SOCIAL IMPACT ASSESSMENT REPORT

FOR THE

KEBRAFIELD ROODEPOORT COLLIERY NATIONAL ENVIRONMENTAL MANAGEMENT ACT APPLICATION FOR ENVIRONMENTAL AUTHORISATION REF:17/2/3N-289 & INTEGRATED WATER USE LICENSE APPLICATION

Department: Minerals Resources Ref: MP 30/5/1/2/2/479 MR



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TABLE OF CONTENTS

1.	INTRODUCTION	9
1.1.	Background	9
1.2.	Project Details	9
1.3.	Social Impact Assessment	9
1.4.	Approach to the SIA Study	10
1.5.	Key Components of an SIA	10
1.6.	Terms of Reference	10
1.7.	Assumptions and Limitations	10
2.	PROJECT DESCRIPTION	11
2.1.	Project Location	11
2.2.	overview of the Mining Operation	11
2.3.	Box Cut Opencast Mining with a Roll-over Rehabilitation Sequence	13
3.	LEGISLATION AND POLICY INSTRUMENTS	17
3.1.	The Constitution of the Republic of South Africa	17
3.2.	National Environmental Management Act (No107 of 1998)	17
3.3.	National Water Act (No 36 of 1998)	18
3.4.	Mineral and Petroleum Resources Development Act No 22 of 2008)	18
3.5.	Nkangala District Municipality Integrated Development Plan (2013-2014)	18
3.6.	Steve Tshwete Local Municipality Spatial Development Framework (2008)	19
3.7.	Mpumalanga Economic Growth and Development Path (2011)	19
3.8.	Provincial Growth and Development Strategy (2004 – 2014)	19
4.	SOCIO-ECONOMIC OVERVIEW OF THE STUDY AREA	20
4.1.	Mpumalanga Province	20
4.1.1	. Population	21
4.1.2	2. Age-Sex Structure	22
4.1.3	8. Marital Status	22
4.1.4	Education	23
4.1.5	5. Type of Dwelling	23
4.1.6	5. Tenure Status	24
4.1.7	2. Electricity Use	24
4.1.8	B. Access to Basic Services	25
4.1.9	e. Labour Force	25

4.2. Nka	ngala District Municipality	26
4.2.1.	Population	27
4.2.1.1.	Population Size	27
4.2.1.2.	Population Growth Rate	28
4.2.1.3.	Race Groups	28
4.2.1.4.	Functional Age Group	28
4.2.1.5.	Household Heads	29
4.2.1.6.	Age and Sex Structure	29
4.2.1.7.	Dependency Ratio	30
4.2.1.8.	Marital Status	30
4.2.2.	Education	31
4.2.2.1.	Highest Level of Education Attained	31
4.2.2.2.	School Attendance	31
4.2.3.	Unemployment Rate	32
4.2.4.	Housing	32
4.2.4.1.	Average Household Size	32
4.2.4.2.	Types of Main Dwelling	33
4.2.4.3.	Tenure Status	33
4.2.5.	Access to Basic Services	34
4.2.5.1.	Electricity Use	34
4.2.5.2.	Refuse Removal	34
4.2.5.3.	Potable Water	35
4.2.5.4.	Sanitation facilities	35
4.2.6.	Average Household Income	36
4.3. STE	EVE TSHWETE LOCAL MUNICIPALITY	36
4.3.1.	Population	37
4.3.1.1.	Population Size	37
4.3.1.2.	Population Growth Rate	38
4.3.1.3.	Race Groups	38
4.3.1.4.	Functional Age Group	38
4.3.1.5.	Age Structure	39
4.3.1.6.	Household Heads	39
4.3.1.7.	Dependency Ratio	40
4.3.1.8.	Marital Status	40

4.3.2	2.	Education	41
4.3.2	2.1.	Highest Level of Education Attained	41
4.3.2.2. School Attendance		School Attendance	41
4.3.3	8.	Employment	42
4.3.3	8.1.	Unemployment Rate	42
4.3.3	8.2.	Employment Status	42
4.3.4	ŀ.	Housing	43
4.3.4	l.1.	Type of Main Dwelling	43
4.3.4	l.2.	Tenure Status	43
4.3.4	1.3.	Number of Households	44
4.3.4	l.4.	Household Size	44
4.3.5	5.	Access to Basic Services	45
4.3.5	5.1.	Electricity Use	45
4.3.5	5.2.	Refuse Removal	45
4.3.5	5.3.	Potable Water	46
4.3.5	5.4.	Toilet Facilities	46
4.3.6	S.	Average Household Income	46
4.3.7	7 .	Land Use	47
5.	SOC	IAL IMPACT RATING METHODOLOGY	48
6.	ASSESSMENT OF KEY SOCIAL IMPACTS		50
6.1.	1. Construction Phase		50
6.2.	2. Operational Phase		55
6.3.	3. Decommissioning Phase		58
6.4.	6.4. Cumulative Impacts		59
7.	CONCLUSION AND RECOMMENDATIONS		60

LIST OF TABLES

Table 1: Project Proponent Details

Table 2: Landowner Details

LIST OF FIGURES

Figure 1: Proposed Site Location 11 Figure 2: Layout of Mine as Per Results of Exploration Drilling 12 Figure 3: Typical Coal Surface Mining Opencast Sequence Indicating Primary Procedures 14 Figure 4: Typical Coal Surface Mining Opencast Sequence indicating Rollover Backfill Rehabilitation 14 Figure 5: Opencast Coal Mining Sequence 15 Figure 6: Opencast coal mining typical progressive steps (No 1- 5) 15 Figure 7: Provincial Boundary Changes from 2001 to 2011 (Statistics SA, 2012) 20 Figure 8: South Africa Land Area Distribution (Statistics SA, 2014) 21 Figure 9: Population of Mpumalanga Province (Statistics SA, 2014) 21 Figure 10: Number of Households in Mpumalanga (Statistics SA, 2014) 22 Figure 11: Age-Sex Structure (Statistics SA, 2014) 22 Figure 12: Marital Status (Statistics SA, 2014) 23 Figure 13: Level of Education for those Aged 20 Years and Older (Statistics SA, 2014) 23 Figure 14: Types of Dwellings (Statistics SA, 2014) 24 Figure 15: Tenure Status (Statistics SA, 2014) 24 Figure 16: Electricity Use in Mpumalanga (Statistics SA, 2014) 25 Figure 17: Access to Basic Services (Statistics SA, 2014) 25 Figure 18: Employment and Unemployment (Statistics SA, 2014) 26 Figure 19: Nkangala District Municipality Map (Source: Steve Tshwete SDF, 2010) 27 Figure 20: Population of Nkangala DM (Statistics SA, 2014) 27 Figure 21: Population Growth Rates (Statistics SA, 2014) 28 Figure 22: Race Groups in Nkangala (Statistics SA, 2014) 28 Figure 23: Functional Age Groups in Nkangala (Statistics SA, 2014) 29 Figure 24: Female and Child Household Heads in Nkangala (Statistics SA, 2014) 29 Figure 25: Age-Sex Structure of Nkangala DM (Statistics SA, 2014) 30 Figure 26: Dependency Ratios in Nkangala (Statistics SA, 2014) 30 Figure 27: Marital Status in Nkangala (Statistics SA, 2014) 31 Figure 28: Level of Education in Nkangala (Statistics SA, 2014) 31 Figure 29: School Attendance of the Population Group Aged 5 to 24 Years (Statistics SA, 2014) 32 Figure 30: Unemployment Rate in Mpumalanga (Statistics SA, 2014) 32 Figure 31: Average Household Size in Nkangala (Statistics SA, 2014) 33 Figure 32: Main Dwelling Types in Nkangala (Statistics SA, 2014) 33 Figure 33: Tenure Status in Nkangala (Statistics SA, 2014) 34 Figure 34: Electricity Use in Nkangala (Statistics SA, 2014) 34 Figure 35: Access to Refuse Removal (Statistics SA, 2014) 35 Figure 36: Access to Piped Water (Statistics SA, 2014) 35 Figure 37: Access to Sanitation Facilities (Statistics SA, 2014) 36

9 9

Figure 38: Local Municipality Locality Map (Source: Steve Tshwete LM SDF, 2010)	37
Figure 39: Population of Steve Tshwete (Statistics SA, 2014)	38
Figure 40: Race Groups in Steve Tshwete (Statistics SA, 2014)	38
Figure 41: Functional Age Groups (Statistics SA, 2014)	39
Figure 42: Age Structure of Steve Tshwete (Statistics SA, 2014)	39
Figure 43: Household Heads in Steve Tshwete (Statistics SA, 2014)	40
Figure 44: Dependency Ratio of Steve Tshwete (Statistics SA, 2014)	40
Figure 45: Marital Status of Steve Tshwete (Statistics SA, 2014)	41
Figure 46: Highest Level of Education Attained (Statistics SA, 2014)	41
Figure 47: School Attendance in Steve Tshwete (Statistics SA, 2014)	42
Figure 48: Unemployment Rate in Steve Tshwete (Statistics SA, 2014)	42
Figure 49: Employment Status in Steve Tshwete (Statistics SA, 2014)	43
Figure 50: Type of Main Dwelling (Statistics SA, 2014)	43
Figure 51: Tenure Status in Steve Tshwete (Statistics SA, 2014)	44
Figure 52: Number of Households (Statistics SA, 2014)	44
Figure 53: Average Household Size (Statistics SA, 2014)	45
Figure 54: Electricity Use in Households (Statistics SA, 2014)	45
Figure 55: Households with Access to Refuse Removal (Statistics SA, 2014)	45
Figure 56: Households with Access to Tap / Piped Water	46
Figure 57: Households with Access to a Toilet Facility (Statistics SA, 2014)	46
Figure 58: Land Cover and Use in Steve Tshwete (Source: Steve Tshwete LM SDF, 2010)	47

ACRONYMS

AIDs	Acquired Immune Deficiency Syndrome				
CS	Community Survey				
CSI	Corporate Social Investment				
DEADP	Department of Environmental Affairs and Development Planning				
DMR	Department of Mineral Resources				
DM	District Municipality				
ECO	Environmental Control Officer				
EIA	Environmental Impact Assessment				
EMPr	Environmental Management Programme				
GHS	General Household Survey				
GVA	Gross Value Add				
HD	Historically Disadvantaged				
HIV	Human Immunodeficiency Virus				
IDC	Industrial Development Corporation				
IDP	Integrated Development Plan				
IEM	Integrated Environmental Management				
KPA	Key Performance Area				
LM	Local Municipality				
MEGDP	Mpumalanga Economic Growth and Development Path				
MPG	Mpumalanga Provincial Government				
MPRDA	Mineral and Petroleum Resources Development Act				
NEMA	National Environmental Management Act				
PGDS	Provincial Growth and Development Strategy				
ROM	Run of Mine				
SDF	Spatial Development Framework				
Stats SA	Statistics South Africa				
Std	Standard				
STD	Sexually Transmitted Disease				
SIA	Social Impact Assessment				
WULA	Water Use License Application				

1. INTRODUCTION

1.1. BACKGROUND

Eco Elementum (Pty) Ltd has been appointed by Eyethu on behalf of the applicant Kebrafield (Pty) Ltd to undertake the Environmental Impact Assessment (EIA) study and Water Use Licensing Application (WULA) for all the relevant activities listed under the National Environmental Management Act - NEMA (No. 107 of 1998) (as amended) and the National Water Act (No 36 of 1998) for the proposed colliery. The proposed Kebrafield Roodepoort Colliery will constitute an opencast mine producing approximately 800 000 tons of high grade coal over a period of approximately three years.

A mining right MP30/5/1/2/2/479 MR was granted to Kebrafield (Pty) Ltd, and it includes various farms and associated farm portions although for this specific project only portion 17 of the farm Roodepoort 151 IS is under consideration for use. As part of the EIA study currently underway, a Social Impact Assessment (SIA) is required to be undertaken.

1.2. PROJECT DETAILS

As mentioned above, the proposed colliery will be located on farm portion 17 of the farm **Roodepoort 151IS.** At present, a section of the proposed site is being used for maize cultivation and cattle grazing.

Applicant	Kebrafield (Pty) Ltd			
Contact Person	Wayne van der Burgh c/o Burgh Group Holdings (Pty) Ltd			
Physical Address	54 Guinea Fowl Street, Silver Lakes, Pretoria			
Postal Address	P.O. Box 71986, Die Wilgers, 0041, Pretoria			
Telephone	012 807 0229			
Fax	012 807 0339			

Table 1: Project Proponent Details

Table 2: Landowner Details

Landowner	Joseph Christiaan van Wyk
Contact Person	Van Wyk Attorneys
Physical Address	48 Mouton Street, Hendrina
Postal Address	P.O. Box 22, Hendrina, 1095
Telephone	013 293 0505
Fax	013 293 0530
Farm SG Code	T0IS00000000115100017

1.3. SOCIAL IMPACT ASSESSMENT

According to (Vanclay, 2002) a Social Impact Assessment (SIA) is defined as "the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programmes, plans and projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment" In summary, it involves the identification and evaluation of social impacts and thereafter proposing mitigation measures to enhance or prevent the impacts.

The key objective of an SIA is to avail a chance to Interested and Affected Parties (e.g. state organs, developers, communities, non-governmental organizations, civil society) to understand what the project is about and identify social impacts that may arise from a project (DEADP, 2007).

1.4. APPROACH TO THE SIA STUDY

For this particular SIA, a technocratic approach has been used that makes use of a quantitative research technique and this mainly involved the use of secondary data from census results, Integrated Development Plans, Spatial Development Strategies, Provincial Growth Paths and the internet.

1.5. KEY COMPONENTS OF AN SIA

The role of an SIA as part of an EIA study cannot be downplayed as it aids in providing a better understanding of the affected communities who make up the social environment. The Guidelines for Involving Social Assessment Specialists in EIA Processes (DEADP, 2007), outlines the following as key components of an SIA:

- "Describing and obtaining an understanding of the proposed intervention (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA.
- Collecting baseline data on the current social environment and historical social trends.
- Identifying potential alternatives.
- Identifying and collecting data on the SIA variables and social change processes related to the proposed intervention. This requires consultation with affected individuals and communities.
- Assessing and documenting the significance of social impacts associated with the proposed intervention.
- Assessing the alternatives and identifying potential mitigation measures.
- Developing a Monitoring and Evaluation Programme."

1.6. TERMS OF REFERENCE

Based on the above, this SIA will entail:

- Describing the environment that may be affected by the proposed colliery
- Describing the manner in which the environment may be affected by the proposed colliery
- Describing and assessing the potential social issues associated with the proposed colliery
- Identifying negative and positive impacts that may arise as a result of the proposed colliery and suggesting ways in which these impacts may be enhanced or mitigated against.

The tasks outlined above will be achieved by:

- A review of indicators with data from 2001 and 2011 Censuses, 2007 Community Survey and General Household Surveys (GHS) from Statistics South Africa (Stats SA).
- Review of legislation and policies of the geographical area.
- Review of information from other specialist studies undertaken for the project and other comparable projects.

1.7. ASSUMPTIONS AND LIMITATIONS

- All information provided to Eco Elementum by Eyethu is correct and valid.
- Eco Elementum does not accept responsibility for information that is availed later in the study.
- All data from published sources is accurate and valid as the time of publication.
- The scope of this study is limited to assessing the potential social impacts arising as a result of the proposed Kebrafield colliery.

2. PROJECT DESCRIPTION

2.1. PROJECT LOCATION

The proposed Kebrafield Roodepoort Colliery is located on the farm Roodepoort 151 IS portion 17 in the town of Pullen's Hope in the Steve Tshwete Local Municipality (LM) and within the Nkangala District Municipality (DM).

Pullen's Hope is situated approximately 5km west of the N11 between Middelburg and Hendrina. The proposed development is also situated south of Optimum Colliery, which supplies coal to the Hendrina power station immediately southwest of Pullen's Hope.

The image below illustrates the position of the proposed project site in relation to other towns in the vicinity of the operation. Only the northern section of portion 17 of the farm Roodepoort 151IS is proposed for the development and is indicated by the reddish polygon to the west of the town Pullen's Hope.



Figure 1: Proposed Site Location

2.2. OVERVIEW OF THE MINING OPERATION

The Kebrafield Roodepoort Colliery will be an opencast mine producing 800000 tons of high grade Bituminous Coal over a period of approximately three years. The coal is found in a single coal seam (2.5 -3.0m thick) of the Witbank Coal Field at depths varying from 6.5m to 28m deep. The colliery will be covering an extent of approximately 60ha of the 410ha Portion 17 of Roodepoort 151 IS farm (approximately 15% of the farm). The extent of the mining area is predetermined by the extent of the coal seam as has been determined during the prospecting phase of the project.

Mining methods vary widely and depend on the location, type and size of mineral resources. Surface mining methods are most economical in situations where mineral deposits occur close to the surface (e.g. coal, salts and other evaporite deposits or road quarry material) or form part of surface deposits (e.g. alluvial gold and diamonds, and heavy mineral sands). For this specific project, the mining of coal by means of surface mining methods is viable due to the fact that the resource is situated close enough to the surface to make it economically mineable. Typical surface mining methods include: strip mining and open pit mining, as well as dredge, placer and hydraulic mining in riverbeds, terraces and beaches. The Kebrafield Roodepoort Colliery will be mined by means of open pit or also known as opencast mining methods following a roll over rehabilitation sequence. These activities always disrupt the surface and this, in turn, affects soils, surface water and near-surface ground water, fauna, flora and all alternative types of land-use.

Besides the rate and method of mining, the location, variety and scale of mine infrastructure also influences the nature and extent of impacts. The Kebrafield Roodepoort Colliery will be mined relatively quickly in a period of one year compared to other mining operations that could last for several years and/or even decades. The fast mining sequence will ensure impact duration during mining is short. Typical mine infrastructure will include: haul roads; spoil dumps; surface facilities (e.g. offices, workshops, car parks and warehouses); tailings; waste rock disposal areas; transport and service corridors (e.g. railway lines, roads, pipelines, conveyers, power and water corridors); product stockpiles; chemicals and fuel storage areas; and housing facilities.

Figure 2 below illustrates the mine layout as is currently anticipated but is expected to change as the project is finalized.



Figure 2: Layout of Mine as Per Results of Exploration Drilling

The activities that will be established as part of the proposed Kebrafield Roodepoort Colliery include:

- Site preparation
- Box cut opencast mining with a roll over rehabilitation sequence
- Crushing and screening of the Run of Mine (ROM) coal

- Access road, haul road construction and road diversion of the existing road
- Semi temporary site offices and security office
- Semi temporary sanitation and change house
- Stores and store yard
- Workshop and maintenance area
- Bulk fuel storage
- Pollution control facility/dam (evaporation and dust suppression use)
- Clean and dirty water separation system
- Trenching
- Fencing
- Mine fleet hard park
- Staff and visitors parking
- Drilling, blasting and explosives handling
- Topsoil, subsoil, overburden, discard and ROM stockpiles
- Weighbridge
- Waste management
- Mine closure and rehabilitation

2.3. BOX CUT OPENCAST MINING WITH A ROLL-OVER REHABILITATION SEQUENCE

The most economical method of coal extraction from coal seams depends on the depth and quality of the seams, and also the geology and environmental factors of the area being mined. The impact of coal mining processes is generally differentiated by whether they operate on the surface or underground. In this instance the coal will be extracted by means of opencast surface mining methods. Coal is mined only where technically feasible and economically justifiable. Evaluation of technical and economic feasibility of a potential mine requires consideration of many factors namely: regional geological conditions; overburden characteristics; coal seam continuity; thickness, structure, quality, depth and strength of materials above and below the seam for roof and floor conditions; topography (especially altitude and slope); climate; land ownership (it affects the availability of land for mining and access); surface drainage patterns; ground water conditions; availability of labour and materials; coal purchaser requirements in terms of tonnage, quality, and destination; and capital investment requirements.

The Kebrafield Roodepoort Colliery operation proposes to use the rollover mining and rehabilitation method. Rollover opencast mining is typical of small scale opencast mining operations in the Mpumalanga coal fields. The open cast-able reserves will be mined in conventional truck and shovel mining methods using the lateral roll-over technique in a single direction. This would mean mining from the one side of the development footprint in a linear fashion towards the opposite side while backfilling and rehabilitating the area that has already been mined, thus creating the effect that the mining cuts are rolling over in a single direction. Sustainable development applied to mining works necessarily includes rehabilitation with the aim of either restoring the land to its original use, or eliminating or reducing adverse environmental impacts to a long-term acceptable condition. The process is driven primarily by legislation which ensures that the mine owner must comply with the intention of achieving those end conditions, which are defined in broad terms by guidelines.

An initial box cut as well as an access pit ramp into the box will be constructed first. A double box cut has been planned to enable mining in both a northerly and southerly direction, thereby increasing the face length and production rates. The ramp will have a maximum slope of 12°. Topsoil from the initial box cut will be stripped,

where after the subsoil and hard overburden will be drilled, blasted and removed. Topsoil, subsoil and hard overburden will each be stockpiled separately. After removal of the coal from the initial box cut, subsequent box cuts will be made and the initial void filled with the stockpiled hard overburden, subsoil and finally topsoil which will then be seeded and grassed to re-establish vegetation coverage to grazing capability.



Figure 3: Typical Coal Surface Mining Opencast Sequence Indicating Primary Procedures



Figure 4: Typical Coal Surface Mining Opencast Sequence indicating Rollover Backfill Rehabilitation

Figure 5 below indicates the typical mining sequence which involves initial removal of the overburden which will then be stockpiled behind the mining area to ensure it can be replaced back in the initial box cut. The physical mining of the coal seam follows which is then placed into trucks to be taken to the crushing and screening facility. From here discard coal will be extracted and replaced in the bottom of the opencast pit, while the product will be taken to the weighbridge via trucks and then removed off site. The overburden is replaced back into the pit as mining progresses leaving a minimum area open at a single time. The topsoil which was stripped and stockpiled separately before mining commenced, is then replaced and prepared to the optimal composition. This ensures that the field can be restored to grazing land as was the pre-mining land use.



Figure 5: Opencast Coal Mining Sequence

The sequence in Figure 6 serves as a further illustration of the anticipated project:

- Step (1) is where the topsoil will be stripped and stockpiled separately. After this, drilling takes place to enable blasting of the overburden.
- During step (2) the overburden is then removed by conventional truck and shovel methodology and stockpiled separately within the mining footprint.
- Thereafter, Step (3) includes the removal of under-burden which is typically associated with more hard material than fine material (typical of overburden) and is usually the sandstone layer on top of the coal seam. This material is also stockpiled separately.
- Next is step (4) which is the physical extraction of coal takes place.
- Lastly, step (5) indicates the conventional truck and shovel methodology of removing the material.



Figure 6: Opencast coal mining typical progressive steps (No 1- 5)

The following basic principles of rehabilitation form the basis of the roll-over mining methodology that entails concurrent rehabilitation as mining progresses:

- Prepare a rehabilitation plan prior to the commencement of mining which includes detailed surveys of the pre-mining environment to ensure the landscape can be restored to the pre-mining environment as close as feasible.
- Agree on the long term post mining land use objective for the area with the relevant government departments, local government and private landowners. The land use must be compatible with the climate, soil, topography of the final landform and the degree of the management available after rehabilitation.
- Progressively rehabilitate the site, where possible, so that the rate of rehabilitation is similar to the rate of mining.
- Prevent the introduction of noxious weeds and alien vegetation (typical to areas of disturbance).
- Minimise the area cleared for mining and associated infrastructure to only what is ultimately required and ensure no additional clearance of unnecessary areas.
- Reshape the land disturbed by mining operations so that it is stable, adequately drained and suitable for the desired long-term land use.
- Minimise the long-term visual impact by creating landforms which are compatible with the surrounding landscape.
- Reinstate natural drainage patterns disrupted by mining wherever possible.
- Minimise the potential for erosion by wind and water both during and following mining.
- Characterise the topsoil and retain it for use in rehabilitation. It is preferable to reuse the topsoil immediately rather than storing it in stockpiles. Only discard if it is physically or chemically undesirable, or if it contains high levels of weed seeds or plant pathogens.
- Consider spreading the cleared vegetation on disturbed areas.
- Deep rip compacted surfaces to encourage infiltration, allow plant root growth and join the topsoil to the subsoil, unless subsurface conditions dictate otherwise.
- Ensure that the surface (one or two metres) of soil is capable of supporting plant growth.
- If topsoil is unsuitable or absent, identify and test alternative substrates, e.g. overburden may be a suitable substitute after addition of soil improving substances.
- Re-vegetate the area with plant species consistent with the post mining land use.
- Monitor and manage rehabilitation areas until the vegetation is self-sustaining.

3. LEGISLATION AND POLICY INSTRUMENTS

3.1. THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of South Africa (Act No 108 of 1996) is the cornerstone of democracy in South Africa and under Chapter 2 it outlines the Bill of Rights which includes Section 24 that states:

Everyone has the right

- a) to an environment that is not harmful to their health or well-being; and
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that
 - i. prevent pollution and ecological degradation;
 - ii. promote conservation; and
 - iii. secure ecologically sustainable development and use of natural resources while promoting a justifiable economic and social development.

Section 24 thus requires that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval.

3.2. NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NO107 OF 1998)

The National Environmental Management Act (No 107 of 1998) (as amended) is the main piece of legislation in South Africa that governs all matters pertaining to the protection and conservation of the environment. This Act sets out in Chapter 1 the National Environmental Management Principles which amongst other things states that:

"(2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and <u>social</u> interests equitably.

(3) Development must be <u>socially</u>, environmentally and economically sustainable.

(4) (a) Sustainable development requires the consideration of all relevant factors including the following:

(viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

(b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

(h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.

(i) The <u>social</u>, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment."

NEMA also establishes the platform for ensuring Integrated Environmental Management (IEM) whose objective includes:

"23 -2(b) identify, predict and evaluate the actual and potential impact on the environment, <u>socio-economic</u> conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management."

24 (1) In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on—

(a) the environment; (b) socio-economic conditions; and (c) the cultural heritage,

of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity."

From the above excerpts of the Act, it can be seen that there is a strong focus on addressing social issues in the quest to ensure sustainable environmental management.

3.3. NATIONAL WATER ACT (NO 36 OF 1998)

The purpose of the National Water Act is "to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors (a) meeting basic needs of current and future generations; (e) facilitating <u>social</u> and economic development."

3.4. MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT NO 22 OF 2008)

Mining operations require environmental authorisation from the Department of Mineral Resources (DMR) for the mining right application in terms of Section 22 of the Mineral and Petroleum Resources Development Act (MPRDA). The following issues must be considered whilst undertaking the Environmental Impact Assessment study.

- The objectives of the MPRDA include giving effect to Section 24 of the Constitution by ensuring that the Nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development. (Section 2(h) of the MPRDA).
- The principles set out in Section 2 of NEMA serve as guidelines for the interpretation, administration and implementation of the environmental requirements of Section 37(1)(b) of the MPRDA.
- Section 38(1)(a) of the MPRDA requires that effect be given to the general objectives of Integrated Environmental Management laid down in the NEMA. IEM is a philosophy, which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development process in order to achieve a desirable balance between conservation and development;
- The Environmental Management Programme (EMPr) to be submitted is not limited to but must inter alia
 include the requirements of regulation 51 of the MPRDA. For instance, where regulation 51(a)(ii) refers
 to measures for the prevention, management and remediation of each environmental impact, these
 clearly must be understood in the context of the NEMA where the general objectives of the IEM include
 ensuring that the effects of activities on the environment receive adequate consideration before actions
 are taken in connection with them. This clearly requires a description of the mining project that lists each
 activity pertaining to the mining project, in order that each such activity can be assessed.

3.5. NKANGALA DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN (2013-2014)

The District's latest Integrated Development Plan (IDP) states that "it is the *principal strategic planning instrument, which guides and informs all planning and development, and all decisions with regard to planning, management and development, in the municipality. It is the the key instrument to achieve developmental local governance for decentralised, strategic, participatory, implementation orientated, coordinated and integrated development.*" The compilation of the IDP must take into account the current social environment in order to come up with Key Performance Areas (KPA) that would be formulated so as to address the various issued identified during that financial year.

3.6. STEVE TSHWETE LOCAL MUNICIPALITY SPATIAL DEVELOPMENT FRAMEWORK (2008)

The Spatial Development Framework (SDF) is a document that is prepared by the local government in order to direct the planning, development and use of municipality land with a view of ensuring development that is economically, socially and environmentally sustainable. The drafting of an SDF must include the assessment of the social environment of the local municipality which involves variables such as population, employment and economic status. SDFs and IDPs are related and therefore "they need to be aligned with set goals and directives and need to be reviewed continually to ensure synergy with local, provincial and national government" NDM, 2008.

3.7. MPUMALANGA ECONOMIC GROWTH AND DEVELOPMENT PATH (2011)

The Mpumalanga Economic Growth and Development Path (MEGDP) was compiled in a bid to address three main challenges facing the inhabitants of the province namely *unemployment, poverty and inequality*. These challenges could be attributed to and augmented by the history of apartheid and in more recent times the global economic recession. As a result, there have been concerted efforts to foster integrated economic development and to ensure sustainable natural resource use (Mpumalanga Provincial Government - MPG, 2011). An annual provincial economic growth rate of 5% to 7% has been marked as one of the ways in which targets set to address these challenges will be achieved with mining being a pivotal sector. The Growth Path thus succinctly outlines its key objective is "to improve the labour absorption of the economy, to reduce carbon emissions and to strengthen the link between science and technology on the one hand and growth and jobs on the other."

This Growth Path identifies that mining (mainly of coal, chrome, gold and platinum) is a key sector (although it is a capital intensive) identified for the provision of jobs in the province with projections from the Industrial Development Corporation (IDC) showing that mining could create 140000 direct jobs by 2020 and 200000 by 2030. At present, the vital role of mining in the provision of jobs in the province is acknowledged as worldwide, Mpumalanga ranks as the third largest coal exporting region. Locally, coal is mainly used for electricity generation.

3.8. PROVINCIAL GROWTH AND DEVELOPMENT STRATEGY (2004 – 2014)

The Mpumalanga Province Growth and Development Strategy (PGDS) is described by the MPG (2004) as the "the fundamental policy framework for the provincial government which sets the pace and tone for growth and development in the province. It addresses the key and most fundamental issues of development spanning the <u>social</u>, economic and the political environment and was developed for the purpose of aligning the policies and strategies of all spheres of Government. In short, it aims to ensure that development in the province can be sustained, is efficient, coordinated and integrated. One of the essential segments in the province that should have been attended to by the end of this 10 year framework is social development.

4. SOCIO-ECONOMIC OVERVIEW OF THE STUDY AREA

This section aims to put into context the social environment of the area of the proposed development by providing information on a three levels namely:

- Provincial Level
- District Municipality Level
- Local Municipality Level

4.1. MPUMALANGA PROVINCE

Mpumalanga province is the second smallest in size after Gauteng measuring 76495km² and covering 6.3% of the land area in the country. This current land area represents a decrease in the land area as the size recorded during census 2001 was 79487km². This decrease is attributed to the allocation of land to the City of Tshwane from the Victor Kanye (previously called Delmas) (Statistics SA, 2012).

The province is bordered to the North by Limpopo, to the West by Gauteng, to the South West by Free State, to the South East by KwaZulu Natal and Swaziland to the East. The administrative capital of the province is Nelspruit which is located approximately 400k from Johannesburg.



Figure 7: Provincial Boundary Changes from 2001 to 2011 (Statistics SA, 2012)



Figure 8: South Africa Land Area Distribution (Statistics SA, 2014)

4.1.1.POPULATION

The population of Mpumalanga has been steadily rising over the years with the current population recorded as 4039939 persons. A comparison between the three census periods reveals that between 1996 and 2001, the population increased by 7.7%, from 2001 to the 2007 Community Survey (CS) it increased by 8.3% and finally by 10.9% from the CS to 2011.



Figure 9: Population of Mpumalanga Province (Statistics SA, 2014)

The number of households in the province has also been increasing over the years in line with the increasing population as shown in Figure 10. Over a 15 year period, the number of households has risen from 669801 in 1996 to 1075488 in 2011.



Figure 10: Number of Households in Mpumalanga (Statistics SA, 2014)

4.1.2.AGE-SEX STRUCTURE

Figure 11 below illustrates the age-sex structure of the province which reveals that the population in Mpumalanga is mainly made up of young people falling under the age of 35. From a sex perspective, 48.6% of the population is composed of males while 51.4% are females, a ratio that has been maintained over the years from 1996.



Figure 11: Age-Sex Structure (Statistics SA, 2014)

4.1.3. MARITAL STATUS

In terms of marital status, the majority of the population has never been married a situation that has remained almost constant at over 60% over the three census periods. In contrast, the segment of the population that is married or living together as partners has remained under 30%.



Figure 12: Marital Status (Statistics SA, 2014)

4.1.4. EDUCATION

The level of education of the people (aged 20 years and above) of Mpumalanga shows a trend of fluctuation amongst those who have no form of schooling and those who have a grade 12 / Std 10 / Matric level of education. During censuses 1996 and 2001, a large segment of the population had no schooling whereas census 2011 revealed that the majority had at minimum a grade 12 / Std 10 / matric level of education. In contrast, the number of people who have received higher education training has steadily been rising over the years.



Figure 13: Level of Education for those Aged 20 Years and Older (Statistics SA, 2014)

4.1.5. TYPE OF DWELLING

The majority of the population of Mpumalanga lives in formal dwellings whereas the percentage of the population living in informal dwellings has been gradually declining.



Figure 14: Types of Dwellings (Statistics SA, 2014)

4.1.6. TENURE STATUS

Majority of the residents (over 50% of households) of Mpumalanga own their houses which they have paid off or are still paying for and this has been varying over the years. The percentage of households that rent houses has also been changing with a sharp increase experienced for the period 2007 to 2011.



Figure 15: Tenure Status (Statistics SA, 2014)

4.1.7. ELECTRICITY USE

Electricity is used for various purposes in the province and these include cooking, heating and lighting. The largest percentage of households utilizes electricity for lighting, followed by cooking and lastly for heating and all this use has been steadily increasing over the years.



Figure 16: Electricity Use in Mpumalanga (Statistics SA, 2014)

4.1.8. ACCESS TO BASIC SERVICES

The provision of basic services namely, refuse removal, toilet facilities and potable water is one of the major responsibilities of local municipalities. In Mpumalanga, 30% of the households at minimum have access to these basic services of which the highest percentage of households recorded during census 2011 had access to piped water. Access to refuse removal services and flush toilets has been increasingly steadily although it still remains relatively low at below 50% of the households.



Figure 17: Access to Basic Services (Statistics SA, 2014)

4.1.9. LABOUR FORCE

The number of people in the province who are employed has been constantly increasing with over 800000 persons recorded to be employed during census 2011. In contrast, the number of people unemployed has remained low over the years at slightly over 400000 during the last two census events. The unemployment rate (*defined as percentage of unemployed persons over the sum of employed and unemployed persons*) has indicated variations by ranging from 34.8% in 1996 to 43.1% in 2001 to 31.6 in 2011. The highest number of people who are not economically active was recorded in 2011 at over 1 million.



Figure 18: Employment and Unemployment (Statistics SA, 2014)

4.2. NKANGALA DISTRICT MUNICIPALITY

Mpumalanga province is divided into four (4) district municipalities (DMs) namely Nkangala, Ehlanzeni and Gert Sibande. Nkangala DM covers 16892km² / 188118ha in area and is further composed of six local municipalities namely:

- i. Steve Tshwete
- ii. Victor Khanye
- iii. Emalahleni
- iv. Emakhazeni
- v. Thembisile Hani
- vi. Dr J S Moroka



Figure 19: Nkangala District Municipality Map (Source: Steve Tshwete SDF, 2010)

4.2.1.POPULATION

4.2.1.1. POPULATION SIZE

The population of Nkangala DM has been rising over the years as revealed by the census data and currently stands at 1150240. As per census 2011, the DM has a ratio of almost 1:1 for males and females and the trend has remained constant with females forming a larger part of the population than males.



Figure 20: Population of Nkangala DM (Statistics SA, 2014)

4.2.1.2. POPULATION GROWTH RATE

A comparison of Nkangala with Gert Sibande and Ehlanzeni DMs shows that during the 10 year period between 2001-2011 it experienced the highest population growth at 2.5%.



Figure 21: Population Growth Rates (Statistics SA, 2014)

4.2.1.3. RACE GROUPS

The population of Nkangala is mainly composed of Black / African racial groups followed by Whites, Coloured and lastly Indians / Asians being the least. Trends from 2001 to 2011 shows that the percentage of black people has reduced from 91.2% to 88.2%, while coloureds have slightly increased from 0.9% to 1.1%, Indians have increased from 0.3% to 0.7% and whites have also increased significantly from 7.7% to 9.9%.



Figure 22: Race Groups in Nkangala (Statistics SA, 2014)

4.2.1.4. FUNCTIONAL AGE GROUP

The percentage of the population in the functional age groups of 0-14 years has declined significantly by 4.9% from 2001 to 2011. Additionally, the percentage of those 65 years and above has increased slightly by 0.6% within the same time period while the percentage of the population aged between 15-64 years has consistently increased by 4.3%.



Figure 23: Functional Age Groups in Nkangala (Statistics SA, 2014)

4.2.1.5. HOUSEHOLD HEADS

The percentage of female headed households has declined significantly by 5.8.% from 2001 to 2011 and similarly the percentage of child headed households has also declined by 0.8%.



Figure 24: Female and Child Household Heads in Nkangala (Statistics SA, 2014)

4.2.1.6. AGE AND SEX STRUCTURE

The population of Nkangala is mainly made up of young people under the age of 29.



Figure 25: Age-Sex Structure of Nkangala DM (Statistics SA, 2014)

4.2.1.7. DEPENDENCY RATIO

The dependency ratio (defined as the ratio of dependents--people younger than 15 or older than 64--to the working-age population--those ages 15-64¹) of Nkangala has been steadily decreasing from when it stood at 64.2% in 1996 to 60.7% in 2001 and finally to 50.4% in 2011.



Figure 26: Dependency Ratios in Nkangala (Statistics SA, 2014)

4.2.1.8. MARITAL STATUS

The marital status of the people of Nkangala has been varying over the years and results of census 2011 reveals that the largest proportion of the population has never been married. The proportion of those who are married / living together stands at 29.3%. On the other hand, the proportion of those who are widowed and divorced / separated is 3.2% and 1.4% respectively.

¹ http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/demographics/dependency_ratio.pdf



Figure 27: Marital Status in Nkangala (Statistics SA, 2014)

4.2.2. EDUCATION

4.2.2.1. HIGHEST LEVEL OF EDUCATION ATTAINED

For the population group of those aged 20 years and above, the percentage of those who have no schooling has impressively declined by almost half (11.42%) as it was recorded at 24.61% in 2001. The percentage of those who have attained Grade 12 / Matric has also improved from 19.9% in 2001 to 30% in 2011. Similarly, those who have attained a higher education has increased gradually from 6.1% in 2001 to 9.9% in 2011



Figure 28: Level of Education of the Population Group Aged 20 Years and Above in Nkangala (Statistics SA, 2014)

4.2.2.2. SCHOOL ATTENDANCE

The segment of the population of Nkangala aged between 5 and 24 years that attend school has been fluctuating over the years but has constantly remained above the 70% mark. As of 2011, 73.5% of the population attended school which was similar to what was recorded in 2001 and lower than 2001 when 74.6% attended school (a decline of 0.1%).



Figure 29: School Attendance of the Population Group Aged 5 to 24 Years (Statistics SA, 2014)

4.2.3. UNEMPLOYMENT RATE

The unemployment rate of Nkangala has been fluctuating over the years ranging from 35.2% in 1996 to a sharp increase in 2001 (43.8%) and a sharp decline by 2011 to 30.2%.



Figure 30: Unemployment Rate in Mpumalanga (Statistics SA, 2014)

4.2.4.HOUSING

4.2.4.1. AVERAGE HOUSEHOLD SIZE

The average household size in Nkangala has been progressively declining over the years with the size recorded in 2011 at 3.6%.



Figure 31: Average Household Size in Nkangala (Statistics SA, 2014)

4.2.4.2. TYPES OF MAIN DWELLING

According to census 2011, the most common form of dwelling in Nkangala is formal dwellings at 82.8% followed by informal dwellings at 13.9%. Traditional dwelling is the least popular at 2.4% which is a sharp decline from 11.4% in 1996 to 7.4% in 2001 and then to 2.4% in 2011.



Figure 32: Main Dwelling Types in Nkangala (Statistics SA, 2014)

4.2.4.3. TENURE STATUS

A comparison between the findings of census 2001 and census 2011 reveals that the percentage of people owning houses has declined by 3.4% while those who rent their houses has increased by 9.3%.



Figure 33: Tenure Status in Nkangala (Statistics SA, 2014)

4.2.5. ACCESS TO BASIC SERVICES

4.2.5.1. ELECTRICITY USE

Electricity in Nkangala is mainly used for lighting and the percentage of population utilizing it for this purpose has been rising. The other major forms of uses are heating which is second most common whereas cooking is the least common use.



Figure 34: Electricity Use in Nkangala (Statistics SA, 2014)

4.2.5.2. REFUSE REMOVAL

A large percentage of the population in Nkangala has access to some form of refuse removal. 49.7% have their refused removed by the local municipality or a private company while 43.4% have access to a communal dump or own one. Only 6.3% have no access to any form of refuse removal.



Figure 35: Access to Refuse Removal (Statistics SA, 2014)

4.2.5.3. POTABLE WATER

The percentage of the population recorded in census 2011 with access to piped water inside a dwelling or yard was 81.6%. Notably, the percentage with no access to piped water has been reducing from 12.2% in 1996 to 11.2% in 2001 and remarkably to 7.8% in 2011.



Figure 36: Access to Piped Water (Statistics SA, 2014)

4.2.5.4. SANITATION FACILITIES

Over 50% of the population of Nkangala has access to sanitation facilities in the form of a chemical or flush toilet. On the other hand, the percentage of the population with no access to sanitation facilities has also decreased and currently stands at 2.5% as per census 2011.



Figure 37: Access to Sanitation Facilities (Statistics SA, 2014)

4.2.6. AVERAGE HOUSEHOLD INCOME

The average household income has increased during the period 2001 to 2011 from R 35177 to R 89006 an increase of 153%.

4.3. STEVE TSHWETE LOCAL MUNICIPALITY

According to the draft Spatial Development Framework (2010), Steve Tshwete local municipality is located within Nkangala DM, and measures 3976km² with the municipality office being based in Middelburg. Steve Tshwete is composed of a number of towns and settlements namely Komati, Blinkpan, Pullen's Hope, Doornkop, Middelburg, Hendrina, Kraanspoort, Koornfontein, Rietkuil, Mhluzi, Kwa Makalane, Lesedi, Kwazamokuhle, Naledi and Presidentsrus. The town of Pullen's Hope is situated directly to the east of the proposed mine site and is located approximately 40km south of Middelburg and it is the 4th largest within the municipality. Pullen's Hope is also important because it serves the Hendrina Power Station which is located within its boundaries.

Steve Tshwete is located in a prime position as it is near the Maputo Development Corridor and the Middelburg/Bethal/Ermelo/Richards Bay Corridor and it also hosts the Columbus Steel factory. Additionally, Steve Tshwete is the second most urbanized local municipality at 72.1% after Emalahleni at 86.2% (IDP, 2013-2014).



Figure 38: Local Municipality Locality Map (Source: Steve Tshwete LM SDF, 2010)

4.3.1.POPULATION

4.3.1.1. POPULATION SIZE

The population of Steve Tshwete Local Municipality (LM) has increased significantly from 132263 in 1996 to 229830 in 2011. The male to female ratio has been almost equal over the past census periods and a change was recorded in 2001 when the number of males in the population surpassed that of females.



Figure 39: Population of Steve Tshwete (Statistics SA, 2014)

4.3.1.2. POPULATION GROWTH RATE

The population growth rate of Steve Tshwete has more than quadrupled from the period 1996-2001 when it was 1.07% to 2001-2011 recorded as 4.76%. This is evidenced by the increase in the population discussed in section 4.3.2.1 above.

4.3.1.3. RACE GROUPS

The population of the local municipality is dominated by black Africans followed by whites, a trend that has been maintained over the three census periods. Coloureds and Indians are also present but in very small numbers with the latter forming the smallest component of the population.



Figure 40: Race Groups in Steve Tshwete (Statistics SA, 2014)

4.3.1.4. FUNCTIONAL AGE GROUP

The age group of 15-64 years is the largest within the population of Steve Tshwete and it has been rising with the largest increase experienced between 2001 and 2011. The second biggest age group in the population is 0-14 years while the smallest is individuals 65 years and older.



Figure 41: Functional Age Groups (Statistics SA, 2014)

4.3.1.5. AGE STRUCTURE

Steve Tshwete's population is mainly composed of young people between the ages of 0-34 years where after it steadily declines with the least population group aged 85years and above.



Figure 42: Age Structure of Steve Tshwete (Statistics SA, 2014)

4.3.1.6. HOUSEHOLD HEADS

The percentage of the local municipality's population that is headed by females increased from 1996 to 2001 and thereafter, it stagnated between 2001 and 2011. In contrast, the highest percentage of child headed households was recorded in 1996 at 0.3% and there after it reduced to 0.3% in 2001 which was maintained for 2011.



Figure 43: Household Heads in Steve Tshwete (Statistics SA, 2014)

4.3.1.7. DEPENDENCY RATIO

Steve Tshwete LM hosts a population that is mainly made up of individuals falling under the working age group (over 80000 to 160000 individuals from 1996 to 2011). This is followed by dependants who are mainly individuals aged 14 years and younger (over 40000 individuals) and very few individuals over the age 65 (less than 20000) individuals.



Figure 44: Dependency Ratio of Steve Tshwete (Statistics SA, 2014)

4.3.1.8. MARITAL STATUS

Over the three census periods, the marital status of Steve Tshwete has been dominated by individuals who have never been married. This is then followed by individuals who are married / living together whereas individuals who are widowed and divorced form the least number.



Figure 45: Marital Status of Steve Tshwete (Statistics SA, 2014)

4.3.2. EDUCATION

4.3.2.1. HIGHEST LEVEL OF EDUCATION ATTAINED

According to the 1996 and 2001 censuses, the largest portion of the population in terms of higher education had completed some secondary education with the smallest portion only having completed primary school. This changed in 2011 as individuals who had completed grade 12 formed the largest portion while the least remained individuals who have only completed primary school.



Figure 46: Highest Level of Education Attained for Population Aged between 5 and 24 Years (Statistics SA, 2014)

4.3.2.2. SCHOOL ATTENDANCE

The number of people attending school in the municipality continues to increase as revealed by the census results where in 2011 it stood at over 50000 individuals. Similarly, those not attending school have also been rising but to a smaller extent with the highest number (over 20000) recorded during census 2011.



Figure 47: School Attendance in Steve Tshwete for Population Aged between 5 and 24 Years (Statistics SA, 2014)

4.3.3. EMPLOYMENT

4.3.3.1. UNEMPLOYMENT RATE

The highest unemployment rate in the municipality was recorded in census 2001 when it stood at 35.4%. This rate had reduced drastically as recorded during census 2011 which was almost equal to that recorded during the 1996 census.



Figure 48: Unemployment Rate in Steve Tshwete (Statistics SA, 2014)

4.3.3.2. EMPLOYMENT STATUS

The number of people employed in the local municipality is more than the unemployed, a situation that has been constant over the three census periods. The highest number of employed people was recorded in 2011 at over 80000 while the lowest number of unemployed people was recorded in 1996.



Figure 49: Employment Status in Steve Tshwete (Statistics SA, 2014)

4.3.4. HOUSING

4.3.4.1. TYPE OF MAIN DWELLING

The most common form of dwelling in Steve Tshwete is formal housing followed by informal dwellings albeit to a significantly reduced extent. The least number (below 10000) of households in the municipality live in traditional houses.



4.3.4.2. TENURE STATUS

During census 2001, the majority of the residents of Steve Tshwete lived in houses that they owned / had fully paid off and the least occupied houses that were rent free. This changed in 2011 as the majority of the residents lived in rented houses, and this was closely followed by residents who owned their houses. An almost equal number of residents lived in houses that were still on mortgage or were rent free.



Figure 51: Tenure Status in Steve Tshwete (Statistics SA, 2014)

4.3.4.3. NUMBER OF HOUSEHOLDS

The total number of households in Steve Tshwete has been steadily increasing over the years and the current count is 64971 as revealed by census 2011.



Figure 52: Number of Households (Statistics SA, 2014)

4.3.4.4. HOUSEHOLD SIZE

The average household size currently stands at 3.3% which is a decrease from 1996 when it was 3.9% and 3.8% in 2001.



4.3.5. ACCESS TO BASIC SERVICES

4.3.5.1. ELECTRICITY USE

In Steve Tshwete, electricity is mainly used for lighting and this is supported by the constant results of the censuses 1996, 2001 and 2011. To date, the number of households with access to electricity has also increased to over 40000 compared to approximately 20000 households in 1996 and 2001.



Figure 54: Electricity Use in Households (Statistics SA, 2014)

4.3.5.2. REFUSE REMOVAL

Refuse in Steve Tshwete is mainly removed by the local municipality and according to census 2011 results, more than 50000 households were serviced. Other households make use of communal or own refuse dumps for waste management whereas the number of households with no access to a form of rubbish disposal is minimal.



Figure 55: Households with Access to Refuse Removal (Statistics SA, 2014)

4.3.5.3. POTABLE WATER

The number of households in Steve Tshwete with piped water inside the house / yard has exponentially increased from the last count conducted during census 2001. Currently, over 50000 homes have access to tap water as compared to under 10000 households which still access water from communal taps or have none at all.



Figure 56: Households with Access to Tap / Piped Water

4.3.5.4. TOILET FACILITIES

The most widespread type of toilet facility among households in the local municipality is the use of flush / chemical toilets. The use of chemical / flush toilets has increased over the years and currently stands at over 50000 households. The use of pit latrines and bucket toilets is not common occurring in less than 10000 households over the three census periods. In 2001, 1381 households were recorded as having no access to a toilet.



Figure 57: Households with Access to a Toilet Facility (Statistics SA, 2014)

4.3.6. AVERAGE HOUSEHOLD INCOME

The distribution of the average household income in Steve Tshwete has increased from R55369 in 2001 to R1340266 in 2011 (242%). In terms of annual per capita disposable income (income received after taxes), Steve Tshwete had the highest amongst all LMs at R29339 (IDP, 2013-2014).

4.3.7.LAND USE

Steve Tshwete municipality is covered by a number of land uses as shown in the figure below.



Figure 58: Land Cover and Use in Steve Tshwete (Source: Steve Tshwete LM SDF, 2010)

5. SOCIAL IMPACT RATING METHODOLOGY

The impact assessment criteria used to determine the impact of the proposed development are as follows:

- Nature of the impact
- The **Source** of the Impact
- Extent The physical and spatial scale of the impact
- **Duration** The lifetime of the impact, that is measured in relation to the lifetime of the proposed development
- Intensity The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself
- **Probability** This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time;

Mitigation: The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

Previous experience has shown that it is often not feasible or practical to only identify and address possible impacts. The rating and ranking of impacts is often a controversial aspect because of the subjectivity involved in attaching values to impacts. Therefore, the assessment will concentrate on addressing key issues.

Activities within the framework of the proposed development and their respective construction and operational phases, give raise to certain impacts. For the purpose of assessing these impacts, the project has been divided into two phases from which impacting activities can be identified, namely:

- a) Construction phase: All the construction related activities on site, until the contractor leaves the site.
- b) Operational phase: All activities, including the operation and maintenance of the proposed development.

The criteria against which the activities were assessed are given below.

CATEGORY	VALUE	DESCRIPTION OR DEFINITION
	Extent	Extent to which the impact will occur
Site	1	Only as far as the activity
Local	2	Site and immediate surroundings
Regional	3	Impact on a regional scale
National /	4	National or International
International		
	Duration	The term or time period during which the impact is expressed, not
	Duration	The term or time period during which the impact is expressed, not the time until the impact is expressed. Where necessary, the
	<u>Duration</u>	The term or time period during which the impact is expressed, not the time until the impact is expressed. Where necessary, the latter is separately specified.
Temporary	Duration 1	The term or time period during which the impact is expressed, not the time until the impact is expressed. Where necessary, the latter is separately specified. This is very short term, usually a construction impact
Temporary Short term	Duration 1 2	The term or time period during which the impact is expressed, not the time until the impact is expressed. Where necessary, the latter is separately specified. This is very short term, usually a construction impact During the operational activities
Temporary Short term Long term	Duration 1 2 3	The term or time period during which the impact is expressed, not the time until the impact is expressed. Where necessary, the latter is separately specified. This is very short term, usually a construction impact During the operational activities During closure / decommissioning of the operation

Severity		The magnitude of the potential impact	
Very Low 1		Natural, cultural and social functions are not affected	
Low 2		Affected environment is altered but natural, cultural, and social	
		functions and process continue both in a modified way	
Moderate	3	Natural, cultural and social functions and processes are altered	
		to the extent that it would temporarily cease	
High	4	Natural, cultural and social functions and process are altered to	
		the extent that it would permanently cease	
	Probability	The likelihood of the impact occurring	
Improbable	1	Low possibility because of design or historic experience	
Probable	2	Distinct probability to occur	
Highly proba	ible 3	Most likely to occur	
Definitely	4	Will occur regardless of any prevention measures and/or there is	
		a history of (an) incident/s and/or complaints	
	Significance	This is integration (i.e.an opinion) of the severity, type, extent,	
		probability and duration of the impact. It is the best judgment of	
		whether the impact is important or not within the broad context,	
		once mitigation is taken into account.	
		By adding the value of the extent, duration, severity and	
		probability, a significance value will be obtained for each impact.	
		A significance rating is assigned twice to the impact. Firstly, to	
		indicate significance without mitigation or optimization and	
		secondly, to indicate significance after mitigation or optimization.	
		This is done to highlight the importance of mitigation or	
		optimization of potential impacts.	
No impact		A potential concern or impact, which, upon evaluation, is found to	
		have no impact.	
Very Low	1-4	Impacts will be of very low significance if the added values are	
		between 1 and 4.	
Low	5 - 8	Impacts will be of low significance if the added values are	
		between 5 and 8.	
Moderate	9 - 12	Impacts will be of moderate significance if the added values are	
		between 9 and 12.	
High	13 - 16	Impacts will be of high significance if the added values are	
		between 13 and 16.	
Very High	17 - 20	Impacts will be of very high significance if the added values are	
		between 17 and 20.	

6. ASSESSMENT OF KEY SOCIAL IMPACTS

Vanclay (2002) describes social impacts as "The consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional". Social impacts are rarely objective but instead are mostly subjective as individuals interpret matters differently depending on factors such as religion, culture, gender and level of education.

6.1. CONSTRUCTION PHASE

The key social issues associated with the construction phase include:

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS		PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
Approximately more than 100 direct jobs will be created which will be a mix of skilled (e.g. engineers, land surveyors, project managers), semi-skilled (e.g. equipment operators, vehicle drivers) and non skilled (e.g. manual labourers) positions. The jobs created are mainly associated with the construction of various infrastructure that is required at a mine e.g. roads, offices, stores, dams, fences, etc. A portion of the jobs created should be made available to local community members particularly the historically disadvantaged (HD) ones.	Extent: Local (+2) Duration: Short term (+1) Intensity: Low (+2) Probability: Definite (+4) Significance: Moderate +9)	•	Labour (particularly semi-skilled and low skilled) and contractors should be sourced locally where possible and reasonable. Local construction personnel and contractors must be trained so that their skills may be developed for use in the future beyond the jobs at the mine. Local community members, authorities and organizations should be informed of job opportunities available and the procedures (if applicable) to be followed in order to secure the jobs. Women should be considered in the provision of jobs to ensure that the entire community benefits. The developer must compile a database of goods and services providers from the local community who comply with their procurement requirements before commencement of the tender process for acquiring various services and goods. The developer and the local branch of the chamber of commerce in Steve Tshwete should strategize on ways in which the benefits of the proposed mine can be enhanced for the benefit of the receiving area.	Extent: Local (+2) Duration: Short-term (+2) Intensity: Moderate (+3) Probability: Definite (+5) Significance: Moderate (+12)

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS
			AFTER MITIGATION:
associated with the construction of mine infrastructure might also be created. These include businesses such as catering grocery, plant hire / supply, cleaning, transport, security, rental of accommodation, clothing stores, training facilities etc.			
All the above have the net effect of transforming the town of Pullen's Hope into a stature almost similar to that of Hendrina. Furthermore, the income generated will add to the much needed revenue that will be collected by the Steve Tshwete LM.			
Disruption of existing family	Extent: Local (-2)	• Labour (particularly semi-skilled and low skilled) and	Extent: Local (-2)
structures and social networks due	Duration: Short-term (-2)	contractors should be sourced locally where possible	Duration: Short-term (-2)
to the in migration of workers and	Intensity: Low (-2)	and reasonable. This is because those from the local	Intensity: Very low (-1)
job seekers into the area and	Probability: Highly Probable (-3)	will be no added pressure on available local amenities	Probability: Probable (-2)
that are too near the mine site.	Significance: Moderate (-9)	 such as housing. A monitoring forum should be formed consisting of community members so that the community can be 	Significance: Low (-7)
The movement of people		briefed from time to time on the risks to the society's	
particularly males into the local		fabric as a result of the project.	
municipality may lead to		 A code of conduct for the construction workers should be compiled and the information provided to and 	
incidences such as increased		signed by all relevant stakeholders in order to provide	
able to secure employment.		guidance on what behaviour is or is not permitted or	
dilution of family values leading to		acceptable.	
behaviours such as prostitution.		 A FIV/AIDS, STDS awareness programme should be designed and the members of the community together 	
promiscuity, teenage pregnancies		with the workers should be regularly trained and road	

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS
			AFTER MITIGATION:
and alcohol and drug abuse; increased number of people infected with HIV/AIDs and Sexually Transmitted Diseases (STDs).	Extent: Local (-2)	 shows conducted on risky behaviour that could expose them to these diseases. The contractor / developer should plan and provide for transport, housing, weekend breaks of any workers who are brought in from outside the town. The development site must be fenced off to prevent trespassing. Surrounding land owners need to be notified well in 	Extent: Local (-2)
infrastructure on surrounding	Duration: Temporary (-1)	advance of planned developments so that they are able	Duration: Temporary (-1)
properties. The presence of	Intensity: Low (-2)	to secure their property.	Intensity: Very Low (-1)
workers at the site and their	Probability: Probable (-2)	and signed by all parties on what action to take in the	
constant movement and activities could potentially result in veld fire incidences, damage to fences, gates, crops and possible death of livestock.	Significance: Low(-7)	 event of damage to property. An incidents report needs to be opened and maintained by the Environmental Control Officer at the site. This report will be used to record any complaints or incidences of damage to property. A code of conduct for the construction workers should be compiled and the information provided to and signed by all relevant stakeholders in order to provide guidance on what behaviour is or is not permitted and the consequences of disobedience. The development site must be fenced off to prevent trespassing. Housing for site workers should be provided at a properly designed and constructed camp. Open fires for whatever purpose be it cooking or heating must be strictly prohibited at the construction site and camp. Construction activities such as welding should be confined to designated areas and should be conducted during weather conditions that are not risky e.g. calm winds. 	Significance: Low (-5)
		 Adequate and easily accessible fire fighting equipment and a well stocked tool shed must be maintained to 	

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS
			AFTER MITIGATION:
POTENTIAL IMPACTS Reduced quality of life of the community in terms of physical and psychological health. During construction, many trucks, cars, and equipment such as fork lifts, cranes, and excavators will be in use at the site. This might lead to damage of existing roads; decreased safety of pedestrians and other road users; increase in traffic, increase in dusty and noisy conditions; improper waste management; and contamination	Extent: Local (-2) Duration: Short term (-2) Intensity: Moderate (-3) Probability: Definite(-4) Significance: Moderate (-11)	 PROPOSED MITIGATION enable repairs on damage property to be done without delay. In addition, a few workers should be trained on the proper use of the equipment. Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction. All safety incidents must be reported to the appointed safety officer. Proper signage must be erected on the site and adjacent properties so that people are made aware of the activities and its dangers. Ablution facilities must be provided on site and should be regularly emptied by a licensed service provider. Workers should be informed that relieving of oneself in surrounding bushes is strictly prohibited. Speed limits that have been set at the site and surrounding areas must be strictly adhered to and harsh provided on site and should be provided areas for a first strictly adhered to and harsh provided areas for strictly adhered to and harsh provided areas must be strictly adhered to and harsh provided and the strictly adhered to and harsh provided areas for strictly a	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION: Extent: Local (-2) Duration: Temporary(-1) Intensity: Low (-2) Probability: Probable (-2) Significance: Low (-7)
and other road users; increase in traffic, increase in dusty and noisy conditions; improper waste management; and contamination of ground and surface water resources. Presently, the roads in Pullen's Hope are tarred and in a fairly good condition.		 Workers should be informed that relieving of oneself in surrounding bushes is strictly prohibited. Speed limits that have been set at the site and surrounding areas must be strictly adhered to and harsh punishments set for offenders. The appointed contractor must ensure that any road damage caused by mine trucks is swiftly repaired to ensure safety of all road users. Dust suppression measures must be implemented to reduce the amount of dust released into the air. Such measures include using water bowsers to periodically spray the site especially during dry weather conditions. In addition, trucks transporting spoil material or top soil from the site must be covered to prevent loss of material while in transit. Equipment and trucks that produce loud noise must be fitted with appropriate silencers where possible. Workers on site must be trained on the correct handling of spillages and precautionary measures that need to have implemented to minimum addition and the minimum addition and trucks that produce lough noise must be fitted with appropriate silencers where possible. 	
		 Workers must be provided with spill kits and spills must be cleaned up immediately. 	

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS
			AFTER MITIGATION:
Damage to farming land and infrastructure such as buildings and roads due to construction activities may result in huge financial losses (repair costs, demolitions or decreased property	Extent: Local (-2) Duration: Temporary (-1) Intensity: Moderate (-3) Probability: Highly Probable (-3) Significance: Moderate (-9)	 General and hazardous waste disposal bins must be provided at various strategic locations on the site. An Environmental Control Officer (ECO) must be appointed to monitor that measures prescribed for noise, dust, and water resources protection are adhered to. A system needs to be put in place at the local health centres to monitor any changes in diseases particularly respiratory or those associated with contaminated water such as dysentery, typhoid etc. Ground water, surface water, air quality, and noise monitoring system must be implemented to ensure that levels prescribed are complied and if not urgent measures are taken to correct the situation. The mine should be designed in an efficient way that maximizes use of space and reduce wastage. This will eventually reduce the footprint of the mine. A rehabilitation programme must be included in 	AFTER MITIGATION: Extent: Site (-1) Duration: Temporary (-1) Intensity: Low (-2) Probability: Probable (-2) Significance: Low (-6)
demolitions or decreased property values) and loss of land for cultivation and grazing particularly on surrounding farm portions. Blasting of the ground for establishment of foundations might cause sink holes, underground fires or reduce stability of the land. This impact is critical because rural folk mainly rely on natural resources to sustain their livelihoods	Significance: moderate (-5)	 the appointed contractor's contract. Disturbed areas must be fully rehabilitated so that in future they can be utilized for uses such as maize farming that is presently being undertaken. The appointed ECO must ensure that the rehabilitation programme is complied with. 	Significance. Low (-0)

6.2. OPERATIONAL PHASE

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
The operation of the mine will create a number of full time direct jobs which will be created which will be a mix of skilled (e.g. engineers, land surveyors, project managers), semi-skilled (e.g. equipment operators, vehicle drivers) and non skilled (e.g. manual labourers) positions. Additional, complementary local jobs other than those directly associated with the operation of the mine infrastructure might also be created. These include businesses such as catering grocery, plant hire / supply, cleaning, transport, security, rental of accommodation, clothing stores, training facilities etc. All the above have the net effect of transforming the town of Pullen's Hope into a stature almost similar to that of Hendrina. Furthermore, the income generated will add to the much needed revenue that will be collected by the Steve Tshwete LM.	Extent: Local (+2) Duration: Temporary (+1) Intensity: High (+4) Probability: Definite (+4) Significance: Moderate +11)	 Labour (particularly semi-skilled and low skilled) and contractors should be sourced locally where possible and reasonable. The number of employment opportunities for local community members can be increased through the implementation of a skills development and training programme that will aid in meeting some goals in the Steve Tshwete local municipality IDP. Local community members, authorities and organizations should be informed of job opportunities available and the procedures (if applicable) to be followed in order to secure the jobs. Women should be considered in the provision of jobs to ensure that the entire community benefits. The developer must compile a database of goods and services providers from the local community who comply with their procurement requirements before commencement of the tender process for acquiring various services and goods. The developer and the local branch of the chamber of commerce in Steve Tshwete should strategize on ways in which the benefits of the receiving area. 	Extent: Local (+2) Duration: Temporary (+2) Intensity: High (+4) Probability: Definite (+5) Significance: High (+13)
The employment of workers at the mine will lead to an increase in	Extent: Local (+2) Duration: Long-term (+3)	 The local municipality must improve the social amenities so as to encourage its residents to spend 	Extent: Regional (+3) Duration: Long-term (+3)

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
disposable income in the town of Pullen's hope. These workers will spur economic growth by spending money in the local towns by shopping for household items, clothing, and spending money in entertainment areas and by rental or purchase of property.	Intensity: High (+4) Probability: Definite (+4) Significance: High (+13)	money locally.	Intensity: High (+4) Probability: Definite (+4) Significance: High (+14)
The operation of the mine may lead to an improvement of the quality of life of the community due to an increase in income levels.	Extent: Local (+2) Duration: Long term (+3) Intensity: Low(+2) Probability: Highly Probable (+3) Significance: Moderate(+10)	 All workers must be trained on financial management to ensure that they spend their money prudently and thus eventually having a positive impact on their living conditions. As per the requirements of the Social and Labour Plan, the mine must be obliged to form a community trust into which a certain percentage of the coal revenue will deposited into the trust. The money in the trust must be used in community up-liftment projects such as building of schools, health centres, libraries, community halls, crèches etc. The funds in the trust must be monitored and audited to ensure that they are used for credible projects that benefit all members of the community. 	Extent: Local (+2) Duration: Long term (+3) Intensity: High (+4) Probability: Definite (+4) Significance: High (+13)
Disruption / modification of the sense of place and visual landscape. Currently, the proposed site is being used for maize cultivation which is a typical rural land use.	Extent: Local (-2) Duration: Short term (-2) Intensity: Moderate (-3) Probability: Definite(-4) Significance: Moderate (-11)	 Natural vegetation must be maintained as much as possible during mining. This is because vegetation creates a screening effect thereby reducing the impact on the natural landscape. Other mitigation measures prescribed in the visual impact assessment report must be implemented. 	Extent: Site (-1) Duration: Short term (-2) Intensity: Low (-2) Probability: Probable (-2) Significance: Low (-7)

Reduced quality of life of the community in terms of physical and psychological health. During operation, many trucks, cars, and equipment such as fork lifts, cranes, and excavators will be in the site. This might lead to damage of existing roads; decreased safety of pedestrians and other road users; increase in traffic, increase in dusty and noisy conditions; improper waste management; and contamination of ground and surface water resources. • Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during the safety incidents must be reported to the appointed to the appointed to make the site. This might lead to damage of existing roads; decreased safety of pedestrians and other road users; increase in traffic, increase in dusty and noisy conditions; improper waste management; and contamination of ground and surface water resources. • All safety incidents must be provided on site and should be regularly emptied by a licensed service provider. Workers should be informed that relieving of oneself in surrounding areas must be strictly adhered to and harsh punishments set for offenders. • Significance: Low (-7) • Dust suppresents • The appointed contractor must ensure that any road damage caused by mine trucks is swiftly repaired to reduce the amount of dust released into the air. Such measures include using water bowsers to periodically spray the site especially during dry weather conditions. In addition, trucks transporting spoil material or top soil	POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS	PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS
Reduced quality of life of the community in terms of physical health. During operation, many trucks, cars, and excavators will be in the sity: Moderate (-3) probability: Definite(-4) Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction. Extent: Local (-2) Duration: Temporary(-1) Intensity: Low (-2) Probability: Definite(-4) operation, many trucks, cars, and excavators will be in use at the site. This might lead to damage of existing roads; conditions; improper waste management; and other road users; increase in traffic, increase in dusty and noisy conditions; improper waste resources. Significance: Moderate (-11) Ablution facilities must be provided on site and should be regularly emplied by a licensed service provider. Workers should be informed that relieving of oneself in surrounding areas must be strictly prohibited. Significance: Low (-7) Speed limits that have been set at the site and surrounding areas must be strictly adhered to and harsh punishments set for offencers. Speed limits that have been set at the site and surrounding areas must be strictly adhered to and harsh punishments set for offencers. Dust surpresion measures must be implemented to reduce the amount of dust released into the air. Such measures include using weather conditions. In addition, trucks transporting spoil material or top soil				AFTER MITIGATION:
 from the site must be covered to prevent loss of material while in transit. Equipment and trucks that produce loud noise must be fitted with appropriate silencers where possible. Workers on site must be trained on the correct handling of spillages and precautionary measures that need to be implemented to minimize potential spillages. Workers must be provided with spill kits and spills must be cleaned up immediately. General and hazardous waste disposal bins must be provided at various strategic locations on the site. 	Reduced quality of life of the community in terms of physical and psychological health. During operation, many trucks, cars, and equipment such as fork lifts, cranes, and excavators will be in use at the site. This might lead to damage of existing roads; decreased safety of pedestrians and other road users; increase in traffic, increase in dusty and noisy conditions; improper waste management; and contamination of ground and surface water resources.	Extent: Local (-2) Duration: Short term (-2) Intensity: Moderate (-3) Probability: Definite(-4) Significance: Moderate (-11)	 Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction. All safety incidents must be reported to the appointed safety officer. Proper signage must be erected on the site and adjacent properties so that people are made aware of the activities and its dangers. Ablution facilities must be provided on site and should be regularly emptied by a licensed service provider. Workers should be informed that relieving of oneself in surrounding bushes is strictly prohibited. Speed limits that have been set at the site and surrounding areas must be strictly adhered to and harsh punishments set for offenders. The appointed contractor must ensure that any road damage caused by mine trucks is swiftly repaired to ensure safety of all road users. Dust suppression measures must be implemented to reduce the amount of dust released into the air. Such measures include using water bowsers to periodically spray the site especially during dry weather conditions. In addition, trucks that produce loud noise must be fitted with appropriate silencers where possible. Workers on site must be trained on the correct handling of spillages and precautionary measures that need to be implemented to minimize potential spillages. Workers must be provided with spill kits and spills must be cleaned up immediately. General and hazardous waste disposal bins must be provided at various strategic locations on the site. 	Significance: Low (-7) Significance: Low (-7)
appointed to monitor that measures prescribed for			appointed to monitor that measures prescribed for	

POTENTIAL IMPACTS	SIGNIFICANCE RATING OF IMPACTS		PROPOSED MITIGATION	SIGNIFICANCE RATING OF IMPACTS AFTER MITIGATION:
			noise, dust, and water resources protection are adhered to.	
The mine will contribute to the	Extent: National (+4)	٠	No mitigation measure proposed.	Extent: National (+4)
growth of the national economy by	Duration: Long-term (+3)			Duration: Long-term (+3)
creating employment opportunities	Intensity: High (+4)			Intensity: High (+4)
which consequently improves the	Probability: Definite (+4)			Probability: Definite (+4)
lives of the employees and the				
communities in which they live. In	Significance: High (+15)			Significance: High (+15)
addition, the coal mined will be				
supplied to the Hendrina Power				
Station so as to generate				
electricity that is distributed around				
the country.				

6.3. DECOMMISSIONING PHASE

The proposed mine is expected to last for approximately 3 years after which it will need to be decommissioned. This may involve the demolition of the infrastructure, removal of equipment, and rehabilitation of the entire status to the natural state that it was in originally. Few job opportunities will be available during decommissioning and will only be temporary in nature. Furthermore, those employed at the mine will be laid off which has a negative spin off on their dependents and community in which they are based. This therefore, highlights the critical importance of a Social and Labour Plan in which the mine owners must fund and facilitate implementation of programmes that ensure the livelihoods of the community are protected throughout the life of the mine up to decommissioning. A positive impact of the decommissioning is that after rehabilitation, the natural environment will be restored to a post mining condition and also the site can be used for cultivation or livestock grazing which the local community can use to sustain their livelihood.

In order to reduce the negative impacts associated with decommissioning the following should be implemented:

- All workers must be given sufficient notice to allow them to plan for the immediate future.
- Adequate and reasonable severance packages must be provided to all workers to be retrenched.
- All rubble from demolition and disused and damaged equipment must be transported off site to a licensed disposal facility so that it does not become an eyesore.

6.4. CUMULATIVE IMPACTS

One of the cumulative impacts of constructing and operating a mine in the town of Pullen's Hope is that the ripple effects of disruption of existing family structures, dilution of the society's values and social networks will be felt for a long time. Increased incidences of teenage pregnancies, alcohol and drug abuse and increased rates of infection of people with HIV/AIDs (28.8% prevalence rate recorded in 2011 as per Nkangala IDP-2014) and STD's will put more pressure on the local government to provide social facilities such as rehabilitation centres, day care centres and social grants. In addition, a high incidence of disease occurrence reduces the number of able bodied individuals who can contribute to the growth of the local economy and creates more dependents. Lastly, teenage pregnancies result in the creation of single parent families and may prevent the teenage mothers from completing their education due to the diverted attention to the children.

Another cumulative impact of establishing the mine is that the natural landscape of the rural area is diminished and land uses that are compatible with the surrounding environment (e.g. livestock rearing and food crops cultivation) are reduced and replaced with large earth work operations that are characteristic of a mine. The net effect of this is a change in the sense of place and perception of Mpumalanga as a green, fertile province that is scenic and dotted with natural features such as wetlands and various wild animals. A decrease in the amount of arable land poses a threat to food security which is one of the pillars of the growth of a nation. Therefore, local community members must be encouraged to established vegetable gardens for their own consumption and possibly selling any surplus.

Last but not least, the operation of the mine for the production of coal contributes to the generation of electricity at the Hendrina Power Station. The net effect of this is that the additional electricity that is fed to the national grid ensures a secure energy supply to various consumers such as industries, small businesses and homes. A reliable supply of energy is crucial for the growth of any economy because it encourages both local and foreign investment, aids in the stabilization of the nation's currency, and facilitates job creation.

7. CONCLUSION AND RECOMMENDATIONS

The findings of this SIA indicate that the construction and the operation of the proposed Kebrafield Colliery have both positive and negative impacts. Positive impacts are mainly due to creation of employment opportunities, boosting of the local economy due to increased disposal income and contribution to the revenue of Steve Tshwete which ultimately may lead to improved quality of life. On the contrary, negative impacts may be experienced due to migration of job seekers into Pullen's Hope; damage to property and infrastructure because of mine activities; decline in the quality of life due to air, noise, land and water pollution and increased traffic.

As was seen in the preceding chapters, the majority of the population of Steve Tshwete is made up of individuals who are in the working age group of 15 to 64 years; are relatively educated having completed grade 10 / 12; and the number of those attending school is gradually rising. In 2011, the unemployment rate in Steve Tshwete stood at 19.9% with the number of those employed having significantly increased from previous years to just over 80000 people. Given this backdrop, the mine offers an opportunity to contribute to the overall improvement of the socio-economic status of Pullen's Hope.

Striking a balance between economic, social and environmental conservation is often challenging considering the numerous stakeholders and differing motives. A healthy competitive environment needs to be established for the opposing land uses such as mining, agriculture and human settlement because mining activities lead to large scale destruction of the environment and land disturbance. The Mpumalanga Growth and Economic Development Path (2011), therefore emphasizes that mining companies and their owners must be held responsible and be obliged to rehabilitate disturbed land and implement Corporate Social Investment (CSI) projects so that community members benefit from the proceeds of the mine. On the other hand, challenges that dog the mining industry must be addressed in order to create a level playing field and welcoming environment and encourage compliance with environmental legislation by those wishing to invest in mining. These include:

- Inadequate water supply
- Shortage of skilled personnel that forces mining companies to source workers from elsewhere
- Industrial strikes that paralyze operations
- High rates of HIV / AIDs infection rates that lead to an increase in lost man hours
- Flouting of environmental and mining legislation leading to creation of negative perceptions
- Poor quality human settlement leading to poor living conditions for mine workers
- Limited infrastructure which increases the cost of operations.
- Land claims which create uncertainty for mining operations

According to the Nkangala's IDP (2013), the mining sector is the third largest contributor to the Gross Value Add (GVA) of Steve Tshwete at 39.8%. Manufacturing followed by agriculture are the leaders in GVA contribution in the municipality. In addressing the above challenges, the Provincial Path (2011) outlines the following solutions:

- "Upgrading and maintenance of the coal haulage network.
- Increasing the level of higher skilled graduates.
- Expanding the water network and increasing reliance on water transfer schemes
- Increasing South Africa's base load and improving alternative energy supply
- Establishing mining supplier parks to enhance enterprise development in the province
- Resolving land claims in order to release land for development
- Providing comprehensive support to small-scale mining enterprises to exploit opportunities presented by corporate social investment initiatives, retreatment of sub-economic deposits and dumps, and dimension stones."

Ultimately, if the proposed Kebrafield Colliery is authorized, every effort must be directed to ensure that it leaves a lasting positive legacy in the community of Pullen's Hope. This can be done by enforcing the implementation of mitigation measures that are outlined in the Environmental Management Programme (EMPr) which is a legally binding document under the National Environmental Management Act (No. 107 of 1998).

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