



## **Economic Impact Assessment and Sustainable Land Use Assessment for the proposed Commissiekraal Coal Mine**

prepared for SLR Consulting (Africa) (Pty) Ltd in support of the environmental  
impact assessment and the environmental management programme for the  
proposed mining development for

**Tholie Logistics (Pty) Ltd**

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**Tholie Logistics (Pty) Ltd -**  
**Economic Impact Assessment and Sustainable Land Use**  
**Assessment for the proposed Commissiekraal Coal Mine**

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# THOLIE LOGISTICS (PTY) LTD - ECONOMIC IMPACT ASSESSMENT AND SUSTAINABLE LAND USE ASSESSMENT FOR THE PROPOSED COMMISSIEKRAAL COAL MINE

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## ACRONYMS AND ABBREVIATIONS

Below a list of acronyms, abbreviations and definitions used in this report.

ACRONYMS / ABBREVIATIONS	DEFINITION
ADM	Amajumba District Municipality
DME	Department of Minerals and Energy (now DMR)
DMR	Department of Mineral Resources
EIA	Environmental impact assessment
EMP	Environmental management plan
ELM	eMadlangeni Local Municipality
GDP	Gross Domestic Product is defined by the Organisation for Economic Co-operation and Development (OECD) as an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs).
IDP	Integrated Development Plan
IRR	Internal Rate Of Return is the discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project.
LED	Local economic development
Mercury	Mercury Financial Consultants (Pty) Ltd
MPRDA	Mineral and Petroleum Resources Development Act, Act 28 of 2002
NPV	Net present value is difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyse the profitability of an investment or project.
PV	Present value
SLP	Social and labour plan
SLR	SLR Consulting (Africa) (Pty) Ltd

# **THOLIE LOGISTICS (PTY) LTD - ECONOMIC IMPACT ASSESSMENT AND SUSTAINABLE LAND USE ASSESSMENT FOR THE PROPOSED COMMISSIEKRAAL COAL MINE**

## **1 INTRODUCTION**

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants, has been appointed by Tholie Logistics (Pty) Ltd (Tholie Logistics) to undertake the environmental impact assessment and compile the environmental management programme for the proposed development of the Commissiekraal Coal Mine. SLR has appointed Mercury Financial Consultants (Pty) Ltd (Mercury) to undertake the Economic Impact Assessment and Sustainable Land Use Analysis for the proposed project.

Tholie Logistics is proposing to establish a new underground coal mine and related surface infrastructure on the farm Commissiekraal 90HT, which is located the eMadlangeni Local Municipality and Amajumba District Municipality in KwaZulu Natal approximately 28km north of Utrecht.

## **2 OBJECTIVE OF THIS REPORT**

Section 39 of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA) requires a mining right applicant to undertake an environmental impact assessment (EIA) and submit an environmental management plan (EMP). Section 39 (3) (a) –(c), together with Regulation 50 requires the establishment of baseline information concerning the affected environment and an investigation, assessment and evaluation of the impact of the proposed mining operation on the environment, socio-economic conditions and on heritage resources.

The objectives of this specialist investigation was to determine the following in support of undertaking the EIA and the compilation of the EMP as outlined in Regulation 50 of the MPRDA:

- quantify the impact on the socio-economic conditions of directly affected persons by determining the potential impact, in financial terms, of the loss in property value or infrastructure assets and determining the economic loss, in terms of net present value, of commercial, economic or as a result of the proposed mining activity (Regulation 50 (c)); and
- undertake a comparative assessment of the identified land use and development alternatives and their potential on the environment, social and cultural impacts in view of generally accepted sustainable development principles which considers the costs and benefits of social, environmental and economic factors (Regulation 50 (d)).

### **3 BACKGROUND INFORMATION**

#### **3.1 PROJECT OVERVIEW**

Tholie Logistics, a junior South African coal exploration and mining company, is proposing to establish a new underground coal mine and related surface infrastructure to support a mining operation on the farm Commissiekraal 90HT.

Tholie Logistics, originally formed by Mrs Tholie Cibane to apply for and develop coal prospecting rights in northern KwaZulu-Natal, entered into a strategic partnership agreement whereby financial and technical partners were introduced to the company during the years 2008 to 2010. During 2012 additional assets were presented to append a neighbouring prospecting right, thereby consolidating the prospecting area. Tholie Logistics is a sole operating entity (SLR, 2015).

##### 3.1.1 Project location

Tholie Logistics holds the prospecting right (No. KZN 30/5/1/1/2/155PR) for coal over the farm Commissiekraal 90HT in addition to other farms (Donkerhoek, Klipplaat, Strydfontein, Libanon, Holbank, Brakfontein/Mooiplaats, Arrarat, Lusthof, Vredehof) south of the Mpumalanga / KwaZulu-Natal border. The farm Commissiekraal, which covers an area of approximately 2 461 ha, is located in the eMadlangeni Local Municipality and the Amajuba District Municipality, KwaZulu-Natal approximately 28 km north of Utrecht.

The project site is located in a region that is rich in heritage and biodiversity and is seen as a key water production area for downstream water users. The natural setting adds to a strong sense of place and a high to moderate scenic quality.

### 3.1.2 Brief project description

Based on the exploration work conducted on the farm Commissiekraal 90 HT, Tholie Logistics found a feasible ore body that is worth developing. Tholie Logistics will produce Eskom and export quality coal to suit market demand. The anticipated market prices in the medium and long-term are considered to be favourable for project development.

The main aim of the project is to establish an underground coal mine at the Commissiekraal project site. The project will comprise the following:

- underground mining accessed via a box cut;
- on-site crushing and screening;
- temporary stockpiling of coal ore;
- support infrastructure and services; and
- transport off-site by truck to customers directly or via a regional railway siding.

The anticipated production rate will be 1 000 000 tonnes per annum. The total footprint of the surface infrastructure is estimated at this stage to be approximately 20 hectares (ha). The project is expected to create approximately 25 unskilled, 89 semi-skilled and 46 skilled employment opportunities during the construction phase. The operational phase will create 53 skilled, 102 semi skilled and 46 unskilled opportunities. An initial capital investment of R428 million is envisaged and the proposed development is expected to generate an annual turnover of between R300 million and R400 million.

### 3.1.3 Project schedule

The life of mine on current planning is scheduled for 20 years. Construction could commence in 2016 and will take six months to complete after which another 6 months will be utilised to ramp up production. This report covers a twenty year life of mine period.



### 3.2 IDENTIFIED CURRENT LAND USES

The main current land use on Commissiekraal is agriculture, primarily livestock grazing with minor dry land crops and residential (private farmstead and communal tenant/farm worker homesteads) areas. Remnants of forestry/small scale plantation occur within the central region of the project area. The local homesteads have small crop fields in close proximity and also engage in cattle and small-scale livestock farming.

Surrounding land uses are similar to those occurring on site with the addition of conservation in the form of conservancies and protected areas, recreational/tourism facilities/areas associated with nearby towns and game farms, and community activities including schools. Further afield there are other coal mining operations that have been decommissioned and/or closed.

Recreational facilities associated with the towns of Utrecht, Wakkerstroom and Paulpietersburg include public recreational centres, bird watching activities as well as golf and trout fishing clubs. Various tourism resources in the area include the Balele Conservancy, the Wakkerstroom Wetlands and the Battlefields historical area.

Several schools occur within the greater area and along possible transport routes. There are children pedestrian movements associated with trips to these schools, from residential areas which are remote and spread throughout the area. There is no pedestrian provision on any of the roads within the study area, and observations by the traffic specialist show that pedestrians often walk in the road. Mining operations within a 30km radius of the project site include:

- the decommissioned Welgedacht Colliery (Utrecht and Umgala Sections), previously operated by Kangra Coal Properties Ltd – an investee company of the Shanduka Group
- the closed Geluk Mine (previously operated by Mashala Resources which has been acquired by Continental Coal Limited); and
- the closed Kemps Lust Mine (Xstrata Plc).

There is a network of gravel farm roads providing access to the project area. The Commissiekraal farm is currently accessed via a gravel track of varying width (no greater than 4 m wide) off the D699 district road. The farm access track/D699 intersection is laid out for the purposes of agricultural vehicles and other associated traffic. The D699 is a gravel road of varying width but is generally between 6 and 7m wide and provides a link west towards Wakkerstroom, south towards Utrecht and east towards Paulpietersburg.

Surface rights on the farm Commissiekraal and along the proposed access routes are held by private individuals and companies and is outlined in the table below (Table 1).

**TABLE 1: RELEVANT PROPERTIES AND SURFACE OWNERS (SLR, 2015)**

PROPERTY DESCRIPTION	TITLE DEED	SURFACE OWNER	NOTE IN RELATION TO PROJECT
<b>Commissiekraal 90 HT</b>			
Portion 1	T8381/1995	Clement Lens	Alternative access route B, surface infrastructure
Portion 2	T32028/1988	Van Vos Lens Prop Developers CC	Underground mining
Portion 3 & 8	T18429/1981	Nicolaas Lens (deceased) C/o Christine Meyer	Underground mining
Portion 4	T8381/1995	Clement Lens	Underground mining
Portions 5 & 7	T19209/1981	Clement Lens	Underground mining
Portion 6	T19209/1981	Clement Lens	Alternative access route B, alternative access route A, surface infrastructure, underground
<b>Vredehof 17HT</b>			
Portion 1	T13546/1978	Nortje Cecilia Johanna Myra (Beneficiaries: Memory Dawn Joss, Elvira Marcelle Slotow, Roy Bredenkamp, Melodie Anne Delaportas, EJ van Rooyen, N Westenberg, AJ Wessels, JW Wessels, MJ Wessels)	Alternative access route B
<b>Rooipoort 97HT</b>			
Portion 3	T28407/2012	Michelle Landman	Alternative access route A
Portion 9	T9269/1996	Nicolaas Lens (deceased) C/o Christine Meyer	Alternative access route A
<b>Farm 17072HT</b>			
Portion 2	T3145/1961	Snijders Lorraine Albre	Alternative access route A
Portion 3	T3145/1961		Alternative access route A

It should be noted that access route alternative A will no longer be considered. Two landowners along alternative access route A have objected to the access road crossing their property and therefore this access route will no longer be considered for the project.

The landowners are the lawful occupiers of the land. It should be noted that there are several land tenant settlements on the farm Commissiekraal 90 HT. Social scan results and community workers' records indicate approximately 26 households on the farm Commissiekraal 90 HT with an estimated population of around 197 people (SLR, 2015). It is envisaged that two families will be relocated.

### 3.3 POTENTIAL FUTURE LAND USES

The following alternative land-uses may be considered for the farm Commissiekraal:

- conservation, bearing in mind that the surrounding farms have been earmarked for conservation;
- forestry, as remnants of forestry have been identified; and
- agricultural, in line with current activities which is primarily livestock grazing with minor dry land crops.

### 3.4 PROVINCIAL, REGIONAL AND LOCAL SOCIO-ECONOMIC PROFILE

Amajuba District Municipality is located in the north-western corner of KwaZulu-Natal and comprises three local municipalities: Newcastle, eMadlangeni and Dannhauser. The main transportation routes linking the district to its surrounds are the N11, which is the alternative route to Johannesburg from Durban, and the rail line, which is the main line from the Durban harbour to Gauteng. The R34 also bisects the district in an east-west direction and provides a linkage from the port city of Richards Bay to the interior.

A summary of the socio-economic profile of KwaZulu Natal, eMadlangeni Local Municipality and Amajumba District Municipality is provided in Table 2.

**TABLE 2: SUMMARY OF THE PROVINCIAL AND LOCAL SOCIO-ECONOMIC PROFILE**

INDIACTOR	PROVINCIAL LEVEL – KWAZULU NATAL	LOCAL LEVEL – AMAJUBA DISTRICT MUNICIPALITY (ADM)	LOCAL LEVEL – EMADLANGENI LOCAL MUNICIPALITY (ELM)
Population	10 819 128 million <sup>4)</sup>	499 839 million and 110 963 households <sup>1)</sup> Average household size: 4.4. <sup>1)</sup>	34 442 million and 6 252 households <sup>1)</sup> Average household size: 5.3. <sup>1)</sup>
Economic activity	In 2010 manufacturing contributed 20% to the province's economy, followed by financial services (17.6%); Wholesale (12.9%); Transport (12.2%); and Government services (11.4%) <sup>5)</sup> .  Province contributed 16.7% to national GDP. <sup>5)</sup>	In 2011 manufacturing contributed 35% to the district's economy, followed by community services (22%), financial and business services (15.2%) and trade (8.6%) sectors. <sup>2)</sup>  GDP in 2011: R12.33billion. <sup>2)</sup>	Employment sections dominated by Community, social and personal service; Wholesale and Retail Trade; Manufacturing; Transport and storage; Agriculture; Finance and insurance and Construction <sup>1)</sup>  11.3% of the households have no income. <sup>1)</sup>
Unemployment	33.0% <sup>7)</sup>	16.6% <sup>1)</sup> 17.3% of the households have no income. <sup>1)</sup>	17% <sup>3)</sup>

INDIACTOR	PROVINCIAL LEVEL – KWAZULU NATAL	LOCAL LEVEL – AMAJUBA DISTRICT MUNICIPALITY (ADM)	LOCAL LEVEL – EMADLANGENI LOCAL MUNICIPALITY (ELM)
Employment sectors	KwaZulu-Natal is South Africa's second largest economy, contributing on average, 16.0% (2013) to the country's GDP. In 2010, the leading employment sectors were: Wholesale (22.4%), Community Services (18.7%); Financial Services (18% and Manufacturing (16.2%) <sup>5)</sup>	In 2012, the leading employment sectors were: Manufacturing (35%), Community Service (22.2%), Financial (15.2%) and Trade (8.6%) <sup>2)</sup>	Employment sections dominated by Community, social and personal service; Wholesale and Retail Trade; Manufacturing; Transport and storage; Agriculture; Finance and insurance and Construction <sup>1)</sup>
Education	74% of the population has some form of education; 9.1% of adult population obtained a tertiary qualification; 31.2% of the adult population passed matric and 10.8% of the adult population have had no schooling <sup>7)</sup>	5.7% of adult population obtained a higher education; 20.8% of the adult population passed matric and 5.8% of the adult population have had no schooling <sup>4)</sup>	2.9% of adult population obtained a higher education; 13% of the adult population passed matric and 14.3% of the adult population have had no schooling <sup>3)</sup>
Basic Services	86.0 % of households have access to piped either inside yards or some distance away; 77.9% have access to electricity for lighting purposes; 6.3% of households have no access to sanitation. <sup>7)</sup>	92.3 % of households have access to piped either inside yards or some distance away; 83.8% have access to electricity for lighting purposes; 3.5% of households have no access to sanitation. <sup>1)</sup>	58.7 % of households have access to piped either inside yards or some distance away; 48.5% have access to electricity for lighting purposes; 15.3% of households have no access to sanitation. <sup>1)</sup>
Housing	71.6% of households reside in formal and 19% in traditional dwellings <sup>7)</sup>	87.7% of households reside in formal and 7% in traditional dwellings. <sup>1)</sup>	58.2% of households reside in formal and 38.5% in traditional dwellings. <sup>1)</sup>

Notes: 1) Stats SA 2011 (ADM IDP(2014/5)); 2) Global Insights database (ADM IDP(2014/5)); 3) Stats SA 2011 (ELM IDP (2014/15)); 4.) Stats SA, 2012 ([www.statssa.co.za](http://www.statssa.co.za)); 5.) Development Bank of South Africa ([www.dbsa.org](http://www.dbsa.org)); 6.) ELM LED – June 2012; 7) Stats SA 2011 (Census 2011 Municipal report -KwaZulu-Natal)

In comparison to other municipalities within the Amajuba District, the eMadlangeni Local Municipality, consist of vast a vast rural area, which presents the following challenges:

- scattered settlements;
- poor access to infrastructure and basic services;
- aged infrastructure; and
- high levels of unemployment and poverty.

In addition to the challenges listed above, the entire district faces challenges associated with the lack of capacity, skills and budget to efficiently implement strategic and local economic development plans.

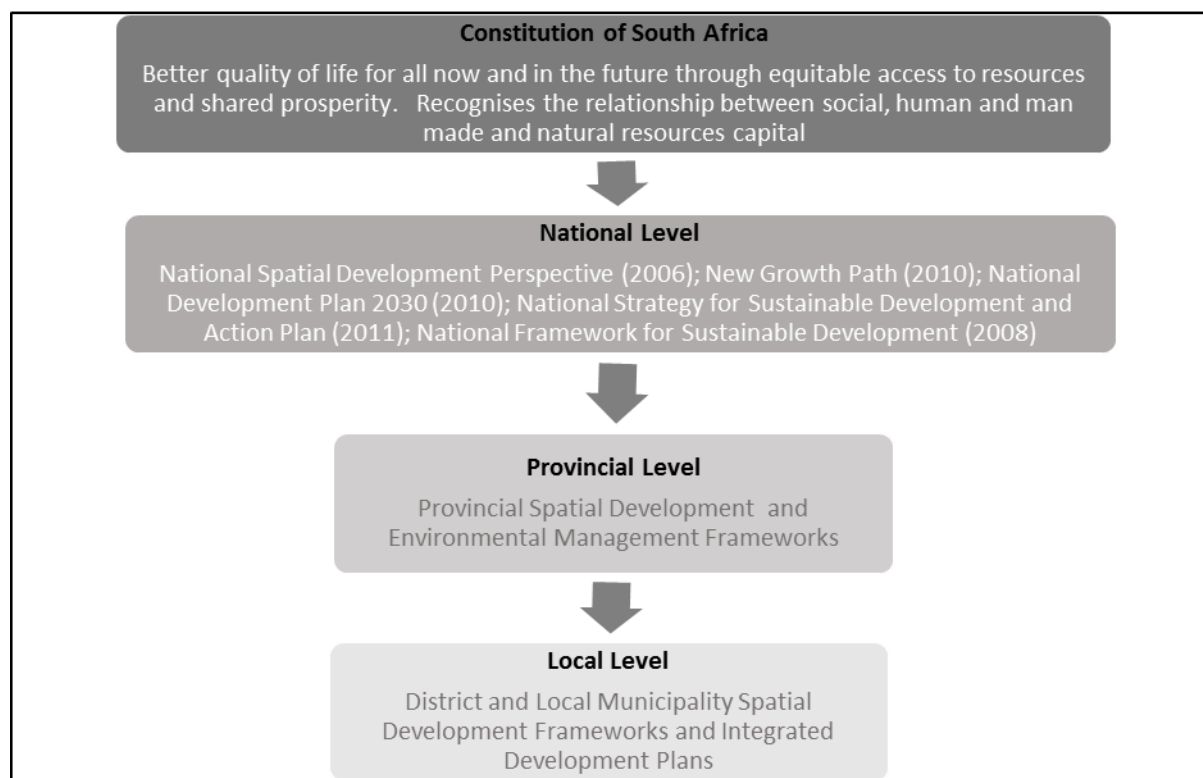
Some of these aspects may present Tholie Logistics with opportunities to contribute towards socio-economic development in the region, especially within the eMadlangeni Local Municipality. These opportunities should typically be addressed in consultation with the relevant authorities as part of the mine's Social and Labour Plan (SLP).

#### **4 NATIONAL, PROVINCIAL AND LOCAL CONSIDERATIONS**

South Africa faces the challenge of simultaneously meeting the following two imperatives:

- developing the economy to meet the needs of all South Africans; and
- ensuring that the productivity and viability of the underlying ecosystems and ecosystem services are maintained at healthy levels over time.

Essentially, these imperatives are embedded in the concept of sustainable development, which is commonly defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Several national, provincial and local policies, strategies and plans have been developed in view of sustainable development in South Africa, of which the most pertinent ones are outlined in Figure 1 and discussed in the sections below.



**FIGURE 1: NATIONAL, PROVINCIAL AND LOCAL CONSIDERATIONS**

#### **4.1 NATIONAL POLICIES AND STRATEGIES**

The Constitution guarantees South African citizens a better quality of life for all now and in the future through equitable access to resources and shared prosperity and recognises the relationship between social, human and man-made and natural resources capital.

##### **4.1.1 National Strategy for Sustainable Development and Action Plan (2011)**

The Strategy for Sustainable Development and Action Plan (NSSD1) is a proactive strategy that regards sustainable development as a long-term commitment, which combines environmental protection, social equity and economic efficiency with the vision and values of the country. It is a milestone in an ongoing process of developing support, and initiating and up-scaling actions to achieve sustainable development in South Africa (DEA, 2011) and has outlined the following strategic objectives:

- enhance systems for integrated planning and implementation;
- sustain ecosystems and use natural resources efficiently;
- move towards a green economy;
- build sustainable communities; and

- respond effectively to climate change.

#### 4.1.2 National Development Plan 2030 (2010)

The national Development Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality by 2030. The core elements of a decent standard of living identified in the plan are:

- housing, water, electricity and sanitation;
- safe and reliable public transport;
- quality education and skills development;
- safety and security;
- quality health care;
- social protection;
- employment;
- recreation and leisure;
- clean environment; and
- adequate nutrition.

#### 4.1.3 New Growth Path (2010)

South Africa has embarked on a new economic growth path in a bid to create 5million jobs and reduce unemployment from 25% to 15% over ten (10) years. The plan aims to address unemployment, inequality and poverty by unlocking employment opportunities in South Africa's private sector and identifies five priority areas (green energy, agriculture, mining, manufacturing and tourism) as part of the programme to create jobs

#### 4.1.4 National Framework for Sustainable Development (2008)

The purpose of the National Framework on Sustainable Development is to enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.

The national framework for sustainable development seeks to build on existing programmes and strategies that have emerged in the first 14 years of democracy. It aims to identify key, short, medium and long-term challenges in our sustainable development efforts, sets the framework for a common understanding and vision of sustainable development; and defines strategic focus areas for intervention (DEAT, 2008).

#### 4.1.5 National Spatial Development Perspective (2006)

The NSDP 2006 provides a framework for a focused intervention by the State in equitable and sustainable development. It represents a key instrument in the State's drive towards ensuring greater economic growth, buoyant and sustained job creation and the eradication of poverty. It provides:

- a set of principles and mechanisms for guiding infrastructure investment and development decisions;
- a description of the spatial manifestations of the main social, economic and environmental trends that should form the basis for a shared understanding of the national space economy; and
- an interpretation of the spatial realities and the implications for government intervention.

## **4.2 MINING LEGISLATION**

Mining development in the past has characteristically been synonymous with a disregard for its social impacts and affected communities. In many instances, mining companies have invested huge amounts of capital for mining development and openly stated that they are contributing to socio-economic development at a grass roots level in mine-affected communities. In reality, however, communities in the developing world have usually been completely bypassed by any development benefits from the project and are often left in a marginalised state, in which they are far worse off than before the mine opened.

Recent legislation in South Africa, such as the Broad Based Socio-Economic Empowerment Charter (BBSEEC) for the Mining Industry and the Mineral and Petroleum Resources Development Act (MPRDA) have confirmed the requirement for mining companies to assess the social impacts of their activities from start to closure, and beyond. Unless a mining operation has considered the social impact and documented it, the Department of Minerals and Energy (DME) will not issue a mining right to the applicant (MPRDA Regulations, 2002). Mining companies also have to compile and



implement a Social and Labour Plan (SLP) to promote socio-economic development in their affected communities and to prevent or reduce negative social impacts.

### **4.3 CONCLUSION**

Therefore, although the growth of the South African economy is of strategic importance, consideration should be given to social and natural resources considering proposed developments. In view of the concept of sustainability the proposed project will have to contribute towards achieving sustainable development whilst contributing towards achieving these higher level objectives.

## **5 QUANTIFICATION OF ECONOMIC IMPACT**

This section focusses on the quantification of the impact on the socio-economic conditions of directly affected persons. This will be undertaken by determining the potential impact on of the loss in property value as well as the economic loss/gain, in terms of net present value as a result of the proposed mining activity as outlined in Regulation 50 of the MPRDA, (Regulation 50 (c)).

There are various direct and indirect factors which may impact on the macro and micro economic environment as a result of the current land use as well as proposed development activities. The extent to which these factors are influenced will depend on the nature and scale of current and proposed land use activities. It is therefore important to understand and assess the economic footprint of the proposed development in comparison to the alternative land use. Factors which need to be considered during an economic assessment include a range economic, social and environmental indicators which are broadly illustrated in Figure 2. These factors may have a potential impact or influence on a local, regional, provincial or national levels during the various phases of the project life cycle.

It is however not possible to assign an economic value to all of these aspects, in particular external factors. External factors or externalities refer to the impact (positive or negative) of economic activity associated with the proposed development that are not incurred directly by those participating in the activity, but are instead borne by society and/or future generations (Nahman et al, 2009).

Typical external factors (externalities) associated with mining developments, will include social aspects such as additional pressures on infrastructure (housing, road network) and basic services (education, health care, transport, security, municipal services) due to an influx people; increase in social ills (crime, HIV/AIDS); health related impacts as a result of environmental pollution; and the general degradation of an area. External environmental factors include pollution; cost of environmental management and rehabilitation; increase in water demand; and the change in post closure land use potential.

The potential social and environmental impacts which may result from the proposed development were investigated and assessed by various specialists as part of the environmental impact assessment process. Although it will not be possible to assign an economic loss or gain to these social and environmental aspects, these impacts was evaluated as part of the sustainability analysis in Section 7.

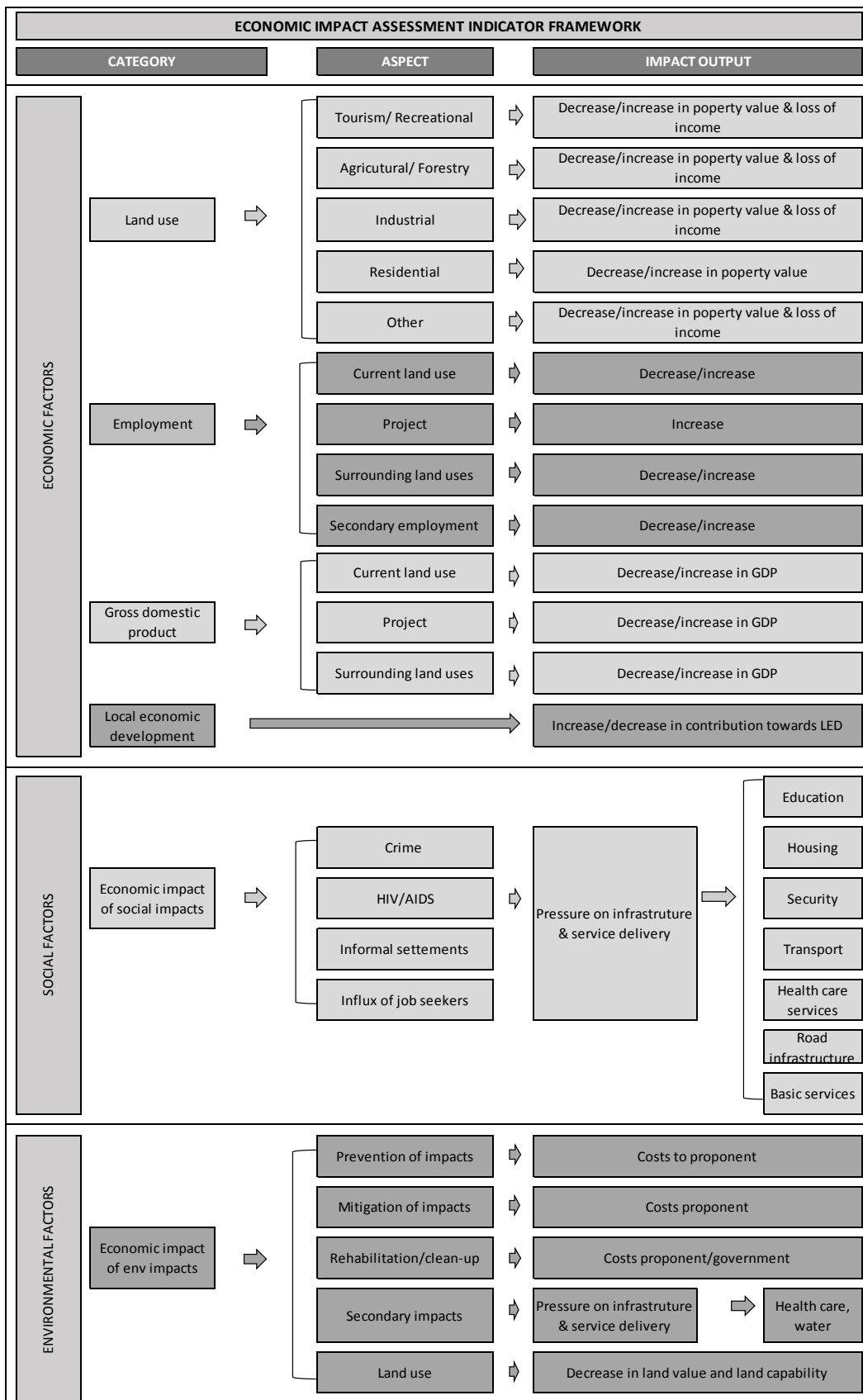


FIGURE 2: ECONOMIC IMPACT FRAMEWORK

The following quantitative economic factors were assessed for current land uses as well as the various project phases of the proposed development as illustrated in Figure 3.

- land value, employment and economic contribution from current land uses and potential future alternative land-use;
- land value, employment, economic contribution, including socio-economic development, and future land use as a result of the proposed development; and
- comparative economic analysis for all project phases.

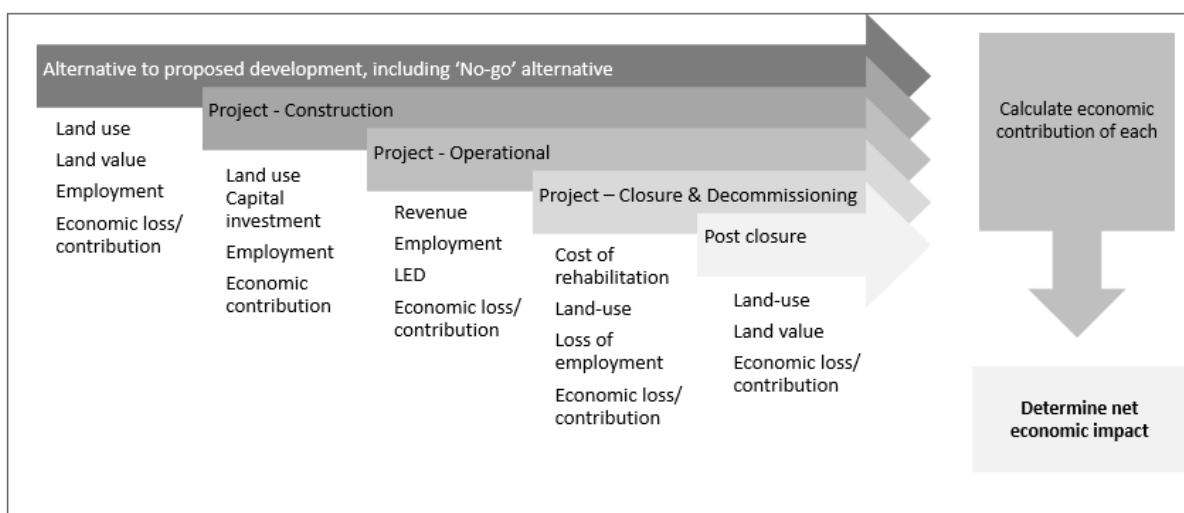


FIGURE 3: APPROACH TO QUANTITATIVE ECONOMIC ASSESSMENT

## 5.1 CURRENT LAND USE CONTRIBUTION

As indicated in Section 3.2, the predominant current land use on the farm Commissiekraal comprises agriculture, primarily livestock grazing with minor dry land crops and residential (private farmstead and communal tenant/farm worker homesteads) areas. The local homesteads have small crop fields in close proximity and also engage in cattle and small-scale livestock farming.

Neighbouring land uses are similar to those occurring on site with the addition of conservation in the form of conservancies and protected areas.

For the purposes of this report, the assessment of the impact on current land uses was undertaken for each of the following two project components:

- mining project footprint on the farm Commissiekraal 90 HT; and
- road transportation of coal from the mine to the customer or rail siding.

Social scan results and community workers' records indicate approximately 26 households on the farm Commissiekraal 90 HT. It is envisaged that most likely only two families will be relocated. It was assumed for the purposes of this study that the relocation and associated compensation will be in line with internationally accepted relocation standards and that no financial or economic loss will be experienced by these individuals and therefore for relocation, no economic loss has been assigned to these households. It was furthermore assumed that the remaining households will be able to maintain their current standard of living without being impacted upon by the mine.

#### 5.1.1 Assessment of current land use: land value

##### Mining project footprint

The total footprint of disturbance on the farm Commissiekraal or the surface infrastructure is estimated at approximately 20 hectares (ha). Normally Mercury would apply a 500m radius to determine the impact on land use value. However, in this instance a conservative approach was taken and it was assumed that the entire Commissiekraal, which covers an area of 2 461 ha, would be impacted upon. The current land values for the mining footprint area were based on information obtained from the eMadlangeni Local Municipality land valuation roll for 2013-2017 (30 January 2013). The farm Commissiekraal was valued at R11.9 million, which equates to a rate of R4 857 per hectare. It should however be noted that this is the lowest possible valuation. It will however be possible that the owner of the land will be able to sell it at a much higher price.

##### Road transport activities

The extent of the road transport activities associated with the transportation of the mines coal from the mine to customers or a regional railway siding will cover 1 000 000 tonnes per annum. It is envisaged at this stage that coal will be transported by means of 34 tonne coal trucks directly to the buyers or to a regional railway siding. This equates to approximately 29400 return trips per annum, bearing in mind the empty truck has to return, this will actually equate to 58 800 trips past a single point.

Assuming a 24 day work month and daylight (12 hours/day) transport only, this will relate to approximately 200 trips on a daily basis or 17 trucks per hour of which half will carry a full load. This may impact on the property values of farms neighbouring the transport route, especially the farms along the access road to the D699 as well as along the D699 district road. The D699 is a gravel road

of varying width but is generally between 6 and 7m wide and provides a link west towards Wakkerstroom, south towards Utrecht and east towards Paulpietersburg.

It is however not possible to assess to which extent these properties will be impacted upon from a land value perspective. It should also be noted that the impact would be for the duration of the life of mine. The demand for farmland in these areas could potentially decrease as a result of the increased mine traffic, which will result in a potential decrease in property values.

#### 5.1.2 Assessment of current land use: employment

##### Mining project footprint (Commissiekraal)

The current land use on the farm Commissiekraal has the potential to generate in the order of 20 employment opportunities depending on the nature of the agricultural activity. This will equate to a present value over the life of mine of R6.1m based on a minimum wage of R2700 per month.

Small crop fields in close proximity to the homesteads as well as the small-scale livestock farming were not taken into consideration. These are maintained by individuals within families residing in the farm homesteads. It is assumed that these individuals will be compensated for their losses, if any.

##### Road transport activities - employment

The impact on current employment within the areas, which could potentially be impacted upon by the transport activities, especially the trucks transporting coal, could not be quantified. These employment opportunities may include the agricultural as well as tourism industries.

#### 5.1.3 Assessment of current land use: economic contribution

##### Mining project footprint (Commissiekraal)

For the purpose of this assessment, it was assumed the entire farm could be utilised for cattle farming and has a high grazing potential. Based on this assumption, the present value which could potentially be generated over the life of mine for commercial cattle is R14 million.

##### Road transport activities

It is assumed that the currently land use activities taking place will continue to take place. It is important to mention that damage to road infrastructure and the increase in traffic could possibly

have an impact on tourism activities. This impact will be confined to the roads earmarked for the transportation of coal. The economic impact of this can however, not be determined.

## **5.2 ASSESSMENT OF POTENTIAL ALTERNATIVE LAND USES: ECONOMIC CONTRIBUTION**

The obvious alternative future land-use on the farm Commissiekraal will be a continuance of current land use activities which comprises agriculture, primarily livestock grazing with minor dry land crops and residential (private farmstead and communal tenant/farm worker homesteads) areas as outlined in Section 3.2 and assessed in Section 5.1. Other potential future land-use scenarios could also include:

- conservation, bearing in mind that the surrounding farms have been earmarked for conservation;
- large scale farming; or
- forestry, as remnants of forestry have been identified to be present on the farm Commissiekraal.

### **5.2.1 Conservation**

There are no current plans or initiatives in place to turn the farm Commissiekraal into a nature reserve or conservation area. There are plans in place to include some of the surrounding farms as part of the Elandsberg Protected Area. Even if any plans were in place for the farm Commissiekraal, it would be difficult to quantify the economic contribution of conservation.

### **5.2.2 Large scale soya bean farming**

Soya is currently a high value crop suitable on the farm Commissiekraal and was selected to calculate the maximum potential agricultural contribution. It was also assumed that 80% of the farm could potentially be utilised for large-scale soya bean production. This is a very prudent assumption as the actual area available to be planted could be significantly smaller.

Calculating the possible revenue, which could be generated on the 80% of available land, soya beans have the potential to generate a revenue stream of R9.85 million per annum. This will equate to R93.6 million in present value over the life of mine. Allowance has been made for 20 employment opportunities, which equates to R6.1 million in net present value over the life of mine.

### 5.2.3 Forestry

Forestry was evaluated as a possible alternative future land use. According to a source at the Nelson Metropolitan University's Forestry Department in George, the time required to apply for a plant permit varies between two to three years. Once a planting permit has been obtained, the granting of the permit could take up to ten years.

The first revenue stream for forestry will only be realised after eight years from establishing the plantation. As such, based on the worst case scenario of receiving a plant permit after 13 years, revenue will only be realised after 21 years of commencing the forestry process. Forestry is therefore not regarded as a feasible alternative over the life of mine.

## 5.3 CONTRIBUTION OF THE PROPOSED MINING DEVELOPMENT

### 5.3.1 Assessment of proposed development: Land Use

The capital investment required for establishing mining infrastructure was not taken into account to determine the land value post mine closure as the infrastructure is mining specific and it was assumed that it will be removed and the area rehabilitated during the decommission and closure phases of the mine in line with the EIA and EMP closure objectives. According to the closure cost estimate study undertaken by SLR in October 2015, a total rehabilitation liability of R8.4 million was assigned to the mining footprint area.

Once the infrastructure has been removed and the area rehabilitated, the land will be restored to natural veld. It will be possible to assign this area for conservation.

### 5.3.2 Assessment of proposed development: direct employment

The project is expected to create approximately 25 unskilled, 89 semi-skilled and 46 skilled employment opportunities during the construction phase. The operational phase will create 53 skilled, 102 semi-skilled and 46 unskilled opportunities. This will equate to a net present value of R685.5 million over the life of mine.

It was assumed that there will be adequate employment opportunities earmarked for previously disadvantaged and local people. It should be noted that local in this instance would automatically apply to regional as the availability of local skills is uncertain.



### 5.3.3 Assessment of proposed development: Economic Impact

An initial capital investment of R428 million is envisaged and the proposed development is expected to generate an annual turnover of between R300 million and R400 million. Over the life mine, this will equate to a revenue value of R2 809 million in present terms, based on an annual turnover of R300 million.

The economic contribution as a result of the proposed development will have a positive impact on direct, indirect and induced effects on the local, regional and national economy. It is envisaged that R3.1 billion over the life of mine will be contributed towards the national economy. This figure was based on the following:

- 70% of the capital investment of R428 million (R299.6 million);
- 100% of present value of life of mine revenue (R2 809 million)

At this stage, the value of the transportation contract is unknown. It should however be noted that this contract will contribute significantly towards the regional or national economy.

The local and regional economy will benefit from the employment value created during the construction period and operational period to the value of R30 million and R655.5million respectively. It was furthermore assumed that 30% of capital expenditure, excluding labour, will also be spend locally or regionally. This equates to an over the life of mine contribution of R792.9 million in present value.

#### **Direct Effects**

Direct effects are the results of the money initially spent in the study region by the business or organisation being studied. This includes money spent to pay for salaries, supplies, raw materials, and operating expenses. The project has a budgeted capital expenditure of R428 million which will have a direct effect on the local economy.

#### **Indirect effects**

The direct effects from the initial and operational spending will create additional activity within the local and regional economy, as businesses benefiting directly from the proposed development will subsequently increase spending at other local businesses (indirect effect) as well as hiring additional staff members.

## Induced Effects

Induced effects are the results of increased personal income a result of the proposed project, including indirect effects. Businesses experiencing increased revenue from the direct and indirect effects will subsequently increase payroll expenditures (by hiring more employees, increasing payroll hours, raising salaries, etc.). Households will in turn, increase spending at local businesses. The induced effect is therefore a measure of this increase in household-to-business activity.

### 5.3.4 Assessment of proposed development: Contribution towards socio-economic development

In addition to the direct and indirect economic impacts discussed above, the mine will through its corporate social investments and social and labour plan, contribute towards the local economic development in the area. The operation of the proposed mine will have the following positive socio-economic benefits to its employees and surrounding communities:

- development of skills through its skills development plan;
- learnership programs to provide learners with an occupational qualification;
- investment in infrastructure development through local economic development and integrated development programmes;

The Tholie Logistics MWP indicated the following investments over the next 5 years of operations as per the Social and Labour Plan requirements.

- human resource development: R810 000
- local economic development R5 million.

## 6 ECONOMIC IMPACT ASSESSMENT

### 6.1 IMPACT ASSESSMENT METHODOLOGY

The impact assessment methodology was prescribed by SLR and is based on the Hacking method of determination of significance of impacts as tabulated in Table 3 below and complies with the method provided in the EIA guideline document. . Part A provides the approach for determining impact consequence (combining severity / nature, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C.

The interpretation of the impact significance is given in Part D. The unmitigated scenario is considered for each impact.

**TABLE 3: CRITERIA FOR ASSESSING IMPACTS (PROVIDED BY SLR)**

<b>PART A: DEFINITION AND CRITERIA</b>					
<b>Definition of SIGNIFICANCE</b>		<b>Significance = consequence x probability</b>			
<b>Definition of CONSEQUENCE</b>		<b>Consequence is a function of severity / nature, spatial extent and duration</b>			
<b>Criteria for ranking of the SEVERITY/NATURE of environmental impacts</b>	<b>H</b>	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.			
	<b>M</b>	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.			
	<b>L</b>	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.			
	<b>L+</b>	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.			
	<b>M+</b>	Moderate improvement. Will be within or better than the recommended level. No observed reaction.			
	<b>H+</b>	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.			
<b>Criteria for ranking the DURATION of impacts</b>	<b>L</b>	Quickly reversible. Less than the project life. Short term			
	<b>M</b>	Reversible over time. Life of the project. Medium term			
	<b>H</b>	Permanent. Beyond closure. Long term.			
<b>Criteria for ranking the SPATIAL SCALE/ EXTENT of impacts</b>	<b>L</b>	Localised - Within the site boundary.			
	<b>M</b>	Fairly widespread – Beyond the site boundary. Local			
	<b>H</b>	Widespread – Far beyond site boundary. Regional/ national			
<b>PART B: DETERMINING CONSEQUENCE</b>					
<b>SEVERITY / NATURE = L</b>					
<b>DURATION</b>	Long term	<b>H</b>	Medium	Medium	Medium
	Medium term	<b>M</b>	Low	Low	Medium
	Short term	<b>L</b>	Low	Low	Medium
<b>SEVERITY / NATURE = M</b>					
<b>DURATION</b>	Long term	<b>H</b>	Medium	High	High
	Medium term	<b>M</b>	Medium	Medium	High
	Short term	<b>L</b>	Low	Medium	Medium
<b>SEVERITY / NATURE = H</b>					
<b>DURATION</b>	Long term	<b>H</b>	High	High	High
	Medium term	<b>M</b>	Medium	Medium	High
	Short term	<b>L</b>	Medium	Medium	High
			<b>L</b>	<b>M</b>	<b>H</b>
<b>SPATIAL SCALE / EXTENT</b>					
<b>PART C: DETERMINING SIGNIFICANCE</b>					
<b>PROBABILITY (of exposure to impacts)</b>	Definite/ Continuous	<b>H</b>	Medium	Medium	High
	Possible/ frequent	<b>M</b>	Medium	Medium	High
	Unlikely/ seldom	<b>L</b>	Low	Low	Medium
			<b>L</b>	<b>M</b>	<b>H</b>
<b>CONSEQUENCE</b>					
<b>PART D: INTERPRETATION OF SIGNIFICANCE</b>					
<b>Significance</b>	<b>Decision guideline</b>				
High	It would influence the decision regardless of any possible mitigation.				
Medium	It should have an influence on the decision unless it is mitigated.				

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Low	It will not have an influence on the decision.
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\*H = high, M= medium and L= low and + denotes a positive impact.

## 6.2 ECONOMIC IMPACT ASSESSMENT

The assessment of the economic indicators which have been discussed in Sections 5.1 to 5.3 and Table 4 below.

**TABLE 4: ECONOMIC IMPACT ASSESSMENT ANALYSIS**

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Land value	<p>The mining activities, including associated transport activities could result in a potential loss in land value. The farm Commissiekraal municipal valuation was determined at R11.9 million. A total rehabilitation liability of R8.7 million was assigned to the mining footprint area, but it should be noted that with mitigation the infrastructure will be removed and the area will be restored to natural veld for grazing. It will also be possible to assign this area for conservation.</p> <p>The mine intends to purchase the land, which will negate the potential impact in land devaluation.</p> <p>The extent of the road transport activities associated with the transportation of the coal may have an impact on land value in the area for the duration of the operational phase, although it was not possible to quantify to which extent.</p> <p>Therefore, in summary the loss in land value without mitigation, which will include the purchasing of the land and rehabilitation, could result in a significant loss in land value. The area will however be rehabilitated and the trucking activities will cease in the decommissioning phase. It is therefore not envisaged as a potential long term impact in the mitigated scenario.</p>	Construction Operational Decommissioning and Closure	H	H	L	H	M	H	M	M	L	M	L	L

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Employment	<p>The project may have the opportunity to create job opportunities in the local and regional area.</p> <p>In its current state it does have the capability to employ in the order of 20 people. This will equate to a present value of R6.1 million over the life of mine. The alternative land use comprising soya farming, will also create 20 employment opportunities. Therefore, with regard to current land use within the mine footprint area, the project will not have an impact, as there is no employment opportunities and no-one will therefore lose any jobs as a result of the project.</p> <p>From a local and regional perspective, the mine will contribute towards creating much needed employment opportunities, resulting in a positive impact, which could be further enhanced with mitigation measures. The project is expected to create approximately 25 unskilled, 89 semi-skilled and 46 skilled employment opportunities during the construction phase. The operational phase will create 53 skilled, 102 semi skilled and 46 unskilled opportunities. An initial capital investment of R428 million is envisaged and the proposed development is expected to generate an annual turnover of between R300 million and R400 million. Recruitment efforts to focus on regional and local sources.</p>	<p>Construction</p> <p>Operational</p> <p>Decommissioning and closure</p>	L+	M	M	L	L	L+	M+	M	M	M	M	M+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	Once the area has been restored, employment opportunities will be limited to that associated with grazing or conservation.													
Impact on economy	<p>The project has the potential to provide a cash injection to the local and regional economy.</p> <p>It was assumed that the entire farm could be utilised for cattle farming and has a high grazing potential. Based on this assumption the present value which could potentially be generated over the life of mine for commercial cattle is R14.m based on current land use capability. Large scale soya bean farming as an alternative land use will have the ability to contribute R93.6 million. The establishment of the mine will therefore prevent these activities to take place for the duration of the mining operation.</p> <p>In comparison, the mining project will generate a present value revue of R2 809 million over the life of mine, which will significantly contribute towards the local, regional and national economy and outweighs the contribution from current land and potential alternative land uses. At this stage, the value of the transportation contract is unknown. It should however be noted that this contract will contribute significantly towards the regional or national economy.</p> <p>The local and regional economy will benefit from the employment value created during the construction period and</p>	Construction Operational Decommissioning and closure	L+	M	M	L	L	L+	H+	H	M	H	M	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	operational period to the value of R30 million and R655.5million respectively. It was furthermore assumed that 30% of capital expenditure, excluding labour, will also be spend locally or regionally. This equates to an over the life of mine contribution of R792.9 million in present value. Without mitigation, the local and regional economy may not benefit from the mine. With mitigation through local economic development and social and labour plans, it will be possible to enhance the contribution the mine will have on a local and regional economic scale. With mitigation some initiatives will be able to be sustained post closure.													
Socio-economic development	<p>The proposed development is expected to create both positive and negative impacts. From a socio-economic perspective, the positive effects, in terms of export earnings, economic development, job creation, household income and government revenue that could be derived are deemed to outweigh the negative impacts that could ensue.</p> <p>The mine will be associated with a number of other negative effects that are more challenging to quantify and to offset. These are associated with the sense of place, loss of family ties, crime situation and pressure on socio-economic infrastructure. Some of the impacts would only last during the construction period (such as 'crime' and impact on socio-economic infrastructure), while others will extend into the operational period and will therefore be of a considerable</p>	Construction Operational Decommissioning and closure	M	M	M	M	M	M	M+	M	M	M	M	M+



ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	longer term.  Post closure, natural veld grazing or conservation will have a much smaller socio-economic footprint than mining.													

## 7 SUSTAINABILITY ANALYSIS OF THE PROJECT

As outlined in Section 2 of this report, one of the objective of this specialist investigation is to undertake a comparative assessment of the identified land use and development alternatives and their potential on the environment, social and cultural impacts in view of generally accepted sustainable development principles which considers the costs and benefits of social, environmental and economic factors as outlined in Regulation 50 (d) of the MPRDA.

From an economic perspective, sustainable development requires that social well-being as minimum, is maintained over time. This could be interpreted in terms of maintaining the stock of productive capital upon which social well-being depends. The stock of productive capital includes human capital (intangible skills and knowledge) and natural capital (ecological systems and natural resource deposits), as well as manufactured capital (tangible produced assets) (Nahman et al, 2009). Under the weak definition of sustainability, the different forms of capital are assumed substitutable, and sustainable development simply requires maintaining the total stock of capital. Thus, welfare can be sustained even while natural capital is depleted, so long as this is compensated for through an increase in other forms of capital.

By contrast, strong sustainability recognises that natural capital is not readily substitutable with other forms of capital, and requires that the stock of natural capital is maintained in its own right. A compromise may be to allow some substitution between different forms of capital, so long as some minimum, core stock of critical natural capital is maintained (Nahman et al, 2009).

### 7.1 SUMMARY OF SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT

Table 5 below provides a summary of the social, economic and environmental impacts of the project which were assessed in the unmitigated and mitigated scenarios.

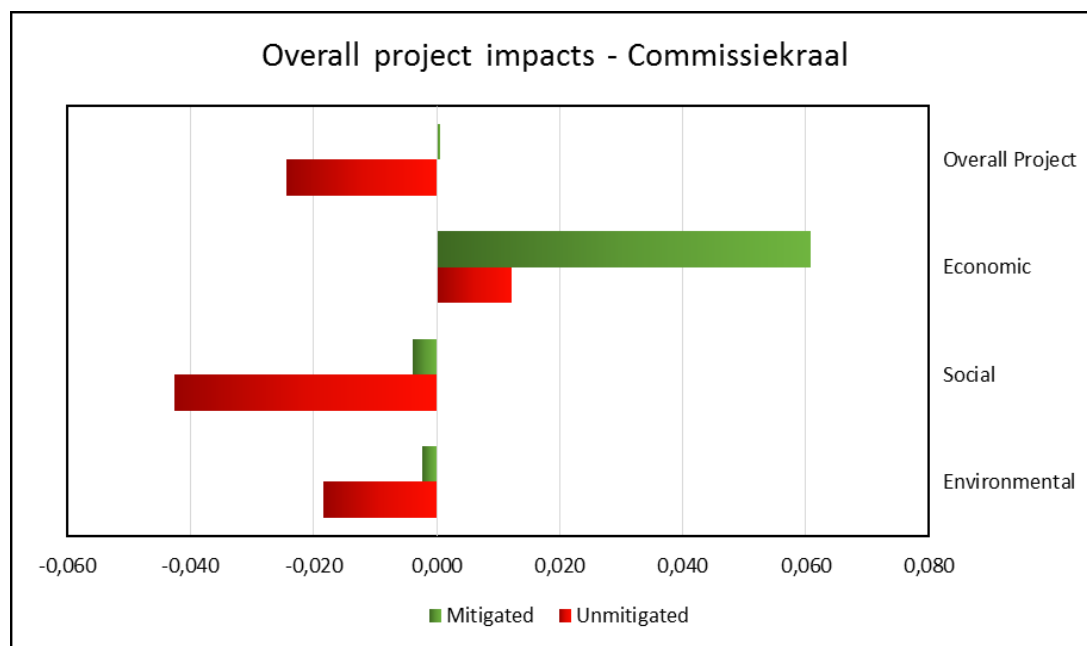
**TABLE 5: SUMMARY OF SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT**

SECTION	POTENTIAL IMPACT	UNMITIGATED	MITIGATED
Topography	Hazardous excavations	High	Low
Soils and land capabilities	Loss of soil resources and associated natural land capabilities	Medium	Low
Biodiversity	Physical loss of biodiversity	High	Medium to Low
	General disturbance of biodiversity	High	Medium to Low
	Loss or disturbance of aquatic ecosystems	High	Medium

SECTION	POTENTIAL IMPACT	UNMITIGATED	MITIGATED
Water	Loss of water affecting third party users	High	Medium to Low
	Contamination of water	High	Medium to Low
Air quality	Increase in air pollution	High	Medium to Low
Noise	Increase in disturbing noise levels	High	Medium to Low
Visual impacts	Negative landscape and visual impact	High	Medium
Land use	Impact on surrounding land uses	High	Medium to low
	Blasting hazards	High	Low
	Project-related road use and traffic – reduced road conditions	High	Low
	Project-related road use and traffic – safety related aspects	High	Medium
Heritage (and cultural)	Destruction of heritage resources	High	Low
	Disturbance (indirect) of heritage resources	Medium	Low
Socio-economic impacts	Loss of mineral resources through sterilisation	Negligible	
	Economic impact (positive and negative)	Low+	Medium+
	Inward migration and social ills	High	Low
	Relocation	High	Low

## 7.2 SUSTAINABILITY ANALYSIS

The sustainability analysis was based on the information contained in Table 5. The outcome of the analysis concluded an overall unmitigated rating of a negative. With mitigation, this rating was improved to positive (very) low, almost neutral as outlined in Figure 4. Positive economic impacts in the mitigated scenario by far outweighed the mitigated negative social and negative environmental impacts. It can be argued that the project will be positive from a sustainable perspective, due to the mitigated medium positive economic impact in combination with the low mitigated social and environmental impacts. As the economic impact was the only aspect out of the twenty aspects rated in Table 5 which contributed towards the economic analysis score, its weighting in relation to the social and environmental analysis was very low (5%).



**FIGURE 4: SUMMARY OF SUSTAINABILITY ANALYSIS**

It should be noted that the rating system which is used to assess the various impacts is based on a subjective approach. These impact ratings obtained were used to determine the suitability potential of the project.

## 8 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to the economic impact assessment:

- the information supplied in relation to employment opportunities, income generation, life of mine, etc. by the client is an accurate reflection of the activities during construction, operational and closure phases of the proposed project;
- with regards to agricultural calculation, it should be noted that the best potential crop yield was assumed;
- a discount factor of 10% as advised by the client was used to calculate the net present value calculations;
- information which were used in some of the agricultural calculations were sourced from third parties. Errors with this information could possible effect the results of the calculations and therefore the assessment;
- it was assumed that 70% of capital investment will be spent nationally and 30% will be spent locally and regionally;
- 100% of the employment value was assign to local and regional;

- land values are based on average land values in the region, however the true value of the land is determined by a range of factors and will therefore most likely be higher or lower than the value used in this report.

## 9 MITIGATION MEASURES

To adequately minimise the negative economic and socio-economic risks and enhance the positive economic and socio-economic impacts, the mine will have to ensure the following:

- ensure mitigation measures as outlined in EIA and EMP will be implemented;
- ensure adequate management and financial resources are made available to fully implement the mitigation measures as outlined in EIA and EMP;
- ideally develop specific socio-economic mitigation measures and corporate social investment strategies in consultation with the relevant authorities to ensure progress towards achieving the national, provincial and local government priorities as outlined in Section 4.

## 10 CONCLUSION

Based on the assessment undertaken as part of this study, the proposed project is regarded as the preferred land use from a pure economic perspective. The outcome of the sustainability analysis concluded an overall unmitigated rating of negative medium to low and a mitigated rating of positive low, almost neutral. Positive economic impacts in the mitigated scenario by far outweighed the mitigated negative social and environmental impacts. It can be argued that the project will be positive from a sustainable perspective, but only marginally due to significant positive economic footprint.

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**(Author)**

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