
**Scoping Report for an alternative
land-use and economic impact
assessment for the Kangala
Extension Project (“The project”)**

Applicant: Universal Coal
Development 1 (hereafter
referred to as UCD1), a
subsidiary of Universal Coal plc

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ACRONYMS

DRC

Democratic Republic of the Congo, 23, 24

DRDLR

Department of Rural Development and Land Reform,
16

EBITDA

Earnings before interest tax, depreciation and
amortisation, 24

Earnings before interest, taxes, depreciation and
amortisation, 36

FTE

Full time economic jobs not to be confused with full
time equivalent jobs, 37

GDP

Gross Domestic Product, 29

Gross Domestic Product, 24

GGP

Gross Geographic Product, 29

GTIS

Gross Tons In Situ, 10

MWP

Mine Works Program, 22, 41

NDM

Nkangala District Municipality, 28

ROM

Run of Mine, 10

Declaration of independence

I hereby declare that I am an independent, economic impact assessor.



SG Muller t\ a Strategy4Good

1 Executive summary – identification of critical impacts

- a) The first critical aspect to analyse is the impact that the new supply of coal will have on the secure provision of coal to the power industry in South Africa. It has been widely publicised that Eskom has a shortage of coal supply in Nkangala and that it is currently trucking coal from outside the district to complement its feedstock requirements for the power stations in Nkangala.
- b) The second critical aspect is the opportunity cost of a decrease in maize production on the affected farm(s) and the effect it will have on food security in the district, and/or and beyond the district.
- c) The next issue is to consider the impact on farm property values directly and indirectly by the project in the study area. Consideration needs to be given that the project will have a life of mine of only 9 years, whereas the lifespan of agriculture is infinite.
- d) Furthermore, given that a large proportion of the project's coal will be exported, the impact on the increase of exports also need to be considered. There is the potential to increase the demand for the SA rand, thereby assisting to stabilise the currency and increase foreign reserves. It is a well-known fact that the SA rand is under pressure and any exports or increase in exports that can result in an inflow of hard currency into the country will improve South Africa's foreign reserves position.
- e) An evaluation of the net effect of increasing mining GGP relative to a decline in agricultural GGP also needs to be undertaken. This GGP trade-off needs to be made between the project income which spans only 9 years and the income that will be lost from maize farming for the next economic generation.
- f) A further important aspect is that the project will not create new jobs but rather replace jobs that are being phased out in another section of the mine. Therefore, several jobs would be lost if maize farm is not commenced with.
- g) It is also vitally important that the economic impact assessment takes cognisance of the current economic policies and legislation, in in particular the economic policies of the region. Nkangala Integrated Development Plan as well as its Local Economic Development Plan. In addition to this, a review of the Victor Khanye Municipality Integrated Development Plan and Local Economic Development Plan is necessary.
- h) An assessment of the multipliers in both industries also need to be made.

2 Introduction

This scoping report is aligned with Appendix 2, Content of Scoping Report from the NATIONAL ENVIRONMENTAL MANAGEMENT ACT 107 OF 1998, ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014.

3 Objective of the Scoping Process

The objective of the scoping process is to, through a consultative process-

- (a) identify the relevant policies and legislation relevant to the activity;
- (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- (d) identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- (e) identify the key issues to be addressed in the assessment phase;
- (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- (g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

In summary, as is stated in the above referred regulations, “a scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process.”

4 The EAP who prepared this report

This report is compiled by SG Muller who holds a B Admin (Political Science, Public Administration and Development Economics) and an MBA (Specialising in Strategy and Corporate Finance), both from the University of Stellenbosch. Through his consulting work over the last two decades Mr Muller specialised in Competitive Economic Strategies for Regions and had undertaken over a hundred Social and Labour Plans for mines and an equal amount of economic impact assessments for mines, specifically aimed at alternative land-use analyses.

Mr Muller was a Partner at two Mining Consulting Firms, namely SRK Consulting and Metago Environmental Consulting.

In this period Mr Muller had developed several practical methodologies to ensure that economic impact assessments and alternative land-use analyses become more standardised. Most of Mr Muller's reports had been reviewed by the DMR and none of his reports have been found to be deficient.

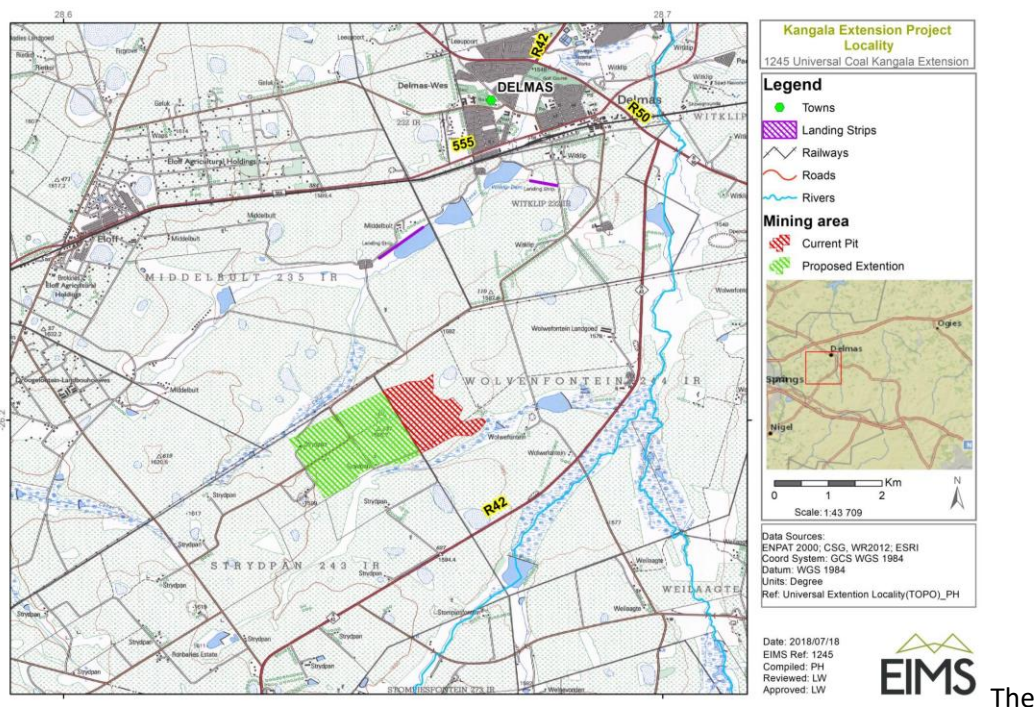
Mr Muller developed a detailed understanding of econometrics over his career and has distinguished himself in translating mining outputs to Gross Geographic economic quantities.

A very important point is that Mr Muller is an independent consultant that has no ties or linkages to the developer of this project.

5 The location of the activity

The project footprint is in Victor Khanye Local Municipality, located within the Nkangala District Municipality, Mpumalanga Province. The project area covers portions 14, 15, 16, 18, 19, 20, 22, 23 and 24 of the Farm Strydpan 243 IR and is situated approximately 7.5km south-east of the town Delmas.

Map 1: Location of Project



development corridor is shown below and can be described as the coal-energy-industrial complex of Gauteng and Mpumalanga on the one hand, and on the other hand is an area that is comparatively productive in maize and crop farming. This potential alternative land-use is the central theme of this report as an analysis is necessary as to which alternative land-use is best for the economy.

Map 2: Development Corridor



6 Description of the proposed activity.¹

6.1 Generic description

UCD1 wishes to develop a new opencast coal mining operation covering an extent of 251 hectares (ha), adjacent to the existing Universal Coal's Kangala Colliery on various portions of the Farm Strydpan 243 IR - herein referred to as the Kangala Extension Project. The proposed Kangala Extension Project is anticipated to use a standard truck and shovel mining method based on strip mining design and layout. The existing coal handling and processing plant at the Kangala Colliery will be utilised for the proposed Kangala Extension Project. It is expected that no new surface infrastructure such as offices, dams, stores facility, workshops, or change house will be required for the project.

6.2 Mining method

Based on the business philosophy of Universal Coal, the opencast mining operations is likely to be outsourced. All opencast mining contractors apply standard truck and shovel mining methods based on a strip-mining design and layout.

The mining method that has been applied since the start of mining operations at Kangala is standard truck and shovel strip mining, which is described as follows:

- The topsoil is removed by truck and shovel and stored at the designated area.
- Thereafter, the softs will be removed by truck and shovel and stored at the designated material stockpiles.
- Next, cast blasting of the hard overburden material will be employed.
- Roll-over dozing of the hard overburden material will follow, where practical.
- Truck and shovel mining techniques are then applied to remove the hard overburden material to expose the various coal seams.
- Finally, the coal seams will be excavated by truck and shovel mining techniques.
- Any parting or inter-burden material between the coal seams will be drilled and blasted before being removed by the truck and shovel technique.

The process is repeated on a strip-by-strip basis. Material (apart from the topsoil) will then be rolled-over into the void created by the removal of the rock and coal in the previous bench, with the hard

¹ Source of this section is the Mine Works Program of the project

overburden and parting/ interburden forming the base, followed by the softs, levelled, and finally topsoil will be placed and seeded.

The current opencast pits at Kangala will be mined up to 2019 and mining operations will start at the project in the middle of 2019, with the establishment of the box cut. As the production at Kangala ramps down, the production at the project will ramp up and by FY 2020, the total production will be from the Project.

The project has a ROM reserve of 41.17 Mt in the current planned mining area. The project area contains 784.11 GTIS. Currently only 44.95 Mt of the total GTIS have been converted to ROM reserves through a detailed mining plan with a balance of 739.16 Mt. The balance of the GTIS will be included in the next phase of mine planning.

6.3 Job creation / maintenance

The mine operations will maintain over 300 direct jobs. More than 85 % of the employees at Kangala are sourced from local communities and surrounding labour-sending areas within the Nkangala District. This has enabled employees to continue with their living conditions.

7 Policy And Legislative Context²

7.1 The National Development Plan³

The National Development Plan (NDP) is a long-term South African development plan, developed by the National Planning Commission in collaboration and consultation with South Africans from all walks of life. Minister Trevor Manuel stated in his speech at the launch of the NDP: “The plan is the product of thousands of inputs and perspectives of South Africans”. It is a plan for a better future; a future in which no person lives in poverty, where no one goes hungry, where there is work for all, a nation united in the vision of our Constitution”. The NDP envisions a South Africa where “everyone feels free yet bounded to others; where everyone embraces their full potential, a country where “opportunity is determined not by birth, but by ability, education and hard work”. A South Africa where “we participate fully in efforts to liberate ourselves from the conditions that hinder the flowering of our talents. To realise such a society we need to transform the domestic economy and focus efforts to build the capabilities of both the country and the people. To eliminate poverty and

² ...including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process

³ Ref: <https://www.gov.za/issues/national-development-plan-2030>

reduce inequality, there should be accelerated growth in the economy, growth that benefits all South Africans. The NDP serves as an action plan for securing the future of South Africans as charted in the Constitution. The Constitution requires that we must build a united and democratic South Africa, able to take its rightful place as a sovereign state in the family of nations”.

The NDP aims to achieve the following objectives by 2030:

- Uniting South Africans of all races and classes around a common programme to eliminate poverty and reduce inequality.
- Encourage citizens to be active in their own development, in strengthening democracy and in holding their government accountable.
- Raising economic growth, promoting exports and making the economy more labour absorbing.
- Focusing on key capabilities of both people and the country.
- Capabilities include skills, infrastructure, social security, strong institutions and partnerships both within the country and with key international partners.
- Building a capable and developmental state.
- Strong leadership throughout society that work together to solve our problems.

According to the NDP by 2030 there should be:

- A reduction in the number of people who live in households with a monthly income below R419 per person from 39 percent to zero.
- A reduction in inequality as measured by the Gini coefficient, from 0.69 to 0.6.
- This can be done by addressing the underlying causes of poverty and inequality by redirecting the focus of policy making from short- term symptom- based policies to longer-term policies based on sound evidence and reason. At the core of the NDP, the NDP aims to ensure the achievement of a “decent standard of living” for all South Africans by 2030. A decent standard of living consists of the following core elements:

- 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
- Adequate nutrition

This scoping report takes the above as an overall vision against which to measure the alternative landuse in the study area.

7.2 Mpumalanga Department of Economic Development and Tourism⁴

7.2.1 Strategic Goal

The following strategic goal is equally of value in using as an overriding criterion for the alternative landuse analysis. “Stimulate robust and sustainable economic growth that would lead towards the reduction of poverty, unemployment, and inequalities by 2014.”

7.2.2 Mpumalanga Vision 2030

Mpumalanga Vision 2030 provides a provincial expression of the key priorities, objectives and targets enumerated in the National Development Plan and expressed within the manifesto. It is a focused and strategic implementation framework that provides a direct implementation response to the National Development Plan. The framework describes the Province’s approach to realizing the objectives of the National Development Plan in the provincial context and informs past and existing sectorial and related planning interventions in Mpumalanga.

7.3 Mpumalanga economic development targets

INDICATOR	NDP TARGET	MPUMALANGA VISION 2030 TARGET
Unemployment	6%	6%
Number of Employed	11 million additional jobs	1.2 million additional jobs. Total employment to 2.1 million to achieve 6% unemployment rate
GDP Growth Rate	Average annual GDP growth above 5%	Average annual GDP growth above 5%.
GDP per capita	Raise per capita GDP to R110 000 in constant prices	Raise per capita GDP to R110 000 in constant prices

⁴ Ref: http://www.mpumalanga.gov.za/documents/docs/dg_pgds.pdf

INDICATOR	NDP TARGET	MPUMALANGA VISION 2030 TARGET
Lower bound poverty line – R416 per person (2009 prices)	Reduce the proportion of households with a monthly income below lower bound poverty line to 0%	Reduce the proportion of households with a monthly income below lower bound poverty line to 0%
Gini Co-efficient (Income inequality)	0.6	0.6
Lower bound poverty line – R416 per person (2009 prices)	The proportion of income earned by the bottom 40% in SA should rise to 10% by 2030	The proportion of income earned by the bottom 40% in SA should rise to 10% by 2030

7.3.1 State of Province Address Mpumalanga 2018⁵

To give further context to the Mpumalanga economic strategy, the following key points from the provincial state of nation address is worthy of summarising.

Education

We must find solutions to resolve this challenge so that every child of Mpumalanga can have a place under the sun.

We must do so to ensure that every child can have a decent meal and go to school to realize his or her own potential.

We have prioritised skills development as a pillar for our development. Therefore our fight against unemployment especially among the youth cannot be divorced from a comprehensive programme on education and skills development.

Agriculture

Our main focus is to stimulate production to ensure that the agriculture sector expands opportunities for new entrants and creates much needed jobs.

We are supporting all our emerging farmers to be ready to supply the Mpumalanga International Fresh Produce Market that is under construction. In this process, we want to unlock the potential of SMMEs, Co-operatives, as well as township and rural enterprises.

Mining

⁵ Ref: State of Province Address Mpumalanga 2018

As things stand, we are expecting our provincial performance to be in line with national growth. This growth might even be higher depending on the performance of the mining industry, more specifically coal.

Investment and Jobs

Among many other investments in the Province, the expansion of Exxaro coal operations in the Belfast area signifies a great deal of confidence that Mpumalanga is the key destination for investment.

That is why it also gives me pleasure that South32 Limited announced in November 2017, an investment of **R4.3 billion** into Mpumalanga, which will extend the life of its Klipspruit Colliery by approximately 20 years. Employment for an estimated **740** people and will create **4 000** additional jobs during the construction phase.

Youth development

As the provincial government, we have set aside resources to support the **Youth Miners Incubation Programme** as part of broadening youth participation, and ownership of mining assets.

In partnership with industry players, we will support our youth in mining to access prospecting and mining rights, and ensure that this sector makes a meaningful contribution to youth development.

Procurement

From the 1st June 2018, government will expand this programme to include the procurement and supply of both dry products and fresh produce. With this expansion, the programme will cover a significant number schools and hospitals.

Infrastructure

Construction of the Mpumalanga International Fresh Produce Market that we mentioned earlier, is gaining traction. Since inception, we have invested approximately R500 million into this project. We have thus far implemented bulk services infrastructure, creating a total of 800 jobs during this construction phase. In April this year, we will be commencing with construction of top-structure market buildings, covering 30 000 m².

Tourism

Given the importance of this sector in our provincial economy, this Government will continue to prioritise the growth of tourism sector through increased investment in the development of liberation heritage routes like Makhonjwa Mountains near Barberton, Waterval Boven, Bethal and Mbuzini.

Arts and Culture

Our Administration committed itself to ensuring that the diversity of our arts, culture and heritage is exploited to its full capacity. To realise the potential of this sector as a major contributor to building social cohesion and economic development in Mpumalanga and the rest of the country, we have initiated the process for the establishment of the Mpumalanga Creative Industry Commission which will be operational before the end of the year.

Socio-economic infrastructure

The province has committed itself to building state of the art schools, boarding schools, and trust that soon we will see a matric pass rate above 80%

Health

The budget for health infrastructure saw an increase from R312 million in 20014/15 to R1,2 billion which translates to an increase of 312% in 2017/18 financial year.

Social Services

Six new offices were built within various communities whilst upgrades and renovations were carried out at a number of community centres across the Province.

7.3.2 Mpumalanga Strategic Objectives⁶

- To provide efficient and effective administrative and strategic support service to the Department
- To facilitate support and development of business enterprises
- To ensure the participation of HDIs in the mainstream of the economy
- Ensure growth in exports and direct investments in the Province
- Ensure the development of competitive industries in the growth sector
- Ensure industrial development in the Province
- To create a platform to enhance sustainable tourism growth
- To implement consumer protection and awareness strategies that creates environment conducive to fair trade
- To ensure the coordination of relevant economic research
- To contribute to the management of information and knowledge
- To provide economic policies and strategies
- To determine the effectiveness and impact of provincial policy and programme objectives and strategies.

⁶Ref: http://www.mpumalanga.gov.za/documents/docs/dg_pgds.pdf

7.3.3 Nkangala Rural Development Plan 2017⁷

7.3.3.1 Guideline

The guidelines for the Development of Spatial Development Framework as prepared by DRDLR defines rural development as “primary economic activities which generally includes: **agriculture**, agro-processing, **mining**, tourism, resource extraction, water, energy”.

7.3.3.2 Essential elements in Nkangala rural development

Objective	Description
Improve Quality of Life	To improve the living standards or well-being of the mass of the people by ensuring that they have security and that their basic needs such as food, shelter, clothing and employment are met.
Enhance Competitiveness	To make rural areas more productive and less vulnerable to natural hazards, poverty and exploitation, and to give them a mutually beneficial relationship with other parts of the regional, national and international economy.
Comprehensive Community Participation	To ensure that any development is self-sustaining and involves the mass of the people. In addition to ensure as much local autonomy and as little disruption to traditional custom as possible.

The spatial vision for the urban and rural parts of the Nkangala District provides important directives towards the NDM Rural Development Plan as noted below:

- Enhancement of local, provincial and national corridors traversing the District, including the N4 (Maputo-Walvis Bay), N11 (Botswana-N3-Durban), and the Moloto Corridor between Thembisile Hani/Dr JS Moroka and City of Tshwane;
- Strengthening of local linkages between the District and surrounding regions e.g. Gert Sibande (**electricity and coal mining**); Ehlanzeni (tourism, export); Sekhukhune (agricultural production and downstream beneficiation from the Dilokong Corridor), Waterberg District (agriculture) and Gauteng, including City of Tshwane and Ekurhuleni (manufacturing, services and trade);
- Consolidating human settlement (housing) and economic activity (industry and business) around the priority district nodal points;

⁷Re: <http://www.ruraldevelopment.gov.za/services/geo-spatial-services-technology-and-rural-disaster/district-rural-development-plan-drdp/file/5881-nkangala-district-municipality-rural-development-plan>

- Creating functional linkages between the Dinokeng tourism initiative in the City of Tshwane and the Mpumalanga Escarpment and Lowveld tourism precincts along the northern ridge series in the District through the underutilised potential located in Dr JS Moroka and Thembisile Hani Local Municipality;
- Promoting and optimising the **mining and electricity generation capacity of the southern coal fields** with a view to restore the agricultural potential of the land once coal reserves are depleted;
- To utilise the nodal and corridor structure of the district to guide and direct infrastructure investment and service delivery in the urban and rural parts of the District;
- To **optimise the agricultural potential** of all land in the District and to convert subsistence farming to sustainable commercial farming through processes of Agrarian Transformation in the priority areas in the NDM. (Dr JS Maroka and Thembisile Hani).

7.3.4 Victor Khanye IDP⁸

The 2013-2018 IDP from Victor Khanye takes as its guide the economic development policies of Nkangala and Mpumalanga. The aspects highlighted above are therefore applicable to Victor Khanye's economic development.

Of significance in this document is that Victor Khanye highlights several industries that it wants to target for development in its 2013 -18 LED Strategy. These are listed below.

- Agriculture and Rural Development
- Green Economy
- Industry and Commerce
- Tourism Development
- SMME and Co-operative development
- **Mining and electricity** development.

8 Context of policy document pertaining the project

8.1 Selected key statements based on the study literature research

⁸ Ref: www.victorkhanyelm.gov.za/index.php/legislation-doc/

The following section highlights some key statements relevant to this study from the various documents discussed below. These highlights serve to emphasise the occurrences of agriculture and mining in these documents.

Statement from the National Development Plan on new job creation drivers:

- 300 000 in **Agriculture** smallholder schemes
- 145 000 jobs in agro-processing by 2020
- 140 000 additional jobs in **Mining** by 2020, and 200 000 jobs by 2030, excluding multipliers.
- 350 000 jobs in Manufacturing by 2020
- 250 000 jobs in Business and Tourism by 2020/

Nkangala development goal

- End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

State of Nation Address in 2017

- The focus areas of the Nine-Point Plan to reignite the economy to be able to create much-needed jobs include industrialisation, mining and beneficiation, agriculture and agro-processing, energy, small, medium and micro enterprises (SMMEs), managing workplace conflict, attracting investments, growing the oceans economy and tourism.
- Only eight million hectares (ha) of arable land have been transferred to black people, which is only 9.8% of the 82 million ha of arable land in South Africa. There has also been a 19% decline in households involved in Agriculture from 2.9 million in 2011 to 2.3 million households in 2016. Government will use the Expropriation Act, 1975 (Act 63 of 1975) to pursue land reform and land redistribution, in line with the Constitution.

State of Province Address

- As the province moves forward, it should be cognisant that the Kusile Power Plant presents downstream opportunities from their Fly-ash and Synthetic Gypsum which are major applications in construction and agriculture. Government will collaborate with Eskom and other role players and come up with concrete multi-year action plans on how to beneficiate these products.

Comments from Nkangala IDP

- The following was identified as an opportunity for the district: “strong agriculture, mining, tourism and government services sectors.”

- Regarding Victor Khanye: In addition to Mining (concentrating on coal and silica), other important sectors in this area are Agriculture (a major provider of food and energy source) and Finance and Manufacturing (capitalizing on proximity to Gauteng).
- In 2015, the mining sector is the largest within Nkangala District Municipality accounting for R 45.9 billion or 40.9% of the total GVA in the district municipality's economy.

Key comments for the Victor Khanye IDP

- The Municipality is currently characterized by an increase in coal mining and related activities, the mining of silica sand is also done at large scale and other important sectors in this area are agriculture, agricultural product processing, industrial and manufacturing. Natural resources make a significant and direct contribution to the Municipalities economy.
- The rural area(s) of the municipality predominantly consists of extensive commercial farming and mining activities. The municipality is a major maize producing area, with an annual maize production calculated at between 230 000 and 250 000 metric tons.
- Job seekers will be restricted to unskilled manual work where the main employer in this sector of employment, namely Agriculture, is receding as a leading employer.
- The Municipality is strategically located in that it is bordering the metropolitan areas of Tshwane and Ekurhuleni respectively to the west and which is an advantage in terms of transport of agricultural and mining products to processing facilities and markets. The main centre of the Municipality is situated in Delmas.
- Mining activities are concentrated mainly on coal and silica. As mentioned, about 3 million metric tons of coal and 2 million metric tons of silica are mined annually in the municipality. The main mining areas are around Delmas in the centre of the municipal area, and also in the far north-eastern corner of the municipal area.
- “There is a growing urgency to establish an equitable and realistic trade-off that maximizes the provincial benefits from mining and energy sectors while mitigating any environmental impacts. According to the MPGDS, the mining, petrochemicals, steel and forestry sectors are dominated by a few global-level companies, with relatively few job opportunities being created due to their intensive capital nature.”

9 Need and desirability of the activity in the context of the preferred location

The key themes from the above policies and goals are the following in the context of the project:

- Job creation is vital in South Africa.
- Both the agricultural and mining sectors are, or should be, important job creation sectors.
- In Victor Khanye both agriculture and mining have a strong comparative advantage and the co-existence of these two sectors are important.

From the above it is evident that from an economic perspective, both mining and agricultural development are critical in Victor Khanye. Given that in this study both industries compete for the same piece of land, the question to address is which economic activity would be *most* desirable for Victor Khanye. Would it be the proposed project, or the continuation of agricultural activities?

The answer to this question will be a central part of the final Economic Impact Assessment and this scoping report prepares for that final report.

In favour of the project at this point is the state in which Eskom finds itself at present. As the mine will sell a large portion of its coal to Eskom the below points are relevant in the future viability of Eskom and its relation to the desirability of the project.

- Eskom is the largest consumer of coal in South Africa, buying about 50 % of the coal produced locally. Domestic coal consumption, especially by Eskom, is expected to increase over the next few years. Eskom has stated over the years that it is facing a large supply deficit, owing to increased demand and under-investment in new mining projects. It was previously estimated that Eskom could face a 40 – 60 million tonnes per annum (Mtpa) shortfall soon.
- Coal export prices have increased substantially since 2017 and strong markets have developed for the export of Eskom grade coal. Eskom is therefore experiencing competition for its coal supplies. This has resulted in improved prices from Eskom.
- Eskom's coal requirements for the period until 2026 are lower than previously anticipated. During this period, Eskom is forecasting a deficit of about 11 Mtpa, compared with the previous deficit stated above of 40-60 Mtpa.
- Eskom estimates it has to contract about 2.17 billion tonnes of coal by 2051, of which an estimated 1.12 billion tonnes will be sourced from long-term supply contracts, including

extensions of existing contracts. The balance is required from new supply contracts, which may include new mines in the Waterberg. Eskom's total coal demand will peak at about 140 Mtpa in 2033. Thereafter, demand will begin to decline in line with the country's Integrated Resources Plan, which aims to diversify energy sources.

- The above will be impacted by renewable independent power producers that supply power to Eskom.

10 Alternatives considered

At present there are only two alternatives to the project.

1. No-go – thus close the existing mining operation.
2. Continue with the project.

The reason for this is that there is only one piece of land for the project and hence it is an either/or decision.

11 Public participation

The EIA main document will make the detailed public participation process known and the economic impact assessor will interview the all relevant impacted stakeholders. The issues raised by the stakeholders will be summarised and documented for public review.

12 The methodologies to be used in the impact assessment

12.1 Alternative land-use analysis

The first methodology to be used will be that of an alternative land-use analysis. This methodology is outlined in the Department of Minerals and Resources' "Guideline For The Compilation Of An Environmental Impact Assessment And An Environmental Management Programme To Be Submitted With Applications For A Mining Right In Terms Of The Mineral And Petroleum Resources Development Act, 2002, (Act No. 28 Of 2002) (The Act)."

We quote from section 6 of this guideline, which indicates the requirements for the purposes of an economic, alternative land-use analysis: "Quantify the impact on the socio-economic conditions of directly affected persons, as determined by the findings and recommendations of an Economic Impact Assessment list report in that regard. The following are specifically stated:

- State the amount of the quantified potential impact, expressed in terms of the loss in value of property or infrastructural assets, that will potentially be impacted upon as a result of the mining activity.
- State the quantified potential impact expressed in terms of the loss in net present value of commercial, economic or business activity which will be impacted upon as a result of the mining activity.
- State the sum of the amounts referred to in the paragraphs above.”

Furthermore, the following is required, as stated in paragraph 9 of this Guideline: “Provide, in listed format, the results of an Economic Impact Assessment, study, which study must be conducted in accordance with generally-accepted principles of sustainable development by integrating social, economic and environmental factors into a comparison of the costs and benefits of the alternative land uses with those of the mining operation on an equitable basis.”

It needs to be stated that the above paragraphs are broad in scope, and no specific standards with respect to methodologies have been specified. To this extent, we use best practice sustainable development standards.

12.2 How this analysis will be undertaken

The above analysis will be undertaken as follows:

Row #	Economic Aspects	How we will calculate these
2	How this analysis will be undertaken	How this analysis will be undertaken
3	The above analysis will be modelled as follows:	The above analysis will be modelled as follows:
4	The project’s GGP will be calculated using the MWP. GGP is the sum of EBITDA and salaries and wages and these numbers are therefore available based on its submitted MWP.	The project’s GGP will be calculated using the MWP. GGP is the sum of EBITDA and salaries and wages and these numbers are therefore available based on its submitted MWP.
5	The GGP lost will be calculated based on the best agricultural yields per hectare, as opposed to the actual yields in the study area. The reason for this is that the farms belong to the applicant and is being leased out to existing farmers. Therefore one would expect that the farms may not be as well utilised as is expected.	The GGP lost will be calculated based on the best agricultural yields per hectare, as opposed to the actual yields in the study area. The reason for this is that the farms belong to the applicant and is being leased out to existing farmers. Therefore one would expect that the farms may not be as well utilised as is expected.
6	Most of the other economic quantities, for example foreign exchange benefits or losses, fiscal numbers, and others are a function of GGP and these will be modelled using known	Most of the other economic quantities, for example foreign exchange benefits or losses, fiscal numbers, and others are a function of GGP and these will be modelled using known

Row #	Economic Aspects	How we will calculate these
	economic quantitative formulae.	economic quantitative formulae.
7	The multiplier effect used will be based on national and regional published multipliers. Multipliers for a study area is notoriously inaccurate because of project specific leakages, but given that multipliers are simply a subset of the direct impacts, the latter is the most instructive and these quantities have a high degree of correctness.	The multiplier effect used will be based on national and regional published multipliers. Multipliers for a study area is notoriously inaccurate because of project specific leakages, but given that multipliers are simply a subset of the direct impacts, the latter is the most instructive and these quantities have a high degree of correctness.
8	The competitiveness rating will be done based on literature research and interviews with the mine.	The competitiveness rating will be done based on literature research and interviews with the mine.
9	The employment quantities are well-known.	The employment quantities are well-known.

12.3 Full economic impact assessment

The table below outlines the material aspects to evaluate during the scoping process.

Impact	Why this is important
Summary of regional and industry competitiveness (Michael Porter Framework)	
Improvement in overall economic competitiveness	The Diamond Porter Framework described above is the backdrop for this aspect, and this is also closely linked to business confidence and international reputation.
Increased business confidence and region reputational enhancement	The importance of business confidence in the region and its reputational enhancement are closely related and both these themes need no further introduction in terms of their importance for economic development.
Related and Support Industries	Stimulation of related and support industries – this is the degree to which the project induces the development of up- and downstream industries over the life of mine.
Factor	Factor conditions are defined above as the degree of development in a region's

Impact	Why this is important
Conditions	basic production factors, such as human, physical, knowledge and capital resources and infrastructure. The more developed these are for the purposes of the industry, the more competitive the industry is likely to be.
Exchange Rate Stabilisation	The balance-of-payments position of a region, or expected changes in transactions with the rest of the world, is the most direct determinant of a region's exchange rate. Demand for foreign currency arises from importing merchandise goods and services, or from the redemption of capital obligations. By contrast, the supply of foreign currency emanates from the exporting of goods and services or from an inflow of foreign capital. If, as a result of the region's transactions with the rest of the world in a given period, the total inflow of foreign currency is greater than the outflow, the supply of foreign currency exceeds the demand. Under these circumstances the currency will appreciate, on average, against other currencies, and vice versa.
Corporate Social Responsibility	Investments in society for the betterment of its standard of living over and above expenditure in the normal course of business.
Foreign Reserves	Foreign exchange may be defined as currency or other financial instruments that allow one region to settle amounts owed to other countries. Amounts owed by the country to the United States, for example, are settled in foreign exchange, that is, in US dollars. Foreign exchange is earned by residents of a region through the sale of goods and services to the international community (exports) and may also be acquired through foreign investments and foreign borrowings. Foreign exchange is used to pay for foreign goods and services bought from other countries (imports). Foreign-currency denominated loans are repaid in foreign currency.
Fiscal Income	Fiscal income is the total income earned by the State in the form of taxes, levies and other forms of income.
Gross Domestic Product	GDP is the total goods and services produced by a region. From the demand side it consists of private consumption expenditure, government expenditure, investment and net exports (or imports). From a supply side it is the sum of EBITDA and salaries and wages.
Employment	The amount of people in full time employment.
Employment Multipliers	Employment multipliers refer to the additional employment created through indirect and induced spending as a result of the mine's operations.
GDP Multipliers	Employment multipliers refer to the additional employment created through indirect and induced spending as a result of the mine's operations.
Poverty Alleviation	Number of people on or below the minimum standard for daily living.
Household Income	This is the income earned by households after tax. This is the amount of cash that will be immediately spent in the economy after a further deduction for savings.
Inflation	<p>Inflation is simply a persistent increase in prices without a corresponding increase in productivity or economic activity. Inflation is caused by many factors, of which the easy printing of money is the worst kind.</p> <p>The causes of inflation is multitude⁹:</p> <ul style="list-style-type: none"> • Rising imported raw materials costs perhaps caused by inflation in countries that are heavily dependent on exports of these commodities or

⁹ <http://www.tutor2u.net/economics/revision-notes/a2-macro-causes-of-inflation.html>

Impact	Why this is important
	<p>alternatively by a fall in the value of the currency in the foreign exchange markets</p> <ul style="list-style-type: none"> • Rising labour costs - caused by wage increases which exceed any improvement in productivity. • Higher indirect taxes imposed by the government • A depreciation of the exchange rate, which has the effect of increasing the price of imports • A reduction in direct or indirect taxation. If direct taxes are reduced consumers have more real disposable income causing demand to rise. • The rapid growth of the money supply – perhaps as a consequence of increased bank and building society borrowing if interest rates are low. Monetarist economists believe that the root causes of inflation are monetary – in particular when the monetary authorities permit an excessive growth of the supply of money in circulation beyond that needed to finance the volume of transactions produced in the economy. • Rising consumer confidence and an increase in the rate of growth of house prices – both of which would lead to an increase in total household demand for goods and services.
Mine Closure	The eventual decommissioning and closing of the mine.

13 Public Participation going forward

The economic impact practitioner will work with the EAP during the public consultation process. Interviews with affected farmers will be held on an individual basis.

14 A description of the environment that may be affected

14.1 The need for describing the receiving environment

The need to describe the receiving environment is to determine whether the proposed project is a better fit to the socio-economic status of that environment relative to the no-go alternative. The no-go alternative implies that the current agricultural activities continue as it is.

The first assumption to be made in an economic impact assessment is that better economic outcomes are desirable to society, and for this reason we evaluate this project's alternative land-use against this criterion. This is almost an inevitable truth.

In the case of this project there are two distinct opposite poles where mining competes directly with agriculture in terms of land, capital and labour. Although there is complementarity between agriculture and mining in that agriculture provides food to the mining sector and, by the same token, mining gives output to agriculture in the form of metals and minerals, both these industries compete

for similar inputs. In relation to this project, based on the pinhead size of the tract of land in the study area, mining is directly opposed to the land which could be used for agriculture, and a decision needs to be made as to which of these two sectors will serve the local economy best. Both coal mining and agriculture are strategic industries and are essential for the well-being of citizens in any country.

In evaluating the trade-off between coal mining and maize farming, which is the case in this project, a range of economic factors need to be evaluation, such as income, production, foreign exchange, net employment creation and other factors. These factors must be analysed in one economic generation which is set at 25-years. Cognisance is taken that even though the philosophy of sustainable development is that this generation should not act in such a way that it impacts the next generation, the 25-year rule of thumb is biased to the economic needs of one generation, but on condition that an economic activity has acceptable environmental risks.

14.2 Salient economic baseline aspects¹⁰

The District is predominantly a rural area, comprising extensive farming, nature reserves and mining areas. There are approximately 165 towns and villages distributed throughout the area. The Nkangala District has a dispersed spatial structure that can mainly be ascribed to the distribution of natural resources (e.g. coal) which determined the location of many settlements, and the former homeland areas to the north which are under Traditional Authority.

This distorted spatial structure makes the provision of community facilities costly and problematic. It results in the duplication of facilities and services, which is evident from the analysis of community facilities in the District. The threshold levels for the provision of community services are however low in rural areas, due to vast distances and low population densities characterising these areas.

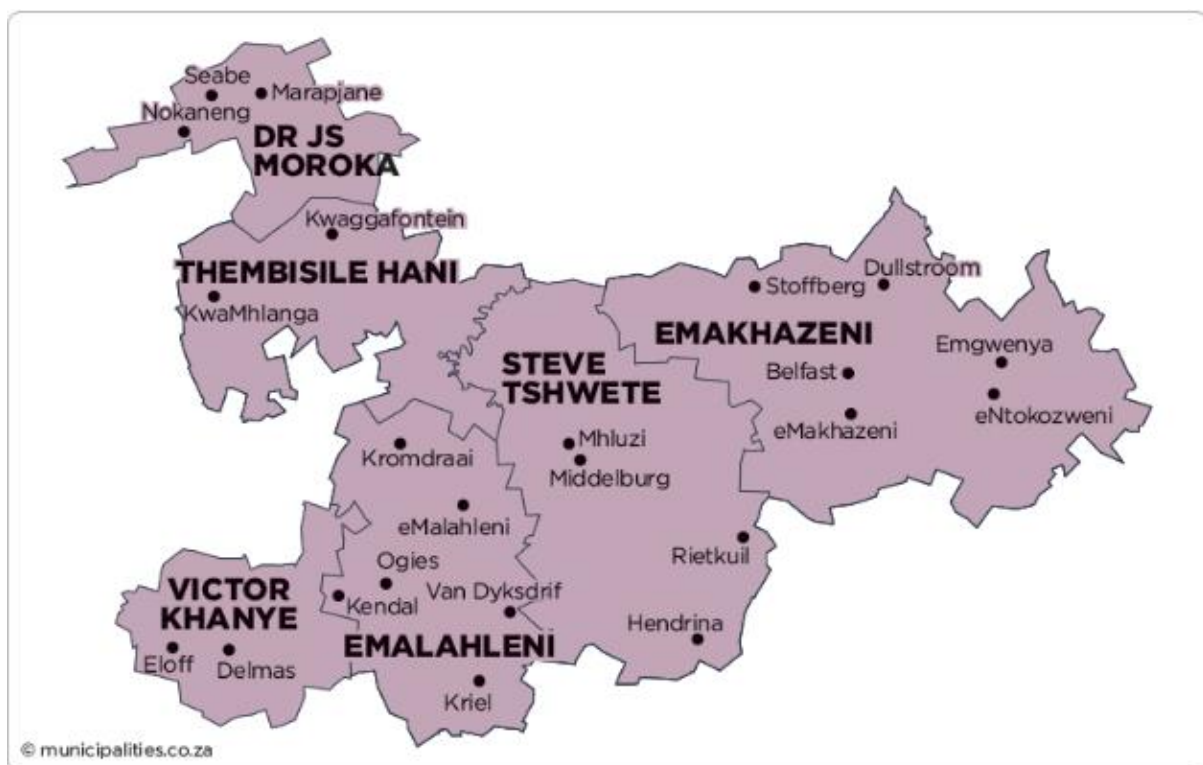
The spatial distribution of people reflects that there are three distinguishable groups of people affected by poverty, namely:

1. Tribal Authority Areas: The main concentration of poor people is in the north west of the Nkangala District. The conglomeration of settlements in these areas present communities displaced. These areas have limited local economies, because expenditure until recently mainly occurred closer to employment centres.

¹⁰ All the salient points below comes from the NKANGALA DISTRICT MUNICIPALITY RURAL DEVELOPMENT PLAN as is available on the Nkangala website.

2. Informal Settlements: The second concentration of poor people is communities residing in informal settlements on the periphery of towns, specifically the informal settlements situated around main city centres. The population densities in these areas are very high, with poor access to basic infrastructure and community facilities. These areas also have no local economies and are reliant on the main centres for employment and business activities.
3. Farms and Mining Villages: The third category of poor people resides in the rural areas on small mining villages and on farms. The communities residing on farms are particularly vulnerable, as they do not have ownership of the land where they are staying and are affected by evictions and unfair labour practices. These communities must travel long distances to the major centres in the Nkangala District to access community facilities and economic activities and are highly reliant on public transport, which is generally poor.

Map 3: District Map



The N4 and N11 freeways create economic opportunities for the Nkangala District through trade opportunities associated with the Maputo and Richards Bay harbours as well as tourism opportunities associated with some of the main tourism centres in South Africa. The inherent potential to this initiative is however not optimally utilised at this stage.

The R540, which runs from the N4 freeway through Emakhazeni and Dullstroom, provides a link with the tourist attractions located in the Graskop, Lydenburg, Sabie, Pilgrim's Rest and Hoedspruit areas (Tourism Triangle) which should be protected and further enhanced in future.

The road network in southern parts of the district is frequently damaged due to high volumes of coal haulage.

The NDM Industrial Development Strategy identified significant potential for manufacturing in the District in other centres like Victor Khanye, Emakhazeni, KwaMhlanga, Kwaggafontein and Siyabuswa but most of this potential is latent at this stage.

Agriculture is very important to the economy of the district. The southern regions of Nkangala are suitable to crop farming, specifically for fresh produce such as maize and vegetables. The northern regions are suitable for cattle farming and game farms.

Agri-processing and export opportunities in view of the linkages to two harbours are not fully utilised while agricultural activity in Thembisile Hani and Dr JS Moroka is at a very low (mainly subsistence) level.

The Nkangala District offers considerable tourism potential. The economy of the eastern areas of the District is already growing due to the increasing popularity of tourist destinations in the Emakhazeni Municipality.

The north western areas of the District also offer opportunities for tourism, through the consolidation of the various nature reserves and open spaces in Dr JS Moroka and Thembisile Hani, but this potential is unexploited at this stage.

The agriculture and tourism sectors have the potential to employ large numbers of relatively unskilled workers. Hence, these sectors should be targeted in order to use indigenous resources to create jobs.

The greatest challenge that the NDM faces is in terms of the availability of water resources, as well as the distribution and management of water services in the former homeland areas.

14.3 Demographics

Nkangala is one of three district municipalities in the Mpumalanga Province. The headquarter of Nkangala is in Middelburg (Steve Tshwete Municipality). Nkangala is composed of 6 local municipalities, of which Victor Khanye is the one where the project is located.

Economically, when one thinks of Nkangala, South Africa's coal and electricity nexus arises. Nkangala is well-known for powering much of South Africa and hence the project, at first glance, ought to be suitable for this area.

Victor Khanye¹¹ is situated on the Western Highveld of Mpumalanga Province covering a geographic area of approximately 1567 square kilometres. The prominent towns and settlements in the municipality include Arbor, Argent, Delmas and Lionelton.

Nkangala, as of end of 2015, had 1.4 million inhabitants, and Mpumalanga itself had a population of 4.2 million - Nkangala thus had a third of Mpumalanga's population in that year.

The population of Nkangala has grown at an annual average rate of 2.1% between 2005 and 2015, which is more than the provincial average of 1.4% or the national average of 1.5%. The increase in the local population can be ascribed to the increase in in-migration of job-seekers to the area.

Victor Khanye is one of the smaller municipalities in Nkangala and had a total population of slightly over 84 000 in 2016. The municipality had a relatively high average annual population growth which amounted to 2.5% between 2011 to 2016.

In 2015 Nkangala's population was *mainly* African and white, at 89% and 9% respectively.

In 2015, 212 000 people in Nkangala were infected with HIV. It is estimated that just over 6.1 million people of the national total are infected with HIV. The rate of increase in HIV infections is in excess of the growth rate of the population of the district, the province and the country as a whole.

14.4 Gross Geographic Analysis

Nkangala had a GGP¹² of R112.3 billion in 2015 and this made up 41.2% of the province's GGP. Nkangala's GGP is 3.1% of the national GDP as at 2015, and this is, relatively speaking, a significant GGP in South Africa. Unfortunately, the average annual growth rate of the Nkangala economy between 2005 and 2015 was only 1.4% and did not match the increase in the population growth rate.

The GGP of Victor Khanye at 2015 current prices was R9.6 billion which was 7.8% of the district municipality. Again, relatively speaking, R9.6 billion is a large economy for a local municipality.

The sectoral breakdown of Nkangala shows that agricultural and mining had respective GGP's of R2.1 billion and R45.9 billion. These made up 43% of Nkangala's total GGP of R112.3 billion in 2015. To put this in perspective, mining and agriculture today comprise (~) 10% of the South African economy. The total of coal mining and electricity production makes up 50% of the Nkangala

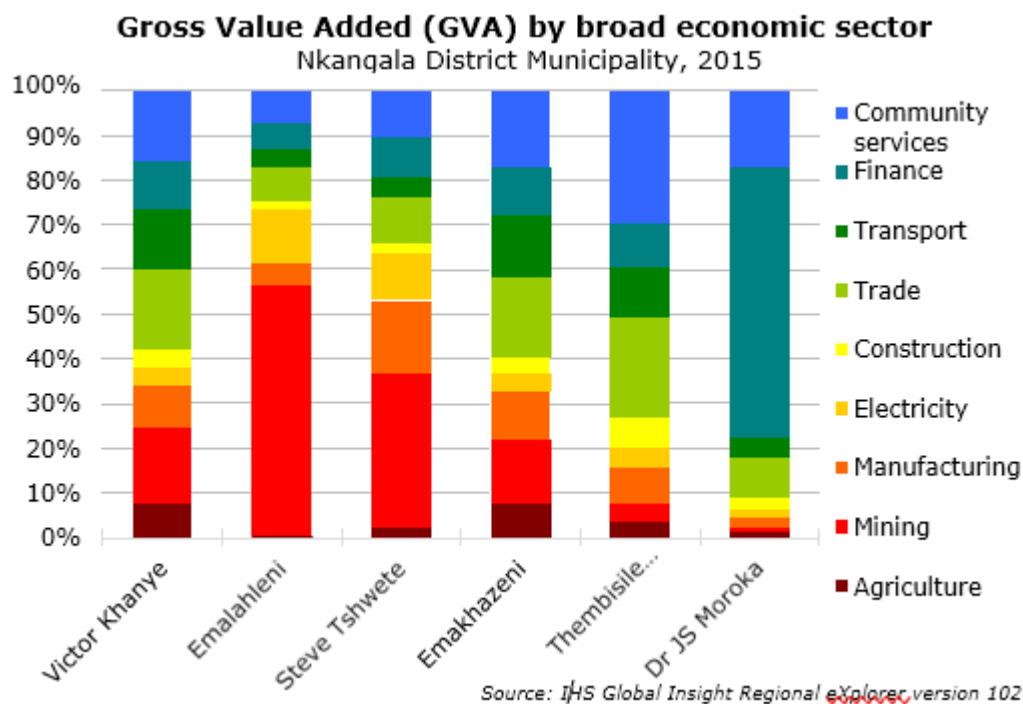
¹¹ All the economic information summarized had been derived from the Nkangala 2017 IDP.

¹² GGP = Gross Geographic Product.

economy, whereas the national equivalent comparison is 12%. This is an indication of how skewed the Nkangala economy is.

In the case of Victor Khanye, the agricultural sector is relatively higher as a proportion of its own GDP compared with the equivalent for Nkangala. In the latter, most of the mining takes place in Emalahleni and Steve Tshwete. The average annual growth rate of agriculture in Nkangala was 1.8% between 2005 and 2015, and for mining it was a relatively low growth rate of 0.9%. The construction and finance sectors had the highest growth rates of all the sectors in the economy.

Map 4: GVA (a slightly different measure of GDP) of Nkangala and its municipalities



Source 1: Nkangala IDP, 2017/18-2021/2022

The Tress index which measures the degree of concentration of an area's economy on a sectoral basis shows that Nkangala has a relatively high concentrated economy as was indicated above where mining and electricity made up more than 50% of the total production in the district. As is to be expected, when a Tress index is high, then one would expect the location quotient for a number of sectors will also be high. A location quotient measures the comparative advantages of one region over another. In the case of Nkangala, the location quotient for mining and electricity respectively is 5 and 2.5 times higher than that of South Africa. On the one hand, this simply corroborates that Nkangala is rich in coal resources, and subsequently power generation plants, which is an undoubted comparative advantage. On the other hand, it also indicates that unless these comparative

advantages are wisely used for economic diversification, Nkangala's economy may not be sustainable.

14.5 Labour and poverty

In 2015, Nkangala had a working age population of 920 000 people. Of this amount, the economically-active population was only 573 000 people. The economically-active population had an average annual growth of 3.4%, which confirms that the influx of work seekers, given that the total population growth rate in SA is much lower. Therefore, the labour force participation rate which is the economically-active population, as a percentage of the total working age population in 2015, was 62.3%. This is 9% more than the national average of 57.9%.

Nkangala's employment as at the end of 2015, were 361 000 people, which is 63% of the economically-active people. That puts the unemployment rate at 37% in Nkangala. Using the same yardstick (please note that different commentators use different calculations), this unemployment rate is higher than the 26% for the whole of SA. The reason why Nkangala has such a high unemployment rate is because two of its rural municipalities, Thembisile Hani and Dr JS Moroka have high unemployment rates (around 50% on average), and this reduces the rate for the district. In addition, all the job seekers entering the local economy do not get formal employment.

The effective demand per job every year is on average a paltry 11 000 jobs per annum, whereas the effective supply of labour is 16 000 per annum. Thus, over a ten-year period, the net supply of labour, that did not get a job, amounted to 50 000 people.

To understand the dire unemployment situation in Nkangala, and by extension the rest of SA, in the former's case it has 355 000 people employed, and 514 000 without a job. This is effective 59% of the working age population without a job, regardless of how the official statistics calculate the measures.

Because of the highly capital-intensive nature of mining and electricity, one now finds that the majority of Nkangala's employment is in wholesale, retail, and community and business services. It can be argued that these are in fact multiplier jobs created by agriculture, mining and power generation. A very high number of people (32 900) work for other households.

Between agriculture, mining and electricity, there are respectively 16 000, 49 200 and 12 100 employees. This makes up only 21% of employment, compared to contributing over 60% to the GGP. In other words, the other economic sectors that contribute 40% to the Nkangala GGP provide 79% of the jobs.

The unemployment rate for Victor Khanye is 21.6%, being the second lowest of all the municipalities in the Nkangala district. Steve Thswete had the lowest unemployment rate at 16.4%.

The poverty rate in Victor Khanye stands at 34.1% which is higher than the 32.3% rate for the Nkangala district. The overall percentage of people in Nkangala living in poverty has decreased by a third between 2005 and 2015.

The Human Development Index, which is a composite index of three basic dimensions being life expectancy, adult literacy rate and GDP per capita, has improved by 20% in the last 10 years, and this is a significant improvement. The Emalahleni and Steve Tshwete municipalities have the highest of the human development indices, with Victor Khanye following in third position out of the 6 local municipalities.

In conclusion, the Nkangala economy is spearheaded by the coal and electricity production industries and, as a result, had attracted many job-seekers into the area. Over the last decade, the area has generated more jobs relative to the economic base than that of the whole of South Africa, but with the in-migration came increased poverty because all the job-seekers were unable to find jobs. Nkangala has two rural and relatively poor municipalities, but Victor Khanye, the project labour area, is relatively wealthy compared with many other municipalities in South Africa.

Witbank, Middelburg and Delmas areas are well developed, and are well-known for their competencies in coal mining and power generation. This is to the project's advantage as it is located in close proximity to these more prosperous areas.

15 First view Impacts

Given that this is a scoping report and a full analysis had not been undertaken yet, the following impacts must be regarded as a first view only.

15.1 Alternative land-use analysis

The methodology of the below table is explained on page 22 in paragraph 12.2.

The below indicates that the mining alternative landuse is better for the local economy based on current information because the net employment benefit to the economy is estimated at 113 people and the net GGP addition for the life of the project is R1.7 billion in 2017 Rand.

Cognisance must be taken that the gross new employment for the mine at steady state is 300 employees, but this is reduced by a factor of 9/25 years to adjust for its shorter life span. As said in

this report, 25 years is a rule of thumb of an economic generation. A similar amount of people would need to be employed during the first two years of mining construction.

In addition to this, the GGP for the project is discounted heavily to address the inherent risk in mine economic failure. In the case of this project, once a bankable feasibility study is complete and a competence persons report had been undertaken, the inherent riskiness of mining viability reduces dramatically.

Table 1: Economic alternative land-use analysis

Row #	Economic Aspects	Katanga	Agriculture	Cost-benefit
2	Potential Agricultural hectares directly displaced		(300)	
3	Precautionary approach (radius of 1 km around mine)		(314)	
4	Total Potential agricultural land lost		(614)	
5	Estimated market value for agricultural land ph (R'000)		R 20 k	
6	Potential Agricultural Land Value Lost		-R 12 m	
7	Life of mine / economic generation (years)	9	25	
8	Initial construction employment (FTEE)	290		
9	Adjust for 2 years construction	23		23
10	Employees per 100 hectare		3	
11	Add new employment/jobs retained vs opportunity losses	300	(18)	282
12	Employment based on FTEE	108	(18)	90
13	FTEE Jobs Created / Retained / (Lost) inc constrc'n	131	(18)	113
14	GDP per employee (R'000)	R 1 888 k	R 250 k	
15	GDP added/lost per annum (Rm)	R 566 m	-R 5 m	R 562 m
16	Discount Rate	33%	6%	
17	Period of Discount	9	25	
18	Present Value of EVA (GDP) (Rm)	R 1 585 m	-R 59 m	R 1 526 m
19	Total Investment/(Property Value Lost)	R 234 m	-R 12 m	R 222 m
20	Total Present Value of EVA + Property value(Rm)	R 1 819 m	-R 71 m	R 1 747 m

Source 2: Own calculation

15.2 Full economic analysis

15.2.1 First view of rating

The table below gives an outline of the scoping impact assessment.

The impact methodology used is that of the methodology provided by the EAP of this study, namely Environmental Impact Management Services. This is described below.

Table 2: Impact assessment methodology

Nature	-1	Negative	CONSEQUENCE	ENVIRONMENTAL RISK
	1	Positive		
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)		
	2	Site (i.e. within the development property boundary),		
	3	Local (i.e. the area within 5 km of the site),		
	4	Regional (i.e. extends between 5 and 50 km from the site)		
	5	Provincial / National (i.e. extends beyond 50 km from the site)		
Duration	1	Immediate (<1 year)		
	2	Short term (1-5 years),		
	3	Medium term (6-15 years),		
	4	Long term (the impact will cease after the operational life span of the project),		
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).		
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),		
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),		
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),		
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or		
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).		
Reversibility	1	Impact is reversible without any time and cost.		
	2	Impact is reversible without incurring significant time and cost.		
	3	Impact is reversible only by incurring significant time and cost.		
	4	Impact is reversible only by incurring prohibitively high time and cost.		
	5	Irreversible Impact		
Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),	PROBABILITY	
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),		
	3	Medium probability (the impact may occur; >50% and <75%),		
	4	High probability (it is most likely that the impact will occur- > 75% probability), or		
	5	Definite (the impact will occur),		
Public feedback	1	Low: Issue not raised in public responses	PRIORITISATION FACTOR	
	2	Medium: Issue has received a meaningful and justifiable public response		
	3	High: Issue has received an intense meaningful and justifiable public response		
Cumulative Impact	1	Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.		
	2	Medium: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.		
	3	High: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.		
Irreplaceable loss of resources	1	Low: Where the impact is unlikely to result in irreplaceable loss of resources.		
	2	Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.		
	3	High: Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).		
Degree of Confidence	Low	<30% certain of impact prediction		
	Medium	>30 and < 60% certain of impact prediction		
	High	>60% certain of impact prediction		
Phases		Planning		
		Construction		
		Operation		
		Decommissioning		
		Rehab and closure		

Table 3: Pre- and Post mitigation impact assessment

IMPACT DESCRIPTION					
Impact	Alternative	Phase	Pre-mitigation ER	Post-mitigation ER	Confidence
Net GGP Impact	Alternative 1	Construction	6	6	Medium
Net Employment Impacts	Alternative 1	Construction	7	7	Medium
Forex savings	Alternative 1	Construction	-9	-9	Medium
Fiscal Income	Alternative 1	Construction	11	11	Medium
Economic development per capita	Alternative 1	Construction	7	7	Medium
Country and Industry Competitiveness	Alternative 1	Construction	6.75	6.75	Medium
Alternative Land-use	Alternative 1	Construction	13.75	13.75	Medium
Need and Desirability	Alternative 1	Construction	9	9	Medium
Net GGP Impact	Alternative 1	Operation	11	16	Medium
Net Employment Impacts	Alternative 1	Operation	9	16	Medium
Forex savings	Alternative 1	Operation	11	14	Medium
Fiscal Income	Alternative 1	Operation	12	12	Medium
Economic development per capita	Alternative 1	Operation	10	12	Medium
Country and Industry Competitiveness	Alternative 1	Operation	14	15	Medium
Alternative Land-use	Alternative 1	Operation	16.25	18	Medium
Need and Desirability	Alternative 1	Operation	17.5	19	Medium
Net GGP Impact	Alternative 1	Decommissioning	-12	-12	Medium
Net Employment Impacts	Alternative 1	Decommissioning	-12	-12	Medium
Forex savings	Alternative 1	Decommissioning	-18.75	-18.75	Medium
Fiscal Income	Alternative 1	Decommissioning	-18.75	-18.75	Medium
Economic development per capita	Alternative 1	Decommissioning	-12	-12	Medium
Country and Industry Competitiveness	Alternative 1	Decommissioning	-15	-15	Medium
Black Economic Transformation	Alternative 1	Decommissioning	-13	-13	Medium
Alternative Land-use	Alternative 1	Decommissioning	-12.5	-12.5	Medium
Need and Desirability	Alternative 1	Decommissioning	-13	-13	Medium
GGP Impact	Alternative 1	Rehab and closure	-18.75	-18.75	Medium
Employment Impacts	Alternative 1	Rehab and closure	-15	-15	Medium
Forex savings	Alternative 1	Rehab and closure	-16.25	-16.25	Medium
Fiscal Income	Alternative 1	Rehab and closure	-16.25	-16.25	Medium
Economic development per capita	Alternative 1	Rehab and closure	-16.25	-16.25	Medium
Country and Industry Competitiveness	Alternative 1	Rehab and closure	-13	-13	Medium
Alternative Land-use	Alternative 1	Rehab and closure	-17.5	-17.5	Medium
Need and Desirability	Alternative 1	Rehab and closure	-16	-16	Medium

The blow are explanatory notes to the above.

Impacts	Operational Phase
Construction Phase	<p>The discussion below pertains mainly to the operational phase, and it needs to be noted that during the construction phase there will be intense employment and GGP creation in the form of investments made.</p> <p>However, compared to an economic generation of 25 years, the economic benefits are derived for a short period, and for that reason that positive impact ratings are not as high as the operational phase.</p> <p>A further factor to note is the new investment in only a fraction of the existing investment in the form of the coal plant. Should the replacement costs of the existing plant be included, as an opportunity cost given that this plant may become disused, then the investment impacts would be rated much higher.</p>
GGP Impact	<p>The reason why the GGP impact above is rated as “somewhat positive”, as</p>

Impacts	Operational Phase
	<p>opposed to “significantly” or “absolutely positive”, which is more desirable, is because the project extension is economically over a short period. An economic generation is 25 years and this extension has a life of mine of only nine years. Our calculation shows that the total GGP added over a 9-year period by the project amounts to R4.4 billion in real terms. The GGP of the project is calculated as the initial investment, the ongoing maintenance investment and the GGP portion of total revenue. Note total revenue is not GGP because all intermediary expenses need to be deducted. GGP is effectively EBITDA plus salaries and wages, in other words accounting items that are not paid across to other firms.</p> <p>The total GGP for Nkangala in 2018¹³ is estimated at R118 billion – this is the obvious GGP for one year only. However, the R4.4 billion above is the total GGP of the project over 9 in real terms. To compare the impact over an economic generation, one has to multiply the R118 billion by 25 years. Using this calculation, the GGP for an economic generation is thus R2 892 billion, and hence the direct increase of the mine’s GGP to that of the Nkangala district over an economic generation amounts to 0.2% directly. (R4.4 billion/R2 892 billion).</p> <p>This fraction increase is small to the Nkangala economy, however, if one compares this expansion for example to the establishment of a maize farm on the same hectares used by the mine, in other words look at it on an alternative land use basis, then this is high. The mine will create a GGP of R4.4 billion over 9 years relative to the opportunity cost of lost agricultural GGP of R328 million over 25 years¹⁴.</p>
Employment Impacts	<p>The mine will effectively not increase employment. It will maintain / “save” 300 permanent jobs when it closes other parts of its operation and expand its production by developing a new open pit coal mine. In economic terms, however, this can be regarded as creating new 300 jobs, because these jobs would have been lost to the economy. However, these jobs are only created for 9 years, and hence the “full time economic jobs” amount to $9/25 \times 300 = 108$ jobs. Often this can be viewed as controversial because it reduces the number of jobs, however, in our view this remains the best method to calculate the benefit.</p>

¹³ Source of Information – Nkangala 2017 IDP – most economic information was obtained from this document, unless otherwise stated.

¹⁴ This calculation is made by Strategy4Good using a variety of different sources.

Impacts	Operational Phase
	<p>The creation of the above 108 FTEE jobs from the project now needs to be compared to the potential job losses in agriculture. To answer this, we make a number of assumptions that are often not popular with applicants of mining right licensees, but as we are independent we find these assumptions conservative and biased towards agriculture. We do this because agricultural land is under pressure and food security is of major concern in this country.</p> <p>Based on publications and surveys by StatsSA there were 0.2 employees per hectare in Nkangala as far back as 1996. At the time of writing this report, we did not have more recent statistics, however, from personal visits and work done in Mpumalanga, our experience is that at present there are possibly 0.1 worker per hectare per maize farmer. This is as a result of mechanisation and in fact the “delabourisation” of farms in SA. In this study we decided to work on an average of 0.15 employees per hectare. Although the farm that’s been impacted is 251 hectares, in our experience a mine indirectly often impacts double that amount of land – often due to dust, traffic, noise and other factors that make farming difficult. Using the precautionary approach liberally, we can thus say that the opportunity job losses in agriculture may be 75 jobs (251 ha x 2 x 0.15 employee per ha). When we thus compare the 108 FTE jobs created by the mine and compare that to the potentially 75 jobs lost in agriculture, then one has to conclude that the net benefit is small.</p> <p>However, this is not a sufficient reason to argue that this mining project should NOT continue. A combination of all the factors indicate that in the main this expansion is economically needed.</p>
Forex savings	<p>South Africa¹⁵ at present has R700 billion in foreign exchange and the project is not likely to export more than R1 billion per annum, and hence this net benefit is not significant. However, a country’s gold reserves and foreign exchange is one of the most important bases for international investor confidence. The higher this amount, the better a country can manage foreign investment and trade, and exchange rate fluctuations. Thus, developments such as this project, relatively small as it may be, has important strategic value.</p>

¹⁵ Source: <https://tradingeconomics.com/south-africa/foreign-exchange-reserves>

Impacts	Operational Phase
	<p>The exact amount of exports from the impacted land is difficult to calculate but the following assumption can be made: Assume the impacted area exports half of its production, then total exports over a 25-year period could potentially be R412 million over an economic generation. The total exports from the mining sector is potentially R9 billion over 9-years. The mining benefit therefore outweighs agriculture considerably.</p>
Fiscal Income	<p>Determining the effective tax rate per industry and in particular per enterprise is very difficult. On average, as an economic quantity, and based on our own internal estimates, both agriculture and mining may well pay tax in the amount of 2% of their total GGP's per industry. The tax to be earned by the project is minute in terms of South African tax base, even should one include PAYE and other indirect taxes. However, it can safely be said that the tax to be paid by the mine, even though only over a 9-year period, will significantly outstrip that of the displaced tax income of farming in the impacted area.</p> <p>If we return to the GGP of R4.4 billion over 9 years of the mine relative to the opportunity cost of lost agricultural GGP of R328 million over 25 years, then it goes without saying at an income tax rate of 2% of GGP, mining could contribute R316 million to the state coffers, and agriculture only R6.4 million over the next economic generation.</p>
Economic development per capita	<p>The actual increase in GGP per capita is relatively small at R331 per capita as a result of the project, relative to an existing R82 645 per capita for Nkangala in 2018. This expansion may assist the poor to a small extent, but not significantly. For this the size of this project and the time duration is too small and short. The dependency ratio (population/formally employed) in 2015 was 3.8 and hence looking at the job creation / maintenance one can argue that the livelihoods of 1 805 are improved/maintained in the district. Although every human life matters this statistic in macro terms is not significant.</p>
Country and Industry Competitiveness	<p>One of South Africa's undoubted competitive advantages had always been stable and inexpensive electricity. Sadly, this does not seem to be the case anymore, and this project expansion undoubtedly will contribute to this competitiveness.</p> <p>A quick calculation indicates that the coal to be provided by the project expansion could result in a contribution of 0.1% of megawatts produced by Eskom. This could potentially mean that R4.6 billion of the national GGP of R4 600 billion (2017) could be supported by this expansion.</p>

Impacts	Operational Phase
Alternative Land-use	<p>When we look at the alternative land use analysis then we can summarise the findings from the above and state that study mining is overwhelmingly more beneficial than agriculture because of the creation of GGP of R4.44 billion over 9 years in real terms relative to the opportunity costs of agricultural GGP of R328 million over 25 years. This is a significant benefit to the local economy.</p> <p>Admitting that we are somewhat biased in favour of agriculture in calculating jobs created versus jobs lost, then we find that the mine will create a FTE jobs of [-] 108 jobs and potentially in agriculture 75 jobs could be lost. The net job benefits are therefore not significant.</p> <p>The project may well earn R1 billion per annum in foreign exchange as opposed to approximately R33 million that agriculture could earn on the impacted properties. Again this is of major significance and a major benefit to mining.</p> <p>Given the high generation of GGP over 9 years of R4. 4 billion relative to the R328 million over 25 years foregone in agriculture, and working on a 2% income tax as a percentage of GGP for both industries, then again mining is by far a better alternative.</p>
Need and Desirability	<p>This expansion's most significant contributor to its need and desirability from an economic perspective, and not an environmental perspective, is that it would add to the sustainable supply of coal to Eskom at a time when it is well known that coal is being transported from outside the region to feed Eskom's power stations. In addition to that it can be said that this project will support the equivalent of R4.6 billion worth of GGP in South Africa through more reliable electricity generation. At a GGP per capita of R383 000 in 2018, then sustaining a GGP of R4.6 billion implies that 12 000 jobs are potentially supported per annum by this expansion.</p>

16 Mitigation / Enhancement

The following mitigation /enhancement measures is recommended:

- a) The mine should establish a similar farm either in the same municipal area, or in a different area in the district to compensate for the loss of agricultural production. The key issue is food security and although the land lost to agriculture is small in extent, this mitigation measure will neutralise the loss of farm production. Based on the IDP information provided, there are agricultural opportunities in the North-western part of the district. The Southern part of the district, where the mine is located, has the climate and soils for crop and maize farming, and if there is scope to establish or restart a farm in the area, then this is recommended.
- b) Should the mine be able to rehabilitate its existing open pit earmarked for closure, this would be the most desirable mitigation measure.
- c) The mine needs to ensure that current employees on the farms need to be placed in either jobs at the mine, or that these employees agree that they do not wish to accept the jobs offered to them.
- d) The bankable feasibility study and independent competence persons reports are necessary to validate the economic viability of the mine.
- e) The mine needs to comply with all the new regulation in the mining charter as this is designed to increase local content and BBBEE procurement. This will strengthen both backwards and forward linkages.
- f) The mine obviously needs to execute its SLP commitments flawlessly as this execution is aimed at developing the quality of life of the inhabitants of the district.

17 Workplan going forward

Workplan to calculate alternative land-use analysis and economic impacts	Information needed / process to follow
<i>Date to be completed: At the final date of the overall EIA.</i>	
a. Interviews with farmers, the mine and other key stakeholders to obtain the information required below.	Individual meetings and attendances of public participation hearings
b. The project's GGP will be calculated using the MWP. GGP is the sum of EBITDA and salaries and wages and these numbers are therefore available based on its submitted MWP.	Obtain latest copy of MWP
c. The GGP lost will be calculated based on the best agricultural yields per hectare, as opposed to the actual yields in the study area. The reason for this is that the farms belong to the applicant and is being leased out to existing farmers. Therefore one would expect that the farms may not be as well utilised as is expected.	Obtain latest economic yields per hectare in local area. Compare to actual yields on piece of land.
d. Most of the other economic quantities, for example foreign exchange benefits or losses, fiscal numbers, and others are a function of GGP and these will be modelled using known economic quantitative formulae.	Undertake economic modelling.
e. The multiplier effect used will be based on national and regional published multipliers. Multipliers for a study area is notoriously inaccurate because of project specific leakages, but given that multipliers are simply a subset of the direct impacts, the latter is the most instructive and these quantities have a high degree of correctness.	Analyse the mine's current procurement data. Obtain national data.
f. The competitiveness rating will be done based on literature research and interviews with the mine.	Literature search.
g. The employment quantities are well-known.	Confirm this information.
h. Potential Agricultural hectares directly displaced is available.	None
i. Precautionary approach (radius of 1 km around mine)	None
j. Total Potential agricultural land lost	Sum of above.
k. Estimated market value for agricultural land ph (R'000)	Desktop literature search to determine value of farms
l. Potential Agricultural Land Value Lost	Product of the above
m. Life of mine / economic generation (years)	Given
n. Initial construction employment (FTEE)	Calculated
o. Adjust for 2 years construction	Calculate
p. Employees per 100 hectare in agriculture	Research and interview with farmers
q. Add new employment/jobs retained vs opportunity losses	Given
r. Employment based on FTEE	Calculated
s. FTEE Jobs Created / Retained / (Lost) inc constrc'n	Given
t. GDP per employee (R'000)	Calculated

Workplan to calculate alternative land-use analysis and economic impacts	Information needed / process to follow
u. GDP added/lost per annum (Rm)	Calculated
v. Discount Rate	Calculated
w. Period of Discount	Given
x. Present Value of EVA (GDP) (Rm)	Calculated
y. Total Investment/(Property Value Lost)	Calculated
z. Total Present Value of EVA + Property value(Rm)	Calculated
aa. Potential Agricultural hectares directly displaced	Calculated

18 Assumptions and limitations

With respect to this scoping study, the following assumptions and limitations have been made:

- a. That the mine will be economically viable.
- b. That the farmland that is being replaced is producing farm produce at an optimum level.
- c. Although this is a rule of thumb, that an economic generation is 25 years, and hence the 9-year life of mine is compared to the agricultural production of 25 years.
- d. The both Agriculture and Mining are important economic sectors for the study area.
- e. That detailed stakeholder consultations will follow and this will inform the final report.
- f. That no environmental fatal flaw impact exists that will make the economic benefits scoped in this report invalid.
- g. That at the writing of this report detailed multiplier effects had not been interrogated.

19 Conclusion

In conclusion at this point of the scoping study, the benefits of the project will outstrip that of the agriculture alternative land-use. The project's strategic value of supplying coal to Eskom is significantly positive, its GGP addition outstrips that of agriculture over an economic generation by a significant amount, and the mining alternative adds more jobs to the local municipality.