a given 5 year period; and
    - Export two different types of coal product simultaneously.

The above options and alternatives were not only considered as isolated cases. Various combinations and permutations of the above were considered as different options, resulting in a matrix of numerous alternatives that were compared with each other from a practical, environmental and economic viability basis.

The outcomes of the Concept Study for each of the following sections, are described below:

- The marketing potential of the Kusipongo resource.

- The ecological and social implications associated with carrying out mining activities in the area of interest.

- Technical requirements associated with the mining expansion.

2.1.1 Marketing Potential

Based on the geological resources considered in the Kusipongo Concept Study, it was determined that a medium volatile product can continue to be produced in the Kusipongo resource and exported for a number of years. However, the coal's deteriorating quality is of such a nature that a lower volatile market will need to be identified and targeted for the later portion of the proposed mine's life.

The prospect of becoming an IPP is a viable option; however, this view has subsequently changed prior to, and confirmed by, the publishing of the Department of Energy's Draft Integrated Electricity Resource Plan for South Africa 2010 to 2030 – IRP 2010. As such, this option was not considered further.

Producing multiple export products is not technically feasible due to capacity constraints at Panbult Siding and capacity and allocation constraints on the Coal Link railway line to Richard's Bay and at the RBCT. As such, the expansion of the mine's production capacity from 3.0 Mtpa to 5.5 Mtpa of

product is not practical due to the Coal Link and RBCT constraints described above.

2.1.2 Ecological and Social implications

It was identified that due to the sensitive nature of the Project Area, initiating early specific specialist studies would ensure that sensitive areas can be identified and that the overall Project footprint could, as far as is possible, avoid these areas, resulting in the least amount of disturbance to the receiving biophysical, ecological and social environment.

It was noted that this process would also need to include a comprehensive stakeholder consultation process. If information was not presented thoroughly and transparently, this could potentially cause substantial delays in the environmental authorisation process.

Potential land use changes resulting from the proposed Project could result in a number of social impacts, regardless of the alternatives selected. To mitigate the potential negative impacts and enhance the potential positive impacts associated with the aforementioned land use changes, it was recommended that:

- A Socio-economic Impact Assessment (SIA), Heritage Impact Assessment, Visual Impact Assessment and a Traffic Impact assessment, as a minimum be included as part of the Environmental Impact Assessment.

- A robust PPP be followed since it was identified that the potential impacts on the Kransbank Private Reserve and areas with high environmental sensitivity will be of great concern to a number of Interested and Affected Parties (I&APs).

- A local skills analysis be initiated and a procurement strategy be developed, at an early stage of the project, to ensure that the optimal number of local people are employed and trained for construction and operation of the proposed mine.

2.1.3 Coal Handling and Transport Options

Conveyor Systems through to the Rail Siding

Although it was technically feasible to construct a belt conveying system from the Maquasa West Adit to the rail siding, the infrastructure required to handle the transfer of coal product to the Coal Link rail trucks was not feasible. Space constraints at the siding would require that adjacent land (that is currently under commercial forestry) be acquired for the temporary storage and handling of coal product. The option was not considered feasible for the following reasons:

- The technical complexity associated with such a coal handling system would be large.

- The costs associated with this option are not feasible for Kangra Coal.

- The acquisition of land where commercial forestry is currently taking place is deemed to be a major hurdle.

- The economic viability of this option was not attractive.

Extension of Existing Rail Sidings to the Mine's Current Location (from Panbult or Ishwepe sidings)

The proposed rail lines would follow new servitudes through land currently used for commercial forestry, private farmland and along existing minor roads or forestry tracks. It was assumed that land acquisition would be required for the full rail servitude. A number of streams, wetlands or smaller rivers would have to be crossed en-route. Drainage structures would have to be accommodated and the route would cross a number of minor roads, where level crossings would have to be provided. A road-over-rail crossing would be the most feasible scenario for traversing the N2 highway just north of the Panbult Station. The vertical alignment of the proposed route was selected to not exceed a grade of 1:100; in order to achieve this alignment, a number of cuttings and areas of high fills would need to be encountered along the route. A gravel service road would also be required along the length of the rail lines. Additional coal product loading facilities would have to be established at the mine site to load the awaiting trains.

Land acquisitions, the perceived impact on the social and biological environment (associated with road, river and wetland crossings) and the existing forestry industry were deemed to be major hurdles for the Project. As such, the economic viability of this option was not attractive.

Construction of a New Dedicated Coal Product Haul Road

Route alignments were considered to Panbult Siding and to the Ishwepe siding of 23 and 25kms respectively using existing paths as far as possible. The cost associated with constructing dedicated coal product haul roads may be a feasible option; however, they are not considered to be a financially reasonable option for Kangra Coal.

Upgrading Existing Panbult Siding

Concept designs were done to extend the capacity of the existing Panbult siding from a 100-wagon capacity to a 200-wagon capacity. This included extensions to the rails and considerations for automated loading systems. A more detailed study of this option was recommended.

2.1.4 Concept Study Conclusions

Outcomes from the study identified that although it would be preferable to increase the quantity of product generated from 3.0 Mtpa to 5.5 Mtpa, this would not be possible due to capacity constraints at the Panbult Siding, as well as capacity constraints associated with the Coal Link Railway Line and at RBCT. As such, once the expansion into the Kusipongo resource becomes operational, the quantity of product will remain at approximately 3.0 Mtpa.

The study also identified that there are a number of socio-environmental sensitivities associated with the Project area. These sensitivities were assessed in detail as part of the ESIA process. The PPP associated with the ESIA should be robust and information relating to socio-environmental sensitivities needs to be relayed to I&APs.

A number of coal handling and transport options were assessed; however, due to the anticipated quantity of coal product not increasing once the proposed expansion Project becomes operational, and the complexity and unattractive economic viability of alternative handling and transport options, it was concluded that existing coal handling and transport facilities will continue to be used.

A conclusion of the Concept study therefore was that the current coal product transport system (trucking of coal to the Panbult Siding), the current coal washing plant location (at Maquasa East), and no increase in the mine's production (i.e. to stay at 3 Mtpa) would deliver the most favourable economic conditions.

2.2 ERM ENVIRONMENTAL SITE SCREENING ASSESSMENT

As is mentioned at the outset of this *Chapter*, ERM conducted a site screening assessment based on environmental and social aspects, of the three possible development sites (*Figure 2.1*) associated with a potential main mine adit and associated ventilation adits. The three possible development sites were based on high level mine planning where access to the coal seam was deemed feasible.

The three possible development sites were referred to as Site A (purple block indicated in *Figure 2.1)*, Site B (green block indicated in *Figure 2.1)*, and Site C (orange block indicated in *Figure 2.1)*. Each site was further broken up into quadrants (as indicated in *Figure 2.1*) of approx. 1 by 1km. The objectives of the site screening assessment were to:

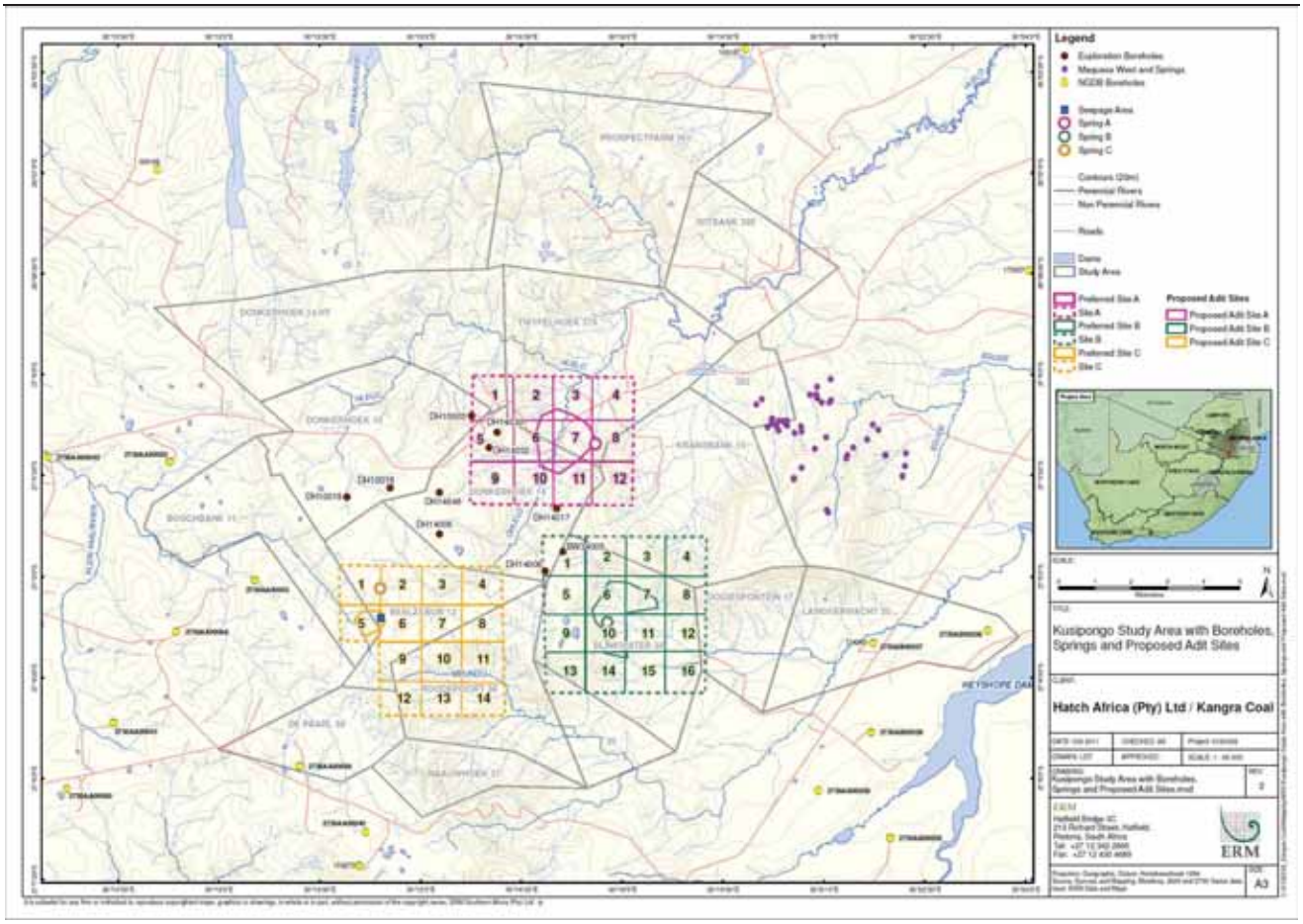
- Detail the environmental and social sensitivities of each site;
- Recommend a preferred site option for the main mine adit based on two positions (Site A and B) identified in the Hatch Concept Study; and

- Identify any environmental and social red flags associated with the proposed locations for the main mine adit and associated ventilation adits.

For the purpose of the screening exercise, the most significant aspects that could affect the position of the main mine adit and associated ventilation adits were selected and used as primary criteria for early screening purposes. The criteria selected were (not in order of importance):

- Cultural resources;
- Ecological aspects;
- Hydrogeological aspects; and
- Social aspects.

Figure 2.1 Site Screening Study Areas



2.2.1 Site Screening Results

Cultural Resources

- The preliminary cultural resources investigation indicated the preferred site for the main mine adit as Site A.

- Site B was considered to be a highly significant archaeological site due to the presence of a sandstone ridge, which is usually associated with rock paintings and Stone Age deposits.

- Site C was considered an ideal location for a ventilation adit; however, changes to the site configuration at Site C were suggested to avoid a site of cultural heritage importance (an old grave and ruins of an old *kraal*).

Ecological Aspects

- Site A was found to have the greatest extent of low sensitive areas (*Figure 2.2*) amongst the three sites screened. Much of this area has become degraded due to human activities and habitation, agriculture and most notably, the presence of alien black wattle plantations. Site A was therefore selected as the preferred site from an ecological perspective for the development of a main mine adit.

- An Ecologically Preferred Location (EPL) within Site A was suggested for the adit (*Figure 2.2*), taking into account:

  - The Ohlelo River (and a 100m buffer) which flows through this site (the Ohlelo River is classified as having a "Very High" ecological importance, particularly in terms of fish and aquatic invertebrate diversity); and
  - The vegetation of the site; the EPL was suggested within an ecologically degraded area of alien wattle trees.

- The majority of Site B was considered to have a moderate ecological sensitivity. Attention must be given however to reducing the possible impacts in the design of the given adit provided its ecological sensitivity; in this respect an EPL was also provided (*Figure 2.3*).

- Site C is located on high altitude grasslands, with a small sponge-like wetland located on the site. As two large gum tree groves (*Eucalyptus camaldulensis*) were located downhill of the site, and as these areas are already disturbed, this area was considered as the EPL for a ventilation adit (refer to *Figure 2.4*).

Figure 2.2 *Ecological Sensitivity Map - Site A*

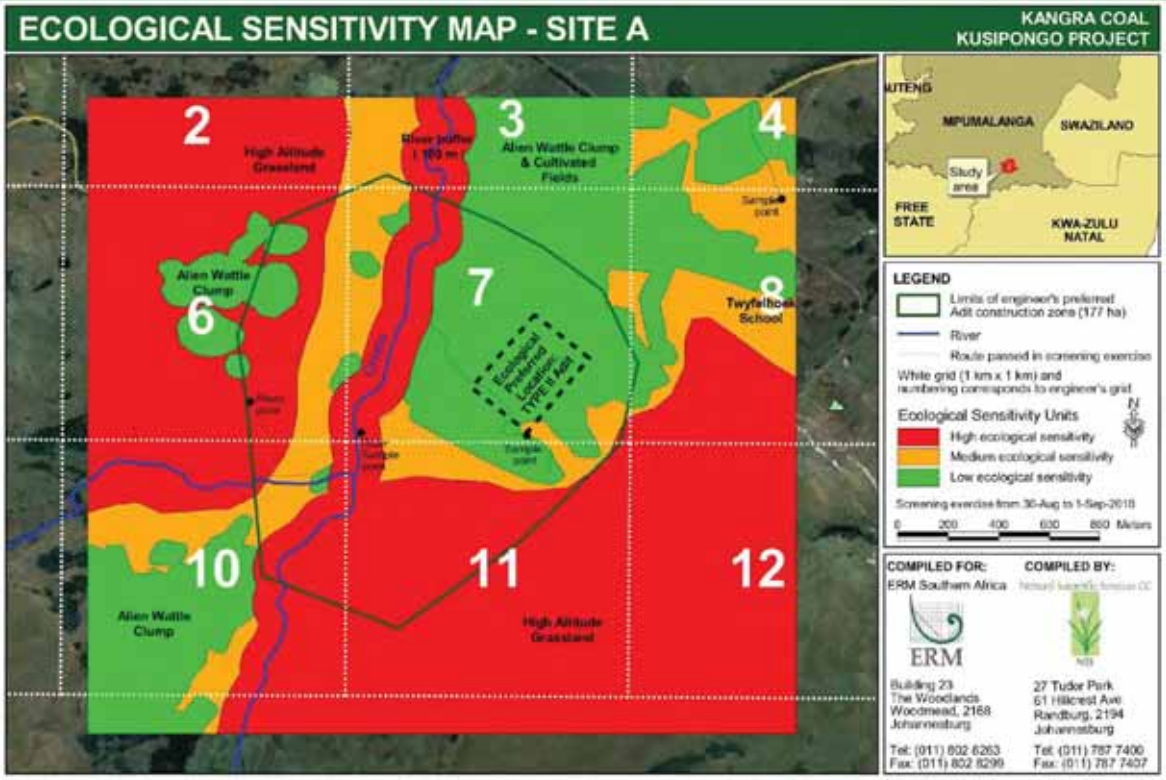


Figure 1 Sensitivity map for **Site A** with an Ecologically Preferred Location for construction of a Type II mine adit

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Figure 2.3 Ecological Sensitivity Map - Site B

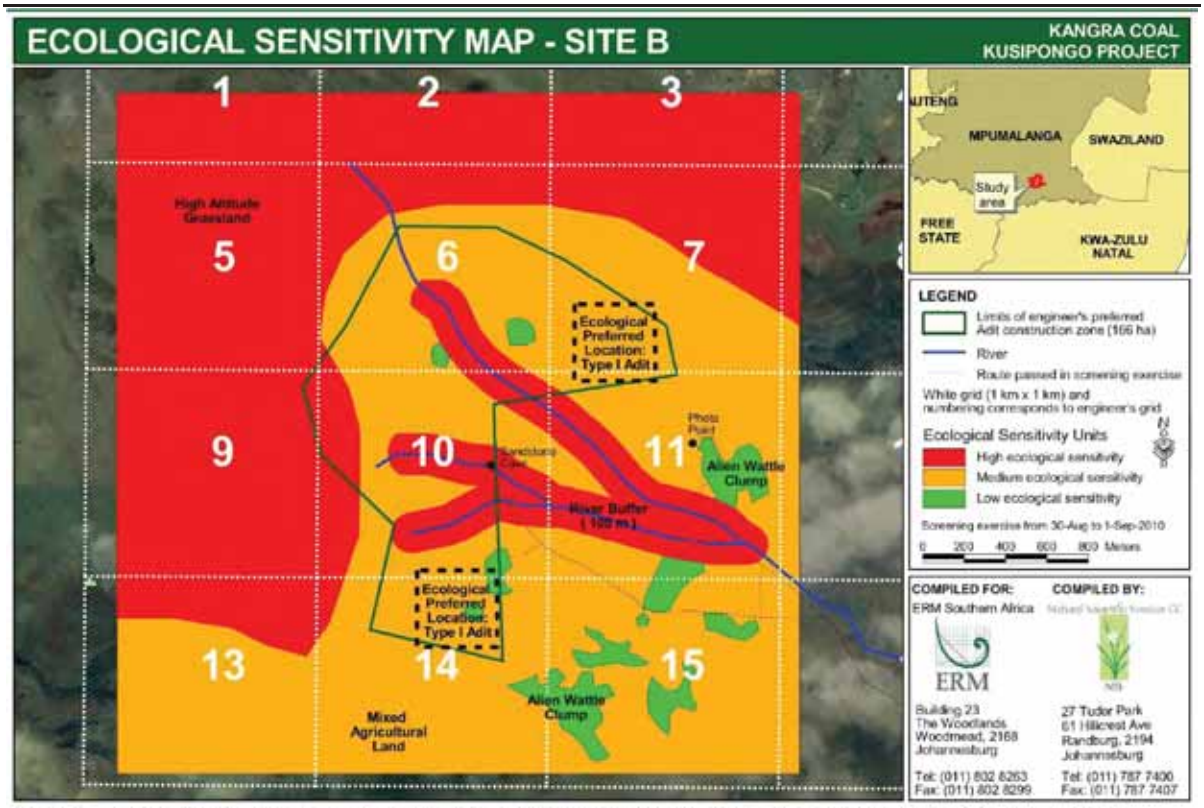

Figure 2 Sensitivity map for **Site B** showing two alternative with an Ecologically Preferred Locations for construction of a Type I adit

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Figure 2.4 Ecological Sensitivity Map - Site C

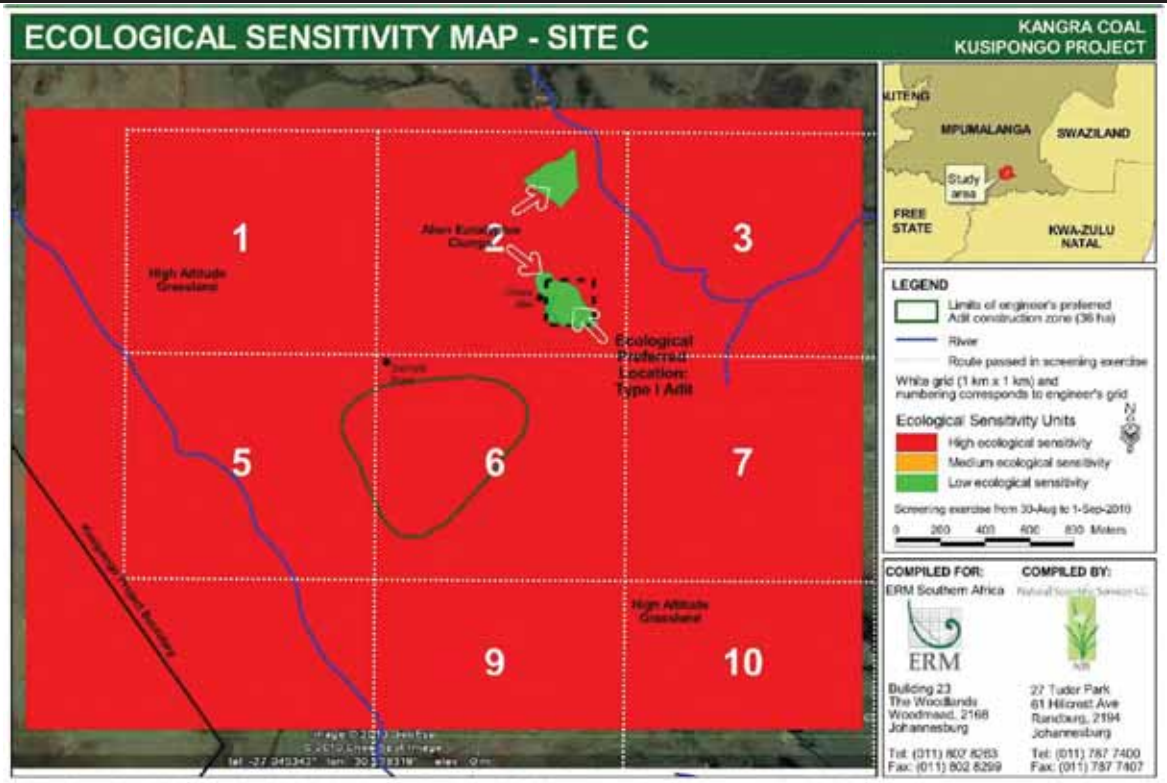

Figure 3 Sensitivity map for **Site C** showing an Ecologically Preferred Location for construction of a Type I adit

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Hydrgeological Aspects

From a hydrogeological point of view, and considering groundwater depth, topography, coal type and seam depth, and the proximity of springs and rivers to development areas, it was concluded that Site A and Site B are not hydrogeologically significantly different from each other.

At Site A, the topography and water levels are slightly higher and deeper respectively, and considering that Site A is in closer proximity to an already impacted area (Maquasa West operations), it was preferred over the more pristine environment at Site B.

The hydrogeological study recommended locations within quadrant 6 at Site A or quadrants 6 or 10 in Site B (*Figure 2.1*). However, it was further mentioned that during closure, all sites would yield decant. Given the potential for mine water decant, the hydrogeological screening assessment recommended that the adit be placed at an elevation as high as technically possible within Site A.

Site C is located within recharge area with shallow seepages, making it very susceptible to water quality impacts.

Social Aspects

The high level site social screening assessment (without any engagement and interaction with potentially affected stakeholders) concluded that Site A is acceptable for the placement of the main mine Adit, although Site B was preferred from a social perspective.

Although it was not expected that public perceptions related to noise, visual and dust impacts would differ between locations, Site A triggers significant traffic related health and safety risks due to the presence of the Twyfelhoek School and the fact that this road is a well-used public road, carrying pedestrians, horses and vehicles. Site B's road does not seem to be frequented by the public as intensely as Site A. In addition, a conveyor belt is not preferred for Site A from a safety perspective, and is likely to impact on the movement patterns of more people compared to Site B.

It was recognised that although it would be possible to avoid the displacement and relocation of people, it would be necessary for both Sites A and B. Resettlement at Site A will be likely higher at Site A (provisionally 20 households) when compared to Site B (provisionally 12 households).

Site A was, from a social perspective, deemed acceptable, conditional to understanding the possible impact to road users, possibly researching the option of deviating the road and conveyor belt route that leads directly to the adit, and keeping resettlement to a minimum.

2.2.2 *Environmental Site Screening Conclusions*

Agreement was reached within all disciplines assessed, that Site A is the preferred site for the main mine adit development, although preferred quadrants within Site A differed between specialist studies.

Site A was generally preferred to Site B, in that Site A is in closer proximity to an already impacted area (Maquasa West operations). It was also concluded that Sites A and B are acceptable for the construction of ventilation adits.

These studies, however recommended preferred locations for each adit development on each site. Given the ecological sensitivities of the Project area, the Ecological Preferred Locations (as presented in *Figure 2.2*, *Figure 2.3*, and *Figure 2.4*) would need to be considered during the design phase of the Project. Given the potential for mine water decant, the hydrogeological screening assessment also recommended that the adit be placed at an elevation as high as technically possible within Site A.

It must be noted that hydrogeological and ecological considerations took preference to social considerations; however, all indicated that Site A was acceptable.

2.3 *HATCH PRE-FEASIBILITY STUDY*

In parallel to ERM's Site Screening Assessment, Hatch carried out a Pre-Feasibility Study, in which adit configurations involving Sites A, B and C were considered. This was later refined in the Feasibility Study, based on a better understanding of the resource and resultant mine design, eliminating the need for a second ventilation site at Site C.

2.3.1 *Preferred Option – Main Mine Adit at Site A*

This option requires that the following adit configurations be constructed at the following sites:

- *Site A* – Main mine adit; and
- *Site B* – Ventilation adit.

Please Note *– the description for the Preferred Option Adit configuration is the option selected in this study, and as such is described in detail in Chapter 3 (Project Description).*

2.3.2 *Alternative 1 – Main Mine Adit at Site B*

This alternative requires that the following Adit configurations be constructed at the following sites:

- *Site A* – Ventilation adit; and
- *Site B* – Main mine adit.

In this alternative the following will be required:

- The existing gravel District road to Site A will provide access to the site and will be maintained by the district authorities.

- A gravel service road will be constructed to Site B in alignment with existing farm tracks.

- A community consisting of approximately 12 households will need to be relocated from the area of Site B to an area which is situated outside a 500m buffer zone from the perimeter of the mine workings.

- Potable water will be supplied to the new development from the existing facilities at Maquasa East. This proposed new route will follow the proposed new corridor from Maquasa East through to Site B.

- A proposed overland conveyor system between Site B and the existing conveyor system between Maquasa West Adit and Maquasa East.

- In addition to the potable pipeline and overland conveyor system, an OHTL from Maquasa West Adit, which will feed the conveyor belt drive units, will also be included in the corridor. The corridor will be fenced with a security fence to restrict access.

- A number of implement/vehicle cross-over's along the conveyor belt route.

- The coal quality at Site B is such that the first few million tons might not be considered marketable coal. As such, if the main mine adit were developed at Site B, it would require a much larger low quality coal discard dump in comparison to having the main mine adit at Site A.

2.3.3 Alternative 2 – No Main Mine Adit/Full Underground Mining Option

In this alternative all mining activities are to take place underground. This alternative requires that only ventilation adits be constructed at the following sites:

- *Site A* – Ventilation; and
- *Site B* – Ventilation.

In this Alternative the following will be required:

- The existing gravel road to Site A will provide access to the site and it is assumed that the road will be maintained by the district authorities.

- A gravel service road through to Site B will be constructed along existing farm tracks.

The main electrical supply by Eskom will terminate at the proposed substation at Site B.

This alternative was not deemed to be technically nor financially feasible, and carries unacceptable occupational health and safety risks.

2.3.4 Alternative 3 – Main Mine Adit at Site A and No Overland Conveyor

This alternative requires that the following adit types be constructed at the following sites:

- *Site A* – Main mine adit; and
- *Site B* – Ventilation.

Please Note – the layout of the main mine adit at Site A in this alternative will be similar to that of the main mine adit at Site A in the preferred option (as described in *Chapter 3* of this report); however, *coal will be transported underground from the adit to existing works at Maquasa West where it will then be brought to the surface for processing in the existing coal processing plant*. The differences to the main mine adit in this alternative (when compared to the main mine adit in the preferred option) will include the following:

- The near horizontal decline shaft will not accommodate a conveyor to bring coal to the surface.

- No product silos or overflow stockpiling areas shall be constructed.

- No additional screens and crushers or recycle-conveyor belts, feeder breakers and recycle chutes will be constructed.

- No new overland conveyors and /or transfer stations will be constructed.

- No new conveyor system for the cross-over for vehicles and implements, livestock and surrounding community members will be constructed.

In this alternative the following will be required:

- It is assumed that the existing gravel district road will be maintained by the district authorities.

- A gravel service road through to Site B will be constructed along existing farm tracks.

- A relatively large number of households (approximately 20) will need to be relocated from Site A to outside a buffer of 500m around the perimeter of the mine workings.

- Potable water will be supplied to the new development from the existing facilities at the Maquasa West Adit. The corridor will be between the Maquasa West Adit and Site A.

- The main electrical supply by Eskom will terminate at the proposed substation at Site A.

This alternative was not deemed to be technically nor financially feasible.

2.3.5 Alternative 4 – Main Mine Adit at Site B and No Overland Conveyor

This alternative requires that the following adit types be constructed at the following sites:

- *Site A* – Ventilation; and
- *Site B* – Main mine adit (with the same layout and configuration as is mentioned for Adit A in Alternative 3 above).

Please Note – the layout of the main mine adit at Site B in this alternative will be similar to that of the main mine adit at Site A in the preferred option (as described in *Chapter 3* of this report); however, *coal will be transported underground from the adit to existing works at Maquasa West where it will then be brought to the surface for processing in the existing coal processing plant*. The differences to the main mine adit in this alternative (when compared to the main mine adit in the preferred option) will include the following:

- The near horizontal decline shaft will not accommodate a conveyor to bring coal to the mine surface.

- No product silos or overflow stockpiling areas shall be constructed.

- No additional screens and crushers or recycle-conveyor belts, feeder breakers and recycle chutes will be constructed.

- No new overland conveyors and / or transfer stations will be constructed.

- No new conveyor system for the cross-over for vehicles and implements, livestock and surrounding community members will be constructed.

In this Alternative the following will be required:

- It is assumed that the existing gravel district road to Site A will provide access to the site and will be maintained by the district authorities.

- A gravel service road through to Site B will be constructed along existing farm tracks.

- A relatively large number of households (approximately 12) will need to be relocated from Site B to outside a buffer of 500m around the perimeter of the mine workings.

- Potable water will be supplied to the new development at Site B from the existing facilities at the Maquasa East.

- The main electrical supply by Eskom will terminate at the proposed substation at Site B.

This alternative was not deemed to be technically nor financially feasible.

An assessment of the alternatives identified in the Pre-feasibility Study, together with the Preferred Option, as presented above, are provided *in Table 2.1* below.

Table 2.1 Alternatives Assessment

Alternative	Socio-environmental and Financial Advantages	Socio-environmental and Financial Disadvantages	Pre-feasibility Study Outcome
Preferred Option – Main mine adit at Site A	• There are more ecologically disturbed areas at Site A than at the other sites (refer to *Figures 7.1* to *7.3*). • The Preferred Option will have a smaller footprint (due to the length of the conveyor route) when compared to Alternative 1. • The Preferred Option has lower occupational health and safety risks as compared to Alternative 2 (where all mining services take place underground). • The Preferred Option has an overland conveyor, which is technically and financially more feasible than Alternatives 3 and 4. • The Preferred Option is technically feasible due to geotechnical stability (roof support and ground discontinuities) and access to mineable coal. • This alternative presents the most favourable conditions from a technical, mine design view with regards to the shaft site selection. This is based on the fact that at the critical point for shaft access, where the overburden thickness equals 20m above the coal seam, is satisfied. • From a cultural and heritage perspective, the Preferred Option is more favourable than Alternative 1. • The quality of coal is suitable unlike coal quality at Site B. • Due to the thickness of the coal seam at Site A, the Preferred Option is deemed to be the most financially feasible.	• This project option has a larger footprint than Alternatives 2, 3 and 4. • Having the Main Mine Adit at Site A triggers significant traffic related health and safety concerns (if not mitigated) due to the Twyfelhoek School and the fact that this road is a well-used public road, carrying pedestrians, horses and vehicles. • It is not expected that public perceptions about noise, visual and dust impacts would differ between the Preferred Option and Alternative 1. It is also not possible to, at this stage, determine with confidence whether the number of people exposed to these potential impacts would be higher for the Preferred Option or Alternative 1; however, it is estimated that more people will be exposed along the length of the conveyor belt for the Preferred Option when compared to Alternative 1. • Due to the higher concentration of people along the length of the conveyor belt, the Preferred Option is not preferred from a safety perspective. In addition, a conveyor belt from Site A is more likely to impact on the movement patterns of people compared to if the conveyor belt came from Site B (Alternative 1). • Although it would be possible to avoid the displacement and relocation of people, the resettlement of households (approx.. 20) will be necessary.	• Although it is not clear at this stage of the process as to the exact number of people that will most likely need to be relocated (estimated 20 households), there are fewer safety and inconvenience concerns associated with Alternative 1. • As both sites are not hydrogeologically different from each other, considering that Site A is in closer proximity to an already impacted area (Maquasa West operations), it was preferred over the more pristine environment at Site B. • From a cultural and heritage perspective the Preferred Option is preferred in comparison to Alternative 1. • In relation to Alternative 2, the Preferred Option has lower occupational health and safety risks, as it is always preferable to transport personnel above ground as opposed to underground. • From a technical engineering and financial perspective, the Preferred Option (together with the adit option at Adit B, and underground mining) is considered to be more feasible than Alternatives 3 and 4, mainly due to the possibility of using a horizontal shaft, as opposed to a vertical shaft or incline shaft type. • This Project option (having the main mine adit at Site A) was the preferred option in the ERM site screening assessment. (refer to *section 2.2.2*). • As such, *this option has been selected as the preferred project option.*
Alternative 1 – Main mine adit at Site B	• Relative to the Preferred Option and Alternatives 2 to 4, there are no social and / or ecological advantages associated with Alternative 1. • Alternative 1 has lower occupational health and safety risks than Alternative 2. • Alternative 1 has an overland conveyor and is thus, from a technical, engineering and financial perspective, more feasible than Alternatives 3 and 4. • The main mine access road for Alternative 1 does not seem to be frequented by the public as intensely as the Preferred Option. • It is not expected that public perceptions about noise, visual and dust impacts would differ between the Preferred Option and Alternative 1. It is also not possible to, at this stage, to determine with confidence whether the number of people exposed to these potential impacts would be higher for the Preferred Option or Alternative 1; however, it is estimated that less people will be exposed along the length of the conveyor belt for Alternative 1 when compared to the Preferred Option.	• The conveyor route from Site B through to Maquasa West will need to be longer than the conveyor route in the Preferred Option. Ecologically, this is not favourable. • Due to the overland conveyor in Alternative 1 having a longer distance than the Preferred Option, financially, Alternative 1 is not as feasible as the Preferred Option. • Although it would be possible to avoid the displacement and relocation of people, it would be necessary for Alternative 1. • From a cultural and heritage perspective, Alternative 1 is less favourable than the Preferred Option, as there are more cultural and heritage resources at Site B. • The low quality coal at Site B means that the first few million tons of coal mined will not be regarded as marketable. This means this alternative would require a larger coal discard dump (to be located on the existing Maquasa East mining license).	• Environmentally, the Preferred Option is more favourable than Alternative 1. • Although it is not clear at this stage of the process as to the number of people that will most likely need to be relocated, there are fewer safety and inconvenience concerns associated with this alternative. • From a cultural and heritage perspective the Preferred Option is preferred in comparison to Alternative 1. • In relation to Alternative 2, Alternative 1 has lower occupational health and safety risks. • From a technical engineering and financial perspective Alternative 1 is considered more feasible than Alternatives 3 and 4. • Due to lower quality coal at Adit B, this alternative would require a larger coal discard dump, with associated environmental risks, when compared to the preferred alternative. • This alternative is more reasonable and feasible when compared to Alternative 2, 3 and 4; however, environmentally and financially is less favourable than the Preferred Option. *As such, this Alternative will not be considered further in the study.*

Alternative	Socio-environmental and Financial Advantages	Socio-environmental and Financial Disadvantages	Pre-feasibility Study Outcome
Alternative 2 – Full underground mining	• Will have the smallest footprint and as a result will have the least social and environmental impact.	• Highest occupational health and safety risks from roof and pillar support instability and ventilation effects. • It is not feasible to have an additional 10.1km (above that installed in the existing mine) of underground conveyor. The system availability of nine (plus existing) conveyors in series would decrease the availability of the conveyors to below 80%. • The average travelling time required to provide people access to the underground workings would increase by 58 minutes per ten hour shift reducing the overall mining productivity to less than 30%. • Existing ventilation (in addition to the planned Kusipongo Expansion ventilation) would have to continue to be operated after the Maquasa West resource is depleted to ensure adequate ventilation for the extended underground conveying, people and equipment access.	• From a mining occupational health and safety and engineering point of view this alternative is less favourable than the Preferred Option and Alternatives 1, 3 and 4. • Occupational health and safety was the key consideration that Hatch took into consideration when assessing Project alternatives. As a result this alternative was not considered a feasible alternative by the Project engineers. • From a technical and cost saving perspective Alternative 2 is less financially favourable than the Preferred Option and Alternative 1. • As such, *this alternative will not be considered further in the study.*
Alternative 3 – Main mine adit at Site A and no overland conveyor	• Socially and ecologically Alternative 3 is more favourable than the Preferred Option and Alternative 1, as the above ground footprint for this alternative will be smaller (as there will be no overland conveyor). • Alternative 3 is less costly than Alternative 4, as the underground conveyor route will be shorter in distance for Alternative 3. • Alternative 3 is more advantageous in comparison to Alternative 2, as it reduces the health and safety risk to mining personnel associated with travelling through the potentially unstable, old workings of the existing Maquasa West and Maquasa West Extension mine. • This alternative reduces the amount of unproductive travelling time that personnel need to access the working areas as required in option 2 (58 minutes per shift).	• Having the main mine adit at Site A triggers significant traffic related health and safety concerns. These are discussed in the socio-environmental and financial disadvantages for the Preferred Option above. • Financially, due to having the conveyor route underground in this alternative, Alternative 3 will be more costly than the Preferred Option and Alternative 1. This additional cost would compromise the feasibility of this alternative. • The Life of Mine in this alternative would be reduced, as the underground conveyor will result in a loss of coal product. • From an engineering point of view, the technicalities associated with having an underground conveyor for the transportation of coal to the existing Maquasa West Adit are not favourable (as described in Alternative 2 above).	• There are fewer safety and inconvenience concerns associated with Alternative 4 when compared to Alternative 3. • Although having an underground conveyor system is socially and environmentally more feasible, from a financial and technical perspective it is not deemed favourable. • As such, *this alternative will not be considered further in the Study.*
Alternative 4 – Main mine adit at Site B and no overland conveyor	• The main mine access road for Alternative 1 does not seem to be frequented by the public as intensely as the Preferred Option. • Relative to the Alternative 3, there are no social / environmental advantages associated with Alternative 4. • Alternative 4 is more advantageous when compared to Alternative 2, as it reduces the health and safety risk to mining personnel associated with travelling through the potentially unstable, old workings of the existing Maquasa West and Maquasa West Extension mine. • This alternative reduces the amount of unproductive travelling time that personnel need to access the working areas as required in option 2 (58 minutes per shift).	• Site B is more ecologically sensitive than Site A. • From an engineering point of view, the technicalities associated with having an underground conveyor for the transportation of coal to the existing Maquasa West Adit are not favourable (as described in Alternative 2 above). • Furthermore as the underground conveyor system will need to be greater in length than Alternative 3, the costs associated with Alternative 4 will be greater. • The low quality coal at Site B means that the first few million tons of coal mined will not be regarded as marketable. • This means this alternative would require a larger coal discard dump (to be located on the existing Maquasa East mining license).	• Alternative 4 has fewer public safety and inconvenience concerns when compared to Alternative 3. • Although having an underground conveyor is socially and environmentally more feasible, from a financial and technical perspective it is not deemed favourable. • Furthermore, Alternative 3 is more favourable ecologically and financially than Alternative 4. • As such, *this alternative is not considered to be either reasonable or feasible and will not be considered further in the study.*

2.3.6 *Pre-Feasibility Study Conclusions*

Outcomes from the study identified that from an occupational health and safety perspective, a full underground mining option was not considered a feasible alternative, particularly due to greater exposure to roof and pillar instability. Furthermore, from a technical engineering and financial perspective, the provision of mining access to underground workings from the Maquasa West Adit was not considered feasible due to:

- Travelling time – to access distant underground working areas;
- Conveying system, in-series reliability and availability; and
- Higher ventilation and associated power requirements.

Although socially and ecologically more feasible, the option of having an underground coal conveyor route from either Site A (Alternative 3) or B (Alternative 4) to the Maquasa West Adit was, from an engineering and financial point of view, not feasible.

In summary, having the main mine adit at Site A, with an overland conveyor transporting coal to the existing Maquasa West Adit (Preferred Option) was deemed by Hatch and ERM as the most feasible and reasonable option.

2.4 *LAYOUT ALTERNATIVES FOR THE MAIN MINE ADIT AT SITE A*

After selection of the general location for the Main Mine Adit, design aspects of the actual portal or shaft, including the type of shaft required and the exact position of the shaft within Site A area were considered.

2.4.1 *Shaft Type*

Three types of shaft systems were evaluated:

- Vertical shaft;
- Inclined shaft; and
- Horizontal shaft.

Based on the mine plan for the Kusipongo resource, a shaft system has to be developed to accommodate for:

- ROM production of approximately 5Mt / annum;

- 300 persons working underground per shift, being transported by means of underground flame proof busses;

- Two 10 hour shifts;

- A peak ventilation volumetric air flow requirement (occurs in approximately year 10) of 1,225 m^3/s at 2.53 kPa;

- A minimum number of five intake airways of 4m x 6.5m (26m^2 cross-sectional area, each);

- The use of continuous mining equipment; and

- Maintenance and store facilities that will be placed on the surface in close proximity to the shaft as part of holistic portal arrangements.

The vertical shaft option is the least attractive and could incur capital investment of up to ZAR1.5 billion for the shaft system alone. A vertical shaft would only be the preferred option in the event of shallow overburden (less than 80m).

The incline shaft option is the second most attractive option and is preferred where overburden is between 40 and 80m and in areas where overburden is not less than 40m. The incline shaft system will incur larger excavation requirements to access the underground workings when compared to the vertical shaft, but due to the less expensive material handling system it can compete financially with the vertical shaft.

In shallow areas with a shallow overburden (less than 40m), the horizontal (or near horizontal) shaft poses the preferred option based on the reduced cost associated with removal of lower volumes of overburden (smaller excavation footprint) when compared to the development of the incline adit.

2.4.2 Shaft Location within Site A

In the Pre-feasibility Study and at the outset of the Feasibility Study, numerous aspects were evaluated to define possible positions for the main mine adit shaft at Sites A and B. These aspects included:

- Overburden thickness;
- Gus Seam thickness;
- *In-situ* coal qualities (ability to produce marketable products);
- Geological discontinuities (faults and dykes);
- Slope stability (geotechnical considerations); and
- Shaft orientation in relation to topography and surrounding infrastructure.

Each of these aspects is discussed for the location of the shaft at Site A, as discussed below.

Overburden Thickness

An area where the vertical distance between the surface topography and the first coal seam (referred to as the overburden) is located is *less than 20m* thick

is not suitable for underground mining due to the lack of stability required for a safe, permanent access point to underground work.

An area where the overburden is *greater than 40m* in thickness is where an extensive inclined shaft would be required and would incur relatively large volumes of overburden to be excavated. The impacted surface area of the excavation would be large and the costs of the excavation would rise dramatically.

An area where overburden is between 20 and 40m is preferred from an access perspective.

Gus Seam Thickness

The majority of the coal in the Gus Seam is, on average, 4m thick. In order to be financial feasible, a minimum seam thickness of 2.7m is required when using standard mining machinery to mine. Ideally, the thickness of the seam mined should be greater than 2.7m, thus allowing the amount of non-coal, shale or poor quality coal to be kept to a minimum.

Unfortunately, this criterion cannot be met anywhere in the study area to which Kangra Coal has prospecting rights, even in the area of Site A. However, at Site A, the distance from the access point to areas where the coal seam is thicker than the 2.7m required is fairly small and this was considered as an acceptable trade-off against the other design criteria.

Coal Quality

Mined coal quality has to satisfy the specifications of the market. Coal with a volatile content of less than 20% will incur financial penalties and may even be rejected by customers. Areas where *in-situ* coal has a volatile content of less than 16% can be mined if it is blended with a significantly higher than 20% volatile coal from another section of the mine.

As such, at the outset of mining, coal will need to have a volatile content greater than 20%, thus making it a saleable product. This will minimize coal discard, unnecessary stockpiling costs and a situation where no revenue is generated.

Geological Discontinuities

Traversing geological discontinuities (faults and dykes) results in major production delays and increased operational costs. Three discontinuities (identified from the geological modelling) in Site A had a significant effect on the final positioning of the main mine adit shaft.

Positioning the shaft to the north or north east of the discontinuity (in for example, the Ecological Preferred Location) would necessitate mining through these discontinuities. Mining through these discontinuities:

- Would significantly delay the production of saleable coal;
- Would result in additional drilling and blasting costs; and
- Would require additional storage volume and associated mitigation of the impacts from these stockpiles, as a result of increased volumes and storage of waste rock from blasting.

Slope Stability

To ensure safe access to the Gus coal seam, the overlaying strata and topography of soil, soft and hard rock must be stable, thus eliminating the risk of the shaft subsiding. Based on geotechnical studies, the current position of the shaft at the main mine adit is geotechnically stable.

Shaft Orientation in Relation to Direct Environment and Infrastructure

The orientation of the shaft at the main mine adit at Site A was determined predominantly by the direction of the main trunk route within the mine. This arterial route and layout allows the main flow of coal on conveyors, access for machinery and personnel to the production sections, provision for electrical and piping utilities and the supply of fresh ventilation to the underground workings. A direction following the shallowest vertical distance from surface was selected to increase the stability of the trunk route in the long term. This orientation would follow a direction below the valley extending to the south and west of the site.

A secondary consideration was associated with the topography of the area. Ideally, the orientation of the trunk route would be along contours, thus optimising excavation volumes and reducing the risk of geotechnical instability.

2.4.3 Conclusions – Location of the Main Mine Adit at Site A

Although the site alternatives assessment was done (and the results analysed in *Table 2.1*), and Site A was identified as the preferred location for the main mine adit, it is recognised that this site (Site A) does have environmental sensitivities, including the presence of wetlands and sensitive grasslands. Based on the suggestion of Site A as the preferred site for the main mine adit, Hatch as the design engineers produced a main mine adit site layout as part of the feasibility study. This layout does infringe on valley slope and valley bottom wetlands, and the design of the adit could not be placed in the Ecologically Preferred Location (EPL) as identified in *Figure 2.2,* primarily due to the presence of faults and dykes and geotechnical (stability) constraints at this location. Alternative positions of the portal away from the valley slope wetlands could not be identified which would satisfy all the critical design criteria, as mentioned above. Alternative positions for the adit were either characterised by poor quality coal, too much or too little overburden, the issues posed by the location of faults and dykes, as well as stability issues.

Given the life of mine projections, these aspects were sufficient to significantly compromise the financial viability of the mine. Accordingly, it was determined that there was no viable alternative to the position of the main mine adit at Site A.

Apart from the position of the portal, alternatives to the layout of other infrastructure within the main mine adit are possible (although it is recognised that these suggested layout changes have not yet been assessed by Hatch), and are discussed below.

2.4.4 Infrastructure Layout Alternatives at Site A

Given the constraints posed by overburden thickness, the thickness of the Gus Seam, the presence of geological discontinuities (faults and dykes), as well as geotechnical considerations, the main mine adit, specifically the main mine portal, is required to be located in quadrants 7 / 11 within Site A (*Figure 2.1* and *Figure 2.2*). During the Pre-Feasibility Study, Hatch proposed an adit layout, given the constraints presented above, as presented in *Figure 2.5* below.

Given the environmental sensitivities of the area, and the potential impacts to the environment associated with the proposed adit layout, ERM suggested further refinement of the adit layout to move the following infrastructure away from sensitive areas such as the 1:100 year floodline and valley bottom wetlands with a defined channel (also indicated in *Figure 2.5*):

- The waste rock dump of 70,000 m^3;
- The temporary contractors' camp;
- The fuel storage depot; and
- The emergency stormwater pond and sewage sludge drying beds (*Figure 2.5*).

The above mentioned refinement has resulted in a revised layout of the main mine adit as is illustrated in *Figure 2.6*. Changes in the revised layout include the following:

- Movement of the waste rock dump and emergency stormwater pond into an area that was previously identified in *Figure 2.2* as the Environmentally Preferred Location (EPL) for mining infrastructure. The EPL is situated away from the Ohlelo River and is situated in an area that was classified as been degraded and having a high abundance of alien wattle trees (refer to *Section 2.2.1* on *Page 2-9*).
- Movement of the temporary contractors camp and fuel storage depot to a point of higher elevation in the main mine adit and away from the valley bottom wetlands with a defined channel.

- Movement of the sludge drying beds outside of the 1:100 year floodline.

Please Note:

The above mentioned refinement to the adit layout has resulted in a change in the siting and technical design specifications of the waste rock dump to what was previously presented in the SEMP that was lodged to the Regional DMR on 27 May 2013.

As such, the Regional Manager (in a letter dated 24 July 2013) requested that the SEMP be amended so as to include the revised infrastructural layout plan. This revised layout is presented in more detail in *Chapter 3* of this SEMP.

Figure 2.5 Previous Layout of Main Mine Adit A

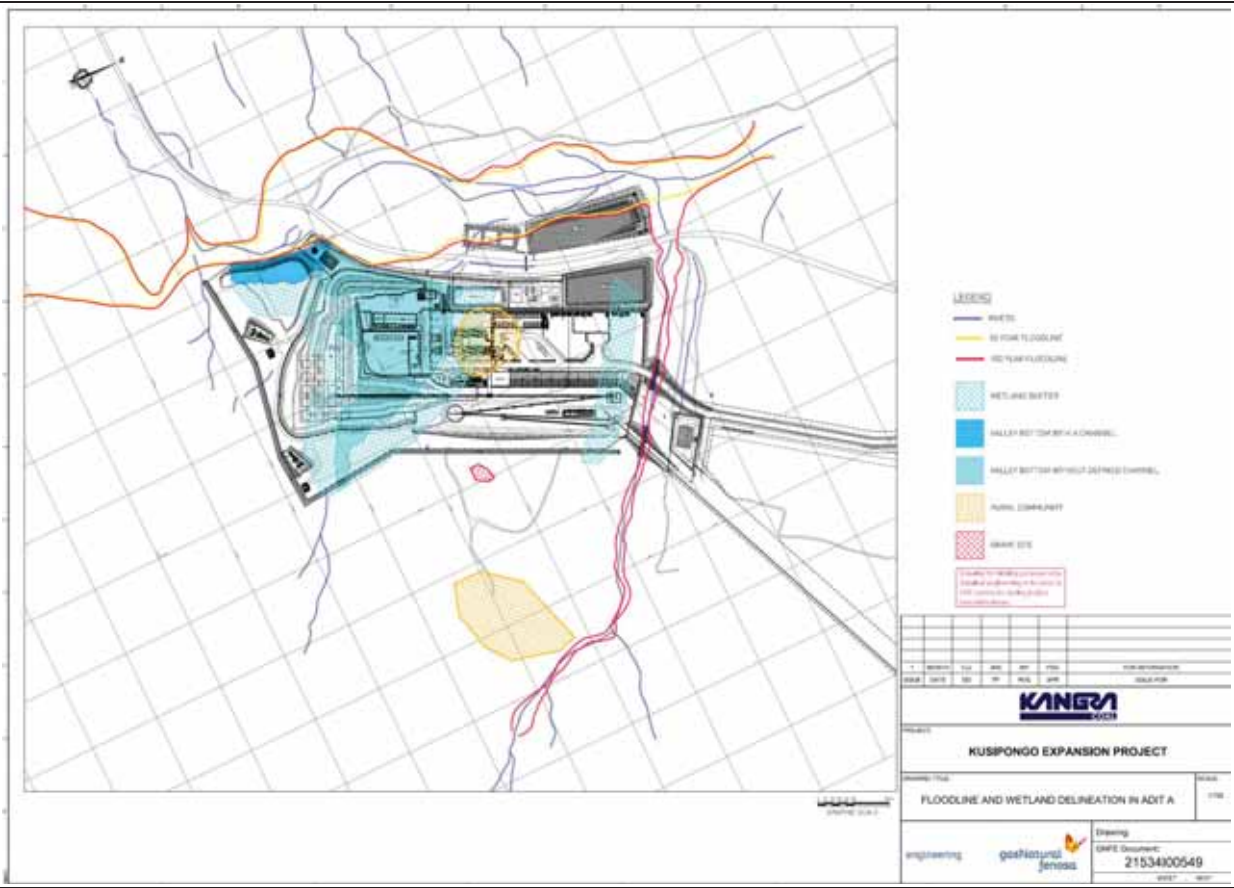
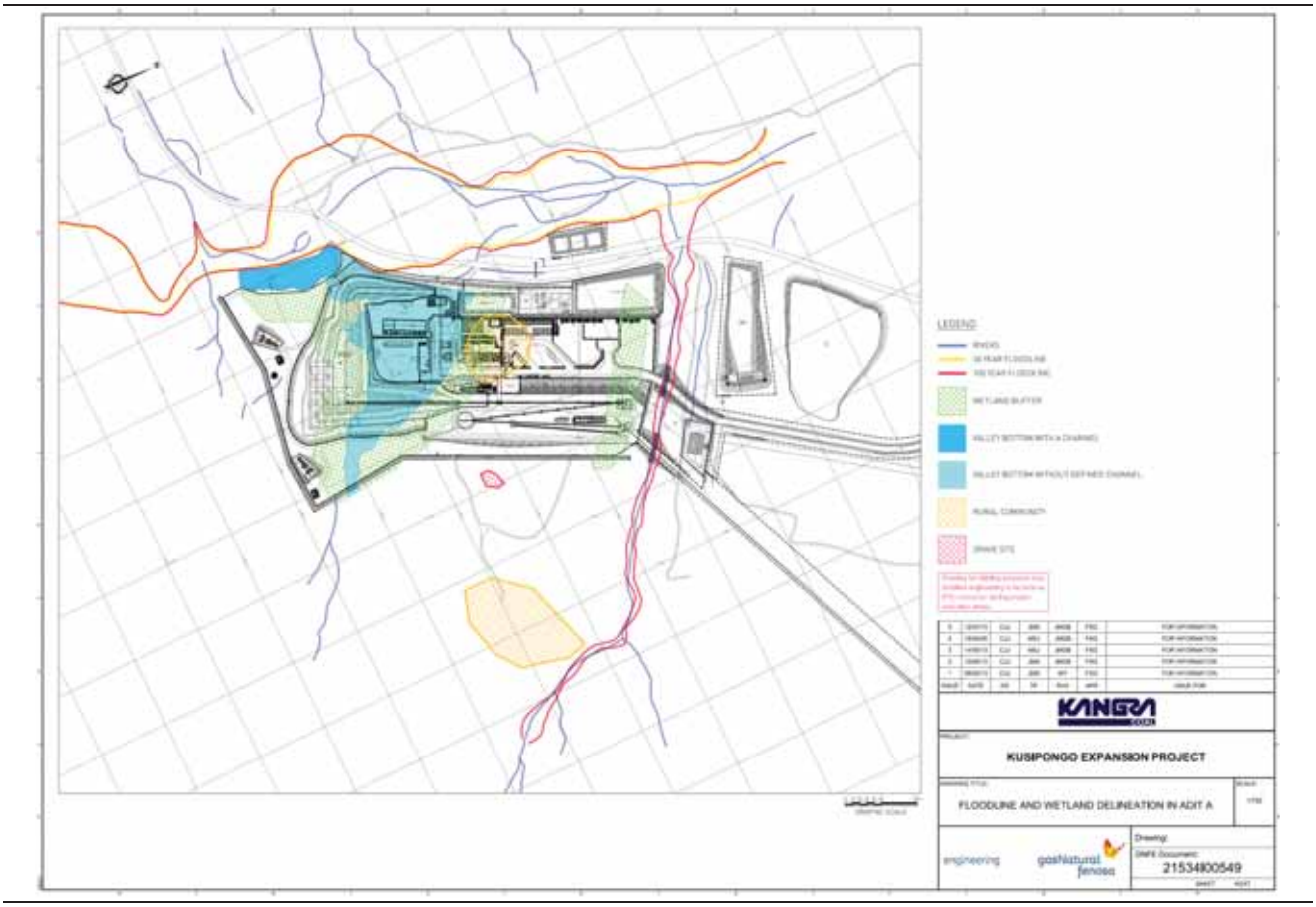


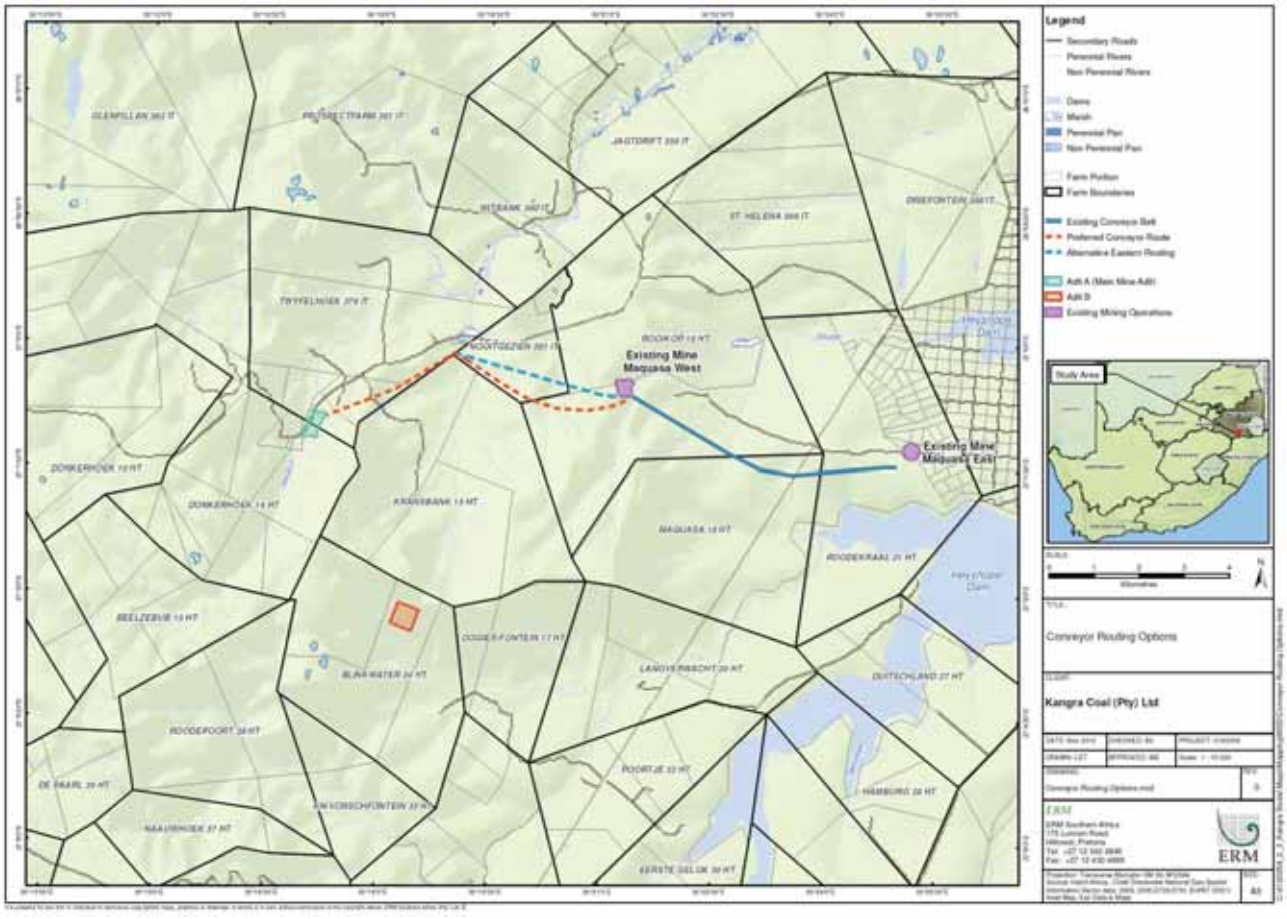
Figure 2.6 ***Revised (Current and Proposed) Layout of Main Mine Adit A***



2.5 ROUTING ALTERNATIVES FOR THE PROPOSED CONVEYOR ROUTE

The conveyor route proposed to transport coal from the main mine adit through to the existing Maquasa West Adit is illustrated as the **Red Line** in *Figure 2.7* below. Initially Kangra Coal proposed routing the conveyor system along the **Alternative Eastern Routing** from the Transfer Point through to the Maquasa West Adit; however, it became evident that it is in this area where Kangra Coal proposes the Maquasa mine expansion projects, which includes open cast mining (as is discussed in *Chapter 1*). As such, this portion of the route (alternative Eastern Routing as per *Figure 2.7* below) was not deemed feasible or reasonable.

Figure 2.7 ***Conveyor Route Options for the Proposed Kusipongo Expansion Project***



2.6 LOCATION ALTERNATIVES FOR THE CONTRACTORS' CAMP

Three locations for the temporary contractor's camp are proposed (*Figure 2.8*). All these three options are located on Kangra Coal property, and all three options are located more than 1km away from the Kransbank Private Reserve.

At this stage of the study there is no preferred site option for the location of the temporary contractors' camp (out of the three alternatives presented in *Figure 2.8*).

The two northern site alternatives for the temporary contractors camp are situated outside of a 100m flood peak buffer for the associated tributary (*Figure 2.9*), whilst the southern siting alternatives south eastern border overlaps the 100m flood peak buffer. This can however be rectified by shifting the location of the southern camp siting alternative towards the west. Other than the tributary illustrated in *Figure 2.9*, no other localized tributaries will be directly affected by the alternative siting options for the temporary contractors' camp.

The locality of the Camp is also shown in *Figure 4.5,* along the road leading westwards to Adit A.

Figure 2.8 ***Proposed Locations for the Contractor's Camp***

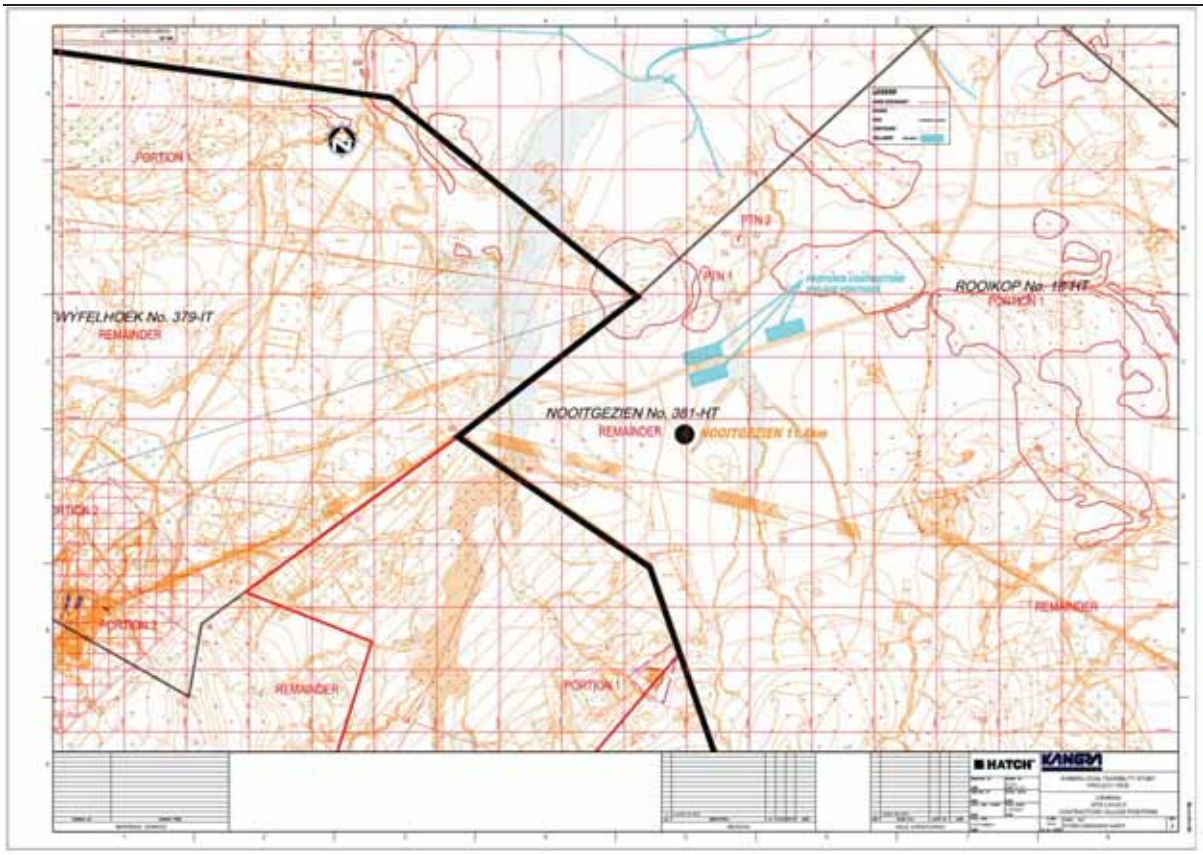
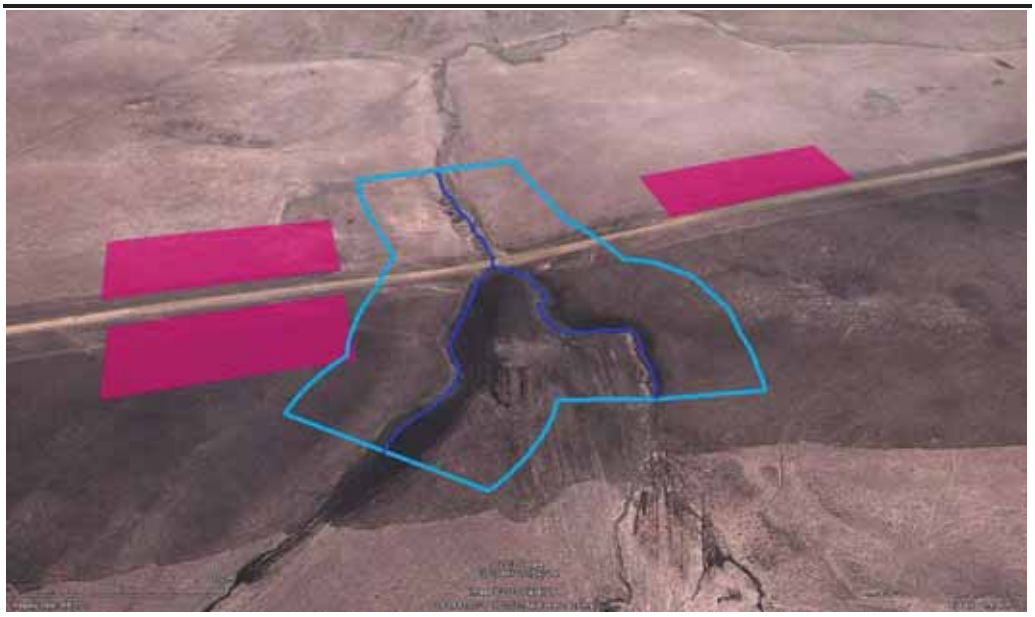


Figure 2.9 ***Flood Peak Buffer Zones for the Proposed Siting Alternatives for the Contractor's Camp Buffer Zone***



2.7 THE NO-GO ALTERNATIVE

Should the proposed Project not be approved, the "No-Go" option would mean that Kangra Coal would not be able to exploit this extensive coal reserve. With the existing mine life of only approximately another 3 to 5 years, the "No-Go" alternative would result in the mine ceasing operations in approximately three to five years. Further, the "No-Go" option would have a considerable opportunity cost, for the following reasons:

- It would result in large negative financial implications for Kangra Coal;
- It would potentially result in the loss of employment (within the next 3 to 5 years) for 750 employees that are currently working at the Savmore Colliery and approximately 350 indirect jobs (contractors);
- An additional 450 additional jobs during construction would not be created, as would be the case if the project were approved; and
- Would negatively affect the supply of coal to both international and local markets.

2.8 CONCLUSION

Following the Concept Study carried out by Hatch, it was concluded that the current transport system (trucking), the current washing plant location (at Maquasa East), and no increase in the mine's production (ie to remain at 3

Mtpa production) would deliver the most favourable economic returns for future mine expansions.

Various alternatives for the proposed Kusipongo expansion project were investigated by Hatch. The disadvantages and advantages of each of these alternatives, from a technical, financial, occupational health and safety, and environmental and social perspective, are given in *Table 2.1*.

For the proposed Kusipongo expansion, the environmental and social Site Screening Assessment concluded that Site A is the preferred site for the main mine adit development. Site A was generally preferred to Site B, in that Site A is in closer proximity to an already impacted area (Maquasa West operations). It was also concluded that Sites A and B are acceptable for the construction of ventilation adits.

These studies, however recommended preferred locations for each adit development on each site. Given the ecological sensitivities of the Project area, the Ecological Preferred Locations (as presented in *Figure 2.2*) would need to be considered during the design phase of the Project. Given the potential for mine water decant, the hydrogeological screening assessment also recommended that the adit be placed at an elevation as high as technically possible within Site A.

It must be noted that hydrogeological and ecological considerations took preference to social considerations; however, all indicated that Site A was acceptable.

Using this information, the main mine adit at Site A was designed. Geological discontinuities and stability concerns, as well as the requirement for overburden depth of greater than 20metres, were limitations that prescribed the location for the main mine portal. Further refinements to the main mine adit were however possible, and the layout of the main mine adit has been revised so as to avoid, in particular valley bottom wetlands and the floodlines of the Ohlelo River.

Such refinements to the current adit layout will however result in a change in the siting and technical design specifications of the waste rock dump to what was previously presented in the SEMP that was lodged with the Regional DMR on 27 May 2013. As such, the Regional Manager (in a letter dated 24 July 2013) requested that the SEMP be amended so as to include the revised infrastructural layout plan. This revised layout is presented in more detail in Chapter 3 of this SEMP.

The 'No-Go' alternative would not provide for any additional economic benefits or for further employment, and is therefore not considered a feasible alternative by Kangra Coal.

3 PROJECT DESCRIPTION

This *Chapter* provides a description of the proposed Project and associated phases and activities, and ancillary infrastructure.

The information provided in this Chapter is derived from the Pre-Feasibility Study carried out by Hatch in 2010 and their Feasibility Study carried out in 2011 and 2012. The Pre-Feasibility Study was aimed at selecting the best Project options for extracting the coal from the Kusipongo resource, by taking into account engineering, environmental, social and economic considerations. Following a better understanding of the resource and resultant mine design, Hatch carried out the Feasibility Study, which was essentially a refinement of the Pre-Feasibility Study (the Hatch recommended Pre-Feasibility option was accepted and that option was further developed during the Feasibility Study). Once the basic design was "frozen" (during the Feasibility Study in July 2012), all design information that had bearing on the ESIA process was provided to the ESIA team.

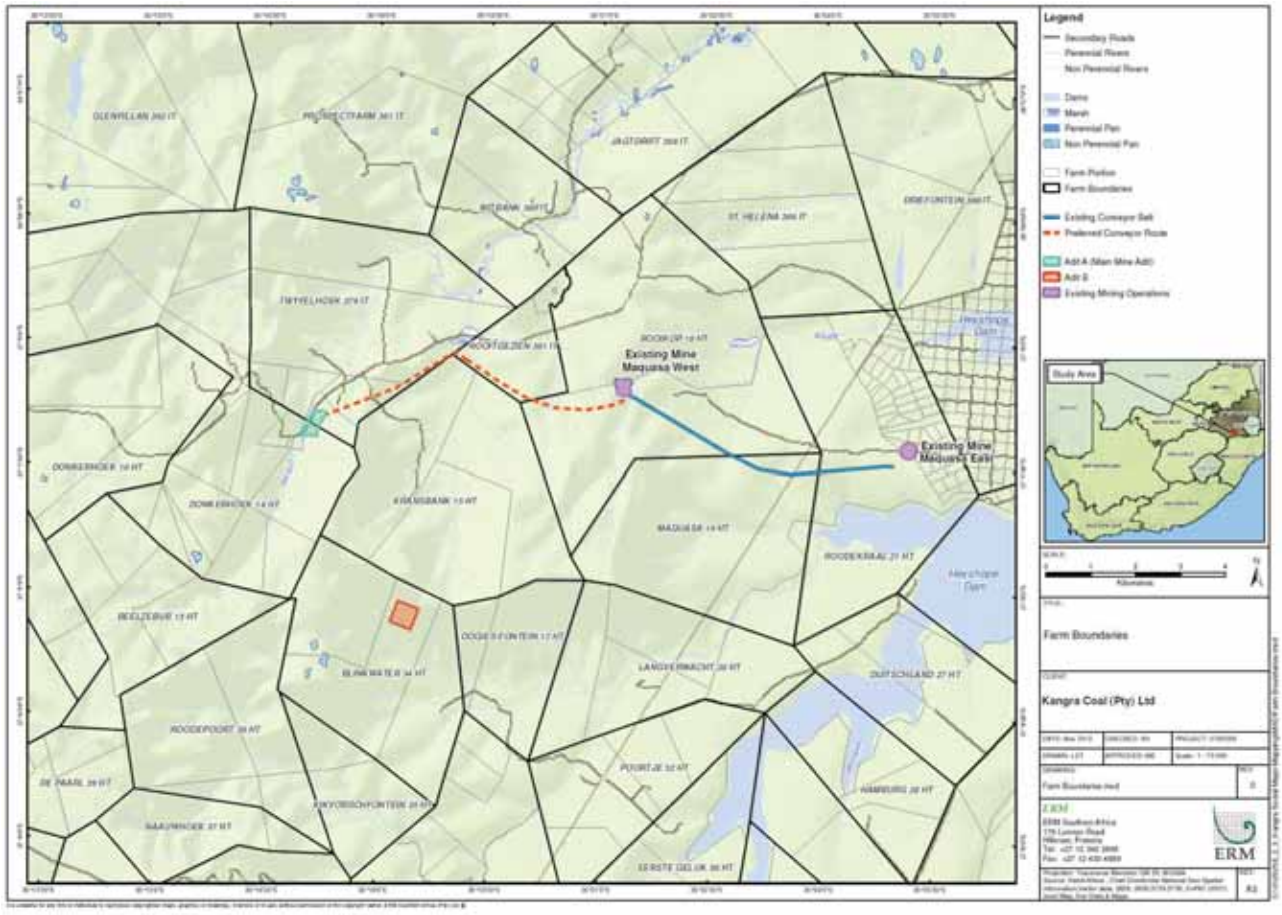
It must be noted however, that as an outcome of the ESIA process, ERM suggested to Kangra Coal that certain main mine adit infrastructure be moved away from sensitive areas such as the 1:100 year floodline and valley bottom wetlands with a defined channel (this is discussed in detail in *Section 2.4.4* of *Chapter 2*). These refinements resulted in a change to the layout of the main mine adit. This refined layout is presented in this Chapter.

The Project description formulated during Hatch's Feasibility Study formed the basis of the Terms of Reference for specialist studies associated with this ESIA.

3.1 PROJECT LOCALITY

During the project Pre-Feasibility and Feasibility assessments carried out by Hatch in 2010 to 2012, a coal reserve was identified at Kusipongo, located to the west of Maquasa West, as illustrated in *Figure 3.1.*

Figure 3.1 Location of Properties Relative to Proposed New Mine Site Infrastructure



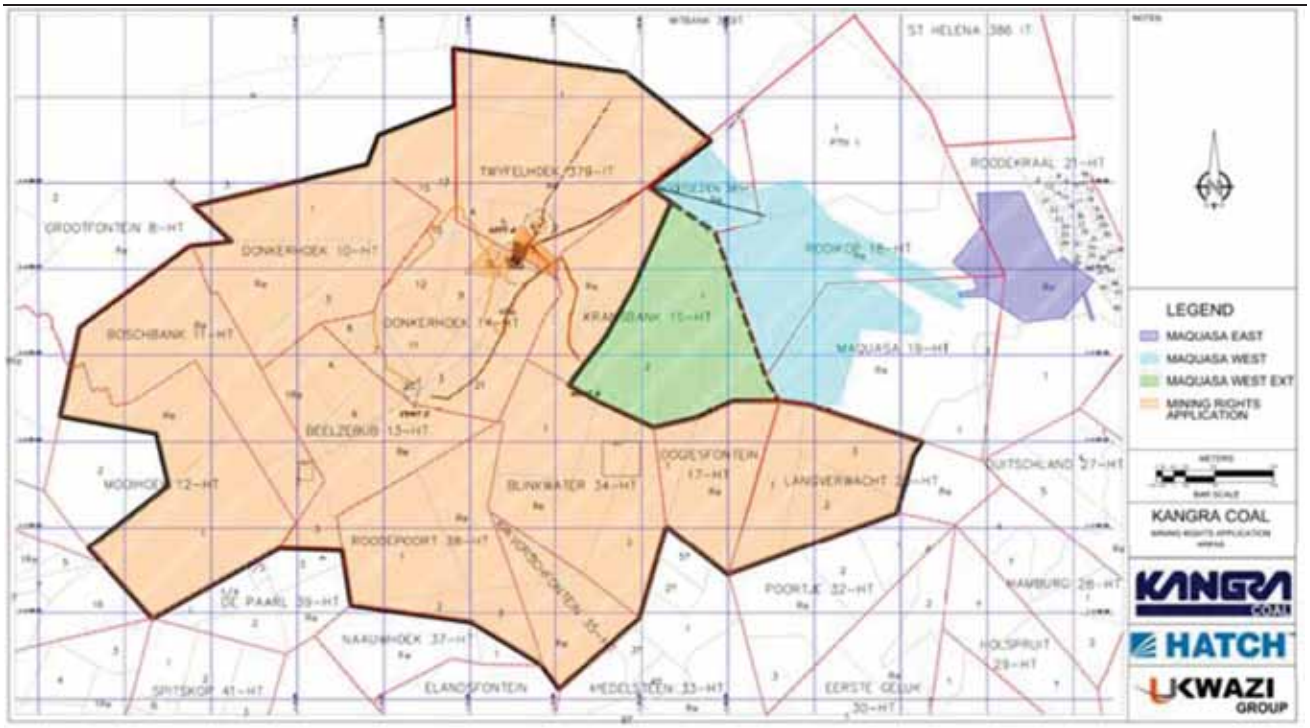
The registered farm descriptions, deeds and Surveyor General Codes of the properties potentially affected by the Kusipongo Resource Expansion mining right area is made up of the following farms, as provided in *Table 3.1* below.

Table 3.1 Registered Description of Land to which the Mining Rights Application refers

Registered description of land or area to which the application relates						
Property Name	Farm No	Registered Division	Portion	Deed Number	SG Code	Portion Size (Ha)
Beelzebub	13	H.T.	3	T098709/2007	T0HT00000000001300003	116.79
Beelzebub	13	H.T.	4	T052059/1999	T0HT00000000001300004	186.01
Beelzebub	13	H.T.	6	T095156/1994	T0HT00000000001300006	337.39
Beelzebub	13	H.T.	1	T052059/1999	T0HT00000000001300001	173.45
Beelzebub	13	H.T.	Re	T040558/2004	T0HT00000000001300000	337.39
Blinkwater	34	H.T.	1	T003976/1998	T0HT00000000003400001	458.04
Blinkwater	34	H.T.	2	T016043/1980	T0HT00000000003400002	480.21
Blinkwater	34	H.T.	Re	T002752/2011	T0HT00000000003400000	603.42
Boschbank	11	H.T.	2	T052059/1999	T0HT00000000001100002	135.20
Boschbank	11	H.T.	Re	T052059/1999	T0HT00000000001100000	1,114.38
Donkerhoek	10	H.T.	1	T007682/1996	T0HT00000000001000001	495.86
Donkerhoek	10	H.T.	3	T113896/2000	T0HT00000000001000003	536.68
Donkerhoek	10	H.T.	Re	T112155/2007	T0HT00000000001000000	543.12
Donkerhoek	14	H.T.	2	T102893/2005	T0HT00000000001000002	163.51
Donkerhoek	14	H.T.	5	T076264/1992	T0HT00000000001400005	1.71
Donkerhoek	14	H.T.	6	T053617/1998	T0HT00000000001400006	49.68
Donkerhoek	14	H.T.	7	T052059/1999	T0HT00000000001400007	73.40
Donkerhoek	14	H.T.	8	T052059/1999	T0HT00000000001400008	63.63
Donkerhoek	14	H.T.	9	T102893/2005	T0HT00000000001400009	177.93
Donkerhoek	14	H.T.	10	T102893/2005	T0HT00000000001400010	51.14
Donkerhoek	14	H.T.	12	T102893/2005	T0HT00000000001400012	168.81
Donkerhoek	14	H.T.	13	T113896/2000	T0HT00000000001400013	219.76
Donkerhoek	14	H.T.	21	T003976/1998	T0HT00000000001400021	145.38
Donkerhoek	14	H.T.	22	T052059/1999	T0HT00000000001400022	53.41
Donkerhoek	14	H.T.	11 Re	T009294/2008	T0HT00000000001400011	190.44
Donkerhoek	14	H.T.	Re	T102893/2005	T0HT00000000001400004	337.64
Kikvorschfontein	35	H.T.	1	T040558/2004	T0HT00000000003500001	147.57
Kikvorschfontein	35	H.T.	Re	T083050/1988	T0HT00000000003500000	424.38
Kransbank	15	H.T.	Re	T139369/2000	T0HT00000000001500000	661.21
Langverwacht	20	H.T.	1	T034864/1982	T0HT00000000002000001	334.44
Langverwacht	20	H.T.	2	T034864/1982	T0HT00000000002000002	334.37
Langverwacht	20	H.T.	3	T034864/1982	T0HT00000000002000003	350.92
Mooihoek	12	H.T.	1	T037863/1971	T0HT00000000001200001	1,062.06
Mooihoek	12	H.T.	Re	T041309/1969	T0HT00000000001200000	560.73
Oogiesfontein	17	H.T.	1	T016043/1980	T0HT00000000001700001	123.21
Oogiesfontein	17	H.T.	Re	T084488/1995	T0HT00000000001700000	603.42
Roodepoort	38	H.T.	1	T008190/2010	T0HT00000000003800001	616.52
Roodepoort	38	H.T.	2	T016044/1980	T0HT00000000003800002	102.19
Roodepoort	38	H.T.	3	T000536/2004	T0HT00000000003800003	157.81
Roodepoort	38	H.T.	Re	T040558/2004	T0HT00000000003800000	468.88
Twyfelhoek	379	I.T.	1	T064191/2003	T0IT00000000037900001	662.56
Twyfelhoek	379	I.T.	3	T053617/1998	T0IT00000000037900003	64.24
Twyfelhoek	379	I.T.	4	T113896/2000	T0IT00000000037900004	60.08
Twyfelhoek	379	I.T.	2	T053617/1998	T0IT00000000037900002	206.97
Twyfelhoek	379	I.T.	Re	T053617/1998	T0IT00000000037900000	993.86
Total (Ha)						15,252.05
Total (m^2)						152,520,475

Properties affected by the mining rights application are provided in *Figure 3.2* below.

Figure 3.2 Properties Affected by the Mining Rights Application



Source: Hatch, Feasibility Study (FEL-3) Report, 2013

The core infrastructure for this proposed Expansion Project consists of a single main mine adit, associated ventilation shaft and connecting conveyor belt, as well as a temporary construction camp (*Figure 3.1*). The coordinates of these facilities are listed in *Table 3.2*.

Table 3.2 Core Infrastructure Locations

Infrastructure	Latitude	Longitude
Adit A (main mine adit)	27⁰ 01′ 01.38″ S	30⁰ 17′ 08.88″ E
Adit B (ventilation)	27⁰ 02′ 30.64″ S	30⁰ 18′ 00.16″ E
Overland conveyor route	27⁰ 00′ 55.64″ S	30⁰ 17′ 15.07″ E (start pt.)
	27⁰ 00′ 34.54″ S	30⁰ 18′ 12.86″ E
	27⁰ 00′ 08.84″ S	30⁰ 18′ 59.86″ E
	27⁰ 00′ 47.37″ S	30⁰ 20′ 25.00″ E
	27⁰ 00′ 38.02″ S	30⁰ 21′ 24.09″ E (end pt.)
Proposed contractor camp (temporary)	26⁰ 59′ 44.29″ S	30⁰ 20′ 30.15″ E

This proposed infrastructure will be located on the following properties (as summarised in *Table 3.3*). The location of these properties relative to the siting of the proposed permanent infrastructure (barring the contractor's camp, which will not be permanent) is also provided in *Figure 3.1*.

Table 3.3 Project Infrastructure Summary Description

Property	Surveyor General Cadastral Code	Title Deed Number	Infrastructure Development Footprint (m²)
Adit A (1)			
Donkerhoek No. 14-HT, Portion 4Re	T0HT00000000001400004	T102893/2005	78 780
Twyfelhoek No. 379-IT, Portion 3	T0IT00000000037900003	T53617/1998	168 724 (incl. adjacent side of D2548 road for water storage)
Twyfelhoek No. 379-IT, Portion 2	T0IT00000000037900002	T53617/1998	59 348
Adit B			
Blinkwater No. 34-HT, Portion Re	T0HT00000000003400000	T002752/2011	±500 (2)
Conveyor Route			
Twyfelhoek No. 379-IT, Portion 3	T0IT00000000037900003	T53617/1998	±9 381
Twyfelhoek No.379-IT, Portion 2Re	T0IT00000000037900002	T53617/1998	±46 932
Twyfelhoek No.379-IT, Remainder	T0IT00000000037900000	T53617/1998	±37 820

Property	Surveyor General Cadastral Code	Title Deed Number	Infrastructure Development Footprint (m^2)
Nooitgezien No. 381-IT, Remainder	T0IT00000000038100000	T36896 / 2006	±112 654
Rooikop No. 18-HT, Remainder	T0HT00000000001800000	T78816 / 2004	±62 012
Contractors Camp During Construction (Temporary)			
Rooikop 18HT, Portion 1	T0HT00000000001800001	T001131 / 2004	±30 000

(1) **Please Note** - this is the area associated with the outer boundary of the main mine adit, and includes areas inbetween infrastructure that will not be developed (i.e. the footprint associated with the removal of topsoil for surface infrastructure will be less).

(2) **Please Note** – although Adit B will only require a surface area of 500m^2, a area of 28 600m^2 has been studied (refer to *Section 3.4.2*).

3.2 DEFINITION OF THE PROJECT AREA AND THE MINE AFFECTED AREA

The Project Area is defined as the area defined by the mining rights application, as defined by *Table 3.1* and *Figure 3.2.*

The Mine Affected Area is defined as those portions of properties on which surface infrastructure is located, as defined by *Table 3.2* and *Table 3.3,* and in *Figure 3.1*.

3.3 PROJECT PHASES

Mining projects are developed in set phases, with each phase having a different combination of activities. For ease of reference, the proposed Project has been divided into the following phases:

- Exploration and Prospecting;
- Planning and Engineering;
- Construction;
- Operation (mining); and
- Decommissioning and Closure.

Please Note – the scope of the Project associated with this ESIA relates to the construction, operation and decommissioning phases only.

The above mentioned Project phases are discussed below.

3.3.1 Exploration and Prospecting Phase

The exploration and prospecting phase commenced in 2006 and was completed in 2011.

This phase largely entailed:

- Exploration boreholes;
- Geotechnical boreholes;
- Mapping;
- Geological modelling of the coal seams; and
- Resources evaluation.

3.3.2 Planning and Engineering Phase

The exploration and prospecting phase is currently guiding the detailed planning and engineering phase, and it is during this phase that the ESIA team work closely with the engineering design team. This allows possible Project process, layout and design alternatives to be investigated, and the assessment of impacts and identification of impact mitigations measures that will be incorporated into the overall Project design. These anticipated impacts and associated mitigation measures are presented in the form of a SEMP (this report).

3.3.3 Construction Phase

The construction phase cannot commence prior to the completion of the planning and engineering phase, approval of the associated SEMP (this report) by the relevant authorities, and until the necessary environmental and mining licenses and authorisations have been obtained. On the assumption that the mine will be established and that all relevant rights and permits will be obtained, it is assumed that construction will commence in 2014. The construction phase will likely include the following initial construction activities:

- Access road to the site of the proposed main mine adit, ventilation adit and along the route of the proposed overland conveyor route;
- Establishment of the temporary contractors camp for use during construction;
- Establishment of the permanent office and support facilities at the main mine adit (Adit A);
- Establishment of the main mine adit (Adit A);
- Establishment of the overland conveyor;
- Establishment of the ventilation adit (Adit B);
- Equipment and facilities establishment; and
- Mining preparation.

3.3.4 Operational Phase

Once the construction phase of the proposed Project is complete, the underground mining activities will commence in the area illustrated in *Figure 3.1.* Early estimates indicate a potential mine life of 10 to 20 years with the potential to generate a ROM production volume of approximately 3.6 to

3.8Mtpa. The operations phase will likely include the following operational activities:

- Underground mining, utilising the bord and pillar technique;
- Blasting;
- Conveyance of coal product to the surface at Adit A;
- Primary and secondary screening and crushing of coal;
- Temporary storage of coal at Adit A in one of two silos;
- Conveyance of coal to the existing Maquasa East coal benficiation plant, via the existing Maquasa West adit;
- Washed coal will continue to be trucked to the existing Panbult siding for distribution to both the inland market and the RBCT for export; and
- Discard of coal discard on the exisiting Maquasa East coal discard dump (this will need to be expanded to accept coal discard over a period of 20 years at an average rate of 1 550 000m^3 per year.

3.3.5 Decommissioning and Closure Phase

Decommissioning and closure occurs at the end of the mine life. The following aspects in the SEMP (this report) will need to be updated periodicially during the life of the proposed Project:

- Decommissioning and sale of mining equipment and infrastructure;
- Restoration and rehabilitation of disturbed areas;
- Management of mine water decant and water treatment prior to discharge; and
- Post closure monitoring.

3.4 PROJECT DESCRIPTION – PREFERRED ALTERNATIVE

The following section provides a description of the preferred Project alternative for this study. Other alternatives to the preferred alternative are described in *Chapter 2*.

3.4.1 Existing Surface Infrastructure

The majority of the surface infrastructure associated with the proposed Project, such as a coal beneficiation plant, material handling facilities and coal discard dump, are located on the existing Maquasa East property. This infrastructure will continue to be used for the processing of coal reserves from the proposed Kusipongo Resource.

It is proposed to transport coal from the main mine adit (Adit A) in the Kusipongo Resource to the existing Maquasa West adit via a proposed new overland conveyor system. From there it is proposed that the overland conveyor system feeds into the existing overland conveyor system, which will then transport coal to the existing Maquasa East Coal beneficiation plant

(*Figure 3.2*). Washed coal will continue to be trucked to the existing Panbult siding for distribution to both the inland market and the RBCT for export.

It is proposed to use the following facilities that *already exist* at the Maquasa West and East sites:

- Main administration building;
- Induction, medical and training facilities;
- Electrical substation;
- Light vehicle workshops;
- Main mine stores;
- Discard dump (this will need to be expanded to accept coal discard over a period of 20 years at an average rate of 1 550 000m^3 per year) (1);
- Coal beneficiation plant; and
- Materials handling facilities.

The location of the proposed new infrastructure, relative to the infrastructure that already exists, and the proposed links between the new and old infrastructure, are indicated in *Figure 3.1.*

3.4.2 Proposed Surface Infrastructure

The proposed Adit A, ventilation Adit B and overland conveyor system are described in more detail below.

Adit A – Main Mine Adit

Adit A will also include within its footprint ventilation shafts; however, it will be designed in such a way to allow workers, materials and machinery access to underground mining operations (inclined adit). *Figure 3.3* and *Figure 3.4* are examples of a main mine adit. These figures are intended to provide examples of the layout of the adit. The inclined adit will provide for a conveyor to bring mined coal to the surface (*Figure 3.3* and *Figure 3.4*).

The construction footprint of the Adit A is approximately 306 851m^2 (2) (refer to *Figure 3.5*, showing the layout of Adit A).

(1) As is mentioned in Chapter 1 - the detailed socio-environmental assessment of the final option relating to the discard dump is currently being undertaken by GCS and will not form part of this Study.
(2) ***Please Note*** - this is the area associated with the outer boundary of the main mine adit, and includes areas inbetween infrastructure that will not be developed.

Figure 3.3 Example of the Infrastructure and General Site Layout Associated with a Main Mine Adit

Figure 3.4 Typical Portal Entrance of a Main Mine Adit

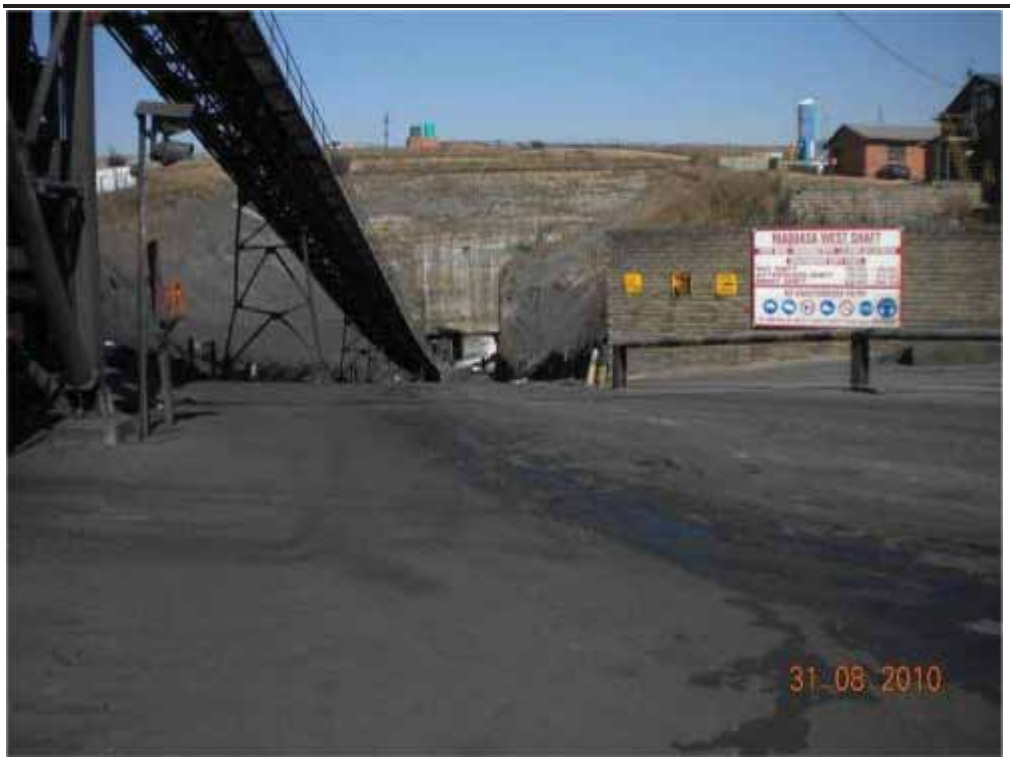
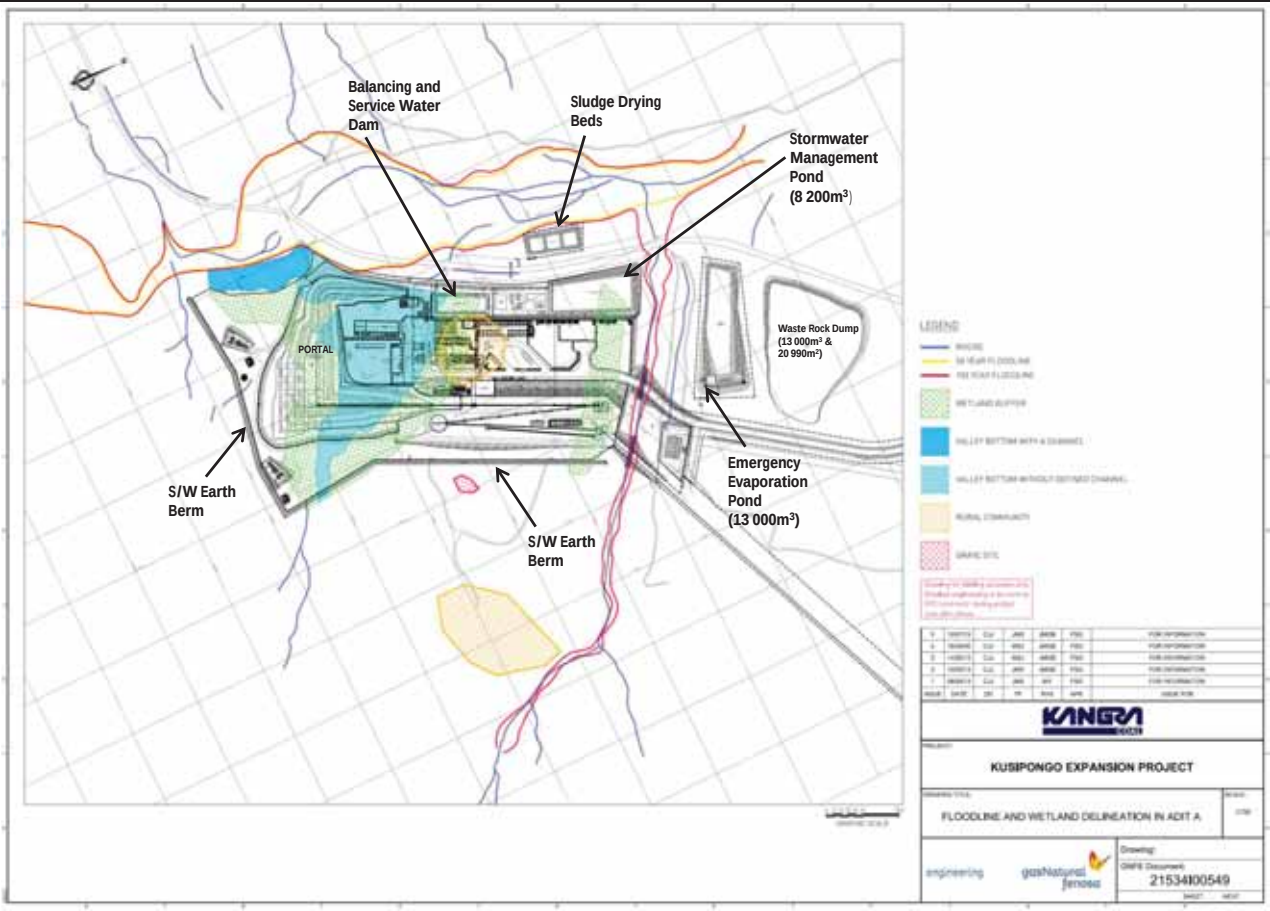


Figure 3.5 ***Proposed Site Layout for the Main Mine Adit (Adit A)***



The following infrastructure, listed below, are proposed and will be developed at Adit A:

- Adit A incline conveyor;
- Primary screening and crusher building; including the primary screen and crusher;
- Silo feed conveyor, including shuttle chute and transfer conveyor (to direct flow to either silo as required);
- A 7 500 ton coal storage silo;
- Secondary screen feed conveyor;
- Secondary screening and crushing building including secondary screen and crusher;
- Recycle conveyor;
- Sacrificial/accelerating conveyor feeding secondary screen undersize to the overland conveyor;
- Dust suppression system for transfer points;
- Main surface ventilation fans and ducting (two fans for each of the two ventilation shafts);

The following support infrastructure and facilities are proposed and will be developed at Adit A:

- Electrical distribution substation, switch gear and step-down transformers. Emergency back-up generators will also be included. These will be installed in the form of an electrical substation and generator building;
- A stormwater management pond and emergencey evaporation pond designed to have a total storage capacity of 21 200m^3 over two ponds;
- Potable water supply and storage sourced from a groundwater borehole identified as ERMBH03 (27° 00' 38.4455" S and 30° 17' 14.1128" E).
- A balancing dam with an approximate size of 4 000m^3 to supply water for underground mining (cutting of coal) purposes;
- Fire fighting system complete with water storage;
- Mechanical and electrical workshops for underground mining equipment;
- A wash bay that will be used for the washing of mining equipment and light duty vehicles;
- Silt traps which will accommodate and settle out fines;
- Brake test ramp for mine vehicles;
- A fuel and oil depot;
- Satellite stores and a magazine building, associated storage and salvage yards;
- Chemical and paint stores;
- Explosives storage;
- A bus shelter and bus turnaround facility;
- A total of 48 above ground parking bays;
- Additional parking for underground vehicles located near the surface workshops;
- Truck lay bye area;
- Locker-room facilities for 300 mine workers;

- A sanitation system, sewage treatment plant with an associated sewage sludge treatment facility;
- Temporary waste storage facilities to accommodate general (domestic, recyclables, etc.) and hazardous waste (used oil, solvents, spent batteries, contaminated rags, overalls, descants, etc);
- Administration offices;
- First aid facilities;
- Lime silo (used for white-wash and dust control underground);
- An Adit rock dump (area – 20 990m^2 and volume – 108 000m^3);
- A security fence around the perimeter of the property and substation;
- A security (guard) house; and
- An access road through to the adit.

Each of this primary and support infrastructure is described in more detail below:

Adit A Portal

The portal, or box cut, is excavated from the surface to the floor of the first (Gus) coal seam. The purpose of the portal is to allow ventilation (down-draft) and access to the underground workings for man, machinery, services and utilities. The portal is used to remove mined coal to the surface.

Infrastructure at Adit A on the surface is to support underground mining activities.

In order to absorb the large variability of the underground production volumes and to prevent the need to store coal on the ground (which would lead to significant environmental impacts), a coal silo, with a live capacity of 7 500 tonnes, will be used.

Waste Rock Dump

Excavated rock from the Adit A portal is provisionally proposed to be placed immediately adjacent to the portal. This waste rock dump will have an area of 20 990m^2 and a volume of approximately 108 000m^3.

During the ESIA process, it was, however identified that intial designs placed this waste rock dump (which was deigned for placement in a topographically level area), within valley bottom wetland with a channel. As this wetland type is considered sensitive, Kangra Coal committed to relocating the Waste Rock Dump away from this wetland, subsequently resulting in the current layout as is presented in this Chapter.

This has, however resulted in a change in the siting and technical design specifications of the waste rock dump to what was presented in the SEMP lodged with the Regional DMR on 27 May 2013. As such, the Regional Manager (in a letter dated 24 July 2013) requested that the SEMP be amended

so as to include the revised infrastructural layout plan. This revised layout is presented in this Chapter.

Electrical

The 11kV Eskom Intake Point of Supply will be located at Adit A. A Consumer Substation will distribute power to the decentralized substation and mini substations. A 22 kV overhead power line will function as the link between Kusipongo and Maquasa West from which the drive systems for the Overland Conveyor will be supplied. These 22kV transmission lines supplying power from Maquasa West to Adit A will be along the conveyor route.

Mini substations will be implemented to distribute power to the admin centre, change house, lamp and crush, workshops, fuel depot and utilities.

Two 5MVa emergency power generators will be housed in a generator building and will supply the main surface fans during power failures.

An example of an electrical substation and generator building is provided in *Figure 3.6*(1).

Figure 3.6 Typical Electrical Substation associated with a Main Mine Adit

(1) ***Please Note*** - this does not include the Eskom Substation (illustrated on *Figure 3.5*) which will be constructed in parallel to the proposed Project. The Eskom Substation is subject to the Eskom EIA approval process and is outside the scope of this application.

Potable Water Supply

Water will *initially* be supplied to the proposed Adit A from the existing facilities at Maquasa West adit (the pipeline will follow the proposed new conveyor corridor between the Maquasa West adit and Adit A), discussed in further detail in the section below.

Potable water requirements were estimated based on an assumed consumption of 150 l/capita/day. The labour force is anticipated to have around 310 people for the morning shift (10 hrs), 130 people for the afternoon shift (10 hrs), 15 people for the maintenance shift (4 hrs) and 85 people at all times for the main mine adit. As such, 45m^3 is determined to be the daily potable water requirement. Boreholes are envisaged to be the only source for potable water. Potable water will be sourced from a groundwater borehole identified as ERMBH03 (27° 00' 38.4455" S and 30° 17' 14.1128" E). This borehole meets the required yield of 0.52 l/s pumped continuously over 24 hours a day, as per a borehole yield test. The volume of water available has been estimated at 45m^3/day (refer to the Groundwater Specialist Report; *Annex C.3*). Water will be extracted from ERMBH03 and pumped into a package water treatment plant before being pumped to an elevated potable water supply tank, that will be erected at the complex and will serve to accommodate peak flow requirements.

Surface Water Management at the Main Mine Adit

Kangra Coal has committed to a Zero Effluent Discharge Policy; meaning zero discharge of effluent (including treated effluent) into the natural environment during the construction and operational Phase of the proposed Project. During the closure phase, it is likely that mine decant will require discharge into the environment. This will be in compliance to the appropriate discharge standards and the receiving water quality objectives applicable at the time).

Surface water management within the main mine adit will restrict any *unpolluted water* to a clean water system external to the adit complex. This will be accomplished with earthfill berms, designed to divert clean stormwater runoff associated with a 1:100, 24 hour storm event. An interior/exterior diversion berm slope of 3:1 (H:V) will be assumed. Storm-water cut-off berms will be constructed during the main earthworks construction. Subsoil drainage will be placed along the length of the berm to reduce the risk of slippage in the wet season.

Impacted *'dirty' stormwater* runoff within the main mine adit footprint will be collected and routed to the two stormwater management ponds for sedimentation of insoluble particulates. The 'dirty' stormwater will pass through a silt trap before entering the stormwater management pond.

The stormwater management ponds are constrained by a lack of space to accommodate a single pond design within the adit A complex area for the 1:100 storm event. Two stormwater management ponds have therefore been

designed to accommodate the 1:100, 24 hour rainfall event. A freeboard of 0.8m is accomodated in the design of the stormwater management pond. A total storage capacity of 21 200 m^3 over two ponds is estimated based on runoff calculations for the adit area, using the 1:100 24 hour rainfall event. The smaller pond is a Stormwater Management Pond of 8 200 m^3, which will reside within the adit A complex. When this capacity is reached, the collected runoff will be directed to the bigger pond (named an Emergency Evaporation Pond) of 13 000 m^3, situated just outside the adit complex. Stormwater runoff from the waste rock dump will be directed to the Emergencey Evaporation Pond.

In the 1:100, 24 hours rainfall event, the retained water volume is expected to flow from the Stormwater Management Pond to the Emergency Evaporation Pond. The Emergency Evaporation Pond should be operated such that retained water be used as soon as possible after each storm event.

Terraces have been designed to ensure that al stormwater drainage is directed towards stormwater drains. All drains will be surface drains with the exception of the workshop area. All surface drains will be v-drains for easy maintenance and u-drains with heavy duty gratings will be constructed at road crossings. All stormwater inside the workshop area will be directed into an underground pipe system and discharged into an oil trap. Water flowing through the oil trap will be discharged into the silt trap and later into the stormwater dam. All surface stormwater will be drained to a silt trap, and once it passes through the silt trap, stormwater will discharges into the stormwater dam.

The stormwater and the make-up water dams will be plastic lined, the emergency eveporation pond will be clay lined.

Management of Mine Infiltration and Decant Water

The preliminary, first-order estimate of the potential infiltration of water into the underground workings was provided in the Specialist Groundwater Report (*Annex C.3*). Underground storage of excess mine infiltration water has been planned and will be considered in the overall water balance.

The mine inflow is expected to supply water for cooling of the continuous miners. No dewatered groundwater will be used in beneficiation; however, a portion of the water will be reused underground for dust suppression and in cooling mining machinery. This dewatered groundwater will be used for service water on the surface, and for dust suppression. Chemical treatment is not necessary for these two uses. The balancing and service water dam, used to store excess mine water, is sized to be 4 000 m^3.

Following mine closure, if decant occurs, water may be treated depending on the quality of the decant. The selection of an appropriate water treatment process will be dependent on the mine decant volumes, decant water quality, and the water quality in the receiving watercourse at the time.

Workshops

The Workshop building is a portal frame building with a span of 15 m. The building is equipped with a 5 ton overhead crane. The building has been divided into two sections; the first section consists of a Mechanical shop, Electrical Shop, 4 service bays, plate/boilermaker workshop, storage rooms, instrumentation workshop, offices and ablution facilities, and is designated for Kangra Coal's use. The second section costing of 2 service bays, a plate / boilermaker workshop, office and store facilities, is designated for use by contractors.

Vehicle Wash Bay

The Building is a steel portal frame building with sheeted roof and sheeted side cladding. The Vehicle wash bay structure serves two purposes. The first purpose is to accommodate the washing of the various mine vehicles. The building is equipped with high pressure washing systems, vehicle hoists, and vehicle ramps to allow washing from all angles. The second purpose of the structure is to allow for vehicle servicing. The hoists allow the vehicle to be elevated for easy access to the underside of the vehicles. The building is divided up into 5 sections. The first two sections are equipped with ramps with a load capacity of 10 tons. The last three sections are equipped with vehicle hoists with a 5.4 ton capacity.

All wash water will be directed into an underground pipe system and discharged into an oil trap. Water flowing through the oil trap will be discharged into the silt trap and later into the storm-water dam.

Stores

The Stores building is a portal frame building with a span of 15 m. The building is designed for both receiving and dispatch. The structure is designed with full forklift access. Areas have been demarcated for the various stores items. Ablution and office facilities have been provided. The stores yard is equipped with covered sheds.

Fuel Storage

A fuel and oil depot to accommodate a cumulative volume of 500m^3 is designed. All fuel and oil storage facilities will be located on hard concrete, and will be bunded to accommodate 100% of the cumulative volume stored.

Change House / Lamp House

The change house is a brick structure with sheeted roof. The building houses a change house facility (showers, ablutions, lockers, laundry) as well as a lamp house facility. The change house is equipped with a male and female section. The male section can accommodate a total of 520 people, and the female section can accommodate 26 people. The maximum peak shift has been

defined to accommodate 370 people. The Laundry is equipped with washing machines, tumble dryers, and a stores facility.

Administration Block and Control Room

The Administration building is a double storey brick structure with sheeted roof. The building accommodates all administration facilities such as the offices, meeting rooms, printing stations, server rooms, ablutions and kitchens. On the ground floor, there is a First Aid room as well as Change house facilities for management and visitors. The main Control room is accommodated on the second floor.

Banksman Cabin

This is a small brick building with sheeted roof located at the entrance to the adit. The building is equipped with ablution and office facilities. The purpose of the building is to manage the personnel and vehicles that enter and exit the underground mining works.

Parking Bays

Provision for 48 covered parking bays has been made. This area will be paved with light duty 50 mm concrete paving blocks. The area will be access boom controlled and fenced in.

There are 6 uncovered visitors parking's available near the security building. There are 6 uncovered Taxi parking bays at the bus turning circle.

Drop off Facility and Bus Shelter

There is a 20m long steel structure bus shelter located at the plant entrance. The drop off facility will allow mine workers to be dropped off and picked up safely, ensuring the least amount of pedestrian movement across roadways. The drop-off surfacing will be premix and the design will have the same specification as the access road. The flow of traffic is one-way in a clockwise direction and this facility acts as the entrance and exit road from the parking area.

Expired Explosives

During the operational phase, expired and unused explosives may need to be suitably disposed of. The NEMWA does not make provision for the disposal of explosives; this is regulated by the Explosives Act (Act No. 15 of 2003) (EA). Section 10 of the EA requires that all explosives be kept, stored and transported in accordance with the conditions of an issued permit and any other applicable regulations. Kangra Coal will suitably store and dispose of expired explosives in accordance with their current permit conditions (reference number 28/1/3/8/3/1/195999).

Temporary General and Hazardous Waste Storage Areas

General waste will be collected and temporarily stored in waste skips. Skips are located near the centre of Adit A, between the office building and the stores (*Figure 3.5*). Skips will be labelled so that recyclable and reusable items are separated out from wet waste designated for disposal at a licensed landfill.

A site designated for the temporary storage of general industrial waste will be located adjacent to the general waste skips to the south (*Figure 3.5*). General industrial waste will include waste items that are too large to place in skips.

It is anticipated that the allowable storage volume for the temporary storage of general waste (including general industrial waste) onsite will exceed 100m^3. General waste types anticipated to be generated onsite are listed in *Table 3.4*.

Table 3.4 General Waste Types

Waste Type	End Use	Approximate Quantity / month
General food and office waste	Disposal to landfill	5 tons
Used Uncontaminated PPE	Disposal to landfill	Unknown *
Paper and cardboard	Recycle	5 tons
Steel Strapping	Recycle	Unknown *
Plastic	Recycle	1.2 tons
Pallets	Reuse / Recycle	Unknown *
Wood	Reuse / Recycle	Unknown *
Conveyor belting	Disposal to landfill	1.4 tons (350m)
Waste tyres	Recycle	0.25tons (50 tyres)
Conveyor Idlers	Recycle	Unknown *
Electrical cables	Recycle	Unknown *
Steel rope	Recycle	Unknown *
General scrap steel	Recycle	8 tons
Pipe work	Recycle	Unknown *
Chains	Recycle	Unknown *
Wire mesh	Recycle	Unknown *
Scrap drills	Recycle	Unknown *
Pumps	Refurbish / reuse	Unknown *
Winches	Refurbish / reuse	Unknown *
Electrical motors	Refurbish / reuse	Unknown *
Bearings	Recycle	Unknown *
Hoses	Recycle	Unknown *
Cutter tips	Recycle	Unknown *
Fluorescent tubes	Recycle	18.5kg (74 tubes)
Fuses and electrical	Recycle	Unknown *

* Unknown - These waste types will be produced on an *ad hoc* basis, as such, approximating the quantity produced is not possible at this stage. As is mentioned below the temporary storage of general waste onsite will exceed the 100m^3 legislative threshold.

All wastes that classified as hazardous will be kept separately and stored in sealed containers designated for the storage of such waste. These containers will be stored in a bunded and roofed facility that is designated for the temporary storage of such waste. All hazardous waste that can be recycled or reused will be regularly collected by certified waste processors for reuse. In the case of disposal, a licensed hazardous waste handling company will be

contracted for transport and disposal to a licensed hazardous waste disposal facility.

The hazardous waste storage area has been strategically located near the workshops and the vehicle wash bay (*Figure 3.5*). This area will be bunded and fitted with a sump containing an oil and water separator. Stormwater will be referred to the stormwater management pond, while spills will be captured for appropriate disposal. The three skips located to the north of the general waste storage area will be used for the temporary storage of contaminated Personal Protection Equipment (PPE), rags, used desiccants, etc. These three skips will be separated from the others by a solid wall.

It is anticipated that the allowable storage volume for the temporary storage of hazardous waste on-site will not exceed 30m^3. Hazardous wastes types that may be generated at the site are listed in *Table 3.5*.

Table 3.5 Hazardous Waste Types

Waste Type	End Use	Approximate Quantity / month
Other hazardous waste: • Contaminated PPE • Used filters • Used rags • Used spill kits • Hydraulic hoses • Seals • Waste solvents • Aerosol cans • Hydrocarbon contaminated soils	Disposal to hazardous waste facility	2 tons
Waste oil (hydraulic and lubricating) and grease	Refine / reuse	2 tons
Batteries	Recycle	0.3 tons (12 vehicle and 14 lamp batteries)
Medical (first aid) wastes	Disposal to licensed disposal facility	15 kg

Sewage

Sewage generated within the surface infrastructure such as offices, change houses and ablution blocks will be collected and routed to a package sewage treatment plant. The expected volume to be treated at the package sewage treatment plant is approximately 41 m^3 / day.

The sewage treatment plant will be a packaged plant based on extended aeration or sequencing batch reactor processes, designed to treat a daily flow rate of 41m^3 (or 14,965m^3 per annum). The sewage treatment plant will include an inlet bar screen, equalisation tank, pumps and blowers for the primary and secondary treatment of raw sewage to reduce total suspended solids (TSS) and the biochemical oxygen demand (BOD). The equalisation tank will provide

normalisation of the influent sewage flow rate, and homogenisation of the sewage characteristics. Secondary treatment will provide aeration for the biological treatment of organic matter and the reduction of BOD. Tertiary treatment will provide disinfection of the treated effluent prior to reuse. Treated water will be pumped into the storm-water dam, and the sludge will be pumped into drying beds. The drying beds will be constructed as close to the sewage plant as possible.

Toilet facility requirements for the underground workings will be met with water-less toilets that will be brought to the surface when full for pumping to the sewage treatment plant.

The sewage treatment plant will also include aerobic sludge stabilisation. Three drying pads, each with a surface area of 70m^2, are proposed; the first drying pad is used to accept wet sludge, the second drying pad is used in the drying process, and the third drying pad will be cleaned, in preparation for the next volume of wet sludge. There is no effluent from drying beds; the final dried sludge can be sterilised and used as compost.

Security and Fencing

This is a brick structure with a sheeted roof. The building is equipped with offices, radio room, ablutions and tea kitchen facilities. The building is located at the entrance of the site, and is equipped with turnstiles to manage the pedestrian entry into the site.

The entire site will be fenced with at least a 2.1m high mesh fence. Vehicle and pedestrian gates and security access points will be provided. Each facility will have its own fencing and security where necessary.

Access Road

The access road connects the District road (D2548) to the main mine adit. The road will have a premix surface and be designed for heavy traffic. The intersection with the District road will be widened to allow vehicles to pass vehicles turning into the mine, and will be designed to ensure adequate sight distances. Concrete edge beams will be placed on either side of the road to protect the road edge and allow storm water to flow freely off the road surface. A light duty concrete lay-bye will be provided as a waiting area for trucks requiring security clearance into the mine.

A cast *in-situ* concrete bridge will be provided to allow the access road to enter the adit site.

Ventilation Adit (i.e. Adit B)

The location of the porposed Adit B is provided in *Figure 3.7*.

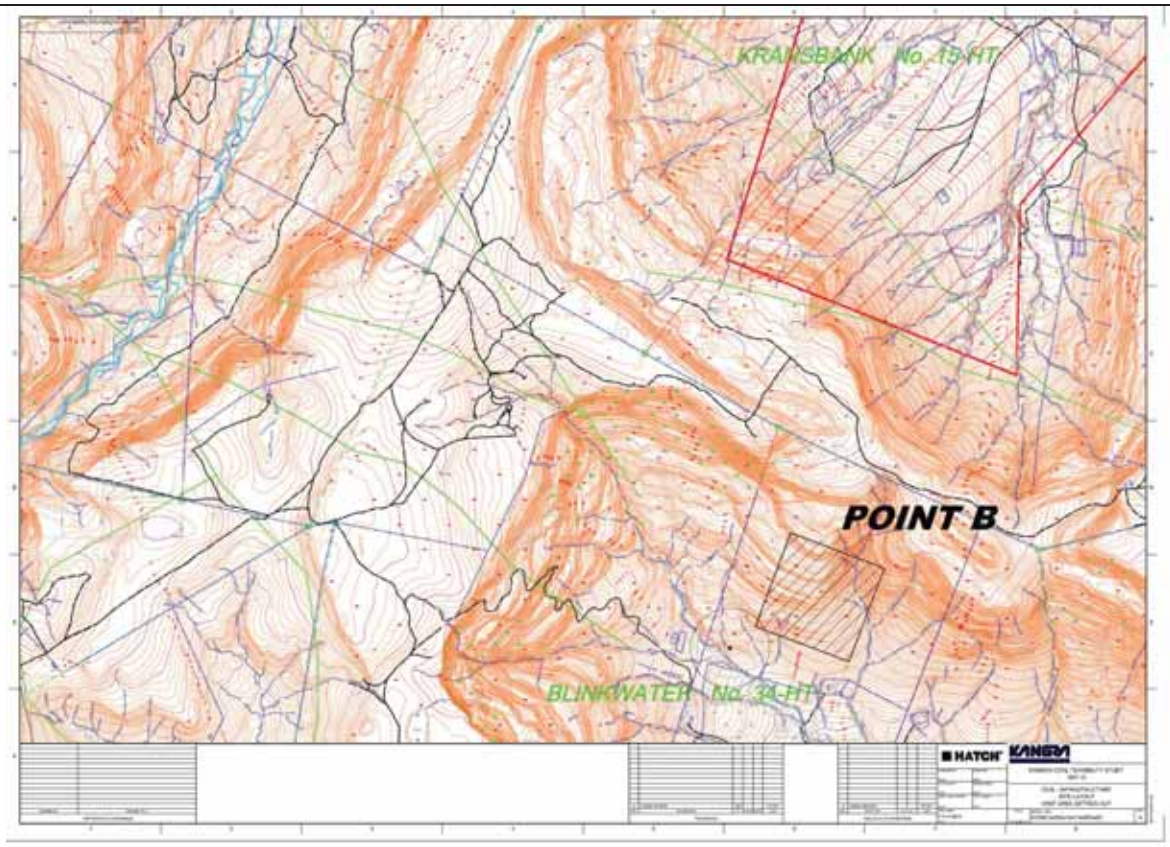
Ventilation at Adit A will supply the main fresh air ventilation intake and exhaust; however, ventilation Adit B will be used solely for ventilation intake.

Adit B will include only a ventilation opening. Access to the underground working via this ventilation opening will be restricted by the installation of a metal grid that will prevent access by humans and animals. Although an area of 28 600m^2 has been set-aside for Adit B, the adit will require approximately 500m^2 in surface area. Fresh air drawn in through this adit will be returned directly to the main exhaust fans at Adit A. Ventilation design has taken into account parameters such as known in-seam methane gas contents, which is evident in the neighbouring Maquasa West mine.

It is estimated that ventilation Adit B will only be constructed approximately five years after construction of the main mine adit (Adit A) is initiated.

A gravel service road through to ventilation Adit B is proposed to follow the alignment of existing farm tracks.

Figure 3.7 Site Location for Ventilation Adit B [1]



(1) ***Please Note*** - this drawing only indicates the locations of the vent – the layout will be much smaller and will be located within the box provided.

Conveyor Route

In order to transport mined coal from Adit A to the coal beneficiation plant on the existing Maquasa East site, it is proposed to construct an overland conveyor belt (*Figure 3.8*), which will tie into the existing conveyor system at the existing Maquasa West Adit. Included in this conveyor corridor will be overhead transmission lines (OHTL), a gravel service road (approximately 8m wide) and a security fence (fenced width of 32m). This proposed corridor will include vehicle, cattle and people crossings. Coal will then be transported along the existing conveyor system from the Maquasa West Adit through to the Maquasa East coal beneficiation plant.

The conveyor is split into two flights of approximately 3 km and 4km long. The conveyor will be similar in configuration to the existing overland conveyor. The conveyors will be ground run supported by light overland modules with angle roof sheeting (*Figure 3.8*).

Figure 3.8 Typical Conveyor Belt System in the Background Transporting Coal to a Wash Plant

Road over Conveyor Crossing

Roads over the overland conveyor will be constructed to allow the local farmers and communities safe access to either side of the conveyor. The crossings will be 3.6 m x 3.6 m box culverts. One culvert will accommodate the service road and the other the overland conveyor. Five positions have been identified. Guardrails will be placed on either side of the ramps over the conveyor route crossing.

Stream and Wetland Crossings

The proposed conveyor route will traverse streams and wetlands. The section of conveyor that traverses a stream, and that is situated within a distance of 12m from the edge of the 1:100 year flood level, will be fully enclosed and raised on a steel gantry. Furthermore, the entire raised section will have a bunded concrete floor to catch any potential coal spillage. Spilled coal will be hand swept into a concrete bunded area, which is positioned at ground level, outside the 1:100 year flood line. Any potentially spilled coal will then be removed from the bunded area and returned to the main mine adit (Adit A). The gravel service road running parallel to the conveyor will traverse the stream over concrete culverts. The gravel road and conveyor terrace will be reduced to one lane so as to minimise culvert lengths.

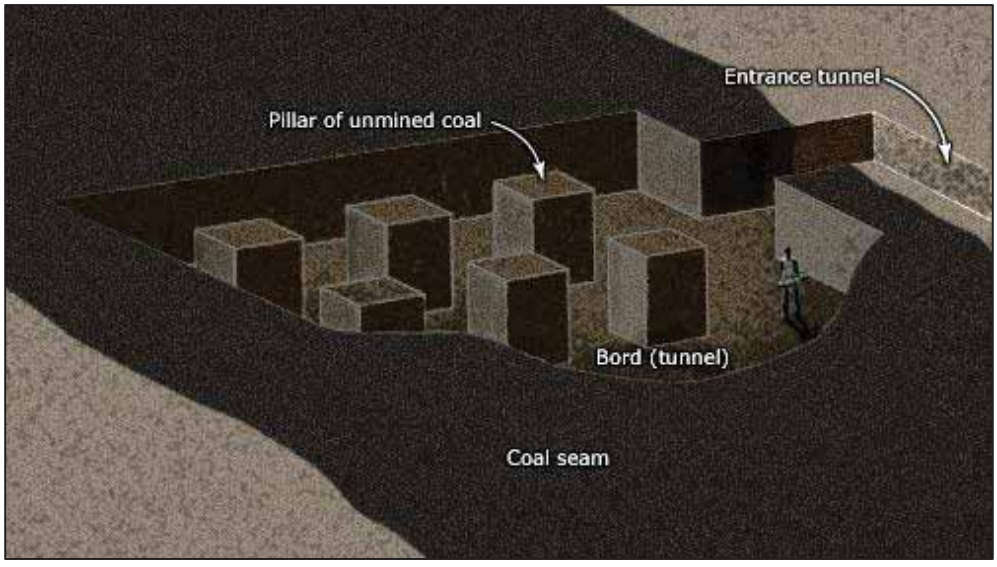
Fencing and Security

Fencing will be placed on both sides along the entire route of the conveyor with exception of the conveyor gantries where the fence will be constructed under the gantry and join up with the fence on the adjacent side. This fence denotes the conveyor servitude. The fence will enclose the service road along the conveyor route. Access to the District road will be via a vehicle gate at each of the service road entrances.

3.4.3 Underground Workings

The proposed Project will be restricted to underground mining and will employ bord and pillar methods, using continuous mining equipment (*Figure 3.9*). This mining method extracts mined material across a horizontal plane and subsequently results in a horizontal array of room and pillar of unmined coal. The unmined pillars are used to support the overburden roof. This mining method is applied in areas that are characterised as having relatively flat-lying deposits.

Figure 3.9 Schematic Example of Proposed Underground Bord and Pillar Mining Method



Source: (www.teara.gov.nz/en/coal-and-coal-mining/6/2)

Coal Seams

The main coal seams currently mined at Maquasa West and Maquasa West Extensions are the GUS and DUN (Dundas) coal seams. The GUS coal seam is located above the DUN coal seam. The proposed mining extent of the said coal seams for the Kusipongo Project is illustrated in *Figure 3.10* and *Figure 3.11*. The proposed mining schedule for each of these seams is also provided in these figures.

The GUS seam in the Kusipongo area can be divided into two, the lower GUS (mainly bright coal) and the upper GUS (mainly dull shale coal and carbonaceous shale). The contact between the upper and lower GUS is a very prominent thin sandstone band.

The GUS seam in the Kusipongo area is typically 3.5 to 4m thick and the DUN seam is typically 1.6 to 2m thick. The parting between the GUS and the DUN is on average 6.1m thick. The said coal reserves have been located at depths between less than 20m and more than 300m below surface.

Figure 3.10 ***Proposed Extent of the GUS Coal Seam, also Showing Proposed Mining Schedule***

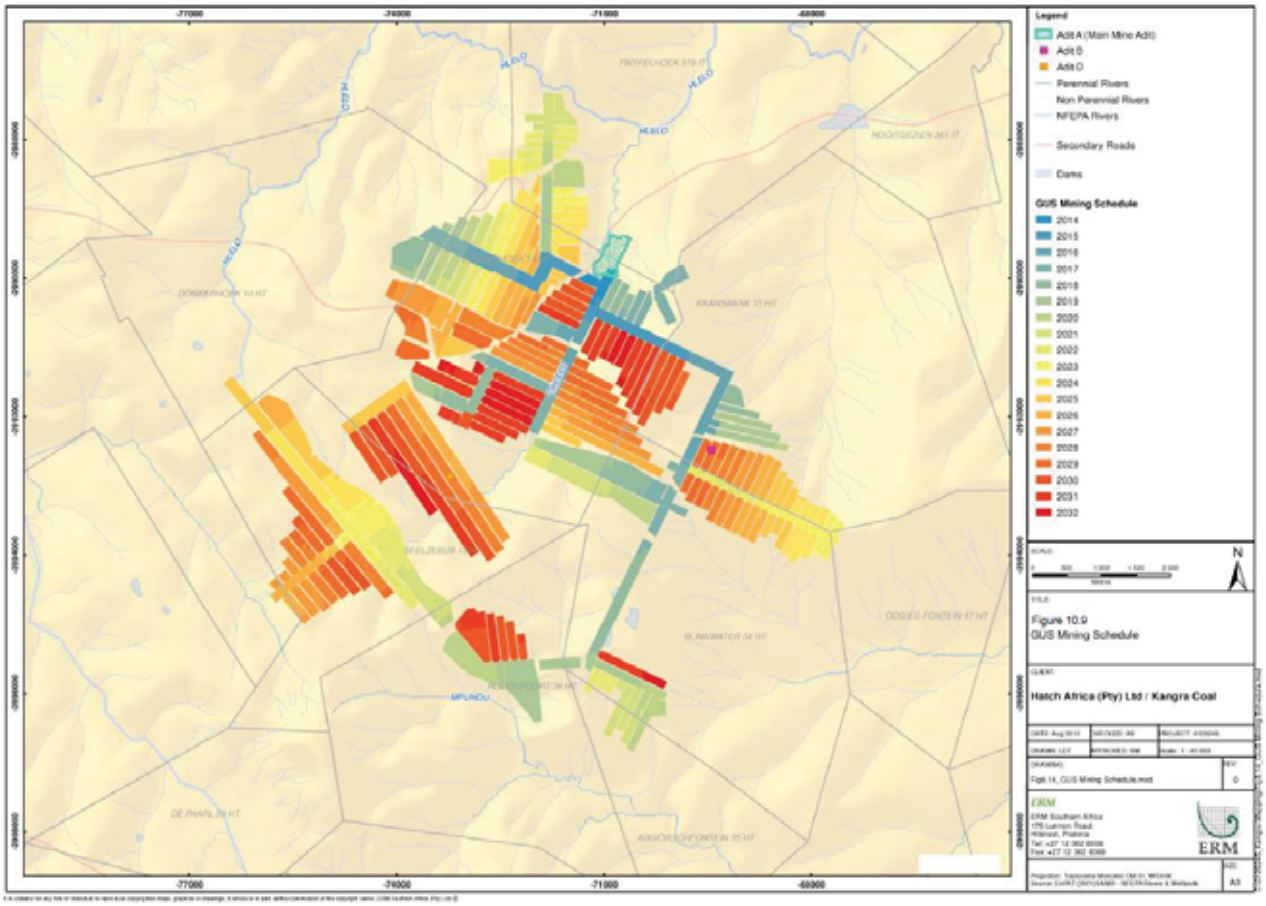
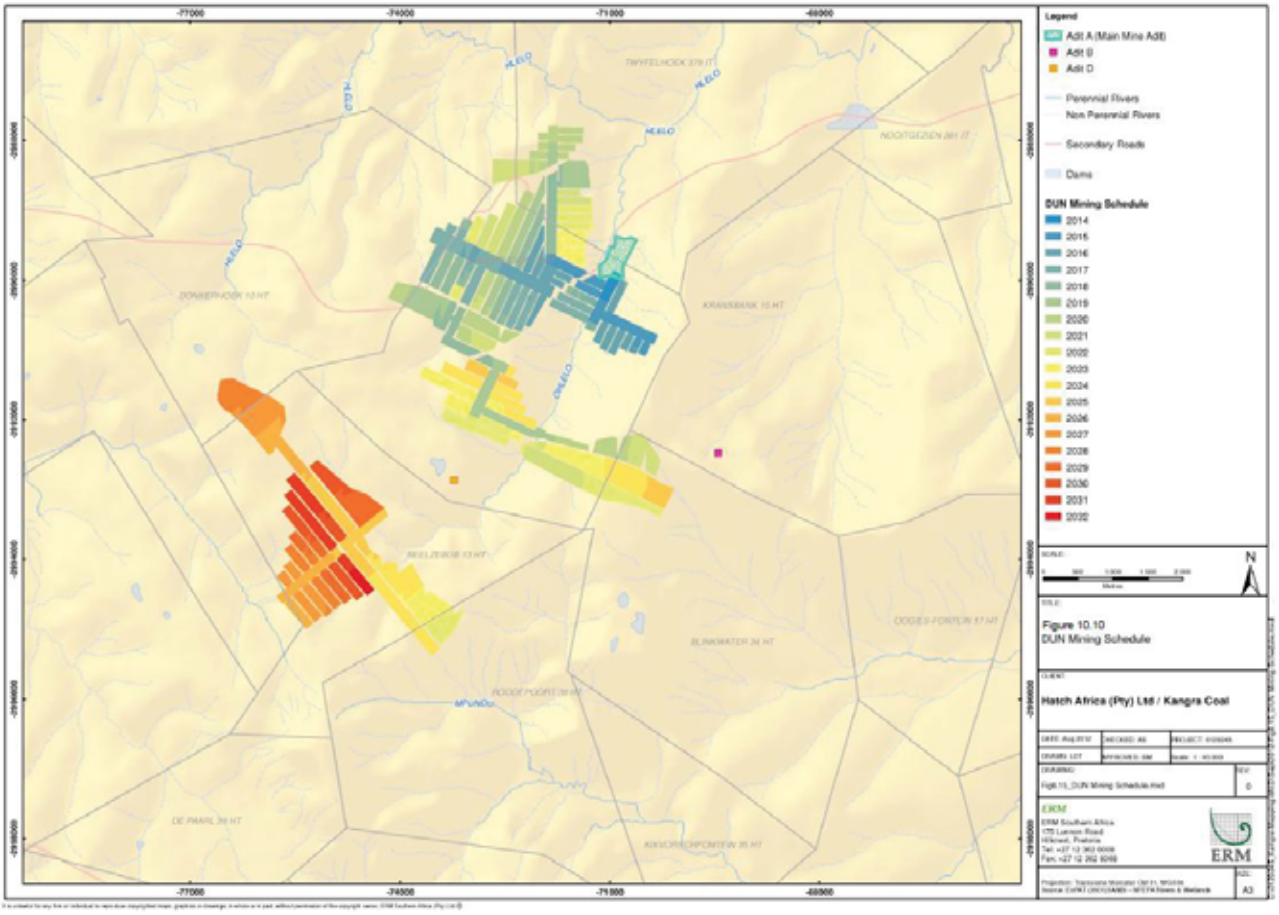


Figure 3.11 ***Proposed Extent of the DUN Coal Seam, also Showing Proposed Mining Schedule***



3.4.4 Contractors Camp (Temporary)

In order for the aforementioned infrastructure to be developed, a temporary contractor's camp will need to be established during the construction phase of the proposed Project. The camp will be used to accommodate semi-skilled, skilled / artisanal and supervisory workers for the duration of construction. The motivation for having a contractor's camp onsite is as follows:

- There is insufficient existing accommodation that is appropriate for the construction labour force in nearby communities (like Driefontein).
- It is preferable to accommodate the construction labour force on-site, so as to reduce the potential negative impacts associated with worker-community interaction.
- On-site accommodation will reduce the amount of travel required by workers to get to the construction sites which greatly improves the efficiency of the construction programme.

Design Assumptions

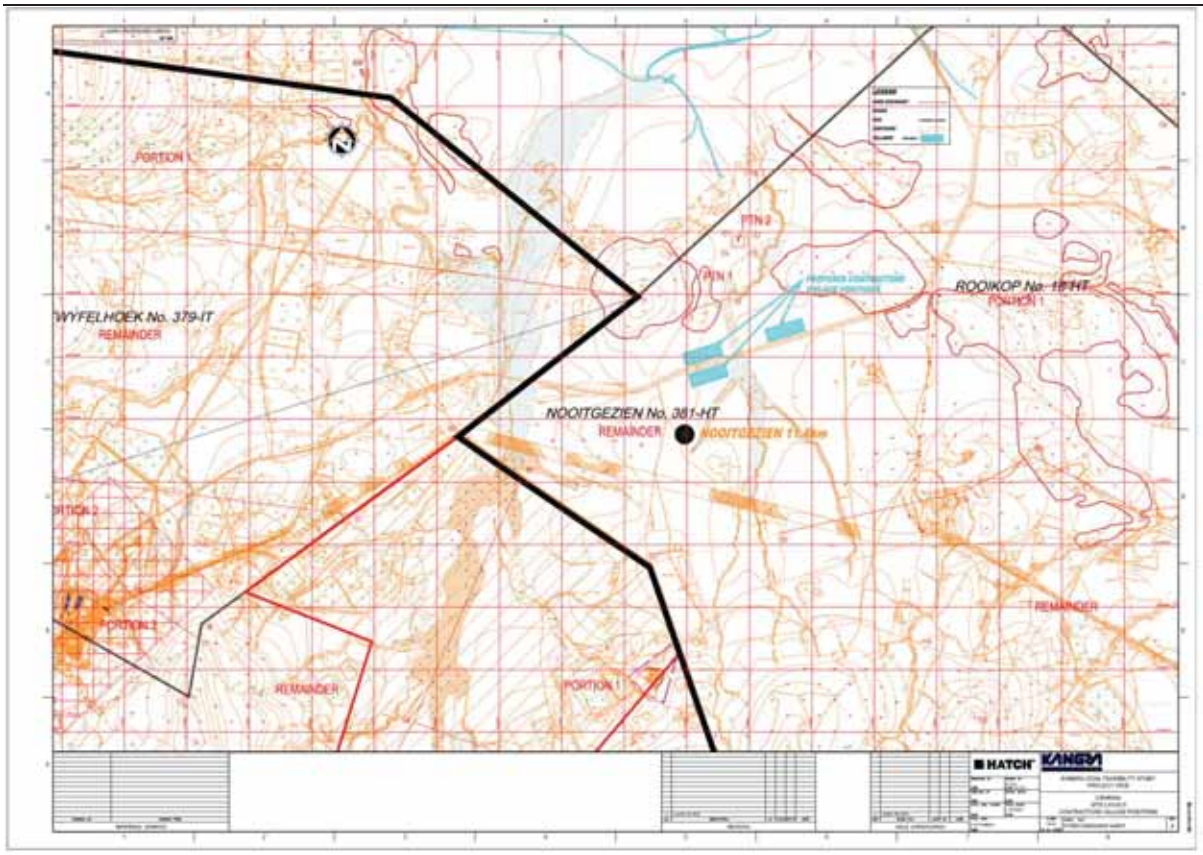
The design of the contractor's camp has taken into account the following assumptions:

- The camp will not accommodate workers from the local community. These workers will reside in their communities and travel to site on a daily basis. This will ensure that local family units are maintained during the construction phase.
- The construction phase is approximately 2 years.
- The construction workforce will comprise of a maximum number of approximately 450 people. Of this, it is estimated that approximately 250 skilled people will come from outside the local area or region and will require accommodation on-site with the remainder of the workforce being accommodated in their local community or in the case of engineers and related professions, in guesthouses in Piet Retief.
- Of the 250 people on site, 50 are expected to be supervision staff, 100 skilled staff and 100 semi-skilled staff.
- All accommodation structures installed as part of the construction village are likely to be of a temporary nature and will be removed by the relevant service providers.

Proposed Location

Three locations for the contractor's camp are proposed (*Figure 3.12*). All of these three options are located on Kangra Coal property. These options are more than 1km away from the Kransbank Private Reserve.

Figure 3.12 ***Proposed Locations for the Contractor's Camp***



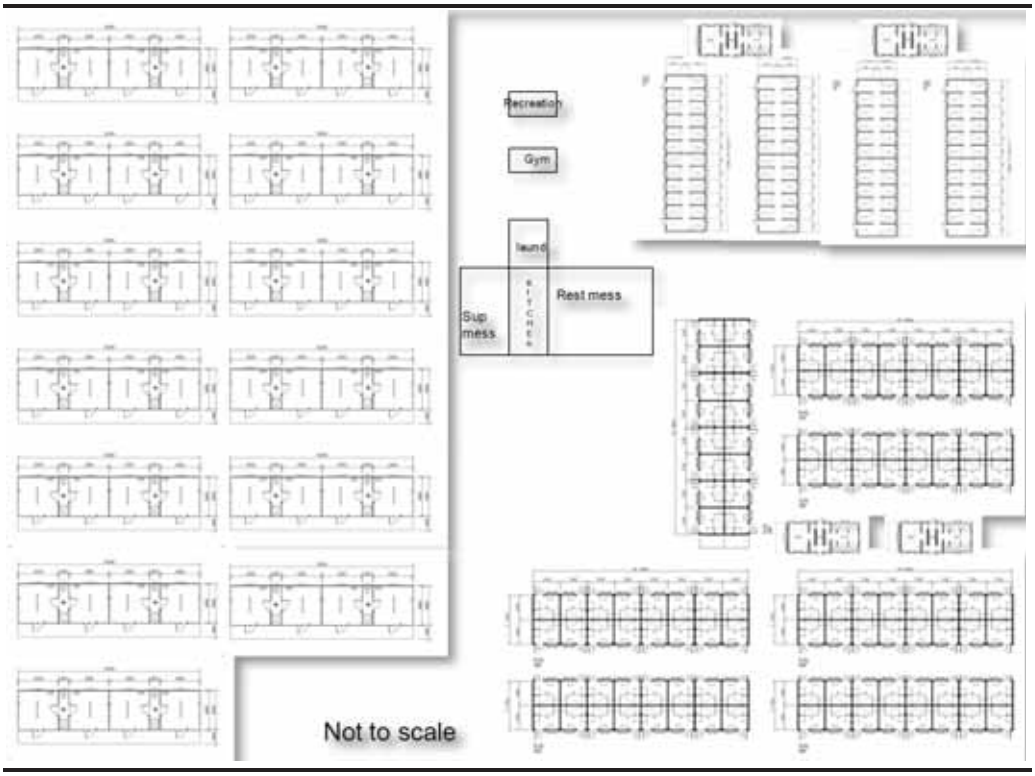
Surface Area Requirements

The total surface area requirement for the contractor's camp is approximately 2.5ha. Estimated surface area requirements for infrastructure associated with the camp and an indicative layout schematic are provided in *Table 3.6* and *Figure 3.13* respectively.

Table 3.6 Surface Area Requirements for Infrastructure associated with the Contractor's Camp

Infrastructure	Size (m^2)
Accommodation structures	2 000
Kitchen, laundry and eating areas	700
Recreational areas	5 000
Laydown area	100
Parking areas	1 500
Bus laydown and turning area	3 200
Ablutions	270
Other, including spacing between facilities	12 000
Total	**24 770**

Figure 3.13 Indicative Schematic Illustrating the Layout of the Contractors Camp



Potable Water

The construction village will require approximately $35m^3$ of potable water per day to be obtained from the same borehole that is to be used for Adit A. A storage volume of $66m^3$ will be provided in storage tanks.

Solid Waste

Solid waste will comprise of typical domestic waste including glass and plastic bottles, food waste, packaging, waste timber and waste cabling. Hazardous wastes produced within the construction village which will require disposal are expected to be limited to aerosol containers, batteries, and empty hazardous chemical (paint, cleaning products etc.) containers.

The estimated quantity of general solid waste (1) expected to be produced on site on a monthly basis is 23m^3. The estimated quantity of hazardous waste to be produced on a monthly basis is 3m^3.

General and hazardous waste will be segregated and suitably stored in a temporary waste handling facility on-site and collected by a reputable waste contractor for suitable disposal to an appropriately licensed waste disposal site.

Waste Water

The contractor's camp will produce sewage effluent (black water) and effluent from the kitchen, laundry, showers and basins (grey water). Approximate quantities of the effluent types are as follows:

- Sewage (black water) – 180m^3 / month
- Kitchen, laundry, showers (grey water) – 690m^3 / month

A portable sewage treatment package plant comprising of tanks fitted in series will be utilised for treatment of the sewage. Treatment will consist of 4 phases, namely – a septic tank, a bioreactor, a clarifier and sterilisation. Treated effluent from this process is anticipated to have the following characteristics:

- COD: <75
- Total Suspended Solids: <25
- NH_3: 6
- *E Coli*: <1,000

Treated effluent will be used for irrigation within the contractor's camp (gardens, recreational sports field etc.), and for dust suppression.

Electricity

Power on-site may be provided *via* a diesel generator capable of producing 164 kW of continuous power. Alternatively, the contractors camp will be linked to the overhead power line to be installed within the proposed overland conveyor servitude.

(1) Based on an estimated waste generation figure of 30 kg per day for a 30 day month and a waste density of 40 kg / m^3

4 REGULATORY GOVERNANCE FRAMEWORK

The environmental authorisation process associated with the proposed Kusipongo Expansion Project is being carried out in line with South Africa's environmental legislation so as to ensure that reasonable measures are taken to warrant environmental protection and to promote sustainable development.

Furthermore, ERM has taken into account the guidelines and standards from the International Finance Corporation (IFC) into consideration, thus aligning the Project with international good practice, albeit that this Project is not seeking funding from any International Finance Institution.

This Chapter constitutes a regulatory governance framework for the proposed Project and has been structured as follows:

- National:
    - National Legislation and Regulations.
    - National Standards.
    - National Guidelines.
    - National Plans and Policies.
- Regional:
    - Regional Legislation.
    - Regional Plans and Policies.
- Municipal Development Plans and Frameworks.
- The Institutional and Administrative Framework from National through to Local Authorities.
- International Guidelines, Standards and Accords.
- International Finance Corporation Standards and Guidelines, and
- Kangra Coal's Corporate Policies and Procedures.

4.1 NATIONAL LEGISLATION

4.1.1 Constitution of the Republic of South Africa (No. 108 of 1996)

Summary of Constitution

The Constitution of the Republic of South Africa is the legal source for all law, including environmental law, in South Africa. The Constitution enshrines the basic, fundamental and inalienable rights of the citizens of the Republic.

Applicability to Project

The Constitution stipulates under Section 22 that every citizen of the republic of South Africa has the right to choose their trade, occupation or profession freely. The practice of trade, occupation or profession may be regulated by law.

The Constitution stipulates under Section 24 that everyone has a right to an environment that is not harmful to their health or well-being. This right and use of natural resources must promote justifiable economic and social development.

The Constitution stipulates under Section 27 that everyone has the right to have access to –

- Health care services, including reproductive health care;
- Sufficient food and water; and
- Social security, including if they are unable to support themselves and dependants, appropriate social assistance.

Furthermore, Section 27 states that the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of each of these rights. Also, no one may be refused emergency medical treatment.

4.1.2 National Environmental Management Act (Act No. 107 of 1998), as amended by Act 62 of 2008

The National Environmental Management Act (NEMA) creates the legal framework that ensures the environmental rights guaranteed in Section 24 of the Constitution are abided by.

As such the fundamental principles that apply to environmental decision making are laid out, the core environmental principle being the promotion of ecological sustainable development. These principles serve as a guideline for any organ of state when exercising any function in the process of decision making under NEMA.

NEMA introduces the duty of care concept which is based on the rule of strict liability. This duty of care extends to the prevention, control and rehabilitation

of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the incarceration of managers or directors of companies for the conduct of the legal persons.

Table 4.1 below includes the sections of the NEMA that are applicable to the Project.

Table 4.1 Relevant Sections Applicable to the Proposed Kusipongo Expansion Project

Section No (s) (in terms of the NEMA) :	Section Detail	Relevance to the Project
Section 2 (2)	*Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*	As these principles are utilised as a guideline by the relevant decision makers in ensuring the protection of the environment, the proposed Project should reflect these principles. Where this is not possible, deviation from these principles will be strongly argued.
Section 2 (3)	*Development must be socially, environmentally and economically sustainable.*	
Section 2 (4) a	*Sustainable development requires the consideration of all relevant factors including the following:* *(i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;* *(ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;* *(iv) that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;* *(vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions;* *(viii) that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*	
Section 2 (4) b	*Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.*	

Section No (s) (in terms of the NEMA) :	Section Detail	Relevance to the Project
Section 2 (4) c	*Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*	
Section 2 (4) e	*Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*	
Section 2 (4) f	*The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.*	
Section 2 (4) g	*Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.*	
Section 2 (4) i	*The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.*	
Section 2 (4) p	*The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*	

4.1.3 National Environmental Management Amendment Act (Act No. 62 of 2008) EIA Regulations

The NEMA provides the environmental legislative framework for South Africa (as is described in *Section 4.1.2* above). Under NEMA a number of regulations have been promulgated. GN.R543 (2010) regulate the procedure and criteria as contemplated in Chapter 5 of the NEMA relating to the submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities in order to avoid detrimental impacts on the environment, or where it cannot be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto.

Furthermore, the NEMA Environmental Impact Assessment (EIA) Regulations provide two categories of activities, namely GN.R544 activities, which potentially only require a Basic Assessment before authorisation, and GN.R545 activities, which potentially require a comprehensive assessment (Scoping and an EIA). In other words, GN.R544 activities are perceived to have a lower impact than GN.R545 activities.

Table 3.1 includes listed activities that are deemed to be applicable to the proposed Project.

Table 4.2 Relevant Regulations Applicable to the Proposed Kusipongo Expansion Project

Relevant Notice:	Activity No (s) (in terms of the relevance or notice):	Description of Listed Activity:	Relevance to the Project	Applicable (Y/N)
GN.R544	2	*The construction of facilities or infrastructure for the storage of ore or coal that requires an atmospheric emissions license in terms of the National Environmental Management: Air Quality Act (Act No. 39 of 2004).*	**This activity will not be triggered**, as the proposed product silo will not be classified as a listed activity in terms of Section 21 of the National Environmental Management: Air Quality Act, as facilities will not have a cumulative carrying capacity exceeding the threshold detailed in Subcategory 5.1 (Storage and handling of ore and coal) of more than 100,000tons.	N
GN.R544	10	*The construction of facilities or infrastructure for the transmission and distribution of electricity –* *(ii) Inside urban areas or industrial complexes with a capacity of 275kV or more*	**This activity will not be triggered**, as the capacity of electricity transmitted will not exceed 22kV.	**N**
GN.R544	11	*The construction of –* *(iii) bridges;* *(v) weirs;* *(x) buildings exceeding 50 square meters in size;*	**This activity will be triggered**, as the infrastructure proposed is in excess of 50m^2. Furthermore, culverts will be	**Y**

Relevant Notice:	Activity No (s) (in terms of the relevance or notice):	Description of Listed Activity:	Relevance to the Project	Applicable (Y/N)
		or *(xi) infrastructure or structures covering 50 square meters or more.* *Where such construction occurs within a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.*	constructed across streams to allow access over the conveyor system (including the service gravel road, which will run parallel with the conveyor route).	
GN.R544	13	*The construction of Facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic meters.*	**This activity will be triggered**, as the proposed project includes the construction of a fuel depot, oil store, chemical store and a paint store. At this stage, the quantity of dangerous goods that are to be stored onsite is uncertain. For this reason, the assumption will be made that capacity will be between 80 and 500m^3.	**Y**
GN.R544	20	*Any activity requiring a mining permit in terms of Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) or renewal thereof.*	**This activity will not be triggered,** as the applicant will be submitting an application for mining rights in terms of Sections 22 and 24 of the Mineral and Petroleum Resources Development Act.	**N**
GN.R544	22	*The construction of a road, outside urban areas,* *(i) with a reserve wider than 13.5 meters; or* *(ii) where no reserve exists where the road is wider than 8 meters; or* (iii) *for which an environmental authorisation was*	**This activity will be triggered**, as roads which are 8m wide will be constructed.	Y

Relevant Notice:	Activity No (s) (in terms of the relevance or notice):	Description of Listed Activity:	Relevance to the Project	Applicable (Y/N)
		obtained for the determination in terms of Activity 5 in Government Notice 387 of 2006 or Activity 18 in Notice 545 of 2010.		
GN.R544	23	*The transformation of undeveloped, vacant or derelict land to –* *(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area, and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares or,*	**This activity will not be triggered**, as the area to be transformed is greater than 20 hectares.	**N**
GN.R544	24	*The transformation of land bigger than 1000 square meters in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule such land was zoned open space, conservation or had an equivalent zoning.*	**This activity will be triggered**, as the proposed Project will be transforming land (in excess of 1,000m^2) which is currently undeveloped to industrial (mining).	**Y**
GN.R544	47	*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre –* *(i) Where the existing reserve is wider than 13.5 metres; or* *(ii) Where no reserve exists, where the existing road is wider than 8 metres –* *Excluding widening or lengthening occurring inside urban areas.*	**This activity will be triggered**, as existing farm roads will have to be extended for a length of more than 1 kilometre.	**Y**
GN.R545	3	*The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in*	**This activity will not be triggered**, as the proposed Project includes the construction of a fuel	**N**

Relevant Notice:	Activity No (s) (in terms of the relevance or notice):	Description of Listed Activity:	Relevance to the Project	Applicable (Y/N)
		containers with a combined capacity of more than 500 cubic meters.	depot, oil store, chemical store and a paint store. At this stage, the quantity of dangerous goods that are to be stored onsite is uncertain. For this reason, the assumption will be made that capacity will be between 80 and 500m^3.	
GN.R545	6	*The construction of facilities or infrastructure for the bulk transportation of dangerous goods –* *(iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50tons a day.*	**This activity will not be triggered**, as coal is not considered a dangerous good.	**N**
GN.R545	*15*	*Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;* *Except where such physical alteration takes place for:* *(i) linear development activities; or* *(ii) Agriculture or afforestation where activity 16 in this schedule will apply.*	**This activity will be triggered**, as an area in excess of 20 hectares, which is currently green fields, is proposed to be developed for mining purposes. NEMA does not provide a definition for industrial land use; as a result, for the purpose of this application mining is classified as a variant of industrial use.	**Y**
GN.R545	20	*Any activity which requires a mining right or renewal thereof as contemplated in Sections 22 and 24 respectively of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).*	**This activity will be triggered**, as the applicant will be submitting an application for mining rights in terms of Sections 22 and 24 of the Mineral and Petroleum Resources Development Act.	**Y**
GN.R546	4	*The construction of a road*	**This activity will be**	**Y**

Relevant Notice:	Activity No (s) (in terms of the relevance or notice):	Description of Listed Activity:	Relevance to the Project	Applicable (Y/N)
		wider than 4 metres with a reserve less than 13.5 metres *ii. Outside and urban area, in critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	**triggered**, as the Mpumalanga C-Plan Terrestrial Biodiversity Assessment identifies part of the project area as *irreplaceable*, whilst other areas are classified as *important and necessary*. As part of the proposed project roads, which are wider than 4m, will be constructed.	
GN.R546	12	*The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, within critical biodiversity areas identified in bioregional plans.*	**This activity will be triggered**, as the Mpumalanga C-Plan Terrestrial Biodiversity Assessment identifies part of the project area as irreplaceable, whilst other areas are classified as important and necessary. As part of the project an area exceeding 300m² will be cleared of indigenous vegetation.	**Y**
GN.R546	13	*The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for…….in any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within a area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; and critical*	**This activity will be triggered**, as the Mpumalanga C-Plan Terrestrial Biodiversity Assessment identifies part of the project area as *irreplaceable*, whilst other areas are classified as *important and necessary*. Furthermore, the National Spatial Biodiversity Assessment identifies part of the project area as been located on the border	**Y**

Relevant Notice:	Activity No (s) (in terms of the relevance or notice):	Description of Listed Activity:	Relevance to the Project	Applicable (Y/N)
		biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.	of the South African Eastern Escarpment and Moist Grasslands. As part of the project an area exceeding 1 hectare in size will be cleared of vegetation. Over 75% of the vegetation which is proposed to be cleared is deemed to be indigenous. The removal of vegetation is required for the purposes of expanding existing mining operations.	
GN.R546	14	*The clearance of an area of 5 hectares or more of vegetation where such removal of vegetation is required for…. in critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority*	**This activity will be triggered**, as the Mpumalanga C-Plan Terrestrial Biodiversity Assessment identifies part of the project area as irreplaceable, whilst other areas are classified as important and necessary. As part of the project an area exceeding 5 hectare in size will be cleared of vegetation. Over 75% of the vegetation which is proposed to be cleared is deemed to be indigenous. The removal of vegetation is required for the purposes of expanding existing mining operations.	**Y**

The applicability of certain activities in the above mentioned table requires that both Basic Assessment and a detailed Scoping and EIA be undertaken. As such **a detailed Scoping and EIA was carried out**, as this will fulfil the legal requirements necessary for all triggered activities.

Proposed Amendments

In 2012, the Minister of the Department of Water and Environmental Affairs gave notice (GN.R778 of 2012) of proposed additions to Listing Notice 1 of 2010, GN R544 of 2010 which requires a basic assessment. These include the insertion of items 55A and 55B:

- "**55A**—*The construction of facilities for the treatment of effluent, wastewater or sewage with an annual throughput capacity of more than 2000 cubic meters but less than 15 000 cubic meters*"; .and

- "**55B**—*The expansion of facilities for the treatment of effluent, wastewater or sewage where the expanded capacity will be increased by 15 000 cubic meters or more.*"

Once enacted, engaging in these activities will require an environmental authorisation in terms of NEMA.

As is indicated in *Section 4.1.8* of this Chapter, the proposed mine will treat approximately 41m^3 of sewage per day (14 965m^3/annum). As this annual amount is essentially equal to the applicable threshold, a conservative approach will be adopted and it will be assumed that the annual volume of sewage treatment will be in excess of 15 000m^3. Furthermore (and as is also indicated in *Section 4.1.8*), the proposed mine will have settling ponds to allow for the containment and possible treatment of stormwater emanating from the site.

As such, although not yet enacted, both of the above mentioned proposed activities will be triggered by the proposed Project and should be taken into account by the respective competent authorities.

4.1.4 *The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)*

Summary of Act

The Mineral and Petroleum Resources Development Act (MPRDA) makes provision for equitable access to, and sustainable development of, the nation's mineral and petroleum resources. The fundamental principles of the Act are:

- Recognising that mineral resources are not renewable.

- Acknowledging that mineral resources belong to the nation and that the State is the custodian.

- That the custodian of these mineral resources is obliged to protect the environment for present and future generations, to ensure ecologically sustainable development of mineral resources by promoting economic and social development.

- Promote local and rural development of communities affected by mining activities.

- Reformation of the industry to bring about equitable access to the resources and eradicating any discriminatory practices.

- To guarantee tenure security.

Applicability to Project

Mining rights, granted by the Minister of Minerals and Resources, is a prerequisite for the proposed Kusipongo Resource Mining Project. In order to apply for a mining right in terms of Section 22 of the Act, an EIA must be conducted and an Environmental Management Programme must be submitted to the Department of Minerals and Resources (DMR) for approval.

Section 39 of the Act details that the Environmental Management Programme must –

- Establish baseline information concerning the affected environment to determine protection, remedial measures and environmental management objectives;

- Investigate, assess and evaluate the impact of his or her proposed prospecting or mining operations on -

    - The environment;
    - The socio-economic conditions of any person who might be directly affected by the prospecting or mining operation; and
    - Any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;

- Develop an environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment; and

- Describe the manner in which he or she intends to-

    - Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
    - Contain or remedy the cause of pollution or degradation and migration of pollutants; and
    - Comply with any prescribed waste standard or management standards or practices.

Furthermore, Section 41 of the Act mentions that an applicant of a mining right must before the Minister approves the Environmental Management Programme make the prescribed financial provision for the rehabilitation or management of negative environmental impacts.

The MPRDA Regulations GN.R26275 of 2004 (namely Sections 50 and 51) provide the content requirements of an Environmental Impact Assessment Report and Environmental Management Programme respectively. According to Section 50, the contents of an Environmental Impact Assessment report must include the following:

- An assessment of the environment likely to be affected by the proposed mining operation, including cumulative environmental impacts;

- An assessment of the environment likely to be affected by the identified alternative land use or developments, including cumulative environmental impacts;

- An assessment of the nature, extent, duration, probability and significance of the identified potential environmental, social and cultural impacts of the proposed mining operation, including the cumulative environmental impacts;

- A comparative assessment of the identified land use and development alternatives and their potential environmental, social and cultural impacts;

- Determine the appropriate mitigatory measures for each significant impact of the proposed mining operation;

- Details of the engagement process of interested and affected persons followed during the course of the assessment and an indication of how the issues raised by interested and affected persons have been addressed;

- Identify knowledge gaps and report on the adequacy of predictive methods, underlying assumptions and uncertainties encountered in compiling the required information;

- Description of the arrangements for monitoring and management of environmental impacts; and

- Inclusion of technical and supporting information as appendices, if any.

According to Section 51, the contents of an Environmental Management Programme must include the following:

- A description of the environmental objectives and specific goals for –

    - Mine closure;
    - The management of identified environmental impacts emanating from the proposed mining operation;
    - The socio-economic conditions as identified in the social and labour plan; and
    - Historical and cultural aspects, if applicable.

- An outline of the implementation programme which must include –

    - A description of the appropriate technical and management options chosen for each environmental impact, socio-economic condition and historical and cultural aspects for each phase of the mining operation;
    - Action plans to achieve the objectives and specific goals contemplated in paragraph (a) which must include a time schedule of actions to be undertaken to implement mitigatory measures for the prevention, management and remediation of each environmental impact, socio-economic condition and historical and cultural aspects for each phase of the mining operation;
    - Procedures for environmental related emergencies and remediation;
    - Planned monitoring and environmental management programme performance assessment;
    - Financial provision in relation to the execution of the environmental management programme which must include –
        - The determination of the quantum of the financial provision contemplated in regulation 54; and
        - Details of the method providing for financial provision contemplated in regulation 53;
    - An environmental awareness plan contemplated in section 39(3)(c) of the Act;
    - All supporting information and specialist reports that must be attached as appendices to the environmental management programme; and
    - And undertaking by the applicant to comply with the provisions of the Act and regulations thereto.

This report fulfils the requirements of Section 39 and 41 of the MPRDA and Sections 50 and 51 of the MPRDA Regulations. However, it must be noted that this report has been titled "Social and Environmental Management Programme" (SEMP) as opposed to "Environmental Management Programme" (as defined in Section 39 of the MPRDA). The purpose of this is to emphasise that the process will not only assess environmental impacts but will also assess potential socio-economic impacts of the proposed Project.

4.1.5 *National Water Act (Act No. 36 of 1998)*

Summary of Act

The purpose of the National Water Act (NWA) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in an environmentally sustainable way.

Applicability to Project

The following Sections of the NWA are deemed applicable to the proposed Kangra Coal Kusipongo Resource Project, given the presence of water courses, streams and wetlands at Adit A and along the route of the conveyor, as well as to the identified users of water in the Project area.

Definition of Watercourse

In terms of the NWA, a *watercourse* is defined as follows (Section 1.1 (xxiv)):

- *A river or spring;*
- *A natural channel in which water flows regularly or intermittently;*
- *A wetland, lake or dam into which the Minister may, by notice in the Gazette, declare to be a watercourse, and reference to a watercourse includes, where relevant, its beds and banks.*

Based on the above definition, even small drainage lines are defined as *watercourses*.

Section 1.1 (xxix) defines a *wetland* as –

… land that us transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Water Use

Section 21 of the NWA defines Water Use as including:

- Taking water from a water resource;
- Storing water;
- Impeding or diverting the flow of a water course;
- Engaging in a stream-flow reduction activity;
- Engaging in a controlled activity identified in s31(1) or declared under s38(1);
- Discharging waste or water containing waste into a water resources through a pipe, canal, sewer, sea outfall or other conduit;
- Disposing of waste in a manner that may detrimentally impact on a water resource;
- Disposing in any manner of water containing waste from or which has been heated in any industrial or power generation process;
- Altering the bed, banks, course or characteristics of a water course;
- Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for human safety; and
- Using water for recreational purposes.

Water Use Licenses

In terms of Section 39 of the NWA, there are a number of activities, which are stipulated in GN.R1191, that require varying authorisations. Water uses that need to be licensed under Section 21 of the Act include:

- Taking water from a water resource;
- Storing water;
- Impeding or diverting the flow of water in a watercourse;
- Engaging in a stream flow reduction activity contemplated in section 36;
- Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- Disposing of waste in a manner which may detrimentally impact on a water resource;
- Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- Altering the bed, banks, course or characteristics of a watercourse;
- Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- Using water for recreational purposes.

A number of water use licenses (number still to be confirmed) will be required for the proposed Project. These license requirements will be coupled with a variety of activities associated with the proposed Project. A specialist has been appointed to identify Project related activities that will require the need for applications for Water Use Licenses. The identification and application of these licenses will take place post ESIA.

Pollution Prevention

Also of relevance to the proposed Project is Section 19 of this Act, which deals with pollution prevention (Part 4).

Part 4 deals with pollution prevention and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question, is responsible for taking reasonable measures to prevent pollution of water resources. If the measures are not taken, the catchment management agency concerned, may itself do whatever is necessary to prevent the pollution or remedy its effects and recover all reasonable costs from the persons responsible for the pollution.

The 'reasonable measures' which have to be taken may include measures to:

- Cease, modify or control any act or process causing the pollution;
- Comply with any prescribed waste standard or management practice;
- Contain or prevent the movement of pollutants;
- Eliminate any source of pollution;
- Remedy the effects of pollution; and
- Remedy the effect of any disturbance to the bed and banks of a watercourse.

With respect to pollution and all alterations of rivers, water courses, water flow systems (above or below ground), the following definition is relevant when considering the potential impacts of development on water resources. Pollution may be deemed to occur when the following are affected:

- The quality, pattern, timing, water level and assurance of flow;
- The water quality, including the physical, chemical and biological characteristics of the water.

A further relevant definition is that of 'waste' which is defined as including:
"…..any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, a water resource to be polluted".

4.1.6 *National Water Act (Act No.36 of 1998) Government Notice No. 704. Government Gazette Vol. 408, No. 20119: Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources*

Summary of Government Notice

Mining and associated infrastructure development is guided by the provisos in the Government Notice number 704 (GN.R704), particularly Regulations 4, 6 and 7, which are described as follows:

- **Regulation 4** – this regulation addresses the locality of developments, where estimated flood zone widths are set as buffer zones for development, or zone widths are prescribed. These include the following:

    - No facility, including residue deposits, dam, reservoir to be located within the 1:100-year floodline or within 100m from any watercourse, borehole or well.
    - No underground or opencast mining or any other operation or activity under or within the 1:50-year floodline or within a horizontal distance of 100m, whichever is the greatest.
    - No disposal of any residue or substance likely to cause pollution of a water resource in the workings of any underground or opencast mine.

- No placement of any sanitary convenience, fuel depots or reservoir for any substance likely to cause pollution within the 1:50-year floodline.

- **Regulation 6** – this regulation addresses the capacity requirements of clean and dirty water systems. The relevant issues in this regard include:

  - Clean water systems should not spill into any dirty water system more than once in 50 years.
  - Likewise, any dirty water system should not spill into clean water systems more than once in 50 years.
  - Any dam that forms part of a dirty water system to have a minimum freeboard of 0.8m above the full supply level.
  - In summary, the water systems should be designed, constructed and maintained to guarantee the serviceability for flows up to and including the 1:50-year flows.

- **Regulation 7** – this regulation addresses the measures to protect water resources and includes the collection and re-use, evaporation or purification of water containing waste; measures to be taken to minimise the flow of any surface water into any mine or opencast workings; prevention of erosion or leaching of materials from any stockpile; ensuring that process water is recycled as far as practicable.

The *major stormwater management principle* prescribed in GN 704 is the one indicating that clean and contaminated stormwater should be kept separate by draining contaminated water dams or ponds for re-use or evaporating and diverting clean stormwater around dirty areas.

Applicability to Project

Based on the above requirements, the Surface Water Assessment and associated Impact Assessment (*Annex C.8*) needs to estimate the flood peaks along affected drainage lines and determine the associated flood zone widths. Flood peak estimation is undertaken through application of methods such as the Rational Method or through statistically analysing available flood data. Site survey data is used in flood modelling software for the determination of flood widths for the stipulated floods as per the recommendations above.

Finally, by overlaying the proposed Project on a site map, the layout of an adequate stormwater management system can be determined and conceptually designed, as required in the Social and Environmental Management Programme (SEMP), thereby limiting the impact of the proposed Project on surface water sources in the greater Study Area.

4.1.7 *National Heritage Resources Act (Act No. 25 of 1999)*

Summary of Act

The National Heritage Resources Act (NHRA) aims to introduce an integrated system for the management of South Africa's heritage resources. Further, the Act empowers civil society to nurture and conserve their heritage resources so that they can be passed onto future generations. The Act provides a framework for the management of heritage resources in South Africa and to protect heritage resources of National significance. In order to meet these objectives, the Act introduces an integrated system that can allow for the identification, assessment and management of heritage resources in South Africa.

Applicability to Project

The Act requires that developments exceeding 0.5ha (including mining developments) undertake a cultural heritage assessment prior to the construction of the development. Should any heritage resources be identified on the proposed site, a permit needs to be acquired from the South African Heritage Resources Agency (SAHRA), before the said resource can be removed, reallocated and/or destroyed.

The SAHRA Minimum Standards makes provision for the compilation and integration of Archaeological Impact Assessments and Paleontological Impact Assessments as specialist components of the broader Heritage Impact Assessment (HIA) and EIAs (SAHRA, 2006). The assessment should be carried out by a South African Heritage Resources Agency (SAHRA) listed consultant.

The Heritage Impact Assessment (refer to *Annex C.4*) associated with the Kusipongo Resource ESIA has been carried out and is in conformance with the SAHRA minimum standards. As part of the ESIA for the proposed Project, ERM contracted Digby Wells Environmental to carry out a cultural heritage assessment on the proposed Project Site. The findings of this assessment together with the associated impact assessment are presented in *Chapter 8* and *Chapter 10* respectively. Furthermore, the specialist report compiled by Digby Wells Environmental is included in *Annex C.4*.

4.1.8 *National Environmental Management: Waste Act (Act No. 59 of 2008) Regulations*

Summary of Act

The National Environmental Management: Waste Act is coupled with and supports the legislation to the NEMA. The Act gives legal effect to the White Paper on Integrated Pollution and Waste Management, and provides the basis for the regulation of waste management in South Africa. Further, the Act contains policy elements and provides a mandate for additional waste regulations that are to be promulgated.

Applicability to Project

Of relevance to the proposed Project is GN.R719 (July 2009), which comprises a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. Activities included in this list require a Waste License. In order to obtain a Waste License, it is necessary that a Basic Assessment (for Category A activities) or Scoping and EIA (for Category B activities) be undertaken, in terms of the NEMA EIA Regulations. *Table 4.3* includes those listed activities that are deemed to be applicable to the proposed Project.

Table 4.3 Relevant Legislation Applicable to the Proposed Kusipongo Expansion Project

Relevant Notice:	Activity No (s) (in terms of the relevance or notice) :	Description of Listed Activity:	Relevance to the Project
GN.R718	A(1)	*The storage, including temporary storage, of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding the storage of waste in lagoons.*	**This activity will be triggered**, as the proposed mine will generate general waste. This waste will be stored (on a temporary basis) onsite at the main mine adit (Adit A); following which, it will be removed for disposal at a licensed disposal facility. At this stage, the quantity of general waste that is to be stored onsite at any one time is uncertain; however the carrying capacity of the area designated for the storage of general waste will be in excess of the 100m³ threshold.
GN.R718	A(2)	*The storage including temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons.*	**This activity will be triggered**, as the proposed mine will generate some hazardous waste. This waste will be stored (on a temporary basis) onsite at the main mine adit (Adit A); following which, it will be removed for disposal at a facility licensed to treat and/or dispose of hazardous waste. At this stage, the quantity of hazardous waste that is to be stored onsite at any one time is uncertain; however the carrying capacity of the area designated for the storage of hazardous waste will be in excess of

Relevant Notice:	Activity No (s) (in terms of the relevance or notice) :	Description of Listed Activity:	Relevance to the Project
			the 35m^3 threshold.
GN.R718	A(3)	*The storage including the temporary storage of general waste in lagoons.*	**This activity will be triggered**, as the proposed mine will have settling ponds to allow for the containment and possible treatment of stormwater emanating from the site.
GN.R718	A(18)	*The construction of facilities for activities listed in Category A of this schedule (not in isolation to associated activity).*	**This activity will be triggered**, as designated areas for the storage of general and hazardous waste will need to be constructed on the site. Furthermore, a settling pond for onsite stormwater will need to be constructed.
GN.R718	B(7)	*The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15,000 cubic meters or more.*	**This activity will be triggered**. The proposed mine will treat approximately 41m^3 of sewage per day (14, 965m^3/annum). As this annual amount is essentially equal to the applicable threshold, a conservative approach will be adopted and it will be assumed that the annual volume of sewage treatment will be in excess of 15, 000m^3. In addition, decanted groundwater (from mine inflow) will only be chemically treated if necessary (during the operational phase) and, solids in the water will be settled out in a silt trap and settling pond (20, 000m^3 volume) prior to on-site use. Kangra Coal are committing to a Zero Effluent Discharge policy for the proposed Kusipongo Resource Project. As such, it is anticipated that all process water will be reused and will not be discharged into

Relevant Notice:	Activity No (s) (in terms of the relevance or notice) :	Description of Listed Activity:	Relevance to the Project
			the natural environment.

The applicability of certain activities in the above mentioned table requires that both Basic Assessment and a detailed Scoping and EIA be undertaken. As such, **a detailed Scoping and EIA will be carried out**, as this will fulfil the legal requirements necessary for all triggered activities.

4.1.9 *Subdivision of Agricultural Land Act (Act No. 70 of 1970)*

Summary of Act

The Subdivision of Agricultural Land Act (SALA) was enacted as a measure by which the Legislature, in the national interest, seeks to prevent the fragmentation of agricultural land into small uneconomic units, by (a) curtailing the common law right of landowners to subdivide their agricultural property; and (b) imposing the requirement to obtain the written consent of the National Department of Agriculture, Forestry and Fisheries (DAFF) Minister prior to any subdivision of agricultural land (which may be refused by the Minister if such subdivision will result in the uneconomic fragmentation of agricultural land). SALA also prohibits, amongst others, the change in land use of agricultural land (from use for agricultural purposes to use for any other purpose) without the prior written recommendation of the DAFF Minister.

Applicability to Project

If agricultural land, that is productive in terms of food and/or fibre production, becomes subdivided in some way as to make the reduced land parcel(s) uneconomic or unsustainable, then agricultural production is diminished. Such actions should be resisted wherever possible, especially where the prevailing agricultural potential is high.

4.1.10 *The Conservation of Agricultural Resource Act (Act No. 43 of 1983)*

Summary of Act

The Conservation of Agricultural Resources Act (CARA) aims at controlling the utilisation of natural agricultural resources in order to ensure that soil, water sources and vegetation are conserved, and that alien and invasive plants are combatted. The Act aims to prevent agricultural practices that contribute to the degradation of the environment.

Applicability to Project

Soils and Agricultural Perspective

CARA aims to protect the prevailing natural agricultural resources of South Africa from change of land use away from agriculture. This is especially important where high potential soils are present. It is an unfortunate fact that the majority of the coal resources of South Africa occur beneath moderate to high potential arable soils, and every time some of these soils are removed from agricultural production, the local, and by implication, regional and national food security situation is affected.

In terms of soil erosion, the primary piece of legislation applicable to erosion of soil is the CARA. The objectives of this Act are to provide for the conservation of the natural agricultural resources of South Africa through maintaining the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.

Biodiversity Perspective

Furthermore, this Act discusses preventing and combating the spread of declared weeds and invader plants in wetlands. In 1984, regulations were passed in terms of the CARA regulations declaring about 50 species "weeds" or "invader plants". On 30 March 2001 the Minister of Agriculture promulgated an amendment to these regulations. This amendment now contains a comprehensive list of species that are declared weeds and invader plants dividing them into three categories. These categories are as follows:

- **Category 1**: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.

- **Category 2**: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30m of the 1:50 year floodline of any watercourse or wetland.

- **Category 3**: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species are allowed.

In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), landowners are legally responsible for the control of alien species on their properties. Various legislative Acts administered by the Ministry of Water and Environmental Affairs (DWEA), as well as other laws (including local by-laws), spell out fining systems, terms of imprisonment and other penalties for contravening the law. However, for CARA, although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear

their land of invasive alien plants and other alien species entirely at the landowners cost and risk.

4.1.11 *The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)*

Summary of Act

The main aim of the National Environmental Management: Protected Areas Act (NEM:PAA) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes and provides for the identification and classification of various types of protected areas to give effect to this intention and underpinning this intention is the stated objective of creating a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity. These protected areas are to fall on state owned land, privately owned land and communally owned land.

The NEM:PAA defines various kinds of protected areas, namely: special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments; world heritage sites; marine protected areas; specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act 84 of 1998); and mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act 63 of 1970).

Applicability to Project

Visual/Landscape Perspective

The proposed Project will need to ensure that the visual/landscape value of protected areas is protected.

Biodiversity

The ESIA will need to take into account any areas defined as a protected area, and understand these areas strategies in managing and conserving its receiving biodiversity.

Protected Areas

Furthermore, according to the NEM:PAA, the following kinds of protected areas are defined in South Africa (*Section 9*):

- Special nature reserves;
- National parks;
- Nature reserves (including wilderness areas);
- Protected environments;
- World heritage sites;
- Marine protected areas;

- Specially protected forest areas;
- Forest nature reserves;
- Forest wilderness areas; and
- Mountain catchment areas.

The term 'private reserve' is not defined in the NEM:PAA and as such a private reserve falls out of the formally protected areas regime. There is no South African formal legal definition for the term 'private reserve'. In order for the Kransbank site (refer to *Figure 2.1* in *Chapter 2*) to be designated as one of the above kinds of protected areas it would have to declare as such by the Minister by notice in the Government Gazette.

Under NEMPAA all protected environments must be designated by notice in the Government Gazette. No evidence of Kransbank in the Government Notices published under NEM:PAA could be identified at the time of this ESIA.

According to the Mpumalanga Biodiversity Conservation Plan (refer to a definition of this Plan in *Section 4.5.4* below) Kransbank is characterised as a SA "Nat" Heritage Site. The acronym Nat could refer to the adjective '**National**' or '**Natural**'.

If the Kransbank is characterised as a South African **National** Heritage Site the legal definition would be found in the National Heritage Resources Act (Act No. 25 of 1999) (NHRA) (refer a definition of the NHRA in *Section 4.1.7*). According to the definition section of the NHRA:

"heritage site" means a place declared to be a national heritage site by South African Heritage Resources Agency (SAHRA) or a place declared to be a provincial heritage site by a provincial heritage resources authority.

For Kransbank to be a heritage site it would have to be incorporated into the National Estate (Section 3 of the NHRA) and thus into the formally protected areas regime in South Africa.

The SAHRA characterised the area as being an 'informally protected area'. This would mean that Kransbank falls out of the formal regulatory legal framework and as such the term 'private reserve' is the most appropriate classification. As is mentioned earlier, no formal legal definition exists for a 'private reserve'.

A South African **Natural** Heritage Site is something completely different. A natural heritage site is defined in Article 2 in the Convention Concerning the Protection of the World Cultural and Natural Heritage (an international UNESCO Convention) as:

"natural heritage": natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view, geological and physiographical formations and precisely

delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation, natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty.

This International Convention has been incorporated into South African law in Section 2 of the World Heritage Convention Act (Act No. 49 of 1999) (WHCA).

There is no evidence to suggest that the Kransbank area is designated as a Natural Heritage Site under the International Convention.

In conclusion, the Kransbank Site is not formally protected in South Africa under the NEM:PAA, NHRA (as the SAHRA as designated the area as an 'informally protected area') or the WHCA and as such should be classified as a '**private reserve'**.

4.1.12 National Environmental Management: Biodiversity Act (Act No. 10 of 2004)

Summary of Act

Similarly to the NEM:PAA the National Environmental Management: Biodiversity Act (NEM:BA) has as an objective to provide for the management and conservation of biological diversity within the Republic and of the components of such biological diversity. As such the focus of this legislation is on the preservation of species and ecosystems irrespective of whether or not they are situated in protected areas.

Applicability to Project

Chapter 4 of the NEM:BA is particularly relevant and provides for:

- The protection of threatened or protected ecosystems, with particular emphasis on critically endangered, endangered, vulnerable and protected ecosystems. – List of Threatened Ecosystems (Notice 1002 of Government Gazette 34808 dated 9 December 2011).

- Listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival. - Threatened or Protected Species Regulations (Regulation 152 of 2007).

- The protection of our natural systems from invasive species.

Chapter 5 of this Act specifically deals with Species and Organisms Posing Potential Threats to Biodiversity. To summarise, the purpose of Chapter 5 is to:

- Prevent the unauthorised introduction and spread of alien species and invasive species to ecosystems and habitats where they do not naturally occur;

- To manage and control alien species and invasive species to prevent or minimise harm to the environment and to biodiversity in particular; and

- To eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Furthermore Section 73 (2) states that a person who is the owner of land on which a listed invasive species occurs must:

- Notify any relevant competent authority, in writing, of the listed invasive species occurring on that land;

- Take steps to control and eradicate the listed invasive species and to prevent it from spreading; and

- Take all the required steps to prevent or minimise negative impacts to biodiversity.

The regulations for this Act were issued for public comment on 3 April, 2009 (Government Gazette Vol. 526, No. 32090). The regulations and lists are not yet promulgated into law; however, it is relevant to point out that Section 21 of the regulations lists the categories for alien and listed invasive species. These include:

- Exempted species being alien species listed in List 1 of the Notice;
- Prohibited species being alien species listed in List 2 of the Notice;
- Listed invasive species being invasive species listed in List 3 of the Notice as:
    - Species requiring compulsory control (1a);
    - Invasive species controlled by a invasive species management programme (1b);
    - Invasive species controlled by area (2); and
    - Invasive species controlled by activity (3).

A species may be listed in different categories for different parts of the country.

4.1.13 National Forests Act (Act No. 84 of 1998)

Summary of Act

The National Forests Act (Act No. 84 of 1998) (NFA) recognises that everyone has the constitutional right to have the environment protected for the benefit of both present and future generations. Natural forests and woodlands form an important part of that environment and need to be conserved and

developed according to the principles of sustainable management. Furthermore, the Act recognises that plantation forests also play an important role in the economy; however, that plantation forests have an impact on the environment and need to be managed appropriately. It is further recognised that the State's role in forestry needs to change and that the economic, social and environmental benefit of forests have been distributed unfairly in the past.

Applicability to Project

One of the objectives of this Act is to provide special measures for the protection of certain forests and tree species and to promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. In terms of Section 15 (1) of the National Forests Act, 1998,forest trees or protected tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the Department of Water Affairs and Forestry (or a delegated authority).

A Government Notice was issued in 2005 listing the protected trees within the borders of South Africa (GN.R767 List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 Of 1998) 5 August 2005). The criteria used to select tree species for inclusion in the protected tree list were:

- Red List Status (rare or threatened species);
- Keystone Species Value (whether species play a dominant role in an ecosystem's functioning);
- Sustainability of Use (whether a species is threatened by heavy use of its products such as timber, bark etc.);
- Cultural or Spiritual Importance (outstanding landscape value or spiritual meaning attached to certain tree species); and
- Other Legislation (whether a species is already adequately protected by other legislation).

4.1.14 National Environmental Management: Air Quality Act (Act No. 39 of 2004)

Summary of the Act

The National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA) commenced on 11 September 2005, and was brought into full force on 1 April 2010. The previous Atmospheric Pollution Prevention Act (APPA) of 1965 was repealed on 1 April 2010.

The NEM:AQA has shifted the approach of air quality management from source-based control to the control of the receiving environment. The act has also placed the responsibility of air quality management on the shoulders of local authorities that will be tasked with baseline characterisation, management and operation of ambient monitoring networks, licensing of

listed activities, and emissions reduction strategies. The main objective of the act is to ensure the protection of the environment and human health through reasonable measures of air pollution control within the sustainable (economic, social and ecological) development framework.

The National Framework for rolling out the Act was published in the Government Gazette on 11 September 2007. The National Framework is a medium- to long term plan on how to implement the Air Quality Act to ensure the objectives of the act are met. The National Framework states that aside from the various spheres of government responsibility towards good air quality, industry too has a responsibility not to impinge on everyone's right to air that is not harmful to health and well-being. Industries therefore should take reasonable measures to prevent such pollution order degradation form occurring, continuing or recurring.

Furthermore, Section 34 of the NEM:AQA makes provision for the Minister to prescribe essential *national noise standards* for the control of noise, either in general or by specified machinery or activities or in specified places or areas; or, for determining a definition of noise and the maximum levels of noise. When controlling noise the provincial and local spheres of government are bound by any prescribed national standards.

Applicability to Project

In terms of NEM:AQA, industries identified as Listed Activities (Section 21) have the responsibilities of:

- Making an application for an Atmospheric Emission License (AEL) and complying with its provisions.

- Being in compliance with:

    1. Any minimum emission standards in respect of a substance or mixture of substances identified as resulting from a Listed Activity.
    2. Any relevant national standards for emissions.
    3. The measurement requirements of identified emissions.
    4. The Minister's requirement for the implementation of a pollution prevention plan in respect of a substance declared as a priority air pollutant.
    5. An Air Quality Officer's legal request to submit an Atmospheric Impact Report (AIR) in a prescribed form.

- Designating an Emission Control Officer if required to do so.

Furthermore, industries identified as Listed Activities must take reasonable steps to prevent the emission of any offensive odour caused by any activity on their premises.

The applicability of Section 21 is as follows - the proposed Project is expected to contribute to ambient air quality by means of airborne emissions that will be generated through the mining process. Section 21 of the NEM:AQA, subcategory 5.1 (storage and handling of ore and coal) stipulates that facilities that are designed to hold more than 100 000 tons of coal will need an Air Emission License (AEL). This activity will not be triggered as the product silo and associated stockpiling area at Adit A will be well below this threshold. As such, it is anticipated that an **AEL will not be required**.

Secondly, the estimated particulate and gaseous air concentrations and particle fallout rates of the potential air emissions has to be compared with the National Ambient Air Quality Standards (see *Section 0.0.0* on *Page 4-30*). Emission reductions must be identified if compliance with the Act is not met by the proposed Project.

From a Noise perspective, Section 34 of the Act is in force; however, no such noise standards have yet been promulgated. Draft regulations have been promulgated for adoption by Local Authorities.

National Ambient Air Quality Standards

National ambient standards were published in the Government Gazette on the 24 December 2009. The national limits and standards issued for air concentrations are documented in *Table 4.4*.

Table 4.4 National Ambient Air Quality Standards (NAAQS)

Substance	Molecular Formula / Notation	Averaging Period	Concentration (µg/m³)	Frequency of Exceedance	Compliance Date
Sulphur dioxide	SO_2	1 hour	350	88	Immediate
		24 hours	125	4	Immediate
		1 year	50	0	Immediate
Particulate Matter (1)	PM_{10}	24 hours	120	4	Immediate – 31 Dec 2014
			75	4	1 Jan 2015
		1 year	50	0	Immediate – 31 Dec 2014
			40	0	1 Jan 2015
Lead	Pb	1 year	0.5	0	Immediate
Carbon monoxide	CO	1 hour	30 000	88	Immediate
		8 hour	10 000	11	Immediate
Nitrogen Dioxide	NO_2	1 hour	200	0	Immediate
		1 year	40	0	Immediate

(1) Subsequent to this assessment of the proposed Project, the National Department of Environmental Affairs also published standards on the 29th of July 2012 for $PM_{2.5}$ air:

- 24 hour: 65 µg/m³ (4 days exceedance – immediate) 40 µg/m³ (4 days exceedance – 1 January 2016) and 25 µg/m³(4 days exceedance – 1 January 2030
- Annual: 25 µg/m³ (immediate), 20 µg/m³ (1 January 2016) and 15 µg/m³ (1 January 2030)

Dust deposition standards have relatively recently also been proposed by the National Department of Environmental Affairs (DEA) (Government Gazette No. 34307 of 27 May 2011), as summarised in *Table 4.5*.

Table 4.5 Target, Action and Alert Thresholds for Ambient Dust Fall (SANS 1929:2005)

Level	Dust-fall Rate [D] (mg/m²/day)	Averaging Period	Permitted frequency of exceedances
Target	300	Annual	
Action Residential	600	30 days	Three within any year, no two sequential months
Action Industrial	1 200	30 days	Three within any year, not sequential months
Alert Threshold	2 400	30 days	None. First exceedance requires remediation and compulsory report to authorities

Applicability to Project

It is necessary to assess both ambient particulate and gaseous pollutants against the NAAQS (*Table 4.4* above) to determine the level of compliance and required mitigation.

(1) (1) Subsequent to this assessment of the project, DEA also published standards on the 29th of July 2012 for $PM_{2.5}$ air:

- 24 hour: 65 µg/m³ (4 days exceedance – immediate) 40 µg/m³ (4 days exceedance – 1 January 2016) and 25 µg/m³(4 days exceedance – 1 January 2030
- Annual: 25 µg/m³ (immediate), 20 µg/m³ (1 January 2016) and 15 µg/m³ (1 January 2030)

Due to the nature of the proposed Project, the most significant air pollution impact is anticipated to be particulate air concentrations and deposition of particulates. It is therefore also necessary to assess the predicted particulate deposition rate against the proposed standard (*Table 4.5*).

Previously, the DEA published dust-fall criteria classified as follows:

"slight"	-	less than 250 mg/m²/day
"moderate"	-	250 to 500 mg/m²/day
"heavy"	-	500 to 1200 mg/m²/day
"very heavy"	-	more than 1200 mg/m²/day

This category "slight" dust-fall is barely visible to the naked eye. By contrast "heavy" dust-fall indicates a fine layer of dust on a surface; with "very heavy" dust-fall being easily visible should a surface not be cleaned for a few days. When dust-fall levels reach in excess of 2 000 mg/m²/day this constitutes a layer of dust thick enough to allow a person to "write" words in the dust with their fingers. The DMR uses the 1 200 mg/m²/day threshold level as an action level. In the event that on-site dust-fall exceeds this threshold, the specific causes of high dust-fall should be investigated and remedial steps taken.

4.1.15 *Model Air Quality Management By-laws for Adoption and Adaption by Municipalities*

Summary of Regulation

Model Air Quality Management By-Laws for adoption and adaptation by municipalities was published by the Department of Water and Environmental Affairs in the Government Gazette of 2 July 2010 as Government Notice 579 of 2010. The main aim of the model air quality management by-laws is to assist municipalities in the development of their air quality management by-laws (which will include air quality limits) within their jurisdictions.

Applicability to Project

If either the Gert Sibane District Municipality or Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities adopt these regulations and develop by-laws dealing with air quality management, the proposed Kusipongo Resource Project will need to comply with these.

Presently, no such by-laws exist.

4.1.16 *Environmental Conservation Act (Act No. 73 of 1989)*

Summary of Act

The Environment Conservation Act (ECA) allows the Minister of Environmental Affairs and Tourism (now the Ministry of Water and Environmental Affairs) to make environmental regulations; including regulations associated with noise (refer to *Section 4.1.17 below*).

Applicability to Project

The current Noise Control Regulations (refer to *Section 4.1.17*) were promulgated in terms of this Act. Kangra Coal will need to ensure that all activities associated with the construction, operational and decommissioning and closure phases are in compliance with the regulations.

4.1.17 *Noise Control Regulation*

Summary of Regulation

In terms of Section 25 of the ECA (refer to *Section 4.1.16* above), the national noise-control regulations (GN.R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The noise-control regulations were revised under Government Notice Number GNR.55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations.

Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996, legislative responsibility for administering the noise control regulations was devolved to provincial and local authorities. Provincial Noise Control Regulations exist in the Free State, Western Cape and Gauteng provinces, but the Mpumalanga province has not yet adopted provincial regulations in this regard.

Applicability to Project

These regulations provide definitions of important concepts regarding noise, as well as when noise impact assessments are required.

A Noise Impact Assessment was carried out as part of the ESIA associated with the proposed Kusipongo Resource Project (refer to *Annex C.5*).

4.1.18 *National Legislation associated with Land Reform and Security of Tenure*

Based on the significance of land in both the national and personal arenas of South Africa, the relevant legal structures or tools used to redress discriminatory land legislation, ensure security of tenure, and to establish communal access and title to land are presented in the table overleaf.

Table 4.6 Legislation associated with Land Reform and Security of Tenure

Legislation	Applicability to Project
Land Reform (Labour Tenants) Act (Act No. 3 of 1996)	• Enactment of this Act was intended to provide security of tenure for labour tenants[1] and those persons occupying or using land as a result of their association with labour tenants; and to provide for the acquisition of land and rights to land by labour tenants; • The Act recognised that the institution of labour tenancy in South Africa (still dominant in 1996) was the result of racially discriminatory laws and practices which led to the undermining of human rights and denial of access to land; • It intended to ensure adequate protection of labour tenants (as people disadvantaged by unfair discrimination) in order to promote their full and equal enjoyment of human rights and freedoms; and • It established measures to assist labour tenants to obtain security of tenure and ownership of land and thereby prevent further prejudice against them.
Extension of Security of Tenure Act (Act No. 62 of 1997)	• This Act was intended to provide for measures with State assistance to facilitate long-term security of land tenure (including purchase of land); • It was intended to regulate the conditions of residence on certain land; • The Act was to prevent unfair eviction, by farm owners, of labour tenants from their homes and avoid the hardships and social conflict that could arise in such situations; and • The Act promotes the achievement of long-term security of tenure for occupiers of land, where possible through the joint efforts of occupiers, landowners and government bodies while giving due recognition to rights, duties and interests of the landowner.
Communal Property Associations Act (Act 28 of 1996)	This Act shapes landownership in the Study Area. The Act was developed to address the need for communities to form Communal Property Associations (CPAs) in order to acquire, hold and manage property. The Act also outlines that CPAs must be non-discriminatory, equitable, democratic and accountable to members so that members are protected against abuse of power by other members. Central to the Act, and working in harmony with the Land Reform and the Extension of Security of Tenure Acts, described above, is the creation of a tool through which communities could reinforce the security of their land tenure. Once registered and approved, a CPA has the authority to sue and be sued, and acquire rights and dispose of immovable property. They also become liable for immovable property, real rights by mortgage, servitude or lease. By law, a CPA must continue despite changes in leadership, or exit of members from the association. Any decision to dissolve the CPA, change the constitution, or to dispose of or acquire property requires an "inclusive" decision making process and majority agreement. It is illegal for any one person to grant or purport to grant community property rights of a CPA.

(1) [1] A 'labour tenant' is a person who is residing, or has a right to reside, on a farm, or has a right to use cropping or grazing land on a farm in return for labour, or is a child or grandchild of such a person.

4.1.19 *Legal Requirement Summary*

On the basis of the legal review the proposed Project will require the following Authorisations:

Statute	Requirement	Competent Authority
NEMA EIA Regulations	Environmental Authorisation through the detailed Scoping and EIA process	The Mpumalanga Department of Economic Development, Environment and Tourism
MPRDA	That an EIA be conducted and Environmental Management Programme be submitted	National Department of Minerals and Resources
Water Act	Water Use Licenses	National Department of Water Affairs
Heritage and Resources Act	That a Cultural and Heritage Resource assessment be carried out	South African Heritage Resources Agency
NEMA Waste Act	Environmental Authorisation through the detailed Scoping and EIA process	The National Department of Environmental Affairs

4.2 *NATIONAL STANDARDS*

4.2.1 *South African National Standards (SANS) as published by the South African Bureau of Standards (SABS)*

In terms of the Standards Act, 2008 (Act No.8 of 2008), the Council of the South African Bureau of Standards (SABS) published the South African National Standards (SANS). The SABS is responsible for maintaining South Africa's database of more than 6 500 national standards, as well as developing new standards and revising, amending or withdrawing existing standards as required. The SABS commercial services can be divided into the following clusters:

1. Chemicals;
2. Electro-technical;
3. Food and Health;
4. Mechanical and Materials;
5. Mining and Minerals;
6. Services; and
7. Transportation.

Applicability to Project

The Project will need to comply to the SANS water quality and noise standards. These standards are discussed in this section.

Water Quality

Of applicability to this Project is the South African National Standard for drinking water (SANS 241-1:2011), applicable to both the potable use of surface and ground water.

Noise

SANS 10103:2008 (The Measurement and Rating of Environmental Noise with Respect to Annoyance and to Speech Communication) provides the maximum average background ambient sound levels, $L_{Req,d}$ and $L_{Req,n}$, during the day and night respectively to which different types of developments may be exposed. Based on onsite measurements, the ambient sound levels on and around the proposed Project Site correspond to the rating levels for a rural area. As such, the acceptable Zone Sound Levels used include:

- **Day** (06:00 to 22:00) - $L_{Req,d}$ = *45 dBA*.
- **Night** (22:00 to 06:00) - $L_{Req,n}$ = *35 dBA*.

SANS 10103 also provides a guideline for estimating community response to an increase in the general ambient sound level caused by an intruding noise. If **Δ** is the increase in noise level, the following criteria are of relevance:

- **Δ ≤ 3 dBA**: An increase of 3 dBA or less will not cause any response from a community. It should be noted that for a person with average hearing acuity, an increase of less than 3 dBA in the general ambient noise level would not be noticeable.

- **3 < Δ ≤ 5 dBA**: An increase of between 3 dBA and 5 dBA will elicit 'little' community response with 'sporadic complaints'. People will just be able to notice a change in the sound character in the area.

- **5 < Δ ≤ 15 dBA**: An increase of between 5 dBA and 15 dBA will elicit a 'medium' community response with 'widespread complaints'. In addition, an increase of 10 dBA is subjectively perceived as a doubling in the loudness of a noise. For an increase of more than 15 dBA the community reaction will be 'strong' with 'threats of community action'.

In addition, the following SABS scientific standards are considered relevant to the Noise Impact Assessment (refer to *Annex C.5*) and Air Quality Impact Assessment (refer to *Annex C.1*) for the proposed Project:

- **SANS 10210:2004** – Calculating and Predicting Road Traffic Noise

- **SANS 10328:2008** – Methods for Environmental Noise Impact Assessments

- **SANS 10357:2004** – The Calculation of Sound Propagation by the Concave Method

- **SANS 1929:2005** – Ambient Air Quality: Limits for Common Pollutants

4.3 NATIONAL GUIDELINES

4.3.1 National Environmental Management Act (Act No. 107 of 1998) Publication of the Companion Guideline of the Implementation of the Environmental Impact Assessment Regulations (GN.R805 of 2012)

Summary of Guideline

The aim of this guideline is to provide information pertaining to the practical implementation of the EIA Regulations, 2010. In particular, the guideline provides clarity on the process that is required to be followed when applying for an EA in terms of the EIA Regulations as well as to interpret the various listed activities. In particular, the document sets out the following:

- The EIA process is described in detail in the guideline and in addition sets out the manner in which a basic assessment process and a scoping and EIA process must be conducted as well as the timeframes which must be complied with;

- The requirements that must be complied with when completing an EIA as well as the time frames which follow the application process;

- The manner in which the holder of an environmental authorisation may amend the authorisation as well as the manner in which the authorisation may be suspended by the competent authority;

- The manner in which an exemption may be applied for by the applicant; and

- The manner within which the appeal process must occur and the time frames within which the applicant must comply.

Applicability to Project

This ESIA process has taken cognisance of this guideline.

4.3.2 National Environmental Management Act (Act No. 107 of 1998) DRAFT Publication of Need and Desirability Guideline in terms of the Environmental Impact Assessment Regulations (GN.R792 of 2012)

Summary of Guideline

In terms of the NEMA EIA Regulations, when considering an application, the competent authority must have regard to a number of specific considerations, including the consideration of the "need for and desirability of the activity." The NEMA EIA Regulations specify that the EIA must provide a description of the need and desirability of the proposed activity and identify potential

alternatives to the proposed activity. It requires that both 'need' and 'desirability' must be considered by the developer, the EAP, the specialists and the competent authority.

The need and desirability guidelines provide that 'need' refers to whether there is a need for the development and the reason for it. The applicant must explain how the development would benefit the local/regional/national community. The greater the emphasis upon the benefit to the surrounding development, the applicant in turn emphasises the need for development.

Desirability of development is looked at in relation to the location of the operation and the area as well as the services to the area, in that whether it will provide an improved convenience to those for whom it's intended without prejudicing the general public. The applicant must motivate how the location of the development on the property and in that particular area would be more desirable than, for example in an urban area.

Applicability to Project

Although still in a draft form, this ESIA process has taken cognisance of this guideline.

4.3.3 DWA Procedure for Identification and Delineation of Wetland Riparian Areas

Summary of Guideline

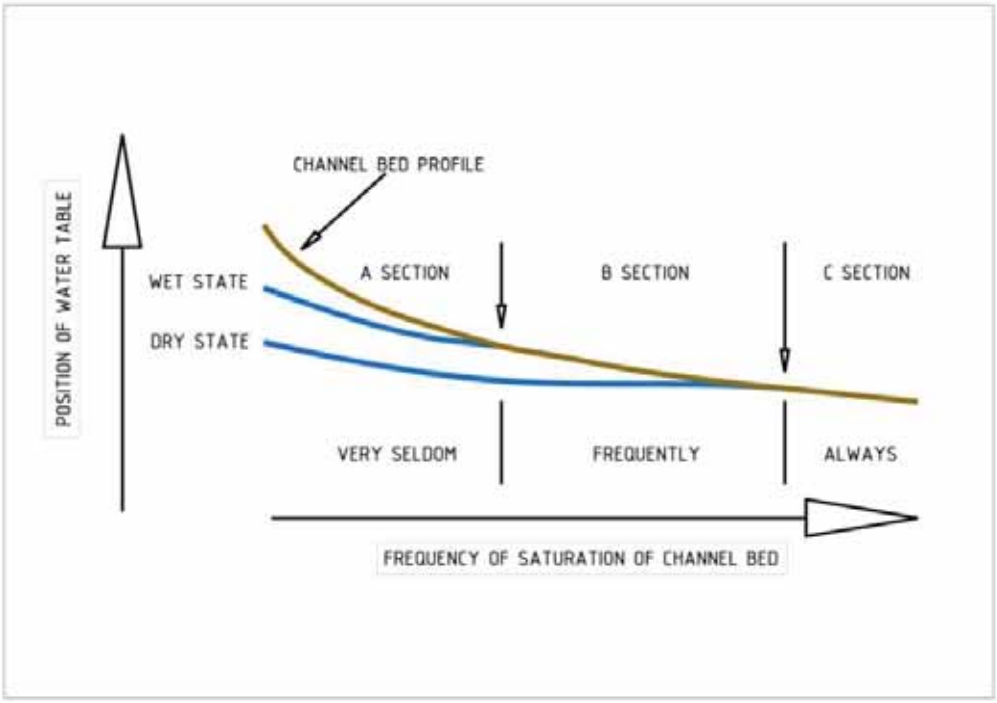
Natural channels may be classified according to guidelines by the DWA in "*A practical field procedure for identification and delineation of wetlands and riparian areas*" as shown in *Figure 4.1* (taken from DWA, 2005). Three sections (namely Sections A to C) along the length of a watercourse are defined as follows:

- **Section A**: above the zone of saturation and does not carry baseflow. Are mostly too steep to be associated with alluvial deposits and are not flooded with sufficient frequency to support riparian habitat or wetlands. This type does however carry stormwater runoff during fairly extreme rainfall events but the flow is of short duration. Section A watercourse sections are the least sensitive watercourses in terms of impacts on water yield from the catchment.

- **Section B**: those channels that are in the zone of the fluctuating water table and only have baseflow at any point in the channel when the saturated zone is in contact with the channel bed. In this Section B **baseflow is intermittent**, with flow at any point in the channel depending on the current level of the water table. Because the channel bed is in contact with, or in close proximity to, the water table, residual pools are often observed when flow ceases. The gradient of the channel bed is flat enough in these

Sections for deposition of material to take place. Initial signs of flood plain development may be observed.

Figure 4.1 Classification of Natural Channels (DWA 2005)



- **Section C**: the water table is always above river bed level and river flow in this section is perennial.

The hydro-geomorphic types of wetlands include floodplain, valley bottom with channel, valley bottom without channel, hillslope seepage feeding a water course, hillslope seepage not feeding a water course and depressions (pans) as illustrated and described below (Kotze *et al.* 2007). It must be noted that the system excludes artificial wetlands from the classification.

- **Floodplain** – Valley bottom areas with a well-defined stream channel, gently sloped and characterised by floodplain features such as oxbow depressions and natural levees and the alluvial (by water) transport and deposition of sediment, usually leading to a net accumulation of sediment. Water inputs occur from the main channel (when the channel banks overspill) and from adjacent slopes.

- **Valley Bottom with a Channel** – Valley bottom areas with a well-defined stream channel but lacking the characteristic floodplain features. May be gently sloped characterised by the net accumulation of alluvial deposits, or may have steeper slopes and be characterised by the net loss of sediment. Water inputs occur from the main channel (when channel banks overspill) and from adjacent slopes.

- **Valley Bottom with No Channel** – Valley bottom areas with no clearly defined stream channel, usually gently sloped and characterised by alluvial sediment deposition, generally leading to a net accumulation of sediment. Water inputs occur mainly from the channel entering the wetland and also from adjacent slopes.

- **Hillslope Seepage Linked to a Stream Channel** – Slopes of hillsides which are characterised by colluvial (transport by gravity) movement of materials. Water inputs are mainly from sub-surface flow and outflow is usually via a well-defined stream channel connecting the area directly to a stream channel.

- **Isolated Hillslope Seepage** – Slopes of hillsides which are characterised by the colluvial (transported by gravity) movement of materials. Water inputs mainly from sub-surface flow and outflow either very limited or through a diffuse sub-surface and/or surface flow, but no direct surface water flow connection to a stream channel.

- **Depression (includes pans) -** A basin-shaped area with a closed elevation contour that allows for the accumulation of surface water (i.e. it is inward draining). It may also receive sub-surface water. An outlet is usually absent, and therefore this type is usually isolated from the stream channel network.

Applicability to Project

A wetland delineation assessment following the DWA delineation guideline was undertaken for the site at Adit A, and along the conveyor route.

Both valley bottom wetlands with a channel and valley bottom wetlands without a channel were identified and mapped at Adit A, and the layout of Adit infrastructure amended accordingly.

Along the conveyor route, numerous wetlands, including valley bottom with a channel, valley bottom without a channel, isolated hillslope seepage and hillslope seepage linked to a channel were identified.

4.3.4 *National Environmental Management Act (Act No. 107 of 1998) Public Participation Guideline (GN.R807 of 2012)*

Summary of Guideline

In 2010, the Minister gazetted a new set of regulations on the requirements for conducting EIAs in terms of Chapter 5 of NEMA. In order to assist potential applicants, interested and affected parties and environmental assessment practitioners to understand their role, the DEA has produced a series of guidelines. These guidelines must be read in line with NEMA and the EIA Regulations of 2010 (refer to *Sections* 4.1.2 and 4.1.3) as they do not substitute primary legislation.

The guideline updates and revises the draft integrated environmental management guideline which was developed in 2005. The public participation guideline provides for *inter alia*: the minimum legal requirements for public participation processes (PPP); the steps of a PPP; guidelines for planning a PPP; and a description of the roles and responsibilities of the various role players.

Applicability to Project

The guideline highlights the fact that the minimum requirements for public participation outlined in the EIA Regulations will not necessarily be sufficient for all applications, and extra steps may need to be incorporated in the PPP. In addition, it provides the variables to be taken into account when deciding the level of public participation and process that should be followed.

The NEMA also requires that guidelines must be taken into account by applicant submitting applications for environmental authorisation.

This ESIA has taken cognisance of this guideline.

4.3.5 Water Quality Guidelines

Water quality guidelines for both surface and groundwater are applicable to the Project, based on the following water users identified for the Project area:

- Aquatic ecology; and
- Stock watering.

The following guidelines published by DWAF are applicable:

- DWAF, 1996. *South African Water Quality Guidelines. Volume 7: Aquatic Ecosystems*; and
- DWAF, 1996. *South African Water Quality Guidelines. Volume 5: Livestock Watering*.

Derivation of Surface and Groundwater Screening levels using the Water Quality Standards and Guidelines

Using baseline surface water and groundwater quality results, the South African Water Quality Standards for Drinking Water (i.e. SANS241:2011), and the South African Water Quality Guidelines for both Aquatic Ecosystems and Livestock Watering, site specific surface water screening levels were derived.

Surface Water Criteria

The following rationale was followed to develop the surface water standards:

- The most conservative of the aquatic ecology/drinking water/livestock watering guidelines was adopted as the screening level, except in the

instance where the average baseline surface water quality exceeded the screening level.

- Where the baseline surface water quality exceeded the screening level, the screening level was set to a value two standard deviations higher than the mean for that parameter in baseline surface water.

- In the case of the major cations and anions, the most conservative screening level was for drinking water. However, due to the extremely low TDS of the baseline surface water, if the drinking water screening levels are adopted, this will result in the TDS exceeding the aquatic ecology screening levels of less than a 15% change in baseline conditions. In order to account for this, screening levels for major cations and anions were calculated assuming stoichiometric dissolution of $CaSO_4$ or NaCl to the point at which the TDS was 15% above the baseline value. This is explained in more detail in the surface water specialist study presented in *Annex C*.8.

The screening level derivation for surface water is shown in *Table 4.7* overleaf.

Please Note:

- The derivation of these screening levels is based on a total of 18 spring and 12 river samples from the wet season only, and the screening levels should be continually updated using additional baseline surface water monitoring data from all seasons.

- The screening levels are intended to be used to assess the quality of water in natural surface water systems. The screening levels are not discharge standards.

- The General Authorisations in Terms of Section 39 of the National Water Act (1998) would apply for waste discharge into surface water systems.

Table 4.7 Derivation of Surface Water Screening Levels

SampleID	Units	Springs		oHlelo Stream		DWAF Aquatic Ecology	SANS241 Drinking Water Quality	DWAF Livestock watering (most conservative species)	Derived screening level	Rationale
		Mean concent-ration	Mean+2SDs	Mean concen-tration	Mean+2SDs	TWQR		TWQR		
Lab pH		7.00	8.5	8.2	8.4	7.9-8.5	5 - 9.7		6.9-8.5	Aquatic ecology & baseline
Lab EC	mS/m	7.22	17.1	8.8	10.7		170			
Lab TDS	mg/L	32.06	73.0	41.0	49.0	33 - 49	1200	1000	30-50	Aquatic ecology
Ca	mg/L	4.32	11.8	5.2	6.3			1000	12	Calculated based on TDS limits
Mg	mg/L	2.93	7.8	3.2	3.7			500		
Na	mg/L	3.53	7.1	5.9	7.7		200	2000	16	Calculated based on TDS limits
K	mg/L	0.94	3.1	1.5	4.5					
Cl	mg/L	5.52	14.5	2.7	4.7		300	1500	22	Calculated based on TDS limits
SO4	mg/L	1.96	4.7	2.9	4.2		250	1000	31	Calculated based on TDS limits
NO3	mg/L as N	0.29	0.71	0.12	0.22	0.22	11	23	0.75	Baseline
F	mg/L	0.37	0.76	0.23	0.27	0.75	1.5	2	0.75	Aquatic ecology
Alkalinity	mg/L as CaCO3	20.09	53.5	32.7	37.3					
Al	mg/L	0.14	0.456	0.017	0.018	0.0100	0.3	5	0.50	Baseline
Fe	mg/L	0.19	1.113	0.075	0.185	0.2031	0.3	10	0.20	Aquatic ecology
Mn	mg/L	0.06	0.320	0.001	0.001	0.1800	0.1	10	0.18	Aquatic ecology
Ni	mg/L	0.01	0.028	-	-		0.07	1	0.07	Drinking water
Zn	mg/L	0.01	0.030	0.012	0.012	0.0020		20	0.03	Baseline
Co	mg/L	-	-	-	-		0.5	1	0.50	Drinking water
Cd	mg/L	-	-	-	-	0.0003	0.003	0.01	0.00025	Aquatic ecology
Pb	mg/L	0.02	0.020	-	-	0.0005	0.01	0.1	0.05	Baseline
V	mg/L	0.02	0.033	0.007	0.014		0.2	1	0.20	Drinking water

Groundwater Criteria

The derivation of the groundwater standards follows a similar rationale to surface water standards, with one difference. Groundwater can be directly screened against drinking water standards because receptors drinking groundwater are exposed directly to the groundwater. However, groundwater that provides baseflow to streams and wetlands is diluted by rainfall, and it is therefore not appropriate to compare groundwater to aquatic ecology screening levels. The following rationale was therefore followed to develop groundwater screening levels presented in *Table 4.8* overleaf:

- A dilution factor, calculated by comparing the concentration of conservative elements in surface water to groundwater, was applied to the aquatic ecology standards. On average, groundwater cations and anions were three times more concentrated that surface water cations and anions. The aquatic ecology screening levels were therefore multiplied by three to account for this dilution.

- The most conservative of the amended aquatic ecology/drinking water/livestock watering guidelines was adopted as the screening level, except in the instance where the average baseline groundwater quality exceeded the screening level.

- Where the baseline surface water quality exceeded the screening level, the screening level was set to a value two standard deviations higher than the mean for that parameter in baseline ground water.

- In the case of the major cations and anions, the most conservative screening level was for drinking water. However, due to the low TDS of the baseline groundwater, if the drinking water screening levels are adopted, this will result in the TDS exceeding the amended aquatic ecology screening levels of less than a 15% change in three times the baseline conditions. In order to account for this, screening levels for major cations and anions were calculated using the same methodology as described for surface water.

Please Note:

The derivation of these screening levels is based on a total of 12 groundwater samples from the wet season (ERM data) and 15 groundwater samples from the dry season (GCS (2013) data). However, the screening levels should be continually updated using additional groundwater monitoring data from all seasons. It should also be noted that the pH screening levels are based on laboratory measured pH values. Laboratory measured pH values are often higher than those measured in the field due to degassing and oxidation processes.

Table 4.8 Derivation of Groundwater Screening Levels

SampleID	Units	Boreholes (ERM)		Boreholes (GCS, 2013)		DWAF Aquatic Ecology	SANS241 Drinking Water Quality	DWAF Livestock watering (most conservative species)	Derived screening level	Rationale
		Mean concent-ration	Mean+2SDs	Mean concen-tration	Mean+2SDs	TWQR x 3		TWQR		
Lab pH		8.1	9.7	8.0	8.5	7.9-8.5	5 - 9.7		6.9-8.5	Aquatic ecology & baseline
Lab EC	mS/m	19.8	36.8	18.3	38.3		170			
Lab TDS	mg/L	99.7	193.4	115.0	304.4	99 - 147	1200	1000	99 - 147	Aquatic ecology taking into account dilution
Ca	mg/L	11.7	25.8	16.8	40.0			1000	38	Calculated based on TDS limits for aquatic ecology taking into account dilution
Mg	mg/L	4.5	11.5	4.9	9.6			500		
Na	mg/L	23.6	65.1	47.0	258.3		200	2000	54	Calculated based on TDS limits for aquatic ecology taking into account dilution
K	mg/L	1.4	2.8	2.7	6.7					
Cl	mg/L	4.9	12.9	4.1	7.3		300	1500	78	Calculated based on TDS limits for aquatic ecology taking into account dilution
SO4	mg/L	3.0	5.5	4.8	12.6		250	1000	93	Calculated based on TDS limits for aquatic ecology taking into account dilution
NO3	mg/L as N	0.3	0.7	1.8	10.8	0.66	11	23	0.66	Aquatic ecology
F	mg/L	0.43	0.96	0.36	0.85	2.25	1.5	2	1.5	Drinking water
Alkalinity	mg/L as CaCO3	85.5	168.7	109.6	281.4					
Al	mg/L	0.025	0.061	0.963	2.638	0.030	0.3	5	2.7	Baseline
Fe	mg/L	1.445	3.046	3.482	11.002	0.609	0.3	10	11	Baseline
Mn	mg/L	0.149	0.435	0.872	3.511	0.540	0.1	10	3.5	Baseline
Ni	mg/L	0.015	0.045		-		0.07	1	0.07	Drinking water

SampleID	Units	Boreholes (ERM)		Boreholes (GCS, 2013)		DWAF Aquatic Ecology	SANS241 Drinking Water Quality	DWAF Livestock watering (most conservative species)	Derived screening level	Rationale
Zn	mg/L	0.019	0.070	0.076	0.162	0.006		20	**0.16**	Baseline
Co	mg/L	-	-		-		0.5	1	**0.5**	Drinking water
Cd	mg/L	0.002	0.003	0.010	0.019	0.001	0.003	0.01	**0.02**	Baseline
Pb	mg/L	0.025	0.039	0.017	0.038	0.002	0.01	0.1	**0.04**	Baseline
V	mg/L	0.019	0.027				0.2	1	**0.2**	Drinking water

4.4 NATIONAL PLANS AND POLICIES

The following table highlights a selection of national plans and policies which are deemed most applicable to the proposed Project.

Table 4.9 National Development Policy Context

Plan/Policy	Key Aspects/Objectives
National Development Plan 2030 (2012) (NDP)	• The NDP, adopted by the ANC National Conference in Mangaung (2012) "envisages an economy that serves the needs of all South Africans – rich and poor, black and white, skilled and unskilled, those with capital and those without, urban and rural, women and men." • The Vision is that, in 2030, the economy should be close to full employment; people will be equipped with the skills they need; ownership of production will be less concentrated and more diverse (where black people and women own a significant share of productive assets); and the economy will be able to grow rapidly, providing the resources to pay for investment in human and physical capital. • Subsequently, the NDP proposes to create 11 million jobs by 2030 by: - Realising an environment for sustainable employment and inclusive economic growth. - Promoting employment in labour-absorbing industries. - Raising exports and competitiveness. - Strengthening government's capacity to give leadership to economic development. - Mobilising all sectors of society around a national vision.
New Growth Path (2009)(likely to be superseded by the NDP 2030 but still in place)	• Presents growth objectives nationally and per province. • Mpumalanga Province (and Gert Sibande District Municipality) having to proportionally contribute towards the achievement of increased employment in, amongst others "Jobs Drivers" in the main economic sectors: - 300 000 in Agriculture smallholder schemes - 145 000 jobs in agro processing by 2030 - 140 000 additional jobs in Mining by 2020, and - 200 000 jobs by 2030, not counting the downstream and side stream effects. - 350 000 jobs as per the Industrial Policy Action Plan 2 targets in manufacturing by 2020 - 250 000 jobs in Business and Tourism by 2020
Government Outcomes (adopted in 2010)	• One of the 12 Outcomes of public service delivery priorities highlighted in the New Growth Path and relevant to this Project is **Outcome 7**: Vibrant, Equitable And Sustainable Rural Communities And Food Security, to be achieved through: - Sustainable agrarian reform and improved access to markets for small farmers. - Improved access to affordable and diverse food. - Improved rural services and access to information to support livelihoods. - Improved rural employment opportunities. - Enable institutional environment for sustainable and inclusive growth.
Medium Term Strategic Framework (MTSF) (2009)	• Seeks to identify the major strategic choices needed to deal with poverty and underdevelopment. Key objectives include:

Plan/Policy	Key Aspects/Objectives
	- Reduction of poverty and underemployment. - Provision of skills required by the economy. - Ensuring that South Africans can fully exercise their constitutional rights and enjoy the full dignity of freedom. - Achievement of a better national health profile and reduction in preventable deaths. - Reduce serious and priority crimes. - Position SA strategically as an effective force in global relations.
National Spatial Development Perspective (NSDP) (initiated in 1999)	• Argues that government's social objectives will be best achieved through infrastructure investment in economically sustainable areas with proven development potential. Therefore, areas displaying little or no potential for growth should only be provided with the constitutionally mandated minimum levels of services, and the focus of government spending should rather be on the people, i.e. social development spending. Government spending on fixed investment, beyond the constitutional obligation to provide basic services to all citizens (such as water, electricity as well as health and educational facilities), would therefore be focused on localities of economic growth and/or economic potential in order to attract private-sector investment, stimulate sustainable economic activities and/or create long-term employment opportunities [(1)]. • Aims to not only provide a strategic assessment of the spatial distribution and socio-economic characteristics of the South African population, but to gain a shared understanding of the distribution of economic activities and potential across the South African landscape – based on this the NSDP sets out a number of guidelines for infrastructure development in South Africa.
The International Council on Mining and Metals (ICMM)	Although not policy or legislative, the International Council on Mining and Metals (ICMM) have published a set of guidelines on good practice guidance on mining and biodiversity (Johnson and Starke, 2006)
The Mining and Biodiversity Forum of South Africa, 2009 (Pre-publication Guidelines for South Africa)	The South African Mining and Biodiversity Forum (SAMBF) was stablished in 2005 to provide a platform for cross-sectoral interaction and co-operation in order to improve biodiversity conservation and management in the mining sector. A review of the status of biodiversity management in the mining industry in South Africa was published (Kuntonen-van't Riet 2007) and a need for the establishment of biodiversity guidelines was identified. The good practice guidance on mining and biodiversity, published by the ICMM was prepared for an international audience, and was therefore generic in nature. A pre-publication document in the South African context was released in 2012 called *Mainstreaming Biodiversity Into Mining: A Guideline For Practitioners And Decision Makers In The Mining Sector*. This guideline document was compiled to incorporate local biodiversity information and best practice guidelines, specific to South Africa. The Guideline aims specifically to integrate "relevant biodiversity information into decision making about mining options and how best to avoid, minimise or remedy biodiversity impacts caused by mining, and in so doing support ecologically, economically and socially sustainable development".

[(1)] It's worth noting that the Local Municipalities of Mkhondo and Pixley KaIsaka Seme are defined within the NSDP classification as areas of Combined Poverty and Economic Activity with high levels of poverty concentration situating them within the environment identified for sustainable economic development while being in need of significant social development spending.

Plan/Policy	Key Aspects/Objectives
South Africa's National Biodiversity Strategy and Action Plan (NBSAP) and the National Biodiversity Assessment (NBSA)	South Africa uses the NBSAP as a plan of action to achieve the Johannesburg Plan of Implementation (JPOI) (this is discussed in further detail in Section 4.8) biodiversity targets as well as providing the first step towards the development of a National Biodiversity Framework (as called upon in Chapter 3 of NEM:BA). According to the Minister of Environmental Affairs and Tourism in 2005, the NBSAP is based on the recognition that South Africa is extremely rich in terms of biodiversity, but is also a developing country where the majority of the population resides in poverty. The NBSAP recognises that Biodiversity should be managed in the context of ensuring equitable benefits to people – both current and future generations. The NBSAP highlights five strategic objectives with a number of outcomes linked to five-year targets, indicators, and activities to achieve the outcomes. Through the NSBA, it is recognized that biodiversity cannot be conserved through protected area networks only. All stakeholders, from private landowners and communities to business and industry must get involved in biodiversity management. NBSAP further identified mining as one of the activities that causes habitat transformation and degradation, and seriously threatens aquatic and terrestrial biodiversity. The strategy therefore promotes the inclusion of biodiversity considerations in mining regulations, guidelines and best practice codes to mitigate negative impacts and encourage sustainable mining practices through partnerships.
National Freshwater Ecosystem Priority Areas (NFEPA) Project	The NFEPA project is a multi-partner project between CSIR, South African National Biodiversity Institute (SANBI), Water Research Commission (WRC), Department of Water Affairs (DWA), Department of Environmental Affairs (DEA), Worldwide Fund for Nature (WWF), South African Institute of Aquatic Biodiversity (SAIAB) and South African National Parks (SANParks). The NFEPA project aims to: • Identify Freshwater Ecosystem Priority Areas to meet national biodiversity goals for freshwater ecosystems; and • Develop a basis for enabling effective implementation of measures to protect FEPAs, including free-flowing rivers

4.5 REGIONAL LEGISLATION

4.5.1 Mpumalanga Parks Board Act (Act No. 6 of 1995)

Summary of Act

The objectives of this Act are as follows:

- To provide effective conservation management of natural resources of the Mpumalanga Province;
- To promote the creation of economic and employment opportunities in pursuit of nature conservation and biodiversity;
- To ensure that natural systems, biodiversity and ecological functions and processes in the Mpumalanga Province are maintained;

- To determine and enforce limits to sustainable utilization of natural resources;

- To contribute to the advancement of scientific knowledge, and facilitate Technology transfer in respect of conservation; and

- Provide information and extension services to the public on conservation management, problem species, legal aspects of conservation and other conservation matters.

Applicability to Project

As the proposed Project is located in the Mpumalanga Province it will need to take into account the requirements of the Act by ensuring that suitable measures have been incorporated into the SEMP (this report) that are associated with maintenance and protection of biodiversity and associated ecological functioning, and that where loss of these systems are unavoidable that this loss is managed in a as sustainable manner as possible.

4.5.2 Mpumalanga Conservation Act, 1998 (Act No. 10 of 1998)

Summary of Act

To consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith.

Applicability to Project

As with the Mpumalanga Parks Board Act, the proposed Project and associated SEMP will have to take into account the necessary measures/conditions included in the Act.

4.5.3 Mpumalanga Tourism and Parks Agency Act (Act No. 5 of 2005)

Summary of Act

This Act provides for the establishment of the Mpumalanga Tourism and Parks Agency (MTPA) and for the management thereof by a Board; to provide for the sustainable development and improvement of the tourism industry in Mpumalanga; to provide for conservation management of the natural resources of Mpumalanga; to confer powers and functions upon the Agency; to provide for the registration of certain persons and entities directly involved in tourism; to provide for transitional arrangements; and to provide for matters incidental thereto.

Applicability to Project

The ESIA process associated with the proposed Kusipongo Resource Mining Project has registered the MTPA as an Interested and Affected Party.

4.5.4 Regional Plans and Policies

The following table highlights a selection of provincial plans and policies seen to be most pertinent to the proposed Project.

Table 4.10 Regional Development Policy Context

Policy	Key Aspects/Objectives
Mpumalanga Economic Growth and Development Path (MEGDP) (2011)	The primary objective of the MEGDP is to foster economic growth that creates jobs, and reduce poverty and inequality in the Province. Main economic sectors (all of which occur in the Gert Sibande District) identified as key to spur economic growth and employment creation and of relevance to this Project include: • Agriculture and forestry through: - Skills development; - Support for small-scale farmers and agri-business; - Fast-tracking the settlement of outstanding land claims; - Optimal utilization of restituted and distributed land; - Increased acquisition of agricultural land for the previously disadvantaged; and - Revisiting of current legislation to create balanced development in areas of competition between mining and farming. • Mining and energy through: - Upgrading and maintenance of coal haulage network; - Increased levels of higher skilled graduates; - Expanding the water network and increase reliance on water transfer schemes; - Increase South Africa's load and improve alternate energy supply; - Establishment of a mining supplier park to enhance enterprise development in the province; - Resolve land claims to release land for development. Comprehensive support to small-scale mining enterprises to exploit opportunities presented by corporate social; and - Investment initiatives, retreatment of sub-economic deposits and dumps, and dimension stones. • Tourism and cultural industries through: - Broadening and diversifying the primarily nature-based tourism product offerings of Mpumalanga into other segments of the market and subsequently grow the economy that create jobs through: ▪ Sustained investment in all aspects of the industry – new products, destination marketing, human capital development in the service industry; ▪ Investing in economic infrastructure, e.g. airport, International Conference Centre, sports Academy, roads for tourism routes, etc. ▪ Comprehensive support to SMMEs to exploit opportunities in the tourism and cultural industries.
Usutu River Water Quality Strategy (Department of Water Affairs Internal	The *objective* of this strategy is to maintain the pristine nature and very high quality of water in the upper Usutu so that it remains suitable for cooling requirements of Eskom's power stations.

Strategic Perspective, No. 6.3 of 2004)	The section of this strategy that is applicable to the proposed Project is as follows: *Assess the mining potential (especially for coal) in the upper Usutu catchment. There should be no further coal mining within this catchment, although a long term plan for the possible development of these reserves should be considered in the light of future demand.*
Mpumalanga Biodiversity Conservation Plan	The biodiversity of Mpumalanga has been recorded and catalogued by the Mpumalanga Parks and Tourism Authority (MPTA) for more than 10 years in what is referred to as the Provincial Biobase Project. This data has been combined and analysed to produce a spatial plan for biodiversity conservation and designed to serve as an environmental decision support tool. Information for the MBCP has been sourced from a draft of the Land-use Guidelines for Biodiversity Conservation Categories in Mpumalanga (Ferrar and Lötter, 2007). The spatial plan groups the province's biodiversity assets into six conservation categories: 1. Protected Areas (PA) - currently under formal biodiversity protection. 2. Irreplaceable areas - in urgent need of PA status. 3. Highly Significant areas - requiring strict land-use controls. 4. Important and Necessary areas - requiring special care. 5. Least Concern - providing sites for development. 6. No Natural Habitat remaining - providing preferred sites for all forms of development These areas have been mapped for the Project area, both in terms of the area's sensitivity rating and impact assessment.
Mpumalanga Tourism and Parks Agency Guidelines for Biodiversity Assessment	To promote national uniform standards in Environmental Management Plans (EMP's) the Mpumalanga Tourism and Parks Agency (MTPA) have set minimum standards that need to be conformed to in terms of Biodiversity Assessments for development applications. These guidelines cover flora, fauna, aquatic and wetland systems.

4.6 MUNICIPAL DEVELOPMENT PLANS AND FRAMEWORKS

The following table highlights a selection of district plans and policies seen to be most pertinent to the proposed Project.

Table 4.11 District Development Policy Context

Policy	Key Aspects/Objectives
Gert Sibande District Municipality Integrated Development Plan (IDP) (2012/13 - 2016/17)	• Ensuring a better life for all through: - Municipal infrastructure development; - Economic and tourism promotion; - Functioning ward committee system; - Community and stakeholder participation; - Efficient systems and administration; and - Human development.
Gert Sibande District Municipality Spatial Development Framework (SDF) (2009)	• Aims to deal with the spatial restructuring in an integrated manner, and to comply with the Municipal Systems Act (2000). • Local authorities embarked on a process of formulating Spatial Development Frameworks (SDFs) for their areas of jurisdiction as part of their Integrated Development Plans (IDPs). This included: - Assessing existing levels of development in the municipality including identification of communities

	which do not have access to basic municipal services; - Developing priorities and objectives including local economic development aims and internal transformation needs; - Establishing development strategies aligned with national or provincial sectorial plans and planning requirements binding on the municipality in terms of legislation; - Establishing a spatial development framework which must include the provision of basic guidelines for a land use management system for the municipality. • The SDF should promote sustainable development i.e. find a balance between the natural, social and Economic environment. This definition is also in line with the Local Agenda 21 Principles. • The general principle endorsed by this Bill is that spatial planning, land use management and land development must promote and enhance: - Equality; - Efficiency; - Integration; - Sustainability; and - Fair and good governance.

Table 4.12 Municipal Development Policy Context

Policy	Key Aspects/Objectives
Mkhondo Local Municipality Integrated Development Plan (IDP) (2010/2011)	• To provide adequate, sustainable service delivery infrastructure • To provide effective, affordable and accessible community services to all • To provide safety and security services to the communities of Mkhondo • To provide effective, transparent and accountable financial management services within the • Municipality • To ensure sound corporate governance
Pixley ka Seme Local Municipality Integrated Development Plan (IDP) (2009 - 2010)	To ensure comprehensive Integrated Planning and Economic Development within the Pixley Ka Seme Local Municipality. To guide development and planning for the political office bearers with emphasis on improving socio-economic situation, meeting millennium targets, improving service delivery mechanisms, strengthening and improving inter-governmental relations and community participation.

4.7 INSTITUTIONAL AND ADMINISTRATIVE FRAMEWORK

4.7.1 National, Regional and Local Authorities

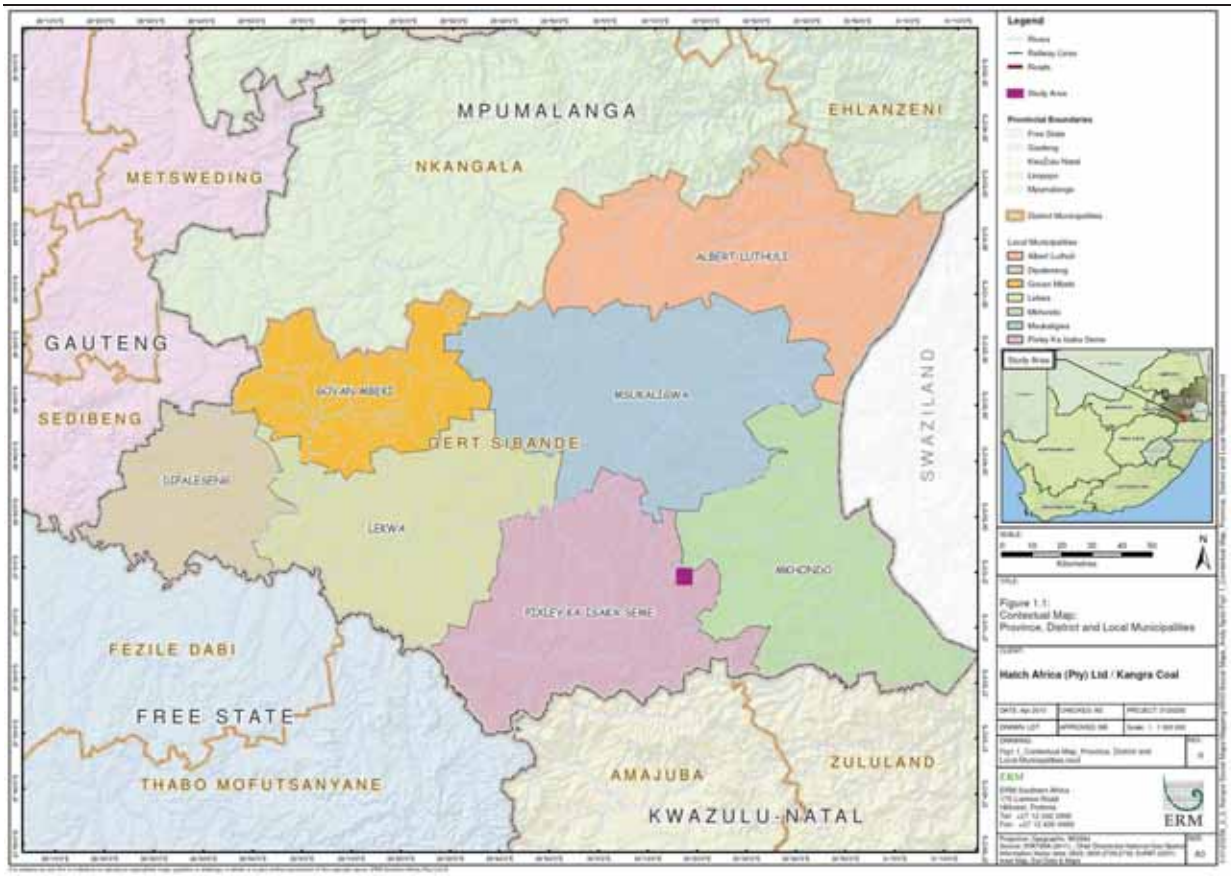
This section briefly presents aspects of South Africa's institutional structures that are relevant to the proposed Project. The levels of government outlined will have varying jurisdiction over the Project. Therefore an understanding and interaction between the parties will be necessary throughout the Project's lifecycle.

South Africa is a constitutional democracy (refer to Section 4.1.1) that is made up of three government structures: national, provincial and local government,

each obtaining powers from the Constitution. It is a sovereign, democratic state and is divided into nine provinces that each has a provincial legislature. The provincial government, and in the case of this proposed Project, the Mpumalanga Provincial Government, is responsible for providing a strategic vision and framework for the province, as well as ensuring cooperation between municipalities and ensuring each municipality performs their respective functions. The district and local municipalities are each responsible for the provision of services and infrastructure within their municipal boundaries (see *Figure 4.4* overleaf). This is facilitated through the development and implementation of Integrated Development Plans (IDPs), Spatial Development Frameworks (SDF) and Local Economic Development (LED) Plans, amongst others (refer to *Section 4.6*).

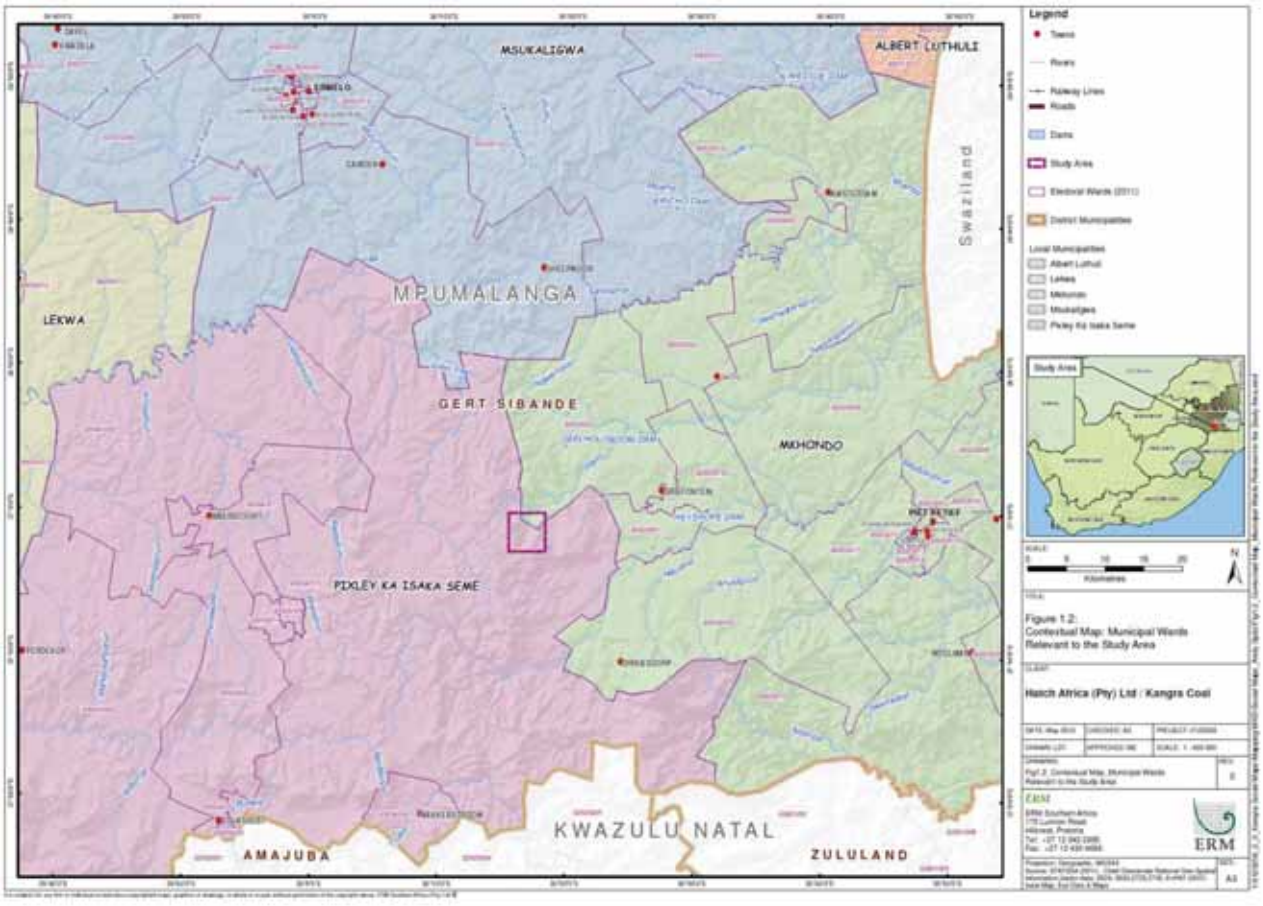
The proposed Project is located within the Mkhondo and Pixley Ka Seme Local Municipalities which fall within the greater Gert Sibande District. These two Local Municipalities are further divided into Wards. Of relevance to the proposed Project are Wards 2 and 3 of the Mkhondo Local Municipality (MLM) and Wards 5 and 10 of the Pixley Ka Seme Local Municipality (PKSLM) (*Figure 4.2* and *Figure 4.3*).

Figure 4.2 ***Contextual Map: Province, District and Municipality***



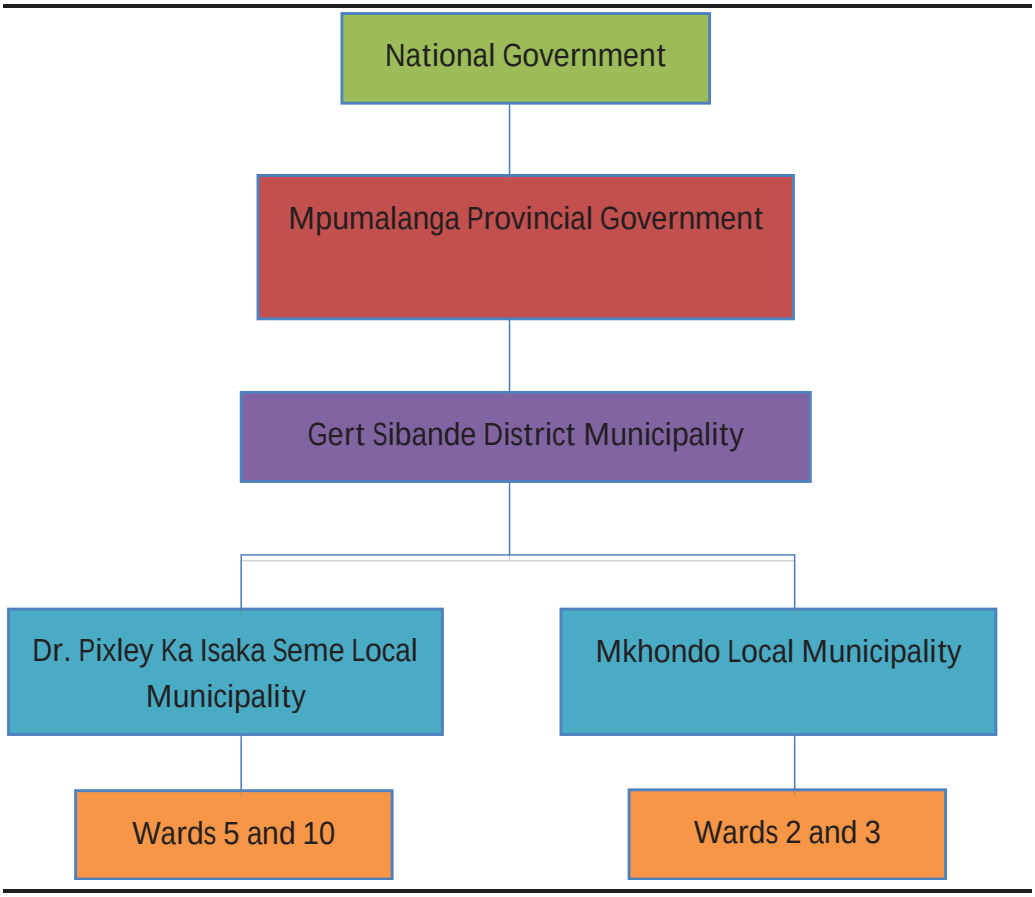
Please Note – Pixley Ka Isaka Seme is synonymous with Pixley Ka Seme

Figure 4.3 ***Contextual Map: Municipal Wards relevant to the Project Area***



Please Note – Pixley Ka Isaka Seme is synonymous with Dr. Pixley Kalsaka Seme

Figure 4.4 Formal Administrative Structure - National to Ward Level



At the national level, there are a number of Departments within whose domain the Project would fall including:

- **The Department of Mineral Resources** – to enable a globally competitive, sustainable and meaningfully transformed minerals and mining sector to ensure that all South Africans derive sustainable benefit from the country's mineral wealth.

- **The Department of Environmental Affairs** - to ensure the protection of the environment and conservation of natural resources, balanced with sustainable development and the equitable distribution of the benefits derived from natural resources.

- **The Department of Water Affairs** - to ensure that all South Africans gain access to clean water and safe sanitation, the water sector also promotes effective and efficient water resources management to ensure sustainable economic and social development.

- **The Department of Energy** - to ensure secure and sustainable provision of energy for socio-economic development.

- **The Department of Agriculture, Forestry and Fisheries** – to ensure a a united and prosperous agricultural sector, with the aim of supporting sustainable agricultural development.

- **The Department of Rural Development and Land Reform** – to develop a Comprehensive Rural Development Programme (CRDP) throughout the country.

- **The Department of Land Affairs** - provide an equitable and sustainable land dispensation that promotes social and economic development.

Specific impacts relating to the Project would be monitored and managed at the Provincial level in relevant departments and through local government, which includes district and local municipalities, and wards. Key amongst the Provincial departments are listed below in *Table 4.13*, together with their mission or mandate.

Table 4.13 Provincial Departments Relevant to the Project

Mpumalanga Department	Mission/Mandate	Applicability to the Project
Agriculture, Rural Development and Land Administration	• Comprehensive development strategy linked to land and agrarian reform and food security. • Speeding up growth and transforming the economy to create decent work and sustainable livelihoods. • Strengthening the skills and human resource base. • Sustainable resource management and use. • Building a developmental state including improvement of public services and strengthening democratic institutions.	May be consulted with on certain aspects of the proposed Project, including resettlement.
Economic Development, Environment and Tourism	• Mandated to steer provincial economic growth activities and ensure the preservation of the environment. • Speed up economic growth and transform the economy to create decent work and sustainable livelihood for the people of Mpumalanga.	Is the competent authority associated with the environmental authorisation process for the proposed Project.
Health	Mandated to provide and promote integrated quality health and social services in partnership with all stakeholders to ensure healthy lifestyles and reduce poverty in all communities in Mpumalanga. Services include: 1. Social Grants 2. Social welfare Services 3. Development	May be consulted with as part of the community benefits programme.

Mpumalanga Department	Mission/Mandate	Applicability to the Project
	Implementation 4. Health Programmes 5. HIV and AIDS Programmes 6. Maternal, Child and Women's Support 7. Mental Health Programmes 8. Rehabilitation Programmes	
Human Settlement	Rural Housing Programmes including • Rural Subsidy: Informal Land Rights • Farm Worker Assistance	May be consulted with on certain aspects of the proposed Project, including resettlement.
Education	Committed to render quality education and training, through good governance, effective teaching and maximum utilization of resources for socio-economic enhancement of all citizens.	May be consulted with as part of the community benefits programme.
Co-operative Governance and Traditional Affairs	Tasked to facilitate and co-ordinate Intergovernmental Structures and Development Agencies for Sustainable Integrated Service Delivery through participation and Traditional system of governance	May be consulted with on certain aspects of the proposed Project, including resettlement.
Department of Social Development	Intent on enabling the poor, vulnerable and excluded within South African society to secure better lives for themselves.	May be consulted with on certain aspects of the proposed Project, including resettlement.
Public Works, Roads and Administration	Acts as the custodian of public infrastructure including transport and other functions such as coordinating the provincial Expanded Public Works Programme.	May be consulted with on certain aspects of the proposed Project.

The above mentioned Departments operate in clusters to achieve goals set in the Province's development and service delivery strategies. Relevant clusters include:

- **The Economic Cluster** (Finance, Agriculture, Rural Development and Land Administration, Public Works and Economic Development, Environment and Tourism); and

- **The Social Services Cluster** (Education, Health and Social Development, Human Settlement and Sports, Culture and Recreation).

District and local councils (which include the wards) are independent and have legislative authority over their areas. Their primary responsibility is district-wide planning and capacity building. The wards or local councils share municipal authority with the district under which they fall.

4.7.2 Traditional Authorities

The continuing significance of the role of traditional leadership within South African society is currently under discussion. This has been particularly so since the scrapping of Apartheid-era legislation, the Black Authorities Act (1951), which employed divide and rule tactics to undermine traditional power structures (SACSIS, 2010). Many laws enacted to replace this Act however continue to perpetuate some of the instituted "traditions", marginalising women and rural communities where about one third of South Africa's population still lives (SACSIS, 2010).

Against this backdrop it is worth noting that the chieftaincy structure still operates in the proposed Project Area, albeit not strongly. Of relevance to the Project are Chiefs Yende, Mthetwa and Tshabalala.

Acting Chief Yende is seen as the main Traditional authority for the proposed Project Area and that area primarily affected by mine surface infrastructure. His chieftaincy, Mahlapahlapa Kwa Yende Traditional Council, includes the Project affected farms (those farms affected by mine surface infrastructure) of Maquasa, Donkerhoek, Twyfelhoek, Rooikop, Nooitgezien as well as Driefontein.

In Mpumalanga traditional leaders' responsibilities specifically include:

- Referring all Chieftainship disputes to the Commission on Traditional Leadership Disputes and Claims; and

- Handling all conflict and disputes between Traditional Leaders and the Community. (http://www.mphtl.gov.za/).

4.8 INTERNATIONAL GUIDELINES, STANDARDS AND ACCORDS

The following table highlights a selection of international guidelines, standards and accords seen to be most pertinent to the proposed Project.

Table 4.14 International Guidelines, Standards and Accords

Plan/Policy	Key Aspects/Objectives	Relevance to the Project
Convention on Biological Diversity (Rio de Janeiro, 1992)	The Convention is the first global, comprehensive agreement to address all aspects of biological diversity (genetic resources, species, and ecosystems). It recognizes - for the first time - that the conservation of biological diversity is "a common concern of humankind" and an integral part of the development process. South Africa signed in 1998, showing further commitment to the conservation of biodiversity. Further to this and discussed in more detail below, South Africa's policy and legislative framework for biodiversity is now well developed, providing a strong	Because South Africa is a signatory to the convention, aspects of this convention pertaining to the conservation of biological diversity should be taken into consideration by the authorities when making a decision on the proposed Project.

Plan/Policy	Key Aspects/Objectives	Relevance to the Project
	basis for the conservation and sustainable use of biodiversity.	
The Ramsar Convention (on wetlands of international importance especially as waterfowl habitat)	Over the years the Convention has broadened its scope of implementation to cover all aspects of wetland conservation and wise use, recognizing all wetlands as ecosystems that are extremely important for biodiversity conservation and for the well-being of human communities. South Africa became signatory to the Ramsar Convention on 21 December 1975.	Because South Africa is a signatory to the convention, aspects of this convention pertaining to the conservation of wetlands should be taken into consideration by the authorities when making a decision on the proposed Project.
United Nations Convention to Combat Desertification	The convention aims to minimise the overuse of water resources so as to mitigate desertification of countries. A convention to reverse the land use practices causing the process of desertification South Africa became signatory to the convention on 09 January 1995.	Because South Africa is a signatory to the convention, aspects of this convention pertaining to the overuse of water resources should be taken into consideration by the authorities when making a decision on the proposed Project.
The Bonn Convention (on conservation of migratory species of wild animals)	The Convention aims to conserve terrestrial, marine and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale. South Africa is a party to this convention.	Because South Africa is party to the convention, aspects of this convention pertaining to the conservation terrestrial migratory species should be taken into consideration by the authorities when making a decision on the proposed Project.
The World Heritage Convention, 1972	The most significant feature of the 1972 World Heritage Convention is that it links together the concepts of nature conservation and the preservation of cultural properties. The Convention recognizes the way in which people interact with nature, and the fundamental need to preserve the balance between the two. South Africa became signatory to the convention on 10 July 1997.	Because South Africa is a signatory to the convention, aspects of this convention pertaining to the preservation of cultural properties should be taken into consideration by the authorities when making a decision on the proposed Project.
The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Since wetlands often form part of special and unique habitats, they are indirectly protected under CITES. South Africa became signatory to the convention on 15 July 1975.	Because South Africa is a signatory to the convention, aspects of this convention pertaining to the conservation of wetlands should be taken into consideration by the authorities when making a decision on the proposed Project.
The IUCN (World Conservation Union)	The Union's mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.	The competent authority should take this into account.
The United Nations : Agenda 21, Rio +5 and the Johannesburg - World Summit on Sustainable	A summit focused on the evaluation of sustainable development programmes and policies and the success achieved towards their realization. The Summit which was hosted in Johannesburg adopted the Johannesburg Plan of Implementation and the Johannesburg Declaration and focussed	The sustainable development programmes and policies evaluated in this summit should be considered by the competent authority when making a decision on the proposed Project.

Plan/Policy	Key Aspects/Objectives	Relevance to the Project
Development, 2002	on the evaluation of sustainable development programmes and policies and the success achieved towards their realization.	
Johannesburg Plan of Implementation (JPOI), Chapter 4, 2002	Chapter four of the JPOI deals with protecting and managing the natural resource base of economic and social development (water; oceans; vulnerability; disaster management; climate change; agriculture; desertification; biodiversity; mountains; tourism; forests; mining). A general target, to achieve by 2010, is a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on earth.	As above.
New Partnership for Africa's Development (NEPAD), 2003	This initiative encourages sustainable development and associated conservation and wise use of biodiversity in Africa. It has been recognised that a healthy and productive environment is a prerequisite for the success of NEPAD, together with the need to systematically address and sustain ecosystems, biodiversity and wildlife. Six areas have been identified: • Combating land degradation, drought and desertification; • Conserving Africa's wetlands; • Preventing and controlling invasive alien species; • Conservation and sustainable use of coastal and marine resources; • Combating climate change in Africa; and • Cross-border conservation and management of natural resources	This initiative should be considered by the competent authority when making a decision on the proposed Project.
The Tripartite Interim Agreement between the Republic of Mozambique, Republic of South African and the Kingdom of Swaziland for Co-operation on the Protection and Sustainable Utilisation of the Incomati and Maputo Watercourses.	The general protocols of this agreement are associated with sustainable, equitable and reasonable utilisation of shared water resources. Furthermore, it is to prevent, reduce and control pollution of surface and ground waters, and protect and enhance the quality status of the waters and associated ecosystems for the benefit of present and future generations. The Protocol aims to promote a partnership between the three countries and to prevent, eliminate, mitigate and control Transboundary impacts. The scope of this agreement is to provide a dynamic process for the short, medium and long-term management of water quality, to implement an exchange of and access to the necessary information and data and to compile a framework for capacity building between the three neighbouring countries.	This agreement should be considered by the competent authority when making a decision on the proposed Project.

4.9 THE INTERNATIONAL FINANCE CORPORATION

Kangra Coal will not be applying for international funding, nor have they opted to meet international standards. ERM have, however used the International Finance Corporation (IFC) standards, as a framework to 'guide' its ESIA process.

The aim of these international standards is to ensure the environmental and social risks associated with major infrastructure development projects are considered and managed by proponents, in line with international good practice. Although the Project is not currently seeking external debt financing, and is therefore not formally required to meet the standards, their application as far as is practicable can serve as a useful risk and performance management tool.

4.9.1 Performance Standards

The IFC, a division of the World Bank Group that lends to private investors, has recently released a Sustainability Policy and set of Performance Standards on Social and Environmental Sustainability (January 2012) (*Box 4.1*). These Standards replace the prior IFC safeguard policies and are used to evaluate any project seeking funding through the IFC.

Box 4.1 IFC Performance Standards

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage

The Performance Standards underscore the importance of managing environmental, social and health issues throughout the life of a project. They identify the need for an effective social and environmental management system that is dynamic and continuous, '*involving communication between the client, its workers, and the local communities directly affected by the Project*'. They require '*a thorough assessment of potential social and environmental impacts and risks from the early stages of project development and provides order and consistency for mitigating and managing these on an ongoing basis*'. (1)

The Performance Standards also reinforce the importance of effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them.

(1) IFC, 2006.

Through the Performance Standards, the IFC requires clients to engage with affected communities through disclosure of information, consultation, and informed participation, in a manner commensurate with the risks to, and impacts on, the affected communities.

4.9.2 *IFC Environmental, Health and Safety (EHS) Guidelines*

The EHS Guidelines are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to Performance Standard 3: Pollution Prevention & Abatement, as well as certain aspects of occupational and community health and safety.

When the host country (South African) regulations differ from the levels and measures presented in the EHS Guidelines, projects will be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

General EHS Guidelines also exist which contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors are listed in *Box 4.2.*

Box 4.2 IFC General EHS Guidelines

General EHS Guidelines

1. Environmental
1.1 Air Emissions and Ambient Air Quality
1.2 Energy Conservation
1.3 Wastewater and Ambient Water Quality
1.4 Water Conservation
1.5 Hazardous Materials Management
1.6 Waste Management
1.7 Noise
1.8 Contaminated Land

2. Occupational Health and Safety
2.1 General Facility Design and Operation
2.2 Communication and Training
2.3 Physical Hazards
2.4 Chemical Hazards
2.5 Biological Hazards
2.6 Radiological Hazards
2.7 Personal Protective Equipment (PPE)
2.8 Special Hazard Environments
2.9 Monitoring

3. Community Health and Safety
3.1 Water Quality and Availability
3.2 Structural Safety of Project Infrastructure
3.3 Life and Fire Safety (L&FS)
3.4 Traffic Safety
3.5 Transport of Hazardous Materials
3.6 Disease Prevention
3.7 Emergency Preparedness and Response

4. Construction and Decommissioning
4.1 Environment
4.2 Occupational Health and Safety
4.3 Community Health and Safety

4.9.3 IFC Sector Guidelines

In addition to the IFC guidelines noted in the sections above, there are certain sector (industry) specific guidelines that are considered applicable for the proposed Project. The applicable guidelines are presented in *Box 4.3* below.

Box 4.3 IFC Sector Specific Guidelines

1. Environmental, Health and Safety Guidelines for Mining
2. Environmental, Health, and Safety Guidelines for Waste Management Facilities
3. Environmental, Health, and Safety Guidelines for Water and Sanitation

4.10 PROPONENTS CORPORATE POLICIES AND PROCEDURES

In addition to national, provincial and local legislation, policies and guidelines, Kangra Coal also has internal policies and procedures to which it needs to comply. Typically, such policies represent high level commitments which Kangra Coal, through the implementation of either elements of, or through certification of, an ISO14001 (or similar) Environmental Management System (EMS), aim to achieve. Procedures detailing the steps to manage identified aspects are in place to ensure commitments made in the various Kangra Coal policies, are met.

Pertinent environmental and social policies applicable to current Kangra Coal activities are described below.

4.10.1 Environmental Policy

Kangra Coal is committed to responsible environmental stewardship and sustainable business practices; Kangra Coal pledges to improve their overall environmental performance across all their business activities. Kangra Coal encourages their business partners and members of the entire Kangra group to participate in this endeavour.

In accordance with this Environmental Policy (ENV-P-001), Kangra Coal strives for compliance with all environmental laws and commits to manage all of its activities in the environment.

5 THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT METHODOLOGY

5.1 INTRODUCTION

The purpose of this SEMP is to examine how the proposed Kusipongo Resource Mining Project will lead to a measurable difference in the quality of the environment and the quality of life of impacted individuals. Over the past decades, environmental impact assessments have expanded to include social impact assessments as well as public participation/consultation in the planning and decision-making process to avoid, reduce, or mitigate adverse impacts and to maximise the benefits of the project proposed. More recently, the emphasis has moved to the ESIA process producing robust social and environmental management conditions, which can effectively be implemented during the life of the project and culminating with an effective decommissioning plan.

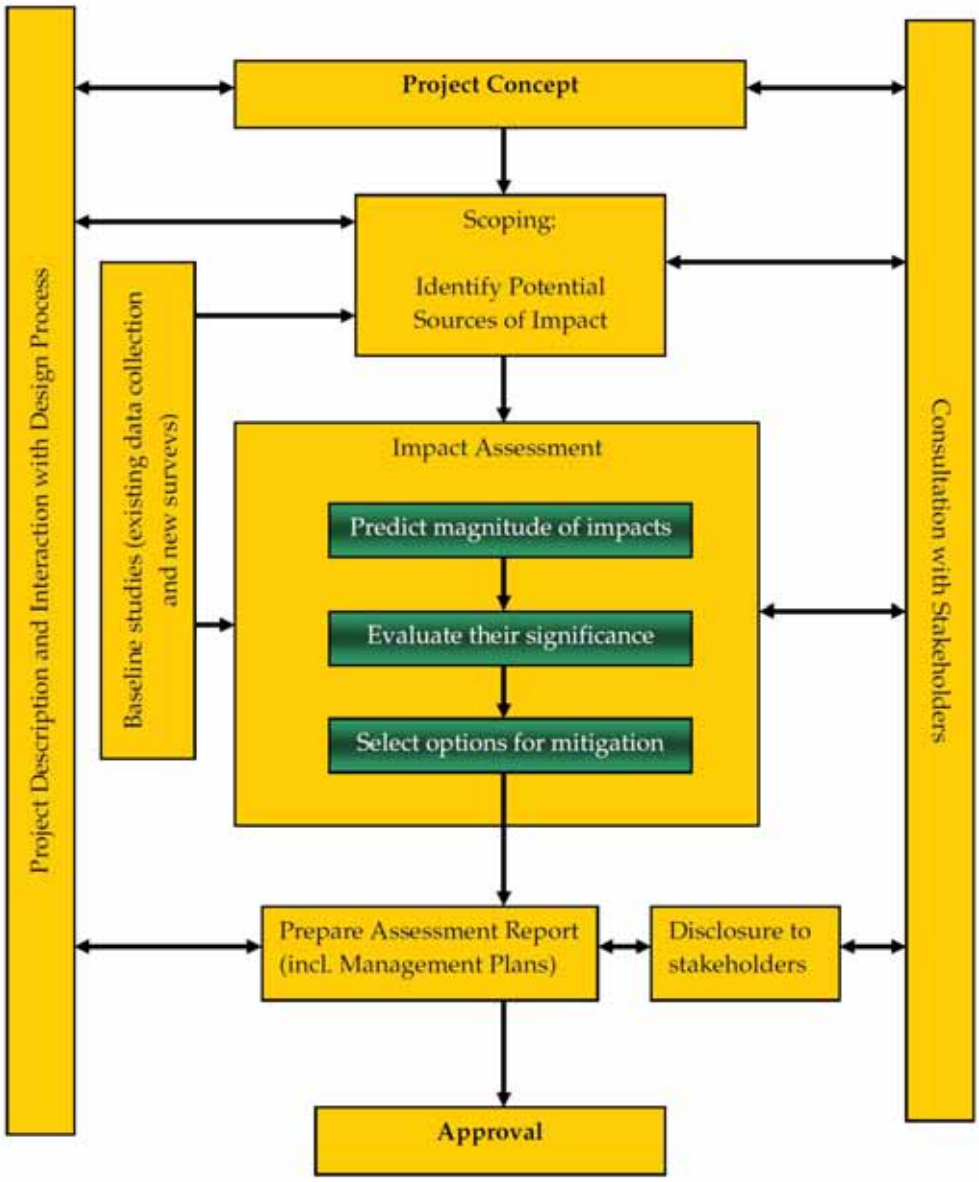
The key stages for this ESIA process are:

- Scoping (and site selection);
- Identification of alternatives;
- Public Participation;
- Baseline data collection;
- Project description and interaction with design and decision-making;
- Assessment of impacts and identification of mitigation/management measures;
- Assessment of cumulative impacts;
- Development of a monitoring programme;
- Compilation of specific social and environmental management plans;
- Compilation of a closure cost estimate; and
- Reporting and disclosure.

Figure 5.1 illustrates a generic overview of the ESIA process. This is, however, not a linear process, but one where several stages are carried out in parallel and where the assumptions and conclusions are revisited and modified as the proposed Project and ESIA progress.

The following sections provide detail on how each stage of the ESIA process was and will be applied to the proposed Project.

Figure 5.1 The ESIA Process



5.2 SCOPING

The purpose of the scoping phase was to identify key sensitivities and those activities with the potential to contribute to, or cause, potentially significant impacts to environmental and socio-economic receptors and resources and to evaluate siting, layout and technology alternatives for the proposed Project. The key objectives of scoping were to:

- Identify the potentially most significant impacts;
- Obtain public views through consultation; and
- Develop the Terms of Reference for the SEMP through consultation so as to ensure that the process and output are focused on the key issues.

During this phase, interested and affected parties and key stakeholders were identified and provided with an opportunity to review the Draft Scoping Report (under NEMA) and the Scoping Report (under the MPRDA) and to raise any interim comments/concerns/queries that they may have with the proposed Project.

The final scoping report (under the MPRDA) was lodged with the Regional DMR on 19 December 2012 and with the National and Regional DEA (under NEMA) on 10 April 2013.

5.3 PUBLIC PARTICIPATION

The key principle of consultation is to ensure that the views of the public are taken into account and reported in the ESIA. The objective is to ensure the assessment is robust, transparent and has considered the full range of issues or perceptions, and to an appropriate level of detail.

Definition of "Public" – Public include those individuals, groups or organisations who themselves could be directly affected by the proposed Project (Project affected people) and those individuals or organisations who, although not directly affected by the proposed Project, represent those affected or have a regulatory duty, an interest, influence or secondary involvement in the proposed Project.

Public participation started during the scoping phase and continued throughout the assessment ensuring that legislative requirements and Project standards were met, that public concerns were addressed in the assessment and that sources of existing information and expertise were identified.

Consultation has been undertaken at a number of stages during the evolution of the Project. An overview of the consultation programme that has been undertaken is described in *Chapter 6*. A full list of stakeholders consulted throughout the ESIA process is also given in *Annex B*.

5.4 BASELINE DATA COLLECTION

The description of the baseline environmental and socio-economic conditions provides information on receptors and resources that have been identified during scoping as having the potential to be *significantly* affected by the proposed Project. It also describes baseline conditions that have been used to make the assessment. The description of the baseline is aimed at providing sufficient detail to meet the following objectives:

- To identify the key conditions and sensitivities in areas potentially affected by the proposed Project;
- To provide a basis for extrapolation of the current situation, and development of future scenarios without the proposed Project;

- To provide data to aid the prediction and evaluation of possible impacts of the proposed Project;

- To understand public concerns, perceptions and expectations regarding the proposed Project;

- To allow the proposed Project to develop appropriate mitigation measures; and

- To provide a benchmark to assess future changes and to assess the effectiveness of mitigation measures.

Baseline studies and associated impact assessments for all specialist studies are included in *Annex C* of this SEMP. These specialist reports also (where necessary) provide the methodology used to collect baseline data. Furthermore, a summary of the baseline environments are provided in *Chapters 7* and *8*.

5.5 *IDENTIFICATION OF ALTERNATIVES*

The interaction between the ESIA team and the design and decision-making process is one of the key areas in which an ESIA process can influence how a project develops. It includes involvement in defining the Project and identifying those activities with the potential to cause environmental and social impacts. Project planning, decision-making and refinement of the Project description continue throughout the assessment process as a result of the development of the proposed Project and in response to the identified impacts.

During the ESIA process, there was extensive liaison between Hatch (the engineering and feasibility consultants for the proposed Project), Kangra Coal, Shanduka Coal and ERM with regard to identifying impacts and potential mitigation measures. Examples of key areas covered between ERM and Hatch include the:

- Initial site screening of potential adit locations.

- Refinement of the layout of the main mine adit so as to avoid having Project infrastructure in areas that are considered (from a hydrological and biodiversity perspective) as being "No-go" areas. An example of this involves the placement of the emergency evaporation pond and sewage sludge drying beds within the 1:100 and 1:50 year floodline and the placement of the 70 000m^3 waste rock stockpile and fuel storage within or close to a wetland classified as a valley bottom wetland with a channel. Kangra Coal have now committed to moving these proposed infrastructure and stockpile away from the identified wetland and floddlines to a more suitable location.

- Refinement of the conveyor route and access/support road to the conveyor routing.

5.6 ASSESSMENT OF IMPACTS AND MITIGATION

The impact assessment stage comprises a number of steps that collectively assess the manner in which the proposed Project will interact with elements of the physical, biological, cultural or human environment to produce impacts to resources/receptors. The steps involved in the impact assessment stage are described in greater detail below.

Please Note - the environmental impact assessment detailed below is an approach that combines *Impact Magnitude* and *Receptor Sensitivity* to determine **Impact Significance**.

The overall approach that specialists (associated with the ESIA for the proposed Kusipongo Resource Project) adopted towards the rating and evaluation of impacts is similar to what is detailed in *Section 5.6.1* below; however, the impact criteria used by the ***Heritage***, ***Noise*** and ***Visual*** specialists are disparate. For the Heritage Impact Assessment, classification of impacts followed and is conformance to the requirements of the South African Heritage Resources Agency (SAHRA). The Noise and Visual Impact Assessments have different impact classifications, but broadly speaking followed the methodology as is defined in this Chapter. These disparate Impact Assessment methodologies are detailed in the respective specialists Impact Assessment Reports (refer to Annex C.4, C.5 and C.9 respectively).

5.6.1 Impact Assessment

The impact characteristic terminology to be used is summarised in *Table 5.1*.

Table 5.1 Impact Characteristic Terminology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct Indirect Induced
Extent	The "reach" of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local Regional International
Duration	The time period over which a resource / receptor is affected.	Temporary Short-term Long-term Permanent
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.).	[no fixed designations; intended to be a numerical value]
Frequency	A measure of the constancy or periodicity of the impact.	[no fixed designations; intended to be a numerical value]

In the case of *type*, the designations are defined universally (i.e., the same definitions apply to all resources / receptors and associated impacts). For these universally-defined designations, the definitions are provided in *Table 5.2*.

Table 5.2 Designation Definitions

Designation	Definition
Type	
Direct	Impacts that result from a direct interaction between the Project and a resource / receptor (e.g., between occupation of a plot of land and the habitats which are affected).
Indirect	Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g., viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land).
Induced	Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
Extent	
Local	Defined on a resource / receptor-specific basis.
Regional	
International	
Duration	
Temporary	Defined on a resource / receptor-specific basis.
Short-term	
Long-term	
Permanent	

In the case of *extent* and *duration*, the designations themselves (shown in *Table 5.1*) are universally consistent, but the definitions for these designations will vary on a resource / receptor basis (e.g., the definition of what constitutes a "short term" duration for a noise-related impact may differ from that of a "short term" duration for a habitat-related impact). This concept is discussed further below.

In the case of *scale* and *frequency*, these characteristics are not assigned fixed designations, as they are typically numerical measurements (e.g., number of acres affected, number of times per day, etc.).

The terminology and designations are provided to ensure consistency when these characteristics are described in an impact assessment deliverable. However, it is not a requirement that each of these characteristics be discussed for every impact identified.

An additional characteristic that pertains only to unplanned events (e.g., traffic accident, operational release of toxic gas, community riot, etc.) is *likelihood*. The likelihood of an unplanned event occurring is designated using a qualitative (or semi-quantitative, where appropriate data are available) scale, as described in *Table 5.3*.

Table 5.3 Definitions for Likelihood Designations

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable).

Likelihood is estimated on the basis of experience and/or evidence that such an outcome has previously occurred.

It is important to note that likelihood is a measure of the degree to which the unplanned event is expected to occur, *not* the degree to which an impact or effect is expected to occur as a result of the unplanned event. The latter concept is referred to as *uncertainty*, and this is typically dealt with in a contextual discussion in the impact assessment deliverable, rather than in the impact significance assignment process.

In the case of impacts resulting from unplanned events, the same resource/receptor-specific approach to concluding a magnitude designation is utilised, but the 'likelihood' factor is considered, together with the other impact characteristics, when assigning a magnitude designation. There is an inherent challenge in discussing impacts resulting from (planned) Project activities and those resulting from unplanned events. To avoid the need to fully elaborate on an impact resulting from an unplanned event prior to discussing what could be a very low likelihood of occurrence for the unplanned event, this methodology incorporates likelihood into the magnitude designation (i.e., in parallel with consideration of the other impact characteristics), so that the "likelihood-factored" magnitude can then be considered with the resource/receptor sensitivity/vulnerability/importance in order to assign impact significance. Rather than taking a prescriptive (e.g., matrix) approach to factoring likelihood into the magnitude designation process, it is recommended that this be done based on professional judgment, possibly assisted by quantitative data (e.g., modelling, frequency charts) where available.

Once the impact characteristics are understood, these characteristics are used (in a manner specific to the resource/receptor in question) to assign each impact a *magnitude*. In summary, magnitude is a function of the following impact characteristics:

- Extent;
- Duration;
- Scale;
- Frequency; and
- Likelihood.

Magnitude essentially describes the degree of change that the impact is likely to impart upon the resource / receptor. As in the case of extent and duration, the magnitude designations themselves (i.e., negligible, small, medium, large) are universally used and across resources / receptors, but the definitions for these designations will vary on a resource / receptor basis, as is discussed further below. The universal magnitude designations are:

- Positive;
- Negligible;
- Small;
- Medium; and
- Large.

The magnitude of impacts takes into account all the various dimensions of a particular impact in order to make a determination as to where the impact falls on the spectrum (in the case of adverse impacts) from *negligible* to *large*. Some impacts will result in changes to the environment that may be immeasurable, undetectable or within the range of normal natural variation. Such changes can be regarded as essentially having no impact, and should be characterised as having a *negligible* magnitude. In the case of *positive* impacts no magnitude will be assigned.

In addition to characterising the magnitude of impact, the other principal step necessary to assign significance for a given impact is to define the sensitivity / vulnerability / importance of the impacted resource / receptor. There are a range of factors to be taken into account when defining the sensitivity / vulnerability / importance of the resource / receptor, which may be physical, biological, cultural or human. Where the resource is physical (for example, a water body) its quality, sensitivity to change and importance (on a local, national and international scale) are considered. Where the resource / receptor is biological or cultural (for example, the marine environment or a coral reef), its importance (for example, its local, regional, national or international importance) and its sensitivity to the specific type of impact are considered. Where the receptor is human, the vulnerability of the individual, community or wider societal group is considered.

Other factors may also be considered when characterising sensitivity / vulnerability / importance, such as legal protection, government policy, stakeholder views and economic value.

As in the case of magnitude, the sensitivity / vulnerability / importance designations themselves are universally consistent, but the definitions for these designations will vary on a resource / receptor basis. The universal sensitivity / vulnerability / importance designations are:

- Low;
- Medium; and
- High.

Once magnitude of impact and sensitivity / vulnerability / importance of resource / receptor have been characterised, the significance can be assigned for each impact.

Impact significance is designated using the matrix shown in *Table 5.4*.

Table 5.4 Impact Significances

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	**Medium**	**High**
Magnitude of Impact	**Negligible**	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources / receptors, and all impacts to these resources / receptors, as the resource / receptor- or impact-specific considerations are factored into the assignment of magnitude and sensitivity designations that enter into the matrix. *Box 5.1*provides a context for what the various impact significance ratings signify.

Box 5.1 Context of Impact Significances

An impact of ***negligible*** significance is one where a resource / receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of ***minor*** significance is one where a resource / receptor will experience a noticeable effect, but the impact magnitude is sufficiently small (with or without mitigation) and / or the resource / receptor is of low sensitivity / vulnerability / importance. In either case, the magnitude should be well within applicable standards.

An impact of ***moderate*** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and / or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of ***major*** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued / sensitive resource / receptors. An aim of IA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

5.6.2 Mitigation of Impacts

Once the significance of a given impact has been characterised using the above mentioned methodologies, the next step is to evaluate what mitigation measures are warranted. In keeping with the Mitigation Hierarchy, the priority in mitigation is to first apply mitigation measures to the source of the impact (i.e., to avoid or reduce the magnitude of the impact from the associated project activity), and then to address the resultant effect to the resource / receptor via abatement or compensatory measures or offsets (i.e., to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude).

It is important to have a solid basis for recommending mitigation measures. The role of any given ESIA is to help develop a consentable project, and to help clients meet their business objectives in a responsible manner. Impact assessment is about identifying the aspects of a project that need to be managed, and demonstrating how these have been appropriately dealt with. As key influencers in the decision making process, the role of the impact assessment is not to stop development or propose every possible mitigation or compensatory measure imaginable, but rather to make balanced judgements as to what is warranted, informed by a high quality evidence base.

Additional mitigation measures should not be declared for impacts rated as not significant, unless the associated activity is related to conformance with an 'end of pipe' applicable requirement. Further, it is important to note that it is

not an absolute necessity that all impacts be mitigated to a not significant level; rather the objective is to mitigate impacts to an as low as reasonably possible (ALARP) level.

Embedded controls (i.e., physical or procedural controls that are planned as part of the project design and are not added in response to an impact significance assignment), are considered as part of the project (prior to entering the impact assessment stage of the impact assessment process).

5.6.3 Residual Impact Assessment

Once mitigation measures are declared, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation measures.

5.6.4 Dealing with Uncertainty

Even with a final design and an unchanging environment, impacts are difficult to predict with certainty, but in projects such as the proposed Kusipongo Resource Project where the design process is currently in progress, uncertainty stemming from on-going development of the Project design is inevitable, and the environment is typically variable from season to season and year to year. Where such uncertainties are material to ESIA findings, they are clearly stated and are approached conservatively ('the precautionary approach') in order to identify the broadest range of likely residual impacts and necessary mitigation measures.

Potential impacts may be assessed using tools ranging from quantitative techniques such as hydrodynamic modelling to qualitative techniques based on expert judgment and historical information. The accuracy of these assessment tools depends on the quality of the input data and available information. Where assumptions have been made, the nature of any uncertainties associated with the assumption is discussed. For qualitative predictions / assessments, some uncertainty is removed through consultation.

5.6.5 Cumulative Impacts/Effects

Cumulative impacts and effects are those that arise as a result of an impact and effect from the Project interacting with those from another activity to create an additional impact and effect. These are termed cumulative impacts and effects.

The impact assessment process predicts cumulative impacts / effects to which the proposed Project may contribute. The approach for assessing cumulative impacts and effects resulting from the proposed Project and another activity affecting the same resource / receptor is based on a consideration of the approval / existence status of the 'other' activity and the nature of information available to aid in predicting the magnitude of impact from the other activity.

5.6.6 Management Systems Integration

Stakeholders and external decision-makers for the proposed Kusipongo Resource Project will rely on the findings of this SEMP (e.g. significance of residual impacts) in coming to their ultimate views. As any given ESIA process is based on predictions made in advance of an activity taking place, it effectively makes assumptions that the project will implement certain controls and mitigation measures. If the controls do not happen, then the SEMP is undermined as a tool for stakeholders and external decision-makers. It is important, therefore, that these 'assumptions', i.e. the mitigation measures, are commitments that will be implemented by Kangra Coal throughout the life of the proposed Project.

It is also important that, over the life of the proposed Project, that the commitments of this SEMP are turned into specific actions and that these form part of Kangra Coal's existing Environmental and Social Management System.

This system should ensure that any unforeseen impact or issues that may arise will be dealt with in an effective manner in accordance with the relevant laws and regulations of South Africa. In this way, stakeholders and external decision-makers should have confidence in the SEMP as a tool to aid their decision-making on the proposed Project.

In order for the implementation of the SEMP to be successful, a statement of the responsibility, timing and reporting requirements associated with each management / mitigation measure or set of measures is generally issued. This SEMP also provides the procedures by which management / mitigation conditions can be monitored (refer to *Part II*, *Chapter 14*).

5.6.7 Reporting and Disclosure

This SEMP will be disclosed to the authorities and Interested and Affected Parties.

5.6.8 Uncertainty and Change Management

As Project design is finalised, a greater level of certainty regarding the impacts of the proposed Kusipongo Project will emerge. Accordingly, Project design changes may occur that need to be accommodated by Kangra Coal and their contractors. Similarly, the organisational structure and roles and responsibilities may also change as the Project progresses.

The ESIA process does not stop with submission of the reports. Therefore, the SEMP will require a mechanism to manage change. At times these changes may be material, potentially influencing the original findings of the SEMP, and hence, the basis for its approval. Such a mechanism to manage change, or a change management system, must ensure that changes to the scope of the proposed Project are subjected to a robust assessment process. Any changes to

Project scope will be evaluated for their degree of significance, and will be incorporated into the appropriate Kangra Coal documentation as follows:

- Minor changes will be reflected in updates/amendments to the SEMP (this document); and

- Substantive changes (such as ancillary infrastructure associated with the proposed Project) that might potentially alter the ESIA process findings (i.e. those that result in changes to the predicted significance of environmental and social impacts) will be subject to re-assessment, further stakeholder consultation, supplementary reporting and revision of the Project's SEMP. Typically, such substantive changes will be submitted as an addendum to this SEMP.

6 PUBLIC PARTICIPATION PROCESS

ERM is conducting the public participation process (PPP) as part of the Environmental and Social Impact Assessment (ESIA) that is associated with the application for Environmental Authorisation, Waste License Application, Water Use License Application (WULA) and the Mining Rights Application Processes for Kangra Coal's proposed Kusipongo Resource Expansion Project in Mpumalanga. The PPP is being conducted by ERM's specialist PPP team and has been carried out in conjunction with the technical environmental studies. This team includes consultants from ERM and GAIA Environmental Consulting as well as a facilitator and translator from Di-Idea Communications (hereafter included in references to the ERM team).

The PPP has been designed to comply with the regulatory requirements set out in

- The National Environmental Management Act (NEMA) (Act No. 107 of 1998) as amended Act 62 of 2008 and the National Environmental Management Waste Act (Act No. 59 of 2008) (NEMWA): Chapter 6 of the Impact assessment regulations of 2010 presented in Government Notice 543 which specifies the minimum requirements for public participation in an EIA under the NEMA.

- The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002). The requirements of Section 39 of the MPRDA and the *Guidelines for Consultation with Communities and Interested and Affected Parties* released by the Department of Mineral Resources (DMR) in early 2011.

- The National Water Act (Act No. 36 of 1998) consultation requirements and the Department of Water Affairs *Generic Public Participation Guidelines*, 2001.

Public participation in an ESIA is not only a statutory requirement, but a process that is designed to provide Interested and Affected Parties (I&APs) with an opportunity to:

- Provide local knowledge on the Project Area;
- Raise issues of concern;
- Identify and confirm issues requiring further investigation in the impact assessment, thus guiding the scope of the specialist work;
- Influence project decisions;
- Evaluate the results of impact assessment studies and suggested enhancement / mitigation thereof.

I&APs represent various interests and sectors of society and the relevant organs of state. Through informed and transparent public participation,

effective social and environmental management / mitigation measures can be established and implemented should the Project be authorised.

The ESIA has been concluded and a Final SEMP is due for submission to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET), Department of Environmental Affairs (DEA). Furthermore, an amended SEMP will be submitted to the Mpumalanga Department of Mineral Resources (DMR) on the basis of a formal request to do so (dated 24 July 2013) . This *Chapter* provides an overview of the PPP and describes what engagement activities have been undertaken to date. It is concluded by identifying what the next steps in the PPP will be.

6.1 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS

The PPP has been designed to achieve the following objectives:

- To ensure that I&APs are well informed about the proposed Project;
- To provide a broad set of I&APs sufficient opportunity to engage and provide input and suggestions on the proposed Project;
- To verify that I&APs' issues have been accurately recorded and considered and / or addressed;
- To draw on local knowledge in the process of identifying environmental and social issues associated with the proposed Project, and to involve I&APs in identifying ways in which these can be addressed; and
- To comply with legal requirements (as detailed above).

The PPP has been designed in four phases, namely:

Pre-scoping Phase

- Identified and consulted with key I&APs Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities, relevant traditional, regional and national authorities and directly affected landowners; and
- Introduced the proposed Project and its processes to key I&APs.

Scoping Phase

- Officially initiated and notified the public of the formal ESIA process;
- Invited prospective I&APs to register as I&APs;
- Engaged with I&APs to identify issues of concern, suggestions and comments about the proposed Project;

- Invited I&APs to make suggestions for enhanced Project benefits and identification of reasonable alternatives;

- Verified that issues raised by I&APs had been accurately recorded through a Draft and Final Scoping Report; and

- Defined the Terms of Reference for the ESIA specialist studies to be undertaken in the impact assessment phase through consideration of issues raised in the public domain.

Impact Assessment Phase

This phase allowed I&APs to provide informed comment on the findings of the specialist assessments and proposed mitigation measures. Due to the need to submit the SEMP to DMR in time to support the 180 day requirement of the Mining Rights Application (MRA), it was initially intended to hold preliminary feedback meetings with key stakeholders and directly affected I&APs prior to the DMR submission. The following I&AP engagement activities were scheduled:

- A focus group discussion with the affected landowners and non-governmental organisations on 16 May 2013.

- Individual one-on-one discussions with the traditional authorities on 17 May 2013; and

- A focus group discussion with the affected community representatives (2 Community Property Associations and Community at Donkerhoek) on 18 May 2013.

Due to service delivery protests in the area however, there was no attendance at the landowner and Non-Governmental Organisations (NGO) focus group meeting and subsequent preliminary feedback meetings were cancelled. The SEMP was therefore submitted to DMR without I&AP comments and responses associated with disclosure of the SEMP in order to meet the required date requested by DMR. This has been discussed with DMR and it has been agreed that an Amended SEMP will be prepared and submitted to DMR following I&AP feedback on the SEMP as part of the NEMA/NEMWA process.

Feedback to I&APS as part of the NEMA/NEMWA process (also detailed in this Chapter) has allowed for review of the Draft SEMP (over a 60 day period for key regulatory authorities and a 49 day comment for all other stakeholders) and has involved active engagement. Comments received during this phase have been:

- Included as an Amended SEMP which has been submitted to the DMR; and

- Included in the Final SEMP which has been submitted to MDEDET and DEA to inform an environmental authorisation decision and Waste Management License in terms of NEMA and NEMWA respectively. This will be released into the public domain again for a 21 day comment period.

Decision Making Phase

Once the MDEDET, DMR and DEA have made a decision about the proposed Project, the public participation team will immediately notify I&APs of this decision and of the opportunity to appeal. This notification will be provided as follows:

- A letter will be sent out, personally addressed to all registered I&APs, summarising the authority's decision and explaining how to lodge an appeal should they wish to; and

- An advertisement to announce the environmental authorisation decision will be published in the *Excelsior* and the *Recorder* newspapers.

6.2 WHO ARE THE I&APS

One of the key principles informing the PPP is that it should be an inclusive process. Given the location of the proposed Project, as well as the location of the existing mine; it is important that I&APs from both Mkhondo and Dr Pixley Kalsaka Seme Local Municipalities are given the opportunity to participate in the process. Notification activities have been designed to ensure that I&APs within both Local Municipalities are invited to be involved in the process.

I&APs were invited to become part of the process in two ways:

- Through notification activities, which were designed to ensure that the broader public were informed of the process and invited to be involved; and

- Through ERM proactively registering I&APs identified as potentially interested or affected through the pre-scoping / scoping phase.

Members of the public have been notified and invited to register as I&APs through a series of English, Afrikaans, Zulu and Sesotho PPP notification materials as appended in *Annexure B.1*.

Key I&APs in the following I&AP groups have been identified and involved in the project:

- **Government**: Authorising and commenting authorities from relevant National, Provincial, District and Local Departments as well as relevant Ward Councillors and elected political representatives. Specifically these have included:
    - Dr. Pixley Kalsaka Seme Local Municipality;
    - Mkhondo Local Municipality;
    - Gert Sibande District Municipality;
    - Mpumalanga Tourism and Parks Agency;
    - Mpumalanga Department of Economic Development, Environment and Tourism;
    - Mpumalanga Department of Co-operative Governance and Traditional Affairs;
    - Mpumalanga Department of Human Settlements;
    - Mpumalanga Department of Public Works, Roads and Transport;
    - Mpumalanga Department of Agriculture, Rural Development and Land Administration;
    - Department of Mineral Resources;
    - South African Heritage Resources Agency;
    - Department of Environmental Affairs;
    - Department of Public Works;
    - Department of Education;
    - Department of Agriculture, Forestry and Fisheries;
    - Department of Water Affairs; and
    - Department of Energy.

- **Directly Affected Traditional Authorities**:
    - Madabukela Traditional Council;
    - Madlangampisi Traditional Council;
    - Lekhotla Traditional Council;
    - Ndlela Traditional Council;
    - Ogenyaweni Traditional Council.

- **Directly Affected I&APs**: Landowners and communities. These are specifically provided in *Table 6.1*.

Table 6.1 Directly Affected I&APs

Name			Properties owned
Mr	Rudi	Kemp	Donkerhoek 10HT Ptn 3, Twyfelhoek 379 HT, Ptn 4
Mr	Pine	Pienaar	Roodepoort 38HT Ptn 1 and Re
Ms	Lynette	Wessels	Oogiesfontein 17HT Ptn 1
Mr	Janie	Du Plessis	Oogiesfontein 17HT Re; Langverwacht 20HT, Ptn 1, 2,3
Mr	CJF	Greyling	Donkerhoek 14HT Ptns 3, 4Re, 7,8,9,10,11,12,21,22; Beelzebub 13HT 1Re, 3,4,6,Re; Boschbank 11HT Ptn 2; Blinkwater 34HT, Ptn 1, 2 and Re; De Paarl Ptn 3

			and Re
Mr		Nkumane	Yende Community Property Association (previously called Thutukani) and Donkerhoek Community;
Mr	Paulos Jabulani	Nhleko	Member of Kanluka Communal Property Association: Kransbank 15HT Ptn 1,2 and Re

- **Neighbouring Landowners**: Neighbouring farm owners and communities.

- **Downstream water users**:
  - MPact
  - NTE Company

- **Environmental and Social Focused Community Based Organisations (CBOs) and Non-Governmental Organisations (NGOs)**::
  - Assegai Catchment Forum
  - Birdlife South Africa
  - Wildlife & Environment Society of South Africa;
  - Wakkerstroom Natural Heritage Association;
  - WWF
  - Endangered Wildlife Trust
  - Sisonke Environmental Club
  - Mkhondo Alathia Rehabilitation Centre
  - Inkomati Catchment Management Agency
  - Usustu River Catchment Management Agency
  - Mkhondo Environmental Protection Agency
  - Heyshope Dam Boating Club
  - Forestry Stewardship Council
  - Forestry South Africa
  - Piet Retief Dienssentrum
  - Simunye Ntombe Community Organisation
  - SAVT Piet Retief
  - SATV Volksrust
  - Christelike Maatskaplike Raad Van Piet Retief
  - 2001 Youth Development
  - Masibumbane Traditional Healers
  - Thandolwethu Community Home Based Care
  - Sinothando Community Health Workders
  - Mkhondo Local Aids Council
  - Mpumulanga Welfare Social Service and Development Forum
  - Thandanani Home Based Care
  - Tholusizo Home Based Care
  - Zenzele Day Care Centre
  - J-Life Ministeries

- SANTA

An I&AP database has been compiled and will continue to be updated throughout the PPP. The existing detailed I&AP database is appended as *Annexure B2*.

6.3 PUBLIC PARTICIPATION ACTIVITIES

Table 6.2 below provides details of the public participation activities undertaken to date. Where activities have already been completed, annexures of supporting material are indicated.

Table 6.2 Public Participation Activities

Activity	Details	Reference in SEMP
Pre-Scoping Phase		
Meetings with relevant I&APs	Meetings with local authorities, appropriate traditional authorities and potentially directly affected landowners in mid July 2011. Introduction of the proposed Project and its processes.	***Annexure B3*** I&AP meeting minutes
Scoping Phase		
Distribution of proposed Project announcement letter and Background Information Document (BID)	BID and announcement documentation emailed and posted to I&APs. (Registration period: 29 July – 26 August 2011)	***Annexure B5*** BID, letters, registration and comment sheet, adverts, site notices
Placing of adverts	Adverts were placed in the *Excelsior* (5 August 2011) and *Recorder* (5 August 2011) newspapers as well as the Municipal circulars (Vuka Pixley Kalsaka Seme and Mkhondo News).	***Annexure B1 and B5*** BID, letters, registration and comment sheet, adverts, site notices
Placing of site notices	Site notices were placed at local libraries, post offices, Municipal offices and frequently visited shops or taxi ranks in Volksrust, Wakkerstroom, Dirkiesdorp, Piet Retief, Driefontein and Daggakraal.	***Annexure B1 and B5*** BID, letters, registration and comment sheet, adverts, site notices
Identification of I&APs	I&AP database which includes I&APs from various sectors of society including directly affected landowners in and around the proposed Project area.	***Annexure B2*** I&AP database
Obtained comments from I&APs	Comments, issues of concern and suggestions received from I&APs were captured in the Comment and Response Report.	***Annexure B4*** Comment and Response Report
Distribution of postponement letter	Postponement letters for the continuation of the Scoping Phase and Draft Scoping Report (DSR) availability were sent to I&APs (20 December 2011).	***Annexure B1*** BID, letters, registration and comment sheet, adverts, site notices
Draft Scoping Report	A DSR was compiled on the basis of comments received. This included a component detailing the public participation activities undertaken to date.	Not applicable
Announcement of DSR	DSR announcement letter sent to all I&APs on the database. Adverts placed in the	***Annexure B5*** DSR public

Activity	Details	Reference in SEMP
	Excelsior and *Recorder* newspapers in early January 2013 to announce the DSR availability together with a schedule and venues for I&AP meetings. Site notices were put up at the following places and contained information about the DSR availability together with a schedule and venues for I&AP meetings: • Volksrust Public Library and Post Office • Wakkerstroom Library and Post Office • Piet Retief Library and Post Office • Driefontein Post Office and Thusong Service Centre • Daggakraal Clinic • Dirkiesdorp Clinic.	participation material
Making DSR available to I&APs	DSR and accompanying documents were placed at the following public places within the proposed Project area: • Volksrust Public Library and Post Office • Wakkerstroom Library and Post Office • Piet Retief Library and Post Office • Driefontein Post Office and Thusong Service Centre • Daggakraal Clinic • Dirkiesdorp Clinic. (DSR public review period: 7 January – 8 March 2013)	***Annexure B5*** DSR Public Participation material
I&AP meetings	The following I&AP engagement activities have taken place to present the results of the Scoping Phase of the Project and receive comment on the DSR: • One-on-one discussion with the traditional authorities for the Project area on 26 January 2013, 10h00-16h00 • A focus group discussion with the affected community representatives (2 Community Property Associations and community at Donkerhoek) on 27 January 2013, 15h00-17h00 • A meeting with the 7 affected (directly and adjacent) Community Property Associations on 28 January 2013, 10h00-13h00 • A focus group discussion with Municipal officials and councillors for the 1 District and 2 Local Municipalities on 29 January 2013, 10h00-12h00 • A focus group discussion with non-governmental organisations on 29 January 2013, 13h00-16h00 • A focus group discussion with affected and adjacent landowners on 29 January 2013, 17h00-19h00 • A public open day at the Driefontein Community Hall on 30 January 2013,	***Annexure B5*** DSR Public Participation material

Activity	Details	Reference in SEMP
	09h00-13h00 • A public meeting at the Driefontein Community Hall on 30 January 2013, 14h00-17h00.	
Obtained comments from I&APs	Comments, issues of concern and suggestions received from I&APs are captured in the updated Comment and Response Report. Responses have been provided by the EAP, Project engineers and Kangra Coal.	***Annexure B4*** Comment and Response Report
Preparation of the Final Scoping Report	The DSR has been modified on the basis of issues raised during the comments period. The Final Scoping Report (FSR) was submitted to the regulatory authorities to inform the required scope of work for the impact assessment phase of the Project. The Final Scoping Report was submitted to the Regional DMR on 19 December 2012 and the Regional DEDET and National DEA on 10 April 2013.	Not applicable
Making FSR available to I&APs	In line with the EIA Guidelines the Final Scoping Report lodged on 10 April 2012 had to be made available for public comment for a period of 21 days that runs in parallel with the competent authority review period. Registered I&APs were notified by mail/email/sms of the availability of the FSR for public comment. Furthermore, the FSR was placed at the following venues: • Volksrust Public Library, Post Office • Wakkerstroom Library • Piet Retief Post Office and Library • Driefontein Post Office • Daggakraal Clinic • Dirkiesdorp Clinic. I&APs were encouraged to submit comments on the FSR directly to the regulatory authorities.	***Annexure B6*** FSR Public Participation material
Impact Assessment Phase		
Notification of preliminary information sharing and feedback meetings	Due to the need to make a submission of the SEMP to the DMR by 27 May 2013, ERM invited directly affected I&APs to preliminary information sharing and feedback meetings. Meetings proposed included: • Community Property Associations for Yende and Kanluka • Community representatives residing on Donkerhoek 10HT • Traditional authorities for the affected area • Landowners for the area and non-governmental organisations that have been actively involved in the Project to date. Notification for these meetings entailed:	***Annexure B7*** Directly affected I&APs notification material

Activity	Details	Reference in SEMP
	• Letters of notification (English) for the key stakeholder engagements • Emails (English) for the key stakeholder engagements • Letters of invitation (Zulu and Sesotho) for the CPA and traditional authority meetings. The above mentioned I&APs were notified between the period 3 May and 6 May 2013 of the upcoming meetings.	
Preliminary information sharing and feedback meetings	There was no attendance at the landowner and NGO meeting and subsequent scheduled meetings were cancelled as a result.	Not applicable
Submission of SEMP to DMR	In order to meet the required MRA timeframes, the Social and Environmental Management Programme was submitted to DMR on 27th May 2013.	Not applicable
Draft SEMP	A Draft SEMP was prepared to report on the results of the ESIA and associated specialist studies. This included a public participation chapter demonstrating work undertaken to date and that proposed for the remainder of the ESIA process. The Draft SEMP was submitted to the regulatory authorities for a 60 day comments period on 14th June 2013.	Not applicable
Notification of the ESIA Feedback Phase and availability of the Draft SEMP 49 days allowed for	Registered I&APs were notified by mail/email/sms of the availability of the Draft SEMP for public comment and further I&AP engagements. The Draft SEMP was placed at the following venues: • Volksrust Public Library • Volksrust Post Office • Wakkerstroom Library • Piet Retief Post Office and Library • Driefontein Post Office • Daggakraal Clinic • Dirkiesdorp Clinic; • ERM website. Additional notification measures included: • Telephonic follow up for meeting attendance	***Annexure B8*** Draft SEMP notification material
I&AP meetings	The following I&AP engagements were held for feedback on the results of the ESIA: • Three focus group discussions with the traditional authorities on 26th July and 30th July 2013 • A focus group meeting with the directly affected CPAs (Yende and Kanluka) and the Donkerhoek community on 27th July 2013	***Annexure B8*** Draft SEMP notification material

Activity	Details	Reference in SEMP
	• A meeting with the 7 affected (directly and adjacent) Community Property Associations on 28th July 2013 • A focus group discussion with Driefontein Community Forum on 29th July 2013 • A focus group discussion with Municipal officials and councillors for the 1 District and 2 Local Municipalities on 30th July 2013 • A focus group discussion with affected and adjacent landowners and non-governmental organisations on 30th July 2013 • Meeting with the regulatory authorities on 31st July 2013. There was no attendance at the regulatory authority meeting.	
Obtained comments from I&APs	Comments, issues of concern and suggestions received from I&APs have been captured in the updated Comment and Response Report. Responses to additional comments have been provided by the EAP, project engineers and Kangra Coal.	***Annexure B4*** Comment and Response Report
Preparation of the Final and Amended SEMPs	The Draft SEMP has been modified on the basis of issues raised during the comments period. This will be submitted to the regulatory authorities to inform the environmental authorisation / licensing decision.	Not applicable
Making Final SEMP available to I&APs	In line with the EIA Guidelines the Final SEMP will be made available for public comment for a period of 21 days following submission to the competent authority. Registered I&APs will be notified by mail / email / sms of the availability of the Final SEMP for public comment. The Final SEMP will be placed at the following venues: • Volksrust Public Library • Volksrust Post Office • Wakkerstroom Library • Piet Retief Post Office and Library • Driefontein Post Office • Daggakraal Clinic • Dirkiesdorp Clinic • ERM website. I&APs will be encouraged to submit comments on the Final SEMP directly to the regulatory authorities.	***Annexure B9*** Notification material for Final SEMP.

A summary of comments / issues and questions raised by I&APs are included in *Table 6.3* below. A full list of comments and associated responses are included in the Comment and Response report (*Annexure B4*).

Table 6.3 Summary of Interested and Affected Parties' Comments

Category	Comments Raised
Proposed Project Specific	• Queries regarding the distance from existing mine • Queries around the continuation of activities at existing mine • Requests for information required on mine plan • Clarity regarding the motivation for the location of the main mine adit • Queries around the location and extent of mining • Queries around surface impacts and need for resettlement • Queries around the ventilation of the underground mine • Queries around landownership where the mine is proposed • Further information required regarding the relative location of the GCS Project • Concern that there are conflicting prospecting rights in the area • Clarity regarding the mining method and safety risks • Queries around the eventual extent of mining operation on the basis of prospecting activities • Queries around the payment of royalties • Clarification as to who the shareholders of Kangra Coal are • Information with regard to the commencement of activities on site • Clarity as to why two projects for Kangra Coal are been undertaken by different consultants • Clarity regarding the different mining operations in the area • Queries around the size of the affected Project Area • Clarity regarding engineering measures taken to mitigate dust impacts and water contamination • Clarity regarding the depth of the mining operation • Clarity regarding the number of contractors to be accommodated in the construction camp • Queries around the engineering of the conveyor belt and continued movement across this servitude • Clarity regarding the location of access roads and surfacing of these • Clarity regarding the possibility of realigning infrastructure to minimise resettlement • Clarity regarding export of the coal

Category	Comments Raised
Public Participation	• Face to face engagement with landowners and communities encouraged • Need for the involvement of councillors to assist with I&AP identification • Need for the involvement of Dr Pixley Kalsaka Seme Municipality • Need for engagement with the Traditional Authorities • Need for Sesotho as well as Zulu translation • Involvement of 7 communities required • Possibility for fragmentation of communities if not afforded equal involvement • Need for transportation to meeting venues if far away • Conflict within the Yende Community and the need to take cognisance of this • Possibility of holding a meeting in Wakkerstroom suggested • Open involvement of all community members to be encouraged • Avoidance of signing attendance registers • Need for feedback on the ESIA • Independence of environmental assessment practitioners • On-going engagement of traditional authorities throughout the life of the operation required • Establishment of a Trust to manage and ensure equal communication with all affected parties. • Need for information sharing and mining awareness workshops with affected communities. • Additional time to review information prior to focus group meetings is required • Involvement of the Driefontein Development Committee in meetings with the Driefontein Community Forum should be encouraged • Need for additional report copy closer to the communities of Twyfelhoek and Donkerhoek • Need for improved relationship with Kangra Coal. • Concern that the Driefontein Community Forum is not representative of the Driefontein Community. • Concern that the stakeholder engagement programme has been incomplete.
Rehabilitation and Closure	• Backfilling of pits and safety and water contamination issues associated with leaving these open. • Risk of acid mine drainage post closure. • Financial guarantee not paid to government. • Assurance that appropriate rehabilitation will take place is required.
Soils	• Impact on soil fertility. • Soil contamination through ground and surface water contamination.
Traffic and Safety	• Increased volumes of traffic on roads. • Damage to existing roads. • Increase in road traffic fatalities. • Health and safety risk to be experienced by employees in the proposed Kusipongo Resource underground mining area.

Category	Comments Raised
Biodiversity	• Impact on wetland areas and associated birdlife. • Impact on biodiversity classified as "irreplaceable" and "highly significant" in terms of the Mpumalanga Biodiversity Conservation Plan (MBCP). • Need to meet provincial targets for conservation. • Section 49 application for no mining development in the area submitted for approval to the Department of Mineral Resources by Mpumalanga Tourism and Parks Agency. • Suggestion for the use of wattle plantations for the absorption of contaminated water and removal of heavy metals. • Biodiversity offsets should be proposed as part of the SEMP. • No effective mitigation is of concern. • Inadequate monitoring of threatened bird species proposed.
Water Availability and Water Quality	• Impact on water quality and water resources in the area. • Dewatering impacts as a result of open pit activities and drawdown into the open pits. • Impact on a key water source for the country as a whole. • Impact of the residue deposit expansion on Heyshope Dam. • Impact of the current conveyor route on Heyshope Dam. • Previous evidence of acid mine drainage and water contamination. • Clarity regarding the duration for which an alternative water supply will be provided. • Suggestion for Kangra Coal to develop a dam for communities to access a clean water supply. • Impact of water contamination and dewatering on new water bottling business in the area. • Need to assess the potential for acid mine drainage. • Clarity regarding the storage of water on site. • Need to consider the impact of dewatering on downstream water users. • Lack of a Water Use License is of concern. • Proposed mitigation anticipated to be ineffective.
Heritage	• Grave resettlements to consider individual families requirements for traditional ceremonies.
Visual	• Lighting impacts on communities need to be minimised.
Spontaneous combustion	• Possible ignition of fine coal dust. • Covering of conveyor belt may result in temperature increases and possibly spontaneous combustion.

Category	Comments Raised
Socio-economic and Community Development	• Need for benefits to the community, via employment and sustainable development and investment in the area. • Resettlement impacts including the relocation of graves and the need to provide social infrastructure for the resettled households. • Importance of ensuring sustainable benefits to the community for the long term (including unborn generations). • Sharing of benefits between the affected (immediately and those more distant) communities required and avoidance of preferences. • Training for employment required. • Existing training initiatives to be clarified. • Proof requested of Kangra Coal's previous community development / social investment initiatives requested. • Historical dissatisfaction with regard to employment and community development offered by Kangra Coal expressed. • Loss of access to land for communities. • Procurement policies of the mine requested. • Priority required for the employment of local people. • Loss of jobs from the closure of the current operations. • Need for Kangra Coal to focus on education, training and skills development for social development in the area. • Traditional authorities request for royalties. Benefits only accruing to landowners. • Financial support for community projects requested. • Benefits from the Social and Labour Plan to be clarified. • Opportunity for power supply to communities. • Eligibility for employment if attended focus group meetings. • Local leadership consultation required for employment opportunities. • Concern that resettlement may result in smaller properties and / or township like development. • Health impacts associated with resettlement if located close to access roads. • Timing of resettlement and influence of this on livelihoods and current agricultural initiatives. • Benefits from RDP Housing programmes if resettled. • Resettlement to impact on previously disadvantaged people and to take people away from existing services. • Need to remain in same CPA area of jurisdiction. • Clarity sought regarding the number of people to be resettled. • Preference given to some private landowners with regard to continued access to Kangra Coal purchased land. • In-migration of people to the area and resultant HIV / Aids impact.
Air Quality	• Increase in NO_x and SO_x emissions. • Harmful fumes as well as odours that may emanate from proposed Project activities. • Impact of dust on grazing activities.
Information Requirements	• Request to have access to the water specialist reports. • Request for the Department of Mineral Resources acceptance letter for the Mine Rights Application. • Request for monitoring reports from current operation. • Request for feasibility study or competent person's report. • Proof of authorisation for current activities.

Category	Comments Raised
Blasting and Vibration	• Cracking of aboveground structures as a result of underground mining including historical cases. • Impacts of blasting. • Monitoring of blasting impacts is required. • Clarity sought regarding reporting mechanisms for blasting impacts. • Notification of blasting events required. • Noise due to blasting activities.
Historical Activities	• No action taken when environmental impacts have been reported. • Promises made to the communities that have not been met. • No action taken on views of the communities. • Social and Labour Plan and Local Economic Development commitments have not been met. • No response to information requests. • Grave relocation ineffective in the past – placed in area of subsistence. • Mitigation for the Kusipongo Project unlikely to be effective if existing management commitments are not implemented.
Other	• Clarity regarding actions that can be taken if unauthorised activities taking place and / or if grievances are not resolved by Kangra Coal. • Clarity regarding claims against transport contractors where vehicle damage has been incurred. • Resolution of land claims required. Mining should not proceed on land under claim. • Kangra Coal's capacity to implement management plan is under question. • Benefits for surface landowners and landusers where there is undermining. • Responsibilities for monitoring the environmental management plan. • Feedback on monitoring results to communities required. • No accountability or actions for cumulative impact mitigation proposed.

Objections to the Project have also been raised and are either included in the Comments and Response Report or (where formally written) attached (*Annexure B10*). Grounds for these objections were related to:

- Biodiversity and water impacts associated with an irreplaceable resource and the impact that this will have on downstream water users;
- Refusal for activities proposed to take place on land of current landowner;
- Concern regarding Kangra Coal's accountability and responsibility with regards to environmental management;
- Concern regarding mitigation proposed as part of the SEMP.

These are detailed in *Table 6.4*.

Table 6.4 Objections to the Proposed Kusipongo Resource Project

I&AP raising objection	Reason for objection	Date
Mr Greyling, Owner of Donkerhoek 14HT Ptns 3, 4Re, 7,8,9,10,11,12,21,22; Beelzebub 13HT 1Re, 3,4,6,Re; Boschbank 11HT Ptn 2; Blinkwater 34HT, Ptn 1, 2 and Re; De Paarl Ptn 3 and Re	• Concerns not addressed by Kangra or in the Final Scoping Report • Objection to granting of mineral right over properties • Mitigation of negative impacts not adequate	29th April 2013 and 14th August 2013
Driefontein Community	• Previous relationship problems with Kangra where promises have not been fulfilled and impacts not addressed.	30th January 2013
Charles Makuwerere, WWF	• Country's water resource should not be compromised on the basis of exported resource. • Area falls within Section 49 application • The area is largely classed as irreplaceable by the provincial MBCP and thus crucial for the achievement of provincial conservation targets • The area is located in endangered and vulnerable threatened ecosystems (in terms of NEM:BA) • The area falls within provincial and national priority protected area expansion zones • Ineffective mitigation anticipated	29th January 2013
Gudren Loubser, Neighbouring landowner and concerned resident	• Previous lack of accountability and responsibility for environmental management and impacts incurred • Impact on the Heyshope dam and downstream water users	31st January 2013
Mpumulanga Tourism and Parks Agency	• No detail provided in submission.	23rd July 2013
Johan A Viviers and Viroshini Naidoo, Mpact	• Impact on the flow of the Ohlelo River on which Mpact is dependant	8th August 2013
Wendy Watson, Wakkerstroom Tourism Association	• Opposition to commercial development, which will destroy the sensitive habitat around Wakkerstroom and tourism potential. • Impact on water and wetlands • Lack of employment opportunities • Impact on road conditions	11th April 2013

I&AP raising objection	Reason for objection	Date
Carolyn Ah Shene – Verdoorn, Birdlife South Africa	• Importance of the area as falling in Grassland Important Bird Area from national and international perspective • Project area forming part of the Wakkerstroom / Luneberg Threatened Ecosystem which is considered to be endangered • Proposed expansion area falls within the greater Usuthu River Catchment, which is recognised under the National Freshwater Ecosystem Priority Areas (NFEPA) for both wetland and river ecosystems. • Impact on the water quality of the Assegai Catchment, which will impact on the nearby Heyshope Dam • Public consultation meetings scheduled were not held and no alternatives provided • Impacts on surface water quality and quantity and insufficient mitigation • Impacts on reduced base flow to wetlands without possible mitigation • The large water transfer scheme and downstream receiving environment are also not duly considered. • Direct loss of watercourses and associated hydromorphic grasslands • No off-sets for wetlands and watercourses proposed • Mitigation for biodiversity impacts insufficient • Threatened bird species monitoring once per year ("on an annual basis") does not equate to an adequate mitigation measure • No direct accountability or action on behalf of Kangra Coal proposed for cumulative impacts • Lack of water use license for existing operations	17th January 2013, 23rd April 2013 and 14th August 2013

6.4 *STAKEHOLDER PARTICIPATION AND LIMITATIONS OF THE PROCESS*

The PPP, although comprehensive and meeting legislative requirements has experienced several constraints which have required adaptation in terms of

the process implemented, but will require further careful management should a positive environmental authorisation decision be received:

- Proactive identification of stakeholders has not included downstream water users, although their registration has been promoted through advertising (undertaken during the Scoping Phase of the study). One of the key findings of the SEMP is that there will be an impact on water availability / quality in the Ohlelo River (which has its confluence with the Hlelo River approximately 25km downstream from the main mine adit) as a result of dewatering operations. A Water Use License application (WULA), and associated processes, is being undertaken in parallel to this ESIA.

- The meeting with the Driefontein Community during the Scoping Phase of the project was disrupted due to frustrations over the lack of benefits the community is receiving and the impacts that the mine has historically had on the people. It was therefore necessary during the Impact Assessment Phase of the project to adopt a different engagement approach. Kangra Coal has established a Community Forum through which regular meetings between Kangra Coal and the Driefontein Community are now held. These parties were engaged as part of the feedback process. Continued notification of registered Driefontein community members has, and will, continue as part of the ESIA process.

- Given service delivery protests in the area, it was not possible to hold the preliminary feedback meetings with Key I&APs before the SEMP was submitted to DMR on 27 May 2013. Subsequent feedback meetings with such I&APs have been held between 26th and 31st July 2013 and an Amended SEMP will be submitted to DMR within the prescribed timeframes. ERM therefore believes that I&AP concerns have been adequately addressed in the said report against which the DMR is to make a decision.

- Participation at many of the stakeholder meetings has been relatively poor, specifically the regulatory authority meeting (on 31st July 2013) for which there were no attendees. Although encouraged, consultation with the regulatory authorities has been very limited. It is assumed that this will be addressed through the authority review process when comment is sought from the relevant competent authorities.

6.5 NEXT STEPS IN THE ESIA PROCESS

The next steps in the process include:

- The submission of the Final SEMP and the addendum to the earlier version of the SEMP to the necessary decision-making authorities.
- The availability of the Final SEMP for I&AP comment for a 21 day comments period

- Notification of the regulatory authorities environmental authorisation decision when this is obtained.

6.6 ON-GOING STAKEHOLDER ENGAGEMENT FOR THE KUSIPONGO PROJECT

The PPP has identified several requests for on-going stakeholder engagement with Kangra which require mention here. Given the poor relationship that Kangra Coal has had with its stakeholders in the past and poor levels of trust that are demonstrated by most stakeholder groups, it is recommended that some of these be considered for implementation. The requests are:

- Continued regular on-going consultation with landowners, landusers, the 7 Community Property Associations, 5 traditional authorities and the Driefontein Community through its representatives should be promoted. A plan for this consultation should be developed and agreed upon with all parties;

- Questions have been raised with regard to the representation of the Driefontein Community Forum and suggestions have been made for the expansion of this body. This requires further investigation and implementation;

- Significant consultation is required in terms of the resettlement process and the uncertainty that exists around this; and

- Opportunities for the empowerment and education of stakeholders should be sought wherever possible. Much interest has been expressed in understanding the mining process better as well as suggestions for involvement in HIV / Aids campaigns.

7 THE RECEIVING ENVIRONMENT – PHYSICAL AND BIOLOGICAL CHARACTERISTICS

It is important to gain an understanding of the physical, biological and social attributes of the Project area of the Kusipongo Resource Expansion Project and its surroundings, as it will provide for a better understanding of the receiving environment in which the Project is being considered.

The description of the baseline environment is essential in that it represents the conditions of the environment before the construction of the proposed Project. The description of the baseline environment therefore provides a description of the current environment against which the impact of the proposed Project can be assessed and future changes monitored.

The information presented in *Chapter 7* and *8* has been collected from desktop studies and supplemented with site visits to the Project Area. The methodologies used to aid data collection are discussed in the respective specialists reports attached in *Annexure C*.

Chapter 7 and *8* describe the physical and biological characteristics and the social characteristics of the receiving environment respectively. The two chapters are organised as follows:

Chapter 7:

- Climate;
- Topography;
- Geology;
- Soils;
- Land Capability;
- Surface Water;
- Groundwater;
- Air Quality;
- Noise; and
- Biodiversity.

Chapter 8

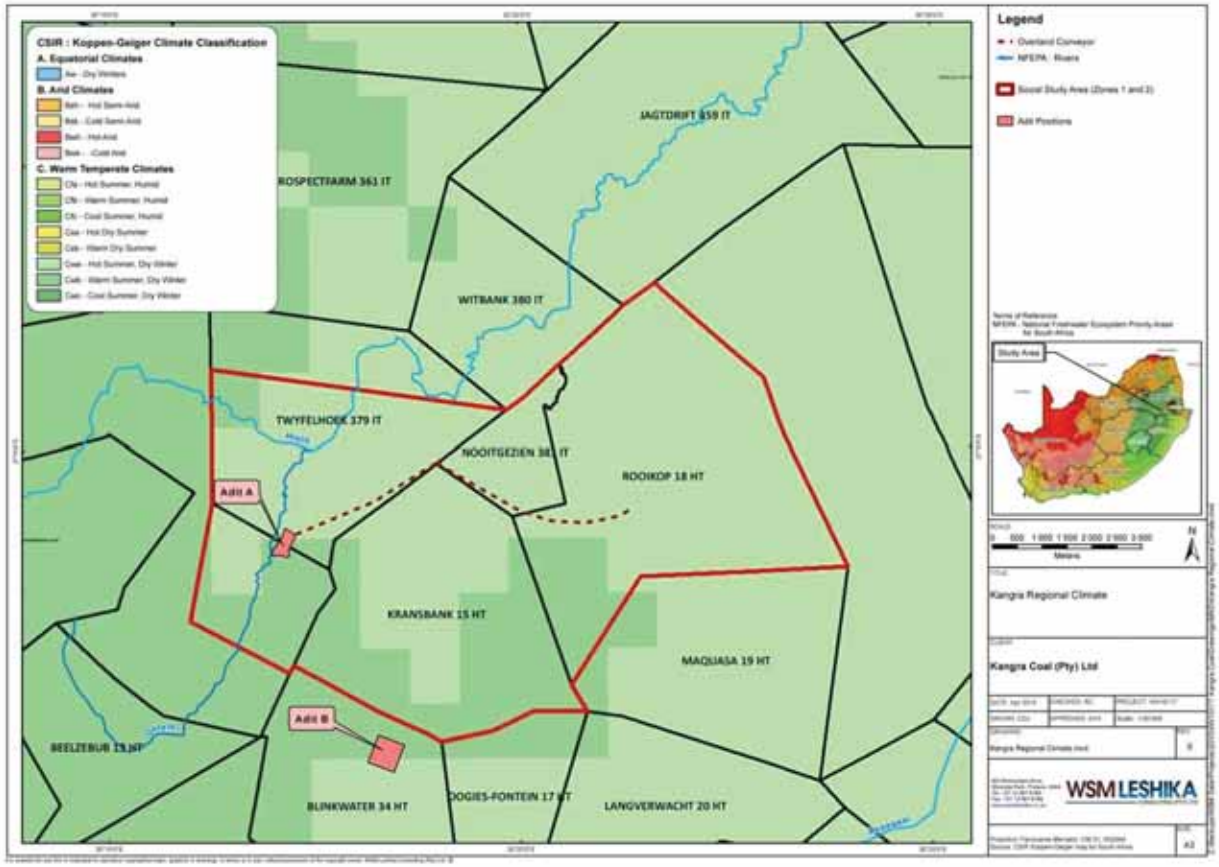
- Socio-economic assessment;
- Visual and landscape assessment; and
- Heritage assessment.

7.2 CLIMATE

The proposed Project is located on the border of two climatic zones, based on the Köppen-Geiger classification for South Africa (Van Dyk and Kumirai

2012), namely the 'Warm Temperate Hot Summer Dry Winter' (Cwa) to the east and the 'Warm Temperate Warm Summer Dry Winter' (Cwb) to the west, as shown in *Figure 7.1*. The higher elevation to the west towards the Vaal River catchment area leads to cooler temperatures. During the warm summer months of December and January the average daily temperature is between 20 and 26°C, while the minimum temperatures in winter drops as low as 4°C.

Figure 7.1 *Köppen-Geiger Climate Classification*

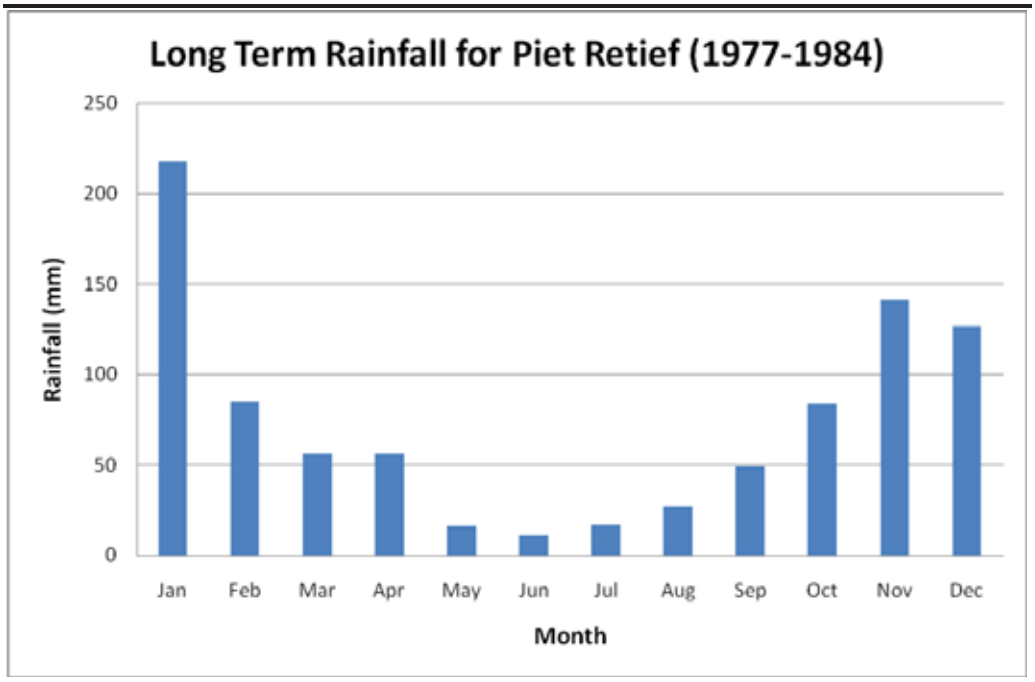


7.2.1 Precipitation

The orography associated with the escarpment to the west of the Project Area has an impact on the local wind and rain climate. Increased precipitation is generally found slightly upwind from the prevailing winds at the crests of mountain ranges, where they relieve and therefore the upward lifting is greatest. As the air descends on the lee side of the mountain, it warms and dries, creating a rain shadow.

Piet Retief lies in the summer rainfall region of South Africa, in which more than 80% of the annual rainfall occurs from October to March, with a peak in January. The rainfall events are highly localised in the form of conventional thunderstorms. These storms are sometimes accompanied by hail. Long-term monthly average rainfall figures for Piet Retief are depicted in *Figure 7.2*. Long-term average total annual rainfall is in the range of 800 to 890 mm (Weather Bureau, 1986). (Further data up to 2005, is presented in *Table 7.1*.

Figure 7.2 Long-term Monthly Rainfall for Piet Retief (1977 to 1984)



Considering the changing climate pattern to the west as described above, the rainfall and evaporation data published by the Water Research Commission in the Water Resources 2005 study (Middleton and Bailey, 2009) is used. The country is divided into quaternary catchment areas and the data for the upper Hlelo River catchment area, quaternary catchment number W52A, is deemed to be more representative of the Project Area and is shown below.

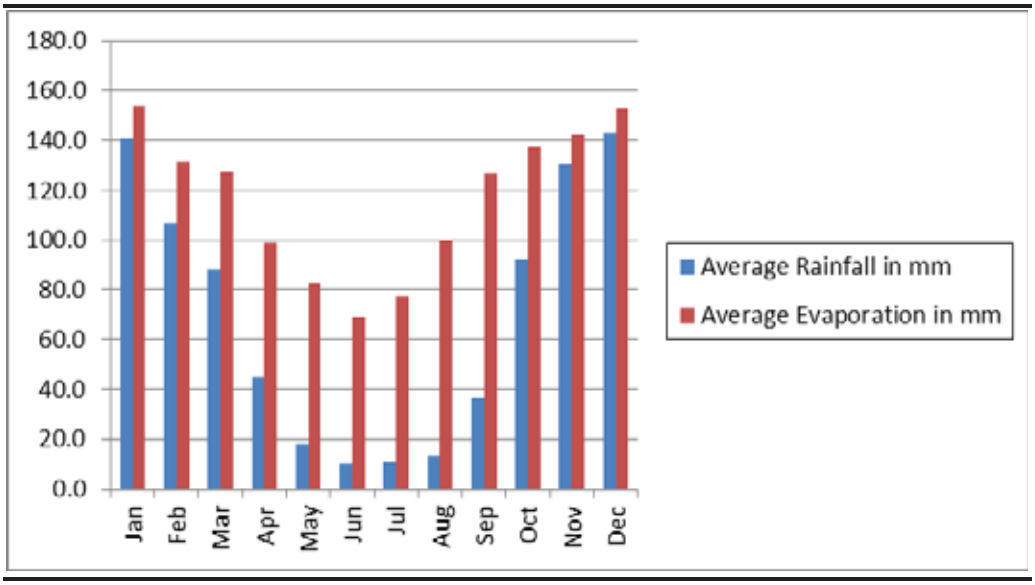
In the Water Resources 2005 study, monthly precipitation data was generated by considering data from up to eleven rain gauges in the Hlelo River region, for an 85 year period. From this record, the average monthly values and the average annual values were calculated. The mean annual precipitation (MAP)

is 836mm while the mean annual Symons Pan evaporation is 1 400mm. The data is shown in *Table 7.1* and *Figure 7.2* overleaf.

Table 7.1 Mean Annual Precipitation and Evaporation (Source: WR2005)

Month	Average Rainfall (mm)	Average Evaporation (mm)
January	140.9	153.72
February	107.1	131.46
March	88.1	127.26
April	44.8	98.98
May	17.9	82.32
June	10.5	69.16
July	11.0	77.56
August	13.4	100.10
September	36.7	126.98
October	92.3	137.06
November	130.5	142.66
December	142.7	152.74
Total:	**836.0**	**1 400.00**

Figure 7.2 Monthly Average Rainfall and S-pan Evaporation



From the above, it is evident that the Project Area receives the majority of its rainfall during the summer months (October through to March) with an average rainfall of just over 800mm/annum. Average annual evaporation is approximately 1 400mm/annum.

7.2.2 Maximum Rainfall – Storm Events

The eastern part of Mpumalanga is part of the landmass in Southern Africa that is affected by cyclones, and in January 1984 Cyclone Domoina resulted in the highest observed rainfall in the area. This was the first cyclone centre to penetrate the country (and the only one to date) (Kovaćz *et al.*, 1985).

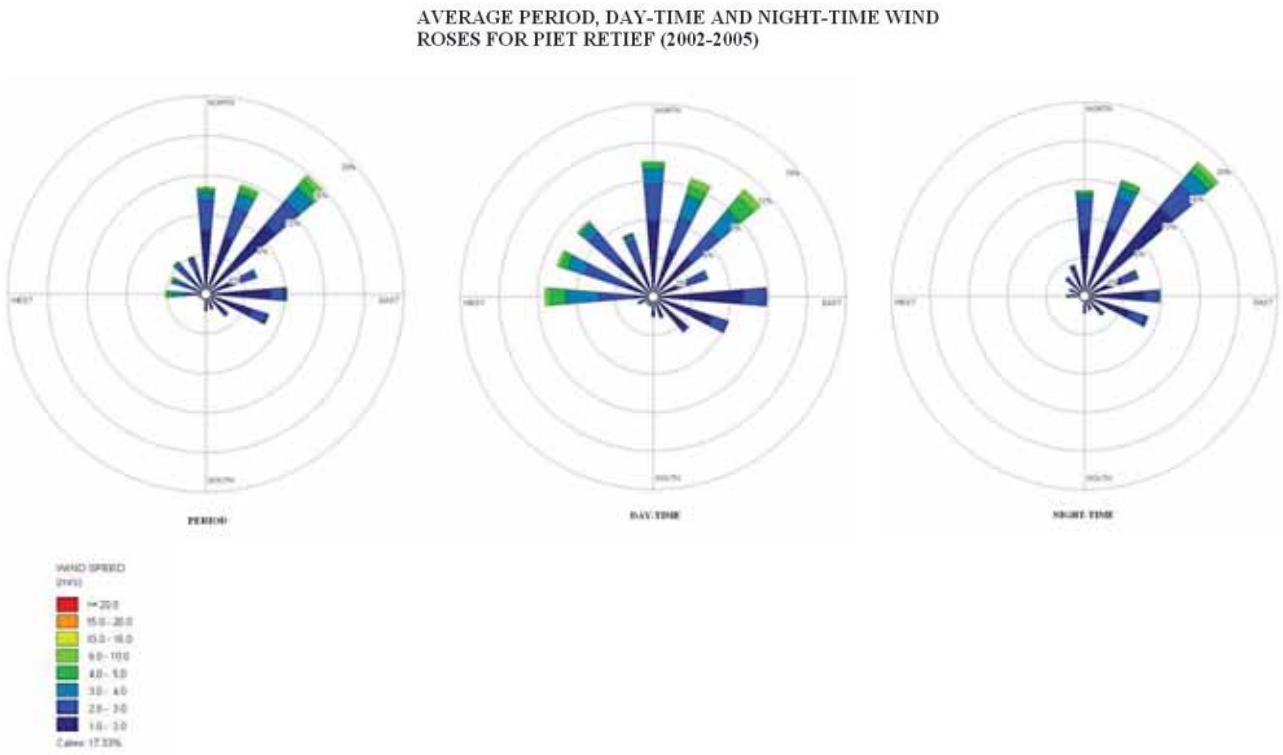
In Piet Retief, Domoina caused a maximum daily rainfall of 186mm, with ha total rainfall over three days of 511mm. The risk of large rainfall and flood events occurring in the area is higher than regions in the moderate central parts of the country.

7.2.3 Wind

Since no on-site meteorological data are available, hourly average meteorological data from the South African Weather Service (SAWS) station in Piet Retief for the period 2002 to 2005 was analysed. This station is located approximately 40km east of the proposed Project area. The prevailing winds are presented in the form of wind roses (1) in *Figure 7.3*.

(1) Wind roses comprise 16 spokes which represent the directions from which winds blew during the given period. The colours reflect the different categories of wind speeds, the grey area, for example, representing winds of 1 to 3 m/s. The dotted circles provide information regarding the frequency of occurrence of wind speed and direction categories. For the

Figure 7.3 Wind Roses for the Period 2002 to 2005 Recorded at Piet Retief



Source: South African Weather Service

The predominant wind direction is from the north-east with a frequency of occurrence of 16%. Winds from the northern sector are also predominant, occurring 10% of the total period. During day-time, strong winds from the north and north-easterly sectors occur frequently (9% and 10% of the time, respectively). There is an increase in north easterly flow with a decrease in westerly and north-westerly air flow during the night-time.

7.2.4 *Ambient air Temperature*

Long-term average maximum, mean and minimum temperatures for Piet Retief are summarised in *Table 7.2*. An annual mean temperature for Piet Retief is 16.6°C.

Table 7.2 Long-term Minimum, Maximum and Mean Temperature for Piet Retief (Schulze, 1986)

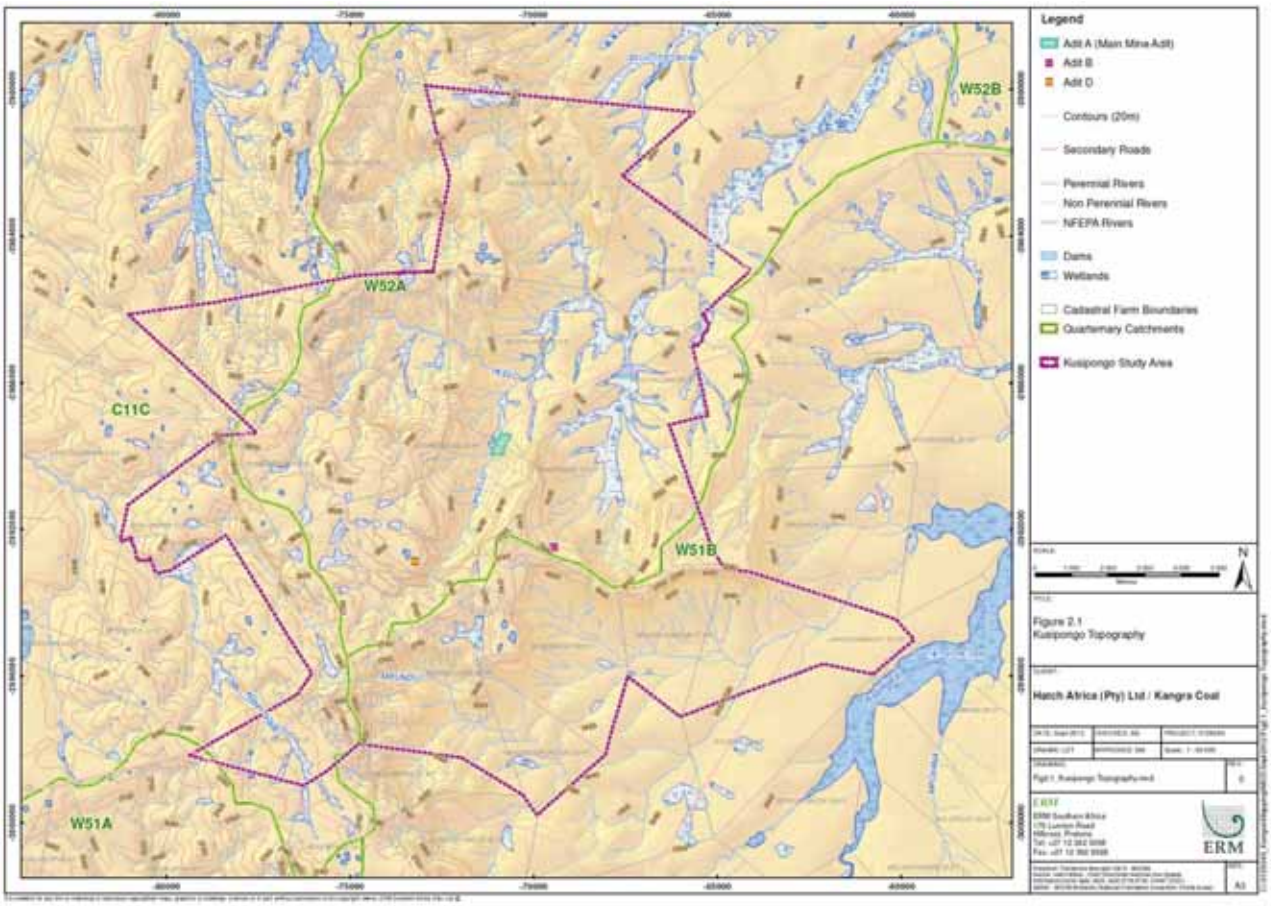
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max	26.4	26.2	25.7	24.1	21.8	19.2	18.9	20.8	21.4	23.4	24.6	26.4
Mean	20.9	20.7	19.7	17.3	14	10.9	11.2	13.4	15	17	18.7	20.1
Min	15.3	15.1	13.6	10.5	6.3	2.7	3.5	6	8.9	10.8	12.9	13.9

7.3 *TOPOGRAPHY*

The Project Area lies within a mountainous area characterised by gentle to steep slopes in the central, northern and southern parts and a high plateau in the western part of the site. The topographically lowest area of the site is located in the south-western part on the farm Langverwacht close to the Heyshope Dam at 1,320 metres above mean sea level (m amsl). The highest area is located in the south-western part on the farm De Paarl at 1,880m amsl (*Figure 7.4*).

The eastern sector of the Project Area is characterised by relatively gentle topography, with heights varying between 1,350 m above mean sea level (amsl) and 1,450 m amsl. Towards the north, the topography rises above 1,500 m amsl and the west (the escarpment), above 1,650m amsl.

Figure 7.4 ***Topography of the Project Area***



The western sector of the Project Area falls within the escarpment. The closest mountain tops include Kusipongo (1,732m amsl) nearby the site proposed for the main mine adit (Adit A) (*Figure 7.5*), Voskop (>1,800m amsl) about 8.5km to the west of the site proposed for Adit A, KuNohukuza (>1,700 m amsl) about 2 km southwest of the site proposed for the ventilation adit (Adit B) and Rand Bergen (>1,800m amsl).

Figure 7.5 Kusipongo Mountain (1,732m amsl)

Figure 7.6 Valley in the Vicinity of the Site Proposed for the Main Mine Adit (Adit A)

7.4 GEOLOGY

7.4.1 Regional Geology

The Project Area is underlain by the sedimentary rocks of the Madzaringwe Formation of the of the *Ecca Group*, which forms part of a segment of the north eastern margin of the Karoo basin, filled with sediments belonging to the *Karoo Supergroup* (refer to *Table 7.3*). The sedimentary rocks were deposited discordantly on the basement, defined by the *Undifferentiated Onverwacht Group*, consisting of lava, tuff, schists and chert. The former forms part of the *Barberton Sequence*.

During the deposition of sediments in the Karoo basin, tension in the crust due to continuing loading lead to failure and subsequently intrusion of Post-Karoo dolerite sills and dykes along weak zones such as fractures, fissures and faults. Consequently dykes and sills varying between a few centimetres to a couple of metres in thickness intruded the Project Area. Most dolerite dykes have a vertical or near-vertical dip.

Table 7.3 Stratigraphy of the Project Area

Phanerozoic	**Palaeozoic**	**250 million years ago (mya)**	*Madzaringwe Formation*
			Ecca Formation
			KAROO SUPERGROUP

7.4.2 Local Geology

Stratigraphy

The Karoo basin in the vicinity of the site of the proposed Project consists of the Ecca Group; which in turn consists out of the Pietermaritzburg Shale Formation at the base, followed by the Vryheid Formation and the Volksrust Shale Formation at the top, with the coal bearing Vryheid Formation being the dominant formation. Underlying the Pietermaritzburg Shale Formation is the Dwyka Formation consisting of tillites. The Vryheid Formation consists of grit, sandstone and shale and contains a number of coal seams. In addition, pebble beds and intra formational conglomerate are locally developed and intercalations of siltstone and mudstone are common in the sandstone, especially in the upper part of the formation. Lenses of calcareous sandstone and sandy limestone are relatively common. The sandstone is generally feldspathic and weakly cemented, especially the coarser varieties.

The coal-bearing part of the Vryheid Formation contains sequential deposition of sediments, represented by upward-fining cycles at the bottom with conglomerate and grit followed by sandstone, shale and eventually coal

seams. These lithologies are interpreted to represent respectively the channellag deposit, the point-bar deposit and the overbank deposit of a meandering stream. Furthermore, recent alluvial deposits occur along the larger drainage lines that traverse the area.

The localised geology around the project area, including identified geological structures is presented in *Figure 7.7*. A typical geological cross-section indicating the vertical geology including dolerite sills is presented in *Figure 7.8*.

Figure 7.7 Local Geology Map

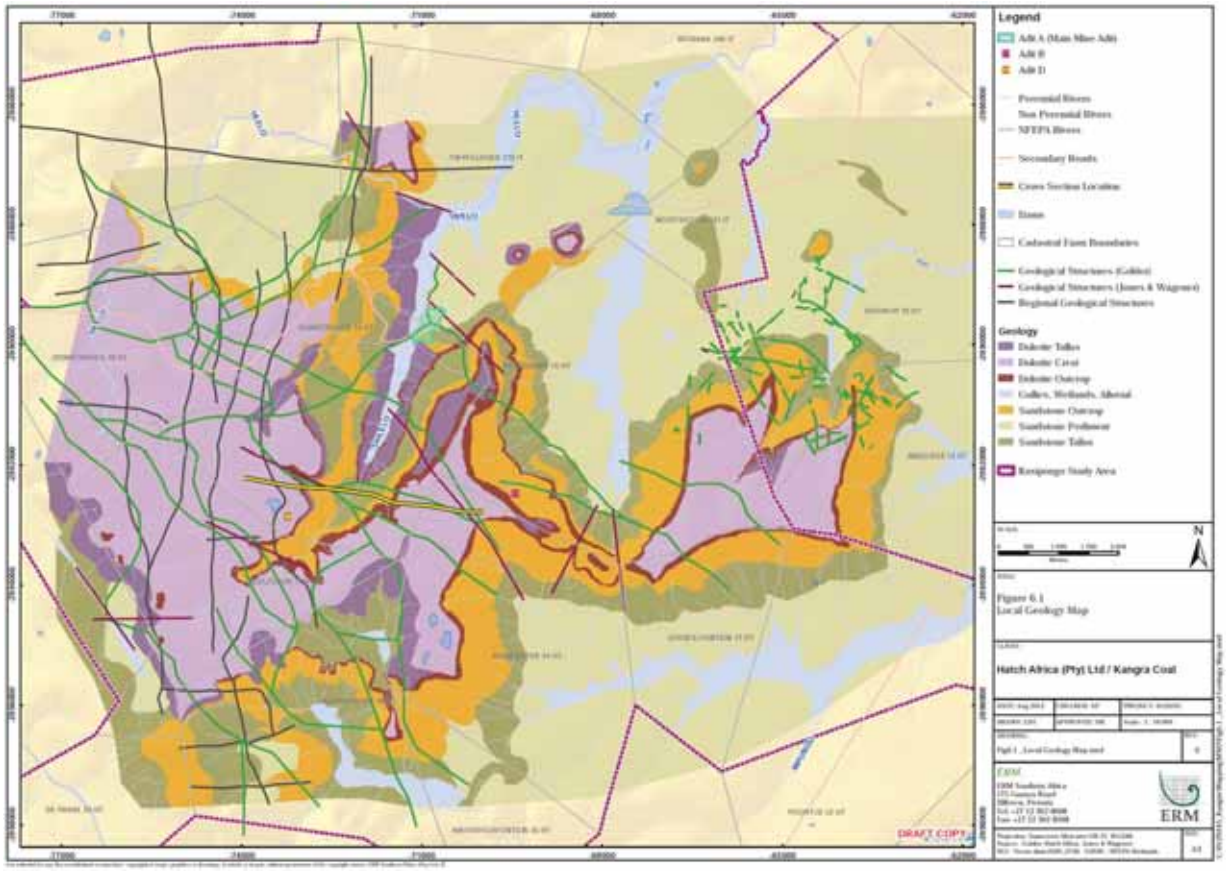
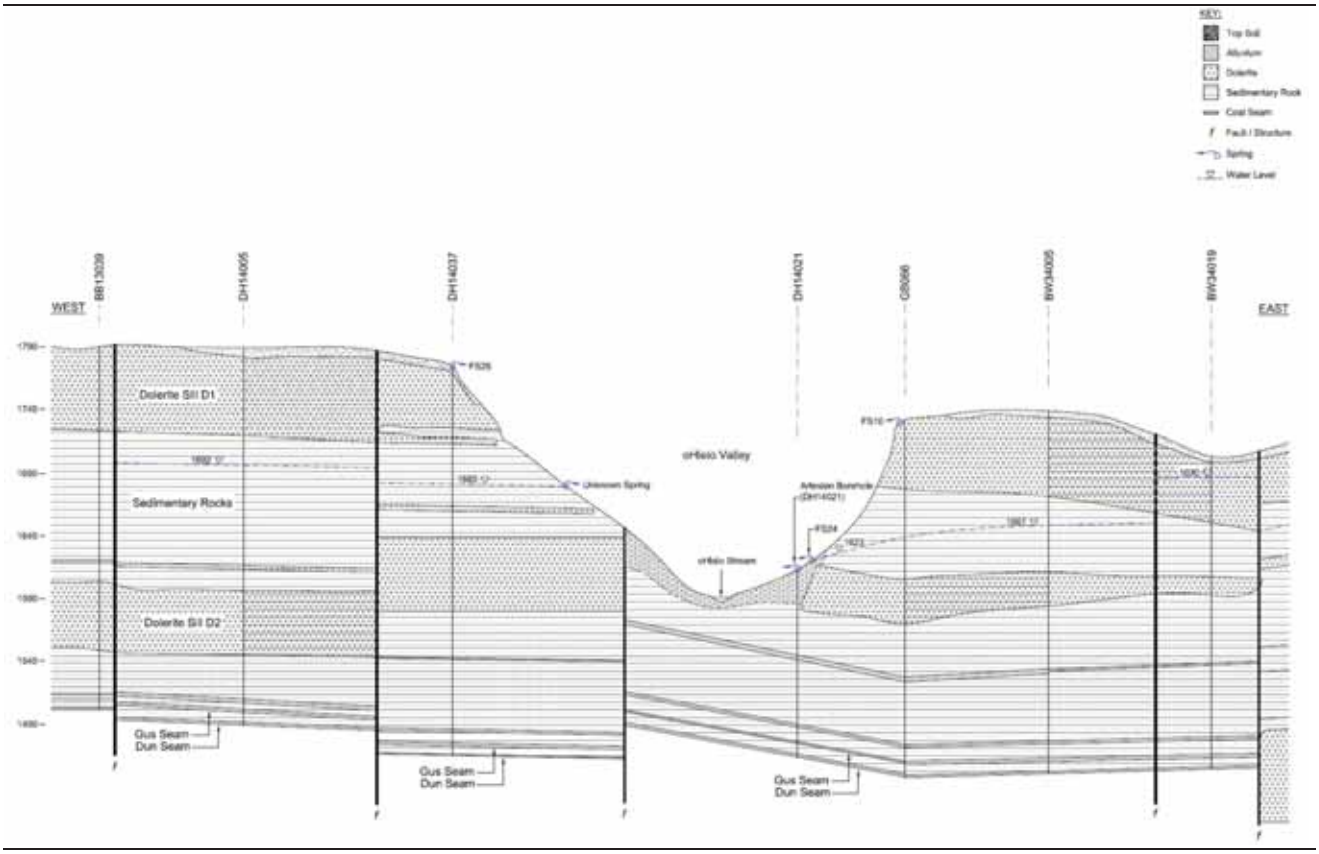


Figure 7.8 ***Typical Geological Cross-Section (West-East)***



Structural Geology

During the deposition of sediments in the Karoo basin, tension in the crust due to continuous loading lead to failure and subsequently intrusion of Post-Karoo dolerite sills and dykes along weak zones such as fractures, fissures and faults. Consequently dykes and sills, varying between a few centimetres to a couple of metres in thickness, intruded the Project Area. Most dolerite dykes have a vertical or near-vertical dip.

The rocks immediately adjoining dolerite intrusions, of both dyke and sill form, are frequently disturbed, fractured and thermally metamorphosed as a result of the injection of the dolerite, which has also let to varying degrees of volatilisation of coal seams.

Significant vertical displacement of the coal seams of several tens of meters has been observed adjacent to some geological structures in the Project Area.

7.5 SOILS

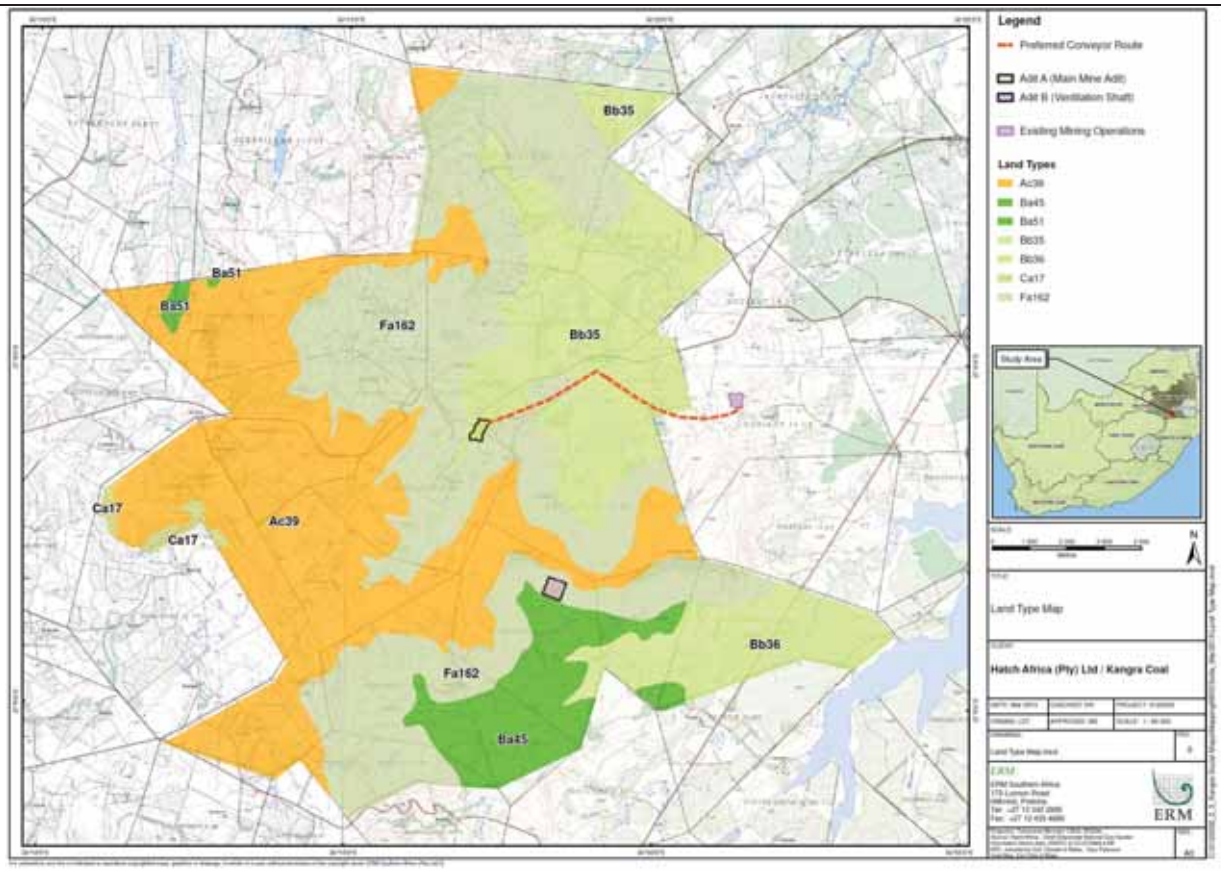
7.5.1 Regional Context

Figure 7.9 illustrates the soil types in the broader Project Area, as originally supplied by ERM. Predominately, the soils are brown to yellow brown, light textured, structureless and relatively deep (600-1200+ mm). These soils are typically found in land type **Ac39**, to the west (shown in orange), where the dominant soil form is Clovelly. This zone lies at a higher elevation than the rest of the area, and land type **Fa162** (shown in grey-green) comprises a zone of more sloping topography where the landscape falls away to the east. Here, the soils are grey-brown, light-textured, structureless and comparatively shallow (300-600 mm). The dominant soil forms are Glenrosa, Mispah and shallower versions of the Clovelly soils found in Ac39. Surface rock also occurs in places.

To the east of Fa162, the landscape that falls towards the Heyshope dam (land type **Bb35**, shown in light green) contains similar soils to those in Ac39, but the soils often have a grey mottled subsoil plinthic horizon, usually at a depth of around 600-1 000 mm), so that the dominant soil forms are Avalon and Glencoe, with some shallower Mispah soils also occurring in places.

In general, the soils in land types **Ac39** and **Bb35** are of moderate to high potential for arable agriculture, with depth being the most common limiting factor. Most of the shallower soils of land type Fa162 have a low arable potential, due to the slopes, shallow soils and occasional rockiness.

Figure 7.9 ***Land Type Map of the Regional Project Area***



7.5.2 Local Context

Main Mine Adit (Adit A)

Figure 7.10 illustrates the distribution of soil types over the footprint of the site proposed for Adit A (1).

The majority of the Adit A footprint (58.7%) comprised of deep, yellow Clovelly soils (**Cv map unit**), with approximately 17.4% of the footprint having shallower Avalon soils (**Av map unit**) in the lower areas towards the Ohlelo River. The tributary of the Ohlelo stream in the south has wet (hydromorphic) soils (8.7% of the Adit A footprint – **Tu map unit**), while the extreme southern part has shallow rocky soils, with steeper slopes (6.7% of the Adit A footprint - **Ms/R map unit**) (*Table 7.4*).

The watercourse in the north of the Adit A footprint has been excavated, with a deep quarry-like excavation occurring resulting in a Mispah 1000 Rock soil type (8.5% of the Adit A footprint – **Exc map unit**) (*Table 7.4*). The reason for the excavation and removal of soil could not be determined at the time of the study.

Overland Conveyor Route

Figure 7.11 illustrates the distribution of soil types over the route of the proposed overland conveyor (1).

The soils along the conveyor route are similar to those occurring at Adit A. They are generally a mixture of moderately deep, yellow-brown, structureless soils, sometimes with subsoil plinthite (map units Cv and Av), along with shallow (<400 mm) soils with occasional rock outcrops. These soils are similar to the Ms/R map unit in the Adit A footprint, but the terrain is flatter and there are only very occasional rocky outcrops (map unit Ms). The route crosses streams at two points, where wet soils, similar to the Tu map unit occur (refer to *Table 7.4* for soil legend for the overland conveyor route).

(1) Please note the following definitions – Av (Avalon 1200),Cv (Clovelly 1200), Exc (Excavated), Ms/R (Mispah 1000, Rock) and Tu (Tukulu 1120)

Figure 7.10 ***Main Mine Adit A Soils Map***

Figure 7.11 Overland Conveyor Route Soils Map

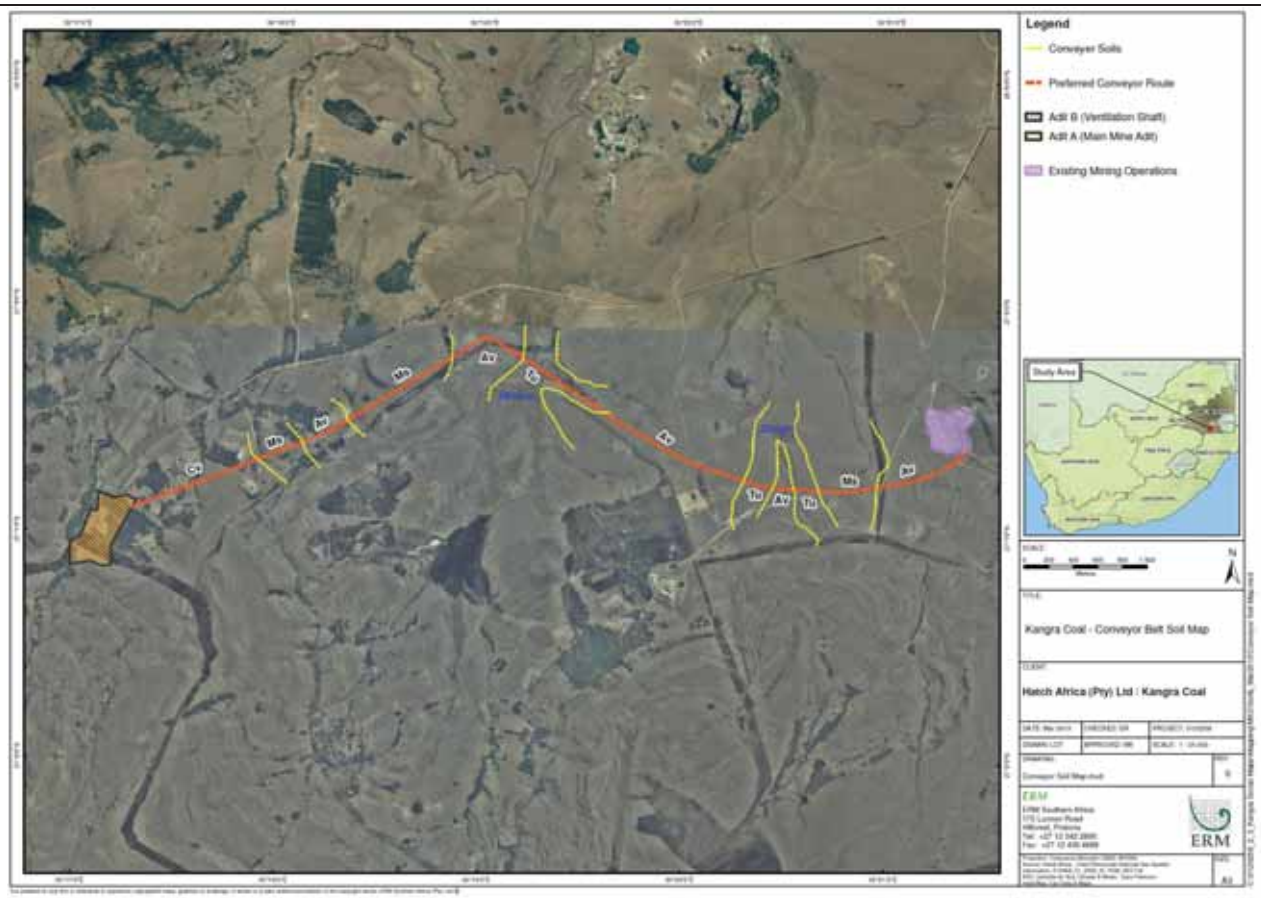


Table 7.4 Soil Legend for the Main Mine Adit (Adit A) and the Overland Conveyor System

Map Unit	Depth (mm)	Dominant Soil Form and Family	Subdominant Soil Form and Family	Soil Characteristics	Adit A		Overland Conveyor Route *	
					Area* (ha)	Percentage Occurrence	Area* (ha)	Percentage Occurrence
Cv	900-1200+	Clovelly 1200	Avalon 1200, Glencoe 1200	Brown, sandy clay loam, structureless to weakly structured topsoil on yellow-brown to yellow, sandy clay loam to sandy clay, structureless to weakly structured subsoil on weathering rock.	10.08	58.7	2.69	10
Av	450-900	Avalon 1200	Glencoe 1200	Brown, sandy clay loam, structureless to weakly structured topsoil on yellow-brown to yellow, sandy clay loam to sandy clay, structureless to weakly structured subsoil on grey, mottled, soft (occasionally hard cemented) plinthite.	2.98	17.4	16.14	60
Tu	500-900	Tukulu 1120	Katspruit 1000	Brown to dark brown, sandy clay loam, weakly structured topsoil on brown, mottled, sandy clay loam to sandy clay, weakly structured subsoil on grey, mottled, structured clay subsoil. Occurs in low-lying areas close to streams – water tables occur.	1.50	8.7	1.35	5
Ms/R	50-250	Mispah 1000, Rock	Clovelly 1200	Brown to yellow-brown, sandy loam to sandy clay loam, structureless to weakly structured topsoil on rock. Abundant rock outcrops also occur.	1.15	6.7	-	-
Ms	50-400	Mispah 1000,	Clovelly 1200, Glenrosa 1211	Brown to yellow-brown, sandy loam to sandy clay loam, structureless to weakly structured topsoil on rock. Occasional rock outcrops also occur.			6.73	25
Exc	-	Map unit has been excavated to a significant (>20 m) depth, with removal of soil material. A stream flows along the bottom of the excavation, but accurate soil classification is difficult, if not impossible.			1.46	8.5	-	-
				TOTAL	**17.17**	**100**	**26.90**	**100**

*** Due to changes in alignment, a detailed systematic survey was not carried out for the eastern portion of the overland conveyor – i.e. from the transfer point through to the existing Maquasa West conveyor. However, the soils along the conveyor system are similar to those in the footprint of Adit A. As such, enough soil information was collected to be able to produce a soil map using the same map units as for Adit A**

Soil Erosion Potential

The soils in the Project Area are not inherently susceptible to erosion. They have a relatively homogenous structure and texture down the soil profile, and the relatively high rainfall in the area means that vegetation growth is usually strong. However, any soil is susceptible to erosion if disturbed, even on the relatively gentle slopes in the Project Area.

Both Adit A and Adit B are situated in sloping areas, so the erosion hazard will be higher there than that of the route proposed for the overland conveyor system.

7.6 LAND CAPABILITY AND AGRICULTURAL POTENTIAL

7.6.1 Land Capability

The pre-mine classes for land capability of the site proposed for Adit A and the proposed overland conveyor route are presented in *Table 7.5* below.

Over 70% of the footprint for Adit A is classed as having a ***moderate to high* arable** potential, with a similar approximate proportion of the length of the conveyor belt alignment (*Table 7.5*).

Table 7.5 Land Capability Classes for the Sites Proposed for Adit A and the Overland Conveyor System

Land Cap. Class	Map Unit	Restrictions / Limitations	Adit A (%)	Conveyor Route (%)
Arable (high)	***Cv***	Almost none. Deep, friable soils, possible slight impeded drainage in places due to high clay content.	58.7	10
Arable (moderate)	***Av***	Moderate to shallow depth to underlying gleyed plinthite in places. Somewhat imperfect drainage.	17.4	60
Grazing	***Ms***	Shallow soils, and occasional surface rock outcrops.	-	25
Wilderness	***Ms/R***	Shallow soils, steep slopes and abundant surface rock outcrops.	6.7	-
Wetland	***Tu***	Low-lying areas with wet, clayey subsoils. Poorly drained, with occasional flood hazard in rainy season.	8.7	5
Wetland (disturbed)	***Exc***	Widespread soil removal. Probably originally a small stream bed, now deep quarry-like pit.	8.5	-

7.6.2 Agricultural Potential

Some areas of arable cultivation were observed in the vicinity of the site proposed for Adit A and the adjoining portion of the route of the proposed overland conveyor, but for most of the route, no cultivation was present, even where relatively deep soils were found.

The shallow soils in the area do not have a significant potential for cultivation, and can be used for grazing at best. Where there is a significant occurrence of rock (map unit Ms/R), with steeper slopes, the grazing potential is reduced.

In terms of the areas surrounding the proposed Project area, there is little cultivation being practised, with only isolated fields, many of which are adjacent to the various rural homesteads present in the Project Area. The Adit A site is partially covered with wattle trees, and there is steeper, rocky topography to the south and north. The significance of this area, which totals 17ha, is not that great to the broader agricultural environment at this stage.

Local land use in the Project Area is discussed in detail in *Chapter 8*.

7.7 SURFACE WATER

Please Note - This Section provides an overview of the key outcomes from the detailed Surface Water baseline study, and is used to inform the Surface Water Impact Assessment presented in *Chapter 9*. The complete Surface Water baseline is included in the Surface Water Impact Assessment attached to *Annex C.8* of this report.

7.8 SURFACE WATER BASELINE

7.8.1 Catchments Applicable to the Project Area

The Project Area is situated in the northern part of primary area "W", which includes a number of eastward draining rivers, including all tributaries of the Usutu River system. The Ohlelo River is one of the southern tributaries of the Usutu River system. The major components of the planned Kusipongo expansion are situated in the Ohlelo River catchment area of the Usutu River catchment, which forms part of the Maputo River Basin. The Ohlelo River flows eastwards from the escarpment to converge with the Nwempisi River in Swaziland. Drainage on top of the escarpment is westwards via the Vaal River to the Orange River system.

The site proposed for the main mine adit (Adit A) and temporary contractor's camp is located within quaternary river catchment areas W52A on the Ohlelo River and its tributaries (refer to *Figure 7.12*). The site proposed for the ventilation adit (Adit B) is located south of Adit A in the headwaters of catchment W51B of the Assegaai River (*Figure 7.12)*. The proposed overland conveyor system will traverse both catchment W52A and W51B, linking Adit A and the existing Maquasa West conveyor system (*Figure 7.12)*.

The locality of quaternary catchment areas W52A and W51B are illustrated in *Figure 7.13* and the characteristics of the catchment are given in *Table 7.6*.

Table 7.6 Details of Quaternary Catchment Areas

ADIT	QUATERNARY CATCHMENT	TOTAL AREA (km^2)	MEAN ANNUAL PRECIPITATION (mm)	MEAN ANNUAL EVAPORATION (mm)	MEAN ANNUAL RUNOFF (mm)
A	W52A	289	836	1 400	107
B	W51B	496	864	1 400	90

Source: Middleton and Bailey (2009)

A description of each quaternary catchment follows below.

Figure 7.12 ***Locality of Proposed Project in Relation to Catchments***

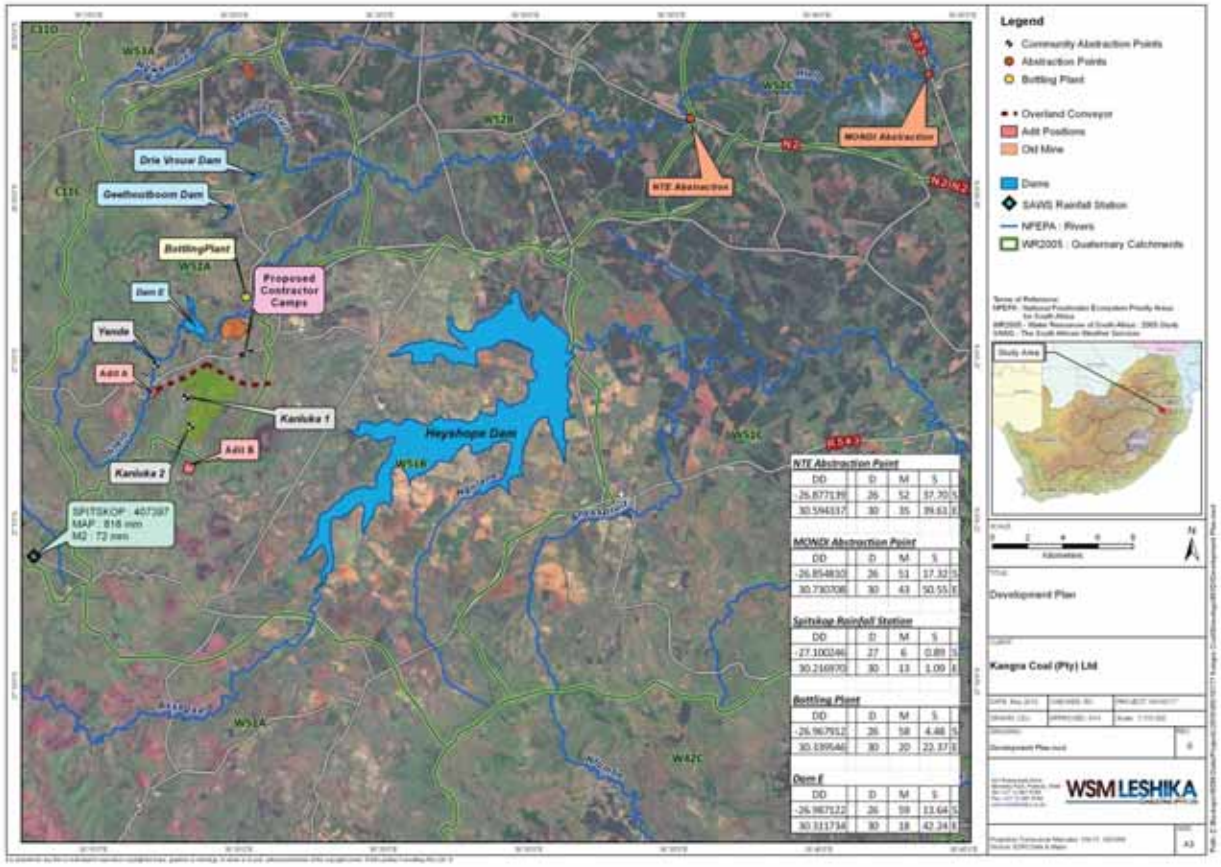
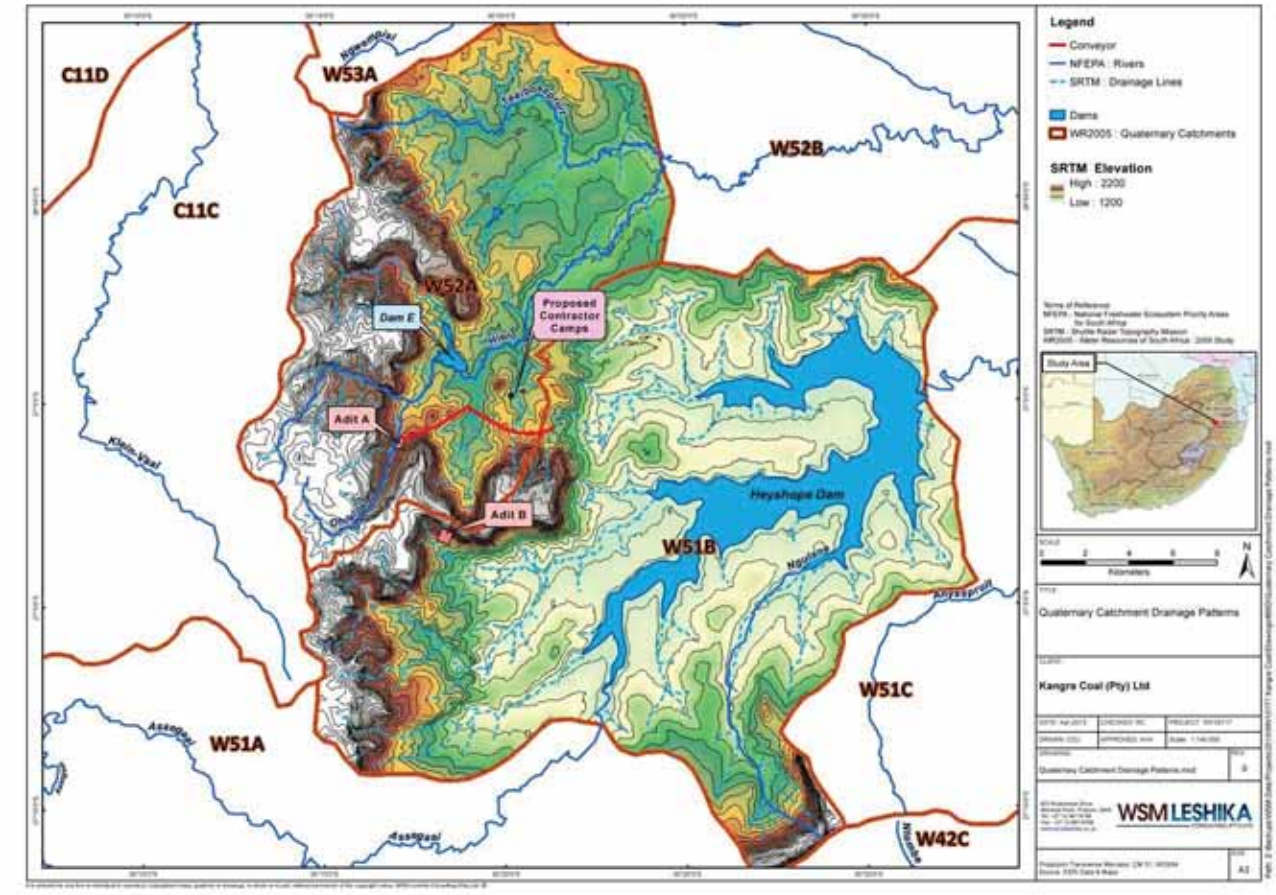


Figure 7.13 Quaternary Catchment Drainage Patterns



7.8.2 Catchment W52A (Ohlelo River Catchment)

Description

The water resources of the upper Usutu River catchment have been developed to transfer water westwards to the Vaal River system where it is allocated for use by Eskom, and transferred directly to the power stations in the Olifants Water Management Area. This development consists of the Heyshope Dam in the W51 catchment, the Morgenstond and Jericho dams in the W53 catchment, and the Westoe Dam in the W54 catchment.

This is in contrast to the Ohlelo River, which is largely undeveloped with no major impoundments. This adds to this river's uniqueness in that its flow system is relatively undisturbed.

The exception in the Ohlelo River catchment is the Geelhoutboom Balancing Dam on a northern tributary of the Ohlelo River, which functions as a large pumping pond: water is transferred by canal from the Heyshope Dam on the Assegaai River to the Geelhoutboom Dam where a high-lift pump station transfers water to the bulk water supply system in the Vaal River catchment area.

There is one registered farm dam located on a northern tributary of the Ohlelo River. The dam (indicated in *Figure 7.13*, and located at coordinates; 26°54'16.14''S 30°20'51.54''E), is known as the "Drie Vrouw Dam" (as registered with DWA) and is a dam safety category Class 1 dam, with height 5.1m and volume of 300 000 m^3.

An un-rehabilitated coal mine and its appurtenant works are situated 11km downstream from the proposed main mine adit (Adit A), along both sides of the Ohlelo River at co-ordinates; 26°58'26.34'' S 30°20'02.88''E. Discarded coal can be found on the flood plain alongside the main channel of the river. Stormwater control dams below the product storage sites, which are outside the river floodplain, have been breached allowing contaminated stormwater to drain into the Ohlelo River at this location.

Another worked-out mine situated on the farm Taaiboschspruit at co-ordinates 26°51'08.28'' S 30°20'28.75'' E, occurs on a tributary to the Ohlelo River, which has its confluence with the Ohlelo River approximately 29km from the site proposed for Adit A.

Water Users in the Ohlelo River catchment

The major direct consumer of water from the Ohlelo River is industry (*viz*. Mondi and NTE Company Ltd (refer to *Figure 7.12*)). Low weirs in the river are used to abstract water. Water is abstracted from NTE where the river crosses the National Highway 2 (N2) (26°52'37.92"S 30°35'39.55"E) and Mondi abstracts further downstream where the Ohlelo River crosses road R33 to Amsterdam (26°51'14.9" S; 30°43'50.36"E). These abstraction points are 35km and 50km downstream of the site proposed for Adit A respectively.

There are no major irrigation developments in the catchment; Middleton and Bailey (2009) estimate the area under irrigation in this catchment is 1.45 km² (0.5% of the catchment area). Small scattered areas under irrigation occur below the Drie Vrouw Dam (*Figure 7.13*). Further downstream afforestation dominates the land use as identified from satellite imagery.

Alien vegetation (regarded by the DWA in its strategy document for invasive alien plants in the Usutu-Mhlatuze WMA as a water user; as indicated in *Appendix C* of the Surface Water Specialist report, given in *Annex C.8*) covers 1.1 km² of this catchment (0.4% of the catchment area). Water use by irrigation and alien vegetation is therefore low.

As per the hydrocensus presented in the Specialist Groundwater report (*Annex C.3*), water is also abstracted from boreholes for use as potable water, and for livestock watering. Water abstraction from boreholes ranges from 0.7 m³/d for boreholes using submersible hand pumps to 57.8m³/d for windmill driven pumps.

The Soco-economic Impact Assessment (*Annex C.6*) found that flow from the higher lying springs and boreholes are mostly used for domestic water supply and for stock watering by local farmers. The Kanluka (Kransbank) and Yende (Twyfelhoek) communities are, however, reliant on stream/river flow for domestic use. These communities draw surface water from the Ohlelo and Kraansbank Rivers directly; these abstraction points are given in *Table 7.22* below.

Table 7.7 Community Surface Water Abstraction Points

SW Abstraction Point Number	Stream/River	X (LO31)	Y (LO31)	User
Point1	Ohlelo	-70690	-2988121	Yende Community
Point2	Kraansbank	-68724	-2991597	Kanluka Community
Point3	Kraansbank	-69017	-2989965	Kanluka Community

Recently, water supply infrastructure has been developed and upgraded to homesteads directly. While the Socio-economic Impact Assessment (*Annex C.6*) captured this data as house connections in order to describe the fact that water was transported directly to people's homesteads, the source of this water remains untreated water directly from springs, streams and rivers. The 45 sampled homesteads sampled in the SIA obtained their water from the following sources:

Means of Water Supply	Percentage of Sampled Homesteads
Borehole or well	2.2%
House connection	66.7%
Neighbour	2.2%
Spring	2.2%
River	26.7%
Total	**100.0%**

Proposed Developments in Catchment W52A

In 2009, the Mpumalanga Department of Agriculture, Rural Development and Land Administration (DARDLA) selected the Donkerhoek area to be developed as a Comprehensive Rural Development Project (CRDP). The main aim of the CRDP, apart from infrastructure development (roads, culverts etc.), is to provide the communities of Donkerhoek, Kwangema and Emahhashini with household water from springs and to improve agriculture by developing a storage dam for irrigation purposes. This dam (given as Dam E in *Figure 7.12* and *Figure 7.14*), and located on the Ohlelo River on the farm Twyfelhoek 379 IT, will, depending on the allowable abstraction, need to be approved by the tripartite member countries of the Incomati Accord (DARDLA, 2010). Following approval, it is the aim of the CRDP to develop an irrigation project.

The project boundaries of this CRDP, shown in *Figure 7.14*, overlay the proposed Kusipongo Resource Expansion Project boundaries.

A water bottling plant is currently under construction in the Donkerhoek area. This bottling plant will utilise borehole water, from boreholes drilled on the farm Witbank 380 IT.

Hydrology of the Ohlelo River

The "naturalized" (or gross) mean annual runoff in the Ohlelo River at the site proposed for Adit A, is 2.66 million m^3/a (Middleton and Bailey, 2009). The average monthly flow data for the period 1920 to 2004 is shown in *Table 7.8*.

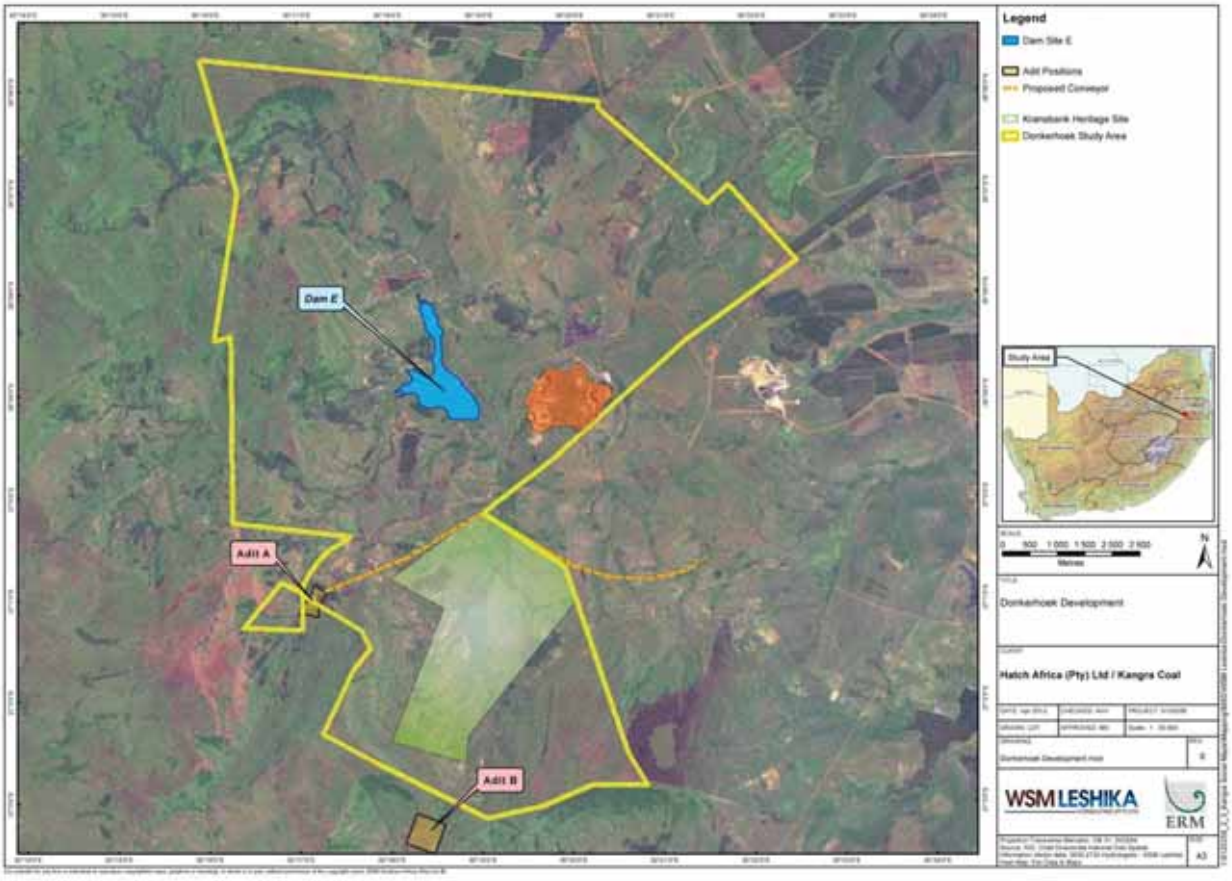
Table 7.8 Naturalized Average Monthly Runoff in the Ohlelo River at Adit A (in million m^3)

Month	Runoff (million m^3)
OCT	0.11
NOV	0.26
DEC	0.433
JAN	0.523
FEB	0.479
MAR	0.34
APR	0.206
MAY	0.115
JUN	0.064
JUL	0.046
AUG	0.039
SEP	0.042
TOTAL ANNUAL FLOW	2.657

Source: Middleton and Bailey (2009)

On analysis of *Table 7.8*, it is clear that the three driest months, on average, are July to September. The Normal Dry Weather Flows have been calculated as 1 081m^3/day, based on the average of the median flow in each of the three driest months.

Figure 7.14 ***Proposed Donkerhoek Development***



Floodline and Flood Volume Estimates

The method used to estimate floodlines and flood volumes for applicable return periods, is provided in the Surface Water Specialist Report (*Annex C.8*).

The river flows on the western boundary of the site, proposed for Adit A, has a narrow, overgrown flow channel (*Figure 7.15*). In addition to the Ohlelo River, a number of small tributaries that drain the hillside to the north east bisect the site. All these tributaries are non-perennial whereas the Ohlelo River is perennial.

Flood peaks have been calculated for the Ohlelo River and associated tributaries that may affect infrastructure proposed on the Adit A site, based on the catchment characteristics provided in *Table 7.9* and *Table 7.10* below.

Figure 7.15 Ohlelo River at the Site Proposed for Adit A (2011)

Table 7.9 Ohlelo Catchment Characteristics

DESCRIPTION	VALUE
Catchment area (km²)	24.83
Length of watercourse to boundary (km)	9.61
Average tributary slope (m/m)	0.0308
Runoff factor	0.383

Table 7.10 Tributary Catchment Characteristics

DESCRIPTION	VALUE
Catchment area (km²)	0.414
Length of watercourse to boundary (km)	1.31
Average tributary slope (m/m)	0.153
Runoff factor	0.337

Results of flood peak estimations are provided in *Table 7.11*. Floodlines have been determined for the Ohlelo River and for the larger tributary that crosses the site on the eastern boundary. The modelling was based on the available contour maps, with preference given to the 1m contours available for the site, so as to enhance model accuracy.

Table 7.11 Results of Flood Peak Calculations (m³/s) for the Adit A Site

CATCHMENT	Flood peak per recurrence period (m³/s)					
	1:2	1:5	1:10	1:20	1:50	1:100
Ohlelo Catchment Area	48.1	86.5	120.2	157.2	207.7	251.9
Tributary Catchment Area	2.9	5.3	7.3	9.6	12.7	15.4

The associated natural 1:100-year and 1:50-year floodlines for the Adit A site area illustrated in *Figure 7.16*.

The 1:50-year floodline (illustrated in red in *Figure 7.16*) and the 1:100-year floodline (illustrated in blue in *Figure 7.16*) are similar for this site, especially on the steep right hand bank.

Figure 7.16 1:50 and 1:100-Year Floodlines at for the Proposed Adit A Site

7.8.3 Catchment W51B (Assegaai River Catchment)

Kangra Coal's current operations at Maquasa and the communities of Driefontein and St Helena are located to the north and north-west of this catchment. Kangra Coal's currently operating and closed mines within this catchment are detailed in *Table 7.12*, and depicted in *Figure 7.17*.

Table 7.12 Kangra Coal Mines within the Model Area

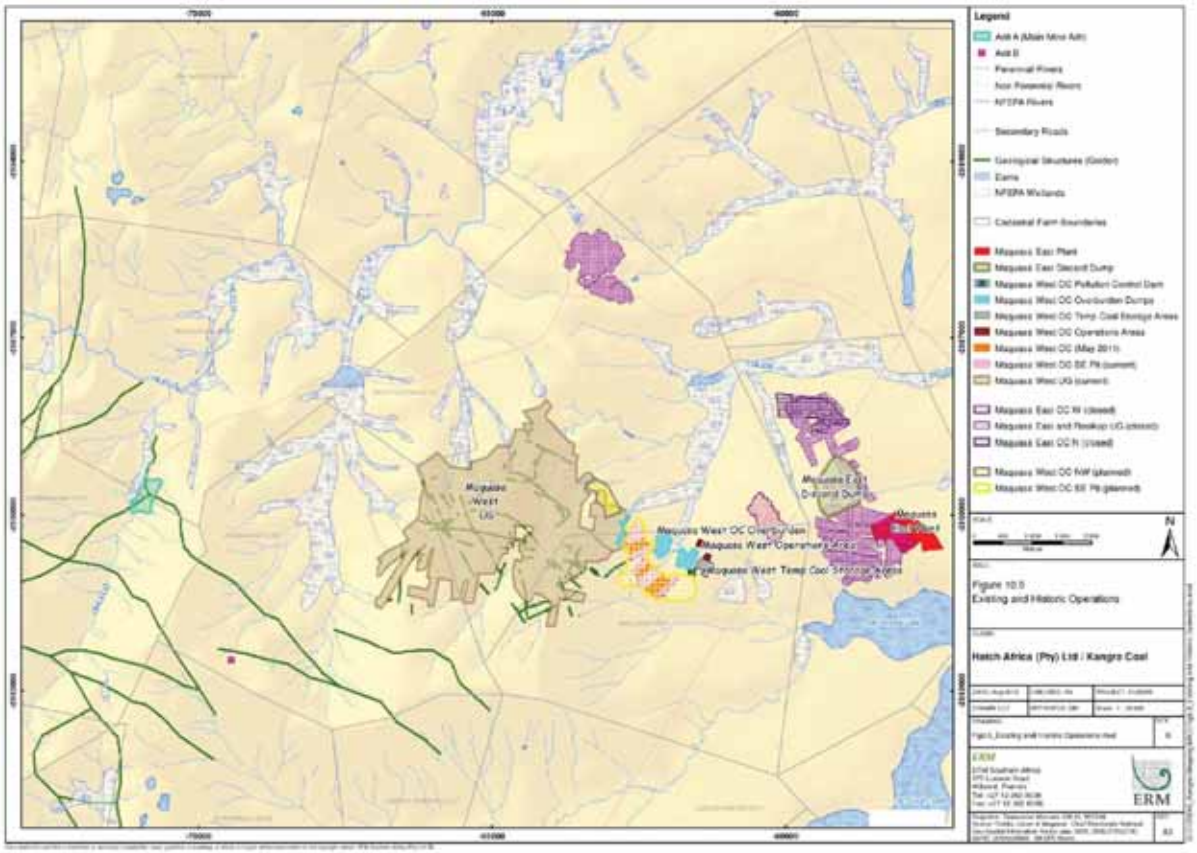
Reserve	Mining Method	Current Status
Maquasa West U/G	Underground, B&P, stooping	Active
Maquasa West O/C	Open Cast, roll-over method	Active and planned
Maquasa East U/G	Underground, B&P, stooping	Closed
Maquasa East O/C 1	Open Cast, roll-over method	Closed
Maquasa East O/C 2	Open Cast, roll-over method	Closed
Rooikop U/G	Underground, B&P, stooping	Closed

Only a small portion of the proposed Project will fall within this catchment. The site proposed for Adit B (ventilation shaft) is located within the upper reaches of quaternary catchment W51B (refer to *Figure 7.13*), which largely drains in an easterly direction to join the Mpundu River, which subsequently discharges into the Heyshope Dam.

Two tributaries pass through the proposed footprint of Adit B (*Figure 7.18*). The one originates from a natural spring located on the watershed of quaternaries W52A and W51B. This tributary passes through the north-easterly corner of the footprint area. The second tributary is a stormwater drainage channel that flows during rainfall events.

Both tributaries contribute towards run-off to the larger tributaries of the Mpundu River, which subsequently drain into the Heyshope Dam.

Figure 7.17 ***Existing Mining Activities***



Due to the catchment area of the Adit B site being small and as no contours are yet available for this site, except the large-interval lines from the 1:50 000 scale topographical maps, no sensible flood lines could be derived for the site. However, flood peaks were estimated for this site, as shown in *Table 7.13* below.

Table 7.13 Estimated Flood Peaks for Two Drainage Lines within the Adit B Site

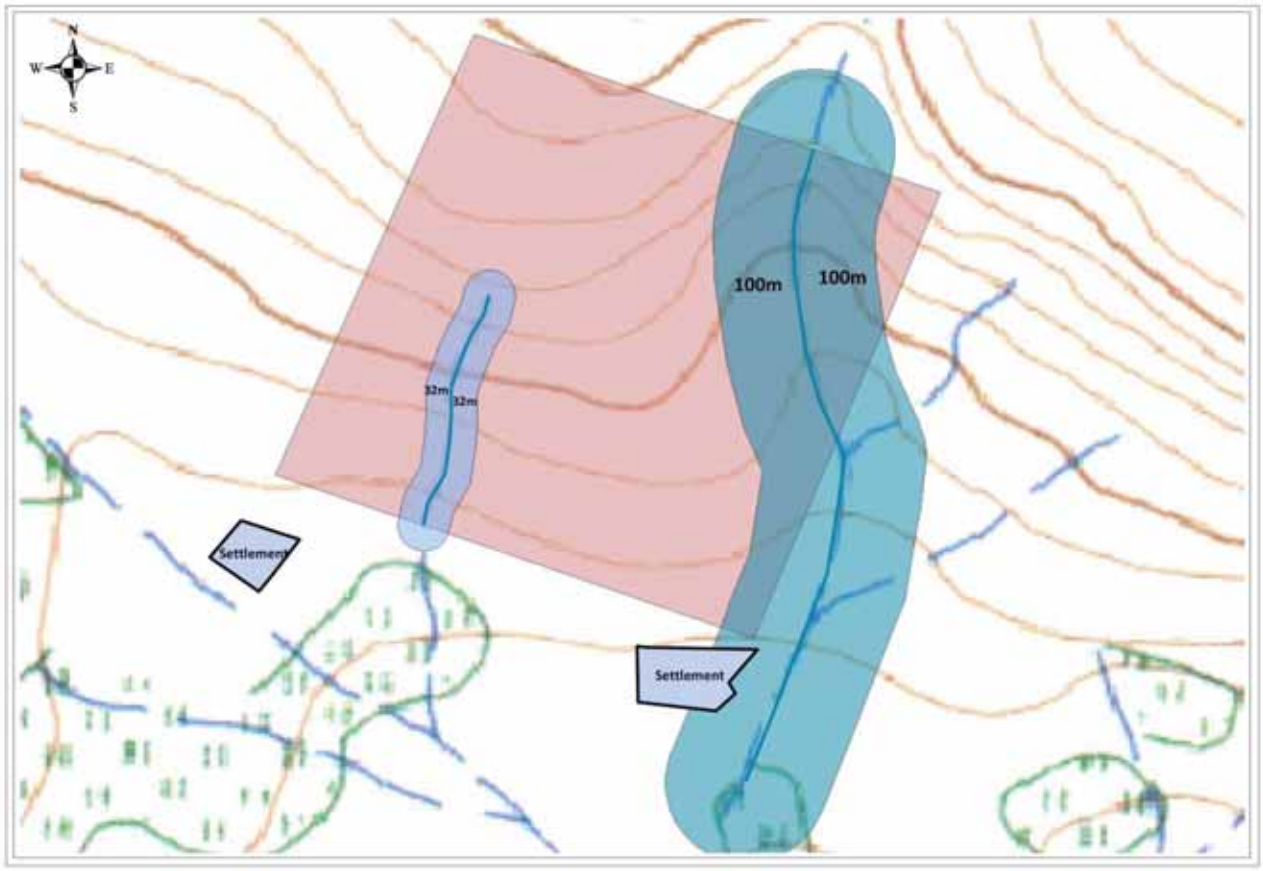
CATCHMENT	Flood peak per recurrence period (m^3/s)					
	1:2	1:5	1:10	1:20	1:50	1:100
Larger eastern drainage line: Catchment Area 0.57km^2	8.02	14.44	20.07	26.25	34.69	42.08
Smaller western drainage line: Catchment Area 0.06km^2	0.97	1.75	2.43	3.18	4.20	5.10

Floodline buffer strips are provided for the two tributaries (*Figure 7.18*) based on the following buffer distances:

- 100m for the natural spring originating tributary; and
- 32m for the stormwater drainage channel tributary.

The buffer distances provided, in the absence of calculated floodlines, are recommended in the *Figure 7.18*.

Figure 7.18 Proposed Flood Zones at the Site Proposed for the Ventilation Adit (Adit B) (based on 1:50 000 Topographical Map)



7.8.4 Proposed Route for the Overland Conveyor System

The proposed overland conveyor route crosses 13 wetlands and seven of these crossings were typified as having a valley bottom (with or without a channel). From an engineering perspective, six streams (A to F) for which the flood peaks could be determined, were identified. The flood peaks for this portion of the proposed Project were determined using the same method used for the site proposed for Adit A.

Catchment characteristics for each of the six streams (A to F) are provided in *Table 7.14* below. Flood peak estimations for each of six streams are provided in *Table 7.15.* Floodlines calculated using this data, as well as the 1m contour interval data provided below, are indicated for each of the six streams in *Figure 7.19*.

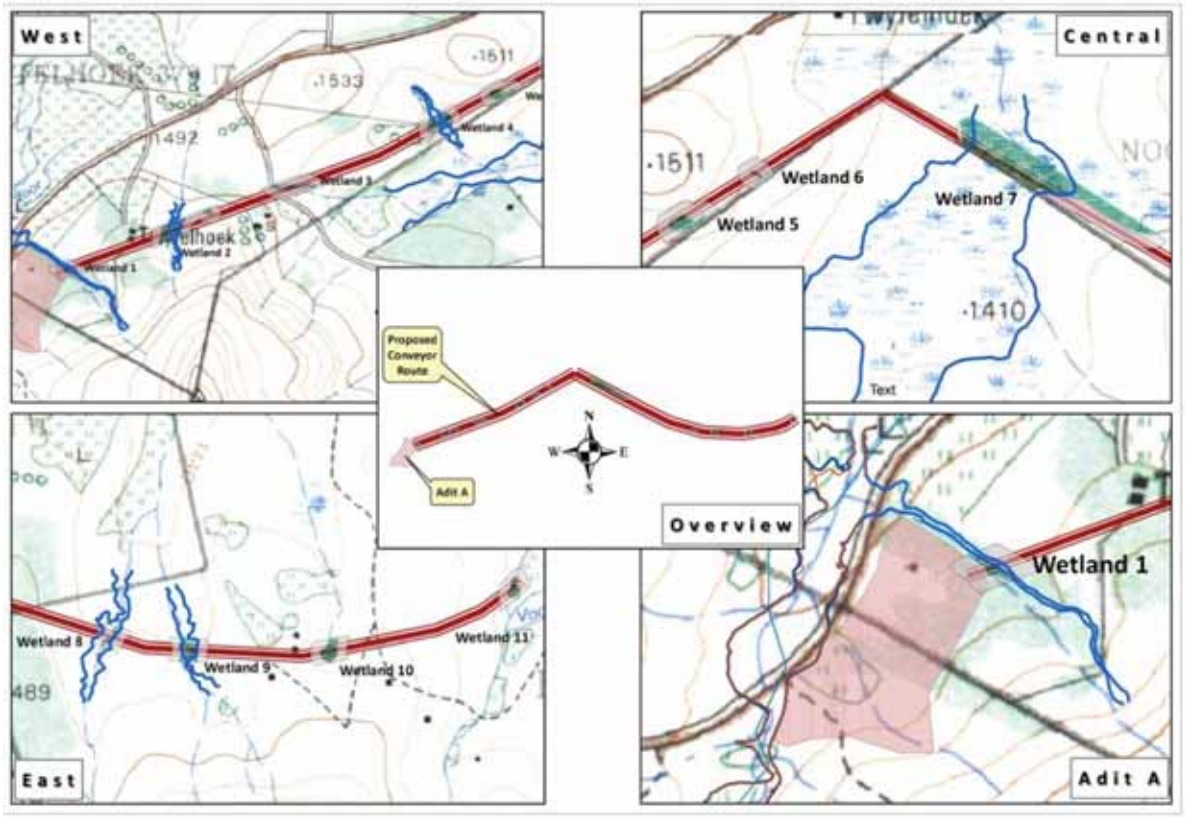
Table 7.14 Catchment Characteristics of the Proposed Route for the Overland Conveyor System

Catchment Characteristics	A	B	C	D	E	F
Wetland Number	1	2	4	7	8	0
Area (km^2)	0.31	0.17	0.49	17.91	1.81	0.55
Length of longest watercourse (km)	0.75	0.75	0.59	5.59	3.32	1.27
Average tributary Slope (m/m)	0.2044	0.2556	0.1333	0.019	0.0749	0.1281
Runoff Factor C	0.472	0.508	0.415	0.428	0.441	0.486

Table 7.15 Flood Peaks of the Proposed Route for the Overland Conveyor System

Peak Discharges (m^3/s)	A	B	C	D	E	F
Q_{50}	14.3	8.6	20.0	175.5	35.8	20.8
Q_{100}	19.8	12.0	27.7	243.6	49.7	28.9

Figure 7.19 ***Floodlines along the Proposed Route for the Overland Conveyor System***



7.8.5 Water Quality

Derived Water Quality Screening Levels

Using baseline surface water (springs and Ohlelo River) and groundwater quality results, the South African Water Quality Standards for Drinking Water (i.e. SANS241:2011), and the South African Water Quality Guidelines for both Aquatic Ecosystems and Livestock Watering, site specific surface water screening levels were proposed.

The derivation of the site specific surface and groundwater screening levels was discussed in detail in *Chapter 4*.

It is important to note that the derivation of these screening levels is based on a total of 18 spring and 12 river samples from the Ohlelo River during the wet season only. The screening levels should therefore be continually updated using additional baseline surface water monitoring data from all seasons.

Also to note is that the screening levels are intended to be used to assess the quality of water in natural surface water systems. The screening levels are not discharge standards. In this regard, the General Authorisations in Terms of Section 39 of the National Water Act (1998) will apply for waste discharge into surface water systems.

Water Quality Sampling Locations

Assegaai River Catchment

Water quality data presented for this catchment were obtained from the Maquasa West Amendment EMP Report compiled by Oryx Environmental (January 2006). (1) This data is of importance as it reflects water quality in streams downstream of existing active and closed Kangra Coal mines.

Dry (August) and wet season (November) water samples were taken in 2001 at six localities (SW1 to SW6) on streams downstream of the mining areas, as shown in *Figure 7.20.*

Ohlelo River Catchment

Water samples were collected at points along the Ohlelo and Hlelo Rivers in October 2009, September 2011 and in February 2013. Although coordinates of the sampling points were not provided for the 2009 sampling run, their locations can be approximated given the site descriptions provided in Donkerhoek Dam Development Project undertaken for DARDLA.

(1) No surface water samples were collected in the Assegaai River catchment; only spring and borehole water quality samples were collected in this catchment as part of the hydrocensus.

Sampling identifications used for the 2009, 2011 and 2013 water sample collections are as follows:

- October 2009: Water 1, Water 3 and Water 4
- September 2011: 1, 2, 3, 4
- February 2013: C1, C2, C3, C4, C5, C6

Although different names are used for the different sampling points in sampling rounds, some of the locations are the same. Details on the sampling locations are shown in *Table 7.16* and *Figure 7.21.*

It should be noted that springs were not sampled during the surface water sampling campaign. Springs were sampled as part of the overall groundwater study, and sampling and identification of springs occurred during the groundwater hydrocensus.

Table 7.16 Details of Water Sampling Localities in W52A

SAMPLE ID AND YEAR SAMPLED	LOCALITY	DESCRIPTION	X (DMS)	Y (DMS)
1 (2011) and C1 (2013)	Donkerhoek	Tributary of the Ohlelo River, upstream of Adit A	27° 01′ 9.92″ S	30° 16′ 50.46″ E
Water 1 (2009) and C2 (2013)	Donkerhoek	Ohlelo River, upstream of Adit A	27° 01′ 3.94″ S	30° 16′ 59.67″ E
C3 (2013)	Twyfelhoek	Ohlelo River, downstream of Adit A	27° 0′ 49.5″ S	30° 17′ 8.53″ E
2 (2011) and C4 (2013)	Twyfelhoek	Ohlelo River, upstream of confluence with Hlelo River	27° 0′ 10.14″ S	30° 17′ 14.61″ E
Water 3 (2009)	Twyfelhoek	Dam Site E (Hlelo River)	26° 59′ 26.05″ S	30° 18′ 57.61″ E
4 (2011)	Twyfelhoek	Downstream of Kransbank Wetland on Road D2548	26° 59′ 54.79″ S	30° 19′ 13.23″ E
3 (2011)	Kransbank	Stream in upper reaches of Kransbank Wetland	27° 02′ 5.93″ S	30° 18′ 24.93″ E
Water 4 (2009) and C5 (2013)	Witbank	Hlelo River, bridge crossing Road D273	26° 58′ 11.01″ S	30° 20′ 38.38″ E
C6 (2013)	Driepan	Hlelo River, downstream of confluence with Taaibosch Spruit, on Road D803	26° 54′ 0.98″ S	30° 27′ 10.96″ E

Figure 7.20 ***Water Quality Sampling Locations in Assegaai River Catchment (2001)***

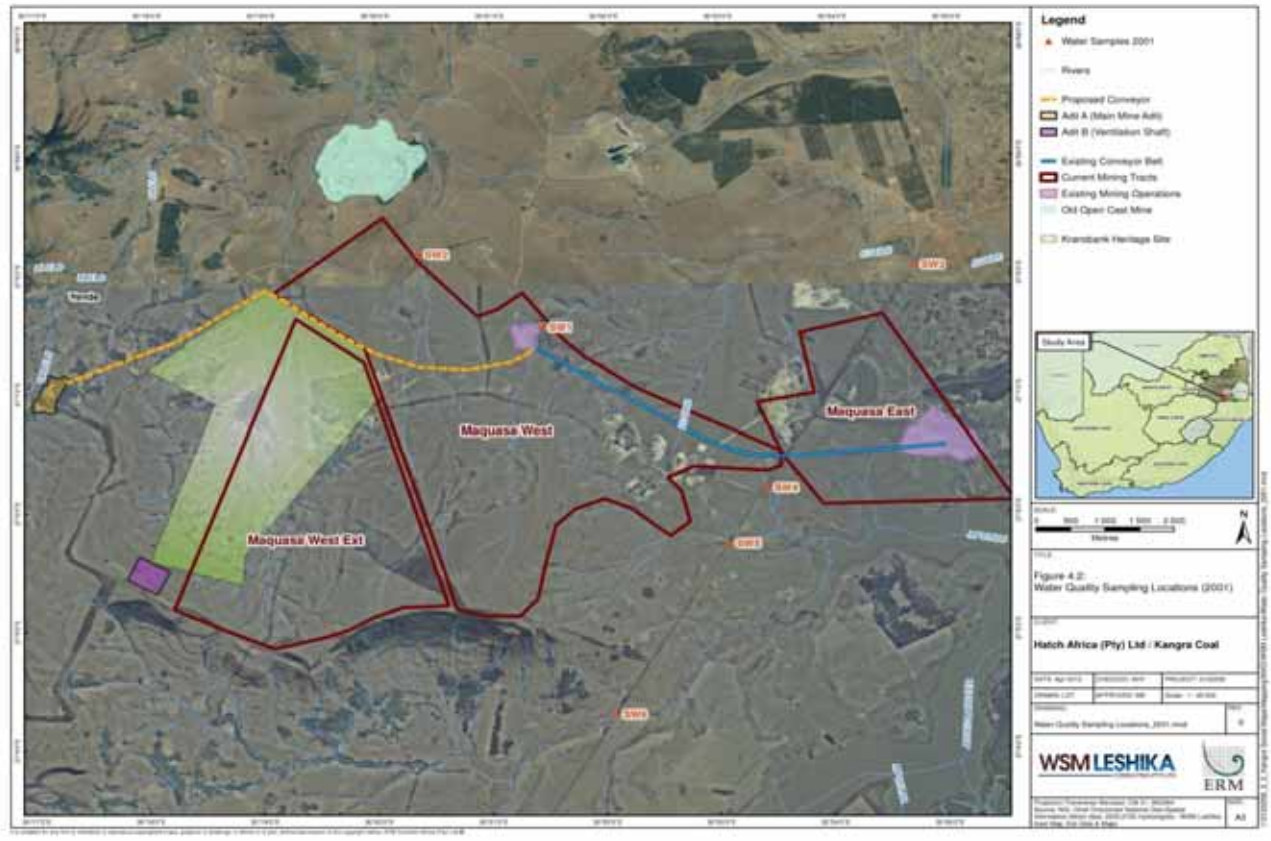


Figure 7.21 ***Water Quality Sampling Locations in Hlelo River Catchment (2009, 2011 and 2013)***

Water Quality Results

Assegaai River Catchment

Water quality data for this catchment area are presented in *Table 7.17*.

In general the water quality is within the proposed RQWO with the following exceptions:

- EC/TDS – As EC is a measure of the total dissolved salt content of water, the TDS results are only discussed here. Sample SW1 (Aug 01) marginally exceeds the screening level for TDS, and this is not considered significant. Both samples from SW3 exceed the TDS screening level. SW3 is the furthest downstream sample and is likely to be affected by agricultural and mining activities in the upstream catchment. TDS and EC are high level screening values, and exceedances should be investigated to evaluate what chemical element is resulting in the TDS or EC exceeding the screening level. In SW3, none of the major ions and only aluminium marginally exceeds the specified screening level. The Aug 01 sample from SW6 significantly exceeds the TDS screening level. This is due to elevated calcium and possibly alkalinity concentrations (alkalinity was not determined in these samples). SW6 appears to be located in a different catchment and may be affected by a different underlying geology.

- Calcium exceeds the specified screening level in SW5 and SW6 in Aug 01. The calcium screening level was derived based on the anticipated acid rock drainage (ARD) reactions which would be expected to occur in the mining areas, resulting in elevated sulphate and calcium concentrations. As such, increases in calcium concentration would provide an early warning of potential impact related to ARD, and calcium at these levels is not expected to have adverse effects on water use in the catchment.

ARD reactions related to mining of sulphidic material would be expected to result in decreased pH and increased sulphate concentrations. The pH and sulphate concentrations in the Assegaai catchment are shown in *Figure 7.22*. Both pH and sulphate concentrations are within the respective RWQO, showing no impact from ARD. Sulphate concentrations are notably higher in the November sampling round than during the August sampling round. This could be explained by flushing of salts that accumulated on mining waste during the dry season by the early summer rains. The effect is most pronounced in samples SW3 and SW4. SW3 is the furthest downstream sample and would show effects from the catchment as a whole, including parts of the Maquasa East mining area, and SW4 is in the tributary that originates immediately to the south of the Maquasa East operations. Hardly any change is noted in SW1 and SW2 which are in unaffected catchments.

The surface water data for the Assegaai Catchment show that surface water has been impacted by neutral mine drainage, but the water generally conforms to the derived RWQO. A round of surface water sampling should be

conducted after early summer rains to ensure that RWQO exceedances are not occurring as salts that accumulated during the dry winter period are flushed into the surface water system.

Figure 7.22 pH and sulphate concentrations in water samples from the Assegaai Catchment

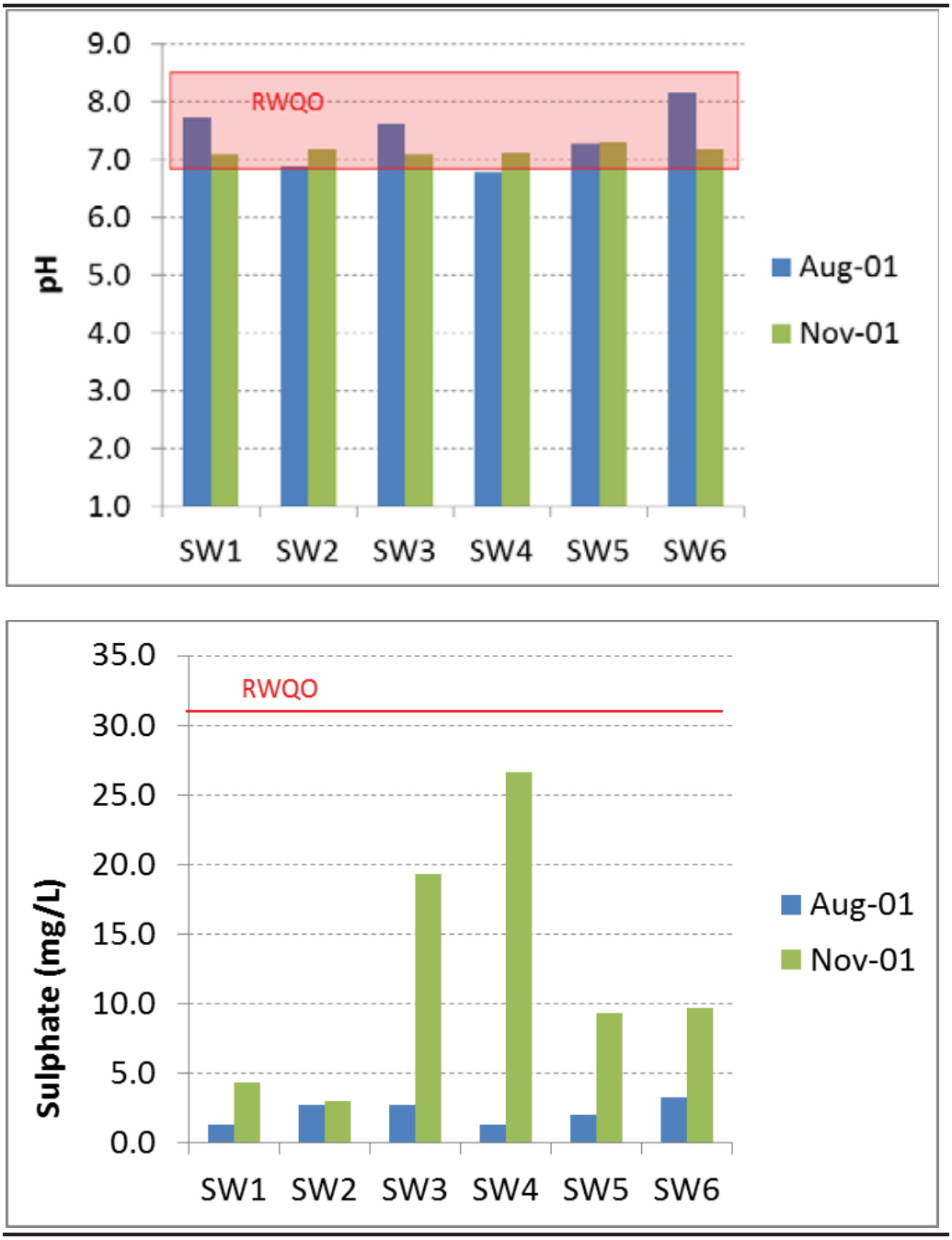


Table 7.17 Water Quality for Surface Water Sampling Sites SW1 to SW6 in the Assegaai River Catchment (2001)

Analyte	Unit	SAMPLING POINTS												PROPOSED RWQO
DATE		SW1 Aug-01	SW1 Nov-01	SW2 Aug-01	SW2 Nov-01	SW3 Aug-01	SW3 Nov-01	SW4 Aug-01	SW4 Nov-01	SW5 Aug-01	SW5 Nov-01	SW6 Aug-01	SW6 Nov-01	
pH		7.7	7.1	6.9	7.2	7.6	7.1	6.8	7.1	7.3	7.3	8.1	7.2	6.9-8.5
EC	mS/m	7.8	4.3	5.7	3.8	8.7	10.0	6.8	9.9	12.1	7.0	24.5	8.2	5.5-9.1
TDS	mg/l	52	28	40	30	70	64	48	60	86	48	160	50	20-50
F	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	0.03	<0.01	0.75
SO_4	mg/l	1.3	4.3	2.7	3.0	2.7	19.3	1.3	26.6	2.0	9.3	3.3	9.7	31
Cl	mg/l	6	4	5	4	4	4	13	3	4	5	9	5	22
Ca	mg/l	5.9	2.5	3.6	3.5	7.2	9.2	5.8	5.9	12.3	5.2	23.7	5.6	12
Mg	mg/l	3.4	1.8	1.8	1.7	4.0	3.2	2.4	3.8	4.8	2.6	11.9	2.8	-
Na	mg/l	2.7	2.3	2.2	1.9	3.5	3.0	3.5	3.6	2.8	3.1	5.4	3.0	16
N	mg/l	<0.1	0.10	<0.1	0.43	<0.1	0.2	0.6	0.1	0.2	0.1	0.2	0.2	0.75
Alkalinity	mg/l as CaCO3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
P	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Al	mg/l	0.05	<0.01	0.78	0.09	0.52	<0.01	0.02	<0.01	<0.01	0.33	0.15	0.29	0.5
Fe	mg/l	<0.01	<0.01	0.12	<0.01	<0.01	0.1	<0.01	<0.01	<0.01	0.27	0.08	0.21	0.2
Mn	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.18
Cu	mg/l	<0.01	<0.01	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	0.19	<0.01	0.10	
Pb	mg/l	<0.01	<0.01	<0.01	0.02	NA	<0.01	0.03	<0.01	0.02	<0.01	0.02	<0.01	0.050

Note: Values in red show constituents where screening levels are exceeded
NA: No test results

Source: Maquasa West Amendment EMP Report (Oryx Environmental (January 2006).

Ohlelo River Catchment

Water quality data for sampling sites in this catchment are presented in *Table 7.18* and *Table 7.19.*

In general the water quality is within the proposed RQWO with the following exceptions:

- pH is below the RWQO in one sample, C4. C4 is the most downstream sample on the Ohlelo River, just before the confluence with the Hlelo River.

- EC/TDS – As EC is a measure of the total dissolved salt content of water, the TDS results are only discussed here. Sample 1 (Sep 11), Sample 4 and Sample Water 4 exceed the RWQO for TDS. In all cases, none of the major ions that constitute the elevated TDS exceeds the specified screening level.

- Iron exceeds the RWQO in Water 1, C4, Water 3, Water 4, C5 and C6. These exceedances are likely to be natural and may be due to the presence of suspended solids in the samples which are analysed as part of the sample. Iron is not naturally soluble in the pH range of the samples.

- Manganese exceeds the RWQO in sample C4. This sample has the lowest pH of the analysed samples.

- Cadmium exceeds the RWQO in three samples, Water 1, Water 3 and Water 4. However, the RWQO for cadmium is very low as no the baseline samples used to determine the RWQOs did not have cadmium detections; therefore the DWAF aquatic toxicology screening levels are used. The RWQOs could be amended to reflect these detections, which are likely to represent baseline conditions.

ARD reactions related to mining of sulphidic material would be expected to result in decreased pH and increased sulphate concentrations. The pH and sulphate concentrations in the Hlelo catchment from February 2013 are shown in *Figure 7.23*. The samples are arranged from upstream to downstream. Apart from pH in sample C4, both pH and sulphate concentrations are within the respective RWQO. Sulphate concentrations increase downstream in the Ohlelo River, from sampling location C1 to C4, and pH decreases from location C2 to C4, with highest sulphate and lowest pH being detected in sample C4. This could indicate a slight ARD related effect due to mining activities in the catchment. However, dilution by the Hlelo River appears to limit the extent of this effect to the lower reaches of the Hlelo River.

The surface water data for the Ohlelo Catchment show that surface water has been slightly affected by mine drainage in the Ohlelo River, but the water generally conforms to the derived RWQO. Dilution in the Hlelo River limits the extent of the ARD effect to the Ohlelo River. No assessment of seasonal changes could be made due the lack of routine monitoring results. A round of

surface water sampling should be conducted after early summer rains to ensure that RWQO exceedances are not occurring as a result of salts, that accumulate during the dry winter period, are flushed into the surface water system.

Table 7.18 Macro-element Water Quality in the Hlelo River Catchment

Element	Unit	SAMPLING LOCATIONS													PROPOSED RWQO (Table 4.18)
	Sample ID	1	C1	Water 1	C2	C3	2	C4	Water 3	4	3	Water 4	C5	C6	
	DATE	Sep-11	Feb-13	Oct-09	Feb-13	Feb-13	Sep-11	Feb-13	Oct-09	Sep-11	Sep-13	Oct-09	Feb-13	Feb-13	
pH		7.2	7.5	8.2	7.8	7.5	7.6	6.6	8.0	7.4	7.4	8.0	7.9	7.7	6.9-8.5
E.C	mS/m	9.8	6.4	13.0	7.2	9.4	9.5	8.2	9.8	11.7	7.6	14.6	8.2	8.4	5.5-9.1
TDS	mg/l	81.0	NA	42.0	NA	NA	48.0	NA	39.0	61.0	41.0	61.0	NA	NA	20-50
NO_3	mg/l	0.7	0.3	0.1	0.3	0.3	0.5	0.0	0.1	0.2	0.4	0.1	0.3	0.4	0.75
F	mg/l	<0.18	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	<0.18	0.2	0.2	0.2	0.75
SO_4	mg/l	5.3	1.3	0.3	2.1	2.8	2.3	4.1	1.6	7.3	2.3	19.7	2.5	2.5	31
Cl	mg/l	19.9	<0.423	1.4	<0.423	<0.423	<1.4	<0.423	2.2	4.9	<1.4	2.1	<0.423	<0.423	22
Ca	mg/l	10.3	4.2	6.9	5.0	4.5	7.9	2.5	5.5	8.2	7.1	9.6	0.2	0.2	12
Mg	mg/l	5.8	2.5	3.7	3.1	2.2	4.9	1.4	3.1	4.6	3.8	4.5	3.1	3.3	-
Na	mg/l	12.0	0.5	4.9	0.3	1.9	4.3	2.0	4.7	8.2	4.7	5.0	0.2	0.2	16
Turbidity	NTU	1.0					3.7			76.3	97.3				-
Alkalinity	mg/l as CaCO3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
P	mg/l		<0.008		<0.008	<0.008		<0.008					<0.008	<0.008	-
B	mg/l	0.012	<0.003		<0.003	<0.003	0.008	<0.003		0.01	0.01		<0.003	<0.003	

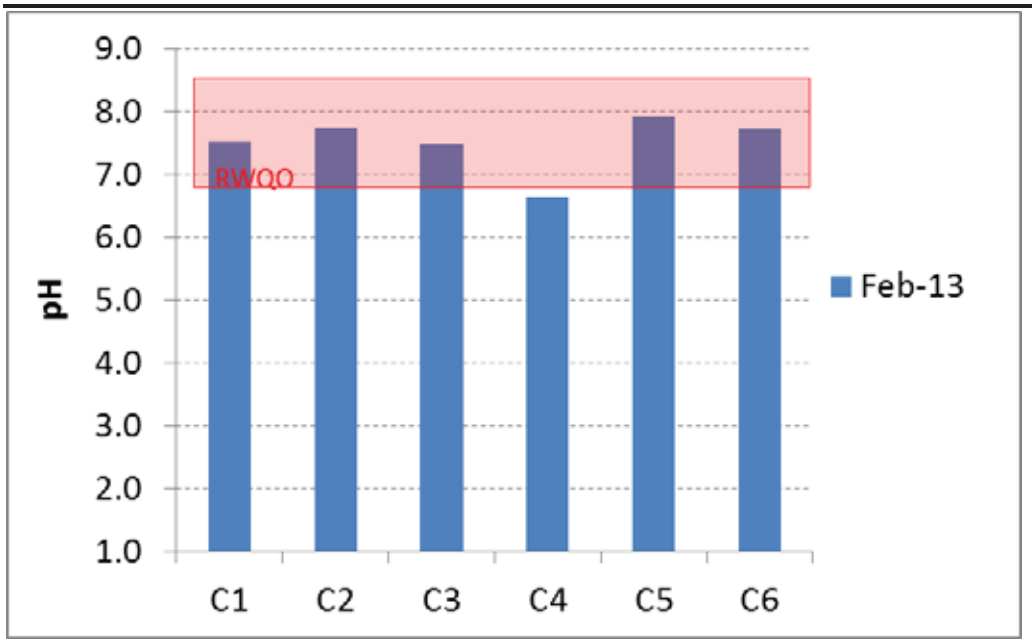
Note: Values in red show constituents where threshold range is exceeded
NA : No test results

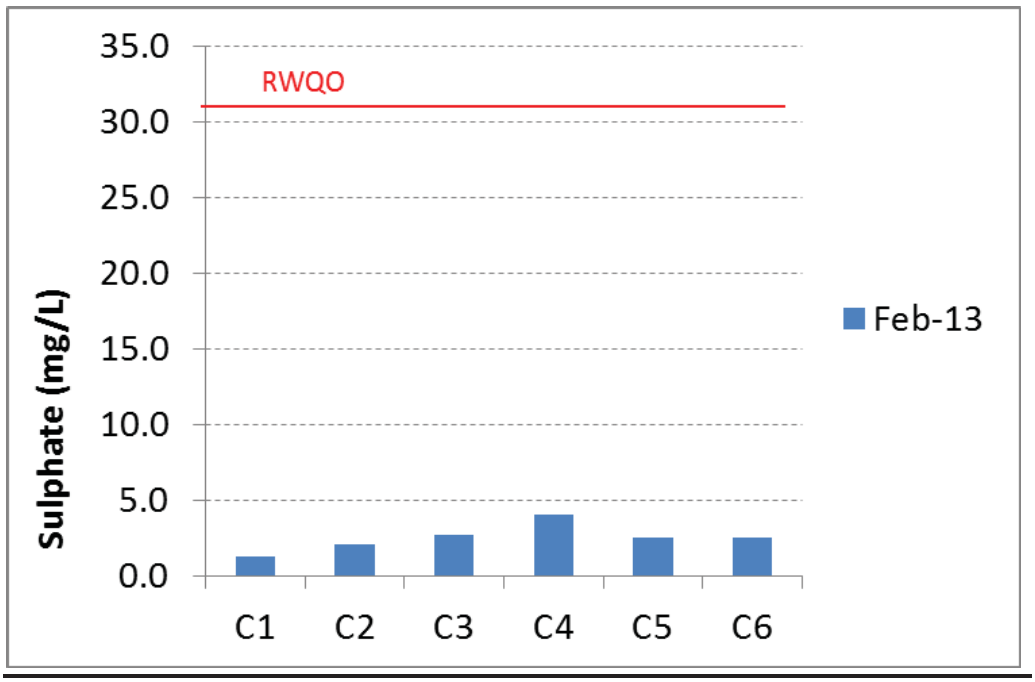
Table 7.19 Trace-element Water Quality in the Hlelo River Catchment

Element	Unit	SAMPLING LOCATIONS												PROPOSED RWQO
	Sample ID	1	C1	Water 1	C2	C3	2	C4	Water 3	4	3	Water 4	C5	C6	
	DATE	Sep-11	Feb-13	Oct-09	Feb-13	Feb-13	Sep-11	Feb-13	Oct-09	Sep-11	Sep-13	Oct-09	Feb-13	Feb-13	
As	mg/l		<0.007		<0.007	<0.007		<0.007					<0.007	<0.007	
Sr	mg/l		0.020		0.022	0.035		0.037					0.042	0.046	
Ba	mg/l		0.007		0.009	0.032		0.071					0.018	0.022	
Al	mg/l	<0.006	<0.003	0.137	<0.003	<0.003	<0.006	<0.003	0.283	0.146	0.140	0.222	<0.003	<0.003	0.5
V	mg/l	0.027	<0.001		<0.001	<0.001	0.024	<0.001		0.021	0.023		<0.001	<0.001	0.2
Cr	mg/l	<0.002	<0.001	0.003	<0.001	<0.001	<0.002	<0.001	0.003	<0.002	<0.002	0.003	<0.001	<0.001	
Mo	mg/l		0.008		0.008	0.007		0.008					0.007	0.008	
Fe	mg/l	<0.006	<0.003	0.302	<0.003	<0.003	<0.006	0.242	0.667	0.108	0.032	0.513	0.236	0.306	0.2
Mn	mg/l	0.002	<0.001	0.001	<0.001	<0.001	<0.001	0.321	<0.001	<0.001	0.001	0.001	<0.001	<0.001	0.18
Ni	mg/l	0.013	<0.001	0.007	<0.001	<0.001	0.003	<0.001	0.007	0.003	0.003	0.007	<0.001	<0.001	0.07
Cu	mg/l	0.004	<0.001	0.018	<0.001	<0.001	0.011	<0.001	0.017	0.019	<0.001	0.017	<0.001	<0.001	
Zn	mg/l	0.036	<0.002	0.010	<0.002	<0.002	0.008	<0.002	0.010	0.010	<0.004	0.010	<0.002	<0.002	0.03
Cd	mg/l	<0.001	<0.001	0.007	<0.001	<0.001	<0.001	<0.001	0.007	<0.001	<0.001	0.007	<0.001	<0.001	0.00025
Pb	mg/l	<0.01	<0.004	0.024	<0.004	<0.004	<0.01	<0.004	0.024	<0.01	<0.001	0.024	<0.004	<0.004	
Ag	mg/l	<0.002	<0.001		<0.001	<0.001	<0.002	<0.001		<0.002	<0.002		<0.001	<0.001	
Be	mg/l		<0.001		<0.001	<0.001		<0.001					<0.001	<0.001	
Co	mg/l	<0.002	<0.001	0.003	<0.001	<0.001	<0.002	<0.001	0.003	<0.002	<0.002	0.003	<0.001	<0.001	0.5
Se	mg/l		<0.007		<0.007	<0.007		<0.007					<0.007	<0.007	

Note: Values in red show constituents where threshold range is exceeded
NA : No test results

Figure 7.23 Variation in pH and Sulphate Concentrations from Upstream to Downstream





7.9 GROUNDWATER

Please Note - This Section provides an overview of the key outcomes from the detailed Groundwater baseline study, and is used to inform the Groundwater Impact Assessment presented in *Chapter 9*. The complete Groundwater baseline is included in the Groundwater Impact Assessment attached to *Annex C.3* of this report.

7.9.1 Field Investigation

The following field investigation programme was carried out during this study to establish the baseline groundwater conditions for the Project Area.

- **Hydrocensus**: A comprehensive hydrocensus was carried out covering a total area of 1 160 km² including the quaternary catchments C11C, W52A and W51B. In total, 75 hydrocensus sites were identified including 44 boreholes and 31 natural springs.

- **Geophysical Investigation**: A total of approximately 8 km of resistivity survey was carried out across the Project Area (16 traverses) to verify the position of faults and dykes and identify drilling targets.

- **Percussion Drilling**: Ten percussion boreholes were drilled across the Project Area to refine the current understanding of local groundwater flow dynamics, including the understanding of hydrostratigraphic units, their water-bearing characteristics and source(s) - receptor(s) linkages. The drilling focused on the previously proposed adit positions (Adit A, B and D). Completed boreholes were constructed as long-term monitoring boreholes.

- **Aquifer Testing**: Aquifer testing was undertaken to define the hydrogeological parameters of the identified aquifers. In total six constant discharge tests and three slug tests were carried out in newly installed boreholes.

- **Water Sampling:** One round of groundwater and surface water sampling was undertaken following the wet season. Samples were collected from newly installed monitoring wells, hydrocensus boreholes and springs as well as from the Ohlelo stream. In total, 56 samples were submitted for analysis of major ions and trace elements and 22 for environmental isotope analysis.

Results of the field sampling programme, and its contribution to better understanding the baseline hydrogeology of the Project Area, are provided below.

7.9.2 Hydrocensus

A hydrocensus carried out over a total area of 1 160 km² including the quaternary catchments C11C, W52A and W51B, identified a total of 75 hydrocensus sites, including the following:

- 44 boreholes of which 20 were privately owned boreholes by farmers and local communities and 24 were existing Kangra Coal monitoring and exploration boreholes; and

- 31 natural springs of which 29 were located on privately owned land and 2 springs were located on land owned by Kangra Coal.

The location of the identified hydrocensus sites are presented in *Figure 7.24*. Hydrocensus survey results and detailed hydrocensus survey field sheets are included in *Annex C* and *D* of the Groundwater Specialist Report (*Annex C.3*).

7.9.3 Water Use

Community and Farm-Boreholes

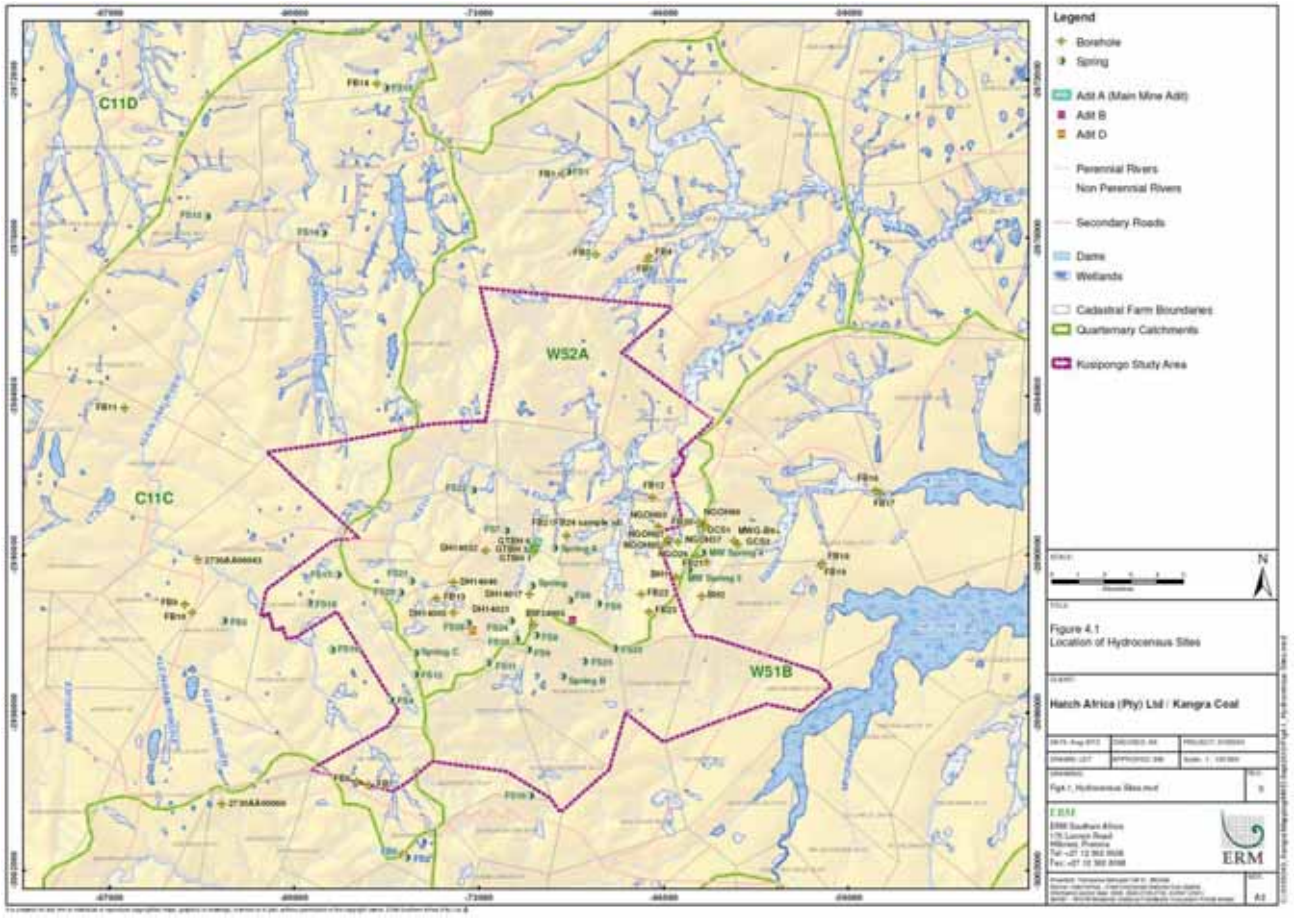
A total of 20 privately owned boreholes were identified during the hydrocensus. Five of these boreholes are located in the vicinity of the planned underground mine; borehole names (given by ERM) and owners are detailed in *Table 7.20*. Borehole depths could not be determined as the boreholes were not accessible for measurements and no information was available. Water abstraction from boreholes ranges from 0.7 m^3/d for boreholes using submersible hand pumps to 57.8m^3/d for windmill driven pumps. The location of the boreholes listed in *Table 7.20* is indicated in *Figure 7.24*.

Table 7.20 Privately Owned Boreholes

Name	Pump Equipment	X (DMS)	Y (DMS)	Water Use	Owner
FB2	Hand Pump	27° 0' 47.072" S	30° 17' 52.651" E	Drinking water	Yende Community (Twyfelhoek School)
FB6	Submersible	27° 7' 18.660" S	30° 14' 4.014" E	Drinking water, stock watering, gardening	C.L. Greyling
FB7	Wind Pump	27° 5' 52.446" S	30° 13' 18.210" E	Drinking water, stock watering	C.L. Greyling
FB8	Wind Pump	27° 5' 48.103" S	30° 13' 2.558" E	Drinking water, stock watering, game watering	C.L. Greyling
FB13	Wind Pump	27° 2' 3.142" S	30° 14' 52.958" E	Drinking water, stock watering	C.J.F. Greyling

Borehole water in the Project Area is mostly used for domestic drinking water supply for local farmers and the Twyfelhoek School, and to a lesser extent for stock watering purposes by local farmers.

Figure 7.24 Location of Hydrocensus Sites



Surface Water

The bulk of the water used in the Project Area is supplied by numerous springs and streams. Spring water and water from streams is predominantly used for domestic drinking water supply purposes for most local communities and for stock watering by local farmers.

A total of 25 springs were identified within the Project Area (FS5 through to FS26, Spring A, Spring B and Spring C). The location of these springs is provided in *Figure 7.24*.

Yields of the identified springs have been quantified during the survey and are presented in *Table 7.21*.

Water use volumes pertaining to surface water have not been estimated.

Table 7.21 Measured Yields of Identified Springs

Name	X (DMS)	Y (DMS)	User	Measured Yield (m^3/d)
FS5	27° 2' 11.105" S	30° 18' 35.665" E	Kanluka Community	NM
FS6	27° 2' 6.169" S	30° 17' 56.658" E	Kanluka Community	38.9
FS7	27° 0' 40.772" S	30° 16' 29.772" E	C.J.F. Greyling	37.6
FS8	27° 2' 49.469" S	30° 17' 9.982" E	C.J.F. Greyling	6.1
FS9	27° 3' 7.414" S	30° 16' 59.491" E	C.J.F. Greyling	NM
FS10	27° 2' 54.270" S	30° 16' 43.102" E	C.J.F. Greyling	14.4
FS11	27° 3' 23.532" S	30° 16' 3.580" E	C.J.F. Greyling	15.4
FS12	27° 3' 37.687" S	30° 14' 23.769" E	C.J.F. Greyling	0.3
FS13	27° 6' 8.022" S	30° 17' 0.847" E	Francois van Niekerk	NM
FS14	27° 1' 33.198" S	30° 12' 38.317" E	Izak Presley	22.5
FS15	27° 2' 8.386" S	30° 11' 58.744" E	Izak Presley	NM
FS16	27° 3' 6.159" S	30° 12' 29.140" E	C.J.F. Greyling	1.4
FS17	27° 3' 22.677" S	30° 18' 15.923" E	C.J.F. Greyling	10.6
FS18	27° 3' 6.477" S	30° 18' 58.005" E	C.J.F. Greyling	2.6
FS19	27° 2' 34.173" S	30° 15' 36.798" E	C.J.F. Greyling	51.8
FS20	27° 2' 11.105" S	30° 18' 35.665" E	Rudi Kemp	2.6
FS21	27° 2' 6.169" S	30° 17' 56.658" E	Rudi Kemp	1.4
FS22	27° 0' 40.772" S	30° 16' 29.772" E	C.J.F. Greyling	1.4
FS23	27° 2' 49.469" S	30° 17' 9.982" E	Jurie Wessels	5.8
FS24	27° 3' 7.414" S	30° 16' 59.491" E	C.J.F. Greyling	7.2
FS25	27° 2' 54.270" S	30° 16' 43.102" E	Kanluka Community	2.3
FS26	27° 3' 23.532" S	30° 16' 3.580" E	C.J.F. Greyling	NM
Spring A	27° 1' 2.224" S	30° 17' 35.581" E	Kanluka Community	3.8
Spring B	27° 3' 40.496" S	30° 17' 46.383" E	C.J.F. Greyling	7.5
Spring C	27° 3' 10.464" S	30° 14' 24.098" E	C.J.F. Greyling	7.2

Notes: NM Not measured

Three community surface water abstraction points were identified in the Project Area (*Table 7.22*).

Table 7.22 Community Surface Water Abstraction Points

SW Abstraction Point Number	Stream/River	X (DMS)	Y (DMS)	User
Point1	Ohlelo	27° 0' 9.462" S	30° 17' 16.035" E	Yende Community
Point2	Kraansbank	27° 2' 2.744" S	30° 18' 26.647" E	Kanluka Community
Point3	Kraansbank	27° 1' 9.672" S	30° 18' 16.344" E	Kanluka Community

Natural Ecosystem and Wetlands

Numerous wetlands are present within the Project Area, which were identified to have a range of anthropogenic and ecological services (NSS, 2011 and SANBI/CSIR, 2010). Furthermore, the Kransbank Private Reserve, which includes large wetland areas, is located approximately 2km to the east of the planned Adit A location.

7.9.4 Geophysical Investigation and Resultant Borehole Locations

A total of approximately 8km of resistivity surveys was carried out across the Project Area (16 traverses) to verify the position of faults and dykes and identify drilling targets.

Based on the resistivity survey data, strategic drilling targets were selected for the drilling of the groundwater characterisation boreholes.

Ten percussion boreholes were drilled across the Project Area to refine the current understanding of local groundwater flow dynamics, including the understanding of hydrostratigraphic units, their water-bearing characteristics and source(s) - receptor(s) linkages. The drilling focused on the previously proposed adit positions (Adit A, B and D). Completed boreholes were constructed as long-term monitoring boreholes.

The locations of the boreholes are presented in *Figure 7.25* and a detailed borehole summary is given in *Table 7.23*.

Figure 7.25 Location of ERM Boreholes

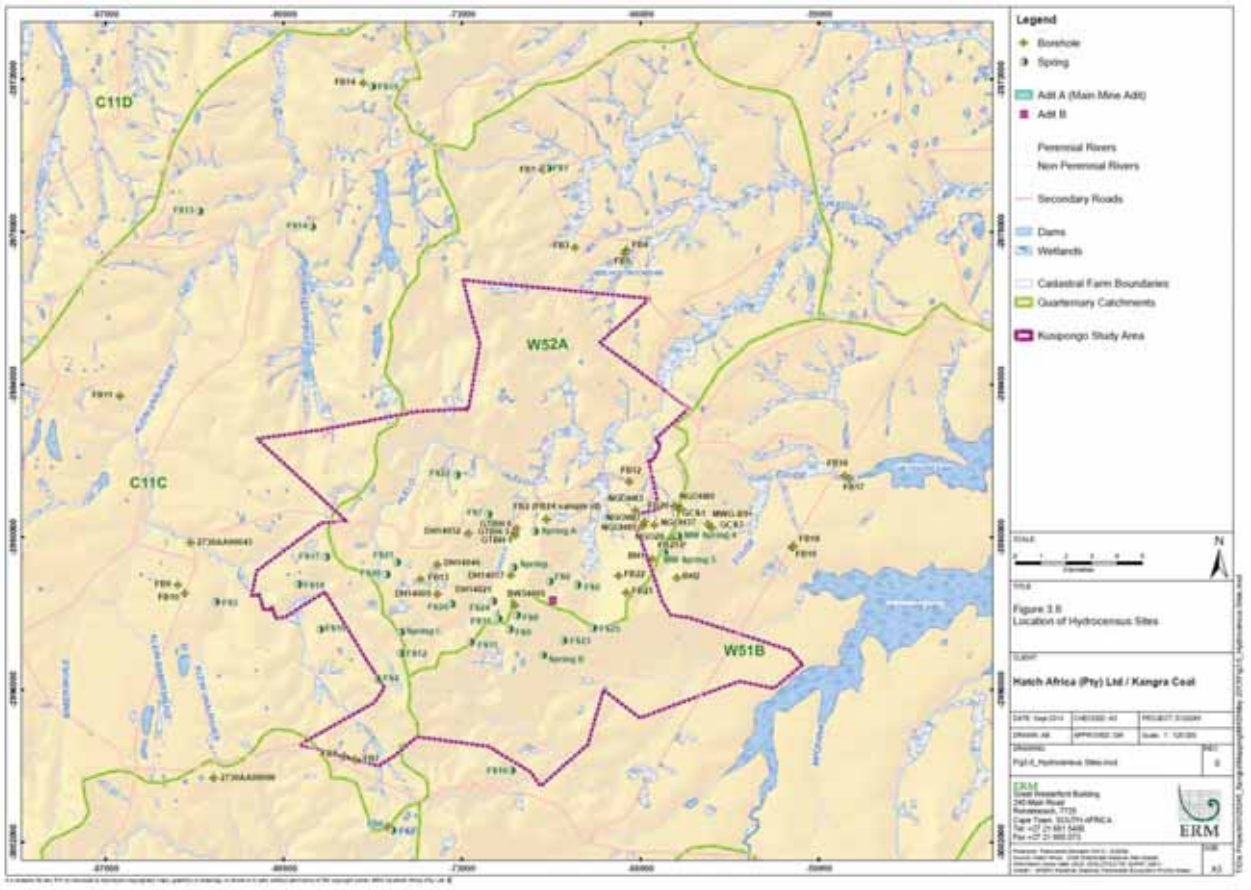


Table 7.23 Detailed Borehole Summary

Borehole ID	Target	Area	Borehole Location			Borehole Data							
			Latitude (DMS)	Longitude (DMS)	Standpipe Elevations (mamsl)	Completion Date	Borehole Depth (m)	Water Strike / s Depth (mbgl)	Total Blow Yield (L/sec)	Static Water Level (mbgl)	Static Water Elevation (mamsl)	Dominant Aquifer Type Intersected	
ERMBH1	Matrix	Adit A	27° 1' 9.072" S	30° 17' 6.628" E	1532.43	23-Mar-11	60	13, 40	0.2	12.56	1519.52	Semi-Confined	Weathered
ERMBH2	SW – GW Interaction	Adit A	27° 0' 59.350" S	30° 17' 3.715" E	1502.33	24-Mar-11	40	4, 36	Seepage	2.64	1499.32	Semi-Confined	Perched & Fractured
ERMBH3	Structure	Adit A	27° 0' 38.446" S	30° 17' 14.113" E	1488.71	25-Mar-11	46	16, 20	8.5	12.65	1475.66	Confined	Weathered & Fractured
ERMBH4	Structure	Adit B	27° 3' 34.807" S	30° 18' 20.306" E	1428.66	2-Apr-11	70	7, 23, 27	0.5	0.47	1427.89	Confined	Weathered & Fractured
ERMBH5	Matrix	Adit C	27° 3' 27.620" S	30° 14' 25.436" E	1782.81	31-Mar-11	90	16, 34, 55	Seepage	8.78	1773.68	Confined	Weathered & Fractured
ERMBH6	Matrix	Adit D	27° 2' 28.635" S	30° 15' 23.420" E	1795.06	29-Mar-11	124	4	Seepage	88.09	1706.69	Unconfined	Perched
ERMBH7	Structure	Adit C	27° 2' 52.688" S	30° 14' 52.285" E	1741.57	30-Mar-11	100	13, 16, 19, 65	1.2	4.4	1736.85	Confined	Weathered & fractured
ERMBH8	Structure	Adit A	27° 0' 57.421" S	30° 17' 10.664" E	1510.12	15-Mar-11	60	37	1.5	10.63	1499.14	Confined	Fractured
ERMBH9	SW – GW Interaction	Adit A	27° 1' 30.048" S	30° 16' 44.775" E	1537.45	26-Mar-11	60	7	Seepage	5.57	1531.33	Unconfined	Perched
ERMBH10	Structure	Adit B	27° 2' 24.606" S	30° 17' 18.488" E	1751.45	10-Apr-11	100	6, 29, 42	0.5	30.83	1720.15	Unconfined	Perched & fractured

Notes: mamsl metres above mean sea level

7.9.5 Water Quality

Derived Water Quality Screening Levels

Using baseline surface and groundwater quality results, the South African Water Quality Standards for Drinking Water (i.e. SANS241:2011), and the South African Water Quality Guidelines for both Aquatic Ecosystems and Livestock Watering, site specific surface and groundwater screening levels were proposed.

The derivation of the site specific surface and groundwater screening levels are discussed in detail in *Chapter 4*.

Water Quality Sampling Locations

Samples were collected at Spring A, Spring B and Spring C in September 2010 and April 2011. The samples from September 2010 are referred to as SWA, SWB and SWC, whereas the samples from April 2011 are referred to as Spring A, Spring B and Spring C. All other samples were collected in April 2011.

Water quality sampling locations are provided in *Table 7.24* and indicated in *Figure 7.26.*

Water Quality Results

Full laboratory results for water quality analyses are provided in *Annex H* of the Specialist Groundwater Report (*Annex C.3*).

Water quality in the mine lease area is compared to the derived screening levels in *Table 7.25* to *Table 7.28*. The derived screening levels are also presented in these tables.

Note:

- Where water quality exceeds the derived screening levels, that parameter at that sampling location is highlighted in grey.
- Where water quality results are below the detectable limit, that parameter for that sampling location is highlighted in a light grey.

In general, water quality is within the derived water standards, indicating water that is suitable for drinking and stock watering, and that can support the local aquatic ecology.

There are a few exceptions, namely:

- Sample NGOH83 (Kangra Coal monitoring borehole) has low pH and concentrations of many ions and metals above the screening level. This exploration borehole is located adjacent to the current Maquasa West underground operations. The groundwater shows signs of impact by acid

rock drainage, with low pH and elevated sulphate and metal concentrations;

- Iron and manganese occur above the derived surface water screening level in some spring samples. The elevated iron and manganese concentrations most likely reflect the presence of naturally reducing conditions in the aquifer, which result in mobilisation of these metals. Iron and manganese typically precipitate out of solution on exposure to atmospheric conditions.

Table 7.24 Water Quality Sample Monitoring Locations

BHID	Latitude (DMS)	Longitude (DMS)	Type
ERMBH1	27° 1' 9.072" S	30° 17' 6.628" E	Monitoring BH
ERMBH2	27° 0' 59.350" S	30° 17' 3.715" E	Monitoring BH
ERMBH3	27° 0' 38.446" S	30° 17' 14.113" E	Monitoring BH
ERMBH4	27° 3' 34.807" S	30° 18' 20.306" E	Monitoring BH
ERMBH5	27° 3' 27.620" S	30° 14' 25.436" E	Monitoring BH
ERMBH6	27° 2' 28.635" S	30° 15' 23.420" E	Monitoring BH
ERMBH7	27° 2' 52.688" S	30° 14' 52.285" E	Monitoring BH
ERMBH8	27° 0' 57.421" S	30° 17' 10.664" E	Monitoring BH
ERMBH9	27° 1' 30.048" S	30° 16' 44.775" E	Monitoring BH
ERMBH10	27° 2' 24.606" S	30° 17' 18.488" E	Monitoring BH
RMBH1	27° 0' 29.091" S	30° 14' 41.397" E	Recommended Monitoring BH
RMBH2	26° 59' 47.261" S	30° 15' 57.838" E	Recommended Monitoring BH
FB2	27° 0' 47.072" S	30° 17' 52.651" E	Abstraction BH
FB6	27° 7' 18.660" S	30° 14' 4.014" E	Abstraction BH
FB7	27° 5' 52.446" S	30° 13' 18.210" E	Abstraction BH
FB8	27° 5' 48.103" S	30° 13' 2.558" E	Abstraction BH
FB13	27° 2' 3.142" S	30° 14' 52.958" E	Abstraction BH
Point1	27° 0' 9.462" S	30° 17' 16.035" E	SW Abstraction Point
Point2	27° 2' 2.744" S	30° 18' 26.647" E	SW Abstraction Point
Point3	27° 1' 9.672" S	30° 18' 16.344" E	SW Abstraction Point
FS5	27° 2' 11.105" S	30° 18' 35.665" E	Spring
FS6	27° 2' 6.169" S	30° 17' 56.658" E	Spring
FS7	27° 0' 40.772" S	30° 16' 29.772" E	Spring
FS8	27° 2' 49.469" S	30° 17' 9.982" E	Spring
FS9	27° 3' 7.414" S	30° 16' 59.491" E	Spring
FS10	27° 2' 54.270" S	30° 16' 43.102" E	Spring
FS11	27° 3' 23.532" S	30° 16' 3.580" E	Spring
FS12	27° 3' 37.687" S	30° 14' 23.769" E	Spring
FS16	27° 6' 8.022" S	30° 17' 0.847" E	Spring
FS17	27° 1' 33.198" S	30° 12' 38.317" E	Spring
FS18	27° 2' 8.386" S	30° 11' 58.744" E	Spring
FS19	27° 3' 6.159" S	30° 12' 29.140" E	Spring
FS23	27° 3' 22.677" S	30° 18' 15.923" E	Spring
FS25	27° 3' 6.477" S	30° 18' 58.005" E	Spring
FS26	27° 2' 34.173" S	30° 15' 36.798" E	Spring
Spring.	27° 1' 48.527" S	30° 17' 4.854" E	Spring
Spring A	27° 1' 2.224" S	30° 17' 35.581" E	Spring
Spring B	27° 3' 40.496" S	30° 17' 46.383" E	Spring
Spring C	27° 3' 10.464" S	30° 14' 24.098" E	Spring

Figure 7.26 Water Sampling locations

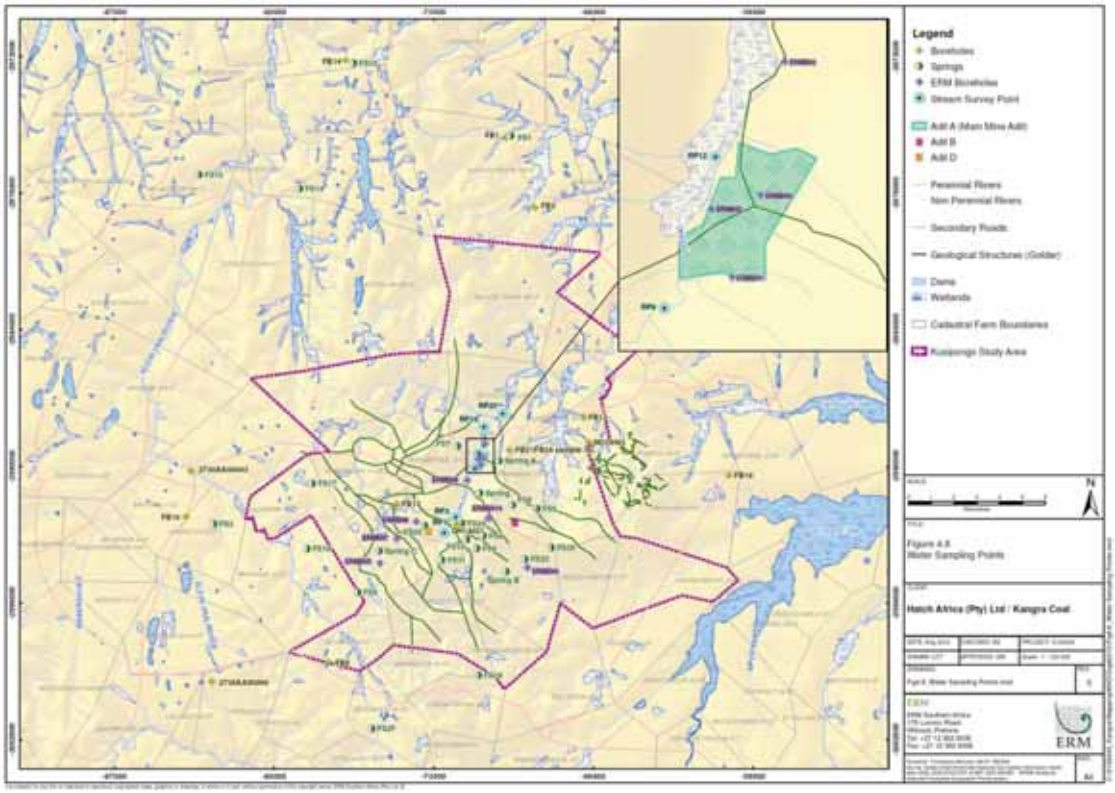


Table 7.25 Major ion chemistry of selected private and monitoring borehole samples

Sample ID	Lithology	Sample depth	Site Type	Date	Lab pH	Lab EC	Lab TDS	Ca	Mg	Na	K	Cl	SO4	NO3	F	Alkalinity
Units		mbgl				mS/m	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L as N	mg/L	mg/L as CaCO3
Derived screening values					**6.9 – 8.5**		**147**	**38**		**54**		**78**	**93**		**1.5**	
NGOH83	Shale	-	Borehole	2011/03/10	**3.4**	236	**990**	**83.1**	113.8	12.8	12.2	14.7	**754**	<0.057	**1.936**	0.0
DH14021	Shale	-	Borehole	2011/03/24	7.5	13.85	69	11.3	7.6	6.9	1.0	<1.408	0.83	0.381	<0.18	68.0
FB13	Dol crest	-	Borehole	2011/03/10	7.1	4.98	24	4.0	2.7	1.9	0.5	1.5	<0.13	0.579	0.188	21.7
ERMBH01	Weath SST	13	Borehole	2011/04/19	7.4	28.86	144	14.8	4.1	41.5	1.8	<1.408	2.39	0.181	0.366	131.1
ERMBH02	Weath SST/Shale	36	Borehole	2011/04/19	6.9	23.34	107	19.4	9.1	10.9	2.2	<1.408	4.74	0.282	<0.18	99.0
ERMBH03	Dolerite	16	Borehole	2011/04/19	8.5	23.29	133	22.5	4.5	25.0	2.1	<1.408	2.42	0.105	0.405	122.9
ERMBH04	Carb Shale	27	Borehole	2011/04/19	8.6	33.07	**164**	4.9	2.2	**62.7**	1.5	4.0	5.4	0.116	0.801	133.7
ERMBH05	Weath Shale/SST/Dol	34	Borehole	2011/04/19	8.2	10.57	41	4.8	2.0	7.8	2.0	3.4	2.94	0.653	0.244	27.8
ERMBH07	Weath Dol	16	Borehole	2011/04/19	**9.5**	19.19	95	5.3	1.8	33.8	0.5	<1.408	3.32	0.206	0.879	61.6
ERMBH08	Fresh SST	37	Borehole	2011/04/19	**8.6**	23.89	144	7.6	1.7	51.1	2.4	10.7	2.53	0.081	0.335	108.4
ERMBH09	Weath SST	7	Borehole	2011/04/19	8.4	24.57	122	21.6	11.9	11.5	1.1	<1.408	2.57	0.197	0.221	118.7
ERMBH10	Weath Dol	42	Borehole	2011/04/19	8.3	11.95	54	12.4	2.0	6.2	0.9	<1.408	2.57	0.523	<0.18	47.6
Minimum					**3.4**	**5.0**	**24.0**	**3.9**	**1.7**	**1.9**	**0.5**	**1.5**	**0.8**	**0.1**	**0.2**	**0.0**
Maximum					**9.5**	**236.0**	**990.0**	**83.1**	**113.8**	**62.7**	**12.2**	**14.7**	**753.6**	**0.7**	**1.9**	**133.7**
Average					**7.7**	**37.8**	**173.9**	**17.6**	**13.6**	**22.7**	**2.3**	**6.9**	**71.2**	**0.3**	**0.6**	**78.4**

Table 7.26 Major Ion Chemistry of Selected Spring and River Samples

Sample ID	Lithology	Sample depth	Site Type	Date	Lab pH	Lab EC	Lab TDS	Ca	Mg	Na	K	Cl	SO4	NO3	F	Alkalinity
Units		**mbgl**				**mS/m**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L as N**	**mg/L**	**mg/L as CaCO3**
Derived screening levels					**6.9 – 8.5**		**50**	**12**		**16**		**22**	**31**	**0.75**	**0.75**	
FS04	SST	Surface	Spring	2011/03/24	7.0	2.41	10	0.88	1.75	0.63	0.17	1.9	<0.13	0.21	0.44	8.2
FS05	Shale	Surface	Spring	2011/03/10	**5.9**	10.79	33	1.80	1.52	6.27	3.76	18.1	<0.13	0.24	0.29	2.8
FS06	Shale	Surface	Spring	2011/03/10	7.5	4.34	30	3.77	4.20	2.07	0.32	1.5	<0.13	0.28	0.27	30.3
FS07	SST	Surface	Spring	2011/03/01	7.7	5.76	23	3.11	2.36	2.98	0.20	4.2	0.71	<0.057	<0.18	16.3
FS08	Dol crest	Surface	Spring	2011/03/10	6.1	1.76	8	0.84	0.46	1.78	0.10	2	<0.13	0.13	<0.18	4.4
FS09	Dol crest	Surface	Spring	2011/03/02	6.6	6.88	31	2.08	1.14	5.32	3.66	10.8	3.06	<0.057	0.22	8.2
FS10	Dol crest	Surface	Spring	2011/03/10	**5.7**	1.86	11	1.70	0.76	1.28	0.31	2.5	<0.13	0.06	<0.18	7.3
FS11	Dol crest	Surface	Spring	2011/03/10	6.7	3.55	21	2.99	1.07	3.38	0.81	1.6	<0.13	0.14	0.37	18.1
FS23	Shale	Surface	Spring	2011/03/18	7.5	3.70	26	2.71	2.37	3.60	0.74	4.7	2.21	<0.057	0.27	16.1
FS24	Shale	Surface	Spring	2011/03/24	6.9	4.41	19	3.04	1.57	2.01	0.32	3.7	1.09	0.22	0.35	12.0
FS25	SST	Surface	Spring	2011/03/26	6.4	3.35	20	2.45	0.99	2.95	0.28	8.2	0.89	0.24	**0.78**	7.1
FS26	Dol crest	Surface	Spring	2011/03/28	6.1	4.24	26	2.32	1.45	2.76	1.54	8.3	<0.13	0.20	**0.77**	15.6
SPRINGA	Dolerite	Surface	Spring	2011/04/19	7.7	15.76	**70**	10.07	8.90	5.25	1.13	5.3	3.06	0.51	<0.18	59.0
SPRINGB	SST/Shale contact	Surface	Spring	2011/03/18	8.1	14.42	**60**	10.56	5.72	5.01	0.71	3.1	4.91	0.24	0.20	49.0
SPRINGC	Dol crest	Surface	Spring	2011/04/19	7.1	8.12	30	4.05	3.81	2.47	0.27	9.8	<0.13	**0.88**	0.40	14.2
SW A	Dolerite	Surface	Spring	2010/09/01	7.7	15.46	**73**	**13.15**	7.21	5.97	0.85	<1.408	0.87	<0.057	0.20	44.7
SW B	SST/Shale contact	Surface	Spring	2010/09/01	8.0	14.75	**64**	9.72	5.27	6.60	0.95	2.6	1.57	0.19	0.29	37.3
SW C	Dol crest	Surface	Spring	2010/09/01	7.7	8.37	22	2.58	2.19	3.24	0.71	<1.408	1.27	0.49	<0.18	11.0
RP01	-	Surface	River	2011/04/19	8.1	7.34	36	4.81	3.01	4.57	0.42	1.8	3.08	0.08	<0.18	30.8
RP03	-	Surface	River	2011/04/19	8.2	8.19	40	5.55	3.21	5.70	0.48	3.2	3.04	0.16	<0.18	30.1
RP09	-	Surface	River	2011/04/19	8.4	10.01	38	4.83	3.49	5.08	0.55	1.5	2.84	0.07	<0.18	32.4
RP12	-	Surface	River	2011/04/19	8.2	9.41	44	6.09	3.37	6.44	0.70	3.2	3.66	0.16	0.25	34.0
RP16	-	Surface	River	2011/04/19	8.2	9.10	47	5.22	3.16	6.78	3.82	3.8	1.65	<0.057	0.21	36.4
RP20	-	Surface	River	2011/04/19	8.1	8.77	41	4.64	2.74	6.72	2.90	<1.408	3.09	<0.057	0.23	32.7
Minimum					**5.7**	**1.8**	**8.0**	**0.8**	**0.5**	**0.6**	**0.1**	**1.5**	**0.7**	**0.1**	**0.2**	**2.8**
Maximum					**8.4**	**15.8**	**73.0**	**13.1**	**8.9**	**6.8**	**3.8**	**18.1**	**4.9**	**0.9**	**0.8**	**59.0**
Average					**7.3**	**7.6**	**34.3**	**4.5**	**3.0**	**4.1**	**1.1**	**4.8**	**2.3**	**0.2**	**0.3**	**23.3**

Table 7.27 Metal chemistry of selected private and monitoring boreholes

Sample ID	Site Type	Date	pH	Al	Fe	Mn	Cr	Cu	Ni	Zn	Co	Cd	Ag	Ga	B	Ba	Be	Bi	Te	Li	Mo	Pb	Rb	Si	Sr	V	Tl
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Derived screening values				**2.7**	**11**	**3.5**			**0.07**	**0.16**	**0.5**	**0.02**										**0.04**				**0.2**	
NGOH83	Borehole	2011/03/10	3.4	1.649	**14.843**	**4.022**	0.002	0.075	**7.100**	**0.533**	**3.985**	0.004	0.002	0.006	0.048	0.058	0.011	<0.01	<0.023	0.178	0.009	<0.01	0.172	5.951	2.81	0.096	<0.087
DH14021	Borehole	2011/03/24	7.5	0.055	<0.006	<0.001	<0.002	<0.001	<0.003	0.057	<0.002	<0.001	<0.002	<0.002	<0.008	0.004	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.033	20.967	0.06	0.021	<0.087
FB13	Borehole	2011/03/10	7.1	<0.006	0.006	0.009	0.002	0.003	0.032	0.005	<0.002	<0.001	<0.002	<0.002	0.011	0.002	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.015	6.18	0.012	0.015	<0.087
ERMBH01	Borehole	2011/04/19	7.4	<0.006	1.821	0.066	<0.002	<0.001	0.009	<0.004	<0.002	<0.001	<0.002	<0.002	0.037	0.139	<0.001	0.04	<0.023	0.015	0.018	<0.01	0.028	13.91	0.408	0.017	<0.087
ERMBH02	Borehole	2011/04/19	6.9	<0.006	2.240	0.423	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	0.002	0.037	0.111	<0.001	0.01	<0.023	0.038	0.011	<0.01	0.034	24.692	0.205	0.025	<0.087
ERMBH03	Borehole	2011/04/19	8.5	<0.006	0.343	0.148	<0.002	<0.001	<0.003	<0.004	<0.002	0.002	<0.002	0.01	0.013	0.271	<0.001	0.04	0.039	<0.001	0.006	0.02	0.017	19.57	0.606	<0.003	<0.087
ERMBH04	Borehole	2011/04/19	8.6	0.016	1.460	0.046	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	0.015	0.029	0.127	<0.001	<0.01	0.06	0.006	0.005	<0.01	0.018	13.499	0.188	<0.003	<0.087
ERMBH05	Borehole	2011/04/19	8.2	0.028	1.982	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	0.001	<0.002	0.015	<0.008	<0.001	<0.001	<0.01	0.059	0.002	<0.003	<0.01	0.015	6.085	0.081	<0.003	<0.087
ERMBH07	Borehole	2011/04/19	9.5	0.019	0.489	<0.001	<0.002	<0.001	0.004	<0.004	<0.002	<0.001	<0.002	<0.002	0.071	<0.001	<0.001	0.04	<0.023	0.01	0.013	<0.01	0.016	16.669	0.025	0.017	<0.087
ERMBH08	Borehole	2011/04/19	8.6	0.009	2.355	0.035	<0.002	<0.001	<0.003	0.006	<0.002	<0.001	<0.002	0.011	0.033	0.119	<0.001	0.03	<0.023	0.008	<0.003	<0.01	0.018	10.1	0.368	<0.003	<0.087
ERMBH09	Borehole	2011/04/19	8.4	<0.006	1.122	0.280	<0.002	<0.001	<0.003	0.006	<0.002	0.002	<0.002	0.012	<0.008	0.168	<0.001	<0.01	0.053	<0.001	<0.003	0.03	0.017	20.036	0.251	<0.003	<0.087
ERMBH10	Borehole	2011/04/19	8.3	<0.006	0.860	0.183	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	0.011	<0.008	0.076	<0.001	<0.01	0.04	<0.001	0.006	<0.01	0.016	11.985	0.12	<0.003	<0.087
Minimum			**3.38**	**<0.006**	**<0.006**	**<0.001**	**<0.002**	**<0.001**	**<0.003**	**<0.004**	**<0.002**	**<0.001**	**<0.002**	**<0.002**	**<0.008**	**<0.001**	**<0.001**	**<0.01**	**<0.023**	**<0.001**	**<0.003**	**<0.01**	**0.015**	**5.951**	**0.012**	**<0.003**	**<0.087**
Maximum			**9.54**	**1.649**	**14.843**	**4.022**	**0.002**	**0.075**	**7.100**	**0.533**	**3.985**	**0.004**	**0.002**	**0.015**	**0.071**	**0.271**	**0.011**	**0.040**	**0.060**	**0.178**	**0.018**	**0.030**	**0.172**	**24.692**	**2.810**	**0.096**	**<0.087**
Average			**7.70**	**0.296**	**2.663**	**0.579**	**0.002**	**0.039**	**1.786**	**0.121**	**3.985**	**0.002**	**0.002**	**0.010**	**0.035**	**0.108**	**0.011**	**0.032**	**0.050**	**0.037**	**0.010**	**0.025**	**0.033**	**14.137**	**0.428**	**0.032**	**-**

Table 7.28 Metal chemistry of selected springs and river samples

Sample ID	Site Type	Date	pH	Al	Fe	Mn	Cr	Cu	Ni	Zn	Co	Cd	Ag	Ga	B	Ba	Be	Bi	Te	Li	Mo	Pb	Rb	Si	Sr	V	Tl
Units				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Derived screening values				**0.5**	**0.2**	**0.18**			**0.07**	**0.03**	**0.50**	**0.00025**										**0.05**				**0.20**	
FS04	Spring	2011/03/24	7.0	<0.006	0.113	<0.001	0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	<0.008	0.002	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.018	4.708	0.01	<0.003	<0.087
FS05	Spring	2011/03/10	5.9	<0.006	0.015	0.002	0.007	0.009	0.028	0.005	<0.002	<0.001	<0.002	<0.002	0.013	0.096	<0.001	<0.01	<0.023	0.001	<0.003	<0.01	0.018	1.914	0.026	0.008	<0.087
FS06	Spring	2011/03/10	7.5	0.044	0.009	0.009	0.007	0.001	0.007	0.004	<0.002	<0.001	<0.002	<0.002	0.013	0.012	<0.001	<0.01	<0.023	0.001	0.013	<0.01	0.01	4.306	0.023	0.013	<0.087
FS07	Spring	2011/03/01	7.7	0.007	0.022	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	<0.008	0.003	<0.001	<0.01	<0.023	0.001	<0.003	<0.01	0.02	7.882	0.015	<0.003	<0.087
FS08	Spring	2011/03/10	6.1	0.007	<0.006	0.010	0.003	0.001	0.006	0.009	<0.002	<0.001	<0.002	<0.002	0.011	0.004	<0.001	0.02	<0.023	<0.001	0.004	<0.01	0.023	1.705	0.004	0.009	<0.087
FS10	Spring	2011/03/10	5.7	<0.006	0.008	0.008	<0.002	0.002	<0.003	0.005	<0.002	<0.001	<0.002	<0.002	0.008	0.002	<0.001	<0.01	<0.023	<0.001	<0.003	0.02	<0.004	<0.03	<0.001	<0.003	<0.087
FS11	Spring	2011/03/10	6.7	<0.006	<0.006	0.008	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	0.008	<0.001	<0.001	<0.01	<0.023	<0.001	0.007	0.02	<0.004	<0.03	<0.001	<0.003	<0.087
FS23	Spring	2011/03/18	7.5	0.078	0.063	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	<0.008	0.004	<0.001	<0.01	<0.023	0.002	0.004	<0.01	0.029	7.691	0.016	<0.003	<0.087
FS24	Spring	2011/03/24	6.9	<0.006	0.087	<0.001	0.003	<0.001	<0.003	0.028	<0.002	<0.001	<0.002	<0.002	<0.008	0.006	<0.001	<0.01	<0.023	0.001	<0.003	<0.01	0.049	5.804	0.018	<0.003	<0.087
FS25	Spring	2011/03/26	6.4	0.278	0.169	<0.001	<0.002	<0.001	<0.003	0.009	<0.002	<0.001	<0.002	<0.002	<0.008	0.024	<0.001	<0.01	<0.023	0.002	<0.003	<0.01	0.045	5.676	0.018	<0.003	<0.087
FS26	Spring	2011/03/28	6.1	0.106	**1.891**	**0.389**	<0.002	<0.001	0.005	0.026	<0.002	<0.001	<0.002	<0.002	0.009	0.014	<0.001	<0.01	<0.023	0.001	<0.003	<0.01	0.044	2.154	0.019	<0.003	<0.087
FS09	Spring	2011/03/02	6.6	0.007	0.036	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	0.01	0.009	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.021	1.134	0.011	<0.003	<0.087
SPRINGA	Spring	2011/04/19	7.7	0.302	0.096	0.011	<0.002	<0.001	<0.003	0.024	<0.002	<0.001	<0.002	<0.002	<0.008	0.004	<0.001	<0.01	<0.023	0.001	0.006	<0.01	0.031	23.704	0.062	0.030	<0.087
SPRINGB	Spring	2011/03/18	8.1	0.056	0.027	<0.001	<0.002	<0.001	<0.003	0.008	<0.002	<0.001	<0.002	<0.002	<0.008	0.025	<0.001	<0.01	<0.023	0.007	<0.003	<0.01	0.031	11.159	0.071	<0.003	<0.087
SPRINGC	Spring	2011/04/19	7.1	0.08	0.035	<0.001	0.006	<0.001	<0.003	0.005	<0.002	<0.001	<0.002	<0.002	<0.008	0.009	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.041	17.644	0.024	0.017	<0.087
SW A	Spring	2010/09/01	7.7	<0.006	0.021	0.128	<0.002	0.033	0.003	0.012	<0.002	<0.001	-	-	0.045	0.065	-	-	-	-	-	<0.01	-	20.305	0.051	-	-
SW B	Spring	2010/09/01	8.0	0.527	**0.342**	0.013	<0.002	0.033	0.005	0.004	<0.002	<0.001		-	0.038	0.044	-		-	-	-	<0.01	-	11.984	0.071	-	-
SW C	Spring	2010/09/01	7.7	0.182	0.100	<0.001	<0.002	0.022	<0.003	<0.004	<0.002	<0.001	-	-	0.035	0.019	-	-	-	-	-	<0.01	-	10.085	0.019	-	-
RP01	River	2011/04/19	8.1	<0.006	0.038	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	<0.008	0.005	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.013	9.160	0.019	0.006	<0.087
RP03	River	2011/04/19	8.2	<0.006	0.009	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	<0.008	0.009	<0.001	<0.01	<0.023	<0.001	0.005	<0.01	0.012	8.857	0.029	0.003	<0.087
RP09	River	2011/04/19	8.4	<0.006	0.062	0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	<0.008	0.02	<0.001	0.25	<0.023	<0.001	<0.003	<0.01	0.022	8.924	0.028	<0.003	<0.087
RP12	River	2011/04/19	8.2	<0.006	0.071	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	0.009	0.01	<0.001	<0.01	<0.023	<0.001	<0.003	<0.01	0.012	8.519	0.030	<0.003	<0.087
RP16	River	2011/04/19	8.2	0.017	0.164	<0.001	0.003	<0.001	<0.003	0.012	<0.002	<0.001	<0.002	<0.002	0.008	0.005	<0.001	0.07	0.026	<0.001	0.008	<0.01	0.156	8.118	0.024	0.011	<0.087
RP20	River	2011/04/19	8.1	0.016	0.108	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	0.009	0.005	<0.001	0.03	0.026	<0.001	0.010	<0.01	0.137	7.101	0.023	0.008	<0.087
Minimum			**5.65**	**0.01**	**0.01**	<0.001	<0.002	<0.001	<0.003	<0.004	<0.002	<0.001	<0.002	<0.002	**0.01**	**0.00**	<0.001	**0.02**	**0.03**	**0.00**	**0.00**	**0.02**	**0.01**	**1.13**	**0.00**	**0.00**	<0.087
Maximum			**8.39**	**0.53**	**1.89**	**0.39**	**0.01**	**0.03**	**0.03**	**0.03**	<0.002	<0.001	<0.002	<0.002	**0.05**	**0.10**	<0.001	**0.25**	**0.03**	**0.01**	**0.01**	**0.02**	**0.16**	**23.70**	**0.07**	**0.03**	<0.087
Average			**7.30**	**0.12**	**0.16**	**0.06**	**0.00**	**0.01**	**0.01**	**0.01**					**0.02**	**0.02**		**0.09**	**0.03**	**0.00**	**0.01**	**0.02**	**0.04**	**8.57**	**0.03**	**0.01**	**-**

7.10 CONCEPTUAL HYDROGEOLOGICAL MODEL

Based on the groundwater field programme described in *Section 7.9*, a Conceptual Hydrogeological Model (CHM) was developed which describes the current understanding of the hydrogeological system in the Project Area. Based on this CHM, a detailed numerical hydrogeological model could be developed, which, when presented together with source terms (identified through geochemical testing), impacts to groundwater can be better predicted. Results from geochemical testing and a description of the Groundwater Numerical Model are provided in the Groundwater Specialist Report (*Annex C.3*), and described briefly in the impacts chapter (*Chapter 9*).

This section discusses the main features of the CHM and hence the current understanding of the hydrogeological regime in the Project Area. Potential impacts to groundwater are discussed separately in *Chapter 9*.

7.10.1 Hydrogeology

Five types of groundwater bearing horizons have been recognised across the site to a depth of 120 m below ground level (bgl), including (i) perched groundwater occurrences, (ii) alluvial horizon, (iii) weathered horizon, (iv) regional fractured horizon, and (v) groundwater occurrences related to structures. The regional groundwater flow direction is generally from west to east and locally follows the surface topography.

Groundwater feeds numerous surface water features in the Project Area including springs, wetlands, streams and rivers. More specifically, the Ohlelo Stream which runs across the Project Area and past the Adit A location receives groundwater baseflow under baseline conditions.

Two dolerite sills are present within the footprint of the Project, a shallower 1st sill and a deeper 2nd sill. Mining is planned to take place beneath the 2nd dolerite sill. Although the dolerite sills can act as barriers to groundwater flow, there are numerous faults/fractures present within the footprint of the proposed Project, which are currently thought to connect water-bearing strata above and below the sills on the Project scale. It is therefore currently assumed that the different groundwater-bearing horizons are interconnected on the Project scale. The compartmentalising effect of structures and dolerite sills and therefore the interconnection of different groundwater bearing horizons should be investigated further through on-going monitoring.

On a more local scale the sills can represent horizontal barriers to groundwater flow which result in the development of wetlands and springs. It is currently believed that local features located above the 2nd dolerite sill would not be significantly impacted by the planned mining operations. These assumptions need to be verified with monitoring as proposed in the Groundwater Monitoring Plan, provided in *Chapter 14* of this report.

7.10.2 Groundwater Bearing Horizons

Lithologies and geological features that are potentially water bearing in the Project Area include alluvium, weathered and fractured rocks (Karoo formations), fractures in the coal seams and geological structures including dolerite dykes, sills and faults. Two prominent dolerite sills occur within the footprint of the proposed Project. Although the dolerite sills are believed to act as barriers to groundwater flow on a local level, there are numerous faults and fractures present within the footprint of the proposed Project, which are currently thought to connect water bearing strata lying above and below the sill on the Project scale. The simplified conceptual geological model was presented in *Figure 7.27*.

Based on the drilling campaign, the following five types of groundwater bearing horizons have been recognised across the site:

i. Perched groundwater occurrences;
ii. Alluvial horizon;
iii. Weathered horizon;
iv. Regional fractured horizon; and
v Groundwater occurrences related to structures.

Each of these groundwater occurrences are described in more detail in the following sections. The Conceptual Hydrogeological model is presented in *Figure 7.28*.

Figure 7.27 Conceptual Geological Model

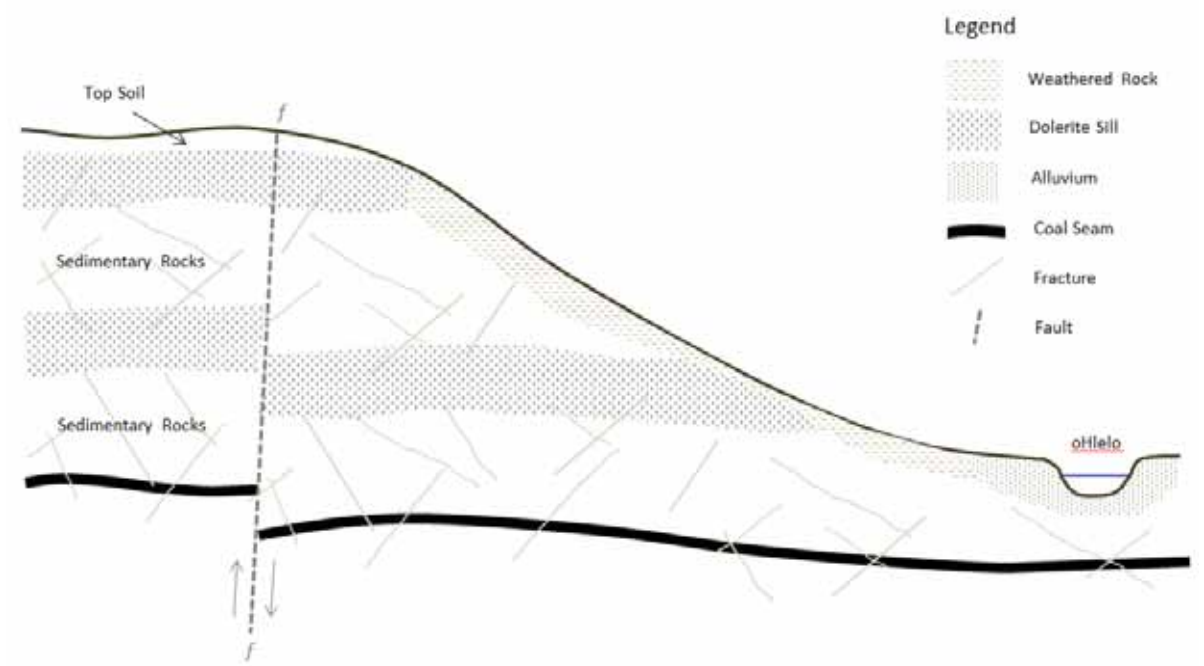
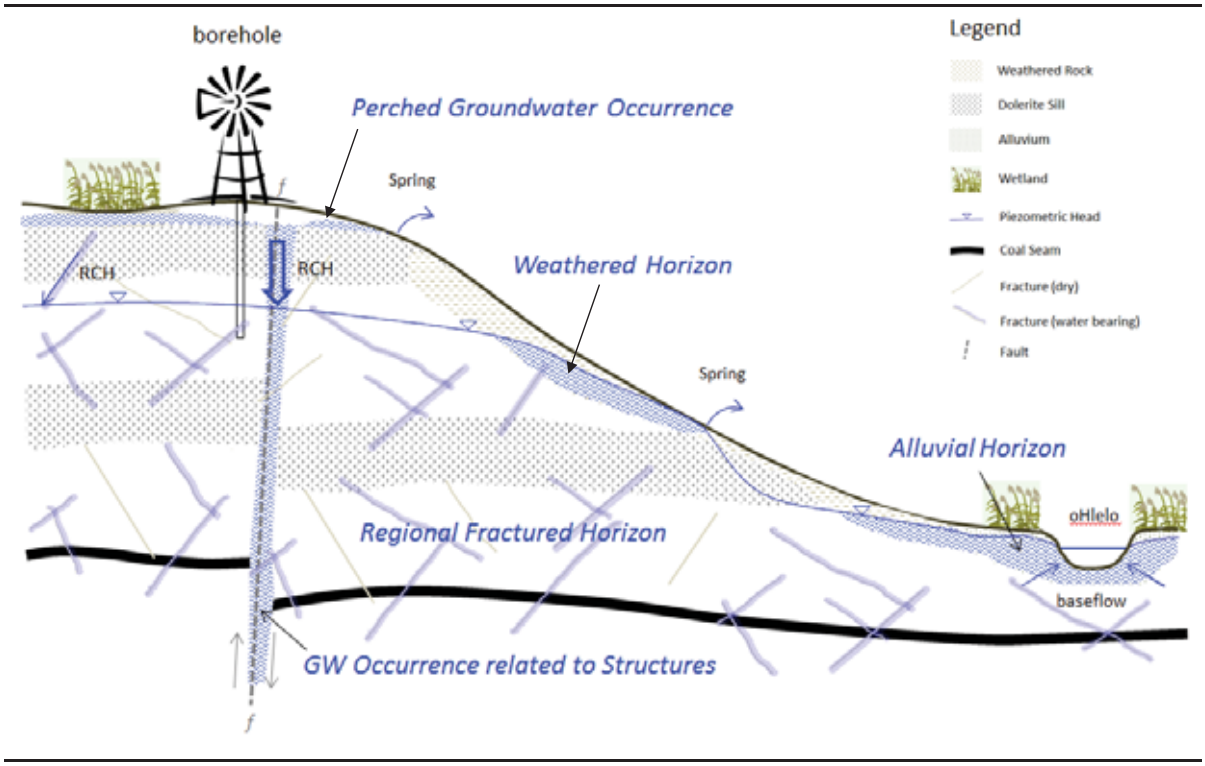


Figure 7.28 Conceptual Hydrogeological Model



Perched Groundwater Occurrence

A perched groundwater occurrence is classified as a localised water table which is suspended on top of a low permeability layer (e.g. dolerite sill or clay layer). Perched groundwater occurrences typically do not have any interaction with the underlying deeper regional water bearing horizons.

Perched groundwater occurrences were indicated as thin horizontal conductivity zones near surface in the geophysics results. Perched groundwater occurrences were intersected in boreholes ERMBH6 and 10 on top of the mountains (*Figure 7.25*). Groundwater fed by direct infiltration of rainfall is locally perched on top of low conductive dolerite sills.

Perched groundwater occurrences were also intersected in boreholes ERMBH1, 2 and 9 (*Figure 7.25*), where a distinct contact zone exists between the top decomposed strata and the lower less permeable weathered rock strata.

Perched groundwater occurrences are generally low yielding with mostly seepage and are responsible for spring flow on top of the mountain across the Project Area. Perched groundwater occurrences are highly vulnerable to surface contamination, which can lead to the contamination of the spring water.

Alluvial Horizons

Alluvial horizons occur along streams and rivers that traverse the area. These water bearing horizons are generally connected to the streams and rivers and can be connected to deeper lying weathered and fractured water bearing horizons depending on the nature of the alluvial sediments.

An alluvial horizon was intersected in ERMBH2 (*Figure 7.25*) located in the Ohlelo valley adjacent to the proposed Adit A position. Alluvial water bearing horizons are highly vulnerable to surface contamination, which can lead to the contamination of the stream and river water.

Weathered Horizon

A weathered water bearing horizon is defined as groundwater saturated strata which possess a secondary porosity associated with weathering of rock strata. Weathered horizons are typically unconfined to semi-confined aquifers.

The weathered water-bearing horizon was intersected in groundwater characterisation boreholes ERMBH1, 3, 4, 5 and 7 (*Figure 7.25*). A total of seven water strikes were intersected which yielded on average 1.5L/sec. The geological strata in the area are weathered from surface down to an average depth of 23m bgl.

The weathered horizon feeds numerous springs in the area. The weathered water bearing horizon is hydraulically connected with the regional fractured water bearing horizon through the highly conductive near-vertical structures cross cutting the area and through fractures in the rock matrix.

Weathered water bearing horizons are vulnerable to contamination originating from surface and shallow mining zones, which can lead to the contamination of springs, stream and river water as well as deeper lying water bearing strata.

Fractured Horizon

A fractured water bearing horizon is defined as a groundwater saturated strata which have secondary porosity due to fracturing. Fractured horizons are common in sedimentary host rock of the Karoo Supergroup. The pores within the Karoo sedimentary rocks are well cemented and are not expected to allow any significant groundwater flow. Therefore, groundwater flow in the sedimentary rocks is expected only along fractures. This horizon is confined.

The regional fractured water bearing horizon was intersected in seven out of the ten groundwater characterisation boreholes (ERMBH2, 3, 4, 5, 7, 8 and 10; *Figure 7.25*). The aquifer depth extends from a depth of about 23m bgl to an unknown depth. The deepest borehole in this investigation was drilled to 124m bgl.

Although this water bearing horizon has the highest number of water strikes (ten), average blow yields are only 0.3L/sec. The proposed Kusipongo Resource underground mining activities will mostly occur within this low yielding aquifer.

Fractured water bearing horizons are vulnerable to contamination originating from mining zones and overlying water bearing strata, which can lead to the contamination of water supply boreholes.

Groundwater Occurrences Related to Structures

Sedimentary host rock immediately adjoining dolerite intrusions, of both dyke and sill form, are frequently disturbed, fractured and thermally metamorphosed (baked lithologies) resulting in increased hydraulic conductivity. These structures can supply considerable water volumes and also act as preferential pathways for groundwater flow and contaminant transport.

Furthermore, significant vertical displacement of the coal seams has been observed adjacent to some geological structures in the Project Area, which suggests that faulting has occurred. Significant differences in water levels were observed across some of these faults, which suggest that in places faults act as barriers to groundwater flow, creating separate groundwater compartments.

The highest blow yields have been encountered on the contact zones between the Karoo sediments and dolerite sill and dyke structures, with an average yield of 2.4L/sec (maximum was 8.5L/sec and minimum 0.5L/sec).

Water bearing, highly conductive structures are vulnerable to contamination originating from surface features such as dumps, and mining zones and can act as preferential groundwater flow paths for contaminant transport. Mine infrastructure (such as coal stockpiles, discard dumps etc.) can lead to the contamination of water supply boreholes that frequently target these high yielding structures. Furthermore, increased mine water inflows can be expected when intersecting high conductive structures.

On the other hand, faults acting as barriers to groundwater flow and contaminant transport, can help to contain contamination in separate groundwater compartments to a certain extent and therefore limit the propagation of contaminant plumes.

7.10.3 Interconnection between Different Groundwater Bearing Horizons

The presence of two superposed dolerite sills is inferred within the footprint of the proposed Kusipongo Resource Project. Although the dolerite sills can act as barriers to groundwater flow, there are numerous faults/fractures present within the footprint of the proposed mine which are currently thought to connect water bearing strata below the said sills with the ones above on a regional scale.

It is therefore currently assumed that the different groundwater bearing horizons are interconnected on a regional scale. On a more local scale the sills can present horizontal barriers to groundwater flow which results in the local development of wetlands and springs.

7.10.4 Groundwater and Surface Water Characterisation / Fingerprinting

Groundwater and surface water characterisation was undertaken to determine:

- The presence of different aquifers;
- Potential linkages between aquifers;
- Potential groundwater-surface water interaction; and
- Groundwater flowpaths.

Such characterisation/fingerprinting involved plotting water chemistry on a Piper diagram to determine whether there are any groupings or trends within the data, plots of alkalinity against altitude, and isotope analysis. The results of such analysis are discussed in full in the Specialist Groundwater Report presented as *Annex C.3*.

Based on an analysis of this data, it is suggested that springs are fed by a mixture of dilute rainwater /perched groundwater with some potential mixing with regional groundwater. The recharge of rainwater to the regional aquifer geochemically evolves through water rock interaction over time to have higher salt concentrations and alkalinity. The aquifers therefore appear to be interconnected. Given the similarity of the perched groundwater to rainfall, it is possible that the majority of the springs are a seasonal phenomenon observed only in the wet season. Although Springs A, B and C have been sampled in the dry season, suggesting that these springs at least run year-round, dry season sampling is recommended to verify the seasonality of the springs.

Groundwater in the weathered and regional fractured horizons appears to be predominantly recharged at higher altitude, and to migrate downwards to lower altitudes. The continuity of the groundwater chemistry suggests that the different aquifers identified in *Section 7.10.2* are interconnected, and that groundwater flows from high altitude to low altitude by draining through fractures in the dolerite sills.

7.10.5 Surface Water - Groundwater Interaction

Groundwater is feeding numerous surface water features in the Project Area including springs, wetlands, streams and rivers. The following paragraphs detail the current understanding of the surface water – groundwater interaction in the Project Area.

Ohlelo Stream

The surface water – groundwater interaction was investigated along the Ohlelo Stream in proximity of the proposed Adit A position, which is the most prominent surface water feature within the Project Area. The investigation results suggest that the Ohlelo Stream is a gaining stream in proximity of the proposed Adit A position, which means that groundwater is feeding the stream (baseflow to stream).

Springs

Two types of springs were identified in the Project Area, based on water chemistry results:

i. Recently recharged water springs; and
ii. Partly evolved or mixed groundwater springs (Spring A and Spring B).

Recently recharged water springs occur in many locations across the investigation area where recently recharged water is perched on top of a less conductive dolerite sill. The groundwater flows along the less permeable dolerite sill until it daylights as spring flow. These springs might be seasonal and the yields will be dependent on the amount of precipitation. The investigation took place during the rainy season and therefore it could not be

confirmed if the identified springs are perennial. Examples are springs FS24, FS26, FS12 etc.

Partly evolved or mixed groundwater springs are at least partially fed by groundwater from the weathered and/or fractured aquifer where the recharged water has had significantly more residence time underground. The evolved groundwater daylights as springs where lower lying dolerite sill's outcrop. Only two such springs were identified in the investigation area, namely Spring A and Spring B. These springs are more likely to be perennial, but this has not been verified.

7.10.6 Water Levels, Groundwater Flow and Gradient

The regional groundwater flow direction is generally from west to east and tends to follow the surface topography. (There is a 99% correlation between surface topography and groundwater elevations [(1)]).

Some of the groundwater elevations do not correlate well with the surface elevation, and plot lower. The main explanation for this phenomenon is the compartmentalising structures present in the Project Area (refer to *Section 7.9.2*). Water levels on either side of those structures can vary substantially.

A conceptual regional groundwater level contour map, based on hydrocensus data (*Section 7.9.2*), is shown in *Figure 7.29*.

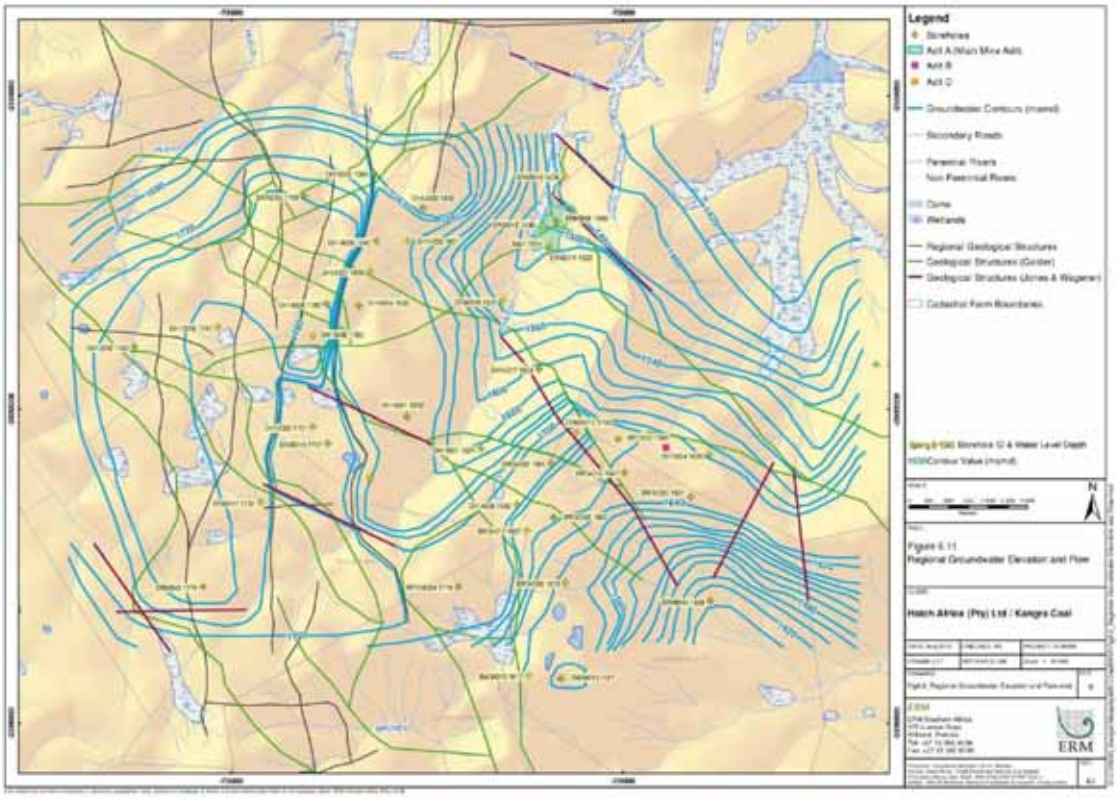
7.10.7 Summary of the Conceptual Hydrogeological Model

In summary, the main assumptions pertaining to the CHM, following a conservative approach, are:

- Interconnectivity of the groundwater systems above and below dolerite sills on the Project scale;
- Springs and wetlands located above the 2nd dolerite sill are not at risk from groundwater drawdown as they are isolated from the mining environment on a local scale; and
- The Ohlelo stream (and associated alluvial groundwater) is connected to the fractured groundwater occurrences where mining is planned to take place.

[1] Groundwater level data from ERM hydrocensus survey, ERM characterisation borehole and NGA borehole data. Springs and water levels influenced by current mining activities have been excluded.

Figure 7.29 Groundwater Contour Map



7.11 AIR QUALITY

Please Note - This Section provides an overview of the key outcomes from the detailed Air Quality baseline study, and is used to inform the Air Quality Impact Assessment presented in *Chapter 9*. The complete Air Quality baseline is included in the Air Quality Impact Assessment attached to *Annex C.5* of this report.

Given the size of the proposed Project and the potential contribution that the Project will make in terms of emissions to the atmosphere, a Project Area of 15km by 15km was defined for the impact assessment.

7.11.1 Potential Air Quality Sensitive Receptors

The immediate Project Area is mainly populated by rural homesteads, with the largest concentration of human population at St Helena (approximately 10km northeast from the site proposed for the main mine adit) and Driefontein (approximately 12km east from the site proposed for the main mine adit. The geographical locations of rural homesteads were informed by the Social Impact Assessment and are presented in *Chapter 8.*

Twyfelhoek Primary School is located approximately 900m east-northeast of the proposed Adit A.

7.11.2 Existing Sources of Air Emissions

Existing activities taking place in the Project Area that could contribute to current atmospheric emissions include the following:

- **Large Tree Plantation Blocks** – could contribute some airborne dust during felling operations. The significance of these emissions contributing to the current air quality in the Project Area is likely to be low.

- **Cultivation of Land** – airborne particulates are expected to be released during the cultivation of land and wind erosion of exposed areas. This would be more significant during drier periods.

- **Current Kangra Coal Mining Activities** – the majority of the fallout (resulting from current Kangra Coal mining activities) at the site of the proposed Project would be in the form of small particles (less than 10 micron in aerodynamic diameters), but may also consist of combustion products such as carbon dioxide, carbon monoxide, sulphur dioxide and oxides of nitrogen. Larger particles would deposit closer to the existing mining operations. Airborne dust emissions would also originate from existing discard and overburden heaps.

  Airborne particulates and diesel exhaust fumes are emitted along haul roads and public roads in the Project Area. Traffic on unpaved roads has the potential to generate significant fugitive dust. Although most of this

dust has the propensity to deposit nearby the road, a significant portion remains airborne (PM_{10} and $PM_{2.5}$) and may be carried over relatively large distances. Relatively little dust is generated along the existing conveyor route.

However, dust is generated by vehicle traffic along the public haul road to the Panbult Siding. Chemical road surface mitigation measures to reduce fugitive dust from unpaved roads have been put in place as shown in *Figure 7.30*. Furthermore, carry-over mud on to the tarred public roads is evident at the Panbult siding (refer to ***Figure 7.31***). When dry, this becomes friable and a source of fugitive dust.

- **Burning of Biomass** – the burning of biomass can also be a significant contributor to airborne particulates. Large clouds of smoke can travel for a number of kilometres whilst still being highly concentrated.

Figure 7.30 Dust Mitigation (Water Spraying) on Public Roads to Panbult Siding

Figure 7.31 Mud Carry-over from Panbult Siding onto Public Road

7.11.3 Measured Baseline Air Quality

Dust Fallout Results

The existing Kangra Coal Mine has a dust fallout network (the details of this network are provided in more detail in the Air Quality Impact Assessment Report – *Annex C.1*).

The dust fallout results for the period January 2009 to February 2011 are shown in *Figure 7.32* overleaf. The Residential Action level of 600 mg/m²/day was exceeded occasionally at both Panbult Siding and at the Maquasa East mine sites.

The highest impacted location was at Panbult Siding, which observed 9 months exceeding or equal to the Residential Action level and 3 months exceeding the Industrial Action level of 1 200 mg/m²/day during the period January 2009 to February 2011.

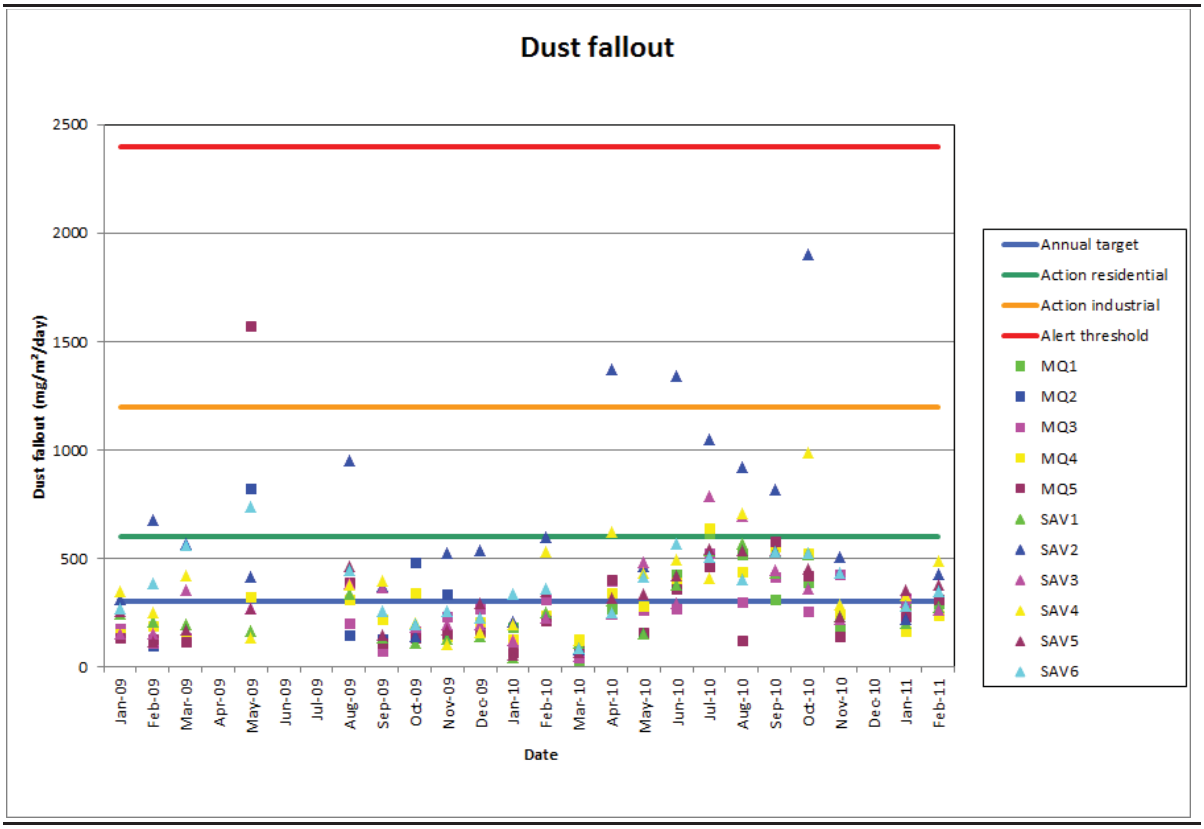
The highest fallout was observed immediately east of current mining operations (illustrated as MQ5 in *Figure 7.32*), where fallout exceeded the Industrial Action level of 1 200 mg/m²/day on one occasion (May 2009). Generally, however, the fallout at the mine buckets was below the Industrial Action level.

No exceedances of the alert threshold of 2 400 mg/m²/day were observed.

Respirable Particulate Air Emissions

Particulate air concentration measurements are not a requirement of Kangra Coal's existing Environmental Management Programme monitoring system. However, according to the State of the Air Report for 2005 (Department of Environmental Affairs, 2009b), PM_{10} concentration levels vary between about 1 and 130 $\mu g/m^3$. In a rural setting, based on these observations, the expected PM_{10} annual average concentration is about 15 to 20 $\mu g/m^3$.

Figure 7.32 Dust Fallout Results



7.12 NOISE

Please Note - This Section provides an overview of the key outcomes from the detailed Noise baseline study, and is used to inform the Noise Impact Assessment presented in *Chapter 9*. The complete Noise baseline is included in the Noise Impact Assessment attached to *Annex C.5* of this report.

7.12.1 Potential Noise Sensitive Receptors

Potential noise-sensitive receptors were initially identified using GoogleEarth®; however, their presence was supported by a site visit to confirm the status of the identified dwellings on 11 and 12 November 2011 (1).

7.12.2 Ambient Sound Level

Day and night time noise measurements were collected on 11 November 2010. The locations used to measure ambient (background) sound levels are presented in *Figure 7.33* overleaf. These points are considered sufficient to determine the ambient (background) sound levels in the Project Area. The results are presented in *Table 7.29*.

(1) It should be noted that residence of existing rural homesteads and the establishment of new dwellings may have changed/taken place from the time the site visit took place in November 2011. Furthermore, the Social Study and associated on-site field data collection took place in Q1 2013. For this reason, the Noise Impact Assessment and associated management/mitigation measures has included coordinates for Noise Sensitive Receptors. Where the Noise Impact Assessment has labelled rural homesteads as a priority, this ESIA has correlated the locality and labelling of these homesteads with those of the Social Impact Assessment.

Figure 7.33 ***Baseline Noise Measuring Locations***

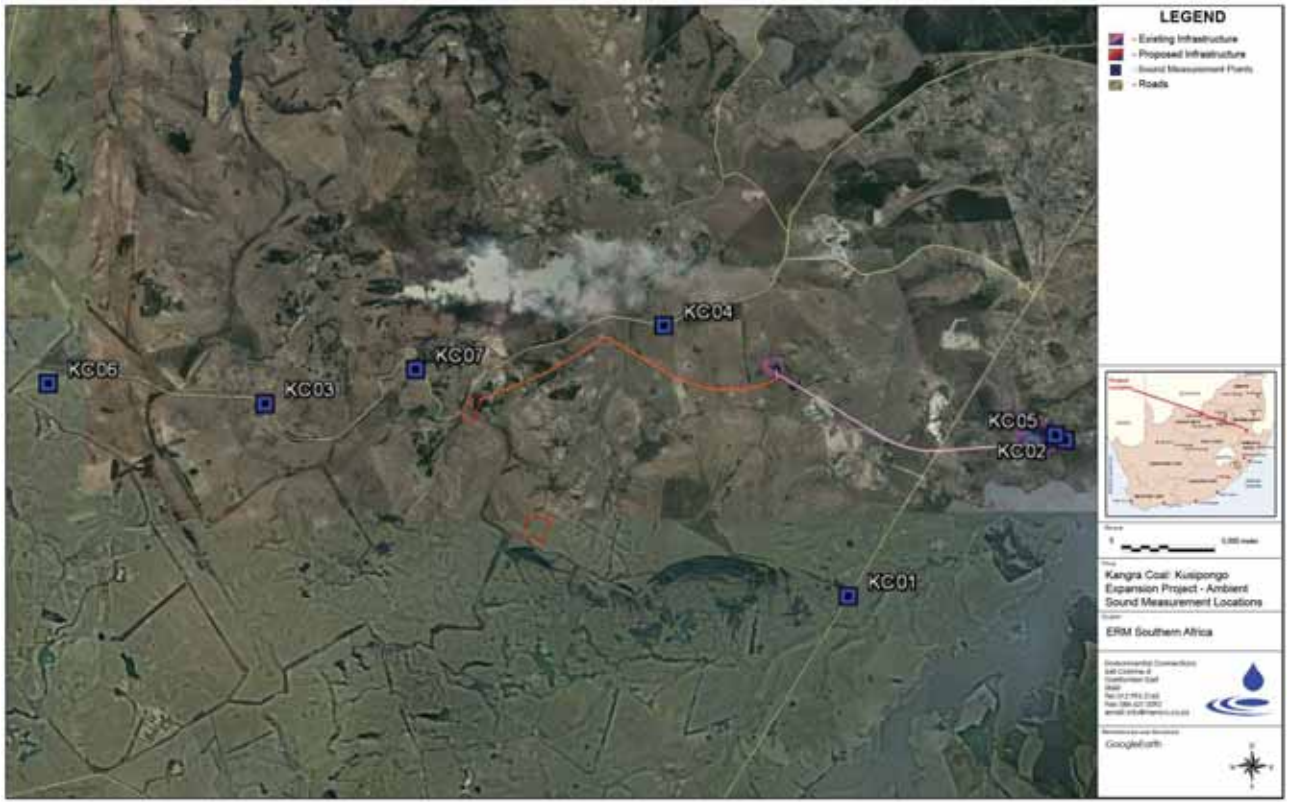


Table 7.29 Results of Baseline Noise Measurements

Point name	$LA_{eq,T}$ (dBA)	LA_{90} (dBA)	$LA_{,max}$ (dBA)	$LA_{,min}$ (dBA)
KC01 Daytime	36.9	27.7	51.0	24.9
KC01 Night-time	38.2	30.1	55.7	28.3
KC02 Daytime	55.4	53.7	66.4	51.8
KC02 Night-time	52.7	49.9	30.4	48.2
KC03 Daytime	59.9	50.5	70.0	40.1
KC03 Night-time	29.3	24.8	54.7	23.1
KC04 Night-time	26.2	23.2	43.5	21.4
KC05 Night-time	55.7	53.4	60.6	51.3
KC06 Daytime	55.4	44.4	67.9	37.6
KC07 Daytime	45.7	41.8	53.5	37.4

LAeq,T – Equivalent continuous sound pressure level with 'A' frequency weighting - The value of the sound pressure level of a continuous steady noise that, a measurement interval of time (t), has the same mean square sound pressure as the sound under consideration whose level varies with time.

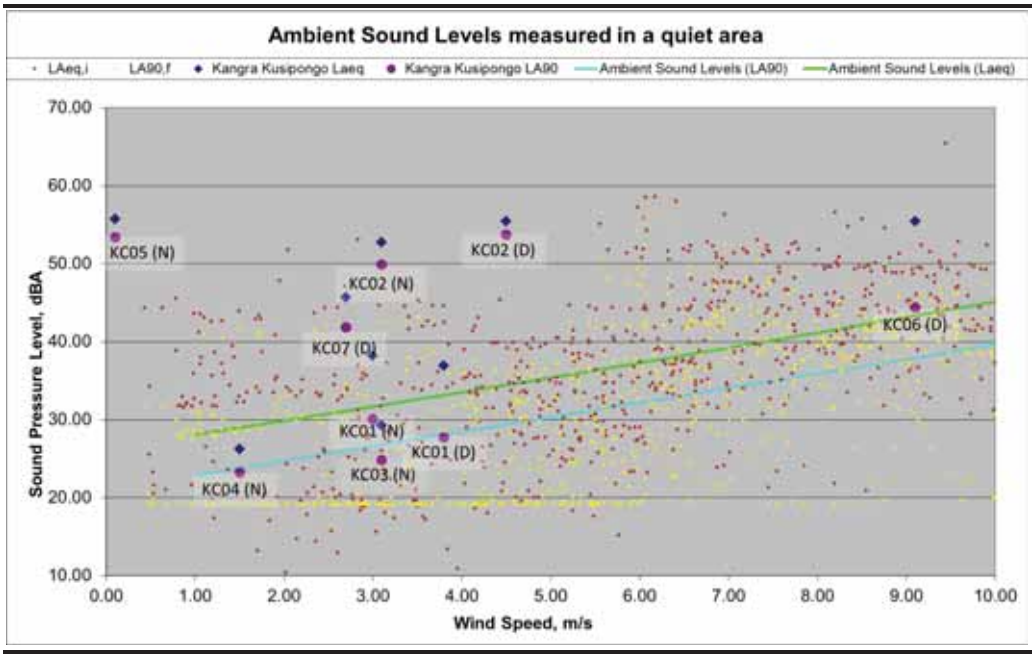
LA_{90} – The percentile sound pressure level exceeded for 90% of the measurement period with 'A' frequency weighting calculated by statistical analysis.

From the data obtained, it can be seen that the ambient daytime sound levels ranges between 27.7 and 50.5 dBA ($LA_{,90}$) and 24.9 and 40.1 dBA ($LA_{,min}$) for measurement locations away from existing mining activities (KC01; KC03; KC06 and KC07). Location KC02 is situated in close proximity to existing mining activities and has an ambient daytime sound level of 53.7 dBA ($LA_{,90}$) and 51.8 dBA ($LA_{,min}$) (*Table 7.29*). Unfortunately wind induced noises dominated the soundscape. There are no correction factors that can allow the elimination of wind induced noises.

Average ambient night-time sound levels ($LA_{,90}$) ranged between 23.2 and 30.1 dBA ($LA_{,90}$) and 21.4 and 28.3 dBA ($LA_{,min}$) away from existing mining activities (KC01; KC03 and KC04). Locations in proximity to existing mining activities ranged between 49.9 and 53.4 dBA ($LA_{,90}$) and 48.2 and 51.3 dBA ($LA_{,min}$). Being the period when a quieter environment is more desired, the night-time ambient sound character is generally of higher importance.

Figure 7.34 below illustrates night-time ambient sound level data as measured at a very quiet area with a sound character considered similar to the Project Area. Measurements closer to existing mining/industrial activities illustrate higher ambient sound levels, with the low difference between the LA_{eq} and LA_{90} for KC02 and KC05, indicating a constant noise source from existing Kangra Coal mining activities that dominated the soundscape of this given area.

Figure 7.34 ***Ambient Sound Levels for a Quiet Environment Similar in Sound Character to that of the Project Area***



7.13 BIODIVERSITY

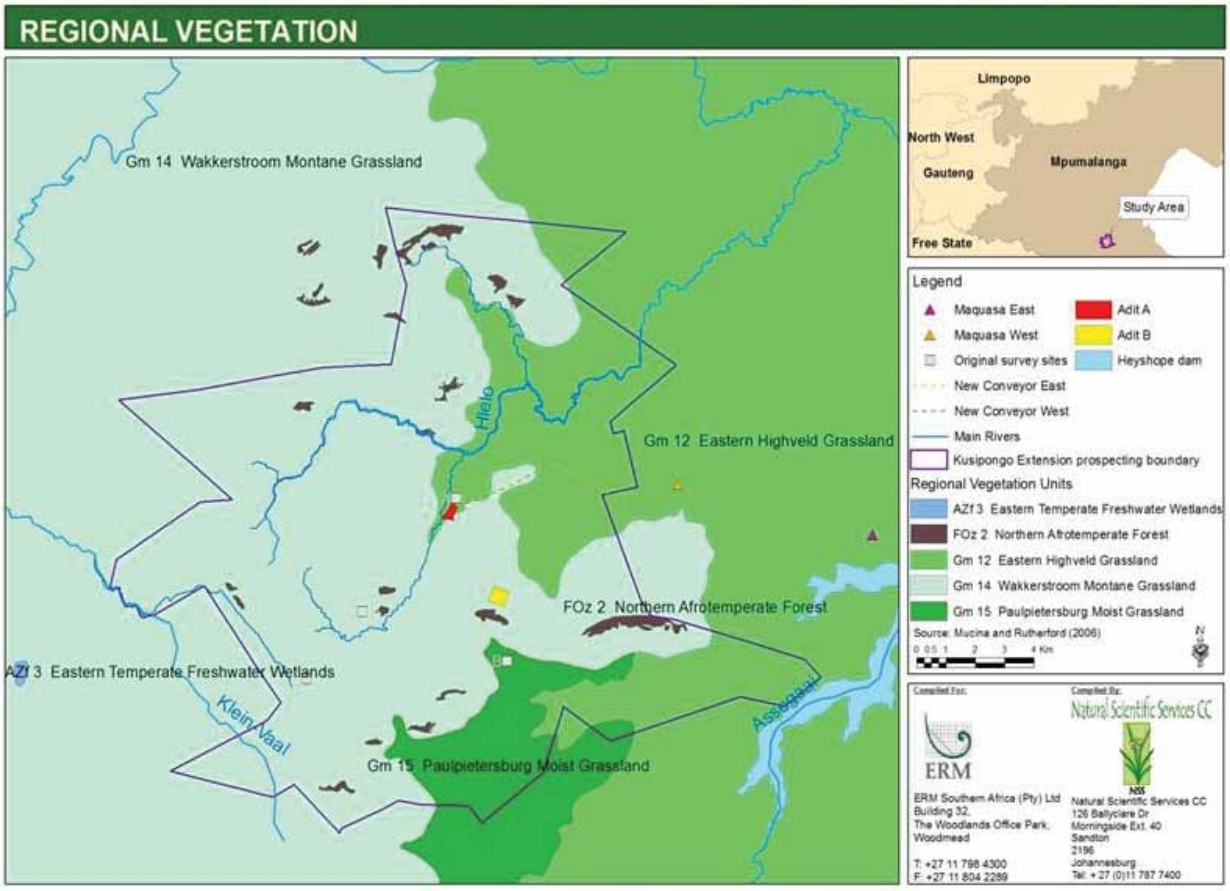
Please Note - This Section provides an overview of the key outcomes from the detailed Biodiversity baseline study, and is used to inform the Biodiversity Impact Assessment presented in *Chapter 9*. The complete biodiversity baseline is included in the Biodiversity Impact Assessment attached to *Annex C.2* of this report.

7.13.1 Vegetation Assessment

Due to the extent of the Project Area, the requirements issued in the original terms of reference for the biodiversity study was that the areas surrounding the different originally proposed adits be investigated in detail. The floral component investigated these areas and mapped vegetation communities based on the wetland catchments identified in the broad wetland assessment.

The Project Area is located within the Mesic Highveld Grassland Bioregion which predominates throughout the higher rainfall, eastern regions of the Highveld and forms a part of the Grassland Biome (Mucina & Rutherford, 2006). The proposed surface expansion area spans three regional vegetation types within this biome (*Figure 7.35*).

Figure 7.35 ***Regional Vegetation***



During the investigations, the following clearly defined zones were identified:

- **Forested Kloofs** – The main vegetation community recognized within these areas is the *Buddleja - Halleria Mixed Forest.* On a national level these areas form part of the Northern Afrotemperate Forest, although not a nationally threatened unit, several plant species are endemic, such as *Scolopia oreophila*, *Maytenus albata*, *Sparrmannia ricinocarpa* and *Streptocarpus polyanthus* subsp. *dracomontanus*. During the study a diversity of woody and pteridophytic species were detected. Conservation Important (CI) species included *Cussonia spicata; Cussonia paniculata; Gloriosa superba; Kniphofia spp; Dierama insigne* (on forest edges) and *Ceropegia meyeri* (on forest edges). This vegetation community was also recognized as a unique habitat for a number of CI faunal species. Due to the diversity and CI species as well as the current alien invasive threat on these communities, a sensitivity rating of *high* was applied.

- **Grassland Exposed Outcrops** – Within these areas two main vegetation communities were identified - *Diospyros - Themeda Rocky Outcrops* and *Alloteropsis - Tristachya Exposed Rocky Grassland.* The main difference between these two communities was the presence of a woody component. Both these communities fall within the Endangered Eastern Highveld Grassland (EHG).

  A number of CI species were recorded including *Agapanthus inapertus; Aloe ecklonis; Haemanthus hirsutus; Pellaea calomelanos; Scilla natalensis* and *Watsonia lepida. Eucomis autumnalis; Scadoxus puniceus; Gladiolus dalenii* and *Satyrium trinerve.* The Endangered *Gerbera aurantiaca (*naturally hybridized version*)* was identified within the *Alloteropsis - Tristachya* Exposed Rocky Grassland.

  These vegetation communities received a *high sensitivity rating*.

- **Open Plateau Rocky Grasslands and Hydromorphic Seep Zones** – The open plateau grasslands and associated seepage areas included the following vegetation communities: *Microchloa - Themeda Upper Plateau Grassland; Agrostis - Cyperus Seepage Grassland;* and *Juncus - Leersia Isolated Hydromorphic Grasslands*.

  The upper *Microchloa - Themeda Upper Plateau Grassland* were in good condition with limited alien infestations and relatively good grazing. CI species included *Satyrium longicauda; Gladiolus longicolis* and the TSP Declining *Boophone disticha* and Rare *Lotononis* species. On a national level this community falls within the Wakkerstroom Montane Grassland (WMG), the Vulnerable Paulpietersburg Moist Grassland (PMG) and Endangered Eastern Highveld Grassland (EHG). The hydromorphic areas within and surrounding this community included the *Agrostis - Cyperus Seepage Grassland;* and *Juncus - Leersia Isolated Hydromorphic Grassland.* Both these units contained limited alien infestations and were in relatively good

(natural) condition. The *Agrostis - Cyperus Seepage Grassland* further falls within the Endangered Eastern Highveld Grassland (EHG). Both are habitat to a number of CI faunal species such as the TSP Declining *Eucomis autumnalis;* the orchids *Satyrium longicauda; Satyrium hallackii* subsp. *Ocellatum* and *Satyrium trinerve.* Sensitivity ratings differed with the *Agrostis - Cyperus Seepage Grassland* being *high* and the *Juncus - Leersia Isolated Hydromorphic Grassland* being *medium-high* (note: these are units which fall within wetlands – areas marked Nationally as Highly Sensitive and Important).

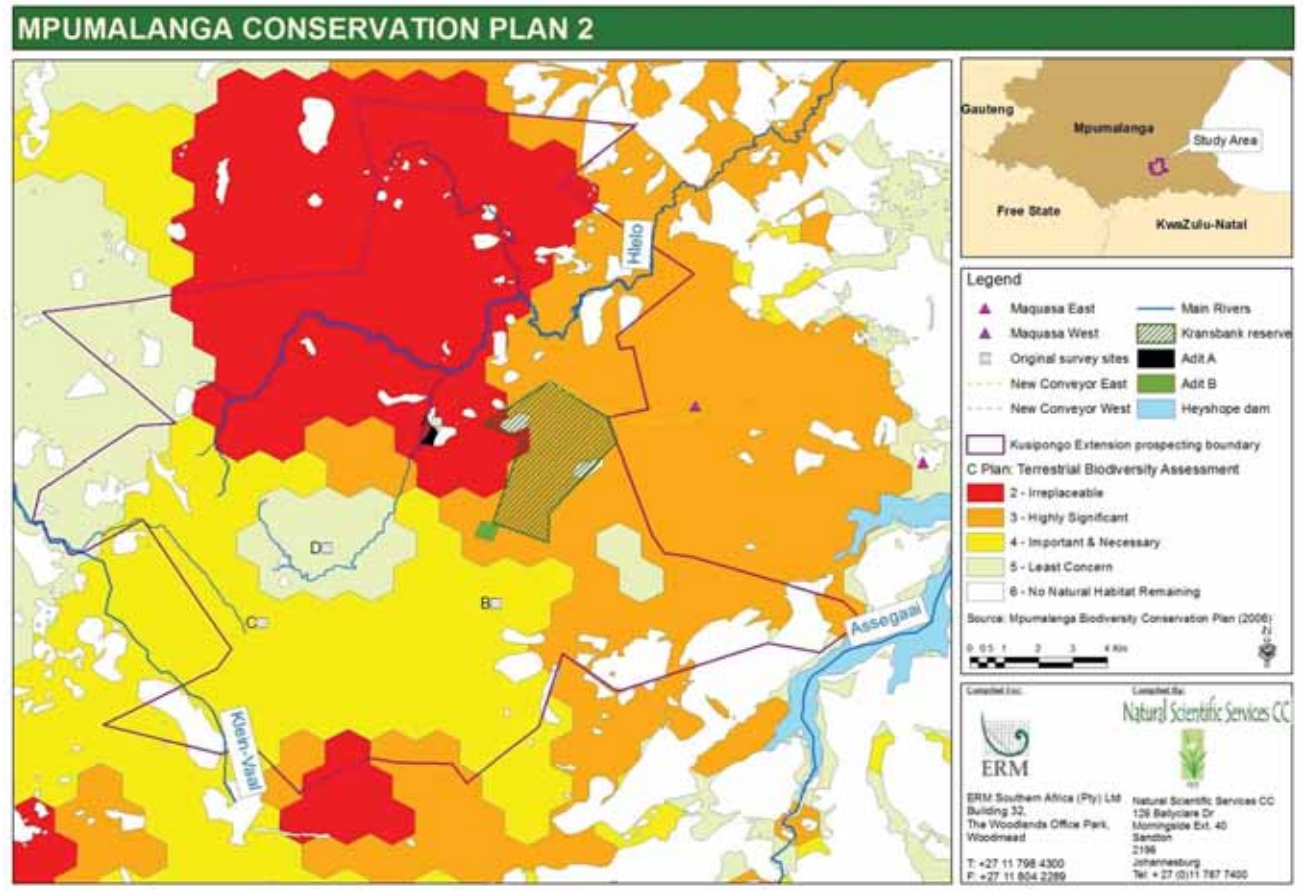
- **Rocky Slope Grasslands and associated Drainage Lines** – Within this group two closely associated vegetation communities were present, the *Juncus - Woodsia Hillslope Drainage* inter dispersed in the *Themeda-Harpochloa Lower Slope Grasslands*. CI species specific to the drainage areas included *Alsophila (Cyathea) dregei; Agapanthus inapertus; Dierama insigne;* the Protected *Eucomis autumnalis* and *Kniphofia spp.* Species such as *Gladiolus longicolis* and the Declining *Boophone disticha* were located in the *Themeda-Harpochloa Lower Slope Grasslands.* These grasslands were more disturbed due to heavier grazing and contained a reduced floristic diversity from the other grassland communities. The sensitivity rating was determined to be MEDIUM. The *Juncus - Woodsia Hillslope Drainage* contained unique and CI species with reduced disturbances.

  The rating provided was *medium-high*.

- **Valley Bottom Grasslands and River Systems** – Within the lower valley areas three communities were identified, the *Hyparrhenia - Eragrostis Pioneer Grasslands; Juncus - Merxmuellera Riparian Grasslands* and the *Juncus - Leersia Isolated Hydromorphic Grasslands* associated with the dams. The *Hyparrhenia - Eragrostis Pioneer Grasslands* were largely affected by grazing with limited species diversity, specifically in the forb and geophytic species. This habitat was dominated by monospecific stands of pioneer species such as *Hyparrhenia.* However, despite the disturbances these communities still play a vital role in habitat for a number of faunal species. The rating provided was determined as *medium*. CI species found within this community included *Eulophia welwitschii* in small patches. The *Juncus - Merxmuellera Riparian Grasslands* received a sensitivity rating of *high*. This habitat has, however, been affected by severe alien infestations and along with the *Buddleja - Halleria Mixed Forest*, require incorporation into an Alien Invasive Management Plan. CI species include *Hesperantha coccinea* and *Eulophia welwitschii.*

It must be noted that according to the Mpumalanga Biodiversity Conservation Plan (CPlan) assessment for the Project Area, the highest proportion of the main mine adit footprint (29%) is listed as *Irreplaceable* (*Figure 7.36*). Furthermore, the areas around the ventilation adit and a portion of the overland conveyor system route have been classified as *Highly Significant*. A similarly high proportion of the greater Project Area (25.6%) has been listed as *Important and Necessary*. Only 12.3% has been classified as areas of *Least Concern* with no natural habitat remaining in fragmented portions (8%) in areas of rural residence.

Figure 7.36 Terrestrial Biodiversity Assessment of the Mpumalanga Conservation Plan



7.13.2 *Faunal Assessment*

The study site falls within the Ekangala / Grassland Biosphere Reserve, which is also recognised as an Important Bird Area (IBA). This IBA is described by Barnes (1998) as one of the most important biodiversity areas in Africa spanning 800 farms, several conservancies and state owned land. The Kusipongo exploration area covers approximately 2.1% of the IBA. Furthermore, the Kangra Coal Project Area is important from an avian perspective, as it provides habitat for conservationally important (CI) bird species. Other faunal groups, although well represented and important, do not demonstrate the critical levels of sensitivity to the area as do birds. This Section considers a site sensitivity comparison based largely on the presence of Large Terrestrial Red Data bird species.

The avifaunal component (DEC, 2011) clearly demonstrates the importance of high altitude grasslands in the greater vicinity of the Project Area and the proposed ventilation adit (Adit B) as being important habitats for large terrestrial CI bird species. Field observations have confirmed locations of suitable habitat for a number of these species. Observations of the following species have been used for development of sensitivity data for the Biodiversity Impact Assessment Report:

- Southern Bald Ibis (*Geronticus calvus*) VU (1)
- Blue Crane (*Anthropoides paradiseus*) VU
- Grey-crowned Crane (*Balearica regulorum*) VU
- White-bellied Korhaan (*Eupodotis senegalensis*) VU
- Denham's Bustard (*Neotis denhami*) VU

The areas around observed locations of the above species have been designated as critically sensitive. Designation of the above locations as Critically and Highly Sensitive achieves the required level of protection for various other CI species that share the same habitat, such as Black-winged Lapwing, Yellow-breasted Pipits, Secretary birds and to a lesser extent Lanner Falcons. Unfortunately, time constraints required field observations to be focussed on selected areas as well as excluding the overland conveyor system and ventilation adit. Extrapolation of results from these areas is thus necessary, and the entire area of high altitude montane grassland is thus designated as Highly Sensitive.

Forests of the Northern Afrotemperate Forest were found to support the Near Threatened Bush Black Bushcap. These forests are important havens for biodiversity within the area, and occupy only a small proportion of the study site. Protecting these small islands of habitat makes a significant contribution towards conserving biodiversity in the area, and these forests are thus also classified with a similar critically sensitive rating.

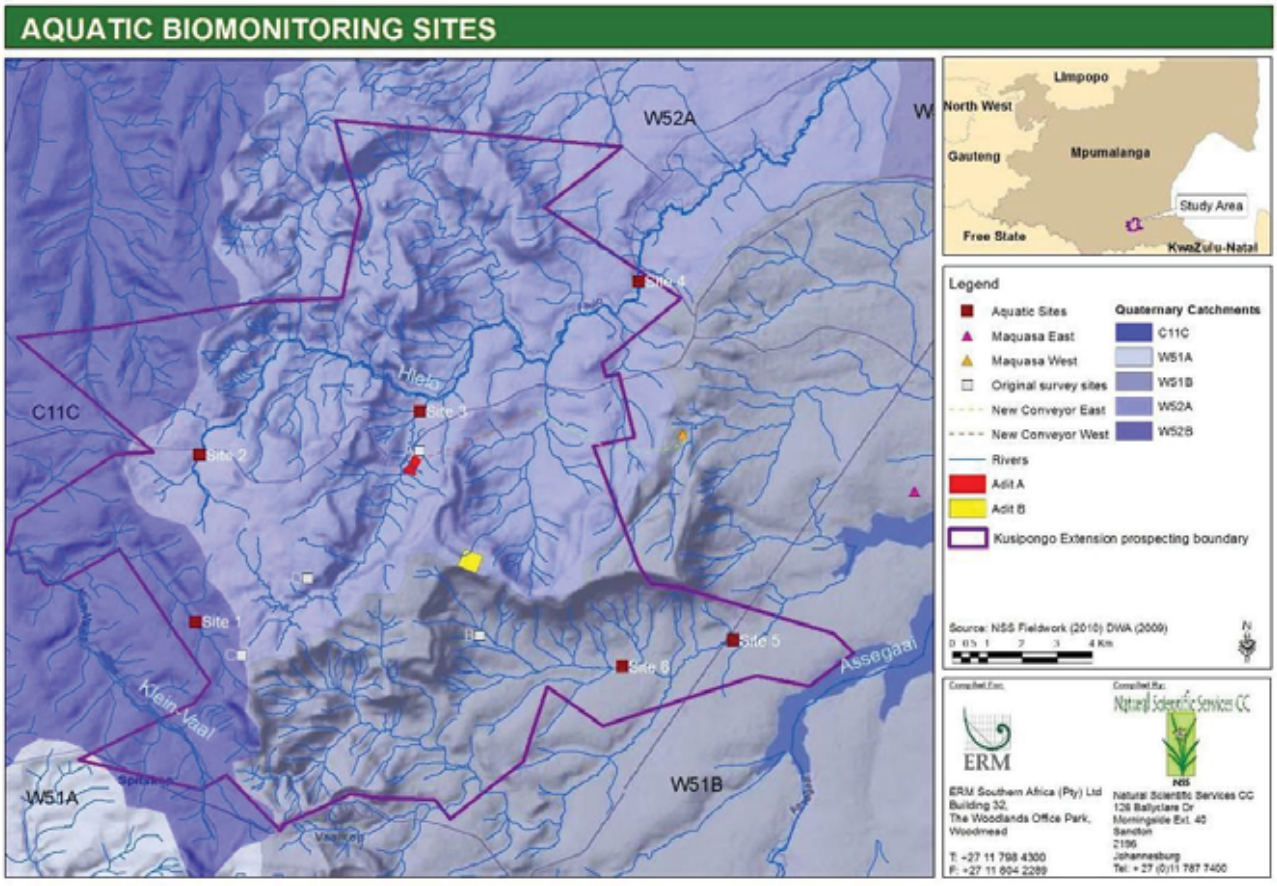
(1) VU - vulnerable species as defined by the IUCN Red List status

7.13.3 Aquatic Assessment

The aquatic assessment sampled six sites along rivers and streams in the Project Area (*Figure 7.37*). These sites were selected where possible to assess baseline conditions upstream and downstream of the proposed adit locations. However, some of the sites are located close to the watershed boundaries and insufficient aquatic habitat exists upstream of these sites to allow for adequate sampling.

The Aquatic assessment is a form of biomonitoring. The assessment of each site goes into a level of detail that shows each site to be unique. The methods are developed to monitor changes in sites over time, and are not intended as a means of comparing sites against one another for the relative assessment of sensitivity. The results do nevertheless provide an estimate of the ecological state of each site.

Figure 7.37 ***Aquatic Biomonitoring Sites***



The following overview of results was achieved:

- **Sites 1 and 2** – were located on small streams within high altitude grasslands. These sites provided insufficient diversity of microhabitats to reveal a broad range of aquatic macro-invertebrate species and yielded very limited diversity of fish species. Limited results are attributed to limited habitat availability.

- **Sites 3 and 4** – were located on the Ohlelo River that drains a large part of the Project Area. The principal catchments of this river are the high altitude grasslands of the site proposed for Adit A. This river showed ample diversity of microhabitats, which together with good water quality yielded a range of aquatic macro-invertebrates restricted to pristine habitat conditions. Sensitive fish species sampled in this river confirm that the river is virtually in its highest possible ecological state. Red Data fish species were not sampled but are expected to occur there. Some impacts such as alien plant infestations and anthropogenic influences were detected but were limited in extent.

- **Sites 5 and 6** – were located on the Mpundu River and a tributary feeding into it. These sites are downstream of the originally proposed main mine adit alternative at Site B, and located in areas heavily impacted by agricultural activities and severe alien plant infestations. Results indicated that the ecological conditions were the poorest recorded within the site. The proposed main mine adit alternative at Site B is located close to the top of the catchment of the aquatic system that was sampled. Conditions there appeared less impacted than at the actual sample locations, although the lack of diversity of aquatic habitats there may have yielded similar results achieved for sample Sites 1 and 2.

Rating of Aquatic Sensitivities

All conditions upstream of a site must be in an ecologically good state to achieve a high estimate ecological condition as recorded for Sites 3 and 4. Conditions for Site 2 are therefore assumed to be in a similar ecological state, and similarly for a significant tributary draining southward into the Ohlelo River above Site 4. Site 1 is located within similar habitat to Site 2 and is exposed to the same management systems. The ecological condition of that stream is thus expected to be similar to Site 2. The river network upstream of Site 4 is therefore designated as Critically Sensitive. Exceptions occur where cultivation practices exist in close vicinity to the river. These areas are classified as sensitive.

The Mpundu River and its tributary demonstrated that the conditions were impacted. The river nevertheless provides important ecosystem functions and feeds into the nearby Heyshope Dam which is an important waterfowl refuge (Barnes, 1998). This river system is therefore classified as Highly Sensitive.

7.13.4 Wetland Assessment

Main Mine Adit (Adit A)

The proposed footprint area of the main mine adit covers an area of 14.5ha. The site is located within a large valley but east of the Ohlelo River. The south-western boundary of the site shares a length of approximately 17m with the Ohlelo River.

Wetland Classifications

Two types of wetlands were identified within this terrain unit according to the HGM classification (Kotze *et al*. 2007). These being (i) the Ohlelo River that can be classified as a Valley bottom wetland with a channel, and (ii) a Valley bottom wetland without a channel. A stream, classified as a Valley bottom wetland with a channel, was observed flowing just north of the site boundary and is intercepted by the proposed overland conveyor system. The proximity of this stream does impact upon the wetlands in this site.

Wetland Delineation

Wetland boundaries have been delineated within the site of the main mine adit based on the combined results of the terrain unit, signs of soil wetness and vegetation indicators. Wetlands were observed to cover just over 25% of the area of the main mine adit. Their layout is illustrated in *Figure 7.38*, and the areas occupied by the various wetland units are presented in *Table 7.30*.

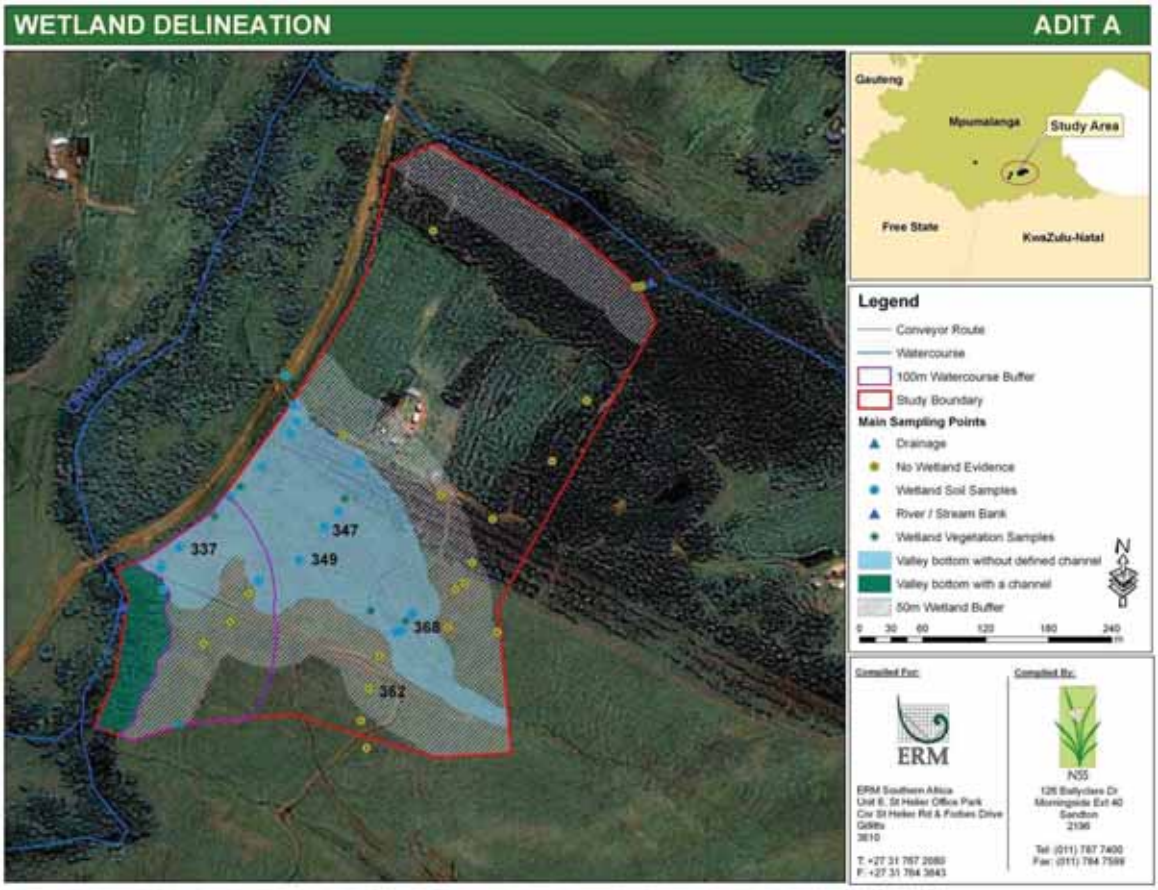
Table 7.30 Areas of the Main Mine Adit occupied by the various wetlands, non-wetlands and proposed buffers

Wetland and Other Units	Area (ha)	Percentage
Valley bottom wetland with a channel	0.54	3.7%
Valley bottom wetland without a channel	3.31	22.8%
Total for all wetlands within the main mine adit	3.85	26.6%
Terrestrial (non-wetland) areas	10.639	73.4%
TOTAL AREA	**14.489**	
50m buffer around all wetlands	4.773	32.9%
Addition of 100m buffer on oHlelo River	0.27	1.8%

Buffer Requirements

A 50m buffer has been placed around the valley bottom wetland without a channel and a small stream flowing just beyond the northern boundary of the site. The Ohlelo River, bordering the south western edge of the site, is considered highly sensitive and a 100m buffer has been recommended there. An overall buffer (excluding overlaps between adjacent buffers) covers an area of 4.97ha representing 35% of the area of the site proposed for the main mine adit (*Table 7.30*). The proposed layout of buffers is incorporated in *Figure 7.38*.

Figure 7.38 ***Wetland Delineation for the Main Mine Adit (Adit A)***



Present Ecological State

The Ohlelo River was sampled during the Baseline Assessment, and habitat integrity realised a final result of 92%, which on a scale of 0 to 5 would equate to a Present Ecological State (PES) value of 4.6 or a rating of A/B (**Slightly modified**).

The second wetland within the main mine adit, i.e. the Valley bottom wetland without a channel was assessed using the intermediate PES scoring system. Based on that assessment, the wetland is considered to be "**Largely natural with few modifications**" - B.

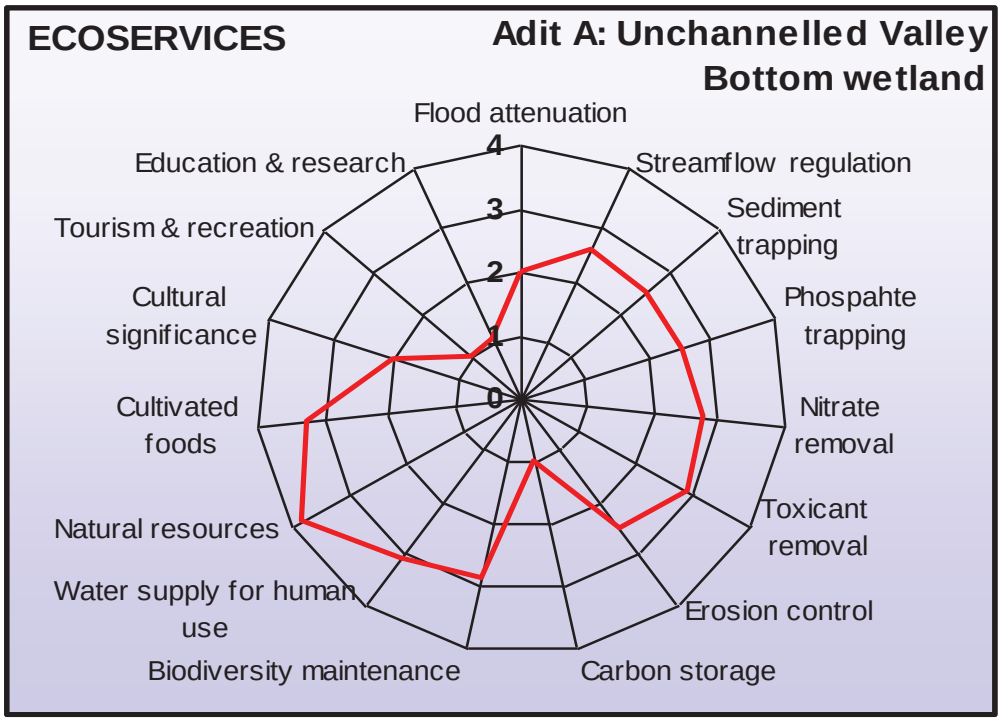
Ecoservices Assessment

Poverty in the area and the dependence of communities on water from the wetland and the Ohlelo River are the dominant features of the assessment. Evidence of water abstraction from the Valley bottom without a channel is illustrated in *Figure 7.39* showing a pipe that has been used to divert water from the wetland towards local houses (1). Cultivation and the large presence of alien wattle trees influence the erosion risk due to an absence of ground cover and the phosphate and nitrate removal services of the wetland (*Figure 7.40*).

Figure 7.39 Water Abstraction and use from the Unchannelled Valley Bottom Wetland within the Boundaries of the Site Proposed for Main Mine Adit

(1) Coordinates of the abstraction site: 27⁰ 00' 40.10" S; 30⁰ 17' 55.24" E

Figure 7.40 ***Results of the Ecoservices Assessment for wetlands in Site Proposed for Main Mine Adit***



Ventilation Adit (Adit B)

A square Project Area of 500 m x 500 m that covers an area of 25 ha was provided for the investigation and delineation of wetlands in the area proposed for the construction of the ventilation adit although the actual footprint area of the adit is not expected to exceed roughly 500m^2 within that square.

Wetland Classifications

Two types of wetlands were identified within the area proposed for the ventilation adit (Adit B) terrain unit according to the HGM classification (Kotze *et al.* 2007). These include (i) a Valley bottom wetland with a defined channel; and (ii) a Hillslope seepage linked to a channel. Also included is a seasonal watercourse that does not fit any of the categories within the HGM classification, but does qualify as a water course according to the National Water Act (refer to *Section 5.2.5* in *Chapter 4)*.

Wetland Delineation

Wetland boundaries have been delineated within the greater area of the proposed ventilation adit based on the wetland classification, presence of soil forms, soil wetness indicators and wetland vegetation. Wetlands were observed to cover approximately 10% of the greater area of the site proposed for the ventilation adit. Their layout is illustrated in *Figure 7.41,* and the areas occupied by the various wetland units are presented in *Table 7.31*.

Table 7.31 Areas of the Greater Site proposed for the Ventilation Adit occupied by various wetlands Non-wetlands and Proposed Buffers

Wetland and Other Units	Area (ha)	Percentage
Valley bottom wetland with a channel	0.92	3.7%
Hillslope seep linked to a channel	1.47	5.9%
Seasonal watercourse	0.09	0.3%
Total for all wetlands within the main mine adit	2.47	9.9%
Terrestrial (non-wetland) areas	22.53	90.1%
TOTAL AREA	**25.00**	
50m buffer around all wetlands	10.39	41.6%

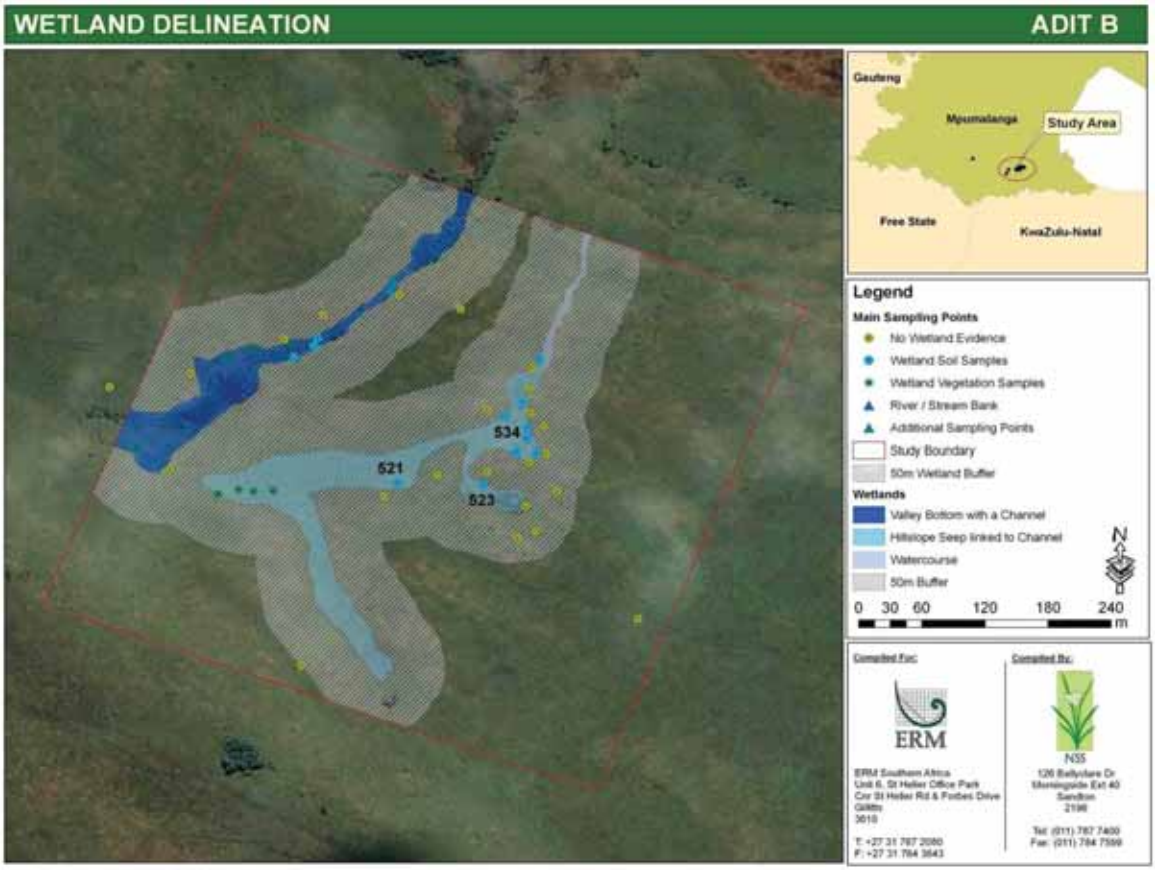
Buffer Requirements

A 50m buffer has been placed around all wetland units, including those within the close proximity of the Adit B boundaries. An overall buffer (excluding overlaps between adjacent buffers) covers an area of 10.4 ha representing 42% of the area of the ventilation adit (*Table 7.31*). The proposed layout of buffers is incorporated in *Figure 7.41*.

Present Ecological State

The channelled wetland was found to be more affected by current impacts (a PES value of 4.2 or a rating of B – "**Largely Natural with Few Modifications**") than the seepage area (a PES value of 4.6 or a rating of A/B – "**Slightly Modified**"). This is mainly due to the construction of a farm dam that influences the natural flow systems and impacts on surrounding vegetation.

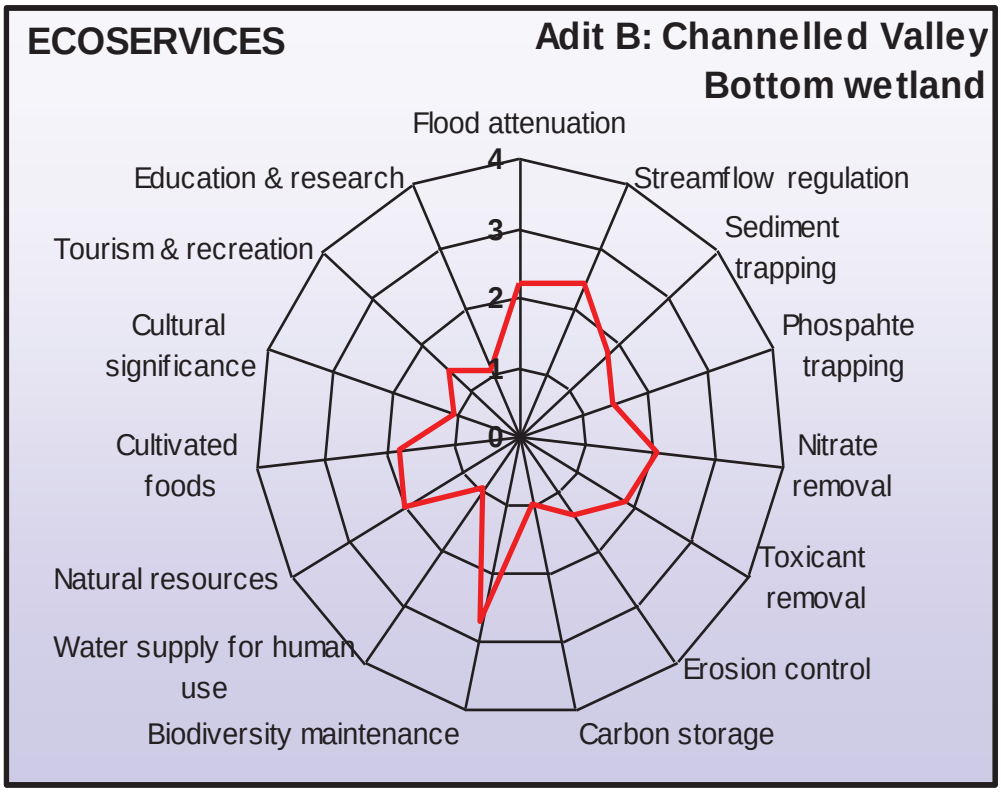
Figure 7.41 Wetland Delineation for the Ventilation Adit (Adit B)



Ecoservices Assessment

No people were observed living in the area, there is no cultivation of crops and the dependence on natural resources there is limited, which significantly alters the outcome of the Ecoservices in comparison to the results obtained for wetlands in the main mine adit Project Area. Biodiversity maintenance is the most significant aspect to emerge from the Ecoservices assessment there. The typical spider web chart produced by the Ecoservices assessment is presented in *Figure 7.42*.

Figure 7.42 Results of the Ecoservices Assessment for Wetlands in the Ventilation Adit (Adit B)



Overland Conveyor System

Wetlands along the originally proposed overland conveyor system route starting at the edge of the proposed main mine adit and extending to the currently operating the Maquasa West Mine were delineated in 2011. This included 13 different wetland stretches that were intercepted by the proposed route. The revised route still crosses over the large wetland associated with the Kransbank Private Reserve and continues along an extended arc to the Maquasa West Mine. This area is under the control of Kangra Coal. This section of the route was investigated in 2012.

Wetland Classifications

A range of wetlands occur along the proposed conveyor route. These (according to the HGM classification – Kotze *et al.* 2007) include:

- Valley bottom with a channel
- Valley bottom without a channel
- Isolated hillslope seepage
- Hillslope seepage linked to a channel

Wetland Delineation

Due to the conveyor being a linear development, the lengths through which the route passes through wetlands was calculated. Along the original route, wetlands were observed to cover an estimated 17%, with the new route this is reduced to 15.6% of the length of the overland conveyor system route (*Table 7.32* and *Figure 7.43*).

Table 7.32 Lengths of the Overland Conveyor System Route Passing through Various Wetlands, Non-wetlands and Proposed Buffers

Wetland	Distance (m)	Percentage
Wetland A Valley bottom wetland with a channel	456	11.1%
Wetland B Valley bottom wetland with a channel	9	0.2%
Wetland C Valley bottom wetland with a channel	68	1.6%
Wetland D Hillslope seepage linked to a channel	72	1.7%
Wetland 13 Hillslope seepage linked to a channel	38	0.9%
Total length of wetlands along the new conveyor	896.4	15.6%

Buffer Requirements

The overland conveyor system route intends crossing each of these wetlands for which authorization will be needed. As such, the actual size of buffers is not expected to make substantial difference towards protection of the wetlands, except if additional infrastructure is required. In this case, where possible, wetlands and a 50m buffer should be endorsed.

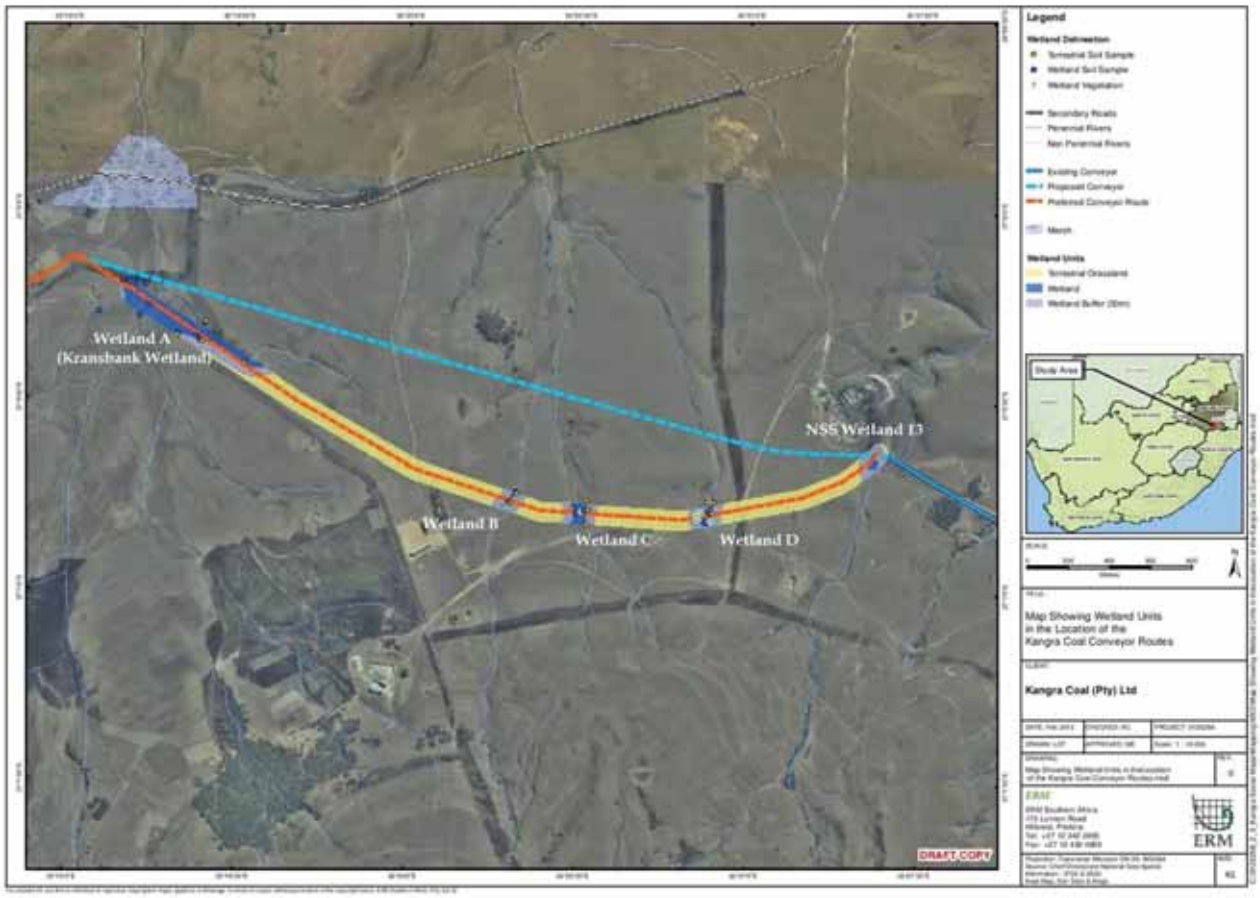
Present Ecological State

Wetlands along the length of the ***original*** proposed overland conveyor system route (this previous alternative route is presented in *Chapter 2*) were grouped according to their wetland type and proximity to one another. These groups of similar wetlands were then assessed. Results for these wetland groups varied from a PES value of 1.75 (D – "**Largely Modified**") to 4.58 (A/B – "**Slightly Modified**").

Cultivation, livestock grazing and infestations of alien wattle trees (*Acacia mearnsii*) were the most common causes for reducing PES scores. For the

wetland with the lowest PES value, this hillslope seepage wetland was heavily affected by runoff and accumulations of coal from the adjacent Maquasa West Mine.

Figure 7.43 ***Wetland Delineation along the Proposed Overland Conveyor System Route***

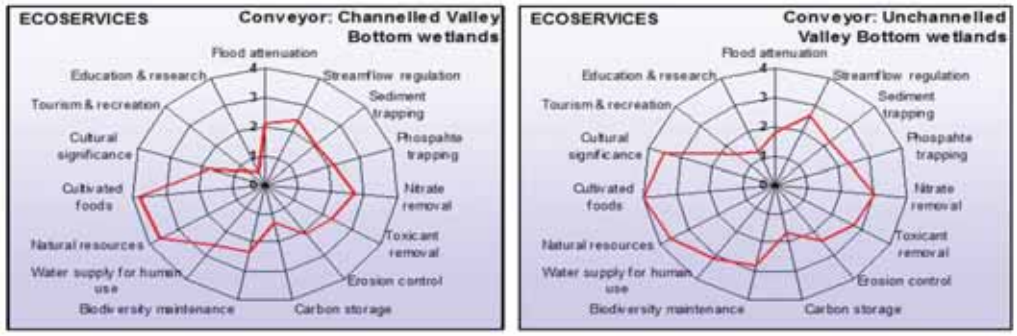


Ecoservices Assessment

Wetlands occurring along the route of the proposed overland conveyor system differ significantly from one another in their type and present ecological state (as shown above). Two Ecoservice assessments were thus done, one focusing on the valley bottom wetlands with a channel and the other focusing on the unchannelled valley bottom systems which is dominated by the large Kransbank wetland.

Similar results were obtained for the two assessments shown in Figure 7.44, as the area is settled by local communities and affected by poverty. The dependence of communities on cultivated foods and natural resources from the wetlands are dominant features of the assessment, as similarly observed within the main mine adit.

Figure 7.44 Results of the Ecoservices Assessment for Wetlands along the Proposed Route for the Overland Conveyor System



7.14 KEY PHYSICAL AND BIOLOGICAL SENSITIVITIES

- **Climate** – wind direction is an important consideration when considering the effects of noise and airborne emissions and the potential impact of these emissions on sensitive receptors in the Project Area. The prevailing wind is northeast and is a pathway for potential noise and airborne emissions that can potentially impact on nearby receptors.

  Furthermore, precipitation in the Project Area is an important aspect to consider when assessing the potential impacts on the surface water environment.

- **Topography** – the Project Area lies within a mountainous area. Local topography will influence local wind patterns and subsequently the dispersion of potential noise and airborne pollutants from the site of the proposed Project. Furthermore, local topography will influence the visibility of the proposed Project from off-site visual receptors. This is considered further in the Visual baseline presented in *Chapter 8*.

- **Soils** – the soils located in the Project Area are not inherently susceptible to erosion. However, the site proposed for Adit A and Adit B are situated

in sloping areas, so the erosion hazard will be higher there than that of the route proposed for the overland conveyor system.

- **Land Capability and Agricultural Potential** – over 70% of the footprint for Adit A is classed as having a moderate to high arable potential, with a similar approximate proportion of the length of the conveyor belt alignment.

  The significance of the area to be developed is not that great to the broader agricultural environment at this stage.

- **Surface Water** – reliance on surface water for potable use (water is untreated and piped directly from surface water to households). Proposed Project infrastructure at the main mine adit is immediately adjacent to floodlines.

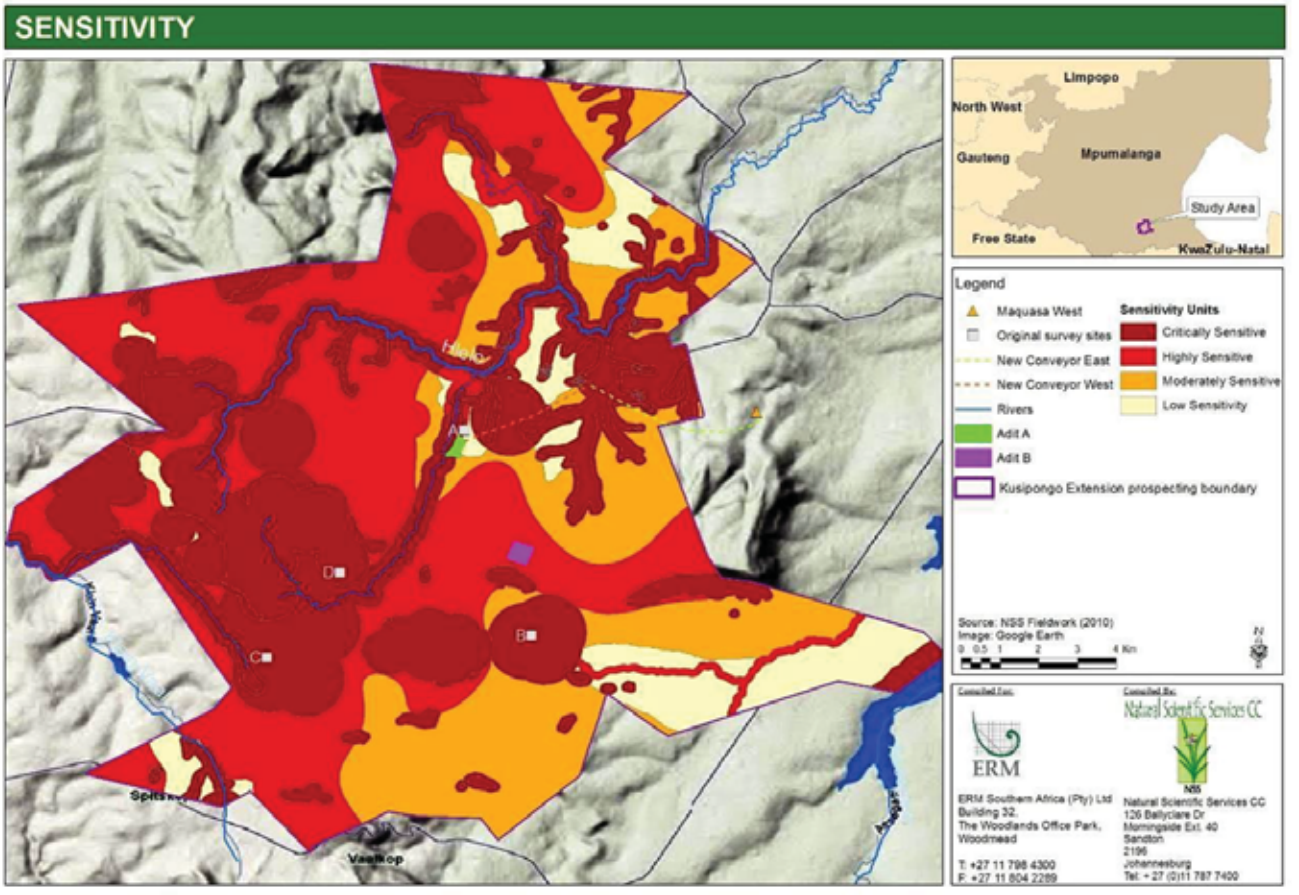
- **Groundwater** – reliance on springs, boreholes and surface water (which is fed by groundwater baseflow) as a source for potable use and livestock watering. Furthermore, the presence of groundwater in aquifers that will be intersected with the Gus and Dundas Coal Seams.

- **Air Quality** – in terms of dust fallout results in the Project Area, the highest fallout was observed immediately east of current Kangra Coal mining operations, where fallout exceeded the Industrial Action level of 1 200 mg/m²/day on one occasion. Furthermore, the expected annual PM_{10} concentration for the Project Area is about 15 to 20 µg/m³.

- **Noise** – the noise environment in the Project Area can be considered to be relatively low, especially in those areas that are situated further away from existing Kangra Coal mining activities. It is in these areas that will be most affected by activities associated with the proposed Project. Furthermore, these areas have rural dwellings.

- **Biodiversity** – for biodiversity specifically, a sensitivity map has been created. Virtually the entire western half of the Project Area is rated as either highly or critically sensitive.

Figure 7.45 Ecological Sensitivity Map



8 THE RECEIVING ENVIRONMENT – SOCIAL CHARACTERISTICS

To determine the social receiving environment ERM had specialists conduct a series of detailed social studies including:

- Socio-economic assessment;
- Visual and landscape assessment; and
- Heritage assessment.

This *Chapter* presents an overview of the social receiving environment within the Study Area of the proposed Kusipongo Resource Expansion Project.

8.1 SOCIO-ECONOMIC

Please Note - This Section provides an overview of the key outcomes from the detailed Socio-economic baseline study, and is used to inform the Socio-economic Impact Assessment presented in *Chapter 10*. The complete Socio-economic baseline is included in the Social Impact Assessment attached to *Annex C.6* of this report.

8.1.1 Socio-economic Study Area and Zones of Influence

The Social Impact Assessment (SIA) has defined three Zones of Influence that make up the broader Study Area – these include (also refer to *Figure 8.1*).

- **Zone 1 (Directly Affected Parties)**:
    - Residents of homesteads and settlements within the Project footprint and up to a 1km distance from Adit A and the Ventilation Adit (Adit B) fence lines.
    - Residents of homesteads and settlements within the conveyor footprint and up to a 500m distance from the fenced overland conveyor system and associated service road / infrastructure corridor.
    - Residents of homesteads and settlements directly above the underground mine footprint.
    - Land users (grazing and farming) within this designated area (1km and 500m).
    - Land owners – Mr Greyling and Kangra Coal.
    - Community Property Associations (CPAs) and individual residents who own land on which infrastructure will be established and whose surface area is above ground where mining / blasting activities will occur (eKaluka and Thuthukani CPAs).
    - Land claimants for Twyfelhoek 379 and Donkerhoek 14.

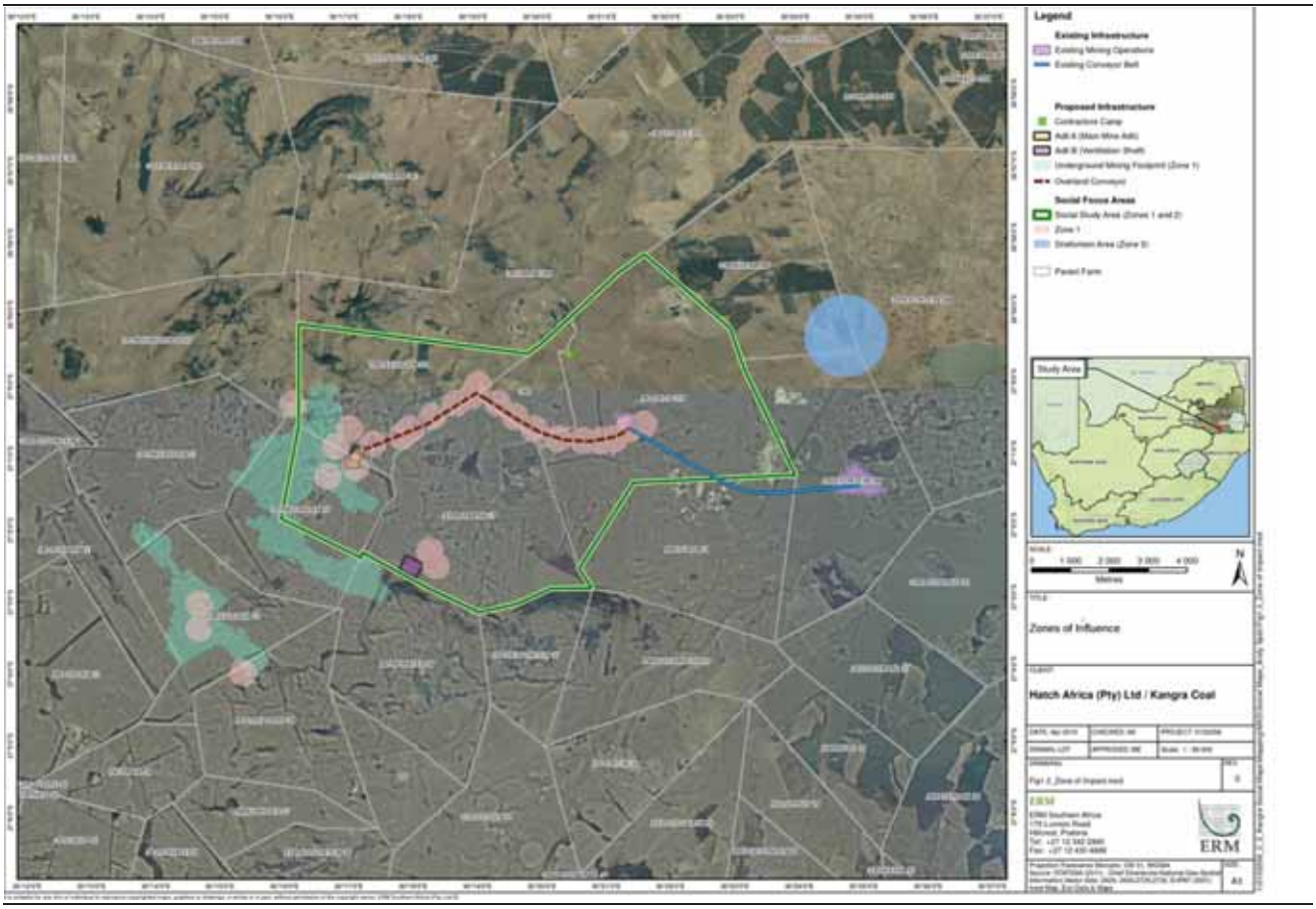
- **Zone 2 (Inconvenienced Parties)**:

    - Homesteads and settlements potentially affected by nuisance factors (noise, vibrations, dust etc.) beyond the 1km/500m Zone 1 but within 2kms/1km of Adits A and B and the conveyor system respectively.

- **Zone 3 (Interested and Affected Parties and the Authorities)**:

    - Driefontein residents who impact upon the Project's license to operate as a result of legacy issues resulting from current Kangra Coal operations in the area (individuals who attended public meetings).
    - Authorities and traditional structures for the affected wards and municipalities.

Figure 8.1 Zones of Influence



8.1.2 *National, Provincial, District and Ward Socio-economic and Utilities Setting*

The SIA attached as *Annex C.6* provides a detailed overview of the social setting for the National and Provincial level and a social overview, overview of utilities, infrastructure and services at a District and Ward level. This Section (*Box 8.1* to *Box 8.5*) below provides an overview of those key factors (from a Provincial to Ward Level) influencing the socio-economic setting of the Study Area.

Box 8.1 Demographics

Provincial level (Mpumalanga)

- The primary economic activity in the Province is mining.
- The population is still young, with the majority being below the age of 35 years.
- The population growth rate between 2001 and 2011 was 1.83%.

District Level (Gert Sibande District Municipality)

- Has the smallest population size in the province (~ 1 043 194 persons in 2011).
- Smallest population growth rate in the Province between 2001 and 2011 at 1.48%. This is lower than the national and provincial growth rates.
- Youth (between 0 to 34 years) constituted the largest share of the District population at 69.8%.

Local Level (Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities)

Mkhondo Local Municipality

- Mkhondo Local Municipality (LM) had the fastest population growth rate in the District at 1.84% (between 2001 and 2011). Between 1996 and 2011, the population nearly doubled from 98 967 to 171 591 people.
- 58.3% of the population is below the age of 24 years.

Dr. Pixley Kalsaka Seme Local Municipality

- In 2011 the population was 83 007 people, with a population growth rate was 2.8% between 1996 and 2001, decreasing to 0.3% between 2001 and 2011.
- In 2011, majority of the population was black (91%).
- 55.6% of the population is below the age of 24 years.

Ward Level (Ward 2 and 3 of the Mkhondo LM and Wards 5 and 10 of the Dr. Pixley Kalsaka Seme LM) (refer to *Figure 4.3* in *Chapter 4*)

The following statistics are collective and show a cumulative value for across all wards.

- A greater% age of the population (44%) is in the 0 to 14 year age cohort, with 21% in the 15 to 24 years age group.
- Of the population, 51% fall within the potentially economically active population, i.e. – between 15 to 64 years.
- Homesteads across all four wards average four to six members per homestead unit.

In Summary:

Mining is the main economic activity in Mpumalanga. The population from Provincial through to Ward level is young. Majority of persons in the District, LMs and Wards are previously disadvantaged persons and a large% age of the population (at a Ward level) is in the potentially economically active population (51%).

Box 8.2 Education

Local Level (Mkhondo and Dr. Pixley KaIsaka Seme Local Municipalities)

Mkhondo Local Municipality

- Less than 70% of the adult population (people aged 20 years and older) do not have a high school education.
- In 2001 nearly 22 806 adults had no schooling. This figure dropped substantially to 15 914 in 2011 (30% decline).
- The amount of matriculated students more than doubled from 8 674 in 2001 to 22 600 in 2011.

Dr. Pixley KaIsaka Seme Local Municipality

- Less than 68% of the adult population (people aged 20 years and older) do not have a high school education.
- In 2001, nearly 14 000 adults had no education and by 2011 this figure dropped to 8 950 (almost a 40% decline).
- The amount of matriculating students increased from 4 938 in 2001 to 11 153 in 2011.

In Summary:

Although there have been significant improvements in the amount of people attending school and matriculating, a significantly large% of the population have less than a high school education.

Box 8.3 Health

Local Level (Mkhondo and Dr. Pixley KaIsaka Seme Local Municipalities)

- Among those most at risk of contracting HIV / Aids are people within the age cohort of 16 to 35 years. This is a large proportion of both the LMs populations.
- In the Dr. Pixley KaIsaka Seme LM, there has been a decreased growth rate in HIV prevalence (1996 to 2010), which if continues could reduce the vulnerability of both LMs populations.

In Summary:

Although a large% age of the LMs population is at risk of contracting HIV/Aids, the prevalence rate has decreased, thus reducing the vulnerability for both LMs.

Box 8.4 Tourism

Provincial level (Mpumalanga)

- Focus to promote tourism as a key sector of the economy.
- In 2010 the Province attracted 1.136 million foreign tourists, compared to 1.035 million in 2009 – a 9.6% increase.

District Level (Gert Sibande District Municipality)

- Have realised that the tourism sector is not properly developed, but are aiming at maximising the potential that the district has in the form of wetlands, grasslands etc.

Local Level (Mkhondo and Dr. Pixley KaIsaka Seme Local Municipalities)

Mkhondo Local Municipality

- Tourism development and preservation are highlighted as being important for the LM.
- Has recognised a number of heritage sites for tourism.

Dr. Pixley KaIsaka Seme Local Municipality

- Has recognised that Wakkerstroom (40km south-south-west) has the potential to become a major destination for domestic as well as foreign tourists.
- Has recognised that Wakkerstroom wetland reserve is the main centre for bird watching in South Africa.

In Summary:

Tourism is a major sector from the Provincial level through to the LM level. Amongst others, Wakkerstroom has been identified as a major destination for the development and preservation of tourism.

Box 8.5 Utilities and Services

Provincial level (Mpumalanga)

- **Water** – a focused effort to provide piped water is noticeable in the Province, with only 13% of the population not having access to piped water.
- **Energy/Fuel Sources** – 86.4% of people living in the Province utilised electricity for lighting in 2011. At a District level, the use of electricity for lighting is lower; however, this has narrowed significantly over the last 10 years.

In Summary:

Water and energy provision in the province have improved.

8.1.3 Migration Patterns

The population has slightly increased on provincial (1.83%), district (1.48%) and local levels (1.84% and 0.30% for Mkhondo and Dr. Pixley KaIsaka Seme LMs respectively) according to 2001 and 2011 Census data.

The substantial difference in the growth level between the two local municipalities may point to population out-migration but also coincides with statistics related to areas affected by HIV / Aids.

According to 2011 Census data, the majority of in-migration to Mkhondo LM and Dr. Pixley KaIsaka Seme LM is from other areas of Mpumalanga at 94.8%, with only 0.8% of all migrants to both local municipalities coming from outside of South Africa from the Southern Africa Development Community (SADC) [1] and of those 1 381 live in Mkhondo LM and 330 live in Dr. Pixley KaIsaka Seme LM (Census 2011).

8.1.4 *The Study Area Socio-economic Setting*

The Study Area related to the proposed Project has been defined in *Section 8.1.1* above. Given that impacts from the Project are likely to be most directly felt within these areas this Section describes the existing socio-economic environment and local perceptions.

A visual homestead count was undertaken for the social Study Area, which identified approximately 112 homesteads or large structures. These were then divided into their Zone of Influence with 42 homesteads in Zone 1 and the remaining 70 homesteads in Zone 2. A total of 45 interviews were carried out with homestead residents, which constitute approximately 40% of the total number of homesteads in the Study Area. Of this total number, approximately 78% of homesteads in Zone 1 were interviewed and 17% in Zone 2.

Homesteads surveyed across 5 farms, were selected as the sample size. These are listed in *Table 8.1* below and presented in *Figure 8.2*:

Table 8.1 Number of Homesteads per Farm

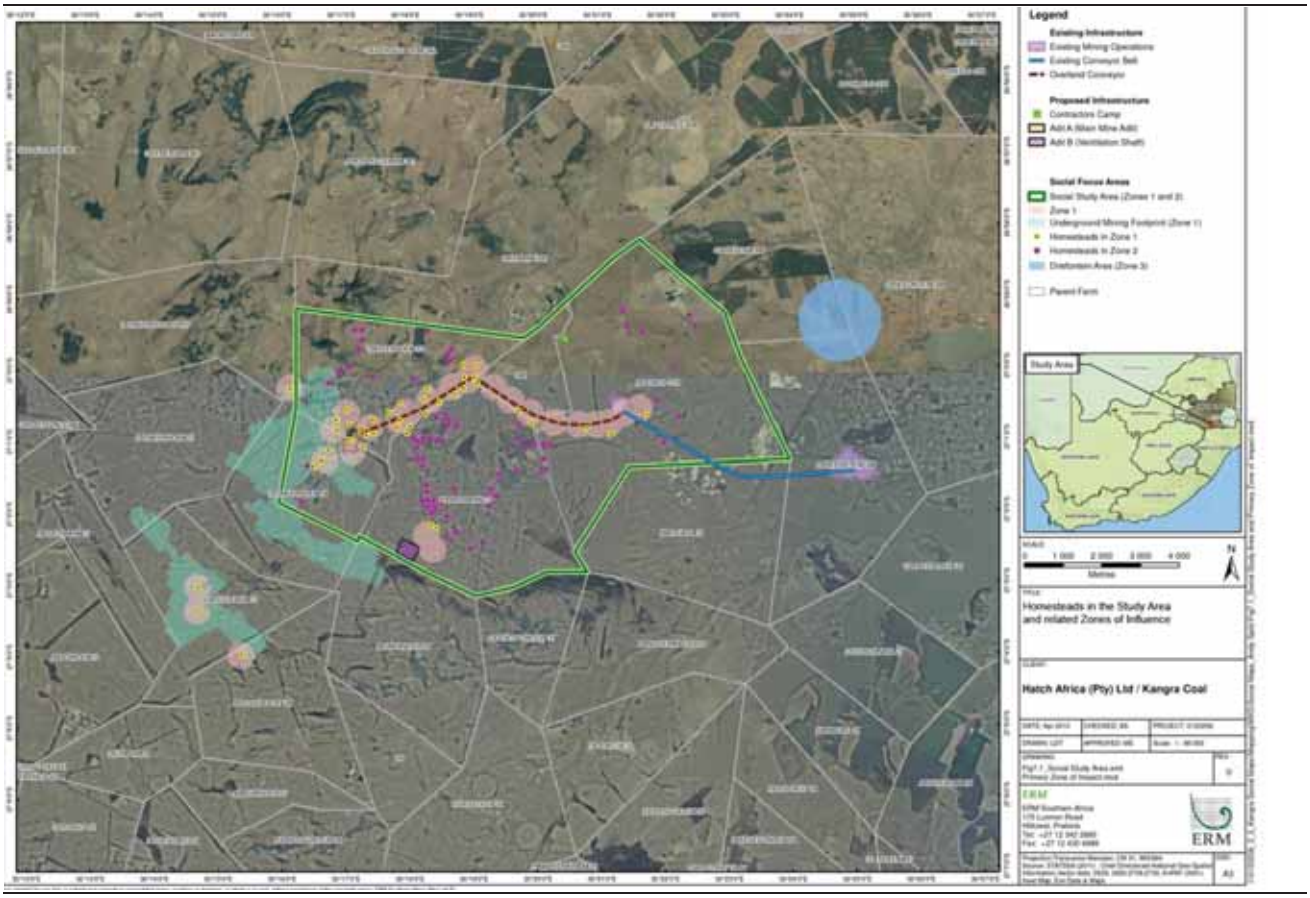
Farm Name	N= [2]
Donkerhoek 14-HT	5 [3]
Kransbank 15-HT	18
Twyfelhoek 379-IT	16
Rooikop 18-HT	5
Nooitgezien 381-IT	1
TOTAL	**45**

1 Angola, Botswana, Democratic Republic of the Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Swaziland, Tanzania, Zambia, and Zimbabwe.

2 N= number of homesteads included in survey.

3 The research team was unable to contact the farm owner in time to obtain permission to conduct interviews on this farm. All interviews with residents from Donkerhoek were therefore conducted off-site.

Figure 8.2 ***Homesteads in the Study Area and related Zones of Influence***



Governance

The broader Study Area would fall under the District and Local Municipalities with their relevant wards. However, given that the Zones of Influence in the Study Area are rural and outside of the wards administration they would fall primarily under traditional authorities. In the case of Zones 1 and 2 communities the relevant authority would be the Mahlapahlapa KwaYende Traditional Council. It should be noted that the role of the traditional authority is not particularly strong in the Study Area.

Large sections of the Study Area fall under Community Property Associations (CPA) (discussed below) and therefore governance and decision-making would be made through the CPA and its committees. The CPA committee (or chairperson) would approach the ward councillors to assist in pursuing development objectives defined by the CPA on a case-by-case basis (e.g. provision of electricity to the farms, or road maintenance as needed etc.).

Local Land Use, Rights and Entitlements

Key Points from this Section

- The history of access to land makes it a sensitive issue in the area.
- On CPA land an individual is not in a position to negotiate in isolation and decisions on land access and use are made communally.
- The land ownership status of Study Area homesteads is likely to play a significant role in how individuals and families respond to the proposed Project and any changes in land access and use.

History of Land Access and Tenure

Historically the land in the Study Area was owned by private landowners and worked by farm labourers (labour tenants). Many labourers lived on the farms for generations and according to field interviews, were required to work for the farmer in return for permission to remain on the land. The 1913 Land Act would have dispossessed many of farmers land and there are currently two land claims in the area. These claims are for Donkerhoek 14HT and Twyfelhoek 379 IT. The Donkerhoek claim has been gazetted as of July 2012, and the Twyfelhoek claim was categorised as "in research".

Land ownership, access and tenure in the Study Area are significantly different today compared to prior to 1997/8. At that time the farms were owned exclusively by white farmers and black labour tenants generally worked on the farms in exchange for living there and a small payment in cash or kind. This had been the case across the country for the past almost 85 years since the 1913 Land Act, and the Study Area was no exception. Since 1997/8 this situation has changed as is represented by current land ownership, access and title in the area.

Aside from the land claims, land in the Zones of Influence (Zone 1 and 2) is currently divided into two categories:

- **Privately Owned Land**:

    - Donkerhoek – various portions purchased from 1998 to 2004 under the names of Corneels Greyling and Ukuchuma Farming Trust Pty Ltd respectively.
    - Rooikop and Nooitgezien – purchased by Kangra Coal from Kangra Group in 2003. The original farm purchases by Kangra Group took place in 1998.

- **Communally Owned Land**:

    - Twyfelhoek – various portions purchased in 1997 and 2001 in the names of Yende Farmers Trust and Thuthukani Communal Property Association respectively.
    - Kransbank – purchased in the name of eKaluka Communal Property Association from Arthur Greyling De Villiers in 2000.

Privately Owned Land

Donkerhoek Farm is owned by Mr CJF Greyling. The farm is used for commercial farming of various crops, including maize, and of livestock, including cattle and sheep. Mr Greyling lives on a different farm, Mooibank, where his family has been resident and owners for several generations (over 100 years).

A small number of people, outside of the farm owner's immediate family, are resident in five homesteads on the Donkerhoek property. Most of them have all been living on the land since before Mr Greyling bought portions of the farm in 1998 and 2004. Four out of five interview respondents have been living there for over 20 years.

Kangra Coal owns Rooikop and Nooitgezien farms and the land is largely used for its sub-surface mineral value (coal mining) and for the establishment of related mining infrastructure on the surface. There are a small number of homesteads on the land and although most of these were not visited [1], and therefore their detailed history is not known, some relatively new homesteads on Rooikop and Nooitgezien, are the results of Kangra mining-related resettlements. Of the homesteads on these two farms, an interview respondent commented that "*there is no change from the original white owners*" and that access to land and grazing is still controlled.

The land access and use entitlements of these residents are not known.

There is a noticeable contrast between the way residents living on privately owned lands describe their lives and those settled as CPA members on their own land. This is discussed in more detail further in this Section.

[1] Most homesteads on Kangra Coal land fall outside of Zones 1 and 2.

Community Property Association Land

Interview respondents describing the settlement of residents on Twyfelhoek and Kransbank farms explained the following:

The Department of Land Affairs acquired the farms of Twyfelhoek and Kransbank from their private owners or from state-owned land as part of a land redistribution and security of tenure programme in the late 1990s, following democracy in South Africa.

In the case of these two farms, two CPAs were constituted Thuthukani (for Twyfelhoek Farm) and eKaluka [1] (for Kransbank Farm) and space and membership were allocated to a number of people who registered with the Department. For Twyfelhoek, the Department approached the farm owner and bought the land while for Kransbank, residents in the area became aware of the farmer's desire to sell and they set up their own loose association of people who requested the Department to purchase the farm on their behalf. In both cases, registration as a member of the CPA comprised residents predominantly from Driefontein and people who had previously been labour tenants on white owned farms in the area.

The CPA refers to all registered members and is managed through a committee of elected representatives under a chairperson. The role of the committee is to ensure that beneficiaries "*get what is due to them*" (eKaluka committee meeting, 19 February 2013) – be it from government development projects like electrification or water services, or from third-party developments that take place on their land.

The CPA lands are allocated to homesteads and for grazing and agriculture. Residents are able to farm crops around their homesteads and cattle are free to graze anywhere on the farms. There is no legal restriction on the number of livestock an individual may own, although the carrying capacity of the land would determine these limits.

Membership of the CPA does not entitle people to sell their land. It may be passed down through generations in a family and settled by extended family members. However, the sale or other extraordinary use of the CPA property would need to be agreed to through a participatory process and majority consent according to the constitution of the CPA.

Homestead Location and Farms

The difference in ownership status is specific farms may represent a significant variable in the assessment of social impacts related to the proposed Project. The histories of specific farms have shaped the social characteristics, material conditions and attitudes of the communities that live on them. In this

[1] This report uses the name EKaluka CPA as this is the name used on title deeds. However, members of the CPA refer to it as Kanluka. The names can therefore be used interchangeably.

case, Twyfelhoek and Kransbank are former "white-owned farms" that were purchased by the South African state in order to enable previously disadvantaged communities to access land and have security of tenure.

Donkerhoek is a privately owned farm. Apart from the farm owner (who does not live on the farm) the majority of affected homesteads are labour tenants with strong historical and economic ties to the farm. Rooikop and Nooitgezien are farms owned by Kangra Coal and include a small number of surveyed homesteads that were resettled by Kangra Coal within the last five years.

Homestead Profile and Population Characteristics of those Surveyed

Key Points from this Section

- Average homestead size is 7.8 people.
- Approximately 42% of residents surveyed are aged between 6 and 18 years suggesting a youthful population in the area.
- Based on the small number of respondents over 50 years old, the population is probably predominantly within the economically active age group.

Population and Age Profile

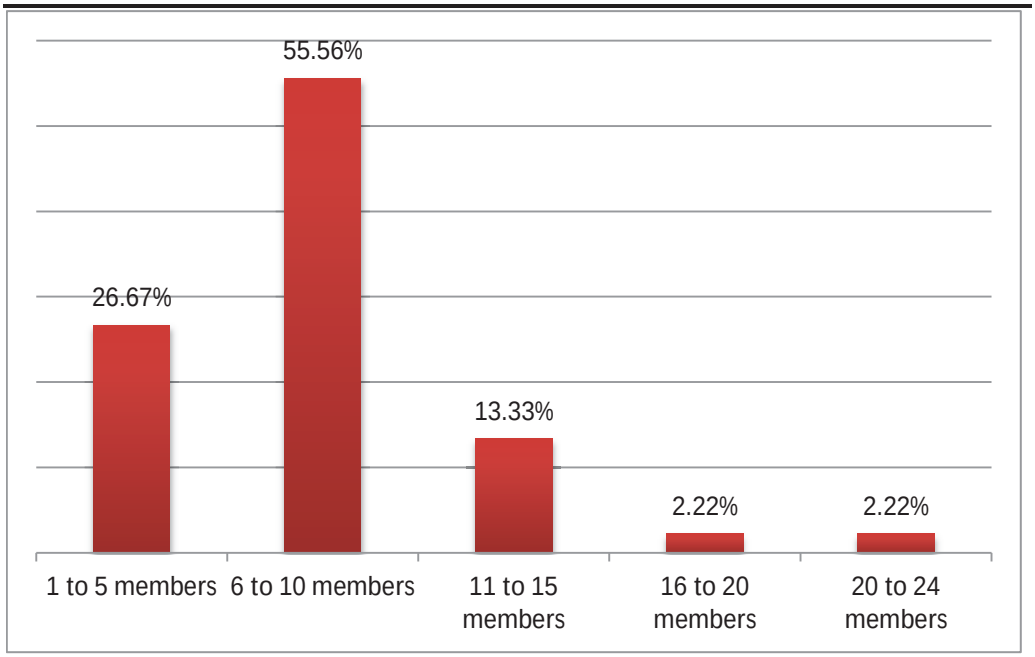
Based on the 45 interviews undertaken (33 in Zone 1 and 12 in Zone 2), and where respondents were asked about the number of residents in a homestead and the number of children within that figure, the sample represents a population of approximately 350 people, 148 of whom are reportedly children of school-going age between 6 and 18 (42% of the sample).

Respondents interviewed were not necessarily the homestead heads but were people available and willing to participate in the survey. Some homestead heads were reported to be away, either in search of work, working on neighbouring farms or working as migrants further away from home.

Homestead Size

The average homestead size was 7.8 persons per homestead (including absent school-going children and migrants). This is slightly higher than the 5 to 6 person average for the District. Homesteads ranged in size from a single person to 24 members. The proportion and relative % of homestead size, is reflected in *Figure 8.3* overleaf.

Figure 8.3 Homestead Size



More than half the homesteads were comprised of between 6 and 10 members whilst more than a quarter were comprised of between 1 and 5 members. This suggests that whilst there is a broad range in size, the majority—more than 80%—were comprised of 10 members or fewer. Many of these homesteads were nuclear families with relatively high numbers of dependents, in relation to economically active members. Only two of the 45 homesteads interviewed had single occupants and in both cases these were older men – one between 51 to 70 and one over 70 years of age. Understanding this general makeup of the homestead will contribute to future planning if the resettlement of homesteads is necessary as a result of the proposed Project.

The recent establishment of a boarding school (Ezakheni Combined Boarding School) that is explicitly intended to cater for children from rural areas, from pre-primary to Grade 12, meant that there were relatively few children of school going age present in the surveyed homesteads [1]. Migrant workers were also included as *de jure* members of the homestead. The significant numbers of absent school children and migrant workers suggests that Project impacts may not be limited to Zones 1 and 2 of Influence and may also affect persons working/schooling further afield.

[1] This initiative was part of a pilot project for the Comprehensive Rural Development Programme (CRDP) of the Minister of Rural Development, Mpumalanga Province. The establishment of this school coincided with the closure of six existing schools in the area. See http://agritv.co.za/articles/ezakheni-combined-boarding-school/

Key Points from this Section

- People live in a rural as opposed to urban / township setting by choice.
- People's relationship and attachment to their land are likely to differ depending on period of occupation and family tenure history. Level of attachment will affect attitudes towards changes in land use and land ownership.
- Of the surveyed homesteads, 45% have been resident in their homesteads for more than 15 years.
- 33% of homesteads resident for less than 5 years were moved to their land in previous Kangra Coal resettlement activities. This creates increased sensitivity to relocating again in the future.
- There is a pattern suggesting that the number of residents per homestead increases in relation to increased residential period. This suggests that the population is likely to grow given that approximately 38% of homesteads have been resident for 10 years and less.
- Few respondents raised the possibility of resettlement. Of those who did, only the four that Kangra Coal had informed would be resettled were in favour of the idea.

The area under discussion is rural with predominantly scattered homesteads. In some parts of the CPA farms, homesteads are clustered more closely together. Fences and gates demarcate most homesteads (clustered and scattered) and land along the main road is fenced.

Many of the homesteads have their own small fields for subsistence farming activities, adjacent to the houses. Twyfelhoek has a significant portion of land allocated to a co-operative agriculture project. Most of both CPAs' farmland is available for livestock grazing.

Residential Period

Respondents were asked how long their families had lived at the current location of their homestead. The results are reflected in *Table 8.2* below.

Table 8.2 Period of Residence

Residential History	n=	%
Less than 5 years	10	22.73%
Between 5 and 10 years	7	15.91%
Between 11 and 15 years	7	15.91%
Between 16 and 20 years	5	11.36%
More than 20 years	15	34.09%
TOTAL	**44**	**100.00%**

As summarized above, more than a third of residents had been living on their current sites for over 20 years and almost a quarter had lived on their present sites for less than 5 years. The affected population therefore includes a high proportion of relatively recent arrivals and long-term residents. Project-related impacts may be experienced differently by these groups and will require responses and mitigation measures that are sensitive to these differences. For example, a family resident in an area for a long period of time may feel strongly connected to the land and may have great difficulties moving from it.

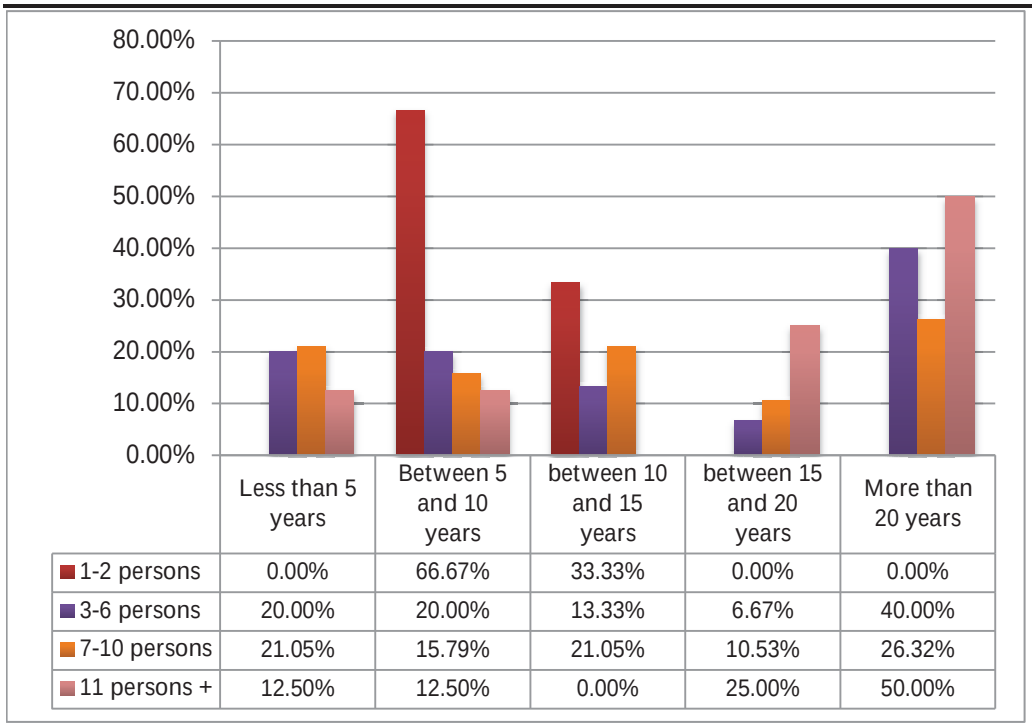
However, relative newcomers with a history of a labour tenancy may also have strong views on their new-found land-ownership status and be less willing to negotiate alternative arrangements.

With regard to residential periods in relation to farm location, the data suggests that the majority of homesteads living on Donkerhoek (4 out of 5) and Rooikop (3 out of 5) have been resident for more than 20 years. In contrast, Twyfelhoek and Kransbank are less geographically stable populations and show greater levels of mobility within the last 20 years. This is explained largely by the fact that these two farms were purchased as part of the land reform programme. Most homesteads settling on these farms in the last 5 to 15 years reported doing so as a direct result of the establishment of the two CPAs on what is now communally-owned land. A number of these respondents chose to move from Driefontein to more rural settings. However, it should still be noted that the largest respondent group for Twyfelhoek (7 out of 15) have been resident for over 20 years. This highlights the mix on CPA land of newcomers and long-standing residents.

It is also worth noting that of the 10 homesteads that have been resident on their land for less than 5 years three (33%) are the result of resettlement on Rooikop and Nooitgezien because of Kangra Coal mining activities elsewhere. In the case of Nooitgezien, the resettlement took place as recently as December 2012 because of mine-related blasting activities adjacent to the original homestead.

The relationship between residential period and homestead size is summarized in *Figure 8.4* below. It shows that households that have been settled for longer periods tend to be larger than households that have settled relatively recently. There is a notably high percentage of 1 to 2 person households that settled between 5 and 10 years previously. This pattern of increasing household size relative to settlement period suggests a likely increase in population in the area in the future. This would be focused particularly on the CPA-owned farms as families become more established on their own land. In addition, land allocated to the eKaluka CPA anticipates 80 homesteads at its final size. Currently there are 50 homesteads registered. Thus significant population growth can be expected on this farm (approximately 37%). Although the detailed information is not available for Thuthukani, it is probable that similar homestead growth could be anticipated.

Figure 8.4 Residential Period and Homestead Size



	Less than 5 years	Between 5 and 10 years	between 10 and 15 years	between 15 and 20 years	More than 20 years
1-2 persons	0.00%	66.67%	33.33%	0.00%	0.00%
3-6 persons	20.00%	20.00%	13.33%	6.67%	40.00%
7-10 persons	21.05%	15.79%	21.05%	10.53%	26.32%
11 persons +	12.50%	12.50%	0.00%	25.00%	50.00%

Housing Infrastructure

Homesteads generally comprised a number of small structures built in close proximity to each other. These structures were generally built of either mud brick or wattle and daub often with thatched roofing, or more robust cement brick structures with corrugated iron roofing (*Figure 8.5*).

Figure 8.5 Housing Examples in the Zones 1 and 2 of Influence

A mix of mud-brick and thatch structures together with cement and brick

A wattle and daub structure

Cement brick structures were generally either four-roomed or two-roomed structures and were mainly either "RDP" houses (provided by the South African government as part of the post-1994 Reconstruction and Development Plan) or built by Kangra Coal for selected homesteads. More than half of all homesteads surveyed (54.6%) included at least one cement brick structure within the homestead [1].

[1] The survey did not distinguish between houses built by Kangra Coal and "RDP houses".

Most RDP and Kangra Coal built houses were reportedly built in 2012. The issue of how and why this housing was allocated has created some confusion amongst surveyed homesteads. The basis on which Kangra Coal housing was built was represented by some respondents to be random and unclear. Some suggested that the two bedroom houses were built as part of an agreement allowing Kangra Coal access to the area for previous mining exploration activities, and to some degree as recompense for inconvenience caused and damage to roads. However, not everyone in the community received these houses. Some respondents thought that it was the elderly and more vulnerable whom were given houses while the opposite opinion was also expressed – that those who were more vocal or powerful received cement brick housing.

Although the survey team did not have access to homesteads on Donkerhoek farm, all respondents from this farm described their homesteads to be of mud-brick or wattle and daub. This group constitutes 25% of homesteads that have no RDP or Kangra Coal cement brick structures. Respondents reported that "government" had offered to build RDP houses for the residents but that the farm-owner had turned down the offer, stating that he would build the necessary housing on his land. Respondents reported that no such housing has since been provided. Ward Councillors confirmed this during a social study team meeting (*pers comm.* February 2013). One survey respondent explained the different materials used by individuals in building their homesteads saying "*You wouldn't build with brick if the land was owned by a white farmer - as you could be fired at any time*". This suggests that people building homesteads using brick and cement feel a sense of permanence on their land.

Community Concerns Related to Housing, Residential Period and Potential Resettlement

Out of all homestead respondents whom raised the issue of potential resettlement, only four were in favour of resettling and all four gave the same reasons – existing crime/theft in the area and the vulnerability of being relatively isolated from other houses. One respondent said she would feel safer if resettled closer to other homesteads. It is interesting to note that these four homesteads were also the only respondents who reported that Kangra Coal had already informed them that they would be moved.

Most CPA residents raised concerns about the possibility of having to move and questioned onto what kind of land and under whose ownership this could happen. Three respondents, all on Kangra Coal-owned land, had been previously resettled – two homesteads moved about four years ago, with their graves, and one was resettled 2 months prior to when this Social study was undertaken. All expressed dissatisfaction with unfulfilled promises of assistance and the quality of housing and compensation provided. Two emphasised that they had had easy access to water in their original homesteads, which was no longer the case. The respondent from the most recently resettled homestead said: "*I miss the old house. It had a big garden. I*

grew tomatoes, spinach, carrots and mielies. This was to live off. Kangra Coal promised to build a fence and supply new seeds but did not, so I cannot start a new garden."

Donkerhoek residents commenting on the potential of resettlement emphasised a concern of the unknown – "*We aren't sure because we don't know what we'll find in the next place. We don't know what's there*", one woman stated. In addition, residents asked if they would be able to choose where they wanted to go or would be instructed and moved. All residents have been living in their homesteads for more than 15 years, and four out of five homesteads for more than 20 years. "*We had no owner when he (Mr Greyling) found us here*" said one resident, highlighting her family's presence pre-dating the farm owner's.

Livelihood Practices

Key Points from this Section

- People rely on a mix of income sources with social grants dominating.
- Main sources of income reported were: pensions (35.56%), welfare grants (31.11%),migrant remittances (15.56%) and local employment (11.11%). There is insufficient agricultural and livestock activity to make it the main source of income.
- Employment opportunities are limited and unemployment is high.
- Subsistence agriculture meets the majority of fresh produce needs of those surveyed. Buying fresh produce only happens when local produce is used up.
- There are new agricultural and livestock projects being undertaken in the Zones of Influence suggesting the intention of increasing local productivity and income generation rather than merely subsistence activities (particularly on CPA land). Some of these activities are taking place within Zone 1 of the Zones of Influence.

Homestead livelihood strategies in the Study Area can be understood as an on-going process of negotiation between demands for the homestead to engage in cash-generating activities, and demands to engage in food-producing activities, while maintaining the social relationships that also contribute to sustainable livelihoods. A range of factors ultimately determine homestead activities and priorities in relation to these two general types of demands.

Livelihoods and Incomes

In a context where employment levels are low and prospects for obtaining employment are limited, homesteads are usually dependent on multiple sources of income and financial support. For survey participants these include the following:

- Cash remittances from homestead members that migrate to urban centres for employment;

- A range of social grants, including pensions, childcare grants and disability grants;

- Subsistence-level agricultural production and gardening that contribute directly to food security for the homestead;

- Limited livestock farming for food or for cash when necessary; and

- Limited access to local employment opportunities (as miners, cattle herders, domestic workers, farm workers etc.).

Whilst Kangra Coal is recognized as a significant employer within the area, only 20% [1] of respondents had at least one member of their homestead employed by Kangra Coal or one of its contractors at the time of the survey. A summary of the main sources of homestead income is presented in *Table 8.3* below.

Table 8.3 Main Sources of Homestead Income

Main Sources of Income	n=	%
Income from business	1	2.22%
Pensions	16	35.56%
Remittance from migrants	7	15.56%
Salary from employment	5	11.11%
Small-scale farming	2	4.44%
Welfare grants (child, disability etc.)	14	31.11%
TOTAL	**45**	**100.00%**

The data summarized above shows that more than two-thirds of homesteads rely on government grants as their most important source of homestead income. This suggests that homestead employment opportunities are limited and levels of agricultural production are relatively low. Reliance on remittances from migrant workers was also relatively low. Dependence on grants points to some income stability while the pensioner is alive and while children fall into the eligible age group. However, the fact that entire families can be predominantly dependent on these grants set up an instability in the medium to long term, if alternative income sources cannot be secured.

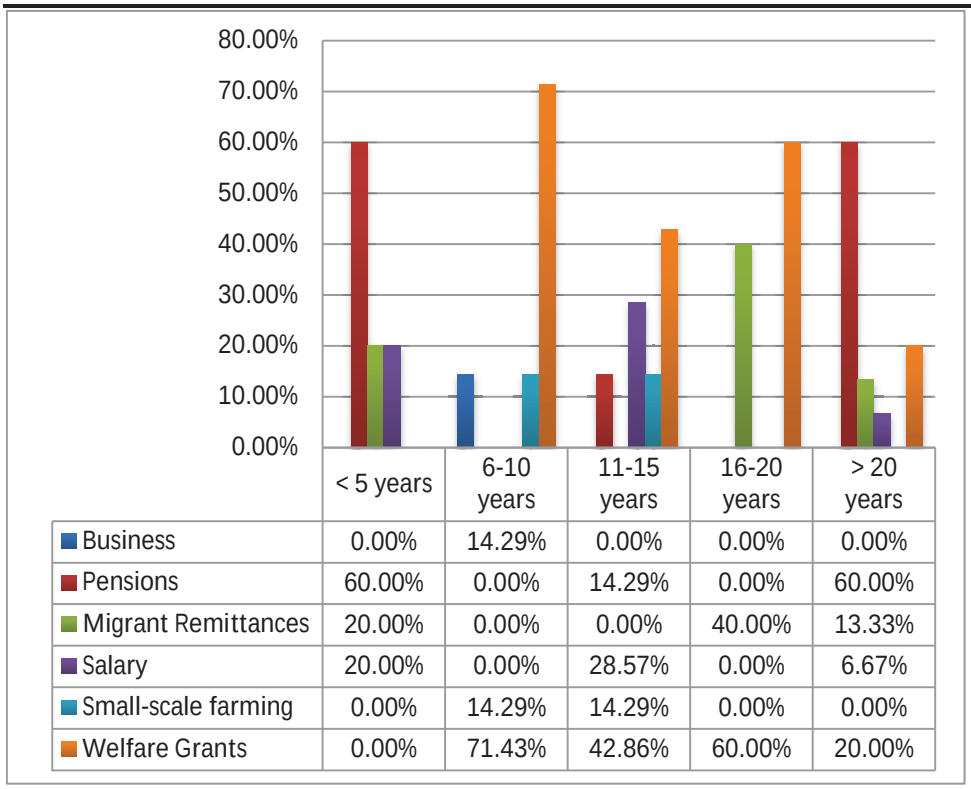
With regard to residential period, recently arrived homesteads and well-established homesteads (> 20 years residence) tended to rely more on pensions whereas homesteads in between these categories relied more on welfare grants. Households that arrived between 16 and 20 years previously, (i.e. before the establishment of CPA farms) relied particularly strongly on migrant remittances. Households that arrived between 11 and 15 years previously reflected the highest reliance on local employment (*Figure 8.6*). These patterns suggest that period of residence shapes access to opportunities and income sources.

An understanding of these dynamics highlights some of the potential strengths and vulnerabilities of different homesteads. The data suggests that it

[1] 9 of 45 homesteads surveyed.

takes time for a family to set down roots and feel sufficiently located in a place to actively seek out livelihood activities. Thus, families who may be resettled could display this vulnerability. Once established, some family members are more able to find employment, even against the backdrop of high local to national unemployment figures.

Figure 8.6 Main Source of Homestead Income and Residential Period



	< 5 years	6-10 years	11-15 years	16-20 years	> 20 years
Business	0.00%	14.29%	0.00%	0.00%	0.00%
Pensions	60.00%	0.00%	14.29%	0.00%	60.00%
Migrant Remittances	20.00%	0.00%	0.00%	40.00%	13.33%
Salary	20.00%	0.00%	28.57%	0.00%	6.67%
Small-scale farming	0.00%	14.29%	14.29%	0.00%	0.00%
Welfare Grants	0.00%	71.43%	42.86%	60.00%	20.00%

It is clear from the analysis of homestead income above that local employment plays a moderate role amongst those surveyed (11.11%), followed by pensions (35.56%), welfare grants (31.11%) and migrant remittances (15.56%). This was verbalised in many interviews when respondents highlighted the lack of local job opportunities in mining, forestry and farming. People expressed anger at the perceived employment of outsiders (from KwaZulu-Natal; Lesotho; Mozambique and Zimbabwe in particular) at the expense of local residents.

Several respondents referred to family members who were forced to seek work in other parts of Mpumalanga and, commonly, in Gauteng. Of those with migrant family members, many were said to be working outside of the Province. This is not surprising given that unemployment in the Province and District is 31.6% and 29.7% respectively. More specifically, Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities have an unemployment rate of 35.9% and 36.1% respectively - more than 4% above the Provincial rate and 10% above the national rate (Stats SA, Census 2011).

Subsistence and Small-Scale Agriculture

Most homesteads have small fields in proximity to the houses. Respondents reported growing maize, cabbages, potatoes, spinach and other less common vegetables (*Figure 8.7*). Growing vegetables is made easier given that the majority of homesteads have access to water in their yards.

Figure 8.7 Subsistence Agricultural Activities

One man, living along the main road, who described his occupation as a small-scale farmer, plants maize, spinach and potatoes to sell, rather than for subsistence. Another respondent said that her mother sold home-grown crops at the local pension market, which took place monthly.

Most respondents said that their home-grown vegetables met the majority of their staple food needs and that when the crops were finished they would then buy maize-meal and other vegetables from shops in Driefontein, Amsterdam and Volksrust. Winter was highlighted as the time of least food security with the situation improving towards the end of August.

Maize was sown in October / November at the beginning of the rainy season and should be ready for harvesting by the end of February / March. One respondent said that a 60kg bag of maize could last almost a month and said he harvested six to eight such bags per season. At least two other respondents from CPA farms reported that the maize they grew typically satisfied approximately half of the household's annual demand for this staple.

A number of Twyfelhoek residents participate in a community agriculture project intended to improve farming production on Twyfelhoek and increase surplus produce for sale. According to one resident, the project is run with a neighbouring farmer, Mr Ferreira, who provides the tools and tractor. Produce is shared between the farmer and participants who work on the project in return for ground maize-meal while surplus produce is sold and profits deposited into a bank account and used for purchases that are intended to contribute to community development (e.g. a tractor).

Livestock and Domestic Animals

A number of respondents in Twyfelhoek and Kransbank highlighted new farming and agricultural activities in the Zone 1 of Influence, (none older than two years) as potential future sources of homestead income.

Several residents producing chickens at home and selling within the community have undertaken this venture to replace the failure of a co-operative chicken-farming project established by Kangra Coal, which was damaged in a storm. One resident suggested that the proposed mine in the area could increase the market for chickens farmed on Kransbank.

A number of respondents had geese, which were used for food if necessary.

Only a small number of respondents spoke about livestock farming. For most, cows, goats and chickens are used for domestic purposes for milk, eggs and meat when necessary. Many CPA residents in the area have animals and expressed satisfaction that the number of cattle they could rear was no longer determined by a white farm-owner. In the past, if they were resident on someone else's land, they were allowed to keep a maximum of three cows and grazing areas were strictly limited. The farm-owner taxed any additional cattle, which is still reportedly the case on non-CPA land in the Study Area. Of the five respondents who spoke of owning cattle, herd sizes ranged from 17 to 25. These respondents also pointed out that seven breeding bulls had been introduced through government to increase cattle farming in the area. The bulls are communally owned and are allowed to graze freely in the area, so as to impregnate cows.

No respondents said that they owned any sheep.

There are a number of goats in the area, which are mainly used for domestic purposes and for traditional celebrations. A few people own horses, which are used for transport, and most homesteads have dogs as pets, for security and occasionally for hunting wild pigs in the mountains (*Figure 8.8*).

Figure 8.8 Common Local Animals

Health

Key Points from this Section

- Provision of health services in Driefontein is basic and mobile services to the Study Area were reportedly increasingly erratic.
- Respondents expressed limited concerns over public health problems.
- HIV-related issues were raised twice during the fieldwork suggesting low prevalence or continued taboos around the issue.

Access to Health Services

The nearest primary healthcare clinics are in Driefontein, which is approximately 15km away from the farthest homesteads in the Zones of Influence, following the main road. According to Acting Chief Yende, there are no doctors at the clinic, which is staffed by nurses. There is also no ambulance. Piet Retief would be the closest hospital (43km from Driefontein) and a return taxi journey would cost a patient R60. There is a dentist working in Driefontein on Tuesdays.

A mobile clinic is supposed to service the farm areas monthly but budget constraints have seen this service becoming erratic over the past months and reports from residents in Zone 1 and 2 are that the clinic had not visited in the month prior to this survey.

According to some respondents, there are no traditional healers practicing in the area. Some people mentioned using natural medicinal remedies found in the less disturbed parts of the Study Area.

A number of residents raised the issue of improved access to medical care. One Twyfelhoek resident described that his new-born infant had died "*…because we couldn't get to that clinic*", while another woman said "*If the mine opens they must bring a clinic closer to us*". Access to medical care is recognised as a development need amongst those in the Zones of Influence.

Local Health Status

The homestead survey made a limited enquiry into chronic health concerns for adults and children. The results did not reveal any widespread public health concerns or environmentally-related diseases. The survey did highlight that there had been a recent outbreak of Chicken Pox in the area, probably circulating in the aforementioned boarding school.

Overall respondents reflected limited recurring health complaints across the age groups and most respondents had to think carefully to identify health problems. This should however not be construed as indicating that the community has no health issues; rather it may highlight a lack of awareness of health issues or a lack of access to health services.

Health concerns expressed by Acting Chief Yende included the spread of HIV, potential increase in teenage pregnancies and the presence of domestic violence, particularly near to Driefontein and directly associated with salary payments and alcohol abuse. One survey respondent reported a child on chronic ARV medicines who had tuberculosis. This was the only mention of HIV during the surveys. Against the backdrop of the Gert Sibande District Municipality Strategic Development Framework Report (2009) which highlighted the Mkhondo LM and Dr. Pixley Kalsaka Seme LM as municipalities with high HIV infection rates, this suggests either that prevalence in the Study Area is low or, more likely, that the subject is still a taboo locally.

Education

Key Points from this Section

- 91.2% of children from surveyed homesteads are enrolled at school. This is almost 20% higher than the district and provincial figure.
- Based on 2011 Census data, only approximately 28.5% of residents in the two relevant municipalities have completed grade 12. This would highlight likely low levels of literacy in the Study Area. This could impact on people's employability for a range of job opportunities in the proposed Project and in general.

Access to Education

Enrolment in school for children of school-going age was 91.2% (135 of 148 children surveyed). This is remarkably high and largely a consequence of the recent opening of the Ezakheni Combined Boarding School, close to Driefontein. As discussed above, this school was developed in order to improve access to quality schooling for children living on farms and remote locations. There are no school fees and boarding is also free. Majority of the local "farm schools" in the Zones of Influence have closed and children from pre-primary level up to Grade 12 are accommodated at the new boarding school. There are reportedly 1 402 learners in the school meaning that children from the Zones of Influence survey sample constitute just fewer than 10% of the student body.

On the face of it, the establishment of this school in 2012 and the 91.2% attendance is an important success story, particularly when school attendance in the Province and District are 74.8% and 73.6% respectively. Comparative enrolment statistics for Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities are not available however of the 132 143 municipal residents over the age of 20, surveyed in the 2011 national census, only 37 753 had completed Grade 12 (28.5%). It is not possible to predict how many of the currently enrolled children from the Zone of Influence area will complete their schooling but the numbers are encouraging.

Some parents who feel their children are too young to go to boarding school have sent them to the local crèche, which was established in the old

Twyfelhoek Primary School facilities. There are currently about 28 children at the crèche, run by a teacher and her assistant.

Energy

Key Points from this Section

- While electricity infrastructure has been installed in many Zone 1 and 2 homesteads, almost 89% of survey respondents rely predominantly on wood for cooking and heating.
- Wood is collected from wooded areas in and around the Zones of Influence.
- Electricity is managed on a pre-paid basis.
- Government has provided a small number of solar panels to homesteads, mainly those beyond the reach of electricity infrastructure.

Electricity and Cooking Fuel

Eskom provides electricity to some homesteads in the Study Area. Local ward councillors explained that if a large enough demand for electricity is demonstrated Eskom will agree to establish the necessary infrastructure. The local municipality carries the installation costs per homestead and then charges the user to recoup its costs. Ward councillors reported assisting in negotiations with land owners/farmers to supply electricity to their farm workers. However councillors said that this is still problematic, as majority of farm-owners do not allow their farm workers to have electricity and running water in their homesteads (*pers comm.* Ward Councillors meeting, 20 February 2013).

The provision of electricity infrastructure to some parts of Zones 1 and 2 is relatively recent (2011/12), covers large parts of Twyfelhoek and only goes up to a point within the Kransbank farm. All serviced homesteads work on pre-paid meters. Mobile phones were generally charged through the pre-paid electricity system, and occasionally using the government-supplied solar panel (*Figure 8.9*).

Figure 8.9 Government Provided Solar Panel for Charging Mobile Phones and Batteries

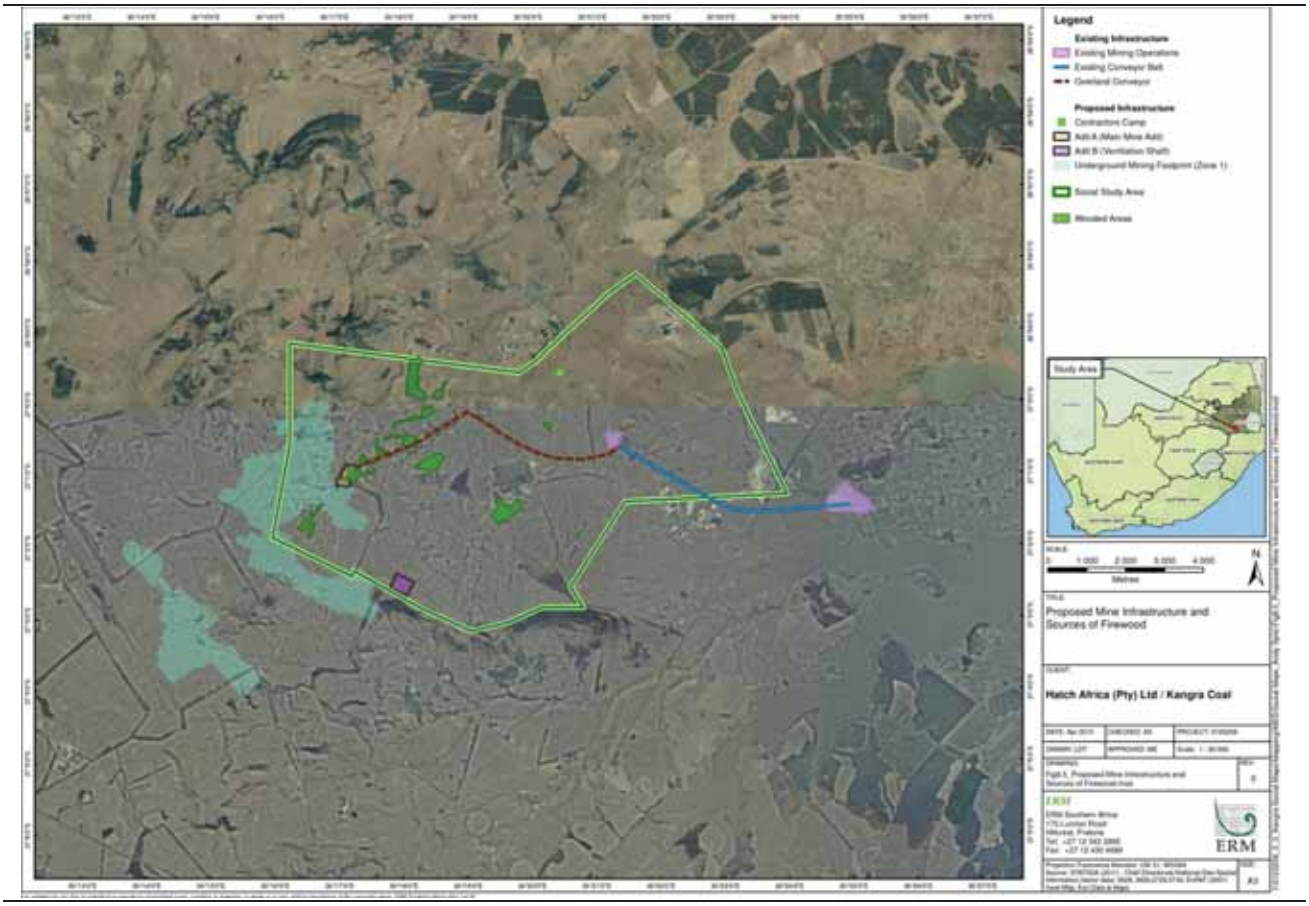
The vast majority of the homesteads surveyed (88.89%) relied on wood as their primary fuel for cooking and even though a number of homesteads had access to pre-paid electricity this was very conservatively used with the main reliance on wood. Only four homesteads (8.89%) used pre-paid electricity as their main source of energy for cooking and only one homestead relied mainly on coal. All of the four homesteads that relied on pre-paid electricity were located on either Twyfelhoek (3) or Kransbank (1).

Homesteads on the Donkerhoek farm all use wood exclusively as the farm-owner has reportedly not permitted the provision of electricity by government in their homesteads.

A small number of government-provided solar panels were seen in homesteads surveyed. In these cases solar power was used mainly for charging of batteries, cell phones and running of televisions and occasionally a light.

Wood is also used for heating in winter. Respondents reported collecting wood from nearby plantations (*Figure 8.10*). One person said he collected wood to sell to other community members.

Figure 8.10 Proposed Mine Infrastructure and Sources of Firewood



Key Points from this Section

- Water quality and availability were presented as important issues for most survey respondents.
- The specialist Groundwater Study of this Project supports respondents' perceptions about potable water quality.
- CPA members emphasised the negative impact of reduced water availability in boreholes near current Kangra Coal mining operations.
- Government has recently installed pipes bringing water to the majority of homesteads within the yards – house connections. Within the surveyed homesteads over 66% have house connections.
- Many homesteads with this new infrastructure fall within Zones 1 and 2 of the Project's influence.

In almost every formal and informal interaction with people in the Zones of Influence and broader Study Area, the importance of already having access to "good quality" drinking water was emphasised and concerns about future Project-related water contamination were raised. Interestingly, the proposed Project is named after the natural spring, Kusipongo, found on the Kransbank farm. The springs, streams and rivers in the Study Area are an important source of water for local communities for drinking, cultivation and livestock watering. One Kransbank respondent commented, "*Where Kangra Coal proposes their Project is where the drinking water comes from*".

Water Supply

The broad Study Area in general and the Zones of Influence in particular have been the focus of a range of government-led development interventions in the post-apartheid period. Recently, this has included development and upgrading of water supply infrastructure to homesteads directly. While the survey captured this data as house connections, in order to describe the fact that water was transported directly to people's homesteads (without pre-treatment), the sources of this water include springs, streams and rivers. *Table 8.4* summarizes where sampled homesteads obtained their water.

Table 8.4 Sources of Homestead Drinking Water

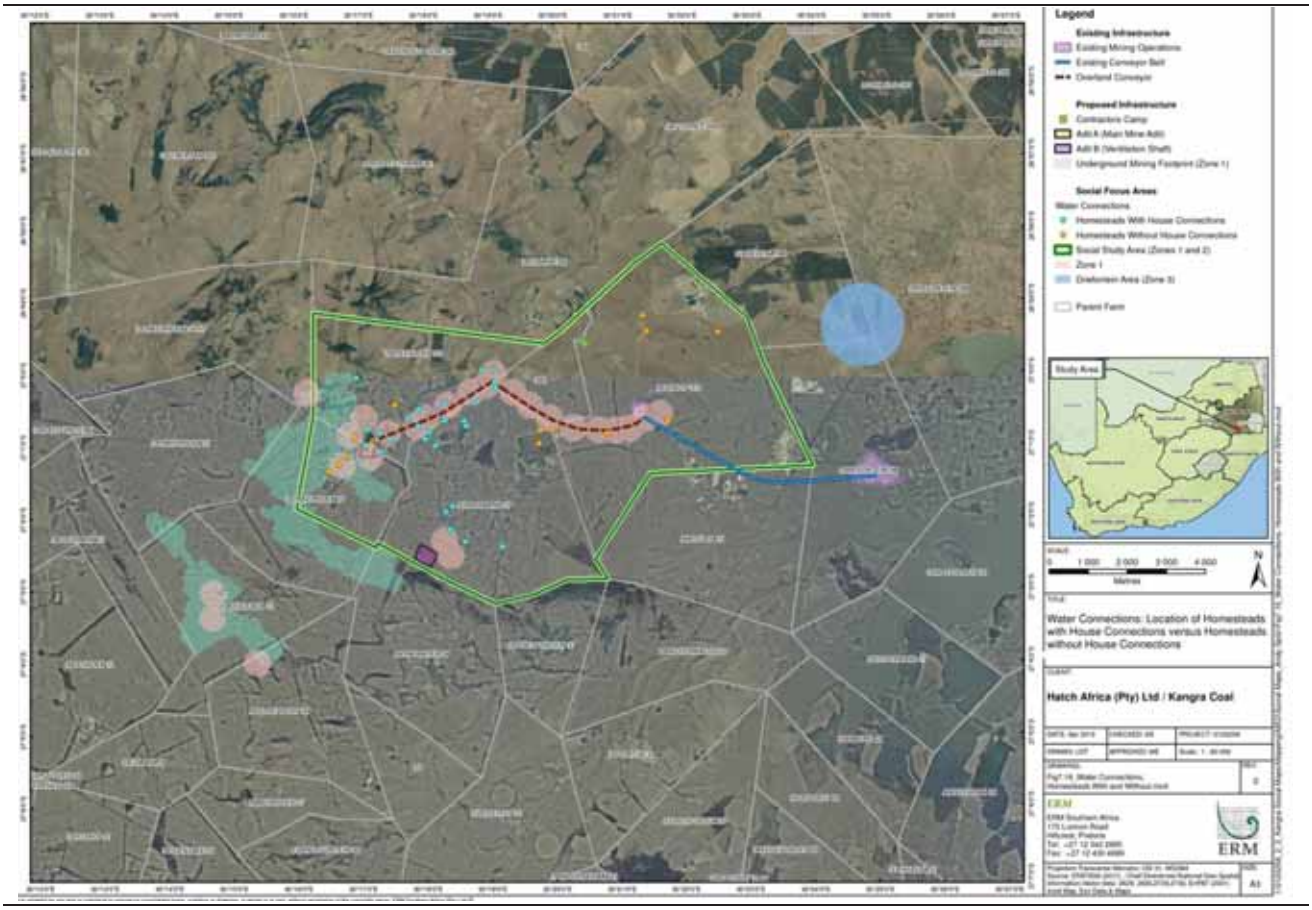
Water Source	n=	%
Borehole or well	1	2.22%
House connection	30	66.67%
Neighbour	1	2.22%
Spring	1	2.22%
River	12	26.67%
TOTAL	**45**	**100.00%**

It is significant that two thirds of homesteads surveyed had "house connections" within their homes. In many cases, these connections were recent developments and were only installed within the year prior to the survey. At least 18 of the homestead connections were confirmed to be fed from local springs while at least eight connections were piped from nearby rivers or streams (without pre-treatment). One of the homesteads resettled by Kangra

Coal on Rooikop farm reported having had access to water at their previous homestead but now had to collect water from the river. "*Commitments from Kangra Coal to give our homestead water access haven't been fulfilled*", the interviewee stated. Homesteads on Donkerhoek all describe accessing water in the same way. There is no infrastructure provided by the farmer, and residents, who live very close together, reported creating small diversions in the stream to direct water to their homesteads.

Compared to many rural communities in South Africa, a relatively high percentage of respondents had water piped into their homesteads—65.91% on average. The spread of house connections over surveyed homesteads is reflected in *Figure 8.11* below.

Figure 8.11 ***Location of Homesteads with House Connection versus No House Connection***



Homesteads with connections (shown in blue) appear to be located predominantly on the western part of the Study Area, particularly around Adit A and the western portion of the proposed overland conveyor system– generally within 1km of the site proposed for the Main Mine Adit or 500m of the route of the proposed overland conveyor. Homesteads located in the valley on the eastern slopes of the Kusipongo Hill identified a specific spring close to the proposed Adit A site as the source of the drinking water that is piped to their homesteads. Homesteads with house connections appear to be clustered on CPA farms around the Kusipongo outcrop.

Most respondents felt that the water quality to their homesteads was "*good*" while a small number of people collecting water directly from river sources described the quality as "compromised" because cattle and other animals also drink from those sources. As one respondent commented, "*…but there's no choice in this case and the family is usually fine*."

The specialist Groundwater Study (please refer to specialist report attached to *Annex C.3*) undertaken in the broader Study Area, and particularly in the Zones of Influence, confirms that ground and surface water quality are generally within the prescribed screening levels identified for ground and water, although microbiological contaminants were not sampled. (Groundwater Study completed for the Proposed Kusipongo Resource Mining Expansion Project by ERM, 2013). According to the Report, the only groundwater identified to show signs of impact by acid rock drainage, with low pH and elevated sulphate and metal concentrations, was sampled adjacent to current Maquasa West operations.

eKaluka CPA committee members were extremely concerned about the effects that mining has already had on water in the area. They suggested that water in the entire area was connected and that homesteads closer to current underground operations have experienced a drop in the water level resulting in some Kangra-installed boreholes drying up.

Telecommunication

Much of the Study Area is covered by mobile phone networks and many homesteads rely on this technology as their primary means of communications. 93.33% [1] of homesteads surveyed possessed at least one functioning mobile phone at the time of the survey. Only three homesteads, all headed by older males, did not possess cell phones [2]. All three were reliant on pensions as their primary source of income and were either living as single person homesteads (2) or two-person homesteads (1).

Reception in the area was reported to be erratic with certain spots known to have better reception.

[1] 42 out of 45 respondents

[2] 1 respondent was between 50 and 70 and 2 respondents were older than 71 years of age.

Roads and Transport

A main gravel road runs in an east-west direction connecting the Study Area and homesteads in the Zones of Influence to Driefontein. Smaller sand roads branch off and snake their way to the more remotely settled homesteads. There are occasional car-tracks through the veld that reach more distant homesteads. Footpaths cross the area suggesting that most access to homesteads is by foot (*Figure 8.12*).

The main road is gravel and is of relatively poor condition in the dry season, creating significant wear and tear on vehicles using the road regularly. In the wet season parts of the road are reportedly impassable without four-wheel drive or in a truck. During the dry season, traffic along this road would generate dust. This is the primary route proposed for vehicles carrying construction material over the 18 month construction phase and dust generation would likely be high (Air Quality Impact Assessment – *Annex C.1*).

Smaller roads within Zone 1 of Influence are also small sand roads. These are in poor condition with potholes and erosion in numerous places. Local residents expressed opinions that Kangra Coal vehicles created and/or exacerbated much of this damage while not undertaking any maintenance or repair.

Survey respondents reported using taxis to get to Driefontein or to larger towns such as Piet Retief, Amesrfoort and Amsterdam for shopping. Taxis pass through the area from Daggaskraal, but are not regular in the area. Transport is also reported to be expensive so people only travel when it is necessary.

Figure 8.12 Road Infrastructure in the Study Area

Main road through Study Area

Internal road to old school building

Internal Road to Homestead

Waste Management and Sanitation

There is no refuse collection in the Study Area and people dispose of waste informally in dumpsites near their homesteads.

Most of the homesteads have long drop toilets on their property, and the majority appear to be ventilated.

Tourism

Wetlands around in the broader Study Area are recognised for their national and international tourist appeal, related predominantly to birding in Wakkerstroom (37km south west of the Study Area). According to a representative of Bird Life Africa, the entire Wakkerstroom economy is dependent on tourism. Based on secondary research, tourism is one aspect of the Provincial and District IDPs highlighted for potential job creation and economic development. However there are no tourism activities and no one is employed in tourism-related jobs in the Study Area and the Zones of

Influence. While environmental changes in the Study Area may impact on existing and potential tourism activities, local communities are not involved in tourism in any way. One social field-worker, who has a diploma in tourism and hospitality, cannot find employment in the district.

Tourism and recreational activities take place at the Heyshope Dam (including water sports and largemouth bass fishing) and these are close to current open cast and underground Kangra Coal activities.

Community Identity, Lifestyle and Sense of Emplacement [1]

Understanding how people identify themselves and their community as well as the relationships within and between communities will assist in anticipating strengths and vulnerabilities to changes in the social environment. The economic activities, settlement practices and major concerns and priorities across the surveyed population suggest a relatively homogenous group of residents – particularly within each of the different farm locations. This should, however, not be simplistically interpreted to mean that identity and cleavages do not set groups apart or negate the need to address each in individual ways.

Expression of Identity

The way people have accessed land (or have not accessed it) and related security of tenure, are fundamental components of identity amongst respondents.

For residents who are members of the eKaluka and Twyfelhoek CPAs, the importance of ownership was strongly expressed. These expressions were often in contrast to the limitations on black ownership of land and other capital resources under Apartheid. Examples provided by respondents included:

- The ability to own as many cattle as people want;
- The freedom for cattle to graze anywhere on the farm;
- Owning a home and not having to work for a farmer to be allowed to live somewhere;
- Making choices as a community for the community – through the CPA and committee;
- Living in cement-brick structures that demonstrate a sense of permanence;
- An entitlement to reject unwanted development on the farms; and
- An entitlement to reap the benefits of land-use on the farms.

In contrast, Donkerhoek residents all emphasised the on-going restrictions of living on a "white farmer's land". These included:

[1] Emplacement refers to the "construction and negotiation of home and belonging as it takes place in daily life" (Hammond, L. 2000)

- The limit on cattle ownership to three and the taxing of any additional animals;
- Restrictions on grazing areas;
- The frustration of the farm-owner's power to control other people's lives;
- The refusal by farmers to allow government provision of RDP housing and water and electrification to homesteads;
- The need for someone from the family to work on the farm in order to be allowed to remain;
- The "tenants'" lack of power in relation to the owner and to decision-making about the farm that may affect the "tenants'" life and security.

For these labour tenants, most of who have lived on the farm for more than 20 years, powerlessness is an important component of how they identify themselves. One respondent said "*Will benefits go to the farmer or to the community?*" and another asked, "*What are the benefits from the mine? They must not go to the white farmer*."

Respondents from Rooikop and Nooitgezien, Kangra Coal-owned farms, presented themselves more passively. One woman said, "*We don't grow anything. We don't have cattle. We can't afford to farm*." Another man, settled on Rooikop for over twenty years, reported that Kangra Coal had mentioned that the homestead might be relocated. While the respondent from a homestead resettled about four years ago is still waiting for the "promised electricity". Another man, resettled onto the farm, said his family was not ploughing anymore because Kangra Coal had said they would help the family after resettlement.

There are no records of resettlement and compensation agreements made between Kangra Coal and affected families so it is not possible to verify or refute these claims.

Community Representation

The role of traditional leadership in capacity building and rural development is extremely limited and the sense of community, particularly on CPA farms has evolved only over the past 5 to 15 years following the formation of CPAs. Most of these respondents did not know each other prior to joining the CPA. They were not from a coherent community and had no specific family ties besides within their own homestead. The former absence of clear leadership and the newly formed CPA are important factors to understand when approaching communities and individuals in future phases of the proposed Project.

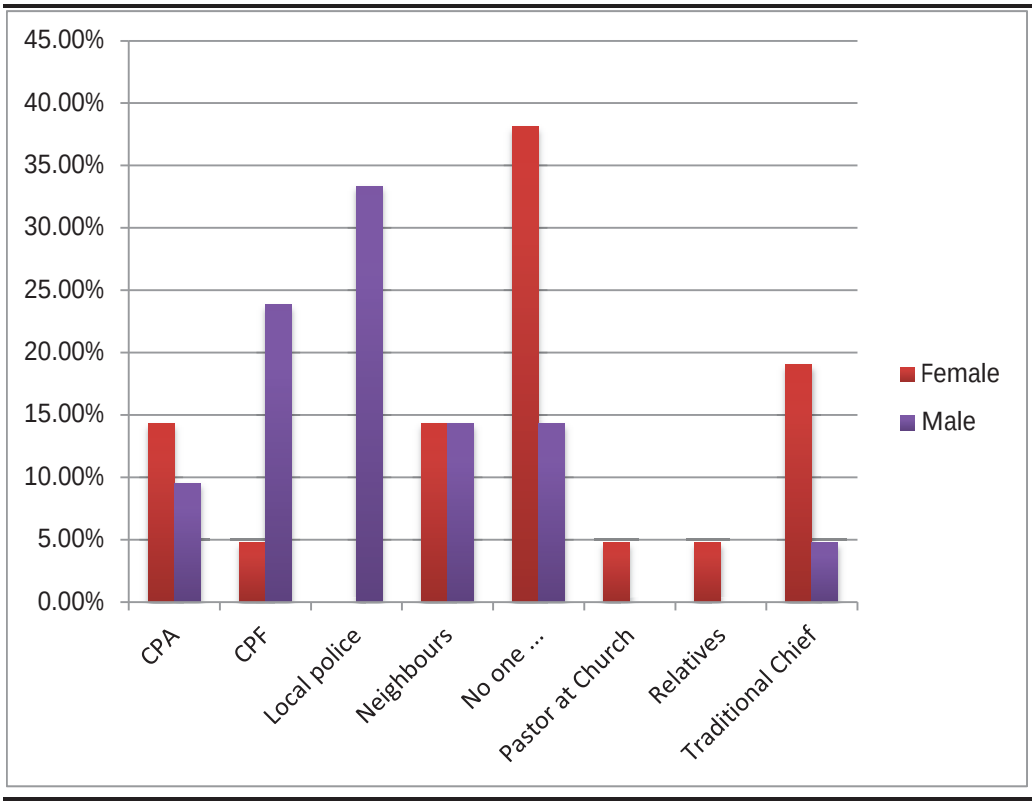
In order to assess the significance and relevance of the various authorities and representative institutions within the Zones of Influence, respondents were asked to identify the person or institution that they would appeal to for assistance in times of need or crisis. The results are summarized in *Table 8.5* below:

Table 8.5 Recognition of Community Authority

Recognised Authority	n=	%
CPF	6	13.33%
Local civic structures	5	11.11%
Local police	7	15.56%
Local tribal authority	5	11.11%
Nearby relatives	1	2.22%
Neighbours	6	13.33%
No answer	3	6.67%
No one	11	24.44%
Pastor at Church	1	2.22%
Grand Total	**45**	100.00%

The highest percentage of respondents (24.44%) indicated that they appealed to "no one". This may confirm that community-based authorities and leaderships institutions are relatively weak and ineffective, overall. A closer analysis suggests that this finding was driven largely by female respondents, with the majority of male respondents emphasizing either the local police of the Community Policing Forum (CPF). This suggests that women may be more isolated or marginalized from formal community representative structures than men (*Figure 8.13* below). It is also interesting to note that women looked to a traditional leader for authority more than men did. Traditional structures have a strong gender bias towards men, and the fact that female respondents nevertheless turn to these authorities suggests a fairly entrenched view of gender roles within the Zones of Influence. This was occasionally reinforced when women asked about potential job opportunities for "young men" rather than the youth or the unemployed in general.

Figure 8.13 Recognised Community Authority and Gender of Respondent



A relatively high proportion of residents on Donkerhoek indicated that they would appeal to "no one" for assistance in times of trouble, as indicated above. This suggests that homesteads on privately-owned farms may be more isolated than those in formal community structures and feel more helpless than respondents from land under communal tenure. The relatively high percentage of residents on Rooikop said that they would appeal to the police for assistance is probably due to the close proximity of Rooikop to Driefontein.

In a telephone interview with Mr Greyling he highlighted that he would turn to family in times of need, as the government structures were not trustworthy.

Sense of Place and Emplacement

Several respondents highlighted the generally peaceful and tranquil nature of where they lived. Soil fertility for subsistence farming was valued, as was the dryness of the specific location of individual homesteads. This should be seen in context of the wetland nature of some parts of the Zones of Influence as well as areas where people might previously have lived. A key aspect of the sense of emplacement for CPA respondents was land ownership and its symbol of freedom – freedom from a farmer; to have multiple head of cattle; to make decisions over their land.

Irrespective of the nature of farms ownership, various respondents emphasised the value of their neighbours and relationships between homesteads as part of what they like about living where they do.

Approximately 14%respondents said that they would approach a neighbour when in need (generally for basic food stuff or small financial assistance) and that wherever possible this help was given and reciprocated. Another respondent highlighted the absence of conflict between homesteads, suggesting that relative distance from one homestead to the other reduced the potential for conflict saying, "*My chickens are not going to go to someone else's yard*".

Respondents spoke of visiting residents on nearby farms and aerial images show footpaths crossing the farms. These relationships are important and buffer some of the more vulnerable residents from isolation. Even though local residents were not part of a distinct community in the past (as mentioned regarding the establishment of the CPAs) they express themselves as a community now and their social interactions reinforce this perception.

Sense of Place

The sense of place can be divided into two different environments, the area to the east of the Mantshangwe Mountains and the area to the west of the mountains. The area to the west of the Mantshangwe Mountains have a rolling topography with the hills and mountains, the Ohlelo River and associated streams, outstretched grassland and cultivated land. This environment emphasises the peaceful nature of the Study Area and evokes a calm and pastoral sense of place.

This scene however changes once you move to the east of the Mantshangwe Mountains and enter into an environment that's been interrupted by the presence of manmade structures such as the residential area of Driefontein, roads and existing mining activities as well as the agricultural timber plantations.

Refer to *Figure 8.17* on *Page 8-46* for the spatial divide in the sense of place of the Study Area.

Community Perceptions and Expectations of Kangra Coal

Key Points from this Section

- There is overall a consistently negative perception of Kangra Coal. This is based on reported experiences and on unmet expectations. Many of these dissatisfactions will need to be addressed before residents would be willing to allow the proposed Project into their area.
- Slight variations within these perceptions amongst interest groups suggest that younger people might be more open to engaging with Kangra Coal than older residents.
- Expectations for employment are high, particularly amongst the economically active respondents.
- People want to see benefits for their communities although they are sceptical about the fulfilment of these wishes.
- Major concerns over proposed Project impacts include damage to buildings; noise and vibrations from blasting; and the loss and pollution of available water in the Zones of Influence.

Project stakeholder meetings were held in several places around the Study Area and all three Zones of Influence, including Driefontein. People's perceptions and experiences of Kangra Coal as expressed in those meetings are documented in the SEMP Public Participation Plan (*Annex B*) and associated Comments and Response Report.

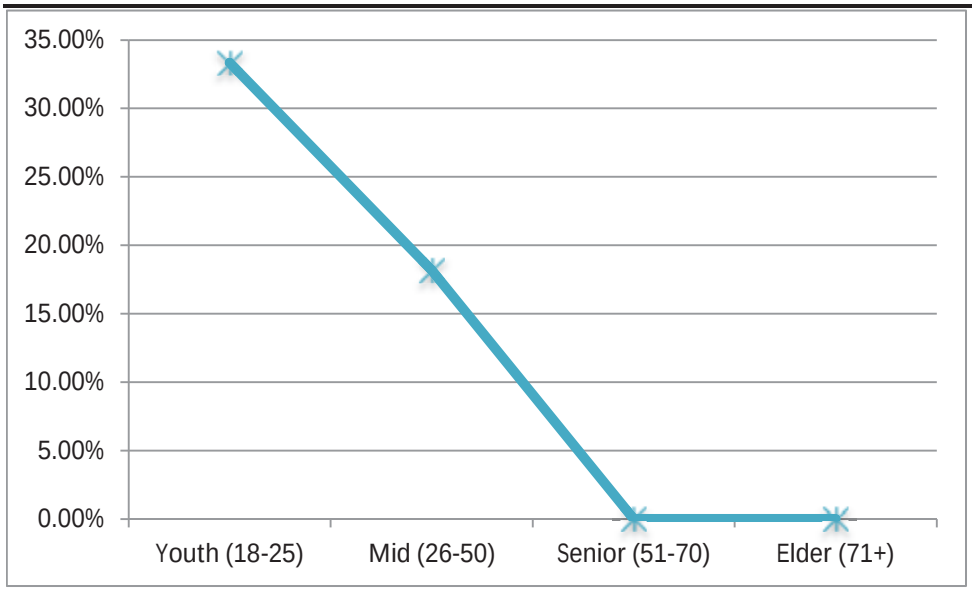
Within the Zones of Influence, community attitudes towards Kangra Coal and perceptions of current activities may provide important insight into how the affected communities may respond to social impacts associated with the Project. As mentioned earlier in this *Chapter*, people's perceptions and experiences were remarkably consistent and the overall view of the company was negative.

Perceptions of Community Benefits from Kangra Coal to Date

When asked if Kangra Coal's current operations had led to benefits or improvements for the community in general, the majority of respondents (77.78%) [1] said "no". Only 11.11% felt that operations brought benefits to the community whereas the remaining 11.11% declared that they were not sure. With regard to gender a slightly higher percentage of female respondents suggested that Kangra Coal's activities had led to community benefits, compared to male respondents (13.04% to 9.09% respectively).

With regard to age, the data suggests unambiguously that younger respondents were more convinced that the company's activities led to broader community benefits than older respondents (*Figure 8.14*). This may suggest a great willingness amongst younger residents to engage with the proposed Project in the anticipation of future benefits.

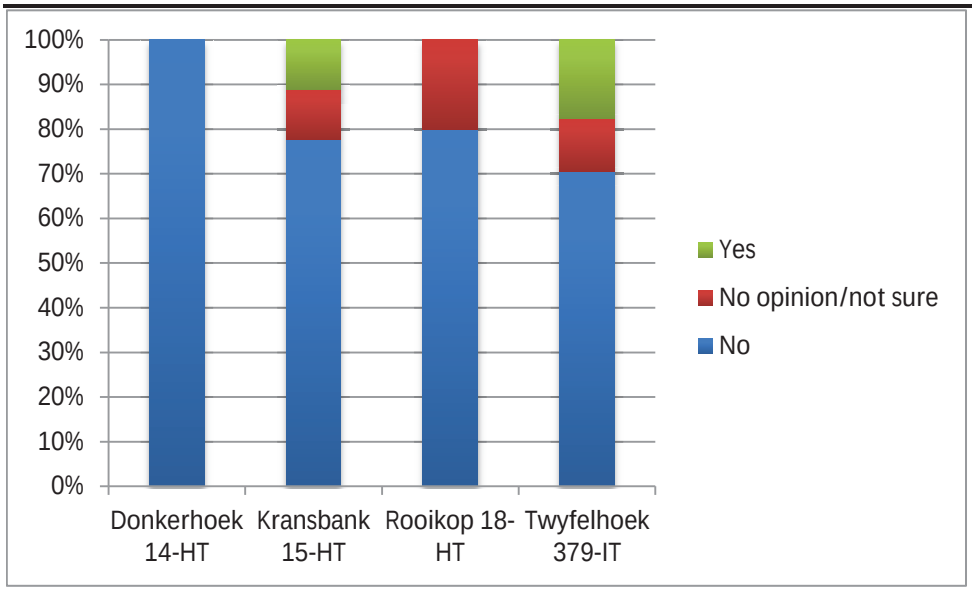
Figure 8.14 Perceptions of Community Benefit of Kangra Coal's Current Operations and Age Category of Respondent



[1] 35 of 45 homesteads surveyed.

The farm on which the homestead is located also appeared to play a significant role in shaping impressions of Kangra Coal's impact on the local community. The only positive perceptions could be found on Twyfelhoek and Kransbank, which are both managed by CPAs. Donkerhoek, Rooikop and Nooitgezien reflected more negative impressions of Kangra Coals current performance (*Figure 8.15*). The fact that some respondents on CPA land did identify benefits could again suggest the potential for constructive interaction between those residents and Kangra Coal in the future.

Figure 8.15 Perception of Community Benefit of Kangra Operations by Farm Location



Negative perceptions were commonly related to unfulfilled expectations – whether about resettlement agreements or non-payment to CPAs for activities taking place on communally owned farms.

Four out of 33 Zone 1 homesteads reported that they had been informed they would be resettled for the Project. All of these homesteads have high expectation of benefits from resettlement commenting on accessing better housing and improved services. An older female respondent said, "*It's no problem if the mine comes here as long as there are some benefits*." Another woman said, "*If they're here they'll have to move us and look after us*."

Perceptions of Impacts from Kangra Coal to Date

Survey respondents were asked to assess whether they or their families had been impacted by Kangra Coal's operations to date and assess the overall nature of that impact. Impacts experienced could include prior resettlement; disruptions from exploration activities; unmet expectations; damage to roads from company vehicles; acquisition of homestead structure; employment; improvement in living conditions etc. The result of this enquiry is summarized in *Table 8.6* below.

Table 8.6 Community Experience of Impact of Kangra Operations

Kangra Coal's Impact	n=	%
Positive	2	4.44%
No effect	18	40.00%
No answer	1	2.22%
Negative	24	53.33%
TOTAL	**45**	**100.00%**

Whereas a sizeable percentage of the respondents felt that Kangra Coal's operations had no impact on them directly (40%), the majority felt that current operations had impacted on their lives in negative ways. Less than 5% of respondents felt that operations had a positive effect on their lives. There did not appear to be significant variations in this trend with regard to the gender of the respondent.

Community Expectations over Kangra Coal's Kusipongo Resource Expansion Project

Of the respondents surveyed, 81.82% knew about the proposed Kusipongo Expansion Project. Respondents were asked to identify expectations of benefits as well as concerns related to the proposed Project. When isolating and identifying their main expected benefits regarding the proposed Project the overall results showed the following (refer to *Table 8.7*).

Table 8.7 Community Perceptions of Potential Benefits of the Project

Potential Benefits	n=	%
Fulfilled promises	1	2.70%
Improved infrastructure	5	13.51%
Increased local employment opportunities	8	21.62%
Increased opportunities for business	1	2.70%
More land for grazing	1	2.70%
No expected benefits	21	56.76%
TOTAL	**37**	**100.00%**

As indicated above, the majority of respondents (56.76%) did not expect any benefits associated with the proposed Project. For those who commented on potential local employment opportunities, 75% were from the 26 to 50 year old age category suggesting that it is this economically active group who have the highest expectations.

In addition to highlighting the benefits, respondents were also asked to identify concerns that the proposed Project may trigger for the community. A summary of responses is presented in *Table 8.8* below.

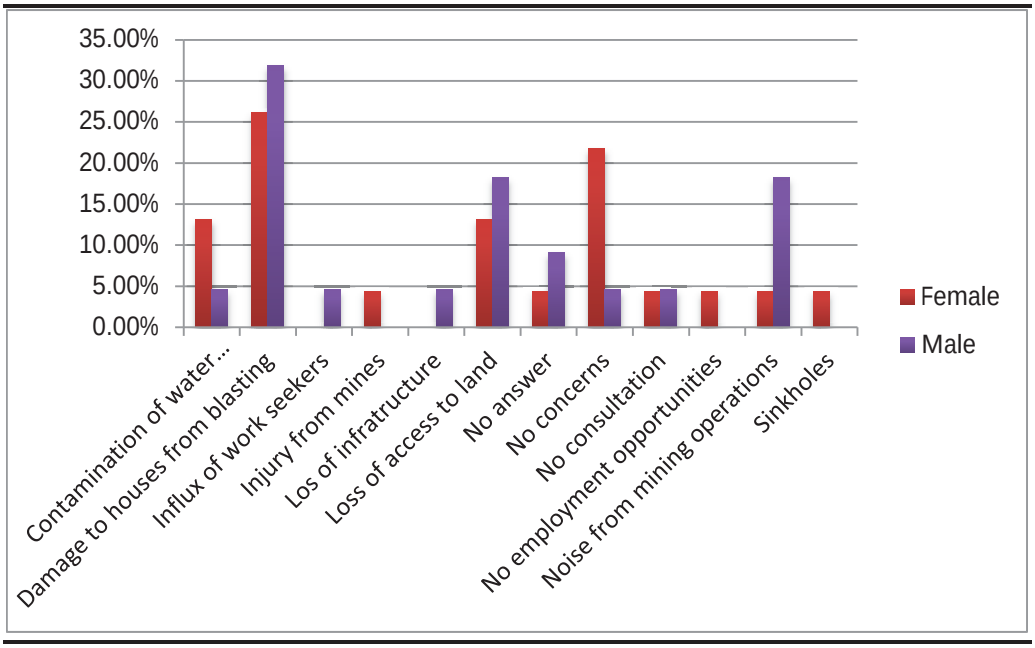
Table 8.8 Main Community Concerns over the Proposed Project Impacts

Main Concerns	n=	%
Contamination of water resources	4	9.52%
Damage to houses from underground blasting	13	30.95%
Influx of work seekers from outside	1	2.38%

Main Concerns	n=	%
Injury from mines	1	2.38%
Los of infrastructure	1	2.38%
Loss of access to land	7	16.67%
No concerns	6	14.29%
No consultation	2	4.76%
No employment opportunities	1	2.38%
Noise from mining operations	5	11.90%
Sinkholes	1	2.38%
TOTAL	**42**	**100.00%**

Expressions of concern over the proposed Project varied considerably between male and female respondents. A relatively higher percentage of female respondents reflected "no concerns" regarding the Project compared to male respondents (women: men ratio of 21.74%: 4.55%). Male respondents reflected a high level of concern over blasting associated with Project activities. The relative absence of expressions of concern from women may reflect culturally based gendered norms and several women mentioned that they did not know anything about mining and were therefore reluctant to express an opinion on how it may affect them, their land or environment (*Figure 8.16*).

Figure 8.16 Community Concerns over the Project and Gender of Respondent



For both men and women the concern over damage to homesteads from blasting was highest, followed by loss of access to land. Women then identified risks of water contamination as their third highest concern while men highlighted noise. Several women commented that the blasting was not only noisy but also frightening, particularly for the children and that this fear was from both the noise and vibrations, which one woman said made her fear for an "earthquake".

Examining concerns by location of the homesteads, it's interesting to note that Donkerhoek respondents represented 40% of the overall "no concern"

responses and Kransbank represented 50% of overall concerns for damage from blasting. This finding may suggest that Donkerhoek residents feel that they have less to lose and in contrast, Kransbank residents, many of who have new brick and cement structures feel vulnerable to damage to property that they own.

The one respondent who highlighted potential injury from mining was from Nooitgezien and had recently been resettled because of risks to the family from fly-rock [1].

A range of comments made during the interviews summarise various respondents' expectations and concerns:

- There should be local jobs – particularly for those affected by the Project;
- Kangra should provide training to ensure locals are qualified to apply and, once trained, people should get opportunities for work;
- Kangra should provide coal to local communities as they are taking the coal from community land;
- Communities should be partners in the Project, sharing the profits – because the mining would affect these farms;
- People already experience the noise and vibrations from blasting in current operations. If this is much closer the impact will be much more severe;
- People are fearful of the explosions, creating sense of potential earthquakes, which may damage houses but also may be dangerous to children and adults alike;
- Mining operations will use up all the water in the area and there won't be enough for local residents' use; and
- Mining will pollute the water and Kangra will leave the area and residents will remain with problems for future generations.

8.2 *VISUAL AND LANDSCAPE*

Please Note - This Section provides an overview of the key outcomes from the detailed Visual and Landscape baseline study, and is used to inform the Visual and Landscape Impact Assessment presented in *Chapter 10*. The complete Visual and Landscape baseline is included in the Visual and Landscape Impact Assessment attached to *Annex C.9* of this report.

[1] Fly-rock is the uncontrolled debris from controlled explosions.

8.2.1 Surrounding Landuse and Landscape Character

Figure 8.17 below illustrates the spatial distribution of the various landscape character types.

The Mantshangwe Mountains are more or less in the middle of the Study Area and to the west is the Heyshope Dam. The Ohlelo River stretches in a north to south easterly direction and passes through the Study Area alongside the site proposed for Adit A (the Main Mine Adit). In addition to the Ohlelo River, there are a number of other small rivers / streams that traverse the Project Site. The grassland is classified as Eastern Highveld Grassland (Mucina and Rutherford, 2006) with slight to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland, scattered rocky outcrops with some woody species. Parts of the Study Area are predominantly used as grazing fields, with clusters of exotic trees scattered throughout the area. There are also cultivated lands and plantations.

To the east of the Study Area is the town of Driefontein. The town is a small densely populated area.

The Study Area consists of four dominant **natural landscape types** – namely:

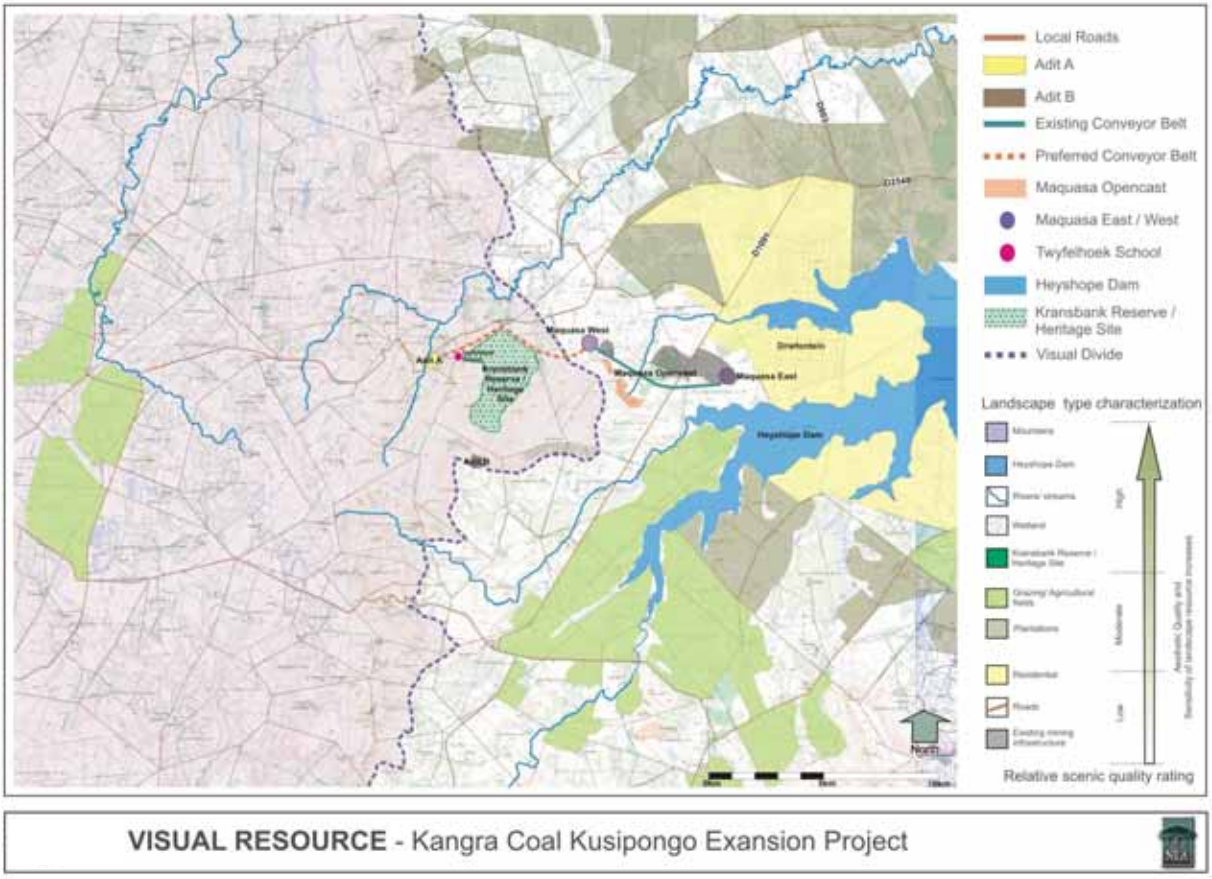
- Mountains and rolling hills, refer to (refer to *Figure 8.20; Figure 8.23; Figure 8.24* and *Figure 8.25*);
- Small rivers, streams and wetlands (refer to *Figure 8.23* and *Figure 8.25*);
- The Heyshope Dam to the east of the site (refer *Figure 8.21; Figure 8.22; Figure 8.23* and *Figure 8.25*); and
- The outstretched Eastern Highveld Grasslands (refer to *Figure 8.25*).

Three other types, mainly derived from **man-made intervention**, also occur within the Study Area – namely:

- Farmstead and rural residential dwellings with their related out buildings (refer to *Figure 8.20* and *Figure 8.24*);
- Structures and landforms directly related to proposed mining activities (refer to *Figure 8.23* and *Figure 8.24*); and
- Linear infrastructure such as the D1091, D2458, D803 and other local roads (refer to *Figure 8.21* and *Figure 8.24*).

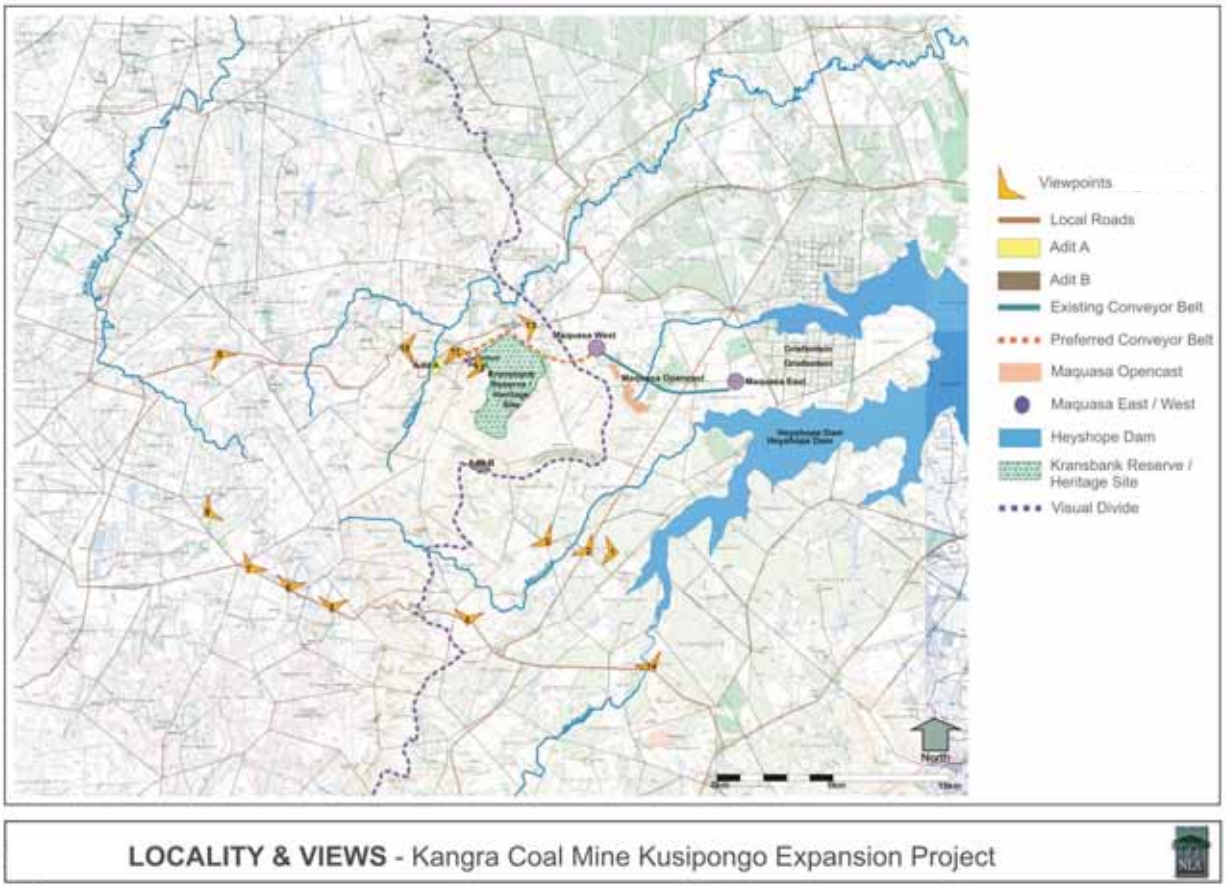
Please Note – the view positions for *Figure 8.19* to *Figure 8.26* are presented in Figure 8.18.

Figure 8.17 ***Visual Resource***



Please Note – reference to Kransbank Reserve / Heritage Site should read Kransbank Private Reserve

Figure 8.18 ***View Points***



Please Note – reference to Kransbank Reserve / Heritage Site should read Kransbank Private Reserve

Figure 8.19 ***Landscape Character – Image 1***

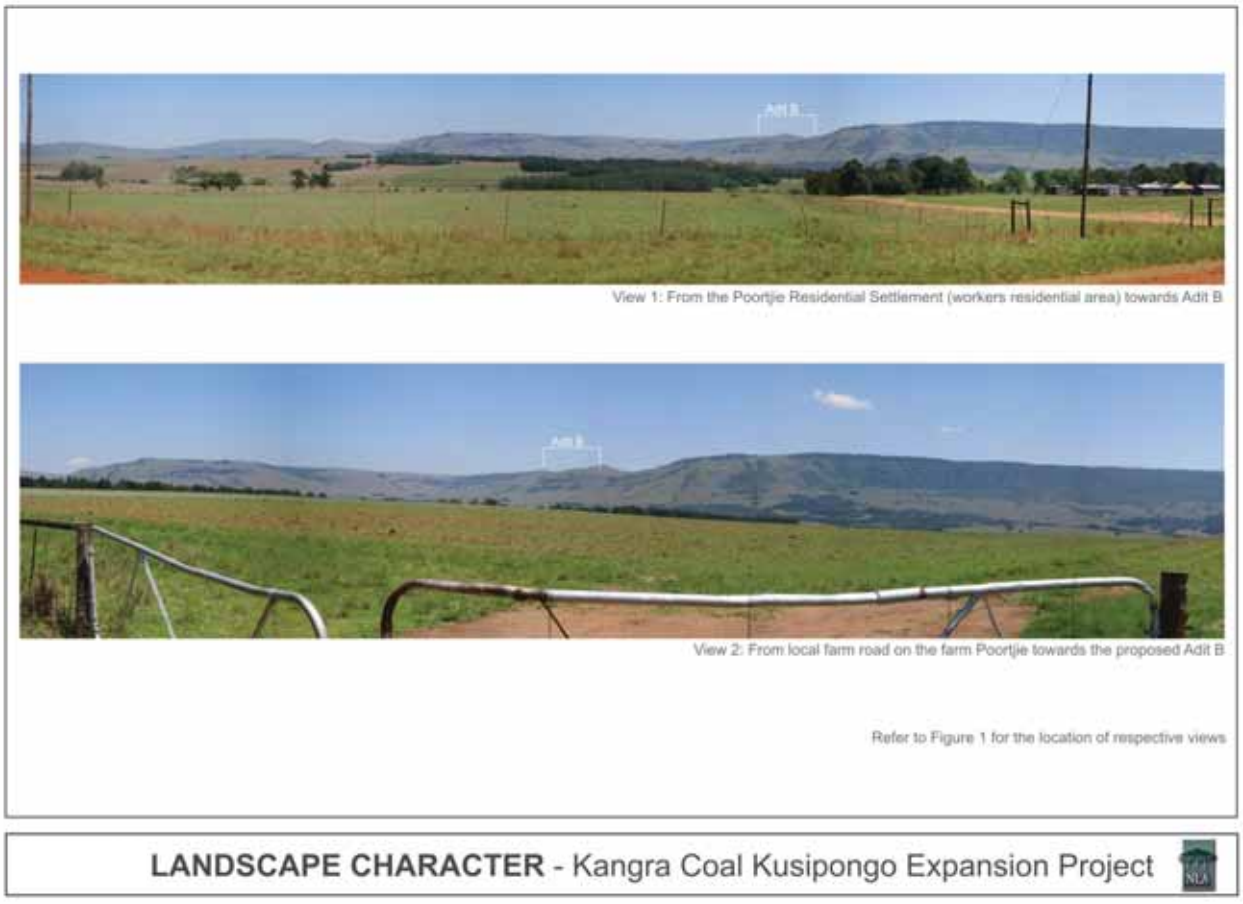


Figure 8.20 ***Landscape Character – Image 2***

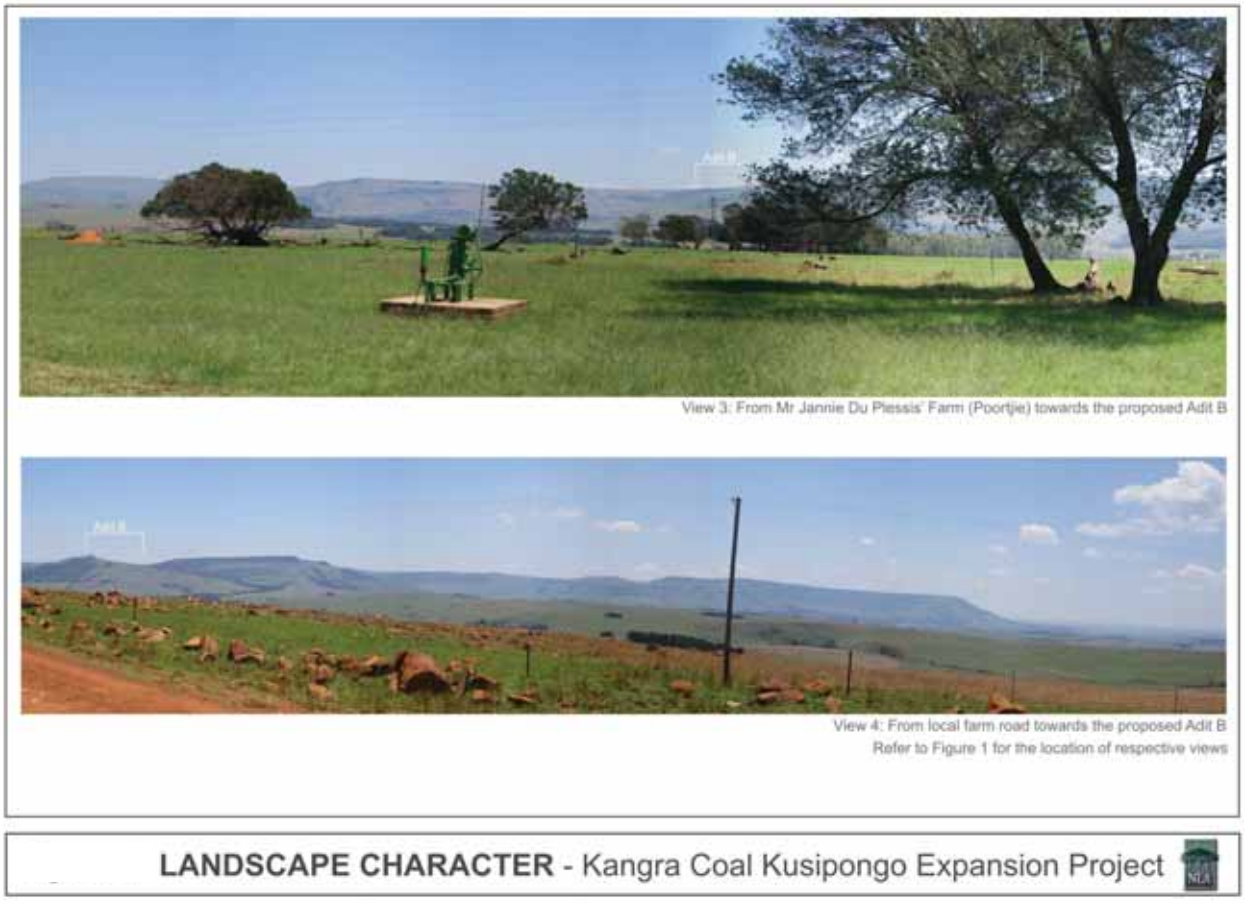


Figure 8.21 ***Landscape Character – Image 3***

Figure 8.22 *Landscape Character – Image 4*

Figure 8.23 Landscape Character – Image 5

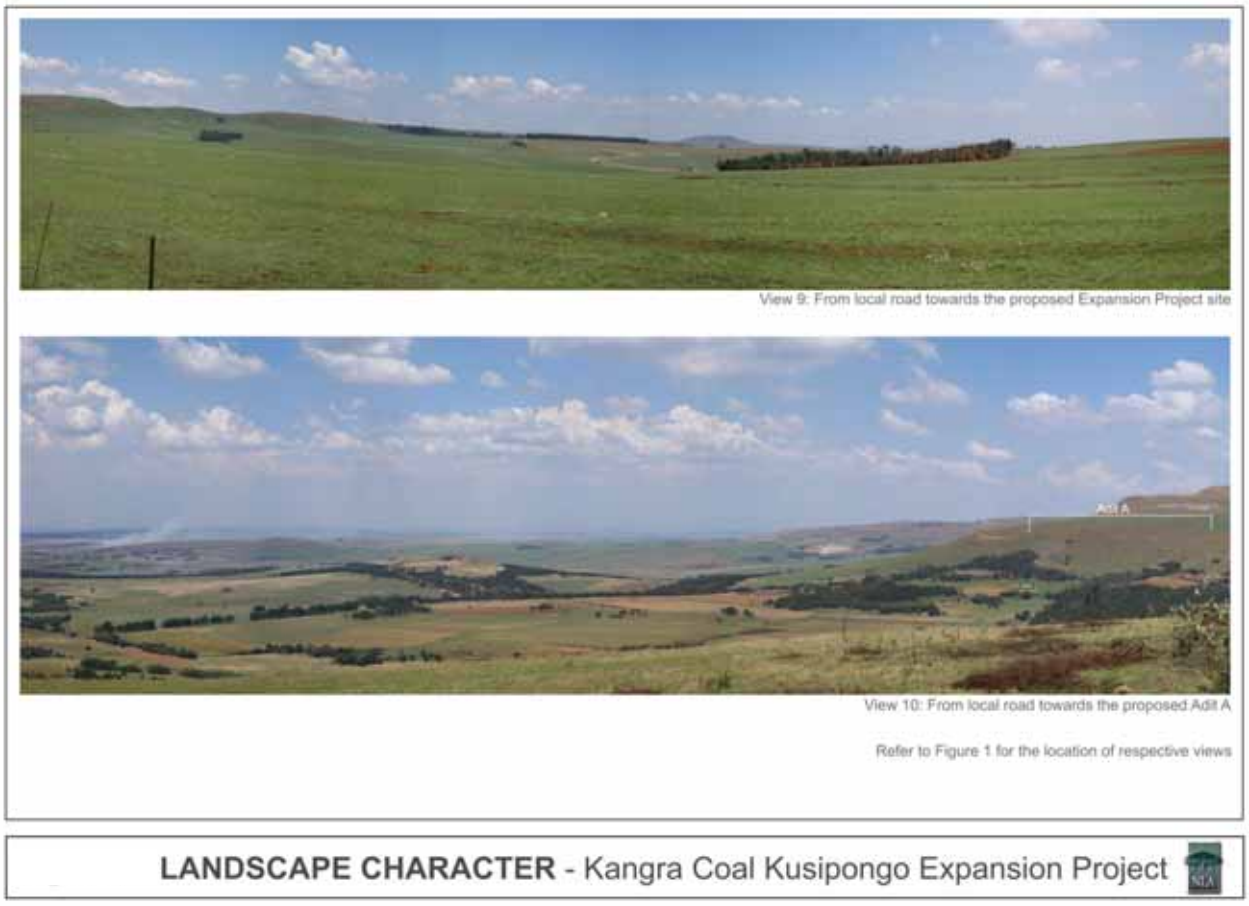
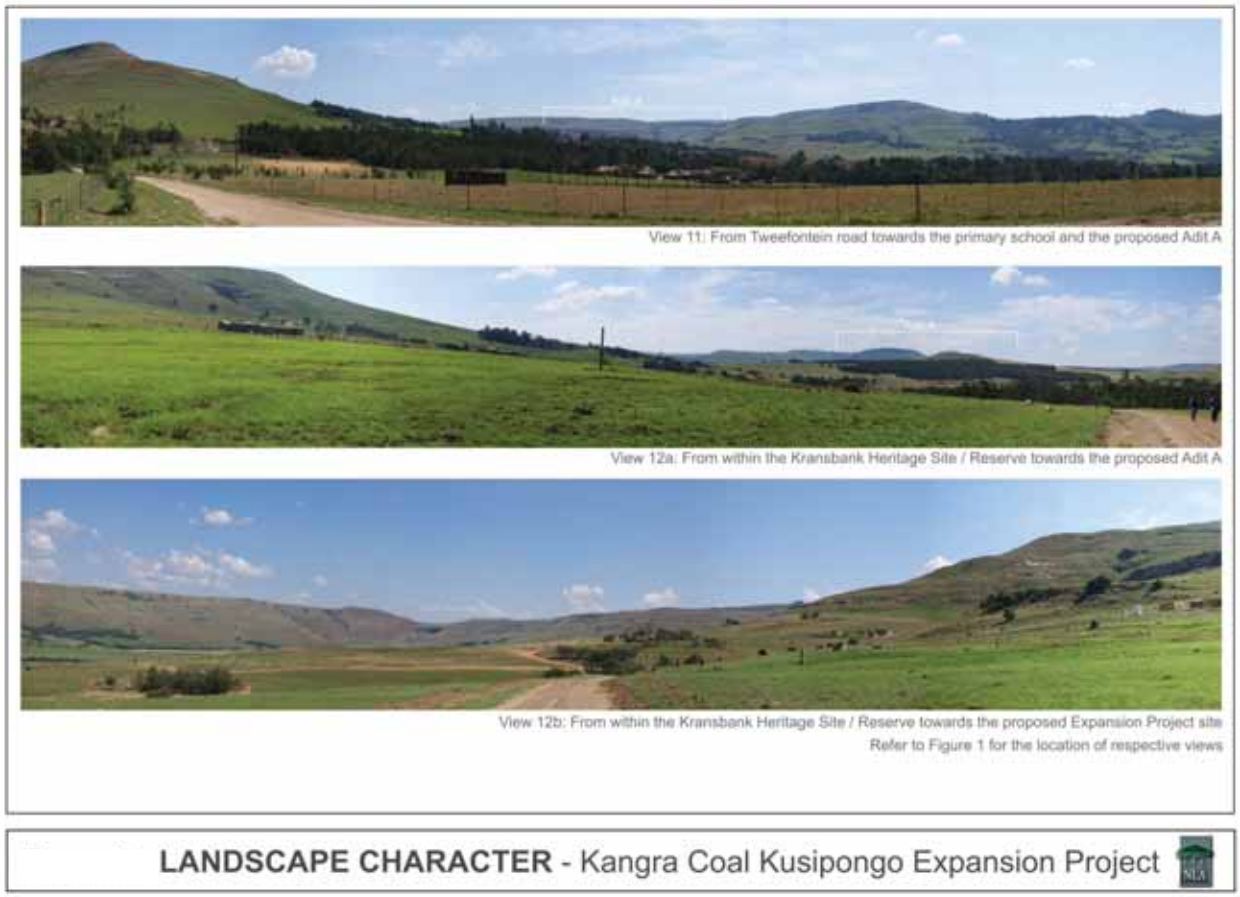
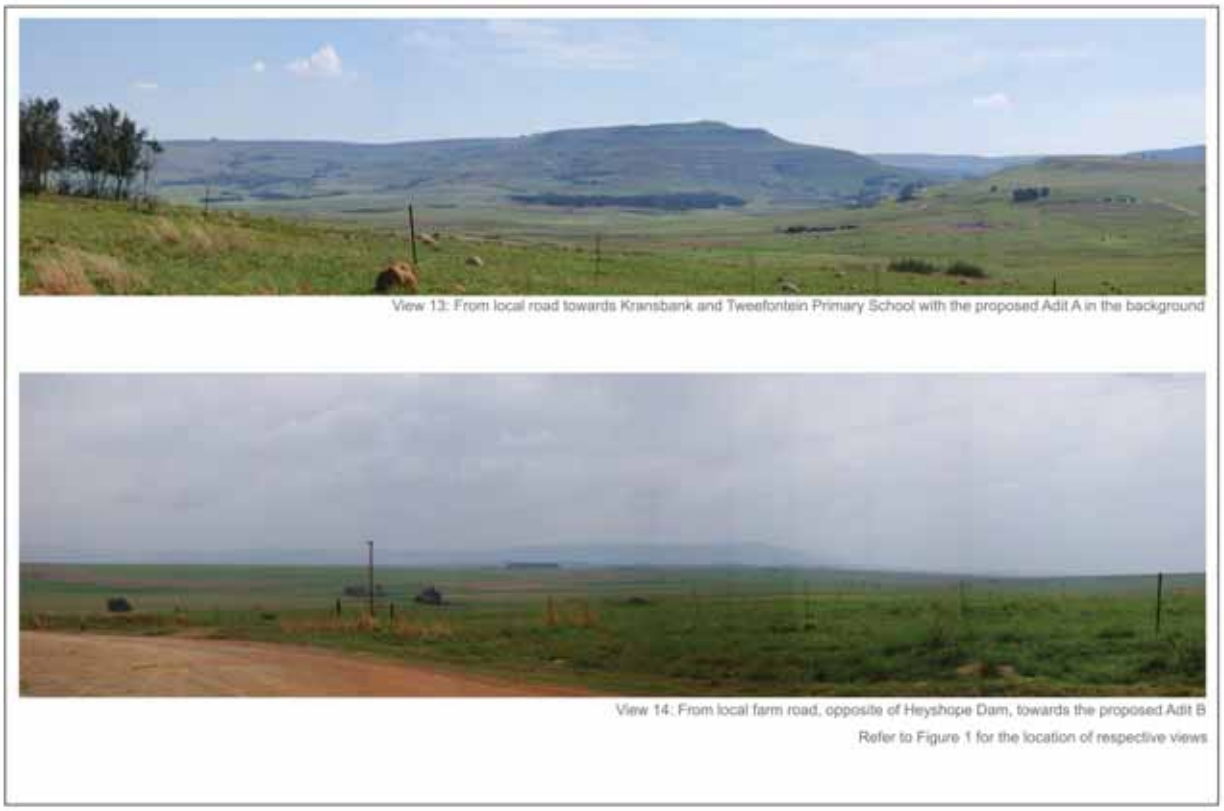


Figure 8.24 ***Landscape Character – Image 6***



Please Note – reference to Kransbank Reserve / Heritage Site should read Kransbank Private Reserve

Figure 8.25 Landscape Character – Image 7



View 13: From local road towards Kransbank and Tweefontein Primary School with the proposed Adit A in the background

View 14: From local farm road, opposite of Heyshope Dam, towards the proposed Adit B

Refer to Figure 1 for the location of respective views

LANDSCAPE CHARACTER - Kangra Coal Project

8.2.2 *Visual Resource / Scenic Quality*

The highest value for scenic quality (please refer to *Annex C.9* for details regarding the methodology for assigning scenic quality) is assigned to the Mantshangwe Mountains that runs through the middle of the Study Area and the Heyshope Dam to the east. The Ohlelo River, smaller streams, the wetlands and the Kransbank Private Reserve are also rated high. The outstretched grasslands have a moderate visual value. The combination of natural features characteristic of these areas, stand out within the context of the region and evoke distinct and unique images to produce a strong sense of place.

The landscape types with the lowest scenic quality rating are the plantations, residential areas, roads and other infrastructures as well as the mining areas.

Based on the above findings, scenic quality values for the various landscape types within the Study Area vary from **high to moderate**. This is due to the fact that landscape types with a high scenic quality (mountains, river, streams and wetlands) are mixed with those with a lower scenic quality (residential, roads, infrastructure and mining areas).

8.2.3 *Sensitive Viewer Locations*

Potential sensitive viewers include those residing in Driefontein Town, rural villages and farmsteads. The residents (farmers, rural villages, etc.) located to the west of the Mantshangwe Mountains will be more sensitive to the proposed Project as there are no similar activities within this portion of the Study Area. Residents (Driefontein and rural villages) on the eastern side of the Mantshangwe Mountains will be less sensitive as these areas already have mining activities within their views.

Other sensitive visual receptors include potential visitors to the Kransbank Private Reserve. Furthermore, individuals using local farm roads, the Twyfelhoek School as well as recreational users of the Heyshope Dam will also be visually affected by the proposed Project. It should however be noted that haze plays a major role in the Study Area and will decrease the visibility of the mining activities from the Heyshope Dam.

8.3 *HERITAGE*

Please Note - This Section provides an overview of the key outcomes from the detailed Heritage baseline study, and is used to inform the Heritage Impact Assessment presented in *Chapter 10*. The complete Heritage baseline is included in the Heritage Impact Assessment attached to *Annex C.4* of this report.

8.3.1 *Study Area*

The Study Area was considered to include the cultural landscape in an approximately 100km radius of the Project Area (defined as the immediate

footprint of surface infrastructure proposed for the Project) within the borders of South Africa (*Figure 8.26*). The Study Area allowed inferences to be made of potential sites that could exist within the Project Area based on previously completed relevant heritage studies, including:

- An archaeological survey conducted by **Huffman and van der Merwe** (1993) for the Savemore Colliery was carried out approximately 16km south east of the Project Area. A total of six sites were identified during the survey. These included Stone Age lithics, Late Iron Age ceramics and grain bin foundations as well as foundations for a historical structure (Huffman & van der Merwe, 1993).

- An archaeological survey conducted by **Huffman and Steel** (1995) for the Balgarthan Colliery was carried out approximately 4km south of the Project Area. A total of seven Swazi homesteads, one recent dwelling and one European farmhouse were identified during the survey (Huffman & Steel, 1995).

- An archaeological survey conducted by **Anderson** (1998) for the Pongola-Vergenoeg transmission line was carried out approximately 94km south east of the Project Area. During the survey, a total of seven Iron Age stone walled sites were identified, five of which contained graves (Anderson, 1998).

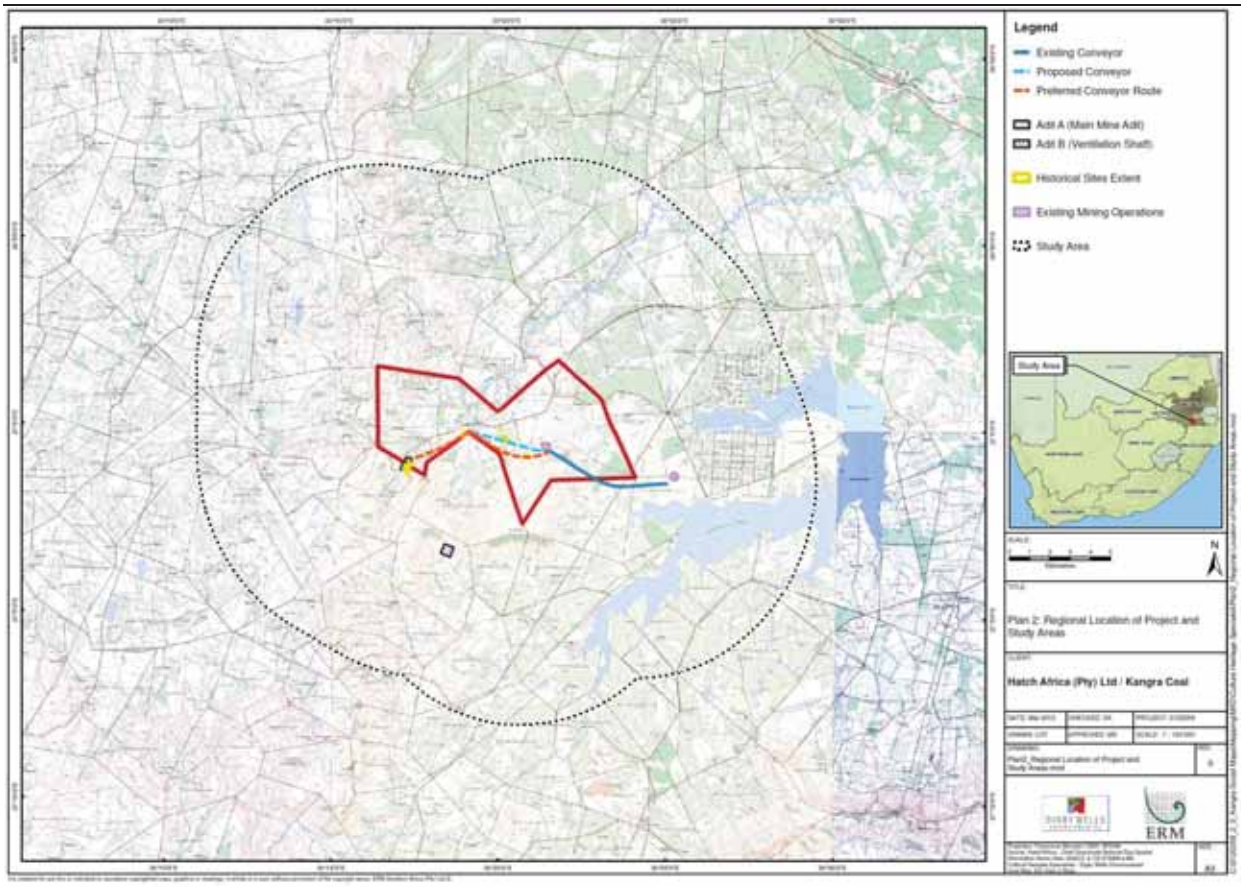
- A Heritage Impact Assessment conducted by **Van Schalkwyk** (2005) for a proposed development on the farm Evergreen 425 IT was carried out approximately 49km north east of the Project Area. A scatter of iron smelting slag was identified and recorded during the survey (Van Schalkwyk, 2005).

- A Heritage Impact Assessment conducted by **Van Schalkwyk** (2006) for the Majuba-Umfolozi 765 KV transmission line was carried out approximately 26km south of the Project Area over a 160km distance. During the study, it was found that a number of heritage resources were located within the Majuba-Umfolozi development area. These include the following sites that lie within and immediately adjacent to the Study Area:

    - Ancestral graves;
    - Rock painting sites that were recorded along and below the eastern uKhahlamba escarpment;
    - Stone Age open air sites [1];
    - Stone walled settlements dating to the Late Iron Age; and
    - Various battlefields.

[1] Open air sites are sites that are in the open as opposed to being in a shelter or cave.

Figure 8.26 Regional Setting of the Project Area 1:50 000



8.3.2 *Paleontological Context* (1)

Within the Mpumalanga Province, the 300 million year old rocks of the Karoo Super Group are well preserved and extensively distributed. In the far north regions of the province, the Karoo rocks comprise a thin layer covering the bedrock but further south towards Carolina and Ermelo the Karoo rocks are thick and contain massive coal seams.

The Mpumalanga coals were formed from rotting forests in vast swamps over a 100-million years period between 200 million years ago (mya) and 300mya. During this time, primitive plants such as *Glossopteris* flora (*Figure 8.27*) were found in abundance throughout the entire southern hemisphere and mammal-like reptiles and later dinosaurs roamed the entire landscape of Mpumalanga.

Figure 8.27 Glossopteris Leaves (Source: Maropeng Museum (Maropeng, 2013))

Coals are, by their nature, plant rich. Good quality coal does not preserve the anatomy of the original plant matter but the shales between the sequences do. Here it is possible to find well preserved *Glossopteris* leaves, roots and inflorescence, lycopod and sphenophyte stems, ferns, cordaitaleans and early gymnosperms. Bones of vertebrates that occurred at this time are seldom preserved with the plants. Fossil of insects, however, are often found. Fossils of plants and insects are found in in the shales of the Ecca Group and are commonly displayed in local and national museums.

(1) ***Please Note*** – a standalone Paleontological study was not completed; rather, the paleontological study forms an integrated component of this HIA.

8.3.3 *Pre-historical and Historical Context*

Please Note

This Section provides a historical context of the *broader* Study Area and its aim is to inform the study as to the potential heritage resources that could potentially be located in the Project Area.

Stone Age

South Africa has been inhabited by tool producing hominids for at least two million years. Much of the evidence for the presence of hominine activity is derived from stone tools. These tools are not only indicative of their presence in the landscape, but also attest to the technological developments of our genus. Varying factors, including geology, geomorphology, climate, fauna and flora have resulted in a complex record of social and technological changes through time.

Early Stone Age

The Early Stone Age (ESA) dates between 200 000 years ago (200ka) and 2 million years ago (mya). General characteristics of the ESA include:

- Simple flakes struck from cobbles, cores and pebble tools;
- Intentionally shaped hand axes, cleavers and picks during the later stages; and
- Large blades in the final or transitional stages.

ESA surface scatters have been investigated at Waterval Drift I off the N2 near Piet Retief and approximately 25km north east of the Project Area.

Middle Stone Age

Middle Stone Age (MSA) sites dating from c. 30 000 to 100 000 Before Present (BP) are known by archaeologists to occur within the Study Area. The MSA dates between 20ka and 300ka. A key technique characteristic of the MSA is the Levalloisian or prepared core technique in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoid systems and intentional blade production from volumetric cores also occur within the MSA. The general characteristics of the MSA include:

- Formal tools such as:
    - Unifacial and bifacial retouched points;
    - Backed artefacts; and
    - Scrapers and denticulates.
- Evidence of shafted tools;
- Occasional marine shell beads;
- Bone points;
- Engraved ochre nodules;

- Engraved ostrich eggshell (OES) fragments;
- Engraved bone fragments; and
- Grindstones.

Within the Study Area, MSA assemblages are commonly found as surface scatters of flaked stone. MSA surface scatters have been investigated at Waterval Drift I and Waterval Drift II off the N2 near Piet Retief and approximately 25km north east of the Project Area.

Late Stone Age

The Late Stone Age (LSA) dates between 20ka and 40ka. The economy of the LSA may be associated with hunter-gatherer or herder societies. Within the LSA, there is much variability between assemblages. Stone tool assemblages are often microlithic but in some areas they are dominated by long scrapers and few backed microliths. The LSA includes a wide range of formal tools such as:

- Scrapers;
- Backed artefacts;
- Shafted stone and bone tools;
- Borers;
- Upper and lower grindstones;
- Grooved stones;
- OES beads;
- Undecorated and decorated OES fragments;
- Flask and / or flask fragments;
- Bone tools;
- Fishing equipment;
- Rock art; and
- Ceramics.

Within the Study Area, LSA surface scatters have been identified and recorded to occur at Twyfelaar, Waterval Drift II, Idalia, Rustplaas, and Oak Harbour (University of the Witwatersrand, 2010). These sites are located off the N2 near Piet Retief, approximately between 23 km and 39 km north east of the Project Area.

An important (in the context of archaeology) recent rock art site discovery is an archaeological site complex at De Wittekrans located approximately 100km northeast of the Project Area. The discovery was made in 2008 during an archaeological impact assessment and subsequently assessed by Ouzman (2009). Although the site complex is relatively far from the Project Area (approximately 100km away), its location in the landscape is sufficiently similar to the landscape in the Project Area. As such, LSA and rock art

sites may also occur in the Study Area [1] and are particularly associated with shelters in sandstone cliffs or outcrops.

Iron Age

The Stone Age is followed by the Iron Age (1 200 to 500 BC) which continues well into the Historic Period (c. 1840 onwards). The Iron Age in South Africa is divided into three periods:

- Early Iron Age;
- Middle Iron Age; and
- Late Iron Age.

Sites including pottery, grain bin foundations, stone foundations and low kraal walls have been identified in Robertsdrift approximately 100km from the Project Area. Stonewalled sites have previously (in 2006) also been recorded within the Study Area (Van Schalkwyk, 2006).

An aerial imagery survey in a previous heritage study (Derricourt & Evers, 1973), led to the discovery of an Iron Age settlement known as Robertsdrift. The site is a Type V [2] settlement at the confluence of the Vaal and Klip rivers outside Standerton approximately 100 km west of the Project Area. Excavations were carried out in the 1970s during which ceramics with comb stamping motifs were identified (Derricourt & Evers, 1973).

Other Iron Age sites have been identified, including Tafelkop and Tafelkop II on the farm Tafelkop 270 IS approximately 80km northwest of the Project Area. These Late Iron Age sites comprise Moloko ceramics and Type V stone walling. Towards the southeast and approximately 100km from the Project Area, heritage studies have documented sites known as Kupwal 14.74 on the farm Kupwal 49 HU and Kortnek on the farm Kortnek 50 HU (University of the Witwatersrand, 2010). These sites have been recorded as Iron Age smelting sites with stone walling.

Battlefields from the Mfecane era, approximately from 1815 to 1840, are located within the Study Area and 50km south east of the Project Area. According to Huffman and van der Merwe (1993), the capital of a Swazi chief, Mandla-angangawempisi (Mandlangampisi), was situated on Kafferkraal 98 HT between 1780 and 1840 (Huffman & van der Merwe, 1993). Mandlangampisi is reputed to have fought and been victorious in two battles against Zulu warriors during the Mfecane period. One specific battle took place in or near a cave known as Mhlogamvula in the KwaMandlangampisi mountain range approximately 20 km south east of the Project Area.

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[1] no rock art sites were found in the Project Area; however, previous sightings in the Study Area were recorded in literature. This is discussed in more detail later in this report.

[2] Type V stone walling consists of the standard core of cattle enclosures surrounding beehive houses and grain bins. Corbelled huts may be present with this type of stone walling (Maggs, 1976).

Historic Period

The Project Area is situated in the centre of KwaYende, an area that includes Heyshope Dam. Today, the capital of KwaYende lies approximately 9km east of the Project Area. The tribal area of KwaYende (previously KwaNgema) is the traditional settlement of Mthonga, the first-born son of Shaka Zulu's half-brother Mpande. Mthonga was a catalyst for the first European settlements (Wakkerstroom Tourism, 2012).

Historically, European settlement occurred from as early as the mid-1830s when Cape Dutch migrants, the *Voortrekkers* and precursors of what would become Afrikaner Boers, entered the region. Some of the first to settle in the region were Boers who left the former Natal (now KwaZulu-Natal) after the Boer Republic of Natalia was annexed by the British. The first towns to be established in the region were those of Utrecht approximately 60km south of the Project Area, Uysenburg (Wakkerstroom), and Volksrust approximately 56 km south west of the Project Area.

Remnants of these early European settlers are scattered across the region and include stonewalled foundations and old oak trees (Huffman & Steel, 1995).

The region saw military action during the First Anglo-Boer War (1880 to 1881) and the Second Anglo-Boer War (1899 to 1902). Citizens of the *Zuid-Afrikaansche Republiek* known as *Burghers* from the surrounding towns and surrounding farms of Wakkerstroom, Piet Retief, Volksrust and others, formed commandos that engaged invading British forces in several places. Important nearby battlefields include Amajuba (1881) and Lancaster Hill (1900) approximately 90km south of the Project Area near Vryheid, KwaZulu-Natal (Coghlan, 1996). During the Second Anglo-Boer War, the British established many infamous concentration camps one of which was located at Volksrust.

Eventually, the British troops under the leadership of General French reached Piet Retief and erected telegraph lines to connect Standerton via Newcastle and Utrecht to the Pongola River at Luneburg (Hippisley, 1903). This particular line was established in 1901 and was 104 km long. Military posts were established all along the line. Further telegraph lines were then established.

In 1901, a British military office was opened in Piet Retief. To restrict the guerrilla tactics of the Boers during the latter phase of the war, an extensive defensive blockhouse system (more than 9 000 blockhouses) was established by the British in the area surrounding Piet Retief.

The above information indicates that there was a British and Boer presence within the broader Study Area. Heritage resources pertaining to this period of history may be present within the Project Area. The sites described above are approximately between 23 km and 100 km of the Project Area and will not be affected by the proposed Project.

Social History

The most recent history includes attempted forced removals of local communities during the 1980s, significantly from the Driefontein and KwaYende areas. This attempted forced removal was as a result of the construction of the Heyshope Dam, which flooded parts of both settlements. There were high levels of resistance from the communities who were adamant against the resettlement (NASA - BAO; 2/4324;T8/7/2/2/W1/3).

Opposition and activism took place between 1981 and 1985. A ruling was made in favour of the two communities and wholesale removal was avoided.

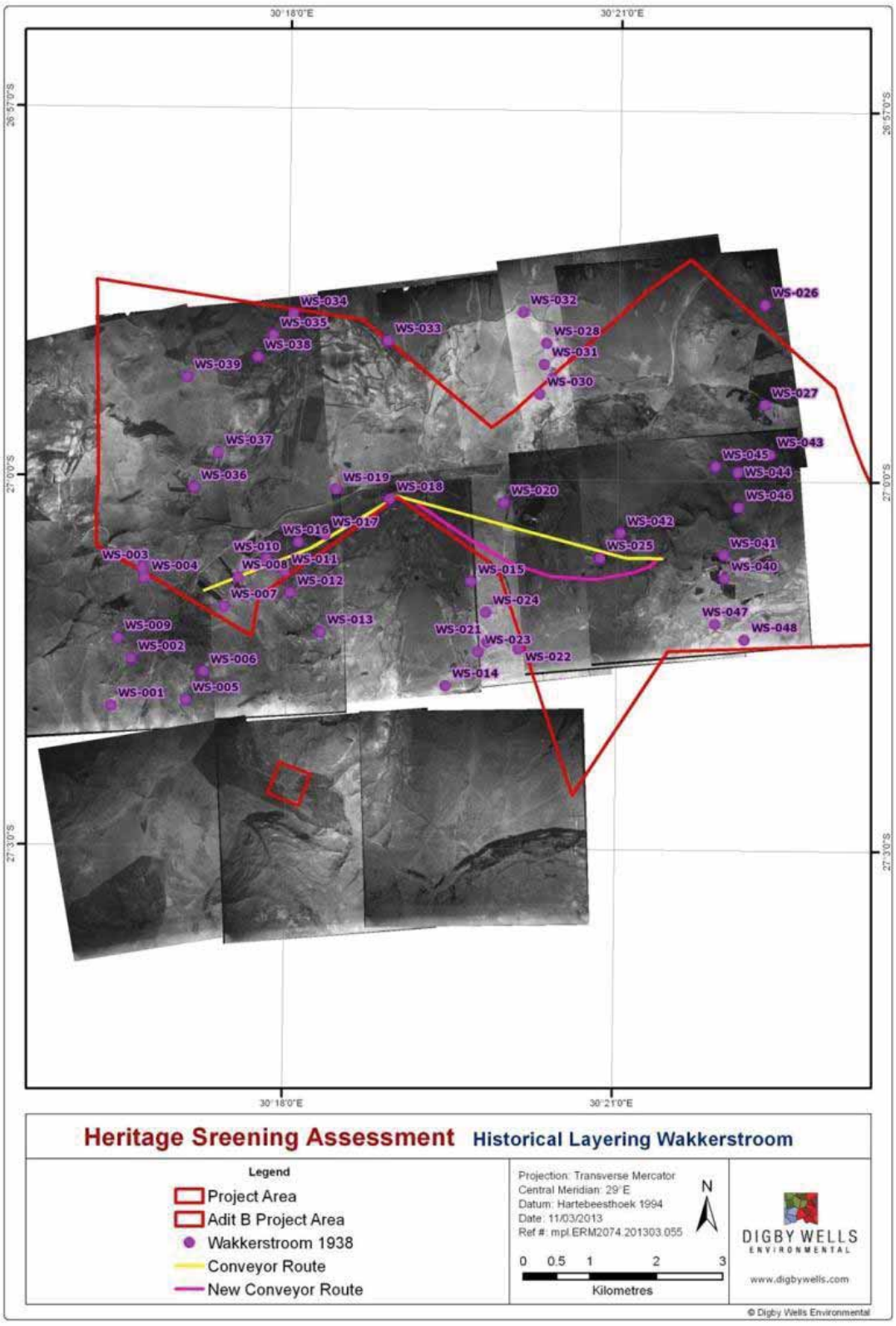
A major cause of concern within the community was the rising water table which was caused by the construction of the Heyshope Dam and which resulted in water damage to many homes in close proximity to the dam. There were also concerns regarding the exhumation and the temporary reburial of such graves, causing much anger in the community.

This shows that there was a historical notion of resistance and mistrust to relocation. That being said compensation was also awarded to families who were relocated. Only those whose properties were flooded were resettled on adjacent land and retained their property rights (Ndaba, 1998). Compensation was offered to affected property owners to reimburse them of any improvements made to their properties that would be destroyed by the construction of the dam (BAO; 2/4324; T8/7/2/2/W1/3).

A survey of historical aerial photographs showed that a number of possible structures occurred in the Project Area from 1938 to 1955 (*Figure 8.28*). These structures could include residential complexes, homesteads and stone walls. The numbering of the possible structures includes the town name, in this case Wakkerstroom (WS), suffixed by the structure number.

The structures located on the sites proposed for the Main Mine Adit, Adit B and overland conveyor system were verified through ground truthing. Only one possible structure identified in the aerial photograph was verified.

Figure 8.28 Historical Aerial Photograph from 1938 Showing Structures Located within the Project Area



Based on the above sections, the landscape may thus be described as an agrarian landscape with a deep time depth, increasing the potential of sites existing from as early as the MSA through to rock art and the Iron Age and into the historic period.

8.3.4 *Heritage Baseline*

Graves

Burying the dead is an emotive and symbolic experience for many people. Choosing to use a cemetery or an historical family burial ground or to bury near the family's homestead are all options. Many families and communities hold traditional ceremonies at ancestral graves at least annually. One respondent cried when talking of the graves near her home saying she was "*remembering the people who died*" and another woman, after reporting on the number of graves in her homestead added: "*…and maybe tomorrow there will be more*."

Location of Graves

More than two thirds (68.18%) [1] of respondents declared that they knew of graves that were located either within or in close proximity to the homestead. In most instances, these were the graves of deceased relatives of long-term residents that were buried in accordance with traditional customs. Those homesteads that did not reflect any awareness of graves located in the vicinity of their homesteads were generally either recent arrivals or chose to bury their dead in cemeteries in more urbanized centres like Driefontein.

As expected, larger homesteads were more likely to be associated with nearby graves, as were homesteads that had been established over a longer period. This data is summarized in *Table 8.9* and *Table 8.10* below.

Table 8.9 Presence of Nearby Graves and Homestead Size

	Presence of Graves	
Homestead Size	**Not Present**	**Graves Nearby**
1 to 2 Persons	3	0
3 to 6 persons	5	10
7 to 10 Persons	4	14
11+ persons	2	6
TOTAL	**14**	**30**

Table 8.10 Presence of Nearby Graves and Residential Period

	Presence of Graves		
Residential Period	**No**	**Yes**	**TOTAL**
Less than 5 years	5	5	10
Between 5 and 10 years	4	3	7
Between 10 and 15 years	3	4	7
Between 15 and 20 years	0	5	5

[1] 30 of 44 homesteads surveyed.

	Presence of Graves		
Residential Period	**No**	**Yes**	**TOTAL**
More than 20 years	2	13	15
TOTAL	**14**	**30**	**44**

Resident of the farm (*Table 8.11*), Nooitgezien, Kransbank and Twyfelhoek reflected a notably lower incidence of graves associated with homesteads, compared to homesteads on Rooikop and Donkerhoek. Reasons for this may relate to the relatively recent arrival of many homesteads on Nooitgezien, Kransbank and Twyfelhoek.

Respondents from two of the Rooikop resettled homesteads reported that they had been resettled with their graves but that no other compensation for relocating the graves had been provided.

Table 8.11 Presence of Nearby Graves on each Farm

	Presence of Graves			
Farm	**No**	**Yes**	**TOTAL**	**%**
Donkerhoek 14-HT	0	5	5	100.00%
Kransbank 15-HT	8	10	18	55.56%
Nooitgezien 381-HT	1	0	1	0%
Rooikop 18-HT	1	4	5	80.00%
Twyfelhoek 379-IT	4	11	15	73.33%
TOTAL	**14**	**30**	**44**	**68.18%**

Screening Assessment

A heritage baseline study conducted by **Pistorius** (2011) for the construction of three proposed adits by Kangra Coal was carried out within the Project Area. During the study, five heritage resources were identified and recorded (Pistorius, 2011). These include the following sites:

Table 8.12 Sites Identified and Recorded during the Heritage Baseline Assessment by Pistorius (2011)

Site ID	Coordinates	Description
G01	27^0 01' 04.3" S 30^0 17' 24.3" E	A single, historic informal grave with stone dressing
CE01	27^0 03' 21.1" S 30^0 14' 51.1" E	A single square cattle enclosure
LIA01	27^0 02' 50.5" S 30^0 22' 38.0" E	A Late Iron Age site with stone wall enclosures
GY01	27^0 03' 18.4" S 30^0 14' 45.8" E	A historical graveyard demarcated with stone walling
SB	27^0 03' 39.9" S 30^0 19' 03.3" E	A sandstone bank that may be associated with Stone Age sites

All site mentioned in *Table 8.12* are located outside of the footprint of proposed Project, and will therefore not be directly impacted on.

A screening assessment of the Project Area was undertaken by Johan Nel (Digby Wells) on 6 December 2012.

The identified sites included historical burial grounds and farmsteads, a Late Iron Age / Historical settlement, and modern settlements with associated burial grounds. Sensitive landscape features that were identified included sandstone ridges and low, boulder-strewn hills.

The NHRA reference numbers and designations (and hence the labelling of resources) are as follows:

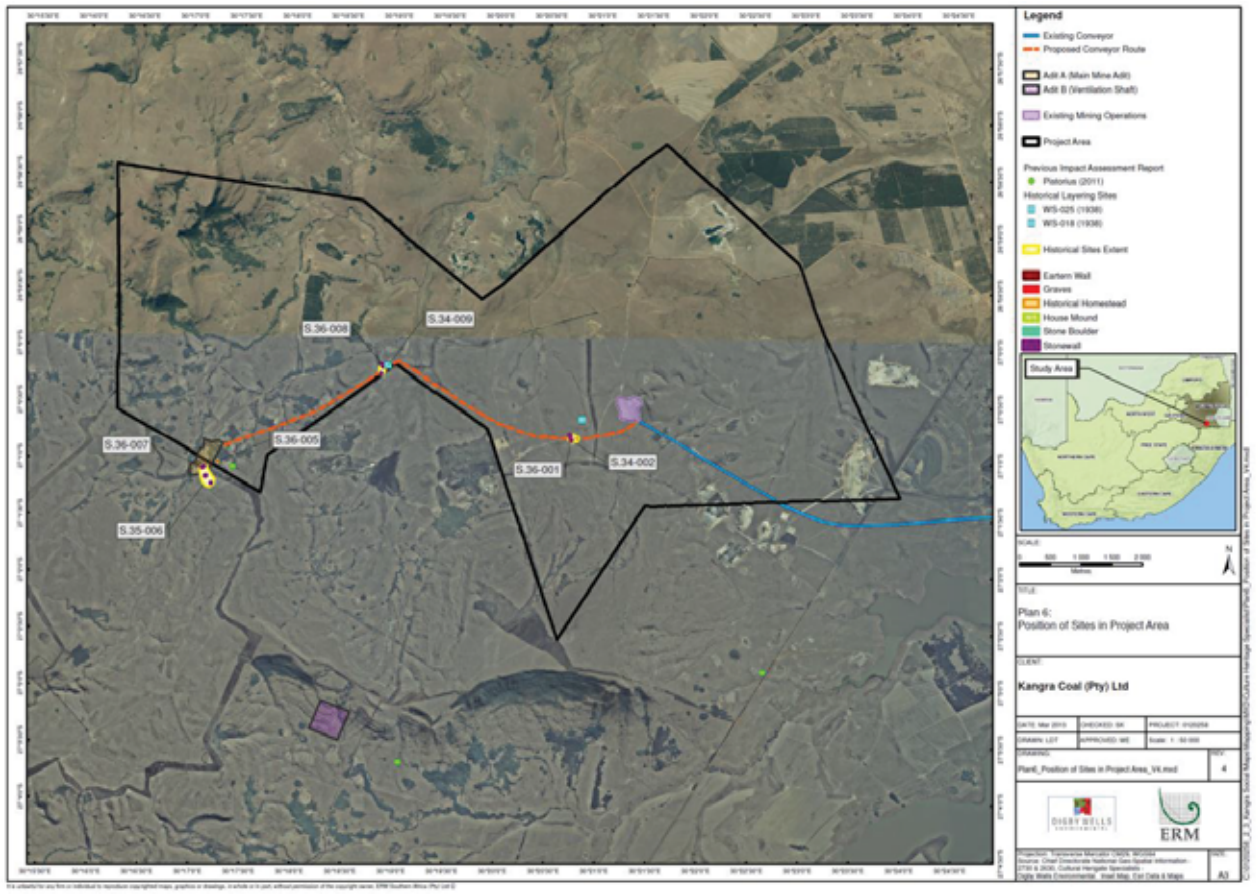
- ***S.34*** – structures;
- ***S.35*** – archaeology, palaeontology and / or meteorites;
- ***S.36*** – burial grounds and graves; and
- ***S.37*** – public monuments and memorials.

The following sites and / or landscape features were identified as being applicable to the proposed Project (*Table 8.13* and *Figure 8.29*).

Table 8.13 Heritage Sites Identified and Applicable to the Proposed Project

Site ID	Coordinates	Description
S.34-002	27^0 00' 47.57" S 30^0 20' 45.88" E	Multi-component historical stone wall structure
S.34 009	27^0 00' 12.62" S 30^0 18' 52.07" E	Multi-component, residential structure
S.35-006	27^0 01' 09.64" S 30^0 17' 08.44" E	Multi-component archaeological stonewalled site
S.36-001	27^0 00' 48.99"S 30^0 20' 43.78" E	Burial ground
S.36 008	27^0 00' 09.70"S 30^0 18' 52.50"E	Burial ground
S.36 005	27^0 01' 02.20"S 30^0 17' 15.30"E	Burial ground with at least 31 graves
S.36 007	27^0 01' 04.96"S 30^0 17' 06.91"E	Burial ground

Figure 8.29 Position of Sites in Project Area 1:10 000



Section 34 Historical Sites – Structures

Two Section 34 Sites (as defined by NHRA) were identified on the Project Site. Both sites are older than 60 years and are therefore protected in terms of Section 34 of the NHRA. These sites, which are historical stone wall structures, are described separately below:

1. **S.34-002** – the coordinates are 27^0 00' 47.57" S and 30^0 20' 45.88" E. The site is a multi-component, historical structure that corresponded to a 1938 aerial photograph in which residential structures were identified (*Figure 8.30*). The structure is approximately 19 234 square meters in extent and is bisected by the proposed overland conveyor route. This heritage resource has no value in aesthetic and technical characteristics, as it is known to occur frequently within the Study Area. In addition, a survey of the historical 1938 aerial photograph indicates that sites similar to S.34-002 are a common occurrence within the Study Area. The site is in a poor condition with active decay visible. Contemporary use and/or occupation of the structure has resulted in the alteration of the structure to such an extent that it has limited information potential. The structure is located near an existing community and burial ground (S.36-001) and may have an association to the community or cultural group for social and/or spiritual reasons. Taking these characteristics into account, the structure was given **a low heritage value**.

2. **S.34-009** – the coordinates are 27^0 00' 12.62" S and 30^0 18' 52.07" E. The site is a multi-component, residential structure that corresponded to a 1938 aerial photograph in which other residential structures were identified (*Figure 8.31*). The structure is approximately 12 367 square meters in extent and is bisected by the proposed overland conveyor route. The heritage resource has no value in terms of its aesthetic and technical attributes, as structure similar to it are known to occur frequently within the Study Area. The structure is in a poor condition with active decay visible. There is no site context and as a result it has limited information to offer. The structure is located near an existing community and burial ground (S.36-005) and may have an association to the community or cultural group for cultural and/or spiritual reasons. Taking these characteristics into account, the structure was given a **low heritage value**.

The locations of these structures in the Project Area are illustrated on *Figure 8.29* on *Page 8-68*.

Figure 8.30 ***Historical Structure S.34-002 Corresponding to a 1938 Historical Aerial Photograph***

Figure 8.31 ***Historical Structure S.34-009 Corresponding to a 1938 Historical Aerial Photograph***

Section 35 Historical Sites - Archaeological Sites

This site (S.35-006) is an archaeological site that is protected in terms of Section 35 of the NHRA. The coordinates for the site are 27^0 01' 09.64" S and 30^0 17' 08.44" E. The site is a multi-component site that is possibly archaeological to early historical. It is a stonewalled site identified on three elevations (*Figure 8.32* to *Figure 8.35*). The archaeological site is approximately 55 807 square meters in extent and falls within the Main Mine Adit footprint. This heritage resource has no value in aesthetic and technical characteristics as this type of site is known to occur frequently within the Study Area. The site is in a poor condition with active decay visible. It has a limited information potential because there was no site context and no archaeological deposit (artefacts) were noted. Taking these characteristics into account, the site was given a **low heritage value**.

The location of this structure in the Project Area is illustrated on *Figure 8.29*.

Figure 8.32 The First Stone Wall Identified and Recorded at the Archaeological Historical Site

Figure 8.33 ***The Second Stone Wall Identified and Recorded at the Archaeological Historical Site***

Figure 8.34 ***The Third Stone Wall Identified and Recorded at the Archaeological Historical Site***

Figure 8.35 The Fourth Stone Wall Identified and Recorded at the Archaeological Historical Site

Section 36 Historical Sites – Burial Grounds and Graves

Site (S.36-001) is a burial ground (refer to *Figure 8.36*) that is protected in terms of Section 36 of the NHRA. The coordinates are 27^0 00' 48.99"S and 30^0 20' 43.78" E. The site is associated with the multi-component historical site S.34-002. S.36-001 is approximately 199 square meters in extent and comprises 11 graves. It is located 18 m south of the proposed conveyor route (*Figure 8.29*). The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a **medium heritage value**.

Figure 8.36 Grave Identified and Recorded in Burial Ground Site

A further three burial grounds were identified in the vicinity of the Project Site. As with the aforementioned burial site, these three sites are protected in terms of Section 36 of the NHRA. These sites include:

1. **S.36-008** - the coordinates are 27^0 00' 09.70"S and 30^0 18' 52.50"E (refer to image of heritage resource in *Figure 8.37*). The site is possibly associated with the historical site S.34-009, which was identified and recorded during the screening assessment and mapped during the HIA. The burial ground is approximately 64 square meters in extent with at least six graves. It is located 82 m north west of the proposed conveyor route (*Figure 8.29* on *Page 8-68*). The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a **medium heritage value**.

2. **S.36-005** – the coordinates are 27^0 01' 02.20"S and 30^0 17' 15.30"E (refer to image of heritage resource in *Figure 8.38*). The burial ground is approximately 668 square meters in extent with at least 31 graves. It is located 30m east of the Main Mine Adit. The burial ground may have a

strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in an excellent condition and is well-preserved. There is little to no decay present and little restoration is required. Based on these attributes, the burial ground was given a **medium heritage value.**

3. **S.36-007** - the coordinates are 27^0 01' 04.96"S and 30^0 17' 06.91"E. This burial ground is protected in terms of Section 36 of the NHRA. The site may be part of the multi-component archaeological site S.35-006 and is located within a circular stonewalled enclosure (*Figure 8.39*). S.36-007 is approximately 20 square meters in extent and is located within the Main Mine Adit footprint. The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a **medium heritage value**.

Figure 8.37 Grave Identified and Recorded in Burial Ground S.36-008

Figure 8.38 Grave Identified and Recorded at Burial Ground S.36-005

Figure 8.39 Single Grave Identified and Recorded in Site S.36-007

8.4 KEY SOCIAL SENSITIVITIES

- **Socio-economic** – land ownership status of Study Area homesteads is likely to play a significant role in how individuals and families respond to the proposed Project and any changes in land access and use.

  Approximately 42% of residents are aged between 6 and 18 years suggesting a youthful population in the Study Area. Furthermore, employment opportunities are limited and unemployment is high, which has resulted in high expectations for employment from the proposed Project.

  Water quality and availability are important issues for most survey respondents. Furthermore, CPA members emphasised the impact on reduced water availability in boreholes near current Kangra Coal mining operations.

  Lastly, it is evident that communities living in the area have negative perceptions of Kangra Coal. This is based on reported experiences and on unmet expectations.

- **Visual and Landscape** – the proposed Project Area has a *high visual resource* value and the following sensitive viewers were noted:

  - Farmsteads and rural villages / residential areas;

- Twyfelhoek School;
- Kransbank Private Reserve;
- Motorist using the local farm roads; and
- Driefontein Community.

Other viewpoints, such as views from the mine roads and the existing mining activities are considered *low sensitivity viewpoints*.

- **Heritage** – heritage resources such as Stone Age sites, Iron Age settlements, historical structures and battlefields, and burial grounds and graves are within the broader Study Area. Furthermore, heritage sites

9 ASSESSMENT OF PHYSICAL AND BIOLOGICAL IMPACTS AND MITIGATION

The predicted impacts to the physical and biological environment as a result of the proposed Kangra Coal Kusipongo Resources Expansion Project are described in this Chapter. Potential impacts to the socio-economic environment as a result of the proposed Project are described in *Chapter 10*.

The two chapters (*Chapter 9*and *Chapter 10*) are organised as follows:

Chapter 9:

- Impacts on Soils;
- Impacts on Surface Water;
- Impacts on Groundwater;
- Impacts on Air Quality;
- Impacts on Noise;
- Impacts from Blasting; and
- Impacts on Biodiversity.

Chapter 10

- Socio-economic Impacts;
- Visual and Landscape Impacts; and
- Heritage Impacts.

Please Note

Table 9.1 below presents the applicability of each impact with respect to the phase of the proposed Project. Furthermore, the reference for mitigation/management measures associated with each impact assessed is included in the table.

Table 9.1 Project Phase Applicability and Mitigation/Management Reference for Physical and Biological Impact Assessment

Impact Assessed	Applicable Phase of the Project				Mitigation/Management Conditions
	Construction	Operation	Decommissioning	Post-closure	
Soils					
Soil loss	X				Page 9-6
Surface Water					
Surface water quality as a result of the activities at the Main Mine Adit	X	X	X		Page 9-12
Surface water quality as a result of the proposed Ventilation Adit	X				Page 9-15
Streams, wetlands and surface water quality associated with the proposed overland conveyor	X	X	X		Page 9-18
Reduced baseflow on surface water and wetlands		X	X	X	Page 9-42
To the Main Mine Adit as a result of stormwater runoff		X			Page 9-21
Groundwater					
Mine dewatering and decant		X	X	X	Page 9-29
Groundwater change and impacts on groundwater users		X	X	X	Page 9-32
Groundwater quality		X	X	X	Page 9-37
Reduced baseflow on surface water and wetlands		X	X	X	Page 9-42
Air Quality					
Construction activities associated with the main mine adit	X				Page 9-49
Coal handling and processing at the main mine adit		X			Page 9-66
Emergency generator sets		X			Page 9-81
Overland conveying of coal		X			Page 9-85
Decommissioning activities			X		Page 9-90
Noise					
Construction activities	X				Page 9-95
Operational activities		X			Page 9-103
Decommissioning activities			X		Page 9-106
Blasting					
Blasting Impacts	X	X			Page 9-106
Biodiversity					
Dewatering and loss of watercourse and associated hydromorphic grasslands		X	X	X	Page 9-114
Direct loss of wetlands and associated hydromorphic grasslands at Adit A	X				Page 9-119
Potential loss of wetlands and associated hydromorphic and upper slope grasslands at Adit B	X				Page 9-124
Contamination of aquatic and wetland systems at Adit A	X	X	X	X	Page 9-130
Contamination of aquatic and wetland systems at overland conveyor system	X	X			Page 9-133
Potential loss of conservation important floral species	X	X			Page 9-139
Increase in alien and invasive species	X	X	X	X	Page 9-143
Sensory disturbance and displacement of fauna	X	X			Page 9-148
Species destruction	X	X			Page 9-153

9.2 IMPACT ASSESSMENT LAYOUT

From *Section 9.3* in this Chapter and *Chapter 10* the impact assessment is laid out as follows:

- Each section begins with the type of impact being assessed (e.g. *Section 9.3.1*– Impacts on Soil Loss as a Result of the Proposed Project).
- Background information relating to the impact is then provided. This includes a description of the baseline environment that will be affected, the Project aspect or activities that will cause the impact and a description of the effected receptors.
- The significance of the impact pre-mitigation is then assessed and rated through use of a rating table.
- Following the pre-mitigation rating table, a section describing the mitigation/management measures Kangra Coal will be adopting are provided.
- Following the consideration of mitigation/management, the significance of the residual impact (post-mitigation) is then assessed and rated.

Please Note

The impact assessment methodology used to assess physical and biological impacts (this *Chapter*) and social impacts (*Chapter 10*) is presented in *Chapter 5* of this SEMP.

9.3 IMPACTS ON SOILS

It must be noted that the impact to soils will be realised as soon as the construction phase of the proposed Project commences and will be maintained throughout the life of the Project.

9.3.1 *Impact on Soil Loss as a Result of the Proposed Project*

Description of the Baseline Environment

The Project Site can be characterised as having deep soils with a moderate to high agricultural potential and shallow soils with a lower agricultural potential. Over 70% of the Project Site can be classified as having a moderate to high arable potential.

Proposed Project Activities

The following activities associated with the construction phase of the proposed Project will result in an impact on soils of the Project Site.

- **Main mine adit (Adit A)** – the infrastructure that is planned will result in land no longer being available for agricultural production, due to removal of topsoil and/or subsoil, as well as the subsequent storage and rehabilitation process. The construction of Adit A will necessitate the removal of existing topsoil over an area of approximately 17ha. The Adit A footprint will be unusable for agricultural production for the life of the mine. Once the mine closes, rehabilitation may be possible, but it is likely that the pre-mining agricultural potential, and associated land capability, will be reduced to a lower level due to the soil handling and replacement process, as well as the time that the soil is likely to be stockpiled.

- **Ventilation adit (Adit B)** – the removal of topsoil and establishment of infrastructure may result in degradation of the soil body, if not mitigated. The construction of Adit B will necessitate the removal of approximately 500m^2 of existing topsoil.

- **Overland conveyor system** – the establishment of an overland conveyor system and associated gravel service road will result in removal and disturbance of the topsoil, but to a much smaller degree than with Adit A and Adit B. Most of the *in situ* soil profile would not be dramatically disturbed, so that, after mine closure, the removal of the conveyor infrastructure should enable the soil potential to be regained, with certain straightforward rehabilitation measures.

Sensitive Receptors

Soil with a moderate to high arability potential in the Project Site will be lost during the construction phase of the proposed Project. This will be specifically relevant where excavations are made, such as Adit A and to a lesser extent at Adit B where access needs to be obtained through the soil profile and into the coal reserve below. Not only will any soil that is removed need to be stored, but the spoil material removed will also have to be stored for the life of the adit, causing problems to the existing topsoil. It is likely that the long-term production potential of the Project Site will be affected.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above and in *Table 9.2*,

Table 9.3 and *Table* 9.4 below, construction of the following Project components will have the following pre-mitigation impact significance:

- **Main mine adit (Adit A)** – the impact from the construction of Adit A is considered a "**Major Negative Impact**".

- **Ventilation adit (Adit B)** – the impact from the construction of Adit B is considered a "**Moderate Negative Impact**".

- **Overland conveyor system** – the impact from the construction of the overland conveyor system is considered a "**Moderate Negative Impact**".

Table 9.2 *Rating of Impacts Related to the Loss of Soil for the Main Mine Adit (Adit A) (Pre-mitigation)*

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The loss of soil will be confined within the footprint of the site proposed for Adit. This loss is relatively small and will not significantly affect the agricultural potential in the surrounding area; however, possible indirect downstream impacts are likely (pre-mitigation).
Duration	Long-term	Will continue as long as coal extraction takes place and to a lesser degree post-closure.
Scale	17ha +	The entire footprint of Adit A will be cleared and utilised and possible indirect downstream impacts. However, the site boundary should be strictly controlled.
Frequency	Continuous	The presence of infrastructure development would have a continuous impact.
Likelihood	Likely	Will occur as a result of site clearing during the construction phase.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The soil resource to be affected is fragile and difficult to restore.		
Significant Rating Before Mitigation		
Major Negative Impact		

Table 9.3 *Rating of Impacts Related to the Loss of Soil for the Ventilation Adit (Adit B) (Pre-mitigation)*

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the footprint of the site proposed for Adit B only. This loss is relatively small and will not significantly affect the agricultural potential in the surrounding area; however, possible indirect downstream impacts are likely (pre-mitigation).
Duration	Long-term	Will continue as long as coal extraction takes place and to a lesser degree post-closure.
Scale	500m² +	Majority of the Adit B footprint will be cleared and utilised and possible indirect downstream impacts. However, the site boundary and planned access routes should be strictly controlled.
Frequency	Continuous	The presence of infrastructure development would have a continuous impact.
Likelihood	Likely	Will occur as a result of site clearing during the construction phase.
Magnitude		
Medium Magnitude		

Sensitivity/Vulnerability/Importance of the Resource/Receptor
Medium Sensitivity
The soil resource to be affected is fragile and difficult to restore.
Significant Rating Before Mitigation
Moderate Negative Impact

Table 9.4 ***Rating of Impacts Related to the Loss of Soil for the Overland Conveyor System (Pre-mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the footprint of the route proposed overland conveyor only. This loss is relatively small and will not significantly affect the agricultural potential in the surrounding area; however, possible indirect downstream impacts are likely (pre-mitigation).
Duration	Long-term	Will continue as long as coal extraction takes place and to a lesser degree post-closure.
Scale	26.9 ha +	The entire footprint of the route proposed for the overland conveyor corridor will be cleared and utilised and possible indirect downstream impacts.
Frequency	Continuous	The presence of infrastructure development would have a continuous impact.
Likelihood	Likely	Will occur as a result of site clearing during the construction phase.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium Sensitivity		
Loss of soil will not be as severe or as permanent as for the adit sites.		
Significant Rating Before Mitigation		
Moderate Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact.

Main Mine Adit (Adit A)

- All usable (non-plinthite) soil material to be stripped and stored for rehabilitation. The average depth of usable topsoil can be equated to the depth per map unit as shown in *Chapter 7*. The depth of stockpiling is not covered by any regulations or even guidelines (Coaltech, 2007); however, the depth of stockpile should ideally not exceed 2.5 to 3m. Soil will be stockpiled separately from any underlying spoil material and cross-contamination will not be allowed. The soil and spoil stockpiles will be stabilised and restricted on the downslope side to avoid erosion of the stockpiles by water runoff. The stockpiles will be re-vegetated using a

creeping indigenous grass seeding to ensure stability as well as possible organic material accumulation.

The amount of usable (non-plinthite) soil material stripped and stored for rehabilitation purposes will be less for the overland conveyor system than for the Adits A and B. Reason being is that construction of foundations for the proposed overland conveyor system and establishment of the associated gravel service road will not involve deep excavation or removal of the whole profile and underlying material.

- Wetland soils (map unit Tu) will be avoided as far as possible. This is important so as to ensure that contamination of natural drainage flow paths and subsequent downstream sediment transport (possibly with coal contamination) does not occur. Where possible, a buffer zone of at least 30m will be established next to all stream beds.

  For the overland conveyor system, detailed design and construction will ensure that water flow in wetlands and streams is unhindered. Furthermore, watercourse embankments will be adequately stabilised so as to ensure long-term stability and avoid the transport of sediment downstream.

- Clearing of vegetation in any given area will only occur immediately before construction is due to commence in that area. Medium to long-term exposure of open bare soil surfaces will be avoided, so as to avert the risk of water runoff induced erosion. Although the prevailing soil erosion hazard is not high, where surface vegetation is removed (for example to create roads or access ways), measures will be put in place so as to prevent excess surface water flow (*viz.* the inclusion of cut-off channels, culverts etc.). Such structures will need to be designed by a transport engineer with specialist knowledge.

  Slopes along the conveyor route are not excessive (range of 2 to 6% on average), so increased surface water flow speeds will unlikely be a problem. However, distance of flow can result in erosion problems even on gentle slopes. As such, water will be directed off the road at regular intervals (such measures also to be specified and applied by a roads engineer).

Residual Impact (Post Mitigation)

As such, given that the above mentioned mitigation/management measures are implemented, construction of the following Project components will have the following post-mitigation (residual) impact significance:

- **Main mine adit (Adit A)** – while the disturbance and subsequent replacement of the soil resource will lead to a deterioration in agricultural potential, soil replacement increases the possibility that soils could eventually be used for arable production, although it is more likely that

only grazing of livestock would be possible. As such, the residual impact can be considered a "**Moderate Negative Impact**" (refer to *Table 9.5* overleaf).

- **Ventilation adit (Adit B)** – while the disturbance and subsequent replacement of the soil resource will lead to a deterioration in agricultural potential, the small area involved, as well as the prevailing conditions (steep slopes, rocks, shallow soils) in the vicinity of Adit B, means that as long as rehabilitation is carried out the residual impact can be considered a "**Minor Negative Impact**" (refer to *Table 9.5* overleaf).

- **Overland conveyor system** – the limited width of the overland conveyor system, along with the fact that only a thin layer of topsoil will be disturbed for the maintenance road, will mean that successful post-mining rehabilitation is possible. The impact from the construction of the overland conveyor system is therefore considered a "**Minor Negative Impact**" (refer to *Table 9.7* overleaf).

Table 9.5 ***Rating of Impacts Related to the Loss of Soil for the Main Mine Adit (Adit A) (Post-mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the footprint of the site proposed for Adit A only.
Duration	Long-term	Will continue as long as coal extraction takes place and to a lesser degree post-closure.
Scale	17 ha	The entire footprint of Adit A will be cleared and utilised; however, minimisation of the downstream impacts of the development activities can reduce the scale of this impact.
Frequency	Continuous	The presence of infrastructure development would have a continuous impact.
Likelihood	Possible	Will occur as a result of site clearing during the construction phase; however, mitigation applied to clearing activities and preservation of soil resources will reduce the likelihood of impacts.
Magnitude		
Medium Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

Table 9.6 ***Rating of Impacts Related to the Loss of Soil for the Ventilation Adit (Adit B) (Post-mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the footprint of the site proposed for Adit B only.
Duration	Long-term	Will continue as long as coal extraction takes place and to a lesser degree post-closure.
Scale	500m^2	Majority of the Adit B footprint will be cleared and utilised; however, minimisation of the downstream impacts of the development activities can reduce the scale of this impact

Frequency	Continuous	The presence of infrastructure development would have a continuous impact.
Likelihood	Possible	Will occur as a result of site clearing during the construction phase; however, mitigation applied to clearing activities and preservation of soil resources will reduce the likelihood of impacts. Furthermore, given the baseline conditions (steep slopes, rocks, shallow soils) in the vicinity of Adit B, restoration of the footprint means that a post-closure landuse/state to near pre-Project baseline is possible.

Magnitude
Small Magnitude
Significant Rating After Mitigation
Minor Negative Impact

Table 9.7 ***Rating of Impacts Related to the Loss of Soil for the Overland Conveyor System (Post-mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the footprint of the route proposed overland conveyor only.
Duration	Long-term	Will continue as long as coal extraction takes place and to a lesser degree post-closure.
Scale	26.9 ha	The entire footprint of the route proposed for the overland conveyor corridor will be cleared and utilised; however, minimisation of the downstream impacts of the development activities can reduce the scale of this impact.
Frequency	Continuous	The presence of infrastructure development would have a continuous impact.
Likelihood	Possible	Will occur as a result of site clearing during the construction phase; however, mitigation applied to clearing activities and preservation of soil resources will reduce the likelihood of impacts. Furthermore, given that the amount of soil material stripped and stored for rehabilitation purposes will be less for the overland conveyor system than for the Adits A and B means that successful post-mining rehabilitation is possible.

Magnitude
Small Magnitude
Significant Rating After Mitigation
Minor Negative Impact

9.4 IMPACTS ON SURFACE WATER

9.4.1 Impacts to Surface Water Quality as a Result of the Activities at Main Mine Adit (Adit A)

Description of the Baseline Environment

Water quality in the Study Area, as well as downstream of the Study Area in the Ohlelo catchments, is compared to the derived screening levels detailed in

Chapter 4. Water quality within the Ohlelo River catchment is, in general, within the proposed RQWO.

ARD reactions related to mining of sulphidic material, and the presence of abandoned mines in this catchment, would be expected to result in decreased pH and increased sulphate concentrations in the catchment.

Sulphate concentrations increase downstream in the Ohlelo River, from sampling location C1 to C4, and pH decreases from location C2 to C4, with highest sulphate and lowest pH being detected in sample C4. This could indicate a slight ARD related effect due to mining activities in the catchment. However, dilution by the Hlelo River appears to limit the extent of this effect to the lower reaches of the Hlelo River.

Proposed Project Activities

The following activities which may be associated with the proposed main mine adit, have the potential to cause surface water contamination:

- *Land Clearing:* Earthworks associated with construction activities, primarily at the site of the main mine adit excavation.

- *Overburden Dumping*: The overburden is anticipated to contain 108,000m^3 of material consisting of sandstone (~70%), weathered material (~15-20%), siltstone (~5-8%), dolerite (~2%), carbonaceous shale (~1.5%) and potentially small amounts of coal from the Alfred seam (~1.3-1.9%). No geochemical data is currently available from which to estimate the chemistry of water leaching from overburden rocks, although the waste rocks to be dumped are relatively inert. The exposure of pyrite-bearing coal via mining activities may lead to oxidation of metal sulphides, leading to a reduction of pH and the establishment of acidic conditions causing leaching of metals (acid rock drainage). Where neutralising minerals occur in the material these may offset the acidity so produced. The pH of the resultant leachate will be influenced by the relative proportions and reaction rates of acid-generating and acid-neutralising minerals present in the material.

- *Coal Dust Fallout*: Rainfall that interacts with coal dust and sweepings which have fallen off the conveyor can become contaminated and adversely affect groundwater and surface water quality.

- *A Sanitation System for 300 Mine Workers, including a Sewage Treatment Plant with an associated Sewage Sludge Treatment Facility:* Untreated sewage will result in nutrient loading of streams and elevated levels of *E. Coli*.

- *Storage of Chemical and Paints as well as Storage of Fuel and Oil in a Depot accommodating a Cumulative Volume of between 80 to 500m^3:* Fuel storage and dispensing, and fuel/oil/paint spillages from maintenance workshops and

vehicle wash bays may result in soil contamination and resultant localised elevated levels of Soaps, Oil and Grease in ground and surface waters. The risk of a spill or chronic low level discharge can affect water quality.

- *The Washing of Mining Equipment and Light Duty Vehicles in a Wash Bay:* As above.

- *The Temporary Storage of Waste in Facilities to Accommodate General and Hazardous Waste:* May result in soil contamination and resultant localised elevated levels of Soaps, Oil and Grease (SOG) and heavy metals in ground and surface waters.

Sensitive Receptors

Sensitive receptors that may be affected by adverse changes to the quality of surface water include communities reliant on surface water as drinking water. Surface water abstraction points are located in the Yende (one) and Kanluka (two) communities.

In addition, the biodiversity study shows the sensitivity of the Ohlelo system to be high; aquatic macro-invertebrate integrity indicated generally few modifications, and the PES of the ichthyofauna assemblage ranged from near natural to moderately modified.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from the proposed mining activities on the surface water quality at Adit A will be a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.21*).

Table 9.8 ***Rating of Impacts Related to Surface Water Quality at Adit A (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The sulphate plume related to the overburden dump and the crushing and conveyor belt area is simulated in the groundwater study to remain localised around Adit A. Contamination of surface waters will be more widespread than groundwater, although present sampling results show water quality deterioration in the catchment is not regional.
Duration	Long-term	The most conservative of the order-of-magnitude estimates of the duration of oxidation of sulphide samples and potential resulting acid rock drainage suggest at least 60 years.
Scale	Altered	The interaction of surface/rain water with coal on conveyors, handling yards and potentially the overburden dump, could lead to the contamination of surface water, especially through groundwater/surface water interaction.
Frequency	Continuous	The risk for the contamination of surface water would continue for the duration of mining, overburden dumping and coal transport/storage until the site is rehabilitated post-closure.

Likelihood	Likely	Given the presence of sulphides in coal material, it is likely that surface water quality will be adversely affected by the generation of sulphates, as well as increased turbidity from surface runoff.
Magnitude		
High Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Surface- and groundwater resources are used for domestic water supply and stock watering, and support aquatic ecology in riverine and wetland habitats.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be implemented to reduce the significance of the impact of the proposed Project to surface water quality at Adit A:

- The proposed Project has committed to a policy of Zero Effluent Discharge. This policy commitment will be maintained and enforced. In addition, Project activities will be routinely audited to ensure this policy commitment is maintained.

- Appropriate management of dust and sweepings and the construction of hard-standing to minimise potential runoff and interaction of water with coal in the Study Area.

- Best-practice water management will be applied at the adit, e.g. clean- and dirty water separation and appropriate containment of dirty water.

- Dirty water will be recycled as far as practicable; otherwise to be evaporated.

- Prevention of the erosion or leaching of materials from any residue deposit or stockpiles from any area and contain material or substance so eroded or leached in pollution control dams, or stormwater control dams.

- All containment facilities used to store contaminated water will be lined.

- Inbuilt controls in the Project design will include the separation of clean and dirty runoff water; wash bays for cleaning of light and heavy vehicles will be installed that have both silt ponds and oily water separators; fuel storage and dispensing areas will be built as per the Project description (bunding, hardstanding, etc.); temporary waste areas will be hardstanding, and the facility for the temporary storage of hazardous wastes will be covered by a roof.

- Rehabilitation of the adit after mine closure to limit on-going risk of water contamination.

Residual Impact (Post-mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact to water quality at Adit A will be a '**Moderate Negative Impact**' post mitigation (*Table 9.22*).

Table 9.9 ***Rating of Residual Impacts Related to Surface Water Quality at Adit A (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Unchanged.
Duration	Long-term	Unchanged.
Scale	Altered	Implementation of the proposed mitigation measures will reduce the potential for contamination of water but will not prevent contamination of water.
Frequency	Constant	The risk for the contamination of water would continue for the duration of mining, overburden dumping and coal transport/storage, irrespective of mitigation measures implemented.
Likelihood	Likely	The presence of coal handling facilities at surface is likely to result in contamination of water.
Magnitude		
Medium Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

9.4.2 *Impacts on the Quality of Surface Water Resources associated with the Proposed Ventilation Adit (Adit B)*

Description of the Baseline Environment

The site proposed for Adit B is located within the upper reaches of quaternary catchment W51B, which largely drains in an easterly direction to join the Mpundu River, which subsequently discharges into the Heyshope Dam. Kangra Coal's current operations at Maquasa and the communities of Driefontein and St Helena are respectively located in the north and north-west of this catchment.

The Adit B site is crossed by small streams and floodlines. The slope of the site is steep (an overall average slope of approx. 20%). The site is undeveloped, in a rural environment.

Proposed Project Activities and Impacts

Activities associated with the construction of the Ventilation Adit (Adit B) that could impact on surface water features, include the construction of an access road to the proposed site.

The Adit will be constructed from below the ground surface and no coal product will be brought to ground surface at Adit B.

Sensitive Receptors

Tributaries identified on the site proposed for Adit B contribute towards run-off to the larger tributaries of the Mpundu River, which subsequently drains into the Heyshope Dam. Furthermore, small rural settlements are located downstream from the proposed Adit B site. These communities may potentially use water from the tributary originating from a natural spring.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from the proposed mining activities on the surface water quality at Adit B will be '**Minor Negative Impact**' (pre-mitigation) (*Table 9.10*).

Table 9.10 ***Rating of Impacts Related to Surface Water Quality associated with the Proposed Ventilation Adit (Adit B) (Pre-mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Erosion from the establishment of access roads will be minor and the extent of the impact will be limited to receptors immediately downstream from the proposed Adit B site.
Duration	Long-term (10 to 20 years)	For life of mine, although the construction of the adit will happen after the construction of Adit A.
Scale	Local	Downstream to immediate receptors, following dilution of sediment will result in the impact becoming negligible. The footprint of the actual ventilation shaft is small.
Frequency	After rainfall events	Erosion would occur during and directly after rainfall events.
Likelihood	Likely (prevalent in the summer months)	Erosion of the access road (pre-mitigation) would likely occur, mainly during the summer months.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low Sensitivity		
Although a small spring likely acts as a water source for a community down-slope of the proposed adit B, sediment loadings as a result of erosion from the access road is likely to be minimal, and the receptor will likely not be affected. Construction of the adit B infrastructure is not major – this includes one shaft built from below ground surface.		
Significant Rating Before Mitigation		
Minor Negative Impact		

Mitigation/Management Measures

The following mitigation/management measures will be implemented so as to reduce the impact:

- During design and construction of the access road to the adit B site, stormwater control measures (*viz*. flow retardation structures) will be provided to minimise the impact associated with erosion. Flow retardation structures will control run-off velocities (and subsequent erosion) by converting the flow pattern to sheet flow.

- During the construction phase, temporary stormwater control berms will be placed on the downstream perimeter of the Adit B footprint, so as to minimise silt ingress into the receiving tributaries. Over flow from the temporary berm should be relatively clean.

- Construction of Adit B and associated access road will (as far as possible) take place during the winter months. The Adit B access road is to follow the alignment of existing tracks to the greatest extent possible.

- The footprint of Adit B is will be kept as small as possible. During construction, laydown areas for construction equipment, vehicles etc. will be demarcated and no access outside of the demarcated area will be allowed.

- The location of the actual ventilation adit will be located outside of the calculated 1:50 year floodline (refer to the Specialist Surface Water Study; *Annex C.8*).

Residual Impact (Post Mitigation)

Based on the implementation of the proposed mitigation measures, the impact from the proposed mining activities on the surface water quality at Adit B will be a '**Negligible Negative Impact'** (post-mitigation) (*Table 9.11*).

Table 9.11 Rating of Impacts Related to Surface Water Resources associated with the Proposed Ventilation Adit (Adit B) (Post-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Erosion from the establishment of access roads will be minor and the extent of the impact will be limited to receptors immediately downstream from the proposed Adit B site.
Duration	Long-term (10 to 20 years)	For life of mine, although the adit B will be constructed after the construction of the main mine adit.

Scale	Local	Mitigation/management measures will decrease the risk of erosion as a result of the access road. Maintaining as small a footprint as possible will also further reduce the risk of erosion and soil disturbance to site.
Frequency	After rainfall events	Erosion would occur during and directly after rainfall events, but at a local scale.
Likelihood	Unlikely	Erosion control measures for the access road will reduce the likelihood of erosion.
Magnitude		
Negligible Magnitude		
Significant Rating Before Mitigation		
Negligible Negative Impact		

9.4.3 *Impacts to Streams, Wetlands and Surface Water Quality associated with the Proposed Overland Conveyor Route*

Description of the Baseline Environment

The route crosses six tributaries with defined streams and seven associated wetlands.

The baseline surface water quality of the Hlelo River catchment (W52A) was described above.

Water quality data for the Assegaai catchment area is, in general, within the proposed RQWO. The pH and sulphate concentrations in the Assegaai catchment are within the respective RWQO, showing no impact from ARD. Sulphate concentrations are, however notably higher in November when compared to August, indicating flushing of salts that accumulated on mining waste during the dry season by the early summer rains. The effect is most pronounced in samples SW3 and SW4. SW3 is the furthest downstream sample and would show effects from the catchment as a whole; SW4 is in the tributary that originates immediately to the south of the Maquasa East operations.

Proposed Project Activities

The following activities which may be associated with the conveyor have the potential to cause surface water contamination:

- *Construction of Conveyor:* The conveyor has to be installed over a number of stream crossings, all designated wetlands. Installation of the pylons and steelwork for the elevated conveyor will require the use of heavy construction equipment and an access road.

- *Transport of Mined Coal via Conveyor:* This will also include routine maintenance and clean-up of spills along the conveyor route. A maintenance road along the conveyor route will provide access to the conveyor for inspection and routine maintenance.

Sensitive Receptors

The proposed conveyor route and associated service road will cross the headwaters (mostly wetlands) of small tributaries feeding the Assegaai and Hlelo Rivers, which will have subsequent effects on receiving wetlands, the users of those wetlands (both social and ecological users). Wetlands are a key resource for the provision of ecosystem services (refer to the Biodiversity Specialist Study; *Annex C.2*).

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from the proposed conveyor route on surface water quality will be a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.12*).

Table 9.12 Rating of Impacts Related to Streams, Wetlands and Surface Water Quality associated with the Proposed Overland Conveyor System (Pre-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	Length of the proposed overland conveyor system is 7km and traverses seven tributaries and associated wetlands that form the headwaters of greater catchment areas in the region (the Assegaai and Hlelo Rivers).
Duration	Long-term	Impacts to tributaries and associated wetland systems would be immediate during the construction phase and will (if not effectively mitigated) result in deterioration to downstream systems over time. Furthermore, should impacted wetlands not be suitably rehabilitated, the effects will be long-term.
Scale	About 2 km	Total width of wetlands that will be affected by the construction of the overland conveyor and associated service road is approx. 2km.
Frequency	Continuous - for the full duration of the proposed Project	Should detailed design not take into account measures for unimpeded flow, the impact will be continuous for the duration of the LOM through to the decommissioning and closure phase.
Likelihood	Likely	The service roads and conveyor will be constructed within the overland conveyor servitude and will need to traverse wetland systems.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity /Importance		
Wetlands play a crucial role in the provision of ecosystem services. Furthermore, the tributaries and associated wetlands that the proposed overland conveyor system will traverse are at the headwaters of major catchments (the Ohlelo River and Assegaai River).		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

When the gravel service road and conveyor crosses the ***wetland to the north of the Kransbank Private Nature Reserve*** the following mitigation measures will be adopted:

- The contractor's access path of no more than 5m wide comprising of steel tracks laid on plastic sheeting over a geofabric should be installed through the wetland systems where piles are to be installed. Once construction of the overland system is completed, the temporary construction "roadway" should be removed and vegetation re-instated. Vegetation re-instatement should be undertaken by a reputable ecologist.

- As the road approaches the 1:100 year floodline adjacent to the wetland, it will be diverted out to district road D2548.

- The access road that runs between the conveyor corridor and the district road will be unfenced, and built to the same standard as the conveyor gravel service road.

- The fence that restricts access to the conveyor corridor, including the service road, will come to an end outside the 1:100 year floodline as the conveyor gantry ramps up to cross the wetland.

- The gantry support structure consists of pylons that will be spaced approximately 23m apart within the 1:100 year floodline and wetland, which is the maximum distance they can be spaced to provide support to the structure.

- The base footing of each pylon will measure approximately 4m x 2m, and will be established lengthwise, parallel to the flow in wetlands.

- From these base footings, two columns will extend from each up to support the gantry.

The following environmental precaution measures will be adopted for ***other water/river crossings***:

- Unlike the crossing detailed above, all other water crossings occur within a defined valley.

- Rectangular culverts will be installed in parallel (lengthwise in line with the flow).

- Culverts will span the distance between the 1:100 year floodlines so that no damming occurs during flood conditions.

- Erosion protection gabion structures will be installed at the entrance and exit points of culverts. "Reno" mattresses will also be installed so as to reduce flow velocities and turbulence.

- The service road will be narrowed to one lane (approximately 4m) over water crossings.

- In the operational phase, the entire raised section which will have a bunded concrete floor, will contain any product (coal) spillages. The spillages will be swept to concrete bunded collection areas placed at ground level well outside of the 1:100-year flood level, on both sides of the crossing to shorten the sweep length. Spilled coal will be collected and returned to the Main Mine Adit.

Residual Impact (Post-mitigation)

Based on the implementation of the proposed mitigation measures, the impact from the proposed conveyor on surface water quality will be a '**Moderate Negative Impact'** (post-mitigation) (*Table 9.13*).

Table 9.13 ***Rating of Impacts Related to Rivers, Streams and Surface Water Quality associated with the Proposed Overland Conveyor System (Post-mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	As above
Duration	Long-term	As above
Scale	Less than 2 km	As above
Frequency	Periodic	Unimpeded flow during operations, along with appropriate design of the conveyor service road, will decrease the risk of impeded flow and impacts to water quality as a result of spillages.
Likelihood	Possible	With mitigation, the likelihood is possible.
Magnitude		
Moderate Magnitude		
Significant Rating Before Mitigation		
Moderate Negative Impact		

9.4.4 Impacts of Reduced Baseflow on Surface Water and Wetlands

Refer to the Groundwater Impacts Section (*Section 9.5.3 Page 9-38*).

9.4.5 Impacts to the Main Mine Adit (Adit A) as a result of Stormwater Runoff

Description of the Baseline Environment

The site proposed for the Main Mine Adit (Adit A) is located within quaternary river catchment areas W52A on the Ohlelo River and its tributaries. The river flows on the western boundary of the site, proposed for

Adit A, has a narrow, overgrown flow channel. In addition to the Ohlelo River, a number of small tributaries that drain the hillside to the north east bisect the site. All these tributaries are non-perennial whereas the Ohlelo River is perennial.

Flood peaks and volumes have been calculated for the Ohlelo River and associated tributaries that may affect infrastructure proposed on the Adit A site, based on the catchment characteristics. Based on the calculations of flood peaks and volumes, floodlines have been determined for the Ohlelo River and for the larger tributary that crosses the site on the eastern boundary. Values for flood peaks, flood volumes, and floodline boundaries are provided in the Specialist Surface Water Report (*Annex C.8*).

Proposed Project Activities

- *Clean Water Cut-off Berms:* A clean water cut-off berm is proposed up slope of the proposed Adit A site, to divert flow from the catchments to the south western and northern ends of the proposed Main Mine adit site into the water course.

- *Storage of Stormwater in two Stormwater Ponds:* Two storm water ponds of capacity 8,200m^3 and 13,000m^3 pond. The total storage thus provided is 21,200m^3. The provided capacity is 50% more than the estimated required capacity, based on a 1:50 year rainfall event. A groundwater balancing dam, having an approximate capacity of 4,000m^3, adds a further margin of safety.

Sensitive Receptors

In this case, the sensitive receptor would be the adit itself. Uncontrolled stormwater could threaten adit infrastructure, and flooding of the adit area could cause contamination and dirty water discharge into the surrounding environment. In this case, the sensitive receptors are as for the impacts as a result of adit activities on surface water quality, as described above.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from floodwaters on the adit itself, and on the water quality of the area surrounding the adit as a result of stormwater discharges, will be a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.14*).

Table 9.14 Rating of Impacts as a Result of Stormwater Discharges on Adit A, and into the Surrounding Environment (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**

Extent	Local to regional	Without mitigation, the effects of flood waters may cause contamination to surface waters, which will impact downstream water quality, possibly to the confluence with the Ohlelo River.
Duration	Medium-term	Although rainfall/runoff is of short duration, contamination downstream will be longer term.
Scale	Altered	To the confluence with the Ohlelo River as a worst case scenario.
Frequency	Periodic	The risk for the contamination of surface water would continue for the duration of mining, overburden dumping and coal transport/storage until the site is rehabilitated post-closure.
Likelihood	Definite	The Project area does experience high intensity/short duration rainfall events.
Magnitude		
High Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Surface- and groundwater resources are used for domestic water supply and stock watering, and support aquatic ecology in riverine and wetland habitats.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

- Mitigation measures will be evaluated in terms of the requirements of GN.R704 (DWAF, 1995) and guidelines in the Best Practice Guideline G1: Stormwater Management, DWAF, August 2006.

- During the construction phase, temporary stormwater control berms will be placed on the downstream perimeter of the Adit A footprint, so as to minimise silt ingress into the Ohlelo River and associated tributaries. Over flow from the temporary berm will be relatively clean.

- The minimum required dam capacity to retain a 1:50 year stormwater run-off event for the dirty water catchment was calculated in the Specialist Surface water report (*Annex C.8*).

- It is a requirement that all facilities associated with the Main Mine Adit be placed above the estimated 1:100 year floodline of the Ohlelo River.

- In-built controls in the Project design (refer to *Chapter 3*) include the adequate design of drains, ditches, oil/water separators, and silt traps, the bunding of major contamination sources (fuel depot, temporary hazardous waste storage area), roofing of temporary hazardous waste areas etc.

Residual Impact (Post-mitigation)

Based on the implementation of the proposed mitigation measures, the impact of stormwater on the adit itself, and on the surrounding environment as a result of stormwater discharges, will be a '**Minor Negative Impact**' (*Table 9.15*).

Table 9.15 Rating of Impacts as a Result of Stormwater Discharges on Adit A, and into the Surrounding Environment (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	As above.
Duration	Long-term	As above.
Scale	Altered	To the confluence with the Ohlelo River as a worst case scenario
Frequency	Infrequent	With mitigation, the risk of contamination of surface water would be less frequent, especially with safety factors built I to the design of flood control infrastructure.
Likelihood	Possible	With mitigation, the likelihood of flood damage and contamination will decrease.
Magnitude		
Medium Magnitude		
Significant Rating After Mitigation		
Minor Negative Impact		

9.5 IMPACTS ON GROUNDWATER

To understand the baseline geohydrology of the Study Area, a Conceptual Hydrogeological Model was described, as provided in *Chapter 7*. This model thus provides an understanding of groundwater baseline conditions, pathways for groundwater flow, and users of that groundwater. In order to *identify* potential impacts to groundwater, geochemical sampling of potential contamination sources was undertaken; these potential sources include coal discard, coal product, and waste rock. A detailed Numerical Groundwater Model was then created, based on the Conceptual Hydrogeological Model, and using the results of the geochemical assessment, to model potential sources, pathways and receptors (users); in this way potential impacts to groundwater could be *predicted*.

The identification and prediction of potential impacts to groundwater is described in this *Section*.

9.5.2 *Identification of Potential Impacts to Groundwater*

Geochemical Assessment

Four samples each of discard, product and raw coal from the GUST seam were analysed by static and kinetic testing methods to evaluate the potential for ARD and metal leaching. The samples represented coal from four geographic locations in the investigation area.

Detailed results of the geochemical assessment are provided in *Chapter 5* of the Specialist Groundwater Report (*Annex C.3*).

The following is a summary of the geochemical assessment findings:

- The presence of pyrite in each of the four composite samples indicates a potential for the materials to generate acidity. The presence of calcite and dolomite indicates the potential for some degree of acid neutralisation.

- Using coal assay data, an assessment of the sulphur content in coal was completed. Although further testing is required, based on sulphur contents, the following materials may be a high risk for ARD:

    - GusT seam discard in the Kusipongo area;
    - GusT washed and stockpiled coal; and
    - GusB washed and stockpiled coal.

- The acid generation potential of discard and product samples, using acid base accounting (ABA), show a negative Net Neutralising Potential and a Neutralising Potential Ration of <1, signifying acid generation is likely. These results were also confirmed through ABA testing of samples of coal and interburden by GCS (2013), which indicate that coal from the area is likely to be acid generating.

- ABA testing of country rock samples (overburden and floor) show low total sulphur contents (<0.14 %S), indicating a low acid potential, but also have a low neutralising potential. Country rock is therefore unlikely to provide much buffering to acid generated by coal material. However, it should be noted that there is a large volume of country rock compared to coal, and the country rock will buffer the acid generated for some time.

- "First flush" results from a humidity cell test, used to identify contaminants of concern (in a relative sense only and not the absolute concentration of these contaminants), show a correlation between the pH of the first flush and the concentrations of major ions and trace elements. The lowest salt and trace element concentrations are measured in KK104, which has the highest pH, and the highest salt and trace element concentrations are detected in KK102 and KK105, which have the lowest pH in the first flush leach.

  The leach test normalised data were compared to the background water quality normalised data, and those analytes in the normalised leach tests which exceeded two standard deviations from the mean of the normalised background water quality were identified as contaminants of concern. Based on this comparison, the following parameters are identified as contaminants of concern:

    - Sulphate
    - Iron
    - Cobalt
    - Nickel

Manganese and aluminium, which are commonly associated with ARD related to coal mines, are not identified as contaminants of concern for the following reasons:

- They are naturally present in water in the area, particularly groundwater;

- The rate of dissolution of aluminium containing minerals is generally slow, therefore it may not be dissolved in a short term leach; and/or

- The amount of readily soluble aluminium or manganese present in the coal samples is limited.

The identification of sulphate, iron, cobalt and nickel as contaminants of concern is supported by the following additional information:

- Sample NGOH83, analysed as part of the hydrocensus shows concentrations of sulphate (754 mg/L), iron (14.8 mg/L), nickel (7.1 mg/L) and cobalt (3.99 mg/L) well above the average background groundwater concentrations for these parameters.

- Sulphate, iron, nickel, arsenic, aluminium, manganese and antimony were identified by GCS (2013) as elements that could result in non-compliant drainage/seepage from the Maquasa West opencast mine.

- Humidity cell tests were conducted in order to determine the long term acid generation and leaching potential of the composite Kangra Coal samples. Although the initial pH of the samples was generally low, the pH soon recovers to near neutral levels of between 7 and 8, verifying the presence of pH neutralising minerals such as carbonates which react with acid generated by oxidation of sulphide minerals.

- Production rates for manganese, nickel and zinc are initially high, correlated with the low initial pH, but the rates then decrease rapidly, and by week 10, the rates are less than 1 mg/kg/week. If the samples become acid, it is likely that the rates of metal dissolution will increase significantly as the solubility of these metals is controlled largely by pH.

  The proportion of sulphur and calcium and magnesium leached from each of the samples was measured in the long term humidity cell test. The sulphur appears to leach relatively quickly, with between 9 and 22 % of the sulphur removed from the sample within 10 weeks. Calcium and magnesium react far more slowly in these samples. These samples are likely to become acid. However, based on the current consumption rates, some neutralisation potential will remain in the sample following depletion of all sulphides. This suggests that the acid generation phase may have a limited lifespan.

Hydrogeological Conceptual Site Model

A hydrogeological conceptual site model was developed to describe the current understanding of the hydrogeological system in the Study Area in terms of potential sources of groundwater and related surface water impact, receptors that may be affected by impacts to groundwater and surface water, and the pathways that could potentially connect them. No risk exists if a source of impact is not linked to a potential receptor.

Potential sources included in the model include the overburden dump, coal dust depositions within the crushing and conveyor area, stormwater management ponds and underground workings. Neither the processing plant nor the discard dump were included as source terms in the model, as existing infrastructure at the Savmore Colliery will be used.

Geochemical modelling, using the data from geochemical samples (as described above) was used to estimate source terms, i.e. expected concentrations in water leaching from the identified sources. The results of such geochemical modelling are described in detail in the Specialist Groundwater Report (*Annex C.3*).

It should be noted that the source terms are the concentrations of the contaminants of concern expected in the leachate in contact with the waste material. Once the leachate enters an aquifer or surface water environment, concentrations of contaminants of concern will decrease due to the following processes:

- Dilution by receiving water body;
- Neutralisation reactions with minerals in sediments/aquifer rocks, resulting in an increase in pH and corresponding decrease in metal (e.g. nickel, iron, manganese) concentrations;
- Adsorption of metals onto minerals in sediments/aquifer rocks; and
- Change in redox conditions to more oxidising/reducing conditions, resulting in precipitation of some minerals.

Due to these processes, concentrations of the contaminant observed in groundwater or surface water are usually significantly less than the calculated source term.

Receptors were identified during the hydrocensus and are described in the groundwater baseline (*Chapter 7*).

In terms of potential migration pathways, contaminated water can migrate from identified sources to receptors in the following ways:

- Water that becomes contaminated through interaction with mine workings, the overburden dump, or coal dust in the crushing yard can migrate into one of the identified water-bearing units. Perched, weathered and alluvial water-bearing units are likely most vulnerable to groundwater contamination but, as there is regional interconnection of the various water-bearing units, the fractured rock water-bearing unit could also become impacted. Contaminated groundwater can then follow the general direction of groundwater flow, or preferential flow paths, forming a contamination plume. Any water supply boreholes that penetrate this plume would be impacted by contaminated water.

- Groundwater feeds springs and provides base flow to streams and wetlands in the Kusipongo area. Contaminated groundwater originating at the identified sources can follow the general direction of groundwater flow or preferential flow paths, forming a contamination plume that can daylight at springs and feed base flow to streams and wetlands.

- Contaminated surface runoff from mine facilities at Adit A can potentially enter streams. This pathway will be largely mitigated by the construction of separate clean and dirty-water drainage systems.

The pathway links the contamination source with the potential receptors, and only in the case where the source and receptor are linked, environmental and human health risks can arise. This section details linkages between identified sources and receptors.

Potential source – pathway – receptor linkages are detailed in *Table 9.16*.

Table 9.16 Source - Pathway - Receptor Linkages

Potential Source	Pathway	Receptor
Contaminated seepage from interaction with mine workings, overburden dump and coal crushing and conveyor area	Groundwater which discharges as springs, into Ohlelo Stream and/or into wetlands	• Communities using water from the stream or springs for drinking, domestic purposes and stock watering • Natural ecosystems, e.g. in wetlands
Contaminated seepage from interaction with mine workings, overburden dump and coal crushing and conveyor area	Groundwater that migrates in water-bearing units and preferential pathways and is intersected in water-supply boreholes	• Communities using groundwater for drinking, domestic purpose and stock watering
Contaminated runoff from overburden dump and coal crushing and conveyor area	Potential for occasional releases into Ohlelo Stream	• Ohlelo stream and natural ecosystems in riparian zone • Communities using water from the stream for drinking, domestic purpose and stock watering

Regional Steady State Groundwater Flow Model

Regional scale steady state groundwater flow models were designed taking into consideration hydrogeological flow boundaries to incorporate a model domain large enough to simulate future mine expansions. The regional models were calibrated in steady state based on the available data, and baseline groundwater elevations and flow were simulated.

The results of the regional models were used to help determ suitable model boundaries and boundary conditions for the detailed two layer local model, which was used to simulate groundwater impacts due to the proposed Kusipongo underground mine and associated main mine adit (Adit A).

The setup and calibration of the local groundwater flow and transport models, as well as the modelling approach, is detailed in the Specialist Groundwater Report (*Annex C.3*).

9.5.3 Prediction of Potential Impacts to Groundwater

The impact assessment considered the potential impacts of the proposed Project activities on surface and groundwater resources, specifically groundwater level, groundwater quality, and surface water and wetland quality. These are described below:

Impacts Related to Mine Dewatering and Decant

This section deals specifically with impacts related to groundwater flowing into the underground workings.

Description of the Baseline Environment

Groundwater levels in the Study Area correlate closely to the topography. The Study Area is located largely on a topographically prominent ridge which runs roughly north-south, ranging in altitude from 1 500m to 1 800m, and Adit A is located in the base of a valley. Baseline groundwater levels are at a higher elevation than the proposed adit position in most parts of the proposed underground mine. The target coal seams are located within the fractured groundwater occurrence.

Proposed Project Activities

During mine operation, dewatering from sumps in underground operations and/or from boreholes will be required to remove groundwater from the workings and allow for safe mining conditions.

Following the completion of mining and the cessation of concomitant dewatering, mine voids will start to fill up and groundwater levels will begin to rebound. However, due to the position of Adit A at an elevation below the pre-mining groundwater levels of 1 800 mamsl, decant will occur at the adit and continue indefinitely.

Modelling indicates that the construction of Adit A at an elevation of 1 520mamsl as proposed will result in decant from the adit commencing in the year 2045 at a rate of approximately 20 200m^3/day, before stabilising in the year 2174 at a rate of 19 900m^3/day. Water quality during operation and initially post-closure will result in exceedances of the derived screening levels for parameters such as pH, sulphate and metals.

Decant at Adit A that is not captured through mine infrastructure is likely to flow directly into the Ohlelo Stream.

Sensitive Receptors

Contaminated decant water can potentially be released into the Ohlelo Stream, particularly post-closure when active water management has ceased, resulting in an impact to the Ohlelo Stream. The Ohlelo Stream is a water resource that is used for domestic water supply and stock watering, and it is a sensitive ecosystem that supports aquatic ecology in riverine and wetland habitats.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above the impacts related to dewatering and post-closure decant will be a '**Major Negative Impact**' during operation and post-closure without mitigation (refer to *Table 9.17*).

The groundwater model is currently based on a number of conservative assumptions and is not calibrated to aquifer stresses of a similar order of magnitude to those applied to it. This implies that reliability of the model predictions is relatively low. However, the model confidence is deemed sufficient to assess conservative impacts and make appropriate mitigation recommendations at the EIA stage of the project. The degree of confidence in this assessment is medium.

Table 9.17 Rating of Impacts Related to Groundwater Level (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Discharged decant water can affect downstream environment
Duration	Long-term	Discharge of impacted decant water may only begin post-closure but impacts will continue until water levels have rebounded and water quality has improved.
Scale	Notably altered	The Ohlelo Stream water quality will be affected by discharge of impacted decant water.
Frequency	Continuous	Decant from Adit A will be continuous
Likelihood	Likely	Dewatering will be required during mining, and as groundwater levels rebound to the level of Adit A post closure, decant will begin.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The Ohlelo Stream is a water resource that is used for domestic water supply and stock watering, and it is a sensitive ecosystem that supports aquatic ecology in riverine and wetland habitats.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Underground storage of groundwater in mined-out and abandoned sections of the underground mine in order to minimise mine inflow water that will need to be managed at Adit A during mine operation.

- Re-use of mine inflow water within the mine facilities, to limit uncontrolled discharges of water impacted by ARD into the surface water system during mine operation.

- Sealing of the adit at mine closure to prevent decant from the adit. However, if the seal fails, the impact of decant will be the same as if no seal was installed. For the purposes of this impact assessment, it is assumed that the seal will prevent groundwater decant from the adit. However, if this is not feasible, alternative water management strategies will be required, such as decant water treatment to acceptable standards prior to discharge into the environment. If the seal is permanent, water tables will recover to the pre-mining level and water will be discharged via the natural/present ways (e.g. springs). The water quality of the springs must be monitored.

- Practice clean/dirty water separation.

- Routinely refine, update and validate the conceptual and numerical models developed in this study by incorporation of on-going monitoring data. The model developed as part of this specialist groundwater investigation has relatively low confidence due to the data limitations and provides conservative predictions. If the model is updated with operational data, the confidence in predictions of impact can be increased, updated and translated into mine management practices, supporting risk management and post-closure planning.

Residual Impact (Post-mitigation)

The mitigation measures above may reduce the scale of the impact to altered, however the significance of the impact is expected to be '**Moderate Negative Impact**' (*Table 9.18*).

Table 9.18 Rating of Residual Impacts Related to Groundwater Level (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Unchanged.
Duration	Temporary	Discharge of impacted decant water should be prevented by underground water storage, re-use of dewatering water and sealing of the adit at mine closure.
Scale	Altered	A higher adit level or sealed adit will prevent decant from occurring or at least reduce decant volumes.
Frequency	Rare	Accidental discharges may occur.
Likelihood	Unlikely	Accidental discharges may occur.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

Impacts of Groundwater Level Change on Groundwater Users

This section details the impact of dewatering activities on groundwater levels and associated receptors.

Description of the Baseline Environment

Groundwater levels in the Study Area correlate closely to the topography. The study area is located on a topographically prominent ridge which runs roughly north-south, ranging in altitude from 1 500 to 1 800mamsl. Groundwater levels are frequently shallower at lower altitudes where they are responsible for the presence of numerous wetlands.

In the vicinity of the proposed mine adit, groundwater levels are between 1 480 and 1 520mamsl. Geochemical analyses of isotopes in groundwater, shallow perched aquifers and springs indicate that some springs have chemical signatures similar to groundwater, which suggests that these springs are fed by regional groundwater.

Proposed Project Activities

The establishment of Adit A at the proposed elevation, *viz.* at 1 520mamsl, and mining GUS and DUN coal seams located at depths between 20 and 350mbgl, will impact on groundwater levels during mining and post mine closure due to required dewatering.

During mine operation, dewatering from sumps in underground operations and/or from boreholes will reduce groundwater levels up to 5km from the planned Project footprint. Simulated drawdowns at private boreholes induced by dewatering activities for the proposed operations generally range from 5 to 15m, but are as high as 260m in one private borehole.

Following the completion of mining and the cessation of concomitant dewatering, mine voids will start to fill up and groundwater levels begin to rebound. Once the water level in the mine void reaches the adit elevation of 1 520mamsl, groundwater is expected to start decanting from the adit opening and groundwater levels are not expected to recover further.

Sensitive Receptors

A total of 20 privately owned boreholes were identified during the hydrocensus, of which five boreholes were identified as sensitive receptors as they are located in the vicinity of the planned underground mine. These five include one community borehole, on which a hand pump is installed, and four private boreholes, three with windmills and one with a submersible pump. Borehole depths could not be determined as the borehole head works were closed.

The simulated groundwater level drawdowns of 5 to 260m during operation can have significant adverse impacts on private water supplies by reducing the available head pressure, lowering the water level to below the pump intake depths, or lowering the water level below the bottom of boreholes causing them to dry up.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above the impact on groundwater levels will be a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.19*).

The extent, i.e.: radius of influence, of dewatering depends on the mine design (i.e.: position of shafts/declines) and mine schedule, as well as the hydraulic conductivity of the rocks. The mine can be designed in such a way as to minimise the extent of the impact, however changes to the mine schedule will provide no mitigation. The duration, scale and frequency of impacts to the groundwater levels depend on the life of mine (or active dewatering) as well as the hydraulic conductivity. The chances (likelihood) of groundwater levels lowering as a result of mine dewatering are certain (likely).

The groundwater model is currently based on a number of conservative assumptions and is not calibrated to aquifer stresses of a similar order of magnitude to those applied to it. This implies that reliability of the model predictions is relatively low. However, the model confidence is deemed sufficient to assess conservative impacts and make appropriate mitigation recommendations at the EIA stage of the project. The degree of confidence in this assessment is **medium**.

Table 9.19 Rating of Impacts Related to Groundwater Level (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Simulated drawdowns confined to adjacent & nearby properties.
Duration	Permanent	Drawdown of >5m anticipated to last beyond life of mine (19yrs) at the local scale.
Scale	Notably altered	Maximum drawdown exceeded 20m in two of six private boreholes.
Frequency	Constant	Dewatering will be continuous during mining and have a constant effect on groundwater levels.
Likelihood	Likely	Depressed groundwater levels will result from mine dewatering.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Farmers and communities in the vicinity of the mine are dependent on surface- and groundwater resources for domestic purposes and for their livelihoods. Limited numbers of boreholes are located within the radius of influence of the mine and will potentially be lost due to groundwater level drawdowns resulting in loss of water resource. Presence of dolerite sills may render certain boreholes isolated from effects of dewatering, however, this would need to be confirmed with monitoring. Post mining, groundwater levels will rise to the level of the adit and therefore pre-mining groundwater levels are not expected to be restored.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Sealing of the adit post-closure to prevent decant at adit and allow groundwater levels to recover. However, if the seal fails, the impact on groundwater levels will be the same as if no seal was installed. For the purposes of this impact assessment, it is assumed that the seal will prevent groundwater from decanting and allow groundwater levels to rebound.

- Groundwater levels in the vicinity of the planned mine should be monitored on a regular basis throughout construction, operation and post-closure phases. Mine dewatering volumes/rates should also be monitored

throughout the operational phase of the Project. The monitoring data should be stored in an appropriate data management tool/database.

- If impact is confirmed by monitoring, impacts to the community's and farmer's water supply must be mitigated by Kangra Coal providing an alternative reliable, clean water supply.

- Routinely refine, update and validate the conceptual and numerical models developed in this study by incorporation of on-going monitoring data. The model developed as part of this specialist groundwater investigation has relatively low confidence due to the data limitations and provides conservative predictions. If the model is updated with operational data, the confidence in predictions of impact can be increased, updated and translated into mine management practices, supporting planning of dewatering measures, risk management and post-closure planning.

Residual Impact (Post-mitigation)

The mitigation measures above may reduce the scale of the impact to altered, however the impact is expected to be a '**Moderate Negative Impact**' (*Table 9.20*).

By providing alternative good quality reliable water source to the affected communities and farmers this impact could be changed to a positive impact.

Table 9.20 Rating of Residual Impacts Related to Groundwater Level (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Unchanged.
Duration	Temporary	If mining results in loss of water resource to farmers and/or communities confirmed by monitoring, the client will provide alternative water source.
Scale	Altered	Sealing of the adit at mine closure will potentially allow groundwater levels to recover, however, the groundwater level drawdown due to mining induced dewatering during operation cannot be mitigated except by providing alternative water supply.
Frequency	Constant	Continuous dewatering will be required during mining.
Likelihood	Likely	Mining will take place at levels below the groundwater level hence it is likely that the groundwater levels will be impacted.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

Impacts on Water Quality

This section discusses the water quality impacts of the proposed Project.

Description of the Baseline Environment

Water quality in the mine lease area is compared to the derived screening levels detailed in *Chapter 4*. In general water quality is suitable for drinking and stock watering, and can support the local aquatic ecology.

There are a couple of exceptions, namely:

- Sample NGOH83 (Kangra Coal monitoring borehole) has low pH and concentrations of many ions and metals above the screening level. This exploration borehole is located adjacent to the current Maquasa West underground operations. The groundwater shows signs of impact by acid rock drainage, with low pH and elevated sulphate and metal concentrations.

- Iron and manganese occur above the derived surface water screening level in some spring samples. The elevated iron and manganese concentrations most likely reflect the presence of naturally reducing conditions in the aquifer, which result in mobilisation of these metals. Iron and manganese in near-neutral pH water typically precipitate out of solution on exposure to atmospheric conditions.

Proposed Project Activities

The following activities which may be associated with the proposed mine expansion have the potential to cause groundwater contamination:

- *Overburden Dumping*. The overburden is anticipated to contain 108,000m^3 of material consisting of sandstone (~70%), weathered material (~15-20%), siltstone (~5-8%), dolerite (~2%), carbonaceous shale (~1.5%) and potentially small amounts of coal from the Alfred seam (~1.3-1.9%). No geochemical data is currently available from which to estimate the chemistry of water leaching from overburden rocks, although the waste rocks to be dumped are relatively inert. The exposure of pyrite-bearing coal via mining activities may lead to oxidation of metal sulphides, leading to a reduction of pH and the establishment of acidic conditions causing leaching of metals (acid rock drainage). Where neutralising minerals occur in the material these may offset the acidity so produced. The pH of the resultant leachate will be influenced by the relative proportions and reaction rates of acid-generating and acid-neutralising minerals present in the material.

- *Coal Dust Fallout*. Rainfall that interacts with coal dust and sweepings which have fallen off the conveyor can become contaminated and adversely affect groundwater and surface water quality.

- *Underground Working*. Coal surfaces exposed to the atmosphere within underground workings can potentially generate acid rock drainage. Humidity in air and groundwater seepage running down walls can react

with coal surfaces. Both the GUS and DUN seams will be mined from Adit A, and coal remaining in the pillars and walls of these seams, as well as dust on the floor, can be exposed to the atmosphere. The open underground workings will be a source of contaminated water during operation and for a time period following closure, however water quality will probably improve once the workings are flooded. Given the acid generating potential of the rocks it is probable that sulphate and metals in the decant water will exceed the derived screening levels during operation and for some time after closure, however the water quality may improve as the underground workings are flooded.

- *A Sanitation System for 300 Mine Workers, including a Sewage Treatment Plant with an associated Sewage Sludge Treatment Facility*. Untreated sewage will result in nutrient loading of streams and elevated levels of *E. Coli*.

- *Storage of Chemical and Paints as well as Storage of Fuel and Oil in a Depot accommodating a Cumulative Volume of Between 80 to 500m³. F*uel storage and dispensing, and fuel/oil/paint spillages from maintenance workshops and vehicle wash bays may result in soil contamination and resultant localised elevated levels of Soaps, Oil and Grease in ground and surface waters. The risk of a spill or chronic low level discharge can affect water quality.

- *The Washing of Mining Equipment and Light Duty Vehicles in a Wash Bay.* As above.

- *The Temporary Storage of Waste in Facilities to Accommodate General and Hazardous Waste.* May result in soil contamination and resultant localised elevated levels of Soaps, oil and Grease (SOG) and heavy metals in ground and surface waters.

The identification of contaminants of concern is based on leach test data for the identified source terms, as well as on an analysis of Project activities. The following parameters are identified as contaminants of concern:

- Sulphate
- Iron
- Cobalt
- Nickel
- SOG

Sensitive Receptors

Sensitive receptors that may be affected by adverse changes to the quality of the groundwater include groundwater users (i.e.: borehole owners or communities reliant on boreholes), and users of surface water resources which are recharged from groundwater. Of the 20 privately owned boreholes identified, 5 are considered sensitive receptors, *viz*.: FB6, 7 8 and 13 belonging to C.L. Greyling, and FB2 at Twyfelhoek School, in the Yende Community.

Nearby surface water resources which may be fed by contaminated groundwater and are therefore at risk, include Ohlelo Stream and several springs as well as several water abstraction points used by local communities.

Nearby surface water abstraction points are located in the Yende (one) and Kanluka (two) communities. In addition to this, fourteen springs which occur in the area and which may be fed by groundwater were classified as moderately to highly vulnerable to pollution from mining activities.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above the impact from the proposed mining activities on the groundwater quality will be a '**Moderate Negative Impact**' pre-mitigation (refer to *Table 9.21*).

The groundwater model is currently based on a number of conservative assumptions and is not calibrated to aquifer stresses of a similar order of magnitude to those applied to it. This implies that reliability of the model predictions is relatively low. However, the model confidence is deemed sufficient to assess conservative impacts and make appropriate mitigation recommendations at the EIA stage of the project. The degree of confidence in this assessment is medium.

Table 9.21 Rating of Impacts Related to Groundwater Quality (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The sulphate plume related to the overburden dump and the crushing and conveyor belt area is simulated to remain localised around Adit A.
Duration	Long-term	The most conservative of the order-of-magnitude estimates of the duration of oxidation of sulphide samples and potential resulting acid rock drainage suggest at least 60 years.
Scale	Altered	The interaction of surface/rain water with coal on conveyors, handling yards and potentially the overburden dump, could lead to recharge of groundwater with sulphate-rich and alter groundwater quality beneath the sources.
Frequency	Continuous	The risk for the contamination of groundwater would continue for the duration of mining, overburden dumping and coal transport/storage until the site is rehabilitated post-closure.
Likelihood	Likely	Given the presence of sulphides in coal material, it is likely that groundwater quality will be adversely affected by the generation of sulphates.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Surface- and groundwater resources are used for domestic water supply and stock watering, and support aquatic ecology in riverine and wetland habitats.		
Significant Rating Before Mitigation		
Moderate Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be implemented to reduce the significance of the impact of the proposed Project to the groundwater quality:

- The proposed Project has committed to a policy of Zero Effluent Discharge. This policy commitment will be maintained and enforced. In addition, Project activities will be routinely audited to ensure this policy commitment is maintained.

- Appropriate management of dust and sweepings and the construction of hard-standing can be used to minimise potential runoff and interaction of water with coal in the Study Area.

- Apply best-practice water management at the adit, e.g. clean- and dirty water separation and appropriate containment of dirty water.

- Rehabilitation of the adit after mine closure to limit on-going risk of water contamination.

- Inbuilt controls in the Project design will include the separation of clean and dirty runoff water; wash bays for cleaning of light and heavy vehicles will be installed that have both silt ponds and oily water separators; and fuel storage and dispensing areas will be built as per the Project description (bunding, hardstanding, etc.).

Based on the relatively low confidence of the ARD assessment, the following additional investigations will be undertaken:

- Verify the metal leaching and neutralising potential of the overburden material (sandstone, clay, dolerite, and potentially small quantities of coal).

- Conduct kinetic field tests on waste rock material to determine the duration of oxidation (and hence potential surface and groundwater contamination).

- Subject to the results of the tests above, the waste management strategy will be reviewed.

Residual Impact (Post-mitigation)

The mitigation measures above will not change the significance of the impact to water quality which remains a '**Moderate Negative Impact**' (*Table 9.22*).

Table 9.22 ***Rating of Residual Impacts Related to Groundwater Quality (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Unchanged.
Duration	Long-term	Unchanged.
Scale	Altered	Implementation of the proposed mitigation measures will reduce the potential for contamination of water but will not prevent contamination of water.
Frequency	Constant	The risk for the contamination of water would continue for the duration of mining, overburden dumping and coal transport/storage, irrespective of mitigation measures implemented.
Likelihood	Likely	The presence of coal handling facilities at surface is likely to result in contamination of water.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

Impact of Reduced Baseflow on Surface Water and Wetlands

This section details the impacts of reduced groundwater baseflow on surface water courses and wetlands.

Description of the Baseline Environment

Numerous wetlands in the Study Area are fed by groundwater and surface water (streams, springs), which are in turn largely fed by groundwater from within the Study Area. Wetlands depend on water and have the potential to dry up as a result of the lowering of the groundwater table and the drying up of springs.

Proposed Project Activities

The establishment of Adit A at the proposed elevation, *viz*. at 1 520mamsl, and mining GUS and DUN coal seams located at depths between 20 and 350mbgl, will result in groundwater level drawdowns during mining and post mine closure due to required dewatering resulting in reduced baseflow to streams and wetlands.

Following the completion of mining and the cessation of concomitant dewatering, mine voids will start to fill up and groundwater levels begin to rebound. Once the water level in the mine void reaches the adit elevation of 1 520mamsl, groundwater is expected to start decanting from the adit opening and groundwater levels are not expected to recover further. Baseflow is therefore not expected to be reinstated after mine closure.

Sensitive Receptors

Numerous streams, springs and surface water abstraction points in the vicinity of the planned Adit A location were identified in the Study Area. The most prominent surface water feature is the Ohlelo Stream flowing closely past the proposed Adit A location. Springs and streams constitute the major water sources, being readily available throughout the year. Spring water and stream water is predominantly used for domestic drinking water supply purposes by most local communities, and for stock watering by local farmers.

Three community surface water abstraction points were identified in the study area, two in Kanluka Community and one in Yende Community. In addition to this, 14 springs, most of which are used for stock watering and as a source of drinking water, were identified as being moderately to highly vulnerable to mine dewatering and the resultant reduction of surface water flow.

Numerous wetlands are present within the Study Area, which were identified to have a range of anthropogenic and ecological services (SANBI/CSIR, 2010) (NSS, 2011). Furthermore, the Kransbank Private Reserve, which includes large wetland areas, is located approximately 2km to the east of the planned Adit A location. Based on data currently available it is assumed that only wetlands located in low lying areas, i.e. below the 2nd dolerite sill, would be affected by mine dewatering due to the presence of dolerite sills. At a local scale the dolerite sills are thought to separate the overlying wetlands from the underlying aquifer and act as layers with low hydraulic conductivity. It is

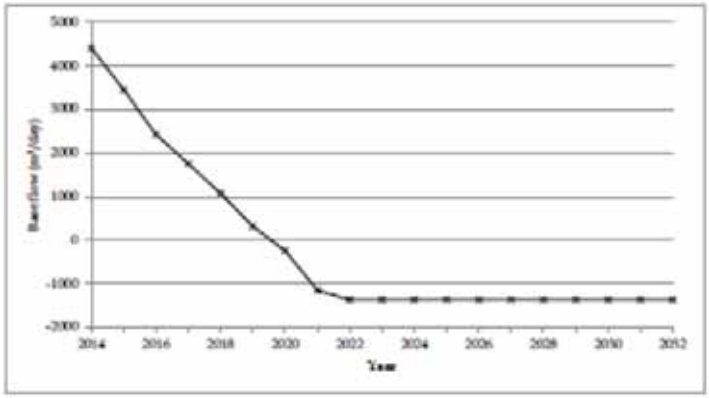
assumed that planned mining activities would therefore not affect the upper wetlands, however, this assumption should be verified with monitoring data.

Significance of Impact (Pre-mitigation)

Modelling results indicate significant impacts on wetlands and streams, especially the Ohlelo Stream in the area of the proposed Project, due to the mining induced groundwater level drawdowns which result in a decrease of baseflow to rivers, streams and wetlands. Changes in the flow regime of the Ohlelo Stream can be expected as a result of dewatering during mining and discharge of decant water after mine closure.

Under baseline conditions the stream receives baseflow from groundwater in excess of 4 000m^3/day. Modelling indicates that the baseflow steadily decreases in the first seven years of mining to zero between year 2019 and 2020, thereafter that the stream loses water to groundwater (*Figure 9.1*). The model indicates that from year 2022 the situation stabilises and the river loses approximately 1 400m^3/day. This may result in a dry stream during the dry season, which can negatively impact communities using surface water as their main water source and aquatic ecosystems.

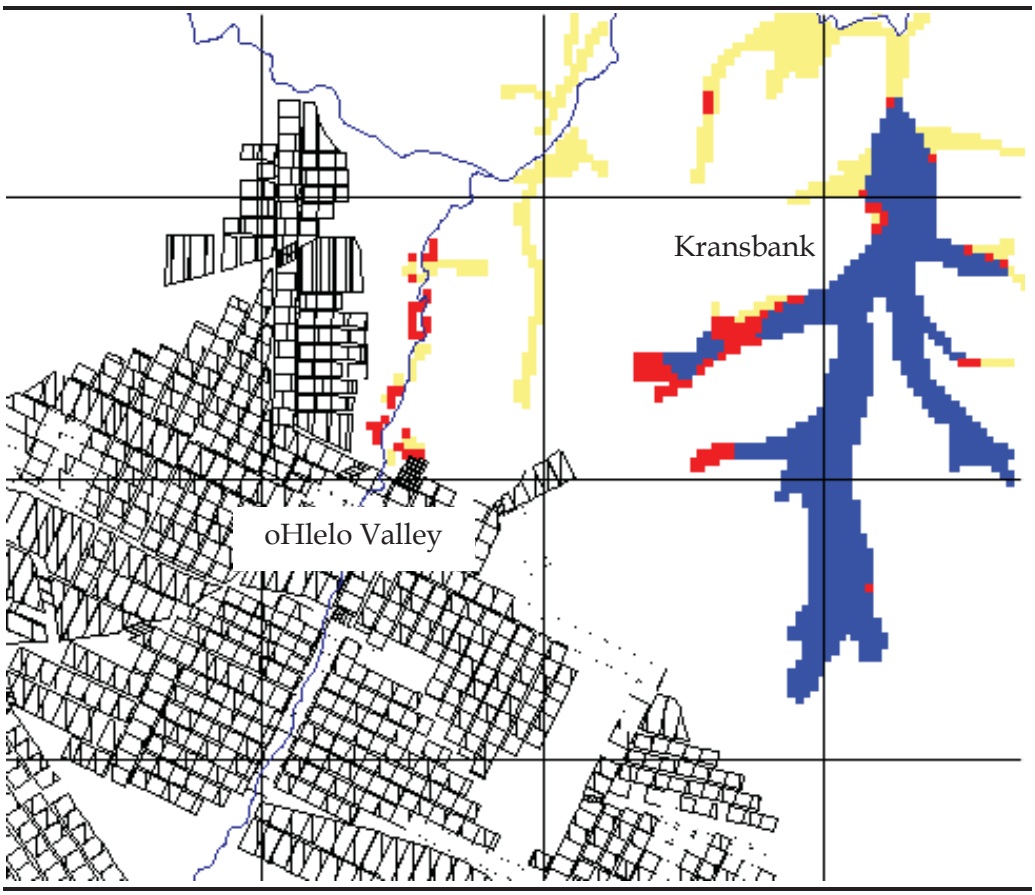
Figure 9.1 ***Groundwater Baseflow to Ohlelo Stream (negative values represent stream losses)***



Model results further indicate that groundwater does not provide any baseflow to wetlands in the Ohlelo Valley at the end of mining; whereas under baseline conditions groundwater provided baseflow for just under 50% of the total area occupied by wetlands in the valley. Parts of the Kransbank wetland also receive less baseflow as well as less recharge from springs.

Figure 9.2 presents the impact on wetlands. Red cells indicate wetlands where groundwater is providing baseflow under pre-mining conditions but not during and at the end of mining. Blue cells represent wetlands where groundwater is still providing baseflow at the end of mining. Yellow cells represent inactive drain cells, where groundwater is not providing any baseflow (pre-mining and at end of mining).

Figure 9.2 Impact on Wetlands



Legend:
Yellow: Inactive drain cells (no groundwater baseflow)
Blue: Active drain cells (groundwater is supplying baseflow at end of mining)
Red: Baseflow pre-mining and no baseflow during and at the end of mining

Based on these results the impact from mining to surface water resources will be a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.23*).

Wetlands and streams are dependent on recharge from groundwater and have the potential to dry up as a result of mine dewatering. Ecosystem processes, particularly those related to wetlands, are dependent on the presence of water and consequently a reduction in the supply of water could be detrimental.

The construction of the adit in the position currently proposed, i.e.: below the pre-mining water table, will lead to indefinite decanting and thereby preclude the complete recovery of the groundwater table to pre-mining levels.

The springs, streams and rivers in the study area are an important source of water for local communities for drinking, cultivation and livestock watering, hence reductions in flow volumes will have significant impacts to them.

The groundwater model is currently based on a number of conservative assumptions and is not calibrated to aquifer stresses of a similar order of magnitude to those applied to it. This implies that reliability of the model predictions is relatively low. However, the model confidence is deemed sufficient to assess conservative impacts and make appropriate mitigation

conditions at the ESIA stage of the Project. The degree of confidence in this assessment is medium.

Table 9.23 Rating of Impacts Related to Surface Water (Pre-Mitigation)

Type of Impact		
Indirect and Cumulative Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The groundwater flow direction is towards the northeast in the bulk of the affected area and hence largely confined to the W52A quaternary catchment.
Duration	Permanent	Reduced surface water levels will exceed the life of mine and associated dewatering.
Scale	Altered	Although perched aquifers and wetlands above the second dolerite dyke will not be affected, dewatering of the mine will result in reduced recharge to surface water and wetlands in the Ohlelo valley and Kransbank, and loss of water flow. This will impact on downstream surface water users along the Ohlelo and aquatic ecosystems in the Ohlelo valley and Kransbank.
Frequency	Continuous	The loss of surface water recharge will continue for the duration of mining and dewatering and post-closure.
Likelihood	Likely	The Ohlelo stream and associated alluvial groundwater is a gaining stream and is connected to the fractured groundwater occurrences where mining is planned to take place. The loss of baseflow to surface water and wetlands due to mine dewatering is inevitable.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Wetlands and riverine ecosystems in the vicinity of the proposed mine are dependent on baseflow from groundwater. The Ohlelo Stream is a water resource that is used for domestic water supply and stock watering, and it is a sensitive ecosystem that supports aquatic ecology in riverine and wetland habitats.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

If the impact results in the loss of the community's and farmer's water supply the client has to provide an alternative reliable, clean water supply to the affected communities and/or farmers.

No mitigations of the impact on wetlands and riverine ecosystems in the vicinity of the proposed Project are possible during operation.

The following mitigation measures will be implemented in order to reduce the significance of the impact of mining and associated dewatering to surface water resources and wetlands post closure:

- Sealing of the adit post-closure to prevent decant at adit, allow groundwater levels to recover and baseflow to be reinstated. However, if the seal fails, the impact on groundwater baseflow to surface water courses and wetlands will be the same as if no seal was installed. For the purposes of this impact assessment, it is assumed that the seal will prevent groundwater from decanting, allow groundwater levels to rebound and baseflow to be reinstated.

- Monitor streamflows in the Ohlelo Stream at different locations including upstream and downstream of the adit and further upstream.

- Monitor the impacts of reduced surface water flow and recharge on sensitive receptors such as wetlands and associated flora/fauna, in order to timeously devise and implement appropriate mitigation measures.

- Routinely refine, update and validate the conceptual and numerical models developed in this study by incorporation of on-going monitoring data. The model developed as part of this specialist groundwater investigation has relatively low confidence due to the data limitations and provides conservative predictions. If the model is updated with operational data, the confidence in predictions of impact can be increased, updated and translated into mine management practices, supporting planning of dewatering measures, risk management and post-closure planning.

Residual Impact (Post-mitigation)

During operation no mitigations of the impact on wetlands and riverine ecosystems in the vicinity of the proposed Project are possible and therefore the impact significance during operation will not change and will remain a '**Major Negative Impact**'.

The post-closure mitigation measures above will reduce the scale of the impact to surface water and wetlands post-closure. However the impact remains a '**Major Negative Impact**' (*Table 9.24*).

By providing an alternative good quality, reliable water source to the affected communities and farmers the impact could be changed to a positive impact for these receptors.

Table 9.24 ***Rating of Residual Post-Closure Impacts Related to Surface Water and Wetlands (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Unchanged.
Duration	Permanent	Reduced surface water levels will continue post-closure, but will gradually rebound to the pre-mining level due to sealing of the adit and/or placing it at a higher elevation. This will result in baseflow being reinstated post-closure.

Scale	Notably altered	Sealing the adit and/or placing the adit at a higher elevation will allow groundwater levels to rebound after mine closure and baseflow to be reinstated.
Frequency	Continuous	Baseflow will be reinstated post closure.
Likelihood	Likely	Baseflow to Ohlelo Stream and wetlands in the Ohlelo valley and Kransbank will likely be reinstated. However, this needs to be verified with on-going monitoring post closure.
Magnitude		
Medium Magnitude		
Significant Rating After Mitigation		
Major Negative Impact		

9.6 IMPACTS ON AIR QUALITY

9.6.1 *Impacts on Air Quality (Airborne Particulates and Dust Fallout) related to Construction Activities at the Main Mine Adit (Adit A) during the Construction Phase*

Description of the Baseline Environment

Current dust fallout measurements at the Maquasa East mine sites indicate that most of the significant fallout rates were nearby the existing mining operations. The Residential Action level of 600 mg/m²/day was only exceeded occasionally over a period of two years. The highest fallout observed at the mine exceeded the Industrial Action level of 1 200 mg/m²/day on one occasion. Generally, however, the fallout at the mine buckets was below the Industrial Action level. No exceedances of the Alert Threshold of 2 400 mg/m²/day were observed.

No particulate air concentration measurements have been done at the existing or proposed mining sites. However, it is estimated, based on the findings in the State of the Air Report (DEA 2009b), annual average PM_{10} concentration levels vary between about 15 to 20 µg/m³ in rural areas. Due to the other activities in the Study Area, it is expected that the upper range would be applicable.

Therefore based on these monitoring results, in terms of dust deposition observations and PM_{10} estimates, the existing air-shed is described as mildly degraded. Due to the lack of development and low vehicle numbers, in terms of NO_2 and SO_2, the existing air-shed is described as un-degraded.

Proposed Project Activities

The main issues associated with construction activities on air quality relate to particulate emissions from excavation and transport of spoil, the placement of fill and the stockpiling of materials. Emissions of dust can also be produced from concrete batching plants, vehicles travelling on temporary untreated roads and wind-generated erosion from open areas.

Other air pollutants can include odours from asphalt laying, asphalt plant and emissions from internal combustion engines of mobile and stationary equipment such as excavators, trucks, generators and compressors.

A detailed air pollution impact assessment would include a comprehensive inventory of all these sources of air emissions. Unfortunately, this level of detail was not available at the time of the investigation. Instead the methodology followed was that proposed by the US EPA, which relates to the dust generation to the area of construction. The US EPA construction emission factor is a fixed value for total suspended particulate matter (TSP): ETSP = 2.688 ton/ha per month of activity. No particle size modifiers are available; however, the US EPA estimates that the PM_{10} fraction is 30%.

The construction dust source category includes the building of residential structures, commercial structures and roads. This emission factor includes air emissions resulting from individual construction operations such as scraping, grading, loading, digging, compacting, light-duty vehicle travel, and other operations. It has generally been found that only the heavy earthmoving portion of a construction project approaches the emissions indicated by this factor.

It is understood that the proposed Project Site has only been used for agriculture purposes. No evidence was found of the soil being contaminated through illegal dumping of general or hazardous waste. The airborne dust generated by excavation and soil removal is therefore not expected to contain any toxic compounds (e.g. pesticide wastes, asbestos, etc.).

The estimated footprint of the development is about 18ha. For the purposes of the calculations, it was assumed that construction activities would occur on average approximately 2ha on any one day. Using the emission factor, it is estimated that the unmitigated airborne particulate emissions from this area would be about 5.4 tonne per month of which about 3.2 tonne per month would be PM_{10}.

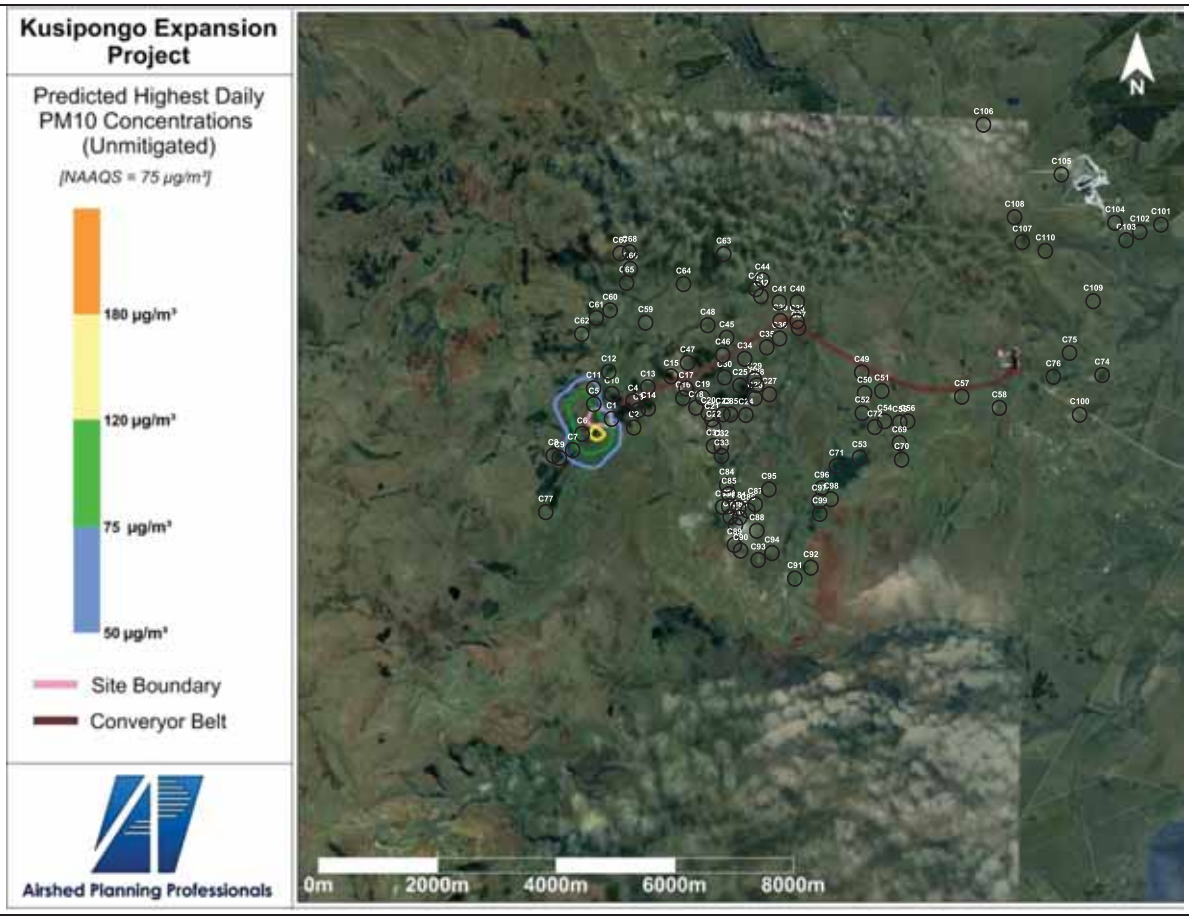
Sensitive Receptors

The unmitigated construction emissions would be dominated by airborne particulates. As a result, and if not mitigated, construction activities have the potential to negatively impact on sensitive receptors some distance from the Project Site.

The immediate Study Area is sparsely populated. Apart from the scattered local rural farming communities, the largest concentration of human population is at St Helena (approximately 10 km northeast from Adit A) and Driefontein (approximately 12 km east of Adit A) of the proposed site for the main mine adit (Adit A). Twyfelhoek Primary School is located approximately 900m east-northeast of the Adit A. The most adversely impacted communities would be those within 500m from the construction activities, as shown in *Figure 9.3*. These include the receptors identified as C1, C2, C3, C4, C5, C7,

C11, C12 and C14 (*Figure 9.3*). The figure illustrates the predicted highest daily average PM_{10} air concentration during construction phase. Given that the limit value for the highest daily average PM_{10} concentration is 75 µg/m³, it is clear that **there is the potential to exceed the NAAQS up to a distance of about 500m beyond the Adit A boundary.**

Figure 9.3 *Predicted Highest Daily Average PM_{10} Air Concentration during the Construction Phase (Pre-mitigation)*



Detailed calculation of the emissions associated with the construction activities have not been quantified as these will depend very much upon the exact activities taking place at any one time or location. However, due to the potential significant impact of unmitigated and uncontrolled emissions, a number of mitigation measures are identified to control emissions of dust and PM_{10}.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, it is the finding of this impact assessment that air quality impacts from construction activities pre-mitigation will be a '**Moderate Negative Impact**'.

This is as a result of the notion that:

- Impacts associated with emissions arising from vehicle exhausts will be a small negative impact for all roads (paved or unpaved);
- Impacts associated with PM_{10} and $PM_{2.5}$ emissions for paved roads will be a negligible negative impact;
- The impacts associated with emissions due to wheel entrained dust (PM_{10} and $PM_{2.5}$) from unpaved roads, dust from open exposed areas and general construction activities will be significant; and
- Based on the situation that there are currently receptors within the 500m predicted impact zone, the rating is considered to be Major.

Refer to *Table 9.25* below.

Table 9.25 Rating of Impacts on Air Quality (Airborne Particulates and Dust Fallout) Related to Construction Emissions at the Main Mine Adit A (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - within 500m of construction activities	It is anticipated that the site preparation activities could result in significant particulate emissions (*large* magnitude – particularly PM_{10}) with no emission controls in place. Construction activities and the movement of vehicles along unpaved roads at the site have the potential to result in significant emissions. Significant emissions (particularly PM_{10}) may travel for up to 500m from the construction activities in significant concentrations.
Duration	Short Term	Impacts would arise throughout the construction period (18 to 21 months).
Scale	500 m from source	Particulate emitting construction activities and the movement of vehicles over unpaved roads during the construction phase will result in emissions that may travel for up to 500m from source.
Frequency	Continuous	Impacts would arise, in effect, continuously from construction activities.

Likelihood	Likely	Impacts will arise throughout the construction period.
Magnitude		
Large Magnitude		
Whilst impacts associated with exhaust combustion gases (e.g. SO_2, NO_2) from vehicles are **small**, the impacts associated with emissions due to wheel entrained dust (PM_{10} and $PM_{2.5}$) from unpaved roads and dust from open areas is **large**.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Based on the situation that there are receptors within the immediate area of impact, the rating is considered to be High.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Since it is expected that a significant portion of airborne emissions during the construction phase would be due to vehicular activities, it is considered essential to apply mitigation to haul roads. Since construction roads would mostly be temporary, it is customary to regulate particulate emissions from haul roads employing a watering programme. More permanent roads will be treated with more durable substances, such as chemical stabilisers/binders or even paving.

The focus of such mitigation will specifically home in on areas nearby residential dwellings.

In terms of construction activities, a number of mitigation measures will be adopted:

- Vehicles will be kept clean and free of residual dirt and mud, and wash down will continue before entering public roads;

- A speed limit of 45km/h will be implemented on unpaved surfaces to minimise the potential for dust to be raised;

- Wind breaks will be erected around the key construction activities (i.e. around the footprint of the main mine adit and temporary contractor's camp), and, if possible, in the vicinity of potentially dusty works;

- All vehicles leaving and accessing the site carrying friable materials will be covered;

- Exposed areas prone to wind erosion will be minimised through the following means:

    - Covering as far and quick as practically possible with vegetation, sheeting or boarding, or
    - Employment of chemical binders.

- Where ground and earthworks are covered or surface binders used, the smallest possible area for working will be exposed;

- Use of localised dampening and activity specific dampening will be used to reduce localised emissions of dust;

- Excessive stockpiling of material will be minimised;

- Removed topsoil will be stockpiled and vegetated so as to prevent wind erosion;

- Where stockpiles are in use, the design will be optimised to retain a low profile with no sharp changes in shape;

- Stockpiles will be located as far away as possible from receptors;

- Stockpiles will be enclosed or sheeted as far as practicable; and

- Drop heights of material when stockpiling will be minimised.

Diesel-powered vehicles will be maintained in reasonable working order and will be in compliance with South African vehicle emission standards. When vehicles are not in use, these will be switched off, unless impractical for health and safety reasons (for example maintenance of air conditioning).

In addition to the implementation of mitigation measures, monitoring of meteorological conditions and ambient dust and PM_{10} will be undertaken (refer to monitoring plan in *Chapter 14*). The monitoring of PM_{10} will be undertaken at the site boundary, and will include provision of 'action levels'. The 'action levels' are trigger points at which investigation of on-site dust raising activities and baseline conditions are investigated. In the event that activities are being undertaken, which are resulting in unacceptable emissions of dust, further localised mitigation and control will be implemented (i.e. localised water spraying), or activities ceased until weather conditions improve of more effective dust suppression is identified.

Potential Resettlement

In those areas where model predictions of the existing baseline and construction of the main mine adit exceed the PM_{10} standard for the Predicted Highest Daily PM_{10} Concentrations of 75µg/m^3, monitoring effort will be focused at these locations to confirm such model predictions. This area is set out in *Figure 9.3*.

Where measured exceedances of the applicable standard persists and are demonstrably due to construction activities associated with the establishment of the proposed main mine adit (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such concentrations at these locations will be well maintained, in some cases the

frequency of such mitigation measures increased (e.g. use of localised dampening), and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.

At this stage of the Project, those rural communities in the immediate vicinity of the proposed site of the main mine adit (illustrated as C1 to C10 *Figure 9.3*.) will almost likely need to be resettled.

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Minor Significance Impact**' (refer to *Table 9.26* below).

Table 9.26 ***Rating of Residual Impacts on Air Quality (Airborne Particulates and Dust Fallout) Related to Construction Emissions at the Main Mine Adit A (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - within 500m of construction activities	The site preparation activities could be mitigated (including the above mentioned resettlement recommendations) to such an extent that would render the residual impacts as *negligible* for the majority of the time. However these measures cannot always guarantee that air quality related impacts will not occasionally occur and hence is considered to be of *minor* significance with appropriate emission controls in place. The mitigation measure of paving roads is considered sufficient to render residual impacts, negligible with regards to emissions of PM_{10}, $PM_{2.5}$ and dust. Gaseous emissions from vehicles are considered to be less significant and of *low* significance.
Duration	Short Term (18 to 21 months)	The mitigation measures are designed to control emissions and associated impacts to receptors as far as practicable, and render residual impacts not significant. However, intermittent impacts may arise at any time during the construction activities.
Scale	500m from source	Although mitigation measured would reduce the scale to less than 200m, occasionally particulate emitting construction activities may result in emissions that may travel for up to 500m from source.
Frequency	Occasional	Although the majority of air quality related impacts will be managed/mitigated for the majority of the time, occasional impacts may arise.

Likelihood	Possible	Occasional air quality related impacts during the construction phase of the proposed Project are still possible, even if receptors are resettled.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Minor Negative Impact		

9.6.2 *Impacts on Air Quality (Airborne Particulates, Dust Fallout and Methane) Related to Coal Handling and Processing in at Main Mine Adit (Adit A) during the Operational Phase*

Description of the Baseline Environment

As discussed in *Chapter* 7, no particulate air concentration measurements have been carried out at the proposed Project Site (Adit A or Adit B) or along the route of the proposed overland conveyor system. However, based on the findings in the State of the Air Report (DEA 2009b), annual average PM_{10} concentration levels are expected to be about 20µg/m³, or perhaps even slightly more due to the existing Kangra Coal mining activities taking place in the Study Area.

Nuisance dust fallout at the Maquasa East mine sites indicate that most of the significant fallout rates were nearby the existing mining operations, with the highest fallout at the mine exceeding the Industrial Action level of 1 200mg/m²/day on one occasion. Generally, however, the fallout at the mine buckets was below the Industrial Action level. No exceedances of the Alert Threshold of 2 400 mg/m²/day were observed.

Therefore, based on these monitoring results, in terms of dust deposition observations and PM_{10} estimates, the existing air-shed is described as mildly degraded near the proposed Project Site, with the level of degradation increasing as the conveyor approaches the existing mining operations at Maquasa.

Proposed Project Activities

The main air pollutant from the proposed Project and associated infrastructure has been identified to be airborne particulates. The activities resulting in these emissions include:

- Coal transfer points;
- Transportation of mined coal along an overland conveyor system;
- Primary crushing and screening; and
- Secondary crushing and screening.

Adit A will be designed in such a way to allow workers, materials and machinery access to underground mining operations (inclined Adit).

Furthermore, the inclined adit will provide for a conveyor to bring mined coal to the surface.

Adit A will have its own independent fresh air ventilation using four fans, (two duel sets). These will be south of the boxcut, on the main underground development. The fans are both for air intake and exhaust. Once ventilated, air will be returned directly to the main exhaust fans.

Adit Exhaust Ventilation at Main Mine Adit B

Ventilation Adit B will be solely used for ventilation, and only for air intake – no exhaust. Adit B will consist of two raise bore down draft ventilation shafts. All section ventilation will consist of a coursing "design", as this will potentially allow for the highest safe air velocities through the mine. Ventilation design took into account parameters such as known in-seam methane gas contents, which is evident in the neighbouring Maquasa West mine.

The proposed volumetric flow rate for each of the fans is 240m³/s at 2 500 Pa and 1.1 kg/m³ inlet density through a 6 m outlet shaft. The exit gas temperature will be between 20 °C and 29 °C. The height of the vent is 10 m above ground level.

The particulate emission rates from Adit A is summarised in *Table 9.27*. The dispersion simulations used the average emission rates for the annual average concentration predictions and the maximum hourly emission rates for the maximum daily average concentration predictions.

Table 9.27 Particulate Air Emissions Calculated for Mine Exhaust Vents

Emission Condition	Emission Concentration (mg/m³)	Annual average (tpa)		Hourly Max (g/s)	
		TSP	PM_{10}	TSP	PM_{10}
Average	3	45.4	45.4		
Maximum	10			4.8	4.8

Mine Methane Emissions

Lloyd and Cook (2005) analysed methane releases associated with six different underground mines (Koornfontein, Twistdraai, Matla, Douglas, New Denmark and Boschmans). From their synthesis of the study, the following interpretation followed:

- Methane in South African coal occurs in the coal adsorbed on a small fraction of the available adsorption sites; and as free methane in faults, fissures and cleat structures associated with the coal. The methane is associated with significant quantities of carbon dioxide, and its concentration in the coal is highly variable. The free methane is probably not determined accurately in the usual method of estimating the seam gas

content, although any free methane in a sample, held in microfractures, pores and cleats probably will be determined.

- When the coal is mined, its methane content is released relatively slowly, while the free methane is released relatively rapidly as long as there are pathways from the coal into the mine atmosphere. However, either the methane feeding such pathways can be exhausted, or the pathways themselves may become blocked by capillary forces or ground movement, so that the contribution from this source can drop rapidly to low levels. As mining proceeds, other pathways are then opened up and methane is again released, although not necessarily at the same rate as previously.

- Coal that is not mined, but left in the floor, roof and pillars, makes only a small contribution to ventilation load because much of the free methane has already been released during mining. There is little driving force to desorb the residual adsorbed methane, although this may enter the mine atmosphere slowly over the years, particularly if there is any ground movement to re-open any pathways to release free methane and thus re-establish the driving force for desorption.

Lloyd and Cook (2005) subsequently provided methane release rates ranging from 0.023t/m³ (Boschmans) to 1.27t/m³ (Twistdraai). These values are significantly lower than some of the specific methane emissions reported in the 1996 SIMRAC report for predicting methane emissions in collieries (Creedy 1996). However, the higher values appeared for collieries of low weekly productions (e.g. Durban Navigation and Indumeni). These specific emissions ranged from 2.8 to 58.6 t/m³. The specific emissions for Middelbult, New Denmark and Brandspruit were reported by Creedy as 1.6, 2.0 and 0.2 t/m³, respectively. The latter reported weekly production rates of 21 000 to 30 000 tonnes, whereas the former collieries ranged from 1 100 to 5 100 tonnes per week.

The proposed Project would have a weekly production of about 73 000 tonnes. For the purposes of this assessment, a specific emission of 1.6t/m³ was assumed, which is applicable to the value reported in Creedy (1996) for Ermelo. This is slightly higher than the Lloyd and Cook (2005) estimates for the specific emission and may therefore be considered slightly conservative.

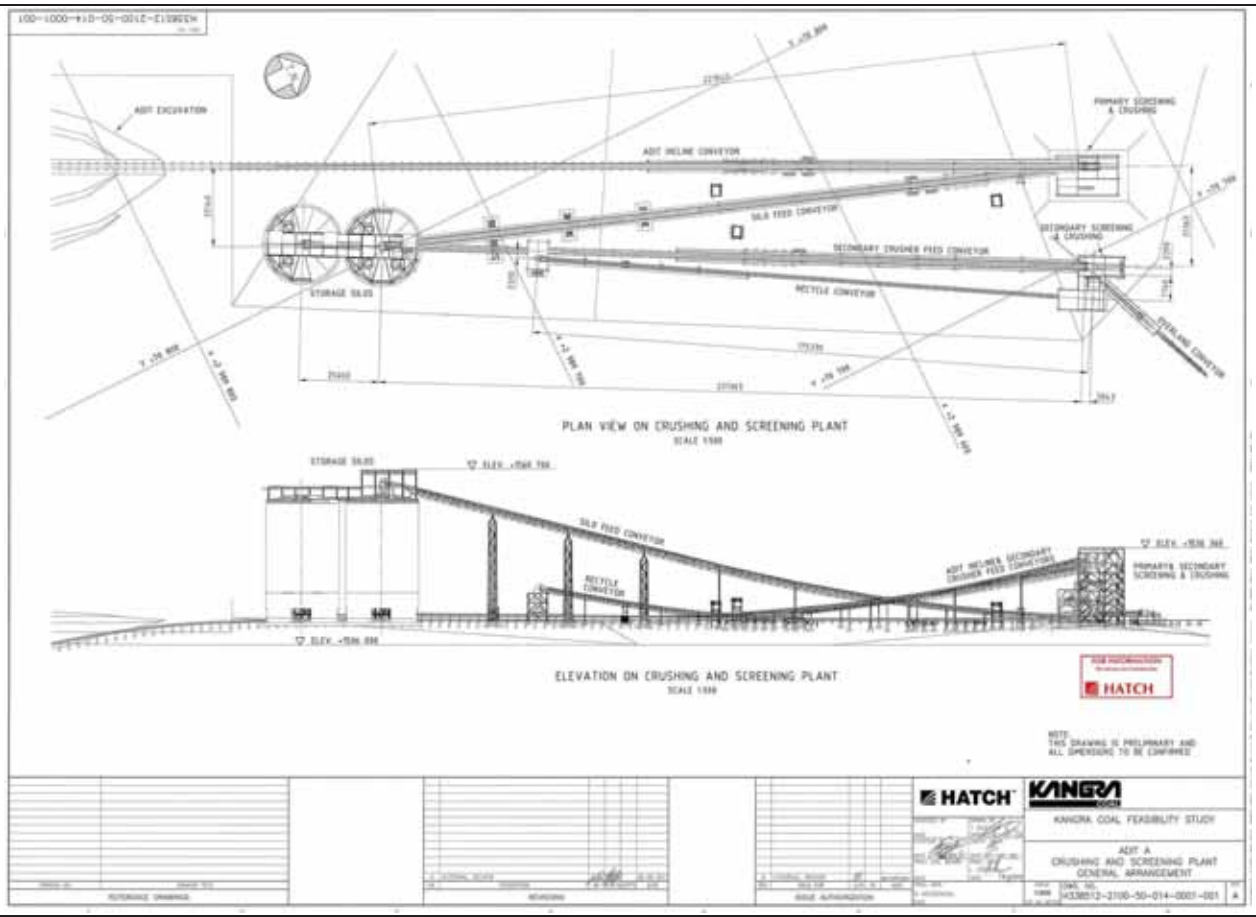
Cook (2005) estimated the methane emitted from South African coal mines to be between 53 999 and 95 000 tpa. Lloyd and Cook (2005) concluded that the release of methane from South African coal mines is approximately 72 000tpa.

Using the methane emission factor of 1.6t/m³, the estimated methane released from the proposed Project would be approximately 3 800 to 4 000 tpa, which would be an additional 5% to the coal mine industry contribution.

Coal Handling, Crushing and Screening

The ROM from the adit would be conveyed as shown in *Figure 9.4*. From the mine the coal would be crushed in the primary crushers before being stored in the storage silos. Coal from the storage silos would then be crushed and screened in the secondary crusher. Over-sized coal would be returned for further crushing in the secondary crusher. The primary crusher is designed to have a maximum and nominal capacity of 3 600 tonne per and 1 528 tonne per hour respectively. The secondary crusher is designed to have a maximum and nominal capacity of 1 915 tonne per and 1 596 tonne per hour respectively.

Figure 9.4 *Primary and Secondary Crushers and Screening Facilities at Main Mine Adit (Adit A)*



The airborne particulate emissions were calculated using the design capacities for both average (nominal) and maximum operating conditions.

Uncontrolled particulate air emissions are summarised in *Table 9.28*. It is calculated that on an annual average, crushing and screening emissions, if not controlled, would result in the main particulate emission source (~93% TSP and ~83% PM_{10}). This would be followed by particulates from the ventilation at Adit A (~8% TSP and ~17% PM_{10}).

Predicted Airborne Concentrations

The United Kingdom's Atmospheric Dispersion Modelling System (ADMS) was employed to calculate ground level air concentrations and fallout rates. Topographical and land use data for the Study Area were included in the model.

This information was provided with a horizontal grid resolution of 250m by 250m. The proposed Project was located approximately in the centre of the Study Area. ADMS simulates ground-level concentrations for each of the receptor grid points. The height of each receptor point was set to 1.5 m above ground level to account for the breathing zone.

All emission sources were included as point, area or volume sources. Well-defined emissions, such as the ventilation points were included as point sources, whereas the conveyor belts were represented by area sources. Tipping, crushing and screening operations were simulated as volume sources. The location, configurations and emission rates used in the simulations are summarised in *Table 9.29* and *Table 9.30* for the annual average and maximum hourly/daily average emissions, respectively.

The ground level air concentrations are given as isopleths of equal values. The plots represent the maximum predicted concentrations at each of the receptor grids included in the model. The predicted (pre-mitigation) air concentration plots for the maximum daily and annual average concentrations are presented in *Figure 9.5* to *Figure 9.8*.

Table 9.28 Particulate Air Emissions Calculated for Uncontrolled Mine Material Handling, Crushing and Screening Operating Activities

Uncontrolled Coal Dust Sources			Annual average (tpa)		Hourly Max (g/s)	
			TSP	PM_{10}	TSP	PM_{10}
Transfer Points	7	Points	6.7	2.3	3.17	1.1
Primary Crushing & Screening	1528	t/h average	133.9	53.5		
	3600	t/h maximum			10.00	4.00
Secondary Crushing & Screening	1596	t/h average	419.4	167.8		
	1915	t/h maximum			15.96	6.38
Ventilation at Adit A	3	mg/m^3 average	45.4	45.4		
	10	mg/m^3 maximum			4.8	4.8
TOTAL			**605.4**	**269.0**	**33.9**	**26.2**

Table 9.29 List of Most Significant Air Emission Sources for the Proposed Project – Annual Average Emission Conditions

Source	Location		Configuration				Exit Velocity [m/s]	Exit Temp [°C]	Emission Rate (g/s)				
	X	Y	Height [m]	Width [m]	Length [m]	Diameter [m]			PM_{10}	TSP	CO	NOx	SO_2
Primary Crusher	230839.13	7008968.73	20	10				20	0.424	1.061			
Secondary Crusher	230870.05	7008959.15	20	10				20	1.330	3.325			
Ventilation Adit	230745.29	7008542.01	10			3.000	8.5	20	1.440				
TIP1 (Silo In)	230774.36	7008768.25	3			1.000	1.0		0.048	0.136			
TIP2 (Silo Out)	230803.31	7008824.94	3			1.000	1.0		0.048	0.136			
TIP3 (Recycle Transfer Tower)	230870.05	7008959.15	3			1.000	1.0		0.048	0.136			
TIP4	232443.17	7009624.32	3			1.000	1.0		0.048	0.136			
TIP5	233704.5	7010453.94	3			1.000	1.0		0.048	0.136			
TIP6	237164.84	7009635.6	3			1.000	1.0		0.048	0.136			
TIP7	237709.85	7009642.06	3			1.000	1.0		0.048	0.136			

Table 9.30 List of Most Significant Air Emission Sources for the Proposed Project – Annual Maximum Emission Conditions

Source	Location		Configuration				Exit Velocity [m/s]	Exit Temp [°C]	Emission Rate (g/s)				
	X	Y	Height [m]	Width [m]	Length [m]	Diameter [m]			PM_{10}	TSP	CO	NOx	SO_2
Primary Crusher	230839.13	7008968.73	20	10				20	1.000	2.500			
Secondary Crusher	230870.05	7008959.15	20	10				20	1.596	3.990			
Ventilation Adit	230745.29	7008542.01	10			3.000	8.5	20	0.720	0.720			
TIP1 (Silo In)	230774.36	7008768.25	3			1.000	1.0		0.048	0.136			
TIP2 (Silo Out)	230803.31	7008824.94	3			1.000	1.0		0.048	0.136			
TIP3 (Recycle Transfer Tower)	230870.05	7008959.15	3			1.000	1.0		0.048	0.136			
TIP4	232443.17	7009624.32	3			1.000	1.0		0.048	0.136			
TIP5	233704.5	7010453.94	3			1.000	1.0		0.048	0.136			
TIP6	237164.84	7009635.6	3			1.000	1.0		0.048	0.136			
TIP7	237709.85	7009642.06	3			1.000	1.0		0.048	0.136			

Figure 9.5 *Predicted Highest Daily Average PM_{10} Air Concentration (Pre-mitigation)*

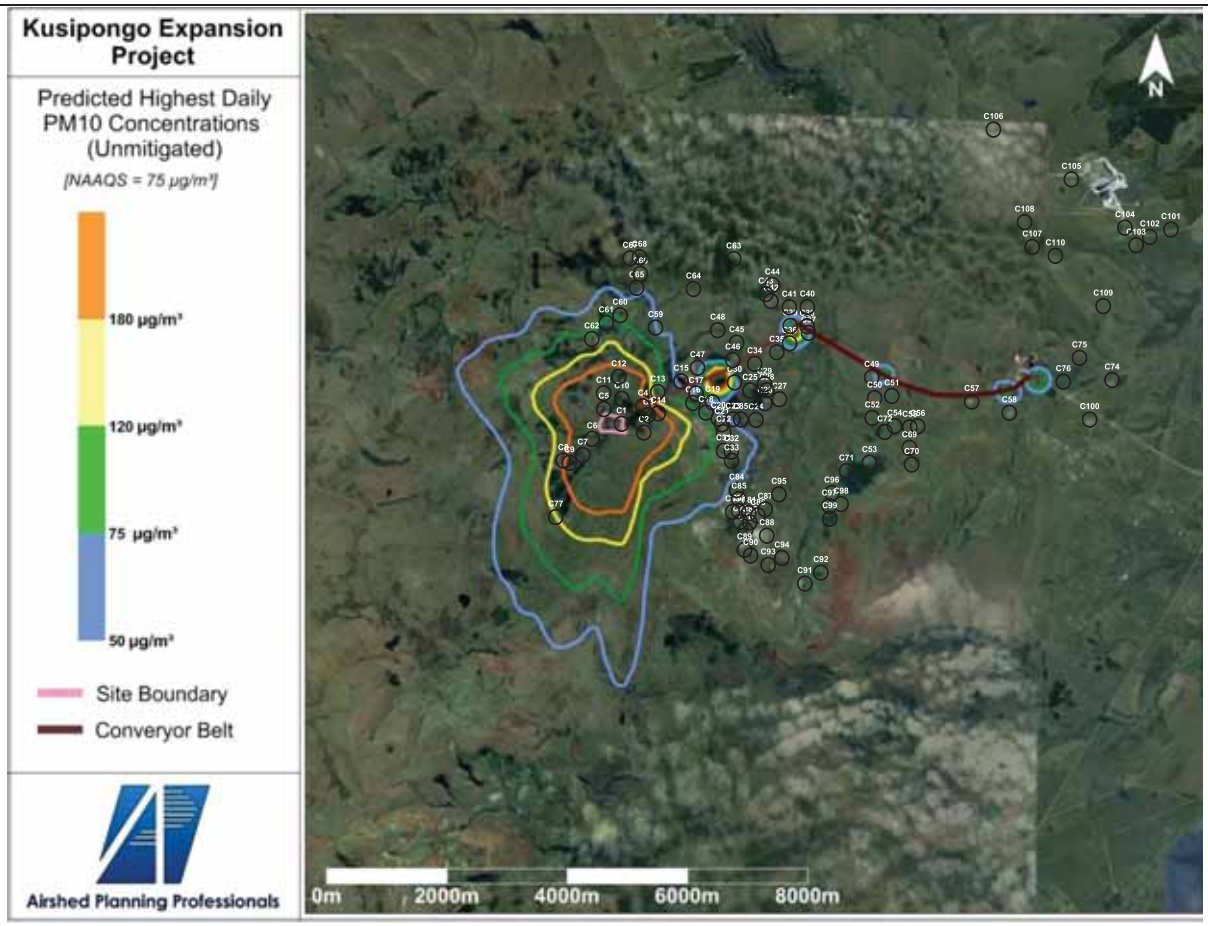


Figure 9.6 *Predicted Zone which Exceeds the 75 µg/m³ Daily Average Air Concentration for PM_{10} more than Four Days per Year (Pre-mitigation)*

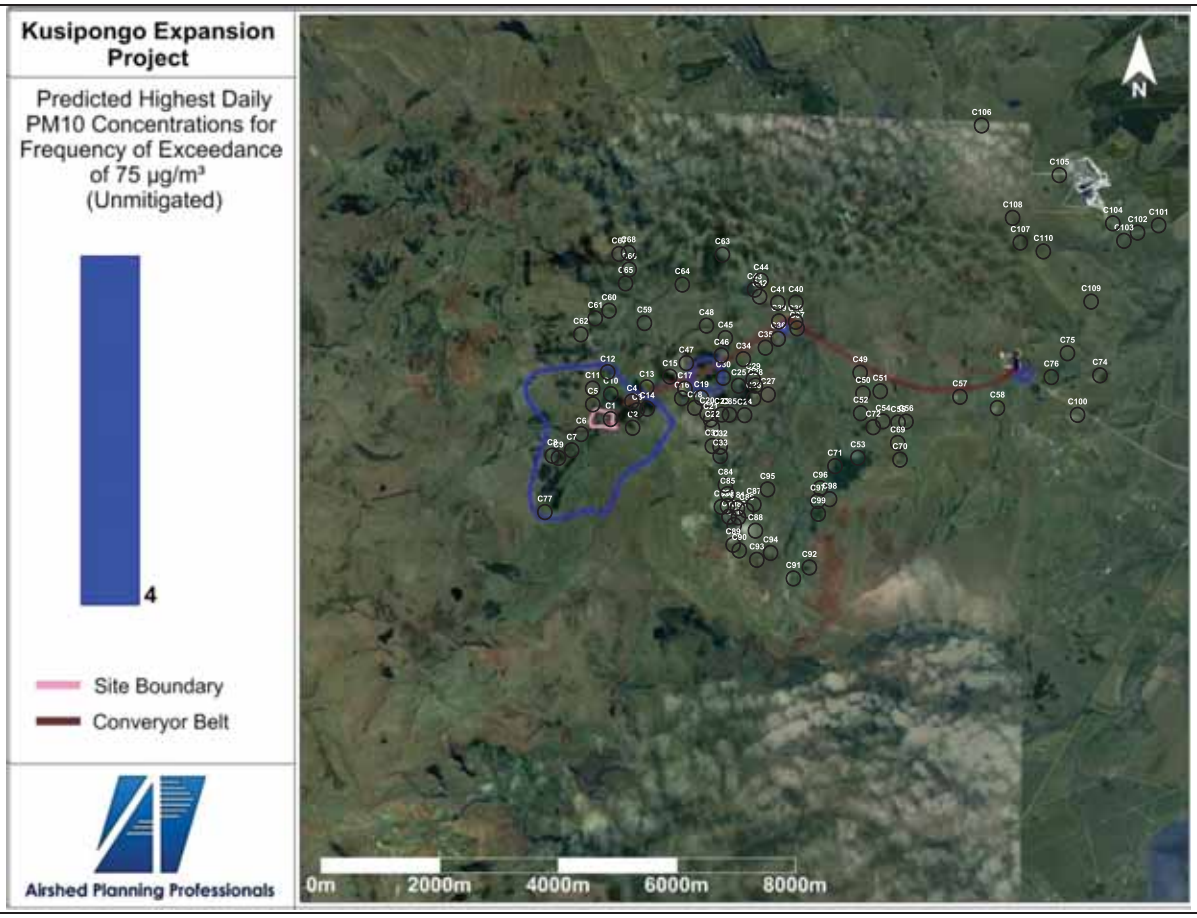


Figure 9.7 *Predicted Annual Average PM_{10} Air Concentration (Pre-mitigation)*

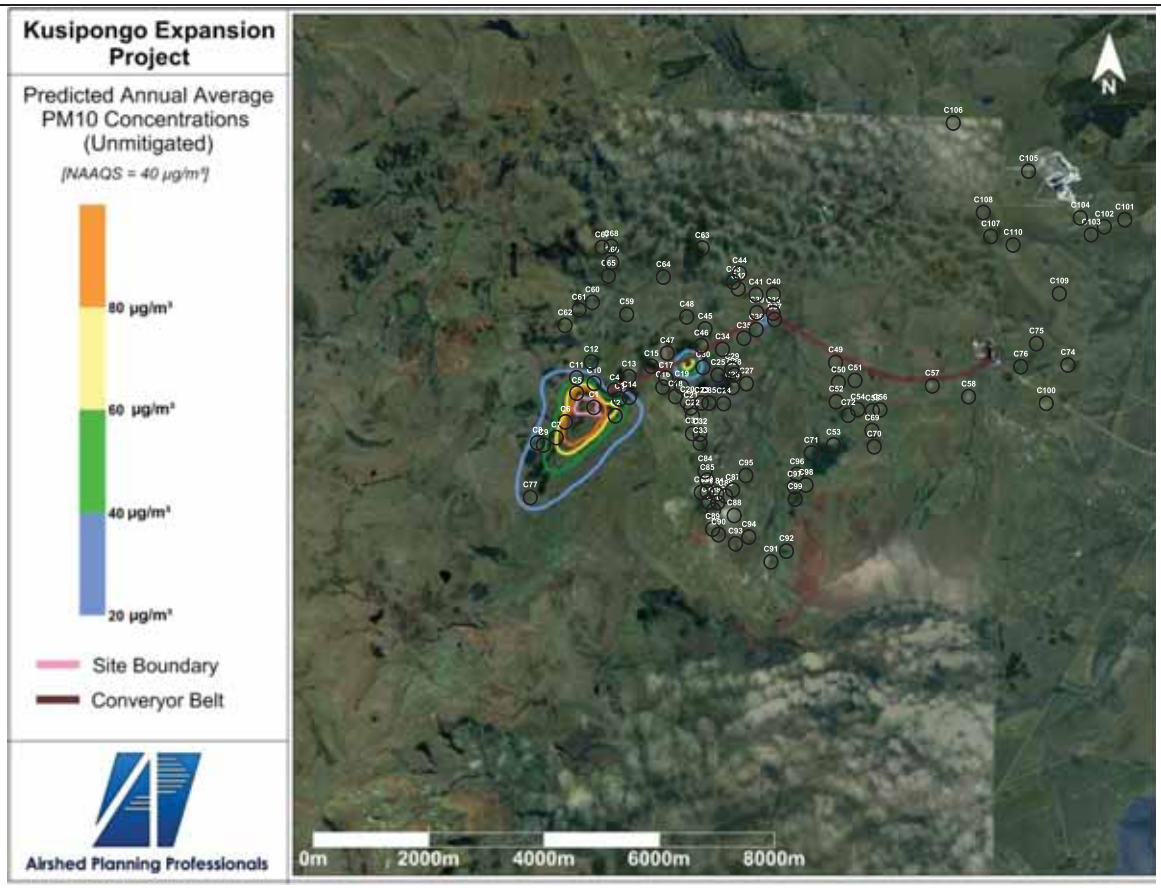
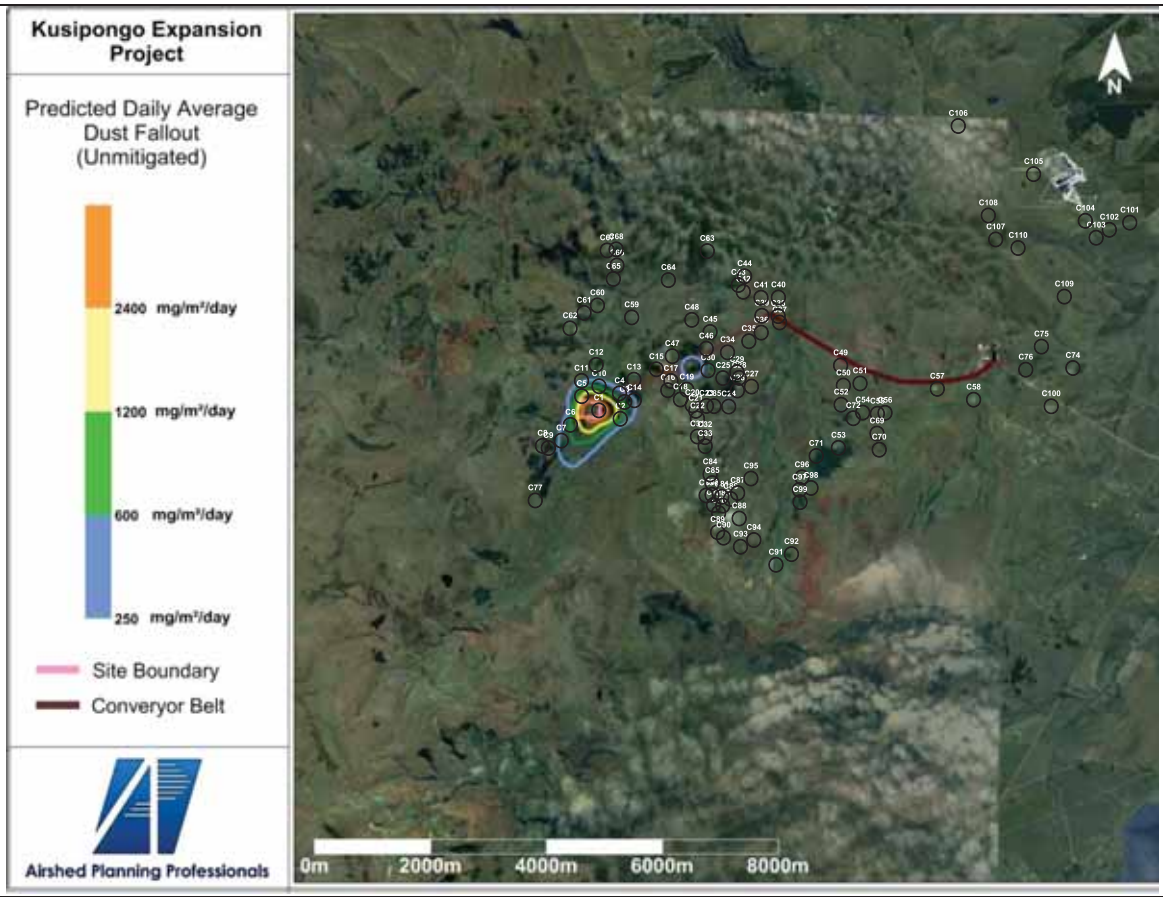


Figure 9.8 *Predicted Daily Dust Fallout Rate (Pre-mitigation)*



Sensitive Receptors

The immediate Study Area is sparsely populated. Apart from the scattered local rural farming communities, the largest concentration of human population is at St Helena (approximately 10 km northeast from Adit A) and Driefontein (approximately 12 km east of Adit A) of the proposed site for the main mine adit (Adit A). Twyfelhoek Primary School is located approximately 900m east-northeast of the Adit A.

Other sensitive receptors that are not located in the immediate vicinity of the proposed expansion project include the towns of Piet Retief (~ 40km east), Volksrust (~ 60km south-west) and Ermelo (~ 65km north-west).

Table 9.31 is a summary of the predicted highest concentrations at ground level for the main air pollutants of concern. Particulate emissions (PM_{10}), if no emission controls are established, was shown to potentially result in significant exceedances of the NAAQS for both the daily and annual average. It was **predicted that the potential exists for the daily average limit value of 75µg/m³ to be exceeded in excess of 4 days per year at distances of up to 2km, towards the south** *(Figure 9.6)*. Exceedances of the limit value are also predicted along the conveyor belt, especially near the transfer points (this is discussed further in *Section 9.6.4*.

Table 9.31 Highest Predicted Ground Level Air Concentrations (Pre-mitigation)

Pollutant	Averaging Period	Highest Predicted Concentration (µg/m³)	NAAQS Limit Value (µg/m³)
PM_{10}	Annual Average	**196**	40
	Highest Daily	**600**	75

Note: bold values in red cells indicate an exceedance of the NAAQS limit value

The most adversely impacted communities would be those within 2km from the main mine adit, as shown in *Figure 9.5* to *Figure 9.8*. Small rural subsistence farming communities that could potentially be negatively impacted from material handling, crushing and screening operations (particulate air concentrations) include C1 to C11 and C14 (refer to Annexe B for geographical coordinates).

The fallout of dust from the operation is normally confined to the immediate area of the mine boundary, typically a few hundred metres, as shown in *Figure 9.8* (260m to the very heavy fallout rate of 1 200 mg/m²-day and about 500m to the fallout rate of 600 mg/m²-day).

The dwellings that could potentially be negatively impacted by dust fallout from the crushing and screening operations include C1, C3, C4, C6 and C10 (refer to *Figure 9.5*).

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, it is the finding of the ESIA that the impact from the associated with coal handling and processing in the main mine adit (Adit A) and associated ventilation will be '**Major Negative Impact**' pre-mitigation (refer to Table 9.32).

Table 9.32 ***Rating of Impacts on Air Quality (Airborne Particulates and Dust Fallout and Methane) Related to Operational Coal Handling and Processing in the Main Mine Adit (Adit A) and associated Ventilation (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - within 2km of the main mine adit (Adit A)	The main air pollutant from the proposed main mine adit (Adit A) and associated infrastructure has been identified to be airborne particulates, namely PM_{10}. Furthermore, the largest sources of these emissions include crushing and screening operations, followed by ventilation locations, conveyor belts and transfer points in the footprint of Adit A. If left un-mitigated, the impact from the mine site is predicted to reach downwind distances of about 2km towards the south. Dust fall is also predicted to be limited to about 500m from the operation. Gaseous emissions from the mine may also contain greenhouse gas emissions, including methane and carbon dioxide. Although the impact of these emissions is of global concern, its significance of considered to be low.
Duration	Long Term (10 to 20 years)	Impacts would arise throughout the life of mine of the proposed Project.
Scale	2km from the main mine adit	Emissions arising from the handling of final product may travel for up to 2km from the main mine adit.
Frequency	Continuous	As the process operates continually, impacts would arise continuously.
Likelihood	Likely	Impacts will arise continuously throughout the lifetime of the proposed Project.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Based on the situation that there are receptors within the immediate area of impact, the rating is considered to be High.		
Significant Rating Before Mitigation		
Major Negative Impact		

Control of Dust from Crushing and Screening Operations

Crushing and screening activities were shown to be the most significant sources of emissions. Dust is generated in all dry screening processes; however, the amount of dust depends on the particle size contained in the ore, the moisture content, and the type of screening equipment used. Generally, a screen processing finer material produces more dust. Also, screens agitated harder and faster produce more dust than those vibrated more gently and slowly. In general, screens emit (Mody and Jakhete, 1988) dust from the following:

- The top one-third of the screen surface where incoming material hits;
- The openings between moving parts (the screen) and stationary parts (the discharge chutes); and
- Discharge chutes.

The following **crusher design** and operational mitigation measures will be adopted as far as practically possible:

- Dust from crushers is normally controlled by water sprays and local exhaust ventilation from the crusher enclosure. The amount of water needed to do the job is hard to specify since it depends on the type of material crushed and the degree to which water will cause downstream handling problems. If the ore is dry, a starting point would be to add a water quantity equivalent to 1% of the weight of the material being crushed (Quilliam, 1974). The nozzle pressure of sprays will avoid stirring the dust cloud and reducing the capture efficiency of the ventilation system.

- The amount of air required for dust control depends on how much the crusher can be enclosed. Enough air should be exhausted from a plenum under the crusher to produce a strong in-draught around the crusher. The use of shrouds or enclosures for crushers can contain the dust so that a dust control system can operate more efficiently. The following potential measures are recommended by Mody and Jakhete (1988):

    - A crusher feed box with a minimum number of openings;
    - Rubber curtains to minimize dust escape and air flow;
    - The crusher to be choke fed to reduce air entrainment and dust emission; and
    - Dust escape at the crusher discharge end can be minimized by properly designed and installed transfer chutes.

The following **screen** design and operational mitigation measures will be adopted as far as practically possible:

- The rate of dust generated by screens cannot be altered; however, properly enclosing the screen can reduce dust emissions. A complete enclosure that can be easily removed for maintenance and inspection could be used. A tight sealing system reduces dust emissions and also minimises air flow, which reduces the exhaust volume for the dust collection system installed downstream. Emission reductions that can typically be afforded are as follows (NPi, 2001):

    - 50% water sprays to keep ore wet;
    - 65% for hooding with cyclones;
    - **75% for hooding with scrubbers**; and
    - 83% for hooding with fabric filters.

- Given the calculated air impact in the vicinity of the proposed operation, it is recommended to implement hooding with scrubbers, i.e. 75% emission reduction, as assumed in *Table 9.34.*

Control of Dust at Transfer Points

The following mitigation/management measures for the control of dust at transfer points will be adopted as far as practically possible:

- A semi-enclosed chute to transfer the material will be provided [1].

- The transfer point will be tightly enclosed, and the dust-laden air will be exhaust from the enclosure through a duct, and either remove the dust from the air with a dust collector or discharge the dust to a return airway [2].

The NPi (2001) indicates 70% emission reduction if enclosed and 99% if enclosed and emission is through a fabric filter. The particulate emission rate for tipping in *Table 9.34* assumed 70% emission reduction, i.e. enclosure only.

The residual impact related to coal handling and processing in the main mine adit (Adit A) and associated ventilation and presented in *Table 9.33* used the above reduction measures in emissions.

[1] Sliding chutes and spouts are widely used in materials handling (Kissell 2003).

[2] As discussed by Kissell (2003), transfer point dust control can be difficult because the falling ore has a "piston effect" due to air entrainment. This air entrainment draws air in at the top of the transfer point enclosure, and it can push dusty air out of the bottom of the enclosure. The piston effect of the falling ore can be reduced by lowering the drop distance; by using "rock ladders" to break the fall of the ore; and by increasing the enclosure size so that entrained air can circulate back to the top of the enclosure.

Table 9.33 Particulate Emission Control Efficiencies

Emission Location	Recommended Control Efficiency	Control Equipment
Crushing and screening	75%	hooding with scrubbers
Conveyor belt transfer point	70%	belt scrapers belt washers
Tipping points	70%	semi-enclosed chute lowering the drop distance

With the necessary emission mitigation/management measures as discussed above, particulate impacts can significantly be reduced (refer to *Figure 9.9* to *Figure 9.11*. The rural dwellings that would potentially still be negatively impacted include C1 and C10. Similarly, the dust fallout rates would significantly be reduced, as shown in *Figure 9.12*. The impact distance to the very heavy dust fallout rate of 1 200 mg/m²-day would reduce to within the plant boundary, and the fallout rate of 600 mg/m²-day to about 130m from the plant boundary.

Table 9.34 Particulate Air Emissions Calculated for Controlled Operational Conditions (Post-mitigation)

Uncontrolled Coal Dust Sources			Annual average (tpa)		Hourly Max (g/s)	
			TSP	PM_{10}	TSP	PM_{10}
Transfer Points	7	points	2.0	0.7	1.0	0.3
Conveyor Belt	7310.38	m	15.3	6.9	48.3	21.7
Primary Crushing & Screening	1528	t/h average	33.5	13.4		
	3600	t/h maximum			2.5	1.0
Secondary Crushing & Screening	1596	t/h average	104.9	41.9		
	1915	t/h maximum			4.0	1.6
Ventilation at Adit A	3	mg/m^3 average	15.1	15.1		
	10	mg/m^3 maximum			1.4	1.4
TOTAL			**170.7**	**78.0**	**55.7**	**24.7**

Figure 9.9 *Predicted Highest Daily Average PM10 Air Concentration (Post-mitigation)*

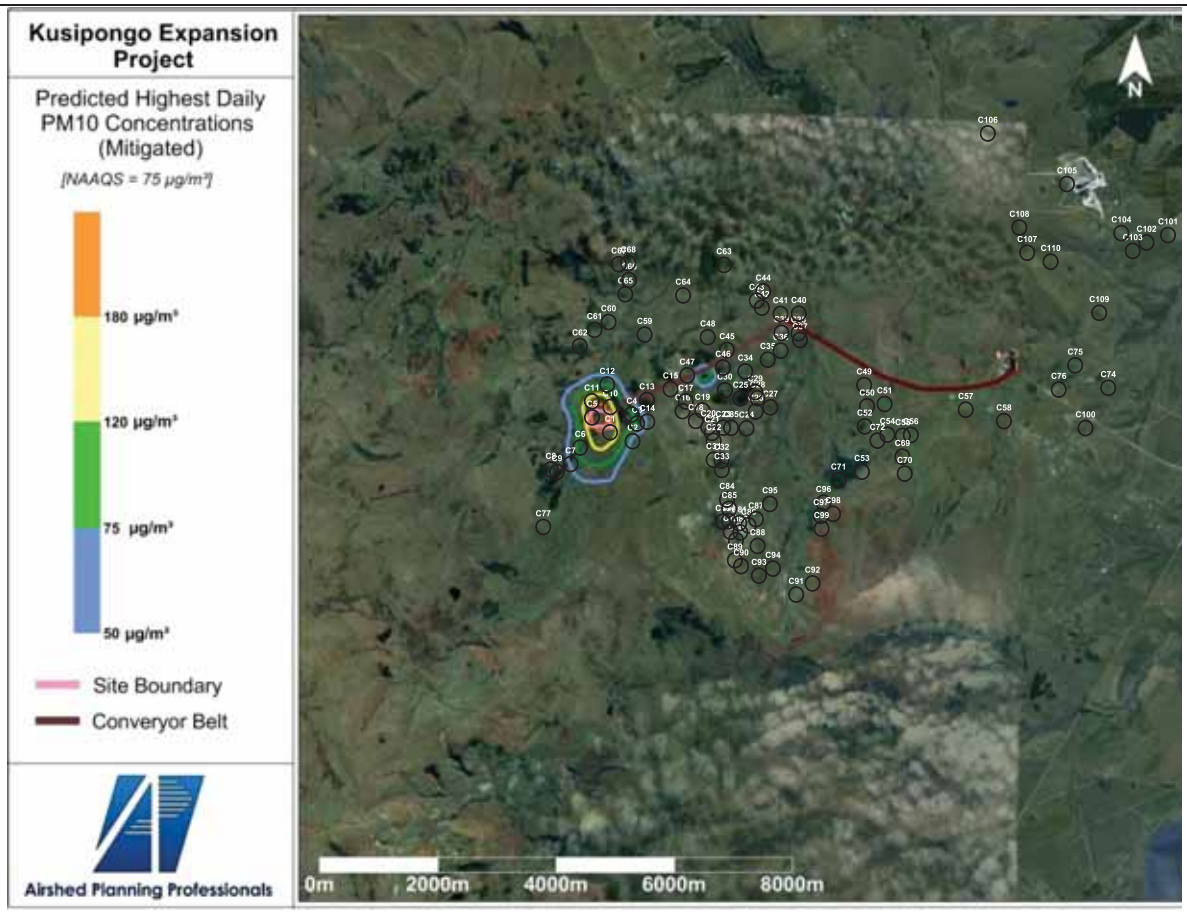


Figure 9.10 Predicted Zone which Exceeds the 75 µg/m³ Daily Average Air Concentration for PM10 more than Four Days per Year (Post -mitigation)

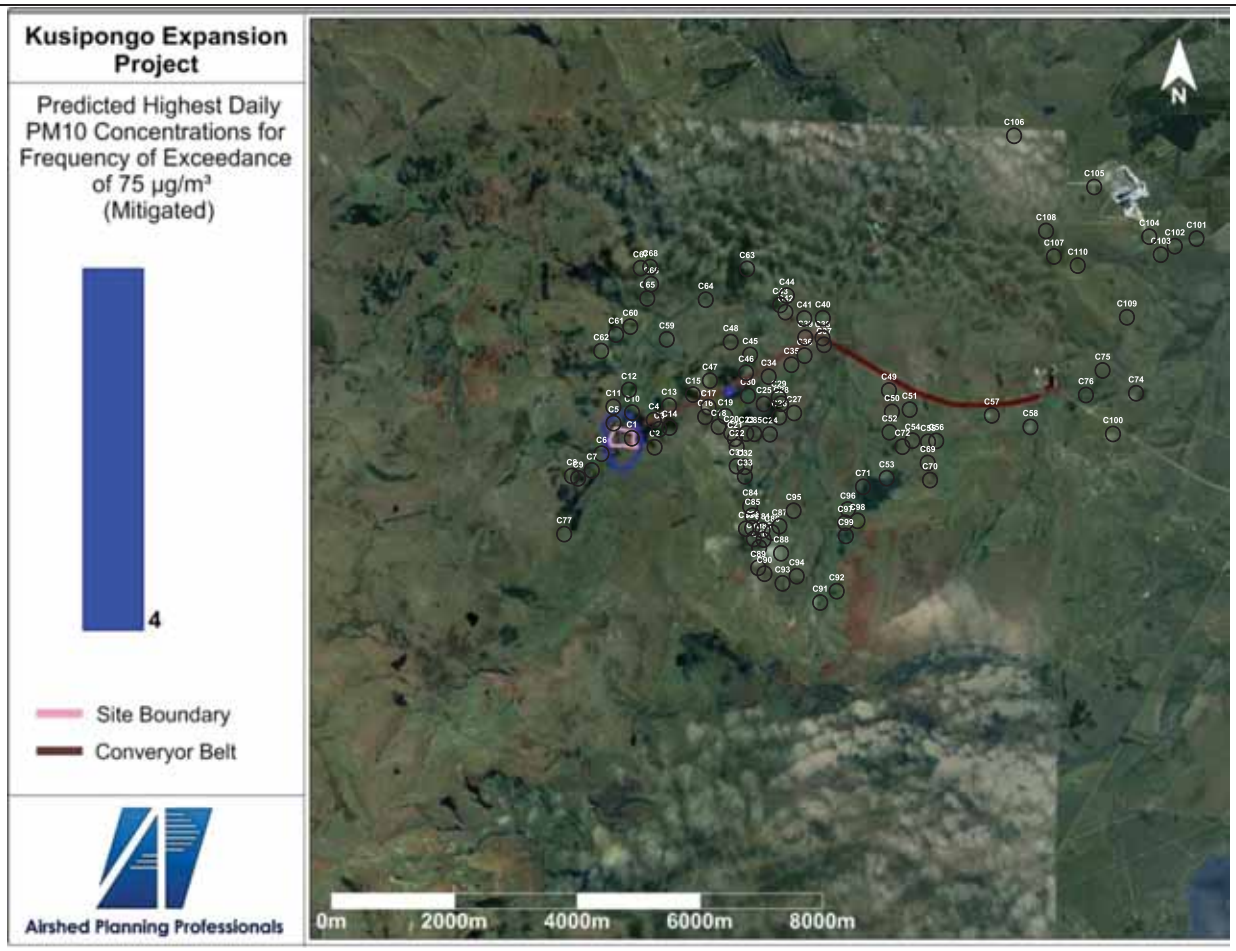


Figure 9.11 Predicted Annual Average PM10 Air Concentration (Post -mitigation)

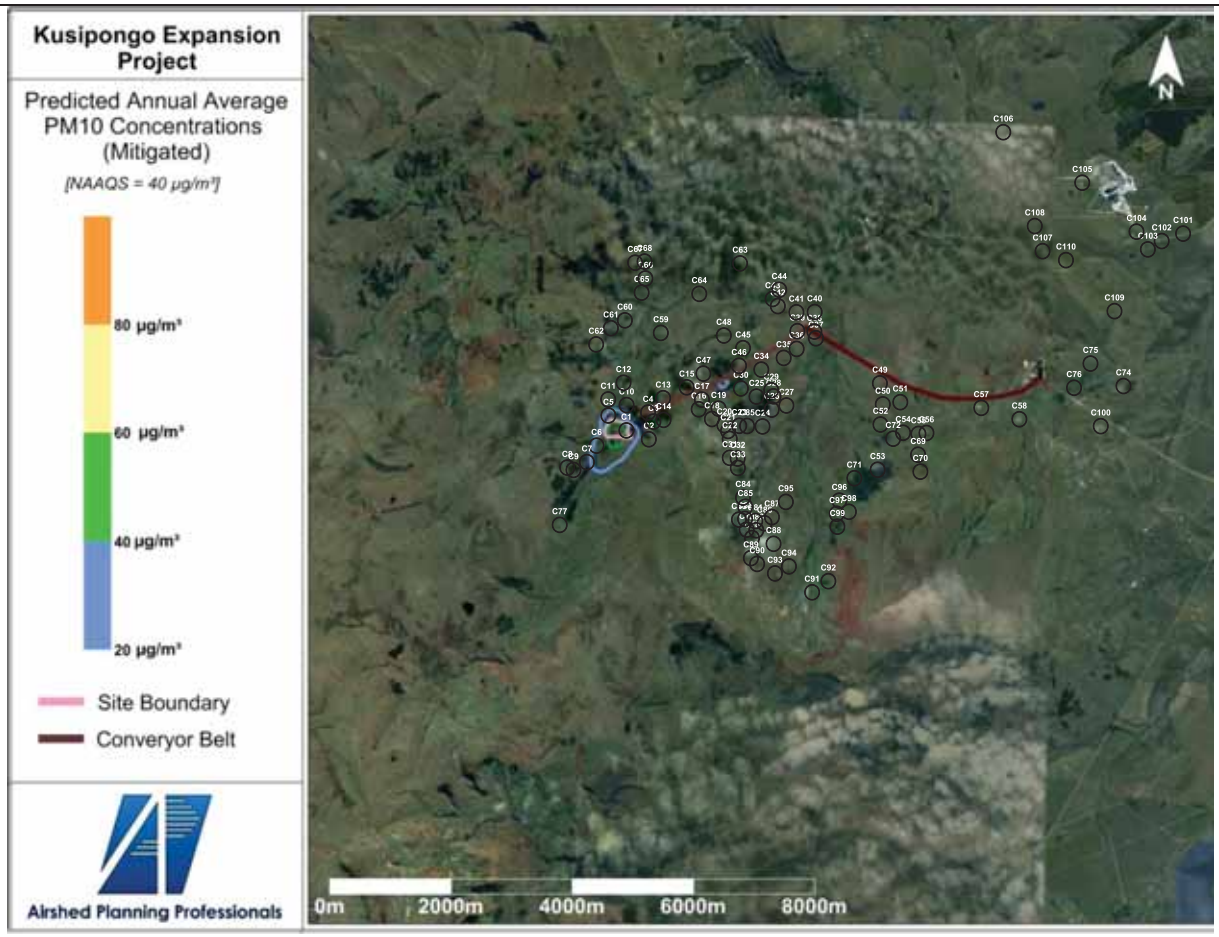
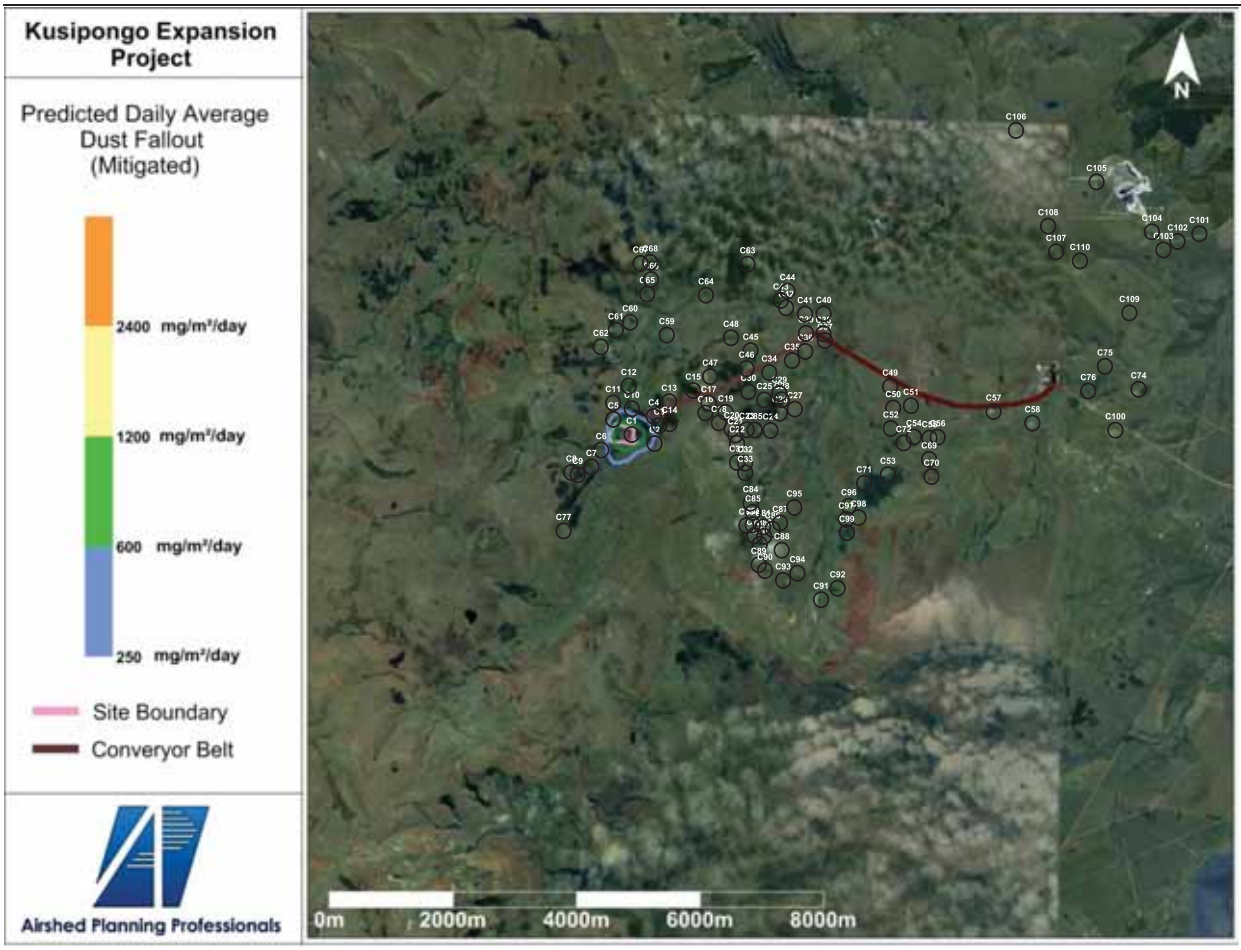


Figure 9.12 Predicted Daily Dust Fallout Rate (Post -mitigation)



Potential Resettlement

In those areas where model predictions of the existing baseline and operation of the main mine adit exceed the PM_{10} standard for the Predicted Highest Daily PM_{10} Concentrations of 75µg/m^3, monitoring effort will be focused at these locations to confirm such model predictions. This area is set out in *Figure 9.5*.

Where measured exceedances of the applicable standard persists and are demonstrably due to operational activities associated with the proposed main mine adit (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such concentrations at these locations will be well maintained (e.g. detailed design of crusher and screening facilities), and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.

As is previously mentioned, at this stage of the Project, those rural communities in the immediate vicinity of the proposed site of the main mine adit (illustrated as C1 to C10 in - *Figure 9.5*) will almost likely need to be resettled.

Residual Impact (Post-mitigation)

As previously mentioned, the mitigation measures above will reduce the scale of the impact to about 300m from the main mine adit. As such, the residual impact will be reduced to a '**Minor Negative Impact**' (*Table 9.35*).

Table 9.35 Rating of Residual Impacts on Air Quality (Airborne Particulates, Dust Fallout and Methane) Related to Operational Coal Handling and Processing in the Main Mine Adit (Adit A) and associated Ventilation (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local – within 300m from the main mine adit	With appropriate emission controls on the crushing and screening operations and implementation of the abovementioned resettlement recommendations, the impact of particulates can be reduced. It is predicted that the NAAQS limit values may, however, still be exceeded in the near vicinity of the plant boundary (~300m). Dust fall is also predicted to be limited to less than 100m from the main mine adit.
Duration	Long Term (10 to 20 years)	Impacts would arise throughout the life of mine of the proposed Project.

Scale	300m from the main mine adit	Emissions arising from the handling of final product may travel for up to 300m from source at the main mine adit.
Frequency	Occasional	Although majority of air quality related impacts will be managed/mitigated for majority of the time, occasional impacts may arise.
Likelihood	Possible	Occasional air quality related impacts during the operational phase of the proposed Project are still possible, even if receptors are resettled.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Minor Negative Impact		

9.6.3 *Impacts on Air Quality (Airborne Particulates, CH, CO, NOx and SOx) Related to Emergency Generator Sets during the Operational Phase*

Description of the Baseline Environment

No air concentration measurements have been done at the proposed Project Site or along the proposed route for the overland conveyor system. Due to the lack of development and low vehicle numbers, in terms of NO_2 and SO_2, the existing air-shed is described as un-degraded.

Proposed Project Activities

Diesel fuel for Emergency Generators will be stored in two underground tanks of 25 000 litres each. The sulphur content of the diesel is assumed to be 0.05%. All other mining equipment will be electric. The current proposal for the Emergency Generators is 5 x 2MVA units. For the purposes of this assessment, the emissions conditions were based on a CAT3516 unit, with a volumetric flow rate of 8.5m³/s and a vent diameter of 0.490 m. The estimated number of hours for the Emergency Generators to operate per year is 500 hours.

The Emergency Generators will result in emissions of combustion products, including carbon dioxide, carbon monoxide, sulphur dioxide, oxides of nitrogen and unburnt hydrocarbons. The air emissions for the diesel generators, rated at 2 MVA each, are summarised in *Table 9.36*. These rates were calculated using the emission factors for combustion engines (NPi 2008) and checked against the emission specifications for a CAT35168.

Table 9.36 Air Pollution Emission Rates for Emergency Generators

Generator Emissions	Total all Generators (annual, tpa)	Per Generator (g/s)	Total all generators (g/s)
Carbon monoxide	16.5	1.83	9.2
Oxides of nitrogen – uncontrolled	75	8.33	41.7
Oxides of nitrogen – controlled	39.5	4.39	21.9
Particulate matter 2.5 µm	2.1	0.23	1.2

Generator Emissions	Total all Generators (annual, tpa)	Per Generator (g/s)	Total all generators (g/s)
Particulate matter 10.0 µm	2.15	0.24	1.2
Polycyclic aromatic hydrocarbons	0.0000003	0.00	0.0
Sulphur dioxide	1.225	0.14	0.7
Total volatile organic compounds	1.9	0.21	1.1

Predicted Air Concentrations

The ADMS model was employed to calculate ground level air concentrations resulting from the Emergency Generators. As with the previous impact assessment, topographical and land use data for a study area of 15km by 15km were included in the model.

The predicted ground level air concentrations are given as isopleths of equal values. The plots represent the maximum predicted concentrations at each of the receptor grids included in the model. Only NO_2 air concentrations were shown to be relatively significant and the highest hourly and annual average concentrations are provided. Predicted pollutant concentration plots for SO_2 and CO were predicted to be well below their respective NAAQS limit values, and there plots were therefore not represented.

The predicted ground level concentration NO_2 (pre-mitigation) for emergency generator sets is illustrated in *Figure 9.13* and *Figure 9.14*.

Furthermore, the location, configurations and emission rates used in the simulations are summarised in *Table 9.37* and *Table 9.38* for the annual average and maximum hourly/daily average emissions, respectively.

Table 9.37 Emergency Generator Sets – Average Emission Conditions

Source	Location		Configuration				Exit Velocity [m/s]	Exit Temp [°C]	Emission Rate (g/s)				
	X	Y	Height [m]	Width [m]	Length [m]	Diameter [m]			PM_{10}	TSP	CO	NOx	SO_2
Generator1	230737.78	7008815.11	6			0.465	44.6	513	0.240		1.83	8.33	0.14
Generator2	230739.48	7008818.79	6			0.465	44.6	513	0.240		1.83	8.33	0.14
Generator3	230740.94	7008823.11	6			0.465	44.6	513	0.240		1.83	8.33	0.14
Generator4	230742.4	7008825.86	6			0.465	44.6	513	0.240		1.83	8.33	0.14
Generator5	230744.11	7008828.93	6			0.465	44.6	513	0.240		1.83	8.33	0.14

Table 9.38 Emergency Generator Sets – Maximum Emission Conditions

Source	Location		Configuration				Exit Velocity [m/s]	Exit Temp [°C]	Emission Rate (g/s)				
	X	Y	Height [m]	Width [m]	Length [m]	Diameter [m]			PM_{10}	TSP	CO	NOx	SO_2
Generator1	230737.78	7008815.11	6			0.465	44.6	513	0.240		1.83	8.33	0.21
Generator2	230739.48	7008818.79	6			0.465	44.6	513	0.240		1.83	8.33	0.21
Generator3	230740.94	7008823.11	6			0.465	44.6	513	0.240		1.83	8.33	0.21
Generator4	230742.4	7008825.86	6			0.465	44.6	513	0.240		1.83	8.33	0.21
Generator5	230744.11	7008828.93	6			0.465	44.6	513	0.240		1.83	8.33	0.21

Figure 9.13 *Predicted Highest Hourly Average Oxides of Nitrogen (NOx) Air Concentration – Hourly NO_2 is typically Less than 30% of NOx*

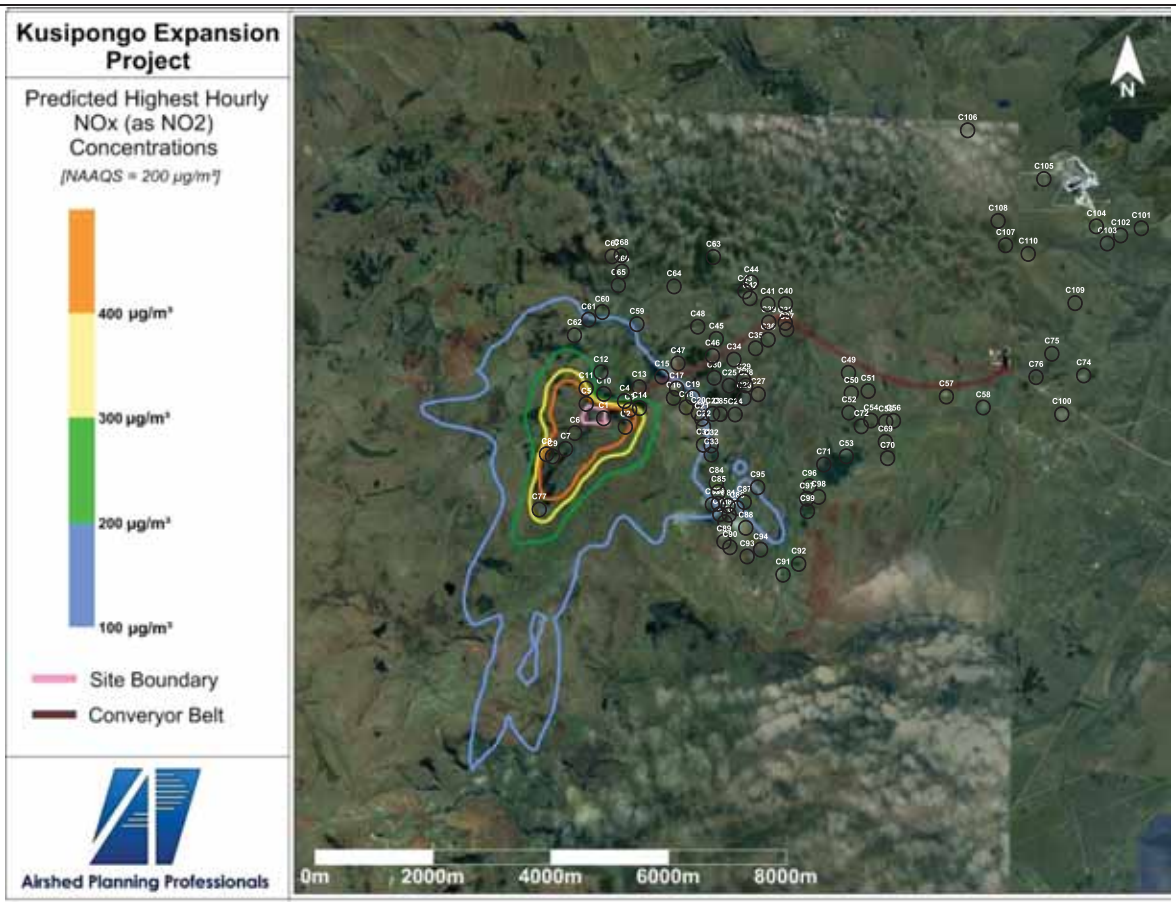
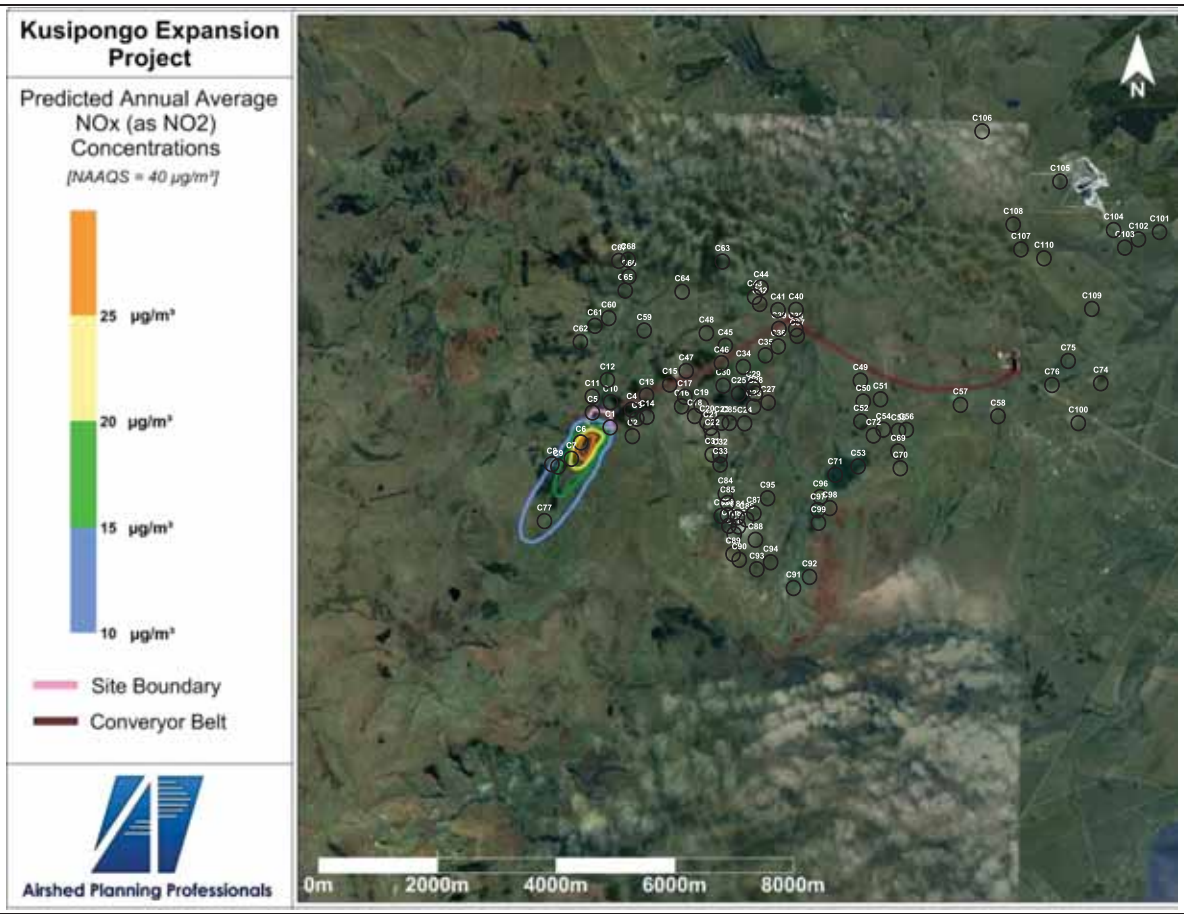


Figure 9.14 *Predicted Annual Average Oxides of Nitrogen Air Concentration – Annual Average NO_2 is typically 75 to 100% of NOx*



Sensitive Receptors

The immediate Study Area is sparsely populated. Apart from the scattered local rural farming communities, the largest concentration of human population is at St Helena (approximately 10km northeast from Adit A) and Driefontein (approximately 12km east of Adit A) of the proposed site for the main mine adit (Adit A). Twyfelhoek Primary School is located approximately 900m east-northeast of the Adit A.

Other sensitive receptors that are not located in the immediate vicinity of the proposed expansion project include the towns of Piet Retief (~ 40km east), Volksrust (~ 60km south-west) and Ermelo (~ 65km north-west).

Table 9.39 is a summary of the predicted highest concentrations at ground level predictions for the main air pollutants. Sulphur dioxide ground level concentrations were predicted to be very low compared to the limit values specified in the NAAQS for all averaging times. Similarly, the predicted carbon monoxide ground level concentrations were predicted to be low compared to the NAAQS for all averaging times.

Table 9.39 Highest Predicted Ground Level Air Concentrations (Pre-mitigation)

Pollutant	Averaging Period	Highest Predicted Concentration (µg/m³)	NAAQS Limit Value (µg/m³)
SO_2	Annual Average	0.3	50
	Highest Daily	4.5	125
	Highest Hourly	30	350
CO	Highest Hourly	200	30000
	Highest 8-Hourly	150	10000
NO_2	Annual Average	15	40
	Highest Hourly	**240**	200

Note: bold values in red cells indicate an exceedance of the NAAQS limit value

Only oxides of nitrogen (NOx) emissions were predicted to be potentially significant. These emissions assume no NOx control on the emergency generators, which is more typical of older generation generators. For example, the latest generators from Caterpillar, includes NOx control, with emissions at most, half that of uncontrolled units. The results shown here therefore represent the worst case.

Emissions of nitrogen oxide (NO) are rapidly converted in the atmosphere into more toxic nitrogen dioxide (NO_2), which is regulated by the NAAQS. However, assuming that all NOx immediately convert to NO_2, is considered too conservative for application of the hourly average air concentrations. Instead, the hourly average assumed that 30% of the NOx is immediately available as NO_2. This is based on the emissions from large diesel vehicle engines. Most industrial emissions emit less than 5% NO_2. Annual average concentrations, on the other hand, assumed 75% to 100% conversion. **Given**

that the hourly average NO_2 would be 30% (or less) of the NOx concentrations, the predicted ground level concentrations were predicted to be below the hourly NAAQS outside the main mine adit boundary. The predicted maximum air concentration within the main mine adit and at the boundary was predicted to be above the hourly limit value; however, the NAAQS does not apply in the workplace. **The predictions therefore indicate compliance with the annual NAAQS.**

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, it is the finding of this AQIA that the impact from the Emergency Generator Sets will be a '**Minor Negative Impact'** (pre-mitigation) (refer to *Table 9.40*).

Table 9.40 ***Rating of Impacts on Air Quality (Airborne Particulates, CH, CO, NOx and SOx) Related to Emergency Generator Sets (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - within the main mine Aait	Gaseous emissions from the operation would be due to the emergency generators and vehicular activities. These pollutants include combustion products: carbon dioxide, carbon monoxide, sulphur dioxide, oxides of nitrogen and unburnt hydrocarbons. The predicted impact due to these gases is low.
Duration	Long Term (10 to 20 years)	Impacts would arise throughout the life of mine of the proposed Project.
Scale	Within the main mine adit	Emissions arising from the emergency generators will confined to the footprint of the main mine adit.
Frequency	Intermittent	Generators would only be used for emergency situations, impacts would arise intermittently.
Likelihood	Possible	Impacts are possible when the situation arises where generator sets need to be used. This will occur throughout the lifetime of the proposed Project.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Small Sensitivity		
Emissions from the generator sets will be confined to the footprint of the main mine adit and will not impact on receptors in the vicinity of the proposed Project.		
Significant Rating Before Mitigation		
Minor Negative Minor Impact		

Mitigation/Management Measures

Since the impact from the emergency generators is of a minor significance, no specific mitigation measures are required. However, consideration will be given to Lo-NO_x Generators, which could typically reduce the emissions by 50%.

Residual Impact (Post-mitigation)

If Lo-NOx Emergency Generators are used, the NO_2 emission impacts would become a '**Negligible Negative Impact**' (*Table 9.41*).

Table 9.41 Rating of Residual Impacts on Air Quality (Airborne Particulates, CH, CO, NOx and SOx) Related to Emergency Generator Sets Air Emissions (Post-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - within the main mine adit	Gaseous emissions from the operation would be due to the emergency generators and vehicular activities. These pollutants include combustion products: carbon dioxide, carbon monoxide, sulphur dioxide, oxides of nitrogen and unburnt hydrocarbons. The predicted impact due to these gases is low; however, the use of Lo-NOx combustion technology, a 50% reduction in NO_2 impacts can be realised, thus reducing the impact to negligible.
Duration	Long Term (10 to 20 years)	Impacts would arise throughout the life of mine of the proposed Project.
Scale	Within the main mine adit	Emissions arising from the emergency generators will be confined to the footprint of the main mine adit.
Frequency	Intermittent	Generators would only be used for emergency situations, impacts would arise intermittently.
Likelihood	Possible	Impacts are possible when the situation arises where generator sets need to be used. This will occur throughout the lifetime of the proposed Project.
Magnitude		
Negligible Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Small Sensitivity		
Emissions from the Generator Sets will be confined to the footprint of the main mine adit and will not impact on receptors in the vicinity of the proposed Project.		
Significant Rating Before Mitigation		
Negligible Negative Impact		

9.6.4 *Impacts on Air Quality (Airborne Particulates and Dust Fallout) Related to Overland Conveying Activities during the Operational Phase*

Description of the Baseline Environment

The existing Kangra Coal Environmental Management Programme does not require Kangra Coal to measure particulate air concentrations; as such, no particulate air concentration measurements have been carried out along the route of the proposed overland conveyor system. However, based on the findings in the State of the Air Report (DEA 2009b), annual average PM_{10} concentration levels are expected to be about 20 $\mu g/m^3$, or perhaps even slightly more due to the existing mine activities. Therefore based on these monitoring results, in terms of dust deposition observations and PM_{10} estimates, the existing air-shed is described as mildly degraded near the site

proposed for the Project; however, degradation increases as the conveyor approaches existing mining operations at Maquasa.

Proposed Project Activities

In order to transport mined coal from Adit A to the existing coal beneficiation plant at Maquasa East, it is proposed to construct an overland conveyor belt, which will tie into the existing conveyor system at the Maquasa West Adit. Included in this conveyor corridor will be the overhead transmission lines, gravel service road and a security fence (servitude width of 32m). Coal will then be transported along the existing conveyor system from the Maquasa West Adit through to the Maquasa East coal beneficiation plant.

Uncontrolled particulate air emissions associated with the overland conveyor are summarised in *Table 9.42* below.

Table 9.42 Particulate (PM_{10}) Air Emissions Calculated for Uncontrolled Overland Conveyor System Operating Conditions

Uncontrolled Coal Dust Sources	Annual average (tpa)		Hourly Max (g/s)	
	TSP	PM_{10}	TSP	PM_{10}
Conveyor Belt	25.4	11.5	80.5	36.2

It is calculated that on an annual average, the overland conveyor system does not contribute significantly to the overall particulate emissions for the proposed Project (~4% TSP and ~4% PM_{10}); however, during strong winds, particulate emissions (pre-mitigation) from the overland conveyor system would dominate, i.e. ~73% TSP and ~76% PM_{10} (*Table 9.42*).

Predicted Air Concentrations

Particulate emissions from the overland conveyer system were simulated using ADMS. Ground level air concentrations and fallout rates were calculated. The conveyor was simulated as a line source and tipping points as point sources. Details of the conveyor used in the dispersion model are given in *Table 9.43* below.

Table 9.43 Overland Conveyor Model Input Data

Source	Location		Configuration		
	X	Y	Height [m]	Width [m]	Length [m]
Conveyor1	230862.73	7008944.05	3	1	1721
Conveyor2	232447.53	7009625.08	3	1	1512
Conveyor3	233715.36	7010449.2	3	1	3533
Conveyor4	237172.65	7009630.2	3	1	544

The predicted air concentration and deposition rate plots for the overland conveyor system are presented in *Figure 9.5* to *Figure 9.8* in *Section 0*.

Sensitive Receptors

The immediate Study Area is sparsely populated. Apart from the scattered local rural farming communities, the largest concentration of human population is at St Helena (approximately 10 km northeast from Adit A) and Driefontein (approximately 12 km east of Adit A) of the proposed site for the main mine adit (Adit A). Twyfelhoek Primary School is located approximately 900m east-northeast of the Adit A.

Other sensitive receptors that are not located in the immediate vicinity of the proposed expansion project include the towns of Piet Retief (~ 40km east), Volksrust (~ 60km south-west) and Ermelo (~ 65km north-west).

Table 9.44 is a summary of the predicted highest particulate concentrations at ground level. Particulate emissions (PM_{10}), if no emission controls are established, was shown to potentially result in exceedances of the NAAQS for both the daily and annual average. If left uncontrolled, the particulate **emissions from the overland conveyor belt has the potential to impact up to 400m from the conveyor** (mainly near the transfer points).

Table 9.44 Highest Predicted Ground Level Air Concentrations (Pre-mitigation)

Pollutant	Averaging Period	Highest Predicted Concentration (µg/m³)	NAAQS Limit Value (µg/m³)
PM_{10}	Annual Average	**72**	40
	Highest Daily	**220**	75

Note: bold values in red cells indicate an exceedance of the NAAQS limit value

Dust fallout is also predicted to be limited to less than 50m from the overland conveyor system.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from the Overland Conveying Activities will be '**Major Negative Impact'** pre-mitigation (refer to *Table 9.45*).

Table 9.45 Rating of Residual Impacts on Air Quality (Airborne Particulates and Dust Fallout) Related to Overland Conveying Activity Air Emissions (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local – within 400m from the overland conveyor system	Pre-mitigation, particulate emissions from the overland conveyor system have the potential to impact up to 400 m from the conveyor (mainly near the transfer points). Dust fall is also predicted to be limited to less than 50m from the conveyor.
Duration	Long Term (10 to 20 years)	Impacts would arise throughout the life of mine of the proposed Project.
Scale	400m from the overland conveyor system	Emissions arising from the transport of the product may travel for up to 400m from the overland conveyor system.
Frequency	Continuous	As the process operates continually, impacts would arise continuously.
Likelihood	Likely	Impacts will arise continuously throughout the lifetime of the proposed Project.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Based on the situation that there are receptors within the immediate area of impact, the rating is considered to be High.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be adopted at the conveyor ends:

- Conveyor belts are usually equipped with belt scrapers; however, conveyor belts will also be equipped with belt washers [12].

- When dust levels are high, a second or even third scraper will be added rather than trying to get a single scraper to work more efficiently (Kissell 2003) [1].

[1] Scrapers and washers play an important role in reducing the amount of dust generated by conveyor belt carry-back. Carry-back is that portion of the carried material that sticks to the belt instead of falling off at the head pulley. It becomes airborne dust as the belt dries and passes over the return idlers. This is typically observed as accumulated material on the roof of the motor cage, on its sides and on the back end of the receiving bin.

[2] Rodgers *et al.* (1978) added a 570 litres per minute water spray system to dry scrapers on a 1400mm (54-inch) belt at a taconite processing plant. The sprays reduced respirable dust by 48% and total dust by 78% compared to dry scrapers alone. Baig *et al.* (1994) reported that airborne coal dust levels were reduced 80%-90% when their belt scrapers were augmented with spray wash boxes.

Control factors for wind generated dust on top of the conveyor belt have been derived from information published in recent assessments for the Dalrymple Bay and Hay Point Coal Terminals and information published in the Australian National Pollution Inventory (NPI 2001). A summary of the control factors is presented in *Table 9.46* overleaf.

Table 9.46 ***Summary of Conveyor Belt Emission Reductions (NPi 2001)***

Control Type on Conveyor	Emission Reduction (%)
Roof and 2 Sides	70
Roof and 1 Side	65
Roof Only	**40**

Please Note – the mitigated particulate emission rate for overland conveyor belts 40% emission reduction, i.e. roof only.

Residual Impact (Post-mitigation)

With the mitigation measures summarised above, the predicted scale of impact will reduce to the immediate vicinity of the conveyor belt, reducing the significance of the impact to a '**Minor Negative Impact**' (*Table 9.48*).

Table 9.47 ***Particulate Emission Mitigation Measures***

Emission Location	Recommended Control Efficiency	Control Equipment
Conveyor belt transfer points	70%	Belt scrapers Belt washers
Conveyor belt cover	40%	Roof
Tipping points	70%	Semi-enclosed chute Lowering the drop distance

[1] Roberts *et al.* (1987) have shown that with each successive scraping, both the percentage of fines and the moisture level of the carry-back substantially increase. This shows that the larger material is preferentially removed by scraping and the smallest fines (which, if multiple scrapers do not remove enough carry-back to cut the respirable dust sufficiently, a water wash system may be necessary).

Table 9.48 ***Rating of Residual Impacts on Air Quality (Airborne Particulates and Dust Fallout) Related to Overland Conveying Activities Air Emissions (Post-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - immediate vicinity of the overland conveyor system	With mitigation, the air pollution impact due to particulate emissions from the overland conveyor would be restricted to the immediate vicinity of the overland conveyor system, with most impact near the transfer points.
Duration	Long Term (10 to 20 years)	Impacts would arise throughout the life of mine of the proposed Project.
Scale	Immediate vicinity of the overland conveyor system	Emissions arising from the transport of the product may travel for up to a few metres from the conveyor belt.
Frequency	Continuous	As the process operates continually, impacts would arise continuously.
Likelihood	Likely	Impacts will arise continuously throughout the lifetime of the proposed Project.
Magnitude		
Small Magnitude		
Significant Rating Before Mitigation		
Minor Negative Impact		

With the necessary emission controls, as discussed above, the particulate impacts can significantly be reduced, as shown in *Figure 9.9* on *Page 9-70* (highest daily average), *Figure 9.10* on *Page 9-71* (zone impacted by 4 exceedances of the daily average limit) and *Figure 9.11* on *Page 9-72* (annual average).

9.6.5 Impacts on Air Quality (Airborne Particulates, Dust Fallout, SOx and NOx) Related to Decommissioning Activities during the Decommissioning Phase

Description of Baseline Environment

Current dust fallout measurements at the Maquasa East mine sites indicate that most of the significant fallout rates were nearby the mining operations. The Residential Action level of 600 mg/m²/day was only exceeded occasionally over a period of two years. The highest fallout observed at the mine exceeded the Industrial Action level of 1 200 mg/m²/day on one occasion. Generally, however, the fallout at the mine buckets was below the Industrial Action level. No exceedances of the Alert Threshold of 2 400 mg/m²/day were observed.

No particulate air concentration measurements have been done at the existing or proposed mining sites. However, it is estimated, based on the findings in

the State of the Air Report (DEA 2009b), annual average PM_{10} concentration levels vary between about 15 to 20 µg/m³ in rural areas. Due to the other activities in the Study Area, it is expected that the upper range would be applicable.

Therefore based on these monitoring results, in terms of dust deposition observations and PM_{10} estimates, the existing air-shed is described as mildly degraded. Due to the lack of development and low vehicle numbers, in terms of NO_2 and SO_2, the existing air-shed is described as un-degraded.

Proposed Project Activities

The decommissioning of the proposed Kusipongo Resource Expansion Project will involve the deconstruction of all mining related and ancillary infrastructure; transport of materials from the site by truck; earthworks to restore the site; and decommissioning and restoration of the mine workings and the overland conveyor system.

Decommissioning activities have the potential to result in significant emissions of dust, PM_{10} and $PM_{2.5}$ to atmosphere, significant emissions of combustion gases and significant impacts on sensitive receptors in the vicinity of the decommissioning activities. Airborne particulate emissions will also result from road and open surfaces. Other air pollutants can include emissions from internal combustion engines of mobile and stationary equipment such as excavators, trucks, generators and compressors.

A detailed air pollution impact assessment would include a comprehensive inventory of all these sources of air emissions. Unfortunately, this level of detail was not available at the time of the investigation. Instead, it is anticipated that a similar impact would result as that predicted for the construction phase (see *Section 9.6.1*).

Sensitive Receptors

Given the nature of decommissioning activities, it is anticipated that air emissions would be dominated by airborne particulates. As a result, and if not mitigated, decommissioning activities have the potential to negatively impact on sensitive receptors some distance from the site.

Based on the same emission factor for construction activities, there is a potential that the highest daily average PM_{10} concentration could exceed the NAAQS standard up to a distance of about 500 m beyond the boundary of the plant. The communities that could potentially be impacted include the receptors identified as C2, C3, C4, C5, C7, C11, C12 and C14 (refer to *Section 9.6.1*). Due to the potential significant impact of unmitigated and uncontrolled emissions, a number of mitigation measures are identified to control emissions of dust and PM_{10}.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above air quality impacts from construction activities pre-mitigation will be a '**Minor Negative Impact**'.

This is as a result of the notion that:

- Impacts associated with emissions arising from vehicle exhausts will be a small negative impact for all roads (paved or unpaved);
- Impacts associated with PM_{10} and $PM_{2.5}$ emissions for paved roads will be a negligible negative impact;
- The impacts associated with emissions due to wheel entrained dust (PM_{10} and $PM_{2.5}$) from unpaved roads and dust from open areas will be significant; and
- Based on the assumption that there will be no sensitive receptors residing in the immediate area of impact, the rating is considered to be Minor. If, on the other hand receptors establish themselves within the area in which existing baseline and Project resulted PM_{10} concentrations are in excess of the Predicted Highest Daily PM_{10} Concentrations of 75µg/m^3, this rating would change to Major.

Refer to *Table 9.49*.

Table 9.49 Rating of Impacts on Air Quality (Airborne Particulates, Dust Fallout, SOx and NOx) Related to Decommissioning Emissions (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - within 500m of decommissioning activities	Decommissioning activities and the movement of vehicles along unpaved roads at the site have the potential to result in significant emissions (*large* magnitude) with no emission controls in place. Significant emissions may travel for up to 500m from the decommissioning activities in significant concentrations.
Duration	Short Term	Impacts would arise throughout the decommissioning period.
Scale	500m from source	Particulate and dust emitting decommissioning activities and the movement of vehicles over unpaved roads during the decommissioning phase will result in dust emissions may travel for up to 500m from source.
Frequency	Continuous	Impacts would arise, in effect, continuously from decommissioning activities.
Likelihood	Likely	Impacts will arise throughout the decommissioning period.
Magnitude		
Large Magnitude		

Whilst impacts associated with exhaust combustion gases (e.g. SO_2, NO_2) from vehicles are **small**, the impacts associated with emissions due to wheel entrained dust (PM_{10} and $PM_{2.5}$) from unpaved roads and dust from open areas is **large**.
Sensitivity/Vulnerability/Importance of the Resource/Receptor
Low Sensitivity
Based on the situation that there are currently no receptors in the immediate area of impact, the rating is considered to be Medium. If, on the other hand receptors establish themselves within the 500m predicted impact zone, this rating would change to High.
Significant Rating Before Mitigation
Minor Negative Impact

Mitigation/Management Measures

The assessment concluded that there will be no significant impacts on people from the release of airborne emissions during the decommissioning phase, as it is assumed that all rural villages directly affected would have been resettled in the construction and operational phases of the proposed Project. As such, measures other than good decommissioning work methods and practices (these practices are similar to those mentioned previously in the *Mitigation/Management Measures* in *Section 9.6.1*) are not required.

Residual Impact (Post-mitigation)

As additional mitigation measures (other than good decommissioning work methods) are not required, the impact will remain as a '**Minor Negative Impact**'.

9.7 IMPACTS ON NOISE

9.7.1 Impacts on the Noise Environment during the Construction Phase

Description of the Baseline Environment

Baseline sound measurements showed that the Study Area is relatively quiet during both the day and night-time periods with low ambient sound levels; however, sound levels increased in closer proximity to existing mining operations. The soundscape in the Project Site can be defined as natural; with faunal, amphibian, insect and wind-induced sounds dominating the sound character.

Because noise levels closer to receptors are generally higher (due to typical household activities generating sound, e.g. listening to the TV/Radio, conversation, cleaning, working, preparing food, etc.), an ambient sound level of *42 dBA* will be assumed at receptor locations. This sound level will be used to estimate how the introduced noises will affect the ambient sound levels.

Proposed Project Activities

It is assumed that construction will occur only during the daytime period and will likely include the following activities:

- Vegetation removal;
- Topsoil removal and the development of infrastructure footprints;
- Site establishment;
- Construction of access roads;
- Developments of the foundations for the conveyor belt system;
- The removal of soft (using excavator) and hard material (drill and blast to remove very hard material) during the development of the adits; and
- The establishment of infrastructure.

Equipment Likely to be used during the Construction Phase of the Proposed Project

At this stage of the Project, it is unknown as to the type of equipment that will be used during the construction phase; however, it is assumed that equipment such as graders, bulldozers, excavators, articulated dump trucks, tip-load-buckets, long-haul delivery trucks, drilling machinery, compressors and diesel generators as well as front-end loaders will be used during the construction phase of the proposed Project.

During the construction phase, noise impacts are related to machinery noise emissions and impulsive noises (tipping of material, hammering, piling and blasting activities). Construction noise sources are generally intermittent and impacts depend on the number and types of equipment used for each activity, the duration of the various activities, the locations where the activities can take place, etc. As such, the potential noise impact has been based on a simplistic model that considers distance from the activity.

Maximum noises generated ($LA_{, max}$) during the construction phase can be audible over a large distance; however, these activities and associated noise emissions are generally of very a short duration. If maximum noise levels exceed 65 dBA at a receptor, or if it is clearly audible with a significant number of instances where the noise level exceeds the prevailing ambient sound level with more than 15 dB, the noise will increase annoyance levels and may ultimately result in noise complaints. Potential maximum noise levels generated by various construction equipment, as well as the potential extent of these sounds, are presented in *Appendix A* of the Noise Impact Assessment Report (*Annex C.5*). Maximum noise events are currently not regulated.

Average or equivalent sound levels (LA_{eq}) is another factor that impacts on the ambient sound levels, and is typically the constant sound level that any given receptor experiences. Typical sound power levels associated with various activities that may be found at a construction site are also presented *Appendix A* of the Noise Impact Assessment Report (*Annex C.5*). Equivalent noise levels are regulated by the National Noise Control Regulations. For a rural area as found at this location the SANS 10103:2008 rating level would be 45 dBA.

For the purpose of this NIA the SANS 10103:2008 daytime rating level of 45 dBA will therefore be used.

Operating a large machine such as a CAT 700 Load Haul Dumper within 1 000m from a receptor during the day would raise the ambient sound levels to a level above the SANS 10103:2008 rating level at the receptor during the period the machine is operational. The closer the activity is to any given receptor, the higher the risk of a noise complaint being registered.

Other noises associated with the construction phase would relate to increased traffic leading to and from the construction area. For the purpose of the NIA, it was assumed that traffic would comprise of 20 vehicles [1] (10 heavy and 10 light delivery vehicles) travelling at 60km/h. The assessment however indicated that LA_{eq} levels would be less than 45 dBA within a distance of 50m from the road. As such, noise from construction traffic is considered a low concern.

Sensitive Receptors

For the purpose of model simulation for the NIA, a number of Hitachi EX1200 Excavators [2] were assumed at locations where construction activities were likely to take place, including along the route of the proposed conveyor belt. The projected noise level was calculated in terms of $LA_{eq,1hr}$ level (the equivalent noise level that the receptor will experience over an hour with the machine operating at full load), with the calculated potential noise levels presented in *Table 9.50*.

[1] Worst-case scenario

[2] The excavator was used as the noise source as it produces a louder equivalent noise than most other equipment

Table 9.50 Potential Daytime Noise Levels and Magnitude of the Construction Noise Impact

Receptor	Co-ordinates (Lat/Lon Deg. Min. Sec WGS84)	Projected Day Noise Level	Change from Ambient sound level (taken as 42 dBA)	Distance from closest (potential) activity (m)	Magnitude
PSR01	27 0'37.76"S, 30	59.0	14.1	168	High
PSR02	27 0'48.80"S, 30	46.6	3.9	452	Low
PSR03	27 0'59.27"S, 30	39.8	1.1	747	Low
PSR04	27 1'3.84"S, 30	39.2	1.0	767	Low
PSR05	27 1'15.64"S, 30	34.6	0.4	988	Low
PSR06	27 1'4.34"S, 30 20'8.13"E	40.0	1.2	636	Low
PSR07	27 1'23.17"S, 30	32.0	0.2	1462	Low
PSR08	27 1'27.46"S, 30	31.0	0.2	1727	Low
PSR09	27 1'38.68"S, 30	29.9	0.1	2156	Low
PSR10	27 1'45.83"S, 30	29.5	0.1	2156	Low
PSR11	27 1'52.22"S, 30	29.1	0.1	2061	Low
PSR12	27 1'59.02"S, 30	29.1	0.1	1914	Low
PSR13	27 2'3.35"S, 30	28.8	0.1	1901	Low
PSR14	27 2'12.66"S, 30	34.8	0.4	1030	Low
PSR15	27 2'26.46"S, 30	31.5	0.2	1339	Low
PSR16	27 2'21.02"S, 30	29.4	0.1	1632	Low
PSR17	26 59'59.93"S, 30	52.2	8.0	307	Medium
PSR18	26 59'59.39"S, 30	51.6	7.4	325	Medium
PSR19	27 0'13.48"S, 30	72.0	27.0	45	High
PSR20	27 0'9.33"S, 30	69.4	24.5	60	High
PSR21	27 0'17.97"S, 30	51.0	6.9	319	Medium
PSR22	27 0'27.08"S, 30	63.0	18.1	129	High
PSR23	27 0'31.17"S, 30	52.7	8.4	265	Medium
PSR24	27 0'34.47"S, 30	46.2	3.7	660	Low
PSR25	27 0'46.01"S, 30	55.7	11.0	305	High
PSR26	27 0'51.77"S, 30	54.6	10.1	321	High
PSR27	27 1'3.88"S, 30	57.1	12.4	290	High
PSR28	27 0'59.33"S, 30	72.1	27.2	103	High
PSR29	27 1'48.63"S, 30	32.6	0.2	1709	Low
PSR30	27 2'1.08"S, 30	30.2	0.1	2070	Low
PSR31	27 0'1.93"S, 30 17'9.31"E	35.0	0.4	1594	Low
PSR32	27 0'4.83"S, 30 17'1.39"E	35.1	0.4	1586	Low
PSR33	27 0'7.07"S, 30	35.5	0.5	1532	Low
PSR34	27 0'13.99"S, 30	36.5	0.6	1378	Low
PSR35	27 0'20.15"S, 30	38.1	0.8	1205	Low
PSR36	27 1'56.63"S, 30	36.9	0.6	951	Low
PSR37	27 3'24.09"S, 30	28.4	0.1	1746	Low
PSR38	27 2'9.01"S, 30	42.4	1.9	596	Low
PSR39	27 3'37.33"S, 30	25.3	0.0	2356	Low
PSR40	27 3'32.28"S, 30	26.6	0.1	2061	Low
PSR41	27 3'37.08"S, 30	26.1	0.1	2140	Low
PSR42	27 2'11.20"S, 30	41.3	1.5	623	Low
PSR43	27 0'42.91"S, 30	58.0	13.2	184	High
PSR44	27 0'54.90"S, 30	65.2	20.2	89	High
PSR45	27 0'50.28"S, 30	67.1	22.1	74	High
PSR46	27 0'37.47"S, 30	57.1	12.4	193	High
PSR47	27 0'49.08"S, 30	55.9	11.2	214	High
PSR48	27 0'49.04"S, 30	50.4	6.5	336	Medium
PSR49	27 0'54.58"S, 30	47.3	4.3	477	Low
PSR50	27 0'57.45"S, 30	44.1	2.6	608	Low
PSR51	27 0'38.64"S, 30	58.2	13.4	197	High
PSR52	27 0'43.20"S, 30	48.2	4.9	455	Low
PSR53	27 0'39.98"S, 30	46.2	3.6	498	Low

PSR54	27 0'43.48"S, 30	43.9	2.5	612	Low
PSR55	27 0'50.42"S, 30	41.7	1.7	775	Low
PSR56	27 0'48.48"S, 30	40.2	1.2	856	Low
PSR57	27 1'14.99"S, 30	38.2	0.8	1151	Low
PSR58	27 1'20.19"S, 30	36.7	0.6	1340	Low
PSR59	27 1'35.99"S, 30	34.7	0.4	1514	Low
PSR60	27 1'47.48"S, 30	35.3	0.4	1191	Low
PSR61	27 1'47.67"S, 30	35.7	0.5	1150	Low
PSR62	27 1'46.75"S, 30	33.4	0.3	1378	Low
PSR63	27 1'38.78"S, 30	32.3	0.2	1708	Low

Significance of Impact (Pre-mitigation)

Based on the analysis provided above noise related impacts from construction activities associated with the proposed Project will be a "**Major Negative Impact**" (pre-mitigation) for potential noise sensitive receptors identified as having a high magnitude in *Table 9.50* (refer to *Table 9.2* below).

Table 9.51 Rating of Impacts Related to Noise Emissions during the Construction Phase of the Proposed Project (Pre-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact would be limited to the local area up to approximately 1km from source.
Duration	Short-term	Activities will take place during the day-time hours and will continue for 18 to 21 months.
Scale	Large	Construction activities are likely to influence the baseline ambient sound levels over an area of more than 1km from source. The magnitude of the noise levels is likely to be in excess of 55 dBA for receptors living in a distance of 300m from where construction activities will take place.
Frequency	Daily	The activities generating noise are anticipated to take place daily during daylight hours.
Likelihood	Definite	Because of the very low ambient sound levels in the Project Area, it is definite that the receptors will be aware of the increased noise levels. The proximity of existing receptors means that noise levels during construction will be in excess of 55 dBA for a number of communities.
Magnitude		
Large Magnitude		
Construction activities without mitigation will result in noise levels up to 72 dBA at the closest receptors (refer *Table 9.50*)		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Local communities affected would comprise of a number of individuals ranging from babies, teens, adults and the elderly. It has been proven that very young children and the elderly are generally more susceptible to increased noises, especially if these noises contain an impulsive component, frequently associated with construction activities (such as hammer blows).		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Kangra Coal will implement the following mitigation/management measures so as to reduce the significance of the impact:

- When working within a distance of 500m [1] of potential noise-sensitive receptors, the number of simultaneous noise emitting activities will (where possible) be minimised, thus reducing the impacts associated with cumulative noise emissions [2].

- A good working relationship between mine management and all potentially noise-sensitive receptors will be ensured. Communication channels will be established to ensure prior notice to the sensitive receptor if work is to take place close to them. Information that will be provided to potentially sensitive receptor(s) includes:

    - Proposed working dates, the duration that Kangra Coal will be working in the area and working times;
    - The reason why the activity is taking place;
    - The construction methods that will be used; and
    - Contact details of a responsible person where any complaints can be lodged should there be an issue of concern.

- When simultaneous noise emitting activities are to take place close to potential noise-sensitive receptors, the working time will be co-ordinated with periods when the receptors are not at home. An example would be to work within the 8 am to 2 pm time-slot, as:

    - Potential noise-sensitive receptors are most likely to be at school or work; and
    - Normal daily household activities (cleaning, listening to TV/Radio, etc.) will generate other noises that would most likely mask construction noises, thus minimizing the effects of cumulative noise impacts.

- Equipment will be well maintained and fitted with the correct and appropriate noise abatement measures.

Potential Resettlement

In those areas where model predictions indicate a change from ambient sound levels (taken as 42 dBA) and construction of the proposed Project exceeds

[1] Studies have shown that noise measurements taken from construction activities indicated that noise levels are generally less than 50 dBA at distances in excess of 500m from where activities are been undertaken. Also refer to *Annex A*.

[2] Noise levels cumulatively increase as the number of noise sources increases. A conceptual machine may emit 50 dBA at 100m, but the addition of the same machine will increase the noise emissions with 3 dBA (to 53 dBA – logarithmic addition). The more equipment operating simultaneously the higher the resulting sound pressure levels (acoustic energy) and the higher the noise level.

levels in excess of 55dBA (indicated in Red in *Table 9.50* above), the monitoring effort will be focused at these locations to confirm such model predictions.

Where measured exceedances of the applicable standard persist and are demonstrably due to construction activities associated with the establishment of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If *avoidance* of Major significant impacts is not feasible using these measures during the Construction phase, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal.

Residual Impact (Post Mitigation)

With suitable mitigation/management this impact is likely to decrease resulting in a residual assessment of the impact to a "**Minor Negative Impact**" (refer to *Table 9.5* below).

Table 9.52 ***Rating of Impacts Related to Noise Emissions during the Construction Phase (Post-mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact would be limited to the local area up to approximately 1km from source.
Duration	Short-term	Activities will take place during the day-time hours and will continue for 18 to 21 months.
Scale	Minor to medium	Construction activities are likely to influence the baseline ambient sound levels over an area of more than 1km from source; however, with implementation of the above mitigation measures the the magnitude of the noise impact would likely decrease to levels close to the SANS 10103 rating level for a rural district (45 dBA).
Frequency	Daily	The activities generating noise are anticipated to take place daily during daylight hours.
Likelihood	Possible	Because of the very low ambient sound levels in the Project Area, it is definite that the receptors will be aware of the increased noise levels; however, with implementation of the above resettlement recommendations, the magnitude of the noise impact would likely be close to the SANS 10103 rating level for a rural district (45 dBA). As such, the likelihood of complaints from communities in the Project Area should be low.
Magnitude		
Small Magnitude		
Construction activities with mitigation will result in noise levels close to the SANS 10103 daytime rating level for a rural area.		

Significant Rating After Mitigation
Minor Negative Impact

9.7.2 *Impacts on the Noise Environment during the Operational Phase*

Description of the Baseline Environment

Baseline sound measurements showed that the Study Area is relatively quiet during both the day and night-time periods with low ambient sound levels; however, sound levels increase in closer proximity to existing mining operations. The soundscape in the Project Site can be defined as natural; with faunal, amphibian, insect and wind-induced sounds dominating the sound character.

Because noise levels closer to receptors are generally higher (due to typical household activities generating sound, e.g. listening to the TV/Radio, conversation, cleaning, working, preparing food, etc.) an ambient sound level of *42 dBA* will be assumed at receptor locations. This sound level will be used to estimate how the introduced noises will increase the ambient sound levels.

Proposed Project Activities

The operational phase of the proposed Project comprises a considerable number of processes, activities and equipment that generate noise. The proposed Project will operate 24 hours a day, 7 days a week.

Operational activities that can produce noise at the Main Mine Adit (Adit A) and associated coal transport system will include:

- General activities at the workshop area;
- General activities at the vehicle ramp;
- Operation of the ventilation fans (4x ventilation fans);
- Primary and secondary crushing and screening of mined coal;
- Material transfer into and out of storage silos;
- Coal tipping; and
- Operation of the overland conveyor system.

As with the construction phase, maximum noises can be audible over a large distance but the character of noise changes during the operational phase to a noise with a broadband character that is less impulsive. Maximum noise events are currently not regulated.

Equivalent sound levels are regulated in terms of the National Noise Control Regulations. For a rural area as found at this location the SANS 10103:2008 **daytime rating level would be 45 dBA and 35 dBA for the night-time period**. This environmental NIA will only investigate the night-time period as this is

the time-period where a quieter environment is more important for receptors [1].

The sound power levels at source for noise emitting equipment listed in *Table 9.53* was used in modelling noise levels and its extent during the operational phase. The layout as modelled is presented in *Figure 9.15* [2].

Table 9.53 ***Sound Power Levels of Equipment as used in Modelling for Operational Impacts***

Equipment	Sound Power Level (dBA)
Coal silo (Material Transfer)	103.2
Coal crushing	114.5
Coal Screen	105.1
Conveyor Belt	81.0
Conveyor Transfer points	99.4
General noise	108.8
Ventilation Fan	110.1

As with the construction phase it was assumed that 10 heavy and 10 light vehicles will be using the access road to and from Adit A per hour during the night-time hours.

[1] Day-time noise levels would be similar to the night-time noise levels, but, because of the 10 dB lower rating level, night-time would represent the worse-case scenario. By addressing the potential night-time noise impacts the applicant would also directly address daytime noise impact.

(2) ***Please Note*** - although the layout of the main mine adit has been amended the locations of the equipment illustrated in this Figure are still applicable.

Figure 9.15 Location of Noise Generating Activities during the Operational Phase (as modelled)

Sensitive Receptors

For the purpose of the model simulation for noise related impacts during the operational phase of the proposed Project and for this NIA, the placement of noise generating activities during the operational phase were assumed at locations presented in *Figure 9.15*. The project noise levels associated with this configuration of noise generating activities and the magnitude of the perceived noise impact is presented in *Table 9.54* and *Figure 9.16*.

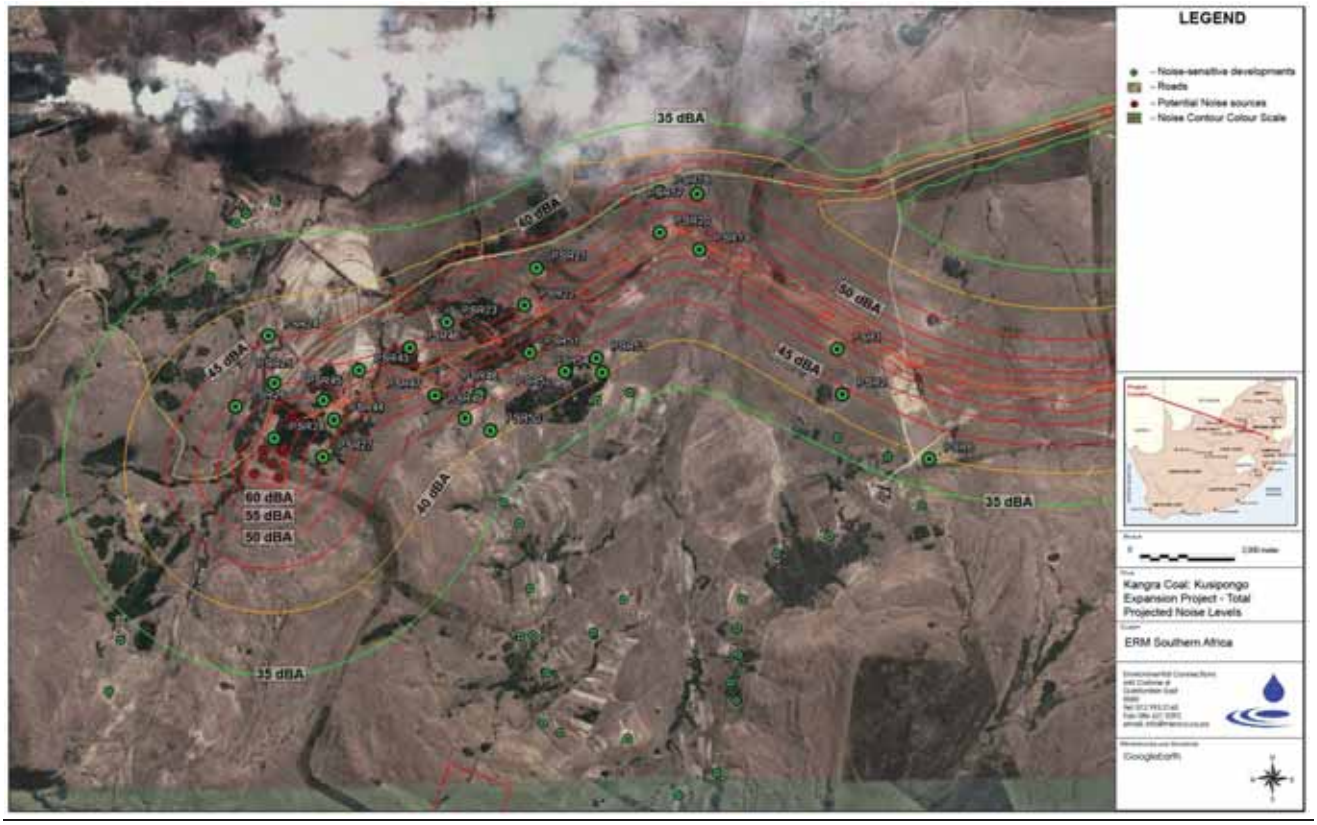
The projected noise level is calculated in terms of the logarithmic change from night-time rating levels for a rural district (35 dBA).

Table 9.54 Potential Logarithmic Change in Baseline Night-time Noise Levels and Magnitude of the Operational Noise Impact

Receptor	Co-ordinates (Lat/Lon Deg. Min. Sec WGS84)	Projected Night-time Noise Level	Change from Night-time Rating Level for a Rural District (35 dBA)	Distance from Closest (Potential) Operational Activity (m)	Magnitude
PSR01	27 0'48.80"S, 30 19'44.38"E	52.5	17.5	168	High
PSR02	27 0'59.27"S, 30 19'43.00"E	43.8	9.3	452	Medium
PSR03	27 1'3.84"S, 30 19'56.82"E	37.2	4.3	747	Low
PSR04	27 1'15.64"S, 30 20'5.92"E	37.8	4.6	767	Low
PSR05	27 1'4.34"S, 30 20'8.13"E	32.5	1.9	988	Low
PSR06	27 1'23.17"S, 30 19'40.74"E	39.5	5.8	636	Medium
PSR07	27 1'27.46"S, 30 19'26.47"E	27.5	0.7	1462	Low
PSR08	27 1'38.68"S, 30 19'16.92"E	26.5	0.6	1727	Low
PSR09	27 1'45.83"S, 30 19'15.55"E	25.3	0.4	2156	Low
PSR10	27 1'52.22"S, 30 19'15.97"E	24.8	0.4	2156	Low
PSR11	27 1'59.02"S, 30 19'13.91"E	24.3	0.4	2061	Low
PSR12	27 2'3.35"S, 30 19'15.48"E	23.9	0.3	1914	Low
PSR13	27 2'12.66"S, 30 18'45.60"E	23.6	0.3	1901	Low
PSR14	27 2'26.46"S, 30 18'59.63"E	24.9	0.4	1030	Low
PSR15	27 2'21.02"S, 30 19'10.05"E	23.2	0.3	1339	Low
PSR16	26 59'59.93"S, 30 19'4.73"E	23.0	0.3	1632	Low
PSR17	26 59'59.39"S, 30 18'54.36"E	47.4	12.7	307	High
PSR18	27 0'13.48"S, 30 19'5.33"E	47.4	12.6	325	High
PSR19	27 0'9.33"S, 30 18'54.56"E	61.8	26.8	45	High
PSR20	27 0'17.97"S, 30 18'20.83"E	59.8	24.8	60	High
PSR21	27 0'27.08"S, 30 18'17.54"E	46.8	12.1	319	High
PSR22	27 0'31.17"S, 30 17'56.38"E	54.4	19.4	129	High
PSR23	27 0'34.47"S, 30 17'7.59"E	48.5	13.7	265	High
PSR24	27 0'46.01"S, 30 17'9.17"E	44.2	9.7	660	Medium
PSR25	27 0'51.77"S, 30 16'58.62"E	53.3	18.4	305	High
PSR26	27 1'3.88"S, 30 17'22.40"E	51.4	16.5	321	High
PSR27	27 0'59.33"S, 30 17'9.18"E	54.5	19.6	290	High
PSR28	27 1'48.63"S, 30 16'27.07"E	64.1	29.1	103	High
PSR29	27 2'1.08"S, 30 16'23.85"E	33.7	2.4	1709	Low
PSR30	27 0'1.93"S, 30 17'9.31"E	31.1	1.5	2070	Low
PSR31	27 0'4.83"S, 30 17'1.39"E	32.8	2.0	1594	Low
PSR32	27 0'7.07"S, 30 16'58.72"E	33.1	2.2	1586	Low

PSR33	27 0'13.99"S, 30 16'51.89"E	33.5	2.3	1532	Low
PSR34	27 0'20.15"S, 30 16'51.58"E	34.8	2.9	1378	Low
PSR35	27 1'56.63"S, 30 18'23.53"E	36.4	3.8	1205	Low
PSR36	27 3'24.09"S, 30 17'56.94"E	28.3	0.8	951	Low
PSR37	27 2'9.01"S, 30 18'22.52"E	22.1	0.2	1746	Low
PSR38	27 3'37.33"S, 30 18'40.91"E	27.1	0.7	596	Low
PSR39	27 3'32.28"S, 30 18'25.34"E	21.1	0.2	2356	Low
PSR40	27 3'37.08"S, 30 17'58.37"E	21.5	0.2	2061	Low
PSR41	27 2'11.20"S, 30 18'27.16"E	21.6	0.2	2140	Low
PSR42	27 0'42.91"S, 30 17'32.34"E	26.5	0.6	623	Low
PSR43	27 0'54.90"S, 30 17'25.50"E	52.1	17.2	184	High
PSR44	27 0'50.28"S, 30 17'22.60"E	58.4	23.4	89	High
PSR45	27 0'37.47"S, 30 17'46.23"E	59.7	24.7	74	High
PSR46	27 0'49.08"S, 30 17'53.15"E	51.2	16.3	193	High
PSR47	27 0'49.04"S, 30 18'5.17"E	50.8	15.9	214	High
PSR48	27 0'54.58"S, 30 18'1.29"E	46.7	12.0	336	High
PSR49	27 0'57.45"S, 30 18'8.24"E	44.1	9.6	477	Medium
PSR50	27 0'38.64"S, 30 18'18.97"E	41.1	7.0	608	Medium
PSR51	27 0'43.20"S, 30 18'28.65"E	51.4	16.5	197	High
PSR52	27 0'39.98"S, 30 18'37.19"E	43.6	9.1	455	Medium
PSR53	27 0'43.48"S, 30 18'38.86"E	42.7	8.4	498	Medium
PSR54	27 0'50.42"S, 30 18'37.27"E	40.4	6.5	612	Medium
PSR55	27 0'48.48"S, 30 18'46.12"E	37.5	4.5	775	Low
PSR56	27 1'14.99"S, 30 18'11.79"E	36.5	3.8	856	Low
PSR57	27 1'20.19"S, 30 18'16.12"E	34.9	2.9	1151	Low
PSR58	27 1'35.99"S, 30 18'19.05"E	33.4	2.3	1340	Low
PSR59	27 1'47.48"S, 30 18'19.77"E	31.2	1.5	1514	Low
PSR60	27 1'47.67"S, 30 18'16.34"E	29.7	1.1	1191	Low
PSR61	27 1'46.75"S, 30 18'36.21"E	30.2	1.2	1150	Low
PSR62	27 1'38.78"S, 30 18'44.6"E	27.9	0.8	1378	Low
PSR63		27.7	0.7	1708	Low

Figure 9.16 *Total Projected Noise Levels during the Operational Phase of the Proposed Project – Contours of Constant Sound Levels*



Significance of Impact (Pre-mitigation)

Based on the analysis provided above the noise related impacts from operational activities associated with the proposed Project will be a "**Major Negative Impact**" (pre-mitigation) for potential noise sensitive receptors identified as having a high magnitude (*Table 9.54*) or that are located in the Red Zone (refer to *Figure 9.16* above). Refer to Table 9.55 below.

Table 9.55 Rating of Impacts Related to Noise Emissions during the Operational Phase of the Proposed Project (Pre-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact would be limited to the local area up to approximately 2km from source.
Duration	Long-term	Activities will take place both during day- and night-time hours and will continue for the duration of the operational phase of the proposed Project (10 to 20 years).
Scale	Large	Operational activities are likely to influence the baseline ambient sound levels over an area in excess of 1 000ha. The magnitude of the noise levels are likely to increase baseline noise levels to 5 dBA or higher than the SANS 10103 night-time rating level of 35 dBA for receptors living in a distance of 630m from the proposed overland conveyor system and approximately 900m from the area proposed for the Main Mine Adit (Adit A). Noise-sensitive receptors in the confines of these distances will likely lay complaints relating to noise.
Frequency	Constant	The activities generating noise are anticipated to take place continuously (24 hours per day, 7 days a week).
Likelihood	Definite	Because of the very low ambient sound levels in the Project Area, it is definite that the receptors will be aware of the increased noise levels. The proximity of existing receptors means that baseline noise levels during operational phase will increase by 5 dBA for a number of communities in the Study Area.
Magnitude		
Large Magnitude		
Operational activities without mitigation will result in noise levels exceeding the SANS 10103 night-time rating level (for a rural area) for a number of rural communities in the Project Area.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Local communities affected would comprise of a number of individuals ranging from babies, teens, adults and the elderly. It has been proven that very young children and the elderly are generally more susceptible to increased noises.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Kangra Coal will adopt the following mitigation/management measures so as to reduce the significance of the impact:

- A good working relationship between mine management and all potential noise-sensitive receptors will be ensured. Communication channels will be established to ensure prior notice to the sensitive receptor if work is to take place close to them.

- All equipment will be well maintained and fitted with the correct and appropriate noise abatement measures. This is critical for the conveyor belt system.

- A noise component will be introduced to the Environmental Awareness education (Training and Induction courses) for employees and contractors (refer to condition included in *Chapter 15*). This is especially important for the drivers of vehicles that will operate vehicles at night.

Potential Resettlement

In those areas where model predictions indicate an increase in baseline noise levels to 5 dBA or higher than the SANS 10103 night-time rating level of 35 dBA (as provided in *Table 9.54*), monitoring effort will be focused at these locations to confirm such model predictions.

Where measured exceedances of the applicable standard persists and are demonstrably due to operational activities associated with the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If *avoidance* of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the RAP to be developed by Kangra Coal.

Residual Impact (Post Mitigation)

With suitable mitigation/management this impact is likely to decrease resulting in a residual assessment of the impact to a "**Minor Negative Impact**" (refer to *Table 9.56*).

Table 9.56 Rating of Impacts Related to Noise Emissions during the Operational Phase (Post-mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact would be limited to the local area up to approximately 2km from source.
Duration	Short-term	Activities will take place both during day- and night-time hours and will continue for the duration of the operational phase of the proposed Project (10 to 20 years).

Scale	Minor	Operational activities are likely to influence the baseline ambient sound levels over an area of more than 2km from source; however, with the implementation of the above mentioned mitigation measures will result in noise levels close to the SANS 10103 night-time rating level for a rural district.
Frequency	Daily	The activities generating noise are anticipated to take place continuously (24 hours per day, 7 days a week).
Likelihood	Possible	Because of the proximity of the receptors to the activities as well as the very low ambient sound levels in the area, it is definite that the receptors will be aware of the increased noise levels. The implementation of the above mentioned mitigation measures will result in noise levels close to the SANS 10103 night-time rating level for a rural district and the likelihood of complaints should be low.
Magnitude		
Small Magnitude		
Operational activities with mitigation will result in noise levels close to the SANS 10103 night-time rating level for a rural area.		
Significant Rating After Mitigation		
Minor Negative Impact		

9.7.3 Impacts on the Noise Environment during the Decommissioning Phase

Description of the Baseline Environment

Baseline sound measurements showed that the Study Area is relatively quiet during both the day and night-time periods with low ambient sound levels; however, sound levels increased in closer proximity to existing mining operations. The soundscape in the Project Site can be defined as natural; with faunal, amphibian, insect and wind-induced sounds dominating the sound character.

Because noise levels closer to receptors are generally higher (due to typical household activities generating sound, e.g. listening to the TV/Radio, conversation, cleaning, working, preparing food, etc.), an ambient sound level of *42 dBA* will be assumed at receptor locations. This sound level will be used to estimate how the introduced noises will affect the ambient sound levels.

It must be noted however, that after a number of years of coal mining the sound character in the area is expected to be different.

Proposed Project Activities

During the decommissioning phase of the proposed Project, noise impacts will be related to the dismantling and removal of infrastructure as well as the rehabilitation (earthworks and re-vegetation) of previously disturbed areas. With regard to noise emissions, decommissioning works are less intensive than construction, although involving similar equipment, but usually not requiring heavy earthworks.

Sensitive Receptors

Communities within a distance of 500m from where decommissioning activities will take place will be the most affected; however, affected communities would have been resettled during the construction and operational phase of the proposed Project.

Significance of Impact (Pre-mitigation)

As is mentioned above, decommissioning works are less intensive than that of construction; as such, activities associated with decommissioning would have similar or lesser impacts to those predicted for construction (refer to *Section 9.7.1*). However, should affected communities have already been resettled in the construction and operational phases of the proposed Project, the impact will be a "**Negligible Negative Impact**" pre-mitigation.

Mitigation/Management Measures

The assessment concluded that there will be no significant impacts on people from noise during the decommissioning phase should affected communities have already been resettled in the construction and operational phases of the proposed Project, and additional mitigation measures other than good construction work methods and practice (set out in *Section 0.0.0*) are not required.

Residual Impact (Post Mitigation)

As additional mitigation measures (other than good decommissioning work methods) are not required, the impact will remain as a "**Negligible Negative Impact**".

9.8 IMPACTS AS A RESULT OF BLASTING

9.8.1 Description of the Baseline Environment

As is discussed in *Section 9.7* the Study Area is relatively quiet during both the day and night-time periods with low ambient sound levels; however, sound levels (and the effects of blasting) increase in closer proximity to existing mining activities.

9.8.2 Proposed Project Activities

In addition to the key impacts detailed above, the proposed Project will also have impacts associated with blasting.

Due to the hardness of rock, blasting will be required during the expansion of underground workings. Impacts associated with blasting for the proposed Project are most likely to be associated with ground vibration. Impacts

associated with airblast and intermittent dust emissions are unlikely, as blasting will take place below ground surface.

9.8.3 *Sensitive Receptors*

As is detailed in *Chapter 10*, the Project Area comprises old and new residential areas comprising formal and informal housing structures. Informal structures are more traditional homesteads generally built of either mud brick or wattle and daub often with thatched roofing, whilst new RDP houses and other more formal brick and cement buildings have been built in the new areas. These structures are susceptible to vibration impacts (as a result of blasting), which can result in cracking. Furthermore, structures or buildings that are already cracked are more susceptible, as their ability to resist tensile transient stresses are limited by the presence of the pre-blasting-existing cracks.

9.8.4 *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, blasting related impacts associated with the proposed Project will be a "**Moderate to Major Negative Impact**" (Pre-mitigation) for potential blast sensitive receptors identified as having a high magnitude (refer to *Table 9.57*).

Table 9.57 Rating of Impacts Related to Blasting during the Construction and Operational Phase of the Proposed Project (Pre-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact would be limited to the local area up to approximately 1km from source.
Duration	Medium to Long-term	Activities will take place during day time hours and will commence during the construction phase and continue the operational phase.
Scale	Large	Blasting activities are likely to influence the baseline social environment in a distance of up to 1km from source. The magnitude of blasting impacts will increase as one moves closer to source. Blast-sensitive receptors in the confines of the 1km proximity will likely lay complaints relating to blasting.
Frequency	Infrequent	The activities generating blast impacts are anticipated to take place in predefined times (during day light hours) during the construction and operational phases of the proposed Project.
Likelihood	Definite	Due to the hardness of rock, blasting will be required and receptors will be aware blasting related impacts.
Magnitude		
Moderate Magnitude		
Blasting activities during the construction and operational phases of the proposed Project without mitigation will result in blasting related impacts for a number of rural communities in the Project Area.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		

Local communities affected would comprise of a number of individuals residing in the Study Area, especially those living in structures or buildings that are already cracked.

Significant Rating Before Mitigation
Moderate to Major Negative Impact

9.8.5 Mitigation/Management Measures

Kangra Coal has the following existing blasting procedures developed by Trollope Mining Services (Pty) Ltd.:

- *Operating Procedure for Blasting Control (SOP Mining 046 – 28 August 2007)*
- *Boulder Blasting (SOP Mining 025 – 21 March 2007)*
- *Pre-split drilling and Blasting (SOP Mining 016 – 21 March 2007)*
- *Use of Blasting Accessories (SOP Mining 018 – 21 March 2007)*

Furthermore, Kangra Coal has a Code of Practice for the use of explosives, which is drawn up in accordance with the Guideline DMR Reference No. DMR 16/3/2/4-A3 (Rev. August 2012).

The objectives of these procedures and code of practice is to provide Kangra Coal with standard operating procedures or codes for the control of blasting activities and to ensure that blasting is carried out in accordance with all applicable regulations and mine standards.

In addition to the above, Kangra Coal will ensure an effective communication programme is setup between the mine and potential blast-sensitive receptors (receptors within a 1km radius from the blasting site). Communication will include the provision of the following information to sensitive receptors prior to each blast:

- Proposed blasting dates, the duration that Kangra Coal will be blasting in the area and the times that blasting will take place;
- The reason why blasting is necessary; and
- Contact details of a responsible person where any complaints can be lodged should there be an issue of concern.

Mitigation strategies for blasting include:

- Kangra Coal will conduct multi-hole test blasts in the early days of the proposed Project in order to optimise their design. These will also be used to train Kangra Coal personnel and develop the most appropriate blasting methods. These test blasts will also be used to educate surrounding communities about the potential risks of blasting and the practices that Kangra Coal will follow.
- Vibration will be reduced by use of buffer holes to minimise the transmission of blast induced vibration.

In the event that a temporary vacation of the property is not appropriate, consideration will need to be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected people and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project. As part of the RAP process, Kangra Coal will need to carry out a survey of structural integrity of household up to 1km from where blasting will take place.

9.8.6 Residual Impact (Post Mitigation)

With suitable mitigation/management this impact is likely to decrease resulting in a residual assessment of the impact to a "**Minor to Moderate Negative Impact**" (refer to *Table 9.58*).

Table 9.58 Rating of Impacts Related to Blasting during the Construction and Operational Phase of the Proposed Project (Post-mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact would be limited to the local area up to approximately 1km from source.
Duration	Short-term	Activities will take place during day time hours and will commence during the construction phase and continue the operational phase.
Scale	Moderate	Blasting activities are likely to influence the baseline social environment in a distance of up to 1km from source; however, with the implementation of the above mentioned mitigation measures this scale could be reduced
Frequency	Infrequent	The activities generating blast impacts are anticipated to take place in predefined times (during day light hours) during the construction and operational phases of the proposed Project.
Likelihood	Possible	Due to the hardness of rock, blasting will be required; however, with implementation of the above mentioned mitigation measures receptors will be less aware of blasting related impacts.
Magnitude		
Small to Moderate Magnitude		
Blasting activities during the construction and operational phases of the proposed Project will result in blasting related impacts for a number of rural communities in the Project Area; however, with effective implementation of mitigation measures these impacts can be reduced.		
Significant Rating After Mitigation		
Minor to Moderate Negative Impact		

9.9 IMPACTS ON BIODIVERSITY

This Section addresses the following main impacts:

- **Habitat loss and changes in hydrology through groundwater dewatering**

The loss of wetlands and their associated hydromorphic grassland habitats in the greater region due to groundwater dewatering

- **Habitat loss through construction**

The loss of wetlands and their associated hydromorphic grassland habitats through construction activities

- **Changes in Habitat Integrity**

Altering wetland, associated grassland habitat and aquatic systems integrity during all phases of the mine

- **Specific Species related impacts**

The potential loss of conservationally important floral species during construction of the mine, an increase in alien and invasive species, fauna sensory disturbance and displacement and species destruction /mortalities during construction and operational phases.

9.9.1 *Impacts Related to the Potential Loss of Watercourses and associated Hydromorphic Grasslands due to Groundwater Dewatering*

Description of the Baseline Environment

A number of watercourses of significance, including the NFEPA Kransbank Natural Heritage Site [(1)] (Ferrar and Lotter, 2007) wetlands which feed into the greater Endangered NFEPA Ohlelo River, and associated hydromorphic grasslands, could be affected by alterations to the groundwater resources during the operation and closure of the mine.

According to the Groundwater Study (*Annex C.3*) the following is stated:

- Modelling results suggest significant impacts on wetlands and streams, especially the Ohlelo, in the area of the proposed mine due to the mining induced groundwater level drawdowns, which result in a decrease of baseflow.

- Relative to the total area occupied by wetlands in the Ohlelo Valley, this affects a large area of wetlands located in the valley and also the Kransbank wetland. The "end of mining" model results suggest that groundwater is not providing any baseflow to wetlands in the valley; and under baseline conditions groundwater provided baseflow for just under 50% of the total area occupied by wetlands.

(1) please Note - this ESIA Study has identified that the Kransbank Site is in actual fact a Private Reserve

- Modelling results also suggest that the Ohlelo River, which receives baseflow from groundwater under baseline conditions, becomes a losing (flow is reduced) river after just a couple of years of mining, which means that groundwater is not providing baseflow. This may result in a dry river during the dry season.

- However, it should be noted that the model results do not take into account seasonal variation of climatic parameters such as rainfall. Recharge into wetlands and rivers/streams provided by surface water run-off is not considered in the models either. The decrease in average yearly baseflow as simulated by the models therefore indicates that wetlands will most probably receive baseflow from groundwater during shorter periods in the year or not at all and are therefore more prone to drying out.

In terms of the wetlands within the greater region, an evaluation of the Present Ecological State (PES) of the systems that the overland conveyor system route will bisect, was assessed by NSS in 2011. This can be used as a reflection or extrapolation of the current state for the greater wetlands in the region. The PES scores ranged from C to A/B mainly representing largely natural systems. The Kransbank wetland received a PES rating of a *B - Largely natural with few modifications*.

In addition to this, through the aquatic study the Ohlelo System, PES ratings showed that:

- Aquatic macro-invertebrate integrity indicated generally few modifications, ranging from natural to moderately modified, with the presence of relatively rare and sensitive macro-invertebrate families.

- The PES of the ichthyofauna assemblage ranged from near natural to moderately modified. Note: numerous species present in the Ohlelo River catchment have relatively low distributions but high sensitivities to ecosystem modifications. In addition to this, the presence of the Near Threatened Barbus species, *B. brevipinnis*, could not be discounted in the Ohlelo tributary.

- The sensitivity of the Ohlelo tributary is considered high and consequently the need for the appropriate conservation and protection of the aquatic species in the upper Ohlelo tributaries.

These systems were also identified as important areas for faunal species specifically the breeding and foraging grounds of numerous Conservation Important avifauna. According to Van Rooyen (2010) the Study Area is important in a national context for maintaining populations of large terrestrial Red listed avifauna. The greater Wakkerstroom Montane Grasslands in which the Project Areas is situated, are one of the few remaining strongholds for a number of these species, hence the designation of the Ekangala Biosphere

reserve and Important Bird Areas and the now recent Section 49 Application for zero mining submitted by the MPTB.

It is important to note that groundwater is feeding the numerous surface water features discussed above, including the springs and smaller wetlands feeding these systems. Of particular concern is the Ohlelo River which emanates in the Study Area with a major tributary flowing past the Main Mine Adit study area.

Proposed Project Activities

Alteration of groundwater resources during operations and post closure.

Sensitive Receptors

Receptors include the Ohlelo River System, the wetlands (including associated vegetation communities) in the region and the species dependant on these systems. The impact will include the loss of aquatic species that are sensitive to changes in flow or are dependent on certain habitat types, for example deep waters or fast flows. The wetlands provide important habitat to a number of significant faunal species, the loss of these wetlands, or the modification, may result in the habitat for these species being lost:

Aquatic species of significance included:

- *Barbus brevipinnis*: possible presence, Near Threatened, Barb
- *Amphilius uranoscopus*: sensitive, Stargazer (mountain catfish)
- *Barbus argenteus*: sensitive species, Rosefin barb
- *Chiloglanis anoterus*: sensitive species, Pennant tail suckermouth
- *Oligoneuridae*: sensitive family, Brush-legged mayflies
- *Heptageniidae*: sensitive family, Flat-headed mayflies
- *Perlidae*: sensitive family, stoneflies
- *Psephenidae*: sensitive family, Water Pennies

Sensitive avifaunal species of significance include:

- Grey-crowned Crane (*Balearica regulorum*) EN
- Half-collared Kingfisher (*Alcedo semitorquata*) NT
- Blue Crane (*Anthropoides paradiseus*) VU

Species utilising the surrounding grasslands for breeding and foraging which may fall into the buffer zones of these wetlands include:

- White-bellied Korhaan (*Eupodotis senegalensis*) VU
- Southern Bald Ibis (*Geronticus calvus*) VU
- Black-bellied Bustard (*Lissotis melanogaster*) NT

Apart from the Protected and lower listed Red Data floral species found within these systems (refer to *Section 9.9.6*), the possibility of *Nerine platypetala* (VU) occurring is high.

Mammal species include the Rough-haired golden mole *Chrysospalax villosus* (CR), an endemic and known from restricted areas in the Mpumalanga province. Habitat includes on the fringes of marshes or damp vleis.

Significance of Impact (Pre-mitigation)

Modelling results suggest that the Ohlelo system, which receives base flow from groundwater under baseline conditions, becomes a losing (flow is reduced) stream after just a couple of years of mining, which means that groundwater is not providing base flow but the stream is losing water to the aquifer. This may result in a dry stream during the dry season, which can negatively impact the aquatic ecosystems and the terrestrial species dependant on it. Furthermore groundwater modelling results suggests that due to the mining-induced groundwater level drawdowns, which result in a decrease of base flow supplied by groundwater, large areas of wetlands located in the valley and the Kransbank wetland will be impacted. The "end of mining" model results suggest that groundwater is not providing any base flow to wetlands in the valley; whereas under baseline conditions groundwater provides base flow for just under 50% of the total area occupied by wetlands.

The impact will not only be evident during operation, but will continue indefinitely post-closure. The current elevation of the adit is below the recovery water level of the mine, meaning that the final mine void will act as a drain with groundwater decanting from the adit opening.

Changes in the biodiversity of aquatic organisms are expected to occur downstream from this mining area. Many of the macro-invertebrate and fish species identified in the Ohlelo River system were sensitive. These species are usually sensitive to changes in their environment including changes in flow and riparian habitat. If activities influence either of these aspects there is a high risk of decreased abundance or total disappearance of these sensitive species downstream from the mining area, particularly in the Ohlelo River.

Indirect impacts to the biodiversity include changes in ecosystem dynamics and equilibriums. Generally changes are associated with deteriorated populations of sensitive species, and the increased abundances of hardy or alien species.

Based on the analysis provided the impact from the operation of the mine will be a "**Major Negative Impact**" pre-mitigation (refer to *Table 9.59*).

Table 9.59 Rating of Impacts on the Potential Loss of Watercourses and associated Hydromorphic Grasslands due to Groundwater Dewatering (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	As per the groundwater report, the systems are dependent on groundwater. Flow will be drastically reduced in the Ohlelo and wetland systems will be lost.
Duration	Permanent	Impacts will continue after the life of the project. The "end of mining" model results suggest that groundwater is not providing any base flow to wetlands in the valley. Post-mining the adit will act as a drain with decant occurring indefinitely.
Scale	Largely confined to the quaternary catchment W52A	The groundwater flow direction is towards the northeast in the bulk of the affected area and hence largely confined to the W52A quaternary catchment. Impacts are expected to be intensive for approximately 5km (Kransbank approximately 4km from Adit). The impacts will gradually decrease along the Ohlelo system due to water supply from adjoining tributaries.
Frequency	Continuous	Impacts are expected to influence the river system continuously through the life of the mine and after closure.
Likelihood	Definite	Flow reductions as per the ERM Groundwater Report (2013) are definite.
Magnitude		
Large Magnitude		
The proposed activities are expected to affect habitat structure, entire population or species at sufficient magnitude to cause a decline in abundance and/or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
High PES ratings are given for the Ohlelo (Endangered) and surrounding wetland systems (NFEPA Kransbank Private Reserve) with the majority been classified as largely natural to natural. Macro-invertebrates and fish found within the Ohlelo system are considered sensitive and their natural distribution and population numbers are steadily reducing. Numerous Terrestrial species that are dependent on these systems are considered Conservation Important Species.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Very limited mitigation for the loss of these systems is available. If the proposed Project is approved then the following will be conducted as a minimum.

Monitoring Measures

The modelled groundwater responses are based on various assumptions and the effects of these responses on the wetland functionality and integrity will need to be monitored. The following monitoring measures are suggested:

- Hydrology including water volume and flow rate of the Ohlelo River will be monitored on a monthly basis.

- Water quality of the Ohlelo River (refer to *Chapter 14*).

- Aquatic biomonitoring of the Ohlelo River (refer to *Chapter 14*).

- Riparian integrity of the Ohlelo River and associated tributaries will be monitored by a vegetation ecologist on an annual basis to assess the health of the riparian vegetation and the survival of threatened and protected occurring there, e.g. Tree ferns (*Alsophila dregei*).

- The functionality and integrity of a representative selection of wetlands (including the Kransbank) will be monitored pre, during and post operations, by wetland and vegetation ecologists (on an annual basis) to determine if changes to base flow, surface flow or vegetation dynamics are occurring. The PES of the Kransbank will need to be determined prior to the commencement of the proposed Project.

- The presence of threatened terrestrial birds dependant on the wetlands will be monitored by a competent ornithologist on an annual basis.

Results of the above monitoring programmes will be analysed and consolidated into an annual report by a senior SACNASP registered ecologist appointed by Kangra Coal. Each annual report will be peer reviewed by appropriately qualified academics and non-governmental organisations with an interest in the ecology of the Study Area. The peer-reviewed report will be submitted to the MTPA for approval on the measures to mitigate the on-going impacts on the wetlands and water courses.

If monitoring trends indicate the potential for irreversible damage to the ecological system in the Project Area as a result of mining-related construction or operations, adaptive management strategies will be developed and implemented before such damage can occur. Adaptive management strategies will be incorporated into management plans, prior to peer review and submission to the MTPA for approval. Forms of Offsets are one of the measures that will need to be investigated as discussed below.

Residual Impact (Post-mitigation)

Very limited mitigation for the loss of these systems is available. As such, following implementation of the above mitigation/management measures this impact is likely to remain a '**Major Significance Impact**' post-mitigation (refer to *Table 9.60*).

As the groundwater model is currently based on untested assumptions, a conservative approach was followed with this assessment, which will be updated as monitoring results become available, thus strengthening the assumptions in the groundwater model.

Due to the current lack of information on groundwater and surface water interactions, it is not possible to determine the extent of potential wetland loss, and thus it is not yet possible to make recommendations regarding offsets. The determination of offsetting requirements thus needs to be delayed pending improved inputs on the anticipated loss of groundwater resources to the wetlands. Offset requirements must also be calculated to compensate for the loss of wetlands around the Main Mine Adit as discussed in *Section Error! Reference source not found.*.

Table 9.60 ***Rating of Residual Impacts associated with Potential Loss of Watercourses and associated Hydromorphic Grasslands due to Groundwater Dewatering (Post-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	As per the groundwater report, springs and wetlands located above the 2nd dolerite sill are not at risk from groundwater drawdown, as they are isolated from the mining environment on a local scale. The Ohlelo stream (and associated alluvial groundwater) is, however connected to the fractured groundwater occurrences where mining is planned to take place. Flow will therefore be reduced in the Ohlelo and some wetland systems will be lost.
Duration	Permanent	Impacts will continue after the life of the project. The "end of mining" model results suggest that groundwater is not providing any base flow to wetlands in the valley.
Scale	Largely confined to the quaternary catchment W52A	Impacts are expected to be intensive for approximately 5 km (Kransbank approximately 4km from Adit). The impacts will gradually decrease along the Ohlelo system due to water supply from adjoining tributaries.
Frequency	Continuous	Impacts are expected to influence the river system continuously through the life of the mine and after closure.
Likelihood	Definite	Flow reductions as per the ERM Groundwater Report (2013) are definite.
Magnitude		
Large Magnitude		
Significant Rating after Mitigation		
Major Negative Impact		

9.9.2 Impacts Related to the Direct Loss of Wetlands and associated Hydromorphic Grasslands at the Main Mine Adit

Description of the Baseline Environment

There were two types of wetlands identified within the main mine adit Study Area, according to the HGM classification (Kotze *et al*. 2007). These being:

- A Valley bottom wetland with a defined channel (channel of the Ohlelo River System).

- A Valley bottom wetland without a defined channel.

Buffers of 50m were calculated for these systems, with a 100m buffer on the Ohlelo River System. Over 60% of the main mine adit Study Area is under wetland with associated buffers which incorporates the hydromorphic grasslands present. These wetlands represent 0.07% of the estimated wetland extent [(1)] within the Study Area. Both wetlands were assessed using the intermediate PES scoring system of DWAF (1999). Results showed that both systems contained a high PES score (B – Valley Bottom System; A/B - Ohlelo). The Ecoservices Assessment focused on the valley bottom without a channel (23% coverage). According to the results of the WET-EcoServices assessment, the ecosystem services that are likely to be provided to any significant degree by the wetland are as follows:

- Natural Resource and Water Supply for Human Use – Poverty in the area and the dependence of communities on water from the wetland and the Ohlelo River are the dominant features of the assessment.

- Maintenance of biodiversity (moderately high) – Second to this is the importance of the hydromorphic grasslands that are remaining on the site as habitat for fauna and flora – potential Conservation Important (CI) species are located within these habitats (more detail in Section 9.9.6).

- Nitrate and toxicant removal (moderately high).

And to a lesser extent:

- Erosion control (intermediate to moderately high);
- Streamflow regulation (intermediate to moderately high); and
- Phosphorus trapping (intermediate to moderately high).

Proposed Project Activities

Activities associated with the main mine adit that could impact on wetlands in the footprint of the adit include:

- Proposed construction of the emergency evaporation ponds, waste rock stockpile, sewage sludge drying beds and other infrastructure within these wetlands and associated buffers (refer to *Figure 9.17*).

Sensitive Receptors

The wetland systems and associated hydromorphic grassland habitats present within and surrounding the main mine adit area which feed into the Ohlelo River System.

[(1)] This is a broad estimate with no on the ground delineations

Significance of Impact (Pre-mitigation)

The impact from the development of Adit A will result in the direct loss of 3.85ha of the unchannelled wetland system. Loss of the channelled valley bottom wetland (banks of the Ohlelo River) have been avoided through relocation of infrastructure such as the Emergency Evaporation Pond outside of the wetland area and into less sensitive terrestrial land dominated by a grove of alien wattle trees.

The greater concern is the potential impact of development of the adit on the Ohlelo River valley bottom system. This will result in a direct loss of the eco-services provided by these wetlands and a deterioration of the PES within the downstream wetland systems. The Rating is considered a '**Moderate to Major Negative Impact**'. The rationale for this is set out in pre-mitigation table below (*Table 9.61*).

Table 9.61 Rating of Impacts Related to the Potential Loss of Wetlands at Main Mine Adit, and Surrounding Systems (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	The proposed main mine adit is located at the start of the catchment, these systems ultimately contribute to the greater Ohlelo catchment.
Duration	Permanent	If positioned within the wetlands identified, these systems will be lost and the downstream watercourse affected. There will be a permanent loss of the associated hydromorphic grasslands and including other ecosystems services mentioned above.
Scale	Low; (over 60% of the main mine adit boundary)	These wetlands represent 0.07% of the estimated wetland extent (1) within the Project area.
Frequency	Continuous	The wetlands would be removed during construction. Habitat will be lost and the PES of the Ohlelo system reduced.
Likelihood	Definite	Over 60% of the area surveyed for the main mine adit is wetland with their associated buffers – the loss of these systems is definite.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Baseline results indicate that both systems contained a high PES score (B – Valley Bottom System ; A/B - Ohlelo). These are seen as largely natural systems. These wetlands represent 0.07% of the estimated wetland extent (2) within the Study Area.		
Significant Rating Before Mitigation		

(1) This is a broad estimate with no on the ground delineations

(2) This is a broad estimate with no on the ground delineations

Moderate to Major Negative Impact

Mitigation/Management Measures

As is mentioned in *Chapter 4, Section 4.4.4,* given the environmental sensitivities of the area, and the potential impacts to the environment associated with the proposed adit layout, Kangra Coal have refined the layout of the main mine adit, so as to reduce the potential impacts to both valley bottom wetlands and the Ohlelo River system. The following design refinements have taken place (also indicated in *Figure 9.17*):

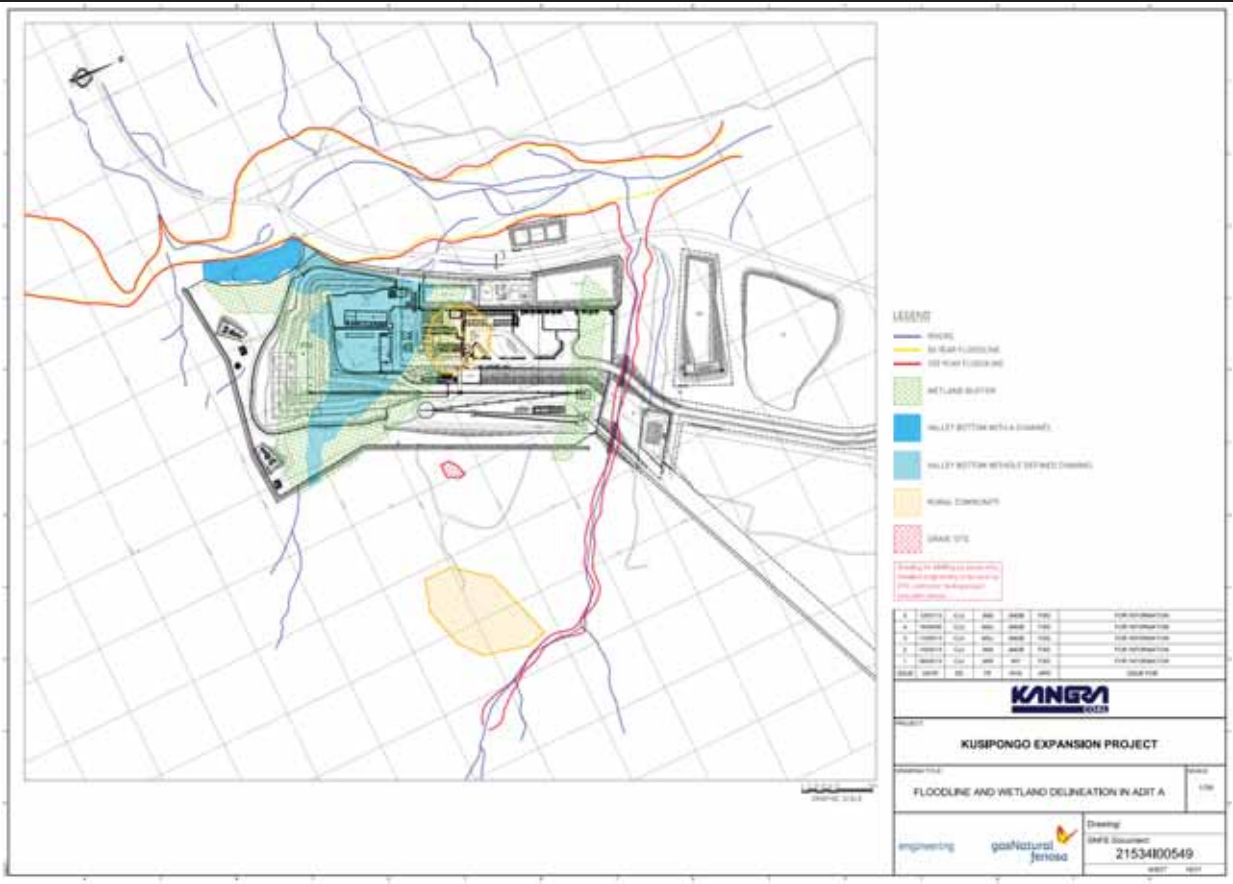
- Placement of the waste rock dump of 70 000m^3 away from the valley bottom wetland (with a channel) and the 1:100 floodline of the Ohlelo River.

- Placement of the temporary contractor's camp away from the valley bottom wetland to an alternative location within the boundaries of Adit A which will be subjected to construction activities at a later stage of the construction phase (such as planned parking areas for the adit or the like).

- Placement of the fuel storage depot away from the valley bottom wetland (with a channel) at a point within the boundary of Adit A with a higher elevation.

- Placement of the emergency stormwater pond and sewage sludge drying beds out of the 1:100 floodline of the Ohlelo River at a point above the access road indicated (*Figure 9.17*).

Figure 9.17 Revised Layout of Main Mine Adit A



Compensatory Measures

Offsetting the loss of this wetland as a result of this impact may not be essential, however this loss should be considered in offsetting of wetlands in the greater area as a result of groundwater dewatering as described in *Section 9.9.1*.

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Moderate Negative Impact**' (refer to *Table 9.62* below).

Table 9.62 Rating of Residual Impacts Related to the potential loss of wetlands at the Main Mine Adit (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	Infrastructure layout has been changed prior to development of much of the mitigation, however remaining infrastructure will not change and therefore the same wetland extent will be impacted as calculated above.
Duration	Permanent	If positioned within the wetlands identified, these systems will be lost. There will be a permanent loss of the associated hydromorphic grasslands as well as other ecosystems services mentioned above.
Scale	Medium	The wetlands to be lost represent less than 0.07% of the estimated wetland extent within the Project Area.
Frequency	Continuous	The wetlands would be completely removed during construction. Habitat will be lost and the PES of the Ohlelo system could potentially be reduced.
Likelihood	Definite	Over 60% of the area surveyed is wetland and associated buffer – the loss of these systems is definite.
Magnitude		
Medium to Low Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Minor to Moderate Negative Impact		

9.9.3 Impacts Related to the Potential Loss of Wetlands and associated Hydromorphic and Upper Slope Grasslands at the Ventilation Adit (Adit B)

Description of the Baseline Environment

Although the ventilation adit site and associated access infrastructure was not surveyed by NSS, areas in the previously surveyed Sites on the plateau grasslands may show similar structure at the ventilation adit. Potential habitats include:

- *Microchloa – Themeda* Upper Plateau Grassland
- *Alloteropsis – Tristachya* Exposed Rocky Grassland
- *Agrostis - Cyperus* Hydromorphic Grasslands

No habitat descriptions are provided for the access route, as the footprint area is unknown. Apart from the current dam along the existing watercourse, these habitats (where they were sampled) are relatively natural with minimal disturbances (i.e. limited to no alien invasive). Two types of wetlands were identified within the ventilation adit site footprint, according to the HGM classification (Kotze *et al*. 2007). These include:

- A Valley bottom wetland with a defined channel covering an area of 0.9ha in the boundary supplied.

- A Hillslope seepage linked to a channel covering an area of 1.5ha in the boundary supplied.

Note: these systems do extend beyond the boundary supplied.

Also included is a seasonal watercourse that does not fit any of the categories within the HGM classification, but does qualify as a river according to the National Water Act. All of these systems drain into the greater Kransbank Private Reserve.

Buffers (50m wide) have been calculated for these wetland systems due to their largely natural state and the fact that as they fall within the relatively natural upland grasslands, which covers an area of 10.4ha representing 42% of the area of the ventilation adit. The wetland systems mentioned above were assessed using the intermediate PES scoring system of DWAF (1999). Results showed that both systems contained a high PES value (B – Valley Bottom System; A/B - Hillslope Seep). For these wetlands, Biodiversity maintenance is the most significant aspect to emerge from the Ecoservices Assessment. All habitats present within the region are relatively undisturbed with limited alien infestations. They are biodiversity rich and potentially provide habitat for a number of Red Listed and Conservation Important Species.

Access routes to the site were not supplied at the time of this assessment, therefore the baseline (types and condition) description of these wetlands that the proposed linear infrastructure would bisect is unknown.

Proposed Project Activities

Activities associated with the ventilation adit (Adit B) that could impact on wetlands in the footprint of Adit B include:

- The potential construction of the ventilation shaft directly within the footprint of these systems and the direct removal of vegetation communities.

- Road route to the site – the site will require year-round access which entails increased use of roads and upgrading of the road access to the site.

- Surrounding habitats / biodiversity could be impacted upon due to stacking of construction materials, topsoil storage, dumping of any waste materials, off road driving etc.

Sensitive Receptors

Sensitive receptors associated with this impact include:

- The two wetland systems and the watercourse in the footprint of the greater area for Adit B (as is defined above);

- The associated hydromorphic and upland grasslands and the possible species they support, including:

    - The rare and endemic Delalande's Sandveld Lizard *Nucras lalandii*, found close to the original Site C and D;
    - The Roodepoort Copper *Aloeides dentatis* (VU) – not detected in surveys but possible;
    - The Transvaal Grass Lizard *Chamaesaura aenea*; and
    - CI Floral species.

- The greater Kransbank Private Reserve.

Significance of Impact (Pre-mitigation)

The construction of Adit B could result in the loss of wetlands and associated habitats. Furthermore, the ecoservices that these systems provide could also be lost. These services include nitrate removal, streamflow reduction and to a lesser extent toxicant removal and sediment trapping.

Based on the baseline limited analysis and the information available and assuming a worst case scenario that one of the wetlands would be lost pre-mitigation the impact will be '**Major Negative Impact'** pre-mitigation (*Table 9.63*).

Table 9.63 Rating of Impacts Related to the Potential Loss of Wetlands and associated Hydromorphic and Upper Slope Grasslands at the Ventilation Adit (Adit B) (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
A negative direct impact on the loss of wetlands and associated habitats described above for the ventilation adit.		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	One of the mountain sources of the water entering the Kransbank Wetland.

Duration	Permanent / Long Term	A permanent loss of wetland and habitat within the ventilation adit area and access footprints. Long term effects on the hydrology/water supply to the downstream watercourse and Kransbank wetlands. Long-Term degrading of the associated communities through construction activities.
Scale	Medium - Minor	Ecosystem services will be lost but these services are supplied by wetlands in surrounding areas.
Frequency	Continuous	The removal of wetlands and associated habitat within the footprint is immediate, with continuous degradation of surrounding units.
Likelihood	Highly Likely	No exact position of the ventilation shaft is provided, but the fact that over 41% of the area surveyed is wetland and associated buffer – the loss of these systems is Highly likely (if unmitigated). The loss of associated vegetation communities is considered highly likely within the footprint area and degradation of surrounding communities is considered Likely.
Magnitude		
Medium Magnitude		
The impact magnitude, although often related directly to the size of the area, in this case, the loss of wetland and certain habitats results in potentially altering a wetland system downstream.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
These areas are natural habitats containing limited disturbance. In support of this, the PES score was rated as largely natural (B – Valley Bottom System; A/B - Hillslope Seep). The hydromorphic grasslands fall within a wetland system that feed into the Kransbank Private Reserve Site downstream. The importance of these habitats is considered High.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Avoidance Measures

Due to the nature of the area, crossing wetlands for the access routes will be unavoidable. However, planning to define the linear networks to try and minimise the length of the footprint and to also avoid as many wetland systems as possible will be undertaken.

Wetland buffers (50m) have been calculated around each wetland. The selected location of the ventilation adit will avoid both wetlands (associated hydromorphic grasslands) and as far as possible their buffers.

Minimisation Measures

Once the points above are addressed and the ventilation adit is to be constructed, the following impact minimisation measures will be implemented:

- Crossings of streams, drainage lines and other wetlands for linear infrastructure will include effective implementation of drainage control,

such as the building of bridges, placement of culverts or drifts as deemed appropriate by registered civil engineers.

- Temporary barriers will be erected protecting surrounding habitats from construction activities. This will also assist in reducing any off road driving and dumping of materials.

- Wetland and buffer boundaries will be pegged and clearly demarcated within the areas where the activities are planned. The footprints of construction activities will be kept outside of these demarcations.

- Roads passing along steep gradients (gradients equal to or greater than 1 in 10) will include erosion control measures, as deemed appropriate by registered civil engineers. Effective stormwater management measures will also be implemented and maintained along these roads.

- All surplus and waste materials will be removed from the site at the end of the construction phase.

Rehabilitation Measures

Assuming that the ventilation adit is not located within any of the wetland habitats, the only rehabilitation that will take place will involve the restoration of the surrounding grasslands potentially impacted upon during construction as well as the road network to the site (if this required a wider track for construction equipment, than what is required for operational/maintenance purposes). Areas identified as compacted during the construction process will require some 'reworking' – possibly tillage or sub soiling depending on the degree of compaction. Topsoil removed during the initial phases will not be taken off site, but rather used in any rehabilitation efforts on site immediately after construction on areas that will not be utilised during the operational phase of the Adit B, and along the access/linear infrastructural routes. This will include any areas set aside for the construction materials etc. These areas will then be rehabilitated with indigenous species (seeding or individuals) found on the plateau.

Note: Redundant infrastructure will be removed as early as possible and areas appropriately rehabilitated. This concept is important during the decommissioning phase, but will also be applied during construction and operational phases of the proposed Project.

Compensatory Measures

In the extreme case that the ventilation adit cannot be moved and the wetland / or a portion thereof is lost, a Hectare Equivalent approach taking into consideration wetland integrity/ functionality of the wetland lost should be conducted. Based on the outcome of what hectare equivalents are required, wetland areas identified for rehabilitation should therefore be secured in the same catchment.

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Minor Negative Impact**' (refer to *Table 9.64* below).

Table 9.64 Rating of Residual Impacts Related to the Potential Loss of Wetlands and associated Hydromorphic and Upper Slope Grasslands at the Ventilation Adit (Adit B) (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	On site	If the ventilation shaft is placed away from the wetlands and associated Hydromorphic Grasslands, the larger system will not be affected.
Duration	Short-Medium Term	During the construction phase and into initial operations for the shaft. Rehabilitation efforts will continue into the operational phase until monitoring results show otherwise.
Scale	Minor	Processes will be altered but the habitats are found within the surrounding areas.
Frequency	Once – Off	The removal of habitat within the footprint is immediate, limited to no degradation of surrounding units in the long-term.
Likelihood	Unlikely	If development falls outside the buffer zones, the loss of wetland and associated hydromorphic communities is considered unlikely.
Magnitude		
Small Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Minor Negative Impact		

9.9.4 Impacts Related to Contamination of Aquatic and Wetland Systems due to the Construction and Operation of the Main Mine Adit

Description of the Baseline Environment

Water quality assessments in-stream showed the quality of water to be mainly within the Target Water Quality Range (TWQR). The sites that fell outside of the TWQR's were mainly situated within the Klein Vaal and Mpundu tributaries.

The in-stream and riparian habitat integrity was predominantly natural in the Klein Vaal and the Ohlelo Rivers, with slight changes related to river crossings from roads and upstream non-point source abstraction as well as agricultural activities and human settlement. The majority of modifications to the habitat integrity were observed in the Mpundu River, associated with the infestation of a number of alien woody species including *Acacia mearnsii* (Black Wattle), *Populus* (Grey Poplar) and *Salix* (Weeping Willow).

In general, the macro-invertebrate integrity and ichthyofauna assemblages in the area showed generally few modifications, ranging from near natural to moderately modified.

Note: The aquatic sampling sites were selected based on the greater Study Area, as the exact footprint areas of the adits and overland conveyor system were not known when this study was commissioned.

From the groundwater report (ERM, 2013), water quality within the investigation area is considered good, with most parameters well within South African and international guideline levels. However, borehole NGOH83 located adjacent to existing Maquasa West underground operations, showed signs of impact by acid rock drainage, with low pH and elevated sulphate and metal concentrations. Iron, manganese, nickel, cobalt and cadmium concentrations also exceeded chronic health guidelines.

Proposed Project Activities

The construction and operation of the main mine adit within the buffer of the Ohlelo River and associated tributaries may potentially result in contamination from the following activities/contamination sources:

- Decant from the underground workings will occur, which can potentially generate acid rock drainage and will be a long-term source of contaminated water based on the planned operations. The predicted sulphate concentration of decant water assuming neutral drainage is in the order of 1 500 mg/L. Nickel concentrations could range between 0.5 and 100 mg/L depending on the pH of the decant water. Decant water is therefore likely to be of significantly poorer quality than baseline ground- and surface water [(1)].

- The overburden dump.

- Dust deposition within the crushing plant.

- Uncontrolled run-off from the site poses the risk of contamination of the downstream river from coal dust as well as accidental spillages of fuels, oils etc.

During development of the main mine adit there are expected to be various impacts to the Ohlelo River system. In some instances the boundary of the proposed underground mining layout is closely situated to a non-perennial tributary of the Ohlelo. The Ohlelo River system is a rather sensitive system and as such the impacts are expected to be significant.

[1] In terms of Post – Closure Decant, the current elevation of the adit is below the recovery water level of the mine. The final mine void will stay open and inter-connected with the adit and will act as a drain. As soon as pumping activities, sustained during mining to keep the mine dry cease, mine voids will start to fill up with water. Once the water level in the mine void is above the adit elevation of 1 520 mamsl, groundwater is expected to start decanting from the adit opening. If Adit A is constructed in the location that is currently considered, groundwater flow after mine closure is expected to remain towards the mine and water of poor quality will decant from the adit. Decant will commence in the year 2045 at rate of approximately 20 200 m3/day and will stabilize at 19 900 m3/day in 2174

Furthermore, groundwater modelling results suggest considerable mine inflow rates exceeding 10 000 to 20 000m^3/day for most of the years of mining. If the preplanning of the adit locality remains in the current area, decant will continue post closure stabilising in the year 2174. Geochemical testing indicates that the mine inflows and decant are likely to be of poor quality, with initially increasing sulphate concentrations, followed by a drop in pH and the onset of acid conditions, with associated high sulphate concentrations and metal mobilisation.

Due to the positioning of the adit and the potential large volumes of decant the potential for spillages and contaminants entering the system without adequate onsite management are considered significant. Other issues include:

- Increased turbidity and sedimentation due to (a) erosion and sediment runoff during construction or (b) accidental coal deposits into in stream habitat.

- Solid waste in stream from litter from contractors or rubble during construction.

Sensitive Receptors

Aquatic sites located on the Ohlelo River and its tributaries showed ample diversity of microhabitats, which together with good water quality yielded a range of aquatic macro-invertebrates restricted to pristine habitat conditions. Sensitive fish species sampled in this river confirm that the river is virtually in its highest possible ecological state. Aquatic species sensitive to a change in water quality conditions could be lost from the system. Contamination of the system may not only result in a loss of the species, but may impact on the health and breeding ability of the species. Avifauna such as the Half-collared Kingfisher (*Alcedo semitorquata*) NT are also utilizing this system and associated tributaries.

Significance of Impact (Pre-mitigation)

Changes in the biodiversity of aquatic organisms are expected to occur downstream from this mining area, which will ultimately impact on terrestrial faunal species utilising these system. This includes amphibians, otters and a number of avifauna species including the Half-collared Kingfisher. A number of these species are usually sensitive to changes in their environment including changes in water quality, flow and riparian habitat. If activities influence either of these aspects there is a high risk of decreased abundance or total disappearance of these sensitive species downstream from the mining area, particularly in the Ohlelo River.

Indirect impacts to the biodiversity include changes in ecosystem dynamics and equilibriums. Generally changes are associated with deteriorated

populations of sensitive species, and the increased abundances of hardy or alien species.

Based on the analysis provided above, the impact from the operation of the main mine adit on wetland integrity and functioning and on biodiversity (aquatic and terrestrial) will be a '**Major Negative Impact'** pre-mitigation (refer to *Table 9.65*).

Table 9.65 ***Rating of Impacts from Contamination of Aquatic and Wetland Systems due to the Construction and Operation of the Main Mine Adit (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Impacts that follow on from the direct interactions between the mining footprint and its environment as a result of subsequent interactions within the environment.		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	As per the groundwater report, the systems are dependent on groundwater. Flow will be reduced and contamination through acid mine drainage and through decant will affect the systems long-term.
Duration	Permanent	Decant will continue post operations from the adit into the Ohlelo system.
Scale	At least 5km	Impacts are estimated to be intensive for at least 5km. The impacts will gradually decrease along the Ohlelo system due to dilution effect of adjoining tributaries.
Frequency	Continuous	Impacts are expected to influence the river system continuously through the life of the mine, with decant continuing post closure.
Likelihood	Highly Likely	As per the ERM Groundwater Report (2013), decant quality is expected to be poor. Contamination into the surrounding systems is considered highly possible.
Magnitude		
Large Magnitude		
The proposed activities are expected to affect species or even entire populations at sufficient magnitude to cause a decline in abundance and/or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The Ohlelo System is considered largely natural, with a High PES. It is considered to be **Endangered** (Nel *et al*. 2004) and is also listed as a NFEPA River System Macro-invertebrates and fish found within the system are considered sensitive and their natural distribution and population numbers are steadily reducing. Species within and utilising the aquatic environment downstream are considered sensitive or Red Listed, with species such as Half-collared Kingfisher considered Near Threatened.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Avoidance Measures

- Although a zero discharge policy has been adopted, if for some given reason any water was to be discharged from the main mine adit into the Ohlelo system, it will meet the necessary legislated standard requirements at that time.

- Clean and dirty water will be kept separate and no dirty water will enter any of the wetland/aquatic systems.

- The site plan for the main mine adit and associated surface infrastructure will ensure dirty stormwater surface run-off is contained to prevent/ limit instances where this flows into the stream to the north of the site. Coal dust pollution, spilt fuels, oils and other chemicals will be prevented from reaching the river.

- Invasive or alien plant species will not be planted and will be controlled along all streams/rivers within the area of the main mine adit.

Minimisation Measures

- Ensure that access from the adit to the Ohlelo River system is prevented.

- Dust management measures (refer to *Section 9.6*) during construction and operation of the main mine adit will be implemented.

- A contingency plan will be in place for any accidental spillages (refer to *Chapter 16*).

- Adequate maintenance of equipment and facilities will be conducted regularly to prevent any leakages and spillages.

- Spillage/leaching of coal into the water system from the handling, temporary storage and transport of coal storage will be prevented.

- An Integrated Waste Water Management Plan will also be compiled, approved and implemented.

Monitoring Measures

- Biomonitoring of aquatic systems and riparian habitat up and downstream of the main mine sdit will be conducted on a seasonal basis by a DWA accredited specialist.

- The monitoring of surface water features will be undertaken as per the requirements in *Chapter 14*.

Rehabilitation Measures

In the event of accidental spillages/leakages/leaching all proper measures will be taken to restore the area to its original condition (refer to emergency response measures in *Chapter 16*).

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Moderate to Major Negative Impact**' (refer to *Table 9.66* below).

Table 9.66 ***Rating of Impacts from Contamination of Aquatic and Wetland Systems due to the Construction and Operation of the Main Mine Adit (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site associated with the main mine adit infrastructure cannot be moved and therefore a number of wetlands and associated buffers will be lost. During construction and mining phases there will be unavoidable impacts incurred.
Duration	Permanent	Contamination events can occur throughout the life of the mine and post closure with the continuous treatment of discharge.
Scale	Small – Medium	Zone of influence reduced and impacts are **estimated** to not reach further than 2 to 3km downstream. The impacts will gradually decrease along the Ohlelo system due to dilution effect of adjoining tributaries. This will also reduce the impact on terrestrial species utilising the system.
Frequency	Periodic	Technical failures and accidental spillages can still occur.
Likelihood	Highly Likely	Proximity of footprint to the river systems will remain. Decant will continue long after mine closes. Accidental spillages can still occur, even with mitigation in place.
Magnitude		
Medium Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Moderate to Major Negative Impact		

9.9.5 Impacts Related to Contamination of Aquatic and Wetland Systems due to the Construction and Operation of the Overland Conveyor System

Description of the Baseline Environment

Present Ecological State (PES) ratings of the wetland systems that the proposed overland conveyor system route bisects are mostly rated between a B and A/B score indicating that these systems are largely natural.

Note: no aquatic sites were sampled for this area as at the time of the baseline (2010), the exact footprint areas of the adits and overland conveyor system were not known. It is expected though, that where flow occurs at these crossings, the PES of the in-stream systems would be relatively natural.

A number of conservation important (CI) bird species were observed along the overland conveyor system route during the survey conducted by ERM in 2012. It was clear from these investigations that sensitive bird populations do occur there. These species are large to moderately large birds with a distinctly terrestrial behaviour that depend on the grassland and wetland habitats being in a healthy ecological state.

Proposed Project Activities

The majority of impacts are predicted to occur during construction and include:

- Construction of the overland conveyor system route within the buffer of a number of wetlands.

- Changes in water quality and in-stream integrity through turbidity and sedimentation due to erosion and sediment runoff during construction.

- Alterations of flow.

- Solid waste in these systems from litter from contractors or rubble during construction.

Furthermore, during operation, spillages from the overland conveyor system, (with no preventative measures) may result in contamination of the wetlands and surrounding grassland habitat either due to coal dust, runoff from rain washing over coal spilt below or by directly entering water courses. This may also result in the acidification and eutrophication of aquatic systems with deleterious effects on amphibians and several other wetland dependant species.

Sensitive Receptors

Sensitive Receptors include:

- Several wetland and drainage systems and associated habitats (Kransbank Wetland and identified NFEPA systems);

- In-stream aquatic diversity downstream of the route proposed for the overland conveyor system; and

- Amphibian populations and several other wetland dependant species.

Contamination will also reduce the capacity of grassland and wetland habitats to support Red Data bird species. These species will either avoid these areas or occur at lower densities.

Significance of Impact (Pre-mitigation)

Based on the analysis provided, the impact from the construction and operation of the proposed overland conveyor system will be a '**Major Negative Impact**' pre-mitigation (refers to *Table 9.67*).

Table 9.67 ***Rating of Impacts from Contamination of Aquatic and Wetland Systems due to the Construction and Operation of the Overland Conveyor System (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - Regional	Conveyor footprint extends over several kilometres of grassland habitat. Contamination and changes in flow dynamics of wetlands will have further reaching effects downstream of the site.
Duration	Long-term	During the life of the mine, post closure, this system expected to be removed.
Scale	Small-Medium	Downstream effects estimated to reach 2 to 3km. For associated grasslands habitats scale reduced to approximately 100m based on previous visual assessments along the existing conveyor route. This will also be dependent on wind direction, speed etc. – so is just currently seen as an estimate.
Frequency	Constant	Both when conveyor is operational through spillage and through runoff following rainfall.
Likelihood	Highly Likely	During construction, sedimentation is highly likely to occur as the crew will be working directly within the wetlands and associated buffers. Not all sections of the conveyor are closed (even crossing some of the wetlands); therefore coal spillages are likely to occur.
Magnitude		
Medium Magnitude		
Affects a portion of a population and may bring about a change in abundance and/or distribution over one or more animal/plant species generations, but does not threaten the integrity of that population or any population dependent on it. A moderate magnitude impact may also affect the ecological functioning of a site, habitat or ecosystem but without adversely affecting its overall integrity. The area affected is also important.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The current state of wetlands along the route is considered largely natural. The Kransbank Wetland and other wetlands along the route are specifically protected under national legislation and the majority are classified as NFEPA systems.Numerous species both wetland dependant and terrestrial may be negatively affected by contamination, due to their sensitive nature to change.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Avoidance and Minimisation Measures

- Construction activities for the overland conveyor system will as far as possible take place during the drier winter months.

- Natural flow regimes will not be altered during the construction phase.

- Permits (Water Use Licenses) for disturbance of in stream and riparian habitats will be acquired from the Department of Water Affairs.

- All access tracks during construction will as far as possible cross streams at right angles and at a point where the stream bed is straight and uniform.

- The lay down of materials and equipment in the wetlands will be minimised.

- Construction activities will be limited to a period of low flow so as to avoid the movement and subsequent impact on aquatic biota.

- Excavation and filling activities along stream banks and channels will be minimised. If erosion and sedimentation becomes evident, bank stabilisation and silt-traps will be installed.

- Only materials that are clean, non-erodible and non-toxic will be used in construction areas within wetlands and their associated boundaries.

- Runoff from roads and trails leading to crossings will be diverted into adjacent vegetation. Directing runoff directly into the wetlands will be avoided.

- Exposed soil will be stabilised as soon as practicable.

- If necessary, road and trail approaches to stream crossings will be stabilised with aggregate or other suitable material.

- During operation, the conveyer will allow for the unobstructed flow of water beneath.

- The conveyer will be enclosed when crossing wetland systems as well as along the associated buffers above all the way to minimize the spread of coal dust and spillages.

- Adequate maintenance of the overland conveyor system will be conducted regularly to prevent/minimise coal spillage.

- Regular clean-up operations along the overland conveyor system will be conducted.

- Proactive planning will be in place for any accidental coal spillages (refer to *Chapter 16*).

- When the gravel service road and conveyor crosses the wetland to the north of the Kransbank Private Reserve the following environmental precautions will be adopted:

    - As the road approaches the 1:100 year floodline or wetland buffer, whichever is greater adjacent to the wetland, it will be diverted out to district road D2548.
    - The access road that runs between the conveyor corridor and the district road will be unfenced, and built to the same standard as the conveyor gravel service road.
    - The fence restricting access to the conveyor corridor, including the service road, will come to an end outside the 1:100 year floodline or wetland buffer, whichever is greater, as the conveyor gantry ramps up to cross the wetland.
    - The gantry support structure consists of pylons that will be spaced approximately 23m apart within the 1:100 year floodline, wetland buffer and wetland, which is the maximum distance they can be spaced to provide support to the structure.
    - The base footing of each pylon will measure approximately 4m x 2m, and will be established lengthwise, parallel to the flow in wetlands.
    - From these base footings, two columns will extend up to support the gantry.

- The following environmental precaution measures will be adopted for other water/river crossings:

    - Unlike the crossing detailed above, all other water crossings occur within a defined valley.
    - Rectangular culverts will be installed in parallel (lengthwise in line with the flow).
    - Culverts will span the distance between the 1:100 year floodlines (or wetland buffer) so that no damming occurs during flood conditions.
    - Erosion protection gabion structures will be installed at the entrance and exit points of culverts. "Reno" mattresses will also be installed so as to reduce flow velocities and turbulence.
    - The service road will be narrowed to one lane (approximately 4m) over water crossings.

Monitoring Measures

Seasonal biomonitoring of aquatic systems and associated riparian habitat up and downstream of overland conveyor system will be conducted by an accredited aquatic ecologist. Furthermore, monitoring of surface water quality will be conducted as per the details included in *Chapter 14*.

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Moderate Negative Impact**' (refer to *Table 9.68* below).

Table 9.68 ***Rating of Impacts from Contamination of Aquatic and Wetland Systems due to the Construction and Operation of the Overland Conveyor System (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Conveyor footprint will still extend over several kilometres of grassland habitat, however, impact restricted to footprint area.
Duration	Permanent	During the life of the mine. Post closure, this system expected to be removed.
Scale	Small	Downstream effects reduced and area restricted to within an estimated 50-100m radius. As discussed in pre-mitigation wind direction, frequency and speed still plays a role.
Frequency	Periodic	Both when conveyor is operational through spillage and through runoff following rainfall events.
Likelihood	Likely	During construction, sedimentation is still likely to occur as the crew cannot avoid working directly within the wetlands and associated buffers. Closure of the conveyor along all wetlands and associated buffers reduces the likelihood of contamination of these systems.
Magnitude		
Small Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Moderate Negative Impact		

9.9.6 Impacts Related to the Potential Loss of Conservation Important Floral Species during the Construction of the Proposed Project

Description of the Baseline Environment

Detailed Conservation Important (CI) Species / Red Data Listed specific scans were not undertaken within all footprint areas. NSS conducted a broader assessment of the main mine adit zone and no survey was conducted for the new ventilation adit site and an early season survey along the proposed route for the overland conveyor system was conducted by ERM in 2012. Brief descriptions of the baseline for the main mine adit, ventilation adit and the overland conveyor system are provided below. Those species located along the conveyor could also potentially be located within the alternative sites for the construction camps.

A large proportion of the main mine adit and vicinity contained the alien invasive species *Acacia mearnsii* (Black Wattle). However, the wetland/hydromorphic grasslands to the south and south east could potentially hold CI Species. NSS did identify the Protected Species (PS) *Alsophila (Cyathea) dregei* within the upper grasslands of these systems. Also

the start of the slopes occurs within the west and southern boundaries, and the NT species *Merwilla plumbea* (*Scilla natalensis*, Blue Squill) could occur.

Lotononis amajubica a TSP listed Rare [(1)] species was located just above the positioning of the ventilation adit when surveying the plateau in 2010. A further species found on the slope to the south resembles *Gerbera aurantiaca* (EN). This species could also be present at the ventilation adit. Within the stream system *Podocarpus* (Yellowwood tree) species were present. Three species occur within the region and include:

- *Podocarpus falcatus* (Thunb.) R.Br. ex Mirb.
- *Podocarpus henkelii* Stapf ex Dallim. & A.B.Jacks.
- *Podocarpus latifolius* (Thunb.) R.Br. ex Mirb.

All species are protected under DWA.

Acacia mearnsii was also found along sections of the proposed overland conveyor route. The floral assessment conducted by ERM (2012) along the proposed overland conveyor system route, yielded a number of Protected Species (PS) and one Red Listed species (*Table 9.69*).

Table 9.69 Plant Species of Conservation Importance Observed along the Proposed Overland Conveyor System Route

Species	Common Name	Conservation Status	Habitat
Agapanthus inapertus	Wild Agapanthus	PS	Mixed forest
Alsophila dregei	Tree Fern	PS	Wetlands
Brunsvigia radulosa	Brunsvigia	PS	Grasslands
Eucomis autumnalis	Pineapple Flower	PS	Grasslands & Wetlands
Gunnera perpensa	River Pumpkin	Declining	Wetlands
Kniphofia baurii	Red Hot Poker	PS	Wetlands
Watsonia densiflora	Watsonia	PS	Grasslands
Zantedeschia albomaculata	Arum Lily	PS	Wetlands
PS = Protected species under the Mpumalanga Nature Conservation Act (No. 10 of 1998)			

Other CI species recognised under Mpumalanga legislation (Schedule 11) as Protected Species were found in the greater Survey Area by NSS. These species could potentially occur within the seepage and wetland areas affected by the different construction activities. For example, *Satyrium neglectum* is particularly found on montane slopes in marshy areas up to 3 000masl and could occur around the ventilation adit.

[1] Rare A species is Rare when it meets at least one of four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:

- Restricted range: Extent of Occurrence (EOO) <500 km^2, OR
- Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km^2, OR
- Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
- Small global population: Less than 10 000 mature individuals.

Proposed Project Activities

During the construction / lay down process, removal of vegetation and topsoil will occur at the main mine adit, ventilation adit and route along the overland conveyor system. Vegetation communities within the footprint and immediate surroundings will either be removed or disturbed. Some vegetation clearing will also be required at the construction camps.

Sensitive Receptors

The sensitive receptors include floral CI species that have been recorded in the region. These species (including those that have restricted ranges (*Lotononis* and *Gerbera)*) could be present in the footprint of the Project Site. It must be noted that other potential CI species could have been overlooked and may occur in the Project Area.

Significance of Impact (Pre-mitigation)

Based on the baseline analysis provided above, the impact associated with construction of the various Project activities on CI species will be a '**Moderate Negative Impact**' pre-mitigation (refer to *Table 9.70*). If any threatened species are detected at any of the Project Sites, the significance of this impact will increase.

Table 9.70 Rating of Impacts Related to the Potential Loss of Conservation Important Species during Construction of the Proposed Project (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	Specifically for the Endangered, Rare (species with restricted ranges) and Declining listed species, a contribution to the overall decline in populations could occur regionally. Therefore impacting on one of the communities may influence the overall population stability in the long-term.
Duration	Permanent	The removal of these species within the footprint areas is seen as permanent.
Scale	Medium	Due to the size of the footprint areas to be cleared, scale considered medium (may not remove entire community).
Frequency	Once –off	When the clearing of vegetation for the construction of the various developments is required, Conservation Important species could be destroyed. The frequency of this impact is considered only for that time when the vegetation is cleared.
Likelihood	Likely/ Definite	Already through the existing surveys, numerous conservation important species have been detected. For example: Currently *Alsophila dregei* is in the line of the conveyor and in the drainage on the main mine adit and a small population will definitely be destroyed. (GPS points supplied by ERM, 2013 and within Appendices)
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivty		

The receptors are listed as Conservation Important Species – either through the National TSP, Provincial Ordinances or DWA. These species are vulnerable to environmental change, loss of habitat and anthropogenic influences.

Significant Rating Before Mitigation
Moderate Negative Impact
Currently the rating is Moderate due to the species originally detected being of lower status within the footprints. However, higher listed species such as the Endangered *Gerbera*, could occur and therefore this rating could increase.

Mitigation/Management Measures

Avoidance Measures

- Due to the time lapse between when assessment were initially carried out and when development will take place, all footprint areas approved for development will be reinvestigated by a qualified botanist with appropriate field experience and locations of all conservation important species identified will be recorded and visually marked. These species will then be transplanted to areas outside the zone of impact. The designated mine Environmental Officer should be included in the search.

- Success of transplanting established *Alsophila dregei* (Tree fern) species is considered limited [1] so ideally it should be conserved *in-situ*. Near Threatened, Vulnerable and Endangered species should also remain *in-situ*.

- Protected Species will require permits for removal/destruction.

Minimisation Measures

Once the points above are addressed and the proposed Project is to be developed, minimisation measures will include:

- Biodiversity and conservation awareness will be incorporated into the training and induction programmes (refer to *Chapter 15*). Education of the environmental officer onsite through photographic references of species can be supplied.

- The footprint area and construction lay down areas will be clearly demarcated and no entry in the surrounding areas will be allowed.

- Only a single pre-approved access road to each of the sites will be used – no off road driving will be permitted and a fining system will be enforced.

[1] NSS obtained cconfirmation with a number of growers, Protection of this species *in-situ* is further supported by the Fern Society of Southern Africa.

Monitoring Measures

Species transplanted should be monitored for success of establishment.

Rehabilitation Measures

Topsoil removed during the initial phases will be used in any rehabilitation efforts required during and after the construction phase. Relaying of soils and any areas requiring rehabilitation will be conducted within a few months of removal at each site and along the access/linear infrastructural routes. Plant species requiring location will be planted immediately or will be potted and stored in the right conditions for later planting.

Ideally all areas requiring any form of rehabilitation during and after the construction phase will be seeded/planted with indigenous species.

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Minor Negative Impact**' (refer to *Table 9.71* below).

Table 9.71 Rating of Residual Impacts Related to the Potential Loss of Conservationally Important Species during Construction of the Proposed Project (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	By avoiding the destruction of CI species on site, this assists with the stability of the populations regionally, extent reduced to a local scale.
Duration	Permanent	The local loss of CI species could be permanent, as all species may not have been detected during the different surveys and within the construction phase.
Scale	Small/ Medium	Due to the size of the footprint, scale considered small to medium (may not remove entire community).
Frequency	Once –off/ Continuous	During construction CI communities could be destroyed (once-off). Operational activities such as off-road driving could continuously affect populations.
Likelihood	Possible	There will still be a possibility that CI species may be destroyed during construction that were previously undetected due to their different emergence or flowering times.
Magnitude		
Small Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Minor Negative Impact		

9.9.7 *Impacts Related to the Increase in Alien and Invasive Species during all Phases of Proposed Project*

Description of the Baseline Environment

In terms of the current status at each proposed development footprint, alien species are present in varying degrees. At the main mine adit a large proportion of the site is plantation of the Category 2 Alien Invasive species- *Acacia mearnsii* (Black Wattle). Faunal alien species include hunting dogs, Cattle and domestic chickens.

Extensive alien bush clumps occurred in the eastern part of the proposed overland conveyor system route. These areas were settled by local communities and it is possible that Black wattle (*Acacia mearnsii*) was intentionally planted to provide a source of fuel wood for communities. These alien bush clumps are heavily dominated by *Acacia mearnsii* although a variety of alien trees are scattered through the area and possibly were planted there as ornamentals, fruit trees or hedges. Examples are Jacaranda (*Jacaranda mimosifolia*), English Oak (*Quercus robor*), Apricots (*Prunus armeniaca)* and Hawthorn *(Pyracantha angustifolia).*

Along the route, besides the presence of cattle, evidence of feral dogs and possibly also hunting dogs were observed by ERM in 2012 during the field survey. Dogs would displace natural small and medium-sized carnivores and disrupt the natural food chains in the area. Dogs additionally present a health hazard as they can transmit parasites and diseases to both humans and wildlife. Rabies is a particular concern, as many indigenous carnivores are adversely affected but do not transmit this fatal disease, and dogs being accustomed to humans are more likely to come into contact when carrying the disease.

From Google Earth Imagery the areas associated with the potential ventilation adit and the three alternative construction camps indicate relatively natural areas that potentially hold limited alien species. These areas are highly susceptible to invasion through construction and importing of materials.

Proposed Project Activities

Invasive species may be introduced to the sites associated with the proposed main mine adit, ventilation adits, the overland conveyor system and construction camp through the importing of building materials and through the disturbance of soils during the construction phase. Further, the proposed Project may result in an increase in human encroachment and therefore a potential increase in alien faunal species such as feral and hunting dogs, vermin species such as rats and alien avifauna including the Common Mynas (*Acridotheres tristis*).

Sensitive Receptors

Sensitive receptors in this impact assessment include those indigenous species that alien species compete with and the natural remaining habitats on site and in the surrounding areas.

Invasive species can negatively impact ecosystems in a variety of ways. They can:

- Reduce natural habitat and encroach on wetland systems;
- Displace indigenous species;
- Reduce forest health and productivity within the kloofs; and
- Ultimately alter ecosystem processes.

Significance of Impact (Pre-mitigation)

Based on the baseline analysis above, the impact significance is rated as a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.72*).

Table 9.72 ***Rating of Impacts Related to the Potential Increase in Alien and Invasive Species (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local-Regional	An increase in alien species will start locally along the footprints but, due to the number of wetlands and stream present in the Study Area, these can be transported through the catchment settling in other areas.
Duration	Permanent	Without mitigation, alien invasive species will increase and spread throughout and past the life of the mine.
Scale	Medium	Alien species are quick to establish and control an area displacing indigenous species fairly quickly.
Frequency	Continuous	Continued growth and expansion of alien species is expected during all phases of the Project.
Likelihood	Definite	Due to the current alien invasive species present in the area of the main mine adit and overland conveyor system route, the seedbank will contain alien species, disturbance to this will allow for further growth. Materials and soils containing alien species seeds can easily be brought into the ventilation adit area and construction camp if not managed correctly.
Magnitude		
Large Magnitude		
Rating as a high magnitude impact as alien species (fauna and flora) can adversely affect the integrity of a site, habitat or ecosystem.		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The receptors are the receiving habitats – these are considered important under national legislation, plans and policies as Protected as well as the Conservation Important Species mentioned in this report as relying on these systems and being vulnerable to environmental change, loss of habitat and anthropogenic influences.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

An Alien and Invasive Management component to the overall environmental programme will be developed for the proposed Project. A detailed 'on-the-ground' assessment of alien species, their density and distributions will form the baseline. Furthermore, stakeholder engagement strategies will be included into the planning phase of this programme. By ensuring that effective consultation takes place with local communities and all affected parties, any potential misunderstandings (if communities are utilising species such as *Acacia mearnsii* for firewood etc.) and disagreements can be resolved or accommodated in advance.

Further Avoidance Measures

Preventing the introduction of alien invasive species is the cheapest, most effective and most preferred option and warrants the highest priority. This will be achieved through the following:

- Rehabilitation materials will be sourced from reliable suppliers that can certify limited to no weed presence.

- Awareness raising and training of staff, specifically the Environmental Officer onsite will be undertaken. If any alien species are seen emerging the Environmental Officer on site will be able to identify and remove.

- The intentional introduction of an alien plant species will not be considered for any screening effects, landscaping etc. Indigenous alternatives will be considered suitable for the purposes for which the introduction is required.

- No alien plant species or domestic animals such as dogs and cats will be allowed into the construction camps.

Minimisation Measures

Soil/topsoil stockpiles, the route of the proposed overland conveyor system, temporary construction camps, the main mine adit and the ventilation adit will be continuously monitored for the presence of alien species. Any alien species detected by the Environmental Officer will be removed in the correct manner as per the Alien Invasive Management Programme.

Rehabilitation Measures

Kangra Coal will investigate (and potentially get involved in) whether or not there are existing alien eradication programmes along the Ohlelo River system or within the catchment that the DWA is operating. If there are currently no programmes, Kangra Coal's Alien Invasive Programme should address the removal of alien species along the tributaries within the Study Area.

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Minor Negative Impact**' (refer to *Table 9.73* below).

Table 9.73 ***Rating of Residual Impacts Related to the Potential Increase in Alien and Invasive Species (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Through a combination of eradication and future avoidance, species could be restricted to the footprint area of the proposed Project.
Duration	Long Term	Further spread through effective control and eradication measures can be reduced.
Scale	Small	Through the removal and control programme, species densities can be kept down and further dispersal reduced.
Frequency	Seasonal	Continued growth and expansion of alien species is expected seasonally.
Likelihood	Likely	Due to the current alien invasive present in the area, the implementation of a programme will not be able to control and eradicate all alien species.
Magnitude		
Small Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Minor Negative Impact		

9.9.8 Impacts Relating to Sensory Disturbance and Displacement of Fauna during the Construction and Operational Phases of the Proposed Project

Description of the Baseline Environment

The following sensory disturbances could impact on breeding, foraging and ultimately displace fauna within the Study Area. These may include:

- Noise pollution specifically around the main mine adit and the conveyor/road networks [Note: ventilation adit (Adit B) is a passive intake shaft]. The potential route and width of the track required for the construction of Adit B was unknown at the time of this impact assessment.
- Increase in ground vibrations.
- Light Pollution.
- Change in substrates.

According to the Noise Impact Assessment Report (*Annex C.5*), the following current activities are the main sources of noise in the area:

- The road proposed to access the main mine adit will be along the existing extension of the D2548 with the intended use for commercial purposes and through traffic. During the site visit the traffic consisted of light delivery vehicles and taxis at a rate of ±20 per hour (day-time).

- There are no industrial areas or significant noise sources in the immediate vicinity of the proposed main mine or ventilation adits. However, Kangra Coal operates the Maquasa West coal mine (±7 km to the east) as well as the Maquasa coal beneficiation plant (± 12 km) to the east of the proposed study area. These facilities are too far from the proposed adits to result in a cumulative noise impact or influence the ambient sound levels at the proposed sites. These existing mining activities have an ambient daytime sound level of 53.7 dBA ($LA_{,90}$) and 51.8 dBA ($LA_{,min}$) as well as an ambient night level ranging between 49.9 and 53.4 dBA ($LA_{,90}$) and 48.2 and 51.3 dBA ($LA_{,min}$). It is important to note that the ambient night-time sound levels ($LA_{,90}$) ranged between 23.2 and 30.1 dBA ($LA_{,90}$) and 21.4 and 28.3 dBA ($LA_{,min}$) away from existing mining activities.

Due to the position of the project area, the same applies for the current lighting effects within the region with limited pollution emanating from the rural communities and night traffic on the roads.

Proposed Project Activities

- Noise and ground vibrations associated with the construction activities. This can include equipment such as graders, bulldozers, excavators, articulated dump trucks, tip-load-buckets, long-haul delivery trucks, drilling machinery, compressors and diesel generators as well as front-end loaders.
- Increase noise and light pollution through vehicle traffic on the roads (specifically trucks – day and night). Noise assessment predicted LA_{eq} levels would be less than 45 dBA within a distance of 50m from the road, so considered a low impact.
- Blasting during construction and operations.
- Lighting during the operational phases of the main mine adit.
- Lighting and generators at the construction camps.
- Encroachment through construction activities onto surrounding faunal habitat.

Sensitive Receptors

A number of the CI species recorded within the Study Area are known to be intolerant of anthropogenic activity. These species are likely to avoid the area once development of the adit commences, and will continue to do so for the life of mine. These include specific avifauna as well as mammalian species potentially present.

Although Habitat Loss is the most significant impact from the development of this mine, noise and light pollution will also play a role in the displacement of faunal species. The extent of this in Southern Africa has not been studied in detail. In terms of avifauna species the most likely to be impacted upon include the CI species: Blue Crane *Anthropoides paradiseus*; Grey-crowned Crane *Balearica regulorum*; White-bellied Korhaan *Eupodotis senegalensis*, and

Black-bellied Bustard *Lissotis melanogaster*. Nesting density declines could be further expected for species such as the Yellow-breasted Pipit *Anthus chloris* and Black-winged Lapwing *Vanellus melanopterus* while a decline in foraging habitat for species such as Secretary Bird *Sagittarius serpentarius*, and Denham's Bustard *Neotis denhami* is highly likely.

It is well known that most terrestrial avifaunal species are particularly sensitive to disturbance with the majority tending to inhabit areas away from the noise and movements created by people, motor vehicles and moving machinery. However, the same can be said for mammal and reptile species, with very little known on the extent of the effects of noise and light pollution in South Africa. Mammals such as moles and mole rats are known to be specifically sensitive to ground vibrations and may possibly be negatively affected by a change or increase in vibrational activity. CI mammal species that have been recorded in the greater region (habitat is available within the Study Area) that could be affected include: Highveld golden mole *Amblysomus septentrionalis* NT (a southern Mpumalanga Endemic), Rough-haired golden mole *Chrysospalax villosus* CR (also a Mpumalanga restricted species), White-tailed Mouse *Mystromys albicaudatus* EN and the South African Hedgehog *Atelerix frontalis* NT. Bats and in particular gleaning bats are especially sensitive to the effects of noise and increased human activity. Gleaning bats use soft (low amplitude), high frequency echolocation calls to locate and then pick their prey from objects. As an example of a species that occurs in the region and possibly on site[1], the Egyptian Slit-Faced Bat *Nycteris thebaica*, is a gleaning bat that is likely to be negatively impacted by noise and vibrations associated with the construction and operation of the mine adit.

Light may also interfere negatively with nocturnal fauna. Faunal species are likely to return after post closure, although this is often a slow process that may not see a return of the full spectrum of species once present.

Significance of Impact (Pre-mitigation)

Although no research data is currently available in South Africa, international research involving the impacts of traffic noise on the nesting densities of a range of bird species in moist grassland adjacent to roads in Holland showed that the distance at which a disturbance-generated decline in nesting density could be detected extended out to 1700 m from a road carrying 5,000 cars per day, and up to 3530 m from a busy highway carrying 50,000 cars per day. The declines measured differed between species, with more sensitive species exhibiting declines in densities of between 14 and 44% up to 1500 m from the

[1] Although not detected in any of the surveys, this species and other bat species that could be affected by light and noise pollution are likely to occur within the region. The Egyptian Slit-Faced Bat can occur in a wide range of habitats and are essentially cave dwelling, however, utilise road culverts, tree hollows, under raised houses, aardvark burrows, mine adits and sometimes temporarily vacant buildings or structures.

highway verge. Measured noise load levels - dB(A)[1], ranged from 59+/-6 dBA adjacent to the road down to 38 +/-5 dBA in the remote sampling areas.

The above research, as well as research in Canada investigating the impacts of industrial noise associated with oil/gas pipelines has shown significantly that anthropogenic noise causes a decline in the nesting densities of a variety of bird species. Sensitivity to noise varied between the species studied, and the exact mechanism(s) or cause(s) of the documented declines in nesting density are not fully understood.

Given the extent of the impact zone where declines in nesting densities were detected – (up to 3.5 km from the edge of the highway), and the relatively low noise levels – (38+/-5 dBA) where impacts on nesting density were still detected, the impact of anthropogenic noise on bird populations is potentially significant. *Figure 9.16* on *Page 9-102* shows the extent to which projected noise levels will occur, with 35dBA levels as far as 1.6km from the activities at the main mine adit and along the proposed overland conveyor system route. No local research has been undertaken in Southern Africa and there are no data as to the sensitivity of local species to anthropogenic noise but the current Project could have a significant cumulative impact on avifaunal numbers.

The effect of light pollution on natural ecosystems was first studied in 1938, but only during the past 10 years has this subject been more fully researched internationally; most probably due to more rapid encroachments of the urban environment into the natural environment. Light pollution poses a serious threat to wildlife, having negative impacts on plant and animal physiology, especially when introduced into areas that currently contain limited light impact. Light pollution can confuse animal navigation, alter competitive interactions, change predator-prey relations, and cause physiological harm. Examples of international studies (Rich & Longcore, 2006) are provided briefly below:

- Studies suggest that light pollution around wetlands prevents zooplankton, such as *Daphnia*, from rising to the surface and feeding on surface algae, helping cause algal blooms that lower water quality and leads to a decline in numbers and variety of plant and animal species (Moore *et al*, 2000).

- Artificial light at night may interfere with the ability of moths and other nocturnal insects to navigate; this can affect night-blooming flowers that depend on moths for pollination as there is no replacement pollinator that would not be affected by night lighting. The result is a decline in these plants as they are no longer able to reproduce, thus changing the area's long-term ecology (Frank, 1988). This may also affect bat populations.

[1] * dB(A) uses a mathematical model which expresses the noise level in dB(A) as the 24-h value of the equivalent noise level (Moerkerken & Middendorp, 1981).

- Studies in the United States, Canada and the Netherlands have shown that lights on tall structures can disorient migrating birds. The US Fish and Wildlife Service estimate that from 4 to 5 million birds are killed each year in the US after being attracted to tall towers. In Canada there is a programme whereby lights on tall structures are turned off during bird migration periods.

Based on the baseline limited analysis and the information available, it is expected that the impact will be a '**Major Negative Impact**' pre-mitigation (refer to *Table 9.74*).

Table 9.74 ***Rating of Impacts on the Disturbance and Displacement of Fauna during the Construction and Operational Phases of the Proposed Project (Pre-Mitigation)***

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Up to 1.6km from activity and possibly beyond.
Duration	Long-term	During the life of the mine.
Scale	Unknown	It is unknown how many species, foraging and breeding populations noise/light will affect.
Frequency	Continuous	Activities generating noise and light are expected to run 24/7 for the mine specifically during the operational phase.
Likelihood	Highly Likely	Although no solid scientific evidence presented for Southern Africa, certain species are known to be sensitive to anthropogenic activities. Internationally it has been proven that noise and light pollution play a direct negative role in animal behaviour, foraging and breeding patterns.
Magnitude		
Medium/High Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Species most likely affected include conservation important species listed as endangered and vulnerable. Impact is predicted to affect possibly all faunal groups.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation/management measures will be implemented:

- Visual and noise attenuating screening of the main mine adit site utilising species such as the hardy *Searsia lancea* (Karree) and possibly *Leucosidea sericea* (ouhout).

- Equipment will be well maintained and fitted with the correct and appropriate noise abatement measures.

- The introduction of a noise component in the Environmental Awareness education (Training and Induction courses) for employees and contractors. This is especially important for the drivers of vehicles that will operate these vehicles at night on and off the mine.

- Lighting will be kept to a minimum and where possible directed downwards – low visibility spectrum lights and appliances that emit no light above the light's horizontal line will as far as possible be used on mine structures.

- Lighting will be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the night time sky is minimized. The design of the lighting shall be such that the luminescence or light sources are shielded to prevent light trespass outside the Project boundary.

- Night time mining activities and travel during night hours will be limited.

- All lighting will be of minimum necessary brightness consistent with worker safety.

- High illumination areas not occupied on a continuous basis will have switches or motion detectors to light the area only when occupied.

- At the construction camp, minimal outside lighting will be installed at the entrances to the construction office trailers and staff sleep quarters to provide only safe access to these areas.

Residual Impact (Post-mitigation)

Mitigation measures that reduce noise and lighting levels should help reduce the significance of this impact but, given the lack of knowledge regarding the sensitivities of local species, it is not possible to fully assess the extent of such reductions; however, with suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Moderate Negative Impact**' (refer to *Table 9.75* below).

Table 9.75 ***Rating of Impacts on the Disturbance and Displacement of Fauna during the Construction and Operational Phases of the Proposed Project (Post-Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local - Unknown	Mitigation measures that reduce noise and light levels may help reduce the significance of this impact but, given the lack of knowledge regarding the sensitivities of local species, it is not possible to assess the extent of such reductions.
Duration	Long-term	During the life of the mine.
Scale	Unknown	It is unknown how many species, foraging and breeding populations noise/light will affect.

Frequency	Continuous	Activities generating noise and light are expected to run 24/7 for the mine specifically during the operational phase. Possibly reduced activities during the night time operations.
Likelihood	Highly Likely	Through mitigation to reduce these impacts, noise and light will be reduced possibly to a smaller scale and extent, however, the possibility of faunal disturbance is still highly likely.
Magnitude		
Small/Medium Magnitude		
Significant Rating After Following the Mitigation Hierarchy		
Moderate Negative Impact		

9.9.9 *Impacts Related to Species Destruction during the Construction and Operational Phases of the Proposed Project*

Description of the Baseline Environment

Currently the Study Area is largely natural, with limited access. Hunting dogs were seen during the surveys which could be currently affecting smaller faunal species populations. For a species such as the Rough-haired Golden Mole *Chrysospalax villosus*, threats include loss and/or degradation of grassland habitat through land modification and mismanagement of natural grassland and wetland areas as well as the vulnerability to anthropogenic factors such as hunting by domestic dogs (Taylor, 1998) or poisoning through insecticides.

Harvesting of medicinal and culturally significant species was not detected during the surveys, but is more than likely occurring at low levels.

Proposed Project Activities

The following proposed activities could lead to an increase in faunal mortalities and specific floral species destruction:

- Faunal mortalities through hunting, snaring, road kills etc;
- Avifaunal collisions with powerlines from Maquasa West to the main mine adit; and
- Harvesting of cultural and medicinal species.

The establishment of the Project may lead to increased faunal mortality associated with pre-construction, construction and operational phases.

Sensitive Receptors

Sensitive receptors associated with this impact assessment include:

- Faunal species that are less mobile during construction activities – fossorial (burrowing) species in particular.

- Faunal species under threat from poaching / hunting.

- Cultural and Medicinally Important Species.

- Large avifaunal species recorded in the area susceptible to collisions with powerlines such as Blue Crane *Anthropoides paradiseus*, Grey Crowned Crane *Balearica regulorum*, Secretarybird *Sagittarius serpentarius* and bustards such as Denham's Bustard *Neotis denhami*.

Significance of Impact (Pre-mitigation)

The clearing of vegetation prior to construction may lead to the destruction of less mobile fauna such as reptiles and frogs as well as hatchling birds and various rodent species. Earth moving activities may lead to the destruction of any fossorial species within the Project footprint such as moles and in particular the two potentially occurring Threatened golden mole species (although their presence on site was not confirmed – likelihood of occurrence) as well as several reptiles species.

Faunal mortality as a result of collision with vehicles is likely to increase following the start of construction and continue until mine closure. Possibilities for animals to be on the roads include:

- Animals are attracted by grass and any water bodies in roadside ditches, which can often remain well into summer, when little food or water is available elsewhere.

- Food thrown from vehicles (Drews, 1995) and existing animal carcasses resulting from road kill (Forman & Alexander, 1998) attract scavengers etc.

- Roads are also used as open spaces for socialising, and for access to new territories for dispersing young (van der Zande *et al*., 1980).

- Animals are often present on roads simply through the action of crossing to the other side.

The nocturnal habit of a number of faunal species in the study area can lead to most encounters on the road networks occurring in the dark or semi-dark. In addition, most nocturnal mammal species are dark in colour (e.g. Honey Badger *Mellivora capensis*), resulting in low visibility for drivers. Driving at higher speeds and inattentive driving also increases the likelihood of collision. When panicked by oncoming traffic or dazzled by headlights, animals often exhibit unpredictable behaviour, making it difficult for drivers to avoid collision. These roads (particularly through to the main mine adit), apart from the taxis and sedan vehicles will also be utilised by heavy vehicles during the construction and operational activities. These vehicles can be difficult to slow down or manoeuvre quickly in response to any fauna species present on the road. These vehicles are generally not easily damaged by faunal collisions, and drivers may have rigid schedules, discouraging them from slowing down

at hotspots or slowing to avoid incidents. These factors provide very little incentive to avoid fauna even in situations where it is possible. Additionally, it is common for drivers to be complacent about hitting animals and there may be instances of drivers actively attempting to hit animals, especially snakes.

Compared to this direct route towards the main mine adit, access to the ventilation adit will prove more difficult, but will not be utilized as frequently during proposed operations, so mortalities are expected to be less. However, during construction the indirect and difficult access to the ventilation adit may increase the chances of faunal mortality as a result of road kills and ground clearing.

Large terrestrial species have been shown to be particularly at risk from collisions with power lines and this is the major cause of mortalities in some species (www.birdlife.org.za). Although Ludwig's Bustard is not a species located in the study area, the information below serves as an example for the many species that are known to collide with powerlines. Recent studies have found that, on average, about one Ludwig's Bustard collides per kilometre of transmission power-line (>132 kV) per year (www.birdlife.org.za).

In terms of species that contain a cultural or medicinal value, it is well documented that factors like development, over harvesting and unsustainable harvesting are responsible for a decrease in numbers of plants in the field. With an increase of human settlements within the area including those employed by the mine, pressures on the surrounding fauna and floral species is likely to increase through collections / harvesting and poaching.

Based on the available information the impact will be a '**Moderate Negative Impact**' pre-mitigation (refer to *Table 9.76*).

Table 9.76 ***Rating of Impacts Related to the Potential Species Destruction during Construction and Operation (Pre-Mitigation)***

Type of Impact		
Direct Negative Induced Impact		
Both a Direct impact from road mortalities and an Induced Impact through activities such as an influx of communities into the area looking for work and opportunities.		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Mainly focussed around the Project Area and along the main access routes.
Duration	Long-term	Construction activities may result in high species destruction initially but subsequent mortalities, harvesting and deliberate persecution (poaching etc.) will continue to mine closure.
Scale	Medium	Mortalities will not be restricted to within the infrastructure footprint but will occur in surrounding areas and where activity is high.
Frequency	Regular	Injury or death caused by earth moving machinery, people and vehicle traffic is expected to occur regularly. Harvesting and hunting is expected to continue.

Likelihood	Highly Likely	Hunting and harvesting is currently underway and will be expected to increase with more activity in the region. Mining related activities such as ground clearing, earth moving and traffic increases are inevitable. Avifaunal collisions with powerlines are likely, examples mentioned above.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium High Sensitivity		
The majority of the species will not be protected or listed. But are important to ecosystem functioning. Species collected for medicinal purposes, may or may not be Protected or Red Listed such as *Merwilla plumbea* (Blue Squill) (NT). This species is one of the most important bulbous plants used in traditional medicine. Avifaunal species that may collide with powerlines are mostly considered Red Data species worthy of protection.		
Significant Rating Before Mitigation		
Moderate Negative Impacts		

Mitigation/Management Measures

Avoidance Measures

The following avoidance measures will be adopted:

- The areas requiring ground clearing will be surveyed for the presence of faunal species that could be translocated prior to the start of construction. This will be performed by an appropriately qualified zoologist.

- The killing of animals will be discouraged and staff will be educated as to the correct protocol to follow in the event of a snake or other animal being encountered on site. Venomous snake handler training for the Environmental Officer on Site is required.

- Biodiversity education will also be implemented and fed into the surrounding community school programmes.

- Open trenches will always provide a means of escape for trapped animals such as a ramp at one end.

Minimisation Measures

Regardless of the spatial scale at which the mitigation measure is applied, there are two main types of road kill mitigation measures: changing driver behaviour and attempting to change wildlife behaviour. There are three potential ways of changing driver behaviour – these include:

- Changing driver attitude (by increasing public awareness and helping people understand that preventing road kill will benefit the surrounding communities);
- Making traffic aware of hotspots (signage or rumble-strips); and
- Physically or psychologically slowing traffic (traffic-calming devices such as chicanes or speed humps).

Assisting with changes in wildlife behaviour includes:

- Ensure, through education, that littering is an offence and food items etc. should not be disposed of out of vehicle windows and in and around construction activity areas. This will assist in discouraging faunal species from 'loitering' on roadsides and near construction areas.
- Preventing wildlife from crossing roads, at least when cars are present (ultrasonic whistles, reflectors, fencing at certain points).
- Assess along the route where safe crossings (underpasses and escape routes) can be installed.

For harvesting of medicinal / cultural species, Kangra Coal will seek opportunities and consider getting involved in the development of community based medicinal plant production through nurseries and training of communities.

For powerlines, visibility-enhancing devices – such as "Key Tag Flappers," will be attached to lines at approximately 7m intervals (refer to Eskom.co.za for Joelshoek Valley Mitigation Project, with a high success rate of over 80% reduced mortality in species such as Grey Crowned Cranes and Denham's Bustard).

Residual Impact (Post-mitigation)

With suitable mitigation/management this impact is likely to decrease, resulting in a residual assessment of the impact as a '**Minor Negative Impact**' (refer to *Table 9.75* below).

Table 9.77 Rating of Residual Impacts Related to the Potential Destruction of Species during Construction and Operation (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This will remain focussed around the Project Area and along the main access routes.
Duration	Long-term	Construction activities may result in high species destruction initially but subsequent mortalities, harvesting and deliberate persecution (poaching etc.) will continue to mine closure.
Scale	Small	The Scale of the impact could be reduced due to less mortalities on the roads and through ground clearing as well as alternatives implemented for medicinal harvesting.
Frequency	Infrequent	Injury or death caused by earth moving machinery, people and vehicle traffic is still expected to occur but the frequency will definitely be reduced. Exact frequency remains unknown. Harvesting and hunting is expected to be reduced and may only increase over the winter period.
Likelihood	Likely	Hunting and harvesting is currently on-going and will be expected to continue but may be reduced in frequency due to education within the surrounding communities. Mining related activities such as ground clearing, earth moving and traffic increases are inevitable, but awareness will reduce the likelihood of mortalities occurring.

Magnitude
Small Magnitude
Significant Rating After Following the Mitigation Hierarchy
Minor Negative Impact

9.10 SUMMARY OF IMPACTS AND RESIDUAL IMPACTS

A summary of impacts (pre-mitigation) and residual impacts for the physical and biological environments is provided per phase below.

Table 9.78 Summary of Impacts for Construction Phase

Impact	Significance (pre-mitigation)	Residual Impact Significance
Soil Impacts		
Loss of soil as a result of the establishment of the main mine adit (Adit A)	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Loss of soil as a result of the establishment of the ventilation adit (Adit B)	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Loss of soil as a result of the establishment of the overland conveyor system	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Surface Water Impacts		
Impacts to surface water quality as a result of the activities at the Main Mine Adit	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts to surface water quality as a result of the proposed Ventilation Adit	MINOR NEGATIVE IMPACT	NEGLIGIBLE NEGATIVE IMPACT
Impacts to streams, wetlands and surface water quality associated with the proposed overland conveyor	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Air Quality Impacts		
Impacts to air quality as a result of activities associated with the construction of the main mine adit	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Noise Impacts		
Impacts on the noise environment during the construction phase	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Blasting Impacts		
Blasting impacts during the construction and operational phases	MODERATE TO MAJOR NEGATIVE IMPACT	MINOR TO MODERATE NEGATIVE IMPACT
Biodiversity Impacts		
Impacts related to potential loss of wetlands at main mine adit and surrounding systems	MODERATE TO MAJOR NEGATIVE IMPACT	MINOR TO MODERATE NEGATIVE IMPACT
Impacts related to potential loss of wetlands and associated hydromorphic and upper slope grasslands at ventilation adit (Adit B)	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT

Impact	Significance (pre-mitigation)	Residual Impact Significance
Impacts related to contamination of aquatic and wetland systems due to the construction and operation of the main mine adit	MAJOR NEGATIVE IMPACT	MODERATE TO MAJOR NEGATIVE IMPACT
Impacts related to contamination of aquatic and wetland systems due to the construction and operation of the overland conveyor system	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts related to the potential loss of conservation important floral species during the construction of the proposed Project	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Impacts related to the increase in alien and invasive species during all phases of the proposed Project	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Impacts related to the disturbance and displacement of fauna during the construction and operational phases of the proposed Project	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts related to species destruction during the construction and operational phases of the of the proposed Project	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT

Table 9.79 Summary of Impacts for Operational Phase

Impact	Significance (pre-mitigation)	Residual Impact Significance
Soils Impacts		
Loss of soil as a result of the establishment of the main mine adit (Adit A)	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Loss of soil as a result of the establishment of the ventilation adit (Adit B)	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Loss of soil as a result of the establishment of the overland conveyor system	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Surface Water Impacts		
Impacts to surface water quality as a result of the activities at the Main Mine Adit	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts to streams, wetlands and surface water quality associated with the proposed overland conveyor	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Reduced baseflow on surface water and wetlands	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT
Impacts to the Main Mine Adit as a result of stormwater runoff	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT

Groundwater Impacts		
Mine dewatering and decant	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Impacts of groundwater level change on groundwater users	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Impacts on water quality	**MODERATE NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Impact of reduced baseflow on surface water and wetlands	**MAJOR NEGATIVE IMPACT**	**MAJOR NEGATIVE IMPACT**
Air Quality Impacts		
Impacts related to coal handling and processing at the main mine adit	**MAJOR NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**
Impacts related to emergency generator sets	**MINOR NEGATIVE IMPACT**	**NEGLIGIBLE NEGATIVE IMPACT**
Impacts related to overland conveying activities	**MAJOR NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**
Noise Impacts		
Impacts on the noise environment during the operational phase	**MAJOR NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**
Blasting Impacts		
Blasting impacts during the construction and operational phases	**MODERATE TO MAJOR NEGATIVE IMPACT**	**MINOR TO MODERATE NEGATIVE IMPACT**
Biodiversity Impacts		
Impacts related to the potential loss of watercourse and associated hydromorphic grasslands and the change in hydrology in the greater region	**MAJOR NEGATIVE IMPACT**	**MAJOR NEGATIVE IMPACT**
Impacts related to contamination of aquatic and wetland systems due to the construction and operation of the main mine adit	**MAJOR NEGATIVE IMPACT**	**MODERATE TO MAJOR NEGATIVE IMPACT**
Impacts related to contamination of aquatic and wetland systems due to the construction and operation of the overland conveyor system	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Impacts related to the increase in alien and invasive species during all phases of the proposed Project	**MAJOR NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**
Impacts related to the disturbance and displacement of fauna during the construction and operational phases of the proposed Project	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Impacts related to species destruction during the construction and operational phases of the of the proposed Project	**MODERATE NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**

Table 9.80 Summary of Impacts for Decommissioning Phase

Impact	Significance (pre-mitigation)	Residual Impact Significance
Soil Impacts		
Loss of soil as a result of the establishment of the main mine adit (Adit A)	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Loss of soil as a result of the establishment of the ventilation adit (Adit B)	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Loss of soil as a result of the establishment of the overland conveyor system	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Surface Water Impacts		
Impacts to surface water quality as a result of the activities at the Main Mine Adit	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts to streams, wetlands and surface water quality associated with the proposed overland conveyor	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Reduced baseflow on surface water and wetlands	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT
Groundwater Impacts		
Mine dewatering and decant	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts of groundwater level change on groundwater users	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts on water quality	MODERATE NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impact of reduced baseflow on surface water and wetlands	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT
Air Quality Impacts		
Impacts related to decommissioning activities	MINOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Noise Impacts		
Impacts on the noise environment during the decommissioning phase	NEGLIGIBLE NEGATIVE IMPACT	NEGLIGIBLE NEGATIVE IMPACT
Biodiversity Impacts		
Impacts related to the potential loss of watercourse and associated hydromorphic grasslands and the change in hydrology in the greater region	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT
Impacts related to the increase in alien and invasive species during all phases of the proposed Project	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT

Table 9.81 Summary of Impacts for Post Closure

Impact	Significance (pre-mitigation)	Residual Impact Significance
Surface Water Impacts		

Impact	Significance (pre-mitigation)	Residual Impact Significance
Reduced baseflow on surface water and wetlands	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT
Groundwater Impacts		
Mine dewatering and decant	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts of groundwater level change on groundwater users	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impacts on water quality	MODERATE NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Impact of reduced baseflow on surface water and wetlands	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT
Biodiversity Impacts		
Impacts related to the potential loss of watercourse and associated hydromorphic grasslands and the change in hydrology in the greater region	MAJOR NEGATIVE IMPACT	MAJOR NEGATIVE IMPACT

10 ASSESSMENT OF SOCIAL IMPACTS AND MITIGATION

The predicted impacts to the social environment as a result of the proposed Kangra Coal Kusipongo Resource Expansion Project are identified and analysed in this *Chapter*. This includes impacts across the construction, operations and decommissioning phases of the proposed Project.

Social impacts will be assessed across the following aspects:

- Socio-economic
- Landscape and Visual
- Heritage

Please Note

Table 10.1 below presents the applicability of each impact with respect to the phase of the proposed Project. Furthermore, the reference for mitigation / management measures associated with each impact assessed is included in the table

Table 10.1 Project Phase Applicability and Mitigation/Management Reference for Physical and Biological Impact Assessment

Impact Assessed	Applicable Phase of the Project				Mitigation/Management Conditions
	Construction	Operation	Decommissioning	Post-closure	
Socio-economic					
Displacement of homesteads and residents	X	X	X	X	Page 10-8
Loss of access to land for agriculture	X	X	X		Page 10-15
Creation of 450 Construction Jobs and the Retention of 745 Existing Mining Jobs	X	X			N / A – Positive Impact
Resentment and anger from unfulfilled expectations and related livelihood security	X	X			Page 10-21
Increased spending in the local economy	X				N / A – Positive Impact
Loss of productive land and related current and future income opportunities	X	X	X	X	Page 10-29
Reduced current and future tourism potential	X	X	X	X	Page 10-32
Disruption of community life and undermining the sense of place and residents' community identity and sense of emplacement	X	X	X		Page 10-36
Reduced water quality and availability for people	X	X	X	X	Page 10-42
Reduced access to wood for cooking and heating	X	X	X		Page 10-45
Reduced community health and safety	X	X	X	X	Page 10-50
Increased pressure on Driefontein infrastructure and service delivery and possible increased incidents of crime	X				Page 10-54
Poor relationship between Kangra Coal and local communities	X	X			Page 10-59
Landscape and Visual					
Impacts arising from construction activities	X				Page 10-71
Impacts arising from operational activities		X			Page 10-74
Impacts arising from decommissioning activities			X		Page 10-78
Heritage					
Disturbance of graves or loss of access to graves	X	X	X		Page 10-84
Impacts to palaeontology	X				Page 10-81
Section 34 Historical Sites – Structures	X				Page 10-90
Section 35 Historical Sites - Archaeological Sites	X				Page 10-94
Section 36 Historical Sites – Burial Grounds and Graves	X	X	X		Page 10-96
S.36 005 and S.36 008 Burial Grounds	X	X	X		Page 10-100
11.1.1 S.36 007 Grave	X				Page 10-103

10.1 SOCIO-ECONOMIC ENVIRONMENT

The focus of this Section is on the anticipated impacts that the proposed Project will have on the socio-economic environment described in *Chapter 8* and on ways in which these impacts will be prevented and mitigated where negative or maximised where opportunities exist.

In presenting the socio-economic impacts anticipated to arise as a result of the proposed Project this Section draws on participatory fieldwork with affected communities as well as outcomes associated with stakeholder engagement activities, documented in the ESIA's Stakeholder Engagement Plan and associated Comments and Response Report *(Annex B)*. In addition, information and specialists' understandings accumulated during other similar work in South Africa and worldwide, have contributed to this impact assessment.

Impacts that require resettlement, compensation and livelihood restoration planning are presented in this assessment but due to the significance of the issue a separate specialised study (to develop and Implement a Resettlement Action Plan) will be undertaken under the auspices of Shanduka Coal post the ESIA process. This plan will fully address the scale of this impact, individual homesteads affected; community land affected and will detail the approach to be taken in addressing resettlement, compensation and restoration measures.

The assessment of the socio-economic impacts presented in this Section takes into account the results stemming from the assessment of the physical and biological environment. Their effects on the socio-economic environment and their social implications are included and are cross-referenced where relevant.

The predicted significant impacts to the socio-economic environment as a result of the proposed Kusipongo Resource Expansion Project are described below. For ease of review they have been divided into the following themes:

- Physical and Economic Displacement;
- Socio-Economic Environment and Livelihoods;
- Socio-cultural Identity and Relationships;
- Natural Resources;
- Community Health and Safety;
- Social Infrastructure and Governance; and
- Legacy.

10.1.1 Physical and Economic Displacement

Homesteads and their Residents will be displaced as a Result of the Proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities

Description of the Baseline Environment

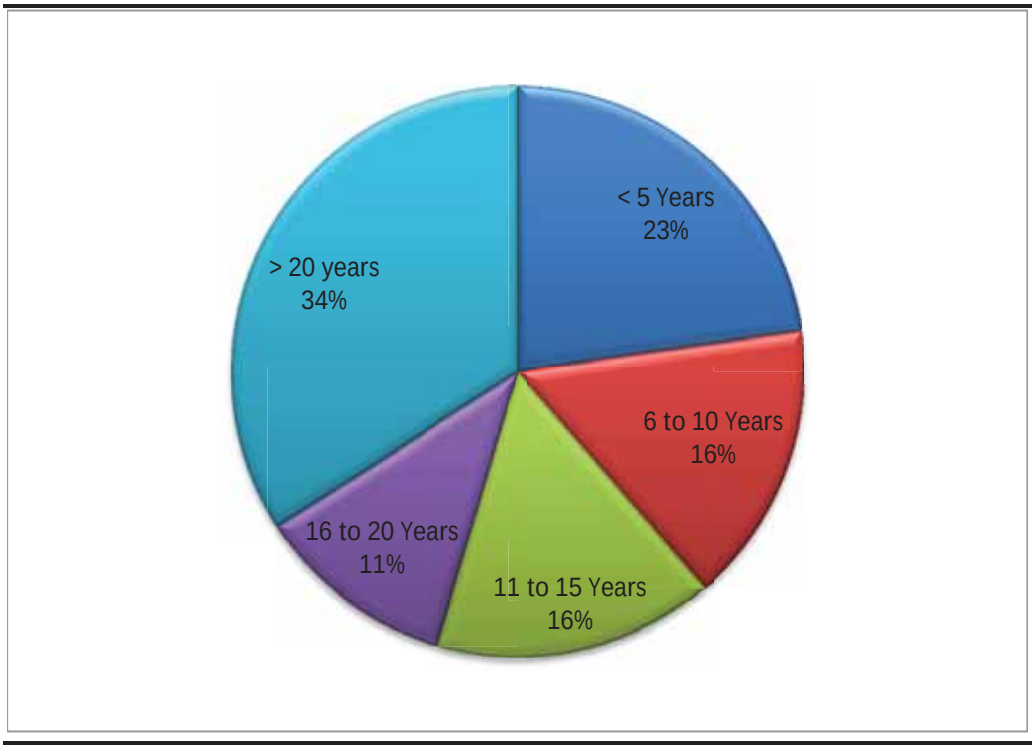
The footprint of the proposed Project extends over a number of farms with different types of land ownership and security of tenure arrangements for the residents. Homesteads in the Zone 1 of Influence include a variety of residential buildings, outbuildings, livestock structures and small-scale agricultural fields.

Of the 42 homesteads identified within Zone 1, 33 [1] were surveyed and the results presented below.

Table 10.2 Period of Residence by Farm Location for Homesteads in the Zone 1

Farm	>5 yrs	5 to 10 yrs	10 to 15 yrs	15 to 20 yrs	20+ yrs	No Answer	Total Homesteads
Kransbank	2	4	4		1		11
Twyfelhoek		2	1	4	6	1	14
Donkerhoek				1	4		5
Nooitgezien	1						1
Rooikop					2		2

Figure 10.1 Period of Residence for All Respondents (as %)



[1] 33 homesteads out of 42 identified within Zone 1 of Project impacts (78% sample).

All of these households participate in a variety of livelihood activities to ensure their survival. As discussed in *Chapter 8* livelihoods depend on a balance of social grant and pension incomes, migrant remittances and salaries, as well as subsistence agriculture and livestock farming which reduce people's dependence on a purely cash economy. Most survey respondents reported the centrality of home-grown foods over those bought for cash.

Proposed Project Activities

The proposed Project will construct mining infrastructure at two nodes – Adit A, for entry into the mine and Adit B as a ventilation shaft. There will also be a linear development of 7km for the overland conveyor transporting coal from Adit A to Maquasa West where it will tie into the existing overland conveyor and be transported to the existing beneficiation plant and Maquasa East. There will also be a temporary contractor's camp built to house approximately 250 non-local employees for the duration of construction (18 to 24 months). This will be situated within Kangra Coal's Rooikop farm and is more than 1km away from any other homesteads. Approximate footprint requirements for these Project activities is shown in *Table 10.3* below.

Table 10.3 Approximate Footprint Requirement for Project Infrastructure

Infrastructure	Footprint Requirement (m^2)	Footprint Requirement (Ha)
Adit A	184 709 (m^2)	18.5ha
Adit B (Ventilation)	500 (m^2)	0.05ha
Conveyor Belt	268 800(m^2)	27.0ha
Contractors Camp (temp)	30 000(m^2)	3ha
TOTAL	**484 009 (m^2)**	**48.4 ha**

Following completion of the construction phase the proposed mine will become operational for an anticipated 10 to 20 years. Activities associated with the operational phase of the proposed Project will include 24hr underground mining, associated underground blasting (during daytime), day-to-day surface activities at Adits A and B and 24hr operation of the overland conveyor transporting coal to Kangra Coal's existing materials handling facilities. These activities will generate noise and increases air emissions.

At closure, portions of the land will be rehabilitated.

The proposed Project will result in this land (approximately 50ha) being lost to homesteads either from the direct use of land for infrastructure development and operation, or as a result of health and safety, noise and air quality impacts on homesteads in proximity to these activities [(1)].

[1] The Noise Impact Assessment has identified the need to relocate homesteads within 630m of the conveyor based on noise impacts. This increases the number of impacted households beyond those assessed in the Socio-economic Study but based on the Noise specialist's report 630m should be used as the defining impact distance for the conveyor. Exact numbers of homesteads within this range will be confirmed during the Resettlement and Compensation Process

Sensitive Receptors– People and their Homesteads

As highlighted above, there are approximately 42 homesteads within Zone 1 of the Zones of Influence and the proposed Project activities will potentially impact on these homesteads directly affecting families living on the land.

Numbers of potentially impacted homesteads are shown in relation to their farms and tenure status is presented in *Table 10.4*.

Table 10.4 Potentially Affected Homesteads in Relation to Location on specific Farms

Farm	No.	Ownership
Kransbank	9	Communal – eKaluka CPA
Twyfelhoek	20	Communal – Thuthukani CPA
Donkerhoek	5	Private – CJ Greyling
Nooitgezien	3	Private – Kangra Coal
Rooikop	3	Private – Kangra Coal
Other [1]	2	Private

Please Note:

The number of affected homesteads may differ from what is presented above, based on the outcomes of noise and air quality monitoring as is provided in *Chapter 14*. Current modelling results for noise and air quality have indicated potential homesteads for resettlement. Actual monitoring data (as is described in *Chapter 14*) will validate the predicted requirements for resettlement.

These potentially impacted homesteads have different connections to their land, based on their tenure status and duration of living there, amongst other attachments. But for all, residential infrastructure and the entitlement to live where they do are important factors for individual and family wellbeing and sustainability.

Kransbank and Twyfelhoek are communally owned farms managed as a community by the CPAs and through the representative committees. As a whole the CPA owns the land but individual members are not entitled to sell or negotiate their stake in the land. Furthermore, the community decides on how the land is used and by who if outside parties wish to undertake developments or commercial activities on CPA land. Thus impacted homestead owners are not, on their own, in a position to negotiate issues of relocation or compensation for loss of homesteads resulting from activities described above. This creates some vulnerability for individuals. Furthermore, the nature of CPA members' attachment to their land, physically and symbolically, must be fully acknowledged and understood. People have become part of a community and feel entitlement to ownership – perhaps for the first time in their lives. Undermining this would have additional significant negative impacts.

[1] Roodepoort 38_ht and Beelzebub 13-HT. These farms are not included directly in the study as operations will all be sub-surface.

For residents of Donkerhoek, most of who have lived there for over 20 years but have no formal title to their homesteads, vulnerability is high. Furthermore, 4 out of 5 homesteads are within Zone 1 and the remaining single homestead is a further 200 meters away from proposed infrastructure.

Many residents on Kangra Coal land have lived on the farms before Kangra Coal's purchase in the late 1990s. The Land Reform (Labour Tenants) Act of 1996 and Extension of Security of Tenure Act (1997) provides protection and some rights to both this and the Donkerhoek group. However, the more complex legal rights are sometimes disregarded during project implementation. For example, one Nooitgezien resident in the Zone 1 was resettled by the company as recently as December 2012 and is now, once again, at risk of losing her homestead.

People's attachment to their land, given the particularly exploitative land tenure history in South Africa, should not be underestimated based on an absence of a title deed. A private farm-owner or land-owner, as applies to Donkerhoek and Kangra Coal, is not entitled to make a decision that impacts the security of tenure of other families and individuals in his land. The active involvement of these homestead owners in discussions and negotiations about loss of land is part of Kangra Coal's legal obligations.

It is important to further recognise specific vulnerabilities of various individuals or groups within the affected homesteads. The baseline description has highlighted some of the vulnerabilities related to duration of residence; main source of income; family size; land tenure; access to resources and decision-making. Some general examples include:

- Elderly people (and some disabled) for whom losing their home could be extremely traumatic.

- People who rely on their relationships with neighbours as a source of support (emotional and material) could become isolated.

- Families with a long history in the homestead may have ancestral graves in or nearby that will be affected (just under 33% of homesteads surveyed in the Zones) could find this upheaval unsettling – emotionally and traditionally (see the Heritage Impact Assessment Report associated with the ESIA for the proposed Kusipongo Resource Expansion Mining Project).

- Families relying on multiple livelihood strategies that lose access to their fields (almost 100% of homesteads surveyed) will be put at increased risk.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the magnitude of this impact is considered to be large and the impact of **"Major Negative"** significance for all directly affected homesteads and residents, pre-mitigation (*Table 10.5*).

Table 10.5 Rating of Impacts associated with Potential Displacement of Homesteads and their Residents as a Result of the proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the Zone 1 area of influence.
Duration	Permanent	10 to 20 year life of mine plus land disturbance beyond closure.
Scale	48.4 Ha (approximately 42 Homesteads)	Settlement within the Zone 1 of Influence is either not possible or too disrupted because of the footprint requirement and infrastructure or for health, safety and nuisance factors for residents.
Frequency	Continuous	Will be a constant impact from the construction phase through to post closure of the mine. Even if land is returned to its original state in 10 to 20 years' time it would be unreasonable to anticipate moving people temporarily from the affected areas until mine closure.
Likelihood	Definite	If the proposed Project goes ahead this impact will be inevitable.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The complexity of land issues in South Africa's history together with the security and insecurity of land tenure arrangements in the Zones of Influence, and the real and symbolic significance of land, establishes a social environment of high vulnerability and sensitivity for those affected. Additionally, poor prior examples of Kangra Coal resettlement activities highlight post-resettlement vulnerabilities for those affected.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

Should this proposed Project be authorised, Kangra Coal will contract a third party specialist (Slate Consulting) to develop a Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) for those homesteads that are earmarked for resettlement. The RAP will specify the procedures that a resettlement involving physical displacement (or physical and economic displacement) shall follow, and the specific actions that will be taken, to compensate affected people and communities. The LRP will specify the procedures that a resettlement involving economic displacement shall follow, and the specific actions that will be taken, to compensate affected people and communities.

In keeping with Kangra Coal's commitment to meet the 2012 IFC Performance Standards (PS), the RAP and the LRP will be developed in accordance with the requirements of IFC PS 5 on Land Acquisition and Involuntary Resettlement, which include the following key objectives:

- Avoid or at least minimise displacement, wherever feasible, by exploring alternative project designs.

- Avoid forced eviction.

- Mitigate the adverse social and economic impacts of land acquisition or restrictions on land use by: (i) providing compensation for loss of assets at full replacement cost; and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected.

- Improve, or restore, the livelihoods and standards of living of displaced persons.

- Improve living conditions among physically displaced persons through the provision of adequate housing and security of tenure at resettlement sites.

As part of the resettlement programme, the following approach and mitigation measures will be used to reduce the significance of the impact:

- Kangra Coal recognises that negotiated prior and informed consent from all landowners and affected stakeholders is required prior to the placement of surface infrastructure on private and communally owned land.

- Land-owners (private and communal) will be informed about what is proposed on their land. Give equal recognition to the interests of private and communal ownership when negotiating access to the land. All affected labour tenants living on private land will be included in these negotiations.

- A comprehensive Resettlement negotiation process will take the following into account:

    - The Air Quality and Noise Specialists have identified impacts (refer to *Chapter 9*) that will potentially result in the need for resettlement of certain homesteads. The resettlement and compensation negotiation process will take these specialist findings into account, verified through further monitoring of noise and air quality impacts.
    - The CPA rights and the complexity of decision-making within the structure will be recognised by Kangra Coal.

- The entire process will be formally documented.

- Where resettlement in Kransbank and Twyfelhoek is required, people will (as far as possible) be relocated to new sites within their CPA farm to reduce community disruption. Kangra Coal is aware that people have chosen particular homestead locations because of natural conditions, and will ensure that these are maintained or improved, including ease of access to roads and transport.

- If relocation within the CPA land is not feasible, Kangra Coal will ensure that people have the same land tenure status in their re-established locations.

- A Community Benefit Agreement will be negotiated with CPAs as part of the Resettlement and Compensation Process.

- Where resettlement in Donkerhoek, Rooikop and Nooitgezien is required, Kangra Coal will ensure that homesteads that do not have title deeds (this applies to both Donkerhoek and Kangra Coal owned land) are given security of tenure and entitlements at least equal to their current tenure arrangements – preferably better. The Land Reform Act and Extension of Security of Tenure Act will be used to inform these negotiations. Kangra Coal further realises that it is important to ensure that people living as labour tenants prior to the implementation of the land acts mentioned above (1996/7) are not further discriminated against by becoming "new" residents on land that is again privately owned.

- Kangra Coal will ensure that land identified for resettlement will not be used for any future mining activities.

- Kangra Coal will use impartial legal advisors for reputable legal advice and representation (e.g. Legal Resource Centre) for all affected communities and homesteads. The legal representation will consider the needs of the residents, particularly when security of tenure is being undermined by resettlement.

- Although the majority of survey respondents rely predominantly on social grants and pensions the Resettlement process will fully understand the different components of each affected household's livelihood strategies and ensure that this is replaced, and ideally improved through resettlement.

- In considering how resettlement of some homesteads will affect others, the Resettlement process will develop a full understanding of relationships and social and cultural connections between homesteads. Such an understanding will inform decisions on resettling individual homesteads or entire communities to mitigate the impact. A key example is that out of five homesteads on Donkerhoek only three or four may be affected. However the cluster of families is a community and has lived together for almost two decades. Moving some but not all homesteads may increase the social and economic isolation of those left behind, with potentially

serious consequences. This consideration applies to the entire resettlement approach. Resettlement that is well done will not trigger negative impacts of its own.

Residual Impact (Post-mitigation)

Resettlement of directly affected homesteads to places within their original CPA or to places of greater security of tenure if they are currently on privately owned land would compensate people for their loss of access to homesteads and remove people from the dangers associated with planned mining activities. Furthermore, if a fully participatory process is undertaken and homestead owners and landowners are satisfied with commitments AND implementation of resettlement and compensation agreements the physical and emotional upheaval of losing homesteads and land may be reduced.

Implementation of the mitigation measures above should, overall, reduce the scale of the impact to medium reducing the significance of the impact to a **'Moderate Negative Impact'** (*Table 10.6*).

Table 10.6 ***Rating of Residual Impacts on Homesteads and their Residents through Potential Displacement as a Result of the proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities (Post- Mitigation)***

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to the Zone 1 area of influence.
Duration	Medium-term	Full implementation of a participatory Resettlement and Compensation process should produce an outcome where affected homesteads will be able to settle and re-establish their livelihoods within a limited timeframe (3 to 5 years).
Scale	48.4 Ha (approximately 42 Homesteads)	Settlement within the Zone 1 of Influence is either not possible or too disruptive because of footprint requirements and infrastructure or for health, safety and air quality and noise for residents.
Frequency	Once-off	If affected homesteads are properly resettled and compensated, then the impact on homesteads should cease after the initial event.
Likelihood	Definite	The impact will definitely occur if the proposed Project takes place.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The sensitivity of affected homestead residents will be high based on the discussions in pre-mitigation. However, if the Resettlement and Compensation process is participatory and respectful, people may feel less vulnerable and more empowered to make decisions and take some control over events that will shape their lives. If this happens their vulnerability, post-mitigation, should be reduced.		
Significant Rating After Mitigation		
Moderate Negative Impact		

Loss of Access to Land for Agriculture (approximately 25 Homesteads) and Grazing as a Result of the proposed Project Footprint and Associated Infrastructure

Description of the Baseline Environment

- **Agriculture**

Zone 1 of Influence is a rural farming environment with homesteads and associated adjacent small-scale fields and open areas for livestock grazing. There are a number of groundwater points for livestock drinking across the Zone. There is also land on Twyfelhoek that is under cultivation as part of an agricultural development programme, in which a number of community members are involved.

As described in the baseline section of the report, people living in Zone 1 of Influence rely on multiple livelihood activities of which a significant component is subsistence food production. Most families interviewed

highlighted that their fields produced at least half of their seasonal maize-meal requirements and that only after this produce was used up did the family need to buy maize-meal at a shop. Several families grew a variety of other food crops on this subsistence scale. Produce included tomatoes, spinach, potatoes, cabbage etc. Only two survey respondents [1] reported growing nothing – either because they did not have the means to buy seed or because they were waiting to be helped by Kangra Coal as part of their resettlement assistance / compensation.

- **Livestock**

Under apartheid laws all residents living on white owned farms in the Study Area were restricted to three head of cattle that could graze only in small, designated areas. This is no longer the case on CPA land although it is still applicable on Donkerhoek and Kangra Coal-owned land. Kransbank and Twyfelhoek members are entitled to own as many head of cattle and other livestock as is possible within the land's carrying capacity and animals are free to roam and graze throughout the farm. Numbers of livestock have increased and a breeding programme has been initiated through the introduction of seven bulls to the farms. Government provided the bulls about two years ago and herd numbers are reportedly beginning to increase. People's freedom to own unrestricted numbers of livestock and the farms' carrying capacity for these animals serves both a practical purpose within homestead livelihood strategies (meat when necessary or animals to sell) as well as a symbolic function highlighting people's freedom and autonomy on CPA land.

Proposed Project Activities

The proposed Project activities described in *Chapter 3*, 48.4 ha apply equally to the loss of land for agriculture and grazing within the footprint of the proposed infrastructure. The agricultural fields of approximately 25 homesteads will be directly impacted while grazing land for additional families will also be directly impacted. Furthermore, the conveyor infrastructure, running for 7km, will practically divide the land with a fenced barrier running through it. This will restrict free movement by cattle across the area and therefore limit where they can graze and find water. The layout of the CPA farms into areas of loosely clustered homesteads and large tracts of land available for grazing suggests land use planning for unrestrained access for livestock across the farms. It also allows herds to find their own grazing areas without a herder.

The above activities will result in the agricultural land being lost to homesteads (as a component of the direct impact on homesteads discussed above) as well as the loss of agricultural and grazing land within the proposed Project footprint and Zone 1 of Influence and the loss of free access to grazing across the farms.

[1] About 4% of the survey sample

Sensitive Receptors

As highlighted above there would be approximately 25 homesteads directly impacted by proposed Project activities that would lose access to their fields. These homesteads are all strongly dependent upon subsistence agricultural as a component of their survival. Loss of these fields would force people to rely more on a cash income with which to purchase previously home-grown food. Over 66% of respondents rely predominantly on state grants and pensions (R280 per child or R 1 200 for pensions per month) and would be left extremely vulnerable if they were forced to draw more heavily on these incomes to supplement their food security.

The loss of livestock or a forced reduction in numbers due to curtailed access to grazing would impact on people's ability to choose to use the animals for food or income when necessary.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from the loss of access to land for agriculture and grazing is assessed to be a **"Major Negative Impact"**, pre-mitigation (*Table 10.7*).

Table 10.7 Rating of Impacts Related to Loss of Access to Land for Agriculture (for approximately 25 Homesteads) and Grazing as a Result of the proposed Project Footprint and Associated Infrastructure (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to site of disturbance (within 1km from Adits A and B and 500m from the conveyor, and temporary contractors' camp footprint). Also affecting movement across the CPA farms and Rooikop and Nooitgezien.
Duration	Long Term	The impact will be triggered during construction and will continue through operations (10 to 20 year life of mine). Disturbed land will be rehabilitated at closure.
Scale	48.4 Ha directly (approximately 25 Homesteads) and all CPA residents who own livestock	Subsistence fields for approximately 25 homesteads and livestock farming and grazing is either not possible or too disrupted because of footprint requirement and infrastructure. The presence of the conveyor further disrupts the entire 7km corridor, splitting the land on either side. This increases the number of directly affected individuals to all those who graze cattle in the area.
Frequency	Continuous	Will be a constant impact from Construction for the life of the proposed Project. Even if land is returned to its original state post the operational period it would be unrealistic to anticipate moving people temporarily from the affected areas until mine closure.
Likelihood	Definite	This impact is inevitable if the proposed Project goes ahead.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Affected homesteads and the additional individuals whose livestock will be impacted rely heavily on a mix of livelihood activities for their survival. The disruption or undermining of one component of a livelihood strategy heightens the vulnerability for affected residents, their food security and survival.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be implemented to reduce the significance of the impact:

- All Resettlement mitigation measures presented in the impact assessment above will apply. This includes gaining access to privately and communally owned land and to negotiating resettlement and compensation agreements for those who lose fields and grazing and whose subsistence is therefore undermined.

- Similarly, mitigation highlighted above for communal and private landowners who lose agricultural and grazing land, will apply to this

impact. Negotiations will be undertaken through the Resettlement process to determine fair compensation for the loss of current and future land use.

- Access points will be identified and culverts constructed to enable safe and convenient movement across the conveyor for people and animals. The placement of such underpasses/crossings will be regular enough so as to limit the inconvenience and detour length for affected parties. Aerial images, together with community participation, will determine the maximum distance between any two culverts.

The previous impact explains that resettling people within their current CPA farms will be undertaken to reduce social disruptions. However, the appropriateness of this will be addressed from the perspective of grazing and the remaining carrying capacity of the land. In the event that no satisfactory mitigation measures can be determined, and where local residents' livelihoods continue to be at risk, Kangra Coal, in discussion with affected CPAs, will purchase alternative land, of the same size, quality and productivity as the current CPA farms to ensure people's continued survival. This land will be registered as per the current CPA tenure arrangements. The land will be sterilized to ensure no future mining activities threaten to unsettle affected communities. In such a situation it may also be beneficial to discuss resettling affected homesteads from privately owned land onto the new CPA land as part of those communities.

Residual Impact (Post-mitigation)

If well implemented, the mitigation measures above would reduce the magnitude of the impact to medium reducing the significance of the impact to a '**Moderate Negative Impact**' (*Table 10.8*).

Table 10.8 Rating of Residual Impacts Related to Loss of Access to Land for Agriculture (for approximately 25 Homesteads) and Grazing as a Result of the proposed Project Footprint and Associated Infrastructure (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Restricted to site of disturbance (1km round Adits A and B and 500m from the conveyor, and temporary contractors' camp footprint).
Duration	Permanent	The impact will be triggered during construction and will continue through operations (10 to20 year life of mine). Disturbed land will be rehabilitated at closure.

Scale	48.4 Ha (approximately 25 Homesteads) and livestock owners in the Zones of Influence	Subsistence fields for approximately 25 homesteads and livestock farming and grazing is either not possible or too disrupted because of the footprint requirement and infrastructure. The presence of the conveyor further disrupts the entire 7km corridor, splitting the land on either side. This increases the number of directly affected individuals to all those who graze cattle in the area. Depending on the extent and success of the mitigation measures, replacement land will be sourced or people will be resettled in areas that will enable the same levels of subsistence agriculture and provide the same access to cattle grazing as is currently available.
Frequency	Once-off or Intermittent	The impact will be constant impact from Construction for the life of the proposed Project. Even if land is returned to its original state in 10 to 20 years' time it would be unrealistic to anticipate moving people temporarily from the affected areas until mine closure. Resettled homesteads would be able to re-establish their agricultural fields and livestock will have sufficient access to grazing. The threat to people's livelihood security would be diminished. If people are resettled within the CPA land, access to grazing will continue to be limited but mitigation measures will facilitate alternative ways for livestock to access remaining grazing lands.
Likelihood	Definite	This impact is inevitable if the proposed Project goes ahead.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium Sensitivity		
The sensitivity of affected homestead residents will be high based on the discussions in pre-mitigation. However, if the Resettlement and Compensation process is participatory and respectful, people may feel less vulnerable and more empowered to make decisions and take some control over events that will shape their lives. If this happens their vulnerability, post-mitigation, should be reduced. Additionally, if loss of access to grazing land is limited, and alternate access points to remaining land established, people's vulnerability to this impact will again be reduced.		
Significant Rating After Mitigation		
Moderate Negative Impact		

10.1.2 Socio-Economic Environment and Livelihoods

The impacts of the proposed Project on the socio-economic environment and livelihoods in the Zones of Influence and the broader Study Area are anticipated to be limited as the proposed Kusipongo Resource Expansion Project is expected to replace existing Kangra Coal underground mining already present in the Study Area. Therefore, large-scale new activities and concomitant impacts are unlikely. What should be borne in mind is that approximately 745 people currently employed by Kangra Coal, are likely to lose their jobs if the proposed Project does not go ahead.

Creation of 450 Construction Jobs and the Retention of 745 Existing Mining Jobs

Description of the Baseline Environment

Over 30% of the population in the Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities are within the potentially economically active age range.

However, there is high unemployment in the Study Area as well as in the Zones of Influence. Figures for the local municipalities are on average 30% and the social survey undertaken for this study reported a 64% unemployment rate.

Proposed Project Activities

The proposed Project is anticipated to create 450 jobs during construction (which is expected to be 18 to 24 months in duration). Of these, Kangra Coal expects that 250 people will be semi-skilled and skilled positions and will be sourced from outside of the Study Area. The company anticipates local employment opportunities for this phase to number approximately 200 depending on local skills levels.

During operations the proposed Project will employ 745 people. However these employees will be drawn directly from the existing Kangra Coal operations that are planned to cease at the same time as Kusipongo operations would begin. Thus no new employment will be created during the operations phase by the proposed Project.

If the proposed Project does not go ahead none of the job opportunities will be created and the 745 current positions will not be retained.

Sensitive Receptors

Levels of education in the Study Area as well as more broadly in the two affected local municipalities are relatively low. The 2011 National Census reports that in these local municipalities only about 28% of people over the age of 20 have completed Grade 12. Kangra Coal has implemented a policy where its minimum educational requirement is Grade 12 (or equivalent). This is documented in its SLP. Thus the locally available skills and qualification range required for most of the employment opportunities is limited. Thus, the ability of local residents to take advantage of the benefits of employment opportunities and concomitant improvements in the security of livelihoods is considered to be low.

The 745 people currently employed by Kangra Coal, together with their dependents, are assessed to be highly sensitive to the loss of jobs if the proposed Project does not go ahead and their livelihoods would be significantly undermined.

No details are available for the anticipated wage bill from skilled to unskilled labour making the actual economic benefits of these employment opportunities impossible to assess.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact from new employment opportunities is assessed to be '**Minor Positive Impact'** while the retention of

existing jobs is assessed to be a **'Major Positive Impact'** pre-mitigation (*Table 10.9*).

Table 10.9 Rating of Impacts Related to the Creation of 450 Construction Jobs and the Retention of 745 Existing Mining Jobs (Pre-Mitigation)

Type of Impact		
Direct Positive Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local and Regional, National	250 construction jobs will be created for people from outside of the Study Area while 200 unskilled jobs will likely be filled locally. 745 jobs on which the employee and his/her dependents (local and from further afield) depend will be retained.
Duration	Medium-Long term	Construction will last for 18 to 24 months. Operations are expected to continue for 10 to 20 years.
Scale	450 jobs during construction and 745 jobs retained in operations	250 Skilled and semi-skilled jobs are likely to be filled from outside the Study Area with the remaining 200 unskilled opportunities anticipated to be locally filled. 745 current employees are resident locally.
Frequency	Intermittent	The impact of employment will begin at construction when contract positions are filled and will end at mine closure. However, the impact of new opportunities will be most intensely experienced during construction and early operation.
Likelihood	Likely	These jobs are necessary for construction and operations.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low Adaptability / High Sensitivity		
Low levels of education reduce local residents' ability to adapt to employment opportunities, where these are available. The sensitivity to loss of employment from those currently employed is high.		
Significant Rating Before Mitigation		
Positive Impact		

Resentment and Anger from Unfulfilled Expectations of Improved Employment Opportunities and Related Livelihood Security

Description of the Baseline Environment

As described above, over 30% of the population in the PKSLM and MLM are within the potentially economically active age range. Of this number approximately 30% are unemployed. In the Zones of Influence, survey figures reported a 64% unemployment rate.

Stakeholders at public meetings emphasised high employment expectations as well as extremely high levels of community frustration and anger based on

perceptions of limited local employment opportunities and benefits from current Kangra Coal projects. These feelings were echoed in the Zones of Influence surveys.

Proposed Project Activities

The proposed Project will create 450 new jobs for the duration of construction (18 to 24 months). Of these, Kangra Coal expects that 250 people will be semi-skilled and skilled positions and will be sourced from outside of the Study Area. The company anticipates local employment opportunities for this phase to number approximately 200 depending on local skills levels.

Sensitive Receptors

Levels of education in the Study Area as well as more broadly in the two affected local municipalities are relatively low with approximately 28% of people over the age of 20 having completed Grade 12. Kangra Coal has implemented a policy where its minimum educational requirement is Grade 12 (or equivalent). This is documented in its SLP. Thus the locally available skills and qualification range required for most of the employment opportunities is limited. Nevertheless, local communities, which will experience the most direct negative impacts from the proposed Project, expect, and in many instances have demanded, local employment opportunities. For these communities the extremely limited number of new jobs during construction will be a disappointment. People are already angry at what they perceive to be more employment of outsiders than locals and an absence of training opportunities to empower local residents with the skills to meet employment requirements. Thus the communities and individuals in and around the Study Area are assessed to be highly sensitive to this impact.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the magnitude of this impact is expected to be medium and the impact on local communities will be **'Major Negative Impact'** pre-mitigation.

It seems peculiar to assess the possibility of even a handful of new jobs within a negative significance range. However, this rating must be understood as an overall weighing up of the very limited job opportunities against the high expectations and pre-existing levels of anger and frustrations. During construction the probability of employing non-local contractors is high and this will exacerbate existing perceptions from local residents (*Table 10.10*).

Table 10.10 Rating of Impacts Related to Resentment and Anger from Unfulfilled Expectations of Improved Employment Opportunities and Related Livelihood Security (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	People in the broader Study Area (including the Zones of Influence and Driefontein) are aware of the proposed Project and have expectations of new jobs and pre-existing perceptions and anger around existing employment patterns. These communities will see construction activities and contractor employment most clearly and will experience the very limited possibility of finding jobs on the proposed Project themselves.
Duration	Medium-term	Construction will last for 18 to 24 months and will be the time of most visible new job opportunities. During this time the significance of the impact will be greatest. People will expect additional new job opportunities at the start of operations and their expectations will not be met. The impact of unmet expectations should diminish after a few years of operations.
Scale	Residents of Driefontein and the Study Area	Driefontein and the Study Area and Zones of Influence will be affected.
Frequency	Intermittent	The impact will begin at construction when contract positions are filled and will end at mine closure. However, the impact will be most intensely experienced during construction and early operation.
Likelihood	Likely	The limited number of construction and operation related jobs are confirmed in Kangra Coal's Project planning and Social and Labour Plan and are therefore likely to be accurate. How local communities may respond to the unmet expectations regarding the scale of employment opportunities is the uncertain variable for likelihood. Based on comments made during the Social Study and during stakeholder engagement levels of disappointment, anger and frustration are anticipated to be high and the impact is therefore assessed to be likely.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Stakeholders have already vociferously expressed their opinions and expectation related to employment issues. For those communities experiencing this impact their level of sensitivity is high and the importance of the issue has been flagged.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Commission or undertake a skills audit or commission in Driefontein and the Study Area prior to allocating construction contracts. This information will be used to maximise local contracting.

- Based on the outcome of the skills audit, individuals will be identified for training to increase their employment potential as contractors. Employment will be during construction as well as to take over from some of the non-local semi-skilled employees through an employment and procurement progression-planning programme.

- Local employment will be included as a tender condition for contractors and establish a measurable percentage for these local positions. Local employment will include contractor commitments to train local residents who have the potential to fill certain semi-skilled levels (e.g. drivers of construction equipment; builders etc.). Fulfilment of these commitments will be auditable.

- On-going stakeholder engagement will be established during which people's expectations of employment are realistically addressed **prior** to the start of construction activities.

- Kangra Coal will ensure that alternative benefits for local residents are visible and understood as a trade-off for the limited employment opportunities. These benefits may include development projects where people's skills are developed for other employment opportunities or the establishment of entrepreneurial training for self-employment. Kangra Coal's current SLP highlights some of these possibilities.

- As per Kangra Coal's current SLP, community Skills and Capacity Development Programme will be implemented, which aims to increase Grade 12 pass rates in maths and science.

Residual Impact (Post-mitigation)

The mitigation measures above will, over time, reduce the scale of the impact to **'Minor Negative Impact'**. However, unless there is a concerted effort and resources focussed on this issue it is likely to remain '**Moderate Negative Impact'** throughout construction and early operations (*Table 10.11*).

Table 10.11 Rating of Residual Impacts Related to Resentment and Anger from Unfulfilled Expectations of Improved Employment Opportunities and Related Livelihood Security (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	People in the Study Area (including Zones 1 and 2 of Influence and Driefontein) are aware of the proposed Project and have expectations of new jobs and pre-existing perceptions and anger around existing employment patterns. These communities will see construction activities and contractor employment most clearly and will experience the very limited possibility of finding jobs on the proposed Project themselves. However these will also be the communities who are the focus of mitigation measures and who should benefit both from the training opportunities and from on-going stakeholder engagement to contain levels of expectations.
Duration	Short-term (2-3 years)	Construction will last for 18-24 months and will be the time of most visible new job opportunities. People will expect additional new positions to be created at the start of operations. With full implementation of mitigation measures the impact should decrease in intensity during early operations.
Scale	Local	Driefontein and the broad Study Area and Zones of Influence will be affected.
Frequency	Intermittent	The impact will begin at construction when contract positions are filled and will end at mine closure. However, the impact will be most intensely experienced during construction and early operation. Mitigation measures around training and mentorships as well as entrepreneurial development should be recognised by affected residents as alternative opportunities to direct employment and also reduce the frequency and intensity of perceived unmet expectations.
Likelihood	Possible	Will successful implementation of mitigation measures that benefit local communities in ways other than employment the likelihood of this impact occurring would be reduced to possible.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium Magnitude		
Stakeholders have already vociferously expressed their opinions and expectations related to employment issues. For those communities experiencing this impact their level of sensitivity is high and the importance of the issue has been flagged. However with mitigation fully implemented people's sensitivity to the issue of unmet expectations should be reduced.		
Significant Rating After Mitigation		
Minor to Moderate Negative Impact		

Increased Spending by the Proposed Project will contribute to the Local Economy

Description of the Baseline Environment

The economies of communities around the Study Area are small and are not focussed on construction or servicing of large industry. Furthermore, the Social Baseline Study shows that there are limited levels of education and skills in the broader Study Area that could service the construction and contracting needs of the proposed Project.

Kangra Coal currently employs 745 employees on underground mining operations in the area. These operations are anticipated to cease within the next three years and all employees will be transferred to the proposed Project if it takes place.

Proposed Project Activities

The Capital Expenditure (CAPEX) on the proposed Project is estimated to be around R1.2 billion. The vast majority of this expenditure will happen outside of the Study Area, and no details are currently available to suggest the distribution of expenditure within the Provincial or even National economy.

During construction, approximately 450 contractors will be employed and they will earn a monthly income. At this time no details of the range of salaries is available. Approximately 250 positions will be filled from outside the Study Area and the remaining 200 jobs are likely to be filled locally. Non-local contractors will be temporarily housed in on-site accommodation built for the proposed Project.

During operations no additional jobs will be created by the proposed Project over and above those 745 positions already existing in Kangra Coal's current workforce.

Sensitive Receptors

The local economies (in the Study Area and the larger towns in the vicinity of the proposed Project) are not positioned to take advantage of or benefit from broader CAPEX for the Project. The extent of expenditure would likely be confined to small-scale purchases related to servicing the temporary contractor's camp.

The development of the proposed Project would increase spending in the local economy during construction, when approximately 450 wage-earning contractors reside in the area for up to 2 years. The majority of these employees, who will come from outside of the area, will be housed and fed in a self-contained contractors camp, thereby limiting their salary-spend locally. Furthermore, the extent of income flowing into the local economies through salaries or direct expenditure cannot be estimated based on available information.

Most of Kangra Coal's requirements (technical, material, food etc) will be sourced from outside of the Study Area as they are not generally locally available.

Significance of Impact (Pre-mitigation)

Based on existing Kangra Coal operations in the area it is not anticipated that there will be significant additional direct economic benefits or indirect spin-offs for the local economy (and the Study Area in particular). Therefore the

significance of this impact is assessed to be '**Minor Positive Impact'** on the local economy (*Table 10.12*).

Table 10.12 Rating of Impacts Related to Increased Spending by the Proposed Project will Contribute to the Local Economy (Pre-Mitigation)

Type of Impact		
Positive Indirect Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional	A very small amount of money will be spent in the Driefontein / Study Area economy. However some basic foodstuffs may be sources within the Province.
Duration	Short-term	A change in income will occur during construction through wages. Given that no new employment will be created during operations, the increased expenditure by employees will take place only in the 18 to 24 months of construction and return to the *status quo* thereafter.
Scale	450 contract workers and some day-to-day Project expenses in Driefontein and surrounding larger towns	A small amount of the proposed Project needs will be serviced at this level. Driefontein has no established infrastructure to service even the food requirements of the construction workforce. Therefore at most, small day-to-day running costs might be procured in the surrounding small towns and contractors may spend some of their salaries locally.
Frequency	Intermittent	The increased employment and associated monthly salaries will occur for the duration of construction after which it will cease.
Likelihood	Possible	Most expenditure is likely to happen outside of the Province and almost certainly outside of the Study Area. Very little local expenditure is anticipated.
Magnitude		
Positive Impact		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low Sensitivity		
The local economic environment is not developed enough to cater to almost any of the possible Project needs. Therefore local expenditure into the economy will be extremely limited.		
Significant Rating Before Mitigation		
Positive Impact		

Loss of Productive Land and Related Current and Future Income Opportunities as a Result of Proposed Project Infrastructure and the Division of Farms by the Overland Conveyor

Description of the Baseline Environment

Land in the Zones of Influence is used for residential, agricultural and livestock farming, on commercial and subsistence scales as part of the owners' livelihood strategies. Current activities on CPA land also suggest plans for increased agricultural and livestock income generation through cultivation and livestock husbandry.

The proposed Project-affected land is divided into two forms of ownership – private and community based.

Private ownership is relevant to Kangra Coal's own farmland and therefore needs no negotiation around access. Mr CJF Greyling who is a commercial farmer, is the owner of the other private land (Donkerhoek Farm). The farms of Twyfelhoek and Kransbank are communally owned and used for residential as well as subsistence agriculture and livestock farming with intentions of expanding these activities into more commercially sustainable activities in the future.

Proposed Project Activities

The proposed Project infrastructure would be developed on privately and communally owned land. The footprint requirement is anticipated to be 46.8 ha and required access to mine infrastructure, once established, would traverse farms not owned by Kangra Coal (*Figure 10.2* overleaf). In addition, placement and fencing of the conveyor and associated maintenance road and power lines will restrict access across the CPA land of both farms.

Sensitive Receptors

CJF Greyling, as the owner of Donkerhoek, is a commercial farmer, farming cattle, sheep and maize and other crops. The portion of footprint requirement for Adit A on Donkerhoek 14-HT sub-division 4Re is approximately 8 ha. Mr Greyling has retained legal representation for negotiating proposed Project access to his farm and appropriate remuneration and compensation for loss of land and associated income. Based on the above his vulnerability to the impact is considered low.

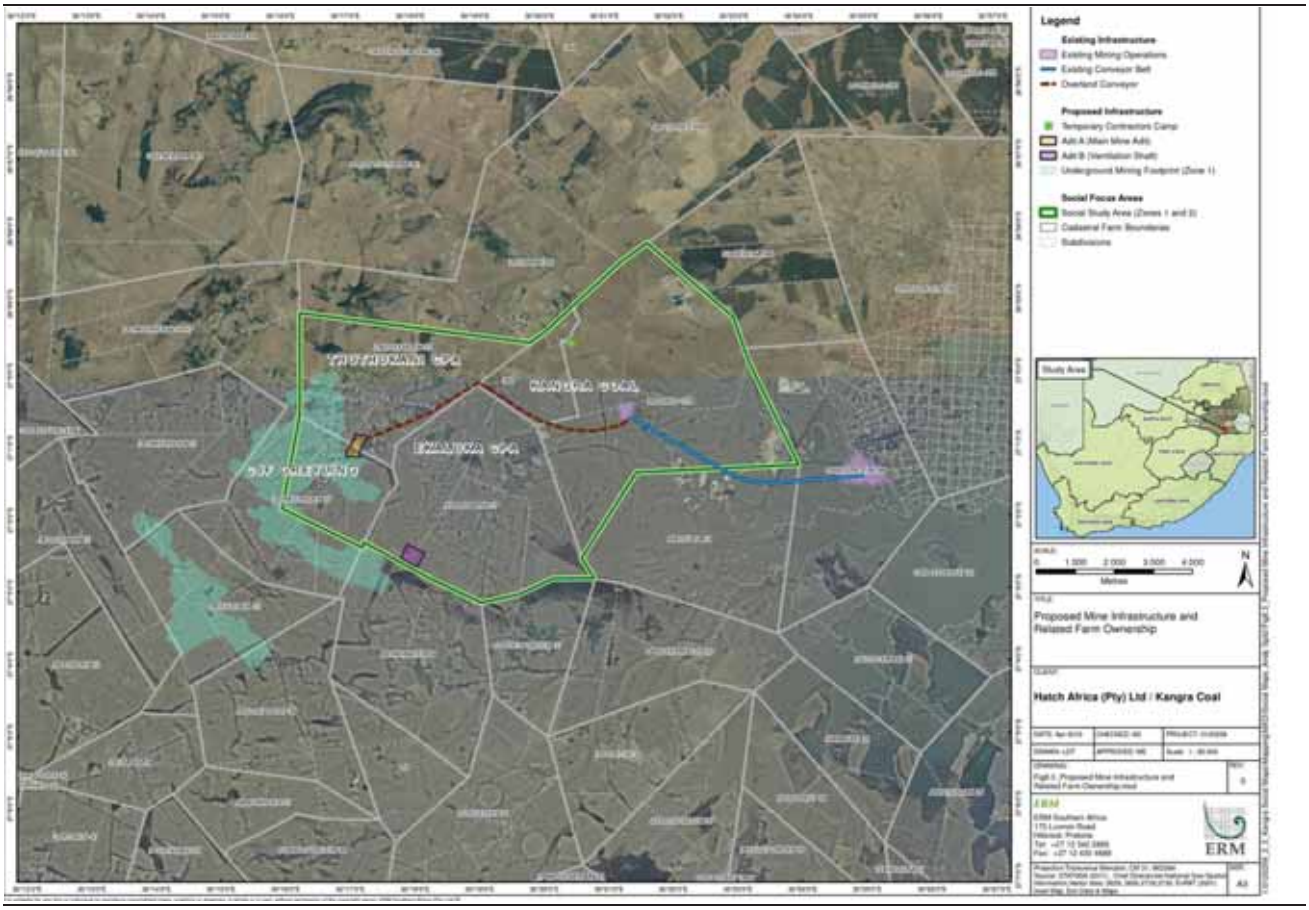
The Thuthukani and eKaluka CPAs are engaged in small-scale agriculture and livestock farming as part of mixed livelihood strategies (discussed above) and focused on future potential community development. The Project footprint on Twyfelhoek land (under Thuthukani CPA) is anticipated to be 10.3 ha for Adit A and 9.5 ha for the conveyor. Adit B (the ventilation shaft) will have a footprint of approximately 2.8 ha on Kransbank farm (eKaluka CPA). Access to and from these infrastructure sites will, of necessity, cross the various farm lands. While the direct loss of productive land is limited movement of animals across the area will be restricted and therefore impact on the feasibility of livestock farming in the medium to long-term.

The CPAs do not have their own legal representation, nor are they sufficiently empowered to undertake free and fair negotiations to allow the proposed Project access to and use of their land. In additional to actual loss of productive land and its contribution to current and future income, the long-term impact on land and water from underground mining activities and dewatering is strongly perceived by community members as a threat to the lands productivity and sustainability.

CPA members and committee representatives have highlighted a lack of trust in Kangra Coal and a strong resistance to allowing the proposed Project access to their farms. This is predominantly based on previous examples that they provided of Kangra Coals activities in the area and people's beliefs that the land has been damaged and the owners have not been properly compensated. Concerns over water quality and quantity feed into this perception. There are fears that mining activities will damage the land and reduce its long-term viability during operations and post-closure.

The communities owning these farms are therefore considered to be highly sensitive to this impact, even though actual footprint requirement is limited.

Figure 10.2 Proposed Mine Infrastructure and Related Farm Ownership



Significance of Impact (Pre-mitigation)

Based on the analysis provided above and taking into account the relatively limited footprint but highly sensitive receptors, this impact is assessed to be of a **'Moderate to Major Negative Impact'** significance, pre-mitigation (*Table 10.13*).

Table 10.13 Rating of Impacts Related to Loss of Productive Land and related Current and Future Income Opportunities as a Result of Proposed Project Infrastructure and the Division of Farms by the Overland Conveyor (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The proposed Project footprint and affected farms.
Duration	Permanent	The impact will extend for the life of mine (10 to 20 years) and where land cannot be rehabilitated, the impact will be permanent.
Scale	Donkerhoek Twyfelhoek Kransbank	There are three affected farms that are not owned by Kangra Coal and that are identified as sites for proposed Project infrastructure.
Frequency	Continuous	From construction to mine closure, and depending on possible rehabilitation, perhaps beyond closure.
Likelihood	Likely	This property acquisition will occur if the proposed Project goes ahead. The extent of its impact on current and future income generation cannot be quantified in this study.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Affected communities and landowners are highly sensitive to material and symbolic impacts on their land and are vulnerable to the loss of this land-use and its related income (current and potential). This assessment is based on the historical sensitivity of land tenure issues and the role that land use plays in the owners' livelihood strategies, current and future. Donkerhoek farm owner, Mr CJF Greyling, is deemed less vulnerable to the impact as a result of his legal representation, which should enable him to negotiate fair remuneration for his loss.		
Significant Rating Before Mitigation		
Moderate to Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- As discussed under the mitigation of physical and economic displacement above the proposed Project will negotiate in good faith with affected land owners to establish fair remuneration and compensation for loss of access to and productivity of land and for damage (long-term and permanent). Where appropriate, Kangra Coal will facilitate legal representation of CPAs to ensure agreements fully consider the needs of current and future generations of CPA members.

- A Community Benefit Agreement will be drawn up in which realistic benefits, financial and developmental, will be agreed to as recognition for the CPA's contribution to the proposed Project's development. Without access to the land the proposed Project could not go ahead and in a post-Marikana mining environment, it is necessary to recognise and share the benefits of a development with more than the Company's shareholders.

Residual Impact (Post-mitigation)

The mitigation measures above will transform the magnitude of the impact to a positive thereby changing the significance of the impact to a '**Positive Impact'**. Responsible implementation of a Community Benefit Agreement (as opposed to Corporate Social Responsibility spending) will also help to reverse existing negative perceptions of Kangra Coal and thereby reduce resistance to the proposed Project on CPA land.

Reduced Current and Future Tourism Potential as a result of Changes to the Natural Environment and Potential Impacts on Water Quality

Description of the Baseline Environment

The Study Area and Zones of Influence are predominantly rural and are used for a mix of residential and small-scale agricultural and livestock activities. The Heyshope Dam is the closest designated recreational area to the proposed Project and no other tourism ventures were reported to exist in the area at present. The dam is known as one of the prime largemouth bass fishing lakes in the country. It is fed by the Assegaai River and is within the same quaternary catchment as the proposed Project. Wakkerstroom has a thriving avian-based tourism (approximately 37km south of the Study Area but in a discreet catchment area).

Proposed Project Activities

The establishment of a coal mine with associated infrastructure in the Study Area will change the nature of the area in a number of ways, including from a visual and noise perspective. It will also impact on the quality and quantity of ground and surface water. Details of these impacts are addressed in the Groundwater and Surface Water Hydrology Specialists Reports associated with the Kusipongo Resource Expansion ESIA.

Sensitive Receptors

There are no current tourism activities in the Study Area. Additionally, economic activities related to tourism were reportedly non-existent for residents of Driefontein. There is the Kransbank Private Reserve; however, no plans for tourism development in the immediate future have been highlighted and no plans were identified by WWF or Bird Life Africa.

Tourism has been identified as a focus area of potential economic activity for the Province and the District in the Integrated Development Plans. Thus, even

in the absence of formal tourism plans the impact on future potential for tourism and related income generation in the area should be recognised.

Heyshope Dam is the most sensitive tourism site in the vicinity of the Study Area. Its attraction nationally is angling activities for largemouth bass, as well as other fish species. The fish are dependent on the water quality and the tourism is directly dependent upon the fish. Although the local economy is not heavily dependent upon the related tourism, losing visitors to the dam would have some socio-economic impacts for surrounding towns (Piet Retief in particular).

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this impact is assessed to be a '**Minor Negative Impact'** pre-mitigation (*Table 10.14*).

This assessment of significance weighs up the limited impact on future tourism potential in the Study Area, based on the absence of planning to date and on the potentially small impact that undermining tourism in the Heyshope Dam and its surrounds would have on surrounding communities and towns economies.

Table 10.14 Rating of Impacts Related to Reduced Current and Future Tourism Potential as a result of Changes to the Natural Environment and Potential Impacts on Water Quality (Pre-Mitigation)

Type of Impact		
Direct, Cumulative Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	District (Pixley Ka Seme and Mkhondo)	Local impact is limited based on absence of existing or planned tourism in the Study Area. However, if the impact were to reach the Heyshope Dam, which lies within the proposed Project's catchment area, the extent could be district wide.
Duration	Long-term	The presence of the proposed Project would reduce the viability of the Study Area for tourism activities at the local level from construction and for the 10 to 20 year life of mine. Further degradation of the environment, particularly related to water quality for fish and bird life, could have impacts beyond the life of mine – perhaps permanently.
Scale	A small number of tourism service providers in nearby towns (e.g. Piet Retief)	The economy of the town of Piet Retief benefits to some degree from local tourism. Dependants of those employed in tourism (e.g. accommodation and food) could also be impacted.
Frequency	Intermittent	The impact may occur intermittently during tourist seasons.
Likelihood	Possible	The impact is likely to occur at some time during the life of the mine. Impacts on the water in the catchment are also possible.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low Sensitivity		
Vulnerability of the receptors is dictated to by the low levels of dependence on tourism in the Study Area. People dependant on income from tourism activities in the Heyshope Dam may demonstrate a higher level of vulnerability due to the absence of alternative livelihood options.		
Significant Rating Before Mitigation		
Minor to Negligible Negative Impact		

Mitigation/Management Measures

There are no realistic mitigation measures to reduce the significance of this impact. The most pro-active initiatives are to share information about the proposed Project with the District tourism industry and more broadly, to ensure that the nature of impacts are accurately communicated and understood.

Kangra Coal will look at the viability of spending some of its Social and Labour Plan budget for community development, training and entrepreneurial mentorship on nurturing local tourism projects.

Residual Impact (Post-mitigation)

The significance of the impact will remain unchanged.

10.1.3 Socio-cultural Impacts

Introducing Mining Activities into a Rural Environment together with the Disruption of Community Life through Resettlement and Restricted Movement will undermine the Sense of Place and Residents' Community Identity and Sense of Emplacement

Description of the Baseline Environment

There are different components to "identity" and "sense of place" operating in the Zones of Influence specifically and the Study Area more broadly. Summarised, these include Identity and Land as well as Identity and Sense of Emplacement. These are discussed below:

- **Identity and Land**

The Baseline in *Chapter 8* presents the detailed background to identity in relation to land. Perhaps the key component is expressed in relation to land ownership and tenure. For labour tenants their sense of community is derived from living together for over 15 years and feeling controlled by the landowner. This applies particularly to the five homesteads on Donkerhoek.

Residents surveyed on Nooitgezien and Rooikop express similar relationships to the land but are more geographically dispersed so show a limited sense of community identity. To exacerbate this, several of these respondents were moved to the area as a result of mining activities within the last five years.

For CPA respondents land ownership and its symbol of freedom was most commonly emphasised – freedom from a farmer; to have multiple head of cattle; to make decisions over their land. One CPA committee member stated, "*they can't start here until they've fixed what they started there*" pointing to exploration areas that had not been rehabilitated and emphasising his sense of power and control over exploitation of the land.

Survey respondents on CPA land also expressed the greatest sense of communal identity, even if they were relatively new to the area. The idea of land ownership, albeit communal, firmly establishes a sense of belonging and group identity that goes with longer-term development objectives. This was equally applicable on Twyfelhoek and Kransbank.

Further, identity amongst survey respondents on the different farms was also expressed in a fairly united opposition on the proposed Kangra Coal Project.

- **Identity and Sense of Place and Emplacement**

The sense of place valued by local residents related to the generally peaceful and tranquil nature of where they lived. Being part of a rural community with fertile soils for subsistence farming was valued, as was the dryness of the specific location of individual homesteads.

Irrespective of the nature of farms ownership, various respondents emphasised their sense of belonging or emplacement in relation to their neighbours and the supportive relationships between homesteads as part of what they valued about living where they do. People reported visiting one another from different sides of the main road and aerial images highlight some of these paths. The sense of space between homesteads and the absence of conflict were also seen to contribute to emplacement.

One CPA committee representative summarised his view of mining in the Zone of Influence as follows: "We didn't buy this farm to see it scarred like that." He explained that he wanted to see farming and grazing but visible mining activities created cracking on the surface and reduced people's access to water. Mining damaged the feel of the land.

Proposed Project Activities

The establishment of mine infrastructure will change the rural, tranquil nature of the area. It will also necessitate resettlement of some homesteads for health, safety and livelihood reasons, which could dislocate people who have been living as neighbours for extended periods of time. The conveyor will cut an 7km line across the farms and restrict people's access from one side to the other.

During construction and operations mining activity will create noise and air pollution as well as physically alter the environment with large man-made structures. Construction vehicles will travel across the area and between homesteads. The 24hr operation of equipment and the conveyor will foreground the continuous presence of the mine. Details of these impacts are also presented in *Chapter 9* for Air Quality and Noise, and *Section 10.2* for Visual and Landscape.

Sensitive Receptors

Communities are not held together by strong traditional cleavages or leadership loyalties. In fact for many survey respondents that absence of clear leadership was what stood out. Nearly 25% of respondents recognised "no one" as a community leader or authority. As a possible result of this, people have formed smaller and more intimate informal community groupings based on location; history; period of residence in the area; membership of a CPA etc.

In the absence of strong leadership and direction it is anticipated that local residents in the Zones of Influence will be very sensitive to a changed sense of place and its concomitant impact on their sense of identity. This would be particularly true of the older generation as well as people who have lived in

the area for many years. This sensitivity may be slightly lower for more recent residents, and particularly those from Driefontein or larger settlements.

Changes to the sense of place that hint at an unwelcomed imposition of power from outside (Kangra Coal or Government) are likely to be met with very sensitive responses and a vulnerable community. Furthermore, changes that could be interpreted as scars on the landscape will be hard to tolerate particularly for CPA members who feel a strong sense of ownership and title to their land, heightened by the history of farm exploitation and a lack of access to land tenure that many people will have experienced.

Identity and a sense of belonging, or emplacement, are important aspects of human well-being and undermining this places people in vulnerable positions.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact is assessed to be a '**Major Negative Impact'** pre-mitigation (*Table 10.15*).

Table 10.15 Rating of Impacts Related to Introducing Mining Activities into a Rural Environment together with the Disruption of Community Life through Resettlement and Restricted Movement will Undermine the Sense of Place and Residents' Community Identity and Sense of Emplacement (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The five farms in the Study Area where proposed Project infrastructure will be established during construction and where activities will continue for the life of the mine (10 to 20 years).
Duration	Medium Term	People often feel fear of and resistance to change but, with support, somehow manage to adapt within a number of years of an event or change.
Scale	Residents within the Study Area	The changes triggered by the proposed Project will impact on people living within the Zones of Influence (particularly those in Zone 1) and the Study Area more broadly.
Frequency	Periodic	During construction and operation the mine-induced changes will be more and less noticeable. As people become accustomed to the reshaped physical environment their constant awareness of change will become more sporadic. If however, people feel undermined in relation to their decision-making power about these changes, their awareness and resistance is likely to be more constant a feature of their lives.
Likelihood	Likely	Based on fieldwork responses and the definite establishment of mine infrastructure should the Project go ahead, local residents are likely to experience significant changes to their area.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
A history of exploitation contrasted with new-found control over their lives will make many local residents highly sensitive to imposed or top-down changes. Furthermore, for those residents who value the peace and tranquillity of the area the constant activity during construction and operation will be strongly experienced. Given that well-being is closely tied to an individual's sense of security, familiarity and belonging, change will trigger vulnerability – in some individuals and groups more than in others.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

This is a difficult impact to mitigate, as the construction and operation of the mine will unavoidably trigger the impact. However, the following mitigation measures will be used to reduce the significance of the impact:

- A comprehensive Resettlement negotiation process will be undertaken as is detailed in *Section 10.1.1*.

- Open and transparent dialogue will be established with residents of the Study Area as early as possible. This will be done while Kangra Coal is

negotiating access to the affected farms with private and communal owners.

- Kangra Coal will ensure that the sensitivity of land issues is fully understood and develop a consistent and clear approach to communicating proposed Project plans with affected residents.

- All affected residents will be included in this discussion and negotiation process.

- Kangra Coal will ensure that residents are part of the decision-making process and avoid token gestures of participation.

- People will be provided with clear information about potential impacts and changes to their environments and their lives so that people feel able to take decisions.

- Kangra Coal will investigate the potential to partner with the District health department in the provision of mobile health services to the Zones of Influence (particularly for residents in Zone 1 who will be directly impacted) leading up to construction activities, including the medium-term provision of a social worker to monitor emotional and psychological changes in vulnerable individuals and groups.

- Residents will be empowered, through the negotiation process and by facilitating CPA legal representation, so that their concerns and needs are identified, documented and fulfilled, where reasonable. This will prevent people from feeling alienated and disempowered and may foster relationships of trust. Such relationships create a productive environment for host land-owners and the new land-users – the mine.

Residual Impact (Post-mitigation)

The mitigation measures above should reduce the sensitivity of the receptor and thereby the magnitude of the impact to medium reducing the significance of the impact to a **'Moderate Negative Impact'**. If optimally implemented, the mitigations measures should empower residents in their understanding of the proposed Project and more importantly, in feeling that they are part of making life-changing decisions from which they benefit, rather than being the unwitting recipients of change. This would create a **'Positive Impact'** for those able to make use of the empowerment opportunity. Overall, therefore, the post-mitigation residual impact is assessed to be **'Minor Negative'** (*Table 10.16*).

Table 10.16 Rating of Residual Impacts Related to Introducing Mining Activities into a Rural Environment together with the Disruption of Community Life through Resettlement and Restricted Movement will Undermine the Sense of Place and Residents' Community Identity and Sense of Emplacement (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The five farms in the Study Area where proposed project infrastructure will be established during construction and where activities will continue for the life of the mine (10-20 years).
Duration	Medium Term	People often feel fear of and resistance to change but, with support, somehow manage to adapt within a number of years of an event or change. The mitigation measures are intended to provide some of that support.
Scale	Residents within the Study Area	The changes triggered by the proposed Project will impact on people living within the Zones of Influence (Zone 1 in particular) and the Study Area more broadly.
Frequency	Periodic	During construction and operation the mine-induced changes will be more and less noticeable. Depending on people's sensitivity and vulnerability, as they become accustomed to the reshaped physical environment their constant awareness of change will become more sporadic. If however, people feel undermined in relation to their decision-making power about these changes, their awareness and resistance is likely to be more constant a feature of their lives. The mitigation measures are intended to fully recognise people's realistic powers and to fully include them into decisions that will affect their lives.
Likelihood	Likely	Based on fieldwork responses and the definite establishment of mine infrastructure should the Project go ahead, local residents are likely to experience significant changes to their area. Mitigation should empower them to understand and anticipate change – particularly if they have been directly involved in shaping the details of some of that change.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium to Low Sensitivity		
Full and successful implementation of the mitigation measures may reduce many people's vulnerability to this impact. For some individuals there is even the possibility of feeling empowered through the process.		
Significant Rating After Mitigation		
Minor Negative Impact		

10.1.4 Natural Resources

Reduced Water Quality and Availability for People, Agriculture and Livestock Resulting from Mine Activities (Water Use, Dewatering, Contamination)

The proposed Project is anticipated to have impacts on the groundwater level, groundwater quality, and the level and quality of surface water including streams and wetlands.

The Groundwater Impact Assessment Report for the ESIA associated with the Kusipongo Resource Expansion Project addresses the technical details of these anticipated impacts. However, given the significance of this water to local users, it is important to highlight the impacts from a social perspective.

Description of the Baseline Environment

The Study Area has numerous wetlands as well as springs, rivers and streams. There are also a number of boreholes (approximately 20) in the area. The springs, rivers and streams are the main sources of water for local residents, farmers and livestock.

The Study Area in general and the Zones of Influence in particular have been the focus of a range of government-led development interventions in the post-apartheid period. Recently, this has included development and upgrading of water supply infrastructure to homesteads directly. Most survey respondents (over 66%) reported having water connections in their homesteads drawn directly from springs, streams and rivers. *Table 10.17* below summarizes where sampled homesteads obtained their water.

Table 10.17 Sources of Household Drinking Water

Water Source	n=	%
Borehole or well	1	2.22%
House connection	30	66.67%
Neighbour	1	2.22%
Spring	1	2.22%
River	12	26.67%
TOTAL	**45**	**100.00%**

It is significant that two thirds of households surveyed had "household connections" within their homes. In many cases, these connections were recent developments and were only installed within the year prior to the survey.

Ground and surface water quality are generally within the prescribed screening levels identified for ground and water, although microbiological contaminants were not sampled.

Proposed Project Activities

Construction and operation of the proposed Project has the potential to affect water in the Study Area in two main ways. The first is groundwater contamination (reduced water quality) from:

- **Underground Workings** – where coal surfaces exposed to the atmosphere within underground workings have the potential to generate acid mine drainage;

- **Overburden Dumping** – where there the exposure of pyrite-bearing coal from mining activities may lead to oxidation of metal sulphides, leading to a reduction of pH and the establishment of acidic conditions causing leaching of metals (acid rock drainage); and

- **Coal Dust Fallout** – where rain that interacts with coal dust and sweepings that have fallen off the conveyor can become contaminated and adversely affect groundwater (and surface water) quality.

The second impact on water in the Study Area begins as an impact of reduced availability for local users but in the long-term becomes an impact of reduced water quality (and this is still reduced availability of good quality water).

Dewatering which will be necessary to prevent groundwater from affecting both surface and underground operations will trigger reduced availability of water. Dewatering is the intentional pumping of ground and surface water to prevent its infiltration into working areas. Such actions can reduce groundwater levels. According to the Groundwater Impact Assessment Report for the proposed Project, simulated drawdowns induced by dewatering activities for the proposed operations generally range from 5 to 15m, but are as high as 260m in one private borehole.

The Groundwater Impact Assessment Report for the proposed Project suggests significant impacts on wetlands and streams, especially the Ohlelo River in the area of the proposed mine, due to the mining induced groundwater level drawdowns which result in a decrease of baseflow to rivers, streams and wetlands, although perched aquifers, and wetlands fed from such aquifers will not likely be affected.

When dewatering ceases at closure, water will likely decant into the underground workings where, given the acid generating potential of the rocks, it is possible that this decanted water will be of poor quality and require treatment prior to being released into the natural environment. The treatment of any such decant water will need to meet the RWQOs at the time for both surface and groundwater.

Sensitive Receptors

Everyone in the Study Area relies exclusively on water from at least one of these sources (springs, boreholes, or drinking water drawn directly from rivers) for drinking and for livelihood sustaining activities. In the Zones of Influence an existing agricultural development as well as the introduction of bulls to impregnate local cows and increase herd sizes highlight short-to-long-term planning around agriculture and livestock farming – both dependent on reliable access to good quality water.

Several CPA community members raised concerns about water loss and reduced quality resulting from the proposed Project. Members highlighted

examples of boreholes near to current Kangra Coal activities running dry as proof of lower water tables and the need for deeper borehole pumps.

The use of borehole water within the Zones of Influence is reportedly limited as the large majority of homesteads have drinking quality potable spring or river water piped to their homes. If any untreated water from the mining operations is accidentally released into the natural environment it will negatively affect the quality of water in streams and rivers and therefore have a detrimental effect on communities reliant on them as a source of water. In addition, pollution of groundwater that may recharge these surface water systems will adversely affect the community users. Springs, which many survey respondents identified as their main water source, have the potential to be impacted by contamination from polluted groundwater.

The potential pollution of water in the area would be a long-term problem that would be increasingly experienced after the proposed Project has closed and for generations to come.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this impact is assessed to be a '**Major Negative Impact'**, pre-mitigation (*Table 10.18*).

Table 10.18 Rating of Impacts Related to Reduced Water Quality and Availability for People, Agriculture and Livestock Resulting from Mine Activities (Water Use, Dewatering, Contamination) (Pre-Mitigation)

Type of Impact		
Direct, Cumulative Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Regional in the Assegaai and Hlelo catchment	The Baseline Groundwater Impact Assessment Report suggests that the impacts on water quality and availability will be confined to adjacent and nearby properties.
Duration	Permanent	Drawdown and impacts on water quality will continue beyond the life of the mine. Water levels may recover approximately 90 years after dewatering for the proposed Project ceases and pollution of groundwater is conservatively estimated to last at least 60 years.
Scale	Large	The entire water system on which local residents depend for potable water, agriculture and livestock watering will be impacted.
Frequency	Periodic to Continuous	The impact will begin during construction when dewatering activities will start but water levels are likely to rebound post-closure. Acid mine drainage will be triggered once mining activities begin and over-burden is dumped and decant in the underground workings will begin post- closure.
Likelihood	Likely	Depressed groundwater levels will result from mine dewatering and water quality is likely to be adversely affected as a result of the exposure of elements in the mined rock (above and below the surface) to water and related chemical processes.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The anticipated reduction of recharge to springs and streams from groundwater as a result of mine dewatering will be marked, permanent and likely to adversely impact ecosystem processes and communities reliant on surface water. Post closure, large volumes of decant water will have to be dealt with and will contaminate streams if released untreated. Furthermore, the potential for precipitation, surface or groundwater to interact with coal in overburden dumps, conveyor belts, and underground workings, is likely to lead to acid rock drainage and contamination of groundwater. These impacts will effect current and future generation living in the Study Area and would put human health and the productivity of the land at severe risk.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The Groundwater Impact Assessment (*Chapter 9*) for the proposed Project details a number of mitigation measures that the specialists believe, if successfully implemented, will reduce the significance of the proposed Project's impacts on ground and surface water in the Study Area.

One of the mitigation measures identified is the supply of alternative water to communities if water quality or quantity is adversely affected. For this

mitigation measure to be successful Kangra Coal will ensure permanent water replacement piped to people's homesteads and available for agriculture and livestock watering at convenient places and in appropriate quantities. This mitigation measure will be met for decades after mine closure, given the slow recovery of impacts associated with water quality impact.

The following mitigation measures will be used to reduce the significance of the impact:

- Maintenance of the Zero Effluent Discharge Policy.

- Strict controls to prevent accidental release of untreated mine-water into the natural environment as well as seepage of water through the overburden dump and coal-handling areas as well as along the conveyor route will be implemented.

- All water coming out of the mine area will be treated and returned to meet the RWQO prescribed for surface and ground water quality.

- If water access by communities is adversely affected, Kangra Coal will establish an alternative water source that will deliver water to the homesteads as is currently the case. This water delivery will continue for decades until the existing baseline quality of water is achieved.

These mitigation measures are achievable in the short-to-medium term, pre-closure. However, the supply of acceptable quality water to people and for livestock and agricultural purposes post closure must be maintained.

Residual Impact (Post-mitigation)

The mitigation measures above, if successfully implemented for the duration of the impact, will reduce the scale of the impact to medium reducing the significance of the impact to a '**Moderate Negative Impact'**. Kangra Coal is committed to the provision of alternative water supplies to those water users affected by Project activities and will be obliged to treat water post closure to ensure the RWQO at the time are met (*Table 10.19*).

Table 10.19 Rating of Residual Impacts Related to Reduced Water Quality and Availability for People, Agriculture and Livestock Resulting from Mine Activities (Water Use, Dewatering, Contamination) (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local / Catchment	The Baseline Groundwater Specialist Report suggests that the impacts on water quality and availability will be confined to adjacent & nearby properties.
Duration	Permanent	Drawdown and impacts on water quality will continue beyond the life of the mine. Water levels may recover approximately 90 years after dewatering for the proposed Project ceases and pollution of groundwater is conservatively estimated to last at least 60 years.

Scale	Current and future generations living in the affected catchment area	The entire water system on which local residents depend for potable water, agriculture and livestock watering will be impacted. If the full range of mitigation measures is successfully implemented pollution of ground and surface water during operations may be limited.
Frequency	Periodic to Continuous	The impact will begin during construction when dewatering activities will start but water levels are likely to rebound post-closure. Acid mine drainage will be triggered once mining activities begin and over-burden is dumped and decant in the underground workings will begin post-closure.
Likelihood	Likely	Depressed groundwater levels will result from mine dewatering and water quality is likely to be adversely affected as a result of the exposure of elements in the mined rock (above and below the surface) to water and related chemical processes.
Magnitude		
Large Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

Reduced Access to Wood for Cooking and Heating Resulting from Tree-Clearing in the Project Footprint and from Limited Access across the Conveyor

Description of the Baseline Environment

Approximately 89% of the 45 homesteads surveyed in the Zones of Influence rely primarily on wood for cooking and heating. While many homesteads have access to electricity this is sparingly used because it is expensive. Wood is reportedly collected from nearby woodland/forested areas around the Zones and in the broader Study Area.

Proposed Project Activities

The establishment of the proposed Project infrastructure, particularly Adit A and the conveyor route will respectively eliminate a number of wooded areas for Donkerhoek, Twyfelhoek and Kransbank or cut off access to these areas from different parts of the above mentioned farms.

Sensitive Receptors

The high percentage of survey respondents using wood as their primary source of energy suggests that the majority of homesteads in the Zones of Influence would be vulnerable to a loss of access to this "free" natural resource. In addition, the need to supplement this energy source with paid electricity would put increased pressure on people to draw on their limited cash incomes. Wood is also used in homestead construction to a limited degree.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this impact is assessed to be a '**Minor to Moderate Negative Impact'** pre-mitigation (*Table 10.20*).

Table 10.20 Rating of Impacts Related to Reduced Access to Wood for Cooking and Heating Resulting from Tree-Clearing in the Project Footprint and from Restricted Access across the Conveyor (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The clearing of wooded areas within the proposed Project footprint and the establishment of the conveyor which will create a physical barrier about 7kms long will reduce the amount of wood available and its accessibility for community use.
Duration	Long-term	Trees will be cleared for mining infrastructure and may be re-established post closure (20 years). The conveyor would be removed at closure and would therefore no longer create a physical barrier.
Scale	Local residents in Zone 1 of Influence and possibly broader Study Area	The fact that the majority of local residents rely on wood for cooking and heating in the Zones of Influence, and that their cash income to pay for alternative sources of energy is limited, makes the scale of the impact medium even though the hectares of land cleared is relatively small.
Frequency	Continuous	The loss of wood and reduced access to remaining wooded areas will begin with construction and will continue for approximately 20 years.
Likelihood	Likely	The establishment of the infrastructure will definitely occur if the proposed Project goes ahead.
Magnitude		
Minor Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Survey respondents in the Zones of Influence overwhelmingly favour the use of wood over electricity, which is expensive. Their limited cash incomes make them very vulnerable to increased costs of living that would occur if access to wood was lost or significantly reduced and if electricity became the only realistic source of energy for cooking and heating.		
Significant Rating Before Mitigation		
Minor to Moderate Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Kangra Coal will ensure that communities are involved in the clearing of wooded areas pre-construction and that harvested wood is freely available for local consumption. Assist in transporting collected wood from more remote areas to central communal areas;

- Underpasses allowing people access across the conveyor will be installed. This underpass will ensure that reduced access to collecting wood becomes a minor inconvenience.

- Communities have demanded a share (50%) of the coal mined from their land. This is obviously impractical. However Kangra Coal will negotiate the supply of coal to residents and communities within the Study Area and particularly the Zone 1 of Influence as part of their discussions to gain access to CPA land. This ESIA recognises that an arrangement that empowers people to use clean energy is preferable to an exchange for coal. However, buying electrical equipment for cooking and heating has its own related costs, which may be beyond the scope of most local residents and if this is the case then solar energy has limitations for the affected homesteads and communities that are currently equipped for the use of coal.

Residual Impact (Post-mitigation)

The mitigation measures above will reverse the impact to a significance rating of a "**Positive Impact"** (*Table 10.21*).

Table 10.21 Rating of Residual Impacts Related to Reduced Access to Wood for Cooking and Heating Resulting from Tree-Clearing in the Project Footprint and from Restricted Access across the Conveyor (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The clearing of wooded areas within the proposed Project footprint and the establishment of the conveyor which will create a physical barrier about 7kms long and will reduce the amount of wood available and its accessibility for community use. Underpasses will ensure that people walking across the area are not significantly inconvenienced.
Duration	Medium-term	Trees will be cleared for mining infrastructure and may be re-established post closure (20 years). The conveyor would be removed at closure and would therefore no longer create a physical barrier. If trees are planted on both sides of the conveyor and in other appropriate areas to replace those lost (obviously in consultation with the affected land owners) the impact duration would be reduced. Furthermore, if the other mitigation measures are implemented the vulnerability of communities reliant on wood for cooking and heating would immediately be significantly reduced.
Scale	Local residents dependent on wood in Zones 1 and 2 and possibly the broader Study Area	The fact that the majority of local residents rely on wood for cooking and heating in the Zones of Influence, and that their cash income with which to pay for alternative sources of energy is limited, makes the scale of the impact large. Replacement of lost sources would make the mitigation extent large.

Frequency	Limited	The loss of wood and access to remaining wooded areas will begin with construction and will continue for approximately 20 years. However if properly mitigated the frequency of the impact will be reduced until the replacement sources are established (new trees; small quantities of coal; and solar panels).
Likelihood	Likely	The establishment of the infrastructure will definitely occur if the proposed Project goes ahead. The scale of wood clearing is relatively small and the number of local homesteads makes mitigation of this impact relatively manageable.
Magnitude		
Positive Impact		
Significant Rating After Mitigation		
Positive Impact		

10.1.5 Community Health and Safety

Reduced Community Health and Safety Resulting from Project Activities, Air, Water, Noise and Traffic Impacts as well as the Presence of Outsider Contract Workers

Description of the Baseline Environment

The Study Area is currently a quiet and tranquil rural setting in which people engage in small-scale subsistence agriculture and livestock farming. Cash incomes in the area are limited but people reported that their subsistence activities significantly contribute to their livelihoods, relieving some of the pressures to engage extensively in a cash economy.

The social survey made a limited enquiry into chronic health concerns for adults and children. The results did not reveal any widespread public health concerns or environmentally-related diseases. While the area is not completely remote it is protected to some degree for the spread of communicable health risks by the limited migration of people into and out of the Study Area.

Health services to the Study Area are poor. A mobile clinic is supposed to visit monthly but this has been increasingly erratic. People have to travel to Driefontein for basic primary health care and further afield for more complicated medical treatment.

Air and water quality in the Study Area is within accepted World Health Organisation standards with little pollution as a result of low levels of industrialisation or mechanised agriculture. Potable water is sourced from springs, rivers and streams in the area and the Groundwater Impact Assessment associated with the ESIA for the Kusipongo Resource Expansion Project identified generally good quality of drinking water.

There is limited traffic moving through the Study Area and there is only one main road along which this traffic can travel. The often poor quality of this road and fencing off of farms from the main road reduces the potential for traffic accidents with local pedestrians. In addition, the majority of children of

school-going age (over 90%) spend term-time away from home at the nearby Ezakheni Combined Boarding School.

Many residents reported choosing to live in the area for its peacefulness as well as their sense of community. Of the surveyed respondents, 45% have lived in the Study Area for over 15 years (prior to the establishment of the CPA farms). Of the surveyed respondents, 75% are landowners as part of the CPAs. People's attachment to the Area is, amongst other things, related to this sense of place and ownership of land and contributes to their emotional well-being.

Local residents acknowledged some incidents of family violence but emphasised that this was minimal. Levels of social conflict in the Study Area are also reportedly low and people's quality of life, in relation to their sense of place and belonging, is reportedly good.

Proposed Project Activities

During construction there will be a marked increase in traffic in the Study Area as large vehicles transport equipment and machinery for establishing the mine. The current route is planned to use the main road that runs from the site towards Driefontein. Construction Vehicles will also use the smaller roads running between homesteads in Zone 1 of Influence.

Traffic and construction activities, as well as 24hr operation phase activities will increase levels of noise in the area, particularly noticeable at night. Mining activities, including the stockpiling of coal and conveyor transport will contribute to increased air pollutants. There will also be regular traffic to and from Adit A and B during operations and for maintenance along the conveyor. This will add to dust creation and risks of road, pedestrian and horse accidents.

During construction a number of contractors from outside of the Study Area (250 skilled and semi-skilled employees) will be resident locally (although generally in the contractors' camp, separate from local residents). The influx of single men with access to cash often has spinoff effects on local communities including increased sex-work; increased risks of communicable diseases; increased incidents of teenage pregnancies; increased conflicts within families. These risks are particularly high in environments where levels of employment and income are low, as is the case in the Study Area.

Blasting during construction and to some degree during operations will create health and safety risks for local residents.

Sensitive Receptors

The sensitivity of the receptors (local residents) to proposed Project activities and related impacts on health and safety are assessed by considering a number of different baseline characteristics expressed directly by social survey

respondents or judged in context of the baseline environment. Therefore, local residents are expected to be highly sensitive receptors to the changes and activities mentioned above and their associated health and safety impacts. These include increased traffic accident risks; reduced quality of water and air as well as higher levels of noise and increased risks of social conflict and risk-taking behaviour.

A number of survey respondents highlighted fears of blasting and even though these currently take place several kilometres from the Zones of Influence they were perceived as a significant risk to adults and children. The development of sinkholes resulting from underground activities was also described as a health risk. Sinkholes are seen as a danger to children and animals.

In contrast to the high sensitivity, the limited number of jobs created by the proposed Project will help to contain the health risks associated with communicable diseases. A total of 450 construction contractors will be employed, approximately 200 from the surrounding area and 250 from outside of the area. No jobs will be created during operations and therefore the influx of job-seekers and employed migrants is expected to be limited.

Where health impacts are experienced these will be exacerbated because of poor provision of services to the Area and the potential for a drop in people's overall sense of well-being is possible.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this impact is assessed to be a **'Moderate Negative Impact'** pre-mitigation (*Table 10.22*).

Table 10.22 Rating of Impacts Related to Reduced Community Health and Safety Resulting from Project Activities, Air, Water, Noise and Traffic Impacts as well as the Presence of Outsider Contract Workers (Pre-Mitigation)

Type of Impact		
Direct, Induced, Cumulative Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact will be experienced in the Study Area and particularly for residents in Zone 1 of Influence.
Duration	Medium to long-term	The impact will begin with construction activities and will extend into the life of the mine. Impacts on water quality that affect people's health could be experienced beyond the life of the mine.
Scale	Residents in the Zones of Influence and broader Study Area	Homesteads near to infrastructure or along transport routes will be primarily at risk, while residents of the broader Study Area will experience the changes to the nature of the environment and with that may experience potential impacts on their health and sense of well-being.

Frequency	Periodic	The impact will be experienced during specific times of high activity during construction and then at times when water, air and noise pollution are particularly high. A decrease in water quality may become a more permanent impact with its concomitant health effects. As residents become used to the changed sense of place the emotional effect on their well-being may be less prevalent.
Likelihood	Possible	The presence of the proposed Project will definitely trigger some of the impact causes mentioned above. Other causes, like traffic accidents or increased conflict are less likely to occur.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
People's sensitivity to anticipated changes, in context of their current levels of health and well-being, is expected to be high. In addition, the absence of health services increases levels of vulnerability.		
Significant Rating Before Mitigation		
Moderate Negative Impact		

Mitigation/Management Measures

Little can be done to mitigate this impact on people's health and safety based on the direct relationship to proposed Project activities. However, the following mitigation measures will be used to reduce the significance of the impact:

- Environmental mitigation measures highlighted in the Air Quality, Surface and Groundwater and Noise specialist studies will be implemented to limit the proposed Project's impact on air, water and noise at source.

- Strict traffic controls will be implemented prior to and during the construction and operational phases of the proposed Project. Including:

    - Training of all drivers (contractor and Project employed);
    - The introduction of traffic signs to the Study Area, in consultation with local government;
    - Enforcement of speed limits for all vehicles (45km/h);
    - Monitoring and maintenance of road degradation resulting from proposed Project use.

- An education programme will be run, in partnership with the District department of transport sensitising Study Area residents and local school children to traffic hazards.

- Education and awareness programmes will also be run in partnership with the District health services to raise awareness of health risks related to the proposed Project including the transmission of HIV/AIDS. These programmes will be implemented in local schools, communities and amongst employees.

- Kangra Coal will attempt to partner with the local health department to support monthly mobile health visits to the Study Area, including the involvement of a social worker tasked with identifying negative changes to local levels of emotional health and well-being. This service will be integrated into activities highlighted as mitigation measures for resettlement management and monitoring.

- Contract workers will be inducted to the Project through a programme that includes sensitivity to the local social environment. Health risks will also be highlighted in a standard Health and Safety programme that includes a focus on HIV / Aids.

- The contractors' camp will be equipped with recreational and entertainment facilities. Further, the camp will be closed to outsider visitors and hawking will be discouraged from the fence-line. Free condoms will be made available at the camp and Kangra Coal will have free confidential HIV testing and counselling for its employees.

- An emergency preparedness plan will be developed by Kangra Coal and will be communicated to local residents with regular safety drills undertaken to ensure that people know what to do in the event of an accident.

Residual Impact (Post-mitigation)

The mitigation measures above if fully implemented will reduce the magnitude of the impact to small and the sensitivity of some of the local residents to medium thereby reducing the significance of the impact to a **'Minor Negative Impact'** (*Table 10.23*).

Table 10.23 Rating of Residual Impacts Related to Reduced Community Health and Safety Resulting from Project Activities, Air, Water, Noise and Traffic Impacts as well as the Presence of Outsider Contract Workers (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact will be experienced in the Study Area and particularly for residents in Zone 1 of Influence.
Duration	Medium to long-term	The impact will begin with construction activities and will extend into the life of the mine. Impacts on water quality that affect people's health could be experienced beyond the life of the mine.
Scale	Residents in Zone 1 of Influence and broader Study Area	Homesteads near to infrastructure or along transport routes will be primarily at risk, while residents of the broader Study Area will experience the changes to the nature of the environment and with that may experience potential impacts on their health and sense of well-being.

Frequency	Periodic	The impact will be experienced during specific times of high activity during construction and then at times when water, air and noise pollution are particularly high. A decrease in water quality may become a more permanent impact with its concomitant health effects. As residents become used to the changed sense of place the emotional effect on their well-being may be less prevalent.
Likelihood	Possible	The presence of the proposed Project will definitely trigger some of the impact causes mentioned above. Other causes, like traffic accidents or increased conflict are less likely to occur.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium Magnitude		
People's sensitivity to environmental changes to water and air quality will remain unchanged. However, with time some of the changes to the natural environment and ambient noise levels will become less noticeable and thus people's sensitivity to the changes will reduce. With the implementation of education programmes around traffic and communicable disease risks local residents and contract workers should be less vulnerable that they would be prior to construction.		
Significant Rating After Mitigation		
Minor Negative Impact		

10.1.6 Social Infrastructure and Governance

Increased Pressure on Driefontein Infrastructure and Service Delivery Resulting from an Influx of Job-Seekers to the Study Area and Possible Increased Incidents of Crime

Description of the Baseline Environment

Driefontein is a relatively small settlement of about 15 000 to 16 000 inhabitants. It includes old and new residential areas comprising formal and informal housing structures. Older structures are more traditional homesteads with some small subsistence agriculture fields, whilst new RDP houses and other brick and cement buildings have been built in the new area. The new area is also laid out in a more formal grid-like arrangement that enables easier construction of infrastructure and provision of municipal services.

There are a number of schools in the area (primary and high) and two primary health care facilities, but no fulltime doctors. Most of the roads are unpaved. There is access to electricity across many of the houses.

Levels of unemployment are high and tax contributions to the local municipality are low.

Proposed Project Activities

If the proposed Project moves into the construction phase there is likely to be some anticipation of employment opportunities from outside of the area (different districts or provinces). Such expectations in the context of a country with high unemployment (over 25%) are likely to trigger in-migration to the Project Area. However, as emphasised above, the proposed Kusipongo

Resource Expansion Project is not an entirely new project but rather an extension of existing operations in the area and, besides creating 450 jobs for the 18 to 24 months of construction (200 of which will be filled by local residents), no new jobs will be created during operations. However, people will still have expectations of job opportunities and may be induced to settle in Driefontein to access these perceived opportunities.

The temporary construction camp will house approximately 250 people but will be located on Kangra Coal's land, some 8.5km from the beginning of Driefontein settlements. The camp will be closed and will provide for most of the daily needs of resident contractors. However contractors are likely to spend some of their free time in Driefontein, as it is the nearest large settlement. This will place some additional pressure on local infrastructure and resources (mainly recreational). The potential for increased petty crime related to the presence of salaried individuals, could require additional policing to that which is currently available.

Sensitive Receptors

Municipal infrastructure and service provision in Driefontein are already limited. If migrants were to enter the area they would most probably settle in Driefontein out of necessity - it is relatively near the proposed Project, and other land in the Study Area is privately and communally owned, making access to settle difficult. Even a moderate influx of migrants seeking employment on the proposed Project would exacerbate pressure on existing Driefontein service delivery and infrastructure.

Any increase in crime (thefts, muggings, increased prostitution and related family conflicts, and violent crimes) would place existing limited policing resources under pressure to respond.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this impact is assessed to be a **'Moderate Negative Impact'** pre-mitigation (*Table 10.24*).

Table 10.24 Rating of Impacts Related to Increased Pressure on Driefontein Infrastructure and Service Delivery Resulting from an Influx of Job-Seekers to the Study Area and Possible Increased Incidents of Crime (Pre-Mitigation)

Type of Impact		
Induced Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	An influx of employment-seekers would likely be experienced in Driefontein as it is the closest large settlement in the area and farms in the Study Area are either privately or communally owned so not accessible to in-migration. Increased incidents of crime are likely to be focused around Driefontein.

Duration	Short-term	The impact of in-migration is anticipated to occur prior to construction and possibly again prior to operations. However, the absence of actual job opportunities, in conjunction with limited alternative opportunities in Driefontein, would probably result in people leaving the area again in the short-term. Impacts related to the presence of contract workers could occur during for the 18-24 month duration of this phase.
Scale	Difficult to estimate but anticipated to be moderate	The fact that the proposed Project will not create significant employment opportunities is likely to limit employment related in-migration.
Frequency	Intermittent	In-migration would probably be experienced at specific moments in the proposed Project cycle – pre-construction and pre-operations. And events of crime would also be intermittent focused mainly around the construction phase.
Likelihood	Possible	The extent of in-migration and its related pressure on infrastructure and service delivery in Driefontein would depend on the circulation of information about the proposed Project and the level of expectation created around employment opportunities.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Municipal service delivery and infrastructure in Driefontein is already limited and in the absence of significant income with which to upgrade these services, the in-migration of a moderate number of job-seekers would place significant pressure on the local municipality. Additionally, the limited policing resources locally available would be sensitive to any increased levels of crime.		
Significant Rating Before Mitigation		
Moderate Negative Impact		

Mitigation/Management Measures

In a country with high levels of unemployment information about potentially large developments spreads easily and people are willing to uproot themselves in search of possible employment. The following mitigation measures will be used to reduce the significance of the impact:

- A coherent and rigorous communication plan will be developed and widely disseminated to ensure that a clear message about the realistic limits to job opportunities from the proposed Project. The plan will include the use of different appropriate media including local newspapers and local radio stations.

- Local communities and Kangra Coal employees will be informed regularly about upcoming Project decisions and activities. This will contain levels of expectations, particularly regarding job opportunities. It is anticipated that this will reduce the scale of in-migration.

- A small office will be set up within the Study Area to deal with Project-related enquiries from local residents.

- A central Project office will be set up in Piet Retief which will provide information about job opportunities and will handle all job applications besides those submitted by residents in the Study Area (including Driefontein). The office will disseminate regular Project information. Situating the office away from the Study Area is intended to draw job-seekers to a central point and discourage temporary settlement in Driefontein.

Mitigating Project-induced increase in crime and its concomitant pressure on policing resources is difficult. Therefore Kangra Coal will establish communication channels with the local police and community police forums and explore ways in which to support local policing if there is increased pressure on the limited resources as a result of the Project.

Residual Impact (Post-mitigation)

The mitigation measures above should reduce the magnitude of the impact of in-migration to Driefontein and its associated pressure on infrastructure and service delivery to negligible reducing the significance of the impact to a '**Minor Negative Impact"** (*Table 10.25*).

Table 10.25 Rating of Residual Impacts Related to Increased Pressure on Driefontein Infrastructure and Service Delivery Resulting from an Influx of Job-Seekers to the Study Area and Possible Increased Incidents of Crime (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	An influx of employment-seekers would likely be experienced in Driefontein as it is the closest large settlement in the area and farms in the Study Area are either privately or communally owned so not accessible to in-migration.
Duration	Short-term	The impact is anticipated to occur just prior to construction and possibly again prior to operations. However, the absence of actual job opportunities, in conjunction with limited alternative opportunities in Driefontein, would probably result in people leaving the area again in the short-term.
Scale	Difficult to estimate but anticipated to be minor	The fact that the proposed Project will not create significant employment opportunities is likely to limit employment related in-migration. If mitigation measures around communication and information dissemination are successfully implemented the number of job seekers should be further reduced.
Frequency	Intermittent	In-migration would probably be experienced at specific moments in the proposed Project cycle – pre-construction and pre-operations
Likelihood	Possible	The extent of in-migration and its related pressure on infrastructure and service delivery in Driefontein would depend on the circulation of information about the proposed Project and the level of expectation created around employment opportunities.
Magnitude		
Negligible Magnitude		
Significant Rating After Mitigation		
Minor Negative Impact		

10.1.7 Legacy

The Poor Relationship between Kangra Coal and Local Communities, in Conjunction with Perceived Unfulfilled Promises by the Company, will undermine Levels of Trust and Chances of a Social Licence to Operate from Affected Communities and Stakeholders

Description of the Baseline Environment

Kangra Coal has been extracting coal from the Savmore Colliery and operating the current washing plant neighbouring the Driefontein community since the late 1990s. The operations include underground and open pit mining methods.

In carrying out its operations the company has had impacts on the physical and social environments in which it works. It has also resettled a small number of homesteads within its own properties and has made compensation agreements with affected parties. The company has also contracted third parties to undertake numerous construction activities, including replacement housing and the provision of other two-roomed housing in some homesteads

on the neighbouring farms. The strategy and approach to supplying these houses is unclear and residents in the Study Area were also unable to provide clarity on this issue.

A total of 745 people are currently employed in Kangra Coal's operations. It is unknown how many employees are from the local communities and how many are from other areas. The required skills levels for these positions are also not available.

There has been no on-going communication with affected communities and no formal grievance mechanism is in place. A Community Liaison Officer (CLO) has recently been employed but prior to this there was no dedicated community liaison position in current operations.

Kangra has already drawn up and submitted its Social and Labour Plan (SLP) for the proposed Project, which was received by the Department of Mineral Resources in July 2012. Amongst other items the SLP outlines spending on:

- Literacy training for employees;
- Learnerships and bursaries for employees for training at the Coal Colliery Training Centre in Witbank and at engineering departments at various universities;
- Capacity development programmes in the neighbouring community (focused on maths and science in local schools); and
- Small medium enterprise training and mentorship for local communities.

The SLP also identifies approximately 30 homesteads that it says would need to resettle and further states that it has identified the resettlement sites.

Past and Current Kangra Coal Activities

The proposed Project wishes to develop an underground mining operation and associated infrastructure affecting the farms of Donkerhoek, Twyfelhoek, Kransbank, and Kangra Coal's own farms Rooikop and Nooitgezien. To do this it will require permission from the private and communal landowners as well as negotiated agreements to resettle approximately 42 homesteads that would otherwise be directly impacted by its activities.

Stakeholder meetings in Driefontein highlighted high levels of anger and frustration from local residents towards the company. A number of people expressed resistance to the proposed Project citing on previous unmet expectations and unfulfilled commitments as the cause. Sentiments were similar within the Study Area and particularly the Zones of Influence. The following actions by Kangra Coal were raised as factors contributing to people's mistrust of the company and resistance to its presence on their land:

- Poor resettlement practices where compensation had not been fully implemented and where homesteads felt worse-off than before;

- Poor oversight of sub-contractors. People highlighted examples of local employment and infrastructure development promises made by third-party contractors to gain access to the Study Area that had not been fulfilled. People also emphasised that Kangra Coal should not evade its ultimate accountability for this by claiming a lack of responsibility for the contractors and their quality of work;

- A top-down and non-participatory approach to activities in the Study Area, including *ad hoc* building of houses for some homesteads and not for others without providing clear motivation for its approach;

- Impacts on water availability in areas where mining is already taking place. These impacts have raised fears amongst Zone of Influence residents about long-term impacts on their water quality and supply once the company closes operations in the area and communities are left to deal with the on-going impacts;

- A lack of visible benefits, including local development and employment, from over a decade's Kangra mining activities in the Study Area and more broadly; and

- Sinkholes and road degradation resulting from company activities that have not been rehabilitated.

At present, 77.7% of social survey respondents felt that there had been no community benefits from current Kangra Coal operations. 53% of respondents felt that they had been negatively affected by Kangra Coal's operations and only 4.4% felt they had been positively affected. Anticipating potential benefits of the proposed Project, 56.7% of respondents anticipated "no benefits" to be forthcoming based on experiences of the past.

Sensitive Receptors

The proposed Kusipongo Resource Expansion Project is the sensitive receptor of this impact. It is already clear that there is resistance to the presence of the proposed Project by many local residents (as well as other stakeholders). Withholding of access to their land could increase the vulnerability of the proposed Project as it can only access and transport the mineral resources via surface areas outside of its control.

It is possible, based on mining legislation, that permission to go ahead with the proposed Project could be given even in the face of community mistrust and resistance. Furthermore, the fact that government paid for the CPA farms may give them power to enforce acceptance of the proposed Project on CPA land. However, a heavy-handed approach is likely to leave the Project increasingly vulnerable to resistance from local residents and would almost

certainly wipe out the company's chances of achieving a social license to operate.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this is assessed as a **'Major Negative Impact'** pre-mitigation (*Table 10.26*).

Table 10.26 Rating of Impacts Related to the Poor Relationship between Kangra Coal and Local Communities, in Conjunction with Perceived Unfulfilled Promised by the Company will undermine Levels of Trust and Chances of a Social Licence to Operate from Affected Communities and Stakeholders (Pre-Mitigation)

Type of Impact		
Cumulative Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact of community mistrust and anger towards Kangra Coal would affect the proposed Project.
Duration	Medium to Long-term	Resistance has already been triggered and could continue through construction and operations.
Scale	The proposed Project	Levels of resistance based on previous legacy issues impact on the proposed Project as a whole – particularly in its social license to operate.
Frequency	Periodic	Resistance is likely to be expressed at moments in the Project development process rather than continuously. However, the intensity and duration of these moments are likely to vary.
Likelihood	Likely	Many residents in the Study Area, Zones of Influence and broader Stakeholder groups have already clearly expressed their resistance to the proposed Project based on Kangra Cola's legacy in the area.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
Among the basic requirements for the Kusipongo Resource Expansion Project to go ahead is permission from landowners to access their land. High levels of residents' resistance to the company threaten the granting of that permission.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- A comprehensive communication and engagement approach will be developed and implemented immediately to engage with affected communities and landowners. This will include residents on privately owned land (Donkerhoek, Rooikop and Nooitgezien). The approach will be facilitated through appropriately trained communications and

community practitioners and will focus on establishing open lines of communication that can initiate relationships of trust between parties.

- From the above interactions, a list of immediate remedial actions will be drawn up and a timeframe established for implementation. Kangra Coal will address issues on the list and report back to communities on completion of each item.

- Negotiations for access to privately and communally owned land will be initiated in an open and transparent manner. These interactions will be undertaken as per the mitigation recommendations for Resettlement and Compensation processes as is described above.

- A Community Benefit Agreement will be drawn up between Kangra Coal and each affected community as described above.

- The CLO will establish on-going and regular interaction between the company, residents of the Study Area and particularly Zone 1 of Influence.

- A grievance mechanism will be drawn up through which local residents can log their grievances. A formal procedure of receiving, evaluating, addressing and finalising these grievances will be communicated to local residents.

- Kangra Coal will re-evaluate its control of third-party contractors and will take direct responsibility for promises made and work undertaken on its behalf.

- All community related development planning will be undertaken with participation of affected communities. The plans will be formally documented with objectives, required actions, performance indicators and monitoring and reporting requirements. These will be made accessible in appropriate languages and formats to affected communities.

- All Kangra Coal activities related to social development or social investment projects will be fully documented and communicated so that residents of the Study Area and surrounding communities can see community benefits from the presence of the company in their area.

- Kangra Coal will develop a company-wide communication strategy for all its operations in and around the Study Area. This will focus on clear and consistent messages and regular interactions between the company and local communities. A key component of this strategy will be the two-way nature of communication where communities are provided with relevant and accessible information and where their concerns and suggestions are heard, documented and responded to. This will be an important step in establishing relationships of trust between the company and its hosts and neighbours.

Kangra Coal recognises that a concerted effort needs to be made to remedy its poor image in the community and to establish constructive relationships that will facilitate its social license to operate going forward.

Residual Impact (Post-mitigation)

The mitigation measures above are extensive and require significant commitment from the company. However, failure to address the current situation will leave the proposed Project vulnerable to local resistance. If fully implemented the mitigation measures should reduce the magnitude of the impact to small reducing the significance of the impact to a '**Moderate Negative Impact'** in the short term. Ideally, through on-going interactions and the establishment of trust between parties the significance of the impact can be further reduced to **'Minor Negative'** in the medium term *(Table 10.27*).

Table 10.27 Rating of Residual Impacts Related to the Poor Relationship between Kangra Coal and Local Communities, in Conjunction with Perceived Unfulfilled Promised by the Company will undermine Levels of Trust and Chances of a Social Licence to Operate from Affected Communities and Stakeholder (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact of community mistrust and anger towards Kangra Coal would affect the proposed Project.
Duration	Medium to Long-term	Resistance has already been triggered and could continue through construction and operations. Successful mitigation measures implemented immediately could reduce the duration of the impact too short to medium term
Scale	The proposed Project	Levels of resistance based on previous legacy issues impact on the proposed Project as a whole – particularly in its social license to operate.
Frequency	Sporadic	Resistance is likely to be expressed at moments in the Project development process rather than continuously. However, the intensity and duration of these moments are likely to vary. Successful mitigation could decrease the frequency with which this resistance is experienced and expressed.
Likelihood	Possible	Many residents in the Study Area, Zones of Influence and broader Stakeholder groups have already clearly expressed their resistance to the proposed Project based on Kangra Cola's legacy in the area. Successful implementation of mitigation measures would reduce the likelihood of local residents and other stakeholders resisting the proposed Project.
Magnitude		
Small Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The Company's sensitivity remains high. However, improved relations with communities in the Study Area that would result from successful mitigation would reduce the vulnerability of the proposed Project to resistance from landowners and residents.		
Significant Rating After Mitigation		
Minor to Moderate Negative Impact		

10.2 LANDSCAPE AND VISUAL ENVIRONMENT

10.2.1 Visual Intrusion

Due to the moderate to high scenic quality of the Study Area (refer to *Chapter 8*), the visual intrusion of the proposed Project will be high. Although there are existing mining activities within the Study Area, the proposed infrastructure will be located within visual sensitive areas / high scenic quality areas and will therefore be intrusive to the area as a whole.

The proposed site for the Main Mine Adit (Adit A) and the overland conveyor system will be located in close proximity to the Kransbank Private Reserve and will be in contrast to the existing land use. Adit B is located within an area characterised as rural and will contrast highly with the existing land-use activities. The Adits will not only be in contrast with the landscape character of the Study Area but will also be in contrast to the sense of place of the Study Area and will therefore contribute to a **high visual intrusiveness**.

The visual intrusion of the proposed Adit A after sunset will be high, as the site is proposed in an area that is not exposed to a lot of light and the lights associated with mining activities will brighten the area. Adit B and the conveyor belt will also have a high visual intrusion after sunset.

10.2.2 Visibility and Visual Exposure

Visual exposure of the proposed Project is determined by the proximity of the viewer to the Project Site. The visibility and visual exposure for viewers is as follows:

- **High** – within 0.8km of the proposed Project Site;
- **Moderate** – within 0.8km and 3km of the proposed Project Site; and
- **Low** – with distances greater than 3km.

The proposed Project will be visible from approximately 25% of the 'zone of potential influence'. It is clear from the viewshed analysis (*Figure 10.3* to *Figure 10.5*) that the rolling topography of the proposed Study Area is screening the view from areas within the 'zone of potential influence'.

- **Main Mine Adit (Adit A)** – will be ***highly visible*** for all views located within the immediate vicinity (0 to 0.8km) of the Project Site. Views from the west, south, east and the sections to the north will be screened as a result of the rolling topography of the Study Area. Although the proposed Adit A will not be visible from the Kransbank Private Reserve it will be visible from the roads leading to the Reserve. The proposed Adit A will be visible from the Twyfelhoek School and from residents staying within the area directly adjacent to the site proposed for Adit A. It should be noted that although Adit A is located between highly dense vegetated areas the structures are higher than the surrounding trees and is therefore visible

above the tree canopy height. The views are therefore partially obstructed but unfortunately still visible (refer to *Figure 10.3*).

- **Adit B** – will be ***highly visible*** for viewers located directly next to the ventilation shafts and within 0.8km from the site. Although Adit B is located on the plateau / edge of the mountains most of the views towards Adit B is screened or partially screened by the rolling topography. Adit B will be visible from the north and from sections towards the east and the west (refer to *Figure 10.4*).

- **Overland Conveyor System** – will have a ***low visibility*** and will mostly be seen by people travelling along the conveyor route or when the conveyor belt crosses roads.

Night Time

It is anticipated that the proposed Adit A will have an impact after sunset as it will light up the receiving area. It is not anticipated that there will be any impacts from Adit B as there will be no lighting.

Figure 10.3 Viewshed - Main Mine Adit (Adit A)

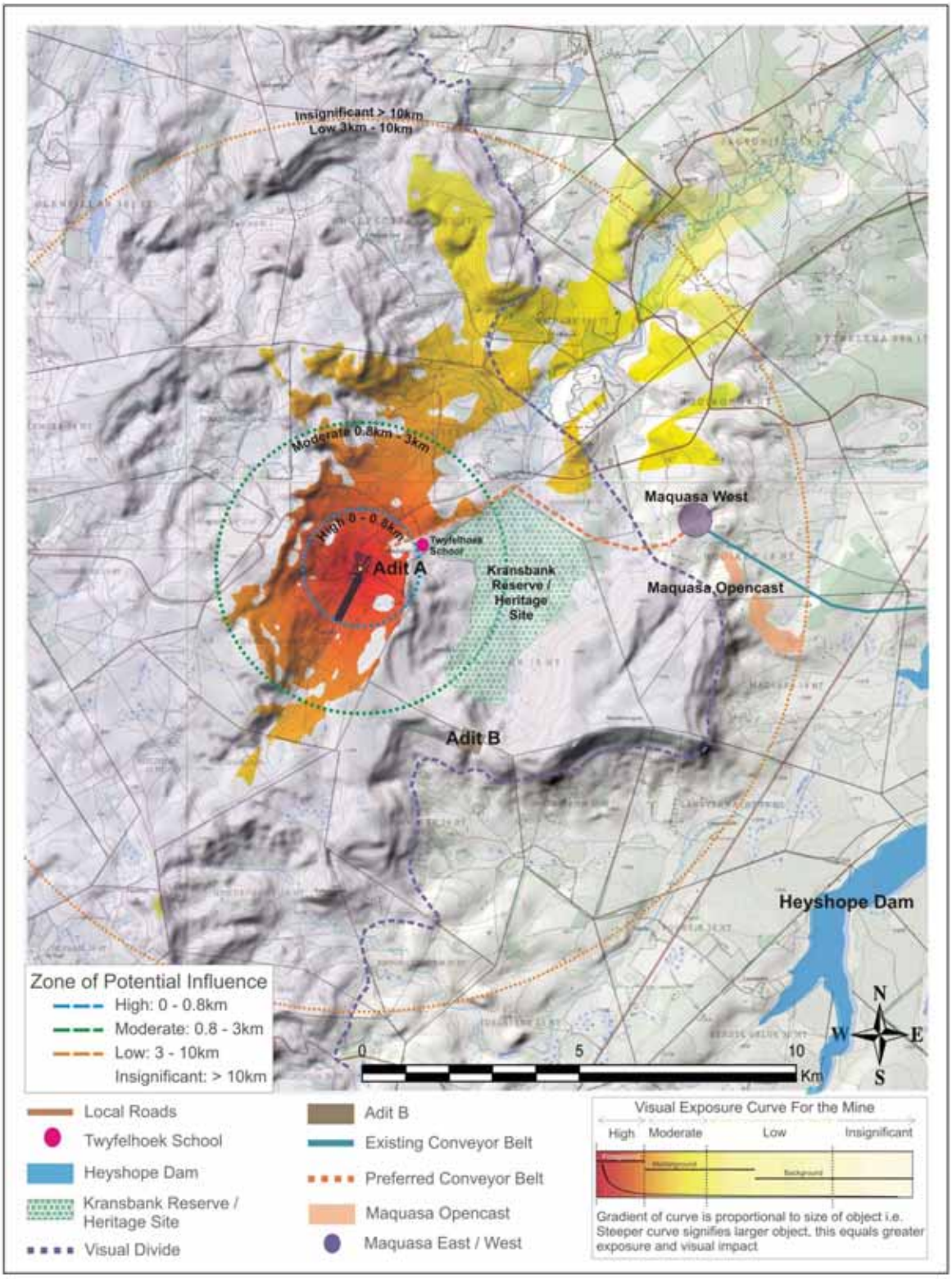


Figure 12: **VIEWSHED** - Kangra Coal Kusipongo Expansion Project: Adit A

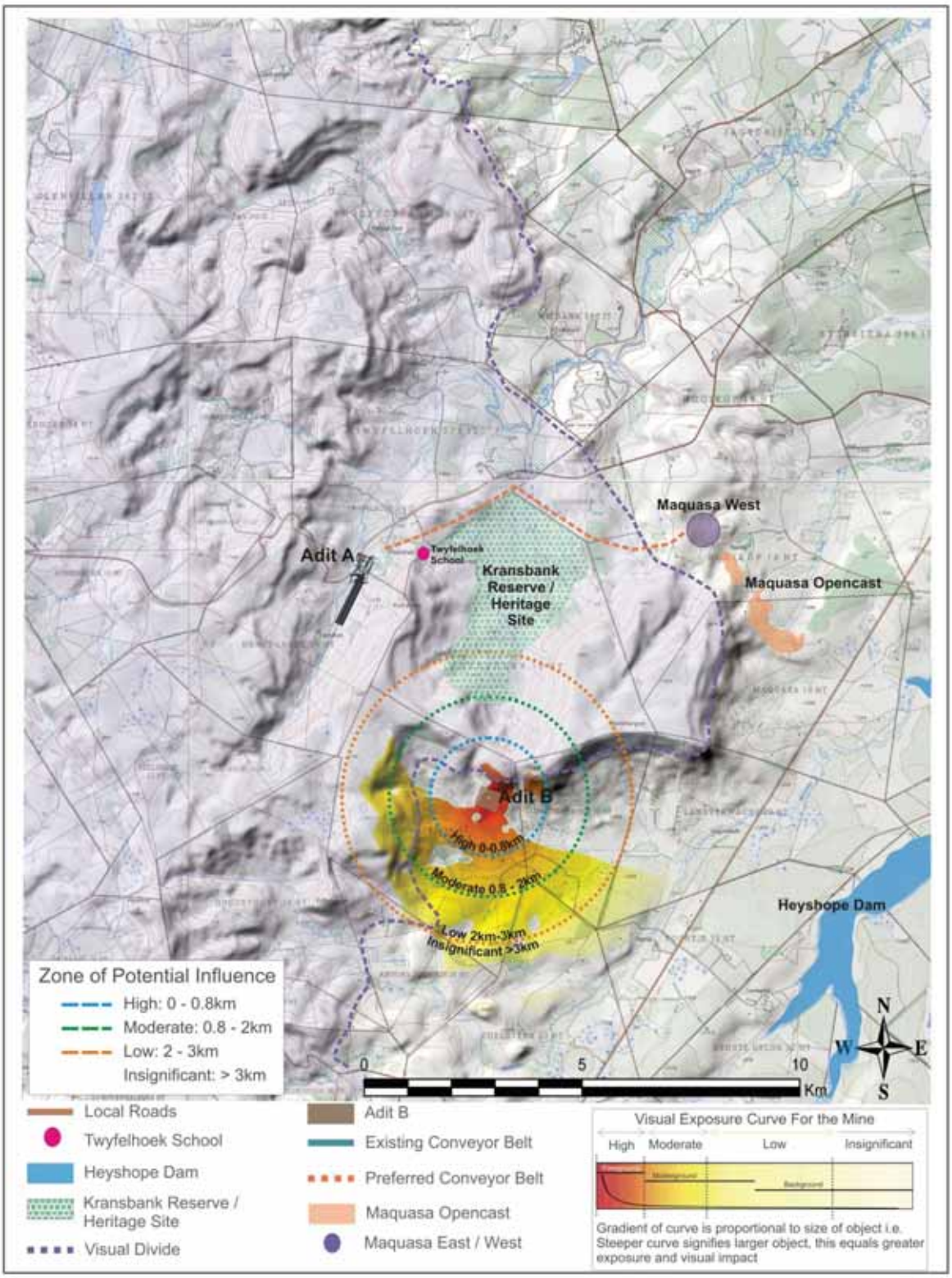


Figure 13: **VIEWSHED** - Kangra Coal Kusipongo Expansion Project: Adit B

Figure 10.5 Viewshed - Adit A and Adit B Combined

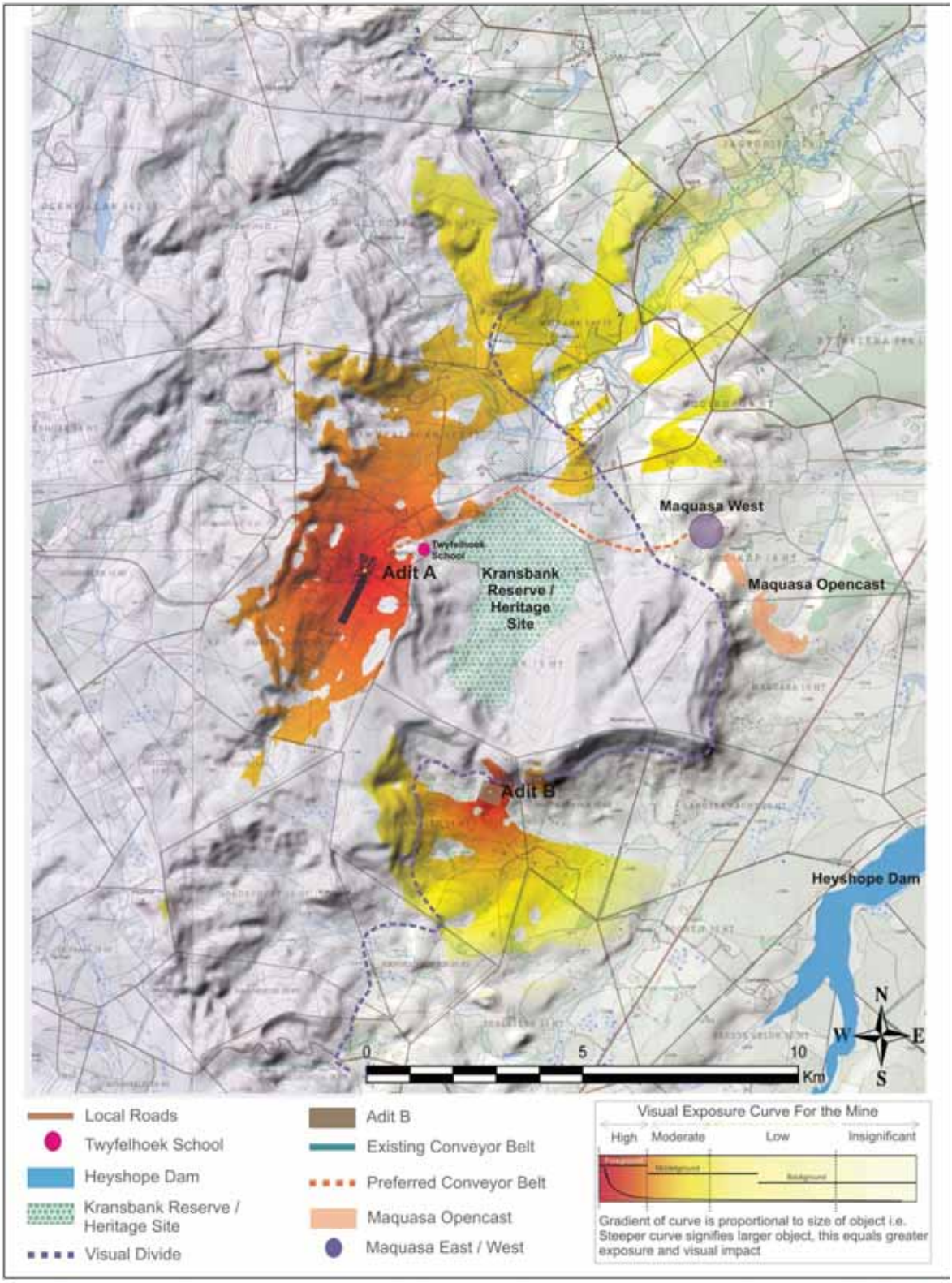


Figure 14: **VIEWSHED** - Kangra Coal Kusipongo Expansion Project: Combined

The **visual exposure** for the proposed Project will be as follow:

- **Proposed Mine Main Adit (Adit A)** – will result in a ***high*** visual exposure for people / pupils from the Twyfelhoek School, residents in the immediate vicinity as well as for motorists / pedestrians travelling along the local road (refer to *Table 10.28*).

- **Proposed Adit B** – will result in a ***low*** visual exposure for residents in the area, as the distance between the Adit and residents is approximately 9km (refer to *Table 10.29*).

- **Overland Conveyor System** – would result in a high visual exposure (refer to *Table 10.30*); however, although the conveyor borders some sensitive viewer locations (Twyfelhoek School and the Kransbank Private Reserve) it will not be fully visible due to the height of the belt, screening from vegetation and the topography of the Study Area. As such, the overland conveyor system will also result in a ***low*** visual exposure.

Table 10.28 Visual Exposure of the Proposed Main Mine Adit (Adit A)

	HIGH EXPOSURE (significant contribution to visual impact)	**MODERATE EXPOSURE** (moderate contribution to visual impact)	**LOW EXPOSURE** (minimal influence on visual impact)	**INSIGNIFICANT EXPOSURE** (negligible influence on visual impact)
Local roads	**0 – 0.8 km**	**0.8 – 3.0 km**	**3.0 – 10.0 km**	**Over 10.0 km**
Farmsteads	0 – 0.8 km	**0.8 – 3.0 km**	**3.0 – 10.0 km**	**Over 10.0 km**
Villages / residents	0 – 0.8 km	**0.8 – 3.0 km**	**3.0 – 10.0 km**	**Over 10.0 km**
Kransbank Private Reserve	0 – 0.8 km	**0.8 – 3.0 km**	**3.0 – 10.0 km**	**Over 10.0 km**
Twyfelhoek School	**0 – 0.8 km**	0.8 – 3.0 km	3.0 – 10.0 km	Over 10.0 km

Please Note – Sections that are **BOLD** are applicable to the proposed Kangra Kusipongo Resource Coal Mine Kusipongo Expansion Project.

Table 10.29 Visual Exposure of the Proposed Adit B

	HIGH EXPOSURE (significant contribution to visual impact)	MODERATE EXPOSURE (moderate contribution to visual impact)	LOW EXPOSURE (minimal influence on visual impact)	INSIGNIFICANT EXPOSURE (negligible influence on visual impact)
Local roads	0 – 0.8 km	0.8 – 3.0 km	**3.0 – 10.0 km**	Over 10.0 km
Farmsteads	0 – 0.8 km	0.8 – 3.0 km	**3.0 – 10.0 km**	Over 10.0 km

Please Note – Sections that are **BOLD** are applicable to the proposed Kangra Kusipongo Resource Coal Mine Kusipongo Expansion Project.

Table 10.30 Visual Exposure of the Proposed Overland Conveyor System

	HIGH EXPOSURE (significant contribution to visual impact)	MODERATE EXPOSURE (moderate contribution to visual impact)	LOW EXPOSURE (minimal influence on visual impact)	INSIGNIFICANT EXPOSURE (negligible influence on visual impact)
Local roads	0 – 0.8 km	**0.8 – 3.0 km**	**3.0 – 10.0 km**	**Over 10.0 km**
Farmsteads	0 – 0.8 km	0.8 – 3.0 km	**3.0 – 10.0 km**	**Over 10.0 km**
Kransbank Reserve / Heritage Site	**0 – 0.8 km**	**0.8 – 3.0 km**	**3.0 – 10.0 km**	**Over 10.0 km**
Twyfelhoek School	**0 – 0.8 km**	0.8 – 3.0 km	3.0 – 10.0 km	Over 10.0 km

Please Note – Sections that are **BOLD** are applicable to the proposed Kangra Kusipongo Resource Coal Mine Kusipongo Expansion Project.

10.2.3 Sensitivity of the Visual Receptors

The sensitivity of the visual receptors will be ***high*** for the proposed Kusipongo Resource Expansion Project, as the proposed Project will bring change to the landscape character and views from sensitive viewing areas.

10.2.4 Severity of Visual Impact

The *severity* of visual impact will be ***high*** as the proposed Project is situated in a natural environment. The visual intrusion will also be high as the proposed Project will be introduced into an area that has a high scenic quality.

Although the proposed Project will result in the loss or alteration of the baseline characteristics of the Study Area, it will be partially screened /

obstructed from sensitive viewers as a result of the receiving topography. The visibility of the proposed Project is rated as being moderate for most sensitive viewers, as it will fall within either the middle-ground or background view of the viewer.

10.2.5 Impacts to the Landscape and Visual Environment during the Construction Phase of the Proposed Project

Description of the Baseline Environment

The receiving environment is characterised by a rolling topography, which is created by the combination of mountains and rolling hills, small rivers, streams and wetlands. The Heyshope Dam is located to the east of the site. Man-made interventions include the farmsteads and rural residential dwellings with their related out buildings, structures and landforms directly related to the mining activities as well as infrastructure such as the Driefontein Road and other local roads (D1901 and D2548).

Proposed Project Activities

Landscape and visual changes resulting from the construction phase include:

- The removal of vegetation;
- The establishment of the site construction camp, including the material for construction;
- The construction and installation of the different mining elements, workshops, offices etc.;
- The movement of heavy and light construction vehicles;
- Dust created by construction activities and the movement of vehicles; and
- Lighting provided during the construction period, especially security lighting.

Sensitive Receptors

During the construction period construction activities will cause a major change in landscape characteristics over a localized area. The change will be from a natural environment to an area characterised by mining infrastructure, which results in a high change in the key views. This will have a high negative effect on the landscape character and the visual quality of the Study Area. Construction activities will also add to the cumulative negative effect the mining industry currently has on the visual quality of the landscape.

The main visual receptors will include the farmsteads and rural villages located close to the Project Site, Twyfelhoek School and local roads passing the site as well as potential visitors to the Kransbank Private Reserve.

Significance of Impact (Pre-mitigation)

This impact has been assessed as a '**Major Negative Impact**' prior to mitigation (refer to *Table 10.31*). The reason for this is due to the change the proposed Project will bring to the natural environment and the impact it will have on sensitive viewers located around the Project Site. The Project will be intrusive to the environment and will not just be visible to the communities staying in the area but will also change the sense of place of the area surrounding the Project Site.

This negative impact is likely to be experienced by the farmsteads and rural villages located within close proximity to the Project Site.

The visual impact of the proposed temporary construction camp (staff accommodation during construction) will be high as it will be located directly next to the local roads. Since the accommodation is only temporary the impact will be high for the construction period and will only be low if all structures are removed and the area is successfully rehabilitated.

Table 10.31 Rating of Impacts Related to Landscape and Visual Environment during Construction (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is likely to be experienced by farmsteads / villages located close to the proposed Project Site, especially the villages located around the proposed site for the Main Mine Adit (Adit A). Communities (Driefontein) located further away are unlikely to be significantly disturbed due to their distance from the proposed Project Site.
Duration	Temporary and Short Term	The construction period is only temporary (18 to 24 months in duration) and this includes the establishment of a temporary Construction Site Camp, which will be decommissioned at the end of the construction phase.
Scale	Limited to within the Study Area	The change in landscape will occur within the Study Area and will be limited to a 10km zone of potential influence for Adit A and a 3km zone of potential influence for Adit B.
Frequency	NA	For unplanned events only.
Likelihood	NA	For unplanned events only.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
High sensitivity of the receiving landscape and visual receptors due to the visual intrusion, change in the sense of place of the area and the visibility of the proposed Project.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Dust suppression techniques, as per the specifications of the Air Quality Impact Assessment in *Chapter 9*, will be in place at all times during the construction phase of the proposed Project. This is specific to areas where vegetation has been removed, soil stockpiles, on temporary / permanent unpaved road and any other areas where soil will be exposed.

- As much vegetation as possible will be kept during site clearance. The trees that are currently located around the Main Mine Adit (Adit A) site form a vegetation screen that could partially screen views towards the mine infrastructure and even the temporary construction camp. These trees will be kept in order to minimise the visual impact of the Main Mine Adit (Adit A).

- Buildings and structures constructed during the construction phase will (as far as possible) be painted with colours that reflect and complement the natural browns and greens of the surrounding landscape. Pure light colours and pure blacks will be avoided as much as possible.

- To reduce the potential of glare, external surfaces of buildings and structures will (as far as possible) be articulated or textured to create interplay of light and shade.

- High pole top security lighting along the periphery of the Main Mine Adit and will, as far as possible, be avoided.

- Worker/security movement areas (pathways and roads) will be lit with low level 'bollard' type lighting and post top lighting will be avoided.

- The temporary contractors camp and construction sites will be kept neat / tidy at all times.

- Exposed areas will be restored / rehabilitated as soon as possible after decommissioning of the Temporary Construction Camp site.

- Fires will not be permitted so as to avoid veld fires.

- Construction material will be stored neatly in a designated area.

- Construction vehicles will keep to speed limits (45km/h is recommended in the air quality impact assessment) so to avoid excessive dust generation.

- *Ad hoc* monitoring will be implemented so as to ensure that visual screening and dust control measures during the construction phase of the proposed Project are implemented effectively.

- Progressive rehabilitation measures will be implemented during the early stages of the proposed Project, beginning during the construction phase if possible.

Residual Impact (Post-mitigation)

Should the above mitigation / management measures be implemented successfully the significance of the impact could be reduced to '**Moderate Negative Impact**' (*Table 10.32*). The main reason for this is the visibility of the proposed Project will be reduced, which could result in a reduction in the magnitude of the impact, as less sensitive viewers will be able to see the Project.

Table 10.32 Rating of Residual Impacts Related to Landscape and Visual Environment during Construction Post-Mitigation

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is likely to be experienced by homesteads located close to the proposed Project Site, especially the homesteads located around the proposed site for the Main Mine Adit (Adit A). Communities (Driefontein) located further away are unlikely to be significantly disturbed due to their distance from the proposed Project Site.
Duration	Temporary and Short Term	The construction period is only temporary (18 to 24 months in duration) and this includes the establishment of a temporary Construction Site Camp, which will be decommissioned at the end of the construction phase.
Scale	Limited within the Project Site	The change in landscape will occur within the study area but will be limited to the Project Site and directly surrounding areas, should mitigation measures be implemented.
Frequency	NA	For unplanned events only.
Likelihood	NA	For unplanned events only.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

10.2.6 Impact to the Landscape and Visual Environment during the Operational Phase of the Proposed Project

Description of the Baseline Environment

Please refer to the description of the baseline environment as is described in *Section 10.2.5*.

Proposed Project Activities

Landscape and visual changes resulting from operational phase activities include:

- The Main Mine Adit (Adit A) and Ventilation Adit (Adit B) and associated infrastructure;
- Overland conveyor system;
- Rock Dump in the footprint of Adit A;
- The movement of heavy and light vehicles;
- Dust created by the movement of vehicles; and
- Lighting of operational workings at the Main Mine Adit during the night time.

Sensitive Receptors

The main visual receptors which will be impacted upon during the operational phase of the proposed Project will include farmsteads and rural villages located close to the Project Site, Twyfelhoek School and local roads passing the site and visitors to the Kransbank Private Reserve. Communities such as Driefontein, which are located further away from the Project Site, are unlikely to be significantly disturbed due to their distance from the proposed Project Site.

During the operational period the structures and infrastructure associated with Adit A, B and the overland conveyor system will be more prominent than during the construction phase, and will result in a major change in landscape characteristics over a localized area resulting in a high change in key views. Adit A will be visible for residents directly surrounding the proposed Project Site, as well as residents located to the north and the north-east of the Project Site. Visitors to the Kransbank Private Reserve might not have a clear view of the proposed Project, but will have a view of the Project when travelling to the Project Site. Viewers from Twyfelhoek School will have an obstructed view towards the Project Site due to the rolling topography and vegetation that screens the view. Adit B will be mainly visible from farmsteads located within a 3km zone of potential influence surrounding the Project Site.

The operational phase will add to the cumulative effect that existing mining activities have on the visual quality of the landscape. In addition day-time impacts, the proposed Project will have a visual impact at night, as lighting will affect the residents staying in the Study area. This impact will however be limited to viewers surrounding Adit A since there will be no lighting at Adit B.

Significance of Impact (Pre-mitigation)

This impact has been assessed as a '**Major Negative Impact'** prior to mitigation (refer to *Table 10.33*). The reason for this is due to the change that the proposed Project will bring a change to the natural environment and the

impact it will have on sensitive viewers located around the Project Site. The Project will be intrusive to the environment and will not just be visible to the homesteads staying in the area but will also change the sense of place of the area surrounding the Project Site.

This negative impact is likely to be experienced by the farmsteads and rural homesteads located within close proximity to the Project Site (located within 3km and located to the north and northeast of Adit A) as well as visitors to the Kransbank Private Reserve.

Table 10.33 Rating of Impacts Related to Landscape and Visual Environment during Operation (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is likely to be experienced by rural homesteads located in close proximity to the site, especially the homesteads located around the Main Mine Adit (Adit A). Communities (Driefontein) located further away are unlikely to be significantly disturbed due to their distance from the proposed Project Site.
Duration	Long Term. Duration of the Life of Mine.	The operation period is a long term period (10 to 20 years) but not a permanent period and structures will be removed during the decommissioning period.
Scale	Limited within 3km from the Project site	The change in landscape will occur within the Project Site. For the proposed Adit A, it will be limited to the area directly surrounding the site (within 3km) as well as areas located to the north and the north-east of the site. The area for Adit B is limited to the west, south-west, south and the south-east.
Frequency	NA	For unplanned events only.
Likelihood	NA	For unplanned events only.
Magnitude		
Large Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
High sensitivity of the receiving landscape and visual receptors due to the visual intrusion, change in the sense of place of the area and the visibility of the proposed Project.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Dust suppression techniques, as per the specifications of the Air Quality Impact Assessment are included in *Chapter 9*, will be in place at all times during the operational phase of the proposed Project. This is specific to areas where vegetation was removed, soil stockpiles, on temporary / permanent unpaved road and any other areas where soil will be exposed.

- Vegetation screens (combination of indigenous trees and shrubs) will be planted along the boundaries of sensitive viewing areas surrounding Adit A (farmsteads, villages, Twyfelhoek School, Kransbank Private Reserve). Please note that when planting a vegetation screen the screen will be as close as possible to the sensitive viewer.

- Adit B is situated on a plateau / mountain and there are currently no trees surrounding the immediate site; however, there are groups of trees in the nearer vicinity. As such, a vegetation screen will be planted along the boundary of Adit B and will not look out of place.

- A Professional Landscape Architect in conjunction with an Ecologist will be appointed to advise on the establishment of these natural screens, so as to avoid having unnatural look and to avoid the introduction of unwanted species into the Study Area.

- The negative impact of night lighting, glare and spotlight effects, will be mitigated by using all or a combination of the following methods:

    - Install light fixtures that provide precisely directed illumination, so as to reduce light "spillage" beyond the immediate surrounds of the immediate Project Site.
    - Avoid high pole top security lighting along the periphery of the Project Site.
    - Use security lighting at the periphery of the site that is activated by movement and are not permanently switched on.

- *Ad hoc* monitoring will be implemented to ensure that visual screening and dust control measures for the proposed Project are implemented effectively during the operational phase.

- Operational vehicles will keep to speed limits (45km / h is recommended in the air quality impact assessment) so to avoid excessive dust generation.

Residual Impact (Post-mitigation)

The mitigation / management measures above will reduce the significance of the impact to a '**Moderate Negative Impact'** (*Table 10.34*). Should mitigation measures be implemented successfully the scale of the impact will be reduced to a much smaller area surrounding Adit A and Adit B. It should however be noted that vegetation screening might take a few years before they completely screen views and therefore the impact might start out as a "Major Negative Impact" but overtime will become a "Moderate Negative Impact".

Table 10.34 Rating of Residual Impacts Related to Landscape and Visual Environment during Operation (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is likely to be experienced by rural homesteads located in close proximity to the site, especially homesteads located around the Main Mine Adit (Adit A). Communities (Driefontein) located further away are unlikely to be significantly disturbed due to their distance from the proposed Project Site.
Duration	Long Term. Duration of the Life of Mine operations.	The operation period is a long term period (10 to 20 years) but not a permanent period and structures will be removed during the decommissioning period.
Scale	Limited within the immediate Project Site	The change in landscape will occur within the Project Site and will be limited to the directly surrounding viewers, viewers travelling past the Project Site or viewers that are on elevated areas. The mitigation / management measure will reduce the scale but it should be noted that this will only happen if the mitigations are implemented successfully.
Frequency	NA	For unplanned events only.
Likelihood	NA	For unplanned events only.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Moderate Negative Impact		

10.2.7 Impacts to the Landscape and Visual Environment during the Decommissioning Phase of the Proposed Project

Description of the Baseline Environment

Please refer to the description of the baseline environment as is described in *Section 10.2.5*.

Proposed Project Activities

Landscape and visual changes resulting from decommissioning activities include:

- Decommissioning of the Main Mine Adit (Adit A) and the Ventilation Adit (Adit B) structures and associated infrastructure, including the overland conveyor system;
- The replacement of overburden (waste rock) into adit entrances;
- The movement of heavy and light vehicles when moving material from the site;
- Dust created by the movement of vehicles and the decommissioning and removal of structures and infrastructure;

- Lighting provided during the decommissioning period, specifically security lighting; and

- Rehabilitation activities.

Sensitive Receptors

During the decommissioning period it is assumed that all structures and infrastructure will be removed and that the area will be rehabilitated. These activities will create dust and may result in untidy / messy working areas.

The main visual receptors will include the farmsteads and rural homesteads located close to the Project Site, Twyfelhoek School and local roads passing the site as well as visitors to the Kransbank Private Reserve. Communities such as Driefontein, located further away from the Project Site, are unlikely to be significantly disturbed due to their distance from the proposed Project Site.

Significance of Impact (Pre-mitigation)

This impact has been assessed as a '**Major Negative Impact**' prior to mitigation (refer to *Table 10.35* below). The reason for this is that decommissioning activities are characterised as being untidy and create dust. As such, decommissioning activities will likely be intrusive to the environment and will be visible to the rural homesteads staying in the area.

This negative impact is likely to be experienced by the rural homesteads located within close proximity to the Project Site (located within 3km of Adit A and B and located to the north and north-east of Adit A) as well as visitors to the Kransbank Private Reserve.

Table 10.35 Rating of Impacts Related to Landscape and Visual Environment during Decommissioning Pre-Mitigation

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is likely to be experienced by rural homesteads located close to the Project Site, specifically homesteads located around Adit A. Communities (Driefontein) located further away are unlikely to be significantly disturbed due to their distance from the proposed Project Site.
Duration	Temporary and Short Term	The decommissioning period is only temporary but the outcomes of rehabilitation are permanent.
Scale	Limited to within the Study Area	The change in landscape will occur within the Study Area and will be limited to a 10km zone of potential influence for Adit A and a 3km zone of potential influence for Adit B.
Frequency	NA	For unplanned events only.
Likelihood	NA	For unplanned events only.

Magnitude
Medium Magnitude
Sensitivity/Vulnerability/Importance of the Resource/Receptor
High Magnitude
High sensitivity of the receiving landscape and visual receptors due to the visibility and the visual intrusion of the proposed Project during the decommissioning phase.
Significant Rating Before Mitigation
Major Negative Impact

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Dust suppression techniques, as per the specifications of the Air Quality Impact Assessment included in *Chapter 9*, will be in place at all times during the decommissioning phase of the proposed Project. This is specific to areas where vegetation was removed, soil stockpiles, on temporary / permanent unpaved road and any other areas where soil will be exposed.

- During this phase it will not be necessary to remove the vegetation screens as it will form part of the natural environment.

- The Project Site will be rehabilitated / restored to as close as the pre-mining environment as possible.

- High pole top security lighting along the periphery of the Project Site will be avoided.

- Security lighting at the periphery of the site that is activated by movement will be used. These lights will not be permanently switched on.

- Worker movement areas (pathways and roads) will be lit with low level 'bollard' type lights and post top lighting will be avoided.

- All material will be stored neatly in a designated area until it can be removed.

- Vehicles used during the decommissioning phase will keep to speed limits (45km / h is recommended in the air quality impact assessment) so to avoid excessive dust generation.

- *Ad hoc* monitoring will be implemented to ensure that visual impact management measures for the decommissioning phase of the proposed Project are implemented effectively.

Residual Impact (Post-mitigation)

The mitigation / management measures above will reduce the significance of the impact to a '**Minor to Moderate Negative Impact**' (*Table 10.36*). Should mitigation measures be implemented successfully the scale of the impact will

be reduced to a much smaller area surrounding Adit A and Adit B. By the time the proposed Project is decommissioned vegetation screens should be suitably established and as a result will screen views from sensitive viewer locations and also assist with dust suppression. The decommissioning phase (post-mitigation) will therefore be less intrusive and visible for viewers than the construction and operational phases.

Table 10.36 Rating of Residual Impacts Related to Landscape and Visual Environment during Decommissioning (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	This impact is likely to be experienced by rural homesteads located close to the Project Site, specifically homesteads located around Adit A. Communities (Driefontein) located further away are unlikely to be significantly disturbed due to their distance from the proposed Project Site.
Duration	Temporary and Short Term	The decommissioning period is only temporary but the outcomes of rehabilitation are permanent.
Scale	Limited to immediately adjacent to the Project Site	The change in landscape will occur within the Project Site and will be limited to site specific and directly adjacent areas since the mitigation measures such as vegetation screening will be suitably established.
Frequency	NA	For unplanned events only.
Likelihood	NA	For unplanned events only.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Moderate to Minor Negative Impact		

10.3 HERITAGE

The predicted impacts to the paleontological and heritage environment as a result of the proposed Project are described in this Section. The heritage resources that will be discussed in this *Chapter* are only those that will be impacted upon by the proposed Project. These include those detailed in *Table 10.37*.

Table 10.37 Heritage Sites Identified and Applicable to the Proposed Project

Site ID	Coordinates	Description
S.34-002	27^0 00' 47.57" S 30^0 20' 45.88" E	Multi-component historical stone wall structure
S.34 009	27^0 00' 12.62" S 30^0 18' 52.07" E	Multi-component, residential structure
S.35-006	27^0 01' 09.64" S 30^0 17' 08.44" E	Multi-component archaeological stonewalled site
S.36-001	27^0 00' 48.99"S 30^0 20' 43.78" E	Burial ground
S.36 008	27^0 00' 09.70"S 30^0 18' 52.50"E	Burial ground
S.36 005	27^0 01' 02.20"S	Burial ground with at least 31

Site ID	Coordinates	Description
	30⁰ 17' 15.30"E	graves
S.36 007	27⁰ 01' 04.96"S 30⁰ 17' 06.91"E	Burial ground

10.3.1 *Impacts on the Palaeontology (1) in the Study Area*

Description of the Baseline Environment

The stratigraphy of the Project Area consists of the Madzaringwe Formation of the Ecca Group. The Madzaringwe Formation consists of lenses of sandstone and shale and contains a number of coal seams. Lenses of calcareous sandstone and sandy limestone are relatively common. The rocks of the Ecca Group are of paleontological importance and the desktop research done indicates that there may be fossils in the Study Area which could be encountered when construction and mining commences.

Proposed Project Activities

Construction activities relating to the Main Mine Adit and Adit B that could impact on potential fossil heritage (beneath ground surface) include earth moving activities and excavations for civil works. Machinery involved in excavation may damage or destroy fossils, or they may be hidden within the excavated material.

Sensitive Receptors

Fossils may be affected by Project activities discussed above. The existence of subsurface fossils is unknown because no excavations have taken place in the general area. If subsurface fossils exist they could be found during site construction.

Significance of Impact (Pre-mitigation)

During the field survey, no surface fossils were identified along the proposed conveyor routes or within the Adit A and Adit B footprints. However, one must make the assumption that most fossil heritage is embedded within the rocks beneath the land surface or obscured by surface deposits such as alluvium or soil and by vegetation cover.

Fossils plants are not well preserved in coal seams due to the natural coalification process where the fossil plants undergo changes from peat to lignite to bituminous coal. According to Section 2 (xxxi) of the NHRA, these fossil fuels along with fossiliferous rocks intended for industrial use are not included in the definition of paleontological resources.

(1) ***Please Note*** – a standalone Paleontological study was not completed; rather, the paleontological study forms an integrated component of this HIA.

Fossilised remains or trace fossils of animals or plants which lived in the geological past do occur in the shales associated with the coal seams. These paleontological remains are defined as heritage resources in Section 2 (xxxi) of the NHRA but there existence beneath the surface can only be verified through monitoring excavations. **In this sense, the impact of construction activities such as excavations is positive for palaeontology, provided that efforts are made to monitor and rescue the fossils.**

Mitigation/Management Measures

Subsurface fossils fall under the protection and management of the Chance Find Procedure. A Chance Find and Fossil Find Procedures will be developed and implemented during the construction and mining phases of the Main Mine Adit and Adit B.

Please Note:

Refer to Chance Find and Fossil Find Procedures in *Appendix C* of the Heritage Impact Assessment Report (attached as *Annex C.4*)

An appointed Environmental Control Officer (ECO) will be suitably trained by a paleontological specialist to identify paleontological resources and will be present on site during the construction and operational phase of the proposed Project. This monitoring may be limited to overburden dumps in which fossil material may be deposited with overburden material.

10.3.2 *Disturbance of Graves or Loss of Access to Graves Resulting from Placement of Project Infrastructure and Related Safety Risks*

In the past many rural families would have chosen to bury their deceased in or around their homesteads or in family gravesites. Private landowners may have prohibited this but fieldwork in the area (both for this social baseline report and for the Heritage Impact Assessment Study associated with the ESIA for the proposed Project) has identified a number of single and multiple gravesites in the Zones of Influence.

Currently, people have the choice of using municipal graveyards or local, informal graves in and around homesteads.

Description of the Baseline Environment

Burying the dead is an emotive and symbolic experience for many people. Choosing to use a cemetery or an historical family burial ground or to bury near the family's homestead are all options. Many families and communities hold traditional ceremonies at ancestral graves at least annually.

More than two thirds (68.18%) [(1)] of the 45 homesteads surveyed in the Zones of Influence declared that they knew of graves that were located either within,

[1] 30 of 44 homesteads surveyed.

or in close proximity to, the homestead. Within Zone 1, 24 out of 33 surveyed homesteads reported associated graves (73%).

In most instances, these were the graves of deceased relatives of long-term residents that were buried in accordance with traditional customs. Those households that did not reflect any awareness of graves located in the vicinity of their homesteads were generally either recent arrivals or chose to bury their dead in cemeteries in more urbanized centres like Driefontein.

Figure 10.6 below shows that the longer a family is settled in an area the more likely they are to have associated graves in or near their homesteads. In addition, *Table 10.38* highlights the relative percentages of surveyed homesteads per farm location that have associated gravesites.

Figure 10.6 Presence of Nearby Graves and Residential Period

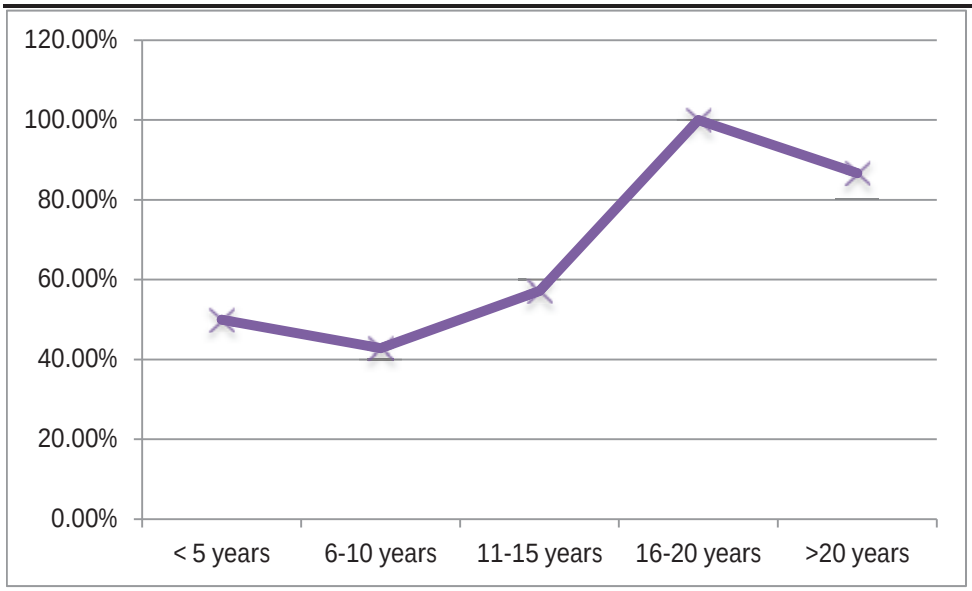


Table 10.38 Presence of Nearby Graves and Farm Location

	Presence of Graves			
Farm	**No**	**Yes**	**TOTAL**	**%**
Donkerhoek 14-HT	0	5	5	100.00%
Kransbank 15-HT	8	10	18	55.56%
Nooitgezien 381-HT	1	0	1	0%
Rooikop 18-HT	1	4	5	80.00%
Twyfelhoek 379-IT	4	11	15	73.33%
TOTAL	**14**	**30**	**44**	**68.18%**

Proposed Project Activities

The location of the proposed Project infrastructure and its associated 48.4 ha footprint (Adits A and B as well as the length of the conveyor) will either destroy land on which graves currently lie or will reduce people's access to grave sites for health and safety reasons or from physical barriers created by

mining activities. These impacts will be triggered during the construction phase and the loss of access will continue through the operation phase.

Sensitive Receptors

The above discussion highlights the likelihood that the majority of Zone 1 homesteads, particularly those settled for upward of 10 years, would have graves associated to their land and homestead. If the proposed Project footprint affects these homesteads, through resettlement or loss of access to an area, the graves will also be affected.

Graves serve multiple purposes. Practically, they are the resting place of a family's ancestor, but they are also markers of a community or family's history, rootedness and belonging. If graves are lost so too is that belonging – particularly for families that have been settled for a long time. Resettlement triggers its own impacts on people's sense of belonging and any loss of connectedness to graves and ancestors would exacerbate this.

For this group of people, the loss of access to gravesites or the potential destruction of graves could create additional vulnerabilities to a sense of rootlessness, as they have no title deeds and the graves are physical markers of their continuous presence on the land.

Significance of Impact (Pre-mitigation)

Based on the analysis provided above, this impact is assessed to be of a '**Major Negative Impact'** pre-mitigation (*Table 10.39*).

A small number of survey respondents who have previously been relocated by Kangra Coal expressed dissatisfaction with the fulfilment of the company's commitments to relocating graves. These previous experiences will heighten concerns about any future grave relocation amongst local residents.

Table 10.39 Rating of Impacts Related to Disturbance of Graves or Loss of Access to Graves Resulting from Placement of Project Infrastructure and Related Safety Risks (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Affected homesteads and graves within the proposed Project footprint. Grave sites not relocated but where access becomes unsafe or difficult.
Duration	Permanent	Either gravesites will be destroyed by Project activities or access to the sites will be permanently altered (20 year life of mine).
Scale	Graves within the 48.6 ha footprint requirement	Not all homesteads within Zone 1 of Influence have associated graves but a large proportion of the survey group (73%) identified gravesites and it is likely that other graves will be identified during a 100% Resettlement and Compensation Process.

Frequency	Continuous	The impact on graves would be triggered by construction activities and would continue to mine closure.
Likelihood	Likely	If the proposed Project goes ahead, based on the number of survey homesteads in the Zones of Influence with associated graves, it will certainly impact on some graves and make access to others more difficult.
Magnitude		
Medium Magnitude		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High Sensitivity		
The important role of graves as markers of rootedness, belonging and connection to deceased family members is almost universally recognised. In addition, local residents' histories around land tenure and rights probably increase this significance and increase people's vulnerability to a loss of these graves and their physical and symbolic roles.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

The following mitigation measures will be used to reduce the significance of the impact:

- Kangra Coal will relocate affected graves or ensure continued safe and convenient access to gravesites.
- Any grave relocation will be undertaken in a culturally appropriate manner in consultation with affected families.
- All costs of respectful and culturally appropriate re-interment will be covered by Kangra Coal.
- Identification of ***all*** affected graves will be carried out during Resettlement and Compensation Planning.
- Where gravesites are not relocated a buffer zone will be established to protect the site and establish safe and convenient access to the site (Heritage Impact Assessment – *Section 10.3*).
- A Chance Finds protocol for graves discovered during construction activities will be established.

Residual Impact (Post-mitigation)

The mitigation measures above implemented fully and respectfully should make affected families feel recognised, considered and respected. The relocation of graves undertaken in this manner (or the establishment of convenient and safe continued access to existing gravesites) should reduce the significance of the impact to a '**Minor Negative Impact'** (*Table 10.40*).

Table 10.40 Rating of Residual Impacts Related to Disturbance of Graves or Loss of Access to Graves Resulting from Placement of Project Infrastructure and Related Safety Risks (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Affected homesteads and graves within the proposed Project footprint
Duration	Short to Medium-term	Graves will either be relocated in the appropriate manner along with the affected homestead or access to the sites will be facilitated in a safe and convenient manner.
Scale	Graves within the 48.6 ha footprint requirement	100% of affected homesteads will either have their graves relocated with them in culturally respectful and appropriate manners (including the payment of all agreed costs), or access to remaining graves will be secured.
Frequency	Intermittent	The impact on graves would be triggered by construction activities and would continue to mine closure. However, relocating graves or providing safe access to them would reduce the frequency of the impact.
Likelihood	Likely	If the proposed Project goes ahead, based on the number of survey homesteads in the Zones of Influence with associated graves, it will certainly impact on some graves and make access to others more difficult.
Magnitude		
Small Magnitude		
Significant Rating After Mitigation		
Minor Negative Impact		

10.3.3 Impacts on Section 34 Sites – Structures

Description of the Baseline Environment

1. **S.34-002** is approximately 19 234 square meters in extent and is bisected by the proposed overland conveyor route (*Figure 10.7*). This heritage resource has no value in aesthetic and technical characteristics, as it is known to occur frequently within the Study Area. In addition, a survey of the historical 1938 aerial photograph indicates that sites similar to S.34-002 are a common occurrence within the Study Area. The site is in a poor condition with active decay visible. Contemporary use and/or occupation of the structure has resulted in the alteration of the structure to such an extent that it has limited information potential. The structure is located near an existing community and burial ground (S.36-001) and may have an association to the community or cultural group for social and/or spiritual reasons. Taking these characteristics into account, the structure was given **a low heritage value**.

Figure 10.7 Stonewalled Site (S.34 002) in Relation to the Overland Conveyor System (indicated as the orange line in the figure)

2. **S.34-009** is approximately 12 367 square meters in extent and is bisected by the proposed overland conveyor route (*Figure 10.8*). The heritage resource has no value in terms of its aesthetic and technical attributes, as structure similar to it are known to occur frequently within the Study Area. The structure is in a poor condition with active decay visible. There is no site context and as a result it has limited information to offer. The structure is located near an existing community and burial ground (S.36-005) and may have an association to the community or cultural group for cultural and/or spiritual reasons. Taking these characteristics into account, the structure was given a **low heritage value**.

Figure 10.8 Stonewalled Site (S.34 009) in Relation to the Overland Conveyor System (indicated as the orange line in the figure)

Proposed Project Activities

Kangra Coal proposes to transport mined coal from the proposed Main Mine Adit in the Kusipongo Resource to the existing Maquasa West Adit via the proposed new overland conveyor system. Sites S.34-002 and S.34-009 are bisected by the proposed overland conveyor system.

The activities that are associated with the establishment and operation of the overland conveyor system have the potential to impact on these historical structures through site clearance activities. In addition, site clearance and construction of the conveyor system will increase human traffic thereby increasing the risk to these sites in terms of accidental or purposeful damage or destruction. The operation and maintenance of the conveyor system will also create long-term risks associated with more regular and increased human traffic, allowing access to the sites. The construction of the conveyor system may also change the landscape character and may impact on the integrity of the sites.

Sensitive Receptors

As is mentioned above, both structures are located near existing communities and burial grounds and may have an association to the community or associated cultural group for cultural and / or spiritual reasons.

Furthermore, the existence of subsurface cultural remains is unknown because no excavations have taken place in the general area. If subsurface cultural remains do exist they could be found during site construction. Subsurface cultural remains fall under the protection and management of the Chance Find Procedure.

Please Note:

Refer to Chance Find and Fossil Find Procedures in *Appendix C* of the Heritage Impact Assessment Report (attached as *Annex C.4*)

Significance of Impact (Pre-mitigation)

The impact related to the construction of the proposed conveyor system on the heritage sites will be a '**Negligible to Minor Negative Impact'** (*Table 10.41*). This significance is attributed to the fact that both heritage resources have a low heritage value.

Table 10.41 Rating of Impacts Related to Section 34 Sites (Structures) (Pre-Mitigation)

Type of Impact		
Direct or Indirect Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	High	Most or the entire heritage resource could be affected by the construction of the proposed conveyor route.

Duration	Permanent	Unless avoided, the structures will be destroyed by groundwork's during the construction phase of the proposed Project.
Intensity	Low	Change to integrity will cause change to overall authentic aspects of the heritage resource, as the structure will be partly or completely destroyed by the construction of the proposed overland conveyor; however, the heritage resource is of a low heritage value and therefore any change to the heritage resource as a result of the Project is not significant.
Probability	Probable	Construction activities will take place on certain portions of the heritage site.
Magnitude		
Low Magnitude		
Value of the Resource/Receptor		
Low Sensitivity		
The heritage resource is of a low heritage value and therefore any change to the heritage resource as a result of the Project is not significant; however, this said both structures are located near existing communities and burial grounds and may have an association to the community or associated cultural group for cultural and / or spiritual reasons.		
Significant Rating Before Mitigation		
Negligible to Minor Negative Impact		

Mitigation/Management Measures

The heritage resources are generally protected and their field rating is Grade IVB, which means that no Project-related mitigation measures are necessary for the site. The sites were significantly recorded and mapped in the HIA and they can be destroyed; however, prior to its destruction, Kangra Coal will confirm whether the communities are using the site as part of a ceremonial area and a destruction permit must initially be obtained from SAHRA.

The following management measure will be implemented during the construction phase of the proposed Project:

- The appointed ECO will be trained to identify heritage resources and will be present on site when ground clearing inside the perimeter of the heritage resource takes place. The ECO will be in a position monitor any potential subsurface exposure of material culture.

Residual Impact (Post-mitigation)

There are no Project-related mitigation measures recommended for this site. However, the heritage-related mitigation measures were implemented as both heritage resources were adequately recorded and mapped and can therefore be destroyed. The above mentioned heritage-related mitigation measures will keep the level of significance for this impact to a **'Negligible Negative Impact'** (*Table 10.42*).

Table 10.42 Rating of Residual Impacts Related to Section 34 Sites (Structures) (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	High	Most or the entire heritage resource could be affected by the construction of the proposed conveyor route.
Duration	Permanent	Unless avoided, the structures will be destroyed by groundwork's during the construction phase of the proposed Project.
Intensity	Low	Change to integrity will cause change to overall authentic aspects of the heritage resource, as the structure will be partly or completely destroyed by the construction of the proposed overland conveyor; however, the heritage resource is of a low heritage value and therefore any change to the heritage resource as a result of the Project is not significant.
Probability	Probable	Construction activities will take place on certain portions of the heritage site; however, the structures have been adequately recorded and mapped and this information has been stored for future reference. The site can therefore be destroyed.
Magnitude		
Negligible Magnitude		
Significant Rating After Mitigation		
Negligible Negative Impact		

10.3.4 Impacts on Section 35 Sites - Archaeological Sites

Description of the Baseline Environment

S.35-006 is approximately 55 807 square meters in extent and falls within the Main Mine Adit footprint (*Figure 10.9*). This heritage resource has no value in aesthetic and technical characteristics as this type of site is known to occur frequently within the Study Area. The site is in a poor condition with active decay visible. It has a limited information potential because there was no site context and no archaeological deposit (artefacts) were noted. Taking these characteristics into account, the site was given a **low heritage value**.

Figure 10.9 Stonewalled Site S.35 006 Bisected by the Main Mine Adit (Main Mine Adit illustrated as orange hatched polygon)

Proposed Project Activities

Site S.35-006 falls within the footprint of the Main Mine Adit and as such will essentially be lost through earth working activities and associated establishment of mine infrastructure.

Sensitive Receptors

The existence of subsurface cultural remains is unknown as no excavations have taken place in the general area. If subsurface cultural remains do exist, they could be found during site construction.

Significance of Impact (Pre-mitigation)

The impact from the construction of the Main Mine Adit on the heritage site will be a '**Negligible to Minor Negative Impact'** (*Table 10.43*). This significance is attributed to the fact that both heritage resources have a low heritage value and is known to occur frequently within the Study Area.

Table 10.43 Rating of Impacts Related to a Section 35 Archaeological Site (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	High	As the archaeological resource falls within the footprint of the Main Mine Adit, it will essentially be lost.
Duration	Permanent	Unless avoided, the structures will be destroyed by groundwork's during the construction phase of the proposed Project.
Intensity	Low	Change to integrity will cause change to overall authentic aspects of the heritage resource, because the site will be destroyed by the construction of Adit A. However, the heritage site has no value in aesthetic and technical characteristics as this type of site is known to occur frequently within the Study Area. The site is in a poor condition with active decay visible. It has a limited information potential because there was no site context and no archaeological deposit (artefacts) were noted. As such, the site was given a low heritage value.
Probability	Probable	Should the proposed Adit A be constructed, the heritage resource will be lost.
Magnitude		
Low Magnitude		
Value of the Resource/Receptor		
Low to Negligible Sensitivity		
The heritage resource is of a low heritage value and therefore any change to the heritage resource as a result of the Project is not significant.		
Significant Rating Before Mitigation		
Negligible to Minor Negative Impact		

Mitigation/Management Measures

Subsurface cultural remains fall under the protection and management of the Chance Find Procedures.

Please Note:

Refer to Chance Find and Fossil Find Procedures in *Appendix C* of the Heritage Impact Assessment Report (attached as *Annex C.4*)

The heritage resource is generally protected and their field rating is Grade IVB, which means that no Project-related mitigation measures are necessary for the site. The site was significantly recorded and mapped in the HIA and no further mitigation measures are required.

The following management measure will be implemented during the construction phase of the proposed Project:

- The appointed ECO will be trained to identify heritage resources and will be present on site when ground clearing inside the perimeter (defined by the extent of the site) of the heritage resource takes place. The ECO will monitor any potential subsurface exposure of material culture.

Residual Impact (Post-mitigation)

There are no Project-related mitigation measures recommended for this site. However, the heritage-related mitigation measures were implemented as the heritage resource was adequately recorded and mapped and can therefore be destroyed. The above mentioned heritage-related mitigation measures will keep the level of significance for this impact to a **'Negligible Negative Impact'** (*Table 10.44*).

Table 10.44 Rating of Residual Impacts to a Section 35 Archaeological Site (Post-Mitigation)

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	High	As the archaeological resource falls within the footprint of the Main Mine Adit, it will essentially be lost.
Duration	Permanent	Unless avoided, the structures will be destroyed by groundwork's during the construction phase of the proposed Project.
Intensity	Low	Change to the integrity of the heritage resource will not cause changes to its authenticity because the heritage resource has been adequately recorded and mapped and the information stored.
Probability	Probable	Project-related mitigation measures, if required, will not avoid change and the site will be destroyed.
Magnitude		
Low Magnitude		
Significant Rating After Mitigation		
Negligible Negative Impact		

10.3.5 Impacts on Section 36 Sites – Burial Grounds and Graves

Description of the Baseline Environment

S.36-001 is approximately 199 square meters in extent and comprises 11 graves. It is located 18 m south of the proposed conveyor route. The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a **medium heritage value**.

Proposed Project Activities

Activities associated with the establishment and operation of the overland conveyor system has the potential to indirectly impact on the S.36-001 heritage resource.

Although the heritage resource is situated 18m away from the proposed conveyor route, site clearance associated with the construction of the conveyor route could destroy or cause damage to the site.

In addition, construction and operational activities associated with the proposed overland conveyor will result in increased human traffic in the Project Area, thereby increasing the risk of accidental or purposeful damage or destruction of the site. The construction of the conveyor system may change the landscape character and may impact on the integrity of site S.36-001.

Sensitive Receptors

The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.

Significance of Impact (Pre-mitigation)

The impact from the construction of the proposed conveyor route on the heritage site will be a '**Minor to Moderate Negative Impact'** (*Table 10.45*).

Table 10.45 Rating of Impacts Related to Burial Ground S.36 001 (Pre-Mitigation)

Type of Impact		
Direct or Indirect Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	Medium	Large parts or aspects of the heritage resource may be indirectly affected by the construction of the proposed conveyor route.
Duration	Permanent	Change to the heritage resource will be permanent and irreversible.

Intensity	Low to Medium	Change to the integrity of the heritage resource will not cause change to its authenticity. The conveyor route could only impact on the surface features of the burial ground and not on the human remains themselves which would remain intact. However, the site is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored..
Probability	Unlikely	The burial ground is not situated within the footprint of the conveyor route.
Magnitude		
Low to Medium Magnitude		
Value of the Resource/Receptor		
Medium Sensitivity		
The heritage resource is of a medium heritage value. Furthermore, the burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.		
Significant Rating Before Mitigation		
Minor to Moderate Negative Impact		

Mitigation/Management Measures

The resource was given a Grade III B field rating. Based on this field rating the heritage resource will be conserved and potential impacts to the resource will be mitigated.

The following Project-related mitigation measures and site management will be implemented to reduce the significance of the impact:

- The graves will be restored where these are dilapidated, protected and conserved in perpetuity. Access to this burial ground will be negotiated with communities in the immediate area.

- A perimeter fence will be built around the burial ground and placed 2m away from the perimeter of the graves. The perimeter fence will include an entry gate to allow visits from relatives and family friends. Kangra Coal will be responsible for the maintenance of this fence.

- Detailed Project design will ensure that there is a 20m buffer between the perimeter fence and the proposed conveyor route.

- The ECO will be present on site when the fence is erected around the burial ground.

Residual Impact (Post-mitigation)

The establishment of a fence around the perimeter of the burial ground will ensure that the heritage resource is maintained for the entire LOM. As such, the residual impact will be a '**Positive Impact**'.

10.3.6 Impacts on the S.36-005 and S.36-008 Burial Grounds

Description of the Baseline Environment

1. **S.36-008** is approximately 64 square meters in extent with at least six graves. It is located 82 m north west of the proposed conveyor route. The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a **medium heritage value**.

2. **S.36-005** is approximately 668 square meters in extent with at least 31 graves. It is located 30m east of the Main Mine Adit (*Figure 10.10*). The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in an excellent condition and is well-preserved. There is little to no decay present and little restoration is required. Based on these attributes, the burial ground was given a **medium heritage value**

Figure 10.10 Burial Ground S.36 005 located approximately 30m east of the Main Mine Adit (Main Mine Adit illustrated as orange hatched polygon)

Proposed Project Activities

Although these sites are situated a distance away from sites proposed for Project infrastructure, the activities that are associated with the establishment and operation of proposed Project infrastructure have the potential to impact on these burial grounds through site clearance activities. In addition, site clearance and construction activities associated with the proposed Project will increase human traffic thereby increasing the risk to these burial grounds in terms of accidental or purposeful damage or destruction. The operational phase of the proposed Project will also create long-term risks associated with more regular and increased human traffic, allowing access to the sites. Proposed Project infrastructure may also change the landscape character and may impact on the integrity of the sites.

Sensitive Receptors

Sensitive receptors for this heritage site include those community members who visit the burial ground.

Significance of Impact (Pre-mitigation)

The impact related to the construction and operation of the proposed Project on heritage sites will be a '**Minor Negative Impact'** (*Table 10.46*).

Table 10.46 Rating of Impacts Related to S.36-005 and S.36-008 Burial Ground (Pre-Mitigation)

Type of Impact		
Direct or Indirect Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	Low to Medium	Isolated parts or aspects of the heritage resource could be indirectly affected by the construction and operation of the proposed Project.
Duration	Permanent	Unless avoided, changes to the heritage resource will be indirect and may occur over the LOM.
Intensity	Medium to Low	Change to the integrity of the heritage resource will not cause change to its authenticity. Indirect impacts associated with proposed infrastructure establishment would only impact on the surface features of the burial ground and not on the human remains themselves which would remain intact. Furthermore, the burial grounds may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Their importance is also based on highly credible information sources. These burial grounds are in an poor to excellent condition and are well-preserved.
Probability	Unlikely	The burial grounds are not situated within the footprints of the infrastructure proposed.
Magnitude		
Medium to Low Magnitude		
Value of the Resource/Receptor		
Medium Sensitivity		
The heritage resources are of a medium heritage value. Project-mitigation must aim to reduce any impacts on the heritage resources as conservation is required. Furthermore, the burial grounds may have a strong association to the community or cultural group for social, cultural and spiritual reasons.		
Significant Rating Before Mitigation		
Minor to Moderate Negative Impact		

Mitigation/Management Measures

The heritage resources were given a Grade III B field rating. Based on this field rating, the heritage resources will be partly conserved and potential impacts to the resources mitigated.

The following Project-related mitigation measures and site management will be implemented in order to reduce the significance of the impact:

- The graves will be restored where these are dilapidated, protected and conserved in perpetuity. Access to this burial ground will be negotiated with communities in the immediate area.

- A perimeter fence will be built around each burial ground and placed two meters away from the perimeter of the graves. The perimeter fences will include an entry gate to allow visits from relatives and family friends. The mine will be responsible for the maintenance of these fences.

- The appointed ECO will be present on site when these fences are been erected around the burial grounds.

Residual Impact (Post-mitigation)

The establishment of a fence around the perimeter of the burial grounds will ensure that the heritage resources are maintained for the entire LOM. As such, the residual impact will be a "**Positive Impact**".

10.3.7 Impacts on the S.36-007 Grave

Description of the Baseline Environment

S.36-007 is approximately 20 square meters in extent and is located within the Main Mine Adit footprint (*Figure 10.11*). The burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources. It is in a fair to good condition and is well preserved. There is some decay present but it can easily be restored. Based on these attributes, the burial ground was given a **medium heritage value**.

Figure 10.11 Single Grave (S.36 007) Located within the Main Mine Adit (Main Mine Adit represented by orange hatched polygon)

Proposed Project Activities

Activities associated with the establishment and operation of Main Mine Adit will result in the loss of S.36-007, as development of the entire footprint of the Main Mine Adit is proposed.

Sensitive Receptors

As is previously mentioned, the burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.

Significance of Impact (Pre-mitigation)

The impact related to the loss of the grave through construction of the Main Mine Adit will be a '**Major Negative Impact'** (*Table 10.47*).

Table 10.47 Rating of Impacts Related to S.36-007 Grave (Pre-Mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Scale	High	The heritage resource will be lost.
Duration	High	Change to the heritage resource will be immediate, permanent and irreversible.
Intensity	High	Change to the integrity of the heritage resource will cause change to its overall authenticity because the impact will occur on the human remains and not just on the surface.
Probability	Certain	The grave is situated within the footprint of the Main Mine Adit (Adit A) and therefore it is certain that the grave will be lost in its entirety.
Magnitude		
High Magnitude		
Value of the Resource/Receptor		
Medium Sensitivity		
The heritage resource is of a medium heritage value. Project-mitigation must aim to reduce any impacts on the heritage resource as conservation is required. Furthermore, the burial ground may have a strong association to the community or cultural group for social, cultural and spiritual reasons. Its importance is also based on highly credible information sources.		
Significant Rating Before Mitigation		
Major Negative Impact		

Mitigation/Management Measures

No Project-related mitigation measures such as changes to design or mine plan were considered as the grave is located within the footprint of the Main Mine Adit (Adit A) and as such will not be preserved. This particular grave will therefore be relocated.

Grave Relocation Process

The Grave Relocation Process (GRP) consists of the following three phases that will be adhered to:

1. Consultation;
2. Permit application; and
3. Exhumation.

Burial grounds and graves are protected in terms of Section 36 of the NHRA and as such cannot be relocated without a permit issued by SAHRA. The GRP is regulated through the NHRA Regulations (Government Gazette No. 21239, Notice No. 548). A summary of each of these three phases is presented in this section.

Phase 1 - Consultation

The GRP is regulated through the NHRA Regulations (Government Gazette No. 21239, Notice No. 548). Chapter XI of the NHRA Regulations regulate the procedure for consultation regarding the burial that will include the following minimum requirements:

- Archival or documentary research regarding the origin of the grave;

- The erection of a site notice for a duration of at least 60 days at the grave displaying in all official languages of the province concerned information about the proposals affecting the site with the following details included:

    - Contact details of the Applicant and/or its nominated representative; and
    - Date by which contact must be made that must be at least seven days after the end of the notification period

- Advertising in the local press;

- Results of direct consultation with local community organisations and/or members that must include:

    - Accurate records of all actions and consultation taken;
    - Contact register of all persons and organisations contacted and their response, copies must be submitted to the SAHRA BGG Unit with the application; and
    - Details of agreements reached between the Applicant and interested parties concerning the future of the grave.

Phase 2 – Permit Application

Chapter IX of the NHRA Regulations provide the legal framework for permit applications for grave relocation. Permit applications will be made to the SAHRA BGG Unit and can only be submitted after the consultation process described above. Section 34 of the NHRA Regulations stipulates the following minimum information that will be included the permit application:

- Name and address, farm number and geographical coordinates of the grave;
- The magisterial district within which the grave is located;
- The contact details of the responsible planning authority;
- Details of the proposed exhumation and relocation;
- Motivation of the proposed exhumation, including supporting documents that may include:
    - The HIA report; and
    - Consultation report presenting results of consultation described above, including copies of agreements reached between Kangra Coal and interested parties.
- Details of the cost of the exhumation;
- The contact details, qualifications and relevant experience of the archaeologist who will be responsible;
- Contact details, identity number and signed consent of the landowner on whose property the grave is situated; and
- Contact details and signature of the Applicant.

A permit for exhumation will only be issued if the exhumation is undertaken under the supervision of an archaeologist and after suitable arrangements have been made for the reinterment of the mortal remains. The Applicant will also be held liable for all costs, unless otherwise agreed on in writing between the former and the interested parties.

Due respect for the customs and beliefs of the community associated with the grave will be upheld.

Phase 3 – Exhumation

Phase three of the GRP includes exhumation, relocation and reburial. Established archaeological field and excavation methodologies will be employed during exhumations to recover all the remains, minimise the damage to the remains and record the context of the burial. In addition, a registered funeral undertaker will be appointed to transport and reinter the remains. Where applicable local municipal by-laws concerning graves will be complied with.

Residual Impact (Post-mitigation) to Site S.36-007

The site will be relocated so there is no residual impact on the physical site location. However, residual impacts on the descendants and/or community (receptors) may occur.

10.4 SUMMARY OF IMPACTS AND RESIDUAL IMPACTS

A summary of impacts (pre-mitigation) and residual impacts for the social environment is provided per phase below.

Table 10.48 Summary of Impacts for Construction Phase

Impact	Significance (pre-mitigation)	Residual Impact Significance
Socio-economic Impacts		
Homesteads and their Residents will be displaced as a Result of the Proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Loss of Access to Land for Agriculture (approximately 25 Homesteads) and Grazing as a Result of the proposed Project Footprint and Associated Infrastructure	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Creation of 450 Construction Jobs and the Retention of 745 Existing Mining Jobs	**POSITIVE IMPACT**	**POSITIVE IMPACT**
Resentment and Anger from Unfulfilled Expectations of Improved Employment Opportunities and Related Livelihood Security	**MAJOR NEGATIVE IMPACT**	**MINOR TO MODERATE NEGATIVE IMPACT**
Increased Spending by the Proposed Project will contribute to the Local Economy	**POSITIVE IMPACT**	**POSITIVE IMPACT**

Impact	Significance (pre-mitigation)	Residual Impact Significance
Loss of Productive Land and Related Current and Future Income Opportunities as a Result of Proposed Project Infrastructure and the Division of Farms by the Overland Conveyor	MAJOR NEGATIVE IMPACT	MINOR TO NEGLIGIBLE NEGATIVE IMPACT
Introducing Mining Activities into a Rural Environment together with the Disruption of Community Life through Resettlement and Restricted Movement will undermine the Sense of Place and Residents' Community Identity and Sense of Emplacement	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Reduced Access to Wood for Cooking and Heating Resulting from Tree-Clearing in the Project Footprint and from Limited Access across the Conveyor	MINOR TO MODERATE NEGATIVE IMPACT	POSITIVE IMPACT
Reduced Community Health and Safety Resulting from Project Activities, Air, Water, Noise and Traffic Impacts as well as the Presence of Outsider Contract Workers	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Increased Pressure on Driefontein Infrastructure and Service Delivery Resulting from an Influx of Job-Seekers to the Study Area and Possible Increased Incidents of Crime	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
The Poor Relationship between Kangra Coal and Local Communities, in Conjunction with Perceived Unfulfilled Promises by the Company, will undermine Levels of Trust and Chances of a Social Licence to Operate from Affected Communities and Stakeholders	MAJOR NEGATIVE IMPACT	MINOR TO MODERATE NEGATIVE IMPACT
Visual and Landscape Impacts		
Impacts to the Landscape and Visual Environment during the Construction Phase of the Proposed Project	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Heritage Impacts		
Impacts on palaeontology	POSITIVE IMPACT	POSITIVE IMPACT
Impacts on Section 34 Structures	NEGLIGIBLE TO MINOR NEGATIVE IMPACT	NEGLIGIBLE NEGATIVE IMPACT
Impacts on Section 35 Archaeological Sites	NEGLIGIBLE TO MINOR NEGATIVE IMPACT	NEGLIGIBLE NEGATIVE IMPACT

Impact	Significance (pre-mitigation)	Residual Impact Significance
Disturbance of Graves or Loss of Access to Graves Resulting from Placement of Project Infrastructure and Related Safety Risks	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Impacts on Section 36 Burial Grounds and Graves	MINOR TO MODERATE NEGATIVE IMPACT	POSITIVE IMPACT
Impacts on the S.36 005 and S.36 008 Burial Grounds	MINOR TO MODERATE NEGATIVE IMPACT	POSITIVE IMPACT
Impacts on the S.36 007 Grave	MAJOR NEGATIVE IMPACT	N/A

Table 10.49 Summary of Impacts for Operational Phase

Impact	Significance (pre-mitigation)	Residual Impact Significance
Socio-economic Impacts		
Homesteads and their Residents will be displaced as a Result of the Proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Loss of Access to Land for Agriculture (approximately 25 Homesteads) and Grazing as a Result of the proposed Project Footprint and Associated Infrastructure	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Creation of 450 Construction Jobs and the Retention of 745 Existing Mining Jobs	POSITIVE IMPACT	POSITIVE IMPACT
Resentment and Anger from Unfulfilled Expectations of Improved Employment Opportunities and Related Livelihood Security	MAJOR NEGATIVE IMPACT	MINOR TO MODERATE NEGATIVE IMPACT
Loss of Productive Land and Related Current and Future Income Opportunities as a Result of Proposed Project Infrastructure and the Division of Farms by the Overland Conveyor	MAJOR NEGATIVE IMPACT	MINOR TO NEGLIGIBLE NEGATIVE IMPACT
Introducing Mining Activities into a Rural Environment together with the Disruption of Community Life through Resettlement and Restricted Movement will undermine the Sense of Place and Residents' Community Identity and Sense of Emplacement	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT

Impact	Significance (pre-mitigation)	Residual Impact Significance
Reduced Water Quality and Availability for People, Agriculture and Livestock Resulting from Mine Activities (Water Use, Dewatering, Contamination)	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Reduced Access to Wood for Cooking and Heating Resulting from Tree-Clearing in the Project Footprint and from Limited Access across the Conveyor	MINOR TO MODERATE NEGATIVE IMPACT	POSITIVE IMPACT
Reduced Community Health and Safety Resulting from Project Activities, Air, Water, Noise and Traffic Impacts as well as the Presence of Outsider Contract Workers	MODERATE NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
The Poor Relationship between Kangra Coal and Local Communities, in Conjunction with Perceived Unfulfilled Promises by the Company, will undermine Levels of Trust and Chances of a Social Licence to Operate from Affected Communities and Stakeholders	MAJOR NEGATIVE IMPACT	MINOR TO MODERATE NEGATIVE IMPACT
Visual and Landscape Impacts		
Impact to the Landscape and Visual Environment during the Operational Phase of the Proposed Project	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT
Heritage Impacts		
Disturbance of Graves or Loss of Access to Graves Resulting from Placement of Project Infrastructure and Related Safety Risks	MAJOR NEGATIVE IMPACT	MINOR NEGATIVE IMPACT
Impacts on Section 36 Burial Grounds and Graves	MINOR TO MODERATE NEGATIVE IMPACT	POSITIVE IMPACT
Impacts on the S.36 005 and S.36 008 Burial Grounds	MINOR TO MODERATE NEGATIVE IMPACT	POSITIVE IMPACT

Table 10.50 Summary of Impacts for Decommissioning Phase

Impact	Significance (pre-mitigation)	Residual Impact Significance
Socio-economic Impacts		
Homesteads and their Residents will be displaced as a Result of the Proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities	MAJOR NEGATIVE IMPACT	MODERATE NEGATIVE IMPACT

Loss of Access to Land for Agriculture (approximately 25 Homesteads) and Grazing as a Result of the proposed Project Footprint and Associated Infrastructure	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Loss of Productive Land and Related Current and Future Income Opportunities as a Result of Proposed Project Infrastructure and the Division of Farms by the Overland Conveyor	**MAJOR NEGATIVE IMPACT**	**MINOR TO NEGLIGIBLE NEGATIVE IMPACT**
Reduced Water Quality and Availability for People, Agriculture and Livestock Resulting from Mine Activities (Water Use, Dewatering, Contamination)	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**
Reduced Community Health and Safety Resulting from Project Activities, Air, Water, Noise and Traffic Impacts as well as the Presence of Outsider Contract Workers	**MODERATE NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**
Visual and Landscape Impacts		
Impacts to the Landscape and Visual Environment during the Decommissioning Phase of the Proposed Project	**MAJOR NEGATIVE IMPACT**	**MODERATE TO MINOR NEGATIVE IMPACT**
Heritage Impacts		
Disturbance of Graves or Loss of Access to Graves Resulting from Placement of Project Infrastructure and Related Safety Risks	**MAJOR NEGATIVE IMPACT**	**MINOR NEGATIVE IMPACT**
Impacts on Section 36 Burial Grounds and Graves	**MINOR TO MODERATE NEGATIVE IMPACT**	**POSITIVE IMPACT**
Impacts on the S.36 005 and S.36 008 Burial Grounds	**MINOR TO MODERATE NEGATIVE IMPACT**	**POSITIVE IMPACT**

Table 10.51 Summary of Impacts for Post Closure

Impact	Significance (pre-mitigation)	Residual Impact Significance
Socio-economic Impacts		
Homesteads and their Residents will be displaced as a Result of the Proposed Project Footprint as well as Potential Air and Noise Impacts related to Proposed Project Activities	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**

Loss of Productive Land and Related Current and Future Income Opportunities as a Result of Proposed Project Infrastructure and the Division of Farms by the Overland Conveyor	**MAJOR NEGATIVE IMPACT**	**MINOR TO NEGLIGIBLE NEGATIVE IMPACT**
Reduced Water Quality and Availability for People, Agriculture and Livestock Resulting from Mine Activities (Water Use, Dewatering, Contamination)	**MAJOR NEGATIVE IMPACT**	**MODERATE NEGATIVE IMPACT**

11 ASSESSMENT OF CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts are those impacts that act together with other impacts (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the proposed Kangra Coal Kusipongo Resource Expansion Project. Cumulative impacts are therefore generally impacts that act with others in such a way that the sum is greater than the parts. This is, however, not always the case – sometimes they will simply be the sum of the parts, but that sum becomes significant.

This chapter considers the cumulative impacts that would result from the combination of the proposed Project and other actual or proposed future developments in the broader Study Area.

11.1 DEVELOPMENT CONTEXT

In addition to the proposed Kusipongo Resource Expansion Project, the Study Area may experience cumulative impacts as a result of existing and proposed developments in the broader Study Area. This section provides an overview of these developments.

Existing activities that could cumulatively impact on the social, physical and biophysical environment include:

- **Kangra Coal Current Mining Activities** – Kangra Coal has been extracting coal from the Savmore Colliery and operating the current washing plant neighbouring the Driefontein community since the late 1990's. The Savmore Colliery currently operates on the Maquasa East, Maquasa West and Maquasa West Extension properties. Current operations entail both underground and open pit mining methods, which produce less than five million tons per annum (Mpta) run-of-mine (ROM) of which 70% is product and 30% discard.

- **A Worked Out Mine** – the mine is situated on the banks the Hlelo River approximately 11km downstream of the proposed main mine adit site (26°58'26.34'' S 30°20'02.88'' E).

- **A Worked Out Mine** – the mine is located on the farm Taaiboschspruit on the northern border of the Hlelo River catchment, about 16.5km (along the length of the river) from the confluence with the Hlelo River (26°51'08.28'' S 30°20'28.75'' E).

Furthermore, the following **developments are proposed** in the Study Area:

- **Kangra Coal Maquasa Expansion** – Kangra Coal has plans to expand existing operations to include eight new opencast pits; the expansion of

existing opencast pits; two new underground mining areas and expanded discard dumps. The new operations are planned to take place on Kangra Coal's Nooitgezien and Maquasa West farms, while extensions will happen on Maquasa and Roodekraal farms, which neighbour Driefontein.

- **New Storage Dam** – the construction of a new storage dam in the Hlelo River, capacity 4.2 million m^3, about 5km downstream of the site proposed for the main mine adit.

These cumulative factors may exacerbate the impacts identified in *Chapters 9* and *10*. Where these impacts may be intensified by these cumulative factors they are discussed in the following sections.

Given the limited detail available regarding such future developments, the assessment that follows is necessarily of a generic nature and focuses on key issues and sensitivities, and how these might be influenced by cumulative impacts with other planned development.

11.2 SOILS

While there are agriculturally productive soils in the Study Area, they are not being extensively *utilized* at present. The most potentially serious cumulative impact relating to soils in the Study Area would be if current mining activities and/or future development activities result in medium to long-term exposure of bare soils without any preventative measures put in place, as this would lead to increased soil erosion and subsequent downstream impacts. This would be especially serious in the vicinity of any of the streams in the area, such as along the conveyor route.

11.3 SURFACE WATER

The Ohlelo and Assegaai River Catchments have been identified by the Department of Water Affairs as being important catchments in the country, as they are a key source of water supply to industry, commercial agriculture and rural communities in the Study Area.

The surface water data for the Ohlelo Catchment show that surface water has been slightly affected by mine drainage in the Ohlelo River, but the water generally conforms to the derived RWQO. The surface water data for the Assegaai Catchment show that surface water has been impacted by neutral mine drainage, but the water generally conforms to the derived RWQO.

With further mining developments in the Study Area, these catchments are likely to come under increased pressure, not only in terms of water abstraction/discharge, but also in terms of the potential contamination of these rivers by diffuse sources of pollution.

On this basis, there is potentially significant cumulative surface water impacts associated with increased development in the Study Area.

11.4 GROUNDWATER

11.4.1 Identified Cumulative Impacts

The cumulative impacts that would result from a combination of the proposed Project and other actual or proposed future developments in the broader Project area include:

- Long term cumulative impacts on surface and groundwater quality, and
- Long term cumulative impacts on streams and wetlands.

Each of these potential cumulative impacts is summarised below.

Impacts on Surface- and Groundwater Quality

The proposed Kusipongo Project is located mainly in the quaternary catchment W52A (Hlelo River), whereas existing and other planned Kangra Coal operations are located in W51B (Assegaai River) with the exception of the planned open cast operation at Nooitgezien, which are also located in W52A.

Cumulative impacts to surface- and groundwater quality from both Kusipongo and Nooitgezien operations therefore have the potential to negatively impact the Hlelo River (the Ohlelo River is a tributary to the Hlelo River) and any downstream water users and ecosystems.

Impact of Reduced Baseflow on Streams and Wetlands

Modelling indicates the potential for impacts on the Kransbank wetland as a result of spring- and baseflow reduction associated with the proposed Kusipongo Resource Expansion Project. Planned opencast operations at Nooitgezien, as well as the currently operating underground mine at Maquasa West similarly have the potential to negatively impact baseflow to the Kransbank wetland due to their location.

The cumulative impacts of these operations have the potential to significantly compromise the Kransbank wetland which is dependent on recharge from groundwater and surface water (streams, springs), which is in turn largely fed by groundwater. Ecosystem processes, particularly those related to wetlands, are highly dependent on the presence of water and consequently a reduction in the supply of water will have a detrimental effect on these.

11.5 AIR QUALITY

Cumulative air quality impacts that would result from a combination of the proposed Project and other actual or proposed future developments in the broader Study Area include:

- Current mining operations at Maquasa;
- Expansion of the Maquasa works to include the expansion of existing opencast pits as well as the addition of eight new opencast pits; and
- The proposed underground mining through these open pits.

Air pollution emissions from the existing surface infrastructure located on the Maquasa East, Maquasa West and Maquasa West Extension properties will contribute to the air pollution levels in the greater air-shed. Fine airborne particulate matter constitutes the main pollutant of interest; however, gaseous combustion products (carbon dioxide, carbon monoxide, sulphur dioxide and oxides of nitrogen) would also contribute to the contamination of the air-shed.

Opencast coal mines can potentially result in significant particulate impacts, and could result in elevated annual average air concentrations of about 25µg/m³ at distances of up to 3km from mining activities (average taken from previous Airshed air quality impact studies of opencast coal mines in South Africa).

Since the closest existing mine is at Maquasa West, which is approximately 6km east of the underground mine operation, it is expected that the existing background concentration would be less than 25µg/m³. This is similar to the value reported in the State of the Air Report for 2005 (DEA 2009b), *viz.* about 15 to 20 µg/m³ for annual average PM_{10} concentrations. A current concentration of 20µg/m³ was therefore assumed for the cumulative impacts in the vicinity of the proposed mining operation. Obviously, the PM_{10} air concentrations along the proposed overland conveyor system would increase when approaching the existing Maquasa West mine. However, it was predicted that the impact of airborne particulates from the conveyor belt would be minimal. The most significant emissions are expected at transfer points.

Accounting for this existing particulate air presence, the cumulative impact at the site of the proposed Project could be significant (i.e. in excess of the standard) at downwind distances of up to 500m instead of the estimated 300m after mitigation.

On this basis, there is potentially significant cumulative air quality impacts associated with increased mining development in the Study Area.

11.6 NOISE

Noise emissions associated with the proposed Project will cumulatively add to the noise levels from existing mining operations as well as any future

operations proposed in the Study Area. However, these cumulative noise increases will generally be negligible unless the proposed activities falls within the same zone of influence identified in this ESIA.

11.7 BIODIVERSITY

The main cumulative impact on biodiversity considered in this report is:

> Loss of Vital habitat due to the further dewatering of the plateau grasslands and wetlands within the Kransbank Private Reserve as a result of sub-surface mining

There is a possibility that the further removal of large volumes of coal sub-surface will change the hydrology of the plateau and valley bottom wetlands – leading to the drying of seeps, springs and drainage lines and a change in the character and quality of grassland habitats. There are a number of mining applications for this region, including Kangra Coal's extension of the Maquasa West with a number of open cast pits and underground mining.

This ESIA identified that groundwater is feeding numerous surface water features in the Study Area including springs, wetlands, streams and rivers. Furthermore, groundwater results suggest significant impacts on wetlands and streams, especially the Ohlelo, in the area of the proposed mine due to the mining induced groundwater level drawdowns, which result in a decrease of base flow to these streams supplied by groundwater. This affects a large area of wetlands located in the Ohlelo Valley, including the Kransbank wetland. The "end of mining" model results suggest that groundwater is not providing any base flow to wetlands in the valley; under baseline conditions groundwater provides base flow for just under 50% of the total area occupied by wetlands.

If further development in addition to the current application is approved for the area, the impact on the wetland habitat and the species it supports is considered to be of major significance, with these systems being completely altered or lost. Numerous species are reliant on these systems. For example, avifaunal species potentially affected are the two crane species, Denham's Bustard *Neotis denhami* and Black-bellied Bustards *Lissotis melanogaster*, White-bellied Korhaan *Eupodotis senegalensis*, Secretarybird *Sagittarius serpentarius*, Yellow-breasted Pipit *Anthus chloris* and Black-winged Lapwing *Vanellus melanopterus*. There is also the potential for significant impacts on the local population of some, if not all, of these species (depending on the extent of plateau grassland affected).

In addition to this, the proposed Project is mainly located at the start of the W52A catchment, in which there is currently very limited development and still has large tracts of natural habitat remaining. Establishment of further developments in this area would open it up for further potential

contamination, and potential cumulative impacts on habitats, wetlands and associated ecology of the region.

The groundwater section of the ESIA showed that the current mining activities from Maquasa West have potentially resulted in an impact (in the form of acid rock drainage) to groundwater, which could result in impacts to surface water systems downstream. Contamination by acid rock drainage from additional mining operations is therefore possible, which could potentially impact on the Ohlelo System.

Additional Cumulative impacts include:

- **A Decrease in Faunal Diversity from Habitat Loss and Fragmentation** – the development of the mine together with other developments (both current and proposed) have the potential to cumulatively impact on fauna in the broader Study Area. This is associated with a potential influx into the area. Along with the influx of people come an array of anthropogenic impacts such as increased pressure on local fauna through persecution and poaching. Increases in domestic animals may negatively affect faunal diversity. Domestic dogs and cats out-compete native carnivores and actively predate many indigenous species. Furthermore, increased development in the Study Area results in isolation of natural areas, which may lead to decreases in faunal diversity, not only locally, but on a regional scale through population declines as a result of genetic isolation. These impacts should be considered to be of major significance considering the location of the Project Area within a relatively pristine area of the already fragmented and threatened grassland biome.

- **Agriculture** – currently agricultural activities in the greater area result in organic enrichment and higher turbidity levels in the smaller streams. Although these levels were not excessive in the system, the accumulative effects from agriculture and mining can result in increased stress on biota, decreased immunity and in some cases toxicity. There is also a risk of effect from additional pesticide contamination in crop farming vicinity, although this was not measured in the baseline ecological report.

- **Existing River Crossings –** there are many existing gravel river crossings by gravel roads with in-channel supports. These crossings can change the flow regime downstream and add to sediment load in the rivers. Changes in flow and water quality can impact on the type and abundance of taxa in the river and the biotopes they utilize. Through increased development within the area the probability that more road networks and therefore river crossing, will be required.

11.8 SOCIO-ECONOMIC

The cumulative impacts that would result from a combination of the proposed Project and activities identified in *Section 11.1* above include:

- Continual Requirement for Land in the Area;
- Impacts on Homesteads and Adjacent Fields and Graves;
- Loss of Land for Grazing and Agriculture;
- Further Undermining of Relationships of Trust between Communities and Kangra Coal's;
- Reduced Water Quality and Availability in the Area;
- Increased Risks to Community Health and Safety;
- Disruption of Community Access;
- Increased Expectations of Employment Opportunities and Community Benefits; and
- Further Undermining of Tourism Potential in the Area.

Each of these potential cumulative impacts is described below.

Continual Requirement for Land in the Broader Study Area

When looking at the mapping of new opencast pits, underground workings and waste dumps in conjunction with the Kusipongo Resource Expansion mapping, it would be reasonable to anticipate the identification and proposed mining of further coal deposits in the area besides those already identified. If this happens the entire nature of the area will be changed over time from rural (green field) to industrial (brown field). The quality of life of communities and individuals living and owning land in the area would be significantly undermined, as would their livelihoods.

Impacts on Homesteads and Adjacent Fields and Graves

There are not many additional homesteads within the newly identified cumulative areas of influence. However there are a few that are visible and that would be impacted and probably need to be resettled in order to secure their health and safety. Based on the current survey it's likely that these homesteads would have associated fields and graves attached to them.

The resettlement process would need to follow the same recommendations as those outlined in the Impact section of this report.

If, over time, the majority of land between current Maquasa operations and Kusipongo planned operations will be mined then it would be appropriate, in discussion with affected communities to identify and purchase alternative farm land of the same financial and natural resource value and to resettle communities as a whole, rather than to disrupt relationships and livelihoods with piecemeal resettlements at on-going intervals.

Loss of Land for Grazing and Agriculture

Additional land-take for mining activities will reduce the amount of land available for agriculture and livestock grazing. Although the new areas of

activity lie on Kangra Coal's land and would not impact on CPA grazing, there are residents who use the land for their livestock, albeit on a small scale.

Aerial images show at least one large livestock watering point, which would be lost.

A continual reduction in available land for agriculture and grazing will increase pressure on remaining resources in the area. This could also affect people's food-security and aspects of their livelihood strategies.

Further Undermining of Relationships of Trust between Communities and Kangra Coal

There are already high levels of mistrust towards Kangra Coal from local residents. The addition of a new project, which has further land-take implications and which will add to the changes in the sense of place of the area as well as levels of noise and other aspects of resource pollution, is likely to feed into people's suspicion that they are being incrementally overtaken by mining activities.

The fact that there will be new information circulating in the community with new maps and new employment figures and a host of new concerns for local residents, needs to be sensitively addressed with a comprehensive communication and engagement approach to avoid confusion and increased levels of mistrust and suspicion.

Any lack of fulfilment of Kangra Coal's commitments in current operations or in relation to the proposed Kusipongo Resource Project will also have knock-on effects when approaching the social aspects of future projects.

Reduced Water Quality and Availability in the Study Area

Additional water use and extraction of water from opencast pits and underground operations, particularly in an area where the water table is already very shallow, may increase the impacts on water availability in the current Zones of Influence as the drawdown area expands.

Additional issues of ARD are likely to have cumulative impacts on water in the catchment and downstream of activities. These will affect downstream water users, possibly including the Heyshope Dam.

Increased Risks to Community Health and Safety

Cumulative impacts on air quality, water quality and noise, as well as increased traffic in the area could increase health and safety risks for local residents. An influx of employment-seekers with concomitant changes in social behaviour and increased risks of the spread of communicable diseases also increases health and safety risks.

Disruption of Community Access

Aerial images of footpaths between farms and homesteads, plus social research in the Study Area, highlight the common movement of people across the Study Area for social and livelihood reasons. Establishing underpasses across the conveyor mitigates some of this impact. However, if new mining activities and related infrastructure further restrict access for safety reasons, the establishment of underpasses becomes insignificant.

Increased Pressure on Service Delivery in Driefontein

Pressure on service delivery and infrastructure in Driefontein has not been identified as an impact of major negative significance. However, if there are numerous possible employment opportunities (actual or perceived) then the migration of job-seekers to Driefontein may become a significant impact for authorities attempting to supply services and meet infrastructural needs in the area.

Increased Expectations of Employment Opportunities and Community Benefits

If numerous mining projects take shape in the broader Study Area, local residents' expectations of employment opportunities and community benefits are likely to be fuelled. If, as in the past, these expectations are not met, the possibility of conflict between residents and the company, or between residents and "outsiders" could increase.

Further Undermining of Tourism Potential in the Area

Cumulative mining impacts in the broader Study Area may over time preclude any potential tourism development. In addition, cumulative water quality impacts could affect the largemouth bass fishing at the Heyshope Dam.

11.9 VISUAL

The cumulative impacts that would result from a combination of the proposed Project and other actual or proposed future developments in the broader Study Area include:

- Additional change in the character and the visual resource value of the landscape, since more man-made structures will be introduced into the area;

- A change in the sense of place of the Study Area as the area will become more urbanised;

- Increased visual impact at night caused by the combination of the different light sources, especially referring to the glow created by the mining activities as well as the surrounding communities such as Driefontein; and

- Increased development in the area will result in excessive dust emissions, since more vehicles will be driving on unpaved roads, larger areas will be cleared of vegetation and the creation of more (potentially exposed) stockpiles.

11.10 HERITAGE

Increased development in the greater Study Area will have a number of cumulative impacts on heritage resource. For example, tourism and mining could, over the long term, increase human activity that could change, alter or destroy heritage resources.

Other identified cumulative impacts would result from the Maquasa Mine Expansion Projects. The development of the proposed Project and the continual mining at the Savmore Colliery through Maquasa East, Maquasa West, and Maquasa West Extension, would result in cumulative impacts on heritage resources.

Cumulative impacts that could result from a combination of the proposed Project and other actual or proposed future developments in the broader Study Area include:

- **Site Clearance and the Removal of Topsoil** – could result in damage to or the destruction of heritage resources that have not previously been recorded. Heritage resources such as burial grounds and graves and archaeological and historical sites are common occurrences within the greater Study Area. These sites are often not visible and as a result, can be easily affected/lost.

- **Increased Human Activity** – allows increased access to nearby heritage resources. Furthermore, many heritage resources in the greater Study Area are informal, unmarked and may not be visible, particularly during the wet season when grass cover is dense. As such, construction workers may not see these resources, which results in increased risk of resource damage and/or loss.

- **Increased Atmospheric Emissions** – the continued operation of the Savmore Colliery and the establishment of the proposed Maquasa Mine Expansion Project together with the Kusipongo Resource Expansion Project may potentially result in increased atmospheric emissions (dust and particulate matter) in the greater Study Area. These emissions could

result in a change to the integrity of tangible heritage resources such as rock art sites located in the broader Study Area. Rock art sites can become covered with coal dust which would result in a change to the integrity and authenticity of the heritage resource.

- **Vibrations and Earth Moving Activities associated with Mining** – has the potential to crack/damage rock art covered surfaces, which are known to occur in the greater Study Area.

- **Dewatering of Mine Workings** – has the potential to exfoliate and dry-out rock art sites.

- **Impacts to Paleontological Resources** – no specific paleontological resources were found in the Project Area during the time of this study; however, this does not preclude the fact that paleontological resources may exist within the greater Study Area. As such, future developments have the potential to impact on possible paleontological resources in the area.

- **Subsidence** – Potential subsidence of existing and proposed underground mine workings, has the potential to result in the collapse of burial ground and graves in the Study Area.

11.11 MITIGATION

The following management measures should be considered to help mitigate cumulative impacts:

- Current and prospective mining developments in the broader Study Area should (when applicable) form a Water Committee to manage water resources on a collaborative basis. The committee should share a collective responsibility for monitoring groundwater levels, surface water flows and water quality. The Water Committee has the responsibility of sharing data and further ensuring the sustainable use of the collective resource.

  Representatives of the Water Committee should include the mine environmental managers, mine operational managers, Non-governmental organisations and representatives of Local and Regional and Potentially National Government.

- The establishment of a Regional Mining Forum, where mining companies in the area can discuss community relations, environmental performance share lessons learnt, align strategies, seek efficiencies across the delivery of local benefits and help improve cooperation in the pursuit of sustainability

goals. These meetings should be transparent and collaborative where the sharing of data is recommended.

- It is recommended a Strategic Impact Assessment be undertaken, which would enable a comprehensive consideration of potential impacts that may result from the development of the mining industry in the region. Such an assessment would ideally feed into land use zoning, analysis of infrastructure, utility and social service needs. In addition this type of assessment would consider the cumulative impact to bio-physical and social receptors of the potential impact on water resources. Such an integrated and holistic approach would prevent isolated and iterative decision-making. This assessment would ideally be led by the National or Provincial Government.

- Monitoring of change, which would allow for the proactive management of negative trends that could arise over time. This would require the establishment of a monitoring capability within local government and a set of indicators that would allow the positive and negative impacts associated with change to be tracked.

- When appropriate, community development/benefit initiatives should be aligned between different developments parties. This will ensure that investment is made in a sustainable and strategic manner helping to maximise its benefits.

- Alignment of recruitment between current and prospective mining developments in the broader Study Area should be undertaken, as this will help to ensure that there is a viable labour pool of local employees for companies and help to build the skills and experience of local people.

12 CONCLUSION

Kangra Coal currently operates the Savmore Colliery on their Maquasa East, Maquasa West and Maquasa West Extension mining licenses, located in the Gert Sibande District Municipality, Mpumalanga. The Savmore Colliery is located approximately 51km west-south-west of Piet Retief and 64km south east of Ermelo. Current mining operations have sufficient reserves for approximately the next 3 to 4 years. As such, Kangra Coal proposes to expand their existing mining operations on these existing mining licenses to include the addition of eight new opencast pits, two new underground mining areas and the provision of an expanded or new discard dump(s). In addition to this, Kangra Coal propose to develop the Kusipongo coal resource (the proposed Project), situated to the west of existing operations. The establishment of these proposed Projects would extend the life of mine for approximately an additional 10 to 20 years, thus ensuring the continued provision of coal to both local and international markets.

Coal plays a crucial role in the provincial economy of Mpumalanga and contributes approximately 18.4% to the Gross Domestic Product (GDP) of the Gert Sibande District Municipality. The District Municipality, in its Integrated Development Plan (2009-2010), has noted that in order to enhance local economic development, the agricultural, mining, manufacturing and tourism sectors should be promoted and supported.

Both the Mkhondo Local Municipality IDP (2010/2011) and the Dr. Pixley Kalsaka Seme Local Municipality IDP (2009 – 2012), recognise the importance of mining as a key economic sector within these two Local Municipalities. However, both IDP's recognise the significant challenges they face in balancing the needs of environmental protection with the economic and developmental needs of the Region.

This Project is not immune to these same challenges. It is recognised that the proposed Kusipongo Resource expansion is situated in an area that has been earmarked by numerous stakeholders (both Regional and National) as an area that needs to be conserved. According to the Mpumalanga Biodiversity Conservation Plan (C-Plan) (developed by the Mpumalanga Parks and Tourism Authority), a large proportion of the grasslands in which the Project is proposed (29%) are considered *irreplaceable* and there is thus an urgent need for their protection. In addition, the area of the proposed Project falls within the Ekangala / Grassland Biosphere Reserve, which is recognised as an Important Bird Area (IBA). This IBA is described as being one of the most important biodiversity areas in Africa, spanning 800 farms. As such, a Section 49 Application has been lodged, and is currently being considered by the Mpumalanga DMR, which proposes an exclusion area of 233,393ha covering 120 farms in the Mkhondo and Dr. Pixley Kalsaka Seme Local Municipalities. The reasoning behind this Section 49 Application is that, firstly, the area is considered critically important from a water production perspective;

secondly, the area is largely classified as irreplaceable grasslands by the Mpumalanga C-Plan; thirdly the area is located in endangered and vulnerable threatened ecosystems (in terms of National Environmental Management Biodiversity Act (Act No. 10 of 2004)); and lastly, the area falls within provincial and national priority protected area expansion zones.

Conversely, the proposed Project is a key strategic project for Kangra Coal, given that the existing operation is approaching depletion (in 3 to 5 years' time). As such, new resources are required to maintain their current levels of production; the Kusipongo resource (this Project) and Maquasa extensions have been identified as feasible options to extend the life of the Colliery.

In addition, and in support of the developmental needs of the Local Municipalities, District and Mpumalanga Province, as described in their respective IDPs, this Project will contribute to export earnings, will result in the retention of approximately 750 jobs and the creation of an anticipated 450 jobs during the construction phase (of 18 to 24 months in duration), and will continue to result in a contribution to the local economy through the provision of local employment and its requirement for other services.

In recognition of these sensitivities, this ESIA for the proposed Kusipongo expansion has attempted to identify all impacts, and propose rigorous mitigation measures to both enhance positive impacts, and reduce negative impacts.

It is also recognised that some limitations to this ESIA study remain. These limitations, and a plan to address such limitations, include the following:

Public Consultation

As is mentioned in *Chapter 6*, the PPP, although comprehensive and meeting legislative requirements, has experienced several constraints, which have required adaptation in terms of the process implemented, but will require further careful management should a positive approval be received:

- Proactive identification of stakeholders has not included downstream water users, although their registration has been promoted through advertising (undertaken during the Scoping Phase of the study). One of the key findings of the SEMP is that there will be an impact on water availability / quality in the Ohlelo River (which has its confluence with the Hlelo River approximately 25km downstream from the main mine adit) as a result of dewatering operations. A Water Use License application (WULA), and associated processes, is being undertaken in parallel to this ESIA.

- The meeting with the Driefontein Community during the Scoping Phase of the project was disrupted due to frustrations over the lack of benefits the community is receiving and the impacts that the mine has historically had on the people. It was therefore necessary during the Impact Assessment

Phase of the project to adopt a different engagement approach. Kangra Coal has established a Community Forum through which regular meetings between Kangra Coal and the Driefontein Community are now held. These parties were engaged as part of the feedback process. Continued notification of registered Driefontein community members has, and will, continue as part of the ESIA process.

- Given service delivery protests in the area, it was not possible to hold the preliminary feedback meetings with Key I&APs before the SEMP was submitted to DMR on 27 May 2013. Subsequent feedback meetings with such I&APs have been held between 26th and 31st July 2013 and an Amended SEMP will be submitted to DMR within the prescribed timeframes. ERM therefore believes that I&AP concerns have been adequately addressed in the said report against which the DMR is to make a decision.

- Participation at many of the stakeholder meetings has been relatively poor, specifically the regulatory authority meeting (on 31st July 2013) for which there were no attendees. Although encouraged, consultation with the regulatory authorities has been very limited. It is assumed that this will be addressed through the authority review process when comment is sought from the relevant competent authorities.

Groundwater Model

Simplifications had to be made with regards to the modelled hydrogeological regime due to a lack of sufficient field data (i.e. limited drilling and aquifer testing programmes). Although this is not atypical for a project of this nature, further groundwater level monitoring data, mine dewatering data, and longer term ARD leach tests will serve to improve model predictions, and therefore the level of confidence with all such predictions.

To manage these limitations, a management condition of this SEMP is that the conceptual and numerical model be routinely refined, updated and validated by incorporation of on-going monitoring data. In this way, the confidence in predictions can be increased, updated and translated into updated water management programmes, supporting risk management and post-closure planning.

Summary

Both the Mkhondo Local Municipality IDP (2010/2011) and the Dr. Pixley Kalsaka Seme IDP (2009 – 2012), recognise the importance of mining as a key economic sector within these two Municipalities. However, both IDP's recognise the significant challenges they face in balancing the needs of environmental protection with the economic and developmental needs of the Region.

This project is not immune to these challenges. This ESIA has therefore attempted to describe both the benefits of the proposed Kusipongo Resource expansion Project as well as the environmental and social sensitivities associated with it. Where impacts are identified, detailed mitigation measures to reduce the significance of these impacts are described; in the case of positive impacts, measures to enhance such positive impacts are provided.

Kangra Coal recognise these sensitivities, and have provided a written undertaking to implement the measures prescribed in this SEMP (as provided in *Part II*, *Chapter 19*) as a demonstration of their commitment in implementing all such mitigation measures.

ERM recommends that the Mpumalanga Department of Minerals and Resources, the National Department of Environmental Affairs and the Mpumalanga Department of Economic Development, Environment and Tourism consider both the benefits and the sensitivities associated with the proposed Kusipongo Resource Expansion Project, so that an informed decision be made in this regard.

Social and Environmental Management Programme **PART II**

Management Programme

13 ENVIRONMENTAL AND SOCIAL MITIGATION AND MONITORING MANAGEMENT PLAN

This Chapter provides a summary of the environmental and social mitigation/management and monitoring conditions (and associated cost estimates) applicable for the proposed Kusipongo Resource Expansion Mining Project. These conditions stem from *Chapter 9* and *10* in *Part I* of this SEMP.

13.1 ENVIRONMENTAL MITIGATION AND MONITORING MANAGEMENT PLAN

Table 13.1 and *Table 13.3* below respectively provide a summary of the mitigation/management measures and monitoring measures applicable for the physical and biophysical environment, together with the corresponding management objectives, key performance areas, roles and responsibility and applicability in terms of the Project phases.

The cost estimates have been derived through estimates provided by Shanduka Coal for their Wonderfontein Colliery and estimates have been derived through ERM's experience and involvement in previous projects.

Table 13.1 Management of Environmental Mitigation Measures during Construction

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
Environmental Control Officer	Construction	Ensure conformance to the SEMP, environmental permits/authorisations and applicable legislation	Conformance to Project Standards	N/A	960,000 (this cost is total cost to company)
			Soils		
Soil loss	Construction	Maintain land quality	No erosion detected from the Adit A site, or along the conveyor route No noticeable increasing trend in turbidity of surface waters during construction.	All usable soil material to be stripped and stockpiled and re-vegetated for later use during rehabilitation	150,000
				Wetland soils will be avoided as far as possible	
				Clearing of vegetation in any given area will only occur immediately before construction is due to commence in that area the medium to long-term exposure of open bare soil surfaces will be avoided	
				Water will be directed off the road at regular intervals to avoid erosion	
			Surface Water		
Impacts to Water Quality at the main mine Adit A	Construction	Maintain a zero discharge policy for the Project Minimise wetland and river system impacts	Meet the prescribed RWQO for surface waters	Appropriate erosion control measures to be in place during site clearance.	Costing assumes construction of soil berm upstream of main mine adit to ensure segregation of dirty and clean water runoff .600,000
Impacts on the Quality of Surface Water Resources associated with the Proposed Ventilation Adit (Adit B)	Construction	Maintain a zero discharge policy for the Project Minimise wetland and river system impacts	Meet the prescribed RWQO for surface waters	During design and construction of the access road to the adit B site, storm water control measures (viz. flow retardation structures) should be provided to minimise the impact associated with erosion. Flow retardation structures will control run-off velocities (and subsequent erosion) by converting the flow pattern to sheet flow.	50,000
				During the construction phase, temporary stormwater control berms should be placed on the downstream perimeter of the adit B footprint, so as to minimise silt ingress into the receiving tributaries. Over flow from the temporary berm should be relatively clean.	
				Construction of adit B and associated access road should take place during the winter months. The adit B access road is to follow the alignment of existing tracks to the greatest extent possible.	
				The footprint of adit B is to be kept as small as possible. During construction, laydown areas for construction equipment, vehicles etc. are to be demarcated and no access outside of the demarcated area should be allowed.	
				The location of the actual ventilation adit should be located outside of the calculated 1:50 year floodline (refer to the Specialist Surface Water Study; Annex C.8).	
Impacts to streams, wetlands and surface water quality associated with the Proposed Overland Conveyor Route	Construction	Maintain a zero discharge policy for the Project Minimise wetland and river system impacts	Meet the prescribed RWQO for surface waters	When the gravel service road and conveyor crosses the ***wetland to the north of the Kransbank Private Nature Reserve*** the following mitigation measures will be adopted:	Costs will be included in detailed engineering design.
				The contractor's access path of no more than 5m wide comprising of steel tracks laid on plastic sheeting over a geofabric should be installed through the wetland systems where piles are to be installed. Once construction of the overland system is completed, the temporary construction "roadway" should be removed and vegetation re-instated. Vegetation re-instatement should be undertaken by a reputable ecologist.	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
				As the road approaches the 1:100 year floodline adjacent to the wetland, it will be diverted out to district road D2548	
				The access road that runs between the conveyor corridor and the district road will be unfenced, and built to the same standard as the conveyor gravel service road	
				The fence that restricts access to the conveyor corridor, including the service road, will come to an end outside the 1:100 year floodline as the conveyor gantry ramps up to cross the wetland	
				The gantry support structure consists of pylons that will be spaced approximately 23m apart within the 1:100 year floodline and wetland, which is the maximum distance they can be spaced to provide support to the structure	
				The base footing of each pylon will measure approximately 4m x 2m, and will be established lengthwise, parallel to the flow in wetlands	
				From these base footings, two columns will extend from each up to support the gantry.	
				The following environmental precaution measures will be adopted for ***other water/river crossings***:	
				Rectangular culverts will be installed in parallel (lengthwise in line with the flow);	
				Culverts will span the distance between the 1:100 year floodlines so that no damming occurs during flood conditions;	
				Erosion protection gabion structures will be installed at the entrance and exit points of culverts. "Reno" mattresses will also be installed so as to reduce flow velocities and turbulence; and	
				The service road will be narrowed to one lane (approximately 4m) over water crossings.	
Impacts to the main mine adit as a result of Storm water Runoff	Construction	Maintain separate dirty /clean water systems Maintain the integrity of the main mine Adit site with respect to storm water Zero discharge of dirty storm water in to the environment	Meet the prescribed RWQO for surface waters (by maintaining clean/dirty water separation).	Mitigation measures should be evaluated in terms of the requirements of GN 704 (DWAF, 1995) and guidelines in the Best Practice Guideline G1: Stormwater Management, DWAF, August 2006.	Costings for erosion control berms for the main mine adit included in the above. This coting assumes construction of soil berm upstream of main mine adit to ensure segregation of dirty and clean water runoff Costs will be included in detailed engineering design.
				During the construction phase, temporary stormwater control berms should be placed on the downstream perimeter of the Adit A footprint, so as to minimise silt ingress into the Ohlelo River and associated tributaries. Over flow from the temporary berm should be relatively clean.	
				The minimum required dam capacity to retain a 1:50 year stormwater run-off event for the dirty water catchment was calculated in the Specialist Surface water report (*Annex C.8*).	
				It is a requirement that all facilities associated with the Main Mine Adit be placed above the estimated 1:100 year floodline of the Ohlelo River.	
				In-built controls in the Project design (refer to *Chapter 3*) include the adequate design of drains, ditches, oil/water separators, and silt traps, the bunding of major contamination sources (fuel depot, temporary hazardous waste storage area), roofing of temporary hazardous waste areas etc.	
			Air Quality		
Construction activities associated with the Main Mine Adit	Construction	Minimise atmospheric emissions	Relevant ambient air quality regulations are met at identified sensitive receptors Relevant occupational air	Vehicles will be kept clean and free of residual dirt and mud, and wash down will continue before entering public roads	Certain mitigation measures will be included in detailed
				A speed limit of 45km/h will be implemented on unpaved surfaces to minimise the potential for dust to be raised	
				Wind breaks will be erected around the key construction activities	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
			quality regulations are met for applicable mine working areas Zero incidents of community complaints	All vehicles leaving and accessing the site carrying friable materials will be covered	engineering design. Ait quality mitigation during the construction period will amount to 1,500,000.
				Exposed areas prone to wind erosion will be minimised through vegetation, sheeting, boarding or the use of chemical binders	
				localised dampening and activity specific dampening will be used to reduce localised emissions of dust	
				Excessive stockpiling of material will be minimised	
				Removed topsoil will be stockpiled and vegetated so as to prevent wind erosion	
				Stockpiles will be well designed to minimise wind erosion and located as far as possible from receptors	
				Drop heights of material when stockpiling will be minimised	
			Noise		
Construction activities	Construction	Minimise noise emissions	Relevant ambient noise regulations are met at identified sensitive receptors Relevant occupational noise quality regulations are met for applicable mine working areas Zero incidents of community complaints	When working within a distance of 500m [1] of potential noise-sensitive receptors, the number of simultaneous noise emitting activities will be minimised	Maintenance of equipment is assumed to covered under engineering costs. Maintenance of noise abatement measure specifically costed at 1,600,000
				Communication channels will be established to ensure prior notice to the sensitive receptor if work is to take place close to them and to plan for working times to overlay with times when receptors are not at home	
				Equipment will be well maintained and fitted with the correct and appropriate noise abatement measures	
			Biodiversity		
Direct loss of wetlands and associated hydromorphic grasslands at Main Mine Adit A	Construction	Minimising the project footprint	No impact to valley bottom wetland	Placement of the waste rock dump of 108,000m^3 away from the valley bottom wetland (with a channel) and the 1:100 floodline of the Ohlelo River.	N/A
				Placement of the temporary contractors camp away from the valley bottom wetland to an alternative location	
				Placement of the fuel storage depot away from the valley bottom wetland (with a channel) at a point within the boundary of Adit A with a higher elevation	
				Placement of the emergency stormwater pond and sewage sludge drying beds out of the 1:100 floodline of the Ohlelo River	
Contamination of aquatic and wetland systems at Main Mine Adit	Construction	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	Clean and dirty water will be kept separate and no dirty water will enter any of the wetland/aquatic systems	Majority of these mitigation measures are covered above. Alien vegetation control is assumed at 1,200,000 during construction. Spill management and clean-up is assumed at 1,500,000
				The site plan for the Main Mine Adit and associated surface infrastructure will ensure dirty stormwater surface run-off is contained to prevent/ limit instances where this flows into the stream to the north of the site	
				Invasive or alien plant species will not be planted and will be controlled along all streams/rivers within the area of the Main Mine Adit	
				Ensure that access from the adit to the Ohlelo River system is prevented	
				Dust management measures during construction and operation of the Main Mine Adit will be implemented	
				A contingency plan will be in place for any accidental spillages	
				Adequate maintenance of equipment and facilities will be conducted regularly to prevent any leakages and spillages	
				Spillage/leaching of coal into the water system from the handling, temporary storage and transport of coal storage will be prevented	

[1] Studies have shown that noise measurements taken from construction activities indicated that noise levels are generally less than 50 dBA at distances in excess of 500m from where activities are been undertaken. Also refer to *Annex A*.

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
				An Integrated Waste Water Management Plan will also be compiled, approved and implemented	
				In the event of accidental spillages/leakages/leaching all proper measures will be taken to restore the area to its original condition	
Contamination of aquatic and wetland systems at Overland Conveyor System	Construction	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	Construction activities for the overland conveyor system will as far as possible take place during the drier winter months	ECO costs are included above. Spill costs have been included above. Other costs are assumed to be incorporated in engineering design.
				Natural flow regimes will not be altered during construction phase	
				Permits (Water Use Licenses) for disturbance of in stream and riparian habitats will be acquired from the Department of Water Affairs	
				All access tracks during construction will as far as possible cross streams at right angles and at a point where the stream bed is straight and uniform	
				The lay down of materials and equipment in the wetlands will be minimised	
				Construction activities will be limited to period of low flow	
				Excavation and filling activities along stream banks and channels will be minimised	
				Only materials that are clean, non-erodible and non-toxic will be used in construction areas within wetlands and their associated boundaries	
				Directing runoff directly into the wetlands will be avoided.	
				Exposed soil will be stabilised as soon as practicable	
				If necessary, road and trail approaches to stream crossings will be stabilised	
				During operation, the conveyer will allow for the unobstructed flow of water beneath	
				The conveyer will be enclosed when crossing wetland systems	
				Adequate maintenance of the overland conveyor system will be conducted regularly to prevent/minimise coal spillage	
				Regular clean-up operations along the overland conveyor system will be conducted	
				Proactive planning will be in place for any accidental coal spillages	
				Regarding the gravel service road that crosses the wetland to the north of Kransbank Reserve the following must be adhered to: As the road approaches the 1:100 year floodline or wetland buffer, whichever is greater adjacent to the wetland, it will be diverted out to district road D2548. The access road that runs between the conveyor corridor and the district road will be unfenced, and built to the same standard as the conveyor gravel service road. The fence restricting access to the conveyor corridor, including the service road, will come to an end outside the 1:100 year floodline or wetland buffer, whichever is greater. The gantry support structure consists of pylons that will be spaced approximately 23m apart within the 1:100 year floodline, wetland buffer and wetland. The base footing of each pylon will measure approximately 4m x 2m, and will be established lengthwise, parallel to the flow in wetlands.	
				The following environmental precaution measures will be adopted for other water/river crossings: Rectangular culverts will be installed in parallel (lengthwise in line with the flow). Culverts will span the distance between the 1:100 year floodlines (or wetland buffer). Erosion protection gabion structures will be installed at the entrance and exit points of culverts. "Reno" mattresses will also be installed so as to reduce flow velocities and turbulence. The service road will be narrowed to one lane (approximately 4m) over water crossings.	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
Potential loss of conservation important floral species	Construction	Maintain footprint of the mine infrastructure to a minimum Maintain land quality	Awareness training given to 100% of employees Zero incidents of unregulated off road driving or working outside of demarcated zones.	All footprint areas approved for development will be reinvestigated by a qualified botanist with appropriate field experience and locations of all conservation important species identified will be recorded and visually marked. These species will then be transplanted to areas outside the zone of impact	60,000 Other costs have been incorporated above.
				Alsophila dregei (Tree fern) should be conserved *in-situ*	
				Protected Species will require permits for removal/destruction	
				Biodiversity and conservation awareness will be incorporated into the training and induction programmes	
				The footprint area and construction lay down areas will be clearly demarcated and no entry in the surrounding areas will be allowed	
				Only a single pre-approved access road to each of the sites will be used – no off road driving will be permitted and a fining system will be enforced	
				Topsoil removed during the initial phases will be used in any rehabilitation efforts required during and after the construction phase	
Increase in alien and invasive species	Construction	Maintain land quality Eradication of alien invasive species on mine site	No evidence of the growth and regrowth of alien invasive species in all those areas covered by the mine infrastructure footprint	An Alien and Invasive Management component to the overall environmental programme will be developed for the proposed Project	Alien vegetation management included in costs above.
				Rehabilitation materials will be sourced from reliable suppliers that can certify limited to no weed presence	
				Awareness raising and training of staff, specifically the Environmental Officer onsite will be undertaken	
				The intentional introduction of an alien plant species will not be considered for any screening effects, landscaping etc	
				No alien plant species or domestic animals such as dogs and cats will be allowed into the construction camps	
				Soil/topsoil stockpiles, the route of the proposed overland conveyor system, temporary construction camps, the Main Mine Adit and the Ventilation Adit will be continuously monitored for the presence of alien species	
Sensory disturbance and displacement of fauna	Construction	Minimise atmospheric and noise emissions	Relevant ambient air quality and noise regulations are met at identified sensitive receptors	Visual and noise attenuating screening of the Main Mine Adit site utilising species such as the hardy *Searsia* lancea (*Karree*) and possibly *Leucosidea sericea* (ouhout)	These costs have been taken into account above. Other costs are assumed to be incorporated in engineering design
				Equipment will be well maintained and fitted with the correct and appropriate noise abatement measures	
				The introduction of a noise component in the Environmental Awareness for employees and contractors	
				Lighting will be kept to a minimum and where possible directed downwards and operated by movement sensors - low visibility spectrum lights with minimal impact on fauna	
				Night time mining activities and travel during night hours will be limited	
				At the construction camp, minimal outside lighting will be installed at the entrances to the construction office trailers and staff sleep quarters to provide only safe access to these areas	
Species destruction	Construction	Maintain footprint of the mine infrastructure to a minimum Maintain land quality	Awareness training given to 100% of employees Zero incidents of unregulated off road driving, poaching or working outside of demarcated zones.	The areas requiring ground clearing will be surveyed for the presence of faunal species that could be translocated prior to the start of construction	Translocation of faunal species is assumed to amount to 50,000 Education and awareness training is assumed at
				The killing of animals will be discouraged and staff will be educated as to the correct protocol to follow in the event of a snake or other animal being encountered on site	
				Biodiversity education will also be implemented and fed into the surrounding community school programmes	
				Open trenches will always provide a means of escape for trapped animals such as a ramp at one end	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
				Driving behaviour must be changed to minimize the potential for road kill by doing the following: Increasing public awareness and helping people understand that preventing road kill will benefit the surrounding communities. Making traffic aware of hotspots (signage or rumble-strips and Physically or psychologically slowing traffic	60,000
				Decrease road kills by influencing wildlife behaviour: Minimise littering to discourage wildlife scavenging on roadsides. Preventing wildlife from crossing roads, at least when cars are present (ultrasonic whistles, reflectors, fencing at certain points). Where possible install underpasses and escape routes for wildlife.	
				Encourage the production of medicinal plants in nurseries to minimise the harvesting of important naturally occurring species.	
				Increase the visibility of power lines through the use of Key Tag Flappers.	

Table 13.2 Management of Environmental Mitigation Measures during Operations

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Surface Water					
Impacts to Water Quality at the main mine Adit A	Operation	Maintain a zero discharge policy for the Project Minimise wetland and river system impacts	Meet the prescribed RWQO for surface waters	The proposed Project has committed to a policy of Zero Effluent Discharge. This policy commitment will be maintained and enforced. In addition, Project activities will be routinely audited to ensure this policy commitment is maintained;	Water Management is assumed to be 4,200,000
				Appropriate management of dust and sweepings and the construction of hard-standing can be used to minimise potential runoff and interaction of water with coal in the study area;	
				Apply best-practice water management at the adit, eg. clean- and dirty water separation and appropriate containment of dirty water;	
				Dirty water to be recycled as far as practicable; otherwise to be evaporated.	
				Prevention of the erosion or leaching of materials from any residue deposit or stockpiles from any area and contain material or substance so eroded or leached in pollution control dams, or storm water control dams.	
				Line all containment facilities used to store contaminated water.	
				Inbuilt controls in the Project design should include the separation of clean and dirty runoff water; wash bays for cleaning of light and heavy vehicles will be installed that have both silt ponds and oily water separators; fuel storage and dispensing areas will be built as per the Project description (bunding, hardstanding, etc); temporary waste areas will be hardstanding, and the facility for the temporary storage of hazardous wastes will be covered by a roof.	
	Operations	Maintain a zero discharge policy for the Project Minimise wetland and river system impacts		In the operational phase, the entire raised section of the conveyor, which will have a bunded concrete floor, will contain any product (coal) spillages. The spillages will be swept to concrete bunded collection areas placed at ground level well outside of the 1:100-year flood level, on both sides of the crossing to shorten the sweep length. Spilled coal will be collected and returned to the Main Mine Adit.	240,000
Groundwater					

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Mine dewatering and decant	Operations	Maintain a zero discharge policy for the Project during operations	Meet the prescribed screening levels for groundwater Meet the prescribed RWQO for surface waters at the time Treatment of decant (if applicable) to meet the screening levels for groundwater, and the RWQOs for surface waters at the time.	Underground storage of groundwater in mined-out and abandoned sections of the underground mine in order to minimise mine inflow water that will need to be managed at Adit A during mine operation.	This is assumed under mine operational costs. Groundwater model development assumed at 300,000.
				Re-use of mine inflow water within the mine facilities, to limit uncontrolled discharges of water impacted by ARD into the surface water system during mine operation.	
				Practice clean/dirty water separation.	
				Routinely refine, update and validate the conceptual and numerical models developed in this study by incorporation of on-going monitoring data. The model developed as part of this specialist groundwater investigation has relatively low confidence due to the data limitations and provides conservative predictions. If the model is updated with operational data, the confidence in predictions of impact can be increased, updated and translated into mine management practices, supporting risk management and post-closure planning.	
Groundwater level change and impacts on groundwater users	Operations	High confidence understanding of the groundwater regime as a result of underground mining	Zero community impacts as a result of groundwater drawdown	Sealing of the adit post-closure to prevent decant at adit and allow groundwater levels to recover. However, if the seal fails, the impact on groundwater levels will be the same as if no seal was installed. For the purposes of this impact assessment, it is assumed that the seal will prevent groundwater from decanting and allow groundwater levels to rebound.	Monitoring is costed for at 250,000 Costs associated with groundwater model development as above
				Groundwater levels in the vicinity of the planned mine should be monitored on a regular basis throughout construction, operation and post-closure phases. Mine dewatering volumes/rates should also be monitored throughout the operational phase of the Project. The monitoring data should be stored in an appropriate data management tool/database.	
				If impact is confirmed by monitoring, impacts to the community's and farmer's water supply must be mitigated by Kangra Coal providing an alternative reliable, clean water supply.	
				Routinely refine, update and validate the conceptual and numerical models developed in this study by incorporation of on-going monitoring data. The model developed as part of this specialist groundwater investigation has relatively low confidence due to the data limitations and provides conservative predictions. If the model is updated with operational data, the confidence in predictions of impact can be increased, updated and translated into mine management practices, supporting planning of dewatering measures, risk management and post-closure planning	
Groundwater quality	Operations	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	The proposed Project has committed to a policy of Zero Effluent Discharge. This policy commitment will be maintained and enforced. In addition, Project activities will be routinely audited to ensure this policy commitment is maintained.	These costs have been taken into account above. Other costs are assumed to be incorporated in engineering design For additional Groundwater investigations it is assumed 500,000 for initial kinetic testing of coal
				Appropriate management of dust and sweepings and the construction of hard-standing can be used to minimise potential runoff and interaction of water with coal in the Study Area.	
				Apply best-practice water management at the adit, e.g. clean- and dirty water separation and appropriate containment of dirty water.	
				Rehabilitation of the adit after mine closure to limit on-going risk of water contamination.	
				Inbuilt controls in the Project design will include the separation of clean and dirty runoff water; wash bays for cleaning of light and heavy vehicles will be installed that have both silt ponds and oily water separators; and fuel storage and dispensing areas will be built as per the Project description (bunding, hardstanding, etc.).	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
				Based on the relatively low confidence of the ARD assessment, the following additional investigations will be undertaken: • Verify the metal leaching and neutralising potential of the overburden material (sandstone, clay, dolerite, and potentially small quantities of coal). • Conduct kinetic field tests on waste rock material to determine the duration of oxidation (and hence potential surface and groundwater contamination). • Subject to the results of the tests above, the waste management strategy will be reviewed.	seams and waste products (cost to be revised on an annual basis)
Reduced baseflow on surface water and wetlands	Operations	High confidence understanding of the groundwater regime as a result of underground mining	Zero community impacts as a result of groundwater drawdown	If the impact results in the loss of the community's and farmer's water supply the client has to provide an alternative reliable, clean water supply to the affected communities and/or farmers. No mitigations of the impact on wetlands and riverine ecosystems in the vicinity of the proposed Project are possible during operation.	Costs assume drilling of a maximum number of 3 boreholes initially at 500,000
Air Quality					
Coal handling and processing at the Main Mine Adit	Operation	Minimise atmospheric emissions	Relevant ambient air quality regulations are met at identified sensitive receptors Relevant occupational air quality regulations are met for applicable mine working areas Zero incidents of community complaints	Dust from crushers is normally controlled by water sprays and local exhaust ventilation from the crusher enclosure A screen design that minimizes dust escape will be adopted as far as practically possible It is recommended that hooding with scrubbers be used to achieve 75% emission reduction A semi-enclosed chute to transfer the material will be provided The transfer point will be tightly enclosed, and the dust-laden air will be exhaust from the enclosure through a duct and safely discharged	Costs are assumed to be incorporated in engineering design
Emergency generator sets	Operation	Minimise atmospheric emissions	Relevant ambient air quality regulations are met at identified sensitive receptors Relevant occupational air quality regulations are met for applicable mine working areas Zero incidents of community complaints	Consideration will be given to Lo-NOx Generators, which could typically reduce the emissions by 50%	Costs are assumed to be incorporated in engineering design
Overland conveying of coal	Operation	Minimise atmospheric emissions	Relevant ambient air quality regulations are met at identified sensitive receptors Relevant occupational air quality regulations are met for applicable mine working areas Zero incidents of community complaints	Conveyor belts are usually equipped with belt scrapers and belt washers When dust levels are high, a second or even third scraper will be added rather than trying to get a single scraper to work more efficiently	Costs are assumed to be incorporated in engineering design
Noise					

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Operational activities	Operation	Minimise noise emissions	Relevant ambient noise regulations are met at identified sensitive receptors	Communication channels will be established to ensure prior notice to the sensitive receptor if work is to take place close to them	1,500,000 – this cost include maintenance of operational mine equipment.
			Relevant occupational noise quality regulations are met for applicable mine working areas	All equipment will be well maintained and fitted with the correct and appropriate noise abatement measures	
			Zero incidents of community complaints	A noise component will be introduced to the Environmental Awareness education for employees and contractors	
Biodiversity					
Contamination of aquatic and wetland systems at Main Mine Adit	Operation	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	Clean and dirty water will be kept separate and no dirty water will enter any of the wetland/aquatic systems	Majority of these mitigation measures are covered above. Alien vegetation control is assumed at 250,000 Spill management and clean-up is assumed at 500,000
				The site plan for the Main Mine Adit and associated surface infrastructure will ensure dirty stormwater surface run-off is contained to prevent/ limit instances where this flows into the stream to the north of the site	
				Invasive or alien plant species will not be planted and will be controlled along all streams/rivers within the area of the Main Mine Adit	
				Ensure that access from the adit to the Ohlelo River system is prevented	
				Dust management measures during construction and operation of the Main Mine Adit will be implemented	
				A contingency plan will be in place for any accidental spillages	
				Adequate maintenance of equipment and facilities will be conducted regularly to prevent any leakages and spillages	
				Spillage/leaching of coal into the water system from the handling, temporary storage and transport of coal storage will be prevented	
				An Integrated Waste Water Management Plan will also be compiled, approved and implemented	
				In the event of accidental spillages/leakages/leaching all proper measures will be taken to restore the area to its original condition	
Contamination of aquatic and wetland systems at Overland Conveyor System	Operation	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	Construction activities for the overland conveyor system will as far as possible take place during the drier winter months	Spill costs have been included above. Other costs are assumed to be incorporated in engineering design.
				Natural flow regimes will not be altered during construction phase	
				Permits (Water Use Licenses) for disturbance of in stream and riparian habitats will be acquired from the Department of Water Affairs	
				All access tracks during construction will as far as possible cross streams at right angles and at a point where the stream bed is straight and uniform	
				The lay down of materials and equipment in the wetlands will be minimised	
				Construction activities will be limited to period of low flow	
				Excavation and filling activities along stream banks and channels will be minimised	
				Only materials that are clean, non-erodible and non-toxic will be used in construction areas within wetlands and their associated boundaries	
				Directing runoff directly into the wetlands will be avoided.	
				Exposed soil will be stabilised as soon as practicable	
				If necessary, road and trail approaches to stream crossings will be stabilised	
				During operation, the conveyer will allow for the unobstructed flow of water beneath	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
				The conveyer will be enclosed when crossing wetland systems	
				Adequate maintenance of the overland conveyor system will be conducted regularly to prevent/minimise coal spillage	
				Regular clean-up operations along the overland conveyor system will be conducted	
				Proactive planning will be in place for any accidental coal spillages	
				Regarding the gravel service road that corsses the wetland to the north of Kransbank Reserve the following must be adhered to: As the road approaches the 1:100 year floodline or wetland buffer, whichever is greater adjacent to the wetland, it will be diverted out to district road D2548. The access road that runs between the conveyor corridor and the district road will be unfenced, and built to the same standard as the conveyor gravel service road. The fence restricting access to the conveyor corridor, including the service road, will come to an end outside the 1:100 year floodline or wetland buffer, whichever is greater. The gantry support structure consists of pylons that will be spaced approximately 23m apart within the 1:100 year floodline, wetland buffer and wetland. The base footing of each pylon will measure approximately 4m x 2m, and will be established lengthwise, parallel to the flow in wetlands.	
				The following environmental precaution measures will be adopted for other water/river crossings: Rectangular culverts will be installed in parallel (lengthwise in line with the flow). Culverts will span the distance between the 1:100 year floodlines (or wetland buffer). Erosion protection gabion structures will be installed at the entrance and exit points of culverts. "Reno" mattresses will also be installed so as to reduce flow velocities and turbulence. The service road will be narrowed to one lane (approximately 4m) over water crossings.	
Potential loss of conservation important floral species	Operation	Maintain footprint of the mine infrastructure to a minimum Maintain land quality	Awareness training given to 100% of employees Zero incidents of unregulated off road driving or working outside of demarcated zones.	All footprint areas approved for development will be reinvestigated by a qualified botanist with appropriate field experience and locations of all conservation important species identified will be recorded and visually marked. These species will then be transplanted to areas outside the zone of impact	This has been covered under the construction phase which is more applicable with this impact
				Alsophila dregei (Tree fern) should be conserved in-situ	
				Protected Species will require permits for removal/destruction	
				Biodiversity and conservation awareness will be incorporated into the training and induction programmes	
				The footprint area and construction lay down areas will be clearly demarcated and no entry in the surrounding areas will be allowed	
				Only a single pre-approved access road to each of the sites will be used – no off road driving will be permitted and a fining system will be enforced	
				Topsoil removed during the initial phases will be used in any rehabilitation efforts required during and after the construction phase	
Increase in alien and invasive species	Operation	Maintain land quality Eradication of alien invasive species on mine site	No evidence of the growth and regrowth of alien invasive species in all those areas covered by the mine infrastructure footprint	An Alien and Invasive Management component to the overall environmental programme will be developed for the proposed Project	Alien vegetation management included in costs above.
				Rehabilitation materials will be sourced from reliable suppliers that can certify limited to no weed presence	
				Awareness raising and training of staff, specifically the Environmental Officer onsite will be undertaken	
				The intentional introduction of an alien plant species will not be considered for any screening effects, landscaping etc	
				No alien plant species or domestic animals such as dogs and cats will be allowed into the construction camps	

Impact Assessed	Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
				Soil/topsoil stockpiles, the route of the proposed overland conveyor system, temporary construction camps, the Main Mine Adit and the Ventilation Adit will be continuously monitored for the presence of alien species	
Sensory disturbance and displacement of fauna	Operation	Minimise atmospheric and noise emissions	Relevant ambient air quality and noise regulations are met at identified sensitive receptors	Visual and noise attenuating screening of the Main Mine Adit site utilising species such as the hardy *Searsia* lancea (*Karree*) and possibly *Leucosidea sericea* (ouhout)	These costs have been taken into account above. Other costs are assumed to be incorporated in engineering design
				Equipment will be well maintained and fitted with the correct and appropriate noise abatement measures	
				The introduction of a noise component in the Environmental Awareness for employees and contractors	
				Lighting will be kept to a minimum and where possible directed downwards and operated by movement sensors - low visibility spectrum lights with minimal impact on fauna	
				Night time mining activities and travel during night hours will be limited	
				At the construction camp, minimal outside lighting will be installed at the entrances to the construction office trailers and staff sleep quarters to provide only safe access to these areas	
Species destruction	Operation	Maintain footprint of the mine infrastructure to a minimum Maintain land quality	Awareness training given to 100% of employees Zero incidents of unregulated off road driving, poaching or working outside of demarcated zones.	The areas requiring ground clearing will be surveyed for the presence of faunal species that could be translocated prior to the start of construction	This has been covered under the construction phase which is more applicable with this impact
				The killing of animals will be discouraged and staff will be educated as to the correct protocol to follow in the event of a snake or other animal being encountered on site	
				Biodiversity education will also be implemented and fed into the surrounding community school programmes	
				Open trenches will always provide a means of escape for trapped animals such as a ramp at one end	
				Driving behaviour must be changed to minimize the potential for road kill by doing the following: Increasing public awareness and helping people understand that preventing road kill will benefit the surrounding communities. Making traffic aware of hotspots (signage or rumble-strips and Physically or psychologically slowing traffic	
				Decrease road kills by influencing wildlife behaviour: Minimise littering to discourage wildlife scavenging on roadsides. Preventing wildlife from crossing roads, at least when cars are present (ultrasonic whistles, reflectors, fencing at certain points). Where possible install underpasses and escape routes for wildlife.	
				Encourage the production of medicinal plants in nurseries to minimise the harvesting of important naturally occurring species.	
				Increase the visibility of power lines through the use of Key Tag Flappers.	

Table 13.3 Monitoring of Environmental Mitigation Measures

Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Surface Water				
Construction, Operation, Decommissioning and Post-closure	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	• Surface water quality will initially be monitored monthly. Monitoring frequency will be reviewed once monitoring data is available. • The list of chemical constituents to be analysed will be routinely updated based on previous results. Parameters to be tested include, but are not limited to: o Major constituents pH, EC, (if not measured in the field), TDS, Cl, SO4, NO3, total N, F, Ca, Mg, Na, K, total alkalinity, TPH and *E. Coli*. o Major metals by inductively coupled plasma – mass spectrometry (ICP-MS): Al, Cd, Co, Cu, Fe (Ferric and Ferrous iron), Mn, Ni, Pb, Sb, Zn, U. o Parameters identified as contaminants of concern include Sulphate, Iron, Cobalt Nickel. • In addition to the parameters detailed above, C1, 2 & 3in proximity of Adit A should be monitored for: o BTEX (benzene, toluene, ethylbenzene and xylenes); o EPH (extractable petroleum hydrocarbons); o GRO (gasoline range organics); o DOC (dissolved organic carbon); o COD (chemical oxygen demand); and o *E. coli*. • Samples will be submitted to a SANAS accredited laboratory within recommended holding times. • Water quality results will be compared to the water quality screening levels developed as part of this ESIA process (refer to Section 4.3.4 of Chapter 4) rather than to existing national screening levels • All monitoring records will be stored in a database which is routinely updated, maintained, and includes all metadata associated with the monitoring activities. • The monitoring programme and data will be reviewed annually and amended if necessary. (please refer to a detailed overview of the surface water monitoring programme including monitoring locations provided in Section 12.6 of Chapter 14)	Surface water monitoring costs are assumed at 360,000
Groundwater				
Construction, Operation, Decommissioning and Post-closure	Maintain a zero discharge policy for the Project during operations	Meet the prescribed screening levels for groundwater Meet the prescribed RWQO for surface waters at the time	• Monitor stream flows in the Ohlelo Stream at different locations including upstream and downstream of the adit and further upstream. • Monitor the impacts of reduced surface water flow and recharge on sensitive receptors such as wetlands and associated flora/fauna, in order to timeously devise and implement appropriate mitigation measures. • Routinely refine, update and validate the conceptual and numerical models developed in this study by incorporation of on-going monitoring data.	Groundwater monitoring costs are assumed at 360,000 (leach testing costs have been taken into account further above)

Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
			• In addition to the existing boreholes and the recommended new boreholes, Kangra Coal will monitor private boreholes, springs and surface water abstraction points, as a risk management measure in order to ensure a reliable and complete dataset of water levels and water chemistry exists for these holes. • The frequency of water level measurement is divided between monthly (manually with a water level or 'dip' meter), and continual (automatically on 1-hour readings, with pressure loggers installed in the borehole). • The frequency of water level measurement is divided between monthly (manually with a water level or 'dip' meter), and continual (automatically on 1-hour readings, with pressure loggers installed in the borehole). • If any of the currently selected monitoring boreholes should run dry due to groundwater drawdown, replacement boreholes will be drilled to greater depth. • Groundwater quality in monitoring wells will initially be monitored quarterly and private boreholes, springs and surface water abstraction points will be sampled 6-monthly. Monitoring frequency will reviewed once monitoring data is available. • Sampling protocols as detailed in Weaver (2007) should be followed. In particular, for groundwater and spring water the following will be undertaken: o pH and EC will be monitored in the purge water in the field until they stabilise prior to collecting a sample; and o Samples for trace element analysis will be appropriately filtered and acidified in the field to ensure results are representative of dissolved species in the aquifer. o Samples will be submitted to a SANAS accredited laboratory within recommended holding times. o The list of chemical constituents to be analysed will be routinely updated based on previous results. Parameters to be tested include, but are not limited to: o Major constituent's pH, EC, (if not measured in the field), TDS, Cl, SO4, NO3, total N, F, Ca, Mg, Na, K, total alkalinity. o Major metals by inductively coupled plasma – mass spectrometry (ICP-MS): Al, Cd, Co, Cu, Fe (Ferric and Ferrous iron), Mn, Ni, Pb, Sb, Zn, U. • In addition to the parameters detailed above, boreholes ERMBH1, 2, 3 and 8 in proximity of Adit A should be monitored for: o BTEX (benzene, toluene, ethylbenzene and xylenes); o EPH (extractable petroleum hydrocarbons); o GRO (gasoline range organics); o DOC (dissolved organic carbon); o COD (chemical oxygen demand); and o *E. coli*. • Parameters identified as contaminants of concern include Sulphate, Iron, Cobalt Nickel. • Water quality results will be compared to the water quality screening levels developed as part of this ESIA process (refer to *Chapter 4*) rather than to existing national screening levels • All monitoring records will be stored in a database which is routinely updated, maintained, and includes all metadata associated with the monitoring activities. • The monitoring programme and data will be reviewed by an independent hydrogeologist annually and amended if necessary.	
Air Quality				

Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Construction and Operation	Minimise atmospheric emissions	Relevant ambient air quality regulations are met at identified sensitive receptors Relevant occupational air quality regulations are met for applicable mine working areas Zero incidents of community complaints	Kangra Coal will install a weather station that, as a minimum, measures wind speed, wind direction, ambient air temperature and rainfall; however, it is also advisable (from an air quality perspective) to measure relative humidity, solar radiation and barometric pressure. The weather station will be located at the main mine adit away from obstacles and the wind measurements will be done at a height of 10m above ground level	Assumed equipment purchase costs of 500,000 Annual costs thereafter are assumed at 60,000
			Meteorological data will be reviewed on a daily basis by the environmental function during construction to establish those conditions under which significant impacts arise; this will include consideration of wind direction and wind speed in particular, and its influence on noise and air quality emissions	
			During the operational phase, the meteorological data, although logged at an hourly scale, will be downloaded on a monthly basis.	
			The monitoring programme will include the following elements: • Real time monitoring of PM10; • Real time monitoring of meteorological parameters; • Passive monitoring of dust deposition; and • Passive monitoring of NO2 and SO2. In addition to physical monitoring, monitoring will also be undertaken using visual inspections and by recording and acting upon substantiated complaints from local communities	
			PM10 Monitoring Real time monitoring of PM10 will be undertaken upwind and downwind of the main mine adit during construction, operational and decommissioning phases. During the construction phase the monitoring data will be reviewed on a daily basis; and during the operational phase will be considered on a monthly basis. Where PM10 emissions associated with the site are above the action levels, investigations will be made into the sources of emissions and measures implemented to manage emissions.	
			Passive Monitoring of Dust Deposition Monitoring will be undertaken using passive deposition monitoring upwind and downwind of the main mine adit during the construction and operation phases During the construction and operational phases the monitoring data will be reviewed on a monthly basis by the environmental manager	
			Passive Monitoring of NO2 and SO2 Although it is predicted that gaseous emissions are expected to have a low impact, long-term air concentration levels of NO2 and SO2 using passive diffusion tubes will be monitored Passive sampling will be undertaken upwind and downwind of the Emergency Generators, or along the north-eastern and south-western plant boundaries. The monitoring data will be reviewed by the environmental manager on a monthly basis.	
			Visual Inspection During the construction, operation and decommissioning phase's, Kangra Coal will undertake visual inspections of activities resulting in dust on-site. The visual inspections will be undertaken on a daily basis Where significant emissions are observed, these will be recorded by the environmental manager in accordance with the quality management system.	
			Noise	

Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Construction and Operation	Minimise noise emissions	Relevant ambient noise regulations are met at identified sensitive receptors Relevant occupational noise y regulations are met for applicable mine working areas Zero incidents of community complaints	An acoustic consultant will be appointed to design a detailed noise measurement programme for all phases of the proposed Project. The noise measurement programme will allow for quarterly noise measurements to be taken in 10-minute bins over a period of at least 24 hours	Assumed equipment purchase costs of 200,000 Annual costs thereafter are assumed at 15,000
			Measurements will be collected as construction commences through the operational phase of the proposed Project, and carried out in accordance with SANS 10103:2008 (or any future updates) using instruments as defined in the National Noise Control Regulations (or any future promulgated laws). Should (for any given reason) during the construction and operational phases of the proposed Project, it be realised that the applicable standards (day time for the construction phase and or night time for the operational phase) be exceeded, and that these exceedances are demonstrably due to activities associated with the establishment/operation/decommissioning of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described in Section 9.7 of *Chapter 9* to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation. If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project. (please refer to a detailed overview of the Noise monitoring programme including monitoring locations provided in Section 12.8 of *Chapter 14*)	
Biodiversity				
Operation and Post Closure	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters Maintain aquatic ecological integrity at baseline (pre-construction) levels	Water volume and flow rate of the Ohlelo River. This will need to take place until the system has stabilised post-closure. (Monthly)	Flow rates in the Ohlelo River have been accounted for above. Assumed biodiversity specialist input at 60,000
			Riparian integrity along the Ohlelo River and associated tributaries by a vegetation ecologist to assess health of the riparian vegetation and the impact on threatened and protected species (for example Tree Ferns – *Alsophilia dregei*). This will need to take place until the system has stabilised post-closure.(Annual basis)	
			The functionality and integrity of a representative selection of wetlands (including Kransbank) by a wetland and vegetation specialist to determine if there are changes to base flow, surface flow or vegetation dynamics. This will need to take place until the system has stabilised post-closure. The Present Ecological State of the Kransbank wetland will need to be established prior to the construction phase. (Annual basis)	
			Bio-monitoring of aquatic systems and riparian habitat in those locations specified in the surface water monitoring programme (refer to **Error! Reference source not found.**) by an accredited aquatic ecologist. (Biannual seasonal monitoring)	
			The presence of threatened terrestrial birds dependant on wetlands by an ornithologist specialist. This will need to take place until the system has stabilised post-closure. (Annual basis)	
			Results of the above monitoring programmes will be analysed and consolidated into an annual report by a SACNASP registered ecologist appointed by Kangra Coal with recommendations on adaptive management of the impacts on the wetlands and water courses. The report will be submitted to the MTPA for approval on the measures to mitigate the on-going impacts on the wetlands and water courses.	

Applicable Phase of the Project	Environmental Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
			Visual Monitoring Any flora species transplanted during the construction phase of the proposed Project will be monitored on an on-going basis, until such time that plants/trees have established and show signs of re-growth. All soil stockpiles during the construction and operational phase of the proposed Project will be continuously monitored for any alien/invasive plant(s). Should any alien/invasive plant(s) be detected by the environmental officer (or similar function), the presence of these species will be suitably recorded, following which the plant(s) will be removed in the correct manner as per the prospective Alien Invasive Management Plan	

Table 13.4 Management of Social Mitigation Measures during Construction

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
Community Liaison Officer (CLO)	Construction	Ensure conformance to social commitments in the SEMP, environmental permits/authorisations and applicable legislation	Conformance to Project Standards	N/A	600,000 cost to company over the construction phase. It is assumed that only one CLO will be contracted.
			Socio-economic		
Displacement of homesteads and residents	Construction	Fair and equitable resettlement of project impacted peoples	Negotiated and informed consent of project affected landowners Relevant ambient noise regulations are met at identified sensitive receptors Relevant occupational noise quality regulations are met for applicable mine working areas Zero incidents of community complaints. Resettlement of all Project affected Peoples according to industry recognised best practice	Kangra will carry out a full Resettlement process. Negotiated and informed consent must be obtained from all landowners and affected stakeholders prior to placement of infrastructure on private and communally owned land Equal recognition to the interests of private and communal ownership will be included in the negotiation process The entire process will be formally documented Kangra Coal must ensure that the preferred natural conditions chosen for settlement are maintained or improved, including ease of access to roads and transport Kangra Coal will ensure that people have the same land tenure status in their re-established locations. A Community Benefit Agreement will be negotiated with CPAs as part of the Resettlement and Compensation Process Kangra Coal will ensure that homesteads that do not have title deeds are given security of tenure and entitlements at least equal to their current tenure arrangements – preferably better Kangra Coal will ensure that land identified for resettlement will not be used for any future mining activities Kangra Coal will use impartial legal advisors for reputable legal advice and representation for all affected communities and homesteads The Resettlement process will fully understand the different components of each affected household's livelihood strategies and ensure that this is replaced, and ideally improved through resettlement The Resettlement process will develop a full understanding of relationships and social and cultural connections between homesteads in order to inform decisions on resettling individual homesteads or entire communities to mitigate the impact	Resettlement process and associated costs (including economic displacement) are not covered under the ESIA process and will be covered under a separate RAP process post ESIA by Slate Consulting. Noise and Air Quality monitoring have been accounted for above.

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
				Noise monitoring locations will be at those sensitive receptors where noise model predictions indicate an exceedance in ambient sound levels that are above those included in SANS 10103. As with the measures provided for air quality above, when measured exceedances of the applicable standard persists and are demonstrably due to activities associated with the establishment/operation of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation. If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.	
Loss of access to land for agriculture	Construction	Fair and equitable resettlement of project impacted peoples	Zero incidents of community complaints.	Negotiations will be undertaken through the Resettlement process to determine fair compensation for the loss of current and future land use Access points will be identified and culverts constructed to enable safe and convenient movement across the conveyor for people and animals In the event that no satisfactory mitigation measures can be determined, and where local residents' livelihoods continue to be at risk, Kangra Coal, in discussion with affected CPAs, will purchase alternative land, of the same size, quality and productivity as the current CPA farms to ensure people's continued survival	Resettlement process and associated costs (including economic displacement) are not covered under the ESIA process and will be covered under a separate RAP process post ESIA by Slate Consulting. Other costs are assumed to be incorporated in engineering design
Resentment and anger from unfulfilled expectations and related livelihood security	Construction	Skills and Capacity Development Programme	Local employment provided to an agreed percentage of local community members during the construction phase Zero incidents of community complaints.	Kangra will undertake a skills audit or commission in Driefontein and the Study Area prior to allocating construction contracts Based on the outcome of the skills audit, individuals will be identified for training to increase their employment potential as contractors Local employment will include contractor commitments to train local residents who have the potential to fill certain semi-skilled levels On-going stakeholder engagement will be established during which people's expectations of employment are realistically addressed prior to the start of construction activities Kangra Coal will ensure that alternative benefits for local residents are visible and understood as a trade-off for the limited employment opportunities As per Kangra Coal's current SLP, community Skills and Capacity Development Programme will be implemented	Skills audit is assumed to cost 500,000 On-going CLO engagement costs.
Loss of productive land and related current and future income opportunities	Construction	Fair and equitable resettlement of project impacted peoples	Negotiated and informed consent of project affected landowners	Kangra will negotiate in good faith with affected land owners to establish fair remuneration and compensation for loss of access to and productivity of land and for damage	Resettlement process and associated costs (including economic

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
			Zero incidents of community complaints.	A Community Benefit Agreement will be drawn up in which realistic benefits, financial and developmental, will be agreed to as recognition for the CPA's contribution to the proposed Project's development	displacement) are not covered under the ESIA process and will be covered under a separate RAP process post ESIA by Slate Consulting
Reduced current and future tourism potential	Construction	Community empowerment	Evidence of community empowerment programmes	Kangra Coal will look at the viability of spending some of its Social and Labour Plan budget for community development, training and entrepreneurial mentorship on nurturing local tourism projects	This is covered under the SLP budget
Disruption of community life and undermining the sense of place and residents' community identity and sense of emplacement	Construction	Minimal disruption	Zero incidents of community complaints.	A comprehensive Resettlement negotiation process will be undertaken	Costs will be covered under the RAP process, SLP process and the CLO costs to company.
				Kangra Coal will ensure that the sensitivity of land issues is fully understood and develop a clear approach to communicating proposed Project plans with affected residents	
				All affected residents will be included in this discussions, negotiations and the decision making process.	
				Kangra Coal will investigate the potential to partner with the District health department in the provision of mobile health services to the Zones of Influence	
				Residents will be empowered, through the negotiation process and by facilitating CPA legal representation	
Reduced water quality and availability for people	Construction	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	Prevent accidental release of untreated mine-water into the natural environment as well as seepage of water through the overburden dump and coal-handling areas as well as along the conveyor route will be implemented	As is mentioned above, Kangra Coal have budgeted for the provision of 3 boreholes. Water management measures have been covered above.
				All water coming out of the mine area will be treated and returned to meet the RWQO prescribed for surface and ground water quality	
				If water access by communities is adversely affected, Kangra Coal will establish an alternative water source that will deliver water to the homesteads as is currently the case	
Reduced access to wood for cooking and heating	Construction	Minimal disruption	Zero incidents of community complaints.	Kangra Coal will ensure that communities are involved in the clearing of wooded areas pre-construction and that harvested wood is freely available for local consumption	Alien vegetation clearing control costs have been covered above. Other costs are assumed to be incorporated in engineering design.
				Underpasses allowing people access across the conveyor will be installed allowing access to collecting wood becomes a minor inconvenience	
				Kangra Coal will negotiate the supply of coal to residents and communities within the Study Area and particularly the Zone 1 of Influence as part of their discussions to gain access to CPA land.	
Reduced community health and safety	Construction	Improved Community Health and Safety	Zero H&S Community incidents	Strict traffic controls will be implemented prior to and during the construction and operational phases of the proposed Project	Community health and safety costs assumed at 2,000,000
				An education programme will be run, in partnership with the District department of transport sensitising Study Area residents and local school children to community health and safety	
				Kangra Coal will attempt to partner with the local health department to support monthly mobile health visits to the Study Area	
				Contract workers will be inducted to the Project through a programme that includes sensitivity to the local social environment	
				An emergency preparedness plan will be developed by Kangra Coal and will be communicated to local residents with regular safety drills undertaken to ensure that people know what to do in the event of an accident	

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
Increased pressure on Driefontein infrastructure and service delivery and possible increased incidents of crime	Construction	Improved Community wellbeing	Zero incidents of community complaints. Well informed community	A rigorous and coherent communication plan will be developed to ensure that a clear message about the realistic limits to job opportunities from the proposed Project	CLO costs have been included above
				An office will be set up within the Study Area to deal with Project-related enquiries from local residents	
				A central Project office will be set up in Piet Retief which will provide information about job opportunities and will handle all job applications besides those submitted by residents in the Study Area	
Poor relationship between Kangra Coal and local communities	Construction	Harmonious mine and community relationships	Zero incidents of community complaints	A comprehensive communication and engagement approach will be developed and implemented immediately to engage with affected communities and landowners	CLO costs have been included above.
				Kangra Coal will address issues raised by the communities and report on completion of each item.	
				Negotiations for access to privately and communally owned land will be initiated in an open and transparent manner	
				A Community Benefit Agreement will be drawn up between Kangra Coal and each affected community as described above	
				The CLO will establish on-going and regular interaction between the company, residents of the Study Area and particularly Zone 1 of Influence	
				A grievance mechanism will be drawn up through which local residents can log their grievances	
				All community related development planning will be undertaken with participation of affected communities	
				All Kangra Coal activities related to social development or social investment projects will be fully documented and communicated	
				Kangra Coal will develop a company-wide communication strategy for all its operations in and around the Study Area	
Landscape and Visual					
Construction activities	Construction	Minimise visual exposure to sensitive visual receptors	Zero incidents of community complaints Relevant ambient air quality regulations are met at identified sensitive receptors Appropriate landscaping and visual barriers in place	Dust suppression techniques will be in place at all times during the construction phase of the proposed Project	These aspects have been considered under air quality and engineering design
				As much vegetation as possible will be kept during site clearance	
				Buildings and structures constructed during the construction phase will be painted with colours that reflect and complement the natural browns and greens of the surrounding landscape	
				High pole top security lighting along the periphery of the Main Mine Adit and will, as far as possible, be avoided	
				Pathways and roads will be lit with low level 'bollard' type lighting and post top lighting will be avoided	
				The temporary contractors camp and construction sites will be kept neat / tidy at all times.	
				Exposed areas will be restored / rehabilitated as soon as possible after decommissioning of the Temporary Construction Camp site	
				Fires will not be permitted so as to avoid veld fires	
				Construction material will be stored neatly in a designated area	
				Construction vehicles will keep to speed limits (45km/h)	
				Ad hoc monitoring will be implemented so as to ensure that visual screening and dust control measures are implemented effectively	
				Progressive rehabilitation measures will be implemented during the early stages of the proposed Project	
Heritage					
Disturbance of graves or loss of access to graves	Construction	Fair and equitable resettlement of project impacted peoples / sites	Negotiated and informed consent of project affected landowners	An appointed Environmental Control Officer (ECO) will be suitably trained by a paleontological specialist to identify paleontological resources and will be present on site during the construction and operational phase of the proposed Project	Heritage costs assumed at 1,100,000

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Over Two Year Construction Phase
Palaeontology	Construction		Zero incidents of community complaints or destroyed sites Chance Find Procedure	Kangra Coal will relocate affected graves or ensure continued safe and convenient access to gravesites	
				Any grave relocation will be undertaken in a culturally appropriate manner in consultation with affected families	
				All costs of respectful and culturally appropriate re-interment will be covered by Kangra Coal	
				Identification of all affected graves will be carried out during Resettlement and Compensation Planning	
				Where gravesites are not relocated a buffer zone will be established to protect the site	
				A Chance Finds protocol for graves discovered during construction activities will be established	
Section 34 Historical Sites – Structures	Construction	Suitable identification of heritage resources and zero damage to these resources	Zero incidents of community complaints or destroyed sites Chance Find Procedure	The appointed ECO will be trained to identify heritage resources and will be present on site when ground clearing inside the perimeter of the heritage resource takes place	Heritage costs provided for above
Section 35 Historical Sites - Archaeological Sites	Construction	Suitable identification of heritage resources and zero damage to these resources	Zero incidents of community complaints or destroyed sites Chance Find Procedure	The appointed ECO will be trained to identify heritage resources and will be present on site when ground clearing inside the perimeter of the heritage resource takes place	
Section 36 Historical Sites – Burial Grounds and Graves	Construction	Suitable restoration of burial ground	Zero incidents of community complaints or destroyed sites	The graves will be restored where these are dilapidated, protected and conserved in perpetuity	Heritage costs provided for above
				A perimeter fence will be built around the burial ground and placed 2m away from the perimeter of the graves	
				Detailed Project design will ensure that there is a 20m buffer between the perimeter fence and the proposed conveyor route	
				The ECO will be present on site when the fence is erected around the burial ground	
S.36 005 and S.36 008 Burial Grounds	Construction	Suitable restoration of burial ground	Zero incidents of community complaints or destroyed sites	The graves will be restored where these are dilapidated, protected and conserved in perpetuity	Heritage costs provided for above
				A perimeter fence will be built around each burial ground and placed two meters away from the perimeter of the graves	
				The appointed ECO will be present on site when these fences are been erected around the burial grounds	
S.36 007 Grave	Construction	Fair and equitable resettlement of project impacted peoples / sites	Negotiated and informed consent of project affected landowners	No Project-related mitigation measures such as changes to design or mine plan were considered as the grave is located within the footprint of the Main Mine Adit (Adit A) and as such will not be preserved. This particular grave will therefore be relocated.	Grave relocation assumed 100,000

Table 13.5 Management of Social Mitigation Measures during Operation

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Community Liaison Officer (CLO)	Construction	Ensure conformance to social commitments in the SEMP, environmental permits/authorisations and applicable legislation	Conformance to Project Standards	N/A	300,000 cost to company annually. It is assumed that only one CLO will be contracted.

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Socio-economic					
Displacement of homesteads and residents	Operations	Fair and equitable resettlement of project impacted peoples	Negotiated and informed consent of project affected landowners Relevant ambient noise regulations are met at identified sensitive receptors Relevant occupational noise quality regulations are met for applicable mine working areas Zero incidents of community complaints. Resettlement of all Project affected Peoples according to industry recognised best practice	Kangra will carry out a full Resettlement process. Negotiated and informed consent must be obtained from all landowners and affected stakeholders prior to placement of infrastructure on private and communally owned land Equal recognition to the interests of private and communal ownership will be included in the negotiation process The entire process will be formally documented Kangra Coal must ensure that the preferred natural conditions chosen for settlement are maintained or improved, including ease of access to roads and transport Kangra Coal will ensure that people have the same land tenure status in their re-established locations. A Community Benefit Agreement will be negotiated with CPAs as part of the Resettlement and Compensation Process Kangra Coal will ensure that homesteads that do not have title deeds are given security of tenure and entitlements at least equal to their current tenure arrangements – preferably better Kangra Coal will ensure that land identified for resettlement will not be used for any future mining activities Kangra Coal will use impartial legal advisors for reputable legal advice and representation for all affected communities and homesteads The Resettlement process will fully understand the different components of each affected household's livelihood strategies and ensure that this is replaced, and ideally improved through resettlement The Resettlement process will develop a full understanding of relationships and social and cultural connections between homesteads in order to inform decisions on resettling individual homesteads or entire communities to mitigate the impact Noise monitoring locations will be at those sensitive receptors where noise model predictions indicate an exceedance in ambient sound levels that are above those included in SANS 10103. As with the measures provided for air quality above, when measured exceedances of the applicable standard persists and are demonstrably due to activities associated with the establishment/operation of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation. If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.	Resettlement process and associated costs (including economic displacement) are not covered under the ESIA process and will be covered under a separate RAP process post ESIA by Slate Consulting. Noise and Air Quality monitoring have been accounted for above.
Loss of access to land for agriculture	Operations	Fair and equitable resettlement of project impacted peoples	Zero incidents of community complaints.	Negotiations will be undertaken through the Resettlement process to determine fair compensation for the loss of current and future land use Access points will be identified and culverts constructed to enable safe and convenient movement across the conveyor for people and animals	Resettlement process and associated costs (including economic displacement) are not

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
				In the event that no satisfactory mitigation measures can be determined, and where local residents' livelihoods continue to be at risk, Kangra Coal, in discussion with affected CPAs, will purchase alternative land, of the same size, quality and productivity as the current CPA farms to ensure people's continued survival	covered under the ESIA process and will be covered under a separate RAP process post ESIA by Slate Consulting. Noise and Air Quality monitoring have been accounted for above.
Resentment and anger from unfulfilled expectations and related livelihood security	Operations	Skills and Capacity Development Programme	Local employment provided to an agreed percentage of local community members during the construction phase Zero incidents of community complaints.	Kangra will undertake a skills audit or commission in Driefontein and the Study Area prior to allocating construction contracts	These costs have been assumed above.
				Based on the outcome of the skills audit, individuals will be identified for training to increase their employment potential as contractors	
				Local employment will include contractor commitments to train local residents who have the potential to fill certain semi-skilled levels	
				On-going stakeholder engagement will be established during which people's expectations of employment are realistically addressed prior to the start of construction activities	
				Kangra Coal will ensure that alternative benefits for local residents are visible and understood as a trade-off for the limited employment opportunities	
				As per Kangra Coal's current SLP, community Skills and Capacity Development Programme will be implemented	
Loss of productive land and related current and future income opportunities	Operations	Fair and equitable resettlement of project impacted peoples	Negotiated and informed consent of project affected landowners Zero incidents of community complaints.	Kangra will negotiate in good faith with affected land owners to establish fair remuneration and compensation for loss of access to and productivity of land and for damage	Resettlement process and associated costs (including economic displacement) are not covered under the ESIA process and will be covered under a separate RAP process post ESIA by Slate Consulting
				A Community Benefit Agreement will be drawn up in which realistic benefits, financial and developmental, will be agreed to as recognition for the CPA's contribution to the proposed Project's development	
Reduced current and future tourism potential	Operations	Community empowerment	Evidence of community empowerment programmes	Kangra Coal will look at the viability of spending some of its Social and Labour Plan budget for community development, training and entrepreneurial mentorship on nurturing local tourism projects	This is covered under the SLP budget
Disruption of community life and undermining the sense of place and residents' community identity and sense of emplacement	Operations	Minimal disruption	Zero incidents of community complaints.	A comprehensive Resettlement negotiation process will be undertaken	Costs will be covered under the RAP process, SLP process and the CLO costs to company, which are assumed to be 300,000 per annum.
				Kangra Coal will ensure that the sensitivity of land issues is fully understood and develop a clear approach to communicating proposed Project plans with affected residents	
				All affected residents will be included in this discussions, negotiations and the decision making process.	
				Kangra Coal will investigate the potential to partner with the District health department in the provision of mobile health services to the Zones of Influence	
				Residents will be empowered, through the negotiation process and by facilitating CPA legal representation	
Reduced water quality and availability for people	Operations	Maintain a zero discharge policy for the Project	Meet the prescribed RWQO for surface waters	Prevent accidental release of untreated mine-water into the natural environment as well as seepage of water through the overburden dump and coal-handling areas as well as along the conveyor route will be implemented	As is mentioned above, Kangra Coal have budgeted for the provision of 3

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
				All water coming out of the mine area will be treated and returned to meet the RWQO prescribed for surface and ground water quality	boreholes.
				If water access by communities is adversely affected, Kangra Coal will establish an alternative water source that will deliver water to the homesteads as is currently the case	Water management measures have been covered above.
Reduced access to wood for cooking and heating	Operations	Minimal disruption	Zero incidents of community complaints.	Kangra Coal will ensure that communities are involved in the clearing of wooded areas pre-construction and that harvested wood is freely available for local consumption	Alien vegetation clearing control costs have been covered above.
				Underpasses allowing people access across the conveyor will be installed allowing access to collecting wood becomes a minor inconvenience	
				Kangra Coal will negotiate the supply of coal to residents and communities within the Study Area and particularly the Zone 1 of Influence as part of their discussions to gain access to CPA land.	Other costs are assumed to be incorporated in engineering design.
Reduced community health and safety	Operations	Improved Community Health and Safety	Zero H&S Community incidents	Strict traffic controls will be implemented prior to and during the construction and operational phases of the proposed Project	Community health and safety costs assumed at 1,000,000
				An education programme will be run, in partnership with the District department of transport sensitising Study Area residents and local school children to community health and safety	
				Kangra Coal will attempt to partner with the local health department to support monthly mobile health visits to the Study Area	
				Contract workers will be inducted to the Project through a programme that includes sensitivity to the local social environment	
				An emergency preparedness plan will be developed by Kangra Coal and will be communicated to local residents with regular safety drills undertaken to ensure that people know what to do in the event of an accident	
Increased pressure on Driefontein infrastructure and service delivery and possible increased incidents of crime	Operations	Improved Community wellbeing	Zero incidents of community complaints. Well informed community	A rigorous and coherent communication plan will be developed to ensure that a clear message about the realistic limits to job opportunities from the proposed Project	CLO costs have been included above
				An office will be set up within the Study Area to deal with Project-related enquiries from local residents	
				A central Project office will be set up in Piet Retief which will provide information about job opportunities and will handle all job applications besides those submitted by residents in the Study Area	
Poor relationship between Kangra Coal and local communities	Operations	Harmonious mine and community relationships	Zero incidents of community complaints	A comprehensive communication and engagement approach will be developed and implemented immediately to engage with affected communities and landowners	CLO costs have been included above.
				Kangra Coal will address issues raised by the communities and report on completion of each item.	
				Negotiations for access to privately and communally owned land will be initiated in an open and transparent manner	
				A Community Benefit Agreement will be drawn up between Kangra Coal and each affected community as described above	
				The CLO will establish on-going and regular interaction between the company, residents of the Study Area and particularly Zone 1 of Influence	
				A grievance mechanism will be drawn up through which local residents can log their grievances	
				All community related development planning will be undertaken with participation of affected communities	
				All Kangra Coal activities related to social development or social investment projects will be fully documented and communicated	
				Kangra Coal will develop a company-wide communication strategy for all its operations in and around the Study Area	
Landscape and Visual					

Impact Assessed	Applicable Phase of the Project	Social Management Objective	Key Performance Area	Mitigation/Management Measures	Cost (ZAR) Annually
Operational activities	Operation	Minimise visual exposure to sensitive visual receptors	Zero incidents of community complaints Relevant ambient air quality regulations are met at identified sensitive receptors Appropriate landscaping and visual barriers in place	Dust suppression techniques will be in place at all times during the construction phase of the proposed Project	These aspects have been considered under air quality and engineering design.
				Vegetation screens will be planted along the boundaries of sensitive viewing areas surrounding Adit A	
				Vegetation screen will be planted along the boundary of Adit B	
				The negative impact of night lighting will be mitigated by using direct illumination light fittings, avoiding high pole security lighting and using motion activated security lighting on the periphery	
				Ad hoc monitoring will be implemented so as to ensure that visual screening and dust control measures are implemented effectively	
				Operation vehicles will keep to speed limits (45km/h)	
Heritage					
Disturbance of graves or loss of access to graves	Operations	Fair and equitable resettlement of project impacted peoples / sites	Negotiated and informed consent of project affected landowners	An appointed Environmental Control Officer (ECO) will be suitably trained by a paleontological specialist to identify paleontological resources and will be present on site during the construction and operational phase of the proposed Project	Heritage costs assumed at 50,000 in terms of maintenance efforts
Section 36 Historical Sites – Burial Grounds and Graves	Operations	Suitable restoration of burial ground	Zero incidents of community complaints or destroyed sites	The graves will be restored where these are dilapidated, protected and conserved in perpetuity	Heritage costs provided for above
				A perimeter fence will be built around the burial ground and placed 2m away from the perimeter of the graves	
				Detailed Project design will ensure that there is a 20m buffer between the perimeter fence and the proposed conveyor route	
				The ECO will be present on site when the fence is erected around the burial ground	
S.36 005 and S.36 008 Burial Grounds	Operations	Suitable restoration of burial ground	Zero incidents of community complaints or destroyed sites	The graves will be restored where these are dilapidated, protected and conserved in perpetuity	Heritage costs provided for above
				A perimeter fence will be built around each burial ground and placed two meters away from the perimeter of the graves	
				The appointed ECO will be present on site when these fences are been erected around the burial grounds	

Table 13.6 Monitoring of Social Mitigation Measures

Applicable Phase of the Project	Environmental Social Objective	Key Performance Area	Mitigation/Management Measures	Costs (ZAR) Annually
Socio-economic				
Construction and Operational	Minimise atmospheric and noise emissions Fair and equitable resettlement of project impacted peoples	Relevant ambient air quality and noise regulations are met at identified sensitive receptors Relevant occupational air quality regulations are met for applicable mine working areas Zero incidents of community complaints	In those sensitive receptors where model predictions of the existing baseline and construction and operation of the main mine adit exceed the PM10 standard for the Predicted Highest Daily PM10 Concentrations of 75µg/m3,or the applicable residential noise standards at night, monitoring effort will be focused at these locations to confirm such model predictions. Where measured exceedances of the applicable standard persists and are demonstrably due to activities associated with the establishment/operation of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts to reduce any such concentrations at these locations will be well maintained, in some cases the frequency of such mitigation measures increased (e.g. use of localised dampening), and the mitigation programmes frequently audited to ensure their effective and continued implementation. If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a	These have been covered under the air quality and noise monitoring programmes. RAP costs are not included in this ESIA and will be considered separately under the RAP process.

Applicable Phase of the Project	Environmental Social Objective	Key Performance Area	Mitigation/Management Measures	Costs (ZAR) Annually
			later stage of the proposed Project.	
			Heritage	
Construction	Preservation of applicable heritage sites	Chance Find Procedure in place Environmental awareness of all construction staff undertaken	During the field survey, no surface fossils were identified along the proposed conveyor routes or within the main mine adit and Adit B footprints. Most fossil heritage is embedded within the rocks beneath the land surface or obscured by surface deposits such as alluvium or soil and by vegetation cover. As a result, an appointed Environmental Control Officer (ECO) or the Environmental Function at Kangra Coal will be trained to monitor for and identify any paleontological resources during the construction and operational phases. Monitoring may be limited to soil and overburden dumps in which fossil material may be deposited with overburden material.	These costs have been included above.

14 SOCIAL AND ENVIRONMENTAL MONITORING PLAN

14.1 INTRODUCTION

This *Chapter* details a framework outlining a plan essential for effectively monitoring social and environmental mitigation/management measures. The SEMP has been developed as per the requirements of Section 51 (sub-section (b) iv) of the MPRDA Regulations (GN.R 26275), and provides an outline to ensure that a Plan is in place to ensure the suitable and on-going monitoring of social and environmental commitments.

Kangra Coal will update their existing environmental monitoring programme contained in their current Environmental Management Programmes to include specific monitoring procedures for the proposed Kusipongo Resource Expansion Project, and provide appropriate resources to implement these procedures during the construction, operational and decommissioning and closure phases of the proposed Project.

Please Note – *Chapter 14* provides a detailed description of verification, monitoring, reporting and documentation associated with the social, physical and biophysical environment during the decommissioning and closure phase of the proposed Project.

This Plan should be considered a dynamic, changing document, and will need to be amended periodically in the light of operational changes, extended non-conformance with identified standards and/or water quality screening levels (as described in *Chapter 4*), or once an aspect is deemed well enough managed (identified through the analysis of monitoring data), that the monitoring frequency can be altered.

In the course of the ESIA, impacts (both positive and negative) to the physical, natural and socio-economic environments have been identified and suitable mitigation/management measures for these impacts have been recommended (*Chapter 13*). In order to ensure that these mitigation/management measures are sufficiently implemented, Kangra Coal will need to establish a formal monitoring programme to ensure the success of all such mitigation measures recommended, are successful. In addition, Kangra Coal should use the monitoring data collected to drive improvements in Kangra Coal's social and environmental management programmes.

In addition, monitoring data should provide assurance to regulators, stakeholders and lenders that their requirements with respect to environmental and social performance are being suitably implemented and managed.

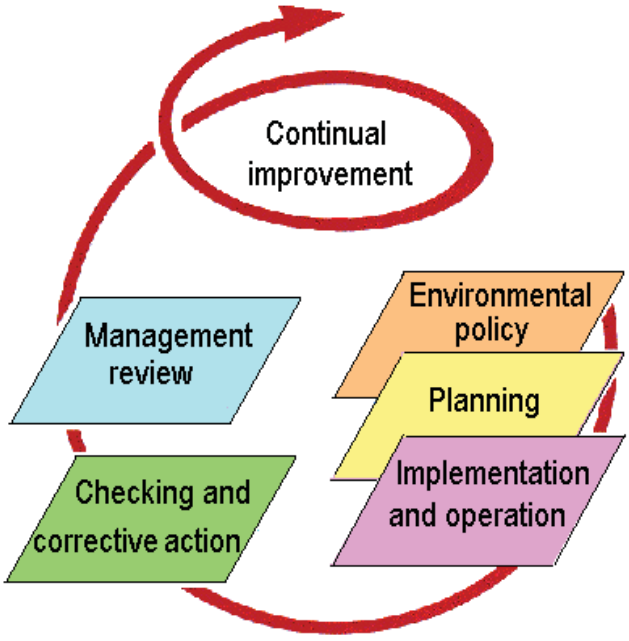
This is best achieved by including the monitoring programme as part of Kangra Coal's Environmental Management System.

14.2 THE MONITORING PLAN: WHERE IT FITS IN AN OVERALL ENVIRONMENTAL MANAGEMENT SYSTEM

The main elements of an Environmental Management System (EMS) are provided in *Figure 14.1*, and comprise the following four phases:

Planning:	Establishing the *objectives* and processes necessary to deliver results in accordance with Kangra Coal's Environmental Policy.
Doing:	Implementing the processes through defining *mitigation* measures and assigning *responsibilities* for undertaking or implementing such mitigation measures.
Checking:	*Monitoring* and *measuring* these processes against the policy, objectives and targets, legal and other requirements (such as those provided in *Chapter 4*), and *reporting* of the results.
Acting:	Taking actions to continually improve performance of the ESH-MS through the *training* of personnel and *auditing* of results.

Figure 14.1 Elements of an Environmental, Social and Health Management System (after ISO14001:2004)



Kangra Coal's *Environmental Policy* was provided in *Chapter 4*. The ESIA has essentially undertaken most of the initial *planning* aspects required by an EMS by identifying environmental and social impacts and formulating mitigation measures to manage them. This Plan will discuss some of the "Checking"

aspects – in the context of this Plan, this involves a description of responsibilities in terms of the implementation, as well as aspects of "checking and corrective action", which details what is to be monitored, where, and how often.

14.3 ROLES AND RESPONSIBILITIES

The successful implementation of the SEMP requires a commitment from Kangra Coal, and roles and responsibilities associated with monitoring needs to be defined within the following functions:

- Environmental function;
- Community communication and engagement function;
- Local development and social investment function;
- Security and emergency response function; and
- Community health, wellness and safety function.

Similarly, specific roles and responsibilities need to be defined for contractors and subcontractors. During construction, and to a lesser extent operations, contractors will be the key implementers of mitigation measures (as defined in *Chapter 13*) and will also be responsible for ensuring compliance with the Project policies and commitments.

Contractors must, as part of their obligations, undertake regular environmental, social, health and safety inspections and provide reports to allow for the monitoring and evaluation of performance. Although the contractors will have the primary roles in delivering on this, Kangra Coal will have the ultimate accountability for ensuring that monitoring measures are carried out.

14.4 ENVIRONMENTAL AND SOCIAL MONITORING

This Section presents a monitoring framework for the following environmental and social aspects:

- Climate
- Surface Water
- Groundwater
- Noise
- Air Quality
- Biodiversity
- Socio-economic
- Visual
- Heritage

14.5 METEOROLOGICAL MONITORING

Kangra Coal will install a weather station that, as a minimum, measures wind speed, wind direction, ambient air temperature and rainfall; however, it is also advisable (from an air quality perspective) to measure relative humidity, solar radiation and barometric pressure.

The weather station will be located at the main mine adit (refer to *Figure 14.4* on *Page 14-15*) away from obstacles and the wind measurements will be done at a height of 10m above ground level.

Meteorological data will be reviewed on a daily basis by the environmental function during construction to establish those conditions under which significant impacts arise; this will include consideration of wind direction and wind speed in particular, and its influence on noise and air quality emissions.

During the operational phase, the meteorological data, although logged at an hourly scale, will be downloaded on a monthly basis.

The weather station should be calibrated at least annually.

14.6 SURFACE WATER

Monitoring of surface water is required for the following purposes:

1. To detect the actual impact on surface water quality/quantity timeously.

2. To assess the cumulative impacts on surface water quality/quantity from current operational and abandoned mines in the catchment areas.

3. To assess whether the mitigation/management measures provided in *Chapter 13* are effective, supporting the update of mitigation measures where necessary.

Surface Monitoring Plan

The surface water monitoring plan is presented in *Table 14.1* below. This monitoring plan fulfils the monitoring actions required to address items 1 and 2 above.

Table 14.1 Surface Water Monitoring Plan

ID	Latitude	Longitude	Location	Primary Purpose	Water Quality Monitoring Frequency	Water Flow Monitoring Frequency
C1	27° 01′ 9.92″ S	30° 16′ 50.46″ E	Tributary of the Ohlelo River, upstream of Adit A	To assess water quality that will not be influenced by any activities at Adit A	Monthly	-
C2	27° 01′ 3.94″ S	30° 16′ 59.67″ E	Ohlelo River, upstream of Adit A (paired with ERMBH2)	To assess water quality that will not be influenced by any activities at Adit A, streamflow rates directly upstream of Adit A and surface/groundwater interaction	Monthly	Monthly
C3	27° 0′ 49.5″ S	30° 17′ 8.53″ E	Ohlelo River, downstream of Adit A	To assess water quality immediately downstream of activities occurring at Adit A	Monthly	-
C4	27° 0′ 10.14″ S	30° 17′ 14.61″ E	Ohlelo River, upstream of confluence with Hlelo River	To assess water quality downstream of activities occurring at Adit A, before any dilution effects occur as a result of flows from the Hlelo River and streamflow rates of Ohlelo River downstream of Adit A	Monthly	Monthly
C5	26° 58′ 11.01″ S	30° 20′ 38.38″ E	Hlelo River, bridge crossing Road D273	To assess water quality immediately downstream of old mining activities and streamflow rates of Hlelo River	Monthly	Monthly
C6	26° 54′ 0.98″ S	30° 27′ 10.96″ E	Hlelo River, downstream of confluence with Taaibosch Spruit, on Road D803	To assess water quality in the Hlelo River and to establish changes in water quality as a result of inflows from the Taaibosch Spruit and streamflow rates of the Hlelo River	Monthly	Monthly
C7	26° 53′ 43.078″ S	30° 24′ 1.971″ E	Taaibosch Spruit, before its confluence with the Hlelo River	To assess water quality in the Taaibosch Spruit, uninfluenced by water quality in the Hlelo River and streamflow rates of the Taaibosch Spruit	Monthly	Monthly
C8	26° 59′ 45.597″ S	30° 20′ 19.405″ E	Tributary to the Hlelo River upstream of the abandoned mine, and adjacent to the planned temporary construction camp	To assess water quality in the tributary and any impacts as a result of the temporary construction camp and operation of the conveyor	Monthly	-
C9	27° 3′ 30.919″ S	30° 18′ 29.957″ E	Tributary adjacent to ventilation Adit B	To assess water quality immediately downstream of activities occurring at Adit B	Monthly	-
C10	26° 59′ 55.591″ S	30° 19′ 12.080″ E	Tributary to the Hlelo River downstream of the conveyor belt route	To assess water quality in the tributary and any impacts as a result of the temporary construction camp and operation of the conveyor	Monthly	-
C11	27° 1′ 30.349″ S	30° 16′ 48.706″ E	Ohlelo River, upstream of Adit A (paired with ERMBH9)	To assess streamflow rates of Ohlelo River further upstream of Adit A and surface/groundwater interaction	-	Monthly

The monitoring plan is a living document that needs to be updated as monitoring data results are generated. Details in support of *Table 14.1* are listed as follows:

- Each surface water sampling location was selected in order to monitor particular mining infrastructure, or applicable rivers and tributaries, which is detailed as the 'primary purpose'.

- Surface water quality and flow rates will initially be monitored monthly. Monitoring frequency will be reviewed once monitoring data is available.

- Surface water flow monitoring will be carried out concurrently with surface water quality monitoring (at the same locations and same frequency of monitoring).

- The list of chemical constituents to be analysed will be routinely updated based on previous results. Parameters to be tested include, but are not limited to:

    - Major constituents pH, EC, (if not measured in the field), TDS, Cl, SO_4, NO_3, total N, F, Ca, Mg, Na, K, total alkalinity.
    - Major metals by inductively coupled plasma – mass spectrometry (ICP-MS): Al, Cd, Co, Cu, Fe (Ferric and Ferrous iron), Mn, Ni, Pb, Sb, Zn, U.
    - Parameters identified as contaminants of concern include Sulphate, Iron, Cobalt Nickel.

- In addition to the parameters detailed above, C1, 2 & 3in proximity of Adit A should be monitored for:

    - BTEX (benzene, toluene, ethylbenzene and xylenes);
    - EPH (extractable petroleum hydrocarbons);
    - GRO (gasoline range organics);
    - DOC (dissolved organic carbon);
    - COD (chemical oxygen demand); and
    - *E. coli*.

- Samples will be submitted to a SANAS accredited laboratory within recommended holding times.

- Water quality results will be compared to the water quality screening levels developed as part of this ESIA process (refer to *Section 4.3.4* of *Chapter 4*) rather than to existing national screening levels. These screening levels are intended to be used to assess the quality of water in natural surface water systems.

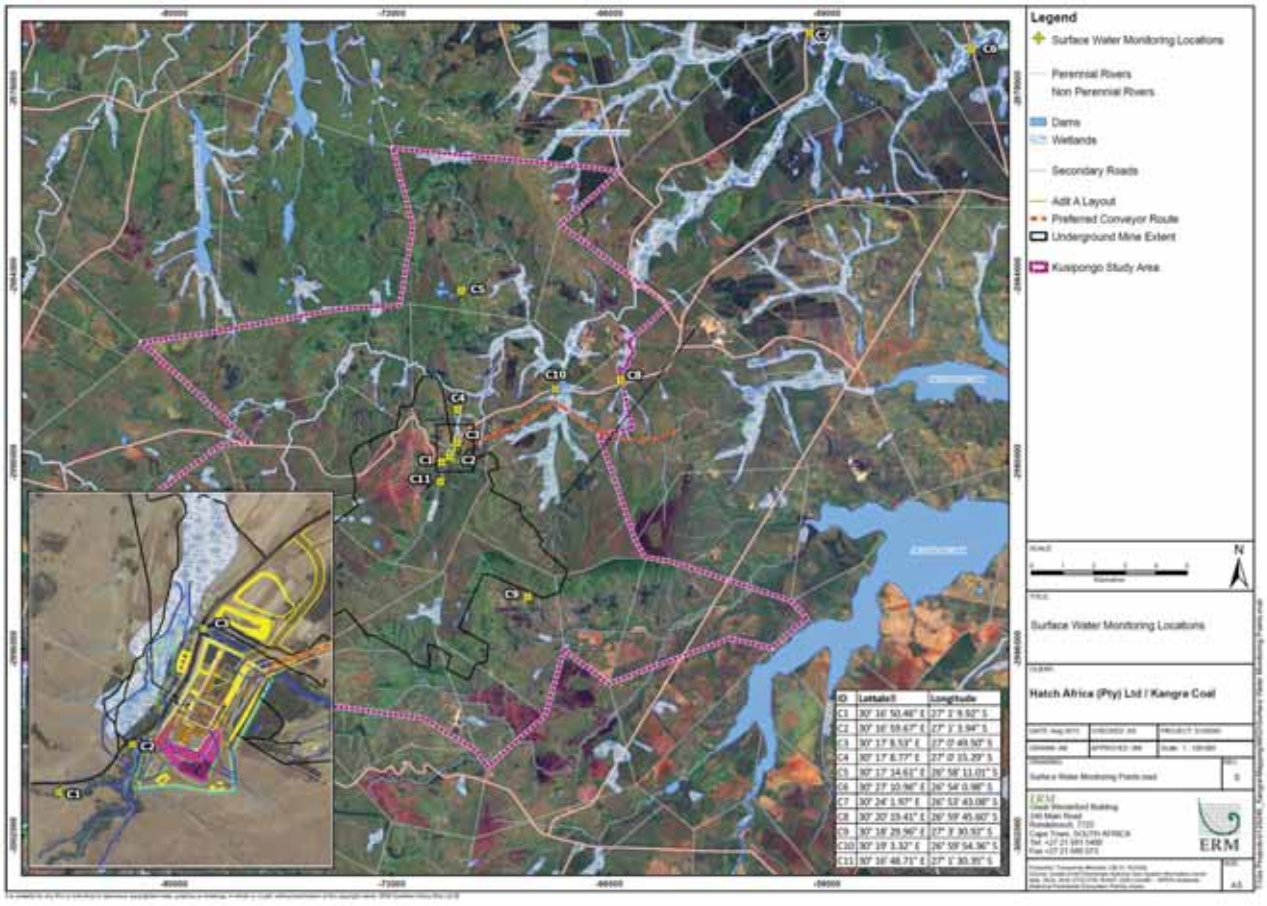
- The screening levels are not discharge standards. In this regard, the General Authorisations in Terms of Section 39 of the National Water Act (1998) will apply for waste discharge into surface water systems. The monitoring of discharges in surface water systems is, however not

included in the surface water monitoring plan, given Kangra Coal's commitment to a Zero Discharge Policy.

- All monitoring records will be stored in a database which is routinely updated, maintained, and includes all metadata associated with the monitoring activities.

- The monitoring programme and data will be reviewed annually and amended if necessary.

Figure 14.2 Surface water Monitoring Points for the Proposed Kusipongo Resource Expansion Project



14.7 GROUNDWATER

The groundwater monitoring plan has been developed taking into account the best practice guidelines for water monitoring in the South African mining industry (DWA, 2007). The measurement of water levels and taking of groundwater samples discussed below will proceed according to the best practice for monitoring methods, as outlined by Weaver (2007).

Monitoring of groundwater is required for the following purposes:

1. To detect the actual impact on groundwater quantity and quality timeously.

2. To assess whether the mitigation/management measures given provided in *Chapter 13* are effective, supporting the update of mitigation measures where necessary.

3. To support adaptive management in which the numerical groundwater model can be updated based on new information increasing its confidence level and then used to predict groundwater impacts and assist with social and biodiversity impacts and closure planning. With updated high confidence predictions the mine can act in a pre-emptive manner, thus reducing risks, rather than acting in hindsight when monitoring data reveals a problem.

4. To interrogate unknowns identified in this report, in which various field investigations can be carried out to test and improve the conceptual hydrogeological understanding of the aquifer system.

Groundwater Monitoring Plan

The groundwater monitoring plan is presented in *Table 14.2* below. This monitoring plan fulfils the monitoring actions required to address items 1, 2 and 3 above.

Table 14.2 Groundwater Monitoring Plan

BHID	Latitude	Longitude	Type	Primary Purpose	Water Level Monitoring Frequency	Flow Rate (Yield) Monitoring Frequency	Water Quality Monitoring Frequency
ERMBH1	27° 1' 9.072" S	30° 17' 6.628" E	Monitoring BH	Upstream of OBD (background)	Monthly		Quarterly
ERMBH2	27° 0' 59.350" S	30° 17' 3.715" E	Monitoring BH	Downstream of Adit A	Continual		Quarterly
ERMBH3	27° 0' 38.446" S	30° 17' 14.113" E	Monitoring BH	Downstream of Adit A	Monthly		Quarterly
ERMBH4	27° 3' 34.807" S	30° 18' 20.306" E	Monitoring BH	SE Boundary	Monthly		Quarterly
ERMBH5	27° 3' 27.620" S	30° 14' 25.436" E	Monitoring BH	SW Boundary	Monthly		Quarterly
ERMBH6	27° 2' 28.635" S	30° 15' 23.420" E	Monitoring BH	Adit D	Monthly		Quarterly
ERMBH7	27° 2' 52.688" S	30° 14' 52.285" E	Monitoring BH	Water Level Drawdown	Continual		Quarterly
ERMBH8	27° 0' 57.421" S	30° 17' 10.664" E	Monitoring BH	Crushing and Conveyor	Continual		Quarterly
ERMBH9	27° 1' 30.048" S	30° 16' 44.775" E	Monitoring BH	Ohlelo Stream Interaction	Monthly		Quarterly
ERMBH10	27° 2' 24.606" S	30° 17' 18.488" E	Monitoring BH	Water Level Drawdown	Continual		Quarterly
RMBH1	27° 0' 29.091" S	30° 14' 41.397" E	Recommended Monitoring BH	NW Boundary	Monthly		Quarterly
RMBH2	26° 59' 47.261" S	30° 15' 57.838" E	Recommended Monitoring BH	N Boundary	Monthly		Quarterly
FB2	27° 0' 47.072" S	30° 17' 52.651" E	Abstraction BH	Risk Management			6-monthly
FB6	27° 7' 18.660" S	30° 14' 4.014" E	Abstraction BH	Risk Management			6-monthly
FB7	27° 5' 52.446" S	30° 13' 18.210" E	Abstraction BH	Risk Management			6-monthly
FB8	27° 5' 48.103" S	30° 13' 2.558" E	Abstraction BH	Risk Management			6-monthly
FB13	27° 2' 3.142" S	30° 14' 52.958" E	Abstraction BH	Risk Management			6-monthly
Point1	27° 0' 9.462" S	30° 17' 16.035" E	SW Abstraction Point	Risk Management		Monthly	6-monthly
Point2	27° 2' 2.744" S	30° 18' 26.647" E	SW Abstraction Point	Risk Management		Monthly	6-monthly
Point3	27° 1' 9.672" S	30° 18' 16.344" E	SW Abstraction Point	Risk Management		Monthly	6-monthly
FS5	27° 2' 11.105" S	30° 18' 35.665" E	Spring	Risk Management		Monthly	6-monthly
FS6	27° 2' 6.169" S	30° 17' 56.658" E	Spring	Risk Management		Monthly	6-monthly
FS7	27° 0' 40.772" S	30° 16' 29.772" E	Spring	Risk Management		Monthly	6-monthly
FS8	27° 2' 49.469" S	30° 17' 9.982" E	Spring	Risk Management		Monthly	6-monthly
FS9	27° 3' 7.414" S	30° 16' 59.491" E	Spring	Risk Management		Monthly	6-monthly
FS10	27° 2' 54.270" S	30° 16' 43.102" E	Spring	Risk Management		Monthly	6-monthly
FS11	27° 3' 23.532" S	30° 16' 3.580" E	Spring	Risk Management		Monthly	6-monthly
FS12	27° 3' 37.687" S	30° 14' 23.769" E	Spring	Risk Management		Monthly	6-monthly
FS16	27° 6' 8.022" S	30° 17' 0.847" E	Spring	Risk Management		Monthly	6-monthly
FS17	27° 1' 33.198" S	30° 12' 38.317" E	Spring	Risk Management		Monthly	6-monthly
FS18	27° 2' 8.386" S	30° 11' 58.744" E	Spring	Risk Management		Monthly	6-monthly
FS19	27° 3' 6.159" S	30° 12' 29.140" E	Spring	Risk Management		Monthly	6-monthly
FS23	27° 3' 22.677" S	30° 18' 15.923" E	Spring	Risk Management		Monthly	6-monthly
FS25	27° 3' 6.477" S	30° 18' 58.005" E	Spring	Risk Management		Monthly	6-monthly
FS26	27° 2' 34.173" S	30° 15' 36.798" E	Spring	Risk Management		Monthly	6-monthly
Spring.	27° 1' 48.527" S	30° 17' 4.854" E	Spring	Risk Management		Monthly	6-monthly
Spring A	27° 1' 2.224" S	30° 17' 35.581" E	Spring	Risk Management		Monthly	6-monthly
Spring B	27° 3' 40.496" S	30° 17' 46.383" E	Spring	Risk Management		Monthly	6-monthly
Spring C	27° 3' 10.464" S	30° 14' 24.098" E	Spring	Risk Management		Monthly	6-monthly

Notes: OBD Overburden Dump
BH Borehole

The monitoring plan is a living document that needs to be updated as monitoring data and modelling results are generated. Details in support of Table *14.2* are listed as follows:

- Each borehole was selected in order to monitor particular mining infrastructure, which is detailed as the 'primary purpose'.

- Monitoring boreholes installed by ERM have been selected for monitoring where available. Where there are no boreholes available, and monitoring in a certain position is recommended, a Recommended Monitoring Borehole is listed (RMBH1 and RMBH2). The approximate location of these boreholes is shown in *Figure 14.3*.

- In addition to the existing boreholes and the recommended new boreholes, Kangra Coal will monitor private boreholes, springs and surface water abstraction points, as a risk management measure in order to ensure a reliable and complete dataset of water levels and water chemistry exists for these holes.

- The frequency of water level measurement is divided between monthly (manually with a water level or 'dip' meter), and continual (automatically on 1-hour readings, with pressure loggers installed in the borehole). Certain boreholes are selected for continual measurement for improving the conceptual understanding of aquifer behaviour. In private boreholes, water level measurement is not possible because the boreholes are not accessible for these measurements.

- If any of the currently selected monitoring boreholes should run dry due to groundwater drawdown, replacement boreholes will be drilled to greater depth.

- Groundwater quality in monitoring wells will initially be monitored quarterly and private boreholes, springs and surface water abstraction points will be sampled 6-monthly. Monitoring frequency will reviewed once monitoring data is available.

- Sampling protocols as detailed in Weaver (2007) should be followed. In particular, for groundwater and spring water the following will be undertaken:

    - pH and EC will be monitored in the purge water in the field until they stabilise prior to collecting a sample; and
    - Samples for trace element analysis will be appropriately filtered and acidified in the field to ensure results are representative of dissolved species in the aquifer.

- Samples will be submitted to a SANAS accredited laboratory within recommended holding times.

- The list of chemical constituents to be analysed will be routinely updated based on previous results. Parameters to be tested include, but are not limited to:

    - Major constituents pH, EC, (if not measured in the field), TDS, Cl, SO_4, NO_3, total N, F, Ca, Mg, Na, K, total alkalinity.
    - Major metals by inductively coupled plasma – mass spectrometry (ICP-MS): Al, Cd, Co, Cu, Fe (Ferric and Ferrous iron), Mn, Ni, Pb, Sb, Zn, U.
    - Parameters identified as contaminants of concern include Sulphate, Iron, Cobalt Nickel.

- In addition to the parameters detailed above, boreholes ERMBH1, 2, 3 and 8 in proximity of Adit A should be monitored for:

    - BTEX (benzene, toluene, ethylbenzene and xylenes);
    - EPH (extractable petroleum hydrocarbons);
    - GRO (gasoline range organics);
    - DOC (dissolved organic carbon);
    - COD (chemical oxygen demand); and
    - *E. coli*.

- Water quality results will be compared to the water quality screening levels developed as part of this ESIA process (refer to *Section 4.3.4* of *Chapter 4*) rather than to existing national screening levels.

- All monitoring records will be stored in a database which is routinely updated, maintained, and includes all metadata associated with the monitoring activities.

- The monitoring programme and data will be reviewed by an independent hydrogeologist annually and amended if necessary.

Additional Recommended Monitoring

Apart from groundwater, dewatering volumes and pumping/discharge rates in existing and new mines will also be monitored.

Additional Recommended Field Investigation

Table 14.3 below presents an action list that will be used to interrogate unknowns identified in this ESIA process and to test and improve the conceptual hydrogeological understanding of the aquifer system. Additional field investigations will be tied in with:

- **Conservative Assumptions** – the most conservative assumptions of the conceptual hydrogeological model including the interconnectivity of the different superposed groundwater systems across the different dolerite sills on a Project scale, springs and wetlands located above the 2nd dolerite sill are not at risk from groundwater drawdown (local scale) and the

connectivity of the Ohlelo River and the fractured groundwater occurrences where mining is planned to take place.

- **Uncertainties Identified during the Modelling Phase** – additional data can provide more certainty to the groundwater model developed as part of this ESIA process especially with regards to identified sensitive parameters including recharge, transmissivity (hydraulic conductivity) and drain conductance (hydraulic conductivity of the coal seams, seam roof and –floor).

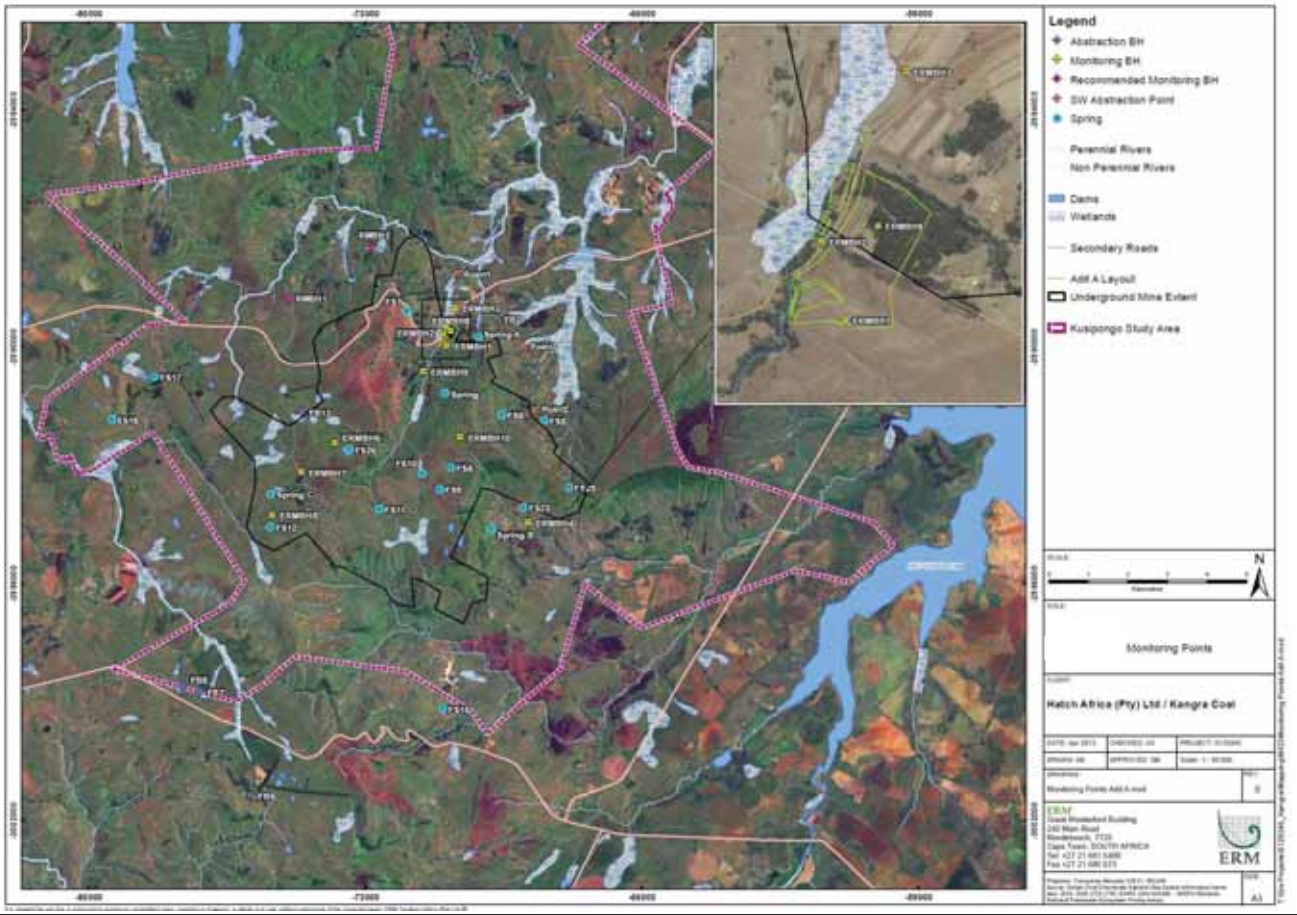
A hydrogeological support consultant will be contracted by Kangra Coal to manage the proposed monitoring, additional field investigations and the routine updating of the numerical models.

Table 14.3 Field Investigations

Unknown/Limitation	Investigation
Groundwater recharge	The predictions provided in the numerical groundwater model are highly sensitive to the recharge value applied, yet this is a parameter with little data. Recharge will be investigated via various methods, including but not limited to: • Comparison of continuously monitored water levels to rainfall events, to identify which rainfall events contribute to groundwater recharge and the volume of recharge; • Conduct a specific recharge investigation to quantify stream loss on top of the mountains; and • Quantify direct infiltration.
Hydraulic parameters of the different groundwater horizons	The predictions provided in the numerical groundwater model are highly sensitive to the transmissivities (T) / hydraulic conductivities (K) of the different modelled strata. Additional field investigations will aim for an improved spatial coverage by boreholes and aquifer tests including observation boreholes for better understanding of T/K values and storativity values of the different groundwater horizons.
Vertical profile of hydraulic conductivities	Perform a series of packer tests to: • Investigate the vertical profile of hydraulic conductivities (K) in relation to the coal seams, seam roof and -floor in shallow and deep coal seam areas to improve confidence in the parameter *drain conductance*, which has proven very sensitive with regards to predicted mine water inflows; and • Investigate the K distribution with depth in the water bearing strata to prove/disprove the conservative assumption in the conceptual hydrogeological model that K values remain constant with depth.
Interconnectivity of different groundwater horizons across dolerite sills and other structures	Drilling and aquifer testing of nested boreholes targeting the different water bearing horizons including comparison of continuously monitored water levels and drilling deeper boreholes at higher elevation in order to: • Investigate the compartmentalising effect of structures and dolerite sills in the Project Area; and • Investigate the interconnectivity of different superposed groundwater bearing horizons.

Unknown/Limitation	Investigation
ARD and NP of the host rock	Conduct further geochemical testing, including field testing, to provide more confidence in current results that are not statistically robust: • Include samples of the country rock to verify the metal leaching and neutralising potential of the overburden material (sandstone, clay, dolerite, and potentially small quantities of coal); and • Kinetic field tests to be conducted on waste rock material to determine the duration of oxidation (and hence potential surface and groundwater contamination).

Figure 14.3 ***Groundwater Monitoring Points for the Proposed Kusipongo Resource Expansion Project***



14.8 NOISE

Considering the proximity of noise-sensitive receptors to the proposed Project Site, an acoustic consultant will be appointed to design a detailed noise measurement programme for all phases of the proposed Project. The noise measurement programme will allow for quarterly noise measurements to be taken in 10-minute bins over a period of at least 24 hours.

Noise monitoring locations are based on noise model predictions for the proposed Project, and more specifically, where predictions indicate the following at noise sensitive receptors:

- **Construction Phase** – change from ambient sound levels (taken as 42 dBA) as a result of the proposed Project that are in excess of 55dBA.

- **Operational Phase** – increase in baseline noise levels to 5dBA or higher than the SANS 10103 night-time rating level of 35 dBA (as the operation will be 24hours per day).

As such, noise measurements will be taken at the following location during the following phases of the proposed Project (refer to *Table 14.4*).

Table 14.4 Noise Measurement Locations for Construction and Operational Phases

Receptor	Coordinates		Monitoring Required	
	Latitude	Longitude	Construction Phase	Operational Phase
PSR01	27⁰ 0' 37.76" S	30⁰ 19' 42.99" E	X	X
PSR17	26⁰ 59' 59.39" S	30⁰ 18' 54.36" E		X
PSR18	27⁰ 0' 13.48" S	30⁰ 19' 5.33" E		X
PSR19	27⁰ 0' 9.33" S,	30⁰ 18' 54.56" E	X	X
PSR20	27⁰ 0' 17.97" S	30⁰ 18' 20.83" E	X	X
PSR21	27⁰ 0' 27.08" S	30⁰ 18' 17.54" E		X
PSR22	27⁰ 0' 31.17" S	30⁰ 17' 56.38" E	X	X
PSR23	27⁰ 0' 34.47" S	30⁰ 17' 7.59" E		X
PSR25	27⁰ 0' 51.77" S	30⁰ 16' 58.62" E	X	X
PSR26	27⁰ 1' 3.88" S,	30⁰ 17' 22.40" E	X	X
PSR27	27⁰ 0' 59.33" S	30⁰ 17' 9.18" E	X	X
PSR28	27⁰ 1' 48.63" S	30⁰ 16' 27.07" E	X	X
PSR43	27⁰ 0' 54.90" S	30⁰ 17' 25.50" E	X	X
PSR44	27⁰ 0' 50.28" S	30⁰ 17' 22.60" E	X	X
PSR45	27⁰ 0' 37.47" S	30⁰ 17' 46.23" E	X	X
PSR46	27⁰ 0' 49.08" S	30⁰ 17' 53.15" E	X	X
PSR47	27⁰ 0' 49.04" S	30⁰ 18' 5.17" E	X	X
PSR48	27⁰ 0' 54.58" S	30⁰ 18' 1.29" E		X
PSR51	27⁰ 0' 43.20" S	30⁰ 18' 28.65" E	X	X

Measurements will be collected as construction commences through the operational phase of the proposed Project, and carried out in accordance with SANS 10103:2008 (or any future updates) using instruments as defined in the National Noise Control Regulations (or any future promulgated laws).

Should (for any given reason) during the construction and operational phases of the proposed Project, it be realised that the applicable standards (day time

for the construction phase and or night time for the operational phase) be exceeded, and that these exceedances are demonstrably due to activities associated with the establishment/operation/decommissioning of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described in *Chapter 13* to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.

14.9 AIR QUALITY

Air quality monitoring is required during the construction, operation and decommissioning phases of the proposed Project. The monitoring programme is designed to assist in the decision making process around implementing mitigation measures, verifying the efficiency of mitigation measures and ensuring that unacceptable impacts are not arising at nearby sensitive receptors.

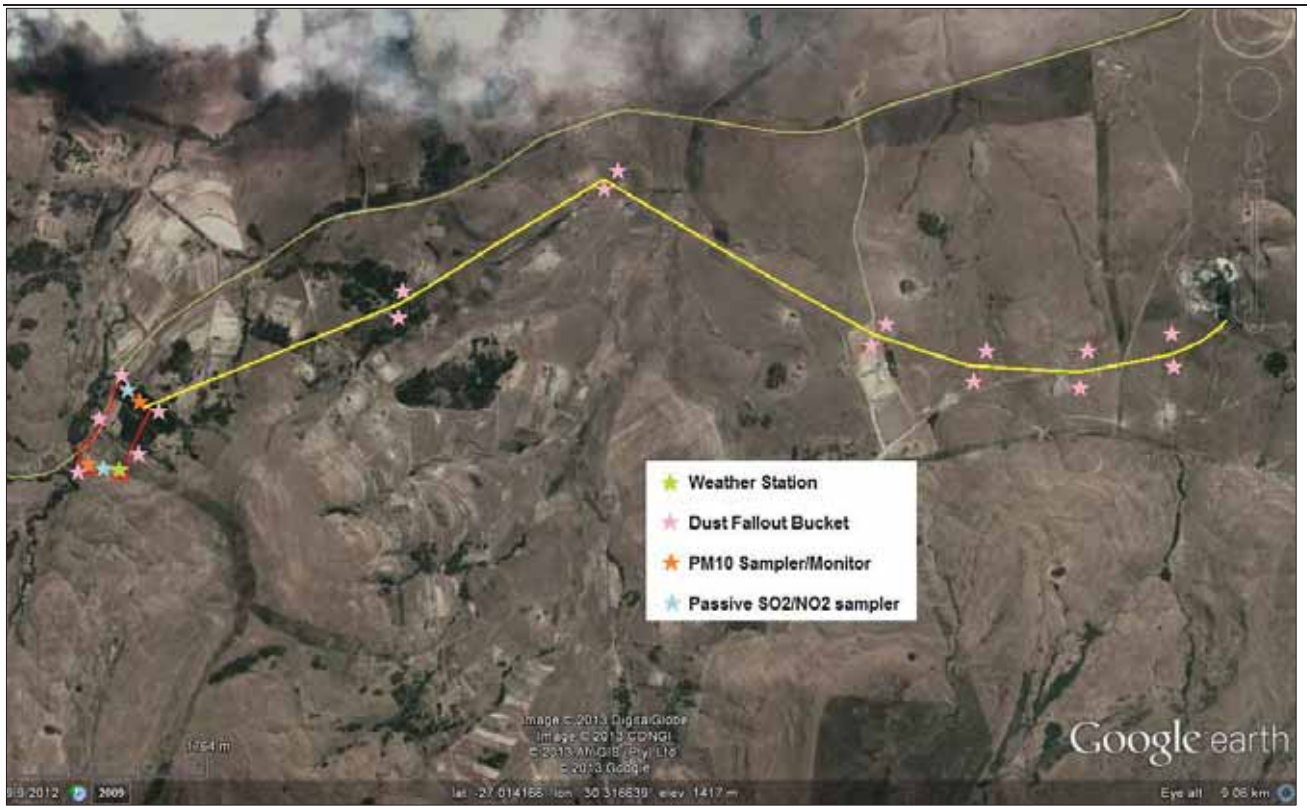
The monitoring programme will include the following elements:

- Real time monitoring of PM_{10};
- Real time monitoring of meteorological parameters;
- Passive monitoring of dust deposition; and
- Passive monitoring of NO_2 and SO_2.

In addition to physical monitoring, monitoring will also be undertaken using visual inspections and by recording and acting upon substantiated complaints from local communities. Indicative monitoring locations [1], subject to finalisation following detailed Project design, will be set out as per *Figure 14.4* overleaf. This is discussed in more detail below.

[1] Exact monitoring locations are not possible until all aspects of security and siting constraints have been resolved, in addition to the finalisation of the proposed project design specifications. Siting constraints include accessibility and presence of trees or other structures.

Figure 14.4 ***Indicative Air Quality Monitoring Locations***



14.9.1 PM_{10} Monitoring

Real time monitoring of PM_{10} will be undertaken upwind and downwind of the main mine adit during construction, operational and decommissioning phases. The difference in the upwind and downwind concentrations of PM_{10} should be used to ascertain the contribution to ambient PM_{10} from the site. On this basis the site will employ one upwind monitoring location, i.e. towards the northeast and one downwind monitoring location, i.e. towards the southwest during construction and operation (refer to *Figure 14.4* for indicative monitoring locations). Cognisance should however be taken that the wind rose (presented in *Section 7.2* of *Chapter 7*) may not be an exact representation of the conditions at the proposed Project.

During the construction phase the monitoring data will be reviewed on a daily basis; and during the operational phase will be considered on a monthly basis. Where PM_{10} emissions associated with the site are above the action levels, investigations will be made into the sources of emissions and measures implemented to manage emissions.

PM_{10} monitoring will be undertaken using devices that are recognised by the DEA for compliance purposes. In this regard, gravimetric sampling (filter-based methods) is required. The use of "mini-vol", filter based sampling requires the daily changing of filters.

Automatic filter-based sampling techniques (e.g. utilising Tapered Element Oscillating Microbalance (TEOM)) may also be considered; however these are costly and require highly specialised servicing.

Other examples of monitoring methods, albeit not gravimetric, include light scattering devices such as the Topas, Osiris, AirQual, and methods such as the Beta Attenuation Monitor. The latter technique has also been used in combination with gravimetric sampling. These techniques have the benefit of providing short term real-time data upon which decisions around mitigation and control can be based.

For management purposes, light-scattering monitors will be considered. However, consideration of filter-based sampling will be included in the monitoring campaign, albeit only on a weekly or monthly basis to serve as a form of calibrating the light-scatter scatter monitoring results. If necessary, the filter-based sampler may also be utilised to show compliance with the NAAQS.

The equipment will be serviced by a competent party on a monthly basis to ensure effective operation, and will be overhauled by a qualified engineer on an annual basis.

14.9.2 Passive Monitoring of Dust Deposition

Monitoring will be undertaken using passive deposition monitoring upwind and downwind of the main mine adit during the construction and operation phases (*Figure 14.4)*. Dust fall measurement will also occur along the conveyor belt, as shown in *Figure 14.4*. The difference in the upwind and downwind deposition will be used to ascertain the contribution to deposited dust from the operation. On this basis the proposed Project will employ eight upwind and eight downwind monitoring locations, and one along the western boundary of the plant (refer to *Figure 14.4* for indicative locations*)*. Whilst all of these fallout monitors will be in place during the operational phase, it may be considered to only place the five closest to the plant during construction.

During the construction and operational phases the monitoring data will be reviewed on a monthly basis by the environmental manager. Where dust emissions associated with the site are above the action levels, investigations will be made into the sources of emissions and measures implemented to manage emissions.

The monitoring will be done in accordance with the DEA's proposed standards, *viz.* according to the ASTM 1739-98 standard measurement method. This method employs a single bucket device consisting of a cylinder not less than 150mm in diameter with height not less than twice its diameter and exposed for one calendar month (30 ±2 days).

14.9.3 Passive Monitoring of NO_2 and SO_2

Although it is predicted that gaseous emissions are expected to have a low impact, long-term air concentration levels of NO_2 and SO_2 using passive diffusion tubes will be monitored. These are relatively inexpensive to operate and will provide the proposed Project a development of any trends in these pollutants during the operational phases.

Passive sampling will be undertaken upwind and downwind of the Emergency Generators, or along the north-eastern and south-western plant boundaries. The monitoring data will be reviewed by the environmental manager on a monthly basis.

The analysis of samples will be undertaken by a suitably certified laboratory.

Diffusion tubes utilise the principle of targeted diffusion of gases onto a reagent, in this case NO_2 and SO_2. In the laboratory the tubes are titrated to calculate a concentration in air, when taking into account exposure time.

14.9.4 Visual Inspection

During the construction, operation and decommissioning phase's, Kangra Coal will undertake visual inspections of activities resulting in dust on-site. In the event that activities on site are observed to be generating significant airborne dust, the activity generating the emissions will be reviewed and as required, additional mitigation implemented, or if required, activities will be ceased. The visual inspections will be undertaken on a daily basis, and will reflect the ethos of 'see it, own it', in terms of identifying and addressing significant dust emissions. Where significant emissions are observed, these will be recorded by the environmental manager in accordance with the quality management system. This may include electronic record keeping as well as hardcopy reports. On the basis of the reports, where there are activities that repeatedly result in significant emissions, further investigations will be undertaken to reduce emissions.

This will be the role of the site environmental function, or nominated representative.

14.10 BIODIVERSITY

The groundwater model and associated responses on the receiving environment (specifically surface water features *viz.* wetlands and the Ohlelo River) are based on various assumptions and the effects of these responses on these systems and associated biodiversity will be monitored. *Table 14.5* provides these monitoring measures.

Table 14.5 Biodiversity Monitoring

Monitoring Action	Applicable Phase			Frequency of Monitoring
	Construction	Operation	Post-Closure	
Water volume and flow rate of the Ohlelo River. This will need to take place until the system has stabilised post-closure.		X	X	Monthly
Riparian integrity along the Ohlelo River and associated tributaries by a vegetation ecologist to assess health of the riparian vegetation and the impact on threatened and protected species (for example Tree Ferns – *Alsophilia dregei*). This will need to take place until the system has stabilised post-closure.		X	X	Annual basis

Monitoring Action	Applicable Phase			Frequency of Monitoring
	Construction	Operation	Post-Closure	
The functionality and integrity of a representative selection of wetlands (including Kransbank) by a wetland and vegetation specialist to determine if there are changes to base flow, surface flow or vegetation dynamics. This will need to take place until the system has stabilised post-closure. The Present Ecological State of the Kransbank wetland will need to be established prior to the construction phase.		X	X	Annual basis
Biomonitoring of aquatic systems and riparian habitat in those locations specified in the surface water monitoring programme (refer to *Table 14.1*) by an accredited aquatic ecologist.		X	X	Biannual (seasonal monitoring)
The presence of threatened terrestrial birds dependant on wetlands by an ornithologist specialist. This will need to take place until the system has stabilised post-closure.		X	X	Annual basis

Results of the above monitoring programmes will be analysed and consolidated into an annual report by a SACNASP registered ecologist appointed by Kangra Coal with recommendations on adaptive management of the impacts on the wetlands and water courses. The report will be submitted to the MTPA for approval on the measures to mitigate the on-going impacts on the wetlands and water courses.

Visual Monitoring

Any flora species transplanted during the construction phase of the proposed Project will be monitored on an on-going basis, until such time that plants/trees have established and show signs of re-growth.

All soil stockpiles during the construction and operational phase of the proposed Project will be continuously monitored for any alien/invasive plant(s). Should any alien/invasive plant(s) be detected by the environmental officer (or similar function), the presence of these species will be suitably recorded, following which the plant(s) will be removed in the correct manner as per the prospective Alien Invasive Management Plan.

14.11 SOCIO-ECONOMIC

Monitoring for Potential Resettlement

At this stage of the proposed Project, the number of homesteads (**outside** of the proposed Project footprint) that will be displaced is not certain. Displacement of these homesteads is dependent on potential air quality and noise impacts related to the proposed Project activities, both at the main mine adit and along the route of the proposed overland conveyor system. These monitoring efforts are described below.

Air Quality

In those sensitive receptors where model predictions of the existing baseline and construction and operation of the main mine adit exceed the PM_{10} standard for the Predicted Highest Daily PM_{10} Concentrations of 75µg/m^3, monitoring effort will be focused at these locations to confirm such model predictions. These areas are set out in *Figure 14.5* and *Figure 14.6* for the construction and operational phases respectively.

Where measured exceedances of the applicable standard persists and are demonstrably due to activities associated with the establishment/operation of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such concentrations at these locations will be well maintained, in some cases the frequency of such mitigation measures increased (e.g. use of localised dampening), and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.

Figure 14.5 ***Predicted Highest Daily Average PM_{10} Air Concentration during the Construction Phase***

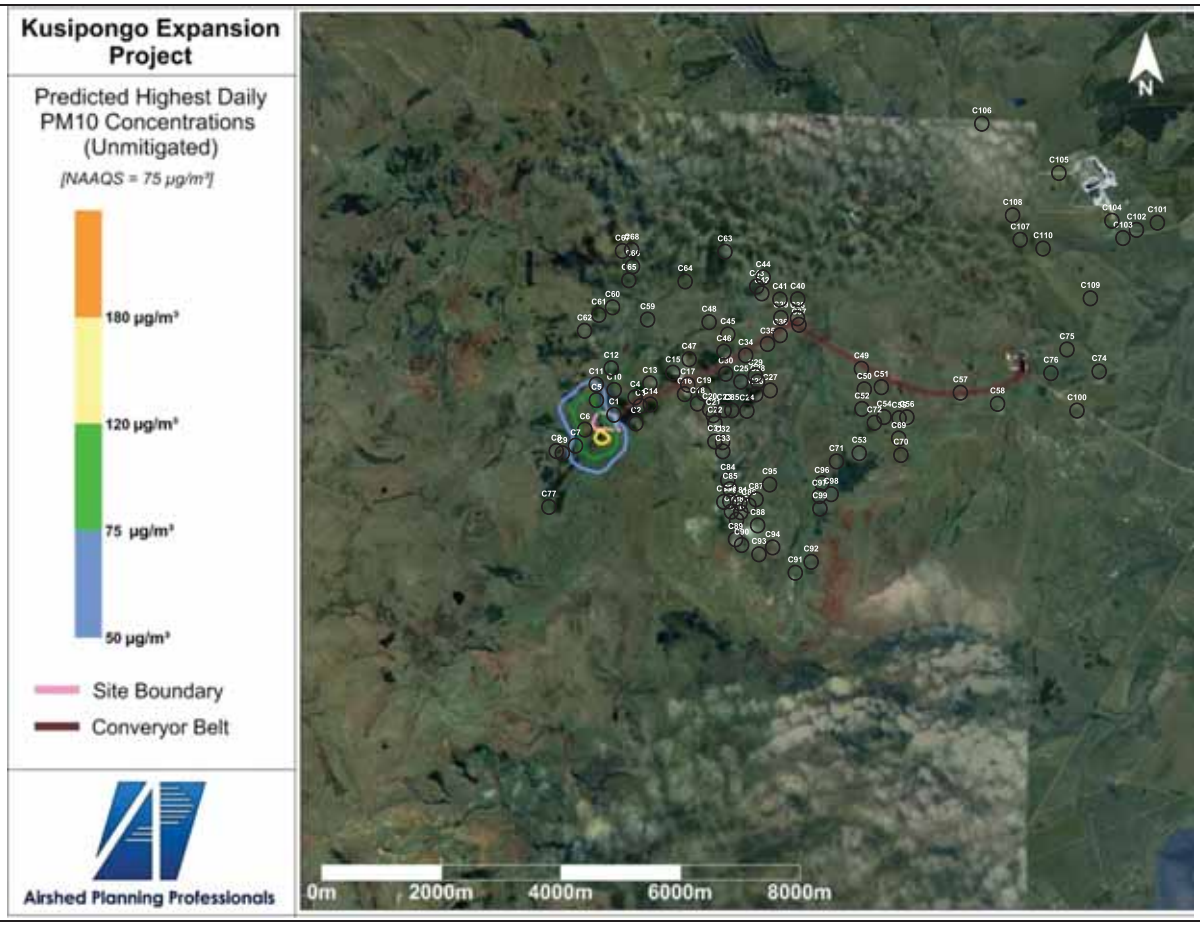
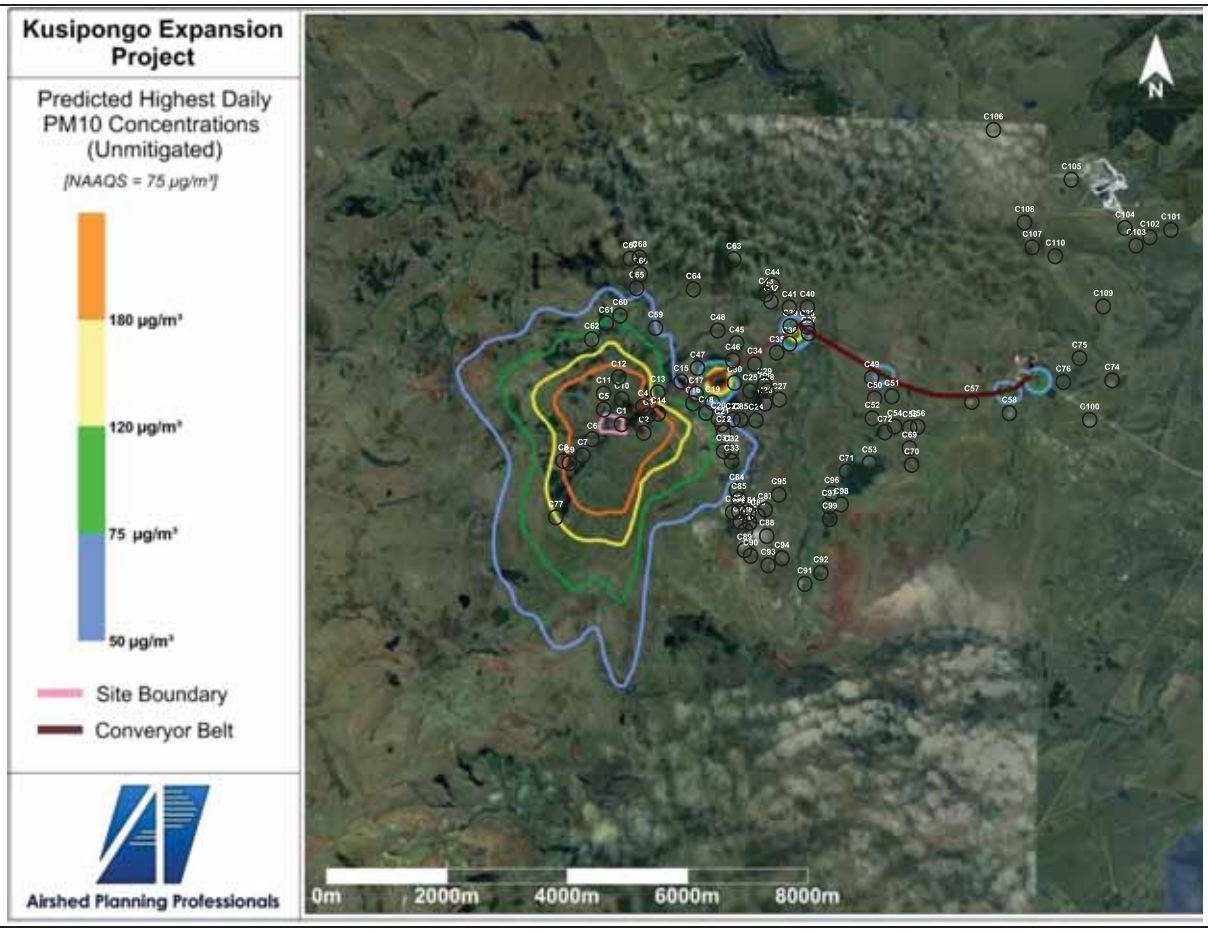


Figure 14.6 ***Predicted Highest Daily Average PM_{10} Air Concentration during the Operational Phase***



Noise

As is mentioned in *Section 14.8* on *Page 14-16*, noise monitoring locations will be at those sensitive receptors (refer to *Table 14.4*) where noise model predictions indicate an exceedance in ambient sound levels that are above those included in SANS 10103.

As with the measures provided for air quality above, when measured exceedances of the applicable standard persists and are demonstrably due to activities associated with the establishment/operation of the proposed Project (i.e. not because of regionally increased baseline), the mitigation efforts described above to reduce any such levels at these locations will be well maintained, in some cases the frequency of such mitigation measures increased, and the mitigation programmes frequently audited to ensure their effective and continued implementation.

If avoidance of Major significant impacts is not feasible using these measures, consideration will be given to the option of resettling the affected community/structures. This will be explored in consultation with the affected communities and will be planned and implemented in accordance with the Resettlement Action Plan (RAP) to be developed by Kangra Coal at a later stage of the proposed Project.

14.11.2 *Heritage*

During the field survey, no surface fossils were identified along the proposed conveyor routes or within the main mine adit and Adit B footprints. Most fossil heritage is embedded within the rocks beneath the land surface or obscured by surface deposits such as alluvium or soil and by vegetation cover. As a result, an appointed Environmental Control Officer (ECO) or the Environmental Function at Kangra Coal will be trained to monitor for and identify any paleontological resources during the construction and operational phases. Monitoring may be limited to soil and overburden dumps in which fossil material may be deposited with overburden material.

14.12 *REPORTING*

This monitoring plan will collect data that is to be collated, analysed, compared to the requisite regulations, screening values, standards and/or guidelines, and reported to those authorities stipulated in the Mining Rights, Environmental Authorisation, Water Use Licenses and Waste Management License.

15 SOCIAL AND ENVIRONMENTAL AWARENESS PLAN

This Chapter (Social and Environmental Awareness Plan – S&EAP) details a framework outlining procedures essential for effective education of employees, contractors and their sub-contractors on social and environmental matters and responsibilities. The S&EAP has been developed as per the requirements of Section 51 (sub-section (b) vi) of the MPRDA Regulations (GN.R 26275), and provides an outline to ensure that systems are in place to ensure that those working for the proposed Project are aware of their social and environmental commitments.

Kangra Coal will update their existing Environmental Awareness Systems to include specific awareness procedures for the proposed Kusipongo Resource Expansion Project, and provide appropriate resources to provide social and environmental awareness training during the construction, operational and decommissioning and closure phases of the proposed Project.

Kangra Coal will require that all managers associated with the proposed Kusipongo Resource Expansion Project adhere to the mitigation / management measures detailed in the SEMP (this report) and the Company Environmental Policy and identify, evaluate, and minimize risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will need to be entrusted to maintain the necessary level of environmental performance for their activities. In addition, contractors and their associated sub-contractors will also need to demonstrate compliance to mitigation / management measures included in the SEMP.

In order for the above to be realised, Kangra Coal will need to ensure that the key aspects of the SEMP and the Company's Environmental Policy are communicated to the aforementioned in the form of on-going social and environmental awareness training.

This Plan should be considered to be "living" and will need to be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

15.1 TRAINING

The key components of training requirements are to ensure key site personnel, including contractors, understand the:

- Environmental and social requirements of the proposed Project and how these will be implemented and monitored on site;

- Contents and relevant requirements of Project actions contained within the SEMP;

- Environmental and social sensitivities of the Study Area;

- Procedures to be followed in the event of non-compliance with environmental and social requirements; and

- Procedures for responding to the media, unauthorised visitors to the site, and enquiries from the public.

They must also:

- Know how to deal with unforeseen environmental and social incidents; and

- Be aware of their roles and responsibilities with respect to environmental and social issues.

15.1.1 Project Sponsors Training Programme

One of the most important mechanisms for the enhancement of the Project's environmental and social performance will be the continued implementation of a training programme for all Project personnel including the personnel of contractors and subcontractors.

Training will include:

- Induction training for all staff including modules on: health and safety, environmental awareness, accommodation rules, worker code of conduct, stakeholder engagement, grievance mechanisms and cultural heritage awareness;

- Toolbox training for specific tasks; and

- Training for individuals involved in tasks with specific responsibilities.

Refresher training programmes will also be implemented to ensure continual improvement in environmental awareness for all Project personnel.

Training will be provided at each stage of the Project, from initial establishment of logistical facilities through to construction, operation and eventually decommissioning and closure. The training function will assist managers in developing and co-ordinating training programmes as required.

Training records will be maintained by the training function and an assessment of the effectiveness of the training programmes will be included as part of the internal audit procedures.

15.1.2 Contractor Training Programme

Contractors will be responsible for ensuring that all their personnel are aware of their environmental and social responsibilities. They will develop and implement training programmes to the satisfaction and approval of the Project Sponsors.

Training will include:

- Induction training for all staff prior to carrying out any work on site. This will include modules on: health and safety, environmental awareness, accommodation rules, worker code of conduct, stakeholder engagement, grievance mechanisms and cultural awareness;

- Toolbox training for specific tasks;

- Training for individuals involved in tasks with specific responsibilities; and

- Training programmes organised by the Project Sponsor as required.

The contractor will keep auditable records of training given. Assessment of the effectiveness of the training programme will be included as part of the SEMP audit procedures.

15.1.3 Specific Social and Environmental Training Focuses

Training will (in particular) focus on the following specific social and environmental topics:

Environmental

- Biodiversity and conservation awareness, including:

    - To ensure that all construction footprints are maintained to a minimum.
    - To stay out of "No-go" areas, especially demarcated wetlands.
    - Having to maintain single entry/exit routes to working areas and to refrain from establishing informal routes/tracks or off road driving.
    - Training of the Environmental Officer (or equivalent) of key species identification (for both indigenous and alien flora and fauna) through photographic references.
    - The discouragement of killing animals and the correct protocol to follow in the event of a snake or other animal being encountered on site.
    - Venomous snake handler training for the Environmental Officer (or equivalent) on Site.

- That littering is an offence and food items etc. must not be disposed of out of vehicle windows and in and around construction / operation activities.

Social

- Noise awareness, especially important for the drivers of vehicles that will operate vehicles at night.

- Training on the Chance find Procedure set out in the Heritage Impact Assessment (*Annex C.4*).

- Landowner etiquette.

- The maintenance of speed limits.

- Sensitivity to the local social environment, in particular highlighting health risks such as on HIV / Aids.

- Training of the Environmental Officer (or equivalent) on identification of paleontological resources.

Furthermore, Kangra Coal will seek opportunities to run an education programme, in partnership with the District department of transport sensitising residents in the vicinity of the proposed Project and local children to traffic hazards.

16 SOCIAL AND ENVIRONMENTAL EMERGENCY RESPONSE PLAN

This Chapter (Social and Environmental Emergency Response Plan – S&ERP) details a framework outlining procedures essential for effectively containing emergency situations for the proposed Project. The S&ERP has been developed as per the requirements of Section 51 (sub-section (b) iii) of the MPRDA Regulations (GN.R 26275), and provides an outline to ensure that systems are in place so as to react and appropriately manage unwanted outcomes. This S&ERP has been developed to address the general requirements associated with efficient response to these unwanted outcomes. Kangra Coal will use this framework S&ERP for mitigating impacts that may be unforeseen or unidentified until construction or operation is underway, and will develop a detailed operational plan based on identified hazards.

Kangra Coal will update their existing Emergency Response Systems to include specific operational emergency procedures for the proposed Kusipongo Resource Expansion Project and provide appropriate resources to respond to process upset, accidental, and emergency situations for operations and activities during construction, operation and decommissioning and closure phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

This S&ERP has been compiled within the context that Kangra Coal requires managers of all projects and operations to adhere to the Company Environmental Policy and to evaluate, identify and minimise risks to the environment. Furthermore, all operations/activities associated with the proposed Kusipongo Resource Expansion Project will require site-specific emergency response plans to mitigate impacts which meet or exceed all applicable regulations.

The objectives of this Plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities;
- Set out the framework for hazard identification in order to define procedures for response to the situations including the development of contingency measures;
- Structure a process for rapid and efficient response to and manage emergency situations during the construction, operational and decommissioning and closure phases of the proposed Kusipongo Resource Expansion Project; and
- Assign responsibilities for responding to emergency situations.

The construction, operation and decommissioning phases of the proposed Project will result in activities that have the potential to result in unwanted outcomes and/or emergency situations. The S&ERP is aimed at defining the process and responsibilities for managing these situations, thus reducing likelihood and severity of inadequate management.

This Plan should be considered to be a "live" document and will need to be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

16.1 ROLES AND RESPONSIBILITIES

With respect to this Plan, Kangra Coal has the responsibility to:

- Provide emergency response services and to structure and coordinate emergency response procedures for the proposed Project;
- Ensure that specific emergency responsibilities allocated to them are organised and undertaken; and
- Ensure that employees and contractor third parties are trained and aware of all required emergency procedures.

16.2 UPDATING EXISTING EMERGENCY RESPONSE SYSTEM

Prior to updating the existing emergency response system, Kangra Coal will develop a hazard identification risk assessment programme, which will involve a baseline risk assessment of the proposed Project, from construction through to decommissioning. This risk assessment will aid in thorough risk identification. This risk assessment programme will need be repeated to take into account non-routine tasks, new Project activities and changes made to the existing process.

Furthermore, Kangra Coal will co-ordinate the proposed Project emergency response process and will engage communities and local government to inform them of the emergency response planning and processes, and integrate as appropriate with available services.

16.3 EMERGENCY COMMUNICATIONS AND COORDINATION PLAN

In any emergency situation where there is an ***immediate*** threat to communities, personnel or the environment, the Mine Manager shall be notified immediately. The General Manager will dispatch the emergency response coordinator who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a ***developing*** emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Mine Manager (or if the Mine Manager is absent the Environmental Manager) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident / near miss must be reported on to the General Manager.

If an emergency situation poses a direct threat to communities in the area, the Environmental and / or Community Officers will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator will be tasked with responding to the potential risk. Should the emergency situation be such that it can be managed by Kangra Coal, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent / minimise potential risks.

16.4 RESPONSE TO INCIDENTS

An **incident** is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts as a result of all such incidents.

For Kangra Coal, environmental incidents can be classified in three categories, with each category having specific reporting and follow-up requirements (*Table 16.1*).

Table 16.1 Environmental Incident Categories

Classification	Category 1	Category 2	Category 3
Identification	An incident resulting in a breach of licence conditions, environmental regulations and / or Kangra Coal standards; an incident that is reportable to the government by law or other statute, or has caused significant environmental harm or injury to people, animals, or property. This category incident also includes incidents whose impacts have	An incident with potential to breach licence conditions or environmental regulations or standards, but which is not reportable to the government (though voluntary disclosure may be undertaken at the discretion of site management). Has the potential to cause significant environmental harm or injury to people or animals and / or has	An incident with little potential to breach licence conditions or environmental regulations or standards and which is not reportable to the government and / or the management committee.

Classification	Category 1	Category 2	Category 3
	extended onto publicly accessible land and which have the potential to adversely impact on surrounding communities, livestock or wildlife.	impacted on publicly accessible land in some measure. This includes incidents that have interfered with the public domain outside the Kangra Coal concession, but which are not reportable by law to Government.	
Reporting	Immediately reportable to the Kangra Coal board of directors.	Reportable to all management associated with site operations of the Project.	Reportable only to the environmental manager (or equivalent thereof).
Follow up	Formal investigation will be required.	Formal investigation required.	Informal investigation actions required.

The actions resulting from any formal or informal investigations will be used to update the SEMP.

16.5 *SOCIAL AND ENVIRONMENTAL EMERGENCY PROCEDURES*

Emergency Procedures have been developed for each of the main risk scenarios identified, including:

- **Fire** - an event where an object or objects are ignited by a source and burn with a flame or where smoke is visible;
- **Flooding** – an event where flow rates in rivers significantly rise or in the event of storm conditions with heavy rains; and
- **Chemical/Fuel Spills** – when any chemical or fuel is accidently released into the natural environment.

The purpose of these procedures is not to detail exact measures for every scenario as this is known to be impractical. Response personnel must be able to develop *in situ* the specific response strategies for individual scenarios, whilst relying on the generic guidelines and support measures described in this plan.

16.5.1 *Fire*

The following emergency procedures must be implemented when fire occurrence (or evidence thereof) is noted at the proposed Project during the construction, operational and decommissioning phases:

- The appropriate Manager mandated to manage emergency events must be notified.

- Personnel in the immediate vicinity of the fire, including the designated Evacuation personnel must be immediately notified.

- All persons located in the area in which the fire is located must be evacuated. Evacuation must be carried out as per the Evacuation Procedure (*Section 16.6*).

- All doors and windows of buildings and vehicles that are in the immediate vicinity of the fire must be closed.

- The fire must be contained with the **correct** extinguisher ***ONLY*** by those trained to do so.

- Those requiring assistance must be assisted and first must be rendered ***ONLY*** by those trained to do so.

- Those confined to an area where there is smoke, must move under the level of the smoke and cover their nose / mouth.

- All effluents from fire fighting efforts will routed to the emergency evaporation pond.

16.5.2 Flooding

Proactive Management Measures

The following proactive actions must be carried out to understand the risks of flooding for the proposed Project:

- Develop an understanding of the potential flood events to which the site of the proposed Project is exposed – i.e. flood events associated with the Ohlelo River and surrounds.

- That the local weather forecast is constantly monitored, especially during the wet season.

- All key equipment must be raised above (or away) expected flood levels (1:100 year floodline).

In the event of flooding onsite, the following emergency procedures will be implemented:

- The appropriate Manager mandated to manage emergency events must be notified.

- All personnel onsite, including the designated Evacuation personnel must be immediately notified.

- All equipment must be safely shutdown and all electrical equipment must be isolated.

- Dirty (contaminated) floodwaters from the site of adit A and from the associated waste rock dump will be channelled to the emergency evaporation pond.

- All persons onsite must be evacuated. Evacuation must be carried out as per the Evacuation Procedure (*Section 16.6*).

16.5.3 Chemical/Fuel Spills

Spill Hazard Identification

Kangra Coal will maintain a register of spill hazards associated with all activities during all phases of the proposed Project.

All third party contractors will undertake spill hazard identification studies to identify spill hazards associated with their operations and pass these on to Kangra Coal.

The spill hazard identification will include approximate volumes, storage and transfer locations and risks associated with each chemical. It will also include an up-to-date plan or map of the proposed Project site and the locations of all managed chemical products.

Part of the process of developing the detailed spill hazard identification will be to assess the risk of spills. Risk will be evaluated based on likelihood of a spill including handling and transfer methods, presence of secondary containment, phase of chemical product (solid/liquid) preventative measures designed and in-place and the potential impacts of a spill based on toxicity, the potential for a spill to reach water courses, potential volumes available for spills, potential of a spill to affect human health.

Chemicals with a higher risk-rating will be evaluated to identify measures to risk associated with the contaminant.

Spill Prevention Measures

The following measures will be followed to prevent spills

- Training of operators regarding proper methods for transporting, transferring and handling substances that have the potential impact to human health or the environment.

- Institution of a preventative maintenance program including inspection schedules to confirm and maintain the mechanical integrity and operability of pressure tanks, piping systems, relief and vent values

systems, containment infrastructure, shutdown systems, controls, pumps and associated process equipment.

- Implementation of Standard Operation Procedures for handling materials including refuelling vehicles, diesel tanks, and managing secondary containment areas.

- Provision of secondary containment, drip trays or other overflow and drop containment measures, for hazardous materials containers at connection points or other possible overflow points. Identification and provision of all equipment necessary to handle, transfer or transport materials properly.

- Use of transfer equipment that is compatible with and suitable for the characteristics of the materials transferred and designed to ensure safe transfer.

- Use of dripless hose connections for vehicle tank and fixed connections with storage tanks.

- Installation of gauges on tanks to measure volume inside.

- Review of all potential pollutants characteristics prior to introduction to site and establishment of proper storage, handling and transportation procedures and spill risk analysis.

- Monitoring sheets for all contaminants on-site will be readily available. These will include human health effects of chemicals handled and will be included in the required chemical environmental and safety training for all employees handling or otherwise exposed to the contaminants. All appropriate personal protective equipment, handling and response procedures identified in the monitoring sheets or otherwise recommended by the suppliers/manufacturers will be incorporated into a Spill Prevention Control and Containment Plan and followed by the proposed Project staff.

- The Project will retain a qualified third-party to review and audit chemical storage and distribution systems, including appropriate testing every five years.

- Bulk transfers of chemicals during delivery will be observed by Kangra Coal personnel trained in preliminary hazard analysis methods.

- Standard Operating Procedures for chemical transportation, unloading, transfer, storage, handling, use and disposal shall be developed, kept current, effectively implemented by trained personnel.

Spill Control and Countermeasures

The following measures will be followed in the event of a spill:

- Maintenance of updated emergency contact information list at all spill response kits locations.

- Maintenance of spill route maps at potential spill locations.

- Documented availability of all spill response equipment that is capable of handling a large spill.

- Documented availability of specific personal protective equipment and the necessary training needed to respond to different potential spills.

- Maintenance of spill response kits on all Project fuel and lubrication vehicles.

- Maintenance of spill response guidelines at all spill response kit locations.

- Maintenance of an up-to-date plan of the proposed Project site showing the location of all contaminants, spill response kits and other response equipment.

- Maintenance of an updated table of all contaminants on-site and recommended spill response procedures.

- Development, implementation and regular training and testing of a facility-wide Spill Response Plan.

- First-aid training for all relevant mine personnel.

- All spills will be reported to appropriate management personnel.

Spill Response Sub-plans

A site-specific spill response sub-plan will be developed by Kangra Coal and will address:

- Roles in the event of a spill including: spill coordinator (the person on the ground at the spill site, who is responsible for immediate actions taken to contain the spill, respond to immediate dangers, notify necessary responders) and the rest of the mine site and personnel.

- Internal and external notification procedures.

- Decision system for determining severity and risk and defining an appropriate response.

- Communication system to be followed during the spill, first response and clean-up and communication infrastructure required i.e. radios, telephone systems etc.

- Facility evacuation routes and procedures.

- Post-event activities such as clean-up and disposal, incident investigation, employee re-entry and restoration of spill-response equipment.

- Reporting requirements at the time of the spill and after the spill.

Transportation of Hazardous Materials and Chemicals

The transportation of certain substances presents the potential for spills due to traffic accidents or other accidents or incidents en-route to or from the proposed Project site. Precautions that will be followed include:

- Third party contractors will use transportation vehicles and tanks suitable for the materials and transportation routes used and maintained in adequate condition to insure proper handling and safety of chemicals.

- Contracts involving chemical transportation will require compliance with applicable laws as well as Kangra Coal policies and plans and will require responsible management of chemicals including emergency response and spill clean-up.

- Truck drivers will be required to notify the site of their departure time and arrival time and maintain a log of travel.

- All vehicles will be equipped with spill response kits appropriate to the materials being transported. The contractor will be required to maintain these in good condition and working order.

- Drivers will be trained in spill and emergency response and will have a means of communicating with the site, their administrative offices and emergency personnel for the entire transportation route.

- Up-to-date emergency contact information and monitoring sheets and manifests documenting the volume, phase and characteristics of the chemical being transported will be carried with each shipment.

Spill Emergency Procedures

In the event of a spill onsite, the following emergency procedures must be implemented:

- The appropriate Manager mandated to manage emergency events must be notified.

- Personnel in the immediate vicinity of the spill, including the designated Evacuation personnel must be immediately notified.

- The risk of explosion (if known) must be communicated to the Health and Safety Manager onsite.

- Vehicle ignition or power supply to bowser pumps where the spill occurred must be immediately switched off.

- If possible, all drains and valves in the vicinity of the spill must be closed.

- The application and use of spill kits must be used ***ONLY*** by those trained to do so.

- The appropriate spill response and clean-up contractor must be notified and all contaminated material as a result of the spill must be suitably disposed of off-site.

16.6 EVACUATION PROCEDURE

All staff must be aware of the possible escape routes prior to the emergency situation. Always assure safety of the assembly point prior to evacuation.

- The appropriate manager mandated to manage emergency events will give instruction or the alarm will sound to evacuate a specific area.
- All staff appointed as Evacuation Officers must assist with the evacuation.
- All onsite must follow the instructions of the Evacuation Officer.
- Follow the directional pointers to the nearest emergency exit.
- Evacuate according to the emergency lay out plan.
- Use staircase according to the indications on the lay out plan (lifts may not be used).
- Always evacuate to the bottom of the building only in extreme cases to the top.
- First evacuate the mobile employees followed by the frail and the injured.
- Evacuation personnel should work in pairs where possible to assist one another lifting heavy injured employees.
- Help mobile employees who are struggling or appear unsure.
- Walk briskly but do not run.
- Stay calm, do not panic. Panic can spread and cause unnecessary chaos.
- When evacuating always keep left along the evacuation routes.
- In the case of fire or smoke, crawling may be better than walking.
- Do not forget that visitors may be disabled and may need help.
- Assist visitors that are not familiar with the evacuation procedure.
- Keep record of staff and visitors
- Do not obstruct the task of the professional Emergency Services.
- Carry out a search / check before leaving the area.
- Evacuation officer must be the last one to leave the area.
- All personnel onsite must report directly to the allocated assembly point
- Do not leave the assembly point until it has been deemed safe to do so.
- Report to the Health and Safety Manager.

16.7 COST FOR EMERGENCY RESPONSE

Costs for emergency response and management will be included in the capital expenditure budget for during the construction phase and operational budget for during the operational and decommissioning phases of the proposed Project.

16.8 VERIFICATION

The execution of emergency drills will be included into the existing environmental emergency response system and will include the following:

- Fire Drills;
- Flooding Threat Drills;
- Chemical Spill Drill; and
- Emergency Evacuation Drills.

Reporting and monitoring requirements for the S&ERP will include:

- Monthly inspections and audits;
- Quarterly report of accidents / incidents;
- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments;
- Bi-annual emergency response drills; and
- Annual reporting on training.

Emergency response drills and reporting maintained by the Mine Manager will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies.

Updates / revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager. On a bi-annual (twice annually) basis Key Performance Indicators (KPIs) will be compared against past-performance and analysed for trends to determine if there are areas the can be improved.

Changes as a result of the trend analysis and identified areas for improvement will be implemented following the Project's change management system as required.

17 ENVIRONMENTAL REHABILITATION PLAN

This Chapter (Environmental Rehabilitation Plan) details a framework which aims to address environmental issues related to the rehabilitation, decommissioning and closure of the proposed Kusipongo Resource Expansion Project. This plan has been developed as per the requirements of Section 51 (sub-section (b) v) of the MPRDA Regulations (GN.R 26275), and describes the manner in which environmental rehabilitation will be implemented during the various phases of the proposed Project.

Unlike most other industrial activities, mining activities will eventually cease as a finite resource is exploited. Activities may also cease when costs associated with mining coal no longer make it profitable. It is also possible for the proposed Project to be mothballed for a period of time due to economic reasons. Rehabilitation and closure during any of these scenarios will allow disturbed land to be rehabilitated to one or more sustainable post-Project land uses.

Following detailed design of the proposed Project, Kangra Coal will develop a conceptual closure plan for the Project that will be based on this plan. This plan will then be used to update their existing mine closure plans to include specific closure procedures for the proposed Kusipongo Resource Expansion Project.

This Environmental Rehabilitation Plan has been compiled within the context that the proposed Project will be evaluated, planned, constructed and operated so as to reduce adverse social and environmental impacts and to meet or exceed requirements set out in applicable laws, regulations and standards. Also, where these laws are absent, Kangra Coal will apply cost effective good management practices to protect the social and biophysical environments.

The overall closure objective is to leave the mine (and associated infrastructure) area in a condition that minimises adverse impacts on the social and natural environment and with a legacy that makes a positive contribution to sustainable development. The proposed Project closure objectives include:

- Leaving a safe environment for both humans and animals;
- Making all areas stable and sustainable;
- Implementing progressive rehabilitation measures, beginning during the construction phase if possible;
- Returning rehabilitated land-use to the pre-mining environment where possible;

- Maintaining and monitoring all rehabilitated areas and, if monitoring shows that the objectives have been met, making an application for closure;

- Preventing soil and surface / groundwater contamination by managing any discharges to be both compliant with national legislation and to be within the prescribed RWQOs applicable at that time;

- Managing possible subsidence in such a way that lives will not be endangered or that environmental impacts are minimised;

- Complying with Local, Regional and National regulatory requirements;

- Following a process of closure that is progressive and integrated into the short and long term mine plans and that will assess the closure impacts proactively at regular intervals throughout Project life cycle;

- Managing the retrenchment of employees and the cessation of procurement contracts in such a way so as to avoid or minimise potential negative impacts of closure;

- Active partnerships with local communities, where possible; and

- The prevention, minimisation and mitigation of negative environmental impacts from operations.

This Plan applies to the rehabilitation, decommissioning and closure of the proposed Kusipongo Resource Expansion Project. Recommendations and commitments relating to closure have been included based on the Project plan available at the time. It is expected that this closure plan will be updated when Project design is finalised. Accordingly, this Plan will be regularly reviewed and updated to reflect revised Project design and learnings experienced during its implementation.

Rehabilitation and closure planning is a complex and iterative process that involves interaction with a wide range of parties to ensure that it progresses smoothly. Closure objectives have been outlined so that planning can ensure that all activities during construction, operation, and decommissioning and closure are planned with the end use in mind.

17.1 KEY RESIDUAL ENVIRONMENTAL AND SOCIAL RISKS

Residual risks identified as having a moderate to major post-mitigation significance in the impact assessment include:

Table 17.1 Key Residual Environmental and Social Risks

Residual Impact	Phase of the Proposed Project			
	Construction	Operational	Decommissioning	Post-closure
Key Residual Environmental Risks				
Potential loss of wetlands at the main mine adit and surrounding systems	X			
Contamination of aquatic and wetland systems due to the construction and operation of the main mine adit	X			
Contamination of aquatic and wetland systems due to the construction and operation of the overland conveyor system	X	X		
Disturbance and displacement of fauna during the construction and operational phases of the proposed Project	X	X		
Mine dewatering and decant		X	X	X
Reduced baseflow on surface water and wetlands		X	X	X
Potential loss of watercourse and associated hydromorphic grasslands and the change in hydrology in the greater region		X	X	X
Key Residual Social Risks				
Displacement of homesteads and their residents	X	X	X	X
Loss of access to land for agriculture and grazing	X	X	X	
Resentment and anger from unfulfilled expectations of improved employment opportunities and related livelihood security	X	X		
Undermined levels of trust and chances of a social licence to operate from affected communities and stakeholders	X	X		
Landscape and visual environment	X	X	X	
Reduced water quality and availability for people, agriculture and livestock		X	X	X

In addition, a Social and Emergency Response Plan (*Chapter 16*) has been developed to react and appropriately manage unwanted outcomes and provide appropriate resources to respond to process upset, accidental, and emergency situations for operations and activities during construction, operation and decommissioning and closure phases. This plan was developed as per the requirements of Section 51 (sub-section (b) iii) of the MPRDA Regulations (GN.R 26275).

17.2 FACTORS INFLUENCING REHABILITATION PLANS

During the preparation and review of rehabilitation plans, a number of different factors need to be considered which may influence decisions in selecting a rehabilitation strategy. These include:

- The conservation value of a proposed environmental outcome;
- The importance to local communities of the economic productivity of the proposed future land capability;
- The consistency of the proposed land use with local and regional plans; and
- The long term ownership of the land.

Irrespective of the rehabilitation outcome, the environmental authority must ensure that rehabilitation will endure expected climatic variations and that the land will be sustained for a land use consistent with the surrounding area.

17.3 ROLES AND RESPONSIBILITIES

Overall accountability for rehabilitation, decommissioning and closure, and setting and reviewing related targets related to this Plan, will lie with Kangra Coal.

Furthermore, Kangra Coal has the responsibility for defining, communicating and monitoring the requirements of contracting third parties and suppliers operating under their control and influence.

17.4 INTEGRATED MINE CLOSURE MANAGEMENT

For the purposes of this Plan, the final post-closure land use proposed for the proposed Project is as close to the pre-mining environment as possible. This proposed final land use may be amended as this closure plan is revised. Although closure occurs once operations cease, rehabilitation measures will take place from as soon as construction commences, and will continue through each phase of the proposed Project. The rehabilitation strategies and

the necessary closure management measures for each phase of the proposed Project are discussed in this section.

17.4.1 Management during Construction

The key factors to consider during the construction phase are to minimise the area affected by the development, minimise potential future contact of contaminating materials with the environment, and to maximise the recovery and effective storage of those profile materials that will be most useful during the rehabilitation process after the proposed Project is complete. In other words, construction should be carried out with closure in mind.

The following management measures apply:

- Ensure that Project planning has, where possible, minimised the area to be occupied by infrastructure. This area should be clearly demarcated on a map. In the event that additional areas are to be disturbed there should be a necessity for this disturbance, and permission sought from the appropriate personnel (i.e. the Kangra Coal Environmental Function).

- Ensure that construction crews restrict their activities to the planned areas.

- Ensure (where possible) that soil stripping takes place during the winter months. This will help to maintain the structural integrity of the soils.

- Ensure sequential soil stripping (topsoil and sub-soils) and that these soils are kept separate from one another. It is suggested that an average topsoil depth of 250mm be stripped and stockpiled separately from the lower 400 to 500mm of sub-soils.

- Locate all soil and overburden stockpiles in areas where they will not require relocation prior to replacement for final rehabilitation (such as in the use of surface water berms).

- Topsoil stockpiles will be heaped no more than 1.5m high, will have an angle of 1:6 (9.5°) and will be vegetated for the life of mine. It is important that any wet (if impacted) and dry soils are stockpiled separately where these may occur, and that the structural integrity and erosive nature of the soils is managed during the stockpiling phase so as to leave these soils utilizable for rehabilitation.

- Seeding of indigenous grasses on relevant stockpiles may be necessary in order to ensure the soil viability is retained.

- Ensure that all stockpiles are clearly and permanently demarcated and located in defined "No-go" areas.

- All infrastructure is designed with closure in mind – either for a clearly defined dual purpose (i.e. buildings to be used post closure) or for ease of deconstruction.

Management of the Temporary Contractors' Camp during Construction

For the purposes of this Plan, the contractors' camp will be decommissioned and suitably rehabilitated at the end of the construction phase. The following actions will apply:

- All infrastructure which cannot be used by alternative land users will be demolished and the following options can be considered for their viability:

    - Removal from site and disposal at a registered waste facility or landfill offsite; and / or
    - Equipment – sell and remove off site.

- The final site will be rehabilitated so as to return the rehabilitated area to as close to the pre-mining environment as possible. This will be undertaken by carrying out the following rehabilitation activities:

    - The final site will be contoured;
    - The final site will be covered with previously removed soil, top-soiled (soils horizons will not be mixed);
    - Self-succession of vegetation will be allowed to occur and if this does not happen, then suitable indigenous vegetation will be replaced. In areas disturbed a mixture of terrestrial grass species will be reintroduced after fertilization has been added. Fertilizers are required for soils that are leached or eroded and have low organic matter content;
    - Erosion control and stormwater run-off control measures will be implemented;
    - Rehabilitation will be monitored and growing mediums added as necessary; and
    - Erosion will be repaired if and when it occurs.

17.4.2 Management during Operation

Although closure planning should be conducted prior to the commencement of the Project, the lifespan means that major environmental and societal changes may have occurred that will affect the original planned land use. Accordingly, closure plans will be revised periodically throughout the life of the Project and annually during the last seven years of the Project life cycle.

The closure plan will include an in-house risk assessment and risk management system, with relevant systems and protocols, maintenance and monitoring systems, and regular review of performance leading to correction of the system to eliminate non-conformances in respect of the rehabilitation risk.

With respect to ensuring the rehabilitation process is scheduled throughout the life of the Project, this closure plan will be updated post detailed Project Design and during the life of mine to include the following:

- A listing of the physical attributes of the Project site.
- A listing of the objectives with respect to rehabilitation and closure.
- A listing of all activities that are to be taken throughout the life of the Project.
- An assessment of how each activity may potentially impact on the proposed Project to achieve its rehabilitation objectives.
- An evaluation (rating) of the risk of rehabilitation failure occurring as a result of each action, or failure to act.
- For those risk items rated "high", methods of avoidance, mitigation, – and if all else fails, treatment – will be identified and operational management procedures developed to manage each key risk.
- Proposals for monitoring performance in relation to these policies and procedures.
- A program for regularly assessing the effectiveness of the implementation of each procedure and the intrinsic effectiveness of the procedure (monitoring of effectiveness of the procedure to ensure achievement of the rehabilitation objectives).
- Provision for demonstrating how continuous improvement is being implemented for the proposed Project, such that any future certification requirements can be met. This can either refer to improvement in performance in managing the key risks identified at each site, or a progressive incorporation of the lower-rank risks into the formal management, prevention and mitigation regime.
- A program for regularly reviewing the system and its procedures to ensure that all objectives are being met.

With respect to ensuring that the closure plan effectively ensures that the rehabilitation activities will conform to the commitments made in the SEMPR (this report), the following activities are required:

- A list of key items will be maintained during the life of the proposed Project. These include soil stockpiles.

- Soil stockpiles will remain clearly identified and maintained (free from erosion and wind blow emissions through use of impermeable wind breaks and indigenous vegetation establishment).

- All changes in Project planning will be fully assessed for their potential impact on land rehabilitation prior to their implementation.

17.4.3 Operations and Infrastructure Requiring On-going Rehabilitation

With respect to ensuring that the rehabilitation process is scheduled throughout the life of the Project, the following activities will be undertaken during the operational phase of the proposed Project to ensure that activities being undertaken are done in a way that has closure rehabilitation in mind:

General Management

- Periodic checks must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of the eroded areas, and where necessary, the relocation of the paths causing the erosion, are to be undertaken.

- If a major spillage (of soil contaminants) occurs a suitable and reputable contractor will be contracted to clean the contaminated area and rehabilitate the soils, as appropriate. If any other minor spillage occurs the spillage will be cleaned immediately and the contaminated area will be rehabilitated, as appropriate.

- Soil/topsoil stockpiles, the route of the proposed overland conveyor system, temporary construction camp, the main mine adit and the ventilation adit will be continuously monitored for the presence of alien species. Any alien species detected by the Environmental Officer will be removed in the correct manner as per the prospective Alien Invasive Management Programme.

- Ongoing clearing of alien vegetation that may have spread as a result of land disturbances during site preparation.

17.5 MANAGEMENT DURING DECOMMISSIONING AND CLOSURE

Once operations cease decommissioning can commence. The sequence of decommissioning is vital to ensure that facilities that are required during decommissioning remain active until they can be finally rehabilitated and closed. This refers to the temporary waste storage facilities and the sewage and waste water treatment facilities, which should remain open to receive waste from the Project site during decommissioning, as well as services and amenities such as provision of diesel, potable water and electricity. Once all infrastructure has been removed these sites can be rehabilitated.

17.5.1 Impacts and Issues during Decommissioning and Closure

Social and environmental impacts have been detailed in the SEMPR. A summary of the impacts and issues that apply to the decommissioning and closure phase include:

Environmental Impacts:

- Altered groundwater gradients (and as a result a reduction in the baseflow of surface water features) associated with dewatering of underground workings during the operational phase.
- Potential decant of ARD impacted water into the Ohlelo System when groundwater levels have rebounded to the elevation of the adit (1,520masl).
- Increased levels of dust and noise emissions during decommissioning and closure activities.
- Impact on soil and surface water features as a result of hydrocarbon spills.
- Impact on flora and fauna due to direct interference, hydrocarbon spills and / or deterioration in soil and water quality.

Social Impacts:

- Cessation of income generating opportunities from direct and indirect contracting for the proposed Project.
- Loss of sense of place and decreased social and cultural cohesion.
- Worsening of health profile related to spills emissions and contamination.
- Disturbance or damage to heritage and archaeological sites.
- Exposure of workforce to insufficient health and safety conditions (during decommissioning).
- Exposure of workforce to insufficient labour and accommodation conditions (during decommissioning).

17.5.2 Objectives and Targets

Environmental Objectives and Targets

- To remove all mining infrastructure and decommission all underground workings according to professionally engineered designs and authority's requirements.

- To shape disturbed areas in accordance to the mine plan.
- To ensure that water quality on site, and any effluent releases meets statutory requirements.
- To meet the RWQOs applicable at the time for surface and ground water.
- To monitor runoff and drainage from rehabilitated sites and take remedial measures if necessary.
- To monitor dust levels emanating from recently rehabilitated areas.
- To manage the post-mining water table and consequent impacts on ground- and surface water use, particularly with respect to mine water decant.

Social Objectives and Targets

- To avoid, mitigate and manage all social and health impacts related to the decommissioning and closure of the proposed Project.
- To work with relevant stakeholders to jointly design and define the processes of handover of infrastructure (if necessary).
- To plan an 'exit strategy' for all community development activities.
- To plan for the retrenchment of employees and the cessation of procurement contracts.
- To define the required engagement in preparation for decommissioning and closure.

17.5.3 Management Measures

Please Note:

Chapter 18 (Financial Provision) provides a guide in terms of quantitative measures that need to be considered from Mine Closure (*Section 16.2*). These measures are taken from the MPRDA Regulations (Regulation 56 – Principles for Mine Closure) Government Gazette Vol. 466 No. 26275.

Kangra Coal will consider these principals whilst carrying out closure activities.

This section describes management measures for Project related infrastructure, and environmental and social aspects.

Management of Project Operations and Infrastructure during Decommissioning and Closure

Specific recommendations for the relevant operations and infrastructure associated with the mine are discussed in detail below.

Access Roads and Conveyor Route

Prior to the construction of conveyor routes, the associated service road and the gravel service road to ventilation Adit B, the ground surface will be stripped and stockpiled as a flattened linear windrow to the side of the conveyor route / access road, on the upslope side of the route, for replacement over the route at closure. Self-succession of vegetation will be allowed to occur and if this does not happen, then suitable indigenous vegetation will be replaced in order to ensure the soil viability is retained. It will be necessary to ensure that the windrow does not impede any potential run-off water flow (which would cause erosion of the windrow). Localized drainage lines or gaps will be left open strategically to allow drainage through the windrows.

At closure, the conveyor structures including plinths will need to be removed. Carbonaceous material which has fallen from the conveyor belts, particularly at transfer points, or from vehicles using the roads, and accumulated along the routes, will need to be collected and properly disposed of on the discard dump situated at Maquasa East. The routes will then be ripped on contour (even if this means ripping across the direction of the route), and the stockpiled topsoil replaced by pushing it back onto the route. Again, self-succession of vegetation will be allowed to occur and if this does not happen, then suitable indigenous vegetation will be replaced.

The existing access road through to the proposed main mine adit will be upgraded to accommodate proposed Project related traffic. At closure, this road will be left in place for use by communities.

Infrastructure at the Main Mine Adit (Adit A)

For the purposes of this Plan, during the closure and decommissioning phase, it is assumed that the main mine adit will be demolished in its entirety. The following actions will apply:

- All infrastructure which cannot be used by alternative land users will be demolished and the following options can be considered for their viability:
    - Removal from site and disposal at a registered waste facility or landfill offsite; and / or
    - Equipment – sell and remove off site.
- The final site will be rehabilitated so as to return the rehabilitated area to as close to the pre-mining environment as possible. This will be undertaken by carrying out the following rehabilitation activities:

- Removal and suitable disposal of all coal spillages;
- Excavation and suitable disposal of contaminated soils to the depth of contamination;
- The final site will be contoured;
- The final site will be covered with previously removed soil, top-soiled (soils horizons will not be mixed);
- Self-succession of vegetation will be allowed to occur and if this does not happen, then suitable indigenous vegetation will be replaced. In areas disturbed a mixture of terrestrial grass species will be reintroduced after fertilization has been added. Fertilizers are required for soils that are leached or eroded and that have low organic matter content;
- Erosion control and stormwater run-off control measures will be implemented;
- Rehabilitation will be monitored and growing mediums added as necessary; and
- Erosion will be repaired if and when it occurs.

Crushing and Screening Plant at the Main Mine Adit

Kangra Coal will ensure that the Crushing and Screening Plants will be removed from service and decommissioned during mine closure. It is assumed that this infrastructure is not offered for sale and is removed from the site.

The Crushing and Screening Plants will be removed based on the following general requirements:

- The structures will be demolished to 1m below ground level;
- Salvageable materials will be removed from site and sold as scrap for recycling;
- Unsalvageable (contaminated) materials will be removed for off-site disposal and if necessary will be treated prior to off-site disposal;
- All concrete slab foundations and walls will be broken up and removed; and
- The footprints associated with the Crushing and Screening Plants will be rehabilitated as part of rehabilitation efforts for the Main Mine Adit (see final site rehabilitation associated with Main Mine Adit above).

Underground Workings at Main Mine Adit (Adit A)

For underground mining the following management measures will be adopted:

- Salvageable material from underground will be sold, re-used or suitably disposed of.

- The portal and Adit A ventilation shafts will be sealed with concrete bulk heads.

  The adit will need to be properly sealed (with concrete bulkheads) whereafter the adit void will be backfilled using the previously stockpiled materials (70 000m^3 worth). It is anticipated that the adit void would be overfilled, initially to allow for settlement of the backfill material, and finally to allow for a slightly domed landform over the adit void. This is done to shed water away from the back-filled void and prevent accumulation of water and possible ingress to the workings. The top will then be covered with the remainder of the stockpiled topsoil, followed by vegetation establishment (as is mentioned above). Engineering designs, complying with South African laws, regulations and standards, will be implemented.

  Due to the expansion factor, the volume of material excavated from the adit will be more than adequate to provide for the final domed landform over the adit void. In addition, the voids can also be used to dispose of carbonaceous discard and demolition rubble at closure, which will reduce the volumes of hard backfill material required.

- Management of potential subsidence associated with underground workings in such a way that lives will not be endangered or that environmental impacts are minimised.

Ventilation Shaft (Adit B)

At closure the ventilation shaft will be used as disposal sites for inert material such as demolition rubble. The shaft will then be sealed with concrete slabs, after which a layer of soft excavated material will be placed over the slab, again to provide a slightly domed landform, covered with topsoil, and vegetated.

Temporary Waste Storage Facilities

Although temporary, waste storage facilities fall within the footprint of the main mine adit. These will be one of the final sites to be rehabilitated as they need to remain open for the duration of the decommissioning phase in order to receive waste from the site.

Waste Water Treatment Plant and Sewage Treatment Plant

Although the waste water treatment plant (WWTP) and sewage treatment plant falls within the footprint of the main mine adit, these will be one of the final sites to be rehabilitated as they need to remain open for the duration of

the decommissioning phase in order to receive grey and black waste water respectively from the site.

Onsite Balancing Dams and Stormwater Management/Emergency Evaporation Ponds

The following onsite water management dams / ponds in the footprint of the Main Mine Adit will need to be removed and rehabilitated at mine closure:

- Balancing and Service Water Dam
- Stormwater Management Pond
- Emergency Evaporation Pond

Closure and rehabilitation of the above mentioned will involve:

- Evaporation of all remaining effluent to atmosphere;
- Classification of the settled fines (sludge) in terms of its hazardous rating;
- Removal of sludge from dams / ponds for suitable off-site disposal;
- Removal of liner from dams / ponds for offsite disposal; and
- The footprints associated with dams / ponds will be rehabilitated as part of rehabilitation efforts for the Main Mine Adit (see final site rehabilitation associated with Main Mine Adit on *Page 17-11*).

Overhead Transmission Lines from Maquasa West

Overhead transmission lines (OHTL) supplying electricity from the existing Maquasa West Works will need to be dismantled, removed from site and either sold or recycled.

The final footprints associated with the base of towers, will be rehabilitated so as to return the rehabilitated area to as close to the pre-mining environment as possible. This will be undertaken by carrying out the following rehabilitation activities:

- The final site will be contoured.
- The final site will be covered with previously removed soil, top-soiled (soils horizons will not be mixed).
- Self-succession of vegetation will be allowed to occur and if this does not happen, then suitable indigenous vegetation will be replaced. In areas disturbed a mixture of terrestrial grass species will be reintroduced after fertilization has been added. Fertilizers are required for soils that area leached or eroded and that have low organic matter content.

- Erosion control and stormwater run-off control measures will be implemented.

- Rehabilitation will be monitored and growing mediums added as necessary.

- Erosion will be repaired if and when it occurs.

Management of Environmental Aspects during Decommissioning and Closure

Surface Water Management

During decommissioning and closure, the following management measures will be implemented:

- On gentle slopes, water will be encouraged to flow off the rehabilitated surface, as surface flow, as quickly as possible without causing erosion. This will ensure that water does not infiltrate too deeply and come into contact with material containing sulphides.

- Erosion control measures will be put in place at all disturbed areas.

Groundwater Management

During decommissioning and closure, the following management measures will be implemented:

- As is mentioned above, the adit will be sealed on decommissioning. Any decant water runoff will be contained and treated to the applicable legislated discharge standards prior to discharge.

- Treatment of groundwater decant at mine closure must also ensure that the RWQO for surface and groundwater at the time can be met.

Air Quality Management

Rehabilitation and mitigation will be continuous throughout the life of the proposed Project in order to result in minimal effort to apply final rehabilitation strategies.

Dust is the most problematic air quality impact during decommissioning. Dust control measures for open areas can consist of wet suppression, chemical suppressants, vegetation, wind breaks, etc. Wet suppressants and chemical suppressants are generally applied for short storage pile durations. For long-term control measures vegetation frequently represents the most cost-effective and efficient control.

Fauna and Flora

During decommissioning and closure the infrastructure no longer required will be removed from the area. This will result in activities similar to those during the construction phase with regard to increased heavy machinery and trucks in the area. These should remain in designated areas and on roads.

All areas in which infrastructure is removed will be re-vegetated with indigenous species. An indigenous mix of predominantly pioneer plant seeds will be distributed over the soil in the disturbed area. The re-vegetated area will be visually monitored at least once a week and problem areas treated immediately.

The possible introduction of alien species will require on-going monitoring and all alien species will be removed in such a way so as to prevent spreading and seed dispersal.

Monitoring and active management can be stopped once rehabilitated areas reach sub-climax status, with at least 50% of the pre-mining species having established themselves and able to regenerate themselves.

Environmental Awareness

This Social and Environmental Awareness Plan (S&EAP – *Chapter 15*) has been developed to make all individuals (contractors working on site during the various phases of the proposed Project, employees and the community at large) aware of the various social and environmental commitments that have been developed and their roles and responsibilities with respect to each of these commitments.

The social and environmental awareness aspects related to the decommissioning and closure phase will need to be developed through the various practicable interventions developed during the construction and operational phases respectively. It is expected that these interventions together with international good practice environmental options at that given point in time, will form the basis of the strategy which will inform the closure of the proposed Kusipongo Resource Expansion Project.

Management of Social Aspects during Decommissioning and Closure

Heritage

During the decommissioning and closure phase of the proposed Project, no new areas are expected to be disturbed and/or impacted. Subsequently, no additional sites of archaeological heritage significance are expected to be impacted during decommissioning. Furthermore, the majority of sites of heritage significance would have been recorded and/or assessed in preceding phases.

Retrenchment of Employees

Kangra Coal will begin a process of engagement with employees regarding retrenchment at least one year prior to the commencement of retrenchment activities. As part a retrenchment plan, Kangra Coal will seek wherever possible, alternatives to retrenchment, plan in consultation with workers, ensure a process of non-discrimination, ensure compliance with national law and any collective bargaining agreements, and ensure that all relevant payments are made to workers.

In preparation for any retrenchment Kangra Coal will provide certification for training received and letters of reference to all employees.

Exit Strategy for Community Development

As part of community development, Kangra Coal will consider methods for the cessation of community development funding during the decommissioning and closure phases. This may include the establishment of a locally administered Community Development Fund, partner funding for community development activities or planning for grant application and capacity development for a locally administered Community Development Fund.

Stakeholder Engagement in Preparation of Closure

Kangra Coal will prepare for the decommissioning and closure phases by incorporating information around the decommissioning activities and post-closure land characteristics during routine engagement activities. During the transition from operations to decommissioning phases Kangra Coal will prepare a series of engagement workshops with relevant stakeholders at a regional, national and local level to inform them of the decommissioning activities and the anticipated changes and impacts it will cause.

17.6 POST CLOSURE

Post closure follows decommissioning and rehabilitation and is the phase during which monitoring continues to ensure that residual impacts are being managed and to ensure that necessary maintenance activities are carried out. Monitoring will continue until predictable trends are established. Residual impacts are expected to include impact associated with ground and surface water, biodiversity, visual impact of rehabilitated areas, subsidence and potential socio-economic impacts which are currently difficult to quantify.

The measures for post closure that are developed and agreed include:

1. Surface Water:

- Monitoring of water quality until a predictable trend is established. In the event that water quality does not meet the RWQO prescribed at the time,

water quality monitoring shall be ongoing to identify the source(s) of contamination ascribed to the project's activities, if applicable. If such contamination is as a result of past project activities, mitigation measures shall be implemented to remedy any such contamination.

2. Groundwater:

- Groundwater levels in the vicinity of the planned mine (in particular locations FB2, FB6, FB7, FB8, FB13 and ERMBH3 – refer to *Chapter 14* for the coordinates of these locations) will be monitored post-closure until a predictable trend is established or until levels rebound back to their pre-mining levels.

- Groundwater quality levels in the vicinity of the planned mine (in particular locations FB2, FB6, FB7, FB8, FB13 and ERMBH3 – refer to *Chapter 14* for the coordinates of these locations) will be monitored post-closure to assess conformance to the groundwater quality screening levels at the time. Ongoing treatment of groundwater decant, if applicable, may be required to ensure the RWQO in the Ohlelo River are met.

- Kangra Coal will maintain the provision of an alternative reliable, clean water supply to impacted communities and farmers until water availability and quality of their initial water sources have reached pre-mining values.

3. Biodiversity:

The effects of dewatering on reduced baseflow for surface water features and the subsequent impact on the Ohlelo System and hydromorphic grasslands will need to be monitored until such time that a predictable trend has been established. Monitoring efforts have been elaborated on in *Chapter 14* and will include:

- Aquatic biomonitoring of the Ohlelo River.

- Riparian integrity of the Ohlelo River and associated tributaries.

- Functionality and integrity of the representative selection of wetlands (including the Kransbank) to determine if there are changes to base flow, surface flow or vegetation dynamics.

4. Landuse:

As is mentioned at the outset of this Chapter, the objective in terms of end / final landuse of the proposed Project after decommissioning and closure will be to ***return the rehabilitated footprint of the proposed Kusipongo Resource Expansion Project to the pre-mining environment where possible.***

The pre-mining environment is detailed in Part I of the SEMP in *Chapters 7* and *8*, and can be described as been in an area that ranges from been

ecologically degraded with alien wattle trees to Mesic Highveld Grasslands that are classified by the MPTA as being as *irreplaceable*. The Project Area is situated in an area that can be characterised as having a high variety of springs, wetlands and rivers that are fed by regional groundwater and that are used by rural communities as a means of drinking water. Furthermore, the agricultural potential of the area is moderate to high, and is used by farmsteads and small rural communities for residence, grazing of livestock and the production of small crop / vegetable fields.

- End / final landuse will conform to the surrounding landuse.
- Reconstructed landform stability and ability to support the intended final landuse:
    - Ensure rehabilitated areas are maintained in terms of erosion control, vegetation is established as per intended landuse,
    - Ensure topography conforms to requirements of ultimate land user.

5. <u>Managing residual or latent risk:</u>

- Assessment of future risk.

Post closure is managed through a monitoring plan and liaison with the relevant authorities. Post closure objectives should comply with objectives and targets for closure. Towards the end of the life of the proposed Project, the post closure objectives will be refined to accommodate the site conditions at the time.

For now, the conceptual and numerical model predicts that post closure monitoring could last up to 90 years. Once it can be proven that the above categories satisfy the post closure objectives, an application for closure can be made.

17.7 VERIFICATION AND MONITORING

The objective of monitoring during the decommissioning and closure phase is to ensure that the agreed rehabilitation processes are successful and that the closure objectives prescribed are met. There is thus a need to carefully monitor the progress of the physical aspects of rehabilitation (soil stripping, overburden handling and landform development, and soil replacement) during the construction, operational and closure phase, and the progress of re-establishment of the desired final landuse.

The list of items that will be monitored will vary from site to site, and is usually based on the closure criteria that have been negotiated for the site. Typically, they may include several or all of the following items:

- Alignment of actual final topography to agreed planned landform;
- Depth of topsoil replaced;
- Chemical, physical and biological status of replaced soil;
- Presence of erosion;
- Surface water drainage systems and surface water quantity and quality;
- Groundwater quantity and quality at agreed locations;
- Vegetation basal cover;
- Vegetation species diversity;
- Invasive species;
- Faunal re-colonisation; and
- Proportion of mined land that has been fully rehabilitated.

Maintenance of rehabilitated sites is often the difference between the ultimate successes or failure of rehabilitation and monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved. Post closure monitoring will be required to ensure rehabilitation is taking place and there are no residual impacts. This monitoring will take place in conjunction with other post closure monitoring programmes, such as biodiversity monitoring, groundwater and surface water monitoring. Monitoring of the social aspects will also take place during decommissioning and closure.

17.8 REPORTING AND DOCUMENTATION

A final closure plan contemplated in Section 43(3) (d) of the MPRDA will need be to be developed and submitted to the Regional Department of Minerals and Resources for approval prior to closure. This Plan will need to conform to Section 62 of the MPRDA Regulations (GN.R26275 of 2004).

Post closure monitoring results will be incorporated into a report and submitted to authorities for review.

The Kangra Coal environmental function will be required to ensure monitoring is on-going (until predictable trends are established) and are to liaise with the Kangra Coal Board of Directors.

17.9 FINANCIAL PROVISIONS FOR MINE CLOSURE

Furthermore, financial provision is required in terms of Section 41 of the MPRDA to achieve the total quantum for the rehabilitation, management and remediation of negative environmental impacts. The quantum of financial provision must include a detailed itemisation of actual costs required for –

- Premature closure;
- Decommissioning and final closure of the proposed Project; and
- Post closure management of residual and latent environmental impacts.

The Financial Provision for Mine Closure is presented in *Chapter 18* of this SEMP.

18 FINANCIAL PROVISION

According to the regulations set out in the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA), it is necessary for Kangra Coal to compile a closure cost estimate for their proposed Kusipongo Resource Expansion Project, and to update this on a regular, specified basis. The financial provision for the environmental rehabilitation and closure of any mine and its associated mining operations forms an integral part of the MPRDA, and is addressed in Sections 41(1), 41(2), 41(3) and 45 of the Act. The cost updating process is based on the available figures as per the mine layout drawing (*Figure 3.5* on *Page 3-12*) and Project Description (*Chapter 3*) and additional Project information provided by Hatch – the lead Project Engineers.

According to Regulation 56 (Principles for Mine Closure) of the MPRDA in the Government Gazette Vol. 466 No. 26275, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that prospecting or mining operations are closed efficiently and cost effectively. According to South African legislation, regulations published in terms of the Minerals Act (Act No. 50 of 1991 (i.e. regulations 5.16.1 to 5.16.4) requires the holder of a mining authorization to:

- Compile Environmental Management Programmes that indicate adequate financial means in terms of both sufficient and acceptable pecuniary provision to the satisfaction of the DMR; and

- Annually, to the satisfaction of the DMR, and in consultation with an expert, determine the quantum of pecuniary provision.

The "***Guideline Document for the Evaluation for the Quantum of Closure Related to Financial Provision Provided by a Mine***" [(1)], was developed by the DMR in September 2004 (Report No. 5863-5900-2-P, Rev 1.6), and was updated in January 2005, in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure of mining sites. This document was used in the determination of the closure cost estimation for the proposed Kusipongo Resource Project, together with Project-specific data and quantities received from Kangra Coal and Hatch.

18.1 METHODOLOGY

The "***Guideline Document for the Evaluation for the Quantum of Closure Related to Financial Provision Provided by a Mine***" was used to as the primary guideline to quantify the Project's closure cost estimate. As mentioned above, technical data and infrastructure quantities were supplied

[1] DMR (2005). Official guideline as contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

by Kangra Coal and Hatch. The guideline document is generic in nature and cannot answer all mining scenarios or deal with all situations relating to financial provision, rehabilitation and mine closure. Further advice and/or experience has been obtained from the existing Kangra Coal mining operations (e.g. Maquasa East and West, Panbult Siding, Mpisi, Savmore Extension and Taaibochspruit Colliery) and based on circumstances that prevail at other mine sites, to fully assess the quantum for financial provision. The guideline document covers the most essential closure components that are generally required for the closure of a mine site. Site-specific conditions were also considered.

The following closure components are suggested by the DMR for determining the quantum for financial provision:

- Dismantling of process plant and related structures;
- Demolition of steel structures;
- Demolition of reinforced concrete buildings and structures;
- Rehabilitation of access roads;
- Demolition of housing facilities;
- Opencast rehabilitation including final voids and ramps;
- Sealing of vertical and incline shafts;
- Rehabilitation of overburden and spoil stockpiles;
- Rehabilitation of process waste deposits and evaporation ponds;
- Rehabilitation of subsided areas;
- General surface rehabilitation, including grassing of all denuded areas;
- River diversions;
- Fencing;
- Water management (separating clean and dirty water, management of polluted water and managing the impacts on groundwater); and
- Maintenance and aftercare.

A master rate for each closure component is provided in the DMR guideline, and a multiplication factor is applied to the master rate (depending on the risk class and the area sensitivity). The master rate for each closure component is based on the "generally accepted closure methods". It is important to note that this rate was approved in 2005 and therefore needs to be updated based on appropriate CPIX.

The next step was to determine and apply the appropriate weighting factors, based on the specific mine location. The two applicable weighting factors include:

- **Weighting Factor 1 (dependant on the nature of the terrain where the mine is located)** – this factor is applicable as it is more difficult (and hence more costly) to undertake work related to mine closure in areas that are undulating or rugged. As such, weighting factor 1 was applied to each of the closure components.

- **Weighting Factor 2 (relates to the proximity of the mine to an urban centre)** – this factor is applicable as there will be increased costs to transport machinery, goods and personnel to more remote mine sites. As such, weighting factor 2 was applied to each of the closure components.

18.2 GENERALLY ACCEPTED CLOSURE METHODS

The "generally accepted closure methods" associated with the applicable Project components (i.e. infrastructure and activities related with the proposed Project) used to determine the master rate applied to the closure cost estimations, are outlined below.

18.2.1 Component 1: Processing Plant

Applicability to the Proposed Kusipongo Resource Project:

There will be a primary and secondary crusher on the Adit A site (combined volume of 43031.06m^3 [1] as well as two silos (combined volume of 67 500m^3 [2]). An overland conveyor system will also be built; the total area of which will cover a total area of 268 800m^2 [3].

18.2.2 Components 2(a), 2 (b) and 5: Steel and Reinforced Concrete Structures and Housing, Facilities and Services

The common method of valuation to determine the Master rate for steel and reinforced concrete buildings and structures, and for housing facilities and services assumes that:

- All structures should be demolished to 1m below ground level;
- The rubble is to be buried adjacent to the sites, provided this adheres to the National Waste Management Strategy;
- Silos should be imploded and buried;
- The areas should be shaped, top soiled with 300mm of topsoil and vegetated or as stated in the relevant EMP document;
- Monitoring and maintenance is costed in the relevant areas; and
- The concrete hardstand is the area between buildings such as workshops, offices etc.

[1] Hatch (2011). Adit A Crushing and Screening Plant General Arrangements (H338512-2100-50-014-0001-001)

[2] Hatch (2011). Adit A Crushing and Screening Plant General Arrangements (H338512-2100-50-014-0001-001)

[3] Quantity provided by Hatch

Applicability to the Proposed Kusipongo Resource Project:

The total area covered by all steel and brick buildings and/ or structures is approximately 2268.21m² [1]. The salvage value of the building (cost for scrap metal, cables etc.) can be recouped depending on the contractor's disposal preference at the time of decommissioning. Buildings structures may be donated to various organisations for use, reducing demolition costs.

18.2.3 Component 4 (a) and 4 (b): Railways

Applicability to the Proposed Kusipongo Resource Project:

This component is not applicable (refer to Chapter 3).

18.2.4 Component 6: Opencast Rehabilitation

Applicability to the Proposed Kusipongo Resource Project:

This component is not applicable (refer to Chapter 3).

18.2.5 Component 7: Sealing of Shafts, Adits and Inclines

The sealing of vertical and incline shafts are primarily a safety consideration and this should be conducted in such a manner that potential safety risks are avoided where possible. Normally, inert building rubble arising from the demolition of surface infrastructure should be deposited into the shafts. A mass concrete cap of 1 000mm thickness is placed onto the building rubble deposited into the shaft. It should be noted that, in specific circumstances, dedicated engineering design and specification of these caps could be required.

Allowance should also be made for methane venting of the underground mine workings with a methane formation potential by means of strategically placed venting boreholes. The unit cost is based on filling and capping of both vertical and inclined shafts of dimensions 12.5m diameter and 5.5 x 5.5m respectively. The Master rate allows for the average cost of rendering both vertical and an incline shafts safe.

[1] Quantity provided by Hatch

Applicability to the Proposed Kusipongo Resource Project:

The portal associated with Adit A covers an approximate area of 3 500m² [(1)], whilst Adit B covers 100m² [(2)]. These two adits will be backfilled, plugged and rehabilitated to an approximate depth of 20m below the surface (depth to the coal seam) accordingly during closure.

18.2.6 *Components 8 (a), 8 (b) and 8 (c): Overburden and Spoils, Process Plant Waste: Basic, Salt-producing and Process Plant Waste: Acidic, Metal-Rich*

Component 8 (a): Overburden and Spoils

Overburden and spoils usually have a low pollution potential and hence only need to be shaped to create a stable landform. The Master rate therefore includes shaping and grassing/vegetation of the overburden and spoils.

Applicability to the Proposed Kusipongo Resource Project:

Although an approximate area of 1.2738ha is designated for overburden stockpiling on site, this has been excluded from the closure cost estimate. It is assumed that the overburden will be used to backfill the adits upon closure and this cost has therefore been included in Component 7 (sealing of adits) and Component 10 (general surface rehabilitation).

Component 8 (b): Process Plant Waste: Basic, Salt-producing

Basic, salt-producing residue deposits are typical of the mining activities for base metals (copper, cadmium, cobalt, iron-ore, molybdenum, nickel and tin), chrome, diamonds and precious stones, gold, silver and uranium, phosphate, platinum, mineral sands (ilmenite, titanium, rutile and zircon), and industrial sands (andalusite, barite, bauxite, cryolite and fluorspar).

Applicability to the Proposed Kusipongo Resource Project:

This component does not make provision for coal mines; therefore, this component is not applicable for the proposed Project.

Component 8 (c): Process Plant Waste (acidic, metal-rich) and Evaporation Ponds

Acidic, metal-rich residue deposits are typical of the coal mining activities. The generally accepted closure methods for acidic, metal-rich plant waste are primarily aimed at the following:

- Limiting seepage of contaminants from the processing waste deposit; and

[1] This quantity was calculated by dividing the volume of Adit A (70000m³) by the depth to the coal seam to obtain a surface area.

[2] Although the footprint area of Adit B is 500m², the actual Adit is assumed to be approximately 100m2.

- Prevention of contaminated seepage entering local surface and groundwater resources.

The Master rate includes allowances for slope modification, armouring and evaporative covers, lined pollution control dams and lined cut-off trenches. Slope modification is enforced by the DMR to achieve residue deposit stabilisation. Generally, average modified outer slopes of 1:3 (18°) are required.

Benches, at regular intervals, may also be required and these should ensure that the modified outer slopes between benches do not exceed 35 to 40m in order to curb storm water flow velocities on the outer slopes. Benches should be at least 5m wide, sloping inwards at a slope of about 1:10. Moreover, the lateral slopes of the benches should be selected with the following in mind:

- 1:2 year flow events should not result in bench flow velocities of less than 0.3m/s. Flow velocities less than 0.3m/s could cause sediment build-up on the benches and eventual bench overtopping and resultant outer slope damage; and

- 1:50 year flow events should not result in bench flow velocities exceeding 1m/s. Flow velocities in excess of 1m/s could cause bench scouring and hence, damage to stormwater chutes, resulting in failure of the stormwater handling system.

Applicability to the Proposed Kusipongo Resource Project:

There will be two pollution control dams on site with a combined capacity of 21 200m^3 [1] as well as a groundwater balancing dam with a capacity of 4 000m^3 [2].

The cost for the rehabilitation of the coal discard dump is not included in the costing estimate. As coal discard from this Project is to be disposed of on the existing coal discard dump located in the Maquasa East mining right, it is assumed that the closure costs of this specific component are included in the overall costs of the Maquasa East closure cost estimate.

Dedicated Covers

Current generally accepted closure methods allow for a dedicated cover to be provided on the modified outer slopes of the residue deposit. The cover has to fulfil the following primary functions:

- Protection of the integrity/stability of the modified outer slope.

[1] Quantity provided by Hatch

[2] Quantity provided by Hatch

- Limiting the ingress of air and water into residue material that has the potential to contaminate local groundwater by means of contaminated seepage arising from the footprint area of the deposit.

- Separation of the deposited residue from uncontaminated surface runoff arising from the outer slopes of the residue deposit.

- Contribution to the aesthetic appeal of the rehabilitated residue deposit.

Applicability to the Proposed Kusipongo Resource Project:

Covers fulfilling the above functions could be of varying nature, comprising of natural and/or synthetic material. The Master rate allows for an evaporative cover of sandy/loam material. It has been assumed that material of this nature is available within free haul distance from the residue deposit to be rehabilitated or has been stockpiled in close proximity of the residue deposit. The unit cost allows for the establishment of a borrow-pit to source evaporative cover material. Ideally, the established borrow-pit can be converted into a pollution control dam to collect and evaporate possible contaminated seepage arising from the rehabilitated residue deposit.

The volume of material required to create an evaporative cover of 750mm thickness on the hypothetical residue deposit with modified outer slopes, amounts to 135 000m^3. The associated armouring material for the outer layer of 300mm thickness amounts to 55 500m^3. It has also been assumed that the armouring material can be obtained within a reasonable haul distance.

Pollution Control Dam

Current generally accepted closure methods indicates that operational pollution control dams are properly lined to prevent the migration of the contaminated water impounded in the dam to the shallow groundwater or the nearby receiving surface water environment. Mostly, synthetic (HDPE) liners are provided for this purpose. However, these liners have a finite life and eventual failure of these liners would result in the salts and other contaminants that accumulated in the pollution control dam(s) over the years to be dissipated into the receiving water environment. Hence, from a holistic view the provision of a pollution control dam serves a limited function, only postponing the release of contaminants into the receiving water environment. However, contaminant release would be spread-out over a period of about 50 years, starting from mine residue deposit rehabilitation to final disintegration of the liner in the pollution control dam(s). This situation would most likely allow for an acceptable residual impact, with salt/contaminant release into the receiving water environment at a rate that does not exceed the "natural" assimilative capacity of the receiving water resource. The only exception could be extremely sensitive water resources.

Based on the above, the Master rate allows for a pollution control dam lined with a 1.5mm thick HDPE liner, located on a prepared bed of 250mm thickness. Allowance has also been made for geosynthetic layer between the bed and the HDPE liner. The liner would be secured to the outer perimeter of the pollution control dam by means of routine folding-in methods.

The surface area of the dam is based on a nett evaporation of 750mm. The volume of contaminated seepage arises from the residue deposit that cannot be intercepted by the evaporative cover is estimated at 1% MAP (750mm). A surface area of about 1 500m^2 is required.

The Master rate also allowed for the following:

- Concrete stormwater chutes at 200m spacing along the modified perimeter of the rehabilitated residue deposit;
- Benches to be integrated into the stormwater chutes; and
- Energy dissipation in the chutes just upslope of chute/bench crossings as well as within the final chutes reach, just before discharge into the receiving surface water environment.

18.2.7 Component 10: General Surface Rehabilitation

Final surface rehabilitation of areas disturbed by mining and related activities should be aligned to the selected final land use. Irrespective of the final land use, general surface rehabilitation normally should ensure the following:

- Surface topography that emulates the surrounding areas and aligned to the general landscape character. Steep slopes in excess of 6% should also be avoided if possible.
- Landscaping that would facilitate surface runoff and result in free draining areas. If possible, the drainage lines should be reinstated.
- An area without unnecessary remnants of structures and surface infrastructure to give the rehabilitated area a "neat" appearance. Special attention must be given to shape and/or removal of heaps of excess material being the legacy of prolonged mining and related activity.
- An area suitable for revegetation.

The unit cost for general rehabilitation allows for shaping and landscaping of disturbed areas. The Master rate allows for the shaping of material to a depth/thickness of about 500mm. An extra over allowance in the unit cost of 50% has been made to cover the removal and/or destruction of surface infrastructure remnants and/or other undesirable objects such as trees, foundations, concrete slabs, etc.

Applicability to the Proposed Kusipongo Resource Project:

General surface rehabilitation for the proposed Kusipongo Resource Expansion Project will include the infrastructure areas, dams, temporary stockpile, access roads, adits and conveyor route. The total area is approximately 57.28ha.

18.2.8 Component 11: River Diversions

Although not desirable, river diversions are unavoidable in some cases to allow mining, especially opencast mining, to proceed. Wetland areas are normally associated with river diversions and during the operational period some form of riparian habitat could most likely have established within the stream diversion area. Hence considerations should be given whether a stream diversion should be changed at mine closure. This could require dedicated assessments to guide decision-making in this regard. Moreover, removal of stream diversions could result in stream flow over mined areas that could result in undesirable water quality effects. In the event that river diversions should be removed at closure, the Master rate is the same as for general surface rehabilitation.

Applicability to the Proposed Kusipongo Resource Project:

A tributary running from the Kusipongo Mountain to the Ohlelo River will be diverted (segregation of clean and dirty stormwater). An area of 1 750m² [1] is estimated for the associated culverts. The entire diversion area will be updated in the subsequent closure cost update, once detailed design has been finalised.

Please Note – the diversion of this tributary should not be interpreted as "River" diversion, it is merely an *informal drainage line* leading down the slope of the Kusipongo Mountain towards the Ohlelo River.

18.2.9 Component 12: Fencing

Applicability to the Proposed Kusipongo Resource Project:

It is envisaged that Adit A and B, as well as the conveyor route, will be fenced. Approximately 20 466m of fencing is required for these components.

18.2.10 Component 13: Water Management

Underground mine workings has the potential to eventually fill up with water and decant. Depending on the decant mode and the type of product mined, this water could be of a poor quality. Hence provision should be made to collect and handle this water to limit degradation of water resources in the vicinity of potential decant. Collection and neutralisation (with associated metal removal) is an established management practice to deal with this water. However, the elevated salt content normally associated with this water is still a matter of concern. Hence, advanced treatment such as desalination of this water is currently considered and in some cases pilot plants have been established to assess feasibility. Treatment technologies not producing brine are currently favoured. However, this is not possible with all types of excess

[1] Quantity provided by Hatch

mine water. The filling of a mine could involve a notable period of time and the required treatment capacity to handle the excess mine water could only be required decades after mine closure. Hence the future implementation of these plans most likely by third parties should also receive consideration.

The Master rate is based on a hypothetical mine that comprises the following:

- Both opencast (1) and underground mine workings;
- The opencast workings amount is about 800ha;
- The underground working amount is about 5 500ha;
- Decant from the mine will occur over periods varying from 15 years to 90 years after mining at a specific mining area has ceased;
- Decant flow is likely to be 840m^3 per hectare per year for the opencast workings (15% recharge) and 300m^3 per hectare per year for the underground workings (3% recharge);
- Decant flow is treated prior to discharge at a rate of ZAR 7.00 per m^3; and
- Capital costs for the treatment plants are R15 million per 1 000 m^3 for the opencast workings (less than 2 500m^3/d per site) and R10 million per 1 000m^3 for the underground workings (about 5 000m^3/d).

Applicability to the Proposed Kusipongo Resource Project:

Water management has not been costed for at this stage, as it is assumed that the adit will be plugged. This component must be updated should it be identified that decant water at mine closure would require treatment before discharge to conform to the RWQO at the time.

A section (Component 13 (a)) is included for monitoring of surface and groundwater, for a period of 5 years. Sum rates for the water management have been estimated at R200 000 per year. This cost estimate will need to be readjusted during the LOM as and when the conceptual and numerical groundwater model is refined.

18.2.11 *Component 14: Maintenance and Aftercare*

The Master rate assumes a maintenance and aftercare period of 2 to 3 years after mine production ceases, and covers:

- Annually fertilising of rehabilitated areas;
- Monitoring of surface and subsurface water quality surface;
- Control of wattle and all other alien plants; and
- General maintenance, including rehabilitation of cracks and subsidence.

(1) Please Note - in the case of the proposed Project only underground mine workings will be applicable

Applicability to the Proposed Kusipongo Resource Project:

The area for maintenance and aftercare includes the adit areas, infrastructure areas, and the conveyor route; however, excludes the dams/evaporation ponds. This equates to an area of 56.57 ha.

18.2.12 *Component 15: Specialist Studies and Closure Environmental Management Programme*

Specialist studies (hydrological, hydrogeological, soils, etc.) may be required for the closure Environmental Management Programme and costs associated with these may include drilling of additional monitoring boreholes, additional sampling etc. The involvement of specialists must be confirmed at closure to the end of the life of the mine and the closure cost estimate updated accordingly.

Applicability to the Proposed Kusipongo Resource Project:

Provision is made for on-going specialist hydrogeological studies, to improve the accuracy of the current detailed groundwater numerical model. It is also assumed that the drilling of additional monitoring boreholes will be required. An updated groundwater numerical model will be critical in understanding the volumes of decant at mine closure, (if applicable). A provisional amount of R2 500 000 has been budgeted for this component.

Preparation of a closure environmental management programme is an integral part of decommissioning and closure of a mine. This cost has been estimated at minimum R500 000.00 and must be updated as necessary (i.e. in terms of specialist involvement).

18.3 *CLOSURE COST ESTIMATIONS*

The closure costs provide proposed capital expenditure estimations in terms of general rehabilitation. It should be noted that in many instances quantities have been estimated. Compound inflation (January 2006, 2007, 2008, 2009, 2010, 2011, 2012, and 2013) has been added to the master rates provided in the DMR 2005 closure cost guideline as per *Table 18.1*.

Table 18.1 *Inflation Rates*

Date	CPIX (%)
01 January 2006	4.00
01 January 2007	6.00
01 January 2008	9.30
01 January 2009	8.10
01 January 2010	6.20
01 January 2011	3.70
01 January 2012	6.30
01 January 2013	5.40

Source: Adapted from: http://liberta.co.za/blog/cpi-inflation-rate-in-south-africa-current-and-historical/

Table 18.2 provides a summary of the new master rates used for the closure cost analysis, based on a compounded inflation rate from 2006 to 2013.

The total rehabilitation/ closure cost estimate for the proposed Kusipongo Resource Expansion Project Mine is R 43 127 470.90 as calculated in *Table 18.3*.

Table 18.2 New Master Rates

Component No.	Description	Unit	Value in Jan-05 (ZAR)	Value in Jan-06(ZAR)	Value in Jan-07(ZAR)	Value in Jan-08(ZAR)	Value in Jan-09(ZAR)	Value in Jan-10(ZAR)	Value in Jan-11(ZAR)	Value in Jan-12(ZAR)	Value in Jan-13(ZAR)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m^3	6.82	7.09	7.52	8.22	8.88	9.43	9.78	10.40	10.96
2(a)	Demolition of steel buildings and structures (including floor slabs)	m^2	95.00	98.80	104.73	114.47	123.74	131.41	136.27	144.86	152.68
2(b)	Demolition of reinforced concrete buildings and structures	m^2	140.00	145.60	154.34	168.69	182.35	193.66	200.82	213.48	225.00
3	Rehabilitation of access roads	m^2	17.00	17.68	18.74	20.48	22.14	23.52	24.39	25.92	27.32
4(a)	Demolition and rehabilitation of electrified railway lines	m	165.00	171.60	181.90	198.81	214.92	228.24	236.69	251.60	265.18
4(b)	Demolition and rehabilitation of non-electrified railway lines	m	90.00	93.60	99.22	108.44	117.23	124.50	129.10	137.23	144.65
5	Demolition of housing and facilities (including floor slabs)	m	190.00	197.60	209.46	228.94	247.48	262.82	272.55	289.72	305.36
6	Opencast rehabilitation (including final voids and ramps)	ha	96700.00	100568.00	106602.08	116516.07	125953.88	133763.02	138712.25	147451.12	155413.48
7	Sealing of shafts, adits and inclines (including concrete cap)	m^3	51.00	53.04	56.22	61.45	66.43	70.55	73.16	77.77	81.97
8(a)	Rehabilitation of overburden and spoils	ha	66400.00	69056.00	73199.36	80006.90	86487.46	91849.68	95248.12	101248.75	106716.18
8(b)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	82700.00	86008.00	91168.48	99647.15	107718.57	114397.12	118629.81	126103.49	132913.08
8(c)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	240200.00	249808.00	264796.48	289422.55	312865.78	332263.46	344557.21	366264.31	386042.58
9	Rehabilitation of subsided areas	ha	55600.00	57824.00	61293.44	66993.73	72420.22	76910.28	79755.96	84780.58	89358.73
10	General surface rehabilitation, including grassing of all denuded areas	ha	52600.00	54704.00	57986.24	63378.96	68512.66	72760.44	75452.58	80206.09	84537.22
11	River diversions	ha	52600.00	54704.00	57986.24	63378.96	68512.66	72760.44	75452.58	80206.09	84537.22
12	Fencing	m	60.00	62.40	66.14	72.30	78.15	83.00	86.07	91.49	96.43
13	Water management (separating clean and dirty water, managing polluted water and managing the impact on groundwater, including treatment or containment, when required)	ha	20000.00	20800.00	22048.00	24098.46	26050.44	27665.57	28689.19	30496.61	32143.43
13 (a)	Surface and groundwater monitoring for 5 years	Sum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	2 to 3 years of maintenance and aftercare	ha	700.00	728.00	771.68	843.45	911.77	968.29	1004.12	1067.38	1125.02
15 (a)	Specialist study - groundwater assessment including drilling	Sum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15 (b)	Specialist study - closure EMPR	Sum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

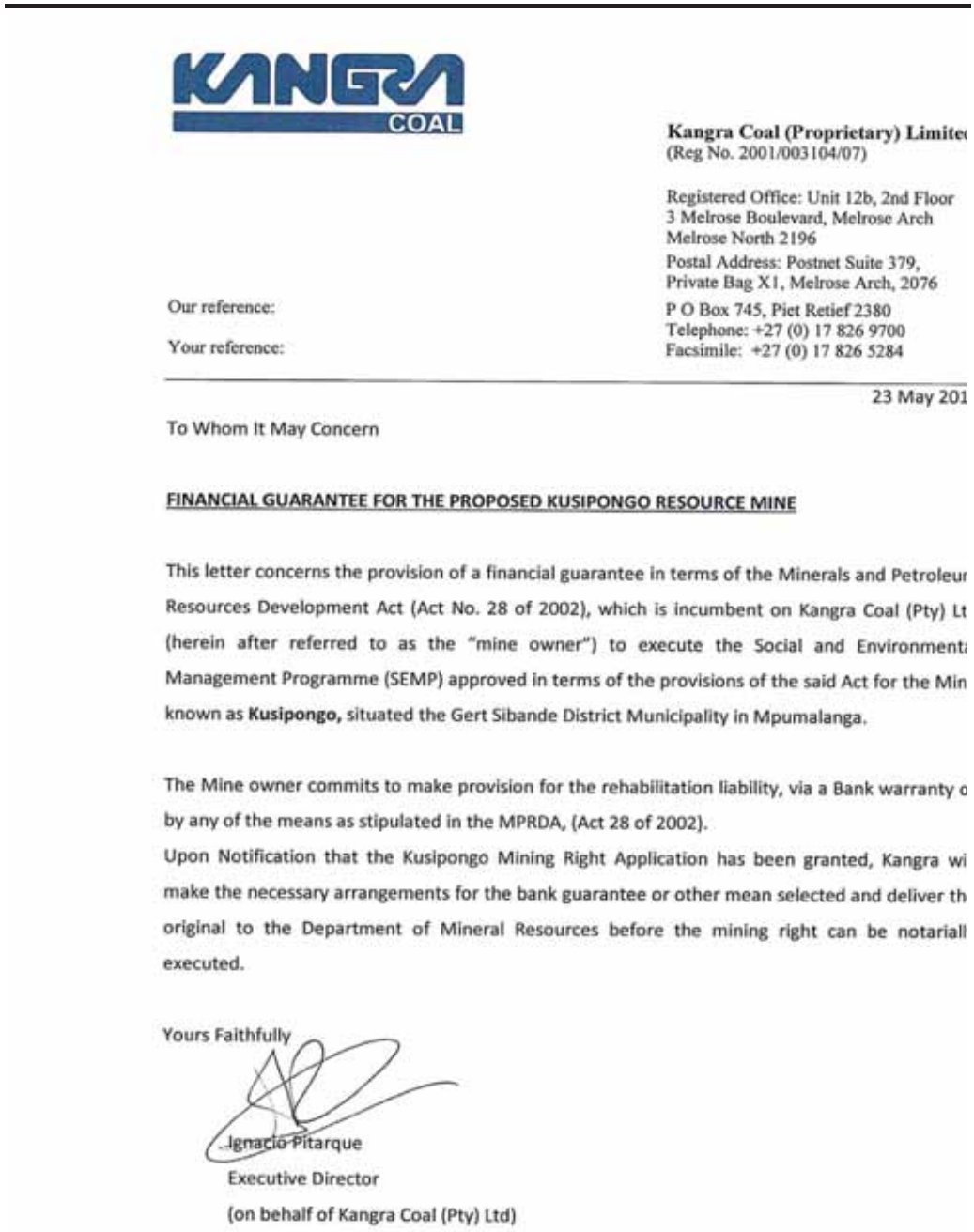
Table 18.3 Closure Cost Estimate

Rehabilitation Costs							
Mine	Kusipongo				**Location:**	Piet Retief	
Evaluators:	ERM Southern Africa (Pty) Ltd				**Date:**	January 2013	
			A	**B**	**C**	**D**	**E=A*B*C*D**
No	**Description**	**Unit**	**Quantity**	**Master rate**	**Multiplication factor**	**Weighting factor 1**	**Amount (South African Rands)**
			Step 8	Step 6	Step 6	Step 7	
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m³	379331.06	R 10.96	1.00	1.10	R 4 573 594.62
2(a)	Demolition of steel buildings and structures (including floor slabs)	m2	2268.21	R 152.68	1.00	1.10	R 380 944.55
2(b)	Demolition of reinforced concrete buildings and structures	m2	3523.08	R 225.00	1.00	1.10	R 871 977.81
3	Rehabilitation of access roads	m2	177000.00	R 27.32	1.00	1.10	R 5 319 576.78
4(a)	Demolition and rehabilitation of electrified railway lines	m	0.00	R 265.18	1.00	1.10	R 0.00
4(b)	Demolition and rehabilitation of non-electrified railway lines	m	0.00	R 144.65	1.00	1.10	R 0.00
5	Demolition of housing and facilities (including floor slabs)	m	0.00	R 305.36	1.00	1.10	R 0.00
6	Opencast rehabilitation (including final voids and ramps)	ha	0.00	R 155 413.48	1.00	1.10	R 0.00
7	Sealing of shafts, adits and inclines (including concrete cap)	m³	72000.00	R 81.97	1.00	1.10	R 6 491 686.92
8(a)	Rehabilitation of overburden and spoils	ha	0.00	R 106 716.18	1.00	1.10	R 0.00
8(b)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0.00	R 132 913.08	1.00	1.10	R 0.00
8(c)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0.71	R 386 042.58	1.00	1.10	R 300 083.77
9	Rehabilitation of subsided areas	ha	TBC	R 89 358.73	1.00	1.10	R 0.00
10	General surface rehabilitation, including grassing of all denuded areas	ha	57.28	R 84 537.22	1.00	1.10	R 5 326 418.87
11	River diversions	ha	0.18	R 84 537.22	1.00	1.10	R 16 273.41
12	Fencing	m	20466.00	R 96.43	1.00	1.10	R 2 170 896.48
13	Water management (separating clean and dirty water, managing polluted water and managing the impact on groundwater, including treatment or containment, when required)	ha	0.00	R 32 143.43	1.00	1.10	R 0.00
13 (a)	Surface and groundwater monitoring for 5 years	Sum	5.00	R 200 000.00	1.00	1.10	R 1 100 000.00
14	2 to 3 years of maintenance and aftercare	ha	56.57	R 1 125.02	1.00	1.10	R 70 009.39
15 (a)	Specialist study - groundwater assessment including drilling	Sum	1.00	R 2 500 000.00	1.00	1.10	R 2 500 000.00
15 (b)	Specialist study - closure EMPR	Sum	1.00	R 500 000.00	1.00	1.10	R 550 000.00
						Sub Total 1 (Sum of items 1 to 15)	**R 29 671 462.61**
Multiply by Weighting Factor 2 (Step 4.4)	**1.05**					**Sub Total 2**	**R 31 155 035.74**
1	Preliminary and General	Add 6% of Subtotal 1 if Subtotal 1 ≥ R 100,000,000.00					**NA**
		Add 12% of Subtotal 1 if Subtotal 1 ≤ R 100,000,000.00					**R 3 560 575.51**
2	Contingencies	10.0% of Subtotal 2					**R 3 115 503.57**
						Sub Total 3 (Subtotal 2 plus Sum of management and contingency)	**R 37 831 114.82**
						VAT (14%)	**R 5 296 356.08**
						GRAND TOTAL (Subtotal 3 plus VAT)	**R 43 127 470.90**

Sub-total 1 = Sum of (quantity x rate x factor for risk x factor for terrain)
Sub-total 2 = Sub-total 1 + factor for accessibility
Sub-total 3 = Sub-total 2 + percentage for contingencies and p&g
Sub-total 4 = Sub-total 3 plus VAT (Grand Total)

Should the Mining Right and SEMP be approved, Kangra Coal will make provision for the estimated closure cost as calculated in *Table 18.3* by means of a Bank Guarantee or via the existing SARS approved Kangra Coal Rehabilitation Trust Fund. Refer to *Figure 18.1* below for Kangra Coal's commitment to provide for the closure cost estimate

Figure 18.1 Kangra Coal Commitment to Meet Financial Provision for the Proposed Project



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(Reg No. 2001/003104/07)

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Telephone: +27 (0) 17 826 9700
Facsimile: +27 (0) 17 826 5284

Our reference:

Your reference:

23 May 201

To Whom It May Concern

FINANCIAL GUARANTEE FOR THE PROPOSED KUSIPONGO RESOURCE MINE

This letter concerns the provision of a financial guarantee in terms of the Minerals and Petroleur Resources Development Act (Act No. 28 of 2002), which is incumbent on Kangra Coal (Pty) Lt (herein after referred to as the "mine owner") to execute the Social and Environmenta Management Programme (SEMP) approved in terms of the provisions of the said Act for the Min known as **Kusipongo,** situated the Gert Sibande District Municipality in Mpumalanga.

The Mine owner commits to make provision for the rehabilitation liability, via a Bank warranty o by any of the means as stipulated in the MPRDA, (Act 28 of 2002).
Upon Notification that the Kusipongo Mining Right Application has been granted, Kangra wi make the necessary arrangements for the bank guarantee or other mean selected and deliver th original to the Department of Mineral Resources before the mining right can be notariall executed.

Yours Faithfully

Ignacio Pitarque
Executive Director
(on behalf of Kangra Coal (Pty) Ltd)

18.4 PROGRESSIVE TOTAL

The DMR requires 10 forecasts (one for each of the first 10 years of operation) and the progressive total in the tenth year (excluding concurrent rehabilitation). This however cannot be calculated for the proposed Project at this stage and will be included in the next closure cost calculation (a year from when the mining right is obtained). All activities relating to the proposed Project will occur on the area demarcated, and as approved in the mine plan. On-going dust-suppression, best practise environmental management and monitoring will be conducted on site to ensure that the extent of the footprint area is not increased.

I the undersigned in my capacity as Kangra Coal's General Manager do hereby undertake to ensure that the social and environmental conditions and recommendations associated with this the Social and Environmental Management Programme for the proposed Kusipongo Resource Expansion Mining Project are adhered to, including any amendments approved by the Minister, as well as the requirements of the Minerals, Petroleum and Resources Development Act (No. 28 of 2002) and the regulations thereof.

Name and Surname: JACQUES PREYTENBACH

Identification Number: 750514 5259 082

Capacity: GENERAL MANAGER

Company: KANGRA COAL

Signature:

Date: 17/05/2013

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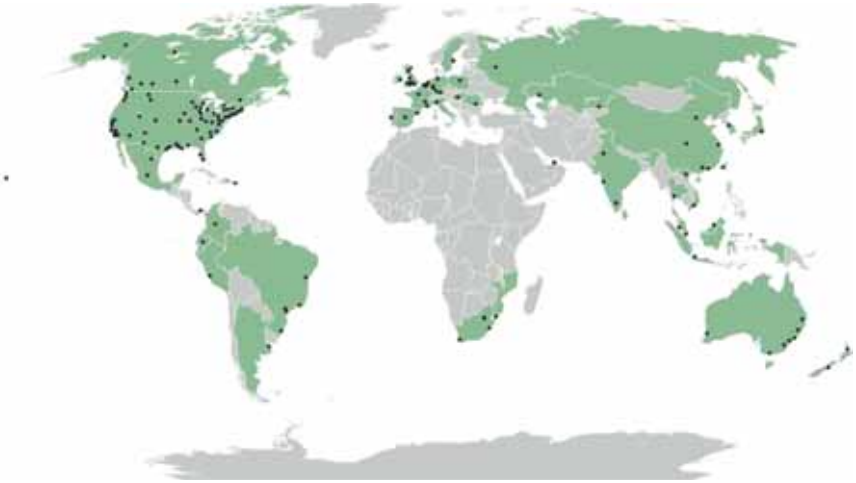

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Annex A

Signed Independence of the EAP

4.2 The Environmental Assessment Practitioner

I, Michael John Everett , declare that –

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation **8** of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010;

- I have a vested interest in the proposed activity proceeding, such vested interest being:

N/A

Signature of the environmental assessment practitioner:

E.R.M.

Name of company:

8/8/2011

Date:

Annex B

Public Participation Process Report

Annex B1

Pre Scoping Public Participation Materials

Background Information Document and Invitation to Comment

Proposed Kangra Coal Kusipongo Expansion Project

Aim of this Document

The aim of this Background Information Document is to provide stakeholders with information about the proposed expansion of Kangra Coal's Kusipongo Coal mining operation and the associated Environmental and Social Impact Assessment (ESIA) and permitting processes. It also calls for all stakeholders to register as Interested and Affected Parties.

The project is subject to several authorisation and licensing processes, including an EIA in accordance with the requirements of the EIA Regulations of 18 June 2010 under the National Environmental Management Act (NEMA) (Act 107 of 1998), as amended, a mining rights application process in accordance with the Mineral and Petroleum Resources Act 28 of 2002 (MPRDA), as well as other processes associated with environmental legislation including the National Water Act and the National Environmental Management: Waste Act.

The authorising authorities for the respective authorisation and licensing processes will be Mpumalanga Department of Economic Development, Tourism and Environment, the National Department of Environmental Affairs, the Department of Water Affairs and the Department of Mineral Resources.

These processes require that a public participation process be undertaken. Interested and Affected Party (I&AP) stakeholders will have the opportunity to register (RI&APs) and be part of the process and raise issues and concerns that they may have.

To ensure you are fully informed and receive all necessary information please register by contacting Nomsa Fulbrook-Bhembe of ERM by 26 August 2011.

Tel: 011 798 4300
Fax: 011 804 2899
Email: nomsa.fulbrook-bhembe@erm.com
Postal address: Postnet Suite 90, Private Bag X12, Tokai, 7966

Project Description

Kangra Coal (Pty) Ltd proposes to expand their current mining operations facility at the Savmore Colliery, near Piet Retief in Mpumalanga. The Savmore Colliery currently operates on the Maquasa East, West and West Extension mining rights. Current operations entail both underground and open pit mining methods.

The proposed expansion project involves an underground mine at the Kusipongo Resource, located approximately 15 km west of Driefontein, spanning across the Mkhondo and Dr Pixley Kalsaka Seme Municipalities. The anticipated run-of-mine (ROM) production volume is expected to be 5 Mtpa, with the majority of product being exported for use as thermal coal. The proposed mine is estimated to have a lifespan of approximately 30 years.

Project Scope

The scope of the proposed project involves the development and construction of:

- An underground mine at Site X shown on the map overleaf;
- A large Adit* facility at Site A;
- Two smaller sites with vertical ventilation shafts at Adits* B and D;
- An overland conveyor for the transport of coal;
- Upgrade of the existing access roads; and
- Electricity distribution infrastructure.

These are described further overleaf.

**An Adit is a passage (vertical or horizontal) from the surface to the underground mine*

Project Location

The proposed Adit A is located on the following farms:

- Twyfelhoek 379 (Portion 2 and 3);
- Donkerhoek 14 (Portion 4)

The proposed Adit B is located on farms:

- Kransbank 15 (Portion 2 and Remainder)

The proposed Adit D is located on farms:

- Donkerhoek 14 (Portion 22 and Remainder of Portion 2)

The proposed overland conveyor is located on farms:

- Twyfelhoek 379 (Portion 2 and Remainder);
- Rooikop 18 (Portion 1 and Remainder); and
- Nooitgezien 381 (Remainder)

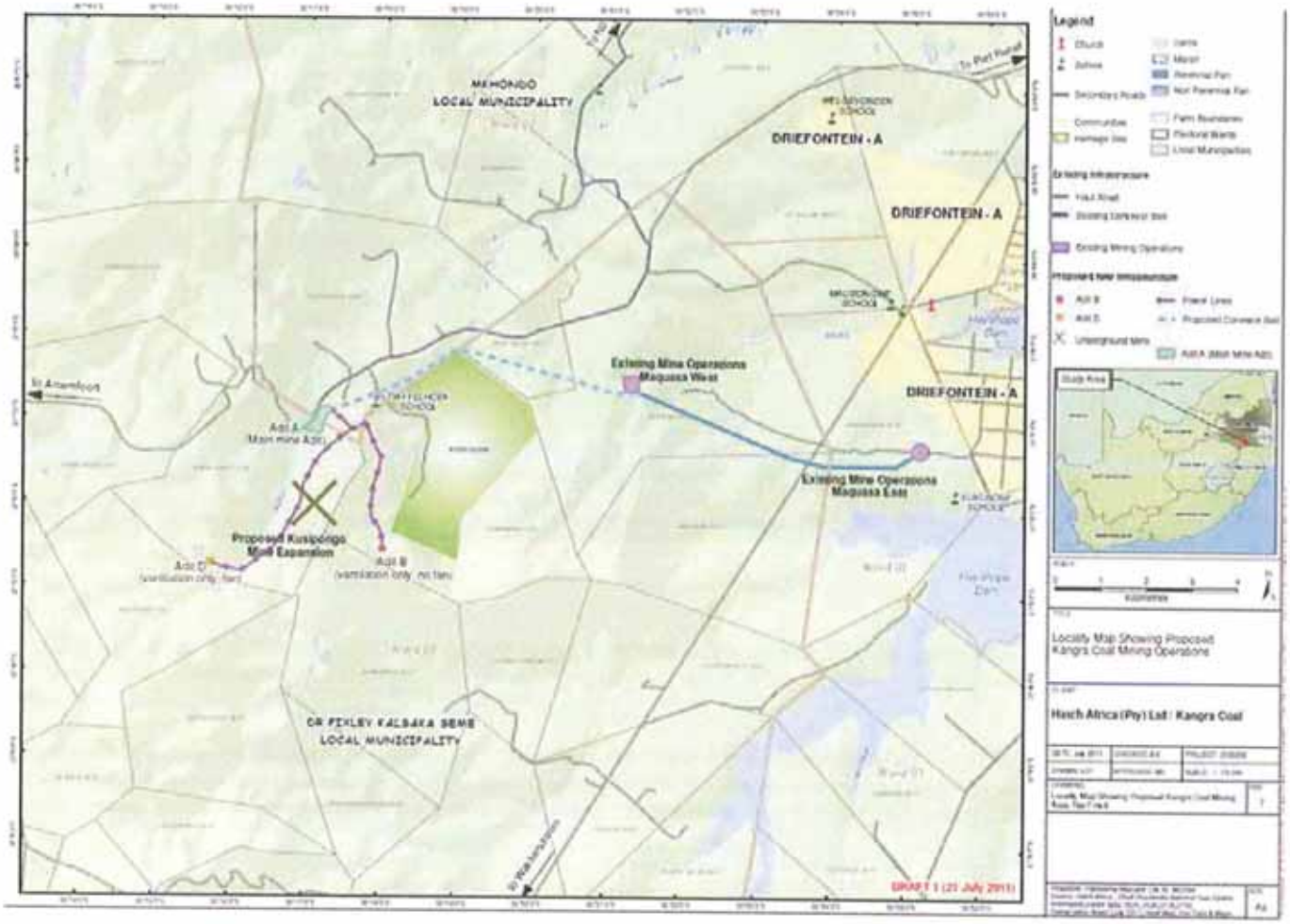
WHO IS KANGRA COAL?

Kangra Coal was incorporated as Zinan Property Holdings in 2001, and the name was changed to Kangra Coal (Pty) Ltd in 2003. Kangra Coal is based in Piet Retief, South Africa.

Kangra Coal was previously a privately owned business. In 2004 the South African investment company Shanduka Coal Investments (Pty) Ltd entered into the company. During 2007 the Spanish utility Union Fenosa (now Gas Natural Fenosa) acquired the majority stake, with Kangra Coal becoming a subsidiary of Union Fenosa. S.A Kangra Coal has three main strands to its business: it exports coal through trade contacts, it supplies the domestic market and it also exports to India. Clients are predominantly coal traders, cement and timber factories and sugar mills.

Background Information Document and Invitation to Comment

Proposed Kangra Coal Kusipongo Expansion Project



More Information on the Project Scope

Underground Mine

- Two coal seams consisting of a top (Gus) and bottom (Dundus) seam will be mined where possible.
- The mining of both seams will employ the board and pillar methods with chequerboard pillar extraction.

Details about Proposed Surface Infrastructure

Adit A: Large Facility at Site A (Type II Adit)

- Inclined Adit providing access to miners and a conveyor to bring mined coal to surface with ventilation shafts in close proximity.
- Main electrical and distribution substation. Emergency back-up generators will also be included.
- Temporary waste facilities for domestic and hazardous waste.
- Mechanical and electrical workshops for underground mining equipment.
- The installation of potable water storage tanks and distribution system.
- Coal crushing and storage facility.

Adit B & D: Smaller Ventilation Shafts (Type I Adit)

- Ventilation shafts, including ventilation fan at Adit **D.** These will be serviced by electrical infrastructure.
- Stormwater diversion berms will be erected if required at the surface of ventilation shafts.

Overland Conveyor

- An overland conveyor system which brings coal from the new mine to the existing Maquasa West Adit and Maquasa East coal beneficiation conveyor system.
- A maintenance road will also be constructed alongside the conveyor.
- Fencing along the conveyor corridor, with crossings for vehicles, livestock and surrounding community members at key locations.
- A pipeline and associated pump to transfer potable water from the existing Maquasa East (or West) water supply facilities to Adit A.

Access Roads

- Access to Adit B and D will be almost entirely constructed along existing farm track routes up to the existing gravel district road.
- Access to Adit A will be along the existing district road.

Background Information Document and Invitation to Comment

Proposed Kangra Coal Kusipongo Expansion Project

The Environmental Impact Assessment Process

Under the EIA Regulations of 18 June 2010 under the NEMA (Act No. 107 of 1998) as amended, an EIA is required to be undertaken for the proposed development of an underground mine. This EIA will assess the positive and negative impacts of the proposed project. In addition, several other permitting processes are triggered including a mining rights application, and a water and waste licence application.

Environmental Resources Management (ERM) are the independent consultants who have been appointed to conduct these processes.

The project activates the following listed activities under the EIA Regulations,18 June 2010 under the NEMA (Act No. 107 of 1998), as amended:

Government Notice R544:

- *Activity 11*
- *Activity 13*
- *Activity 22*
- *Activity 24*
- *Activity 47*

Government Notice R545:

- *Activity 15*

Government Notice R546:

- *Activity 4*
- *Activity 12*
- *Activity 13*
- *Activity 14*

The following activities are triggered under the National Environmental Management: Waste Act 59 of 2008:

Government Notice R718:

- *Activity A(1)*
- *Activity A(2)*
- *Activity A(3)*
- *Activity A(18)*
- *Activity B(7)*

The Public Participation Process: General

The relevant environmental Acts and Regulations include the Mining & Petroleum Resources Development Act, NEMA EIA Regulations, National Water Act and National Environmental Management: Waste Act. An integrated Public Participation Process will be carried to comply with the requirements of the various regulatory requirements and permitting processes. The objective of the public participation process is to inform stakeholders of the proposed project, involve them in the assessment of impacts and ensure that stakeholders are able to raise issues and concerns for consideration by ERM during the independent impact assessment, by Kangra and by the authorising authorities.

The Public Participation Process: Current Registration Phase

The first phase in our public participation process will be a registration phase, where interested and affected parties have the opportunity to register their interest. This Background Information Document is also being circulated to provide people a background on the proposed project and the associated assessment and authorisation processes.

Those with an interest in the process should register in the project so as to receive updates during the process and to be given the opportunity to comment through the process.

To register, contact Nomsa Fulbrook-Bhembe of Environmental Resources Management. She can be contacted at:

- **Telephone:** 011 798 4300
- **Fax:** 011 804 2899
- **Email:** nomsa.fulbrook-bhembe@erm.com
- **Postal address:** Postnet Suite 624, Private Bag X29, Gallo Manor, 2148

To ensure you are fully informed and receive all necessary information please register by contacting:
Nomsa Fulbrook-Bhembe of ERM by 26 August 2011.

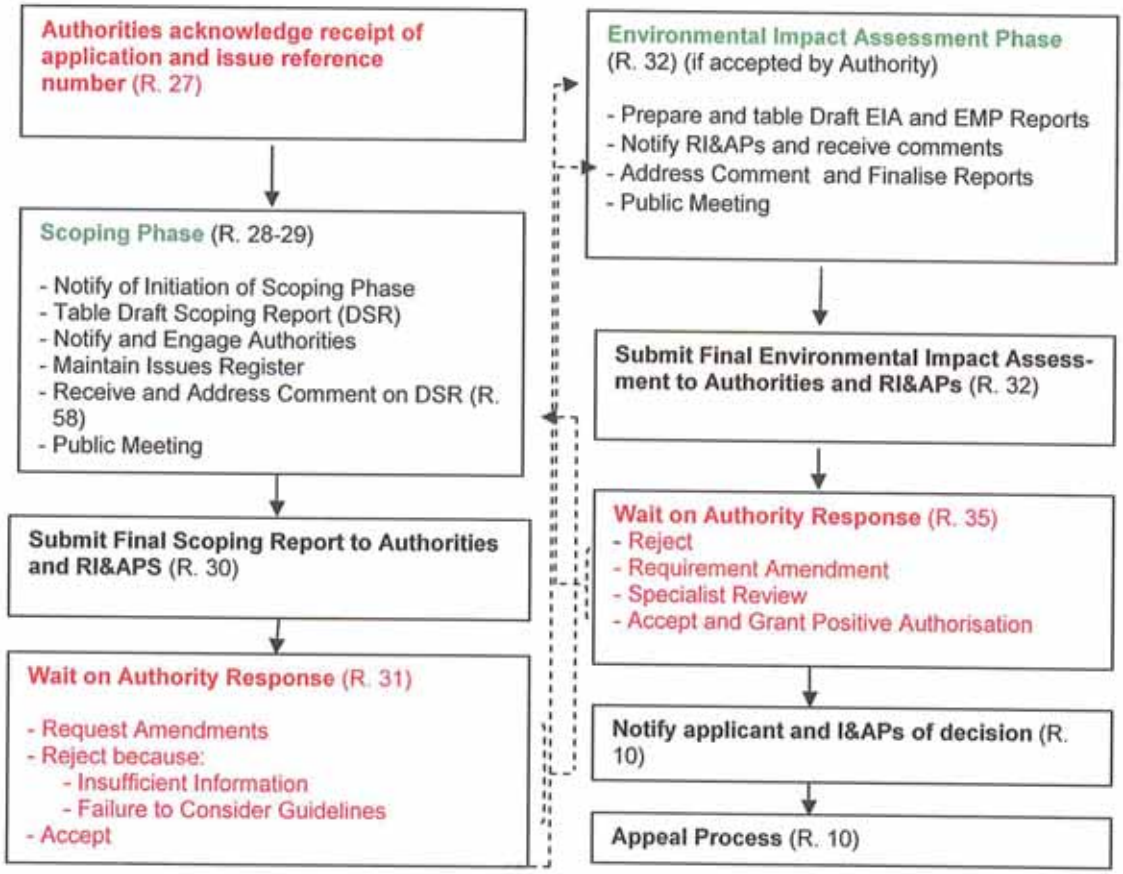
Background Information Document and Invitation to Comment

Proposed Kangra Coal Kusipongo Expansion Project

Next Steps in the Public Participation Process: The EIA Phase

After the registration exercise, the EIA process will officially begin through a Scoping Phase and subsequently an Impact Assessment Phase. During the Scoping Phase a draft scoping report (DSR) will be made available for public review and comment. The DSR will serve to identify the impacts of the proposed development and include a Plan of Study for the EIA. Information regarding the release of the DSR will be made available to all stakeholders through an advertisement and through direct correspondence with registered I&APs (RI&APs).

The diagramme below shows the process that will be followed during the EIA process. After the initial registration period that runs until 26 August 2011, the EIA process will be initiated through the Scoping Phase.



Contact Information

For any information, to register or to comment, please contact Nomsa Fulbrook-Bhembe of Environmental Resources Management. She can be contacted at:

- **Telephone:** 011 798 4300
- **Fax:** 011 804 2899
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Background Information Document and Invitation to Comment

Proposed Kangra Coal Kusipongo Expansion Project

Please fill in your details	
Name:	Organisation:
Telephone:	Position:
Cell phone:	Email:
Address:	

It would be useful if you could answer the questions below but please feel free to provide any comments you would like to raise. Please continue on additional paper if required.

1. What are the primary concerns faced by you/ your community/ your organisation with regards to this proposed expansion and development of an underground mine? Please clearly list your issues, concerns, views and/or questions you may have regarding this project.

2. Do you have or know of any information that might be relevant to the EIA (e.g. community, social, environmental or economic information)?

Agtergrond-Inligtingsdokument en Uitnodiging om Kommentaar te lewer

Voorgenome Kangra Steenkool Kusipongo Uitbreidingsprojek

Doel van hierdie Dokument

Die doel van hierdie Agtergrond-Inligtingsdokument is om belanghebbendes van inligting te voorsien aangaande die voorgenome uitbreiding van Kangra Coal se Kusipongo Steenkoolmynboubedrywighede en die verwante Omgewings-impakstudie (OIS) en toelatingsprosesse. Dit vereis ook dat alle belanghebbendes as Geïnteresseerde en Geaffekteerde Partye moet registreer.

Hierdie projek is onderhewig aan verskeie magtiging- en lisensiëringprosesse, insluitend 'n OIS ingevolge die vereistes van die OIS-Regulasies van 18 Junie 2010 onder die Wet op Nasionale Omgewingsbestuurs (WNOB) (Wet 107 van 1998), soos gewysig, 'n mynbouregte-aansoekproses ingevolge die Wet op Mineraal- en Petroleumbronne Wet 28 van 2002 (WMPB), sowel as ander prosesse geassosieer met omgewingswetgewing, insluitend die Nasionale Waterwet en die Wet op Nasionale Omgewingsbestuur: Afval.

Die bemagtigsowerhede vir die onderskeie magtiging- en lisensiëringprosesse sal die Mpumalanga Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing, die Nasionale Departement van Omgewingsake, die Departement van Waterwese en die Departement van Minerale Hulpbronne wees.

Hierdie prosesse vereis dat 'n openbare deelnameproses plaasvind. Geregistreerde Geïnteresseerde en Geaffekteerde Party (RGG&GP) belanghebbendes sal die geleentheid gebied word om deel van die proses te wees en kwessies en besorgdhede wat hulle mag koester, te voor te le.

Om te verseker dat u ten volle ingelig is en alle nodige inligting bekom, registreer asseblief deur Nomsa Fulbrook-Bhembe van ERM teen 26 Augustus 2011 te kontak.

Tel: 011 798 4300
Faks: 011 804 2899
E-pos: nomsa.fulbrook-bhembe@erm.com
Posadres: Postnet Suite 90, Privaatsak X12, Tokai, 7966

Projekbeskrywing

Kangra Coal (Edms) Bpk is van voorneme om hulle huidige mynboubedrywighede-fasiliteit by die Savmore Steenkoolmyn, ongeveer 15km wes van Driefontein, naby Piet Retief in Mpumalanga, uit te brei. Die Savmore Steenkoolmyn is tans operasioneel op die Maqausa -Oos, -Wes as ook die Westelike uitgebreide mynreg gebiede. Huidige bedrywighede behels beide ondergrondse en oopskagmynmetodes.

Die voorgenome uitbreidingsprojek betrek 'n ondergrondse myn by die Kusipongo-hulpbron. Die verwagte volume van mynloopproduksie (MLP) is 5 Mtpa, die meeste produkte synde vir uitvoer vir gebruik as termiese steenkool. Die leeftyd van die voorgenome myn sal na beraming ongeveer 30 jaar wees. Die mynboumetode sal bord- en pilaarmetodes met ruitbord pilaarekstraksie toepas, met gebruikmaking van aaneenlopende myntoerusting.

Project Scope

Die omvang van die projek behels die ontwikkeling en konstruksie van:

- 'n Ondergronde myn by Terrein X soos aangedur op die kaart (bladsy 2);
- 'n Groot skag* fasiliteit by Ligging A;
- Twee kleiner ventilasie skagte* by Ligging B en D;
- 'n Bogrondse vervoerder vir die vervoer van steenkool;
- 'n Toegangspad; en
- Elektrisiteitdistribusie-infrastruktuur.

** 'n Skag is 'n vertikale of horisontale tonnel wat vanaf die grond oppervlakte na die ondergrondse myn deurloop.*

Ligging van Projek

Die voorgenome Skag A is geleë op die volgende plase:

- Twyfelhoek 379 (Gedeelte 2 en 3)
- Donkerhoek 14 (Gedeelte 4)

Die voorgenome Skag B is geleë op plase:

- Kransbank 15 (Gedeelte 2 en restant)

Die voorgenome Skag D is geleë op plase:

- Donkerhoek 14 (Gedeelte 22 en restant van gedeelte 2)

Landvervoerder:

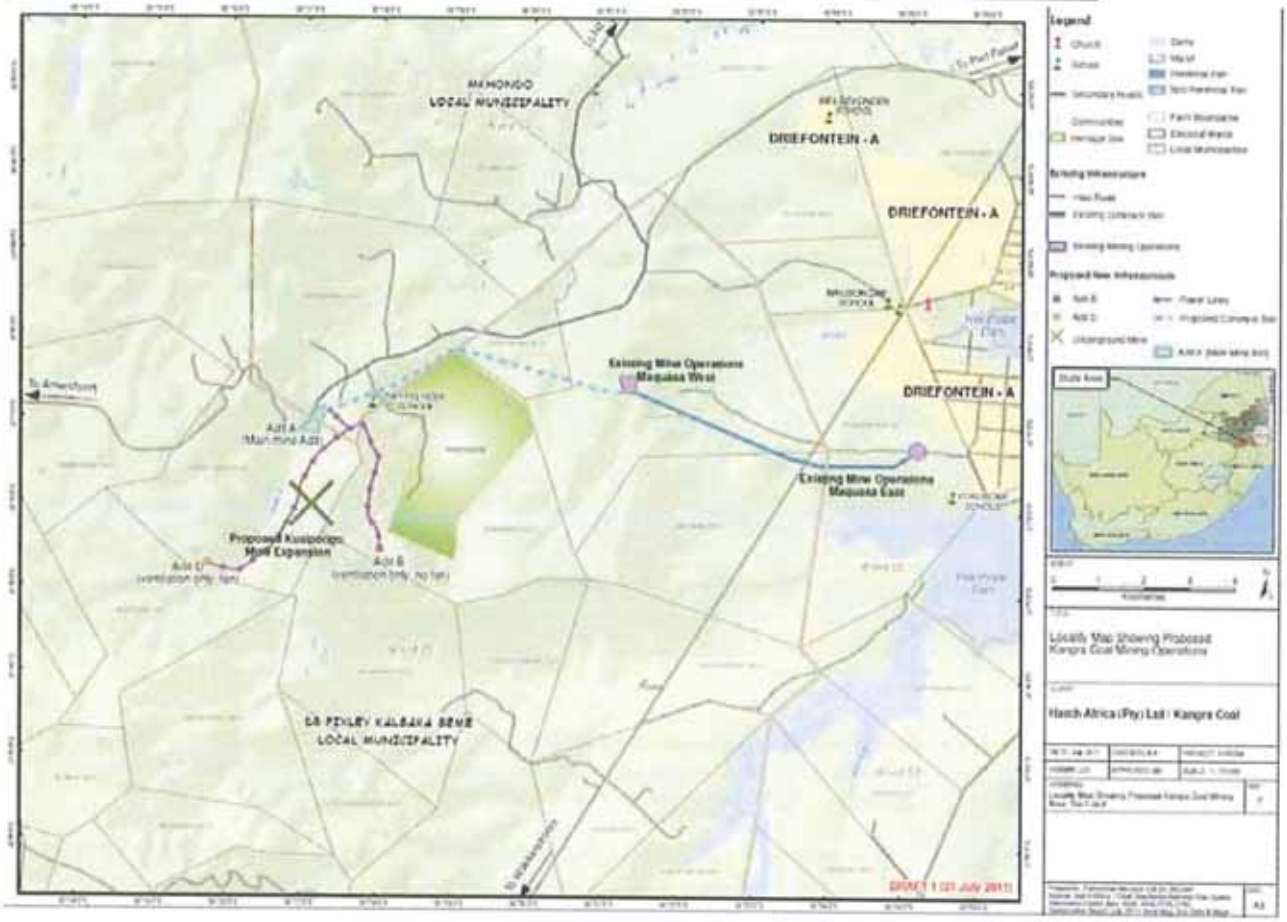
- Twyfelhoek 379(Gedeelte 2 en restant)
- Rooikop 18 (Gedeelte 1 en restant)
- Nooitgezien 381 (Restant)

WIE IS KANGRA COAL?

Kangra Coal is in 2001 geïnkorporeer as Zinan Property Holdings en die naam is in 2003 verander na Kangra Coal (Edms) Bepk. Kangra Coal is gebaseer in Piet Retief, Suid-Afrika.
Kangra Coal was voorheen 'n privaat sake-onderneming. In 2004 het die Suid-Afrikaanse beleggingsmaatskappy Shanduka Coal Investments (Edms) Bpk tot die maatskappy toegetree. Tydens 2007 het die Spaanse nutsmaatskappy Union Fenosa (nou Gas Natural Fenosa) die hoofaandeel bekom, met Kangra Coal wat 'n filiaal van Union Fenosa SA geword het.
Kangra Coal se besigheid het drie hoofstrome: die uitvoer van steenkool deur handelskontakte, voorsiening aan die plaaslike mark asook uitvoere na Indië. Kliënte is merendeels steenkoolhandelaars, sement- en houtfabrieke en suikermeulens.

Agtergrond-Inligtingsdokument en Uitnodiging om Kommentaar te lewer

Voorgenome Kangra Steenkool Kusipongo Uitbreidingsprojek



Meer inligting oor die bestek van die projek

Ondergrondse Myn

- Twee steelkool some bestaande uit 'n boonste soom (Gus) en onderste soom (Dundus) sal woor moontlik gemyn word.
- Die myn metode sal van ondergrondse tonnels en pilare gebruik maak waar die steenkool gedurigdeur onttrek word.

Besonderhede oor die Voorgestelde Bogrondse Infrastruktuur

Skagte A: Groot fasiliteit by ligging A (Tipe II Skag)

- Skuin skag gee toegang vir myners en 'n vervoerband wat steenkool na die opper-vlakke toe sal bring, sal naby die vertikale ventelasie skagte opgerig word.
- Hoof elektriese en distribusiesubstasie, skakeltuig en verlaagtransformators. Noodondersteuning opwekkers sal ook ingesluit word en sal in die vorm van 'n substasie geïnstalleer word.
- Tuidelike afvalfasiliteite vir huishoudelike en gevaarlike afvalhysbakke.
- Meganiese en elektriese werkswinkels vir ondergrondse myntoerusting.
- Die installering van drinkbare water opgaartenks en verwante distribusiestelsel, insluitend brandweer-infrastruktuur.
- Steenkool breker en stoor fasiliteit.

Skagte B & D: Kleiner Ventilasie Skagte (Tipe I Skag)

- Ventilasie skagte, met ventilasie waaier by Stag D. Elektriese infrastruktuur sal ook hier aangebring word.
- Stormwater-afleiberms sal indien nodig by die oppervlak van ventilasieskagte opgerig word.

Landvervoerder:

- 'n Oorlandse vervoerband sal steenkool bring van die voorgestelde nuwe myn na die bestaande Maquasa Wes skag en Maquasa Oos Steenkool vervoer sisteem. 'n Dienspad sal ook langs die oorlandse vervoerband opgerig word.
- Heinings om die vervoerband, wat voorsiening maak vir oorgange vir voertuie en implemente, lewende hawe en omliggende gemeenskapslede, waardeur toegang oor die grondvlakvervoerbandstelsel weer ingestel word.
- 'n Pyplyn en verwante pomp om drinkbare water vanaf die bestaande Maquasa-Oos (of -Wes) watervoorraad-fasiliteite na die Tonnel te vervoer.

Toegans paaie

- Toegang tot die skagte B en D sal omtrent heeltemal langs bestaande plaasvoetpaaie opgerig word tot by die bestaande gruisdistrikpad.
- Toegang tot die skag A sal langs die bestaande gruisdistrikpad wees.

Agtergrond-Inligtingsdokument en Uitnodiging om Kommentaar te lewer

Voorgenome Kangra Steenkool Kusipongo Uitbreidingsprojek

Die Omgewingsimpakstudieproses

Onder die OIS-Regulasies van 18 Junie 2010 onder die WNOB (Wet Nr. 107 van 1998) soos gewysig, word vereis dat 'n OIS onderneem word vir die voorgenome ontwikkeling van 'n ondergrondse myn. Hierdie OIS sal die positiewe en negatiewe impakte van die voorgenome projek assesseer. Daarbenewens word verskeie ander toelatingsprosesse in werking gestel, insluitend 'n aansoek om mynbouregte, en 'n aansoek om 'n water- en afvalbestuurlisensie.

Environmental Resources Management (ERM) is die onafhanklike konsultante aangestel om hierdie prosesse uit te voer.

Die projek aktiveer die volgende gelyste aktiwiteite onder die OIS-Regulasies, 18 Junie 2010 onder die WNOB (Wet Nr. 107 van 1998), soos gewysig:

Regeringskennisgewing R544:

- *Aktiwiteit 11*
- *Aktiwiteit 13*
- *Aktiwiteit 22*
- *Aktiwiteit 24*
- *Aktiwiteit 47*

Regeringskennisgewing R545:

- *Aktiwiteit 15*

Regeringskennisgewing R546:

- *Aktiwiteit 4*
- *Aktiwiteit 12*
- *Aktiwiteit 13*
- *Aktiwiteit 14*

Die volgende aktiwiteite word in werking gestel onder die Wet op Nasionale Omgewingsbestuur: Afval, Wet 59 van 2008:

***Regeringskennisgewing* R718:**

- *Aktiwiteit A(1)*
- *Aktiwiteit A(2)*
- *Aktiwiteit A(3)*
- *Aktiwiteit A(18)*
- *Aktiwiteit B(7)*

Die Openbare Deelnameproses: Algemeen

Die relevante Omgewingswette en -Regulasies sluit in die Wet op Mynbou & Petroleumontwikkeling, WNOB OIS Regulasies, Nasionale Waterwet en die Wet op Nasionale Omgewingsbewaring: Afval. 'n Geïntegreerde Openbare Deelnameproses sal uitgevoer word om te voldoen aan die verskeie regulerende vereistes en toelatingsprosesse. Die doelwit van die openbare deelnameproses is om belanghebbendes in te lig oor die voorgenome projek, hulle te betrek by die assessering van impakte en te verseker dat belanghebbendes in staat gestel word om kwessies en besorgdhede te opper vir oorweging deur ERM tydens die onafhanklike impakstudie deur Kangra en deur die magtigingsowerhede.

Die Openbare Deelnameproses: Huidige Registrasiefase

Die eerste fase in ons openbare deelnameproses sal 'n registrasiefase wees, waar geïnteresseerde en geaffekteerde partye gevra sal word om hulle belang te registreer. Hierdie Agtergrond-Inligtingsdokument word ook gesirkuleer om mense van 'n agtergrond te voorsien aangaande die voorgenome projek en die verwante assessering- en magtigingsprosesse.

Diegene met 'n belang in die proses moet in die projek registreer om sodoende opdaterings tydens die proses te verkry en om die geleentheid gebied te word om regdeur die proses kommentaar te lewer.

Om te registreer, kontak Nomsa Fulbrook-Bhembe van Environmental Resources Management. Sy kan gekontak word by:

- **Telefoon:** 011 798 4300
- **Faks:** 011 804 2899
- **E-pos:** nomsa.fulbrook-bhembe@erm.com
- **Posadres:** Postnet Suite 624, Privaatsak X29, Gallo Manor, 2148

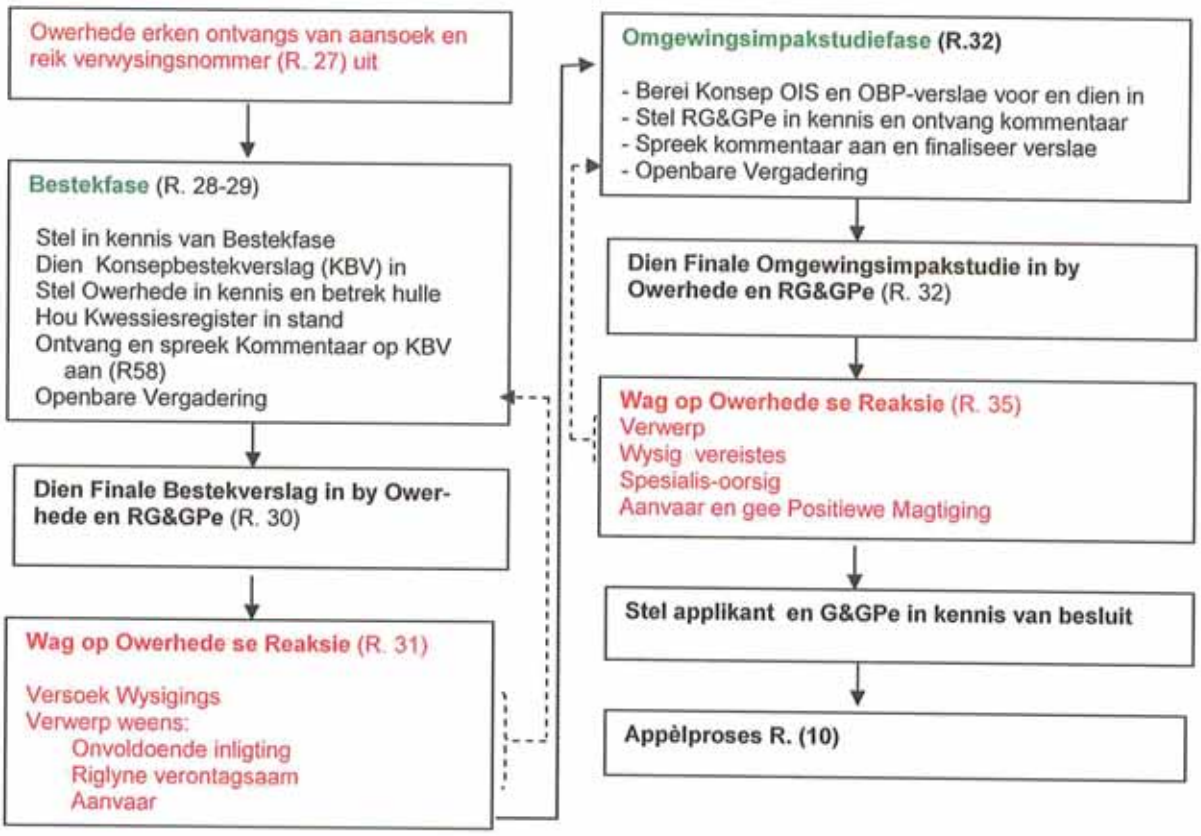
Agtergrond-Inligtingsdokument en Uitnodiging om Kommentaar te lewer

Voorgenome Kangra Steenkool Kusipongo Uitbreidingsprojek

Volgende Stappe in die Openbare Deelnameproses: Die OIS-Fase

Na die registrasieproses sal die OIS-proses amptelik begin deur 'n Bestekfase en daarna 'n Impakstudiefase. Tydens die Bestekfase sal 'n Konsepbestekverslag (KBV) beskikbaar gestel word vir openbare oorsig en kommentaar. Die KBV sal dien om die impakte van die voorgenome ontwikkeling te identifiseer en 'n Plan van Aksie vir die OIS in te sluit. Inligting rakende die vrystelling van die KBV sal aan alle belanghebbendes beskikbaar gestel word deur middel van 'n advertensie en deur middel van direkte korrespondensie met geregistreerde G&GPe (RG&GPe).

Die onderstaande diagramme dui die proses aan wat gevolg sal word tydens die OIS-proses. Na die aanvanklike registrasieperiode wat tot 26 Augustus 2011 sal duur, sal die OIS-proses deur die Bestekfase geïnisieer word.



Kontakbesonderhede

Vir enige inligting, om te registreer of kommentaar te lewer, kontak asseblief vir Nomsa Fulbrook-Bhembe van Environmental Resources Management. Sy kan gekontak word by:

Telefoon: 011 798 4300
Faks: 011 804 2899
E-pos: fulbrook-bhembe@erm.com
Posadres: Postnet Suite 624, Privaatsak X29, Gallo Manor, 2148

Agtergrond-Inligtingsdokument en Uitnodiging om Kommentaar te lewer

Voorgenome Kangra Steenkool Kusipongo Uitbreidingsprojek

Vul asseblief u besonderhede in	
Naam:	Organisasie:
Telefoon:	Posisie:
Selfoon:	E-pos:
Adres:	

Dit sal van nut wees indien u die onderstaande vrae kan antwoord maar moet nie huiwer om enige kommentaar te lewer nie. Gebruik asseblief nog papier indien nodig.

1. Wat is die belangrikste besorgdhede wat u /u maatskappy / u organisasie in die gesig staar met betrekking tot hierdie voorgenome uitbreiding van 'n ondergrondse myn? Lys asseblief die kwessies, besorgdhede, opinies en/of ander vrae wat u aangaande hierdie projek mag hê.

2. Besit u of weet u van enige inligting wat relevant mag wees tot die OIS (bv maatskaplike, sosiale, omgewings- of ekonomiese inligting)?

Umqulu Wolwazi Olusemuva Nesicelo Sokuphawula
Ukusikiselwa Kokukhuliswa Kwephrojekthi ye-Kangra Coal Kusipongo

Injongo Yalomqulu

Injongo Yalomqulu Yolwazi Olusemuva ukunikeza abanesabelo ebhizinisini ulwazi mayelana nokukhuliswa okusikiselwe komsebenzi wokumayina amalahle we-Kangra Coal Kusipongo kanye Nokuhlolwa Kokuthinteka Kwemvelo okuhlangene (i-EIA) nokuvumela izinqubo. Ibiza futhi nabanesabelo ebhizinisini ukuba babhalise Njengabahlanganyeli Abanesithakazelo Nathintekayo.

Lephrojekhti ingaphansi kwezinqubo zokulayisensa nokugunyazwa ezimbalwa, kuhlanganise ne-EIA ngokuvumelana nezindingeko Zemithetho ye-EIA yango-18 June 2010, Ngaphansi Komthetho Wokuphatha Ezemvelo Wesizwe (i-NEMA) (Umthetho 107 ka-1998), njengoba ulungisiwe, inqubo yokufaka amalungelo okumayina ngovumelana Nomthetho 28 Wezokwembiwa Phansi kanye Nophalafini Wamalambu ka-2002 (i-MPRDA), kanye nezinye izinqubo ezihlangene nemithetho yemvelo kuhlanganise Nomthetho Wamanzi Esizwe kanye Nokuphathwa Kwemvelo Yesizwe: Umthetho Wokungcola.

Amagunya agunyaza izinqubo zawo zokugunyaza nokulayisensa ayoba Umnyango wase-Mpumalanga Wokuthuthukiswa Kwezomnotho, Zokuvakasha kanye Nemvelo, Umnyango Wesizwe Wezemvelo, Umnyango Wezamanzi kanye Nomnyango Wezokwembiwa.

Lezinqubo zidinga ukuthi inqubo yokuba nesandla komphakathi yenzeke. Ababambi icasa Beqembu Elinesithakazelo Elibalisiwe Nelithenthekanyo (RI&AP) bayoba nethuba yokuba inxenye yalenqubo nokuphakamisa izinkinga kanye okungenzeka banakho.

Ukuqinisekisa ukuthi uyaziswa ngokuqele nokuthola imininingwane yonke efanele sicela ubalise ngokuthinta Nomsa Fulbrook-Bhembe we-ERM ngaphambi kwezi-26 August 2011.

Tel: 011 798 4300
Fax: 011 804 2899
Email: nomsa.fulbrook-bhembe@erm.com
Ikheli: Postnet Suite 90, Private Bag X12, Tokai, 7966

Incazelo Yephrojekthi

Kangara Coal (Pty) Ltd isikisela ukukhulisa indawo yayo yamanje yomsebenzi wemayini e-Savmore Colliery, eduze ne-Piet Retief e-Mpumalanga. Savmore Colliery kwamanje esebenzela Zempumalanga ye-Maquasa, Intshonalanga namalungelo wemayini Asentshonalanga Enwebekile. . Imisebenzi yamanje isibenzisa zombili izindlela zokumayina ngaphanzi komhlaba kanye nokumayina okuvulekile kwangaphezulu.

Iphrojekthi yokukhulisa esikeselwayo ihlanganisa imayini yangaphanzi komhlaba e Kusipongo Resource, engaba amakhilomitha angu-15 Entshonalanga ye-Driefontein. Isilinganiso sokukhiqiza okulindelwe sokusebenza kwemayini [run-of-mine] (ROM) silindelwe ukuba ama-Mtpa angu-5, futhi ubuningi bomkhiqizo buyothunyelwa ngaphandle ukuze busetshenziswe njengamalahle wokutshisisa. Imayini esikiselwayo ilinganiselwa ukuthatha iminyaka engaba ngu-30 ikhona.

Isinyathelo Esilandelayo Kuyinqubo Yokuba Nesandla Komphakathi: Isigaba se-EIA

Ubukhulu be-Phrojekthi

Ubukhulu balephrojekthi esikiselwayo buhlanganisa ukuthuthukiswa nokwakhiwa kwe:

- Imayini yangaphanzi komhlaba e-Ndawo X njengoba kuboniswe kw balazwe ekhasini elilandelayo;
- Indawo enkulu Yephaseji* kwi-Ndawo A;
- Amaphaseji* amabili amancane wokungenisa umoya kwi-Ndawo B no D;
- Ibhandi elihambayo langangaphezulu komhlaba lokuhambisa amalahle;
- Imigwaqo yokungena; kanye
- Nempahla yokwabiwa kwegesi.

**Iphaseji iwumsele (ocishe uqonde thwi noma ovundlile) osukela ngaphezulu ukuya ngaphansi kwemayini.*

Indawo Yephrojekthi

Iphaseji A esikiselwayo isemapulazini alandelayo:
- Twyfelhoek 379 (Ingxenye 2 no-3)
- Donkerhoek 14 (Ingxenye 4)

Iphaseji B esikiselwayo isepulazini elandelayo:
- Kransbank 15 (Ingxenye 2 Nokusele)

Iphaseji D esikiselwayo isepulazini elandelayo:
- Donkerhoek 14 (Ingxenye 22 Nokusele Kwengxenye 2)

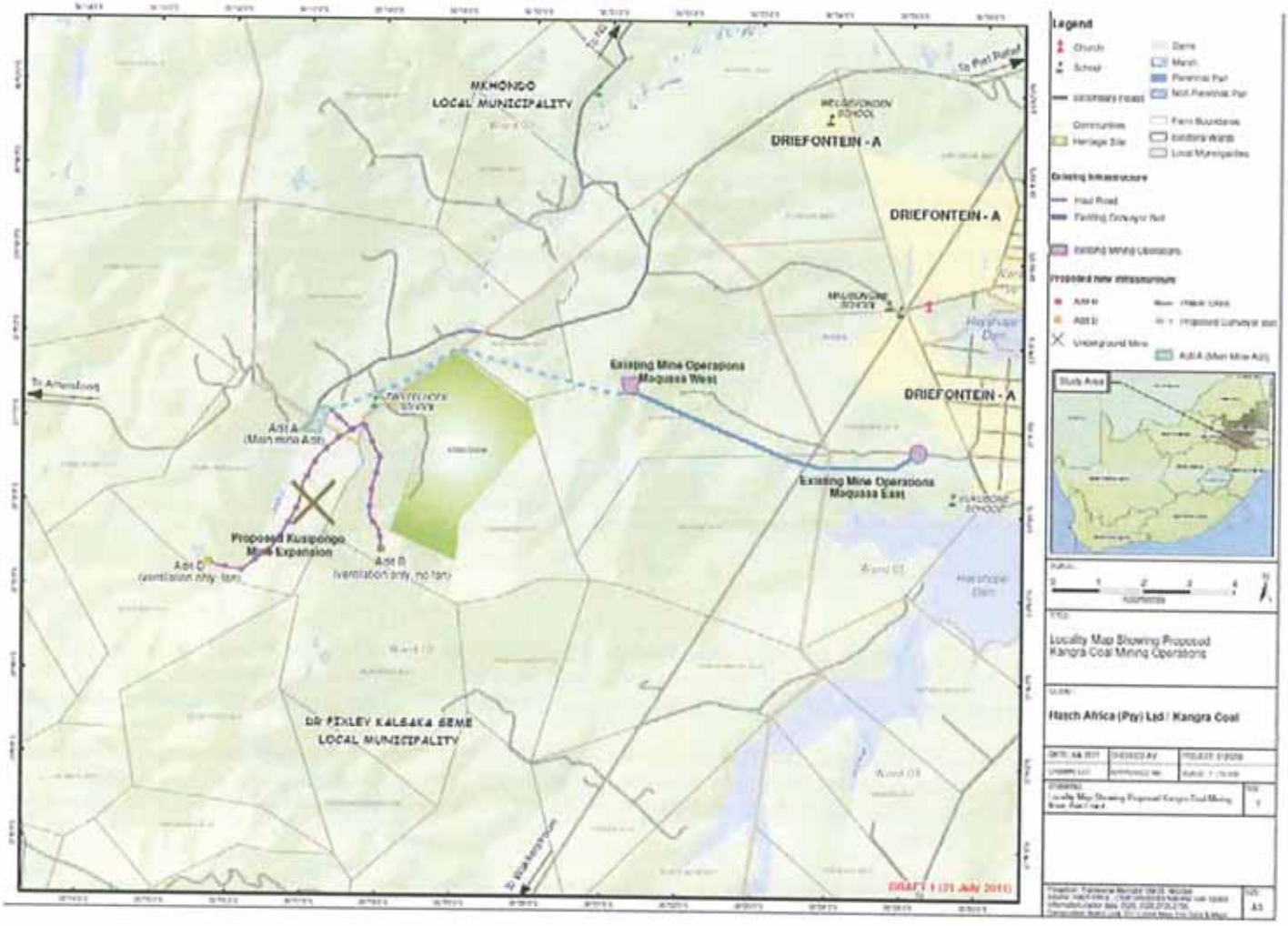
Ibhandi Elihambayo Langaphezulu Komhlaba:
- Twyfelhoek 379 (Ingxenye 2 Nokusele)
- Rooikop 18 (Ingxenye 1 Nokusele)
- Nooitgezien 381 (Nokusele)

KANGRA COAL IYINI?

Kangra Coal yaqaliswa kuyi Zinan Property Holdings ngo-2001, futhi igama lashintshelwa ku-Kagra Coal (Pty) Ltd ngo-2003. Kangra Coal ise Piet Retief, Eningizimu Afrika.

Kangra Coal ekuqaleni bekuyibhizinisi yomuntu siqu. Ngo-2004 inkampani eyenza inzalo YaseNingizimu Afrika, i-Shanduka Coal Investments (Pty) Ltd iye yangena kulenkampani. Ngo-2007 Inhlangano Fenosa yase-Spain yosizo (manje iyi Gas Natural Fenosa) iyeyaba nesabelo esikhulu, okuye kwenza ukuthi Kangara Coal yibe ngaphanzi Kwenhlangano Fenosa. S.A.
Kangra Coal inemicu emithathu emikhulu kuyibhizinisi layo: ithumela amalahle ngaphandle ngezimvumelwano zokuhwebisana, inikeza imakethe yasendaweni futhi ithumela ngaphandle e-India. Ubuningi bamakhasimende amabhizinisi wamalahle, usimende kanye namankampani wenkuni nezindlu zokugaya umoba.

Umqulu Wolwazi Olusemuva Nesicelo Sokuphawula
Ukusikiselwa Kokukhuliswa Kwephrojekthi ye-Kangra Coal Kusipongo



Ukwaziswa okwengeziwe Ngobukhulu be-Phrojekthi

Imayini Yangaphanzi Komhlaba

- **Imisele emibili yamalahle yaphezulu (Gus) neyaphansi (Dundus) izogutshwa uma kunokwenzeka.**
- Ukugutshwa kwemisele emibili kuzosebenzisa izindlela zepulangwe nensika nokutapa kwensika kwe-chequerboard, kusetshenziswa impahla yemayini eqhubekayo.

Imininingwane mayelana Nempahla Yangaphezulu Esikiselwe

Iphaseji A: Indawo Enkulu kwi-Ndawo A (Iphaseji Yohlobo II) ihlanganisa:

- Imigodi yokungenisa umoya eqonde kuthe ndindilizi kuhlanganisa isibhibhizelo esikhiphayo esingenisa abasebenzi bemayini nebhandi elihambayo ukuletha amalahle agutshiwe phezu komhlaba.
- Isiteshi esincane sogesi nesabayo. Ijeneretha yezimo eziphuthumayo nayo izohlanganiswa.
- Izindawo zokunqola ezisetshenziselwa ukunqola kwasendaweni nokuyingozi.
- Izindlu zokusebenzela zemishini kanye nogesi zempahla yemayini yangaphanzi komhlaba.
- Ukufakwa kwamatangi aphathekayo wamanzi namasistimu wokuyabelana, kuhlanganisa nempahla yokucima umlilo.
- Indawo yokugaya nokugcina amalahle.

Iphaseji B & D: Imigodi Emincane Yokungeniswa Komoya (Iphaseji Yohlobo I)

- Imigodi yokungeniswa komoya, kuhlanganise isibhibhizelo sokungenisa umoya ku-Phaseji D. Lezi ziyonakekelwa impahla yogesi.
- Imisele ecijile yokudlulisa amanzi emvula izokwakhiwa uma kudingeka ngaphezulu kwemigodi yokungenisa umoya.

Ibhandi Elihambayo Langaphezulu Komhlaba

- Ibhandi elihambayo langaphezulu komhlaba eliletha amalahle kusukela kumayini omusha ukuya kuyibhande elihambayo eligaya amalahle elikhona kakade Lasephasejini Esempumalanga ye-Maquasa West Adit kanye Nasentshonalanga ye-Maquasa.
- Ufakwa kocingo ngasemhubheni webhandi elihambayo, nedawo yokudlula kwezimmoto, izifuyo kanye nabantu bemphakathi osendaweni.
- Ipayipi kanye nephampu elihlobene lokuhambisa amanzi aphathekayo kusukela ezindaweni ezikhona kakade zokunikeza amanzi zase Mpumalanga Maquasa (noma Ntshonalanga) ukuya Kuphaseji.

Imigwaqo Yokungena

- Ukungena Kuphaseji B no-D kuzokwakhiwa cishe ngasezindleleni ezincane zasepulazini ezikhona kakade kuze kufike kumgwaqo wesigodi wenhlabathi okhona kakade.
- Ukungena Kuphaseji A kuyoba endleleni ekhona kakade yomgwaqo wesifunda.

Umqulu Wolwazi Olusemuva Nesicelo Sokuphawula
Ukusikiselwa Kokukhuliswa Kwephrojekthi ye-Kangra Coal Kusipongo

Inqubo Yokuhlolwa Kokuthinteka Kwemvelo

Ngaphansi Kwemithetho ye-EIA yango-18 June 2010 ngaphansi kwe-NEMA (Unthetho 107 wango-1998) olungisiwe, kuyadingeka ukuthi i-EIA yenziwe mayelana nokuthuthukiswa okusikiselwe kwemayini yangaphansi. Le EIA izohlola izindlela zokuthintheka okuqondile nokungaqondile kwalephrojekthi esikiselwe. Ngaphezu kwalokho, izinqubo ezinye ezigunyazwayo ezimbalwa ziyezaba umthelela kuhlanganise isicelo samalungelo wemayini, namanzi kanye nesicelo selayisensi yamanzi.

Environmental Resources Management (ERM) umxhumanisi ozimele owabelwe ukuqhuba lezinqubo.

Lephrojekthi ivuselela olunye uhlu olulandelayo lwemisebenzi ngaphansi Kwemithetho -EIA Imithetho EIA yango-18 June 2010 ngaphansi kwe-NEMA (Umthetho 107 wango-1998), njengoba kulungisiwe:

Isaziso Sikahulumeni R544:

- *Umsebenzi 11*
- *Umsebenzi 13*
- *Umsebenzi 22*
- *Umsebenzi 24*
- *Umsebenzi 47*

Isaziso Sikahulumeni R545:

- *Umsebenzi 15*

Isaziso Sikahulumeni R546:

- *Umsebenzi 4*
- *Umsebenzi 12*
- *Umsebenzi 13*

Imisebenzi elandelayo iyeyaba umthelela ngaphanzi Kokuphathwa Kwezemvelo Ezweni Umthetho Wokungcola 59 wango 2008:

I saziso Sikahulumeni R718:

- *Umsebenzi A(1)*
- *Umsebenzi A(2)*
- *Umsebenzi A(3)*
- *Umsebenzi A(18)*
- *Umsebenzi B(7)*

Inqubo Yokuba Nesandla Komphakathi: Okunye Okuvamile

Imithetho eqondene nezemvelo ihlanganisa Umthetho Wokuthuthukiswa Kwencebo Yemayini Nopetiloli, imithetho ye-NEMA EIA, Umthetho Wezwe Wamanzi kanye Nokuphathwa Kwezemvelo Ezweni: Umthetho Wokungcola. Inqubo Yokuba Nesandla Komphakathi Ehlanganisiwe izokwenziwa ukuthi ivumelane nezindingeko zemithetho ehlukahlukene nezinqubo zokugunyazwa. Injongo yenqubo yokuba nesandla komphakathi iyukwazisa abaneqhaza kwiphrojekthi esikiselwe, ibahlanganise ekuhlolweni kokuthinteka kube nokuqiniseka ukuthi abaneqhaza bayakwazi ukukhipha uvu lwabo ukuthi zicatshangelwe i-ERM phakathi nokuhlolwa kokuthinteka kokuzimela,i-Kangra nabagunyazayo.

Inqubo Yokuba Nesandla Komphakathi: Isigaba Samanje Sokubhalisa

Isigaba sokuqala kwenqubo yethu yokuba nesandla komphakathi kuzoba isigaba sokubhalisa, kulabo abanesithakazelo nabathintekayo bazocelwa ukuba babhalise izithakazelo zabo. Umqulu Wolwazi Olusemuva luyelwajikeleziswa ukuze kutholakale abantu abanolwazi ngale phrojekthi ehlobene nokuhlolwa kanye nokughunyazwa kwenqubo.

Kulabo abanesithakazelo kulenqubo kudingeka babhalise kule phrojekhti ukuze bakwazi ukuthola ukwaziswa phakathi kwenqubo banikwe ithuba lokusikisela phakathi kwenqumo.

Ukuze ubhalise, thintana no Nomsa Fulbrook-Bhembe wase Environmental Resources Management. Angathintwa ku:

Ucingo: 011 798 4300
Fax: 011 804 2899
Imeyli: nomsa.fulbrook-bhembe@erm.com
Ikheli: Postnet Suite 624, Private Bag X12,Gallo Manor, 2148

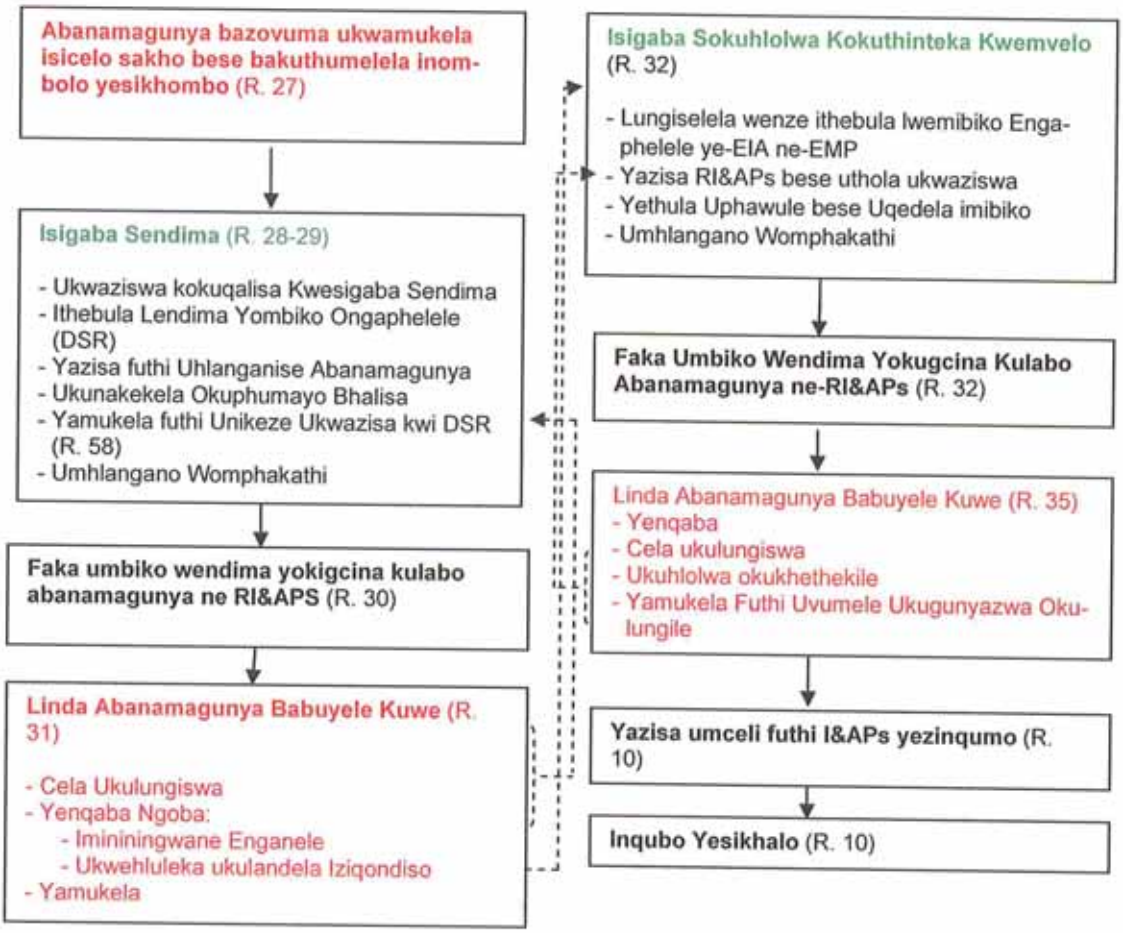
Ukuqinisekisa ukuthi uyaziswa ngokugcwele nokuthola imininingwane yonke efanele sicela ubhalise ngokuthintana no Nomsa Fulbrook-Bhembe we-ERM ngaphambi kwezi-26 August 2011.

Umqulu Wolwazi Olusemuva Nesicelo Sokuphawula
Ukusikiselwa Kokukhuliswa Kwephrojekthi ye-Kangra Coal Kusipongo

Izinyathelo Esilandelayo Kuyinqubo Yokuba Nesandla Komphakathi: Isigaba se-EIA

Ngemva kokubhalisa , inqubo ye-EIA izoqala ngokusemthethweni Ngesigaba Sendima nesigaba sokuhlolwa. Phakathi nesigaba sendima kuzoba nombiko ongaphelele wendima (DSR) kuzokwenziwa kutholakale okubuyekeziwe kumphakathi. I-DSR izokwazi ukubona ukuthinteka kwentuthuko esikiselwe futhi kuhlanganiswe nepulani lokulungiselela i-EIA. Imininingwani emayelana nokukhululwa kwe-DSR kuzokwenziwa kutholakale kubo bonke abaneqhaza ngokukhangisa ngokuvumelana ngokuqondile ngokubhaliswa kwi-I&APs (RIAPs).

Isifanekiso esingenhla sibonisa izinqubo ezizolandelwa phakathi nequbo ye-EIA. Ngemva kwesikhathi sokuqaliswa kokubhaliswa esiyoqhubeka kuze kube 26 August 2011 inqubo ye-EIA izoqaliswa Ngesigaba Sendima .



Imininingwani Yokuthintana

Uma kudingeka eminye imininigwane ukubhalisa noma ukuphawula sicela uthinte u Nomsa Fulbrook-Bhembe wase Environmental Resources Management. Angatholakala:

- **Ucingo:** 011 798 4300
- **Fax:** 011 804 2899
- **Imeyli:** nomsa.fulbrook-bhembe@erm.com
- **Ikheli:** Postnet Suite 624, Private Bag X12,Gallo Manor, 2148

Umqulu Wolwazi Olusemuva Nesicelo Sokuphawula
Ukusikiselwa Kokukhuliswa Kwephrojekthi
ye-Kangra Coal Kusipongo

Sicela ugcwalise imininingwani yakho	
Igama:	Inhlangano:
Ucingo:	Isikhundla:
Umakhalekhukwini:	Imeyli:
Ikheli:	

Kungakuhle uma ungaphendula yonke imibuzo engenhla kodwa sicela uzizwe ukhululekile uma ufuna ukuphawula. Sicela uqhubekele ephepheni elilandelayo uma kudingeka.

1. Yiziphi izinkinga eziyinkhathazo obhekana nazo/emphakathini wakini/enhlanganweni yakho mayelana nalokhu kukhuliswa nokuthuthukiswa okusikiselwe kwemayini yangaphansi? Sicela ucacise uhlu lwezinkinga zakho, izinkathazo, nemibono, kanye/noma nemibuzo ongase ube nayo mayelana nale phrojekthi.

2. Ingabe unayo noma wazi imininingwani engase ibe usizo kwi-EIA (isibonelo.umphakathi, abantu, ezemvelo noma imininingwani yezimali)?

PHOTOLOG

Photo 1 . *Site Notice Placement - Daggakraal Clinic*

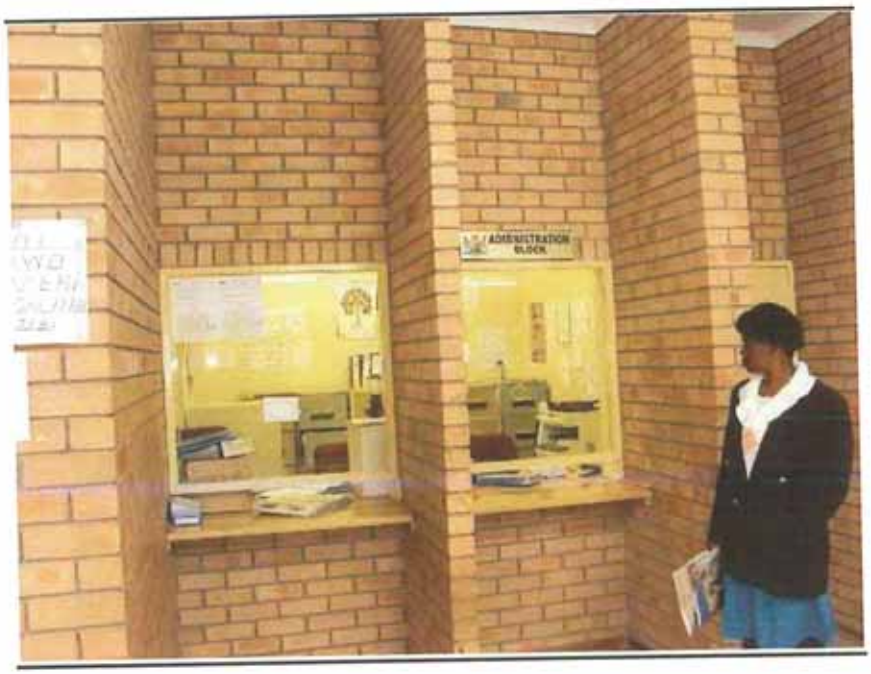


Photo 2 *Site Notice Placement - Daggakraal Community Hall*

Photo 3 *Site Notice Placement - Dirkiesdorp Clinic*

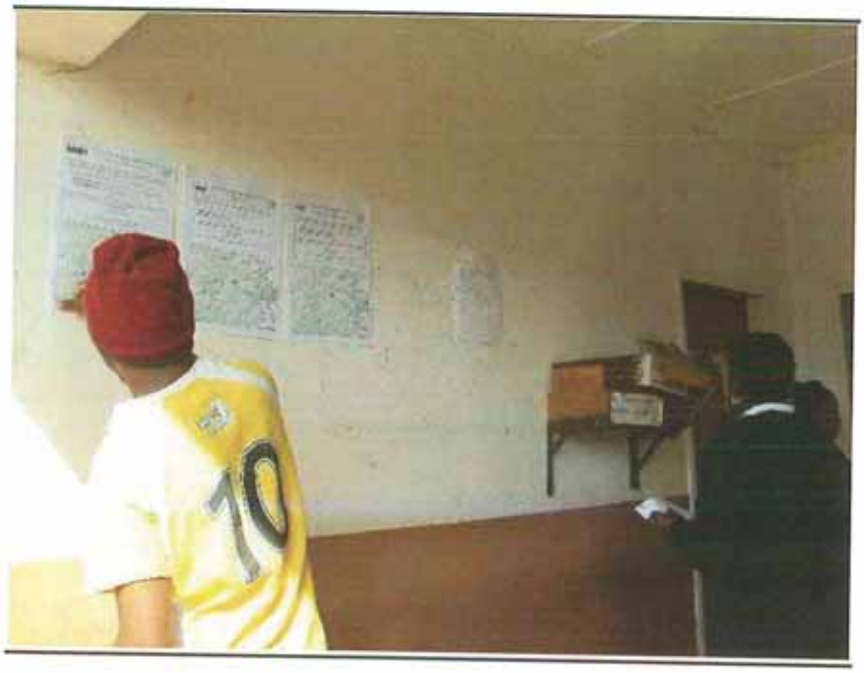


Photo 4 *Site Notice Placement - Dirkiesdorp Ngema Shop*

Photo 5 *Site Notice Placement - Driefontein Corner Shop*

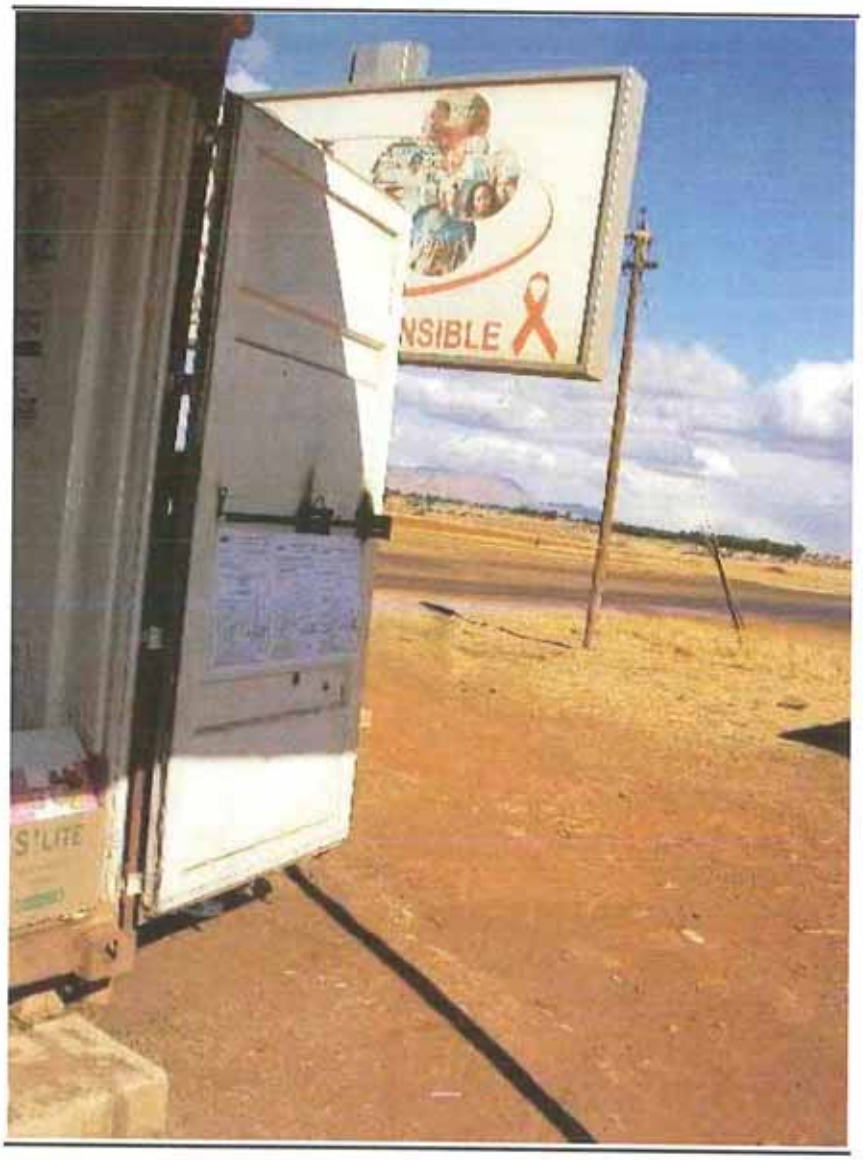


Photo 6 *Site Notice Placement - Driefontein Motor Spares*

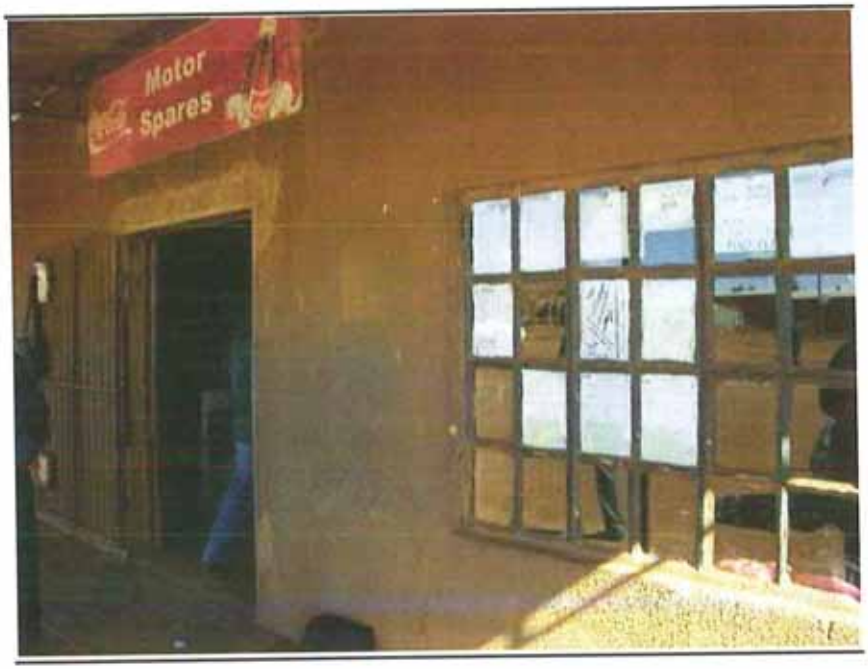


Photo 7 *Site Notice Placement - Driefontein Thusong Centre*

Photo 8 *Flyer Distribution at Thuthukani*

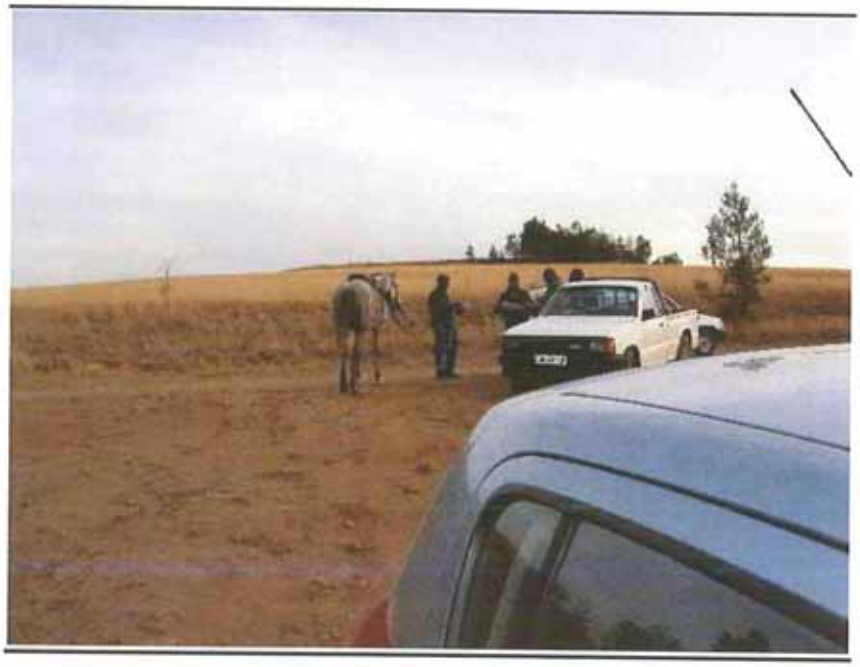


Photo 9 *Kanluka Chairperson Receiving Public Participation Materials*

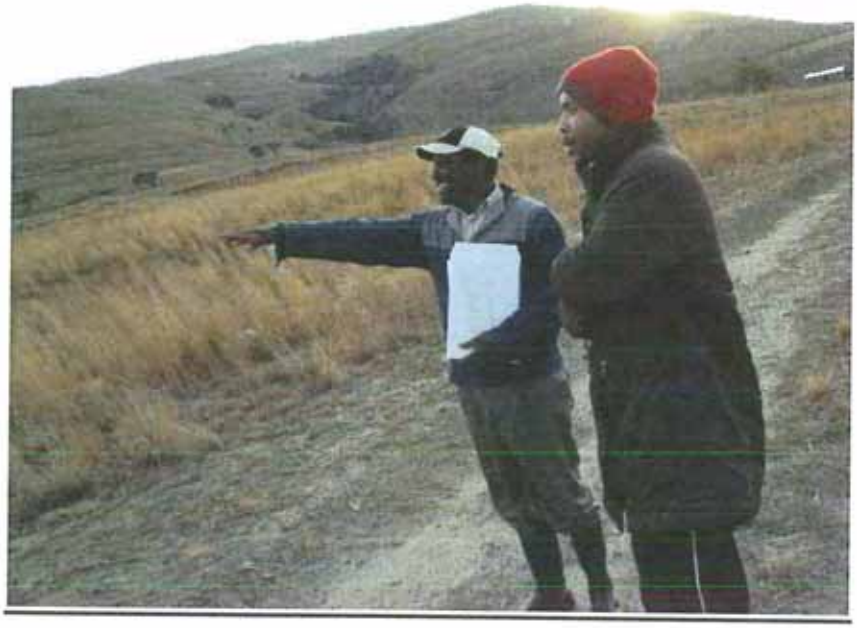


Photo 10 *Dropping of Material at Birdlife*

Photo 11 *Site Notice Placement - Mkhondo Municipality*

Photo 12 *Site Notice Placement - Piet Retief Library*

Photo 13 *Site Notice Placement - Piet Retief Library 2*

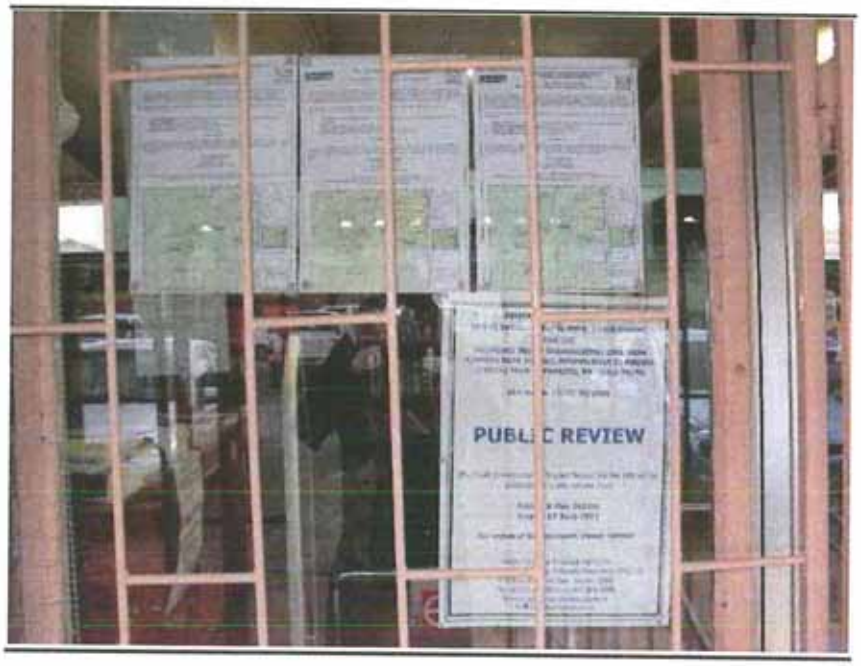


Photo 14 *Site Notice Placement - Piet Retief Post Office*

Photo 15 *Site Notice Placement - Dr Pixley Kalsaka Seme Local Municipality 1*

Photo 16 *Site Notice Placement - Dr Pixley Ka Isaka Seme Local Municipality 2*

Photo 17 *Site Notice Placement - Twyfelhoek primary school*

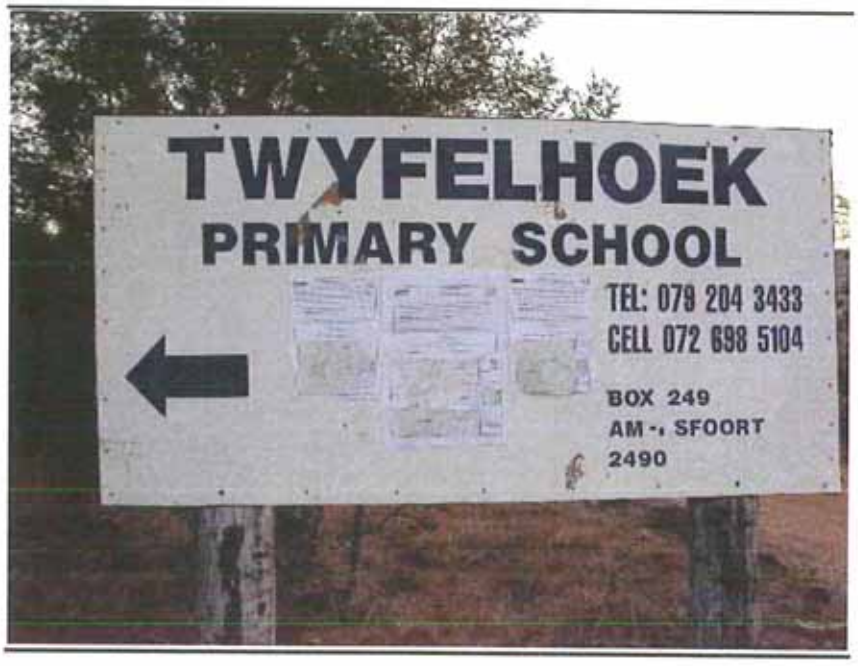


Photo 18 *Site Notice Placement - Volksrust Library 1*

Photo 19 *Background Information Document - Volksrust Library 2*

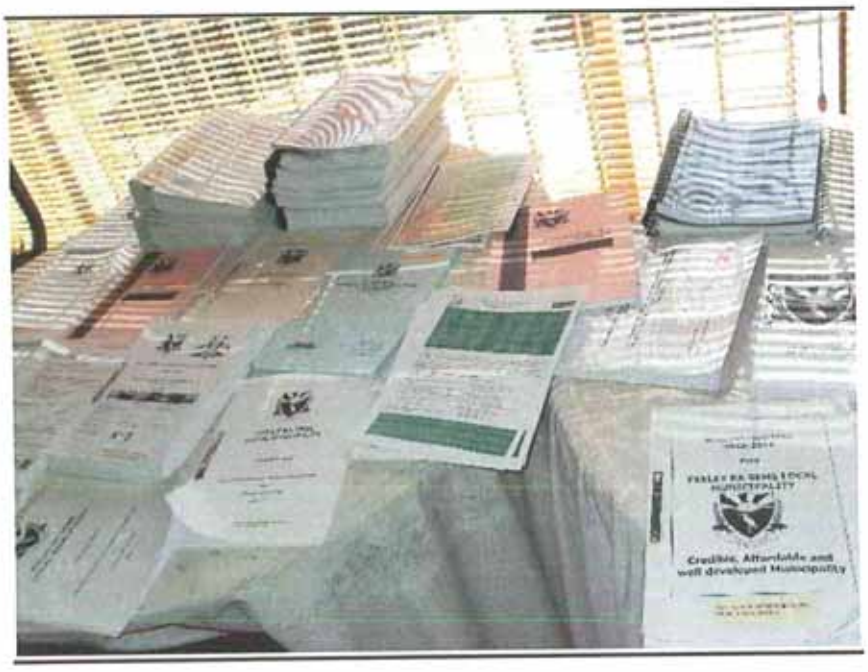


Photo 20 *Site Notice Placement - Volksrust Post Office*

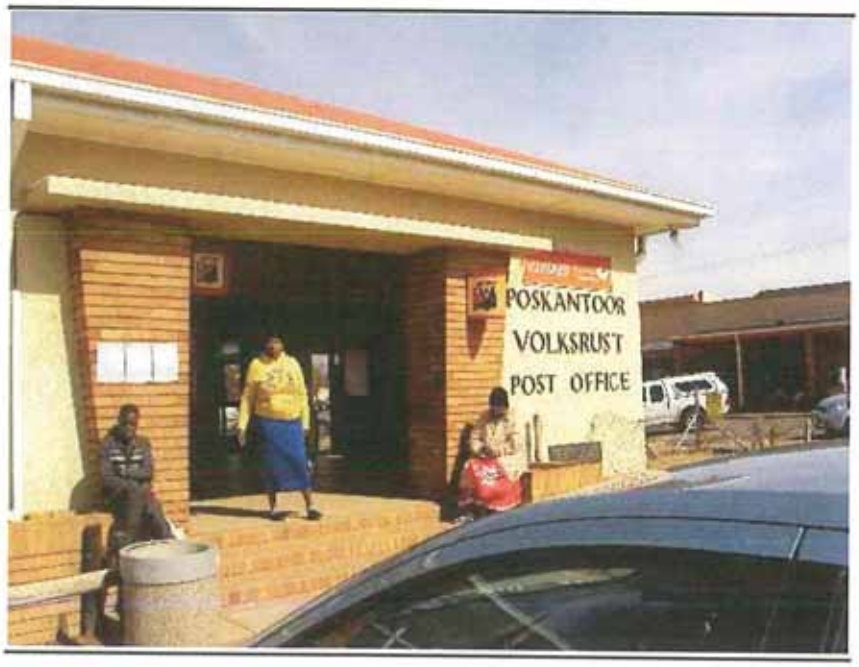


Photo 21 *Site Notice Placement - Volksrust Post Office 2*

Photo 22 *Site Notice - Wakkerstroom Library*

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT, MINING RIGHTS APPLICATION, INTEGRATED WATER USE LICENSE AND WASTE APPLICATION

Proposed Kangra Coal Kusipongo Expansion Project

Kangra Coal (Pty) Ltd. is considering expanding their coal mining operations at the Savmore Colliery, to include the Kusipongo coal resource situated between the Mkhondo and Dr Pixley Kalsaka Seme Municipalities in Mpumalanga. The site of the proposed expansion is situated approximately 15km west of Driefontein near Piet Retief. The proposed activity involves the development of an underground mine, thereby extending their existing Maquasa East and West mining activities.

In accordance with the relevant environmental regulations, the Environmental Impact Assessment requires the following authorisations/licenses prior to commencement:

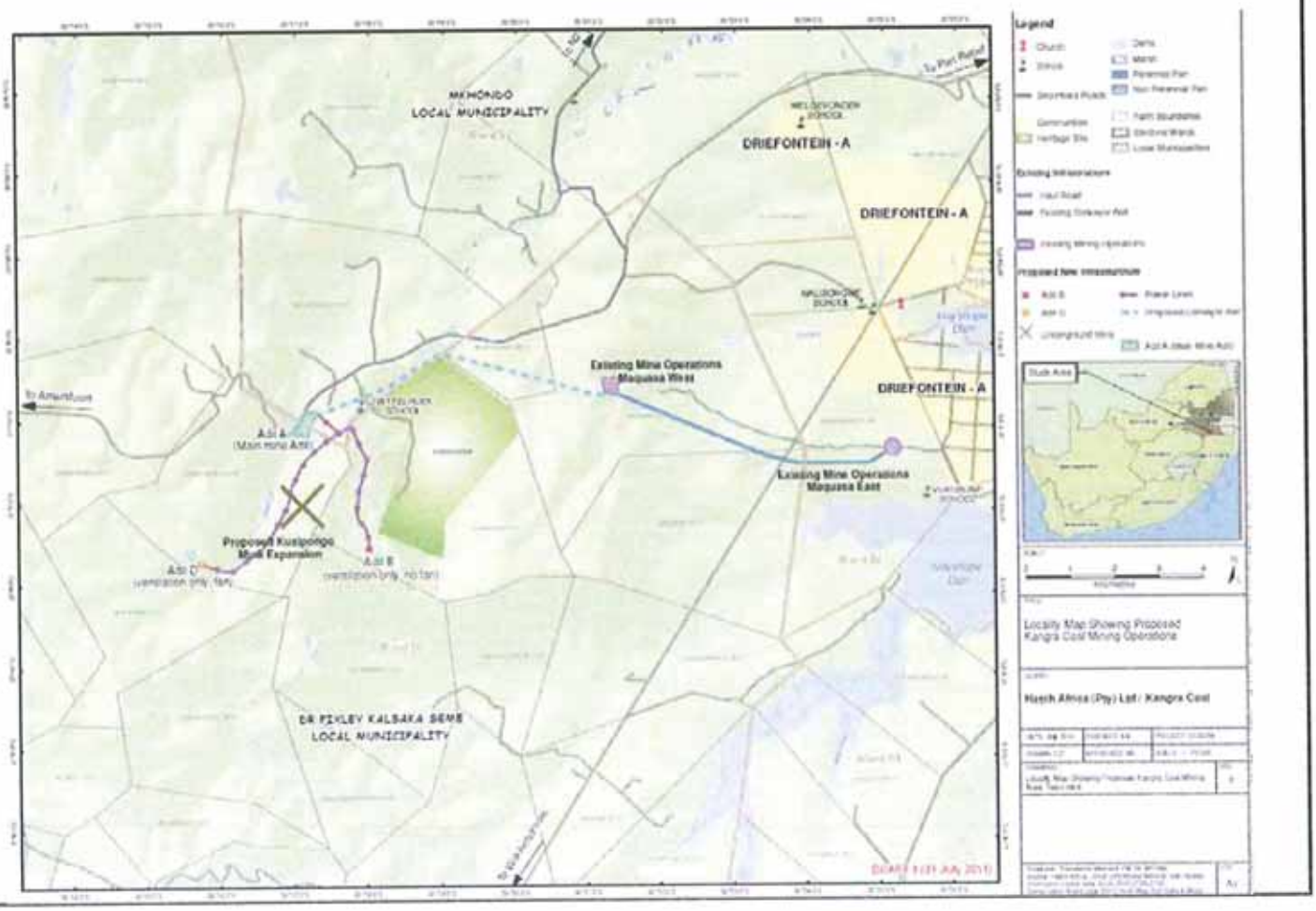
- **Environmental Authorisation** from the Mpumalanga Department of Economic Development, Tourism and Environment
- **Water Use License** from the Department of Water Affairs
- **Mining Right Application** from the Department of Mineral Resources
- **Waste Management License** from the Department of Environmental Affairs

Become Involved

Environmental Resources Management Southern Africa (Pty) Ltd (ERM) is the independent environmental consultant coordinating the authorisation and licensing processes listed above. To register as an Interested & Affected Party, to receive further information on the project and to participate in the process please submit your details to the contact person given below.

Nomsa Fulbrook-Bhembe
011 798 4300 (Tel);
011 804 2899 (Fax); or
Nomsa.fulbrook-bhembe@erm.com

To ensure you are fully informed and receive all necessary information please register by contacting Nomsa Fulbrook-Bhembe of ERM by 26 August 2011. The (EIA) Scoping Phase will begin thereafter.



KENNISGEWING VAN OMGEWINGSIMPAKSTUDIE, AANSOEK OM MYNBOUREGTE EN GEÏNTEGREERDE AANSOEK OM WATERGEBRUIK-EN AFVALBESTUURLISENSIE

Voorgenome Kangra Coal Kusipongo Uitbreidingsprojek

Kangra Coal (Edms) Bpk oorweeg dit om hulle steenkoolmynboubedrywighede by die Savmore Steenkoolmyn uit te brei om die Kusipongo steenkoolbron in te sluit. Die terrein van die voorgenome uitbreiding is ongeveer 15km wes van Driefontein naby Piet Retief geleë (in Mkhondo en Dr Pixley Kalsaka Seme Munisipaliteit, Mpumalanga). Die voorgenome aktiwiteit behels die ontwikkeling van 'n ondergrondse myn, waardeur hulle bestaande Maquasa-Oos en -Wes mynboubedrywighede uitgebrei sal word.

Ingevolge die relevante omgewingsregulasies, vereis die Omgewingsimpakstudie die volgende magtigings/lisensies alvorens 'n aanvang geneem word:

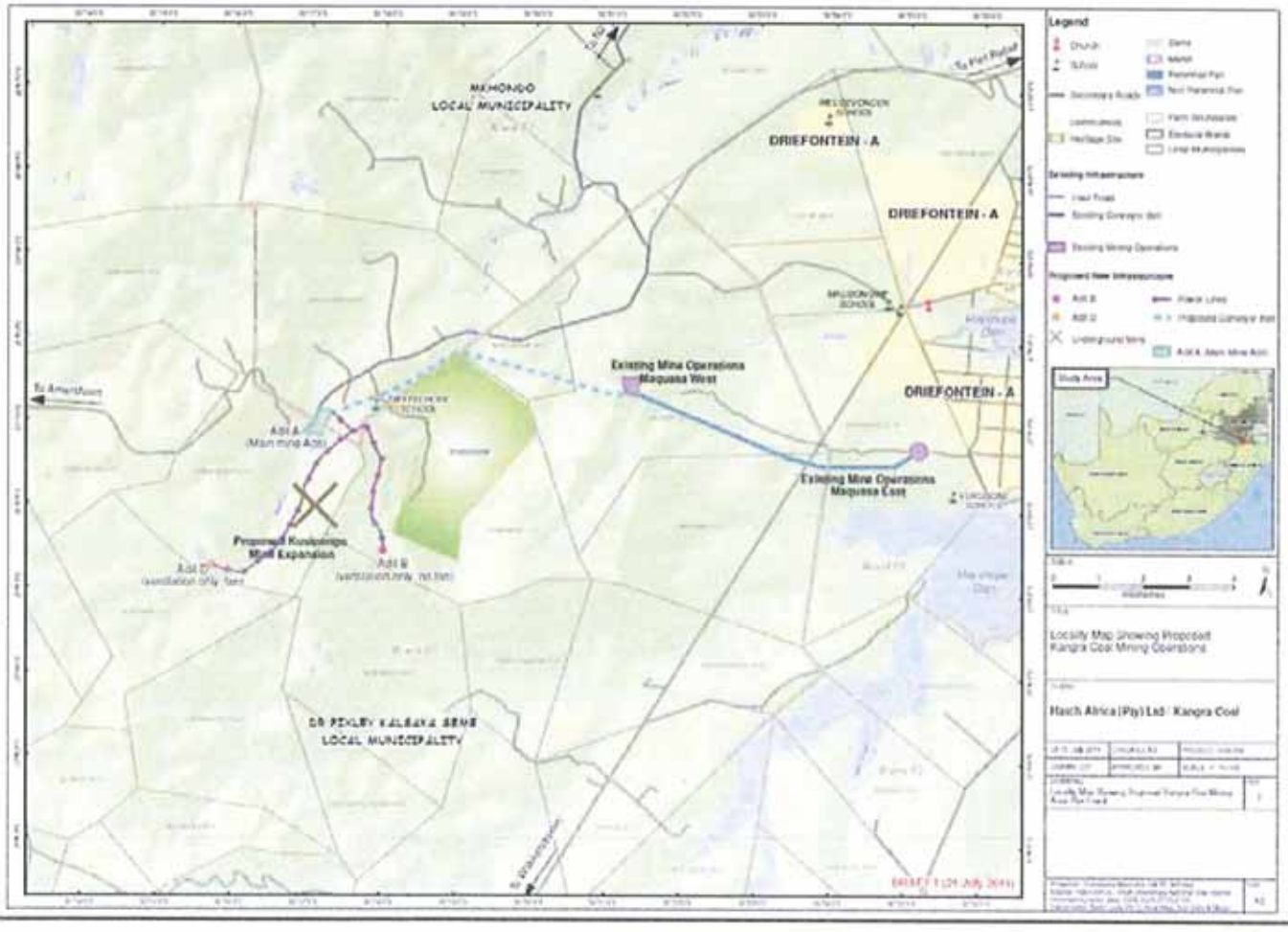
- **Omgewingsmagtiging** van die Mpumalanga Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing
- **Watergebruiklisensie** van die Departement van Waterwese
- **Aansoek om mynbouregte** van die Departement van Minerale Hulpbronne
- **Afvalbestuurlisensie** van die Departement van Omgewingsake

Raak betrokke

Environmental Resources Management Suider-Afrika (Edms) Bpk (ERM) is die onafhanklike omgewingskonsultant wat die lisensiëringsprosesse hierbo gelys, koördineer. Om as 'n Geïnteresseerde & Geaffekteerde Party te registreer en om verdere inligting aangaande die projek te ontvang en aan die proses deel te neem, dien asseblief u besonderhede by die onderstaande kontakpersoon in.

Nomsa Fulbrook-Bhembe
011 798 4300 (Tel);
011 804 2899 (Faks); of
Nomsa.fulbrook-bhembe@erm.com

Om te verseker dat u ten volle ingelig word en alle nodige inligting ontvang, registreer asseblief deur Nomsa Fulbrook-Bhembe van ERM teen 26 Augustus 2011 te kontak. Die omgewingsimpakstudie (bestekfase) sal kort daarna begin.



ISAZISO SOKUHLOLWA KOKUTHINTEKA KWEMVELO, ISICELO SAMALUNGELO WE-MAYINI, ILAYISENSI EHLANGANISIWE YOKUSETSHENZISWA KWAMANZI KANYE NESICELO SOKUNGCOLA

Ukusikiselwa Kokukhuliswa
Kwephrojekthi ye-Kangra Coal Kusipongo Expansion Project

Kangra Coal (Pty) Ltd. icabangela ukukhulisa umsebenzi wayo wemayini yamalahle e-Savmore Colliery, Mkhondo Nomasipala be-Dr Pixley Kalsaka Seme, e-Mpumalanga Ukuze ihlanganise nengcebo yamalahle e-Kusipongo. Isizinda sokukhuliswa okusikiselwayo sitholakala entshonalanga ye-Driefontein eqhele ngebanga elicishe libe amakhilomitha angu-15 eduze nase-Piet Retief. Lomsebenzi osikiselwayo uhlanganisa ukuqaliswa kwemayini yangaphansi komhlaba, ngokwenza kanjalo bandisa imisebenzi yabo ekhona kakade Empumalanga Nasentshonalanga ye-Maquasa.

Ngokuvumelana nemithetho eqondene nemvelo, Nokuhlolwa Kokuthinteka Kwemvelo kudinga imvume/namalayisensi ngaphambi kokuqaliswa:

- **Imvume Yendawo** Kusukela Emnyango wase-Mpumalanga Wokuthuthukiswa Kwezomnotho, Ezokuvakasha kanye Nemvelo
- **Ilayisensi Yokusetshenziswa Kwamanzi** Kusukela Emnyango Wezamanzi
- **Isicelo Selungelo Lemayini** Kusukela Emnyango Wezokwembiwa Phansi
- **Ilayisensi Yokukhuculula Ukungcola** Umnyango Wezemvelo

Yiba Nesandla

Environmental Resources Management (Pty) Ltd (ERM) umxhumanisi ozimele oqondanisa izinqubo zokubhalisa eziboniswe ngenhla. Ukuze ubhalise Njengeqembu Elinesithakazelo futhi Elithintekayo, futhi ukuze ukwazi ukuthola ukwaziswa ngephrojekthi futhi ube yingxenye yenqubo, sicela uthumele imininingwane yakho kumuntu wezokuxhumana ochazwe ngezansi.

Nomsa Fulbrook-Bhembe
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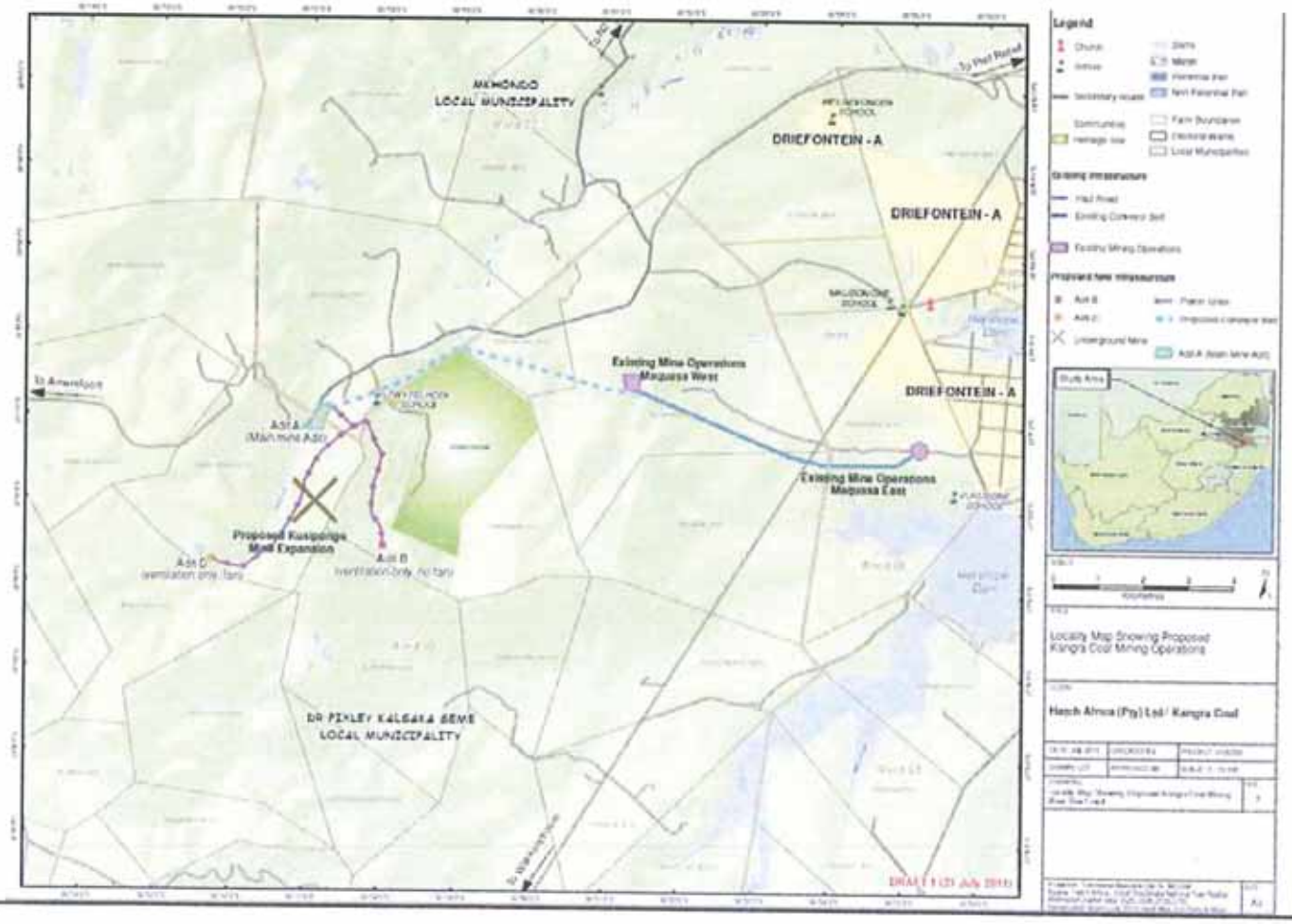
011 804 2899 (Fax); noma
Nomsa.fulbrook-bhembe@erm.com

Ukuqinisekisa ukuthi waziswa ngokugcwele nokuthi uthola konke ukwaziswa sicela ubhalise ngokuthi uxhumane no-Nomsa Fulbrook-Bhembe we-ERM ngaphambi kwezi-26 August 2011. Isigaba Sendima sizobe sesilandela.



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Postal Address:
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Johannesburg
South Africa

28 July 2011

Dear Sir/Madam

Re: Invitation to Register to Become Involved in Public Participation Process Associated with the Proposed Kangra Coal Kusipongo Expansion Project

The Project and Process

Kangra Coal is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Kalsaka Seme Local Municipalities in Mpumalanga. This proposed project involves the construction of an underground mine situated westwards of their existing operations at the Savmore Colliery, approximately 15 km west of Driefontein, near Piet Retief in Mpumalanga.

You have been identified as key stakeholder, and as such are invited to become involved in the process.

Environmental Authorisation and Licensing Processes

In accordance with the relevant environmental regulations, the proposed expansion requires the following authorisations/licenses prior to commencement:

- **Environmental Authorisation** from Mpumalanga Department of Economic Development, Tourism and Environment
- **Water Use License** from the Department of Water Affairs
- **Mining Right Application** from the Department of Mineral Resources
- **Waste Management License** from the Department of Environmental Affairs

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) is the independent environmental consultant coordinating the environmental authorisation process and associated licensing processes mentioned above.

Registered Company address:
Environmental Resources Management
Southern Africa (Pty) Ltd
Building 32, 1st Floor,
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148

Company registration number
2003/001404/07

Public Participation Process

As part of the processes listed above, ERM is required to engage with key stakeholders, inform them of the proposed project, involve them in the impact assessment and address any comments they may submit.

Prior to initiating the first phase of the Environmental Impact Assessment (EIA), ERM wants to offer stakeholders the opportunity to register as interested and affected parties (RI&AP) and to learn some background information on the proposed project. Please find a background information document attached which provides an overview of the proposed development and detail on the upcoming EIA process. To receive further information on the project, and to participate in the process, please register by submitting your details to the official contact person for the project Nomsa Fulbrook-Bhembe at:

- **Tel:** 011 798 4300;
- **Fax:** 011 804 2899;
- **Email:** Nomsa.Fulbrook-Bhembe@erm.com; or
- **Postal**: Postnet Suite 624, Private Bag X29, Gallo Manor 2052

After this initial registration phase has been completed, the first phase of the EIA will begin where a draft Scoping Report will be put into the public domain for your consideration and comment. We will put an advertisement into the Excelsior, Vuka Pixley Ka Seme, Mkhondo News and Recorder newspapers and will also send you correspondence directly to notify you of this.

We look forward to your involvement in the process. Please do not hesitate to contact Nomsa should you have any questions or concerns.

Kind Regards

Andries Venter (ERM Project Manager)

Environmental Resources Management
Johannesburg-kantoor
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Posadres:
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Privaatsak X29
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Johannesburg
Suid-Afrika

29 Julie 2011

Geagte Mnr / Mev / Mej

Insake: Uitnodiging om te Registreer om Betrokke te raak in die Openbare Deelnameproses geassosieer met die Voorgenome Kangra Coal Kusipongo Uitbreidingsprojek

Die Projek en Proses

Kangra Coal (Edms) Bpk oorweeg dit om hulle steenkoolmynbou-bedrywighede by die Savmore Steenkoolmyn uit te brei om die Kusipongo steen-koolbron in te sluit. Die voorgenome projek behels die konstruksie van **'n ondergrondse myn, geleë ten weste van hulle** bestaande bedrywighede by die Savmore Steenkoolmyn, ongeveer 10km wes van Driefontein, naby Piet Retief in Mpumalanga (in al twee Mkhondo en Dr Pixley Kalsaka Seme Munisipaliteit).

U is geïdentifiseer as sleutelbelanghebbende, en word as sodanig genooi om by die proses betrokke te raak.

Omgewingsmagtiging en Lisensiëringsproses

Ingevolge die relevante omgewingsregulasies, vereis die voorgenome uitbreiding die volgende magtigings/lisensies alvorens **'n aanvang** geneem word:

- **Omgewingsmagtiging** van die Mpumalanga Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing
- **Watergebruiklisensie** van die Departement van Waterwese
- **Aansoek om mynbouregte** van die Departement van Minerale Hulpbronne
- **Afvalbestuurlisensie** van die Departement van Omgewingsake

Environmental Resources Management Suider-Afrika (Edms) Bpk (ERM) is die onafhanklike omgewingskonsultant wat die omgewings-**magtigingsproses en verwante lisensiëringsprosesse** hierbo genoem, koördineer.

Openbare Deelnameproses

As deel van die prosesse hierbo gelys, word dit van ERM vereis om met sleutelbelanghebbendes in gesprek te tree, hulle in te lig oor die voorgenome projek, hulle by die impakstudie te betrek en enige kommentaar wat hulle mag indien, aan te spreek.

Alvorens die eerste fase van die Omgewingsimpakstudie (OIS) geïnisieer word, wil ERM belanghebbendes die geleentheid gun om as geïnteresseerde en geaffekteerde partye (RG&GPe) te registreer en

Geregistreerde maatskappy-adres:
Environmental Resources Management
Suider-Afrika (Edms) Bpk
Gebou 32, 1ste Vloer
Woodlandsrylaan
Woodmead, 2148

Maatskappyregistrasienommer
2003/001404/07

Direkteure
Jeremy Soboil (Bestuur)
Dylan Campbell
Grant Bassingthwaighte
John Alexander (VK)
John Simonson (VK)

Kantore wêreldwyd

'n Lid van die Environmental Resources Management-groep

om meer agtergrond-inligting oor die voorgenome projek te bekom. Hierby aangeheg vind asseblief **'n agtergrond**-inligtingsdokument wat **'n oorsig bied van die voorgenome ontwikkeling en** besonderhede oor die komende OIS-proses. Registreer asseblief om verdere inligting oor die projek te bekom en om aan die proses deel te neem deur u besonderhede aan die amptelike kontakpersoon vir die projek, Nomsa Fulbrook-Bhembe, te voorsien by:

- **Tel**: 011 798 4300;
- **Faks**: 011 804 2899;
- **E-pos**: Nomsa-Fulbrook-Bhembe@erm.com; of
- **Posadres**: Postnet Suite 624, Privaatsak X29, Gallo Manor, 2052

Na die aanvanklike registrasiefase voltooi is, sal die eerste fase van die OIS begin, waartydens **'n Konsepbestekverslag aan die publiek** beskikbaar gestel sal word vir u oorweging en kommentaar. Ons sal **'n** advertensie in die Excelsior, Vuka Pixley Ka Seme, Mkhondo News and Recorder-koerante plaas en u per korrespondensie direk hieroor inlig.

Ons sien uit na u betrokkenheid by die proses. Moet asseblief nie huiwer om met Nomsa in verbinding te tree nie indien u enige vrae of besorgdheid het.

Vriendelike groete

Andries Venter (ERM Projekbestuurder)

Ukuphathwa
Kwencebo
Yezemvelo
Ilihovisi lase-Johannesburg
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www.erm.com

29 July 2011

Sawubona Nomzane/Nkosazana

Isi: Isimemo Sokubhalisela Ukuba Ingxenye Yenqubo Yokuba Nesandla Komphakathi Okuhlobene Nephrojekthi Esikiselwayo Yokukhuliswa kwe-Kangara Coal Kusipongo

Iphrojekthi kanye Nenqubo

I-Kangra Coal icabangela ukukhulisa umsebenzi wayo wemayini yamalahle e-Savmore Colliery ukuhlanganisa ingcebo yamalahle ase-Kusipongo. Iphrojekthi esikiselwe ihlanganiswa ukwakhiwa kwemayini yangaphansi komhlaba ezobe ingasentshonalanga kwemisebenzi yabo ekhona kakade e-Savmore Colliery, ecishe ibe ngamakhilomitha angu-15 ngasentshonalanga ye-Driefontein, eduze nase-Piet Retief e-Mpumalanga (Mkhondo Nomasipala be-Dr Pixley Kalsaka Seme).

Ubonakale njengobamba iqhaza ovelele, ngenxa yalokho uyamenywa ukuba ube nengxenye kwinqubo.

Ukugunyazwa kwezemvelo kanye Nezinqubo Zokulayisensa

Ngokuvumelana nemithetho eqondene nendawo, ukukhuliswa okusikiselwe kudinga imvume/amalayisensi alandelayo ngaphambi kokuqaliswa:

- **Ukugunyazwa Kwezemvelo** kusukela Emnyango Wase-Mpulanga Wokuthuthukiswa Kwezomnotho, Ezokuvakasha kanye Nezemvelo
- **Ilayisensi Yokusetshenziswa Kwamanzi** Kusukela Emnyango Wezamanzi
- **Isicelo Selungelo Lemayini** kusukela Emnyango Wezokwembiwa Phansi
- **Ilayisensi Yokukhuculula Ukungcola** kusukela Emnyango Wezemvelo

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) umxhumanisi ozimele oqondanisa inqubo yokugunyaza ezemvelo kanye nezinqubo ezihlobene nokulayisenswa ezichazwe ngenhla.

Inqubo Yokuba Nesandla Komphakathi

Njengengxenye yezinqubo ezichazwe ngenhla, i-ERM kumele izihlanganise nabaneqhaza abavelele, ibazise njephrojekthi esikiselwe, izihlanganise nokuhlola kokuthinteka futhi bethule noma yikuphi ukuphawula engase ikulethe.

Ikheli:
Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg
Iningizimu Afrika

Ikheli Elibhalisiwe Lenkampani:
Ukuphathwa Kwencebo
Yezemvelo
Ningizimu Afrika (Pty) Ltd
Isakhiwo 32, 1st Floor,
The Woodlands Office Park, Woodlands Drive
Woodmead, 2148

Inombolo Yokubhaliswa Kwenkampani
2003 001404 07

Abaqondisi
Jeremy Soboil (Umphathi)
Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Amahhovisi Emhlabeni Jikelele

Ilungu
Leqembu Lokuphathwa Kwencebo
Yezemvelo

Ngaphambi kokuqalisa isigaba sokuqala Sokuhlolwa Kokuthinteka Kwemvelo (EIA), i-ERM ifuna ukunikeza abeneqhaza elivelele ithuba lokubhalisa njengamalungu anesithakazelo futhi athintekayo (RI&AP), futhi nokufunda eminye imininingwane yangemuva kwiphrojekthi esikiselwe. Sicela uthole umqulu wemininingwane onamathiselwe onikeza uhlolojikelele lwentuthuko esikiselwe kanye nemininingwane kwinqubo ezayo ye-EIA. Ukuthola ukwaziswa okwengeziwe mayelana nephrojekthi, kanye nokuba nesandla kwinqubo, sicela ubhalise ngokuthumela imininingwane yakho kumuntu wokuthintana naye ofanele wephrojekthi ye-Fullbrook-Bhembe:

- **Tel:** 011 798 4300
- **Fax:** 011 804 2899
- **Imeyli:** Nomsa.Fulbrook-Bhembe@erm.com; noma
- **Ikheli:** Postnet Suite 624, Private Bag X12, Gallo Manor, 2052

Emva kokuba lesi sigaba esiqalayo sesiphelile, isigaba sokuqala se-EIA sizoqala lapho Umbiko Wendima ongaphelele ubekwa kwisizinda somphakathi ukuze usicabangele futhi uphawule. Sizofaka isikhangiso kumaphaphendaba e-Excelsior, i-Vuka Pixeley Ka Seme, i-Mkhondo News kanye ne-Recorder futhi sizokuthumela okwengeziwe ukuze sikwazise ngalokhu.

Sibheke phambili ekuzibandakanyeni kwakho kule nqubo. Sicela ungapholisi amaseko ukuxhumana no-Nomsa uma kwenzeka uba nanoma iyiphi imibuzo noma izikhalo.

Ozithobayo

Andries Venter (Umphathi Wephrojekthi ye-ERM)

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South Africa

15 December 2011

Dear Sir/Madam,

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED KANGRA COAL KUSIPONGO RESOURCE EXPANSION PROJECT NEAR DRIEFONTEIN, MPUMALANGA

Our sincere thanks to all those stakeholders who have provided comments and suggestions during the initial consultation phase in July and August 2011. This letter serves as an update of the Project progress and the anticipated activities going forward into year 2012. It was envisaged that the Draft Scoping Report (DSR) associated with the above mentioned application would be made available for public comment by the end of 2011; however, due to delays associated with various aspects of the engineering design, the DSR will only be available for public comment early in 2012.

Anticipated next steps

We anticipate that the DSR will be made available for public comment early in 2012 and stakeholders will be invited to attend a public meeting at this time where contents of the DSR will be discussed.

We appreciate your patience and look forward to your further participation in the EIA process. Should you have any questions, need more information or wish to provide comments, please contact Nomsa Fulbrook-Bhembe at:

- Tel: (011) 798 4300
- Fax: (011) 804 2899
- Email: Nomsa.fulbrookbhembe@erm.com

Kind Regards,

Dieter Rodewald
Project Manager

Registered Company address:
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Woodlands Drive
Woodmead, 2148

Company registration number
2003/001404/07

Directors
Jeremy Soboil (Managing)
Dylan Campbell
Grant Bassingthwaighte
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John Simonson (UK)

Offices worldwide

A member of the Environmental Resources Management Group

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South Africa

20 Desember 2011

Geagte Mnr/Mev/Mej,

OMGEWINGS IMPAK STUDIE VIR DIE VOORGESTELDE KANGRA COAL KUSIPONGO HULPBRON UITBREIDINGSPROJEK NABY DRIEFONTEIN, MPUMALANGA

Ons opregte dank aan al die belanghebbendes wat insette en voorstelle gelewer het tydens die oorspronklike konsultasiefase in Augustus 2011. Hierdie brief dien as terugvoer van die projek se vordering en die verwagte aktiwiteite wat volg in 2012. Dit was voorsien dat die konsep omvangsverslag (KOV) wat betrekking hou met die projek beskikbaar sou wees teen die einde van 2011, maar a.g.v. vertragings in verskeie ingenieursontwerpe, sal die KOV eers beskikbaar wees vir publieke kommentaar vroeg in 2012.

Verwagte volgende stappe

Ons verwag dat die KOV beskikbaar gemaak sal word vir publieke kommentaar vroeg in 2012 en dat belanghebbendes uitgenooi sal word om 'n publieke vergadering by te woon om die KOV inhoud te bespreek.

Ons waardeer u geduld en sien uit na u voortgesette deelname in die omgewings impak studie proses. Sou u enige vrae hê, benodig meer inligting of wou kommentaar lewer, skakel asseblief Nomsa Fulbrook-Bhembe by:

- Tel: (011) 798 4300
- Faks: (011) 804 2899
- E-pos: Nomsa.fulbrookbhembe@erm.com

Vriendelike Groete,

Dieter Rodewald
Projekbestuurder

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A member of the Environmental Resources Management Group

Annex B2

Stakeholder Database

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
Land Owners	Landowner - Private & Directly Affected	Mr	CJF	Greyling	Donkerhoek 14HT Ptns 3, 4Re, 7,8,9,10,11,12,21,22; Beelzebub 13HT 1Re, 3,4,6,Re; Boschbank 11HT Ptn 2; Blinkwater 34HT, Ptn 1, 2 and Re; De Paarl Ptn 3 and Re	Private landowner
		Mr		Nkumane	Yende CPA (previously called Thutukani)	Yende Community: Donkerhoek 14HT Ptn 6; Twyfelhoek 379 HT Ptn 2, 3 and 5, Twyfelhoek 379 HT Ptn 1 and Re
		Mr	Jabulani	Nhleko	Owner of Kransbank 15 HT (Portion 2 and possibly Re): Chairperson of CPA and Donkerhoek Community Contact	Member of Kanluka Communal Property Association: Kransbank 15HT Ptn 1,2 and Re
	Other landowners - part of CPAs or Donkerhoek Community - affected	Mr		Tshepo	Owner of Kransbank 15 HT (Portion 2 and possibly Re)	Member of Kanluka Communal Property Association
		Mr	Richard	Hlatsbuayo	Owner of Kransbank 15 HT (Portion 2 and possibly Re)	Member of Kanluka Communal Property Association
		Mr	Themba	Maisela	Owner of Kransbank 15 HT (Portion 2 and possibly Re)	Member of Kanluka Communal Property Association
		Mr	Sphiwe	Senyivango	Owner of Kransbank 15 HT (Portion 2 and possibly Re)	Member of Kanluka Communal Property Association
		Mr	Solomon	Dhlongolo	Owner of Kransbank 15 HT (Portion 2 and possibly Re)	Member of Kanluka Communal Property Association
			Simon			Member of Kanluka Communal Property Association
			Moses	Masando		Member of Kanluka Communal Property Association
			Petros	Dlodlo		Member of Kanluka Communal Property Association
			Andile	Nkosi		
			Gabsile	Nkosi		
			Thutani	Nkosi		
			Ernest	Nkumane		Member of the Yende Communal Property Association
			Jabukeni			Member of Kanluka Communal Property Association
			Moses	Maku		Donkerhoek Community
			Bongani	Mbuyisa		Donkerhoek Community
			Melusi	Yende		Member of the Yende Communal Property Association
			Nele	Yende		Member of the Yende Communal Property Association
			Manzini	Kubheka		Member of Kanluka Communal Property Association

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Tabulani	Nzi		Member of Kanluka Communal Property Association
			Willie	Zulu		Member of Kanluka Communal Property Association
			David	Yende		Member of the Yende Communal Property Association
			Johannes	Mbuyisa		Donkerhoek Community
			Mxasheni	Nkosi		Member of the Yende Communal Property Association
			Fanyana	Simelane		Member of the Yende Communal Property Association
			Richard	Hlatshwayo		Member of Kanluka Communal Property Association
		Mr		Bhekuyise		Thutukani
		Mr		Mgebisa		Member of Kanluka Communal Property Association
			Sollomon			Member of Kanluka Communal Property Association
		Mr	Bednock			Member of the Yende Communal Property Association
			Albert			Member of the Yende Communal Property Association
		Mr		Mhongiseni		Member of the Yende Communal Property Association
		Mr		Mfunfikile		Member of the Yende Communal Property Association
		Mr		Senzo		Member of the Yende Communal Property Association
			Jeremia			Member of the Yende Communal Property Association
			Petros	Phlatshwayo		
			Vusi			
				Lunga		
			J	Mnstahli		
			Kwosi	Msila		
			Sthembile	Nkumane		
			Winnie	Hlatshwayo		
			Ntombenina	Yende		
			Deste	Simbiya		
			Girly	Masonda		
			Dudu	Sibiya		
			Nomthimba	Masonda		
			Gabsile	Nkosi		
			Jabulile	Ngwenya		
			Nelly	Nkambule		
			Sebenzile	Kunile		
			Lori	Duiker		Twyfelhoek
			L	Mafinga		
			T	Nhosi		
			B	Dladla		
			Juliya	Masondo		

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr	Johan	Potgieter	Yende Farmers Trust	Mentor
			Jacob	Yende	Donkerhoek CPA	CPA
	Neighbouring CPAs - chairpeople	Mr	Jackson Butiza	Soxo	Siyasebenze CPA - chairperson	Siyasebenze CPA
			Ntombifuthi	Mamba	Hlanganani CPA - chairperson	Hlanganani CPA
		Mr	Robert	Mnisi	Bombanani CPA - chairperson	Bombanani CPA
		Mr	Enoch	Khumalo	Zamakuhle uHlelo CPA - chairperson	Zamakuhle uHlelo CPA
		Mr	Willem	Linda	Thutukani CPA- Chairperson	Head of Thuthukani Communal Property Association
	Neighbouring CPAs - members		NR	Mnisi		
		Mr		Sibiya	Thtukani CPA	Member of Thuthukani community: Twyfelhoek 379 HT, Ptn 1 and Re
		Mr		Mthokozeni	Owner of Prospect 1	Representative of Prospect 2 Communal Property Association
		Mr		Nhlabathi		
			Manqoba	Zulu		
			SP	Mnisi		
			MD	Nkosi		
			Rorence	Mahlangu	Prospect	
			S. E.	Ndaba	Prospect	
			E.	Zulu	Willbankplas	
			V	Masonda	Prospect 2	
			S.	Zulu	Prospect 2	
			Matheu		Prospect 2	
			D.A	Ngwenya	Willbankplas	
			S.J.	Nkosi	Witbank	
			Z.S	Zulu	Witbank	
			S.S	Zungu	Propsect 1	
			J	Ndlovu	Witbank	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Jackson Butiza		Prospect 2	
			Musa		Prospect 2	
			Nathi		Prospect 2	
			Maria		Prospect 1	
			Sombu		Witbank	
			Nomusa		Witbank	
			Elinah		Witbank	
			Kelinan		Witbank	
			Dorah		Witbank	
			S	Xulu	Prospect	
			Mthokozeni		Prospect 2	
			Nominisi		Propsect 1	
			Thabi		Prospect 1	
			Sizwe		Prospect 1	
			Nokthula		Prospect 1	
			Maria		Witbank	
			Gcibelo		Witbank	
			Elizabeth		Witbank	
			Maria		Witbank	
			Zanele		Witbank	
			Sabelo		Witbank	
		Mr	Nkosinathi		Owner of Prospect 2	Representative of Prospect 1 Communal Property Association
	Neighbouring landowners and downstream water users	Mr	Rudi	Kemp	Donkerhoek 10HT Ptn 3, Twyfelhoek 379 HT, Ptn 4	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr	Pine	Pienaar	Roodepoort 38HT Ptn 1 and Re	
		Ms	Lynette	Wessels	Oogiesfontein 17HT Ptn 1	
		Mr	Jacob	Durr	Representing Ms Wessels	
		Mr	Janie	Du Plessis	Oogiesfontein 17HT Re; Langverwacht 20HT, Ptn 1, 2,3	
				Ukuchuma Farming Pty Ltd	Owner of Donkerhoek HT 14 (portion 4 and 9)	Private land owner
		Mr	Bruce	Trebble	RI&AP	Member of the Public
			Johan	Potgieter		
			Heinz	Weber	Bodenstadt Boerdery	
			Karl	Weber	Bodenstadt	
			Gudrun	Loubser	Mlchondo Concered Resident	
			Werner	Weber	Bodenstadt Boerdery	
		Mr	Johan	Viviers	Mpact	
			Virashini	Naidoo	Mpact	
			Richard	Wass	Mpact	
			Sivi	Govender	Mpact	
		Mr	Peter	Willson	NTE Company	
			Johan	Weber	Moolman BV	
	Communities living on affected communal land		Janet	Mavuso	Daggakraal CHC	Acting M.O.
		Mr	John	Khumalo	Community Representative	Yende Community
			Bangani	Mabaso		
			MR	Hlatshumanye		Ekaluka
			Beki	Makhombothi		Donkershoek
			Bhednock	Dlomlemze		Twyfelhoek
			Bongane	Mbuyisa		Donkershoek
			Matt	Nel		
			Dhlongolo	Ekalak		
			B	Mafso		Twyfelhoek
		Mr	Sirrman	Umahlinza	Council	Rooikop Community - Councillor

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr		Ngovolo	Rooikop Committee	Rooikop Community - Rooikop committee member
		Mr		Unonguloza	Community Member	Rooikop Community
		Mr	Hohn	Woesas	Community Member	Rooikop Community
		Mr		Mgugulu	Community Member	Rooikop Community
		Mr	George	Motha	Community Member	Rooikop Community
		Mr		Stinkolo	Community Member	Rooikop Community
		Mr	Muzi	Mthethwa	Community Member	Rooikop Community
		Mr	Isaiah	Mabele Mayesela	Community Member	Rooikop Community
		Mr		Diank	Community Member	Rooikop Community
		Mr	John	Foster	Community Member	Rooikop Community
		Mr		Skieper	Community Member	Rooikop Community
		Mr	Greydon	Payne	Community Member	Rooikop Community
		Mr		Chirigo	Community Member	Rooikop Community
		Mr	John	Khumalo	Community Representative	Yende Community

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
Local Government	Dr Pixley Kalsaka Seme Local Municipality - Administrative	Mr	Sipho	Mkhatshwa	Dr Pixley Kalsaka Seme	Local Economic Development Manager - Dr Pixley Kalsaka Seme municipality
		Cllr	Vincent	Malatsi	Dept of Co-operative Governance and Traditional Affairs	Dept of Co-operative Governance and Traditional Affairs
		Mr	Dan	Hlanyane	Dr Pixley Kalsaka Seme	Environmental Manager
		Mrs	Zonke	Siwundne	Dr Pixley Kalsaka Seme	Director: Technical
			PB	Malebje	Dr Pixley Kalsaka Seme	Municipal Manager
		Mr	Sibusiso	Mabaso	Dr Pixley Kalsaka Seme	Water/Waste Manager
	Dr Pixley Kalsaka Seme Local Municipality - Political	Mrs	Phagamile		Dr Pixley Kalsaka Seme	Secretary to the Officer of the Speaker
		Mr	Sipho	Shabalala	Dr Pixley Kalsaka Seme	Manager in the Officer of the Speaker - Dr Pixley Kalsaka Seme municipality
		Cllr	ZH	Luhlanga	Dr Pixley Kalsaka Seme	Executive Speaker - Dr Pixley Kalsaka Seme municipality
		Cllr	Fanyana	Mazibuko	Dr Pixley Kalsaka Seme	Ward Councillor 6 - Dr Pixley Kalsaka Seme municipality
		Cllr		Mndebele	Dr Pixley Kalsaka Seme	Ward Councillor 5 - Dr Pixley Kalsaka Seme municipality
			WJM	Mngomezulu	Dr Pixley Kalsaka Seme	Unit Manager
		Cllr	S	Motha	Dr Pixley Kalsaka Seme	Ward Councillor 10 - Dr Pixley Kalsaka Seme municipality
	Mkhondo Local Municipality - Administrative	Mr	Wendy	Mahlangu	Mkhondo local municipality	Local Economic Development Manager - Mkhondo municipality
			Vusiwe	Dube	Mkhondo local municipality	Environmental Manager
			Absolum (AN)	Mahlangu	Mkhondo local municipality	MM
		Mr	Mthembeni	Jele	Mkhondo local municipality	Water/Waste Manager
			T.D	Mabya	Mkhondo local municipality	CFO
		Mr	Steven	Cindi	Mkhondo local municipality	Health and Safty
	Mkhondo Local Municipality - Political	Mrs	Pamela	Vilakazi	Mkhondo local municipality	Secretary to the Officer of the Speaker
			P.C	Langa	Mkhondo local municipality	Speaker

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Cllr	BH	Mtshali	Mkhondo local municipality	Executive Mayor - Mkhondo municipality
		Clr	JM	Phakati	Mkhondo local municipality	
		Clr	LVA	Mkhwanazi	Mkhondo local municipality	Ward Councillor for Ward 11
		Clr		Ngelosi	Mkhondo local municipality	
		Clr	ME	Phakati	Mkhondo local municipality	
		Clr	S.N	Kambule	Mkhondo local municipality	Ward Councillor - Ward 5
		Clr	T.E.	Khumalo	Mkhondo local municipality	
		Clr	CG	Mtshali	Mkhondo local municipality	
		Clr	MO	Nkosi	Mkhondo local municipality	Councillor = Ward 17
		Cllr	Sibongile	Mathacha	Mkhondo local municipality	Representative of 3 - Mkhondo municipality
		Clr	PS	Nhlabathi	Mkhondo local municipality	Ward 6
		Cllr	Lesia	Nhlenyetiwa	Mkhondo local municipality	Ward Councillor 3 - Mkhondo municipality
		Clr	SR	Sangweni	Mkhondo local municipality	Ward 12
		Clr	ZJ	Minsi	Mkhondo local municipality	Ward 14
		Cllr		Sibanyoni	Mkhondo local municipality	Ward Councillor 4 - Mkhondo municipality
		Clr	SP	Kunene	Mkhondo local municipality	Ward 8
		Cllr	Khanyisile	Masondo	Mkhondo local municipality	Ward Councillor 15 - Mkhondo municipality
		Clr	MD	Ntuli	Mkhondo local municipality	
		Mr	Ngelosi	Ndhlovu	Mkhondo local municipality	Member of Municipal Council - Mkhondo municipality
			VD	Nkosi	Mkhondo local municipality	Member of Municipal Council - Mkhondo municipality
		Cllr	AT	Thwala	Mkhondo local municipality	Ward Councillor 1 - Mkhondo municipality
		Clr	SS	Matlebula	Mkhondo local municipality	
		Cllr		Nkosi	Mkhondo local municipality	Ward Councillor 2 - Mkhondo municipality
		Cllr		Yende	Mkhondo local municipality	Ward Councillor 18 - Mkhondo municipality
			Irene	Brussouw	Mkhondo local municipality	Ward Coucillor (7 Piet Retief)
			B.	Myeni	Mkhondo local municipality	Ward Committee Driefonteing

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Cllr	B.J.	Vilakazi	Mkhondo local municipality	PR Councillor 1 Driefonteing
			Lerato	Molopo		Mkhondo Municipality
			Angel	Dlomo		Mkhondo Municipality
			T.S	Mkosi		Mkhondo Ward 2 CLLR
			L	Mhlengethwa	Mkhondo local municipality	
		Clr		Semtshali	Mkhondo local municipality	
		Clr	Rob	Wildon	Mkhondo local municipality	
		Clr	VW	Masuku	Mkhondo local municipality	
		Clr	BT	Mabuzo	Mkhondo local municipality	
		Clr	Jabu	Methula	Mkhondo local municipality	
		Clr	T.G.	Nhleko	Mkhondo local municipality	
		Clr	DM	Thwala	Mkhondo local municipality	
			M L	Yende		Ward 18 CLLR
			SV	Nkainde		Mkhono Municipality
	Gert Sibande District Municipality - Administrative	Mr	Md	Mahlalela	Gert Sibande District Municipality	Director of Rural Development
		Mr	George	Xaba	Gert Sibande District Municipality	Director - Gert Sibande District Dept. Agriculture
		Ms		Fengwayo	Gert Sibande District Municipality	Senior Manager Dept. Public Works Roads and Transport
		Mr	Lucky	Dube	Gert Sibande District Municipality	Manager in the Gert Sibande District Dept
		Mr	Patrick	Khumalo	Gert Sibande District Municipality	Regional Director Gert Sibande Region
		Mr	CA	Habile	Gert Sibande District Municipality	Municipal Manager
		Mr	Wisdom	Mpofu	Gert Sibande District Municipality	IDP Manager
			P	Magagula	Gert Sibande District Municipality	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			F	Nyembe	Gert Sibande District Municipality	
Provincial Government	Mpumalanga Provincial Government	Mr	Hannes	Marais	Mpumalanga Tourism and Parks Agency	Wetland Scientist
		Mr	Simon	Shoba	Mpumalanga Tourism and Parks Agency	
			Francois	Krige	Mpumalanga Tourism and Parks Agency	EIA Scientist LUA Unit SS
		Mr	Louis	Botha	Mkhondo Environmental Protection Agency	Chairperson
			ST	Marebane	Mpumalanga Department of Economic, Development, Tourism and Environment	
		Mr	Mervyn	Lotter	Mpumalanga Tourism and Parks Agency South Africa	Acting Manager: Biodiversity Planning
					Mpumalanga Department of Labour	
		Mr	Vusanani	Dlamini	Mpumalanga Department of Economic, Development, Tourism and Environment	Head of Department
		Dr	Garth	Bachelor	Mpumalanga Department of Economic, Development, Tourism and Environment	Director of environmental impact assessment
		Mr	M	Mnisi	Mpumalanga Dept. Co-operative Governance and Traditional Affairs	Head in the MEC's office
		Ms	Lungile	Setlogelo	Mpumalanga Dept. Human Settlements	Head of Departments Office
		Mr	Mathew	Mohlasedi	Mpumalanga Dept. Public Works, Roads and Transport	Head of Department: Public Works, Roads and Transport
		Ms	Nelisiwe	Sithole	Mpumalanga Dept. Agriculture, Rural Development and Land Administration	Head of Department

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr	Altus	Lotter	Mpumalanga Department of Economic, Development, Tourism and Environment	Compliance Monitoring
		Mr	Erick	Sambo	Mpumalanga Department of Economic, Development, Tourism and Environment	Waste management & pollution
		Mr	Gavin	Cowden	Mpumalanga Department of Economic, Development, Tourism and Environment	Coordination, policies and guidelines
		Mrs	Nocawe	Mthombothi	Mpumalanga Department of Economic, Development, Tourism and Environment	EIA, Compliance monitoring
		Mr	L	Shabane	Department of Agriculture	
		Ms	Glenda	Moloi	Department of Mineral Resources	Personal assistant to the minister
		Mrs	Lynette	Van Damme	South African Heritage Resources Agency (SAHRA)	Chief Executive Officer
		Mr	Benji	Moduka	South African Heritage Resources Agency (SAHRA)	
National Government	National Departments and Agencies	Mrs	Nchedi	Maphokga-Moripe	Department of Environmental Affairs	Head in the office of the ministry
		Mrs	Martha	Mokonyane	Department of Mineral Resources	
			Lucas	Mahlangu	Department of Environmental Affairs	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Malepo	Phoshoko	Department of Environmental Affairs	
		Ms	Nyeleti	Makhubela	Department of Public Works	Dept. Public Works Pretoria
			Feroze	Shaik	Department of Education	Office of the MEC
		Mr	Steve	Galane	Department of Agriculture, Forestry & Fisheries	Stake holder communications and relations, Acting Chief Director
		Mrs	Valerie	Du Plessis	Department ofWater Affairs	Deputy Director of Water Abstraction
		Mr	MD	Cholo	Department of Water Affairs	Chief Superintendent: Jericho Dam
		Ms	Margaret	Khoza	Department of Energy	Private secretary to the minister
Parastatal	Parastatal	Mr	Etian	Terblanche	SANRAL	Project Manager for N2 (area surrounding Piet Retief)
Traditional Authorities	Traditional Authority - Chief		Jacob	Yende	Donkerhoek CPA	CPA
		Mr	VG	Yende	Madlangampisi Traditional Council	Acting chief
	Traditional Authority - Chief	Mr	Peter	Moloi	Lekgotla Tribal Authority Council	Representative from Tribal Authority Council - Dr Pixley Kalsaka Seme
		Chief	SA	Mthetwa	Madabukela Traditional Council	Chief
	Traditional Authority - Chief	Mr		Mthetwa	Madabukela Traditional Council	Acting Chief
	Traditional Authority - Chief	Chief		Tshabalala	Madlangampisi Traditional Council	
		Mr	MT	Yende	Ogenyaweni Traditional Authority	Chief
		Mr	J	Mdluli	Madabukela Traditional Council	Chief
	Traditional Council, Gert Sibande District	Chief	Inkosi	Mnisi	Duma Traditional Council	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
	Traditional Council, Gert Sibande District	Chief	Inkosi	Hlatshwako	Emfumbeni Traditional Council	
	Traditional Council, Gert Sibande District	Chief	TM	Nkosi	Ndlela Traditional Council	Chief
		Mr	MP	Nkosi	Ndlela Traditional Council	TC member
	Traditional Council, Gert Sibande District	Chief	Inkosi	Msibi	Enkhaba Traditional Council	
	Traditional Council, Gert Sibande District			Moloi	Lekgotla Traditional Council	
	Traditional Council, Gert Sibande District	Chief	Inkosi	Mnisi	Mantjolo Traditional Council	
		Chief	Dlamini	Dlamini	Embhuleni Traditional Council	
		Chief	Malaza	Malaza	Mandlamakhulu Traditional Council	
		Prince	JM Nkosi		Somcuba Bhevula Traditional Council	
		Chief	RA Nkosi		Enikwakuyengwa Traditional Council	
			Dile	Moloi	Lekgotla Traditional Council	
			Thokosile	Mabuza	Lekgotla Traditional Council	
			Zanele	Mesina	Lekgotla Traditional Council	
			Yuki	Ndimande	Lekgotla Traditional Council	
			Veli			
		Chief	Nlapho		Mpisikazi Traditional Council	
		Chief	Tp Nkosi		Ebutsini Traditional Council	
Community Representatives	Driefontein Community Forum	Mr	Peace	Simelane	Driefontein Community Forum - Chairperson	Chairperson
			Sabelo	Mabaso	Driefontein Community Forum	Vice Chair
			Maria	Ndlovu	Driefontein Community Forum	Secretary
			Lindiwe	Mchunu	Driefontein Community Forum	Vice Secretary
			Thulani	Mkhonza	Driefontein Community Forum	Treasurer
			Thami	Ngwenya	Driefontein Community	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
					Forum	
			Jabulane	Ngwenya	Driefontein Community Forum	
			Thokozile	Mabuza	Driefontein Community Forum	
			Themba	Hlatshwayo	Driefontein Community Forum	
			Jabulile	Xulu	Driefontein Community Forum	
			Zakhele	Ngwenya	Driefontein Community Forum	
			Amen	Nkosi	Driefontein Community Forum	
		Mr		Yende	Driefontein Community Forum	
		Mr		Nkosi	Driefontein Community Forum	
		Mr		Thwala	Driefontein Community Forum	
			Jabulile	Yende	Driefontein Community Forum	
			Simon	Mabasa	Driefontein Community Forum	
			Doctor	Yende	Driefontein Community Forum	
			Thandi	Madlala	Development Council	
			Goodness	Kwando	Development Council	
	Other attendees at Dreifontein Community Forum Meeting		N.M	Dlamini	Development Council	
			B.J.	Msinda	Development Council	
			SW	Gamise	Development Council - Chairperson	
			MJ	Ngwenya	Development Council	
NGOs	Environmental NGOs				Assegai Catchment Forum	Assegai Catchment Forum
		Mr	Andre	Steenkamp	Birdlife South Africa: Wakkerstroom	Birdlife South Africa: Wakkerstroom - Centre Manager
					Wildlife & Environmental Society of South Africa	Wildlife & Environmental Society of South Africa
		Mrs			Wildlife & Environmental Society of South Africa	Conservation specialist
		Mr	Rupert	Lawlor	Wakkerstroom Natural Heritage Association	Wakkerstroom Natural Heritage Association - Chairperson
		Mr	Angus	Burns	WWF with an interest in Wakkerstroom	WWF with an interest in Wakkerstroom

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
					Escarpment Environmental Protection Group	Escarpment Environmental Protection Group
		Mr	Brent	Corcoran	WWF with an interest in Wakkerstroom	Ma
		Ms	Glenn	Ramke	Endangered Wildlife Trust Crane Working Group	EWT Crane Working Group/Field Officer
		Mrs	Ursula	Franke	Endangered Wildlife Trust	Endangered Wildlife Trust - specialises in avifauna and wetlands
		Mr	M P	Mkhize	Sisonke Environmental Club	Sisonke Environmental Club
		Mr	O	Filter	Mkhondo Alathia Rehabilitation Centre	Mkhondo Alathia Rehabilitation Centre
		Mr	Andre	Beetge	Expertise in wetlands rehabilitation	
		Mrs	Carolyn	Ah Shene-Verdoorn	Birdlife South Africa-Policy & Advocacy Manager	082 776 8333
		Mr	Tony	Sibiya	Inkomati CMA	
		Mr	Cholo	Derrick	Usutu River	
		Mr	Joseph	Mabunda	ICMA	
		Mr	Charles	Makuwerere	World Wildlife Fund	Mining Engagement Coordinator
		Ms	Lizette	Botha	Mkhondo Environmental Protection Agency	HR
		Mr	Eric	Delport	Mkhondo Environmental Protection Agency	Finance
		Dr	Wendy	Watson	Wakkerstroom Tourism Association	Chairperson
		Mr	Schubert	Smith	Heyshope Dam Boating Club	
				Jakobus	Botha	Mkhondo Environmental Protection Agency
	Social NGOs	Mrs	L N	Swart	Piet Retief Dienssentrum - Social Services, Services for the elderly, Organisations providing geriatric care	Piet Retief Dienssentrum - Social Services, Services for the elderly, Organisations providing geriatric care
			P	Msimango	Simunye Ntombe Community Organisation	Simunye Ntombe Community Organisation

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mrs	Anne C	Dique	S A V F Piet Retief - Economic, Social and Community Development organisation	S A V F Piet Retief - Economic, Social and Community Development organisation
		Mrs	H	Hoeksman	S A V F Volksrust	S A V F Volksrust
		Mrs	L N	Swart	Piet Retief Dienssentrum - Social Services, Services for the elderly, Organisations providing geriatric care	Piet Retief Dienssentrum - Social Services, Services for the elderly, Organisations providing geriatric care
			P	Msimango	Simunye Ntombe Community Organisation	Simunye Ntombe Community Organisation
		Mr	R A P	Van Niekerk	Christelik-Maatskaplike Raad van Piet Retief - Economic, Social and Community Development, Community and neighbourhood organisations	Christelik-Maatskaplike Raad van Piet Retief - Economic, Social and Community Development, Community and neighbourhood organisations
			Vusiwe	Petro	2001 Youth Development	2001 Youth Development
			P V	Nkabinde	Thuthukani Stimulation Centre - services for the handicapped	Thuthukani Stimulation Centre - services for the handicapped
			M L	Phakathi	Masibumbane Traditional Healers	Masibumbane Traditional Healers
				Nkosi	Thandolwethu Community Home Based Care	Thandolwethu Community Home Based Care
			T R	Yende	Sinothando Community Health Workers	Sinothando Community Health Workers
			Gezile	Mthethwa	Mkhondo Local Aids Council	Mkhondo Local Aids Council
			WW	Stapelberg	Mpumalanga Welfare Social Service and Development Forum	Mpumalanga Welfare Social Service and Development Forum
		Ms	Ellen	Dladla	Thandanani Home Based Care	Thandanani Home Based Care
			Funfun	Harry	Tholusizo Home Based Care - Prevention and education about HIV/Aids	Tholusizo Home Based Care - Prevention and education about HIV/Aids

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mrs	Cabisile Cathrine Anna	Kubheke	Zenzele Day Care Centre	Zenzele Day Care Centre
			J R	Abrahamse	J-Life Ministries - Religious Congregations and Associations	J-Life Ministries - Religious Congregations and Associations
		Mr	C F	Herbst	Christelik-Maatskaplike Raad: Volksrust	Christelik-Maatskaplike Raad: Volksrust
			Goodness N.	Kunene	SANTA- Sakhisizwe Branch	SANTA- Sakhisizwe Branch
Labour Unions	Labour Unions					LIPWUSA: Liberated People Workers' Union of South Africa
Farmers Union	Farmers union	Mr	NL	Bosman		Agri Mpumalanga
		Mr	Gerty	Venter	Piet Retief Farmers Association	Agri Piet Retief -local Farmers Association
		Mr	FD	Masele		National African Farmers' Union (NAFU)
		Mr	T.N	Weber	Anysspruit Farmers Association	
		Mr	Hennie	Laas	Mpumalanga Landbou/Agriculture	General Manager
Other IAPs	I&AP - other	Mr	Simangaliso	Mthembu	RI&AP	Local business owner
		Mr	David	Lindley	Mondi	
		Mrs	Peti Irene	Nkosi	RI&AP	Member of the Public
		Mr		Ngema	Owns community hall in Dirkiesdorp	Community member Dirkiesdorp
		Mr	Teboho	Klonderboy	RI&AP	Member of the Public
		Mr	Francois	Roux	RI&AP	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr	Roland	Stone	RI&AP	
		Mr	Danny	Leahy	RI&AP	Local business owner
		Mrs	Paula	Leahy	RI&AP	Local business owner
		Mr	Oliver	Stroink	RI&AP	
		Mr	John	Bond	RI&AP	
		Ms	Hendrina Mantombi	Hlope		
			Vincent			
			Mbuso	Dlodlo		
			Mzwandile	Mnguni		
			Nkosinathi	Phakathi		
			Thandi	Shongwe		
			Jabu	Soko		
			Thembi	Khumalo	Zihlakalele	
			Sbongile	Mndebele		
			Mariet	Khumalo		
			Khazonina	Mazibuko		
			Msibi	Sandile		
			Zinhle	Lukhele	Lekhotla tranditional Council	
			Nonhlanhla	Nhlapho	Lekhotla tranditional Council	
			Mike	Tenell	Driefontein	
			Njabulo	Mngomezulu	Driefontein	
			Zanele	Maseko	Driefontein	
			Jalbulile			
			Sizwe	Hickus Simelane	Kangra	
			Simangele	Nyandeni		
			Mpanza	Ntomfuthi	kangra Coal	
			Thoresako	Thalai	Lekhotla tranditional Council	
			Nomibuso	Yende	kangra Coal	
			Zanokuhle	Nkosi		
			Sthembiso	Msizie		
			Jabulile	Hadebe	LEB	
			Rechel	Ngwenya	Ekuthluleni Creche	
			Nomthimba	Masond	Donkerhoek Farm	
			Ntokozo			

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Nomjoumelelo			
			Thulani			
			Mandla			
			Alexina	Nkosi	Zwide Smallscale Mining	
			Jacksen	Dlodlo		
			Samaria	Ndlolu	Siyashukama Coperative	
			Maria	Ndlovu		
			Robert	Maseko	Foloyi Construction	
			Godfrey	Fakvise	Macina Contraction	
			Bongani	Pakude	Macina Contraction	
			FA	Mthembu		
			Sthembiso			
			Prince		Lindelani	
			Sfiso		Lindelani	
			Yende	Collen	Lindelani	
			Clement			
			Salina	Khumalo	Lindelani	
			Minah		Mhlongo	
			Lindiwe		Community Member	
			SP	Phakathi		
			Mandla		Community Member	
			Sfiso	Mthimkhulu	Lindelani	
			Delisile	Mthembu	RDP Mkhize Village	
			Clement	Mthimkhulke	Lindelani	
			Colleen	Yende	Lindelani	
			Ntombi	Gcwele		
			Thandeka			
			Nomkhosi			
			Bongani			
			Nondumiso			
			Josphine			
			Ntombiputhi			
			Smamgatiso			
			Thokozile			
			Thandi			
			Sabeth			
			Zwelithini			
			Mzaryifan			
			Dumsani			
			Madela	Kbehla		
			SF	Madonsela		
			ND	Vilakazi		
			Thembelittle	Shoba		
			Siphi	Majudi		
			Sqa	Mathelowla		
			Vusi	Madlepha		
			Rich	Vikhazi		
			Vusi	Yende		
			Mzwahize	Simelde		
			Mnisi	Nompumelelo		

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Shongwe	Gincple		
			Thuala	Nomusa		
			Regina	Zakolola		
			Buyi	Mthembu		
			Hade	Bongikosi		
			Jend	Khoza		
			Elizabeth	Nkonjani		
			Thulisile	Nhleko		
			Solve	Thakathi		
			Elina	Zwene		
			Jabu	Thethwa		
			John	Zuhgu		
			Johan	Mdiniso		
			Hlengi	Mishalintshah		
			Angel	Khalishwayo		
			Sibusiso	Nhlabathi		
			Sfiso	Nkosi		
			Thobile	Masuku		
			Thembi	Kumale		
			Nonhlanhla	Mnisi		
			Thandi	Songne		
			Nsizwa	Soko		
			Busisiwe	Soko		
			Thoko	Msibi		
			Lindiwe	Mchunu		
			Nodumiso	Semelane		
			Nampi	Slongwe		
			Bee			
			Thulani			
			Mdu	Phakathi		
			Sibusiso	Twala		
			Thulani	Vilakazi		
			Thulani	Manana		
			Nester	Nkosi		
			Dorah	Hlatshnayo		
			Luyanda	Dludlu		
			Mdlelia	Charles		
			Fakude	Innocent		
			Jabulani	Ndlozi		
			Mfankhona	Yende		
			Patric	Nkosi		
			Phillip	Mbuyisa		
			Robert	Ngobese		
			Xollie	Mtshaii		
			Lungile	Hlatshwayo		
			Tholakele	Mtshali		
			Duduzile	Ndlela		
			Sbongile	Ndlobu		
			Mduphakathi			
			Bheki	Mhokazi		

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			David	Vilateazi		
			Boyzy	Hlatshwayo		
			Hlobo	Hlatshago		
			Ntombi	Yende		
			Jabulile	Lukhele		
			Lindiwe	Mchunu		
			Thoki	Msibi		
			Lindiwe	Mchunu		
			Nompi	Shongwe		
			B	Msibi		
			Matha	Msibi		
			Skhumbuzo	Buthelezi		
			Thabo	Mkhusnezi		
			Thoko	Mndebele		
			Mncedisi	Hlatshwayo		
			Samuel	Ndaba		
			Okie	Shabalala		
			Elias	Hlatshwayo		
			Thandi	Mampuru		
			Gumle	Nkosi		
			Sombu	Nkwanyane		
			Thoko	Zondo		
			gabisile	Islamini		
			Busi	Kubeka		
			Sabulani	Khumalo		
			Sibusiso	Micphati		
			Vusi	Mndlopha		
			Nico	Mug		
			Ntombikayiseti	Khumalo		
			P	Moshodi		
			Johan	Mdisiso		
			Nonhlanhla	Musi		
			Thembelittle	Sloba		
			Emmanuel	Nyemba		
			Vusumuzi	Madlopha		
			Sibusiso	Nhubali		
			Nolnhlazi	Mphungoge		
			Mathebula	Thulile		
			Juliat	Phungwage		
			Nokuthula	Ngema		
			Nomgqibelo	Nkosi		
			Nitshantshali	Hleng		
			Mndeni	Khumalo		
			Phumzile	Ngaau		
			Hlengiwe	Chlamini		
			Philisiwe	Mahlobo		
			Sellinah	Nkwanyana		
			Sombu	Nkwanyana		
			Thokozani	nkwanyana		
			Nkosinathi	Mahlobo		

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Jeremia	Nzimande		
			Mdulua			
			Nathi			
			Richard	Malboro		
			Thalitha	Khumalo		
			Lindeni	Mnisi		
			Thembane	Mabuza		
			Nokuthula	Mabuza		
			Nompumelolo	Zulu		
			Ntomokayise	Shabalala		
			Celumusa	Mnisi		
			Sibusiso	Shabalala		
			Ellen	Ngwenya		
			Elizabeth	Nkonyane		
			Noghile	Mduli		
			Hlanze	Wiseman		
			Mncube	Phelelani		
			Sangweni	Mbali		
			Pinky	Ndela		
			Neliswe	Khoza		
			Thandeka	Khoza		
			Lindiwe	Songwe		
			Zwane	Nombdeni		
			Simelane	Zenzile		
			Smangaliso	Mhlanga		
			Hlengiwe	Mbatha		
			Fikile	Vilakazi		
			Zanele	Hlatshwayo		
			Mthunzi	Ngwenya		
			mayna	Yende		
			Busisiwe	Soko		
			Nomasonto	Mabaso		
			Lindokuhle	Maseko		
			Khabo	Nkosi		
			Hickusizwe	Timelane		
			Sesi	Nzimande		
			NF	Maseko		
			SG	Nkosi		
			Khomisile	Vilakazi		
			Phumzile	Dlamini		
			Bhutana	Mamana		
			Nonozi	Hlatshwayo		
			hilatunzi	Moses		
			Vigebende	Lucas		
			Thoto	Nkosi		
			Nonvula	Motha		
			Buyi	Mthembu		
			Miniyed	Simelane		
			Sibongile	Khumalo		
			Happy	Hlatshayo		

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Sifiso	Sibande		
			Mnisi	Nompumelelo		
			Shongwe	Gcinile		
			Twala	Nomusa		
			Thandi	Shongwe		
			Poppy	Khumalo		
			Dorah	Lukhele		
			Ntombi	Sibiya		
			Hlalekeni	Mahlangu		
			Phondile			
			Fikile			
			Moses			
			Buthelezi			
			Tracey	Yende		
			Victor	Mzimeka		
			Sonto	Nkosi		
			Helisiwe	Nkoza		
			Khoza	Thandeka		
			Lungi	Hlatshawago		
			Zinhle	Mavuso		
			Tholi	Mtshali		
			Xoli	Mtshali		
			Xolile	Mtshali		
			Julies	Nuleko		
			Melusi	Sibisi		
			Aavon	Xaba		
			Thulani	Mkhusnezi		
			Melusi	Phakathi		
			Zwelithini	Shoh		
			Sibongile		CDW	
			Rhee	Hlatshawayo	CDW	
			Zandile	Yende		
			Patrick	Madonsela		
			Steve	Dhlamini		
			Sibusiso	Yende		
			Bonginpilo	Marshall		
			Bongani	Simelane		
			Siphiwe	Nkwanyane		
			Patrik	Yende		
			Doctor	Silkosamsa		
			Zeedi	Nkosi		
			Mthobisi	Mnisi		
			Sabelo	Mahlaba		
			Njabulo	Mngamezulu		
			Zanele	Maseko		
			Mbali	Nkosi		
			Khabonina	Mazibuko		

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
			Fikelephi	Shandu		
			jabu	Soko		
			Sphiwe	Yende		
			MT	Shabalala		
			Aison	Mishali		
			Mj	Mtshali		
			SA	Ngobese		
			LB	Mdlieti		
			Sonto	Nqwenya		
			Sonto	Thwala		
			Busisiwe	Mwale		
			Beauty	Grootboom		
			Nathi	Kunene		
			Lindiwe			
			Joseph			
			Johanis			
			Guneile			
			Phindile			
			Sizakele			
			Thembi			
			Sizwe			
			Jabulani			
			Joseph			
			Gabriel			
			Albert			
			Abel			
			Mzaiyifani			
			Zwelithini			
			Thock	Maseko		
			Basina	Bheka		
			Zondwa	Mohlobo		
			Thandi	Nkoko	Tshabalala	
			Kenneth			
			Jabu			
			Sibongile	Linda		
			Lindiwe	Mdelele		
			thandiwe	Mhlongo		
			Lindiwe	Maseko		
			Ntomkhona	Msibi		
			Mbuyisa	Busisiwe		
			Enock	Yende		
			Babili	Mkhamazi		
			Jimi	Nene		
			Khaya	Mbangeni		
			Johan	Shangangu		
		Ms	Marion	Zadlamini		
		Mr	Linda		Driefontein	
		Mr	Nkosi		Driefontein	
		Mr	Nxumelo		Driefontein	
		Mr	Thulani	Mkwanazi	Driefontein	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr	Buthelezi		Driefontein	
		Mr	Sanguni		Driefontein	
		Mr	Mkhwanazi		Driefontein	
		Mr	Mothobela		Driefontein	
		Ms	Gama		Driefontein	
		Ms	Nkosi		Driefontein	
		Mr	Nkwanyana		Driefontein	
		Mr	Vilekezi		Driefontein	
		Mr	Nladonsela		Driefontein	
		Mr	Hlalshwayo		Driefontein	
		Mr	Phungwaya		Driefontein	
		Mr	Nkosi		Driefontein	
		Mr	Hlatshwayo		Driefontein	
		Mr	Khoza		Driefontein	
		Mr	Thela		Driefontein	
		Mr	Phakathi		Driefontein	
		Mr	Nkosi		Driefontein	
		Ms	Mthethwa		Driefontein	
		Mr	Maseko		Driefontein	
		Ms	Hlatshway		Driefontein	
		Mr	Sibiya		Driefontein	
		Ms	Sibisi		Driefontein	
		Mr	Msibi		Driefontein	
		Mr	Methula		Driefontein	
		Mr	Madonsela		Driefontein	
		Ms	Vilakazi		Driefontein	
		Mr	Yende		Driefontein	
		Ms	Gama			
		Ms	Nkosi			
		Ms	Nkosi		Medical Center	
		Ms	Zungu			
		Mr	Mdluli		Community Member	
		Mr.	Mntambo		Driefontein	
		Mr.	Zondo		Driefontein	
		Mr.	Methula		Driefontein	
			Sangweni		Driefontein	
			Sibande		Driefontein	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Ms.	Vilakazi		Driefontein	
		Ms.	Mambane		Driefontein	
		Mr.	Mayisela		Driefontein	
		Mr.	Lunga		Driefontein	
		Mr.	Mpanza		Driefontein	
		Mr.	Madonzela		Driefontein	
		Mr	Dlamini		Siphssihle Investments	
		Mr	Dlamini		African sun bussiness solutions	
		Mr	Matthew	Magwede	FL Smidth Krebs Africa	
		Mr	Vilakazi		DCF	
		Mr	Mayisela		Driefontein	
		Miss	Nkosi			
		Miss	Shabanga			
		Mr	Mkhwanazi		Driefontein	
		Mr	Mandonsela		Driefontein	
		Mr	Simelane		Driefontein	
		Mr	Mkudnasi			
		Mr	Nhlabotu		Driefontein Rap	
		Mr	Lefende			
		Ms	Nkosi			
		Mr	Mathula		Tribal office Yende	
		Mr	Nusuthu		Driefontein Forum	
		Mr	Ngwenya		Driefontein	
		Ms	Hlatshwayo		C.D.W	
		Ms	Nkosi		Driefontein	
		Ms	Mandonsela		Driefontein	
		Mr.	Ndzela		Driefontein	
		Mr	SV	Nkosi		
		Ms	Miranda	Sikhakhane	Mondi	Environmental specialist
		Mr	J	Scotcher	Forestry Stewardship Council	

Stakeholder Group/Category	Stakeholder Sub-Group	Title	First Name	Surname	Organisation	Organisation/Position
		Mr	Roger	Godsmark	Forestry South Africa	Operations Director
		Mr	Chris	Burchmore	Mondi	
		Mrs	Zinhle	Lukhele	L.E. Moloi	L.E. Moloi
			Elias		Twyfelhoek 2	
		Mr	Shadrak	Ngema	Ngema Trust	Member of Ngema Trust
		Mr	William	Ngema	Ngema Trust	Communication person Ngema Trust
		Mr	Robson	Ngema	Ngema Trust	Chairperson Ngema Trust
		Mr		Ngema	Owns community hall in Dirkiesdorp	Community member Dirkiesdorp
			BJ	Mngomezulu	Vukuzithathe Old Age Club	Vukuzithathe Old Age Club
			N P	Ngobese	Bhekisizwe Home Based Care	Bhekisizwe Home Based Care

Annex B3

Minutes from Pre Scoping Meetings

Meeting minutes

Environmental Resources Management

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Subject/Ref	Minutes of meeting with Dr Pixley Kalsaka Seme Local Municipality
Venue	Dr Pixley Kalsaka Seme Local Municipality – Council Chambers
Date of Meeting	20 July 2011
Present	As per the table below
Distribution	All in attendance; Councillors for Ward 10; Internal ERM team; Kangra Coal representatives
Date	16 August 2011

This note serves as the record of the meeting with Dr Pixley Kalsaka Seme Municipality on 21 July 2011. The objective of the meeting was to discuss the proposed Kangra Coal Mine Expansion into the Kusipongo Resource. Table 1 below indicates who attended the meeting.

Name & Surname	Organisation	Position
Oupa D KA Sibeko Mavuso	Department of Urban and Economic Development	Director of Urban and Economic Development
Munira Omarjee	Dr Pixley Kalsaka Seme Local Municipality	Dr Pixley Kalsaka Seme Local Municipality Secretary
Sipho Shabalala	Dr Pixley Kalsaka Seme Local Municipality	Manager for the Officer of the Speaker - Dr Pixley Kalsaka Seme Local Municipality
Cllr ZH Luhlanga	Dr Pixley Kalsaka Seme Local Municipality	Honourable Speaker - Dr Pixley Kalsaka Seme Local Municipality
Peter Moloi	Tribal Authority Council	Representative of the Tribal Authority Council on behalf of Chief Moloi
King S Nkambule	Kangra Coal	Transformation Manager
Sipho Mkhatshwa	Department of Urban and Economic Development – Local Economic Development	Local Economic Development Manager
Fanyana Mazibuko	Dr Pixley Kalsaka Seme Local Municipality	Ward Councillor 6 - Dr Pixley Kalsaka Seme Local Municipality
Nomsa Fulbrook-Bhembe	ERM	Consultant
Jimmy Mnisi	Di-Idea	Facilitator
Lisa van Dongen	ERM	Consultant

Prior to initiation of the meeting formal apologies were given on behalf of the Dr Pixley Kalsaka Seme's Muncipial Manager and Executive Mayor as they were not able to attend the meeting. Apologies were also given on behalf of Chief Moloi who also was not able to attend.

Lisa van Dongen of ERM gave a presentation introducing the proposed Project, the associated licensing processes and the proposed plan for the upcoming public participation process (PPP).

KEY OUTCOMES OF THE MEETING

ACTION OR OBSERVATIONS

A1.1 RESPONSES TO THE PRESENTATION ON THE PROPOSED PROJECT

The following key questions were raised after the introduction to the project:

- The Speaker raised the question about the approximate distance from the existing mine to the proposed mine. He also enquired whether mining activities would continue at the existing mine.
    - ERM responded that an approximate distance would be 7km. Furthermore it was explained that the existing mine would slowly close but that the proposed mine would serve to transfer the employees from the existing mine to the proposed mine.
- Peter Moloi asked how Dr Pixley Kalsaka Seme would be affected by the proposed mine, where the existing map did not clearly show where the municipal boundary fell.
    - An explanation was provided as to how Dr Pixley Kalsaka Seme would be affected in terms of the properties that would be affected by the Project. It was agreed that the local municipality boundaries would be added to the map to illustrate this clearly.

A1.2 RESPONSES TO THE PRESENTATION ON THE LICENSING PROCESSES

The following responses were made to the presentation on the licensing processes:

- The licensing processes, in addition to the responsible authorities, that are required for the project were identified by ERM. It was clearly identified that these processes will be run in an integrated manner.
- In addition the need to potentially to discuss access to land was raised. It was emphasised that these negotiations will occur separately from the public participation and Environmental and Social Impact Assessment (ESIA) process and the scope of work currently identified. In addition it was emphasised that any commitments in this regards cannot be made at this stage.

ERM requested input into the proposed Public Participation Process (PPP) and further asked the municipality to advise on which stakeholders should be targeted for inclusion into the public participation process. The following responses were made:

- It was agreed that the stakeholder groups identified, and the means of communication are relevant for this project.

A1.3 RESPONSES TO PRESENTATION ON PROPOSED PPP PROCESS

- It was also identified that the key Wards to be involved in this process are Wards 5 and 10 (it was later identified that Ward 5 was related to the Wakkerstroom town and that the only directly affected ward was Ward 10). It was also agreed that the Councillors from these Wards would be given the material from the presentation, and would be fully informed of the project and process.

- Peter Moloi also requested for the public participation materials to be sent directly to Chief Moloi. (Note: By telephone later, a follow up meeting was requested between ERM and the traditional authority).

*Note: Concerns around gate keeping from the Traditional Authority (intimation that there might be contest of Traditional leadership)

- It was recommended that there was a need to make direct contact with farmer owners, rather than to rely on the public notification process. Similarly, for affected communities it was noted that the distribution of flyers would not be sufficient and that these would need to be augmented with face-to-face engagement to ensure full understanding.

- The three languages identified (Zulu, English and Afrikaans) were identified as being the appropriate languages for the targeted stakeholders.

- The current stakeholder database for Dr Pixley Kalsaka Seme from their IDP processes was provided to ERM when the meeting was adjourned; however, it was agreed that research about unions would need to be conducted by ERM.

Action: research to be conducted on relevant Unions, as well as social NGOs and CBOs in the area

- In response to a question about appropriate publications the Director of Urban and Economic Development identified that the Excelsior and Vuka Pixley newspaper were appropriate. The Highvelder newspaper was identified as not being a relevant newspaper for the project, given that it was distributed in Ermelo area.

- Venues to display the materials were identified. It was suggested that Volksrust, Wakkerstroom and Dirkiesorp be the main towns to display materials. Key locations were identified as the Post Office, Library and Municipal Offices. Daggakraal was also suggested as an appropriate place to display materials, given that this was where the Traditional Authority was based. It was also suggested that the Project could make use of the schools in the surrounding farms for venues for documents and meetings.

- Potential venues for public meetings were also discussed with the abovementioned towns being suggested. Lisa van Dongen noted that the proposal was not to have road show of meetings in different towns but rather to convene one integrated meeting so all interests would be exposed to one another. The value of such an integrated meeting was acknowledged. It was, however, recommended that transportation be provided to stakeholders for the public meeting.

Action:
Identify potential venue/s to convene public meeting. To be discussed internally followed by external discussion with key

- It was suggested that direct contact be initiated with affected communities when information with regards to the project is disseminated.

- It was suggested that the relevant Ward Councillor (or member of Dr Pixley

Kalsaka Seme Local Municipality) attend meetings with ERM when these were undertaken in the communities, for example the public meetings. stakeholders

- ERM noted their support of the idea of the Councillors attending the public meetings.

- The Speaker raised the question as to how this proposed project will benefit their community, not only from an employment perspective but also in terms of sustainable development and investment in the area. Furthermore, it was suggested that there was a need for the municipality as an institution to be considered as a beneficiary.

  - Kangra Coal responded that their Social and Labour Plan will aim to answer this.
  - ERM also pointed out that the PPP is an excellent opportunity for relationship building between the municipality and Kangra Coal.

Action: ERM to provide Scoping Report directly to Oupa Mavuso

- The Director of Urban and Economic Development suggested that the draft Scoping Report should be sent to the Director of Planning and Economic Development. He then took responsibility for championing this internally, by summarising the key aspects of the Project for Council. This provides a means of stakeholders comprehensively understanding the key findings of the Scoping Phase.

  - ERM endorsed this and thanked the Director for his willingness to be involved in this way. It was broadly agreed that this should complement and not replace a broad distribution of materials to anyone in the municipality who would be interested in receiving these.

- The general question was raised about whether the municipality will be able to comment during the PPP.

  - It was confirmed that the municipality was considered one of the key stakeholders in the process and that ERM would welcome them to comment on the proposed project as well as the associated processes This could be at any point in the process, but particularly in response to the release of the draft Scoping and draft Environmental Impact Reports, which would be tabled for comment and review.

  - Furthermore, Lisa van Dongen stressed upon them the importance of their considering the technical proposal in a neutral way so as support ERM conduct a balanced impact assessment was possible. She noted that ERM would be relying on the municipality to help identify all the potential impacts of the proposed project, and encourage stakeholders to put forward their concerns and opinions.

A1.4 Identification of contact person for ESIA Application

It was agreed that the official contact person for Dr Pixley Kalsaka Seme would be Mr Oupa Mavuso – Director of Urban and Economic Development.

In addition for future correspondence with the municipality, it was requested that all correspondence continue to be sent to the Executive Mayor, the Officer of the Speaker and the Municipal Manager for them to distribute internally as appropriate.

A1.5 Additional & Closing Comments

- It was stressed by Mr Oupa Mavuso that consideration should already be taken of mine closure and rehabilitation.
- It was highlighted that concerns will most likely be raised with regards to NO_x and SO_x emissions, soil rehabilitation and impact on water resources. It is therefore essential that answers will be made available with scientific backing. He noted that he would take responsibility for ensuring the technocrats in the municipality provide technical input and review of such matters.
- It was noted that the municipality's name was changed from Pixley Ke Seme Local Municipality to Doctor Pixley Kalsaka Seme Local Municipality. All materials should reflect the new name.

Finally the municipality thanked Kangra Coal and ERM for coming to involve them early in the process. They expressed their confidence that this process would be undertaken in an appropriate manner going forward.

Meeting
minutes

Subject/Ref	Minutes of meeting with CFJ Greyling
Venue	Wakkerstroom
Date of Meeting	21 July 2011
Present	Mr CJF Greyling, Mr Greyling Senior (father), Nomsa Fulbrook-Bhembe, Jimmy Mnisi, Lisa van Dongen
Distribution	Internal ERM Team; Hatch; Kangra Coal
Date	16 August 2011

Environmental
Resources
Management

ERM

KEY OUTCOMES OF THE MEETING

ACTION OR OBSERVATIONS

A1.6 BACKGROUND:

Mr CFJ Greyling was identified at the beginning of the Puplic Participation Process (PPP) as the owner of Donkerhoek 14 HT. Mr CFJ Greyling has had previous engagement with ERM (the Water Specialists), and thus was aware of ERM. The meeting served as an introduction to ERM's Public Participation team and to follow up on Mr CFJ Greyling's concerns that he had raised previously.

A1.7 COMMENTS AND INPUTS: WATER USE IMPACTS

Mr CJF Greyling's current use of water (particularly for watering his livestock) is via springs. Mr Greyling stated that the first 100 (approximately) exploration holes drilled by Kangra Coal were not filled properly. Consequently he is concerned the holes will 'drain the water table', and cause depletion of water resources.

He also voiced concern over the short and long term impacts: depletion of water resources and the overall impacts on water resources.

A1.8 Comments and Inputs: Mining Related Activities

Mr CFJ Greyling queried why the shaft and surface infrastructure located at Adit A cannot be located on the Kransbank farm.

Mr CFJ Greyling would like confirmation on the exact locations of the mining activities – he thinks mining will be done on either side of Adit A, thus confirmation is required on the exact location and extent of the mining at Adit A.

Mr Greyling Senior (father) also queried the depth of the proposed mining as well as the thickness of the layers to be mined.

Mr CFJ Greyling would like confirmation or evidence that the underground mine will have no effect on any of his surface infrastructure (house etc.) or people living on top of the land.

Mr CFJ Greyling also queried the type of coal to be mined.

A1.9 Comments and Inputs: Air Impacts

Mr CFJ Greyling noted that the dust resulting from the proposed activities at Adit A will directly affect his land for grazing leaving it unsuitable for such activities.

In addition Mr CFJ Greyling noted westward winds will also leave Mr CL Greyling's (Mr CFJ Greylings uncle) land unsuitable for grazing. It will also impact upon the properties south of Adit A.

A1.10 Comments and Inputs: Engagement with Kangra Coal

He noted that he has only met Kangra Coal's contractors to date. He would like to meet the management of Kangra Coal – this is particularly important as they have already started drilling on his land.

Mr CFJ Greyling would like to speak to Kangra Coal about compensation for the use of his land.

Mr CFJ Greyling would also like a guarantee and plan, provided by Kangra Coal; outlining how they will deal with potential draining of water from his farm – in the instance that he no longer has access to water will water be supplied to him?

A1.11 Comments and Inputs: Additional

Mr CFJ Greyling requested that the detailed findings of the hydrological survey be sent to him before they are put in a report and disclosed to the public. This includes providing him details on all of the relevant springs. He requested for this to happen so that he would have time to process and understand the results of the report.

A1.12 PROCESS CONSIDERATIONS:

Mr CFJ Greyling is aware of previous EIA processes that have been conducted in the area for mining related projects, and hence this should be taken into account. More importantly Mr CFJ Greyling raised some important points about his expectations on engagement particularly with Kangra Coal.

This needs to be taken into account by ERM when conducting the PPP and while working at the interface between Kangra Coal and persons like Mr CFJ Greyling.

Meeting minutes

Environmental Resources Management

ERM

Subject/Ref	Minutes of meeting with Mkhondo Local Municipality
Venue	Mkhondo Local Municipality – Council Chambers
Date of Meeting	21 July 2011
Present	As listed in the table below
Distribution	All in attendance; Councillors for Ward 2; Internal ERM team; Hatch team; Kangra Coal representatives
Date	16 August 2011

Meeting minutes

This note serves as the record of the meeting with Mkhondo Municipality on 21 July 2011. The objective of the meeting was to discuss the proposed Kangra Coal Mine Expansion into the Kusipongo resource. Table 1 below indicates who attended the meeting.

Table.1 Attendees at the Public Participation Meeting

Name & Surname	Position
Shadrak Ngema	Member of Ngema
William Ngema	Communications – Ngema
Robson Ngema	Chairperson – Ngema
King Solomon Nkambule	Kangra Coal
Sibongile Mathacha	Ward Councillor – Ward 3
Lesia Nhlenyetiwa	PR Ward Councillor – Ward 3
Khanyisile Masondo	Ward Councillor – Ward 15
Ngelosi Ndhlovu	Member of the Mayoral Committee: Mkhondo Local Municipality
BH Mtshali	Executive Mayor Mkhondo Local Municipality
VD Nkosi	Member of the Mayoral Committee Mkhondo Local Municipality
AT Thwala	Ward Councillor – Ward 1
Inkosi Mthetwa	Representative of Madabukela Traditional Council
Nomsa Fulbrook-Bhembe	Consultant ERM
Jimmy Mnisi	Facilitator Di-Idea Communications
Lisa van Dongen	Senior Consultant ERM

Lisa van Dongen of ERM gave a presentation introducing the proposed project, the associated licensing processes and the proposed plan for the upcoming public participation process (PPP). The map of the proposed mining site was provided to all attendees together with a hard copy of the presentation.

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS

A1.13 RESPONSES TO THE PRESENTATION ON THE PROPOSED PROJECT

The following key questions were raised after the introduction to the project:

- Councillor VD Nkosi (MMC) raised the question about the potential for job creation and the number of jobs that would be created.
    - King Solomon Nkambule from Kangra Coal responded indicating that an approximate 750 existing jobs would be saved through this proposed intervention. In addition to this it was estimated that an additional 300 jobs would be created as a result of the proposed project.
    - ERM noted that these would not be created for several years, where the licensing processes were anticipated to go on for about 2 years, followed by planning and construction phases.
- A general concern was raised about the potential negative impacts of the proposed mine. Specific current negative impacts that were identified with the existing mine were identified including the increased number of trucks on the road related to the mine and the associated increase in fatalities. Lisa van Dongen thanked them for raising these concerns. She also stressed the important role the municipality had in ensuring a balanced impact assessment was possible, where all stakeholder concerns are captured.

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS

A1.14 RESPONSES TO THE PRESENTATION ON THE LICENSING PROCESSES:

The following responses were made to the presentation on the licensing processes:

- Mayor BH Mtshali raised the question about how many people would potentially have to move as a result of the proposed project.
    - ERM responded by noting that current estimations suggest that 35 households may need to be moved, but noted that these were early projections which would need to be ground truthed.
- The Executive Mayor also enquired about how much land the directly affected communities own.
    - Both ERM and Kangra Coal noted that this had not been ascertained as of yet.
- In response to a question, Lisa van Dongen confirmed that all comments received from the municipality would be forwarded to the decision making authorities at National and Provincial government levels so that they were considered during the decision making.

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
A1.15 Responses to Presentation on Proposed Public Participation Process (PPP); ERM requested input into the proposed PPP and further asked the municipality to advise on which stakeholders should be targeted for inclusion into the PPP. The following responses were made: • It was agreed that the stakeholder groups identified by ERM and the means of communication are relevant for this project. • It was identified that the directly affected Ward in this process is Ward 2. However the Councillor from Ward 2, Councillor Nkosi, was not present. It was agreed that Councillor Thwala (Ward 1) will liaise with Councillor Nkosi about the meeting and the project. Furthermore, several other councillors live in Driefontein and surrounds and it was recommended that they therefore should be included (including the councillor for Wards 1 and 18). It was further suggested that ERM should work with the councillor to identify the directly and indirectly affected stakeholders as well as other possible interested stakeholders. • Inkosi Mthethwa (Madabukela Traditional Council) emphasised the importance of involving the right people and communities in the PPP. It was noted that it is important to clearly communicate and engage with local communities. Inkosi Mthethwa suggested that this was best achieved through engaging with the correct Traditional Authority. He noted that they would otherwise get left behind in such processes. • The three languages identified (Zulu, English and Afrikaans) were identified as being the appropriate languages for the targeted stakeholders. • With regards to the establishment of a stakeholder database, it was agreed that this would need to occur through an information gathering process. • In response to a question about appropriate publications, it was identified that the Mkhondo News was an appropriate channel. A contact person for Mkhondo News was provided.	Action: There remains a need to engage the appropriate Ward Councillors, especially Councillor for Ward 2 who was not in attendance. *Note: concerns around gate keeping from the Traditional Authority (intimation that there might be contest of Traditional leadership) Action: Receive their IDP database Action: Investigate whether there are land claims in the area and,

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
• Venues to display the materials were endorsed. It was suggested that Piet Retief should be the main town to display materials. Key locations were identified as the post office, library and municipal offices. It was further suggested that notices could be made available in Driefontein and around the neighbouring farms. • It was noted that, if there were land claims, these people should be included in the process. • It was noted that, if considered necessary, the Mkhondo Municipality would be willing to attend a meeting held in conjunction with Dr Pixley Kalsaka Seme Municipality as the project will span across both municipalities. *A1.16* *A1.17 IDENTIFICATION OF CONTACT PERSON FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) APPLICATION;* It was agreed that the official contact person for the Mkhondo Municipality should be Mr Phasha – Local Economic Development Manager. In terms of future correspondence with the municipality, it was requested that all correspondence be sent to the Executive Mayor and the Municipal Manager for them to distribute internally as appropriate. *A1.18 CLOSING COMMENTS;* The municipality noted that they had a good relationship and were hoping that this would continue. They thanked Kangra Coal and ERM for coming to involve them early in the process. They expressed their confidence that this process would be undertaken in an appropriate manner going forward.	if so, involve these stakeholders in our process.

Meeting
minutes

Environmental
Resources
Management

ERM

Subject/Ref	Notes of Meeting with CL Greyling
Venue	Wakkerstroom
Date of Meeting	22 July 2011
Present	Jimmy Mnisi, Lisa van Dongen, Nomsa Fulbrook-Bhembe, CL Greyling
Distribution	Internal ERM Team; Hatch; Kangra Coal
Date	16 August 2011

KEY OUTCOMES OF THE MEETING

ACTION OR OBSERVATIONS

A1.19 BACKGROUND:

CL Greyling is the uncle of CJF Greyling. CL Greyling was identified as the key landowner on the neighbouring land on Roodeport, Blinkwater, Naauwhoek and Kikvorschfontein.

Lisa van Dongen introduced the proposed Project and provided an explanation on ERM and the public participation process.

A1.20 COMMENTS AND INPUTS:

Following an introduction from Lisa, CL Greyling viewed the map and indicated the properties he farms on.

During the meeting CL Greyling did not voice any concerns; however, it was noted that he was fully aware of Environmental Impact Assessment (EIA) processes and the potential (negative) impacts of mining projects.

Meeting
minutes

Environmental
Resources
Management

ERM

Subject/Ref	Minutes of meeting with Kanluka Community
Venue	Central Meeting Venue on Kanluka Community Land
Date of Meeting	22 July 2011
Present	Nomsa Fulbrook-Bhembe, Jimmy Mnisi, Lisa van Dongen, Members of Kanluka community (see below)
Distribution	Internal ERM Team; Hatch; Kangra Coal
Date	11 August 2011

Name & Surname	Organisation/Position
Richard Hlatsbuayo	Representative of Kanluka community
Themba Maisela	Representative of Kanluka community
Jabulani Nhleko	Representative of Kanluka community
Sphiwe Senyivango	Representative of Kanluka community
Solomon Dhlongolo	Representative of Kanluka community
Nomsa Fulbrook-Bhembe	Consultant ERM
Jimmy Mnisi	Facilitator Di-Idea
Lisa van Dongen	Consultant ERM

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
A1.21 BACKGROUND:	
The Kanluka Community have been identified as one of the communities that own land, and who will be affected by the proposed Project. The Kanluka community form the Kransbank Communal Property Association who has owned land since 2002. The land was acquired through a land claim.	
The area of land owned by the Kransbank Communal Property Association was identified as approximately 1,499ha with 54 households. It was estimated that each house accommodates on average 10 to 15 people.	
A1.22 COMMENTS AND INPUTS:	
The representatives present at the meeting stated that Kangra Coal has already started prospecting and has spoken to members of the Kransbank CPA.	Observation: this may cause fragmentation between communities.
The representatives at the meeting raised the concern that the underground mine will cause cracks in their aboveground structures (houses etc).	Action: some sort of confirmation will need to be ascertained from the technical team in this respect, as there are several parties that have voiced this concern.
They also voiced their concern over the benefits that they will derive from the mine. They voiced the concern that less infrastructure on their property would decrease the flow of benefits to their community.	
The representatives noted the existence of the Kransbank Trust/Heritage Site but noted that there has not been a lot of involvement from authorities. However the government did fence the area off.	Action: further research to be conducted.
A1.23 PROCESS CONSIDERATIONS:	
The fact that Kangra Coal has already had prior engagement with the Kanluka Community may establish an expectation of ERM coming into the arena. There is therefore a need to engage with all communities appropriately.	

Record of Second Meeting

Jimmy Mnisi attended a second meeting on 29 July. The purpose of the meeting was to drop-off materials with Mr Nhleko that will be distributed to the wider community.

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
Jimmy Mnsis met with Jabulani Nhleko of Kanluka Community near his house.	
The meeting consisted of dropping off the material and an explanation about the content of the materials.	
Mr Nhleko agreed to distribute to the community. However it was noted by Jimmy that there is no way to ascertain that the materials have reached the community at large.	Action: follow up on distribution of material is required
It was suggested by Jimmy (to ERM) that a day of follow up or going door-door is needed for the directly affected communities.	

Meeting
minutes

Environmental
Resources
Management

ERM

Subject/Ref	Minutes of meeting with Thuthukani
Venue	Mr Linda's homestead
Date of Meeting	22 July 2011
Present	Nomsa Fulbrook-Bhembe, Jimmy Mnisi, Lisa van Dongen, Mr Linda, Mr Sibiya
Distribution	Internal ERM Team; Hatch; Kangra Coal
Date	16 August 2011

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
A1.24 BACKGROUND:	
The Thuthukani Community was identified as owning land that will be directly affected by the proposed Project. The current representative of the Thuthukani Community is Mr Linda.	
The land belonging to the Thuthukani community has been identified as Twyfelhoek 379.	
A1.25 RESULTS OF THE MEETING:	
The meeting served as an introductory visit. Following introductions it was suggested that a second visit should be organised whereby Jimmy would attend a meeting with the relevant community members.	
It was agreed that Jimmy would return to conduct a formal and thorough introduction to ERM, the Public Participation Process and the Project.	

Meeting minutes

RECORD OF JIMMY MNISI'S MEETING – 28 JULY 2011

Record of Second Meeting

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
Jimmy Mnisi met with Mr Linda of Thuthukani Community near his house.	
The meeting consisted of dropping off the material with Mr Linda and providing an explanation about the content of the materials.	
Places to distribute the materials were discussed. In addition it was indicated that Mr Linda would distribute the materials to his community.	Action: follow up to establish the materials were distributed

Meeting minutes

Environmental Resources Management

Subject/Ref	Minutes of meeting with Dr Yende of Yende community
Venue	Dr Yende's homestead
Date of Meeting	22 July 2011
Present	Nomsa Fulbrook-Bhembe, Jimmy Mnisi, Lisa van Dongen, Dr Yende
Distribution	Internal ERM team; Hatch; Kangra Coal
Date	16 August 2011

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
A1.26 BACKGROUND:	
The Yende Community was identified as owning land that will be directly affected by the proposed Project. Dr Yende spoke on behalf of the Yende Community; however, it was noted that there was uncertainty over the new election of a Chairperson of the community. Dr Yende was identified as the Chairperson of the Donkerhoek Development Committee.	Action: more information required on the Yende Community
The land belonging to the Yende Community has been identified as Twyfelhoek. In addition Dr Yende identified parts of Donkerhoek that also belong to the Yende Community.	
A1.27 COMMENTS AND INPUTS:	
Dr Yende identified that there are other communities in addition to the directly affected communities that should be addressed in the Public Participation Process (PPP). The communities live on the following four farm properties: Prospect 1, Prospect 2, Witbank and Jagdrift. These are neighbouring properties to the north of the Project area. Chairpersons of the Communal Property Associations (from the four farm properties) plus the three affected farm properties form the Donkerhoek Development Committee.	Action: it was agreed that materials will be distributed to the CPA representing the seven communities.
Dr Yende requested full inclusion of all of the aforementioned communities in the PPP. He also requested that if any negotiations occur with Kangra Coal that these communities should be included.	
Dr Yende noted that Kangra Coal had already engaged with the Kanluka community (who neighbour on the Yende community), and this had caused some friction between the communities.	

Dr Yende also requested that the long term benefits of such a project should be identified. He emphasised that the project needs to be sustainable, and needs to consider long term impacts on the unborn generation.

Dr Yende identified the Rural Development Office as a good place for a public meeting (near Driefontein); however, transportation would need to be arranged.

Action: transportation arrangements to be made by ERM for the public meeting.

A1.28 PROCESS CONSIDERATIONS:

It has been noted that there may be existing friction between the directly affected communities as a result of Kangra Coal's previous engagement. This history will go to inform the ongoing PPP. Therefore careful consideration must be taken when engaging with the communities.

Meeting minutes

RECORD OF JIMMY MNISI'S MEETING – 28 JULY 2011

Jimmy Mnisi attended a second trip to the area and met with Dr Yende (at his house) on 28 July. The outcomes of this meeting are documented below.

Record of Second Meeting

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
It was established that Dr Yende has introduced ERM and our process to the Donkerhoek Development Committee. It was confirmed that Donkerhoek Development Committee structure comprises of Chairpersons of the neighbouring CPAs (farm properties). The contact details of the individual Chairpersons were received from Dr Yende.	
Jimmy provided the materials to Dr Yende to distribute to the Chairpersons of the CPAs. It was established that a follow up call must be made to ascertain that they have received the materials.	Action: follow up call to the individual Chairpersons of the Donkerhoek Development Committee.
Dr Yende offered to erect posters at the shop near Twyfelhoek Primary School and on the sign post on the main road.	Action: Dr Yende will supply proof of site notice erection to Jimmy Mnisi.
It was noted by Dr Yende that he may not stay the Chairperson of the Yende Community. He stated that the election of the Yende Community Chairperson has been chaotic. Dr Yende will let us know as soon as a new Chairperson has been elected.	

Meeting minutes

Subject/Ref	Notes of Meeting with Chief Moloi
Venue	Driefontein

Environmental Resources Management

Date of Meeting	29 July 2011
Present	Jimmy Mnisi, Chief Moloi, Peter Moloi, Mr Matona, Tau (Di-Idea Communications)
Distribution	Internal ERM Team; Hatch; Kangra Coal
Date	16 August 2011

KEY OUTCOMES OF THE MEETING	ACTION OR OBSERVATIONS
A1.29 BACKGROUND:	
Chief Moloi has been identified as the Tribal Authority in the area of Dr Pixley Kalsaka Seme Local Municipality.	
This meeting originally served as an introductory visit; however, Chief Moloi had not been briefed on ERM's meeting with the municipality. Thus a brief presentation was given by Jimmy outlining ERM, their process and the proposed project.	
A1.30 COMMENTS AND INPUTS:	
Chief Moloi requested for meeting or for a discussion with Kangra Coal regarding royalties paid to him and the community. He has requested that ERM pass on the message and is requesting for a private meeting with Kangra Coal.	Action: ERM will pass Chief Moloi's request for a private meeting on to Kangra Coal
Chief Moloi would like assurance that the mine operation will not be releasing emissions into the surrounding air. He indicated specifically the release of harmful fumes as well as odours that may emanate from proposed project activities.	
Chief Moloi noted that he would like meaningful jobs to be created for the community as a result of this proposed Project.	
Chief Moloi requested that the materials are translated in to Sesotho for the future. He suggested that this would a better means of communicating with his community.	Action: the comment was noted however it was explained that the selection of languages to be used was based on the approval received from both municipalities and all those in attendance at the meetings.

Chief Moloi mentioned the existence of another Tribal Authority in the area. The Chief's surname was indicated to be Tshabalala. Chief Moloi did not have the contact details for Chief Tshabalala and was not keen to give more information.

Action: Follow up on contacting Chief Tshabalala, and establish contact details.

A1.31 PROCESS CONSIDERATIONS:

Due to the issues raised over the relevant languages to be used in the PPP materials this may need to be discussed as part of our PPP going forward.

During the meetings with both Local Municipalities it was agreed on the use of isiZulu however Chief Moloi's preferred the use of isiZulu.

Action: consider languages to be included in the next round of engagement or if there is motivation to reconsider the use of languages.

Chief Moloi's potential reluctance to provide details on the other Traditional Authority in the area may point to the fact that there maybe rivalry/political agendas between both Authorities in the area.

Action: confirm the presence of the traditional authority.

Consider the way in which both traditional authorities will be engaged during the PPP.

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Subject/Ref	Introduction of Kangra Coal Kusipongo Resource Expansion Project to the Department of Water Affairs
Venue	ERM Offices, Johannesburg
Date of Meeting	25 October 2011
Present	Please see attached attendance register
Distribution	All in attendance; Internal Hatch team; Internal ERM team
Date	3 November 2011

This minute serves as the record of the meeting between Hatch, HydroScience, Environmental Resources Management and the Department of Water Affairs (DWA) on 25 October 2011. The objective of the meeting was to introduce the Project to the DWA. In addition the meeting served to discuss the key sensitivities of the Project and the scheduling going forward.

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A member of the Environmental Resources Management Group

Welcoming to the Meeting	
• ERM welcomed all attendees to the meeting • HydroScience gave an introduction of all attendees	
Objective of the meeting as presented by HydroScience	**ACTION**
• Objectives of the meeting were identified (please refer to presentation attached as Annex B) • HydroScience identified that they will be submitting the Integrated Water and Waste Management Plan (IWWMP) to support the Integrated Water Use License Application (WULA) during the latter part of next year.	
Locality of the Project Area	
• HydroScience presented the locality of the Project including maps illustrating the Projects proximity to Ermelo, Piet Retief and Driefontein • The Study Area was identified including the current location of the Main Mine Adit, and Adits B & D	
Project Overview	
• The existing mine, proposed expansion and all associated infrastructure were identified • It was confirmed that there will be no electricity distribution lines running from Adit A to Adits B & D • The layout of the Main Mine Adit and associated infrastructure was discussed • The Kransbank Site was also identified and described to the DWA • The conveyor belt was identified as one of the new infrastructure items for the Project. The distance of the proposed conveyor belt was noted as being 7.3km in length • The depth to be mined was queried by the DWA, in addition to the thickness of each of the seams, and the overburden depth • When discussing the Project overview it was established that there are currently no plans for the underground storage of groundwater seeping into the underground workings. The DWA suggested that provision for a underground storage dam should be included in the Water Use License Application ***Please note it has now been confirmed that there will be a series of dams constructed underground as part of the Project***	• Confirm distance of conveyor belt to wetlands and crossings over • This information will be made available in the draft Scoping Report (DSR) • Include underground storage facility
NWA Section 21 Water Uses	
• The potential uses of water for the Project were outlined. The relevant sub-sections under Section 21 of the NWA were also identified • It was confirmed that a borehole (located just north east of the site) would be used as a potable water source. Water used in operations will be sourced from stormwater, groundwater seeping into the mine workings, and sewage. It was established that dirty stormwater will be cleaned and processed on site • The location of the sewage sludge drying beds, emergency overflow evaporation pond, and waste rock dump were identified as areas of concern by the DWA (discussed further under wetland section) • DWA noted that all infrastructure within 500 m of a wetland should be included in the Water Use Licence Application	
Water Environment	
• The water resources in the area were identified during the presentation. These include water management areas, quaternary catchments, and surface water resources (please refer to presentation attached as Annex B) • Surface water (particularly wetland at Adit A, rivers etc), and groundwater features in the area were identified as being in pristine condition. Water resources were identified at Adit B and D, thus it was agreed that the total Adit area of 500m² was necessary to allow for the ventilation shafts to be suitably positioned away from the wetlands	• This information

• The DWA queried the type of aquifers that are present in the study area. This is important for identifying the connectivity between shallow and deep aquifers in the area, and their influence on the wetland • The type of aquifers present will also inform which aquifers feed the wetlands, and therefore the depth of mining that should be conducted • The DWA recommended that groundwater monitoring systems are put in place for the boreholes taking into account both shallow and deep aquifers. Surface and shallow groundwater should be monitored monthly, and deep groundwater quarterly • The DWA requested that stormwater management on the Main Mine Adit be addressed. Particularly due to the proximity of the adit to the Hlelo River and its tributary the Ohlelo River • The EIA must not only look at the potential impacts on the immediate wetlands, rather potential impacts to the entire reserve and catchment need to be assessed • It was discussed that the Geelhoutboom Dam and Heyshope Dam may fall under the jurisdiction of the DWA. The EIA will also need to assess the impacts that the proposed Project may have on these two significant water resources. • The EIA will need to also assess the impacts that the proposed Project will have on springs in the area. Affected springs will need to be included in the Water Use Licence Application. • WULAs require a reserve determination to be completed by DWA before the licence can be issued. For this project a reserve would have to be done for the Ohlelo River and the affected wetlands. • It is possible for the Project to undertake a reserve determination but this has to be confirmed in writing by Ms. Barbara Weston and has to be done by specialists recognised by DWA. • The DWA requested that a decant and geochemical model must also be submitted. Acid base accounting and leachate results must be included. • It was established that water quality targets for the area indicate a TDS of 80mg/l. Thus it was questioned whether this could be honoured by the Project. • The DWA also indicated that the water quality of the old mine must be compared with the intended new activity taking into account current compliance at the existing mine.	will be made available in the draft Scoping Report (DSR) • Confirmation required under which jurisdiction the Geelhoutboom and Heyshope Dam fall under
Wetland – Adit A	
• The DWA identified that the conveyor belt crossings over the wetland are a concern. However the DWA voiced greater concern over the permanent infrastructure at Adit A, particularly because the majority of the Adit is located within a wetland. • At least a third of Adit A is located on wetlands – the DWA requested for the current ecological status of the wetlands to be included in ERM's assessment. • The sewage sludge drying beds and emergency evaporation pond are key red flags as they are too close to the Hlelo River. • The lining of the pollution control dams will be confirmed in the Scoping Report but it was believed that they would be lined with HDPE lining. • The Project needs to assess the impacts on deep and shallow aquifers in the area. • The DWA strongly recommended reviewing the position of Adit A. The DWA stressed the technical and financial implications of the current siting. If the groundwater level in the Main Mine Adit area is shallow this will result in large volumes of water in the workings area. Water from the wetland will also be dewatered as the water will be drawn to the underground workings. Dewatering the wetland would also require a Section 21(a) WUL. • The waste rock dump was also identified as a red flag by the DWA. Reason being that the soils on which the dump will be located are unstable, which may result in the rock dump cascading into the Ohlelo River. • Given the reasons above, it was identified that a wetland study must be conducted to understand whether the wetlands are fed by groundwater aquifers (shallow or deep) or surface water. • The wetland assessment must include an assessment of the area within 500 m of the wetland. • An estimate of the probability that the WULA would be approved given the location of Adit A and the project intention to investigate a suitable biodiversity offset was requested from the DWA. • In response to the above Dr Meulenbeld responded that with the current positioning of Adit A, there was a 20% probability that the WULA would be approved by the DWA. • In addition Dr Meulenbeld raised the concern of water infiltration into the Adit A area.	• This information will be made available in the draft Scoping Report (DSR)

Consequently there will be water management and treatment costs which maybe financially viable during the life of the mine. However once the mine closes this will become a government problem, and it is therefore perceived to be a significant liability. • It was stressed that the rehabilitation funds available from Financial Provision set aside for mine closure would be insufficient to cover the costs of water management and treatment. • The DWA strongly recommended shifting Adit A out of the wetland. This would result in a decreased risk of impacting on receiving water resources. This would also increase the chance of the WULA being approved to over a 60% probability.	• Assessment of the current location of Adit A to be conducted
Wetland – Adit B	
• Wetland areas at Adit B were discussed. • . The ventilation shaft must be sited outside of the wetlands. If any groundwater decanting is required then a license must be applied for.	
Wetland – Adit D	
• Again the area for the ventilation shaft should be sited away from the wetland. Consideration must be given to ensure that the access road does not encroach on the wetland.	
Wetlands and Mining	
• The ecological and social ranking (functionality) of the wetland is also a key factor in the assessment for a WULA. • The DWA identified that the mining plan must overlay all watercourses on a master plan. • The DWA also identified that a soil map of the area is required. The map must cover all mining and wetland areas. • From the sensitivity studies conducted by ERM thus far the wetland has been ranked between 4.0 and 5.0, as such these wetlands are in a near pristine condition. • The DWA stated that wetlands with such a rating are almost a no-go. If the ranking of a wetland of such pristine condition is lowered as a result of the Project, it will be very difficult to implement ecological offsets (refer to comments on offsetting below). • It was established by the DWA that for this Project they are not in favour of the offsetting option. The wetland that is to be disturbed/lost is in pristine condition. It is impossible to restore wetland offset areas to a functionality ranking like that of the wetland proposed to be disturbed at Adit A. • On the topic of offsetting the DWA stated that to effectively offset the impacts the Project would need to have an overall positive balance. This would effectively mean upgrading another wetland to pristine condition (and to the same ecological functionality) which is almost impossible and economically unviable. Furthermore the wetlands functionality on water quality is difficult to achieve through offsetting. • The DWA requested for the impact of establishing infrastructure near wetlands to be reassessed, as this Project (as it stands) has a high probability of impacting on the greater catchment. • DWA noted that adit locations in wetlands were common in water use licence applications because this often happened to be the easiest route for accessing the resource. If all the water management and treatment costs over the life of the mine (including the technical design aspects for the water) due to placement of the adit in the wetland were considered, the Adit A location may not prove to be the best location. • The upcoming COP17 in Durban will look towards identifying areas of high conservation status in South Africa. This will put pressure on the DWA to conserve areas such as where the Project is located. • The key point stressed by the DWA was the impact of dewatering on the wetland. • The geology of the area will also influence the impacts. The DWA stressed the importance of including information on soils in the EIA report. • Hatch questioned that if all the possible Project alternatives had been assessed and this positioning was deemed the most reasonable and feasible option, what would the DWA's requirements be if the Project was approved? The DWA responded that if the application was not denied, there will be certain restrictions to the Project. . Such restrictions / conditions of	

the WUL may also render the project economically unviable or not feasible. The Client must carefully assess the risks of the positioning of Adit A, and the financial costs associated with this. • The DWA asked whether ERM will be taking into account the impacts that are associated with current Kangra Coal mining operations in the area. ERM/Hatch responded that the cumulative impacts will be assessed in the EIA report. • Stormwater outlets for clean stormwater runoff into the receiving river courses must not be erosive. As such, energy dissipaters need to be included in Project design and stormwater inflow and outflow rates (m^3/s) need to be calculated. • If the DWA had to grant a WUL for a Project such as this, it would set a negative precedence for other mining Projects in the area, and will place the DWA in a difficult position.	
Public Participation Process	
• Eskom was identified as a potential stakeholder given their interest in the surrounding dams. • In addition the importance of trans-boundary impacts was discussed. This included international agreements with countries such as Swaziland. The importance of this being that Swaziland is fed by water from this area. • The local community needs to be included in discussions on the use of water resources in the Project area, particularly the use of the springs. • The DWA confirmed that it is best practice to extend the 60 day comment period to all stakeholders in the process. • Mr Pieter Viljoen and Mr Kelvin Legge from the National DWA need to be included on the stakeholder database, on dam infrastructure, water quality and international obligations.	
Schedule	
• The schedule for the EIA process and all associated license applications was outlined by ERM. • With regards to the WULA, Hatch queried whether geological exploratory drilling could go ahead on and around the wetland before the WULA for the greater Project is concluded. • In response to the above, the DWA stated that a separate application must be lodged for any geological exploratory drilling on the wetland (and within the 500 m radius of the wetland). However given the DWA's knowledge of the application's association with the proposed Project the DWA raised concerns over authorisation. Dr Meulenbeld stated that authorisation for geological exploratory drilling (and any damages to wetlands) is dependent on the view of the greater application. • The DWA estimated that the licensing period for exploratory drilling will be approximately one week for the National DWA to review and issue authorisation, if all supporting documentation is sufficient and appropriate. • The DWA estimated that the processing and potential approval of the WULA for the greater Project will take approximately six months. These timeframes however assume that all the necessary supporting information accompanies the application.	
Additional	
• The DWA requested for the colour scheme on the site layout maps to be changed. They requested for clearer delineation on the map between the clean and dirty water systems. • In the EIA report the Main Mine Adit (Adit A) layout needs to be overlaid on the wetland delineation map for the area. • No regional water quality guidelines are available. The baseline water quality for the area was therefore important information for the department consideration of the WULA.	

Annex B4

Comments and Response Report

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Question on the distance from the existing mine to the proposed mine. In addition whether mining activities would continue at the existing mine	ZH Luhlanga - Speaker	Dr Pixley Kalsaka Seme Local Municipality	20-Jul-11	Public Participation Meeting with municipality	The approximate distance between the existing and proposed mine is 7km. Mining activities will be ceasing at the existing mine, but the proposed mine will allow for the transfer of employees from the existing mine to the proposed mine	Project description
Query as to why the shaft and surface infrastructure located at Adit A is not located on the Kransbank farm	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	Various factors informed the identification of potential coal access locations. Please refer to Chapter 2 of the Social and Environmental Management Programme, which discusses the siting alternatives associated with the Main Mine Adit	Project description
Would like confirmation on the exact location and extent of the mining at Adit A	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	Please refer to Chapter 3 in the Social and Environmental Management Programme for a full description of the proposed Project.	Project description
Request for more information on mining aspects including the type of coal to be mined, depth and thickness of layers to be mined.	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	Coal to be mined is bituminous, depth 30-300 meters and thickness 1.5-4 meters. Please refer to Chapter 3 of the Social and Environmental Management Programme for a detailed description of the proposed Project.	Project description
Request for confirmation that the underground mine will not effect any surface infrastructure or people living on top of the land.	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	Mining design criteria have been established to eliminate the possibility of surface subsidence.	Project description
What is ventilation and how does it work?		Community Member	27-Jan-13	Twyfelhoek CPA Meeting	A ventilation system will be designed for the new mine as required in terms of the legislation. Ventilation supplies the main fresh air intake and exhaust.	Project description
Which area of Kusipongo is the mine going to be located at?	Mgezeni Hlatswayo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Please refer to Chapter 3 (Project Description) of the Social and Environmental Management Programme which provides a detailed description of farms on which the Kusipongo Resource Expansion Project will be located .	Project description
There was no ventilation for the previous mine, why will there be ventilation for this mine?		Community Member	27-Jan-13	Twyfelhoek CPA Meeting	There is a ventilation system for the current operations. A ventilation system will be designed for the new mine as required in terms of the legislation. Ventilation supplies the main fresh air intake and exhaust.	Project description
What is the difference between Kusipongo/Kangra/Maquasa East and Maquasa West?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Kangra Coal is the Company itself, and Kusipongo, Maquasa East and Maquasa West are the different prospecting or mining rights owned by Kangra Coal.	Project description

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
How many hectares of land will be affected by the Kusipongo Project?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	The mining rights area will cover a number of farms, spanning an area of 15, 252.05 ha. In terms of surface infrastructure, the proposed Project is expected to have a infrastucture development footprint of approximately 60 ha. The Adit footprint will be around 18 Ha, and the conveyor belt will affect 27 Ha along its 7 Km length. A detailed breakdown of affected farms and hectares for the area applied for in terms of mining rights and surface infrastructure is provided in the Project Description (Chapter 3 of SEMP).	Project description
What is the life of the mining operation?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	The current mining operations have a remaining life of mine of 2-3 years. The new Project has an estimated life of 10 to 20 years depending on our ability to unlock some potential markets.	Project description
What is the length of the operation?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community		Project description
Will coal storage be open and thus there may be dust problems?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	In the Adit there will not be open coal storage. Coal will be stored in a 7, 500 ton carryin capacity silo prior to transportation on the conveyor to the existing beneficiation plant. This will minimise dust impacts. It is anticipated that there will be dust impacts however associated with the mining operation. These have been modelled in the air quality specialist study which is detailed in the Social and Environmental Management Programme in Section 9.6 of the report.	Project description
Will the coal on site be stockpiled? Dust will be generated from this stockpile.	Jabulane Ngwenya	Driefontein Community Forum	29th-Jul-13	Meeting with Driefontein Community representatives		Project description
What is the depth of the proposed mining operation?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	The mine will reach up to 250 m depth. Although at the commencement of the mining operations the coal will be close to the surface, given the topography of the terrain, the operation will soon reach more than 100 m depth.	Project description
Will water storage dams be lined?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	The stormwater and the make-up water dams will be plastic lined, the emergency eveporation pond will be earth lined.	Project description
We request a clear map outlining where all the proposed infrastructure is located.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	This is detailed in the Social and Environmental Management Programme (see Figure 3.1 and 3.2). An additional copy of this report has been made available directly to the meeting attendees.	Project description

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
What number of people will be staying in the temporary construction camp?	Malusi Yende		27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	It is expectd that 250 people during the construction phase will need to be accomodated at the temporary contractors camp.	Project description
Will the conveyor belt impede movement across the area?	Malusi Yende		27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	The conveyor is designed to allow for crossing points for vehicles, pedestrains and livestock.	Project description
Will the access roads provided for the project be surfaced as per the existing roads used by Kangra in the area? Where will these be located?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	The access road connects the District road (D2548) to the main mine adit. The road will have a premix surface and be designed for heavy traffic. The intersection with the District road will be widened to allow vehicles to pass vehicles turning into the mine, and will be designed to ensure adequate sight distances. Concrete edge beams will be placed on either side of the road to protect the road edge and allow storm water to flow freely off the road surface. A light duty concrete lay-bye will be provided as a waiting area for trucks requiring security clearance into the mine. A cast in-situ concrete bridge will be provided to allow the access road to enter the adit site. For the ventilation adit, a gravel service road through to ventilation Adit B is proposed to follow the alignment of existing farm tracks.	Project description
Is the Kusipongo Project an open cast or underground project?			28-Jul-13	Meeting with 7 Affected CPAs	The proposed Kusipongo Project is an underground operation.	Project description
Where are the proposed project activities located relative to Prospect 1 and 2?			28-Jul-13	Meeting with 7 Affected CPAs	Prospect 1 and 2 are outside of the proposed study area, but immediately to the north.	Project description

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
What are the names of the farm portions affected	B Masinda	Driefontein Development Council	29th-Jul-13	Meeting with Driefontein Community representatives	The following properties form part of the current mining rights application: Beelzebub 13HT, Portions 1,3,4,6 and Rem; Blinkwater 34HT, Portions 1, 2 and Rem; Boschbank 11HT Portions 2 and Rem; Donkerhoek 10HT Portions 1, 3 and Rem; Donkerhoek 14HT Portions 2,5,6,7,8,9,10,12,13,21,22, 11 Rem and Rem; Kikvorschfontein 35HT Portions 1 and 2; Kransbank 15HT Rem; Langverwacht 20HT Portions 1, 2 and 3; Mooihoek 12 HT Rem; Oogiesfontein 17HT Portions 1 and Rem; Roodepoort 38HT Portions 1,2,3 and Rem; Twyfelhoek 379 HT Portions 1,2,3,4 and Rem.	Project description
What is the location of the proposed mine adit?	M. Ndlovu	Driefontein Community Forum	29th-Jul-13	Meeting with Driefontein Community representatives	The proposed Main Mine adit is located on Donkerhoek 14HT, Portion 4 and Twyfelhoek 379IT, Portions 2 and 3.	Project description
Where is the proposed conveyor belt situated. Is there a chance to change the alignment of the conveyor belt to minimise resettlement impacts. What opportunity does this forum have to influence decisions at this stage of the project?	S.W. Gama	Driefontein Community Forum	29th-Jul-13	Meeting with Driefontein Community representatives	The proposed coveyor is situated across Twyfelhoek 379 IT, Portions 3, Rem of 2 and Rem; Nooitgezien 381IT, Rem and Rooikop 18HT, Rem. In line with best international practise, the alignment of the conveyor belt will be fixed to avoid resettlement wherever possible. The Social and Environmental Management Programme has not been finalised yet and therefore consideration is still being given to project alternatives. Upon an environmental authorisation decision being made, there will be no further changes to the conveyor belt alignment.	Project description
For which area is Kangra applying for rights? We are concerned that Kangra will mine for coal outside there mining rights area	S.W. Gama	Driefontein Community Forum	29th-Jul-13	Meeting with Driefontein Community representatives	The area proposed for the mining rights application is detailed in the Social and Environmental Management Programme (See Section 3.1). Kangra will not be able to mine outside the area that they are authorised to do. The mineral rights in this area will be owned by the State.	Project description
Is the coal exported?	Glenn Ramke	Endangered Wildlife Trust	30-Jul-13	Meeting with landowners and NGOs	Approximately two thirds of coal is currently exported through the Richards Bay Coal Terminal. The proposed Project will continue to export at a similar ratio.	Project description

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Will Kangra Coal need to apply for a new mining area?		Local politician	30-Jul-13	Meeting with local authorities and politicians	Yes. The Social and Environmental Management Programme is being undertaken to support an environmental authorisation decision for a Mining Rights Application.	Project description
Who are the current land owners where the proposed expansion is located?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	The current landowners in the area of the proposed expansion which forms the subject of this SEMP for the Kusipongo Project are Mr CFJ Greyling, eKanluka Community, Yende Community and Kangra Coal. Kangra Coal has however submitted a mining rights application to DMR which covers a wider project area and involves additional landowners. These include: Mr Rudi Kemp, Mr Pine Pienaar, Mr Koos Wessels and Mr Jannie Du Plessis. It has not been possible to contact all of these landowners. This is detailed further in Chapter 6 of the SEMP.	Project description
What are the names of the directly affected farms?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	The names of the direclty affected farms are provided in Chapter 3 (Project Description) of the Social and Environmental Management Plan.	Project description
Where is the GCS project located?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	The GCS Project is located in the exisitng Kangra Coal concession area (i.e. - as part of this Project Kangra Coal will not be applying for new mining rights). GCS are investigating a number of alternatives for proposed open cast mines in Maquasa East and Maquasa West.	Project description
Will Kangra Coal extend to other farms under ground for this proposed expansion?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Yes - underground mining operations associated with the Kusipongo Resource Expansion Project will extend onto other farms, this is explained in Chapter 3 of the Social and Environmental Management Programme. As such Kangra Coal will be applying for mining rights on these farms.	Project description
There is a court case between the government and some land owners, thus the provision of some information could be helpful. This is particularly with reference to the properties involved.	Mr Weber	Landowner	29-Jan-13	Landowner Focus Group Meeting	The details of all the farms that will be affected by the proposed Kusipongo Resource Expansion Project are provided in Chapter 3 of the Social and Environmental Management Programme.	Project description
It has been reported in other public forums that there is another company that holds the prospecting rights for the proposed Kusipongo project area. Clarity is required in this regard.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	This has been clarified in subsequent communications and Kangra is the only prospecting rights holder for the properties forming part of the Kusipongo Project.	Project description
What mining method is proposed for the Kusipongo Project?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Conventional Underground Bord and Pillar Mining with continous miners is the intended mining method.	Project description

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
How many accidents have been reported at the mine so far? What is the risk of pillar collapse?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	An industry specialist was used to design the pillars, which are designed to remain standing even after the end of the life of mine. Kangra Coal's accident rates have shown significant improvement over the last four years. There was one fatality last year, which was classified as a suicide. There has been one accident over the last seven months, with no incidents of pillar collapse.	Project description
What are the safety plans for Kangra Coal?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal has a 'Zero Accidents, Zero Harm' Policy.	Project description
Who are the rock engineers working for Kangra Coal?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Big C Rock Engineers and Nilen v.d Merwe from Wits University.	Project description
What is the remaining life of the current operations?	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting	The remaining life of the current operations is 2-3 years. This is one of the reasons why the Kusipongo Project is proposed.	Project description
ERM recommended to make direct contact with farm owners, rather than just rely on PPP. Similarly, for affected communities noted that distribution of flyers is not sufficient and that these would need to be augmented with face-to-face engagement to ensure full understanding	ZH Luhlanga and Mr Mavuso	Director of Urban & Economic Development and Dr Pixley Kalsaka Seme Local Municipality	20-Jul-11	Public Participation Meeting with municipality	Noted. The PPP has been expanded to allow for more direct contact with these directly affected communities. Please refer to Chapter 6 of the SEMP for further information in this regard.	Stakeholder engagement
Draft Scoping Report should be sent to the Director of Planning and Economic Development. He will champion this internally, summarising key aspects of the project for Council.	Mr Mavuso	Director of Urban & Economic Development	20-Jul-11	Public Participation Meeting with municipality	The Social and Environmental Management Plan will be provided directly to Oupa Mavuso.	Stakeholder engagement
It was suggested that ERM should work with councillors (Ward 2) to identify the directly and indirectly affected stakeholders as well as other possible interested stakeholders	General suggestion		21-Jul-11	Public Participation Meeting with municipality	Noted. The stakeholder database has been compiled through an information gathering process with inputs from key stakeholders.	Stakeholder engagement
Suggestion that the establishment of a stakeholder database would need to occur through an information gathering process	General suggestion		21-Jul-11	Public Participation Meeting with municipality		Stakeholder engagement
Municipality potentially proposed a meeting with Dr Pixley Kalsaka Seme Municipality (if necessary) as the project spans across both municipalities	General suggestion		21-Jul-11	Public Participation Meeting with municipality	Noted. This has been taken into consideration in the public participation plan for all engagements on the project.	Stakeholder engagement
Chief Mthethwa noted the importance of engaging with the relevant communities and indicated this could be achieved through engaging with the correct Traditional Authority	Chief Mthethwa	Tribal Authority - Mkhondo Local Municipality	21-Jul-11	Public Participation Meeting with municipality	Noted. This has been taken into consideration in the public participation plan for all engagements on the project.	Stakeholder engagement
Request for materials to be translated into Sesotho in the future. Disagreement on the use of isiZulu as a means of communication for the PPP	Chief Moloi	Tribal Authority - Dr Pixley Kalsaka Seme	29-Jul-11	Meeting with Chief Moloi	Noted. Materials from the Scoping Phase will be translated into Sesotho as well as isiZulu, Afrikaans and English where required.	Stakeholder engagement
Noted that he is fully aware of EIA processes and the potential (negative) impacts of mining projects	CL Greyling		21-Jul-11	Meeting with CL Greyling	Comment noted.	Stakeholder engagement

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Request for full inclusion of all communities (7) in the PPP and in any negotiations with Kangra Coal	Dr Yende	Yende community - Dr Yende	22-Jul-11	Meeting with Dr Yende	This has been taken into consideration in the public participation plan for all engagements on the project. It should, however, be noted that directly affected communities have been engaged with differently from neighbouring communities because of the difference in the way in which the project will impact upon them.	Stakeholder engagement
Raised concerns about the existing relationship between Kanluka and Kangra Coal where engagement has not been extended to other communities. Noted potential to cause fragmentation between communities	Dr Yende	Yende community - Dr Yende	22-Jul-11	Meeting with Dr Yende	Noted. ERM has communicated this to Kangra Coal. The PPP is aimed at engaging with all Interested and Affected parties.	Stakeholder engagement
Raised concern about the proposed location of the meeting, and potential need for transportation to be arranged	Dr Yende	Yende community - Dr Yende	22-Jul-11	Meeting with Dr Yende	Noted. Further engagements will take cognisance of this constraint.	Stakeholder engagement
Noted potential conflict within the Yende community particularly with the election of a new Chairperson	Dr Yende	Yende community - Dr Yende	22-Jul-11	Meeting with Dr Yende	Noted. This will be considered in future engagement in the area.	Stakeholder engagement
Recommended proactive and positive engagement with stakeholders, identifying the fact that stakeholders can take an aggressive approach during EIA processes	Andre Steenkamp	Birdlife South Africa	21-Jul-11	Meeting with Andre Steenkamp	Agreed. To date, ERM has proactively sought to identify key stakeholders, including stakeholders with an environmental interest. More extensive engagement is also planned with key stakeholder groups.	Stakeholder engagement
Recommended that there is sufficient interest to run a public meeting in Wakkerstroom, but also noted the advantage of having one integrated meeting	Andre Steenkamp	Birdlife South Africa	21-Jul-11	Meeting with Andre Steenkamp	ERM believes that there are advantages of convening an integrated meeting where stakeholders with different interests come together. There will, however, be opportunities to engage through one-on-ones or bilaterals with stakeholders in Wakkerstroom if required/requested.	Stakeholder engagement
The entire community must be invited to these sort of meetings.	Julia Masondo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	A broader open day and community meeting was held in Driefontein on 30th January 2013 and all community members were invited to attend. CPA Meetings preceded this meeting to ensure appropriate notification of the community leadership and directly affected I&APs.	Stakeholder engagement
What is the reason that only committee members are invited?	Julia Masondo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting		Stakeholder engagement
Community Meetings should be held close to areas that are directly affected because some people do not have transportation to get around.	Julia Masondo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted. The stakeholder engagement strategy for the remainder of the environmental authorisation process will take cognisance of this.	Stakeholder engagement
Why is the community meeting taking place in Driefontein which is so far from where the project is proposed to happen?		Community Member	27-Jan-13	Twyfelhoek CPA Meeting		Stakeholder engagement

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Some committee members did not get invitation letters to the meeting. This seems unfair to other committee members.	Senzo Nkumane	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Letters of invitation were provided to the chairpersons of the CPAs with the request to notify all committee members thereof. Concern has been expressed by some of the CPA members with regard to providing contact details and for this reason ERM will make contact and brief chairpersons for all future engagements.	Stakeholder engagement
ERM/Kangra Coal must come back to give feedback to the entire community.	Julia Masondo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted. The stakeholder engagement strategy for the remainder of the environmental authorisation process will take cognisance of this.	Stakeholder engagement
The community must meet on their own and get all their queries together so that they can be discussed in a structured manner on the next round of meetings	Jacob Yende	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted and effort appreciated.	Stakeholder engagement
It is good that there is now communication between Kangra Coal and the communities through public participation processes. The meetings are blessed and appreciated.	Jacob Yende	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted. Thank you.	Stakeholder engagement
People do not need to provide signatures because of a fear of forgery of their signatures. People will write names on the register but not sign it.		Community Member	28-Jan-13	Makotas	Comment noted. The stakeholder engagement strategy for the remainder of the environmental authorisation process will take cognisance of this.	Stakeholder engagement
Signatures seem as binding and people don't want to be bound to anything.		Community Member	28-Jan-13	Makotas	See comment above	Stakeholder engagement
We agree with the young lady. Only names and numbers should be put on the register. There is no need for signatures.	Mr Dlongolo	Community Member	28-Jan-13	Makotas	See comment above	Stakeholder engagement
ERM must come back with feedback to the communities regarding the steps taken by Kangra Coal to rectify their mistakes. Also to report on the development of the project.	Enoch Khumalo	Jagdrift Community	28-Jan-13	Makotas	ERM will respond to the community as required in terms of the environmental legislation of South Africa and will provide the results of the specialist investigations, assessment of impacts and proposed management commitments. Steps taken by Kangra to rectify historical issues need to be addressed and reported on by Kangra directly.	Stakeholder engagement
How broad has the consultation process for the project being?					The stakeholder engagement programme for this project has entailed the following activities to ensure the open involvement and registration of interested and affected parties: media notices, site notices, use of a loud hailer to announce community open day and public meeting, notification of public engagements through the CPAs and holding a meeting and public open day on 30th January 2013 in the Driefontein community. Broader participation is welcolmed.	Stakeholder engagement
What are the deadlines for the commenting period?	Lerato Molopo	Mkhondo Local Municipality	29-Jan-13	Officals Focus Group Meeting	The Draft Scoping Report is available for public comment until 8th March 2013.	Stakeholder engagement

Comment and Response Report
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Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Did ERM/Kangra Coal make sure all the stakeholders or interested and affected parties are invited to community meetnigs?	Councillor Nkosi	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting	All notification measures have been undertaken to ensure that stakeholders are aware of the scheduled meetings. The notifications include direct invitations, newspaper adverts, site notices and loud hailing methods within the communities.	Stakeholder engagement
Spreading the message about the project meetings through the use of loud hailer is the best form of communication with the communities.	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting	Noted. This has been done and will be utilised for further stakeholder engagement.	Stakeholder engagement
ERM should consider presenting to CRDP to extend the level of communication with communities.	Olivia	Kangra Coal	29-Jan-13	Officals Focus Group Meeting	This was discussed further at the meeting with the ward councillors and it was agreed that this was not a suitable forum at which to present.	Stakeholder engagement
The Councillors would like another feedback meeting during the assessment phase to be held as per this round of consultation.					Comment noted. The stakeholder engagement strategy for the remainder of the environmental authorisation process will take cognisance of this.	Stakeholder engagement
When is the comments period for the DSR closing?	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	The Draft Scoping Report is available for public comment until 8th March 2013.	Stakeholder engagement
There are people that can't read or write, they need assistance with signing the register.	Beauty Grootboom	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Beauty provided assistance at the meeting. ERM would like to thank her for that.	Stakeholder engagement
The Driefontein taxi association would like to be consulted when there is a need for transportation for Kangra Coal.	Joseph Mlambo	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted and accepted. This has been done in the past.	Stakeholder engagement
The public meeting is appreciated. Further Kangra Coal should return with some feedback for the communities.	Cinile Shongwe	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted. The stakeholder engagement strategy for the remainder of the environmental authorisation process will take cognisance of this.	Stakeholder engagement
The next meetings should be made public as well and not in secret.	Cinile Shongwe	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted. The stakeholder engagement strategy for the remainder of the environmental authorisation process will take cognisance of this.	Stakeholder engagement
Is the entire community informed about this meeting taking place at the moment?	Jackson Dlodlo	Community Member	30-Jan-13	Driefontein Open House Meeting	The stakeholder engagement programme for this project has entailed the following activities to ensure the open involvement and registration of interested and affected parties: media notices, site notices, use of a loud hailer to announce community open day and public meeting, notification of public engagements through the CPAs and holding a meeting and public open day on 30th January 2013 in the Driefontein community. Broader participation is welcolmed.	Stakeholder engagement
It is appreciated that Kangra Coal has called these meetings and initiated communication with the affected communities.	Maria Ndlovu	Community Member	30-Jan-13	Driefontein Open House Meeting	Comment noted.	Stakeholder engagement

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Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
How long will the environmental studies take to be completed and made available to Interested and Affected Parties?	Goodboy Fakweni	Community Member	30-Jan-13	Driefontein Open House Meeting	ERM anticipates that they will have a Draft Social and Environmental Management Plan available for public review by mid June 2013.	Stakeholder engagement
The public consultation for the EIA and SEMP phases of this application remain incomplete. Public participation meetings planned for 23 April and 21 may were both cancelled, yet no new dates or adequate alternative communication was arranged. This is a fatal flaw and reflects poorly on the environmental consultants.	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter	ERM assumes that this refers to the GCS open cast project as ERM did not have any meetings scheduled for this date. ERM meetings (preliminary feedback) were scheduled the week previously (16th-18th May 2013) and the landowner and NGO meeting was not cancelled, but there was not attendance due to service delivery protests in the area. Further feedback meetings have been held between 26th and 31st July 2013 to which Birdlife South Africa was invited.	Stakeholder engagement
Ongoing feedback on the project is required through the life of the operation.	Chief Tshabalala	Traditional Leader	30-Jul-13	Traditional Authority Meeting	A Stakeholder Manager is available at Kangra for this purpose. Your comment has been noted.	Stakeholder engagement
We suggest that a communication structure such as a Trust be developed which comprises all of the affected communities and all communication is fed through this Trust.	Chief S Yende	Traditional Leader	30-Jul-13	Traditional Authority Meeting	There is a Community Forum that has recently been established for the existing operations. The new project could result in the establishment of a new, but similar body or an extension to the existing Forum.	Stakeholder engagement
Workshops should be held with the local communities to inform them about the project, what the mining process entails and hence promote skills development.	Chief Tshabalala	Traditional Leader	30-Jul-13	Traditional Authority Meeting	This suggeston has been noted.	Stakeholder engagement
Kangra is thanked for this meeting. It has been fruitful. Improved communication will minimise the possibility for service delivery protests.	Chief Yende	Traditional Leader	30-Jul-13	Traditional Authority Meeting	Comment noted. Thank you.	Stakeholder engagement
Communication is required with the Kangra officials. They need to visit Chief Moloi personally.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	This has been communicated to Kangra management and a meeting will be arranged through the Stakeholder Manager at Kangra	Stakeholder engagement
We have had insufficient time to digest the content of the non-technical summaries and presentations. Some of the traditional authorities did not receive non-technical summaries.		Traditional Leader	26-Jul-13	Traditional Authority Meeting	Further information was provided to the traditional authorities and a further meeting was scheduled and held on 30th July 2013.	Stakeholder engagement

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There is significant information being presented in this meeting, that we do not have time to digest. Telephonic follow up may be required.	Chief Tshabalala	Traditional Leader	26-Jul-13	Traditional Authority Meeting		Stakeholder engagement
Please invite the Dreifontein Development Forum to participate in the meetings with the Driefontein Community in future.		Driefontein Development Council	29-Jul-13	Meeting with Driefontein Community representatives	This suggestion has been noted.	Stakeholder engagement
Please can a copy of the full report be placed closer to the affected communities.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	An additional copy of this report has been made available directly to the meeting attendees.	Stakeholder engagement
The community is unhappy. The community does not trust Kangra. Community is being affected by the mining. Kangra needs to improve there relationship with the community. The community want to have a good relationship with Kangra.			29-Jul-13	Meeting with Driefontein Community representatives	It is Kangra Coal's goal tohave a fruitful and healthy relationship with the communities in the area. Kangra is working on amending past issues and trying to improve on the relationship.	Stakeholder engagement
The Driefontein Business Forum is trying to override the Community Forum. This needs to be resoleved internally in Driefontein			29-Jul-13	Meeting with Driefontein Community representatives	Comment noted.	Stakeholder engagement
Our client has already raised various concerns during numerous meetings with Kangra, both individually and as part of the public participation process. These have not been addressed in the SEMP. Mitigation of the major signficant impacts detailed in the SEMP is of concern.		Shepstone & Wylie on behalf of Mr Greyling	14-Aug-13	Email	Clarity has been sought from Shepstone and Wylie with regard to Mr Greyling's specific concerns.	Stakeholder engagement
Why is the meeting with Driefontein being held at Welgekozen Lodge in Piet Retief? The Community Forum are not truly representative of the Driefontein Community and have not been elected for this role.	Marian Zadlamini	Driefontein Community Member	24-Jul-13	Telephonic comment	The meeting that was held at the Welgekozen Lodge on 29th July 2013 was with the Driefontein Community Forum and was not intended to be an open invitation to any community members. Kangra has advised ERM that these parties have been elected into this role at an open public meeting and thus until tested it was assumed that they were representative of the community. This meeting was also attended by the Driefontein Development Committee who also highlighted the need for their involvement. Kangra will expand future committee meetings to include these parties.	Stakeholder engagement

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It is imperative for the YENDE FARMERS TRUST that a favourable, long term relationship be developed between the parties with the main AIM: • To participate in the social and economic life of the community; • Promote employment and training opportunities for the community; • Sustainable contribution to the ECONOMIC ', SOCIAL, and EDUCATIONAL well being of the community.	Johan Potgieter	Mentor of the Yende Farmers Trust	05-Mar-13	Written Comment	It is Kangra Coal's goal tohave a fruitful and healthy relationship with the communities in the area. Kangra is working on amending past issues and trying to improve on the relationship.	Stakeholder engagement
Will there be any transportation provided to ensure that people from distant areas can attend the meetings?	Chief Moloi	Traditional Leader	30-Jan-13	Driefontein Open House Meeting	For future stages of stakeholder engagement, consultation will be held with the affected CPAs and their communities closer to where they reside. This will ensure their participation. General community open days are likely to be held further afield.	Stakeholder engagement
Question as to how this proposed project will benefit their community, not only from an employment perspective but also in terms of sustainable development and investment in the area	ZH Luhlanga - Speaker	Dr Pixley Kalsaka Seme Local Municipality	20-Jul-11	Public Participation Meeting with municipality	Kangra Coal responded that their SLP will aim to answer this. ERM also pointed out that the public participation process is an excellent opportunity for relationship building between the municipality and Kangra Coal	Community development
Raised the importance of ensuring sustainable benefits to the community for the long term (including unborn generations)	Dr Yende	Yende community - Dr Yende	22-Jul-11	Meeting with Dr Yende	The ESIA study identified general perceptions from stakeholders in the area with regard to a lack of visible benefits, including local development and employment, from over a decade of Kangra Coal's mining activities in the Study Area. It also noted that there are seemingly high expectations associated with employment as well as extremely high levels of community frustration and anger based on perceptions of limited local employment opportunities and benefits from current Kangra Coal projects. It is not anticipated that there will be significant additional employment opportunities as a result of the Kusipongo	Community development
Voiced the concern that less infrastructure on Kanluka property (compared to other properties) will decrease the flow of benefits to the community. Kanluka would like to see benefits from the proposed project	Representatives present at meeting		22-Jul-11	Meeting with Kanluka community		Community development
Benefits arising from the mine should be shared among all the affected communities.	Mbangani Mabasa	Community Member	27-Jan-13	Twyfelhoek CPA Meeting		Community development

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There are other communities that are somewhat far from the proposed mining area, but are still affected by the proposed mining activites. Those areas should also reap the benefits of the mine.	Mbangani Mabasa	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Project, but current positions at the existing Kangra mining operations will be retained as far as possible when current mining operations cease. Kangra Coal will ensure that benefits for local residents are visible and understood as a trade-off for the limited employment opportunities. A Community Benefit Agreement will be drawn up in which realistic benefits, financial and developmental, and this agreement will be negotiated with CPAs. Lastly, all Kangra Coal activities related to social development or social investment projects will be fully documented and communicated so that residents of the Study Area and surrounding communities can see community benefits from the presence of the company in their area. At this stage, these benefits may include development projects where people's skills are developed for other employment opportunities or the establishment of entrepreneurial training for self-employment. Kangra Coals current SLP highlights some of these possibilities. Furthermore, as per Kangra Coals current SLP, a Community Skills and Capacity Development Programme will be implemented, which aims to increase Grade 12 pass rates in maths and science (see Chapter 10 of the SEMP).	Community development
How will the directly affected land owners benefit from the proposed project?	Jabulani Nhleko	Community Member	27-Jan-13	Twyfelhoek CPA Meeting		Community development
Are there any measures taken to ensure that the community of Driefontein benefits from the mine? How can this be proven?	Zanele Ngwenya	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting		Community development
Kangra has come and worked on the land for many years but has not provided any benefits for local residents. Residents are asking for some assistance with basic needs.	Jabulile Hlatswayo	Community Member	30-Jan-13	Driefontein Open House Meeting		Community development
The community does not have faith in Kangra Coal therefore any commitments proposed for the new project should be documented and addressed in the social labour plans.	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting		Historical issues
We are a community affected by the proposed project who wishes that a favorable, long-term relationship be developed between Yende Farmers Trust and Kangra. We want Kangra to: participate in the social and economic life of the community; promote training and employment opportunities for the community; and create sustainable economic, social and educational well-being in the community.	Johan Potgieter	Yende Farmer's Trust	30-Jan-13	Email		Community development
Is it possible to have a different company that can train and employ young people in the community to work on these mining projects.	Thulani Nkosi	Prospect 2 Community	28-Jan-13	Makotas	As is mentioned above, Kangra Coal have committed to benefits associated with development projects where people's skills are developed for other employment opportunities or the establishment of entrepreneurial training for self-employment. At this stage, Kangra Coal is the only large corporate company in the Study Area.	Community development
There must be a mine plant in the area that is under the control and/or supervision of the local municipality that ensures that benefits filter down to the local residents.	Enoch Khumalo	Jagdrift Community	28-Jan-13	Makotas	Comment noted. The Municipality would need to initate such a project.	Community development
Does Kangra provide sponsorship to churches?	Carmen Pieters	Community Member	24-Jan-13	Email	The mine does not support religious and political groups and its donation policy rather focusses on Health and Education initiatives.	Community development

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The mine should provide some coal to surrounding communities.	Mrs Manana	Community Member	30-Jan-13	Driefontein Open House Meeting	The mine is unable to provide coal to the communities. Kangra Coal invests in other ways to assist the communities, for example a number of CSI projects have been implemented over the years. Kangra is also currently involved in a housing project. In addition, local people are currently working for Kangra Coal.	Community development
We further wish to enquire about the current procurement policies of Kangra. It is well understood that specialist materials and services cannot be procured from within the local area. How much local business benefaction does Kangra support, thereby assisting in the growth of community sustainability. (we are not referring to CSI programmes as these could be interpreted in various ways)	Gudrun Loubser	Community Member	31-Jan-13	Written Comment	Kangra Coal will try and procure locally if possible. However, it is a challenge due to skills and expertise shortages. The local business that are supported include: Shesa; Eric Howard construction; Joloba Construction; Macina Building; and Omama Bayazama Coal.	Community development
Is there any development that Kangra can point out to show their contribution to the communities?	Zanele Ngwenya	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Kangra Coal has developed the Vukabone School Science Lab. In addition, they have renovated the Dissabled Centre and the followed schools: Malibongwe, Isibanisezwe, Phaphamani, Welgevond and Sakhisizwe.	Community development

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The mine only employs people from outside of the local communities. The existing EMP commits to provide employment opportunities to local people. It also commits to aid with social development which is not taking place.	Jabulani Mabaso	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Kangra Coal has an obligation to employ people from all surrounding communities. Kangra Coal employs more than 100 employees from Driefontein (from a total workforce of 726). In addition, Kangra has: contracted 8 local business in the last year; invested R6.4 million in education since 2009; made donations of R15.3 million wich have been used for the grading of Driefontein roads by Kangra Coal and its contractors; drilled boreholes for water abstraction; installed bill boards to encourage road users to be conscious of pedestrians, cattle and traffic rules; sponsored FET Students, co-sponsored the construction of the FET centre; constructed housing and fencing; established a community trust fund to support the SLP; supported local sporting initiatives; supported old age home, homeless children and the home for the disabled by renovating, painting and repairing electrical faults and providing needed necessities; donated in the form of rubbish bins, pens, pencils, book cases for schools; sponsored a traffic awareness campaign for all school children in Driefontein; donated wheel chairs to the home for the disabled; supported the Driefontein HIV Campaign; made financial donations to Vukabone High School, Ezimnandi Kuphela, Malibongwe Primary School, SAPS Driefontein, Traditional Council, Marantha School, Department of Health, Madabugela Traditional House of Authority, Hoërskool Piet Retief, Qedela School, and Piet Retief TLC; renovated school's using the following local Driefontein contractors.	Employment and community development
How important is the Driefontein Community in the lives of Kangra? What financial contribution is being made to the community? Kangra needs to rethink social development in the community. It is important to invest in education, training and skills development.	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs		Community development
There will be no additional benefits from the Kusipongo project towards the communities.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	See comment above as well as commitments made for future community development as part of the Kusipongo SEMP also detailed in responses above.	Community development

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It is important that Kangra promote skills development so that communities can have continued livelihoods after mining is finished.	Chief Tshabalala	Traditional Leader	30-Jul-13	Traditional Authority Meeting	Kangra Coal have committed to benefits associated with development projects where people's skills are developed for other employment opportunities or the establishment of entrepreneurial training for self-employment. The SLP is a vehicle better suited to deliver benefits to communities. Continuous engagement with the chief and communities on what could be relevant to them will intensify.	Community development
How can the traditional authorities and its communities benefit from the mine. There is a request for skills development and the enhancement of existing skills. Kangra can also assist with road improvements.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi		Community development
There needs to be an even distribution of community benefits to all affected communities.		Traditional Leader	26-Jul-13	Traditional Authority Meeting	Your comment is noted. Kangra Coal's Social and Labour Plan details the social development commitments that Kangra Coal has made. The SLP takes into account different ways and means to help all stakeholders benefit from the existing and future Kangra Coal operations. The SLP normally adopts and aims to address the needs identified in the IDP of the affected Municipality. Social development commitments include the training of forum members and aspiring SMME'S on business principles. Kangra Coal has availed bursaries to 8 students every year. They have constructed a science laboratory at Vukubone Secondary School. Kangra Coal has arranged Maths and Science extra classes which have improved Vukubone's matric results. Every year Kangra has had five interns from local communities. Kangra Coal has responded positively to annual requests from traditional leaders like Mthethwa, Yende x2 and Tshabalala. Those included support for annual celebrations.	Community development
How will the community benefit from the Social and Labour Plan?	Maria Ndlovu	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives		Community development
The usual preference for job opportunities is to those closest to the development not all affected communities. Skills transfer is also very important.		Traditional Leader	26-Jul-13	Traditional Authority Meeting	Through the establishment of a Community Forum, the placement of employment notices at agreed places and the distribution of a local newspaper to all affectedcommunities, Kangra will ensure that the availability of job opportunities is known.	Community development

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Community development and employment opportunities need to extend to all 7 of the affected CPAs.			28-Jul-13	Meeting with 7 Affected CPAs		Community development
The landowners, not the chiefs are benefitting financially from the project.		Traditional Leader	26-Jul-13	Traditional Authority Meeting	Kangra Coal always try to ensure that no one is benefitting differently from the others, but obviously each stakeholder is affected differently, so not all of them can be compensated equally. Whether the affected stakeholder is a landowner or a Chief, each case is particularly studied and they are compensated if necessary based on the merrits of the case.	Community development
Could community members be trained to assist with water treatment activities?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Kangra Coal has no in house water specialist. Through engagement, ideas can be shared which will inform their objectives for the future.	Community development
Can Kangra assist with financial support if the community identifies projects where assistance is required?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	All requests have to be endorsed through the Stakeholder's Manager at Kangra, so Kangra can study each issue separately.	Community development
How will power be supplied to the mine? Is there an opportunity to improve on power supply to the area as a whol?	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Power will be supplied to Kusipongo through an extension of the existing power line at Maquasa West. Improvements to power in the area as a whole would require a new power line from Geelhoutboom substation and additional power provision from Eskom.	Community development
Where is Kangra's Social Responsibility Plan?		Local politician	30-Jul-13	Meeting with local authorities and politicians	Kangra Coal has a Social and Labour Plan which is its comitment to the communities and employees with regard to social responsibilities and benefits.	Community development

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How many people have been trained by Kangra Coal?		Local politician	30-Jul-13	Meeting with local authorities and politicians	Every SLP that Kangra has depicts the number of people to be trained. The current commitment is for 8 bursaries, 8 learnerships and 8 internships on an annual basis. Kangra Coal has been meeting these commitments.	Community development
With regards to Community Development Initiatives, the Yende Farmers Trust would like to state the following: Our community needs to see clear benefits over and above what is available to us right now and based on MUTUAL SATISFACTORY RESULTS, We seek your co-operation in joint initiatives for our community development plan, A scoping/ assessment process based on our COMMUNITY DEVELOPMENT PLAN will be necessary to engage the community strategies, We will establish a community forum to communicate with KANGRA COAL and ERM.	Johan Potgieter	Mentor of the Yende Farmers Trust	05-Mar-13	Written Comment	Kangra Coal has a Social and Labour Plan which is its comitment to the communities and employees with regard to social responsibilities and benefits. All requests have to be endorsed through the Stakeholder's Manager at Kangra, so Kangra can study each issue separately.	Community development
ERM must look within the community to find skills and even train people further to give them a chance of being employable.	Maria Ndlovu	Community Member	30-Jan-13	Driefontein Open House Meeting	ERM is the Environmental Assessment Practioner that is facilitating the environmental authroisation/licensing process for the proposed Kusipongo Resource Expansion Project, and will only be involved in this project for a short duration. As part of this authorisation/licensing process ERM has undertaken a social and environmental impact assessment and have provided Kangra Coal with social management measures that will commit Kangra Coal to a benefits programme that considers local employment and the local skill base (See Chapter 10 of SEMP).	Community development
How can the community benefit during the construction phase of the project?	Goodboy Fakweni	Community Member	30-Jan-13	Driefontein Open House Meeting	Currently, there seems to be high expectations associated with employment as well as extremely high levels of community frustration and anger based on perceptions of limited local employment opportunities and benefits from current Kangra Coal projects. The proposed Project is anticipated to create 450 jobs during construction (which is expected to be 18 to 24 months in duration). Of these, Kangra Coal expects that 250 people will be semi-skilled and skilled positions and will be sourced from	Community development

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I would like to know more about how do Kangra Coal give back to its community. Many of our youth are unemployed (including myself). I have a diploma in office management and technology and I have applied several times but not even once I have received a response but people are hired each and everyday without seeing a post in a newspaper or anywhere.	Dlozi Nxumalo	Community Member	30-Jan-13	Written Comment	outside of the Study Area. The company anticipates local employment opportunities for this phase to number approximately 200 depending on local skill levels. Approximately 750 existing direct and 150 indirect jobs would be saved (from current operations) through this proposed intervention. However, benefits to local communities identified in this ESIA include development projects where people's skills are developed for other employment opportunities or the establishment of entrepreneurial training for self-employment. Kangra Coals current SLP highlights some of these possibilities. Furthermore, as per Kangra Coal's current SLP, a Community Skills and Capacity Development Programme will be implemented, which aims to increase Grade 12 pass rates in maths and science (See Chapter 10 of SEMP).	Community development
The community has agreed not to give Kangra Coal the approval to go ahead with their planned mining activities because they don't give priority to the locals. For instance they employ people from KZN.	Mr Dlongolo	Community Member	28-Jan-13	Makotas		Employment
The community members of Driefontein need employment, however a large majority are unskilled. Some jobs need certificates	Beauty Grootboom	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting		Employment
The community is grateful that the new mine is being proposed. However community members should be employed to increase their work experience and skill even those with low or no skills at all.	Thembani Mkahanya	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting		Employment
The youth within the affected communities should be given work to build up their experience.	Ntonbenhle Nkosi	Community Member	30-Jan-13	Driefontein Open House Meeting		Employment
Where will the labour force be sourced from for the various phases of the proposed mine expansion? Will it go through municipal authorities?	Zinhle Lukhele	Community Member	30-Jan-13	Driefontein Open House Meeting		Employment
When the new mine starts, can new people with new applications for employment be considered?	Clement Mthimkhulu	Community Member	30-Jan-13	Driefontein Open House Meeting		Employment
Kangra Coal has some level of discrimination in terms of their hiring procedures therefore there should be a different mine coming instead of Kangra Coal.	Robert Mnisi	Community Member	28-Jan-13	Makotas		Employment
Where possible local labour should be used for the proposed expansion, for instance within low skills employment such as during the construction phase.	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting		Employment
A large number of people in the affected communities do not have qualifications or high skills to be employable by the mine.	Jackson Dlodlo	Community Member	30-Jan-13	Driefontein Open House Meeting		Employment
The social labour plan should have strategies for creating jobs for the community members.	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting		Employment
The are no objections towards the Kangra Coal Expansion project. The problem is that the local people are often overlooked and not offered jobs.	Ntombifuthi Ndlela	Community Member	30-Jan-13	Driefontein Open House Meeting		Employment

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Kangra Coal has mentioned the availability of work but this never happens.	Jabulani Nhleko	Community Member	27-Jan-13	Twyfelhoek CPA Meeting		Historical issues
Will there be local employment opportunities? Kangra has been in Driefontein for 20 years and has not met its SLP commitments. The community is frustrated in this regard	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting		Historical issues
Does Kangra offer job opportunities?	Sonto C Mtembe		14-Jan-13	Email		Employment
The extra pressure on the road between Wakkerstroom and Piet Retief will destroy the already crumbling road infrastructure with the increased volumes of heavy traffic, and the mine will not provide employment to the unemployed people in the town due to the high technology aspects of modern mining and the lack of appropriate skills in our community.	Dr Wendy Watson	Wakkerstroom Tourism Association	11-Apr-13	Email		Employment
Request for meaningful jobs to be created for the community as a result of the proposed project	Chief Moloi	Tribal Authority - Dr Pixley Kalsaka Seme	29-Jul-11	Meeting with Chief Moloi	It is Kangra Coal target to create as many job opportunities as possible, although it is explained in the SEMP (See Chapter 10) the new Project will contribute to maintain the current number of jobs because the coal production will be the same, but there will be opportunities during the construction phase. Approximately 750 existing direct and 150 indirect jobs would be saved (from current operations) through this proposed intervention. An estimated additional 200 jobs could potentially be created as a result of the proposed project.	Employment
The Traditional Authorities hope that employment opportunities can be maximised as a result of the project.	Chief Yende	Traditional Leader	30-Jan-13	Traditional Authority Meeting		Employment
Asked whether people with disabilities will be welcomed onto the project	Teboho Klonderboy	Members of the Public	29-Jul-11	Email to Nomsa Fulbrook Bhembe	Kangra Coal has confirmed that the project infrastructure has been designed to accommodate people with physical disabilities.	Employment

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I would like to know how Kangra supports the community. I have applied to Kangra several times for jobs but have never received a response back and have never seen a job advertised in the paper or anywhere else.	Dlozi Nkumalo	Community Member	26-Mar-13	Email	Kangra Coal places adverts of available job opportunities on the public notice board at the Municipal offices, at Kangra HR offices, in the *Excelsior* newspaper and in national newspapers depending on the magnitude of the position. Community forum leaders are also provided with a hard copy of the advert. In a recent recruitment drive by one of the contractors, forum representatives were requested to be present as observers in the interviews and were allowed to come and represent the interests of their constituency, the community.	Employment
I have a certificate to show qualifications but still cannot find jobs.	Maboi Maseko	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted.	Employment
People must have equal opportunities to employment. People should not be hired because they are friends with the human resource personnel.	Jackson Dlodlo	Community Member	30-Jan-13	Driefontein Open House Meeting	Local employment will be included as a tender condition for contractors. Local employment will include contractor commitments to train local residents who have the potential to fill certain semi-skilled levels (e.g. drivers of construction equipment; builders etc.). Fulfilment of these commitments will be auditable.	Employment
Councillors may hijack the employment process so that they benefit and the traditional authorities and its communities are left outside of the process.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	This comment is noted, but is beyond Kangra Coal's control.	Employment
Since the current mine will be closing, what will happen to the current employees?	Clement Mthimkhulu	Community Member	30-Jan-13	Driefontein Open House Meeting	If the Kusipongo Project proceeds it is intended that the current employees will be able to retain their jobs. If the project does not proceed, in 2-3 years time the mine will close and people will lose their jobs along with this.	Employment
Is it possible to have local people more involved in the rehabilitation process when the mine is closed down?	Chief Moloi	Traditional Leader	30-Jan-13	Driefontein Open House Meeting	Kangra will consider this request.	Employment
There has been no employment for the open pit projects.			28-Jul-13	Meeting with 7 Affected CPAs	Kangra Coal's background is underground, thus the opencast operations are subcontracted and the job opportunities relies in the subcontractor. But Kangra impose certain rules to its contractors about staff hiring policies, always considering first the local development. A significant number of people have been employed from the community by the opencast contractors.	Employment
The community is attending this meeting and signing the attendance register on the understanding that they have been involved in this consultation process and therefore eligible for employment should the opportunity arise.			28-Jul-13	Meeting with 7 Affected CPAs	The purpose of the attendance register is to ensure that ERM has all of the contact details for the various stakeholders that have attended the meetings thus enabling us to keep you informed of the project. They are not intended for employment purposes.	Employment

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Kangra has taken care of Driefontein with regard to employment, but it is important to cover the broader affected area. The children in the community are looking for work. Most of them do not have a matric level of qualification. But there should be construction employment opportunities for which this level of qualification is required. Local leadership should be engaged with, with regard to these activities.			28-Jul-13	Meeting with 7 Affected CPAs	The Stakeholder Manager at Kangra will take note of this consideration, as he is doing currently at the existing operations in Driefontein, and he'll ensure that the broader area is covered	Employment
The community does not get employment through Kangra	T. Madonsela	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	Kangra Coal has an obligation to employ people from all surrounding communities. Kangra Coal employs more than 100 employees from Driefontein (from a total workforce of 726). Approximately 750 existing direct and 150 indirect jobs would be saved (from current operations) through this proposed intervention. An estimated additional 200 jobs could potentially be created as a result of the proposed project.	Employment
We are concerned that people from the community are not getting job opportunities. Outsiders are being employed.	Maria Ndlovu	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives		Employment
How many local people will be employed/are employed by Kangra?	Glenn Ramke	Endangered Wildlife Trust	30-Jul-13	Meeting with landowners and NGOs		Employment
It was stressed that consideration should already be taken of mine closure and rehabilitation.	Mr Mavuso	Director of Urban & Economic Development	20-Jul-11	Public Participation Meeting with municipality	Noted. Kangra Coal is legally obliged to make financial provision for mine closure and establish a mine closure plan in order to acquire their Mining Right (MPRDA). An Environmental Rehabilitation plan associated for all phases of the proposed Project (Chapter 17) together with a committment to financial provision (Chapter 18) thereof has been included in the Social and Enviromental Management Plan.	Rehabilitation and mine closure
Is the mine going to fill up the holes that they have dug up and are not using them at the moment?	Sibongile Ndlela	Community Member	28-Jan-13	Makotas CPA Meeting	Rehabilitation will occur as agreed in the Mine Plan with the DMR.	Rehabilitation and closure
The holes left behind by the mine cause problems for the community.	Sibongile Ndlela	Community Member	28-Jan-13	Makotas		Rehabilitation and closure
What is going to happen to the open pits that Kangra Coal is no longer mining on?	Chief Moloi	Traditional Leader	30-Jan-13	Driefontein Open House Meeting		Rehabilitation and closure
How long is Kangra Coal and GCS going to leave the open pits unrehabilitated?	Sfiso Thwala	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	This concern has been forwarded to GCS who are undertaking the environmental authorisation work for the open pit project.	Rehabilitation and closure

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There have been many rehabilitations before especially associated with the filling of open pits. However, incorrect or incomplete rehabilitations have led to many injuries in the past.	Chief Moloi	Traditional Leader	30-Jan-13	Driefontein Open House Meeting	Kangra Coal undertakes rehabilitation as agreed in the Mine Plan with the DMR. Kangra Coal regrets if injuries have occurred. However, rehabilitated areas are off limits until final closure.	Rehabilitation and closure
It is understood that the life of the future operation is anticipated to be only for a further ten years. Would this imply that the mine in general is nearing its end and that old operations will be closed down?	Gudrun Loubser	Community Member	31-Jan-13	Written Comment	It is anticipated that the current Kangra Minin g operation has a remaining life of 2-3 years.	Rehabilitation and closure
What mitigation and resources are in place to prevent, what is already evident from two old un-functional shafts decanting mine water, and having an impact on the environment further?	Gudrun Loubser	Community Member	31-Jan-13	Written Comment	GCS is currently preparing a Section 102 application for the existing operations which will propose monitoring and management measures for Kangra to implement to address this issue. It is also been considered as part of the water use license application process which has just been initiated. This issue does not fall within the scope of the Kusipongo Project.	Rehabilitation and closure
Kangra Coal is not or did not pay the required fees to the government for the closure of the current mining operation.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal would like to know which fees and operations are referred to and then can respond accordingly.	Rehabilitation and closure
When the mine closes, what reassurance will there be that rehabiliation will take place properly and the adit will be sealed. There are still open pits remaining in the area after mining operations which are a hazard.	Maria Ndlovu	Driefontein Community Forum	29-Jan013	Driefontein Community Meeting	A mine remains responsible and cannot close until the Department of Mineral Resources issues a closure certificate and as a result acknowledges that rehabilitation has been completed and residual impacts managed to a satisfactory level. Kangra Coal is currently busy with quite a big rehabilitation programme trying to fix some mistakes or things not properly done in the past. Also a rehabilitation fund will be created as a warranty to ensure the comtemplated rehabilitation measures provided in the project.	Rehabilitation and closure
No rehabilitation was done by other mines within the Piet Reteif area in the past which now causes safety and health risks. It should be noted though that Kangra does rehabilitate	Mike Trebble	Community Member	23-Jan-13	Telephonic comment	Comment noted.	Rehabilitation and closure

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Previous and current mines that have operated in the area have closed and open pits remain unattended. When there are heavy rains in the area, there is a high risk of contamination.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Kangra Coal is currently implementing a rehabilitation programme for its old and current operations. Water qualities are being monitored quarterly and reports are being submitted to the Authorities quarterly.	Rehabilitation and closure
The are open pits in the Rooikop area that were mined 20 years ago. Water levels in the area are rising and will be spilling into the rivers. When will these areas be closed?	Chief Mdluli	Traditional Leader	31-Jul-13	Traditional Authority Meeting		Rehabilitation and closure
Will nutrients from the soil be lost when the coal is removed i.e. will the agricultural productivity be affected where there is undermining.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Undermining will take place at a significant depth, thus not impacting on soil nutrients. In addition, in areas of disturbance, soils will be stripped, stockpiled and managed in order to preserve soil nutrients so that these soils can be utilised for rehabilitation purposes (see Section 9.3). The design of the mine has also been on a zero subsidence basis.	Soils
Will the soils be contaminated if the ground and surface water is contaminated? Will this impact on agricultural activities?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	There is a chance of local soil contamination by salts should surface water be contaminated. This will, however be very localised, and the primary mitigation to prevent his from happening is to prevent contamination to any water source, including acid mine drainage. Kangra are also comiiteed to a zero water discharge policy (see Section 9.4) .	Soils

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Common concerns identified were NOx and SOx emissions, soil rehabilitation and impact on water resources	Mr Mavuso	Director of Urban & Economic Development	20-Jul-11	Public Participation Meeting with municipality	The ESIA identified that the impacts of combustion products: carbon dioxide, carbon monoxide, sulphur dioxide, oxides of nitrogen and unburnt hydrocarbons would not be significant environmental impacts, as emissions arising from the emergency generators will be confined to the footprint of the Main Mine Adit and generators would only be used for emergency situations, thus impacts would arise intermittently (refer to Section 9.6.3 in Chapter 9). The study identified that impacts on soils (particulary on the footprint of the Main Mine Adit) would be significant, as the entire footprint of Adit A will be cleared and utilised thus resulting in a permanent loss of soils and land capability(Section 9.3.1 in Chapter 9). Furthermore, the study identified significant impacts on surface water systems (rivers and wetlands) associated with either a decrease in flow (as a result of a decrease in the groundwater level as a result of dewatering) or decreased quality (as a result of decant issues) (Section 9.5 and 9.8 of Chapter 9).	Air quality, soils and water
Raised concern over the release of harmful fumes as well as odours that may emanate from proposed project activities	Chief Moloi	Tribal Authority - Dr Pixley Kalsaka Seme	29-Jul-11	Meeting with Chief Moloi	As part of the ESIA process it was identified that site preparation and operational (include crushing and screening operations, followed by ventilation locations, conveyor belts and transfer points in the footprint of Adit A) activities could result in significant particulate emissions (particularly PM10) (refer to Section 9.6.2 in Chapter 9). If left un-mitigated, the impact from the mine site is predicted to reach downwind distances of about 2km towards the south. However, should the management/mitigation conditions included in Section 9.6.2 of the Social and Environmental Management Programme be adopted (*viz.* the control of dust from crushing and screening operations and transfer points) these impacts will be reduced to a level of minor significance.	Air quality
Concern that the dust from the proposed activities at Adit A will directly affect land for grazing. Also noted that the dust will affect properties south of the site.	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling		Air quality

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What will the air quality impacts of the conveyor be?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	This has been modelled as part of the air quality specialist study (see Section 9.6 of the SEMP). It is anticipated that pre-mitigation, PM10 levels could exceed the National Ambient Air Quality Standards for up to a distance of 400 m from the proposed conveyor belt.	Air quality
For some reason and the people are not sure if this is a result of Kangra or a gas mine in the area, but people are suffocating at night. There are 4-5 people that have died in the area over the last few weeks. Could Kangra provide affected households with oxygen masks to use in emergencies?	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Kangra Coal has not been made aware of such a problem previously. Please report this matter to the Stakeholder Manager at Kangra and each case will be investigated individually to see if it's related to Kangra's operation, so all necessary measures can be implemented.	Air quality
Trucks utilising access roads create a significant air quality problem. Specific reference was made to those passing the newly developed school.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Dust supression is an ongoing objective for Kangra Coal. All trucks, owned and operated by subcontractors are instructed to take the necessary measures to avoid coal spillage. There are currently no Kangra Coal trucks passing the newly developed school. It must be noted that vehicles (including trucks) will be used to transport materials to the site of the proposed Kusipongo Project during the construction phase. These trucks will not utilise the road running directly adjacent the school. Rather, trucks will transport materials along the D803and D1091. The D1091 does however run 1km south of the newly constructed school, so as is mentioned above, dust suppression will need to be maintained. Furthermore, the aforementioned roads will be used to transport workers to and from the proposed Main Mine Adit during the operational phase of the proposed Project.	Air quality
We are concerned that best practise is not currently followed with regard to air quality management at Driefontein.	Jabulane Ngwenya	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	Kangra Coal makes use of specialists to advise on the best practices for all environmental monitoring. The comment is however noted and Kangra Coal will review its current practices to identify any possible areas for improvement.	Air quality

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Air quality is a concern for the community.	T. Madonsela	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	Comment noted. An air quality specialist study has been undertaken to investigate the air quality impacts of the Kusipongo Project. The results thereof are detailed in Section 9.6 of the Social and Environmental Management Programme.	Air quality
What is the wind direction. With residual fall out in this area, what is the potential fire risk?	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Since no on-site meteorological data is available, hourly average meteorological data from the South African Weather Service (SAWS) station in Piet Retief for the period 2002 to 2005 was analysed. This station is located approximately 40km east of the proposed Project area. The prevailing winds during majority of the year is north-east.Their is almost zero risk of a fire being caused by fall out dust as the quantity of dust is not significant enough to sustain a fire. Kangra Coal minimises its risk of spontaneous combustion due to potential safety and product loss concerns.	Air quality
The potential negative impacts of the proposed mine (in addition to the impacts of the existing mine) were raised. This was mainly increased trucks on the road and the associated increase in fatalities.	General concern		21-Jul-11	Public Participation Meeting with municipality	There will be no increase in the number of coal haulage trucks on the road. Coal will be transported from the new facilities to the existing facilities by an extension of the current conveyor system.	Traffic and safety
Noted that Wakkerstroom has already experienced negative impacts due to mining in the area particularly truck traffic on roads resulting in damage to the roads	Andre Steenkamp	Birdlife South Africa	21-Jul-11	Meeting with Andre Steenkamp		Traffic and safety

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There is also the danger of mining trucks on the road and the safety of other road users and pedestrians. The Driefontein community's lives are like this as a result of Kangra.					The social impact assessment identified that reduced community health and safety as a result of (amongst other Project related activities) traffic impacts would be a moderate impact (see Section 10.1.5 of the SEMP. It also identified that homesteads near to infrastructure or along transport routes will be primarily at risk. To minimise the risks of such impacts, Kangra Coal will enforce strict traffic controls. These controls will include the training of all truck drivers, the introduction of traffic signs, enforcement of a 45km/h speed limit and monitoring and maintaining road conditions. Furthermore, an education programme will be run, in partnership with the District department of Transport sensitising Study Area residents and local school children to traffic hazards.	Traffic and safety
It has in the meantime transpired (in conversation with some Kangra mine employees) that the working conditions in the intended area (and also previously working in Wetland areas) will NOT be ideal. The mine tried before to mine there. It is the opinion of miners that the working conditions need to be mentioned and described in detail. From this perspective, i.t.o health, safety and quality of work, the guys will battle in the adverse conditions – a risk which needs to be investigated and highlighted.	Gudrun Loubser	Community Member	06-Feb-13	Written Comment	Kangra Coal will need to comply with the requirements of the Mine Health and Safety Act with regard to working conditions underground and will be inspected and audited in this regard. The ESIA has looked at health and safety external to the mine employees and impacting on adjacent landowners and landusers. Impacts pertaining to the H&S of communities (in particular impacts associated with air, water, noise and traffic impacts) will be experienced in the Study Area and particularly for residents in Zone 1 of Influence. Potential H&S impacts will potentially begin with construction activities and will extend into the life of the mine; however, potential impacts associated with water quality could be experienced beyond the life of the mine (see Sections 9 and 10 of the SEMP). Homesteads near to infrastructure or along transport routes will be primarily at risk, while residents of the broader Study Area will experience the changes to the nature of the environment and with that may experience potential impacts on their health and sense of well-being. The impact will be experienced during specific times of high activity during construction and then at times when water, air and noise pollution are particularly high. A decrease in water quality may become a more permanent impact with its concomitant health	Safety

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					effects. As residents become used to the changed sense of place the emotional effect on their well-being may be less prevalent. This impact was identified as a moderate negative impact pre-mitigation. However, with strict mitigation this impact can be reduced to a Minor Negative Impact.	
Question on the number of people that would have to move as a result of the proposed project.	BH Mtshali - Mayor		21-Jul-11	Public Participation Meeting with municipality	ERM estimated 42 households may need to be moved, but noted that these were early projections	Resettlement
Question raised about how much land the directly affected communities own	BH Mtshali - Mayor		21-Jul-11	Public Participation Meeting with municipality	This remains to be ascertained as part of further resettlement planning.	Resettlement
Are there any plans of relocation for those that are directly affected? Relocation needs to be considered for people and graves	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting	Relocation will be considered if this is required. At this stage of the project, environmental authorisation first needs to be obtained and a mining right issued and then the appropriate resettlement planning work will be undertaken.	Resettlement
Should there be any resettlement, Kangra Coal must ensure that the necessary infrastructure is considered to avoid future difficulties with the relocated communities.	Councillor Nkosi	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting	Comment noted. This will be addressed in a resettlement action plan if required.	Resettlement
Resettlement may be detrimental to the people affected. They currently own large tracts of land and then may be shipped to a township like lifestyle.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Resettlement is a negotiated process. Affected people, their leaders and other authorities will be kept informed throughout the process. International best practise recognises the need for affected people's lives to be improved on, if possible as a result of the resettlement process. The resettlement process is being addressed by an independent resettlement specialist.	Resettlement
Resettlement is of concern to the community. People are going to move from having significant portions of land to residing in much smaller areas on other people's land.			28-Jul-13	Meeting with 7 Affected CPAs		Resettlement

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Previous resettlement placed people close to access roads and there is a concern that this may have a resultant health impact as a result of the dust generated.			28-Jul-13	Meeting with 7 Affected CPAs		Resettlement
When will resettlement be required? We have been approached to be part of a Farmer Development Programme for Grain SA. Should we proceed with this initiative?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Until a cut-off date as been put in place, following the completion of a census and asset inventory on individual households, peoples livelihoods and improvements on these should be allowed to continue. When engagements take place between the affected people and the company that will lead the resettlement process, it will become clear as to whether othe processes should proceed or not. There could not be a blanket response to this concern since every case will be treated with its own merits.	Resettlement
If we are due to benefit from an RDP Housing Programme, will we still benefit from this if we are resettled?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	RDP Housing is provided for by the government so their regulations and guidelines will be applicable in such cases. The Kangra Coal resettlement will not disqualify citizens from their rights.	Resettlement

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There are several issues that we have with regard to resettlement: 1) Our ancestory is established in this area. If we are moved, we will need to start a new life. There are rituals that need to be followed in this regard. 2) During apartheid we were not taken care of. We now have land and have to move again. 3) Some households have already been resettled and are having to go through the process again. 4) when we move we will be away from existing services			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	These issues will be addressed as part of a comprehensive resettlement planning process which will be undertaken independently of this ESIA process. The exhumation of graves can be considered as part of the resettlement if desired, but consultation will be undertaken with the affected families to ensure the humane treatment of people and legislative procedures with regard to heritage resources will be adopted. The resettlement process will take full cognisance of citizen's rights and wherever possible resettlement will be avoided.	Resettlement
The CPAs operate as a company. We will have serious objections to being moved out of the CPA area of jurisdiction.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community		Resettlement
What will happen to people that have not yet developed on their land? Will they be compensated as well?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Where there is the displacement of physical assets or economic activities, compensation will be required. Resettlment will take cognisance of what one has at the time that resettlement is introduced to him/her and the recordings of the census and asset inventory. Compensation will be based on those findings. These issues will be addressed as part of a comprehensive resettlement planning process which will be undertaken independently of this ESIA process.	Resettlement

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How was a number of 42 households reached for resettlement?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	This was calculated at a desktop level from a review of satellite imagery (see Section 10.1.1 of the SEMP). It is an estimate and needs to be confirmed by the resettlement specialist as part of the census and asset inventory.	Resettlement
Unfair preference seems to be given to some individuals in the community that have had their land bought out by Kangra. They are still able to use the land fro grazing purposes.	S. Gama	Driefontein Development Council	29-Jul-13	Meeting with Driefontein Community representatives	There are farmers who have lease agreements with the Mine and are paying Kangra for the use of land. Where Kangra has unused land, further lease agreements can be concluded with aspiring farmers.	Resettlement
In terms of resettlement, will Kangra be purchasing CPA land? Will it be aligning the conveyor to minimise impacts?	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Resettlement will be minimised wherever possible and best practise adopted in the process for those households that need to be resettled. In terms of the nature of land to be secured, that will be informed by the findings of the resettlement survey.	Resettlement

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What is the status of the resettlement process?		Local politician	30-Jul-13	Meeting with local authorities and politicians	The resettlement survey, which seeks to identify households that potentially require resettlement needs to be undertaken. The process is still in the early stages.	Resettlement
	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	Noted. Kangra Coal has taken action to address this concern. Environmental Compliance Reports confirming this have been submitted to the authorities.	Water resources
Request for a guarantee and plan to be provided by Kangra Coal outlining how potential draining of water from the farm will be addressed	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	The impacts and management of natural surface and goundwater features has been included in the Social and Environmental Management Plan (SEMP) (see Section 9.4 and 9.5 of the SEMP). Furthermore, the SEMP provides conditions associated with the management of clean and dirty stormwater runoff. These aspects are covered in Chapter 9 - Physical and Biological Impacts and Mitigation. A draft SEMP (under the NEMA process) will be made available to Registered Interested and Affected Parties (I&APs) for comment during the Impact Assessment Phase. Mr Greyling will be invited to be part of the process of identifying, assessing impacts and developing possible mitigation measures.	Water resources
There is a dam very close to the proposed mine discard dump so the expansion of this is of concern.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	This concern has been forwarded to GCS who will be addressing the dump expansion as part of their scope of work.	Water resources
WWF would like to oppose the project. The country's water resource should not be compromised on account of an exported resource.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	Comment noted.	Water resources
The Department of Water Affairs is working closely with WWF to protect the water resources in the Mpumalanga area.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	Comment noted.	Water resources

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Currently there is contaminated water which is being released into the dam. This is white-ish in colour.	Nkosi S. Yende	Traditional Leader	30-Jul-13		The water is not released to the dam. It emanates from a blocked water pipe from the discard dump. It has been repaired and the clean-up of the affected area has commenced.	Water resources
For how long will Kangra be committed to providing an alternative water supply? Once they have finished mining will they walk away?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	They will be required to provide an alternative water supply until the water quality and availability returns to suitable standards. This will be ascertained through water monitoring post closure (see Section 10.1.4 of the SEMP).	Water resources
There are currently problems with water in the area. Will Kangra build a dam for the communities for the provision of clean water?			28-Jul-13	Meeting with 7 Affected CPAs	Kangra is not entitled to build a dam in this area. All dams are regulated by the Depatment of Water Affairs and due to the critical importance of the Heyshope Catchment they will not allow any one to affect this area.	Water resources
How will the groundwater impact, impact on the business that is opening in the area to produce bottled water.			28-Jul-13	Meeting with 7 Affected CPAs	Monitoring of groundwater levels, quality and the continuous improvement/development of a detailed groundwater model must be maintained by Kangra Coal to ensure/prove this impact does not take place.	Water resources
Proper water management is required with regard to water resources. Sewage water is currently running from the school into the community drinking water supply.			28-Jul-13	Meeting with 7 Affected CPAs	The Social and Environmental Management Programme makes recommendations for water management in Section 9.4 and 9.5 of the report. The Deaprtment of Education is responsible for the schools in the area and this needs to be brought to their attention	Water resources

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Where will water be stored on site given that the mine will be a zero effluent discharge facility.	Glen Ramke	Endangered Wildlife Trust	30-Jul-13	Meeting with landowners and NGOs	Surface water management within the main mine adit will restrict any unpolluted water to a clean water system external to the adit complex. Impacted 'dirty' stormwater runoff within the main mine adit footprint will be collected and routed to the two stormwater management ponds.Two stormwater management ponds have therefore been designed to accommodate the 1:100, 24 hour rainfall event. The smaller pond is a Stormwater Management Pond of 8 200 m3, which will reside within the adit A complex. When this capacity is reached, the collected runoff will be directed to the bigger pond (named an Emergency Evaporation Pond) of 13 000 m3, situated just outside the adit complex.Underground storage of excess mine infiltration water has been planned and will be considered in the overall water balance.The mine inflow is expected to supply water for cooling of the continuous miners. No dewatered groundwater will be used in beneficiation; however, a portion of the water will be reused underground for dust suppression and in cooling mining machinery. This dewatered groundwater will be used for service water on the surface, and for dust suppression. Following mine closure, if decant occurs, water may be treated depending on the quality of the decant (see Sections 9.4 and 9.5 of the SEMP).	Water resources
How much will be stored underground? Currently this is released back into the streams and rivers. Little consideration has been given to the downstream water impacts or the impact on the Department of Water Affairs Transfer Scheme. It is suggested that as opposed to storage underground, the water be treated and then released back into the environment.	Gudrun Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Streamflow monitoring is a requirement based on the GW specialist report. However, it is currently not included in the SW specialist report, which will be amended. Streamflow monitoring will be carried out concurrently with SW quality monitoring (same locations, same frequency) and Kangra Coal has committed to providing an alternative reliable, clean water supply to affected farmers and communities, should monitoring indicate that the impact results in the loss of their water supply.	Water resources

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Is cadmium being monitored as part of the groundwater monitoring programme?	Gudrun Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Yes cadmium will be monitored as part of this programme.	Water resources
What is the impact on the Ohlelo River? Has the surface water study looked at the impact on downstream water users i.t.o water flow. There are 60 000 users located downstream., there is a dam proposed by the Department of Agriculture on the Ohlelo River, Mondi is making use of the water, impacts may be crossing into Swazialnd. This is a fatal flaw associated with the study.	Gudrun Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	The EIA has identified impacts to surface water as a result of decreased baseflow in the Ohlelo River. Cumulative impacts have been qualitatively assessed, and the ESIA has identified that with future mining developments in the Study Area, that the Ohlelo and Assegaai River Catchments are likely to come under increased pressure, not only in terms of water abstraction/discharge, but also in terms of the potential contamination of these rivers by diffuse sources of pollution.	Water resources
Is the mine likely to have a negative impact on water resources?	M.D Cholo	Department of Water Affairs, Chief Superintendent	30-Jul-13	Meeting with landowners and NGOs	According to the groundwater, surface water and biodiversity specialist studies, it is anticipated that there will be a significant impact on water availavility in the Ohlelo River catchment and wetlands in the area as part of the mining operation. Water quality impacts may also result, specifically post-closure. Please refer to Sections 9.4, 9.5 and 9.8 of the Social and Environmental Management Programme for additional information in this regard.	Water resources
Why is the WULA not in place? Is this a non-compliance or a delay from DWA?	M.D Cholo	Department of Water Affairs, Chief Superintendent	30-Jul-13	Meeting with landowners and NGOs	All applications for the previous and existing operations have been submitted, except Kusipongo which is in process, but none of them have been granted. Kangra Coal is following up on applications with the Department of Water Affairs.	Water resources
What is the status of the water use license applications for Kangra?		Local politician	30-Jul-13	Meeting with local authorities and politicians		Water resources

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Kangra Coal has reportedly been operating illegally without a Water Use Licence at the old Savmore, Maquasa East, Maquasa West and Maquasa West Extension sites, as the Department of Water Resources decisions are still pending on these WULAs. Does Kangra intend to expand current activity to the Kusipongo Resource Expansion project without a valid Water Use Licence? If not, please provide us with adequate proof and assurity.	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter	Kangra Coal is working hard to get all pending WULAs for the existing operations approved and the WULA for Kusipongo is being prepared at this moment and will be submitted shortly. A meeting with the Department of Water Affairs (DWA) will be scheduled to resolve the outstanding WULA approvals and current application.	Water resources
How do people access the groundwater resources?		Local politician	30-Jul-13	Meeting with local authorities and politicians	Groundwater resources are accessed through boreholes, springs or baseflow to river systems and wetlands in the area.	Water resources
Kindly be advised ,should the above project have a direct affect on the flow of the Hlelo river we have no choice but to object to the project.	Viroshini Naidoo	Mpact	13-Aug-13	Email	Mpact has been added to the stakeholder database for the project and will receive all future correspondence regarding the Kusipongo Project.The EIA has identified impacts to surface water as a result of decreased baseflow in the Ohlelo River. Cumulative impacts have been qualitatively assessed, and the ESIA has identified that with future mining developments in the Study Area, that the Ohlelo and Assegaai River Catchments are likely to come under increased pressure, not only in terms of water abstraction/discharge, but also in terms of the potential contamination of these rivers by diffuse sources of pollution (see Section 9.4 of the SEMP).	Water resources
Mpact is the last water user on the Hlelo river. The river often drys up in the winter months and thus Mpact cannot agree to any restriction or reduction that will be placed on the flow in the river. Please involve Mpact Piet Retief Mill in all future correspondence regarding this project.	Johan A. Viviers	Mpact	08-Aug-13	Email and telephonic discussion		Water resources
Please register NTE Company Ltd as a stakeholder and forward relevant information to us. We currently have an abstraction permit from the Ohlelo River.	Peter Wilson	NTE Company Ltd	13-Aug-13	Email	A copy of the technical summary of the SEMP and comment and response document has been sent to Mr Wilson.	Water resources
The current conveyor belt is very close to the dam; this could lead to serious negative impacts on the dam.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	The conveyor is designed to be a fully enclosed structure over the river and wetland crossings to prevent any spillages and contamination. The overland conveyor is monitored on a regular basis.	Water resources

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WWF has been working on mapping and recording the water resources of the Mpumalanga areas and it has been revealed that there is a very small area in Mpumulanga which is a major source of water for the country.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	The ESIA process has identified major impacts associated with groundwater decant and drawdown. Furthermore, the groundwater study identified that watercourses (such as the Ohlelo River) and wetlands are highly dependent on groundwater. Flow will be drastically reduced in the Ohlelo and wetland systems will be lost. These impacts are expected to continue after the life of the project. The ESIA also identified that there is very limited mitigation for the loss of these systems available. If the proposed Project is approved then as a minimum, these systems will need to be monitored and monitoring results will be analysed and consolidated into an annual report by a senior SACNASP registered ecologist appointed by Kangra Coal with recommendations on adaptive management of the impacts on the wetlands and water courses. However, this said, given the environmental sensitivities of the area, and the potential impacts to the environment associated with the proposed layout of the Main Mine Adit, Kangra Coal is looking at alternatives to change mine layout by placing the waste rock dump of 70,000 m3, temporary contractor's camp, fuel storage depot and emergency stormwater pond and sewage sludge drying beds away from the valley bottom wetland and the 1:100 floodline of the Ohelo River (See Section 9.8 of the SEMP).	Water resources
The potential impacts on the catchment areas are highly concerning as the affected areas are irreplaceable.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting		Biodiversity and water
The Wakkerstroom Tourism Association is strongly opposed to this kind of commercial development, which will destroy the sensitive habitat around our town, which depends entirely on tourism, mainly related to birding, for its existence. It is well known that coal mining influences the cleanliness of the water, and in this particular instance it has been estimated that it will take 150 years to clean the water in the area after the anticipated 17 years of has taken place.	Dr Wendy Watson	Wakkerstroom Tourism Association	12-Apr-13	Email		Biodiversity and water
The operational phase of the proposed project will definitely affect the wetlands within the surrounding area.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting		Biodiversity and water
Currently there is a Section 49 application which has been submitted to the DMR Mpumulanga Regional Office to try and restrict all mining activities within 234 hectares of the irreplaceable and highly significant environment. When gazetted, mining activities will be restricted in this area. The application was submitted in 2010 and has support from key NGOs in the area.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	ERM has provided WWF with a list of properties forming part of the MRA. WWF has responded to state that several of the properties concerned fall within the Section 49 application. This has been discussed in Section 9.8 of Chapter 9.	Biodiversity and water

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Acid Mine Drainage (AMD) has been reported to Kangra Coal yet nothing was done about it and no response received in this regard. There is a wetland report to prove it too.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Kangra is aware of AMD at old historic operations and have been working with different stakeholders to address it. Kangra is focusing on the most critical areas with the worst cases of AMD as a first priority. Typical interventions to address AMD include:Tree plantations, water treatment facilities, de-watering of old areas and water dosing facilities. Sustainable solutions are not clear at this stage as AMD is extremely difficult to rectify and results are slow and time consuming. No AMD is present at the existing operations and in order to prevent a repeat of the situation at the old operations we are currently working with consultants to design a sustainable water management plan for the existing operations for the future.	Biodiversity and water
WWF believes there are more and more encroachments on sensitive environmental resources in favor of mining activities that are not even critical to the development of the nation of South Africa.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	Comment noted.	Biodiversity and water
WWF urges ERM to consult with MTPA for data on provincial targets of protected areas. These targets are not met if mining is allowed to proceed in these areas.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	The MTPA has been engaged with to date and following further communication with Charles Makuwerere additional stakeholders have been added to the database, consulted and invited to participate in further ESIA activities.	Biodiversity and water

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The majority of the properties which are part of the expansion fall within an Area proposed by Mpumalanga Tourism and Parks Agency (MTPA) for prohibition or restriction of mining in terms of Section 49 of the MPRDA. The Section 49 proposal, which is under consideration by the DMR, proposes an exclusion area of 233393 hectares in extent covering 120 farms in Mkhondo and Pixley ka Seme Local Municipalities. The reasons for the proposed prohibition or restriction of mining include the following: a) The area is critically important from a water production perspective; b) The area is largely classed as irreplaceable by the provincial MBCP and thus crucial for the achievement of provincial conservation targets due to the biodiversity features located there c) The area is located in endangered and vulnerable threatened ecosystems (in terms of NEM:BA) d) The area falls within provincial and national priority protected area expansion zones	Charles Makuwerere	World Wildlife Fund	08-Mar-13	Written Comment	The Social and Environmental Management Plan takes the Section 49 Application into consideration in the the Biodiversity Impacts assessment dealing with impacts associated with potential loss of watercourses and hydromorphic grasslands (refer to Section 9.8.1 in Chapter 9).	Biodiversity and water
WWF-SA advocates for the precautionary principle to be adopted in the proposed expansion project because of the severe impacts coal mining would have on the important hydrology of the area as well as unique biodiversity.	Charles Makuwerere	World Wildlife Fund	08-Mar-13	Written Comment	Since the Scoping Report, Kangra Coal has committed to a Zero Effluent Discharge Policy; meaning zero discharge of effluent (including treated effluent) into the natural environment during the operational Phase of the proposed Project. Groundwater in mined-out and abandoned sections of the underground mine will be stored in order to minimise mine inflow water that will need to be managed at Adit A during the mining operation. Mine inflow water will be reused within the mine facilities, to limit uncontrolled discharges of water impacted by ARD into the surface water system during mine operation.However, the ESIA also documents that the discharge of impacted decant water will begin post-closure and the impacts associated with this continue until water levels have rebounded and water quality has improved. To manage this, Kangra Coal will seal the adit at mine closure, thus preventing decant from the Adit. It is assumed that the seal will prevent groundwater decant from the Adit. However, if this is not feasible, alternative water management strategies will be required, such as decant water treatment to acceptable standards prior to discharge into the environment. If the seal is permanent, water tables will recover to the pre-mining level and water will be discharged via the natural/present ways (e.g. springs). The water quality of the springs will also be monitored. Alternative water management will be required should monitoring indicate that this is necessary (see Section 9.5 of the SEMP).	Biodiversity and water

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It is clear that water quality has deteriorated after the start of mining and this is impacting on downstream water users. It thus imperative that the precautionary principle is applied in this area to prevent potentially disastrous impacts on the environment as well as the social well-being of immediate and downstream water users given the aforementioned deterioration of water quality due to mining.	Charles Makuwerere	World Wildlife Fund	08-Mar-13	Written Comment		Biodiversity and water
WWF-SA does not believe that any mitigation measures proposed for such an activity will be economically viable and sustainable. WWF-SA's scepticism about the efficacy of any mitigation measures is fuelled by the fact that despite the sensitivity of the aquatic biodiversity of the area as acknowledged in your scoping report, the same scoping report in Section 2.4.5 (Water Management), under the heading Excess Water Discharges into the Natural Water Resource you admitted that; "...As a last resort, excess decanted mine water will be discharged into a natural water source" (p2-23). This is worrying given the scourge of Acid Mine Drainage (AMD) in the country at the moment and in this regard we advocate for a precautionary approach and go for the No Go Option.	Charles Makuwerere	World Wildlife Fund	08-Mar-13	Written Comment		Biodiversity and water

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Impacts on surface water quality and quantity, and the associated impacts on streams and wetlands, are unacceptable, given the high sensitivity of the Ohlelo River system and the expected major negative impacts without available mitigation options. Water quality monitoring is insufficient mitigation. Impacts on reduced base flow to wetlands again pose major negative impacts without available or possible mitigation measures. Why is there no proposed compensation for the loss and contamination of the domestic drinking water supply to the greater surrounding area? The large water transfer scheme and downstream receiving environment are also not duly considered. Furthermore, why is no compensation or mitigation proposed for the loss of stock watering supply for Red Meat sector farmers on neighbouring and downstream farms? In terms of direct loss of watercourses and associated hydromorphic grasslands, this impact is considered to be unacceptable in this High Water Yield area. No mitigation measure proposed will be acceptable, given that: “A number of watercourses of significance, including the Kransbank Private Reserve wetlands which feed into the greater National Freshwater Ecosystem Priority Areas (NFEPA) Ohlelo River, and associated hydromorphic grasslands, could be affected by alterations to the groundwater resources during the operation and closure of the mine.” Off-sets for wetlands and watercourses lost are recommended to be investigated. Why are equivalent off-sets for the loss and degradation of grasslands not considered or proposed?	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter	Impacts associated with reduced water quality availability for people, agriculture and livestock resulting from mining activities (water use, dewatering and contamination) were assessed as part of the Social Impact Assessment (Section 10.1.4 in Chapter 10). As part of the detailed set of mitigation measures associated with this impact, Kangra Coal have committed to establishing alternative water sources to those receptors where water access (both quality and quantity) is adversely affected. Furthermore, this water delivery will continue for decades until the existing baseline quality of water is achieved. In terms of downstream impacts, the EIA has identified impacts to surface water as a result of decreased baseflow in the Ohlelo River. Cumulative impacts have been qualitatively assessed, and the ESIA has identified that with future mining developments in the Study Area, that the Ohlelo and Assegaai River Catchments are likely to come under increased pressure, not only in terms of water abstraction/discharge, but also in terms of the potential contamination of these rivers by diffuse sources of pollution (see Chapter 11 of the SEMP). Offsetting wetlands would naturally incorporate the surrounding grasslands. ERM and the biodiversity specialist team does not feel there is a dramatic loss of grassland habitat, and should wetlands be offset, it is believed that there would be an automatic gain to the grasslands. Offsets are a complex issue, and thus the specialist team has not encouraged the requirement for offsets for the following reasons: o The MTPA are not in favour of offsets, and prefer the in situ protection of biodiversity. o The MTPA require wetland offsets to be within the same catchment. o Some of the wetlands of the study site, and their associated grasslands are in a good ecological state, and it will not be easy to find similar habitats on which to base an offset. The requirement for offsets should come from the regulatory authorities when they issue a RoD, which would then stipulate the requirement on the client.	Biodiversity and water

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The proposed location of the proposed project falls within highly significant and irreplaceable areas identified by the MCPC.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	Comment noted. This was considered in the biodiversity impacts assessment (Section 9.8 of Chapter 9).	Biodiversity
How will the impacts of the proposed mining activities be mitigated particularly around the highly sensitive areas?	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	Both social and enviornmental impacts have been assessed through a number of studies including: social (addressing influx), air quality, geohydrological, hydrological and biodiversity . The biodiversity impact assessment provides a number of management/mitigation measurses associated with habitat loss and changes in hydrology through groundwater dewatering, habitat loss through construction, changes in habitat integrity and specific species related impacts. In some cases such as wetland loss, very limited mitigation measures could be provided. Kangra Coal are however considering the alternative layout of some of the infrastructure in the main mine adit so as to avoid development of infrastructure in valley bottom wetlands with a channel (riparian areas along the Ohlelo River), which was identified as been a very sensitive environment. This is discussed in more detail in Chapter 9. In terms of avifauna, the SEMP addressed impacts (Chapter 9) associated with potential species destruction during the construction and operational phases of the Project. This impact was identified as being a moderate negative impact. Mitigation for impacts to avifauna would include, biodiversity education for employees, changing driver behaviour and the installation of visibility-enhancing devices - such as “Key Tag Flappers,” along powerlines.	Biodiversity
Noted the area is a very sensitive environment with key wetland areas and significant birdlife (also from a national perspective), hence strong management/mitigation measures are necessary for the project	Andre Steenkamp	Birdlife South Africa	21-Jul-11	Meeting with Andre Steenkamp		Biodiversity
BirdLife South Africa is still concerned by the environmental impacts of this mining expansion application that cannot be mitigated, including further human influx, habitat destruction, the spread of invasive alien plants, erosion, air-, water and noise- pollution. The biggest concern remains the impact of coal mining on the water quality of the Assegai Catchment, which will impact on the nearby Heyshope Dam, and could have severe negative impacts for avifauna and is one of the most important waterfowl sites in South Africa and is an important winter- and drought- refuge for waterfowl. Heyshope Dam also regularly supports at least 52 species of resident, migratory and nomadic waterbirds, numbering between an estimated 45 000to an extrapolated 100 000 individuals. Any coal mine expansion in the headwaters of such an important water resource and in an ecological corridor will be detrimental to biodiversity conservation, climate change adaptation and regional water security. BirdLife South Africa does not support prospecting or mining of any resource within the Grasslands Biosphere Reserve IBA or adjacent natural areas, and therefore strongly objects to the granting of a mining right for the Kangra Coal Kusipongo Resource Expansion Project.	Carolyn Ah Shene-Verdoorn	Birdlife SA	24-Jan-13	Email		Biodiversity

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BirdLife South Africa remains strongly opposed to the underground and opencast coal Mining Right application for the proposed Kangra Coal (Pty) Ltd Kusipongo Resource Expansion Mining Project in the Mkhondo and Dr Pixley Ka Isaka Seme Loca lMunicipalities in Mpumalanga. BirdLife South Africa is opposed to any mining application inside an Important Bird and Biodiversity Area (IBA), in this case, the Grassland IBA (SA 125). Mining activities are often accompanied by environmental impacts that compromise both avifauna and biodiversity in general. BirdLife South Africa is concerned by the environmental impacts of this mining application that cannot be mitigated, including human influx, habitat destruction, erosion, air-, water- and noise- pollution.	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter		Biodiversity and water

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Given that no mitigation measures are available, and the high proportion of"irreplaceable" and "highly significant" biodiversity categories (MBCP 2007) in the area, a monitoring programme is not an adequate solution or mitigation measure for this significant impact. Do you plan to simply "monitor" species to their local extinction?	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter	The impacts that could potentially lead to the greatest loss of sensitive biodiversity result from lowering of the ground water table and the corresponding loss of springs, seeps and the extensive wetlands it supports. However the ground water specialists have a low level of confidence on how their geohydrology model based on limited available data and the complex subsurface geology of the site. They are unsure of how the ground water will respond to the development of the mine, but the biodiversity specialist team have followed a conservative approach towards the assessment of the impacts. Based on this uncertainty and a lack of practical mitigation, the biodiversity specialists believe that the best approach will be an adaptive management to handling the impacts, which can only be applied if effective monitoring is done. They are well aware that monitoring in itself does not mitigate impacts, and have therefore included the following statement into the monitoring requirements to empower the authorities to act based on the best possible advice: Monitoring results [related to all ecological aspects] are to be consolidated into annual reports by a registered ecologist appointed by Kangra Coal. Each annual report will be peer reviewed, and submitted to the MTPA for approval. If monitoring indicates that serious changes to the ecology have occurred as a result of mining-related construction or operations, then recommendations for adaptive management of the relevant impacts will be developed and tangible modifications incorporated into management plans, prior to peer review and submission to the MTPA for approval (see Section 9.8 of the SEMP).	Biodiversity
Threatened bird species monitoring once per year ("on an annual basis") does not equate to an adequate mitigation measure for the habitat loss, habitat degradation, disturbance and possible persecution or illegal hunting of these Red Data species as well as endemic bird species in the project area. Given that this project lies within the globally recognised Grasslands (SA 125) Important Bird and biodiversity Area, and the high number of threatened bird species that occur and breed in the area, this impact is unacceptable.	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter	The difference between the significance of the pre-mitigation impact and the residual impact is our measure of the effectiveness of the proposed mitigation measures. The biodiversity specialist team have not implied that monitoring of Threatened Bird Species will reduce the residual impact. The residual impact for the loss of wetlands, which will have the biggest impact on all forms of biodiversity including threatened bird species, has been rated as being of Major significance. This clearly implies that it cannot be foreseen how impacts of this magnitude can be mitigated. Based on these facts, the regulatory authorities need to make the decision whether this is acceptable (see Section 9.8 of the SEMP).	Biodiversity

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What is the predominant vegetation type in the area?	Miranda Sikhakhane	Mondi	30-Jul-13	Meeting with landowners and NGOs	The Project Area is located within the Mesic Highveld Grassland Bioregion which predominates throughout the higher rainfall, eastern regions of the Highveld and forms a part of the Grassland Biome. The proposed surface expansion area spans three regional vegetation types within this biome, including – Wakkerstroom Montane Grassland, Paulpietersburg Moist Grassland and Eastern Highveld Grassland.	Biodiversity
Where is the wattle plantation on site?	Glenn Ramke	Endangered Wildlife Trust	30-Jul-13	Meeting with landowners and NGOs	An old abandoned wattle plantation is situated in the north eastern corner of the area proposed for the main mine adit on farm Twyfelhoek No. 379-IT, Portion 3.	Biodiversity
Could the plantations be utilised for the absorption of heavy metals?	Gudrun Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	No. It is better to have propoer watermanagement strategies on site to prevent heavy metal contamination. Also its is more favourable to reduce areas of exotic and unmanaged vegetation, as these are seen as a water user contributing to reduced streamflows in the area.	Biodiversity
Although MTPA is objecting to this proposal I need to congratulate ERM and Natural Scientific Services for an excellant EMP. The Baseline Biodiversity and Impact Assessment was really impressive. The highest standard ever encountered for an ecological study	Francois Krige	Mpumulanga Tourism and Parks Agency	23-Jul-13	Email received	Thank you for your comment.	Biodiversity
Request to have access to the detailed hydrology report (where the impact on each spring needs to be assessed). He also requested for the water specialist reports produced by ERM to be provided to him	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	The detailed hydrological and geohydrological specialist studies will be made available to you.	Information requirements
Can we get a copy of the Department of Mineral Resources' acceptance letter?	Lori Duiker	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	This document cannot be made public due to its confidential nature.	Information requests
Does Kangra Coal have the mining license already?	Lori Duiker	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	The mining license is not yet in place. The current environmental authorisation studies are being undertaken in support of the mining rights application.	Information requests
How far underground does the mine extend? We would like to see the underground mining plan.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Your request for the underground mining plan has been forwarded to Kangra. Kangra has indicated that they will respond to you directly with regard to this request.	Information requests
We request monitoring reports for the proposed and current mining project.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Your request for the monitoring reports has been forwarded to Kangra. Kangra has indicated that they will respond to you directly with regard to this request.	Information requests
Is there a feasibility study or a competent person's report available for public perusal?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Your request for the competent persons report has been forwarded to Kangra. Kangra has indicated that they will respond to you directly with regard to this request.	Information requests

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Will the geohydrological study be made available to the interested and affected parties?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	The geohydrological study was made available for public comment as part of the Draft SEMP Report.	Information requests
Can I get a copy of the scoping report?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	A copy of the Draft Scoping Report was made directly available to Ms Loubser.	Information requests
We appreciate Kangra's honesty in providing the reports requested.	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Comment noted.	Information requests
Houses in the surrounding communities are cracking because of the mining activities.	Mgezeni Hlatswayo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Kangra Coal undertakes its blasting activities in accordance with its 'Code of Practice for the Use of Explosives' and 'Code of Practice to Combat Rockfall and Slope Instability Accidents in Surface Mines'. Some of the procedures are as follows: The amount of explosives used in each hole is controlled; blasting activities are restricted to daylight hours; prior warning is given to community members; people are removed from the blasting zone; and a blast clearance is conducted before every blast. Any damage to structures potentially caused by blasting activities, will be investigated further by Kangra Coal. Compensation will be provided only if it's proven that cracking was due to Kangra Coal's activities. Kangra is currently monitoring its blasting activities, with a mitigation plan being developed accordingly (see Section 10.5 of the SEMP).	Vibrations
The effects of dynamite blast must always be kept in mind when mining starts.	Julia Masondo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting		Vibrations
The communities are affected by Kangra Coal activities and this is evident in that our houses are cracking. Kangra Coal is the cause of this.	Thulani Mkhonza	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting		Vibrations
My house once cracked in half because of Kangra Coal's blastings. This issue was reported but nothing was done about it.	Sbuso Phakathi	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting		Vibrations
The blastings have affected the building structures in the community and these incidents have been reported, yet no action was taken by Kangra Coal.	Ntonbenhle Nkosi	Community Member	30-Jan-13	Driefontein Open House Meeting		Vibrations
The mine blastings cause a lot of vibrations in the communities.	Ntombifuthi Ndlela	Community Member	30-Jan-13	Driefontein Open House Meeting		Vibrations
People are not warned or made aware of when the blasts take place from the mining activity. These blasts can scare people.	Princess Yende	Community Member	30-Jan-13	Driefontein Open House Meeting		Vibrations
Earthquake-like vibrations have been experienced and some are threats to building structures.	Chief Moloi	Traditional Leader	30-Jan-13	Driefontein Open House Meeting		Vibrations
Blasting impacts could be minimised through the communication of blasting times.	Chief Tshabalala	Traditional Leader	30-Jul-13	Traditional Authority Meeting		Vibrations
Blasting will be felt and there will be damages and disturbances as a result of blasting. Monitoring of blasting damages is required.	Chief Yende	Traditional Leader	30-Jul-13	Traditional Authority Meeting		Vibrations
Blasting is a concern of the communities in this area. What are the likely Kusipongo Project impacts anticipated to be in this regard.			28-Jul-13	Meeting with 7 Affected CPAs		Vibrations

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Affected communities should be provided with a schedule of blasting activities and notified timeously of blasts.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi		Vibrations
How should blasting concerns be reported. Previous complaints have been directed to the traditional authorities.	Chief Tshabalala	Traditional Leader	30-Jul-13	Traditional Authority Meeting	A grievance mechansim will be developed for the Kusipongo Project and utilised for the notification and addressing of complaints. Each case should be reported directly to Kangra, through the Stakeholder Manager, and each case will be studied individually	Vibrations
How can we report on the cracking of houses during mine blastings?	Goodboy Fakweni	Community Member	30-Jan-13	Driefontein Open House Meeting		Vibrations
2 Rondawels and a library have been impacted on by blasting in the area.	T Madonsela	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	Kangra is always free to listen to cases. Each case should be reported directly to Kangra, through the Stakeholder Manager, and each case will be studied individually.	Vibrations

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Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
The mining activities causes noise during the night around the nearby communities. Vibrations from blasting and the impact on structures is also of concern.	Khehla Nkosi	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	The noise impact assessment (Section 9.7 of Chapter 9 of the Social and Environmental Management Plan) took into account impacts associated with the proposed Project operating during night time hours and has provided mitigation measures in this regard, including correct and appropriate noise abatement measures, environmental awareness training and resettlement consideration for those communities where predictions indicate an increase in baseline noise levels of 5 dBA or higher than the SANS 10103 night-time rating level of 35 dBA. Furthermore, the social study identified that blasting during construction and to some degree during operations will create health and safety risks for local residents. Mitigation/management measurses associated with this are around resettlement of those communities that will be directly impacted by such health and safety effects.	Noise and vibrations
There are loud noises experience during the day and night from the mining activities.	Chief Moloi	Traditional Leader	30-Jan-13	Driefontein Open House Meeting		noise
The communities are concerned about noise impacts on them including the ventilation fans.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community		Noise
Also given that this community has already lodged complaints of pollution with Kangra and other relevant parties regarding its current activities, why in your company's opinion would Kangra be authorised to expand without having addressed our current concerns? How would Kangra deal with added potential environmental risks, whilst not having successfully demonstrated to this community that it can deal with current challenges?	Mr. Louis Botha,	MEPA (Mkhondo Environmental Protection Association)	16-Aug-11	Email to Lisa Van Dongen	This Social and Environmental Management Programme takes into account impacts associated with legacy issues stemming from Kangra Coals previous and current mining operations. Furthermore, Kangra Coal recognises that a concerted effort needs to be made to remedy its poor image in the community and to establish constructive relationships that will facilitate its social license to operate going forward. As part of the impact assessment associated with legacy impacts, Kangra Coal have committed to a number of conditions that will increase their relationship and communication with communities living in the area (see Section 10.1.7 of the SEMP).	Historical issues
The Rooikop community claim that they were promised the following by Kangra;	Rooikop Community Members		July 2011	Meeting with Rooikop Community		

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1. Kangra promised to give each household in Rooikop a gift in a form of money every month but the money would be paid out in a lump sum yearly. Since 1994 to date not a single household has received the money. The community would like for Kangra to fulfil its promise.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	Kangra Coal has no record of such an agreement. The community is requested to provide proof of such an agreement.	Historical issues
2. We were promised employment. However, only 4 people were employed. They promised that they will employ people from Rooikop before they would go employ people from the neighbouring farms.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	Kangra Coal has no record of such an agreement. They have limited employment opportunities and has a commitment to all communities. Some people from Rooikop have been employed, as confirmed by the community.	Historical issues
3. Kangra promised to do everything for us: fix houses that are cracking, provide electricity, provide water and provide employment for the unemployed. None of these were fulfilled. They also mentioned that they have safety procedures in place to prevent houses from cracking during their mining activity. Nonetheless, our houses are built with clay and are cracking. The safety procedure they mentioned does not seem to be effective. We are pleading for their help in this regard. It has been a long wait for the community.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	Kangra Coal has no record of such an agreement. The community is requested to provide proof of such an agreement.	Historical issues
4. The mine sent Mr Dlamini who is not part of our community to come and look for orphans amongst our community so that they can offer them employment. Nothing has come out of it. We are asking the mine to come and explain the issue around orphans.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	Kangra Coal has no record of such an agreement. They have limited employment opportunities and has a commitment to all communities. People from Rooikop have been employed, as confirmed by the community.	Historical issues
5. The white people that are renting the farm from the mine limit each community member to have a maximum of six cows if they are not employed by them.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	This issue needs to be resolved between the lessee and the community living on the property. It cannot be addressed by ERM or Kangra.	Historical issues
6. 26 members of the community of Rooikop request to see a copy of the title deed because they've been informed that the current users are only renting the facility.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	A copy of Kangra Coal's title deed will be sent to Rooikop Community members.	Historical issues
	Rooikop Community Members		July 2011	Meeting with Rooikop Community		
7. The community of Rooikop would like to know who their counsellor (municipal) is.	Rooikop Community Members		July 2011	Meeting with Rooikop Community	This concern will be addressed in further feedback engagements with this community	Historical issues
The consultants undertaking the Public Participation Process do acknowledge the community's views but Kangra Coal usually do not take any action on these views.	Nathaniel Mlambo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted.	Historical issues
There is no consistency with Kangra Coal, and as such the community does not trust Kangra Coal.	Mgezeni Hlatswayo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted.	Historical issues

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This is not the first time we have attend meetings like this. The meetings are all the same with the same promises but no delivery.	Sibongile Ndlela	Community Member	28-Jan-13	Makotas	Comment noted.	Historical issues
Kangra Coal has made a number of promises but did not deliver. For instance some things as simple as upgrading a road were not even completed by Kangra Coal. Kangra Coalmakes more and more money but do not improve anything within the surrounding communities.	Enoch Khumalo	Jagdrift Community	28-Jan-13	Makotas	Comment noted. The upgrade of Provincial Roads is the responsibility of the Provincial Roads Department, and not Kangra Coal, due to legal implications should accidents occur on these roads.	Historical issues
Kangra Coal must rectify their mistakes such as completing the houses they started building in Kanluka.	Enoch Khumalo	Jagdrift Community	28-Jan-13	Makotas	As far as Kangra Coal is concerned, all of these houses are complete. The community is requested to provide further information regarding incomplete houses to the Mine Manager, who will investigate this further.	Historical issues
How is Kangra Coal addressing the commitments that were made in previous social labour plans that haven't been addressed yet? Kangra needs to explain why Local Economic Developments have not been implemented.	Mhlaliseni Yende	Driefontein Councillor	29-Jan-13	Officals Focus Group Meeting	There are various reasons as to why the previous commitments have not been addressed which include various challenges encountered with the local municipality. There is a Section 102 application that is being put forward to ensure that the previous commitments are being dealt with.	Historical issues
The Driefontein community has been promised lots of things at these meetings and these promises are never met.		Driefontein Community Member	30-Jan-13		Comment noted	Historical issues
Why is Kangra Coal only calling meetings now? They didn't have any meetings in the past and if they did they never came back with feedback to the communities.	Thulani Mkhonza	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Kangra Coal has had meetings with the Driefontein Community Forum (representation of the community) in the past. The stakeholder engagement programme for the new project has entailed the following activities to ensure the open involvement and registration of interested and affected parties: media notices, site notices, use of a loud hailer to announce community open day and public meeting, notification of public engagements through the CPAs and holding a meeting and public open day on 30th January 2013 in the Driefontein community. Broader participation is welcolmed.	Historical issues

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How can the community trust Kangra Coal now with their new proposed project if they consistently failed in the past.	Thulani Mkhonza	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	From the recent stakeholder disclosure engagement fieldtrip in January 2013 for the proposed Kusipongo Resource Expansion Mining Project, the importance for inclusive, transparent and on-going dialogue with all stakeholders (including communities) is recognised. Kangra Coal believes in the fair treatment of communities living in proximity to its current and proposed mining sites and will ensure that a working partnership is established with these communities. To ensure that the negative perceptions are managed, Kangra Coal will formalise and carefully manage its Community Relations Department to be available should any community members wish to lodge a grievance or should they require any further information. It is inevitable that complaints and grievances will arise over the life of mine; however, it is Kangra Coal's intention to address legitimate concerns in a straightforward, timely and culturally appropriate fashion	Historical issues
The monitoring and other related environmental documents have been requested since 2010 but nothing has been delivered from Kangra Coal.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal is not aware of this request. It has been noted and will be responded to directly by Kangra.	Historical issues
Concerns and issues are always raised and brought forward to Kangra Coal however none of them are addressed.	Lindiwe Mcunu	Community Member	30-Jan-13	Driefontein Open House Meeting	Comment noted	Historical issues
Kangra has not demonstrated in taking up its responsibility and accountability to the management of water and especially AMD – even after the community has communicated with the mine.	Gudrun Loubser	Community Member	31-Jan-13	Written Comment	Comment noted. Kangra Coal will investigate this allegation as to why no responses were provided.	Historical issues
Unfortunately Kangra has not responded to our communications. Further evidence of our concerns were raised in various Catchment Management Forum meetings. The minutes of such can be obtained from the DWA offices in Durban. Concerns have further been raised with the Compliance offices in Pretoria.	Gudrun Loubser	Community Member	31-Jan-13	Written Comment	Comment noted.	Historical issues
The community always opens up to Kangra Coal and its promises however, Kangra does not fulfill their promises.	Mr Madlala	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted. Kangra Coal would like to understand which promises are being referred to.	Historical issues

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There are existing problems in terms of water contamination. This has been noted at Maquasa East and West. The management commitments that have been made are therefore not practical. At Maquasa West there are currently pipes releasing contaminated water from the mine to the environment. People are reliant on this water for drinking purposes.	Chief S. Yende	Traditional Leader	26-Jul-13	Traditional Authorities Meeting	Kangra Coal is aware of these areas as it was caused by a broken or blocked pipe from the discard dump. It has been repaired and clean up operations have commenced. All the areas will be clean and measures put in place to prevent a further occurence by the end of 2013.	Historical issues
In light of legacy issues and the absence of Kangra, it is suggested that the traditional authority meeting be cancelled. This can be resumed when Kangra officials are present. It is important that the General Manager is present to discuss issues with the traditional authorities.	Chief S. Yende	Traditional Leader	26-Jul-13	Traditional Authorities Meeting	This meeting was resheduled and held on 30th July 2013.	Historical issues
Contaminated water is currently been pumped into a dam. The grass in the area is dying and the water has a very sour taste.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Kangra Coal is not pumping water into the dam and will investigate this matter and implement remedial actions as required. They are not aware of this incident	Historical issues

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Will the promises made previously be fulfilled by Kangra? If people are not directly affected by the project, but are impacted on, will they receive compensation?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	It is Kangra Coal's commitment to correct past mistakes. Any person affected has to notify the Kangra Coal Stakeholder Manager of any grievances, and each case will be studied case by case. If the impacts of the project fall under any community member land, these will be investigated and the necessary compensation oferred based on the merits of the case. The law prohibits any mining company from undermining any surface structure so it is anticipated that it is only a blastin or ground water supply or quality impact that could impact on surrounding landowners and landusers. Blasting impacts will be monitored and managed (see Section 10.5 of the SEMP) and an alternative water supply will be provided if required (see Section 9.4 and 9.5 of the SEMP).	Historical issues
Previous open cast operations have not been rehabilitated. This is already having an impact on the community.			28-Jul-13	Meeting with 7 Affected CPAs	Kangra Coal is currently implementing a rehabilitation programme for its old and current operations.	Historical issues
There are currently air quality problems as a result of dust from the beneficiation process. Why can the mitigation proposed for Kusipongo not be put in place at the current operations?	S.W. Gama	Driefontein Development Council	29-Jul-13	Meeting with Driefontein Community representatives	It is always more difficult to make engineering modification instead of constructing it in the correct way from the beginning. The process plant was built in 1996 and since then technology has improved tremendously	Historical issues

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Currently water is being discharged and deposited in the dam. Concerned of contamination. Zero discharge is not currently been practised.	Jabulane Ngwenya	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	Kangra Coal not discharging water into the dam and will investigate this matter and implement remedial actions as required. Kangra Coal is not aware of this incident	Historical issues
When there is rain currently, the water that is discharged reaches the dam and results in contamination.	Maria Ndlovu	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives		Historical issues
Agreements have previously been reached between Kangra and the commuities. There was supposed to be a 50/50 agreement. Kangra does not listen to the community and now some of the members are seeking legal advice.	T. Madonsela	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	Kangra Coal has no record of such agreements. Further queries in this regard can be directed through the Stakeholder Manager.	Historical issues
Recent pictures from June 2013 indicates salts collecting in trenches. The Kusipongo Project cannot proceed unless the mitigation measures are adhered to.	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Remedial actions have already been implemented. All the remedial actions will be implemented by the end of 2013 to prevent future occurences.	Historical issues
Are geochemical studies conducted within this Environmental Social Impact Assessment (ESIA) to understand the chemical analysis of the coal and its waste products and hence the risk of acid mine drainage.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Yes - geochemcial studies have been undertaken as part of this ESIA process. A comprehensive Groundwater Impact Assessment report has been attached to the Social and Environmental Management Programme (Annex C.3).	Scope of EIA/EMP
There are graves that have not been relocated properly as there are some subsidence taking place where the graves used to be.	Ntombifuthi Hlatswayo	Community Member	30-Jan-13	Driefontein Open House Meeting	Not all areas have been undermined; thus the graves will need to be inspected first. The community must indicate the affected graves to the mine manager.	Heritage

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Graves are sensitive. Individual requirements for ceremonies are required. Traditional authorities need to be involved in the grave reloaction process.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Grave relocation will be addressed in accordance with the legislative requirements. Affected family consultation and wishes with regard to ceremonies will be sought.	Heritage
Graves are a very sensitive issue in the communities. Cultural rituals will be required. Ancestors could be angered.	Chief Tshabalala	Traditional Leader	30-Jul-13	Traditional Authority Meeting		Heritage
The grave resettlement process is sensitive. There are procedures that need to be followed beforehand.			29-Jul-13	Meeting with Driefontein Community representatives		
Lighting impacts are a concern to the community	Jabulane Ngwenya	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	This has been addressed as part of the visual specialist study and is detailed in Section 10.2 of the Social and Environmental Management Programme.	Visual
What is the risk of the ignition of very fine coal dust (duff)	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Fine coal dust is highly flamable if in the correct environment. This is a real concern for all mining companies with underground operations, and specific measures and monitoring are implemented to minimise risks underground. On the surface the risk is low given that it is an open environment and does not allow for the accumulation of a flammable gas to explosive quantities.	Spontaneous combustion
With the conveyor belt being closed, surely there will be a risk of spontaneous combustion as temperatures will increase.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	The design for the conveyor belt already includes measures to prevent this issue. Furthermore, there is an existing conveyor belt for which this problem has never occurred.	Spontaneous combustion
Kangra does not listen to the people. We do not want them to mine here. Shanduka should be mining here.					Comment noted.	Other
There should be a mining project that is not under the Piet Retief jurisdiction because the officials are only in favour of Piet Retief residents. They are not concerned with the impacts on the Driefontein community.	Julius Nhleko	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted.	Other
For the GCS open pit project, how long will the pits stay open? There are safety issues for people and livestock as a result of these.		Driefontein Community Member	30-Jan-13		This concern will be forwarded to GCS who are undertaking the environmental authorisation work for the open pit project.	Other
It is appreciated that Kangra Coal has taken the time to inform the community about their proposed plans.	Mr Madlala	Driefontein Community Member	30-Jan-13	Driefontein Community Meeting	Comment noted.	Other
Will Kangra Coal eventually apply for mining rights over all the areas that they explored?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	This is dependent on whether the determined reserves are viable to exploit.	Other

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Is Kangra Coal paying the required royalties to the government. And what they based on?	Mr Weber	Landowner	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal is paying the required royalties to the government. This is based on a specific formula, as per the Mineral and Petroleum Resources Royalty Act, 28/2008.	Other
Who are the shareholders of Kangra Coal	Mr Weber	Landowner	29-Jan-13	Landowner Focus Group Meeting	Shanduka 30% and Gas Natural Fenosa 70%.	Other
Are the current Kangra Coal mining operations authorised? Are the relevant authorisation papers available for review?	Gudrin Laubscher	Community Member	29-Jan-13	Landowner Focus Group Meeting	Your request for the relevant authorisation papers has been forwarded to Kangra. Kangra has indicated that they will respond to you directly with regard to this request.	Other
Is Kangra Coal currently meeting its environmental commitments?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal is meeting its commitments, in a continuous process according to the DMR and the environmental authorities.	Other
Is there proof that Kangra Coal is mining responsibly in terms of environmental management?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	A request has been made for previous monitoring reports which would address this issue. This request has been forwarded to Kangra who will address this directly with stakeholders.	Other
Is it worth placing the environment at rist to mine coal that is not really contibuting to the development of South Africa.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Comment noted.	Other
What is the likelihood of the mining right's approval from authorities?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Neither ERM nor Kangra are able to comment on behalf of the regulatory authorities.	Other
Why does Kangra Coal want to mine at the proposed location specifically? Is it ethical to mine at that specific area that Kangra Coal has proposed? The location of the proposed mine is very sensitive and Kangra Coal is well aware of this sensitivity yet they persist on proceeding with the project.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	The project is restricted by the layout of the underground reserve and location of the mountain relative to the reserve. Numerous positions for the adit were investigated and other areas of higher environmental impact were discarded as a result of the sensitivity associated with them. As there are a number of constraints and considerations to position an adit, the chosen site was found to be the only viable option. Kangra Coal is considering alternatives to redesign the location of selected infrastructure in the Main Mine Adit Area so as to keep away from the more sensitive valley bottom wetland with a channel - this is described in more detail in Chapter 4 of the SEMP.	Other
Kangra Coal should set a good example and not proceed with their proposed activity and rather conserve the environment.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Comment noted. In order for the mine to remain in operation, it needs to extend it's mining areas. It is anticipated that the current Kangra Mining operation has a remaining life of 2-3 years.	Other
Does the governmental authorities monitor the current mining operations at Kangra Coal on a regular basis?	Johan Weber	Landowner	29-Jan-13	Landowner Focus Group Meeting	Yes they do.	Other
Are the current monitoring reports taken into consideration when decisions are taken on the approval or disapproval of mining rights applications?	Johan Weber	Landowner	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal expects them to be taken into consideration.	Other

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Kangra Coal has a responsibility towards the community. They should be transparent and trustworthy. For instance if they know something is wrong they should notify the community and also correct their wrong doings.	Japie Laubser	Landowner	29-Jan-13	Landowner Focus Group Meeting	Comment noted.	Other
There are rumours that Kangra Coal has already started preparation for construction for their proposed expansion without any authorisations being approved. There is road construction currently underway.	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Kangra Coal is not undertaking any construction work for the Kusipongo Project.	Other
Compliance and monitoring reports for Panbult siding are also requested?	Gudrun Loubser	Community Member	29-Jan-13	Landowner Focus Group Meeting	Your request for the relevant compliance and monitoring reports has been forwarded to Kangra. Kangra has indicated that they will respond to you directly with regard to this request.	Other
Will there be a relationship between the community members and Kangra Coal as well as it's contractors?	Ntonbenhle Nkosi	Community Member	30-Jan-13	Driefontein Open House Meeting	Kangra Coal will strive towards creating and maintaining this relationship.	Other
We do not support any further development of this mine, We emphatically object the opening up of new shafts, additional infrastructure or any further development of coal-mining related operations by Kangra in the areas under discussion.	Gudrun Loubser	Community Member	31-Jan-13	Written Comment	Comment noted.	Other
Kangra is the only mine located in the Piet Retief area that attends stakeholder meetings i.e., Catchment Management Forum	Mike Trebble	Community Member	23-Jan-13	Telephonic comment	Comment noted.	Other
Request for private meeting or a discussion with Kangra Coal regarding royalties. Request for ERM to pass on the message.	Chief Moloi	Tribal Authority - Dr Pixley Kalsaka Seme	29-Jul-11	Meeting with Chief Moloi	Noted. This message has been past onto Kangra Coal.	Other
Request for a meeting with Kangra Coal to speak about compensation for the use of CJF Greyling's land.	Mr CJF Greyling		21-Jul-11	Meeting with CJF Greyling	This request has been communicated to Kangra Coal.	Other
Kangra Mine came to Rooikop in 1994 and called a public meeting. Kangra representatives asked if we knew the owner of the farm-Rooikop. We responded by saying that the farm belonged to the white people. The Kangra representatives informed us that they are the mine owners; they are here to mine what belongs to their forefathers. The white people that are currently using the farm are renting the land to feed their live stock. They said to us that if we work for those that rent the land from the mine they must pay us or else we must sit and discuss the issue of non payment with them (mine owners).	Rooikop Community Members		Jul-11	Meeting with Rooikop Community	Kangra Coal cannot comment on this issue as they do not have records of such meetings. Prior to 2005 all minerals belonged to individuals or organisations and not the state, and negotiations for minerals were conducted with private individuals or companies. Farmers who rented properties had the right to employ whoever they chose.	Other
The mine should not go ahead with their planned activities.	Mgezeni Hlatswayo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Comment noted.	Other

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The mine usually carries on with their work and their negative impacts and nothing is done to prevent it.	Nathaniel Mlambo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	For the last four years, Kangra Coal has rehabilitated four historic operations of which two were submitted for closure certificates to the goverment. This process will continue for all the old operations, and in close contact with the DMR and environmental authorities	Other
Should the community elect their own person to represent them or should Kangra Coal elect a person for them.	Nathaniel Mlambo	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	Any participation of community representatives needs to be agreed to be the community. Kangra Coal cannot advise in this regard.	Other
There should be different persons representing different communities to avoid biasness towards certain communities.	Mbangani Mabasa	Community Member	27-Jan-13	Twyfelhoek CPA Meeting	It has been assumed that the CPAs are a spread of representation coupled with the traditional authorities. This will be investigated and considered further for the next round of engagement.	Other
Who do consultants work for? ERM or Kangra Coal? Do they receive payments from Kangra Coal? We can't listen to anyone that works for Kangra Coal.		Community Member	28-Jan-13	Makotas	ERM is an independent environmental consultancy appointed to undertake this work. In terms of the legislation of South Africa it is necessary for the Environmental Assessment Practioner (EAP) to complete a declaration of independence when the application forms are submitted. Stakeholders are welcome to question and test this independence throughout the environmental assessment process in order to ensure that an impartial impact assessment is undertaken.	Other
The young community members should come forward and stand up against the negative aspects or impact brought upon the land by Kangra Coal.	Robert Mnisi	Community Member	28-Jan-13	Makotas	Comment noted.	Other
The community does not approve of Kangra Coal.	Enoch Khumalo	Jagdrift Community	28-Jan-13	Makotas	Comment noted.	Other
The local municipality has its public meetings. Will Kangra Coal be attending the meetings?	Lerato Molopo	Mkhondo Local Municipality	29-Jan-13	Officals Focus Group Meeting	Kangra Coal is not aware of such meetings. A request is made to the municipality to send the invite to Kangra Coal, as they would like to attend.	Other
There are some confusions between the project run by GCS and that run by ERM. Why are two projects from the same company within the same area being separated?	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	There are separate processes with separate applications and submissions. The GCS project is for an amendment to the existing mining operation. The Kusipongo Project being undertaken by ERM is in direct response to a new mining rights application and for this reason needs to reamin separate and address the specifics associated with the new application.	Other

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The independence of environmental consultancies is a concern as there have been biases demonstrated by consultancies towards the mining clients in the past.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	ERM is an independent environmental consultancy appointed to undertake this work. In terms of the legislation of South Africa it is necessary for the Environmental Assessment Practioner (EAP) to complete a declaration of independence when the application forms are submitted. Stakeholders are welcome to question and test this independence throughout the environmental assessment process in order to ensure that an impartial impact assessment is undertaken.	Other
It is important to understand that WWF is not against mining activities. The mandate of WWF is to ensure that the environment and in particular the sensitive environments are protected from harmful activities.	Charles Makuwerere	World Wildlife Fund	29-Jan-13	NGO Focus Group Meeting	Comment noted.	Other
Objects to the granting of mining rights over his properties. He has raised concerns to Kangra at meetings and these concerns have never been addressed.	Corneels Greyling	Shepstone and Wylie Attorneys	29-Apr-13	Email	Comment noted.	Other
There are projects in the area that are proceeding without any notification of the affected communities. What actions can the communities take in this regard?	Chief Mdluli	Traditional Leader	30-Jul-13	Traditional Authority Meeting	The regulatory authorities should be contacted in this regard. Notification of affected communities is a legislated requirement and therefore the developer must be in non-compliance with the South African law. Kangra Coal attempts to notify all stakeholders, however it is not always possible to notify every affected individual.	Other
There are projects proceeding in the area, for which there has been no consultation with the affected people.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community		Other
We acknowledge and thank Kangra for the consultation undertaken for this proposed mining expansion. However, Kangra's relationship with the traditional authorities needs to be cemented:		Traditional Leader	30-Jul-13	Traditional Authority Meeting	As required, royalties are paid to government and this requires clarification with the traditional authorities. Traditional authority requests for financial benefits are supported wherever possible by Kangra Coal. Skills development is being rolled out at the Mine to employees. There's a mentorship and career progression programme that is being followed which is part of the SLP. Communities are also being trained, e.g. SMME's training rolled out and paid for by Kangra Coal.	Other
1. Communities and chiefs also need to benefit from Kangra's operations. Royalties have to be paid to the traditional leadership. Although the CPAs have title deeds for the land, the traditional authorities own the land 2. Skills development and transfer is required.	Chief Yende					
A public meeting is being held on 11th Oct '13. It would be appreciated if Kangra could make a contribution to this. Perhaps with the Department of Health, Kangra could put a drama together which will highlight the HIV/Aids plight.		Traditional Leader	30-Jul-13	Traditional Authority Meeting	Further discussions will be made with Chief VG Yende in this regard.	Other

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
My vehicle was damaged by one of the coal transportation contractors and I have approached them, but they have stated that compensation for damage is Kangra Coal's responsibility.	Chief Moloi	Traditional Leader	26-Jul-13	Traditional Authority Meeting - Chief Moloi	Any problems need to be reported to Kangra Coal through the Stakeholder Manager and each case will be investigated and solved if it is a Kangra responsibility.	Other
I have raised this issue previously, but it has not been documented. The area is under land claim and no mining can take place until this is resolved.	Chief Yende	Traditional Leader	26-Jul-13	Traditional Authority Meeting	The Social baseline (Chapter 8 of the SEMP) makes mention that there are land claims on Twyfelhoek 379 and Donkerhoek 14. This will need to be considered by the competent authorities when making a decision on the application. According to government legislation, activities may not stop in an area if someone has instituted a claim. However, government officials who investigate and authenticate the claim need to be respected and given access when they ask. When the claim is finalized and the ownership of the land changes, further negotiations between Kangra Coal and the landowner will be required. This is in view of the fact that instituting a claim does not automatically warrant success thereon.	Other
The Gert Sibande area is experiencing significant impacts from the immigration of people into the area. HIV/Aids is a serious problem.		Traditional Leader	26-Jul-13	Traditional Authority Meeting	Noted. The social baseline study (Chapter 8 of the SEMP) identified that HIV infection rates in the study area are low. This against the backdrop of the Gert Sibande District Municipality Strategic Development Framework Report (2009) which highlighted the Mkhondo LM and Dr. Pixley KaIsaka Seme LM as municipalities with high HIV infection rates, suggests either that prevalence in the Study Area is low or, more likely, that the subject is still a taboo locally. This is noted and will influence the nature of social development projects that are needed for the district. Kangra Coal is part of initiatives that are spearheaded by such departments as DARDLA (Department of Agricultural, Rural Development and Land Administration) to scrutinize the negative impact caused by the scourge of HIV/AIDS.	Other

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
What are the requirements for monitoring the new operations? If Kangra is non-compliant what can be done?			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	The SEMP provides a detailed set of monitoring requirements (Chapter 14 - Monitoring Management Programme) that once approved will need to be implemented by Kangra Coal. The monitoring programme includes monitoring frameworks for climate, surface water, groundwater, noise, air quality, biodiversity, socio-economics, visual and heritage aspects. This monitoring programme will collect data that is to be collated, analysed, compared to the requisite regulations, screening values, standards and/or guidelines, and reported to those authorities stipulated in the Mining Rights, Environmental Authorisation, Water Use Licenses and Waste Management License. Should an interested and affected party be of the opinion that Kangra Coal are non-compliant they have the right to notify the Regional Department of Mineral Resources.	Other
I appreciate this consultation. Mining is turning this area into Johannesburg and I am looking forward to the implementation of the project.		David Yende	27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Thank you for your comment.	Other
Is Kangra going to have sufficient capacity to meet its commitments.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Kangra is fully committed to make this project successful and it has the necessary means to achieve its goals	Other
The community is thankful for the presentation and meeting. They have learnt a lot.			27-Jul-13	Meeting with Yende and Kanluka CPAs and Donkerhoek Community	Thank you for your comment.	Other

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
If Kangra finds coal under my land and undermines the area, how do I benefit?	S.W. Gama	Driefontein Development Council	29-Jul-13	Meeting with Driefontein Community representatives	The law prohibits any mining company from undermining any surface structure so it is anticipated that it is only a blastin or ground water supply or quality impact that could impact on surrounding landowners and landusers. Blasting impacts will be monitored and managed (see Section 10.5 of the SEMP) and an alternative water supply will be provided if required (see Section 9.4 and 9.5 of the SEMP).	Other
Who monitors the environmental management plan implementation and assesses compliance?	S.W. Gama	Driefontein Development Council	29-Jul-13	Meeting with Driefontein Community representatives	The SEMP provides a detailed set of monitoring requirements (Chapter 14 - Monitoring Management Programme) that once approved will need to be implemented by Kangra Coal. The monitoring programme includes monitoring frameworks for climate, surface water, groundwater, noise, air quality, biodiversity, socio-economics, visual and heritage aspects. This monitoring programme will collect data that is to be collated, analysed, compared to the requisite regulations, screening values, standards and/or guidelines, and reported to those authorities stipulated in the Mining Rights, Environmental Authorisation, Water Use Licenses and Waste Management License.	Other
What monitoring and evaluation will be undertaken? A suggestions was made for report back on monitoring results to the communities.	S.W. Gama	Driefontein Development Council	29-Jul-13	Meeting with Driefontein Community representatives	See above response. This suggeston regarding reporting monitoring results to communities has been noted.	Other
If non compliance is demonstrated what are the necessary steps to be taken	P.B. Simelane	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives	The regulatory authorities should be contacted if non-compliance is noted and/or grievances are not addressed or resolved.	Other
Who will be checking up that Kangra is compliant?	Maria Ndlovu	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives		Other
If grievances are not resolved by Kangra, to whom can the community turn? There have been multiple Kangra representatives at meetings.	Jabulane Ngwenya; P.B Simelane	Driefontein Community Forum	29-Jul-13	Meeting with Driefontein Community representatives		Other

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Does Kangra have all of its required licenses to operate. Does it have a water use license	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Not all of them. Some have been granted and others are still pending since before 2009 from the authorities	Other
What assurance can Kangra give stakeholders that it will be legally compliant?	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	No operation in South Africa can give a 100% assurance that it is at al times legally compliant. It is how we deal with the issues of non-compliance that is of more importance and that should be tested.	Other
Would the mine still be in operation tomorrow if it was operating in Spain?	Gudren Loubser	Community Member	30-Jul-13	Meeting with landowners and NGOs	Yes, as long as the Company is addressing the problems and continously strive to be legally compliant.	Other
Who has been proposed for monitoring? Should this not be an independent person?	Glen Ramke	Endangered Wildlife Trust	30-Jul-13	Meeting with landowners and NGOs	It is common practice that the Mine implement and undertake their own monitoring porgramme in accordance with the requirements of this ESMP. The appropriate Authorities are responsible for ensuring data collected is reported and comapred to the applicable permit condition. INdependent thrid party audits of compliance can be undertaken at either the discretion of Kangra Coal or the applicable Authorities.	Other
As noted in our client's comments on the Final Scoping Report in April 2013, our client objects to the granting of a mining right over his grazing farms, and requests that the Regional Manager of the Department of Mineral Resources, Mpumalanga ("the Regional Manager"), refer his objection to the Regional Mining Development and Environmental Committee to consider the objection and advise the Minister thereon, in terms of section 10 of the Mineral and Petroleum Resources Development Act 28 of 2002.		Shepstone and Wylie Attorneys on behalf of Mr Greyling	14-Aug-13	Email	Comment noted.	Other
I would like to be of assistance for the provision of slurry pumps, cyclones and slurry valves	Matthew Magwede		31-Jul-13	Email	Your details have been forwarded to Kangra.	Other

Comment and Response Report
Kangra Coal Kusipongo Expansion Project

Comments/Issues and Suggestions Raised	Commentator	Organisation	Date	Source	Response	Category
Significant cumulative impacts are described, yet there is no direct accountability or action on behalf of Kangra Coal proposed. Does this imply acknowledgement of Kangra Coal's contribution to significant cumulative negative impacts without accepting responsibility?	Carolyn Ah Shene-Verdoorn	Birdlife SA	14-Aug-13	Email and letter	The objective of the cumulative impact assessment is to identify those impacts that are likely to result in a combination of the proposed Project and other actual or proposed developments in the broader study area. Kangra Coal will be mitigating/managing their contribution to the severity of cumulative impacts by implementation of the mitigation/management measures included in the SEMP. The mitigation/management of cumulative impacts also needs to be considered by Non-governmental Organisations; Local, Regional and National Government; and other mining companies in the area.	Other
Who are the key roleplayers in the social environment?		Local politician	30-Jul-13	Meeting with local authorities and politicians	Key roleplayers from a social perspective in the area are the Traditional Authorities, Community Property Associations, labour tenants and other private and communal landowners and landusers. The involvement of these parties as well as the national, provincial and local authorities has been sought.	Other

Annex B5

Scoping Phase Notification Materials

Environmental Resources Management
Johannesburg Office
Building 32, 1st Floor
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148
South Africa
Tel: +27 (0) 11 798 4300
Fax: +27 (0) 11 804 2289
www.erm.com

Postal Address:
Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg
South Africa

7 January 2013 *Project no.: 0120258*

Dear Sir/Madam

Initiation of the Scoping Phase: Invitation to Comment on the Scoping Reports and attend a Public Meeting for the Proposed Kangra Coal Kusipongo Resource Expansion Project, Mpumalanga Province

DEDET reference number: 17/2/3 GS-52 DEA reference number: 12/9/11/L719/6
DMR reference number MP30/5/1/2/2/10046MR

The Project and Process

Kangra Coal (Pty) Ltd. is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Kalsaka Seme Municipalities in Mpumalanga. The site of the proposed expansion is situated approximately 15km west of Driefontein near Piet Retief. The proposed activity involves the development of an underground mine, thereby extending their existing Maquasa East and West mining activities.

You are invited to become involved in the process and register as an Interested and Affected Party (I&AP), if you have not registered yet, in order to receive information on the proposed project and process.

Environmental Authorisation and Licensing Processes

In accordance with the relevant environmental regulations, the Environmental Impact Assessment (EIA) requires the following authorisations/licenses prior to commencement:

- **Environmental Authorisation** from the Mpumalanga Department of Economic Development, Tourism and Environment (DEDET);
- **Water Use License** from the National Department of Water Affairs (DWA);
- **Mining Right Application** from the Mpumalanga Department of Mineral Resources (DMR); and
- **Waste Management License** from the National Department of Environmental Affairs (DEA).

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) has been appointed as the independent environmental consultant coordinating the authorising and licensing processes listed above. The first phase of the EIA process is the scoping phase which involves the development of a ***Draft*** Scoping Report under the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and a Scoping Report under the Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) intended to provide a project description, investigation of alternatives, preliminary social and-environmental baselines, perceived potential impacts and plan of study for the EIA. This letter serves to notify you of the initiation of this scoping phase.

Registered Company address:
Environmental Resources Management
Southern Africa (Pty) Ltd
Building 32, 1st Floor,
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148

Company registration number
2003/001404/07

Directors
Jeremy Soboil (Managing)
Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Offices worldwide

A member of the Environmental Resources Management Group

Environmental
Resources
Management

Public Participation Process

As part of the processes listed above, ERM is required to engage with key stakeholders, inform you of the proposed project, involve you in the impact assessment and address any comments/concerns /queries you may have with the proposed project. In the scoping phase, there are two opportunities for the public to be involved in the process, namely:

- To review and comment on the Draft Scoping Reports (under the NEMA) and Scoping Report (under the MPRDA); and
- To attend a public and/or open house meeting.

The **Scoping Reports** will be available for public comment between Monday, 7 January and Friday, 8 March 2013 on www.erm.com/kangracoal and at the following locations:

- Volksrust Public Library, Post Office
- Wakkerstroom Library
- Piet Retief Post Office & Library
- Driefontein Post Office
- Daggakraal Clinic
- Dirkiesdorp Clinic

You are invited to attend the following public meetings:

Open House
Date & time: Wednesday, 30 January 2012, 9:00 – 13:00
Venue: Driefontein Community Hall

Public meeting
Date & time: Wednesday, 30 January, 2012, 14:00 – 17:00
Venue: Driefontein Community Hall

To register an I&AP, receive further information on the project and to participate in the process, please contact **Tsietsi Monare** at Tel: (011) 798 4300, Fax: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 or kangracoal@erm.com.

We look forward to your involvement in the process. Please do not hesitate to contact Paul should you have any questions or concerns.

Kind Regards

Nestus Bredenhann
Senior Consultant

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT, MINING RIGHT, INTEGRATED WATER USE LICENSE AND WASTE MANAGEMENT LICENSE APPLICATIONS

Proposed Kangra Coal Kusipongo Resource Expansion Project

Kangra Coal (Pty) Ltd. is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Kalsaka Seme Municipalities in Mpumalanga. The site of the proposed expansion is situated approximately 15km west of Driefontein near Piet Retief. The proposed activity involves the development of an underground mine, a ventilation shaft and the extension of the existing conveyor belt thereby extending their existing Maquasa East and West mining activities.

In accordance with the relevant environmental regulations, the Environmental Impact Assessment (EIA) requires the following authorisations/licenses prior to commencement:

- **Environmental Authorisation** from the Mpumalanga Department of Economic Development, Tourism and Environment (DEDET)
- **Water Use License** from the National Department of Water Affairs (DWA)
- **Mining Right Application** from the Mpumalanga Department of Mineral Resources (DMR)
- **Waste Management License** from the National Department of Environmental Affairs (DEA)

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) has been appointed as the independent environmental consultant coordinating the authorising and licensing processes listed above. To receive further information on the EIA and register as an Interested and Affected Party (I&AP), please submit your details to Paul Monare (details provided below).

You are invited to Comment on the Scoping Reports
The ***Draft*** Scoping Report, under NEMA legislation, and Scoping Report, under MPRDA legislation will be made available for public comment between Monday, 7 January and Friday, 8 March 2013 at:

- Volksrust Public Library & Post Office
- Wakkerstroom Library
- Piet Retief Post Office & Library
- Driefontein Post Office
- Daggakraal Clinic
- Dirkiesdorp Clinic

Invitation to Public meetings
The following meetings will be held:

Open House
Date & time: 30 Jan 2013, 9:00 — 13:00
Venue: Driefontein Community Hall

Public meeting
Date & time: 30 Jan 2013, 14:00 — 17:00
Venue: Driefontein Community Hall

If you would like to register as an I&AP, to receive more information or to comment on the Scoping Reports, please contact:

Paul Monare
Tel: 011 798 4300 Fax: 086 292 7318
kangracoal@erm.com
Postnet Suite 624, Private Bag X29, Gallo Manor, 2052
www.erm.com/kangracoal

Notice is given of a Public Participation Process & the intention to apply for Environmental Authorisation in terms of the EIA Regulations of 18 June 2010 under the NEMA (Act No. 107 of 1998), as amended, the National Environmental Management: Waste Act 59 of 2008 (NEM;WA) and the Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA).

DEDET reference number: 17/2/3 GS-52 DEA reference number: 12/9/11/L719/6
DMR reference number MP30/5/1/2/2/10046MR

KENNISGEWING VAN OMGEWINGSINVLOEDBEPALING, EN AANSOEKE VIR MYNREGTE, GEÏNTEGREERDE WATERGEBRUIKSLISENSIE EN AFVALBESTUURLISENSIE

Beoogde Kangra Steenkool-uitbreidingsprojek: Kusipongo-hulpbron

Kangra Coal (Edms) Bpk beoog om die steenkool-mynboubedrywighede by die Savmore Steenkoolmyn uit te brei deur die insluiting van die Kusipongo steenkoolreserwe wat oor die Mkhondo en Dr. Pixley Kalsaka Seme Munisipaliteite in Mpumalanga strek. Die terrein vir die beoogde uitbreiding is ongeveer 15km wes van Driefontein naby Piet Retief geleë. Die beoogde aktiwiteit behels die ontwikkeling van 'n ondergrondse myn, 'n ventilasieskag en die verlenging van die bestaande vervoerband - wat 'n uitbreiding is van die huidige mynboubedrywighede by Maquasa-Oos en -Wes. In terme van die betrokke omgewingsregulasies vereis die Omgewingsinvloedbepaling (OIB) die volgende magtigings/ lisensies voordat enige bedrywighede mag begin:

Omgewingsmagtiging: Mpumalanga Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing (DEDET)
Watergebruikslisensie: Nasionale Departement van Waterwese (DWW)
Aansoek vir Mynregte: Mpumalanga Departement van Minerale Hulpbronne (DMH)
Afvalbestuurslisensie: Nasionale Departement van Omgewingsake (DOS)

Environmental Resources Management Southern Africa (Edms) Bpk (ERM) is as die onafhanklike omgewings-konsultant aangestel om bogenoemde magtiging- en lisensieprosesse te koördineer. Voorsien asb. u besonderhede aan Paul Monare (inligting hieronder) indien u verdere inligting oor die OIB wil bekom, of as 'n Belanghebbende & Geaffekteerde Party (B&GP) wil registreer.

U word uitgenooi om op die Omvangbepalingsverslae kommentaar te lewer
Die ***Konsep*** Omvangbepalingsverslag, i.t.v. NEMA-wetgewing, en die Omvangbepalingsverslag, i.t.v. MPRDA-wetgewing, sal vanaf Maandag, 7 Januarie en Vrydag, 8 Maart 2013 vir openbare kommentaar beskikbaar wees by:

- Volksrust Openbare Biblioteek & Poskantoor
- Wakkerstroom Biblioteek
- Piet Retief Poskantoor & Biblioteek
- Driefontein Poskantoor
- Daggakraal Kliniek & Dirkiesdorop Kliniek

Uitnodiging na Openbare Vergaderings:
Die volgende vergaderings sal gehou word:

Ope Dag
Datum & tyd: 30 Jan 2013, 9:00 — 13:00
Plek: Driefontein Gemeenskapsaal

Openbare vergadering
Datum & tyd: 30 Jan 2013, 14:00 — 17:00
Plek: Driefontein Gemeenskapsaal

Indien u wil registreer, meer inligting verlang of kommentaar wil lewer, kontak asb

Paul Monare
Tel: 011 798 4300 Faks: 086 292 7318
kangracoal@erm.com
Postnet Suite 624, Privaatsak X29, Gallo Manor, 2052
www.erm.com/kangracoal

Kennis geskied hiermee van 'n Proses van Openbare Deelname & die voorneme om aansoek te doen vir 'n Omgewingsmagtiging in terme van die OIB-regulasies van 18 Junie 2010 kragtens die NEMA (Wet Nr. 107 van 1998), soos gewysig, die Nasionale Wet op die Omgewing: Afvalbestuur, Wet 59 van 2008 (NEM;WA) en die Wet op die Ontwikkeling van Minerale- en Petroleumhulpbronne (Nr. 28 van 2002) (MPRDA).

DEDET verwysingsnr: 17/2/3 GS-52 DOS verwysingsnr: 12/9/11/L719/6 DMR verwysingsnr: MP30/5/1/2/2/10046MR

Kennisgewing van Omgewingsinvloedbepaling

Beoogde Kangra Steenkool-uitbreidingsprojek: Kusipongo-hulpbron

Kangra Coal (Edms) Bpk beoog om die steenkool-mynboubedrywighede by die Savmore Steenkoolmyn uit te brei deur die insluiting van die Kusipongo steenkoolreserwe wat oor die Mkhondo en Dr. Pixley Kalsaka Seme Munisipaliteite in Mpumalanga strek. Die terrein is ongeveer 15km wes van Driefontein naby Piet Retief geleë. Die beoogde aktiwiteit behels die ontwikkeling van 'n ondergrondse myn (Adit A), 'n ventilasieskag (Adit B) en die verlenging van die bestaande vervoerband - wat 'n uitbreiding is van die huidige mynboubedrywighede by Maquasa-Oos en -Wes. Environmental Resources Management Southern Africa (Edms) Bpk (ERM) is as die onafhanklike konsultant aangestel om die prosesse te koördineer.

OPENBARE KOMMENTAAR AANGEVRA

In terme van die betrokke omgewingsregulasies vereis die Omgewingsinvloedbepaling die volgende magtigings/ lisensies:

- **Omgewingsmagtiging**: Mpumalanga Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing (DEDET)
- **Watergebruikslisensie**: Nasionale Departement van Waterwese (DWW)
- **Aansoek vir Mynregte:** Mpumalanga Departement van Minerale Hulpbronne (DMH)
- **Afvalbestuurslisensie:** Nasionale Departement van Omgewingsake (DOS)

U word uitgenooi om deel van hierdie proses te wees deur te:

- **Registreer** as 'n Belanghebbende & Geaffekteerde Party (B&GP)
- Die Konsep Omvangbepalingsverslag (i.t.v. NEMA) en die Omvangbepalingsverslag (MPRDA) **deur te gaan & kommentaar daarop te lewer**
- **Openbare vergaderings** oor die Konsep Omvangbepalingsverslag by te woon

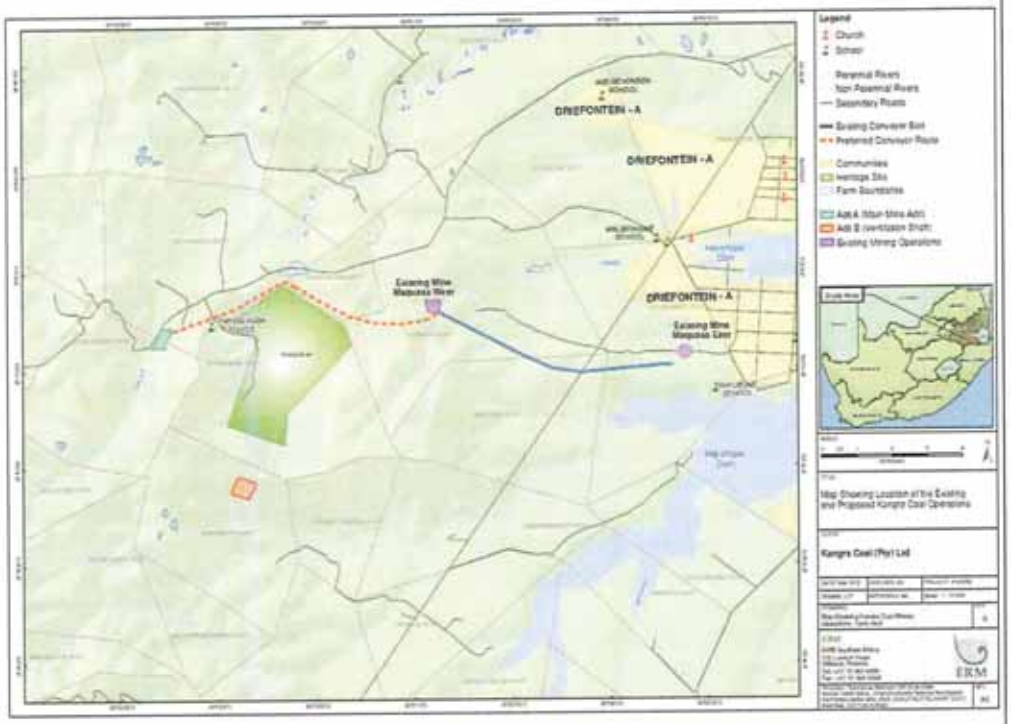
Omvangbepalingsverslae
Die Konsep Omvangbepalingsverslag, i.t.v. NEMA, en die Omvangbepalingsverslag, i.t.v. MPRDA, sal tussen **7 Januarie** en **8 Maart 2013** vir openbare kommentaar beskikbaar wees by:

- Volksrust Bibloteek & Pos Kantoor
- Wakkerstroom Bibloteek
- Piet Retief Pos Kantoor & Bibloteek
- Driefontein Pos Kantoor
- Daggakraal Kliniek
- Dirkiesdorp Kliniek
- Dirkiesdorp Kliniek

Uitnodiging na Openbare Vergaderings:
Die volgende vergaderings sal gehou word:

Ope Dag
Datum & tyd: 30 Jan 2013, 9:00 — 13:00
Plek: Driefontein Gemeenskapsaal

Openbare vergadering
Datum & tyd: 30 Jan 2013, 14:00 — 17:00
Plek: Driefontein Gemeenskapsaal



Kontak asb vir **Paul Monare** van ERM indien u wil registreer, meer inligting verlang of kommentaar wil lewer:

Tel: 011 798 4300 Faks: 086 292 7318 E-pos: kangracoal@erm.com
Postnet Suite 624, Privaatsak X29, Gallo Manor, 2052
www.erm.com/kangracoal

Kennis geskied hiermee van 'n Proses van Openbare Deelname & die voorneme om aansoek te doen vir 'n Omgewingsmagtiging in terme van die OIB-regulasies van 18 Junie 2010 kragtens die NEMA (Wet Nr. 107 van 1998), soos gewysig, die Nasionale Wet op die Omgewing: Afvalbestuur, Wet 59 van 2008 (NEM;WA) en die Wet op die Ontwikkeling van Minerale- en Petroleumhulpbronne (Nr. 28 van 2002) (MPRDA).
DEDET verwysingsnr: 17/2/3 GS-52 DOS verwysingsnr: 12/9/11/L719/6 DMR verwysingsnr: MP30/5/1/2/2/10046MR

Projeknommer: 0120258

Isaziso sokuHlolwa koMthelela eNdaweni

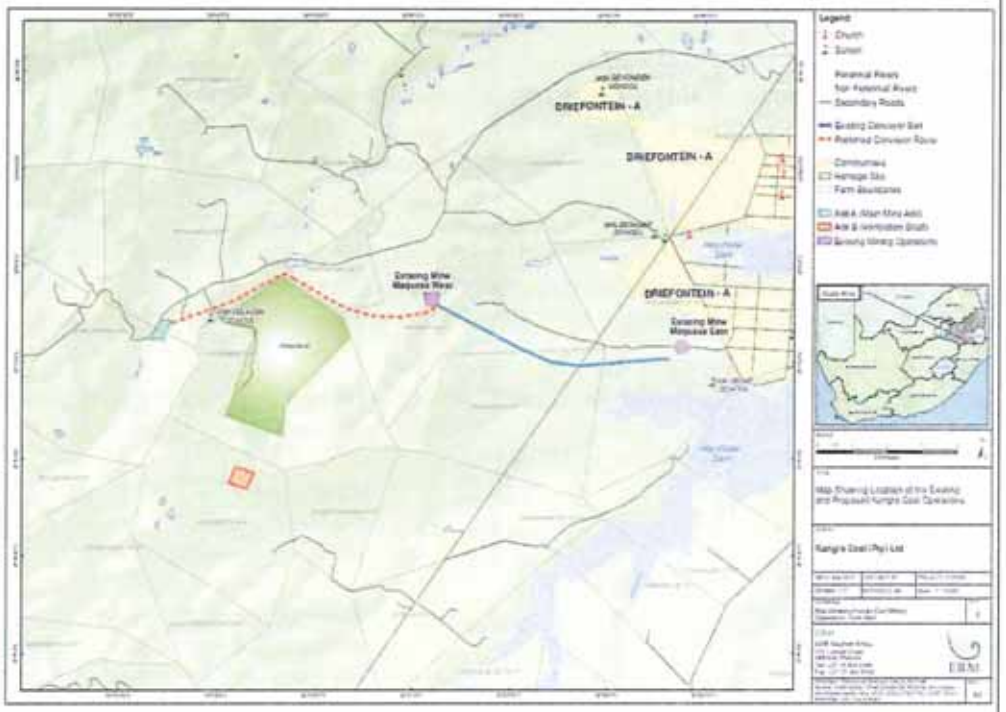
Iphrojekthi ehlongozwayo yokuNwetshwa kwe-Kangra Coal Kusipongo

I-Kangra Coal (Pty) Ltd. ihlongoza ukunweba imisebenzi yabo yokuvukuza amalahle e-Savmore Colliery ukubandakanya ingxenye yamalahle i-Kusipongo etholakala kuMasipala waseMkhondo nowase-Dr Pixley Kalsaka Seme eMpumalanga. Indawo yephrojekthi ehlongozwa ukunwetshwa itholakala cishe emakhilomitheni ayi-15 entshonalanga ne-Driefontein eduze nase-Piet Retief. Lo msebenzi ohlongozwayo ubandakanya ukwakhiwa kwemayini ngaphansi komhlaba (Adit A), umgodi wokungenisa umoya (Adit B) nokunwetshwa kwebhande elikhona, ngaleyo ndlela kunwetshwe imisebenzi yokuvukuza endaweni eMpumalanga ne-Maquasa nasentshonalanga yakhona. I-Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) iqokwe njengabeluleki abazimele ukuze baqhube lezi zinhlelo.

IMIBONO YOMPHAKATHI YAMUKELEKILE

Ngokuhambisana nezimiso zomhlaba ezisebenzayo, ukuHlolwa koMthelela eNdaweni (EIA) kudinga ukugunyazwa / amalayisensi alandelayo ngaphambi kokuqhubeka nohlelo:

- **Ukugunyazwa ngokwendawo** okuvela kuMnyango waseMpumalanga wezokuThuthukiswa koMnotho, ezokuVakasha nezeMvelo (DEDET);
- **Amanzi neLayisensi** kusuka kuMnyango kazwelonke wezaManzi (DWA);
- **Ukufaka isicelo seLungelo lokuVukuza** okuvela kuMnyango waseMpumalanga wezokuMbiwa Phansi (DMR); kanjalo
- **NeLayisensi yokuPhathwa kweMfucuza** okuvela kuMnyango kaZwelonke wezeMvelo (DEA).



Uyamenywa ukuba ube yingxenye yalolu hlelo ngokuba:

- **Ubhalise** njengeNgxenye eneNtshisekelo neThintekayo (I&AP)
- **Ubukeze uphinde uphawule** ngoHlaka loMbiko wokuHlolwa kweNdawo (ngaphansi kwe-NEMA) noMbiko wokuHlolwa kweNdawo (MPRDA)

ImiBiko yokuHlolwa kweNdawo
Umbiko woHlaka lokuHolwa kweNdawo, ngaphnsi kwe- NEMA, noMbiko wokuHlolwa kweNdawo, ngaphansi kwe-MPRDA, kuzotholakala ukuze umphakathi uphawule ngakho phakathi komhlaka 7 **Umasingana** no– 8 **Undasa 2013 lapha**:

- e-Volksrust Public Library & Post Office
- e-Wakkerstroom Library
- e-Piet Retief Post Office & Library
- e-Driefontein Post Office
- e-Daggakraal Clinic nase Dirkiesdorp Clinic

Isimemo sokuthamela imiHlangano yoMphakathi
Imihlangan elandelayo izobanjelwa:
Umhlangano ovulelekile
Usuku nesikhathi: 30 Jan 2012, 9:00 — 13:00
Indawo: Driefontein Community Hall
Umhlangano womphakathi
Usuku nesikhathi 30 Jan 2012, 14:00 — 17:00
Indawo**:** Driefontein Community Hall

Uma ungathanda ukubhalisa, thola imininingwan eyengeziwe uphinde uphawule kuHlaka loMbiko wokuHlolwa kwendawo uyacelwa uthintane no-**Tsietsi Monare we-**ERM:

Ucingo: 011 798 4300 ifeksi: 086 292 7318 I-imeyli: kangracoal@erm.com
Postnet Suite 624, Private Bag X29, Gallo Manor, 2052
www.erm.com/kangracoal

Tsebiso ya Tekolo ya Kameho ya Tikolohoo

Porojeke e Sisintsweng ya Katoloso ya Matlotlo ya Kangra Coal

Kangra Coal (Pty) Ltd. e ntse e lohotha ho atolosa mesebetsi ya yona ya ho rafa mashala e Morafong wa Savmore hore e akarelletse le morafo wa mashala wa Kusipongo o pholletsang le Masepala wa Mkhondo le Dr Pixley Kalsaka Seme e Mpumalanga. Setsha seo ho sisintsweng katoloso ena ho sona se hoo e ka bang dikhilomithara tse 15 ka bophirimela ho Driefontein pela Piet Retief. Mesebetsi e sisintswe e akga tlhabollo ya mokoti wa morafo (Adit A), shafte e fehlang moya (Adit B) le katoloso ya lebanta le teng hona jwale la conveyor, ka tsela yeo ba atolosa mesebetsi ya merafong e etswang Maquasa Botjhabela le Bophirima. Environmental Resources Management Southern Africa (Pty) Ltd (ERM) e kgethilwe e le moeletsi ya ikemetseng wa tsa tikoloho ya hokahanyang mekgwatshebetso ena.

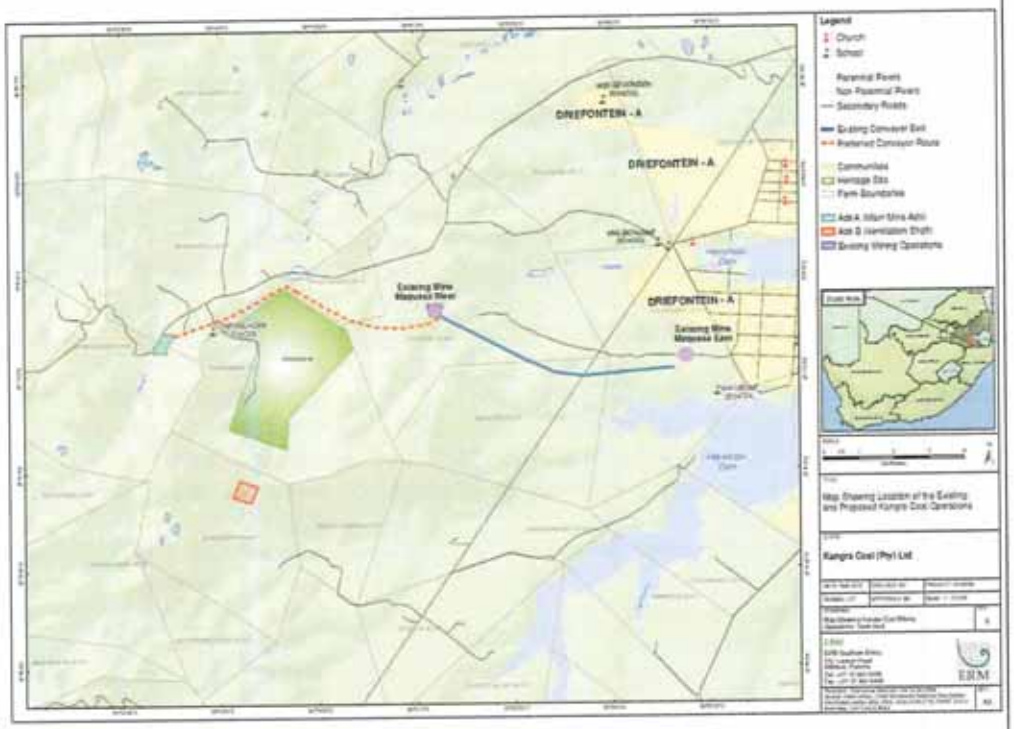
SETJHABA SE MENGWA HO NTSHA MAIKUTLO

Ho iphaphathilwe ka melao e amehang ya tikoloho, Tekolo ya Kameho ya Tikoloho kapa *Environmental Impact Assessment* (EIA) e hloka ditumello / dilaesense tse latelang pele mosebetsi o thakgolwa:

- **Tumello ya Tikoloho kapa *Environmental Authorisation*** ho tswa Lekaleng la Tlhabollo ya Moruo, Bohahlaudi le Tikoloho la Mpumalanga (DEDET);
- **Laesense ya Tshebediso ya Metsi** ho tswa ho Lekala la Naha la Ditaba Tsa Metsi (DWA);
- **Kopo ya Tokelo ya ho Rafa** ho tswa Lekaleng la Dirafshwa Tsa Tlhaho la Mpumalanga (DMR); le
- **Laesense ya Tsamaiso ya Dithwele** ho tswa ho Lekala la Naha la Ditaba Tsa Tikoloho (DEA).

O mengwa hore o be le seabo ho mokgwatshebetso ona ka ho:

- **Ingodisa** o le Lehlakore le Thahasellang & Amehang (I&AP)



Ditlaleho Tsa Tekolo

Tlaleho e Ngotsweng ya Tekolo, e tlasa NEMA, le Tlaleho ya Tekolo, e tlasa MPRDA, di tla phatlalatswa e le hore setjhaba se ka ntsha maikutlo pakeng tsa la **7 Pherekhong** le la **8 Hlakubele 2013** dibakeng tsena:

- Laebrari Setjhaba ya Volksrust & Poso
- Laebraring ya Wakkerstroom
- Posong & Laebraring ya Piet Retief
- Posong ya Driefontein
- Tleliniking Daggakraal le ya Dirkiesdorp

Memo ya diboka tsa Setjhaba

Diboka tse latelang di tla tshwarelwa:

Seboka

Letsatsi & nako: 30 Jan 2012, 9:00 — 13:00

Sebaka: Holo ya Setjhaba ya Driefontein

Pitso ya setjhaba

Letsatsi & nako: 30 Jan 2012, 14:00 — 17:00

Sebaka: Holo ya Setjhaba ya Driefontein

Haeba o batla ho ingodisa, ho fumana tlhahisolesedi e eketsehileng mabapi le ho ntsha maikutlo ka Ditlaleho Tse Ngotsweng Tsa Tekolo, ka kopo ikgokahanye le **Tsietsi Monare** wa ERM:

Thel: 011 798 4300 Fekese: 086 292 7318 Imeile: kangracoal@erm.com
Postnet Suite 624, Private Bag X29, Gallo Manor, 2052
www.erm.com/kangracoal

Notice of Environmental Impact Assessment

Proposed Kangra Coal Kusipongo Resource Expansion Project

Kangra Coal (Pty) Ltd. is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Kalsaka Seme Municipalities in Mpumalanga. The site of the proposed expansion is situated approximately 15km west of Driefontein near Piet Retief. The proposed activity involves the development of an underground mine (Adit A), a ventilation shaft (Adit B) and the extension of the existing conveyor belt, thereby extending their existing Maquasa East and West mining activities. Environmental Resources Management Southern Africa (Pty) Ltd (ERM) has been appointed as independent consultant to coordinate these processes.

PUBLIC COMMENT INVITED

In accordance with the relevant environmental regulations, the Environmental Impact Assessment requires the following authorisations/licenses:

- **Environmental Authorisation**: Mpumalanga Department of Economic Development, Tourism and Environment (DEDET)
- **Water Use License**: National Department of Water Affairs (DWA)
- **Mining Right Application:** Mpumalanga Department of Mineral Resources (DMR)
- **Waste Management License:** National Department of Environmental Affairs (DEA)

You are invited to become involved with this process by:

- **Registering** as an Interested & Affected parties (I&AP)
- **Reviewing & commenting** on the Draft Scoping Report (under the NEMA) and the Scoping Report (MPRDA)
- Attending **public meetings** the project and Draft Scoping Report

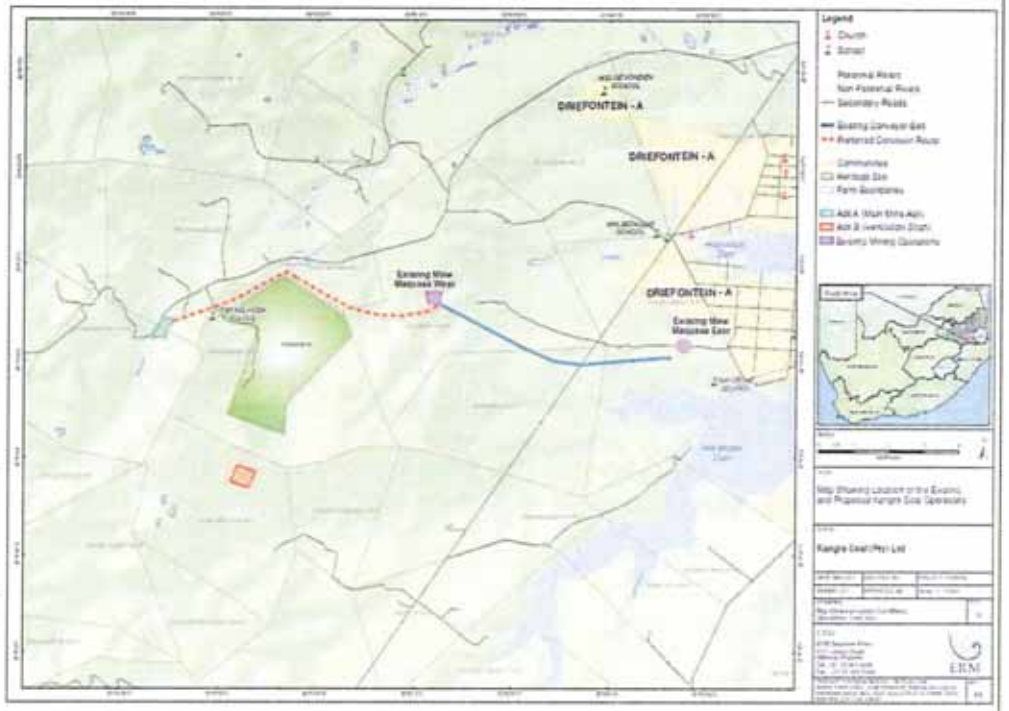
Scoping Reports
The Draft Scoping Report, under NEMA, and Scoping Report, under MPRDA, will be made available for public comment between **7 January** and **8 March 2013** at:

- Volksrust Public Library & Post Office
- Wakkerstroom Library
- Piet Retief Post Office & Library
- Driefontein Post Office
- Daggakraal Clinic
- Dirkiesdorp Clinic

Invitation to Public meetings
The following meetings will be held:

Open House
Date & time: 30 Jan 2012, 9:00 — 13:00
Venue: Driefontein Community Hall

Public meeting
Date & time: 30 Jan 2012, 14:00 — 17:00
Venue: Driefontein Community Hall



If you would like to register, receive more information and comment on the Draft Scoping Reports please contact **Tsietsi Monare** of ERM:

Tel: 011 798 4300 Fax: 086 292 7318 Email: kangracoal@erm.com
Postnet Suite 624, Private Bag X29, Gallo Manor, 2052
www.erm.com/kangracoal

Notice is given of a Public Participation Process & the intention to apply for Environmental Authorisation in terms of the EIA Regulations of 18 June 2010 under the NEMA (Act No. 107 of 1998), as amended, the National Environmental Management: Waste Act 59 of 2008 (NEM;WA) and the Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA).

DEDET reference number: 17/2/3 GS-52 DEA reference number: 12/9/11/L719/6 DMR reference number MP30/5/1/2/2/10046MR

Project number: 0120258

Annex B6

Notification Material for the Final Scoping Report

Environmental Resources Management
Johannesburg Office
Building 32, 1st Floor
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148
South Africa
Tel: +27 (0) 11 798 4300
Fax: +27 (0) 11 804 2289
www.erm.com

Postal Address:
Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg
South Africa

10th April 2013 *Project no.: 0120258*

Dear Sir/Madam

Availability of the Final Scoping Report for the Proposed Kangra Coal Kusipongo Resource Expansion Mining Project, Mpumalanga

DEDET reference number: 17/2/3 GS-52 DEA reference number: 12/9/11/L719/6
DMR reference number: MP30/5/1/2/2/10046MR

The Project and Process

Kangra Coal (Pty) Ltd. (Kangra Coal) is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Kalsaka Seme Local Municipalities in Mpumalanga. The site of the proposed expansion is situated approximately 15km west of Driefontein near Piet Retief. The proposed Project involves the development of an underground mine, thereby extending their existing Maquasa East and West mining activities.

Environmental Authorisation and Licensing Processes

In accordance with the relevant environmental regulations of South Africa, the following environmental authorisation/licenses are required:

- Environmental authorisation (in terms of the National Environmental Management Act No 107 of 1998 (NEMA)) is required for this Project from the Mpumalanga Department of Economic Development, Tourism and Environment (DEDET);
- Mining right approval (in terms of the Mineral and Petroleum Resources Development Act No 28 of 2002 (MPRDA)) from the Regional Department of Mineral Resources (DMR);
- Water use license in terms of the National Water Act No 36 of 1998 from the National Department of Water Affairs (DWA); and
- Waste license (in terms of the National Environmental Management: Waste Act No 59 of 2008 (NEMWA)) from the National Department of Environmental Affairs (DEA).

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) has been appointed as the independent environmental consultant for the above mentioned environmental authorisation/licensing applications.

Status of the Environmental Authorisation and Licensing processes

The Scoping Phase of the overall Environmental and Social Impact Assessment (ESIA) process is reaching its fulfilment and as such the Draft Scoping Report, which was previously made available for public comment and the subject of Interested and Affected Party (I&APs) engagement in January and February 2013, has been finalised on the basis of comment received. This Final Scoping Report is now been made available for further stakeholder comment.

Registered Company address:
Environmental Resources Management
Southern Africa (Pty) Ltd
Building 32, 1st Floor,
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148

Company registration number
2003/001404/07

Directors
Jeremy Soboil (Managing)
Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Offices worldwide

A member of the Environmental Resources Management Group

Access to the Final Scoping Report

The following activities are being undertaken to ensure that I&APs have adequate opportunity to comment on the Final Scoping Report:

- Notification letters (this one) have been forwarded to all registered I&APs for which ERM has postal or email addresses;
- SMSes, which have been translated into Zulu, have been sent to all registered I&APs for whom ERM does not have email or postal addresses;
- Given the significant comment received during engagements held in January and February 2013, the comments and response document has been updated and either emailed or posted to registered I&APs; and
- The Final Scoping Report has been made available for public comment for a 21 day period at the following locations:

Venue	Address	Contact Details
Volksrust Public Library	Cnr Adelaide Street and Nelson Mandela Drive, Volksrust, 2470	017 734 6109
Volksrust Post Office	15 Vrede Street, Volksrust, 2470	017 735 5113
Wakkerstroom Library	Cnr R543 Van Riebeeck and Badenhorst Street, Wakkerstroom, 2380	
Piet Retief Post Office	9 Kruger Street, Piet Retief, 2380	017 826 2266
Piet Retief Library	Retief Street, Piet Retief, 2380	076 532 2388/017 826 8100
Driefontein Post Office	Corner Store Street, Driefontein, 2380	076 837 7385
Daggakraal Clinic	262 Sinqobile A, Daggakraal, 2491	017 753 9033/072 619 0738
Dirkiesdorp Clinic	Cnr Vaalbank Rd & R543, Dirkiesdorp, 2486	082 408 0838/017 735 5305
ERM website	www.erm.com/kangracoal	

Your comment on the Final Scoping Report

The Final Scoping Report will be made available for a 21 day comment period, which will end on 30th April 2013. During the comment period, please forward your comments directly to the regulatory authority at MDEDET 13 De Jager Street, Ermelo, 2350 or DEA Fedsure Building, 315 Pretorius Street, Pretoria, 0001 and provide a copy to Nadia Mol at Tel: (011) 798 4300, Fax: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052.

Following the closure of the comments period, the regulatory authority will be reviewing the contents of the Final Scoping Report and specifically commenting on the proposed way forward for the assessment phase of the project and the detailed specialist investigations.

Environmental
Resources
Management

Please contact **Nadia Mol** at Tel: (011) 798 4300, Fax: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 should you have any queries or suggestions with regards to this letter. Thank you for your participation to date. We look forward to receiving your comments.

Kind Regards

Dieter Rodewald
ERM Project Manager

SMS (translated into Zulu)

Dear Stakeholder

The Final Scoping Report for the Kusipongo Project is available for public comment. It has been made available at Driefontein Post Office & Dirkiesdorp Clinic until 30th April 2013. Please forward your comments directly to the regulatory authority at MDEDET 13 De Jager Street, Ermelo, 2350 or DEA Fedsure Building, 315 Pretorius Street, Pretoria, 0001

Regards
Tsietsi Monare, ERM

Annex B7

Interim Engagement Notification

Environmental Resources Management
Johannesburg Office
Building 32, 1st Floor
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148
South Africa
Tel: +27 (0) 11 798 4300
Fax: +27 (0) 11 804 2289
www.erm.com

Postal Address:
Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg
South Africa

3rd May 2013 *Project no.: 0120258*

Dear Sir/Madam

Interim I&AP Meetings for the Proposed Kangra Coal Kusipongo Resource Expansion Mining Project, Mpumalanga

DEDET reference number: 17/2/3 GS-52 DEA reference number: 12/9/11/L719/6
DMR reference number MP30/5/1/2/2/10046MR

The Project and Process

Kangra Coal (Pty) Ltd. (Kangra Coal) is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Ka Isaka Seme Local Municipalities in Mpumalanga. The site of the proposed expansion is situated approximately 15km west of Driefontein near Piet Retief. The proposed Project involves the development of an underground mine, thereby extending their existing Maquasa East and West mining activities.

Environmental Authorisation and Licensing Processes

In accordance with the relevant environmental regulations of South Africa, the following environmental authorisation/licenses are required:

- Environmental authorisation (in terms of the National Environmental Management Act No 107 of 1998 (NEMA)) is required for this Project from the Mpumalanga Department of Economic Development, Tourism and Environment (DEDET),
- Mining right approval(in terms of the Mineral and Petroleum Resources Development act No 28 of 2002 (MPRDA)) from the Regional Department of Mineral Resources (DMR);
- Water use license in terms of the National Water Act No 36 of 1998 from the National Department of Water Affairs (DWA); and
- Waste license (in terms of the National Environmental Management: Waste Act No 59 of 2008 (NEMWA)) from the National Department of Environmental Affairs (DEA).

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) has been appointed as the independent environmental consultant for the above mentioned environmental authorisation/licensing applications.

Status of the Environmental Authorisation and Licensing processes

The first phase of the environmental authorisation process, the Scoping Phase has been completed. The Final Scoping Report has been drafted and released into the public domain for a 21 day comment period, which closes on 30th April 2013. Specialists have been appointed to investigate the concerns raised during the Scoping Phase and the results of these studies are now available for feedback and incorporation into the SEMP.

Registered Company address:
Environmental Resources Management
Southern Africa (Pty) Ltd
Building 32, 1st Floor,
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148

Company registration number
2003/001404/07

Directors
Jeremy Soboil (Managing)
Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Offices worldwide

A member of the Environmental Resources Management Group

It is intended to submit the SEMP to the Department of Mineral Resources (DMR) in support of a Mining Rights Application on 27th May 2013. Key I&AP feedback on the results of the SEMP will precede the submission of the report to DMR. Broader I&AP feedback will follow in June/July 2013.

Invitation to attend key I&AP feedback meetings

The following interim feedback meetings are proposed:

- Meeting with landowners and key interest groups in the area on 16th May 2013;
- Meeting with individual traditional authorities on 18th May 2013;
- Meeting with the two affected Community Property Associations (eKanluka and Thuthukani CPA) and Donkerhoek residents on 19th May 2013.

You are invited to the following meeting:

Meeting:	Landowners and Key Interest Groups
Date:	16th May 2013
Venue:	Welgekozen Lodge Conference Room
Time:	16h00-19h00

The objectives of this meeting are to:

- Update I&APs regarding project progress;
- Feedback on the results of the specialist investigations;
- Feedback on the results of the impact assessment including significant impacts and fatal flaws;
- Feedback on the proposed mitigation measures;
- Identify I&AP concerns and address comments and questions.

Following these key I&AP meetings the comment and response document will be updated for submission to DMR with the SEMP.

Response to this invitation

Please could you indicate your availability to attend this key I&AP meeting. We require your response for catering purposes by 10th May 2013.

Please contact **Nadia Mol** at nadia.mol@imaginet.co.za; Tel: (011) 798 4300, Fax: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 should you have any queries. Thank you for your participation to date. We look forward to your attendance at the interim meeting.

Kind Regards

Dieter Rodewald
ERM Project Manager

Environmental Resources Management
Johannesburg Office
Building 32, 1st Floor
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148
South Africa
Tel: +27 (0) 11 798 4300
Fax: +27 (0) 11 804 2289
www.erm.com

Postal Address:
Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg
South Africa

3 Nhlaba 2013 *Ino. yephrojekthi: 0120258*

Mnumzane/Nkosikazi Othandekayo

Ukutholakala koMbiko Wokugcina Womsebenzi wePhrojekthi Ehlongozwayo Yokwandiswa Kwemayini YaseKangra Coal Kusipongo, eMpumalanga

Inombolo yerefurensi ye-DEDET: 17/2/3 GS-52
Inombolo yerefurensi ye-DEA: 12/9/11/L719/6
Inombolo yerefurensi ye-DMR: MP30/5/1/2/2/10046MR

Iphrojekthi Nenqubo

I-Kangra Coal (Pty) Ltd. (Kangra Coal) icabangela ukwandisa imisebenzi yayo yokumba amalahle eSavmore Colliery ukuhlanganisa imithombo yamalahle yaseKusipongo etholakala endaweni kaMasipala waseMkhondo naseDr Pixley ka Seme eMpumalanga. Indawo okuhlongozwa ukwandisa umsebenzi kuyo itholakala cishe ebangeni elingu-15km entshonalanga yeDriefontein eduze nasePiet Retief. Iphrojekthi ehlongozwayo ibandakanya ukwenziwa kwemayini engaphansi komhlaba, kanjalo kwandiswe umsebenzi wokumba owenziwa ezimayini ezikhona manje eMaquasa East naseWest.

Isigunyazo Sezemvelo Nenqubo Yokuthola Ilayisensi

Ngokuvumelana nemithetho ethintekayo yezemvelo eNingizimu Afrika, kudingeka isigunyazo/amalayisensi alandelayo ezemvelo:

- Isigunyazo sezemvelo (ngokuvumelana noMthetho Kazwelonke Wokuphathwa Kwezemvelo 107 ka-1998 (i-NEMA)) siyadingeka kule Phrojekthi eMnyangweni WaseMpumalanga Wezokuthuthukiswa Kwezomnotho, Ezokuvakasha Nezemvelo (i-DEDET),
- Isigunyazo samalungelo emayini (ngokuvumelana noMthetho Wemithombo Yokumbiwa Phansi Nowoyela No 28 ka-2002 (i-MPRDA)) eMnyangweni Wesifunda Wezemithombo Yokumbiwa Phansi (i-DMR);
- Ilayisensi yokusebenzisa amanzi ngokuvumelana noMthetho Wezamanzi Kazwelonke No 36 ka-1998 eMnyangweni Kazwelonke Wezezindaba Zamanzi (i-DWA); kanye
- Nelayisensi yemfucumfucu (ngokuvumelana Nokuphathwa Kwezemvelo Kuzwelonke: Umthetho Wezemfucumfucu No 59 ka-2008 (i-NEMWA)) eMnyangweni Kazwelonke Wezindaba Zezemvelo (i-DEA).

I-Environmental Resources Management Southern Africa (Pty) Ltd. (i-ERM) iqokwe njengomxhumanisi ozimele wezemvelo wezicelo ezishiwo ngenhla zesigunyazo/ilayisensi yezemvelo.

Isimo senqubo Yesigunyazo Nelayisensi Yezemvelo

Ingxenye yokuqala yohlelo lokugunyazwa ngokwemvelo, isiGaba sokunikeza incazelo, sesiphothuliwe. Umbiko owuhlaka wokuGcina wokuNikeza iNcazelo

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Directors
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Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Offices worldwide

A member of the Environmental Resources Management Group

usuhlanganisiwe wasatshalaliswa ezindaweni zomphakathi izinsuku ezingama-21 okuyisikhathi sokuphawula, okuvalwa mhla zingama-30 kuMbasa 2013. Ongoti sebeqokiwe ukuphenya ngezihloko ezisemqoka ezibalulekile ezaphakanyiswa ngesikhathi sokunikezwa kweNcazelo kanti imiphumela yalolu cwaningo isiyatholakala ukuze sizwe imibono yabantu kanye nokuba kubandakanywe kuHlelo lokuNganyelwa koMphakathi neMvelo (SEMP). Kuhloswe ukuba kuthunyelwe i-SEMP ku-DMR ngomhla zingama-27 Nhlaba 2013 ukweseka ukuFakwa kwesiCelo samaLungelo okuVukuza. Ukuqinisekisa ukuthi ukuphawula nokukhathazeka kwabaneNtshisekelo nabaThintekayo kwamuva kuyabandakanywa ku-SEMP, **umhlangano wokungenelela nokunikeza izimpendulo** zemiphumela ye-SEMPuzoba ngaphambi kweziphakamiso zombiko ku-DMR. Kufanele kwazeke nokho ukuthi isikhathi sezimpendulo eziphelele kwabaneNtshisekelo nabaThintekayo sizolandela ngoNhlangulana/Ntulikazi 2013.

Isimemo sokuba yingxenye yemiHlangano eQavile yabaneNtshisekelo nabaThintekayo

Imihlangano elandelayo yokungenelela nokunikeza izimpendulo iphakanyisiwe:

- Ukuhlangana nabaninimhlaba kanye namaqembu abanentshisekelo endaweni ngomhla ziyi-16 Nhlaba 2013;
- Ukuhlangana nabantu abayiziphathimandla zomdabu mhla ziyi-17 Nhlaba 2013; kanye
- Nokuhlangana nezingxenye ezimbili zabaninimhlaba abathintekayo eMphakathini (eKanluka kanye neThuthukani CPA) kanjalo nabahlali base Donkerhoek mhla ziyi-18 Nhlaba 2013.

Uyamenywa kule mihlangano elandelayo:

Umhlangano:	Ukuhlangana nabantu abayiziphathimandla
Usuku:	17 Nhlaba 2013

Izinjongo zale mihlangano yilezi:

- Ukwazisa abaneNtshisekelo nabaThintekayo ngenqubekelaphambili yephrojekthi;
- Ukunikeza izimpendulo ngemiphumela yophenyo longoti;
- Ukunikeza izimpendulo ngemiphumela yokuhlola umthelela kubandakanya imithelela enzima;
- Ukunikeza izimpendulo ngezinyathelo ezithathiwe zokuzama ukunciphisa umthelela; kanye
- Nokuhlonzwa kwezikhalo zabaneNtshisekelo nabaThintekayo kanjalo nokubhekana nokuphawula kanye nemibuzo yab.

Kulandela le mihlangano eqavile yabaneNtshisekelo nabaThintekayo idokhyumenti yokuphawula nokuphendula izobukezwa ukuze ihanjiswe ku-MR kanye ne-SEMP.

Ukuphendula lesi simemo

Sicela usho ukuba uzotholakala ukuba yingxenye yalo mhlangano wabaneNtshisekelo nabaThintekayo. Siyayidinga impendulo yakho ngomhla ziyi-10 Nhlaba 2013 ngezizathu zokuhlinzeka izidlo.

Sicela uthine **Nadia Mol** lapha nadia.mol@imaginet.co.za; Ucingo: (011) 798 4300, ifeksi: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 uma kwenzeka uba nemibuzo. Siyakubonga ngokubamba kwakho iqhaza kuze kube manje. Silangazelele ukuba kanye nawe emhlanganweni wesikhashana.

Ozithobayo

UDieter Rodewald
UMphathi Wephrojekthi e-ERM

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South Africa

3 Nhlaba 2013 *Ino. yephrojekthi: 0120258*

Mnumzane/Nkosikazi Othandekayo

Ukutholakala koMbiko Wokugcina Womsebenzi wePhrojekthi Ehlongozwayo Yokwandiswa Kwemayini YaseKangra Coal Kusipongo, eMpumalanga

Inombolo yerefurensi ye-DEDET: 17/2/3 GS-52
Inombolo yerefurensi ye-DEA: 12/9/11/L719/6
Inombolo yerefurensi ye-DMR: MP30/5/1/2/2/10046MR

Iphrojekthi Nenqubo

I-Kangra Coal (Pty) Ltd. (Kangra Coal) icabangela ukwandisa imisebenzi yayo yokumba amalahle eSavmore Colliery ukuhlanganisa imithombo yamalahle yaseKusipongo etholakala endaweni kaMasipala waseMkhondo naseDr Pixley ka Seme eMpumalanga. Indawo okuhlongozwa ukwandisa umsebenzi kuyo itholakala cishe ebangeni elingu-15km entshonalanga yeDriefontein eduze nasePiet Retief. Iphrojekthi ehlongozwayo ibandakanya ukwenziwa kwemayini engaphansi komhlaba, kanjalo kwandiswe umsebenzi wokumba owenziwa ezimayini ezikhona manje eMaquasa East naseWest.

Isigunyazo Sezemvelo Nenqubo Yokuthola Ilayisensi

Ngokuvumelana nemithetho ethintekayo yezemvelo eNingizimu Afrika, kudingeka isigunyazo/amalayisensi alandelayo ezemvelo:

- Isigunyazo sezemvelo (ngokuvumelana noMthetho Kazwelonke Wokuphathwa Kwezemvelo 107 ka-1998 (i-NEMA)) siyadingeka kule Phrojekthi eMnyangweni WaseMpumalanga Wezokuthuthukiswa Kwezomnotho, Ezokuvakasha Nezemvelo (i-DEDET),
- Isigunyazo samalungelo emayini (ngokuvumelana noMthetho Wemithombo Yokumbiwa Phansi Nowoyela No 28 ka-2002 (i-MPRDA)) eMnyangweni Wesifunda Wezemithombo Yokumbiwa Phansi (i-DMR);
- Ilayisensi yokusebenzisa amanzi ngokuvumelana noMthetho Wezamanzi Kazwelonke No 36 ka-1998 eMnyangweni Kazwelonke Wezezindaba Zamanzi (i-DWA); kanye
- Nelayisensi yemfucumfucu (ngokuvumelana Nokuphathwa Kwezemvelo Kuzwelonke: Umthetho Wezemfucumfucu No 59 ka-2008 (i-NEMWA)) eMnyangweni Kazwelonke Wezindaba Zezemvelo (i-DEA).

I-Environmental Resources Management Southern Africa (Pty) Ltd. (i-ERM) iqokwe njengomxhumanisi ozimele wezemvelo wezicelo ezishiwo ngenhla zesigunyazo/ilayisensi yezemvelo.

Isimo senqubo Yesigunyazo Nelayisensi Yezemvelo

Ingxenye yokuqala yohlelo lokugunyazwa ngokwemvelo, isiGaba sokunikeza incazelo, sesiphothuliwe. Umbiko owuhlaka wokuGcina wokuNikeza iNcazelo

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usuhlanganisiwe wasatshalaliswa ezindaweni zomphakathi izinsuku ezingama-21 okuyisikhathi sokuphawula, okuvalwa mhla zingama-30 kuMbasa 2013. Ongoti sebeqokiwe ukuphenya ngezihloko ezisemqoka ezibalulekile ezaphakanyiswa ngesikhathi sokunikezwa kweNcazelo kanti imiphumela yalolu cwaningo isiyatholakala ukuze sizwe imibono yabantu kanye nokuba kubandakanywe kuHlelo lokuNganyelwa koMphakathi neMvelo (SEMP). Kuhloswe ukuba kuthunyelwe i-SEMP ku-DMR ngomhla zingama-27 Nhlaba 2013 ukweseka ukuFakwa kwesiCelo samaLungelo okuVukuza. Ukuqinisekisa ukuthi ukuphawula nokukhathazeka kwabaneNtshisekelo nabaThintekayo kwamuva kuyabandakanywa ku-SEMP, **umhlangano wokungenelela nokunikeza izimpendulo** zemiphumela ye-SEMPuzoba ngaphambi kweziphakamiso zombiko ku-DMR. Kufanele kwazeke nokho ukuthi isikhathi sezimpendulo eziphelele kwabaneNtshisekelo nabaThintekayo sizolandela ngoNhlangulana/Ntulikazi 2013.

Isimemo sokuba yingxenye yemiHlangano eQavile yabaneNtshisekelo nabaThintekayo

Imihlangano elandelayo yokungenelela nokunikeza izimpendulo iphakanyisiwe:

- Ukuhlangana nabaninimhlaba kanye namaqembu abanentshisekelo endaweni ngomhla ziyi-16 Nhlaba 2013;
- Ukuhlangana nabantu abayiziphathimandla zomdabu mhla ziyi-17 Nhlaba 2013; kanye
- Nokuhlangana nezingxenye ezimbili zabaninimhlaba abathintekayo eMphakathini (eKanluka kanye neThuthukani CPA) kanjalo nabahlali base Donkerhoek mhla ziyi-18 Nhlaba 2013.

Uyamenywa kule mihlangano elandelayo:

Umhlangano:	IQembu ye-CPAs
Usuku:	18 Nhlaba 2013
Indawo:	Twyfelhoek Primary School
Isikhathi:	10h00-13h00

Izinjongo zale mihlangano yilezi:

- Ukwazisa abaneNtshisekelo nabaThintekayo ngenqubekelaphambili yephrojekthi;
- Ukunikeza izimpendulo ngemiphumela yophenyo longoti;
- Ukunikeza izimpendulo ngemiphumela yokuhlola umthelela kubandakanya imithelela enzima;
- Ukunikeza izimpendulo ngezinyathelo ezithathiwe zokuzama ukunciphisa umthelela; kanye
- Nokuhlonzwa kwezikhalo zabaneNtshisekelo nabaThintekayo kanjalo nokubhekana nokuphawula kanye nemibuzo yab.

Kulandela le mihlangano eqavile yabaneNtshisekelo nabaThintekayo

idokhyumenti yokuphawula nokuphendula izobukezwa ukuze ihanjiswe ku-MR kanye ne-SEMP.

Ukuphendula lesi simemo

Sicela usho ukuba uzotholakala ukuba yingxenye yalo mhlangano wabaneNtshisekelo nabaThintekayo. Siyayidinga impendulo yakho ngomhla ziyi-10 Nhlaba 2013 ngezizathu zokuhlinzeka izidlo.

Sicela uthine **Nadia Mol** lapha nadia.mol@imaginet.co.za; Ucingo: (011) 798 4300, ifeksi: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 uma kwenzeka uba nemibuzo. Siyakubonga ngokubamba kwakho iqhaza kuze kube manje. Silangazelele ukuba kanye nawe emhlanganweni wesikhashana.

Ozithobayo

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3 Motsheanong 2013 Nomoro ya Projeke: *0120258*

Monghadi/ Mofumahadi/Mofumahatsana ya ratehang

Kopano e Mahareng e Lohothilweng ya Kangra Coal Kusipongo Resource Expansion Mining Project ya Batho ba nang le Thahasello & ba Amehang, Mpumalanga

Nomoro ya tshupo ya DEDET: 17/2/3 GS-52 Nomoro ya tshupo ya DEA: 12/9/11/L719/6 Nomoro ya tshupu ya DMR MP30/5/1/2/2/10046MR

Porojeke le Tshebetso

Kangra Coal (Pty) Ltd. (Kangra Coal) e lohotha ho atolosa ditshebetso tsa yona tsa morafo wa mashala e Savmore Colliery ho kenyeletsa Kusipong coalresource e kgabahanyang le Mkhondo le Dr Pixley Ka Isaka Seme Local Municipalities e Mpumalanga. Setsha se sisintsweng sa katoloso se bonyane dikhilomitara tse 15 bophirima ho Driefontein pela Piet Retief. Projeke e sisintsweng e kenyeletsa ntshetsopele ya morafo o ka tlase, kahoo e atolosa ditshebetso tsa jwale tsa merafo tsa Maquasa East le West.

Tshebetso ya Tumello ya Tikoloho le Lakesense

Ho ya ka melawana e lokelang ya tikoloho ya Afrika Borwa, tumello ya tikoloho /lakesense tse hlokahalang di a latelela:

- Tumello ya tikoloho (ho ya ka Molao wa Naha wa Taolo ya Tikoloho wa 107 wa 1998 (National Environmental Management Act No 107 of 1998 (NEMA))) e hlokeha bakeng sa Projeke ena ho tswa ho Lefapha la Ntshetsopele ya Ikonomi, Bohahlaudi le Tikoloho la Mpumalanga (Mpumalanga Department of Economic Development, Tourism and Environment (DEDET);
- Temello ya tokelo ya ho rafa (ho ya ka Molao wa Merafo le Ntshetsopele ya Mehlodi ya Petroliamo wa 28 wa 2002 (Mineral and Petroleum Resources Development act No 28 of 2002 (MPRDA))) ho tswa ho Lefapha la Mehlodi ya Dimenerale la Lebatowa (Regional Department of Mineral Resources (DMR));
- Lakesense ya tshebediso ya metsi ho ya ka Molao wa Naha wa 36 wa 1998 (National Water Act No 36 of 1998) ho tswa ho Lefapha la Ditaba tsa Metsi la Naha (National Department of Water Affairs (DWA)); le
- Lakesense ya dikgwerekgwere (ho ya ka Molao wa 59 wa 2008 wa Naha wa Taolo ya Tikoloho le Dikgwerekgwere (National Environmental Management: Waste Act No 59 of 2008 (NEMWA))) ho tswa ho Lefapheng la Naha la Ditaba tsa Tikoloho (National Department of Environmental Affairs (DEA))

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) e se e hlomamisitswe jwaloka khonsaltente e ikemetseng ya tikoloho bakeng sa dikopo tsa tumello ya tikoloho/lakesense tse bolotsweng ka hodimo.

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Boemo ba Tumello le lakesense ya Ditshebetso ya Tikoloho

Mokgahlelo wa pele wa tshebetso ya tumello ya tikoloho, Mokgahlelo wa Scoping, o se o phethetswe. Raporoto ya ho Qetela ya Scoping e se e radilwe le ho behwa pontsheng ya setjhaba nakong ya matsatsi a 21 a ho hlahisa maikutlo, e kwallwang ka la 30 Mmesa 2013. Ditsebi di se di hlomamisitswe ho fuputsa dintlha tse mahlonoko tse hlahisitsweng nakong ya Mokgahlelo wa Scoping mme diphetho tsa boithuto bona di se di fumaneha bakeng sa tlaleho le ho kenyeletswa ho Lenaneo la Taolo ya Tikolo le Phedisano (Social and Environmental Management Programme (SEMP)).

Ho rerilwe ho fetisetsa SEMP ho DMR ka la 27 Motshehanong 2013 e le tshehetso ya Kopo ya Tokelo ya ho Rafa (Mining Rifhts Application). Ho netefatsa tlhahiso ya maikutlo le dingongoreho ho tswa ho Batho ba ka Sehloohong ba Thahasellang le ba Amehang hore di kenyeleditswe ho SEMP, **tlaleho ya dikopano tse mahareng** diphethong tsa SEMP di tla tla pele ho phetisetso ya Raporoto ho DMR. Leha ho le jwalo, ho lokelwa ho elwa hloko hore nako ya tlaleho tse felletseng tsa Batho ba Thahasellang le ba Amehang (I &AP) e tla latela ka Phupjane /Phupu 2013.

Memo ya ho ba Teng Dikopanong tse mahareng tsa tlaleho tsa Batho ba ka Sehloohong ba Thahasellang le ba Amehang

Dikopano tse mahareng tsa tlaleho tse latelang di sisintswe:

- Kopano ya beng ba naha le dihlopha tse ka sehloohong tse nang le thahasello sebakeng seo 16 Motshehanong 2013;
- Kopano le marena ka bomong ka la 17 Motshehanong 2013; le
- Kopano le Mekgatlo e amehang ya beng ba Thepa ya Setjhaba (Community Property Associations)(eKanluka le Thuthukani CPA) le baahi ba Donkerhoek ka la 18th Motshehanong 2013.

O memelwa kopanong e latelang:

Kopano: Kopano le marena
Mohla: 17th Motshehanong 2013

Dipheo tsa kopano ena ke ho:

- Ho fana ka tlhahisoleseding ya moraorao ho Batho ba Thahasellang le Ba Amehang mabapi le tswelopele ya projeke;
- Tlaleho ya diphetho tsa diphuputso tse ikgethang;
- Tlaleho ya diphetho tsa tekelo ya sekgahla ho kenyeletswa sekgahla se bonahalang;
- Tlaleho ya pebofatso ya mehato e sisintsweng; le
- Ho hlwaya dingongoreho le ho arabela maikutlo le dipotso tsa Batho ba Thahasellang le ba Amehang

Kamora dikopano tsena tsa Batho ba ka Sehloohong ba Thahasellang le ba

Amaheng tokomane ya maikutlo e tla kenyeletsa tsa moraorao bakeng sa ho romelwa ho DMR le SEMP.

Karabo ya memo ena

Ka kopo bontsha hore o tla fumaneha bakeng sa ho ba teng kopanong ena ya Batho ba ka Sehloohong ba Thahasellang le ba Amaheng. Re hloka karabo ya hao bakeng sa ho fepa ka la 10 Motshehanong 2013 .

Ka kopo e ikopanye le **Nadia Mol** ho nadia.mol@imaginet.co.za; Mohala: (011) 789 4300. Fekse 086 292 7318, Postnet Suit 624, Private Bag X29, Gallo Manor 2052 haeba o na le dipotso. Re leboha ha o nkile karolo ho fihla jwale. Re lebeletse ho ba teng ha hao kopanong e mahareng.

Ka ditumediso

Dieter Rodewald
ERM Project Manager

Annex B8

Notification of Draft SEMP Availability and Technical & Non-Technical Summary of SEMP

Dear Interested and Affected Party

ERM has been appointed to undertake the Environmental and Social Impact Assessment (ESIA) for the proposed Kusipongo Project and has recently compiled the Draft Social and Environmental Management Programme (SEMP) which documents the results of all work, including the technical investigations, which have been undertaken to date. It is intended to feedback to I&APs on this report, the results of the investigations and the proposed mitigation measures.

For this reason, please find the following attached:

- A non-technical summary of the Draft SEMP;
- An updated comment and response document.

Please take note that the comments period for the Draft SEMP closes on 14th August 2013.

Should you have any queries in this regard, please contact Lauren telephonically on (011) 798 4300.

Yours faithfully

Mthathingxenye Othandekayo

IDraft Enviromental and social manangement Programe yomsebenzi we Kusipongo sewuyatholakala ukuze wonke umuntu afake umbono.Itholakala ePosini laseDriefontein kanye naseMtholampilo yase Dirkiesdorp.Umhlangano wefocus group nawo uzoba khona maduzane kanye nabameleli bomphakathi endaweni ezithintekayo kuze kube umhlaka 14 Agasti 2013 ukuze kunikezwe impendulo ndemiphumela walomsebenzi.

IzilokothoRegards
Nadia Mol, ERM

I-ERM ithanda ukukumemela emhlanganweni obuyisa imiphumela ye-Environmental and Social Impact Assessment. Lo mhlangano uzoba ngoMsombuluko 29 July 2013, ngo-10 ekuseni kuya ku-1 emini eWelgekozen Country Lodge ePiet Retief. IKangra Coal izonikezela ngezinto zokuhamba eziya kulo mhlangano ngo 9:00 ekuseni ngoMsombuluko wangomhla ka-29 July 2013, zizosukela kuyi-Corner Store eDriefontein. Ngaphezu kwalokho singathanda ukukwazisa ukuthi iDraft Environmental and Social Management Programme yeKusipongo Project ivulelekele umphakathi ukuba uphawule ngayo. Iyatholakala eHhovisi LePosi laseDriefontein naseMtholampilo waseDirkiesdorp kuze kube umhla ka-14 August 2013.

Ozithobayo
UNadia Mol, we-ERM

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24th June 2013 *Project no.: 0120258*

Dear Sir/Madam

Feedback on the Social and Environmental Management Programme for the Proposed Kangra Coal Kusipongo Resource Expansion Mining Project, Mpumalanga

DEDET reference number: 17/2/3 GS-52 DEA reference number: 12/9/11/L719/6
DMR reference number MP30/5/1/2/2/10046MR

The Project and Process

Kangra Coal (Pty) Ltd. (Kangra Coal) is considering expanding their coal mining operations at the Savmore Colliery to include the Kusipongo coal resource which spans across the Mkhondo and Dr Pixley Ka Isaka Seme Local Municipalities in Mpumalanga. The site of the proposed Project is situated approximately 15km west of Driefontein near Piet Retief. The proposed Project involves the development of an underground mine, thereby extending their existing Maquasa East and West mining activities.

Environmental Authorisation and Licensing Processes

In accordance with the relevant environmental regulations of South Africa, the following environmental authorisation/licenses are required:

- **Environmental Authorisation** (in terms of the National Environmental Management Act No 107 of 1998 (NEMA)) is required for this Project from the Mpumalanga Department of Economic Development, Tourism and Environment (DEDET);
- **Mining Right Approval**(in terms of the Mineral and Petroleum Resources Development act No 28 of 2002 (MPRDA)) from the Regional Department of Mineral Resources (DMR);
- **Water Use Licenses** in terms of the National Water Act No 36 of 1998 from the National Department of Water Affairs (DWA); and
- **Waste License** (in terms of the National Environmental Management: Waste Act No 59 of 2008 (NEMWA)) from the National Department of Environmental Affairs (DEA).

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) has been appointed as the independent environmental assessment practitioner for the above mentioned environmental authorisations/licensing applications.

Status of the Environmental Authorisation and Licensing processes

Following the closure of the comments period on the Final Scoping Report on 30 April 2013, technical investigations have been completed and a Draft Social and Environmental Management Programme (SEMP) prepared to provide feedback on the results of the assessment phase of the Project. The SEMP was submitted to the DMR in support of a Mining Rights Application on 27 May 2013. Interim feedback was sought prior to this submission through meetings which were

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scheduled with directly affected Interested and Affected Parties (I&APs) to discuss the results of the SEMP, but due to service delivery protests in the area, scheduled meetings were not attended and/or cancelled.

Your Involvement in the Feedback Process

As part of the feedback process, several engagement activities are proposed and your involvement is sought therein. These activities include:

- Review and comment on the Draft SEMP which will be made available at public places as detailed in this letter. The comment period for this document commences on 24 June 2013 and closes on 14 August 2013;
- I&AP focus group discussions will be held in the period 26 July to 2 August 2013 and your participation in these is requested. The meeting relevant to your interest group is detailed herein; and
- Submission of written and/or telephonic comment is always welcome.

Information Accompanying this Feedback Letter

Attached to this letter is the following documentation to assist in your review and comment on the Draft SEMP and participation at the I&AP focus group discussions:

- A summary of the Draft SEMP which has been translated where deemed necessary;
- An updated Comments and Response Document with records of all comments gathered in the public domain to date and responses to these (this document is available in English only).

Review of the Draft SEMP

The Draft SEMP is being made available for comment between the 24 June and 14 August 2013. Venues and addresses where this will be available include:

Venue	Address	Contact Details
Volksrust Public Library	Cnr Adelaide Street and Nelson Mandela Drive, Volksrust, 2470	017 734 6109
Volksrust Post Office	15 Vrede Street, Volksrust, 2470	017 735 5113
Wakkerstroom Library	Cnr R543 Van Riebeeck and Badenhorst Street, Wakkerstroom, 2380	083 382 6577
Piet Retief Post Office	9 Kruger Street, Piet Retief, 2380	017 826 2266
Piet Retief Library	Retief Street, Piet Retief	017 826 8100/ 076 532 2388
Driefontein Post Office	Corner Store Street, Driefontein, 2380	076 837 7385
Daggakraal Clinic	262 Sinqobile A, Daggakraal, 2491	017 753 9033/072 619 0738

Venue	Address	Contact Details
Dirkiesdorp Clinic	Cnr Vaalbank Rd & R543, Dirkiesdorp, 2486	082 408 0838/017 735 5305
ERM website	www.erm.com/kangracoal	

In addition, as detailed above, the report can be downloaded from the ERM website.

Invitation to Attend I&AP Feedback Meetings

The following feedback meetings are proposed:

- One-on-one discussions with the three traditional authorities for the area on 26 July 2013;
- Focus group discussion with the two directly affected Community Property Associations (eKanluka and Yende CPA) and Donkerhoek residents on 27 July 2013;
- Focus group discussion with all seven Community Property Associations for the area (jointly known as the Donkerhoek Development Committee. These are scheduled for 28 July 2013;
- Focus group discussion with the Driefontein Community Forum on 29 July 2013;
- Focus group discussion with Municipal Officials and Councillors on 30th July 2013;
- Focus group discussion with Landowners and Key Interest Groups in the area on 30th July 2013; and
- Focus group discussion with key Regulatory Authorities on 31st July 2013.

You are invited to the following meeting:

Meeting: Municipal Council Officials and Politicians
Date: 30th July 2013
Venue: Mkhondo Local Municipality Offices - Council Chambers
Time: 10h00-13h00

The objectives of this meeting are to:

- Update I&APs regarding project progress;
- Feedback on the results of the specialist investigations;
- Feedback on the results of the impact assessment including significant impacts and fatal flaws;
- Feedback on the proposed mitigation measures; and
- Identify I&APs' concerns and address comments and questions.

Response to this Invitation

Please could you indicate your availability to attend this focus group discussion via email/telephonic response. We require your response for catering purposes by 23rd July 2013.

Remainder of the ESIA Process

Following these proposed I&AP engagements and the closure of the comments period on the Draft SEMP, the SEMP will be finalised and made available for a further 21 day public comment period before the commencement of the authority review period. An environmental authorisation decision will then be made by the regulatory authorities. I&APs will be notified in writing and through the media of this decision.

Please contact **Debbie Jo Jansen** at debbiejo.jansen@erm.com or kangracoal@erm.com; Tel: (011) 798 4300, Fax: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 should you have any queries or suggestions with regard to this letter. Thank you for your participation to date. We look forward to your involvement in the feedback process.

Kind Regards

Dieter Rodewald
ERM Project Manager

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22 Juni 2013 *inamba yomsebenzi: 0120258*

Mnumzane / Nkosazane ehloniphekile

Impendulo mayelana nohlelo lokuphathwa kwezenhlalo kanye nemvelo mayelana nokuhlongozwa kwe Kangra Coal Kusipongo Resource Expansion Mining Project, Mpumalanga

DEDET Inombolo yesikhombo: 17/2/3 GS-52 DEA Inombolo yesikhombo: 12/9/11/L719/6
DMR Inombolo yesikhombo MP30/5/1/2/2/10046MR

Umsebenzi kanye nenqubo

IKangra Coal (Pty) Ltd. (Kangra Coal) icabangela ukukhulisa umsebenzi wayo wasemayini yamalahle eseSavmore Colliery kuhlanganise neKusipongo coal resource ewelela eMkhondo kanye neDr Pixley Ka Isaka Seme Local Municipalities eMpumalanga. Isiza salomsebenzi ohlongozwayo sisendaweni ecishe ingmakhilomitha angu-15 empumalanga ye Drietfontein eduzane kwase Piet Retief.Umsebenzi ohlongozwayo uhlanganisa nokuthuthukiswa kwezimayini ezingaphansi komhlaba,Kunwetshwe neMpumalanga Maquasa ebikhona kakade kanye nemisebenzi yaseMayini esentshonalanga.

Ukugunyazwa kwezemvelo kanye nenqubo yokubhalisa

Ngokuqondene nemithetho yezemvelo yaseNingizimu Afrika,Kufuneka Ukugunyazwa kwezemvelo kanye nenqubo yokubhalisa elandelayo:

- **Ukugunyazwa Kwezemvelo** (Ngokokuphathwa kwezemvelo ezweni jikelele ngokomthethosisekelo namba.107 ka 1998 (NEMA)) iyafuneka kulomsebenzi eMnyangweni waseMpumalanga wezokuthuthukiswa komnotho,ezokuvakasha kanye nezemvelo (DEDET);
- **Ilungelo lokuba neMayini eligunyaziwe** (ngokwe Zokuthuthukiswa kwezokumbiwa kanye namagugu Umthethosisekelo namba.28 wango 2002(MPRDA)) eMnyangweni womkhandlu wezokumbiwa phansi(DMR);
- **Amalayisense okusetshenziswa kwamanzi** ngokweZamanzi ezweni jikelele umthethosisekelo namba.36 ka 1998 yase Mnyangweni kazwelonke wezamanzi (DWA);kanye
- **Ilayisense Yezibi** (ngokweZemvelo ezweni jikelele:Izibi umthethosisekelo namba 59 ka 2008 (NEMWA)) yasemnyangweni kazwelonke wezemvelo (DEA).

iEnvironmental Resources Management Southern Africa (Pty) Ltd. (ERM)iqokwe njengengabahloli nabasebenzi bezemvelo abazimele ngokwamagunya ezemvelo abhalwe ngenhla kanye nenqubo yokubhalisa.

Isimo sokugunyazwa kwezemvelo kanye nenqubo yokubhalisa

Ngemuva kokuba siyiphethile indaba embikweni wokugcina oshicilelwe wangezi 30 April 2013,Uphenyo olunzulu seluphothuliwe kanti **umnyango wohlelo lokuphathwa kwezenhlalo kanye nemvelo** (SEMP) seyikulungele

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Company registration number
2003 / 001404 / 07

Directors
Jeremy Soboil (Managing)
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John Simonson (UK)

Offices worldwide

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ukusinikeza impendulo ngomphumela wokuhlolisisa kwabo lomsebenzi. i SEMP yathunyelelwa kwi DMR yesekwa i Mining Rights Application ngomhlaka 27 May 2013. Kuye kwafuneka umbiko wesikhashana ngaphambi kokufakwa kwalesi sicelo emihlanganweni ebihlelwe nezinhlangano ezinesithakazelo ezithintekayo ngokuqondile (I&APs)ukuze baxoxe ngemiphumela ye SEMP, kodwa ngenxa yababebhikishela izidingo zomphakathi endaweni,imihlangano ebihleliwe ayizange iphumelele yabe isihoxiswa.

Ukuhlanganyela kwakho kwinqubo yempendulo

Njengengxenye yalenqubo yempendulo,kuneziphakamiso ezimbalwa ezenziwe okudingeka ukuthi nawe uzibandakanye kuzo. Lomsebenzi uhilela lokhu okulandelayo:

- Ukubheka kabusha futhi uphawule kwi Draft SEMP ezotholakala ezindaweni ezisobala njengoba kubonisiwe kulencwadini. Isikhathi sokuveza uvo kulencwadi kuqala ngomhlaka 24 June 2013 kuvalwe ngomhlaka 14 August 2013;
- I&AP Izingxoxo ezigxilile zeqembu zizobanjwa kusukela ngomhlaka 26 July 2013 kuphele ngomhlaka 2 August 2013 futhi ucelwa ukba ufake isandla kulokhu.Umhlangano ofanayo weqembu ofisa ukuba kulo nayo ifakiwe lapha ; kanti futhi
- Umbono othunyelwe ngencwadi noma ngocingo nawo wamukelekile.

Ukwaziswa okuhambisana nencwadi yempendulo

Okunye okufakwe nalencwadi izincwadi ezizokusiza ukuba ubheke kabusha futhi uphawule kwi Draft SEMP nokuthi ukwazi ukuhlanganyela ezingxoweni ze I&AP focus group:

- I Draft SEMP efingqiwe ehunyushwe lapho kunesidingo khona;
- Incwadi yakamuva enemibono nezimpendulo kanye namaRekhodi ayoyonke imibono ahlanganiswe ezindaweni ezisobala yanamuhla kanye nezimpendulo zayo. (lencwadi itholakala ngesingi kuphela).

Ukubhekwa kabusha kwe Draft SEMP

I Draft SEMP yenziwe ukuba ikwazi ukutholakala ukuze ufake uvo lwakho kusukela ngomhlaka 24 June ngangomhlaka 14 August 2013. Izindawo kanye namkheli alapho lokhu kuzotholakala khona ahlanganisa:

Indawo	Ikheli	Imininingwane yokuxhumana
Volksrust Public Library	Cnr Adelaide Street and Nelson Mandela Drive, Volksrust, 2470	017 734 6109
Volksrust Post Office	15 Vrede Street, Volksrust, 2470	017 735 5113
Wakkerstroom Library	Cnr R543 Van Riebeeck and	083 382 6577

Indawo	Ikheli	Imininingwane yokuxhumana
	Badenhorst Street, Wakkerstroom, 2380	
Piet Retief Post Office	9 Kruger Street, Piet Retief, 2380	017 826 2266
Piet Retief Library	Retief Street, Piet Retief	017 826 8100 / 076 532 2388
Driefontein Post Office	Corner Store Street, Driefontein, 2380	076 837 7385
Daggakraal Clinic	262 Sinqobile A, Daggakraal, 2491	017 753 9033 / 072 619 0738
Dirkiesdorp Clinic	Cnr Vaalbank Rd & R543, Dirkiesdorp, 2486	082 408 0838 / 017 735 5305
ERM website	www.erm.com / kangracoal	

Ukwenezela lapho, njengoba kubonisiwe ngenhla, Umbiko ungazikopishela wona kwi ERM website.

Isimemo sokuba uzothamela umhlangano wempendulo we I&AP

Kuphakanyiswe imihlangano yezimpendulo elandelayo:

- Lapho kuzoxoxwa khona ubusoso nobuso nabaphathi bomdabu basendaweni ngomhlaka 26 July 2013;
- Ingxoxo yeqembu kanye nezinhlangano ezimbili ezithinteka ngokuqondile ezengamele izindawo zomphakathi (eKanluka kanye nase Yende CPA) kanye nabahlali baseDonkerhoek ngomhlaka 27 July 2013;
- Ingxoxo yeqembu kanye nazo zosikhombisa izinhlangano ezengamele izindawo zomphakathi endaweni . Lokhu kuhlelelwe umhlaka 28 July 2013;
- Ingxoxo yeqembu kanye namalungu amphakathi (Community Forum) ngomhlaka 29 July 2013;
- Izingxoxo zeqembu nezikhulu zikamasipala kanye namakhansela ngomhlaka 30 July 2013;
- Izingxoxo zeqembu nabaphathi bomhlaba kanye namaqembu anesithakazelo endaweni ngomhlaka30 July 2013; and
- Umhlangano weqembu kanye namakey Regulatory Authorities ngomhlaka 31 July 2013.

Umenyelwa emhlanganweni olandelayo:

Umhlangano:	Focus Group Discussion –Abahlali base Yende e eKanluka CPAs kanye Donkerhoek
Usuku:	27 July 2013
Indawo:	Twyfelhoek Primary School
Isikhathi:	10h00-14h00

Izizathu zokuba khona kwalomhlangano:

- Ukunikeza I I&Aps umbiko wakamuva mayelana nomsebenzi nentuthuko;

- Ukunikeza umbiko ngemiphumela yochwepheshe bezokuphenya;
- Umbiko wemiphumela uhlanganisa izinkinga ezinkulu;
- Umbiko wemithetho yokuvimbela ehlongozwayo; kanye
- Ukugagula izinto i I&APs' ekhathazeke ngazo bese kuvezwa imibono nemibuzo.

Okusele enqubweni ye ESIA

Ngemuva kwaleziziphakamiso kanye nokuzibandakanya kwe I&AP kanye nokuvalwa kwesikhathi sokufaka imibono kwi Draft SEMP, I SEMP izoqedelwa bese iyatholakala ezinye izinsuku ezingu 21 ukuze wonke umuntu afake umbono ngaphambi kokuba kufike isikhathi sokuba ibuyekezw abasemagunyeniwill .Isinqumo sokukugunyaza kwabazemvelo kuzokwenziwa abasemagunyeni.i I&APs bazokwaziswa ngezincwadi mayelana nalesisinqumo.

Sicela uxhumane no **Lauren Messing** ku lauren.messing@erm.com; Ucingo: (011) 798 4300, Isikhahlamezi: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 Uma unemibuzo nama imibono mayelana nalencwadi. Siyabonga ngokuhlanganyela kwakho kuze kube manje.Sibheke phambili ekuzibandkanyeni kwakho kulenqubo yempendulo.

Izilokotho Ezinhle

Dieter Rodewald
ERM Owengamele Umsebenzi

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Fekese: +27 (0) 11 804 2289
www.erm.com

La[22] Phupjane 2013 *Nom. ya Projeke: 0120258*

Monghadi / Mofumahadi ya Ratehang

Karabo ya Lenaneo la Tsamaiso ya Setjhaba le Tikoloho bakeng sa Projeke e Sisintsweng ya Katoloso ya Matlotlo a Merafo ya Kangra Coal Kusipongo, Mpumalanga

Nomoro ya tshupiso ya DEDET: 17/2/3 GS-52 nomoro ya tshupiso ya DEA: 12/9/11/L719/6
nomoro ya tshupiso ya DMR MP30/5/1/2/2/10046MR

Projeke le Mokgwa oo e Sebetsang ka Wona

Kangra Coal (Pty) Ltd. (Kangra Coal) e nahana ho atolosa mesebetsi ya ho epa mashala Morafong wa Mashala wa Savmore hore o akarelletse le mohlodi wa mashala wa Kusipongo o tshelelang Masepaleng wa Selehae wa Mkhondo le wa Dr Pixley KaIsaka Seme, Mpumalanga. Setsha sa Projeke e sisinngwang se hoo e ka bang 15km ka bophirimela ho Driefontein pela Piet Retief. Projeke e sisinngwang e akarelletsa ho thehwa ha morafo wa ka tlasa lefatshe, kahoo e atolosa merafo ya yona e Maquasa East le West.

Tumello ya Tikoloho le Mekgwa ya ho Fumana Laesense

Ho latela melao e sebetsang ya tikoloho ya Afrika Borwa, tumello / dilaesense tse latelang tsa tikoloho dia hlokahala:

- **Tumello ya Tikoloho** (ho latela Molao wa Naha wa Tsamaiso ya Tikoloho wa 107 wa 1998 (NEMA)) ya hlokahala bakeng sa Projeke ena ho tswa ho Lefapha la Tlhabollo ya Moruo, Bohahlaudi le Tikoloho (DEDET) la Mpumalanga;
- **Tumello ya Tokelo ya Morafo**(ho latela molao wa Tlhahiso ya Dirafshwa le Petroleumo wa 28 wa 2002 (MPRDA)) ho tswa ho Lefapha la Dirafshwa (DMR);
- **Dilaesense Tsa Tshebediso ya Metsi** ho latela Molao wa Naha wa Metsi wa 36 wa 1998 ho tswa Lefapheng la Naha la Ditaba Tsa Metsi (DWA); le
- **Laesense ya Dithole** (ho latela Tsamaiso ya Naha ya Tikoloho: Molao wa Dithole wa 59 wa 2008 (NEMWA)) ho tswa Lefapheng la Naha la Ditaba Tsa Tikoloho (DEA).

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) e kgethilwe e le setsebi se ikemetseng sa tlhahlobo ya tikoloho bakeng sa dikopo tse boletsweng ka hodimo tsa ditumello / phano ya dilaesense tsa tikoloho.

Tumello ya Tikoloho le Mekgwa ya ho Fumana Laesense

Kamora hore ho kwalwe nako ya ho ntsha maikutlo Tlalehong ya ho Qetela ya Tlhahlobo ka la[30] Mmesa 2013, diphuputso tsa ditsebi di se di phethetswe mme Draft Social and Environmental Management Programme (SEMP) e hlophisitsweng ho fana ka karabo ya diphetho tsa tekolo ya mokgahlelo wa

Aterese ya Poso:
Postnet Suite 624
Private Bag X29
Gallo Manor, 2052
Johannesburg
South Africa

Aterese e Ngodisitsweng ya Khamphani:
Sehlopha sa Botsamaisi ba Tikoloho
Southern Africa (Pty) Ltd
Building 32, 1st Floor,
The Woodlands Office Park,
Woodlands Drive
Woodmead, 2148

Nomoro ya ngodiso ya khamphani
2003 / 001404 / 07

Batsamaisi
Jeremy Soboil (Mookamedi)
Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Diofisi lefatsheng ka bophara

Setho sa
Sehlopha sa Botsamaisi ba Matlotlo a Tikoloho

Projeke. SEMP e rometswe DMR ho tshehetsa Kopo ya Ditokelo Tsa Merafo ka la 27 Motshehanong 2013. Tlaleho ya nakong ya kgefu e kopilwe pele ho tliswa kopo ena ka diboka tse neng di lokelwa ho tshwarwa le Batho ba amehang ka kotloloho le Baahi (di-I&AP) e le ho buisana ka diphetho tsa SEMP, empa ka lebaka mehwanto ya phano ya ditshebeletso sebakeng sena, batho ha baa ka ba tla diboke tse neng di hlophisitswe mme / kapa tsa hlakolwa.

Seabo sa Hao Mokgweng ha ho Fanwa ka Karabo

E le karolo ya mokgwa wa ho fana ka karabo, ho sisinngwa hore re tshwarwe ditherisano tse mmalwa mme mona ho kopuwa hore o be le seabo. Dintho tse amehang ditherisanong tseo ke:

- Tlhahlobo le maikutlo ka Tlaleho ya SEMP e tla fumaneha dibakeng sa setjhaba jwalokaha e hlalositswe lengolong lena. Nako ya ho ntsha maikutlo ya tokomane ena e qala ka la 24 Phupjane 2013 mme e fela ka la 14 Phato 2013;
- Ditherisano tse tebileng le sehlopha sa I&AP di tla tshwarwa ka la 26 Phupu ho ya ho la 2 Phato 2013 mme ho kopuwa hore o be le seabo ho tsona. Seboka se amanang le sehlopha sa hao sa ba amehang se tshohlilwe hona mona; mme se
- Kamehla re amohela ho tliswa ha maikutlo a ngotswe le / kapa ka mohala.

Tlhahisoleseding e Tsamayang le Lengolo lena la Karabo

Lengolo lena le tsamaya le tokomane e latelang ho o thusa ha o etsa tlhahlobo le ho ntsha maikutlo ka Tlaleho ya SEMP le seabo sa hao dipuisanong tse tebileng tsa sehlopha sa I&AP:

- Kakaretso ya Tlaleho ya SEMP e fetoletsweng moo ho nkwang ho hlokahala;
- Tokomane e ntjhafaditsweng ya Maikutlo le Dikarabo e nang le ditlaleho tsa maikutlo wohle a bokeletsweng pitsong ya setjhaba pele ho mona le dikarabo tsa tsona (tokomane ena e fumaneha ka Senyesemane feela).

Tlhahlobo ya Tlaleho ya SEMP

Tlaleho ya SEMP e ile ya fumaneha hore batho ba ntshe maikutlo a bona ka yona pakeng tsa la 24 Phupjane le la 14 Phato 2013. Dibaka le diaterese moo e tla fumaneha di akarelletsa:

Sebaka	**Aterese**	**Dintlha Tsa ho Ikgokahanya**
Laebrari ya Setjhaba ya Volksrust	Cnr Adelaide Street and Nelson Mandela Drive, Volksrust, 2470	017 734 6109
Ofisi ya Poso ya Volksrust	15 Vrede Street, Volksrust, 2470	017 735 5113
Laebrari ya Wakkerstroom	Cnr R543 Van Riebeeck and Badenhorst Street, Wakkerstroom, 2380	083 382 6577

Sebaka	Aterese	Dintlha Tsa ho Ikgokahanya
Ofisi ya Poso ya Piet Retief	9 Kruger Street, Piet Retief, 2380	017 826 2266
Laebrari ya Piet Retief	Retief Street, Piet Retief	017 826 8100 / 076 532 2388
Ofisi ya Poso ya Driefontein	Corner Store Street, Driefontein, 2380	076 837 7385
Tleliniki ya Daggakraal	262 Sinqobile A, Daggakraal, 2491	017 753 9033 / 072 619 0738
Tleliniki ya Dirkiesdorp	Cnr Vaalbank Rd & R543, Dirkiesdorp, 2486	082 408 0838 / 017 735 5305
Webosaete ya ERM	www.erm.com / kangracoal	

Ho phaella moo, jwalokaha ho boletswe ka hodimo, tlaleho e ka kopitswa webosaeteng ya ERM.

Memo ya ho ba Teng Dipitsong Tsa Karabo ya Batho ba Amehang le Baahi (I&AP)

Ho sisinngwa dipitso tse latelang moo ho tla fanwa ka karabo:

- Dipuisano tsa batho ba babedi le baetapele ba setso ba bararo ba sebakeng sena ka la 26 Phupu 2013;
- Ditherisano le sehlopha moo ho nang le Mekgatlo e mmedi e amehang ka kotloloho ya Thepa ya Motse (eKanluka le Yende CPA) le baahi ba Donkerhoek ka la 27 Phupu 2013;
- Ditherisano le sehlopha moo ho nang le Mekgatlo yohle e supileng e amehang ka kotloloho ya Thepa ya Motse bakeng sa sebaka sena (yeo ha e kopane e tsejwang e le Komiti ya Tlhabollo ya Donkerhoek. Tsona di tla ba ka 29 Phupu 2013;
- Ditherisano tsa sehlopha le Foramo ya Motse wa Driefontein ka la 30 Phupu 2013;
- Ditherisano tsa sehlopha le Bahlanka ba Masepala le Balekgotla ka la 1 Phato 2013;
- Ditherisano tsa sehlopha le Beng ba Mobu le Dihlopha Tse ka Sehloohong Tse Amehang sebakeng sena ka la 1 Phato 2013; le
- Ditherisano tsa sehlopha le Balaodi ba hlaheletseng ba Boholong ka la 2 Phato, 2013.

O mengwa sebokeng se latelang:

Seboka: Puisano ya batho ba shebaneng le baetapele ba setso
Letsatsi: La 26 Phupu 2013
Sebaka: Ho latela kopo ya baetapele ba setso
Nako: Ho ya ka kopo ya baetapele ba setso

Sepheo sa seboka sena ke ho:

- Beha di-I&AP leseding mabapi le kgatelopele ya projeke;
- Ho fana ka karabo ya diphetho tsa diphuputso tsa ditsebi;
- Ho fana ka karabo ya ditlhahlobo tsa diphello ho akarelletsa le diphello tsa bohlokwa le diphoso tse kotsi haholo;
- Ho fana ka karabo mabapi le mehato e sisinngwang ya pebofatso; le
- Hlwaya dingongoreho tsa I&AP mme o sebetsane le maikutlo le dipotso tsa bona.

Kgopotso ya Mokgwa o Sebediswang wa ESIA

Kamora ho utlwa maikutlo ana a sisintsweng a I&AP le hore ho kwale nakong ya maikutlo Tlalehong ya SEMP, SEMP e tla phethelwa mme e fumanehe ka ka nako ya matsatsi a mang a 21 a hore setjhaba se ntshe maikutlo pele ho thakgolwa nako ya hore ba boholong ba e hlahlobe. Qeto ya tumello ya tikoloho e tla etswa ke batsamaisi ba boholong. Di-I&AP di tla tsebiswa ka lengolo le ka metjha ya phatlalatso mabapi le qeto ena.

Ka kopo ikopanye le **Lauren Messing** ho lauren.messing@erm.com; Thel: (011) 798 4300, Fekese: 086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 haeba o na le dipotso leha e le dife kapa ditlhahiso tse amanang le lengolo lena. Rea leboha ka seabo hao ho tla fihlela kajeno. Re lebeletse seabo sa hao ha ho hlahlojwa karabo.

Kea leboha

Dieter Rodewald
Mookamedi a Projeke ya ERM

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South Africa

22 Juni 2013 *inamba yomsebenzi: 0120258*

Mnumzane Nkumane ohloniphekile

Impendulo mayelana nohlelo lokuphathwa kwezenhlalo kanye nemvelo mayelana nokuhlongozwa kwe Kangra Coal Kusipongo Resource Expansion Mining Project, Mpumalanga

DEDET Inombolo yesikhombo: 17/2/3 GS-52 DEA Inombolo yesikhombo: 12/9/11/L719/6
DMR Inombolo yesikhombo MP30/5/1/2/2/10046MR

Umsebenzi kanye nenqubo

IKangra Coal (Pty) Ltd. (Kangra Coal) icabangela ukukhulisa umsebenzi wayo wasemayini yamalahle eseSavmore Colliery kuhlanganise neKusipongo coal resource ewelela eMkhondo kanye neDr Pixley Ka Isaka Seme Local Municipalities eMpumalanga.

iEnvironmental Resources Management Southern Africa (Pty) Ltd. (ERM)iqokwe njengengabahloli nabasebenzi bezemvelo abazimele ngokwamagunya ezemvelo abhalwe ngenhla kanye nenqubo yokubhalisa.

I-Environmental and Social Management Programme (ESMP) isiwulungele umsebenzi weKusipongo kanti I ERM ukunikeza umbiko ngomphumela walomsebenzi bese behlanganisa nemibono. Kuye kwahlelwa ukuba kube nomhlangano neForamu yabathuthukisi bomphakathi waseYende kanye nabahlali baseDonkerhoek.Ngomhlaka 27 Julayi 2013 ngo 10h00 kuya 14h00 eTwyfelhoek Primary school ukuze kudingidwe lomsebenzi.Lapha sifake nezimemo zabalingani bakho.Zihambisana nombiko ohumushiwe ofingqiwe kanye nembono yakamuva kanye nombiko wempendulo.Singajabula lezizinto ungaziniekeza nozakwenu.

Sicela uxhumane noLauren Messing ku lauren.messing@erm.com; inombolo yocingo (011) 798 4300,isikhahlamezi086 292 7318, Postnet Suite 624, Private Bag X29, Gallo Manor 2052 uma unemibuzo noma ukusikisela mayelana nalencwadi.Siyabonga ngokuhlanganyela kwakho kuze kube manje.

Izilokotho ezinhle

Dieter Rodewald
Owengamele Umsebenzi

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Company registration number
2003 / 001404 / 07

Directors
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Dylan Campbell
Grant Bassingthwaighte
John Alexander (UK)
John Simonson (UK)

Offices worldwide

A member of the Environmental Resources Management Group

1 TECHNICAL SUMMARY

This is a technical summary of the Draft Social and Environmental Management Programme (SEMP) which has been prepared by Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) for an environmental authorisation and mining rights application decision for Kangra Coals proposed Kusipongo Resource Expansion Project. Information presented in this document represents a simplified summary of the proposed project, its anticipated impacts and the possible management thereof. The full Draft SEMP has been made available for public review and comment between 24 June and 14 August 2013. Thereafter it will be finalised and following a further round of public review, submitted to the regulatory authorities to inform the environmental authorisation decision.

Your input into this document is therefore valuable in that you have an opportunity to:

- Comment on the results of the investigations and highlight areas of concern or where further work may be required
- Comment on the likely effectiveness of management that has been proposed and whether additional management measures need to be identified
- Have your comments recorded and submitted with the Final SEMP to the regulatory authorities which will assist them in making the environmental authorisation decision

This technical summary has been made available in English. A non-technical summary is available in English, Sotho and Zulu.

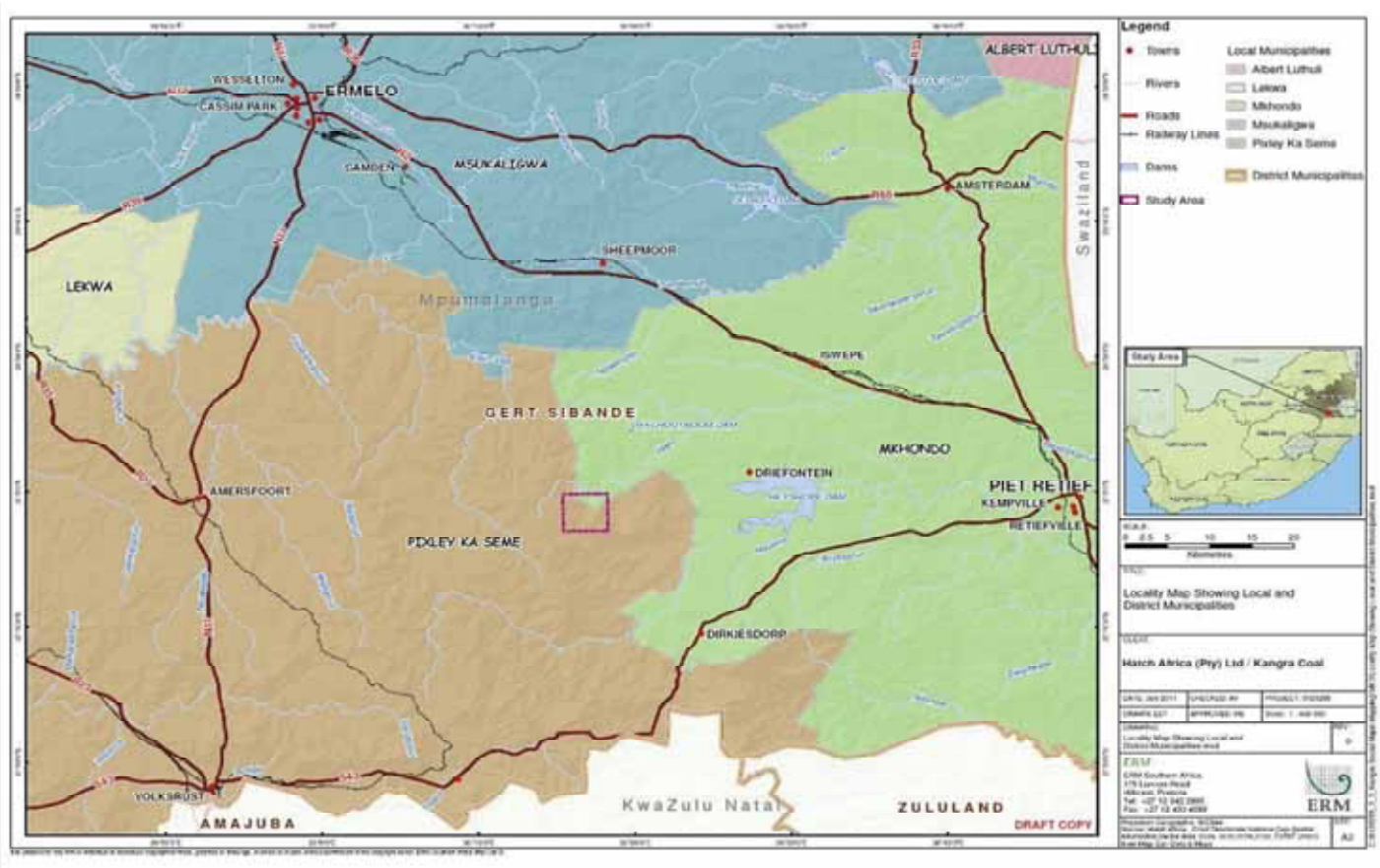
1.1 BACKGROUND

Kangra Coal (Pty) Ltd. (Kangra Coal) currently operates the Savmore Colliery on their Maquasa East, Maquasa West and Maquasa West Extension mining licenses, located in the Gert Sibande District Municipality and Mkhondo and Dr. Pixley Ka Isaka Seme Local Municipalities, Mpumalanga. The Savmore Colliery is located approximately 51km west-south-west of Piet Retief and 64km south east of Ermelo.

Current mining operations have sufficient reserves for approximately the next 3 to 4 years. As such, Kangra Coal proposes to expand their existing mining operations on these existing mining licenses to include the addition of eight new opencast pits, two new underground mining areas and the provision of an expanded or new discard dump(s).

In addition to this, Kangra Coal propose to develop the Kusipongo coal resource (the proposed Project), situated to the west of existing operations (*Figure 1.1*). The establishment of these proposed Projects would extend the life of mine for approximately an additional 10 to 20 years, thus ensuring the continued provision of coal to both local and international markets.

Figure 1.1 Location of the proposed Kusipongo Project



Kangra Coal has two separate environmental authorisation processes currently underway in its concession area, of which the details are provided below:

Environmental Authorisation for the Proposed Kusipongo Resource Expansion Project

Responsible Environmental Assessment Practitioner
Environmental Resources Management Southern Africa (Pty) Ltd. (ERM)

Proposed project description:
- *Details provided in Section 2 below.*

Environmental Authorisation for the Proposed Expansion of Mining Operations at Maquasa

Responsible Environmental Assessment Practitioner
Groundwater Consulting Services (GCS)

***Proposed project description** includes:*
- *Eight (8) opencast pits*
- *Two (2) underground mining areas*
- *Expansion of existing discard dump*

***PLEASE NOTE:** this Technical Summary (NTS) only applies to the Kusipongo Resource Expansion Project Environmental and Social Impact Assessment (ESIA) undertaken by ERM.*

1.2 THE PROPOSED KUSIPONGO RESOURCE EXPANSION PROJECT

The proposed Project is situated to the west of existing operations (*Figure 1.2).*

The proposed Project will be restricted to underground mining; however, surface infrastructure to support this underground expansion will include:

- An adit (entrance to the underground mine which is inclined and through which people, equipment and coal will pass), (referred to as Adit A);

- Associated adit infrastructure (offices, workshops, stores, change house, crushing circuit, silos, etc.);
- A ventilation shaft, (referred to as Adit B);
- A conveyor belt of approximately 7km in length, to transport coal from the underground operations to the existing Maquasa West adit and conveyor system, which will transport the coal to the existing plant facilities at the Savmore Colliery; and

- A temporary construction camp (to provide accommodation for semi-skilled and skilled/artisanal and supervisory workers) during the construction phase of the Project, provisionally located 6km away (towards the east) from the proposed site for the main mine adit A along the extension of the D2548.

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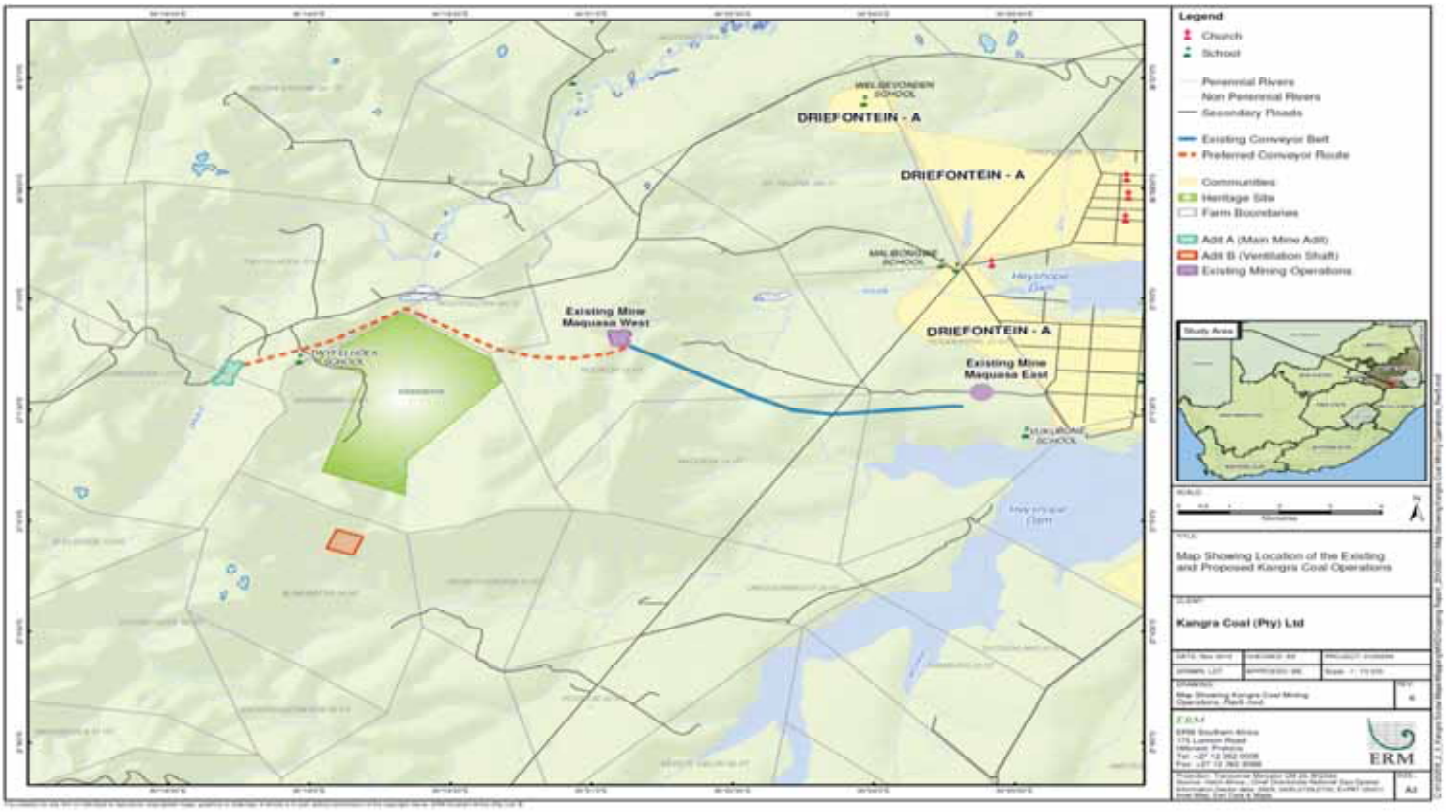
Figure 1.2 Location of the proposed infrastructure for the Kusipongo Project



The management of coal discard is a fundamental part of the proposed Project. All discard produced by the proposed Project will be handled at the existing Maquasa Plant and associated discard facility, and is thus included under the scope of the proposed Maquasa expansion project.

1.3 PROJECT MOTIVATION

Coal plays a crucial role in the provincial economy of Mpumalanga and contributes approximately 18.4% to the Gross Domestic Product (GDP) of the Gert Sibande District Municipality. The District Municipality, in its Integrated Development Plan (2009-2010), has noted that in order to enhance local economic development, the agricultural, mining, manufacturing and tourism sectors should be promoted and supported.

Both the Mkhondo Local Municipality IDP (2010/2011) and the Dr. Pixley Kalsaka Seme Local Municipality IDP (2009 – 2012), recognise the importance of mining as a key economic sector within these two local municipalities.

It is anticipated that the current Kangra Mining operation has a remaining life of 3-4 years. Should the Kusipongo Project not proceed, the existing mine will close with resultant job losses and decreased economic benefit to the project area.

1.4 PROJECT ALTERNATIVES

Significant work has been previously undertaken with reference to the consideration of project alternatives. Specifically with reference to location alternatives for surface infrastructure:

- Various alternatives for the proposed Project have been investigated by Hatch, the project engineering company; and

- A Site Screening Assessment was undertaken by ERM based on ecological, hydrogeological, social and heritage sensitivities.

It has been concluded that relative to other areas assessed, the current area (Site A) is the preferred site for the main mine adit development

Geological discontinuities and stability concerns, as well as the requirement for overburden depth of greater than 20metres, were limitations that determined the location for the main mine portal within the area of Site A. Further refinements to the main mine adit, are however possible, to avoid, in particular valley bottom wetlands and the floodlines of the Ohlelo River.

Such refinements to the current adit layout will however result in a change in the siting and technical design specifications of the waste rock dump as it is currently presented in the SEMP. Further consideration of environmental

impacts and management will be necessary should the design be further modified.

Such refinements to the current adit layout will however result in a change in the siting and technical design specifications of the waste rock dump and the sites emergency evaporation pond as it is currently presented in the Social and Environmental Management Programme (SEMP). Further consideration of environmental impacts and management will be necessary should the design be further modified.

It must be noted that refinements to the waste rock dump will however result in a change in the siting and technical design specifications of the dump to what is currently presented in the SEMP, and thus the requirements in Section 73 of the MPRDA will not be met. As such, a request will be made to the Regional DMR to ask the Minister to exercise her discretion in terms of Section 39(5) of the MPRDA to call for additional information to close-out this gap. Following confirmation of this, ERM will amend the SEMP to include revised technical details pertaining to the new siting of the waste rock dump.

1.5 TERMS OF REFERENCE FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Before the proposed Kusipongo Resource Expansion Project can go ahead an Environmental Social Impact Assessment (ESIA) needs to be undertaken to meet South African legislative requirements. The legislation listed in *Box 1* is applicable to the ESIA:

Box 1.1 Applicable Legislation

- **Environmental Authorisation** from the Mpumalanga Department of Economic Development, Tourism and Environment (DEDET) *National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended by Act No 62 of 2008; and its regulations GN 543, 544 and 545*
- **Water Use License(s)** from the National Department of Water Affairs (DWA) in terms of the *National Water Act (Act No. 36 of 1998) (NWA)*
- **Mining Right Application** from the National Department of Mineral Resources (DMR) in terms of Section 22 (4a) and Section 39 of the *Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)*
- **Waste Management License** from the National Department of Environmental Affairs (DEA) in terms of the *National Environmental Management: Waste Act (No. 59 of 2008) (NEMWA) and regulations GN718*

Environmental Resources Management Southern Africa (Pty) Ltd. (ERM) has been appointed by Kangra Coal to undertake the function of independent Environmental Assessment Practitioner (EAP) to undertake an Environmental and Social Impact Assessment (ESIA) for the proposed Project, and to facilitate the Mining Rights Application, Waste Management Activity License

Application, Environmental Authorisation Application and Water Use License Application (WULA) processes in accordance with the above listed legislation.

1.6 PURPOSE OF THE SEMP

The purpose of the Social and Environmental Management Programme (SEMP) (1) is to present the following, which is summarised in this technical summary:

- A description of the proposed Project and relevant Project alternatives;
- A list of applicable legislation, guidelines and strategies relevant to the project;
- A description of the physical, biological and socio-economic characteristics of the Study Area;
- Information about the ESIA and public participation process (PPP) that has been followed to date;
- A list of issues, concerns and questions raised through the PPP;
- An assessment of anticipated and cumulative impacts on the Study Area for all phases (construction, operational and decommissioning and closure) of the proposed Project;
- Mitigation measures that aim to avoid /minimise/manage the severity of identified impacts or in the case of positive impacts, enhance the benefits associated with the Project.

1.7 PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) has included the following key stages of I&AP involvement:

- **Pre-Scoping Phase**: which introduced the proposed Project and its processes to key I&APs, sought to identify I&APs and develop a strategy for the involvement of all I&APs.
- **Scoping Phase**: which notified all I&APs of the Project, requested

(1) The use of the title "Social and Environmental Management Programme" as opposed to "Environmental Management Programme" (as defined in Section 39 of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)). The purpose of this is to emphasise that the process will not only assess environmental impacts but will also assess potential socio-economic impacts of the proposed Project.

registration and identified and verified issues of concern with regards to the Project. This phase of the Project culminated in the definition of a Terms of Reference for technical investigations and the assessment phase of the Project.

- **Impact Assessment Phase**: this is the current phase that the Project is in, and allows I&APs to provide informed comment on the findings of the specialist assessments and proposed mitigation measures. Engagement is proposed with stakeholders during this phase through the following means:

    - Focus group discussions with I&APs;
    - Availability of the Draft SEMP for public comment. The Draft SEMP is available on ERM's website (www.erm.com/kangra) and has been made available at the following venues

        - Volksrust Public Library
        - Volksrust Post Office
        - Wakkerstroom Library
        - Piet Retief Post Office
        - Piet Retief Library
        - Driefontein Post Office
        - Daggakraal Clinic
        - Dirkiesdorp Clinic

    Following the closure of the comment's period on the Draft SEMP (14 August 2013), the report will be finalised and re-released for public comment before submission to the authorities to inform the environmental authorisation decision.

- **Decision-Making Phase**: When the lead authorities have made a decision stating whether or not the proposed Project may proceed, ERM will inform I&APs of the authorisation decision.

The ESIA Process and associated dates are included in *Figure 2* below.

Figure 1.3 ESIA Process

Stakeholders identified through the PPP

The following stakeholders have been identified through the PPP to date. This list is subject to change as stakeholders participate and are involved in further engagements:

- **Government**: Authorising and commenting authorities from relevant National, Provincial, District and Local Departments as well as relevant Ward Councillors and elected political representatives. Specifically these have included:
  - Dr Pixley Ka Isaka Seme Local Municipality;
  - Mkhondo Local Municipality;
  - Gert Sibande District Municipality;
  - Mpumalanga Tourism and Parks Agency;
  - Mpumalanga Department of Economic Development, Tourism and Environment;
  - Mpumalanga Department of Co-operative Governance and Traditional Affairs;
  - Mpumalanga Department of Human Settlements;
  - Mpumalanga Department of Public Works, Roads and Transport;
  - Mpumalanga Department of Agriculture, Rural Development and Land Administration;