



# **West-Wits MLI (Pty) Ltd Mining Right Application**

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## **Social Impact Assessment Report for the Proposed West Wits Mining Project**

Social Impact Assessment includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions and any social change process invoked by those interventions.

**18 May 2019**

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## DECLARATION OF INDEPENDENCE

Lizinda Dickson, author of the Social Impact specialist report, hereby declares that I am an independent socio-economic impact assessment specialist. I have 23 years of practice and experience in Social impact assessments. Please refer to my CV attached as Annexure A.

Lizinda Dickson compiled the Socio-economic Impact Assessment based on independent research and analysis of the Proposed Development of the West Wits Mining Right Application and associated infrastructure. I hereby confirm that I have no business, financial, personal or other interest in the activity proceeding other than remuneration for work performed as defined under “independent” in Chapter 1 of the Environmental Impact Assessment Regulations, 2014 (as amended).



Lizinda Dickson

18 May 2019

Date

## REGULATED COMPLIANCE

In terms of the National Environmental Management Act (NEMA) 2014 Environmental Impact Assessment (EIA) Regulations contained in Government Notice (GN) R982 of 04 December 2014 (as amended in 2017) all specialist studies must comply with Appendix 6 of the NEMA 2014 EIA Regulations (GN R982 of 04 December 2014). Table 1 show the requirements as indicated above.

**Table 1: Legal Requirements for All Specialist Studies Conducted**

LEGAL REQUIREMENT	RELEVANT SECTION IN SPECIALIST STUDY
(1) A specialist report prepared in terms of these Regulations must contain-	
details of-	
the specialist who prepared the report; and	Chapter 2
the expertise of that specialist to compile a specialist report including a curriculum vitae	Chapter 2
a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix A
an indication of the scope of, and the purpose for which, the report was prepared;	Chapter 3
(cA) an indication of the quality and age of base data used for the specialist report;	Chapter 4.3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Chapter 7
the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Not applicable on the Social Environment
a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Chapter 4
details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Chapter 4 & 7
an identification of any areas to be avoided, including buffers;	Chapter 7
a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Chapter 7.1
a description of any assumptions made and any uncertainties or gaps in knowledge;	Chapter 4
a description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Chapter 7
any mitigation measures for inclusion in the EMPr;	Chapter 7
any conditions for inclusion in the environmental authorisation;	Chapter 9
any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Chapter 9
a reasoned opinion	Chapter 10
whether the proposed activity, activities or portions thereof should be authorised;	Chapter 10
regarding the acceptability of the proposed activity or activities; and	Chapter 10
if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Chapter 7, 9 & 10
a description of any consultation process that was undertaken during the course of preparing the specialist report;	Chapter 4
a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Appendix H
any other information requested by the competent authority.	None

# 1 INTRODUCTION

## 1.1 Background

West Wits is a subsidiary of West Wits Mining Limited, which is an Australian Securities Exchange (ASX) listed exploration and development company with a focus on conglomerate gold in two premier regions, Pilbara (Western Australia) and the Witwatersrand. West Wits has applied for a mining right and mining permits in terms of the Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002). Consent in terms of Section 11(2) of the MPRDA to cede a renewed prospecting right MPT No. 29/2016 from Mintails SA Soweto Cluster (Pty) Ltd (Mintails) to West Wits was granted by the Department of Mineral Resources (DMR) in 2018.

The West Wits Witwatersrand Basin Project (WBP) comprises two historic mining centres known as the Durban Roodepoort Deep and the Rand Leases, both located on the northern edge of the Witwatersrand Basin, southwest of the city of Johannesburg on various portions of the farms Vogelstruisfontein 231 IQ, Vogelstruisfontein 233 IQ, Vlakfontein 238 IQ, Farm Roodepoort 236 IQ, Roodepoort 237 IQ, Witpoortjie 245 IQ, Uitval 677 IQ, Tshekisho 710 IQ, and Glenlea 228 IQ. West Wits intends to establish open pit and underground gold mining operations. Initial operational activities (of short term duration) will be focussed on open pit mining activities. Upon near depletion of resources at the open pit targets, underground resources will be targeted for medium to long term operation. The activities required to enable extraction of these resources include re-establishment of existing incline shafts and related infrastructure as well as rehabilitation of the existing workings.

On behalf of West Wits, Malan Scholes Consulting (Pty) Ltd (MSC) appointed SLR Consulting (South Africa) (Pty) Ltd (SLR) to undertake the Environmental Authorisation Application process required for the Mining Right Application. SLR has appointed Mercury Financial Consultants to conduct and compile both the Economic and Social Impact Assessments.

As part of the Environmental Impact Assessment (EIA), a Social Impact Specialist Study was commissioned. This report contains the Social Impact Assessment (SIA) for the proposed project area, and is compiled to satisfy the requirements for the following legal processes:

- The Mining Right Application (MRA) to the DMR in terms of the Mineral and Petroleum Resources Development Act (MPRDA);
- The Integrated Environmental Authorisation Application to the DMR in terms of the NEMA and the 2014 EIA regulations; and
- The Waste Management License Application to DMR in terms of the National Environmental Management: Waste Act (NEMWA) and its regulations.



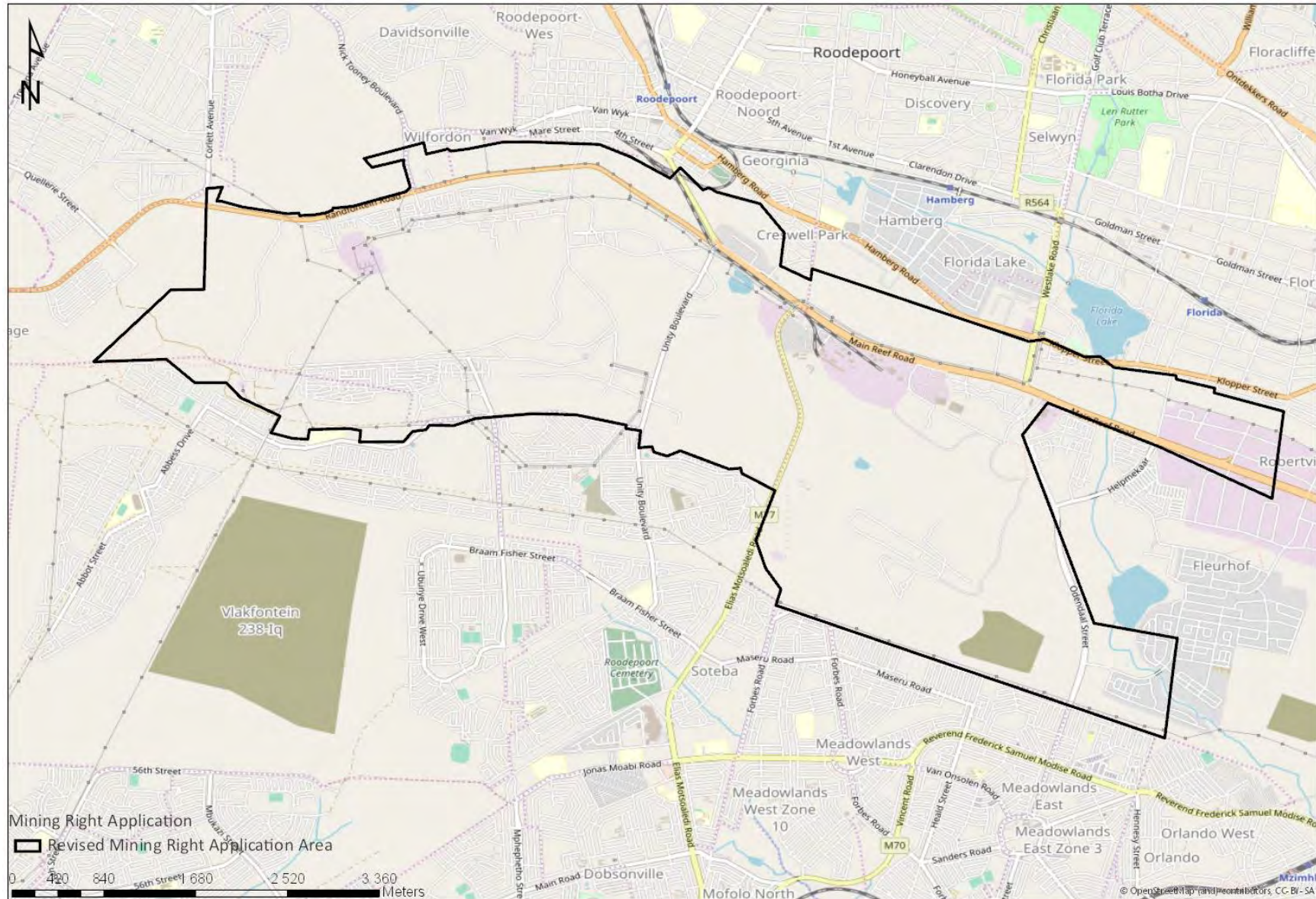


Figure 1: Mining Right Application Area (black outline)

## 1.2 Project Description

The proposed Mining Right Application will be located on Various portions of the following farms:

**Table 2: MRA Properties**

PROPERTIES	PORTIONS
Vogelstruisfontein 231 IQ	Portions 228, 229, 131, 151, 152, 154, 157, 163, 168, 170, 173, 178, 179, 183, 184, 186, 187, 193, 210, 213, 216, 222, 223; Portions of Portions 15, 42, 43, 149, 175, 185, 206, 211, 212, 214, 224; Remainder of portions 4 and 161; and A portion of the remainder of Portions 17 and 18.
Vogelstruisfontein 233 IQ	Remainder of Portion 36 and 48
Vlakfontein 238 IQ	Remainder of Portions 1, 94; and Portion of Portion 92.
Farm Roodepoort 236 IQ	Portion 1; and Remainder.
Roodepoort 237 IQ	Portions 26, 27, 43, 44, 135, 136, 137, 138, 193, 389, 393, 400, 403, 404, 409, 410, 429; Remainder of Portions 1, 5, 401, 407; Portion of Portions 182, 196, 408; and Portion of the Remainder of Portion 14.
Witpoortjie 245 IQ	A portion of Portion 1.
Uitval 677 IQ	Previously known as: Vogelstruisfontein 233 IQ Portion 91; and Vlakfontein 238 IQ Portion 47.
Tshekisho 710 IQ	Previously known as: Roodepoort 237 IQ Portions 402 and 445; and Vlakfontein 238 IQ Portion 95.
Glenlea 228 IQ	Portion of the farm.

The minerals to be mined are gold, uranium and silver with a mineable resource of approximately 424 401 tonnes from the open cast operations and 9 million tonnes from the underground operations.

### 1.2.1 Mine Methodology and Timeframe

In broad terms the proposed project would involve the development of five open pit mining areas (referred to as the Mona Lisa Bird Reef Pit, Roodepoort Main Reef Pit, Rugby Club Main Reef Pit, 11 Shaft Main Reef Pit and Kimberley Reef East Pit) and refurbishment of two existing infrastructure complexes (referred to as the Bird Reef Central Infrastructure Complex and Kimberley Reef East Infrastructure Complex) to access the existing underground mine workings.

The project would also include the establishment of run of mine (ROM) ore stockpiles, topsoil stockpiles and waste rock dumps as well as supporting infrastructure including material storage and handling facilities (for fuel, lubricants, general and hazardous substances), general and hazardous waste management facilities, sewage management

facilities, water management infrastructure, communication and lighting facilities, centralised and satellite offices, workshops, wash bays, stores, change houses, lamp rooms, vent fans and security facilities.

Although the Mining Right Application area is 2 072 ha in size the actual surface disturbance area is only approximately (~) 80 ha comprising opencast pit areas of ~ 73 ha and infrastructure complex areas of ~ 6 ha.

Primary mineral processing will take place on site, where ore will be crushed prior to transportation off-site. All run-of-mine material will be transported off-site to an existing processing plant for concentrating of minerals.

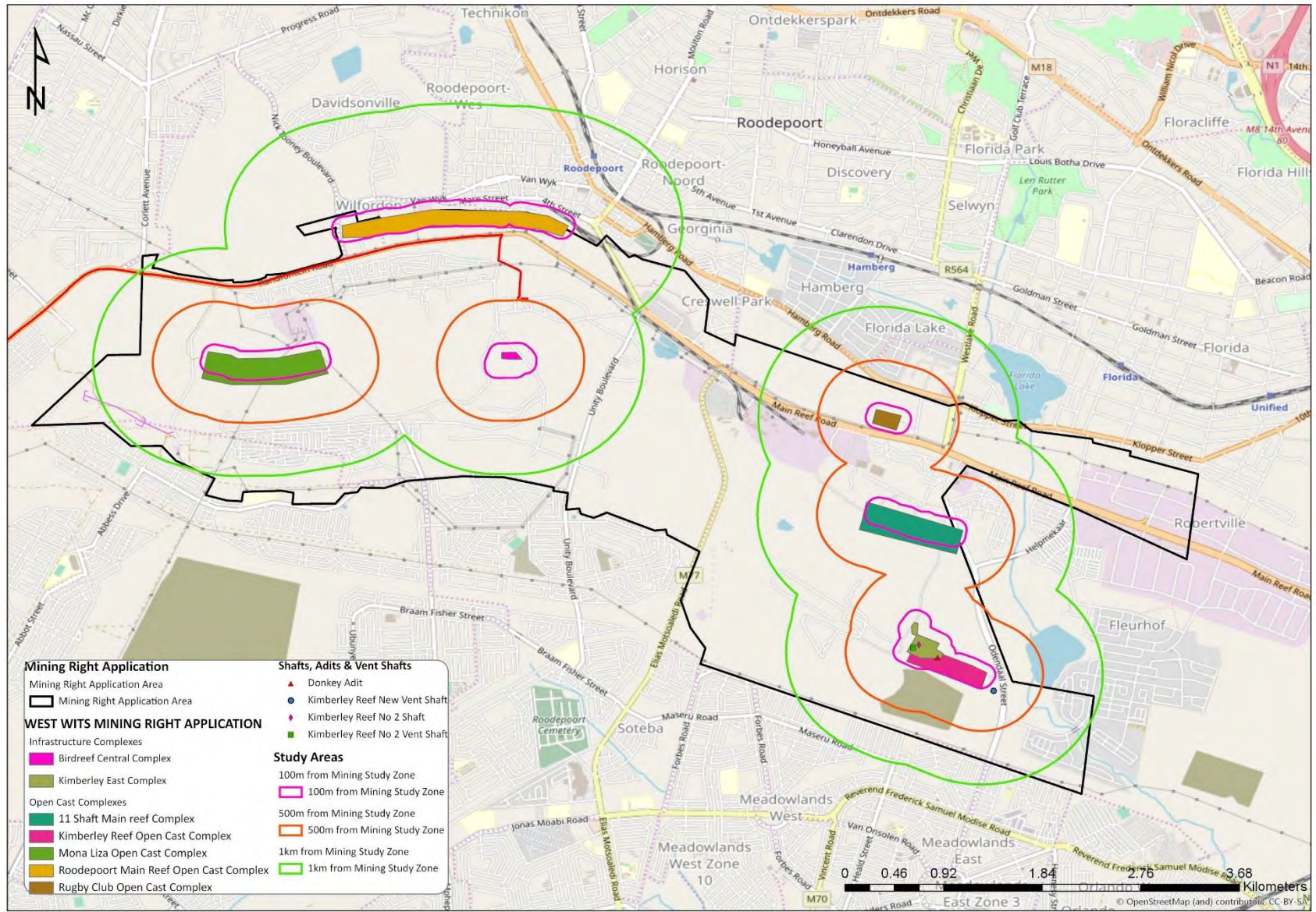


Figure 2: Open Cast and Underground Operational areas within the Mining Right Application area

The expected life of mine for the open pit operations (inclusive of rehabilitation) is three (3) to five (5) years and 30 years (20 years for the Kimberley East underground and 10 years for the Bird Reef Central underground) for the underground operations (see diagram below). The pits would be mined in a phased approach with each pit taking between five and 9 months to be mined and rehabilitated.

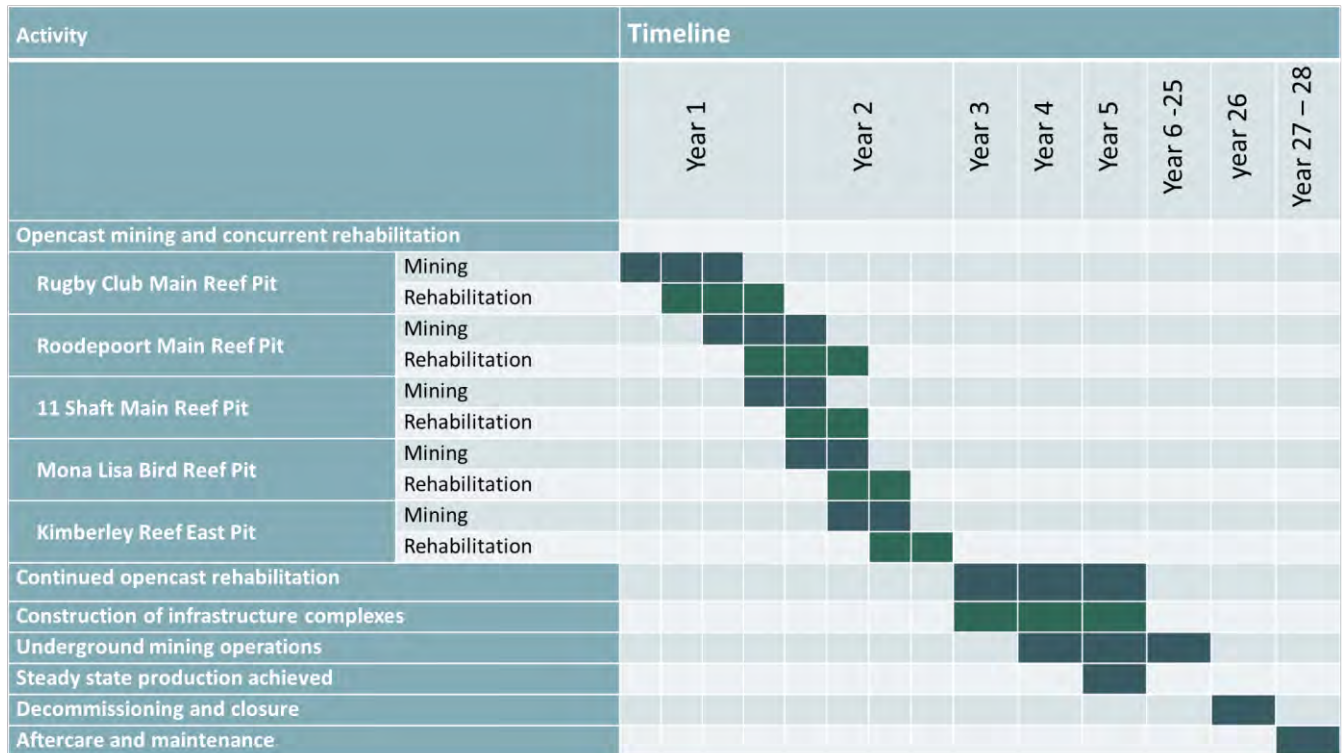


Figure 3: Life of Mine Phases

### 1.2.1.1 Open Cast Mining

Initially, near surface resources will be targeted for mining through means of open pit methods. The resources at the open pit targets are generally outcropping and production would commence at the onset of mining activities. No construction activities, as such, are associated with the open pit sites.

Table 3: Summary of open cast operations

Open pits	Kimberley East	11 Shaft	Rugby Club	Mona Lisa	Roodepoort
Size of mining area	~ 9.2 ha	~ 15 ha	~ 2.6 ha	~ 20 ha	~ 26.5 ha
Mining rate (per month)	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes
Pit depth	20 to 30 m	20 to 30 m	7 to 10 m	20 to 30 m	7 to 10 m
Mineable resource (tonnes)	62 917	117 631	30 212	34 351	179 290
Mining duration (including concurrent rehabilitation, season dependent)	~ 5 months	~ 8 months	~ 3 months	~ 3 months	~ 12 months
Final rehabilitation duration	~ 3 months	~ 3 months	~ 3 months	~ 3 months	~ 4 months
Temporary waste rock dump volume	503 336 m <sup>3</sup>	1 013 436 m <sup>3</sup>	260 288 m <sup>3</sup>	295 947 m <sup>3</sup>	1 103 323 m <sup>3</sup>

Open pits	Kimberley East	11 Shaft	Rugby Club	Mona Lisa	Roodepoort
Temporary waste rock dump height	20 to 30 m	20 to 30 m	10 m	20 to 30 m	10 m

Opencast mining activities would include a conventional excavate, load and haul mining cycle. Once the topsoil and waste rock have been removed and stockpiled, an Xcentric ripper would be used to break the ground. This equipment replaces the need to conduct blasting. This is both for safety reasons and to minimise impacts on the surrounding environment. Ore would then be excavated and hauled to an ore stockpile for crushing before transportation off-site. The five proposed opencast mining areas would be developed in a phased approach. In this regard, once an opencast area has been mined, backfilled using waste rock and rehabilitated, the next opencast area would be targeted. Following final rehabilitation and adequate stabilisation, each of the areas would be made available in line with post-closure land use objectives. No waste rock dumps would remain. It is anticipated that up to 180 000 tonnes of ore would be mined per annum from the opencast resources.

#### 1.2.1.2 Underground Mining

When the resources at the open pit targets near depletion, the underground mining operations would commence. The activities required to enable extraction of these resources include re-establishment of existing incline, circular and vertical shafts and related infrastructure as well as rehabilitation of the existing workings.

Table 4: Summary of Underground Mining

Infrastructure complexes	Bird Reef Central	Kimberley Reef East
Infrastructure complex size	~ 2.19 ha	~ 3.5 ha
Size of mining area	~ 52 ha	~ 100 ha
Mining rate (per month)	15 000 tonnes	15 000 tonnes
Workings depth	100m to interception of reef (up 3 km below surface)	100 m to interception of reef (up 3 km below surface)
Waste rock	All waste rock will remain in the underground workings.	All waste rock will remain in the underground workings.

The underground mining method would be conventional drill and blast breast mining methods. The incline shafts, equipped with a winder house, would provide means for movement of men, material and rock to and from the underground workings. Ore drives would be developed on reef with raises developed from the drives. Loading boxes would be constructed and winches would be installed on the down-dip side of the raise to remove the broken rock from the stopes. Ore would be transported to the incline shafts by means of conventional track bound equipment. Ore would be stored for initial crushing before transportation off-site. Any waste rock produced by the underground mining operations would remain underground. It is anticipated that up to 360 000 tonnes of ore would be mined per annum from the underground resources.

### 1.2.2 Access and Transport

A network of public roads exists in the project area. These include both surface and gravel roads. The northern section of the proposed project area is crossed by the R41 (Mainreef/Randfontein) provincial road; Cemetery Road feeds off Mainreef road to the south and runs through the project area linking Roodepoort in the north to Soweto in the south.

For the opencast mining operations, based on a mining rate of 15 000 tonnes per month, it is estimated that between 7 and 42 trucks (36-ton) would be required to transport processed ore off-site per day. For the underground mining operations with a proposed mining rate of 30 000 tonnes per month, this number would be 14 trucks for each of the two underground mining areas. Ore would be transported via the R41 and R558 to an existing processing plant in the Gauteng region.

Existing surfaced and gravel roads would be used for the project as far as possible. Site specific access to open pits and infrastructure complex has been investigated and considered during the Traffic Impact Assessment (Siyazi, 2019, West Wits TIA). The following table provides a summary of access to the various infrastructure points:

**Table 5: Transport and Access roads**

Infrastructure Point	Access Description
Rugby Club Opencast Operation	Access via existing roads that link up with Main Reef Road (Road R41) at Points I (Reid Road) and J (Westlake Road)
Roodepoort Main Reef Opencast Operations	Access to and from the proposed Roodepoort site would be possible from and to existing roads which link with Randfontein Road (Road R41) which are: a) Access to and from Gustaf Street which links with Randfontein Road (Road R41) at Point G providing access to both portions of the proposed Roodepoort Main Reef site which is intersected by Gustaf Street. b) Access to and from Irridium Street which links with Randfontein Road (Road R41) at Point F. This access option would require the access on Gustaf Street as well since the proposed site is located on both sides of Gustaf Street.
Kimberley Reef East Opencast Operations Kimberley Reef Underground Infrastructure Complex 11 Shaft Opencast Operations	Access to and from the proposed Kimberley Reef East and 11 Shaft sites (opencast and underground activities) would be possible via an existing road that links up with Main Reef Road (Road R41) at Point K.
Mona Lisa Opencast Operations	Access to and from the proposed Mona Lisa site would require a new access road to the north of the proposed site to link up with Randfontein Road (Road R41) and should avoid the Goudrand Township. Three potential points for the proposed access road to link up with Randfontein Road (Road R41) were identified which are: a) Via a new intersection with Randfontein Road (Road R41) west of the Goudrand township (Option 1); or b) Via an internal haul road to the east from where access could be gained to and from Randfontein Road (Road R41) via Gustav Street at Point G (Option 2).

Infrastructure Point	Access Description
	It is important to take note that it would be required that the proposed access road Option 1 serve the broader area around the proposed mining development and not be exclusively for the proposed mining development.
Bird Reef Underground Infrastructure Complex	Access to and from the proposed Bird Reef Shaft site would be possible via existing roads (Gustaf Street) that links up with Main Reef Road (Road R41) at Point G.

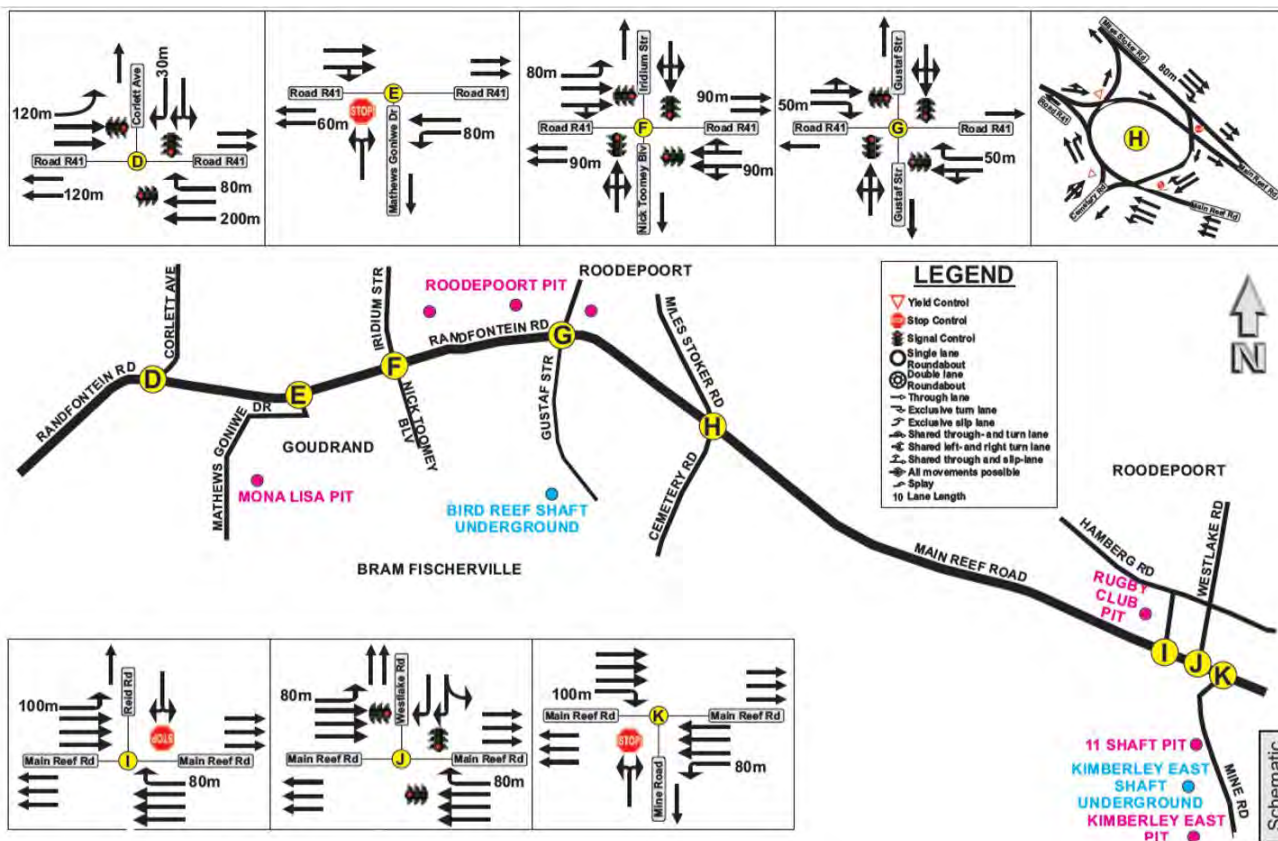


Figure 4: Proposed Transport Routes

### 1.2.3 Security and Access Control

Perimeter fencing is planned around the two infrastructure complexes. These fences would be maintained for the duration of the project. Access control and a security office would be established at the entrance to each of the infrastructure complexes. Safety barriers would be placed around the perimeter of the open pit mining areas.

### 1.2.4 Human Resources

During the opencast mining operations approximately 40 to 50 would be employed. The underground mining operations would employ between 50 to 100 staff. Once construction is complete and at full production employees would be increased to approximately 500 employees.



Local labour would, where possible, be sourced from the surrounding areas. No project or mine housing would be provided during construction and operational phases, as most employees would be sourced locally. Other employees would be sourced from the greater Johannesburg area.

### **1.2.5 Operating Hours**

Operating hours for the opencast mining activities will be a 5.5-day working week, one shift system per day between 06:00 to 18:00 Monday to Friday and between 06:00 to 14:00 on Saturday. During the construction of the surface infrastructure for the underground operations, operating hours will also be a 5.5-day working week, one shift per day from 07:00 to 17:00 Monday to Friday and from 07:00 to 14:00 on Saturdays. During the underground mining, operating hours will be increased to a 7-day week with three 8-hour shifts per day.

In the instance where emergency or critical activities are required as part of either the construction or operational phases, these hours may be extended but would be temporary in nature and for a specific time period.

### **1.2.6 Services**

#### ***1.2.6.1 Water Supply and Management***

Water would be required during the construction phase for domestic use, dust suppression, for washing vehicles and equipment and earthworks. During the operational phase additional requirements to those used during construction would include irrigation of rehabilitated areas. During decommissioning and closure, water would be required for dust suppression, washing vehicles and irrigating rehabilitated areas.

Potable and service water would be sourced from the local municipality during all phases and stored in above-ground potable and service water tank(s) respectively. Service water supply would also be sourced from the treated dewatering water from the underground workings. A network of pipelines would be required to transport potable water and the various service waters within the site.

Water management facilities would be required for the control of storm water. A storm water management plan has been developed for the project. A water use and management plan would also be developed for the project.

### **1.2.6.2 Power Supply and Use**

Power would be required for the underground mining operations during all project phases prior to closure. The operations are expected to require approximately 5.14 MVA of power. It is planned to source this power from Eskom. Backup diesel generators would be available for emergency supply.

## **1.2.7 Waste Management**

### **1.2.7.1 Residue waste**

Waste rock would be produced by the mining operations. This would comprise material excavated to expose the targeted reefs of the opencast and underground reserves. For the opencast mining operations these materials would need to be temporarily stored and/or stockpiled on site before being used as backfill material in the open pits during rehabilitation. For the underground mining operations, these materials would remain underground and used to backfill the mine workings.

### **1.2.7.2 General and hazardous waste**

General and hazardous wastes would be generated during construction and operation phases. These wastes would be handled, sorted and temporarily stored on site in a waste/salvage yard. Where wastes can be re-used or recycled this would be undertaken, or alternatively the wastes would be removed by waste handling companies for recycling, re-use or final disposal at permitted waste disposal facilities.

Illegally dumped general and hazardous waste exists within the project footprint. The final management of this waste is yet to be determined. The proposed project would require the bulldozing, sorting and disposal of this waste on site. A waste management procedure would be developed for the project.

### **1.2.7.3 Sewage**

Portable toilets and temporary ablution facilities would be utilised at each of the proposed open cast areas. Portable toilets would be serviced by external service providers on a regular basis. The construction phase of the underground operations would also use portable facilities until such time as the change houses are operational and the sewage is linked into the municipal supply.

## **1.2.8 Decommissioning and Closure**

The conceptual closure plan objectives are aligned with a rehabilitation plan that supports a post-closure land use of a residential and/or agriculture. The key closure objectives are as follows (Golder, 2019):

- Create a physically stable, safe, rehabilitated landscape that limits long-term environmental degradation, thus enabling the successful establishment of the planned post-mining land use;
- Ensure that local environmental quality is not adversely affected by possible physical effects and chemical contamination arising from the mine site or individual facilities, as well as to sustain catchment yield as far as possible after closure;
- Limit the possible health and safety threats to humans and animals using the rehabilitated mine site as it becomes available;
- Re-instate a suitable land capability over the mine site to facilitate the progressive implementation of the planned post-mining land use;
- Create a landscape that is self-sustaining and over time would converge to the desired ecosystem structure, function and composition;
- Encourage, where appropriate and as aligned to the planned post-mining land use, the re-establishment of native vegetation on the rehabilitated mine site such that the terrestrial biodiversity is largely re-instated over time; and
- Ensure that there is constructive engagement and alignment with local communities and regulatory authorities regarding the proposed end land use.

Broadly speaking, the decommissioning phase would include the removal of infrastructure from site and the final rehabilitation of areas. In consultation with I&APs (especially landowners) the final post closure land use has been identified.

The post-mining land uses related to the proposed five opencast pits are described in the Golder rehabilitation and closure report as follows (Golder, 2019):

- Rugby Club Main Reef pit: the landowner is currently in a planning phase and is considering either residential or mixed industrial development;
- Roodepoort Main Reef pit: the landowner has planned public open or green belt spaces;
- 11 Shaft Main Reef pit: the landowners have earmarked these areas for mixed industrial, residential developments and the construction of bulk service infrastructure;
- Mona Lisa Bird Reef pit: the landowners plan to construct mixed residential developments post closure; and
- Kimberley East pit: part of the area would be used to access the surface infrastructure planned to service the proposed underground operation which would continue beyond the opencast mining operations.

### 1.3 Need and Desirability

The main benefits associated with the proposed project are:

- Direct economic benefits derived from wages, taxes and profits. Indirect economic benefits include the procurement of goods and services and the spending power of employees;
- Implementation of the proposed project resulting in skills development associated with the mining method;
- To mine an existing reserve resource and to thereafter rehabilitate;
- The improvement of historical impacted land and newly impacted areas through rehabilitation and removal of rubble and illegally dumped rubbish.
- The availability of the economically mined and rehabilitated land being freed up for housing developments earmarked for the area, that aim to reduce the housing backlog experienced by the City of Johannesburg, while at the same time creating employment and extracting mineral resources for the benefit of the economy;
- Mined and rehabilitation land holding opportunity for spatial integration by decreasing fragmentation and unlocking development potential in large areas;
- The eradication of access to dangerous historic workings targeted by informal miners (Zama Zama's), which are mainly illegal immigrants, that pose a threat to the health and safety of the communities and to themselves while mining illegally; and

## 2 SPECIALIST DETAILS AND EXPERTISE

Social Scientist	Mercury Financial Consultants
Responsible person	Lizinda Dickson
Authors	Lizinda Dickson, Carien Joubert, Lucky Ngale, Fransis de la Rosa
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## 2.1 Lizinda Dickson

Lizinda Dickson have 23 years of practice and experience in Social and Socio-Economic Impact Assessments for various mining sector, agricultural sector, sport and water sector projects. Her qualifications include a Masters' Degree in Environmental Management & Analysis (in progress). Other diplomas include: Database management, ArcGIS 8 and PlanetGIS. She has conducted studies for institutions and companies such as Anglo Platinum, Impala Platinum, Xstrata, Coal of Africa, Optimum Coal, BHP Billiton, Target Holdings, Platinum Australia, Chromex, Barrick SA, Department of Human Settlement, Department of Water Affairs, Department of Environmental Affairs, various District Municipalities and Local Municipalities. Lizinda's expertise range from Environmental Aspects, Land use, Spatial Planning, Socio-economic Assessment and Management, GIS mapping, Risk assessments, Resettlement Management, complex Stakeholder and Community Engagement strategies to overall project management of complex projects.

Lizinda Dickson compiled the Socio-economic Impact Assessment based on independent research and analysis of the proposed project, and have no business, financial, personal or other interest in the activity proceeding other than remuneration for work performed as defined under "independent" in Chapter 1 of the Environmental Impact Assessment Regulations, 2014 (as amended in 2017).

Please refer to her CV attached as Annexure B.

## 2.2 Carien Joubert

Carien Joubert has 35 years of practice and experience in Social and Socio-Economic Impact Assessments. She is a specialist in Social and Behaviour Sciences especially where Social Change occurs. Carien has a unique understanding of various cultures and social behaviours and has valuable experience in the mining industry addressing complex social impact and management issues. Her experience in these fields ranges a variety of successful projects implemented across the mining, water, and development sectors. Carien is a very charismatic woman and her skill in strategy development and planning serves her with excellent situational cognizance on the over-all project implementation.

Carien Joubert co-authored the Social Impact Assessment based on independent research and analysis of the proposed project, and have no business, financial, personal or other interest in the activity proceeding other than remuneration for work performed as defined under "independent" in Chapter 1 of the Environmental Impact Assessment Regulations, 2014 (as amended in 2017).

Please refer to her CV attached as Annexure B.

### 3 STUDY SCOPE OF WORK

The overall objective of the SIA is to identify and assess the significance of the potential impacts of the project on the social environment (both positive and negative), and in such identify sustainable development opportunities and mitigation measures in order to enhance positive impacts and to reduce negative impacts.

Specific tasks of the SIA are to:

- Review stakeholder engagement records;
- Provide a detailed description and analysis of the social baseline situation;
- Provide an assessment to identify both positive and negative social impacts;
- Propose mitigation and management methods;
- Provide an assessment based on collected baseline data to identify positive and negative social impacts at both local and national level;
- Propose management methods to optimize positive impacts and mitigate negative impacts from the project throughout the project lifetime; and
- Develop Social Management Plans for implementation.

### 4 METHODOLOGY

#### 4.1 Study Zone Delineation

The SIA was conducted based on the evaluation of social networks, livelihoods and land use activities in four study zones. Utilising satellite imagery, aerial photography and the data collected from site visits and observations, these aspects have been mapped in the various study areas. The four study zones include:

- a) the Directly Affected area and a 100 m buffer around mining/infrastructure areas,
- b) an area located within 100 to 500 m around the Operational areas;
- c) an area located within 500 m to 1 km around the Operational areas; and
- d) the Municipal sub-area (which includes Wards 49, 70, 71, 84, and 127). Apart from these immediate study areas, the SIA also took into consideration the provincial and regional social environment. The figure below indicates the study areas:

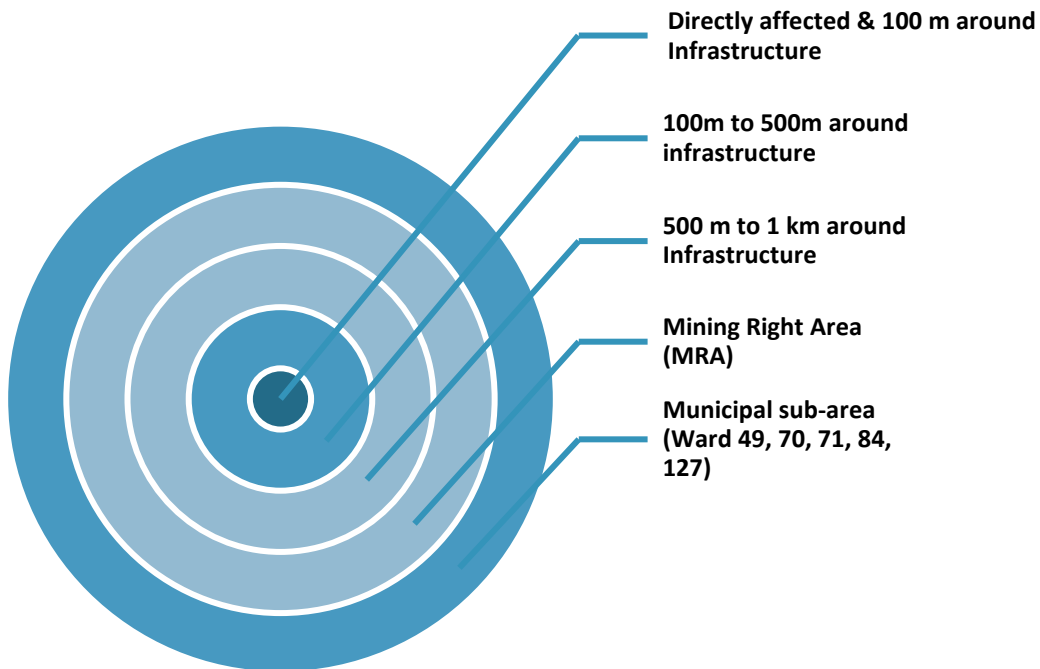


Figure 5: Study Zone Delineation

The thematic map below indicates the delineation of the study areas:

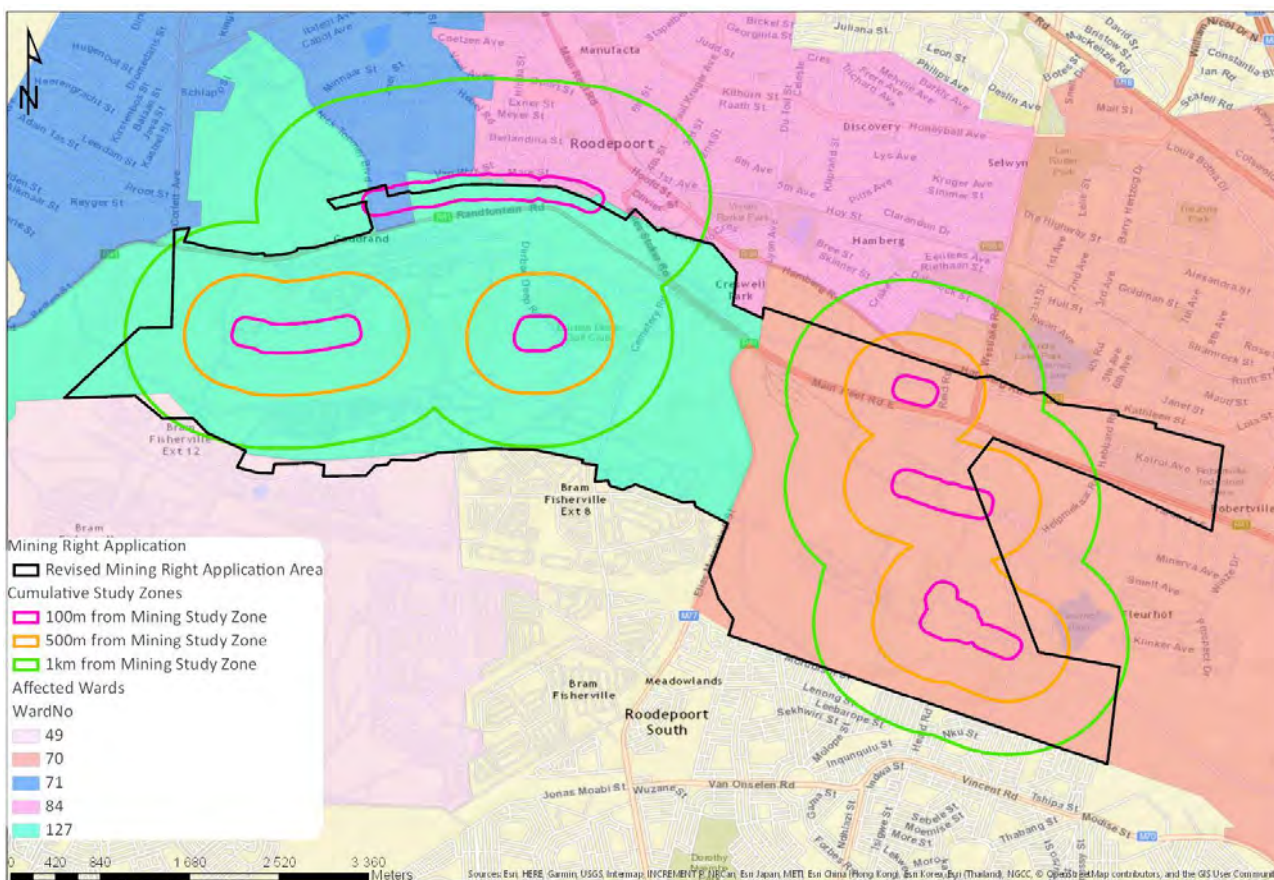


Figure 6: Study Areas Thematic Map

## 4.2 Potential Receptors

Available information, orthophotos and satellite imagery was utilised to identify potential receptors, and thereafter site visits were conducted to verify. The following potential receptors have been included in the SIA:

- Residential areas
- Commercial areas (formal & informal)
- Industrial areas
- Educational sites
- Religious sites (Institutional)
- Planned developments
- Existing or old mining activities
- Informal mining activities

The figure below indicates the potential receptors identified.

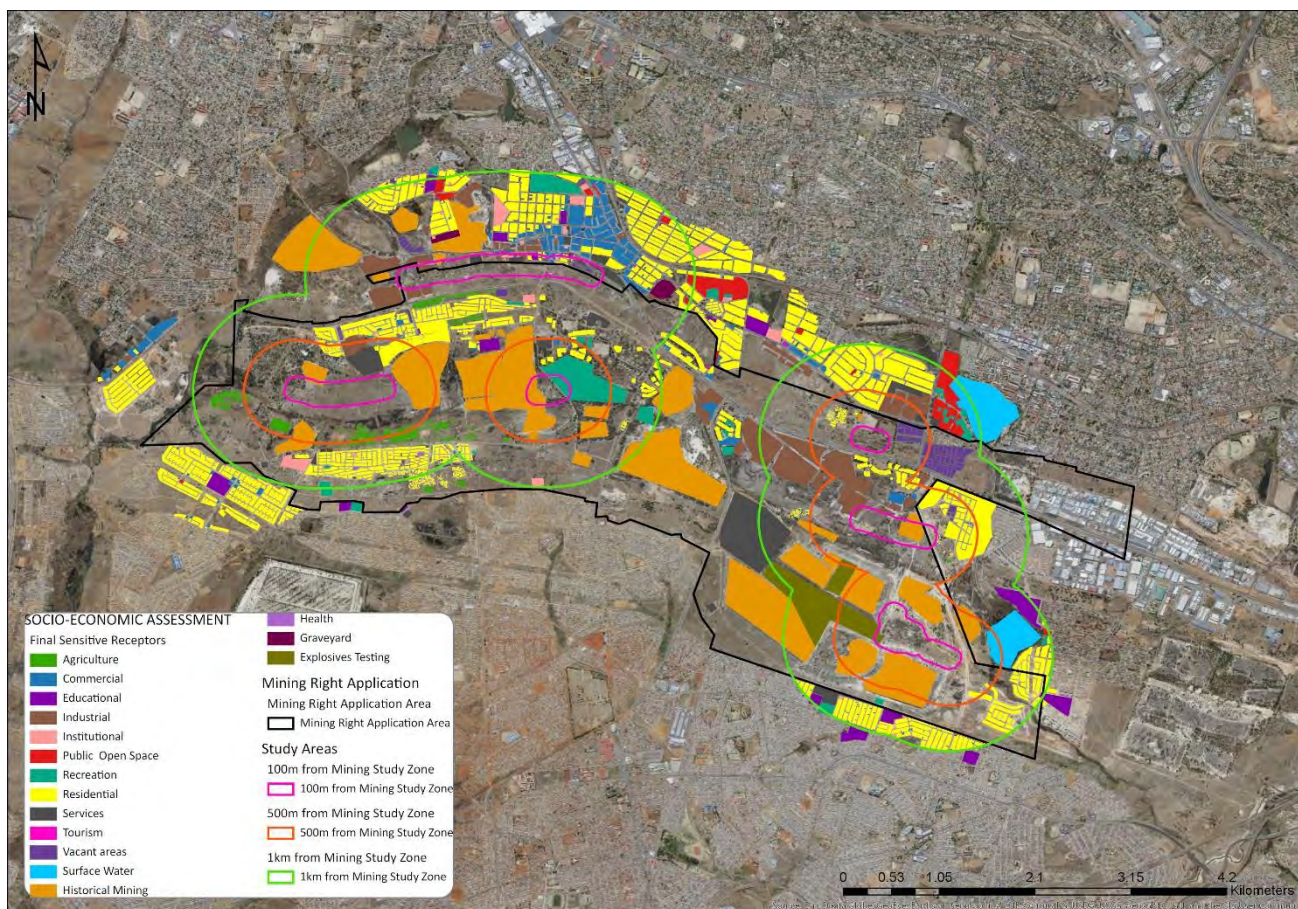


Figure 7: Potential Receptors



## 4.3 Data Collection

To collect data in support of the impact assessment, the following activities have been undertaken:

### 4.3.1 Review of Socio-economic and Planning Documents and Data

In order to document the socio-economic context of the study area a number of important documents and/or sources of information were reviewed, referenced, and used to inform this SIA. These include:

- Gauteng Provincial Growth and Economic Development Strategies
- Gauteng Spatial Development Framework
- City of Joburg Spatial Development Framework
- City of Joburg Metropolitan's Integrated Development Plans
- Census 2011 data and where available the Community Survey 2016. Census data for 2016 is not available electronically up to ward level from Statistics South Africa.
- Community survey 2007
- Quarterly Labour Force Survey 2012 & 2013
- General household survey, 2011
- Income and Expenditure survey 2010/2011
- Mortality and causes of death survey
- Other Socio-economic Assessments (SEA) for similar projects
- Available documentation of planned developments in the area
- Maps and available orthophotos and satellite imagery of the proposed project area and surrounding environment

### 4.3.2 Literature Review

A literature review has been undertaken and focused on best practice (see list in paragraph 12.3) and case studies (see list in paragraph 12.2) and was sourced from academic journals and studies available. Additional documents such as planning documents, which substantiate the baseline profile or provide context to the project, have been referred to where relevant. This provided a conceptual framework for designing the empirical data collection and interpretation.

### 4.3.3 Site Visits and Observations

Direct observation, such as site visits or photographic records, are descriptive records developed by outside or participant observers. It captures free-form impressions, going beyond limitations of previously defined categories, and interactions are observed in a natural setting. Site visits were undertaken as follows:

- 5 February 2019 from 10h00 – 15h00
- 14 February 2019 from 9h00 – 15h00
- 21 February from 11h00 to 15h00

Observations were also made whilst on site or within the wider study area and these have supplemented the other findings.

### 4.3.4 Public Participation Review

A high-level summary of the issues/concerns raised during the public meetings as contained in the Scoping Report are:

- Illegal mining
  - Safety concern
  - How will illegal mining be stopped by the legal mining
- Health issues
  - Air Pollution from dumps/ stockpiles
  - Air pollution from mining – dust
  - Noise impact
  - Radiation concerns
  - Water Quality – pollution of resource
- Jobs creation
  - Benefit to the community, skills development
  - Employment and number of employees (Empowerment)
- Safety concern with mining
  - Open pits
  - Sink holes (not applicable to the area)
- Damage to houses – Cracks
- Sasol /Transnet pipelines
- Relocation of communities

- Rehabilitation of pits - Loss of biodiversity
- Traffic impacts
  - Capacity of roads
- Logistics (transportation, electrical, plumbing and building infrastructure).
- Procurement requirements of West Wits

#### **4.3.5 Sensitivity Assessment (Interaction between Environmental and Socio-economic Impacts)**

The specialist impact assessments that have a potential direct impact on the well-being and socio-economic livelihoods of the potential receptors in the area were considered during the social impact assessment. The following studies were reviewed:

- Air Quality Impact Assessment
- Noise Impact Assessment
- Visual Impact Assessment
- Health Impact Assessment
- Radiological Public Safety Assessment
- Blast Evaluation
- Groundwater Impact Assessment

## **4.4 Social Impact Assessment and Mitigation**

A social impact analysis is undertaken to identify potential changes in the social environment triggered by specific drivers:

- Change in Land use, Cover and Ownership
- Resource Consumption & Ecosystem Services
- Potential Pollution
- Goods, staff and transport
- Need of Human Resources and Recruitment

The change process in the Social Environment can typically be categorized as any of the following change processes:

- Demographic processes
- Socio-economic processes

- Geographic processes
- Institutional and legal processes
- Emancipatory and empowerment processes
- Socio-cultural processes
- Biophysical processes

The objectives of the mitigation measures are:

- To describe an action plan to achieve the mitigation measures identified during the impact assessment.
- To make recommendations on a monitoring programme to review the success of the mitigation measures and to provide information to the relevant decision-makers.
- The potential significance of every social impact identified is determined by using a ranking scale, based on the terminology from the DEA guideline document. The report serves to define and quantify possible impacts and its significance in a coherent and descriptive manner.

#### **4.4.1 Types of Impacts**

In addition to direct impacts that can be experienced as a direct result of a development, impacts can be divided into the following categories: indirect impacts, cumulative impacts and impact interactions (European Commission, 2001). All these categories of impacts need to be considered when conducting a SIA (or any other type of impact assessment for that matter). These categories of impacts will be explained further in the sections that follow.

##### **4.4.1.1 Indirect impacts**

Indirect impacts (impact B) are impacts, which are not a direct result of the project, often produced away from or as a result of a complex pathway. It is sometimes also referred to as second or third level impacts, or secondary impacts (European Commission, 1999<sup>1</sup>). Indirect/secondary impacts are caused by direct/primary impacts (impact A) and often occur later than and/or further away from the occurrence of direct impacts (DEAT, 2004). An example of an indirect impact is the construction of a new road, resulting in improved access to facilities, with the indirect impact being an increase in school attendance because learners can get to school more easily. Human Right Impacts are also indirect impacts.

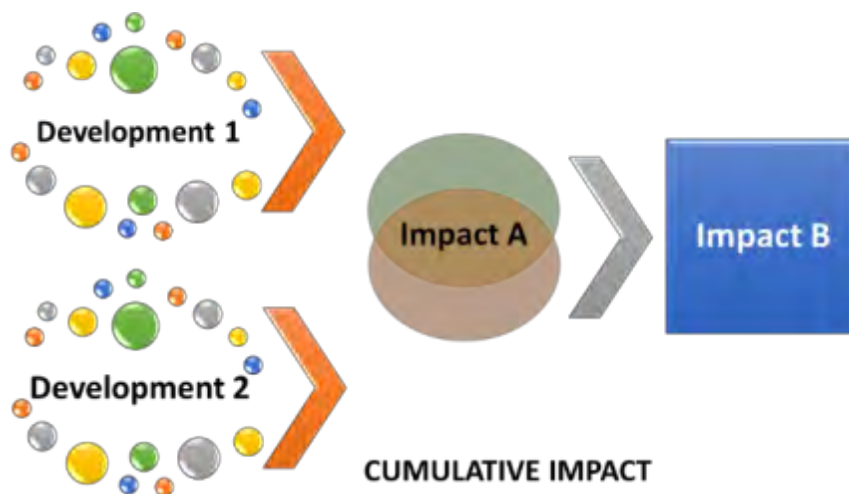
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<sup>1</sup> European Union, 1999. *Study on the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (most recent study)*



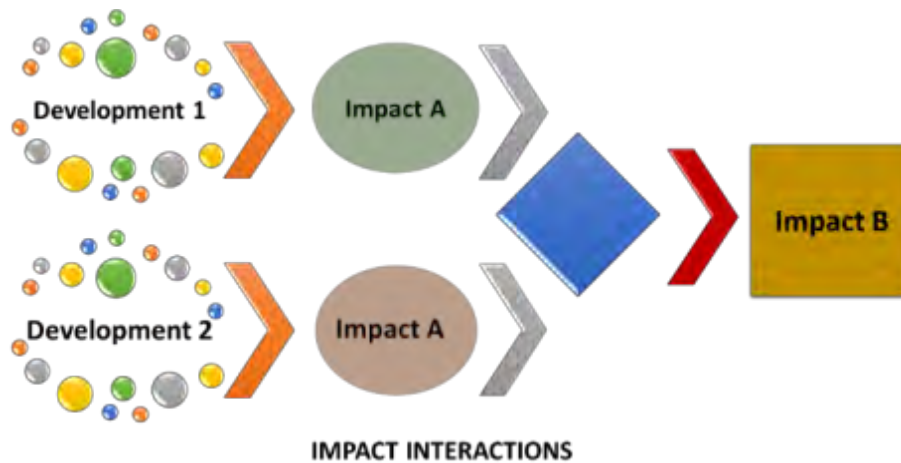
#### 4.4.1.2 Cumulative impacts

Cumulative impacts are impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project (European Commission, 2001). Cumulative impacts result from other impacts of other past, present or future developments. It reflects how the impacts of one project may affect and be affected by other projects and can be seen as the sum of the proposed action plus past and present activity in the same area (DEAT, 2006). For example the construction of several new facilities for the generation of power across the country, resulting in a significant increase in availability of electricity in Eskom's power grid (as opposed to the construction of one solar plant, for example, which will in isolation not have a significant impact on the grid).



#### 4.4.1.3 Impact interactions

Impact interactions are the reactions between impacts, whether between the impacts of just one project or between the impacts of other projects in the area (European Commission, 2001). An impact interaction can for example be the construction of a new clinic in a community on the one hand, resulting in access to quality healthcare, and the installation of a sewage system in the area where there was none, on the other hand, resulting in access to proper sanitation. Both the impacts (access to quality healthcare and access to proper sanitation) will lead to people in the community being healthier and perhaps having a higher life expectancy as a result.



#### 4.4.2 Assessing the Significance of Socio-economic Impacts

According to the NEMA Regulations, 'significant impact means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment'. In line with the Regulations, and based on the qualitative findings of the activities undertaken, each potentially significant impact has been assessed with regard to:

- the nature and status of the impact
- the extent and duration of the impact
- the severity of the impact
- the consequence of the impact
- the probability of the impact occurring
- The mitigation efficiency

##### 4.4.2.1 Nature and Status

The 'nature' of the impact describes what is being affected and how. The 'status' is based on whether the impact is positive, negative or neutral.

##### 4.4.2.2 Spatial Extent

'Spatial Extent' defines the spatial or geographical scale of the impact.

Table 6: Rating of Extent

<b>L</b>	Localised - Within the site boundary.
<b>M</b>	Fairly widespread – Beyond the site boundary. Local
<b>H</b>	Widespread – Far beyond site boundary. Regional/ national

#### 4.4.2.3 Duration

The DURATION of an impact is the expected period the impact would have an effect.

**Table 7: Rate of Duration**

L	Quickly reversible. Less than the project life. Short term
M	Reversible over time. Life of the project. Medium term
H	Permanent. Beyond closure. Long term.

#### 4.4.2.4 Severity

'Severity' defines the level of the impact on the environment.

**Table 8: Rate of Severity**

H	Substantial deterioration (death, illness or injury). Recommended level would often be violated. Vigorous community action. Irreplaceable loss of resources.
M	Moderate/ measurable deterioration (discomfort). Recommended level would occasionally be violated. Widespread complaints. Noticeable loss of resources.
L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ would remain in the current range. Recommended level would never be violated. Sporadic complaints. Limited loss of resources.
L+	Minor improvement. Change not measurable/ would remain in the current range. Recommended level would never be violated. Sporadic complaints.
M+	Moderate improvement. Would be within or better than the recommended level. No observed reaction.
H+	Substantial improvement. Would be within or better than the recommended level. Favourable publicity.

#### 4.4.2.5 Consequence

The Consequence of a function of severity, nature, spatial extent and duration of the impact on the social or ecosystem structure or service.

#### 4.4.2.6 Probability

The 'probability' describes the likelihood of the impact actually occurring.

**Table 9: Rate of Probability**

H	Definite/ Continuous
M	Possible/ frequent
L	Unlikely/ seldom

#### 4.4.2.7 Impact Significance without Mitigation (WOM)

Significance is determined through a synthesis of the various impact characteristics and represents the combined effect of the Consequence (Extent, Duration, and Severity) multiplied by the Probability of the impact. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required.

Table 10: Effect of Significance on Decision-Making

SIGNIFICANCE	DECISION GUIDELINE
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

\*H = high, M= medium and L= low and + denotes a positive impact.

#### 4.4.2.8 Mitigation

“Mitigation” is a broad term that covers all components of the ‘mitigation hierarchy’ defined hereunder. It involves selecting and implementing measures, amongst others protecting the users of the environment from adverse impacts as a result of mining or any other land use. The aim is to prevent adverse impacts from occurring or, where this is unavoidable, to limit their significance to an acceptable level. Offsetting of impacts is the last option in the mitigation hierarchy for any project. The mitigation measures also refer to the optimisation of positive impacts to ensure these impacts’ effects are maximised.

The mitigation hierarchy in general consists of the following in order of which impacts should be mitigated:

- Negative Impacts
  - **Avoid/prevent impact:** Can be done through utilising alternative sites, technology and scale of projects to prevent impacts. In some cases, if impacts are expected to be too high the “no project” option should also be considered, especially where it is expected that the lower levels of mitigation would not be adequate to limit socio-economic impacts.
  - **Minimise (reduce) impact:** Can be done through utilisation of alternatives that would ensure that impacts on the socio-economic environment and eco-services provision are reduced. Impact minimisation is considered an essential part of any development project.
  - **Manage (restore) impact:** Applicable to aspects where impact avoidance and minimisation are unavoidable where an attempt to re-instate impacted aspects and return them to conditions which are like the pre-project conditions.



- **Offset (compensate) impact:** Compensating for latent or unavoidable negative impacts on the socio-economic environment. Offsetting should take place to address any impacts deemed to be unacceptable which cannot be mitigated through the other mechanisms in the mitigation hierarchy.
- Positive Impacts
  - Awareness: Creating awareness of policies and procedures, and where stakeholders can access opportunities
  - Engagement: Engagement with stakeholders and potential beneficiaries to ensure needs and local content is taken into consideration
  - Reaching agreement with stakeholders or potential beneficiaries for a development component, objective or action
  - Action: Acting or implementing decision that would benefit a specific community or stakeholder group

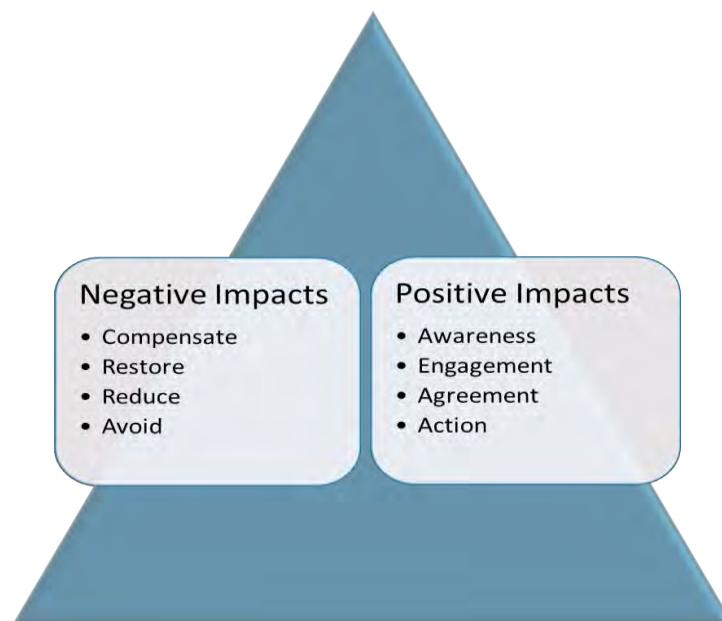


Figure 8: Mitigation Hierarchy

#### 4.4.2.9 Mitigation Efficiency (ME)

Mitigation Efficiency is determined through professional experience and empirical evidence of how effectively and to what degree the proposed mitigation measures may manage the impact.

Mitigation Efficiency is rated out of 1 as follows:

Table 11: Mitigation Efficiency

NEGATIVE CATEGORY	POSITIVE CATEGORY	DESCRIPTOR
Mitigate Low	Optimize Low	Impact <50% mitigated
Mitigate Medium	Optimize Medium	Impact >50% mitigated
Mitigate High	Optimize High	Impact 100% mitigated

#### 4.4.2.10 Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

## 4.5 Social Monitoring and Management Plans

As part of the Environmental Management Programme (EMPr) it is recommended that Social Monitoring and Management Plans be compiled which would serve as a mitigation policy and management plan for the impacts on the social environment.

## 4.6 Limitations and Assumptions

### 4.6.1 Assumptions

**Technical suitability:** It is assumed that the Mining Right Application as identified by West Wits represents a technically suitable site, and the best possible location for the mine activity based on the technical information available to them.

### 4.6.2 Limitations

**Information available:** This study was carried out with the information available to the specialists at the time of executing the study, within the available timeframe and budget. The sources consulted are not exhaustive and additional information, which might strengthen arguments or contradict information in this report, might exist.

**Evidence-based Approach:** The specialists did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to the assessment.

**Socio-economic Sensitive Environments:** Areas that might yield socio-economic sensitivities have been identified through a desktop study utilising available Mapping, Orthophotos and Google Earth™. The areas that have been marked are the sensitive areas visible to the socio-economic specialists at the time of the study, which are in close proximity to the proposed project location under investigation.

**Demographic data:** The demographic data used in the study is largely based on the 2011 Census and where available the Community Survey of 2016. Census data for 2016 is not yet available from Statistics South Africa up to municipal and ward level. While this data does provide useful information on the demographic profile of the affected area, the data are dated and should be treated with care. Where possible, reference is made

to the latest demographic data contained in local Integrated Development Plans and other documents. With regard to the settlements in proximity to the project, a household survey was conducted to ensure accurate and updated data.

**Sense of Place:** Assessment of the impact on sense of place is based on the specialist's opinion as sense of place is a very personal experience and is not easily measurable. Information from the visual impact assessment was utilized to determine the impact.

**Decommissioning Impacts:** Socio-economic impacts associated with the eventual decommissioning of the mine at the end of its life are briefly discussed but are not subject to detail assessment. This omission is motivated by the fact that predictions concerning the characteristics of the receiving socio-economic environment at the time of decommissioning are subject to a large margin of error, thus significantly reducing the accuracy of the impact assessment.

## 5 LEGISLATIVE, POLICY AND PLANNING ENVIRONMENT

### 5.1 Introduction

Section 5 provides an overview of the legislative, policy and planning environment affecting the Mine Right Application. For the purposes of meeting the objectives of the SIA the list below includes the legislation, policy and planning documents that were reviewed. Summaries of these legislations and policies are not necessarily included in this report where relevance is low.

- International Best Practice
  - Equator Principles
  - International Finance Corporation Standards
  - Project Classification
  - Human Rights
- South African Legislation
  - The Constitution, Act 108 of 1996
  - The National Environmental Management Act, Act 107 of 1998 (NEMA)
  - National Heritage Resources Act, Act 25 of 1999 (NHRA)
  - Conservation of Agricultural Resources Act, Act 43 of 1983
  - Mine Health and Safety Act, Act 29 of 1996
  - Land Use Planning Ordinance, Ordinance 15 of 1985
  - Town Planning and Townships Ordinance, Ordinance 15 of 1986
  - Spatial Planning and Land Use Management Act (SPLUMA), Act 13 of 2013
  - Special Economic Zones Act, Act 16 of 2014
  - Promotion of Access to Information Act, Act 2 of 2000
  - Promotion of Administrative Justice Act, Act 3 of 2000
  - Broad Based Black Economic Empowerment Act, Act 53 of 2003
  - Restitution of Land Rights Act, Act 3 of 1996
  - Amendment of the Upgrading of Land Tenure Rights Act, Act 112 of 1991
- Policies and Planning Documents
  - Gauteng Provincial Growth and Economic Development Strategy
  - Gauteng Spatial Development Framework
  - City of Joburg Metropolitan Spatial Development Framework
  - City of Joburg Metropolitan Integrated Development Plan

## 5.2 International Best Practice

The most widely recognised and frequently applied set best practice standards pertaining to the assessment and management of social and environmental impacts are the Performance Standards (PS) on Social and Environmental Sustainability, developed by the International Finance Corporation (IFC) in 2006. The IFC's Performance Standards form part of the Equator Principles.

The IFC's Performance Standards aim to manage social and environmental risks (and impacts) in order to enhance development opportunities in private sector financing in member countries eligible for financing (IFC, 2006 as amended in 2010). The emphasis is on the early identification of potential impacts associated with the project activities during the life cycle of the project, namely construction, operation, decommissioning and closure activities.

IFC Performance Standards define project proponents' roles and responsibilities for managing project activities and associated infrastructure and the requirements for receiving and retaining IFC support.

### 5.2.1 Basic Human Rights

The protection of basic human rights is first and foremost the responsibility of the state. However, in terms of international best practice, private sector companies are increasingly required to uphold and promote these basic rights. The statement below outlines the United Nations International Children's Education Fund (UNICEF) definition of human rights.

**“Human rights are those rights, which are essential to live as human beings – basic standards without which people cannot survive and develop in dignity. They are inherent to the human person, inalienable and universal.”**

Source: UNICEF, 2011

The UN's 'Protect, Respect and Remedy Framework for Business and Human Rights' (2010) underlines the corporate responsibility to protect human rights, address adverse impacts and provide greater access to remedies. The following key aspects of the UN Framework for Business and Human Rights apply to projects:

- **Respecting rights:** It is the responsibility of a company to respect human rights. This is often defined by social expectations and in part is a company's "social license to operate". A company cannot compensate for human rights harm by performing good deeds elsewhere and "doing no harm" may require positive steps such as policies, training and managing impacts.
- **Due diligence:** This concept describes the steps a company must take to become aware of, prevent and address adverse human rights impacts. At a minimum, a company should look at international bill of

human rights and core conventions of the International Labour Organisation (ILO). Companies should consider three sets of factors, namely:

- The country contexts, to highlight any specific human rights challenges they may pose.
  - What human rights impacts the project activities may have within that context.
  - Whether they might contribute to abuse through the relationships connected to their activities, such as with business partners, suppliers, State agencies, and other non-State actors. How far or how deep this process must go, would depend on circumstances.
- **Policies:** Companies need to adopt a human rights policy.
  - **Impact assessments:** Companies must take proactive steps to understand how existing and proposed activities may affect human rights.
  - **Integration:** The integration of human rights policies throughout a company is essential as is leadership from the top to embed respect for human rights throughout a company, as is training to ensure consistency, as well as capacity to respond appropriately when unforeseen situations arise.
  - **Tracking performance:** Monitoring and auditing processes permit a company to track on-going developments.
  - **Sphere of influence:** The sphere of influence conflates two very different meanings of influence: one is impact, where the company's activities or relationships are causing human rights harm; the other is whatever leverage a company may have over actors that are causing harm. The first falls squarely within the responsibility to respect; the second may only do so in particular circumstances.
  - **Complicity:** The corporate responsibility to respect human rights includes avoiding complicity, which refers to indirect involvement by companies in human rights abuses - where the actual harm is committed by another party, including governments and non-State actors. Due diligence can help a company avoid complicity.

## 5.3 Policy and Planning

### 5.3.1 South African Mining Charter

Focus on sustainable transformation of the mining industry. The Mining Charter seeks to achieve the following objectives:

- (a) To promote equitable access to the nation's mineral resources to all the people of South Africa;
- (b) To substantially and meaningfully expand opportunities for Historically Disadvantaged South Africans (HDSA) to enter the mining and minerals industry and to benefit from the exploitation of the nation's mineral resources;

- (c) To utilise and expand the existing skills base for the empowerment of HDSA and to serve the community;
- (d) To promote employment and advance the social and economic welfare of mine communities and major labour sending areas;
- (e) To promote beneficiation of South Africa's mineral commodities; and
- (f) Promote sustainable development and growth of the mining industry.

Social management and mitigation measures, developed as part of the SIA, is aligned to the Mining Charter.

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

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

- enhance systems for integrated planning and implementation;
- sustain ecosystems and use natural resources efficiently;
- move towards a green economy;
- build sustainable communities; and
- respond effectively to climate change.

### **5.3.3 National Spatial Development Perspective (NSDP)**

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

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

The Mining Right Application has taken municipal-level spatial planning into account where possible.

### 5.3.4 National Development Plan 2030 (2010)

According to the National Development Plan, “South Africa needs to rethink urban planning and development to face future challenges. We must grapple with this task and deal intelligently with social exclusion, environmental threats, economic inefficiencies, logistical bottlenecks, urban insecurity, decaying infrastructure and the impacts of new technologies” (NPC, 2011: 284). In Chapter 8, Transforming human settlement and the spatial economy, the NDP highlights the need to:

- Contain and possibly reverse urban sprawl.
- Create sustainable human settlements.
- Focus new urban development, in particular affordable housing, around public transport corridors and economic nodes.
- Create economic hubs within historically black townships that have sufficient market size.
- Integrate townships into wider economic functioning localities.
- Upgrade informal settlements where appropriate.
- Give more attention to the design and quality of urban public space.
- Ensure that state funding does not support the further provision of non-strategic housing investments in poorly located areas.

### 5.3.5 Integrated Urban Development Framework (IUDF) 2016

The IUDF, which was adopted in 2016, is government’s policy aimed at guiding the future growth and management of urban areas. The IUDF builds on various chapters in the NDP and marks a New Deal for South African cities and towns. The key outcome is spatial transformation, which is anchored around three elements: jobs, housing and transport. The urban growth and management model is based on three pillars: compact urban growth, connected infrastructure, and coordinated governance and investments. Four overall strategic goals contribute to achieving the transformative vision of restructured urban spaces and compact, connected cities and towns: spatial integration, inclusion and access, growth, and governance (Gauteng: SDF, 2016).

### 5.3.6 Strategic Infrastructure Projects, 2013

The 18 Strategic Infrastructure Projects (SIPs) cover social and economic infrastructure across all nine provinces, and include catalytic projects that can fast-track development and growth (PICC, 2012). Five of the SIPs are spatially and/or geographically focused. Of key significance to the future development of the province is SIP 2: The Durban–Free State–Gauteng Logistics and Industrial Corridor, which seeks to boost capacity along the nationally significant freight corridor running between Gauteng and Durban.



Key areas of focus and attention include:

- Increasing the use of rail for freight transport, as opposed to the use of roads/trucks.
- Expanding rail, train station, port and logistics hub investment, maintenance and upgrading.
- Enhancing intermodal integration along the N3-corridor.
- Improving feeder route connection to the N3-corridor.
- Strengthening the economies of towns along the N3-corridor.
- Improving safety and security around deliveries on the transportation routes and at the stations, terminals and ports.
- Increasing night-time freight movement to ease congestion.
- Making greater use of smaller trucks for short-haul purposes to and from railway stations and other destinations, to reduce the negative impacts of such movement on road surfaces and the environment.

In Gauteng, projects include the City Deep terminal, the Tambo Springs Inland Port and Logistics Gateway (an inland port/terminal close to Heidelberg) and the Gauteng Aerotropolis with OR Tambo International Airport as key anchor. To implement the SIP and realise its intended objectives would require:

- Coordinated action by all State and non-State stakeholders, notably between role-players in the three spheres of government.
- Incorporation of the SIP in all relevant strategic, spatial development, biodiversity, transport and logistics planning.
- Solid financial planning in support of the initiative.

### **5.3.7 The Neighbourhood Development Partnership Programme: Urban Hubs**

The National Treasury's Neighbourhood Development Partnership Programme (NDPP) has identified a number of township centres as Urban Hubs. The focus is on shifting infrastructure investments to the creation of efficient and effective urban centres in order to increase economic growth, create employment and improve access to urban amenities, especially for the poor in marginalised settlement areas such as townships. The aim of the Urban Hubs is to function as 'town centres' for the surrounding township or cluster of townships, and to provide access to the wider urban area. They would be developed as high-density, mixed-use precincts that contain a diverse variety of land uses, services and activities. At the core of each Urban Hub should be an efficient intermodal public transport facility and a system of public spaces and walkways where people can experience a diverse range of activities.

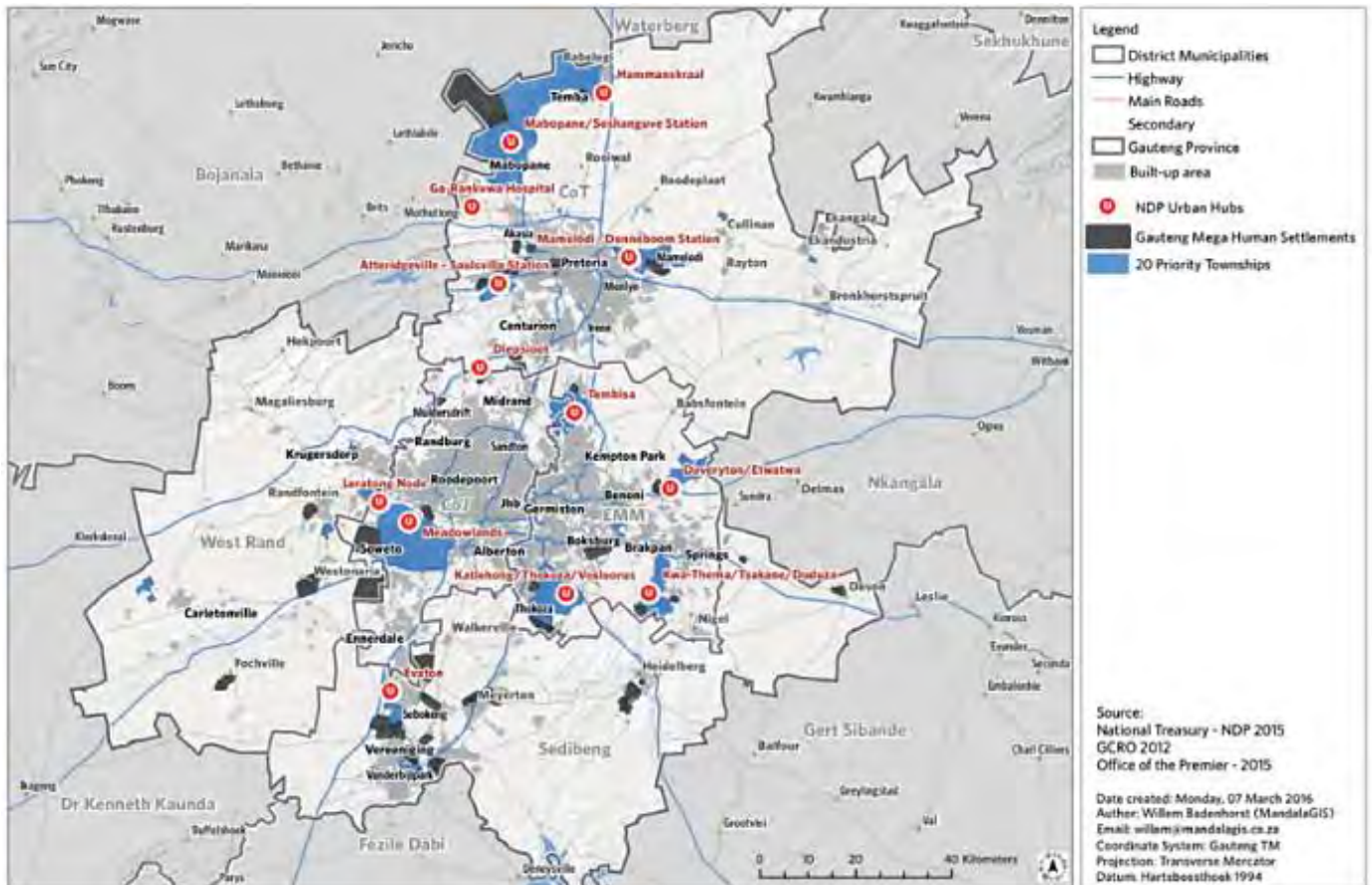


Figure 9: Urban Hubs

### 5.3.8 Gauteng 10-Pillar Programme of Transformation, Modernisation and Re-industrialisation

The 10-Pillar Programme for the economic, social and spatial transformation of Gauteng, includes the two pillars most relevant to the project which are “decisive spatial transformation” and “modernisation of human settlements and urban development”. To achieve radical and decisive spatial transformation would require key elements, including:

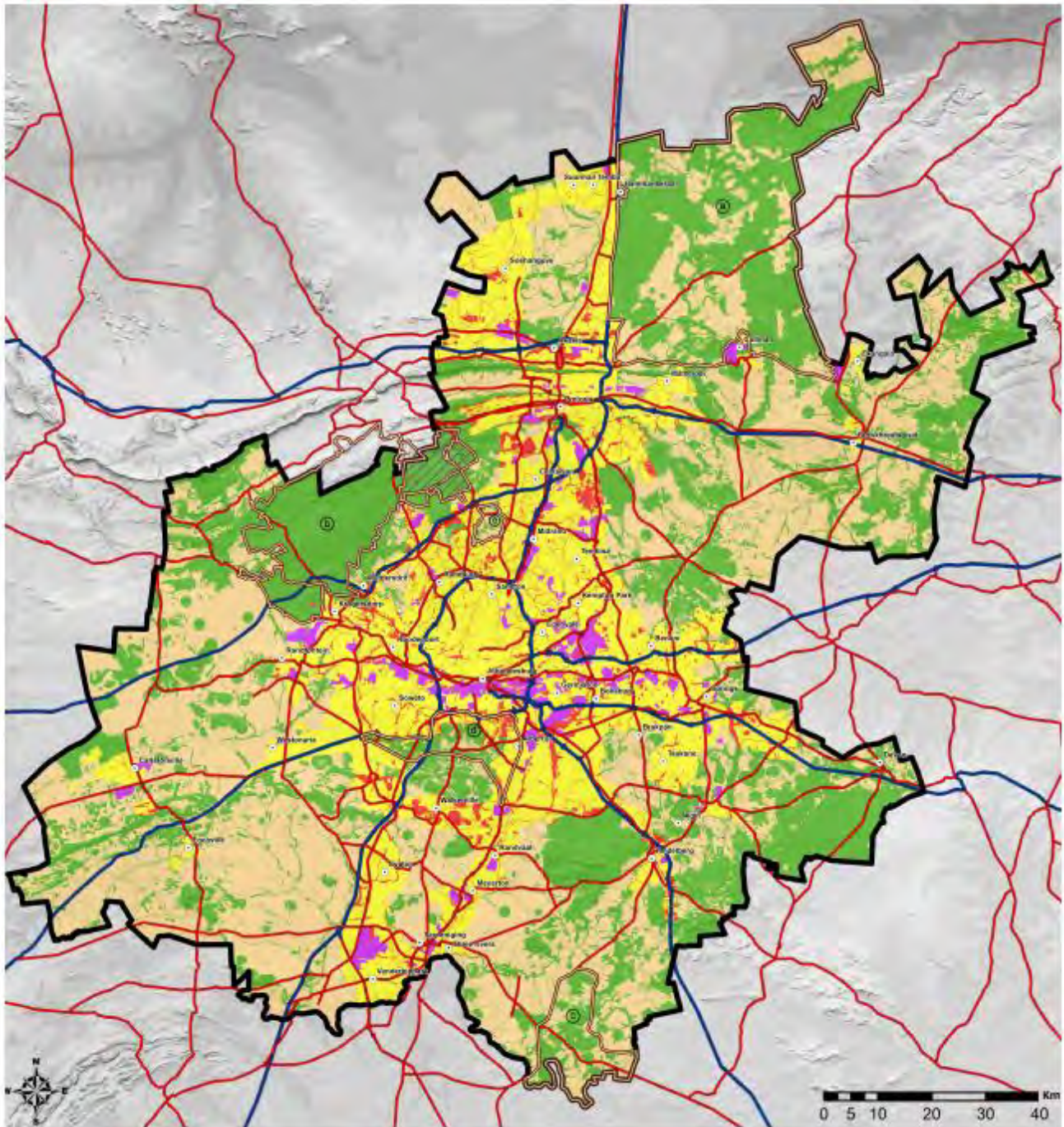
- Transforming the Apartheid spatial economy and human settlement patterns to integrate economic opportunities, transport corridors and human settlements.
- Revitalising and mainstreaming the township economy.
- Enhancing the competitiveness of strategic economic sectors.
- Significant investment in economic infrastructure.

The focus is on three macro interventions: spatial reconfiguration, township economy revitalisation and massive infrastructure investments.

### 5.3.9 The Gauteng Provincial Environmental Management Framework, 2014

This framework's objective is to guide sustainable land-use management within the province. It determines geographical areas where appropriate activities are allowed (environmental management zones) and is aimed at facilitating economic development in the province. The following environmental management zones were developed to address the challenges posed by urban development on natural systems:

- Zone 1: Urban development zone: Urban development activities are streamlined (exempt from environmental assessment requirements), and infill and densification are promoted with the aim of minimising urban sprawl into rural areas.
- Zone 2: High control zone (within the urban development zone): Sensitive areas in the urban development zone are conserved.
- Zone 3: High control zone (outside the urban development zone): Sensitive areas outside the urban development zone are protected.
- Zone 4: Normal control zone: Agricultural uses outside the urban development zone are protected.
- Zone 5: Industrial and large commercial focus zone: Non-polluting industrial and large-scale commercial activities are streamlined (exempt from environmental assessment requirements), specifically in areas that are already used for such purposes and areas that are severely degraded but close to required infrastructure.



**MAP LEGEND:**

**ENVIRONMENTAL MANAGEMENT ZONES**

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Special Control Zones
- Special Control Zone for Conservation, Recreation and Tourism

Gauteng Provincial Boundary

**Roads**

- National Road
- Arterial Road

**Special Control Zones:**  
 (a) Dinokeng  
 (b) CoHwHS  
 (c) Vaaldam  
 (d) Jhb South  
 (e) Jhb North

Figure 10: Gauteng Environmental Management Framework, 2015

The project falls within the southern parts of Zone 1 (Urban Development) and northern parts of Zone 5 Industrial and Commercial Focus.

### **5.3.10 Gauteng Spatial Development Framework (SDF)**

The GSDF 2030 aspires to establish a balanced, polycentric spatial network, with strong and resilient nodes enabling mutually beneficial exchanges of goods and services, and movement of people. Establishing this desired spatial form in the province would not be accomplished overnight but would take years, even decades.

To support the establishment of this polycentric form, four spatial development strategies are to be followed:

- Capitalising on proximity, by directing higher densities closer to economic nodes and public transport networks, and improving conditions in areas closer to economic opportunities, to ensure even greater benefits for the people and economy of these areas.
- Managing new settlement development, to prioritise infill development and densification, rather than expanding residential development outwards, so new settlements are functional and integrated units of the polycentric provincial network and based not only on the availability of land.
- Building an economic network, through a system of high-order nodes and activity corridors, developing economic clusters that benefit from synergies and unlock the advantages of agglomeration.
- Creating a viable and productive hinterland, by protecting valuable resources and high potential agricultural land from harmful development, and managing water resources fugally and effectively.

Ten high-priority provincial spatial development proposals are outlined:

- Intensify nodes, public transport routes and stations, to optimise the benefits of nodes and public transport routes in polycentric networks.
- Strengthen, maintain and enhance nodes, as identified by each municipality, to ensure that development takes place within the nodes.
- Promote spatial integration and township regeneration, through the use of land banking and government land assets, and support for urban hubs.
- Manage municipal urban growth, by enforcing urban growth boundaries, in order to reduce sprawl, manage infrastructure expenditure and ensure better socio-economic integration.
- Expand and integrate municipal bus rapid transit (BRT) networks, to achieve greater connectivity between major nodes and notes and settlements with low levels of economic activity.
- Enhance major road and rail networks, to ensure greater connectivity and a balanced provincial spatial network.

- Provide multi-pronged sustained support to outlying residential areas developed during colonial and Apartheid areas, including human capital development, mobility support and local economic development programmes.
- Strengthen and enhance agricultural production and agro-processing, to optimise the use of high-value agricultural land in the province, create jobs, grow the economy and improve food security.
- Actively manage and protect the environment and eco-systems, including rehabilitating degraded areas and exploring legislating a provincial green belt.
- Improve and optimise provincial tourism opportunities, through directing tourism-related activities to identified tourism areas, and creating strong links between tourism towns and surrounding eco-tourism opportunities.

Towards the realisation of the above and beyond, the GSDF 2030 puts forward a spatial development logic based on five focus areas:

- Focus Area 1 – Shared Economic Prosperity: Maintaining and deepening the economic productive capacity of those areas where a large part of the provincial economy is concentrated.
- Focus Area 2 – Socio-economic Integration: Pursuing densification, diversification and integration in areas where a significant part of the provincial economy is concentrated, where the State owns significant tracts of land, and land prices are not as prohibitive as in the economic core areas
- Focus Area 3 – Economic Consolidation: Focusing township redevelopment, including nodal and corridor development, in townships where most people live, that are most accessible and connected via public transport to the economic core areas and similar township areas, and could develop diverse economic activities.
- Focus Area 4 – Social and Local Economic Support: Enhancing public transport connections with townships where fewer people live and hence economic accessibility is poorer, while at the same time focusing on skills development and supporting local economic development initiatives.
- Focus Area 5 – Rural Enterprise Support: Protecting those parts of the province that provide key environmental support services, are environmentally sensitive, have been formally demarcated as conservation areas, have high agricultural potential, or are used as or have the potential for eco-tourism and rural economic activities.

The project area falls within two focus areas, that of socio-economic integration (focus area 2) and economic consolidation (focus area 3). This can only be achieved in this area if a) the land is suitable for development; and b) there is no other priority prohibiting land development such as either a protected area or mineral resources present.

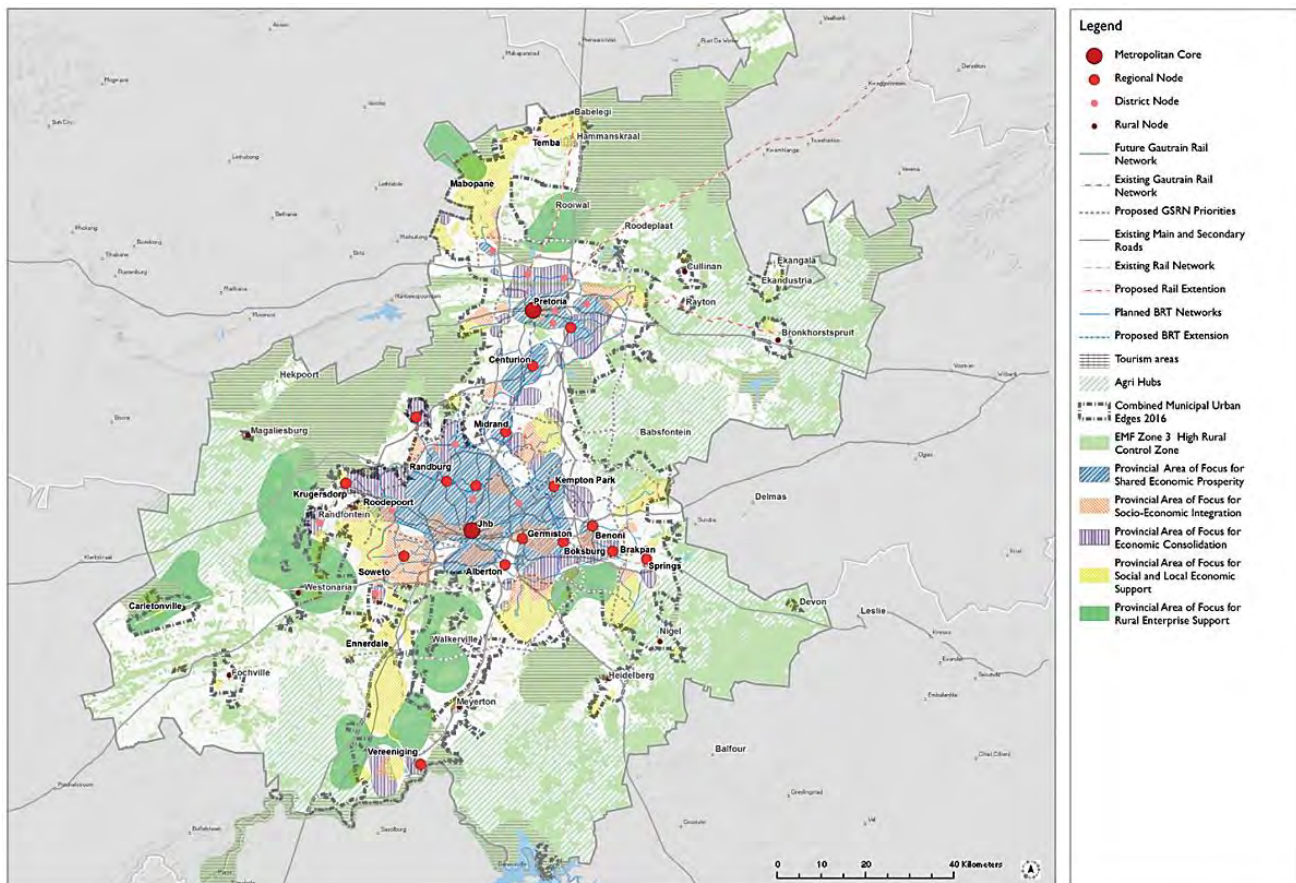


Figure 11: Gauteng Spatial Development Framework Focus Areas

### 5.3.11 City of Joburg (CoJ) Metro Spatial Development Framework

The City of Johannesburg's SDF seeks to address:

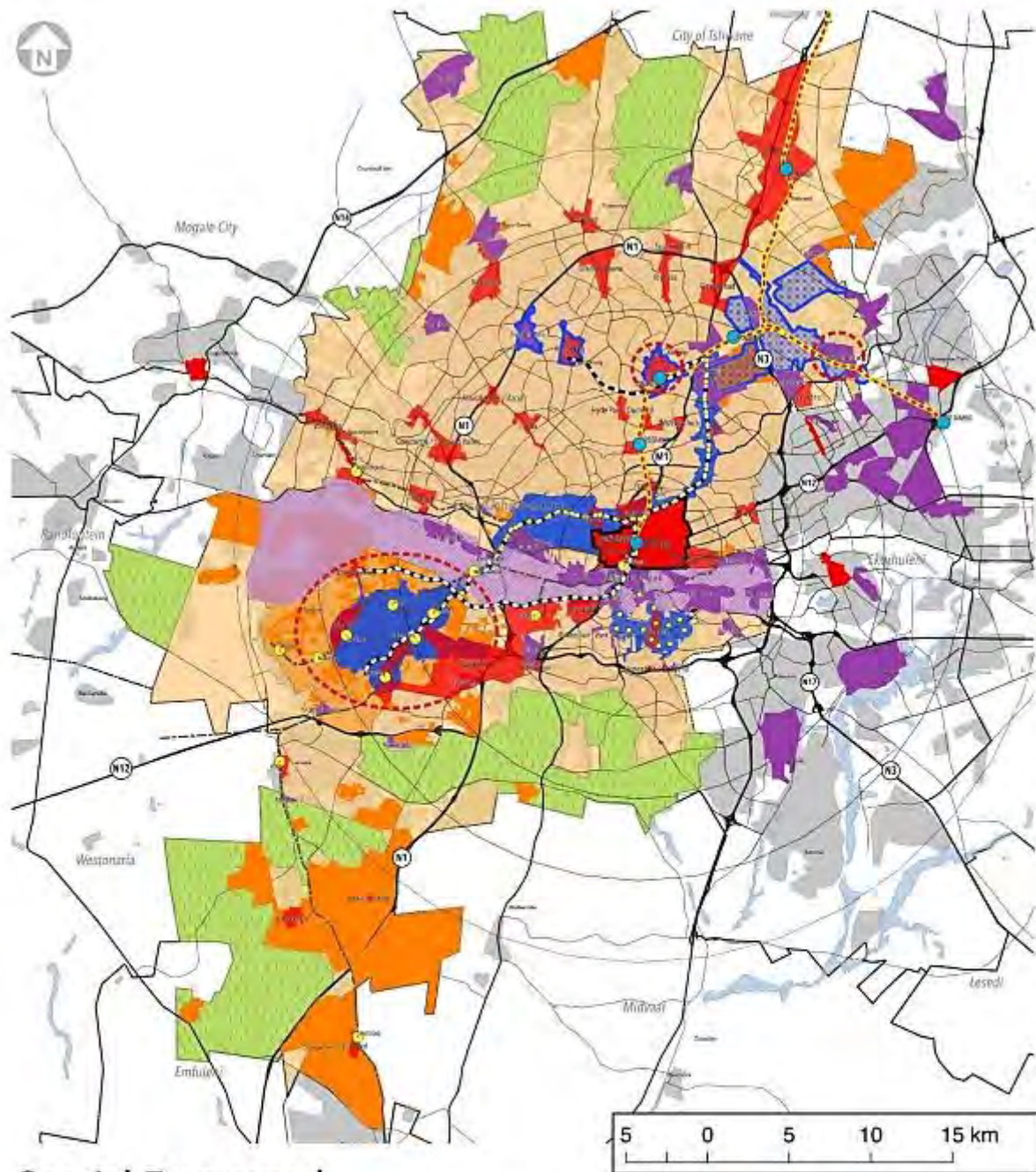
- Spatial inequalities and the job-housing mismatch.
- Urban sprawl and fragmentation.
- Exclusion and disconnection emanating from buffer areas, securitisation and gated developments, and disconnected street networks.
- Inefficient residential densities and land use diversity.
- Increasing pressure on the natural environment and green infrastructure.

The main structuring elements of the SDF centre on the compact polycentric urban model and use the following key elements:

- Creating a strong, accessible, generative urban core through consolidating the central business district (CBD), using public space and the street network, developing key buildings/areas, and linking/expanding towards industrial areas in the south to bridge the integration gap between the north and south.

- Building on a consolidated public transit backbone linked to the Corridors of Freedom Strategy, where transit and/or development corridors link key nodes in the city, supported by strong integrated public transport.
- Unlocking Soweto as a true city district, by growing a more diverse (not predominantly residential) and integrated, self-sufficient urban city-node.
- Addressing marginalisation through (re)urbanisation in highly populated, mostly residential areas (that rely on the Central Business District (CBD) and other core areas for urban amenities) and through the improvement of service provision and linkages, with the view to integration and self-sustained growth.
- Focusing growth, consolidation and reinvestment through a hierarchy of nodes: mixed-use/key urban nodes, industrial nodes, Transit-oriented development (TOD) nodes and neighbourhood nodes.
- Using the mining belt to re-shape the Apartheid city structure by developing these areas and linking outlying areas such as Soweto to their surroundings.
- Developing an Aerotropolis Corridor that would ensure better integration with neighbouring Ekurhuleni Metropolitan Municipality and establish a highly developable link with Johannesburg.
- Integrating a natural structure for ecosystem services, which would ensure the protection and preservation of critical biodiversity areas in the municipality to improve sustainability.
- Developing key areas outside of the priority transformation areas, such as specific restructuring zones, other marginalised areas and the Lanseria node.





### Spatial Framework

#### INTEGRATED TRANSPORT NETWORK

- Railway Stations
- Gautrain Stations (Current Network)
- BRT Nodes
- TOD Precincts
- Gautrain Line (Current Network) copy
- Gautrain Line (Potential Future Link) copy
- Railway Lines
- BRT Backbone

#### ECONOMIC BACKBONE

- Principal Metropolitan Sub-centre
  - Inner City (Metropolitan Core)
  - Urban Nodal Areas
  - Industrial Nodes
  - Mining Belt (Mixed use Area)
- #### PUBLIC TRANSPORT BACKBONE
- Empire Perth / Louis Botha CoF
  - Turtfontein CoF
  - Soweto CoF
  - Randburg - OR Tambo Corridor Elements

#### CONSOLIDATION ZONE

- Consolidation Zone
- Soweto
- Deprivation Areas

#### NATURAL STRUCTURE

- Wetlands and Waterbodies
- C-Plan Area Coverage
- Area beyond UDB
- Gauteng Built-up Areas
- CoJ Boundary

Figure 12: CoJ SDF

### 5.3.12 Unlocking the Mining Belt

The mining belt has been selected by CoJ as one of the crucial development opportunities in the city. It is the most prominent feature of urban fragmentation in the city. There are a number of key opportunity areas along the mining belt, including its potential to integrate the areas of Soweto with the broader urban and economic opportunities around Roodepoort towards Mogale City, and its role in facilitating the southern expansion of the existing Johannesburg Inner City area. This must however be considered in the context of some of the mining belt's environmental and pollution linked realities. As such, strict regulations and legislation (including nuclear, and radiation linked regulations and legislation) must be followed in rehabilitating the mining belt. Land must be made safe in a sustainable manner, before it can be developed. In doing so, a triple benefit can be gained. The city can: (1) clear polluted land, reduce health risks and protect natural resources; (2) free up valuable land for mixed use development and (3) transform the mining belt from a feature of exclusion, to one of connection and inclusion.

The primary objective is to re-shape the historical mining-belt buffer (that segregated areas such as Soweto from the north of the City) into a mixed use, vibrant growth area that bridges the historic spatial divide. The strategy is to identify select strategic interventions that are well suited to re-stitch Johannesburg across the mining belt. In the short term, due to the sheer size of the mining belt, key catalytic projects should be implemented, that would contribute to the long term evolution of the mining belt. The Mining Land (West) Strategic Area Framework provides details of the proposed development and interventions in the area. The development strategy is structured around a number of key strategies, discussed below.

*Connecting the Mining belt, across and within:* Connecting principal and secondary metropolitan sub-centres to one another and the metropolitan core by creating new road connections across the mining belt is a key intervention. A regional and local movement network is critical to optimise the development potential of land and to functionally integrate the area into the surrounding urban fabric. This includes creating a direct road connection between Soweto to Roodepoort with multimodal transport services; improving connections between the Inner City and the Turffontein Corridor of Freedom and protecting and enhancing future north-south connections with the extension of the N17. A strong, continuous east-west central spine highlights the importance of N17 (and its westwards extension) as east-west connector - this road would be the new backbone for structuring economic investment. The N17 route would also provide a critical cross-border connection between areas of opportunity within Ekurhuleni, through Johannesburg and into the West Rand.

Economic diversification is the primary focus of development in the mining belt: First and foremost, it should

provide jobs and economic activities. All development strategies should be geared towards optimising the economic potential of the mining belt, which includes continuation of productive and viable mining activities (including the extraction of gold from and removal of tailings) and the strengthening of industrial and commercial sectors. The strategy includes consolidating current industrial activities and growing the potential for real job creation in the primary economic sector in accessible locations. Potential of reclaimed land for economic development and job creation in close proximity or interconnected with Soweto must be prioritised – the potential of an ICT Hub at NASREC is one such area.

Residential diversification: The mining belt can accommodate a significant proportion of low income and affordable housing within a range of housing typologies and mix of income levels. The residential infill strategy should support the intensification of new economic development and residential should be closely related to access afforded by new links and especially the public transport backbone. The housing typologies and densities should result in compact, walkable neighbourhoods related to public transportation. Importantly, as mentioned above, all housing developments within the mining belt must be subject to regulations and legislation in determining if the land is safe to inhabit.

Establish a comprehensive and functional regional open space system to serve the mining belt area: The mining belt offers the opportunity to accommodate a strong regional open space network that can support the intensification of the developable areas over time. Rehabilitation of degraded and polluted land and mitigation of acid mine drainage is a key intervention, which would have to be phased over a long period of time. This includes exploring the ecological structure of the areas as a key determinant to a future settlement pattern: Geotechnical and undermining constraints would inform land use and building typologies. This process is required to reclaim land for development.

Major bulk infrastructure investment is required: The phasing strategy should be linked to reclamation and connectivity interventions. This is a long-term development strategy.

Partnerships for Development: It is acknowledged that the task of rehabilitating and developing the mining belt is vast and would require co-operation from many stakeholders including mining companies, landowners, various government departments across spheres, and the communities affected (including informal dwellers). It is also acknowledged that the project of rehabilitation is a multi-decade one. As such partnerships should be continued where they exist, or entered into where they do not. Projects such as Project Aurous61 and

Project Hloekisa62 (among others) should thus be supported where they show potential to benefit the residents of Johannesburg.

Some legal and financial tools that are suggested to support the implementation of these strategies are:

- Mechanisms and incentives to encourage mining landowners or new private sector investors to rehabilitate and redevelop the land
- A dedicated environmental restoration strategy that could attract international funds.
- Regularisation or land readjustment programs for informal dwellers to improve tenure security.

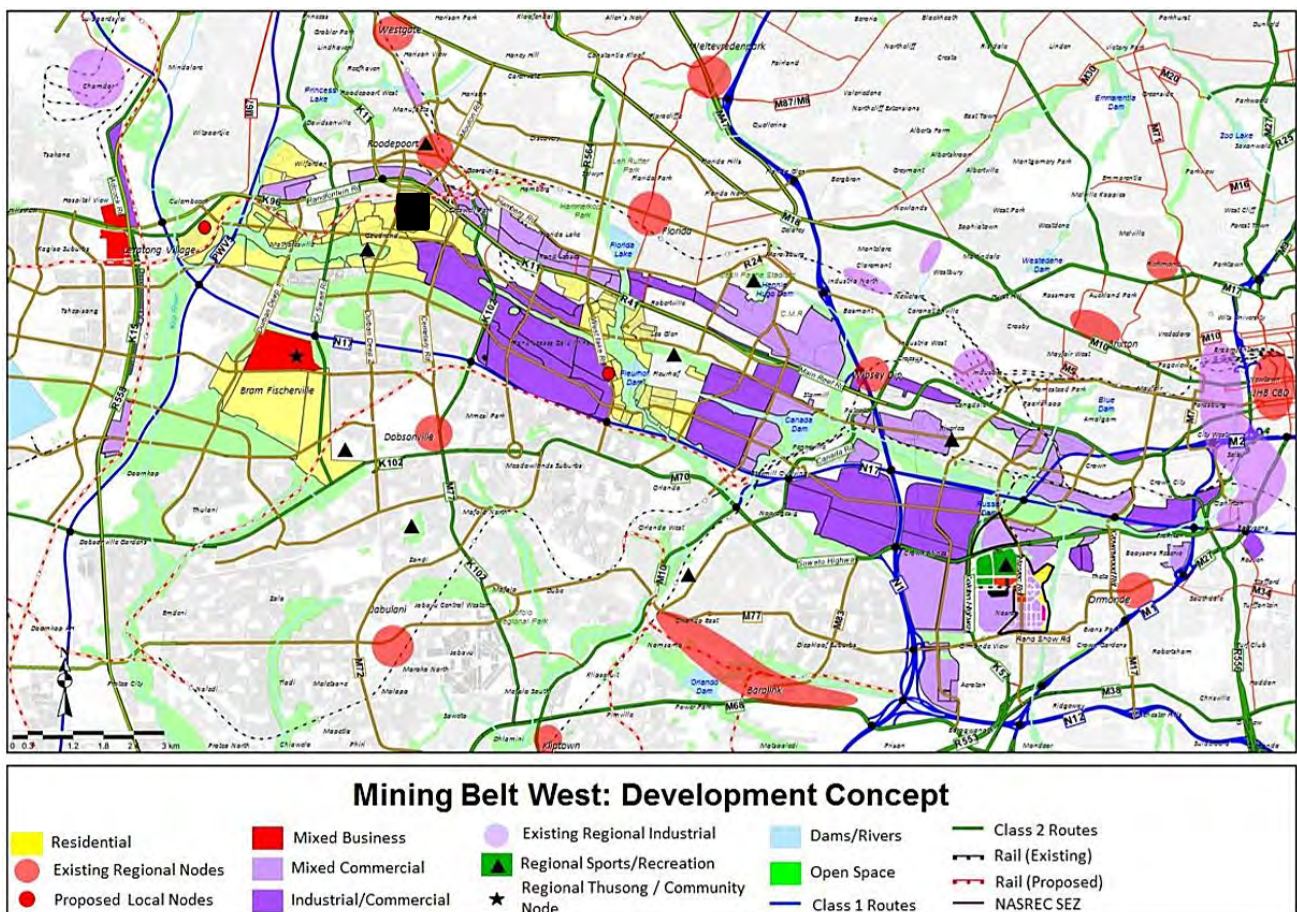


Figure 13: Mining Belt Development Concept (Mining Right Area)

## 6 SOCIAL BASELINE ENVIRONMENT

### 6.1 Socio-Economic Analysis

The following sections provide an analysis of the socio-economic environment in the broader area and within the project area and the informal settlements.

#### 6.1.1 Demographic Analysis

Table 12: Demographic Indicators (Community Profile 2016)

DEMOGRAPHIC	GAUTENG	COJ	WARD ANALYSIS				
			WARD 49	WARD 70	WARD 71	WARD 84	WARD 127
Total population	13.4m	4.95m	46 251	31 023	33 179	33 179	38 731
Number of households	5m	1.9m	14 625	11 249	10 536	10 536	11 249
Population density (people per km <sup>2</sup> )	7.7	3 003	3 135	893	2 825	2 825	2 126
Average household size	3	3	3	3	3	3	2
Female headed households	1.8m	0.7m	5 967	4 015	3 150	3 513	4 477
Young (0-18)	4m	1.5m	15 170	7 412	8 639	8 309	11 070
Mid (19 – 60)	8.6m	3.2m	30 465	21 240	21 116	22 391	27 299
Elderly (60+)	0.75m	0.27m	617	2 371	1 718	2 480	363

The household dynamics within the study area is a key determinant of the demand for services and employment. The average household size is indicative of the quality of life in a study area. This connection is based on the following principle: In areas where average household size is higher the number of dependents is also expected to be greater and thus income per person would be lower. The age and gender composition of a population can have a considerable impact on socio-economic development in a study area. It is indicative of the size of the labour force, worker migration and the demands for health care and other social services.

### 6.1.2 Language

The most prevalent language spoken in the City of Joburg is isiZulu followed by English. Within Ward 70 and 84, the most prevalent language is English followed by Afrikaans. In Ward 127 the most prevalent language is Setswana, followed by isiXhosa.

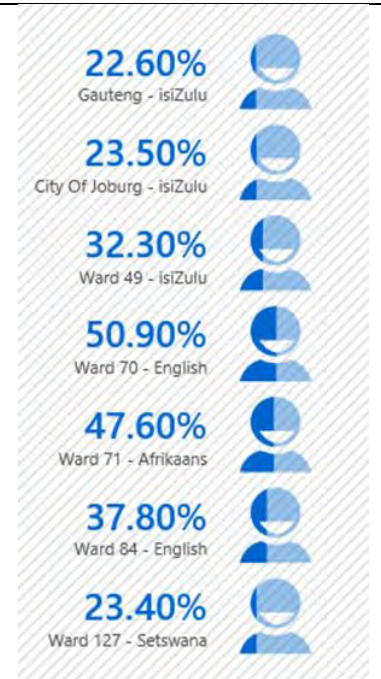


Figure 14: Prevalent languages

### 6.1.3 Household Income

Between 16 – 17% of the Gauteng and City of Joburg households have no income, this is also similar to Ward 127, where 30% of the households have no income. The other towns have between 14 – 21% of households with no income. This indicates to elements of poverty within the neighbouring towns, which can benefit from improved economic development.



Figure 15: Annual Household Income of affected Wards

### 6.1.4 Literacy rates, skills and education

Educational attainment is a key indicator of development in a population. To evaluate long-term provision of education, it is important to disaggregate educational attainment for persons older than 20 years. This is an ideal group since they would have completed attending educational institutions indicating that the level of education, they have is the final one. Statistics South Africa generated a measure of educational attainment for persons over age 20. This group is expected to have completed educational enrolment and therefore giving a good measure for completed level of education.

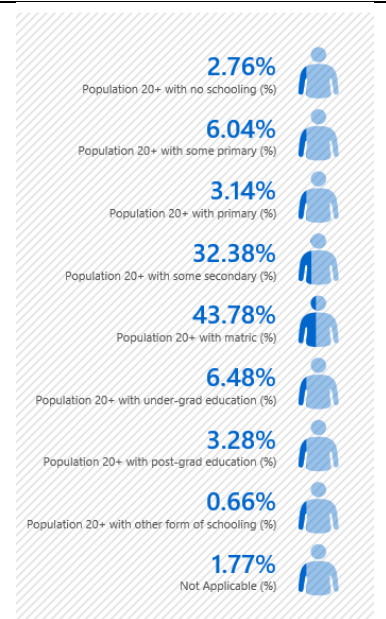


Figure 16: Education Indicators of the affected Wards

### 6.1.5 Employment Status

Unemployment in the affected wards are higher than the Gauteng and City of Joburg averages. Employment is the highest in the towns of Georgina and Roodepoort, which is the seen as established urban centres in the study area. Unemployment in Sol Plaatjies and Matholesville are higher than the Gauteng and City of Joburg averages.



Figure 17: Labour Indicators

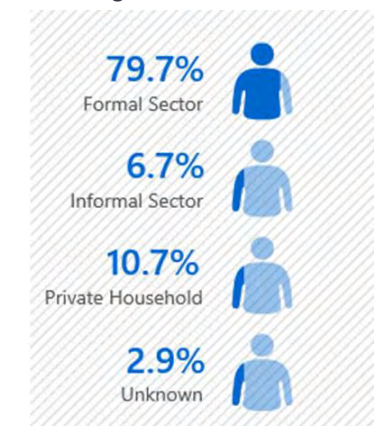


Figure 18: Sector of employment

### 6.1.6 Housing

If there is a high backlog in formal housing availability, this must be taken into consideration by mining companies' housing provision strategies for their employees. Certain considerations and planning is also required to anticipate the impact of influx of work seekers into the local area. The current housing status is important to determine the local area's capacity to respond to change. With an established town and townships within the municipal area, sprawling informal settlements are found adjacent to the nodes, especially where there are mining and other economic activities. The existence of the informal settlements within the municipal area extends the service delivery backlogs in the municipality. Home ownership also indicates how stable a community is. In the Municipal area as a whole, approximately 29.2% of households is either renting accommodation or staying with family members. 38.1% of households own their property and have paid it off and 13.6% of households is currently still paying off home loans.

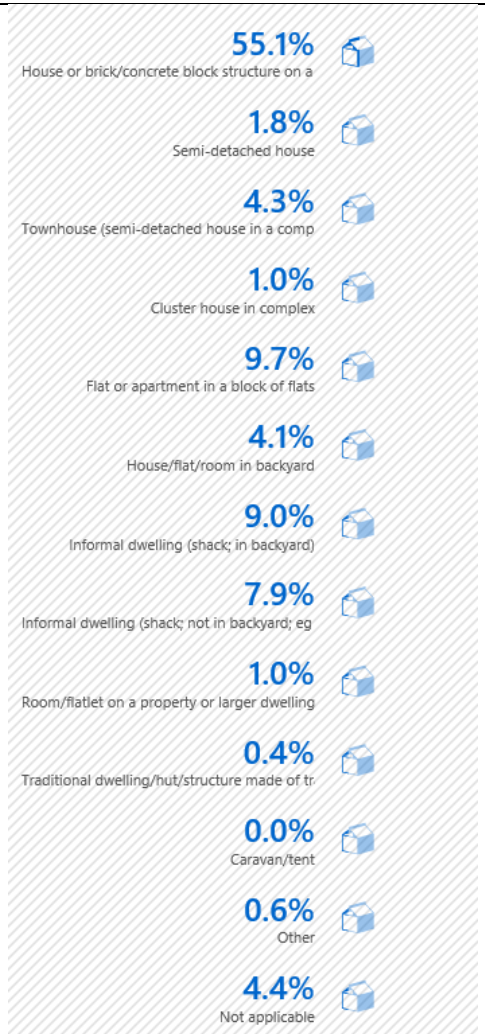


Figure 19: Housing & Ownership in the affected Wards



**6.1.7 Water and Sanitation**

Water and sanitation has generally improved in the municipal area due to service delivery increases. With recent unrests regarding service delivery it is important to ensure mining development does not place additional pressures on service delivery infrastructure and the capacity of municipalities to deliver the necessary services in the local area. Services in the project area are in the main not provided by the municipality.

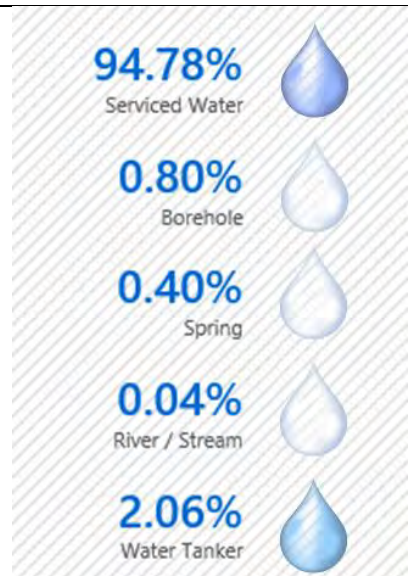


Figure 20: Water Service in the affected Wards

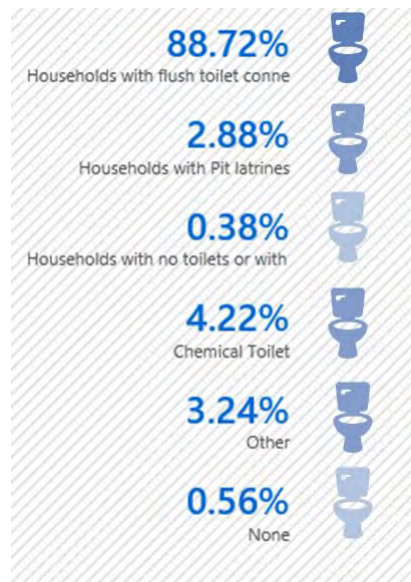


Figure 21: Sanitation Status in the Affected Wards

**6.1.8 Refuse Removal**

Refuse removal in the urban centres are done by the municipality, in some instances people utilize either their own dumps or communal dumps. From observations during the site visit it was also evident that many use unauthorized sites to dump refuse.

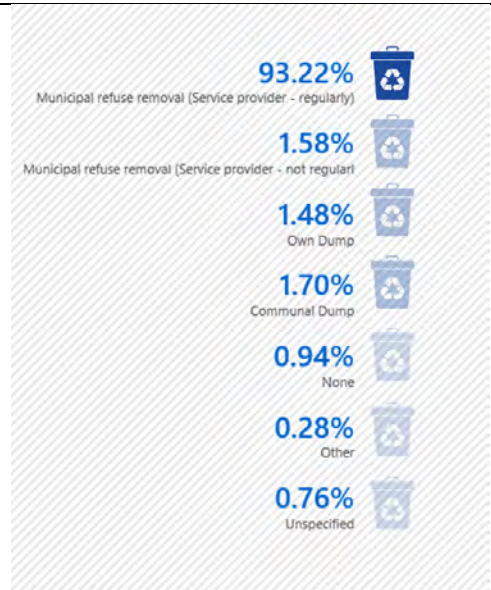


Figure 22: Refuse removal Services in the Affected Wards

**6.1.9 General health and welfare**

HIV/AIDS in South Africa has increased rapidly over the past decade. The social and economic consequences of the disease are far reaching and affect every facet of life in South Africa. Despite South Africa creating a progressive and far-sighted policy and legislative environment for dealing with HIV/AIDS, the prevalence of HIV/AIDS continues to increase. Current prevalence in City of Joburg Metro is 29.5%. Recent statistics indicate that HIV/AIDS prevalence is increasing in Gauteng, therefore policies and awareness campaigns have not impacted significantly on the ground.

**6.1.10 Crime Statistics**

In terms of the latest statistics in Gauteng, 4382 murders were committed in Gauteng in 2018, of these 190 were domestic violence incidents, 105 were because of mob justice, 82 due to taxi violence and 25 were related to illegal mining. The precincts closest to the project area show the following statistics:

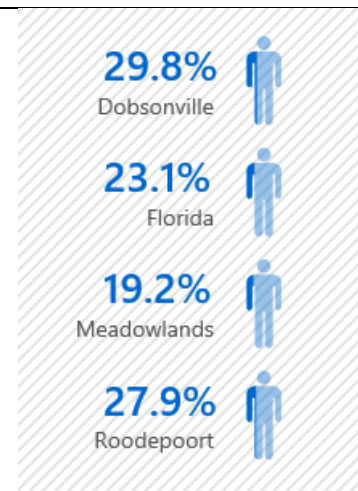


Figure 23: Precinct with the highest reported crimes in 2018

## 6.2 Towns and Settlements

The broader project area is located amongst existing towns and settlements. The closest formal towns are described below:

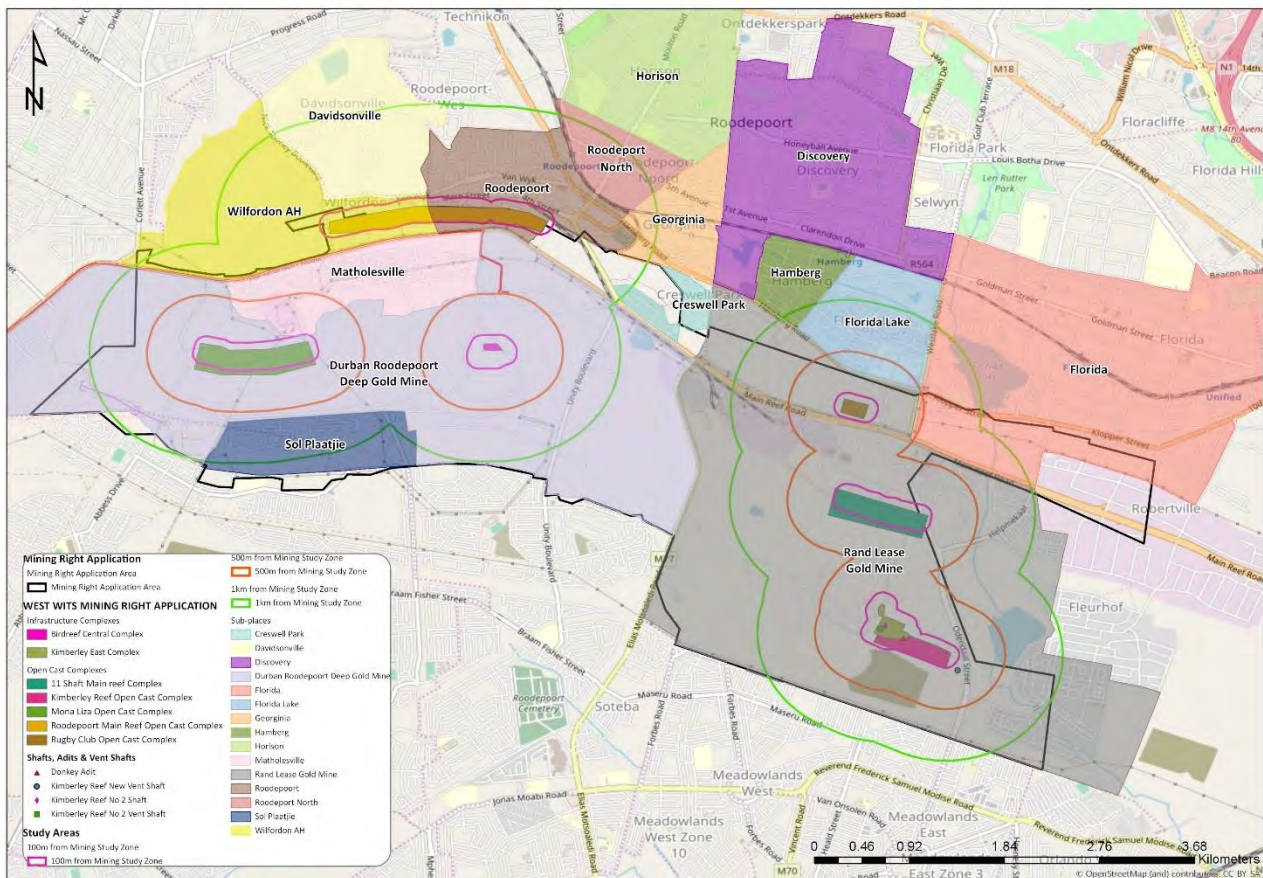


Figure 24: Towns and Settlements

### 6.2.1 Roodepoort and Roodepoort North

Roodepoort Central is located north of the Mining Right Application (MRA) area and makes up the central business district of Roodepoort housing with several Commercial and Light Industrial Activities, with some residential activities to the far west. Roodepoort North is north-east of the MRA area with mostly residential areas, educational, institutional and some commercial activities.

The figure below indicates the predominant land uses in these suburbs:

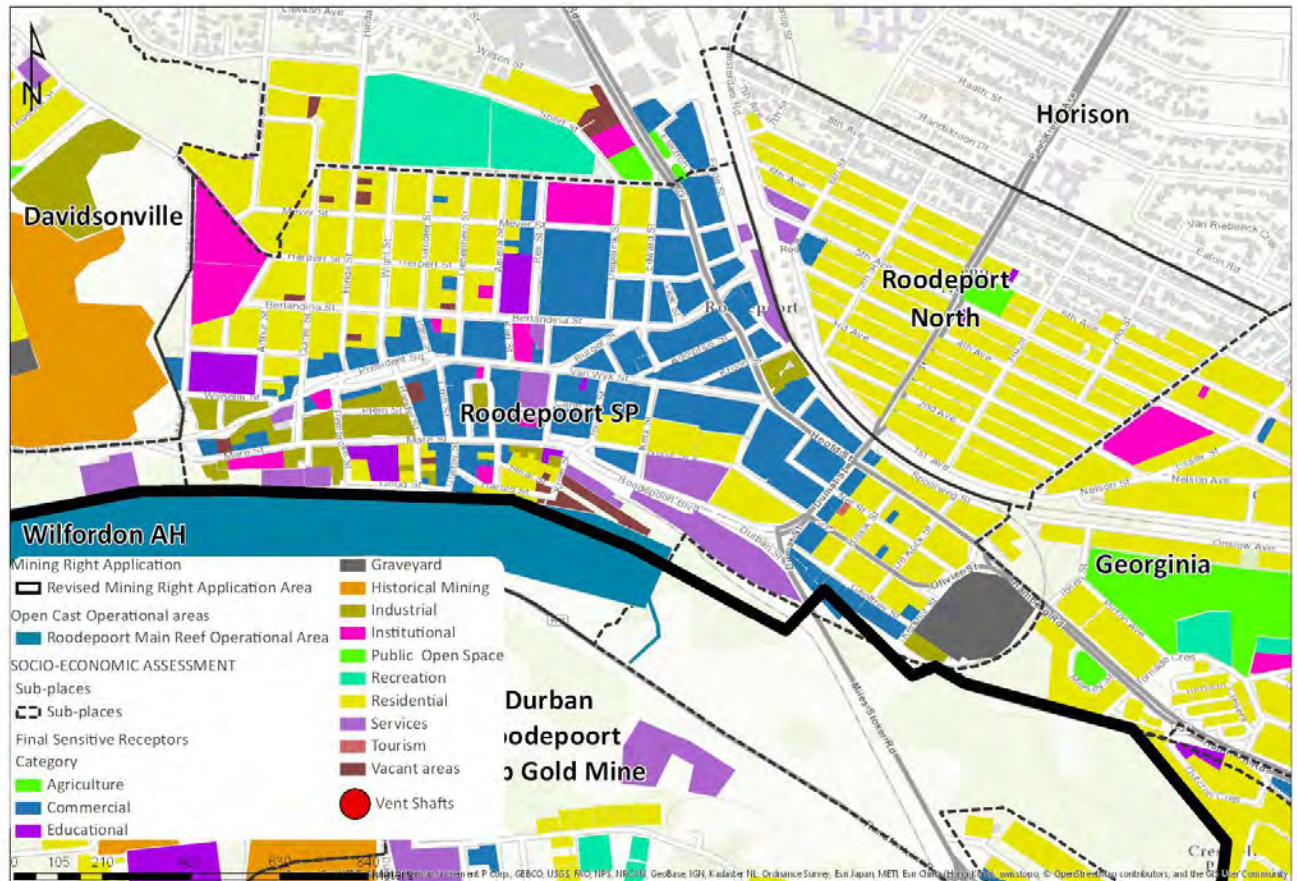


Figure 25: Roodepoort Central and North



Figure 26: Land use activities in Roodepoort Central and North

In Roodepoort Central there are 1 038 households making up a population of 4 905 people with an average household size of 5. The suburb covers an area of 144.8 ha with a density of approximately 34 people per hectare. 70.3% of the people residing in Roodepoort Central are Black, 9.5% Coloured, 11% White and 8.6% are Indian or Asian. 21.4% of the people speak English, followed by Afrikaans (15.8%) and isiZulu (15.6%). The economically active population make up 65.5% of the total population (between ages of 19 and 60), with the youth and elderly making up 34.5%. Of the economically active population 82.5% are employed, 15.4% unemployed and 2.1% are discouraged work seekers. The average annual household income is between R20 000 – R300 000 (R1 700 – R25 000). 21.6% of the households earn less than R840 per month (R10 000 per annum). The area is supplied with water, electricity, sewerage and refuse removal by the municipality.

In Roodepoort North 1 095 households make up a population of 3 567 people with an average household size of 3. The suburb covers an area of 62.2 ha with a density of approximately 57 people per hectare. 48.5% of the people residing in Roodepoort North are Black, 10.8% Coloured, 35.8% White and 3.4% are Indian or Asian. 30.8% of the people speak Afrikaans, followed by English (25.08%) and Setswana (15.5%). The economically active population make up 71.3% of the total population (between ages of 19 and 60), with the youth and elderly making up 28.7%. Of the economically active population 62.4% are employed, 13.6% unemployed, 2.4% are discouraged work seekers and 21.6% are not economically active. The average annual household income is between R20 000 – R300 000 (R1 700 – R25 000). 29.3% of the households earn less than R840 per month (R10 000 per annum). As for Roodepoort Central, the municipality supplies the area with water, electricity, sewerage and refuse removal.

### **6.2.2 Durban Roodepoort Deep**

Durban Roodepoort Deep (DRD) is located central to the MRA area. DRD is an old mining town where the old mining houses are partly being rent-out to local people and some houses are being occupied illegally. There are several houses that have been either broken down by the landowners or vandalized to such an extent that they are uninhabitable. Most commercial activities are informal such as car workshops, tuck-shops, shebeens and other types of informal commercial activities. There are also old Recreation areas established during the operational time of the old mine such as a golf course, rifle range and other sport grounds. The Durban Deep Primary school used to provide Educational services to the community but has since closed due to a lack of services. To the east some light industrial land use activities take place, mostly panel beating, car parts and spares, etc.

The figure below indicates the predominant land uses in these suburbs:

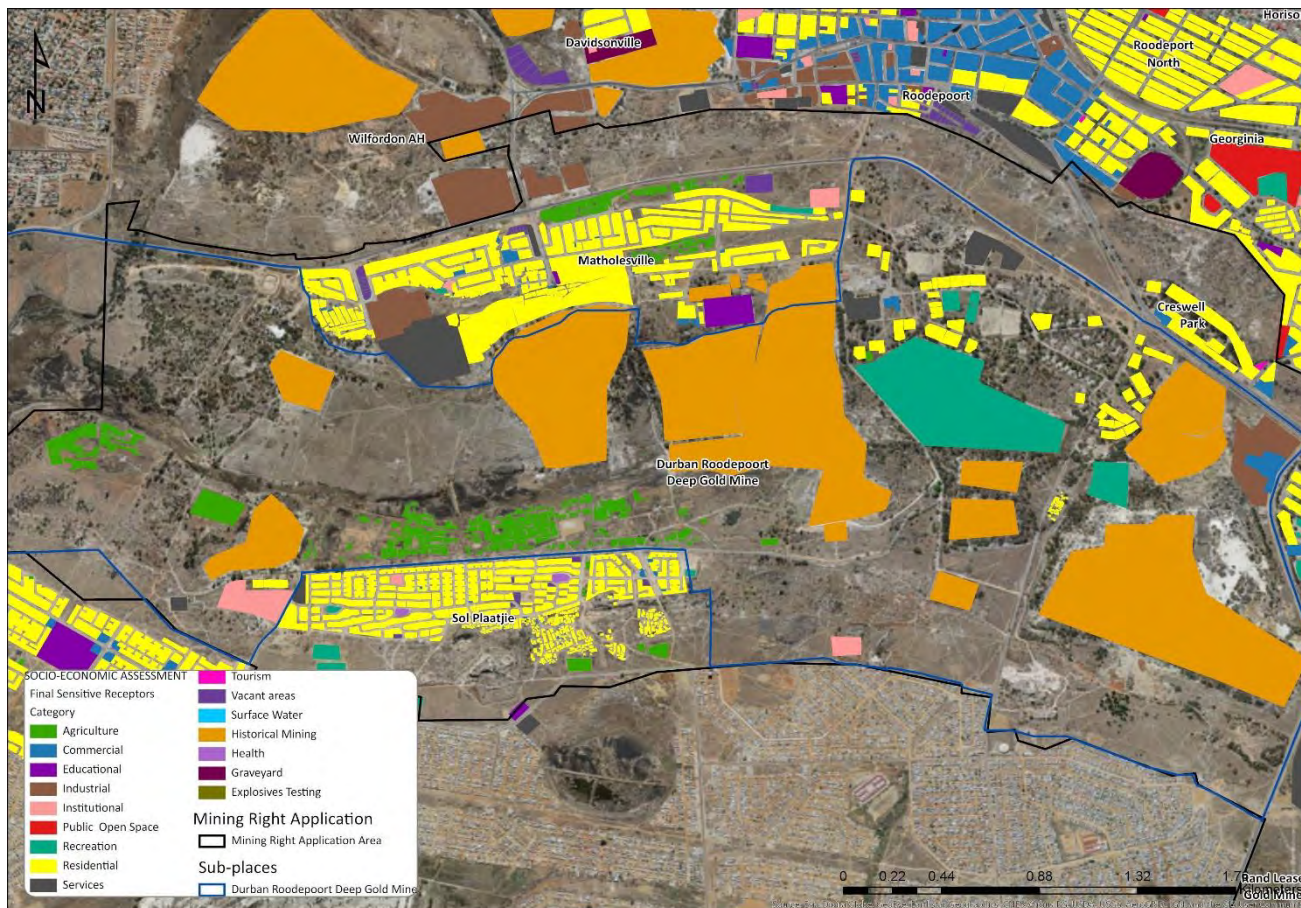


Figure 27: Durban Roodepoort Deep



Figure 28: Land use Activities of Durban Roodepoort Deep

There are 303 households residing in DRD making up a population of 747 people with an average household size of 2. 97% of the people residing in DRD are Black, 0.5% White 0.5% are Indian / Asian and 2% other. 30.2% of the people speak isiZulu, followed by isiNdebele (19.7%) and other non-South African languages (14.7%). The economically active population make up 86.8% of the total population (between ages of 19 and 60), with the youth and elderly making up 13.2%. Of the economically active population 67.3% are employed and 31.6%

unemployed. The average annual household income is between R20 000 – R75 000 per annum (R1 700 – R6 250 per month). 28.2% of the households earn less than R840 per month (R10 000 per annum). The area was previously supplied with water, electricity, sewerage and refuse removal from the municipality, but the services were cut in 2014.

### 6.2.3 Sol Plaatjie

Sol Plaatjie is located within the MRA area to the south of the operations. Land use in this suburb is mostly residential, institutional (churches), and recreation activities with some commercial activities (home based businesses, cafes, shops). There are also old hostels present in the community, and an informal settlement (21% of the households) just south of the community. The community has agricultural land where food is produced located just north of the community.

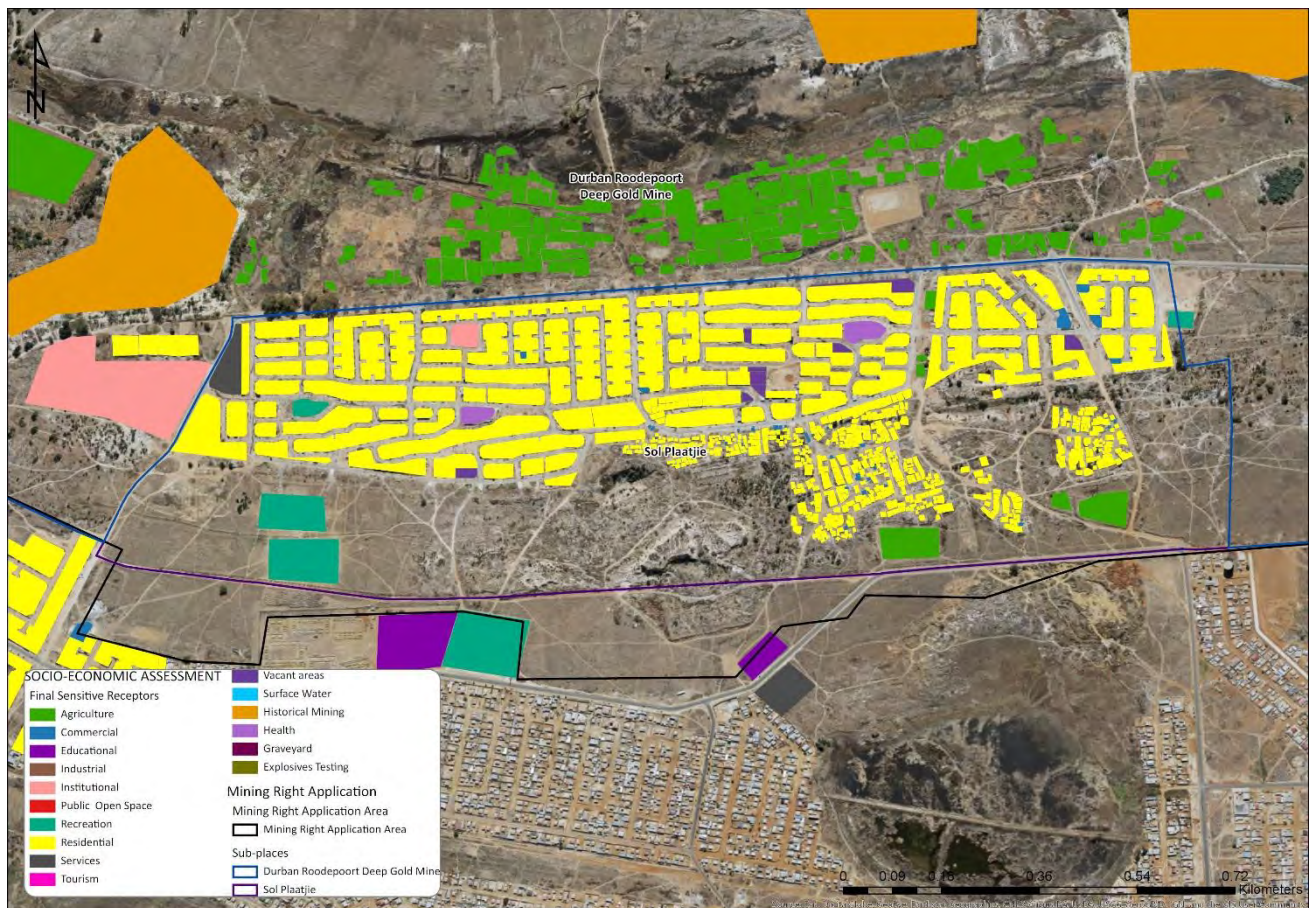


Figure 29: Sol Plaatjie Land use



Figure 30: Land use Activities in Sol Plaatjie

There are 3 633 households residing in Sol Plaatjie making up a population of 9 141 people with an average household size of 3. 99.3% of the people residing in Sol Plaatjie are Black, 0.7% from other population groups. 26.24% of the people speak isiXhosa, followed by isiZulu (21.67%) and Setswana (13.46%). The economically active population make up 51.8% of the total population (between ages of 19 and 60), with the youth and elderly making up 48.2%. Of the economically active population 36.2% are employed and 42.1% unemployed and 21.6% discouraged work seekers. The average annual household income is between R10 000 – R40 000 per annum (R840 – R3 400 per month). 58% of the households earn less than R840 per month (R10 000 per annum). The community is extremely poor and far below the ward average and that of City of Joburg. The area is supplied with water, electricity, sewerage and refuse removal. Some households have private boreholes. The community experiences severe dust pollution from the old Tailings Storage Facility, especially in the winter months.

#### 6.2.4 Creswell Park

Creswell Park is located to the north-east, of the MRA Area. Land use in this suburb is mostly residential with a limited commercial activity (filling station, guesthouse and some shops).



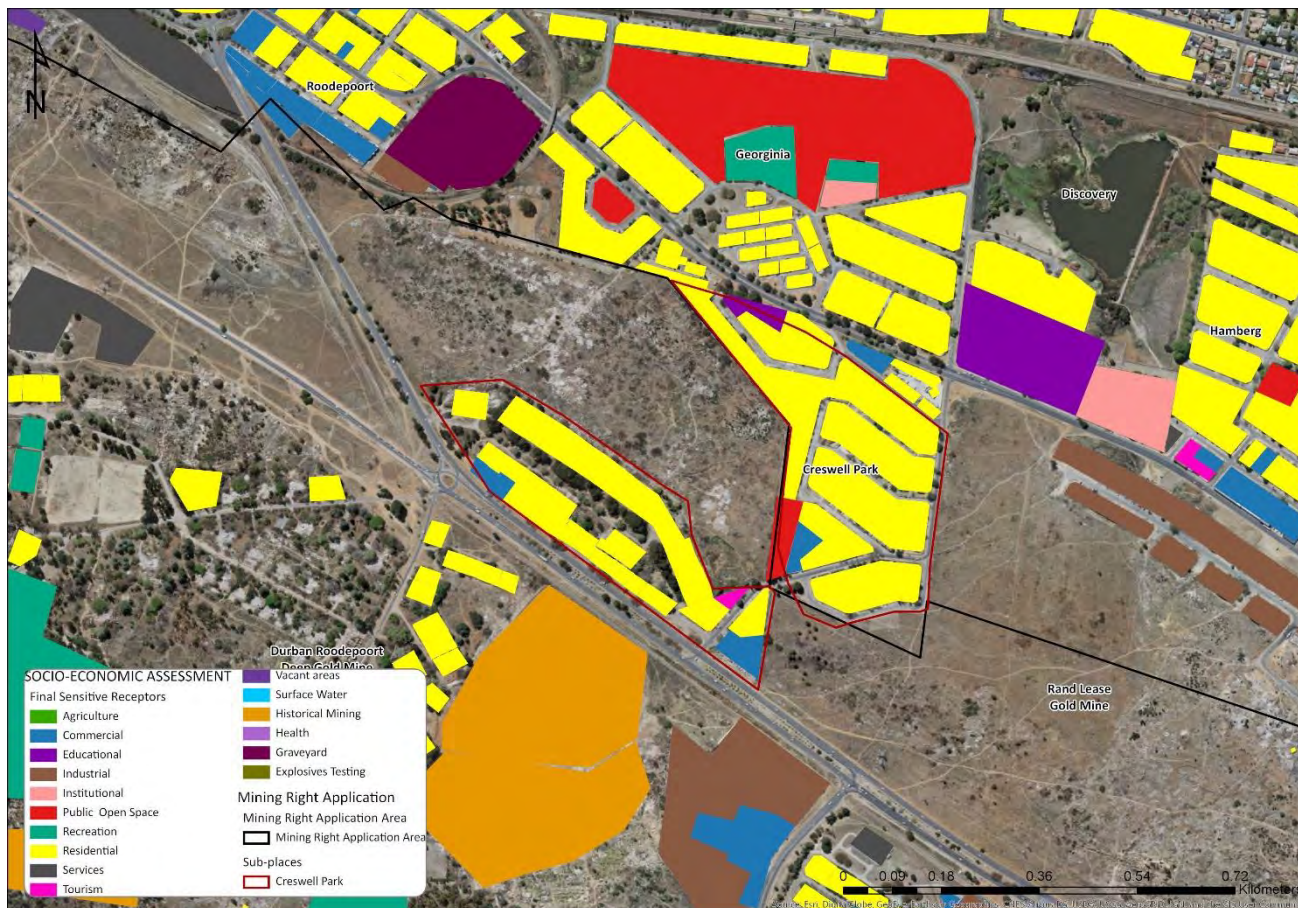


Figure 31: Creswell Park Land use activities



Figure 32: Photos of land use activities in Creswell Park

There are 264 households residing in Creswell Park making up a population of 810 people with an average household size of 3. 84% of the people residing in Creswell Park are Black, 8.1% Coloured, 6.7% White and 1.2% are Indian or Asian. 18.8% of the people speak isiZulu, followed by Setswana (17.4%) and English (12.9%).

The economically active population make up 84.4% of the total population (between ages of 19 and 60), with the youth and elderly making up 15.6%. Of the economically active population 72.8% are employed and 27.2% unemployed. The average annual household income is between R40 000 – R300 000 (R3 300 – R25 000). 11% of the households earn less than R840 per months (R10 000 per annum). The municipality supplies water, electricity, sewerage and refuse removal.

### **6.2.5 Rand Leases Area**

The Rand Leases Gold Mining Company was established in the early 1900's. After closure in 1971, followed by various ownership changes and the re-opening of mining operations, work eventually ceased in the 1990's because of a decreasing gold price. The mining hostel, was one of two worker residential compounds that existed during mining operations, and was referred to as Rand Leases 'B' Compound, built in the early 1940's. Since 2011 Calgro M3 has been redeveloping the farm Vogelstruisfontein 231 IQ, which includes the Old Rand Leases Mine Hostel, into residential units. This public-private partnership with the City of Johannesburg has resulted in the completion of low-, medium- and high-density residential units.

The Rand Leases Area (RLA) is located within the MRA area. There are however two informal settlements located on the property, at the landfill site and the second just south of Florida Lake. The most part of the area's land use is historical mining areas, the landfill and industrial activities.

The figure below indicates the predominant land uses in these suburbs:

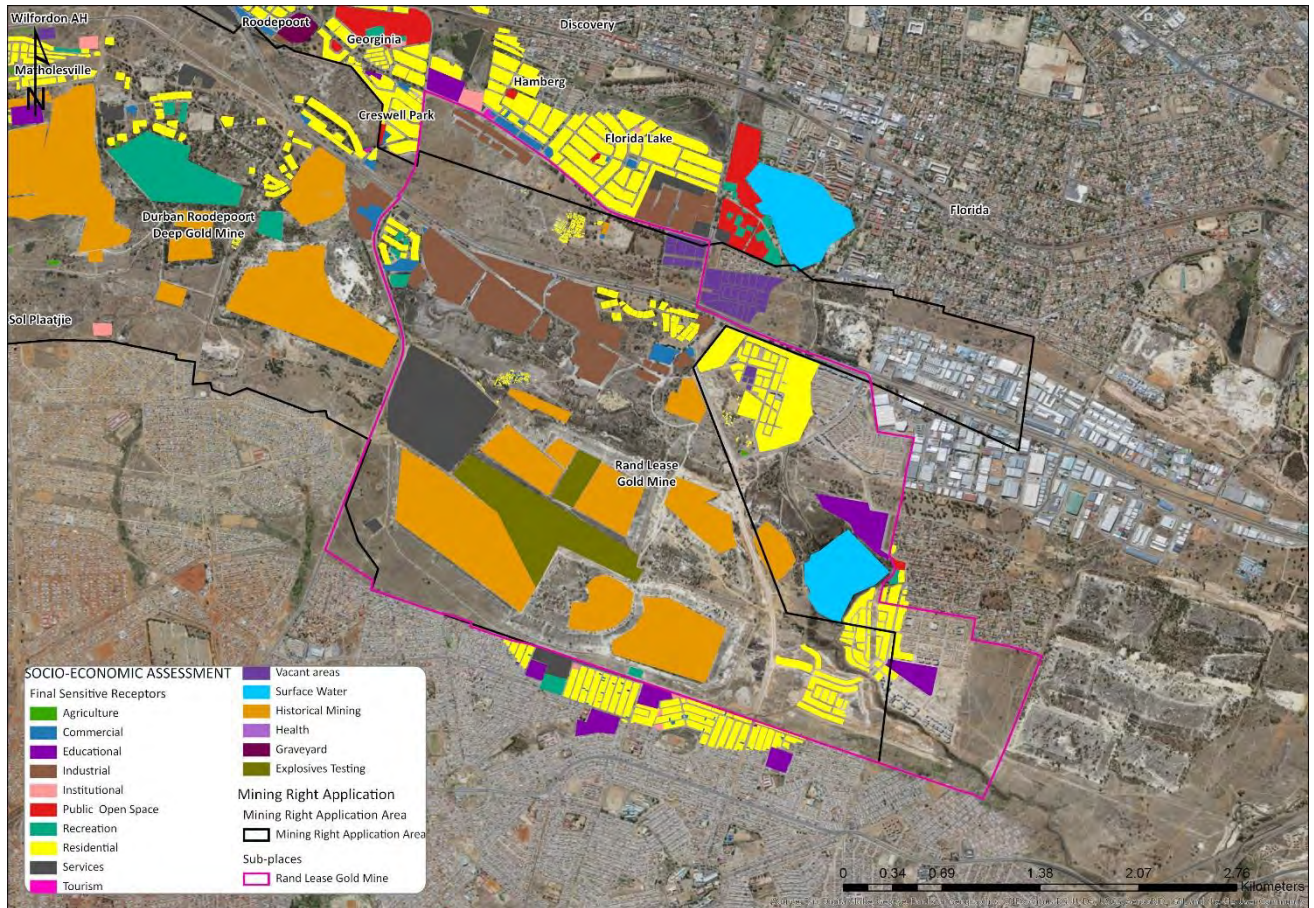


Figure 33: Rand Leases Area



Figure 34: Photos of Land use Activities at RLA

There are 957 households residing in RLA making up a population of 1 938 people with an average household size of 2. 90.2% of the people residing in RLA are Black, 5.5% White and 3.6% Coloured. 18.4% of the people speak isiZulu, followed by Sesotho (13.7%), Tshivenda (12.4%) and other non-South African languages. 8.57% speak non-South African languages. The economically active population make up 86.1% of the total population (between ages of 19 and 60), with the youth and elderly making up 13.9%. Of the economically active population 47.8% are employed and 34.2% unemployed. The average annual household income is between R20 000 – R75 000 per annum (R1 700 – R6 250 per month). 53.3% of the households earn less than R840 per month (R10 000 per annum). Some of the areas are supplied with water, electricity, sewerage and refuse removal from the municipality, but the informal settlements are supplied with sporadic water supply and sanitation services.

### 6.2.6 Florida and Florida Lake

Florida and Florida Lake is located just north of the Mining Right Application (MRA) area. The closest part of Florida consists of the Florida Lake, park and recreational activities. Florida Lake consist of industrial (on its eastern boundary), commercial and residential land use activities.

The figure below indicates the predominant land uses in these suburbs:

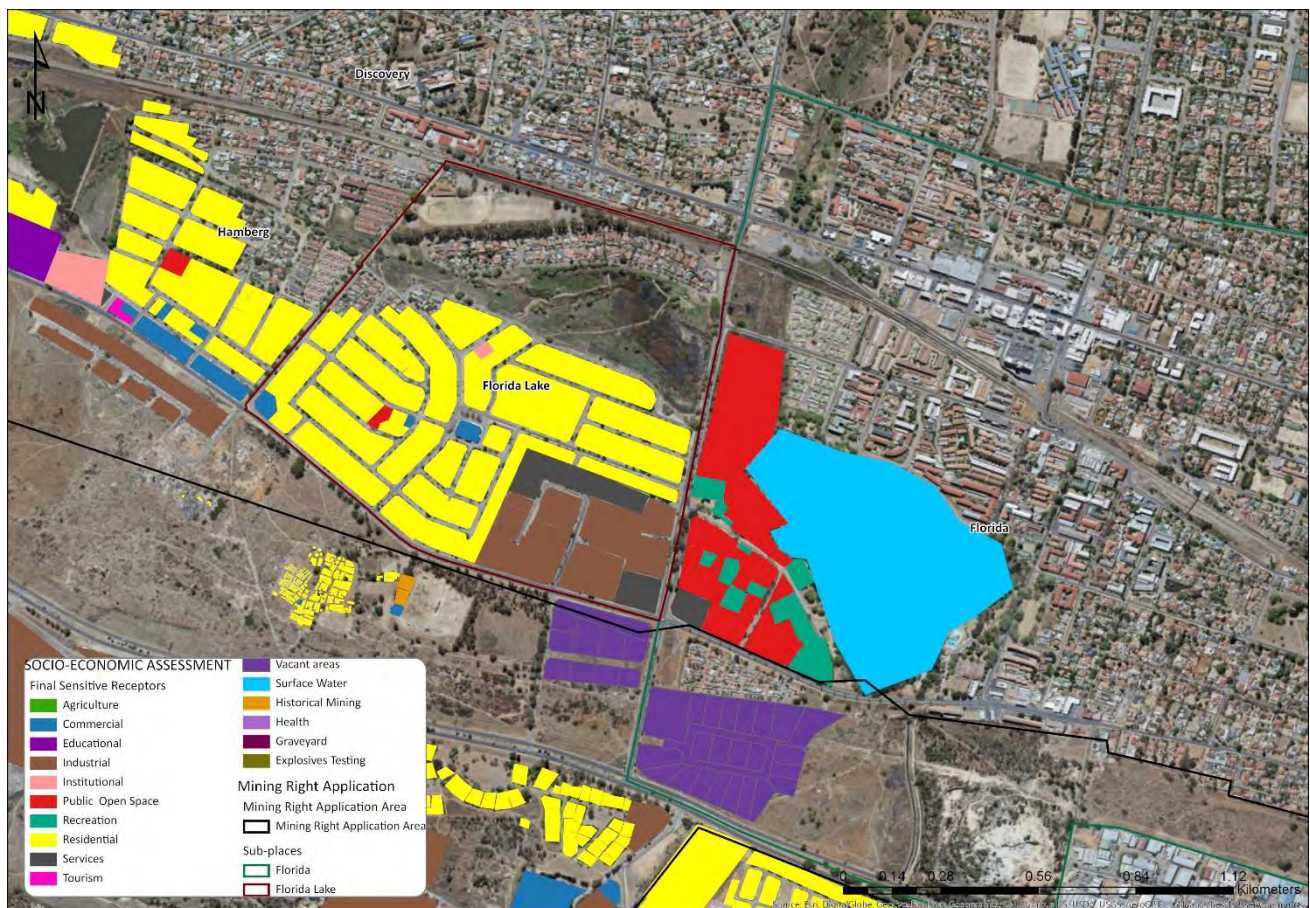


Figure 35: Land use activities of Florida and Florida Lake



Figure 36: Photos of typical land use activities

There are 6 970 households residing in Florida making up a population of 20 082 people with an average household size of 3. In Florida Lake there are 829 households with a population of 2 820 (average household size of 3). 35.9% of the people residing in Florida are Black, 29.6% Coloured, 23.1% White and 9.5% are Indian or Asian. In Florida Lake 52.9% are Coloured, 21.81% White, 18.9% Black and 6.3% are Indian or Asian. 48.1% of the people speak English, followed by Afrikaans (23.6%) and isiZulu (8.2%). This is similar in Florida Lake.

The economically active population make up 71.7% of the total population (between ages of 19 and 60), with the youth and elderly making up 28.3%. Of the economically active population 67.8% are employed, 8.6% unemployed and 21.9% are not participating in the labour market. In Florida Lake the economic active population is 71.4% of which 72.4% is employed and 7.9% unemployed.

The average annual household income for Florida and Florida Lake is between R75 000 – R600 000 per annum (R6 250 – R50 000 per month). 12% of the households in Florida and 9.8% in Florida Lake earn less than R840 per months (R10 000 per annum). The area is supplied with water, electricity, sewerage and refuse removal by the Municipality.

### 6.2.7 Matholesville / Goudrand

Matholesville, also known as Goudrand, is located within the MRA area, just south of the Roodepoort Main Reef Opencast and just north of the Mona Lisa Opencast operations. Land use in this settlement is mostly residential, institutional (churches), educational and some commercial activities (home based businesses, cafes, shops). The community has agricultural land where food is produced located just north of the community. There is a growing informal settlement just south of the formal areas, close to the Eskom’s Princess substation located to the west of the town. To the east of the Matholesville, developers are planning the Goudrand Extension Mixed Housing Development.

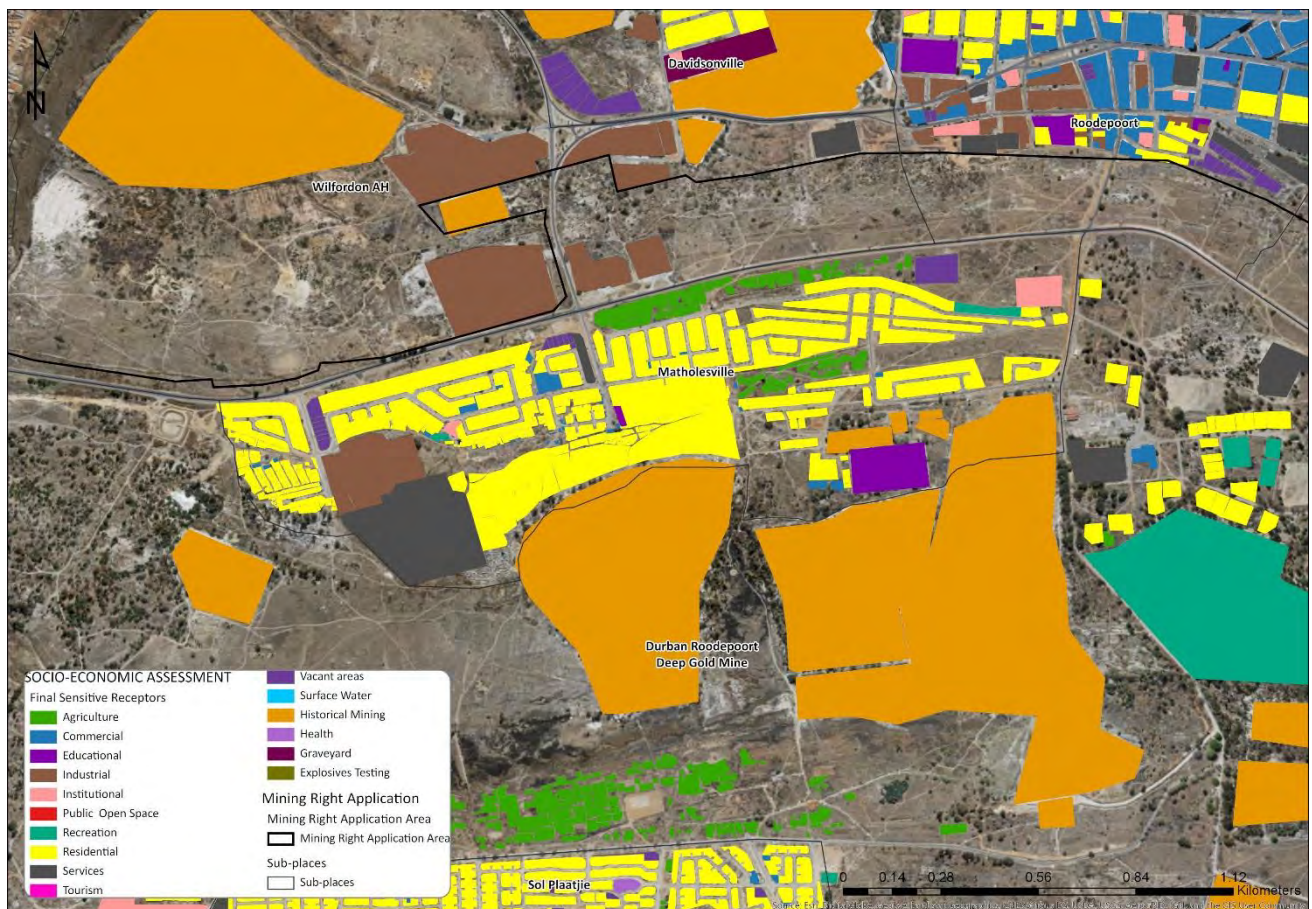


Figure 37: Land use activities at Matholesville



Figure 38: Photos of land-use activities

### 6.2.8 Georgina

Georgina is located to the north and north-east of the Mining Right Application area. Land use in this suburb is mostly residential, institutional (churches), recreation activities, public open spaces but limited commercial activities (home based businesses, cafes, shops). To the north of the suburb is the Tornado Retirement Centre.

The figure below indicates the predominant land uses in these suburbs:

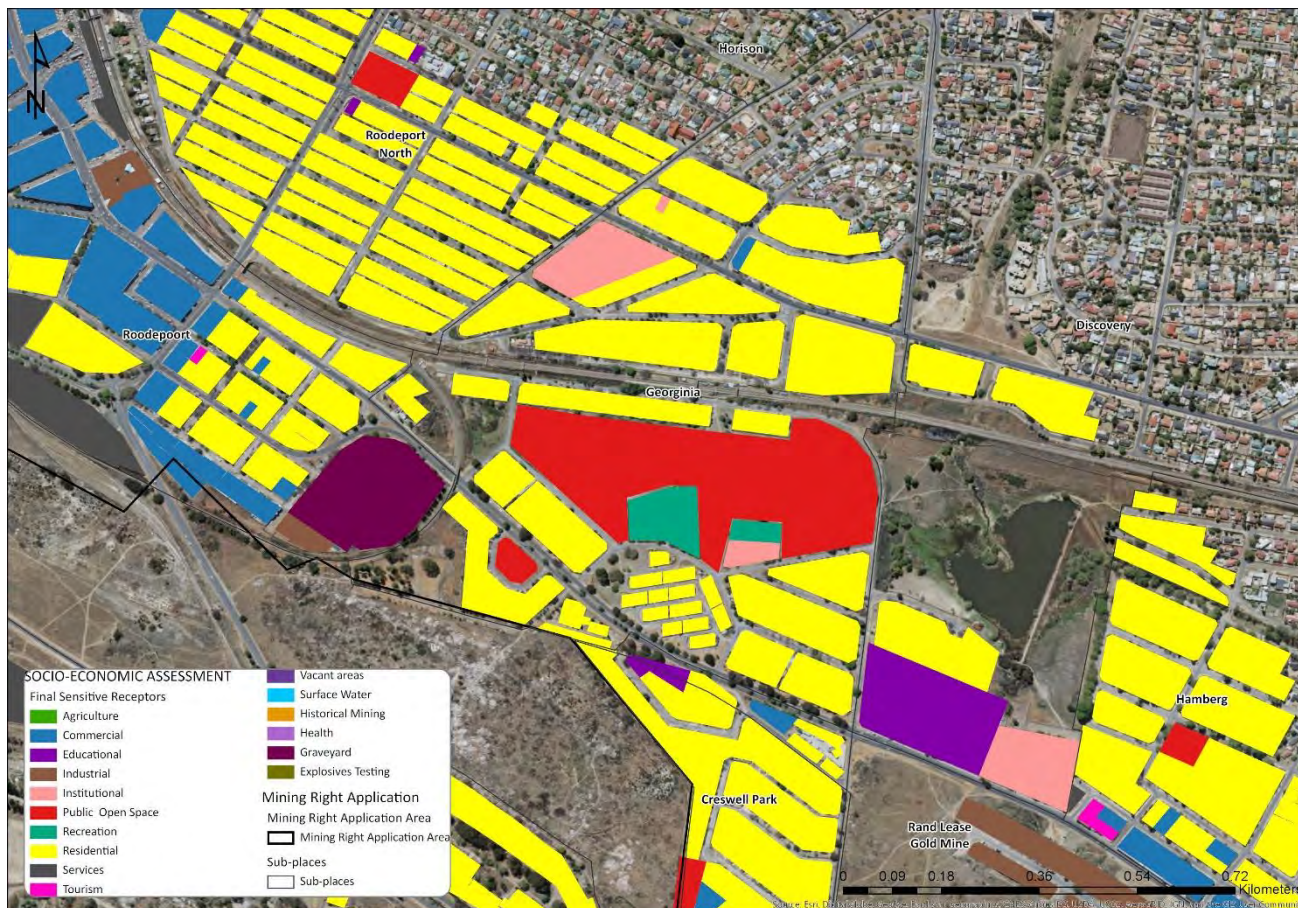


Figure 39: Land use Activities in Georgia



Figure 40: Land use Activities in Georgia

There are 762 households residing in Georgia making up a population of 2 469 people with an average household size of 3. 33.3% of the people residing in Georgia are Black, 27.2% Coloured, 36.5% White and 2.9% are Indian or Asian. 40% of the people speak English, followed by Afrikaans (33.3%) and isiZulu (7.9%).



The economically active population make up 73.3% of the total population (between ages of 19 and 60), with the youth and elderly making up 26.7%. Of the economically active population 91.8% are employed and 6.6% unemployed and 1.6% discouraged work seekers. The average annual household income is between R75 000 – R300 000 per annum (R6 250 – R25 000 per month). 23% of the households earn less than R840 per month (R10 000 per annum). The area is supplied with water, electricity, sewerage and refuse removal by the municipality.

### **6.3 Land use Activities**

The greater Roodepoort region has been extensively altered by historical mining activities since the farms Vogelstruisfontein, Roodepoort, Langlaagte and the two portions comprising Paardekraal (in Krugersdorp) were proclaimed as public diggings by the then Zuid-Afrikaansche Republiek (ZAR) government in 1886. Present land uses associated with the general surrounds include a combination of informal settlements, low-cost and high-cost residential areas, industrial areas, manufacturing and distribution facilities, historical mine housing and historical mine infrastructure (tailings dams, shafts, derelict/abandoned buildings and water dams), bulk service infrastructure, power lines and road infrastructure.

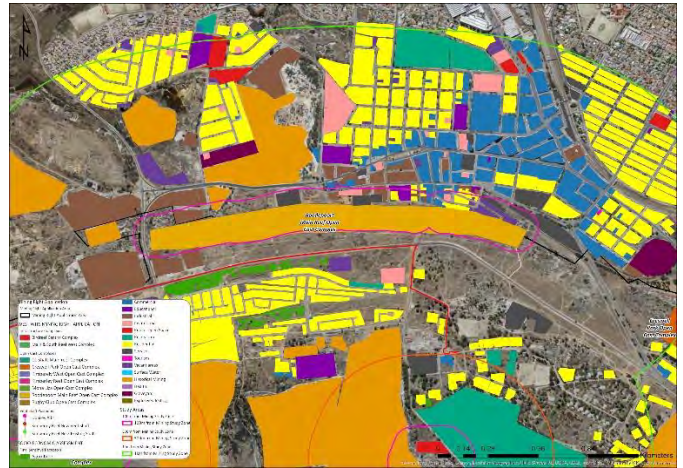
The Mining Right Application area consists of relatively flat terrain covered with secondary grassland and khakibos. Historical mining activities and recent illegal informal mining activities have altered the natural topography of the area. The entire footprint area is also covered by extensive dumping of building rubble and general waste.

Table 13: Number of land use activities in study area

	▼	Agriculture	Agriculture	369
	▼	Commercial	Commercial	658
	▼	Educational	Educational	78
	▼	Industrial	Industrial	187
	▼	Institutional	Institutional	39
	▼	Public Open Sp...	Public Open Sp...	20
	▼	Recreation	Recreation	38
	▼	Residential	Residential	11825
	▼	Services	Services	56
	▼	Tourism	Tourism	3
	▼	Vacant areas	Vacant areas	138
	▼	Surface Water	Surface Water	2
	▼	Historical Mining	Historical Mining	35
	▼	Health	Health	2
	▼	Graveyard	Graveyard	2
	▼	Explosives Testing	Explosives Testing	2

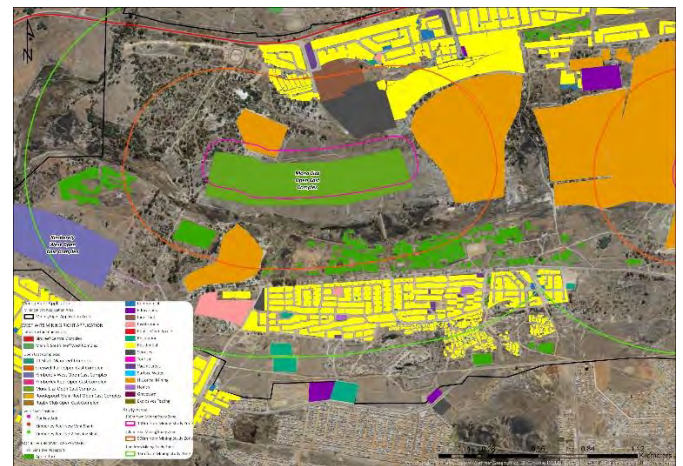
### 6.3.1 Roodepoort Main Reef Opencast Operational Area

The suburbs of Roodepoort and Matholesville straddle the opencast area to the north and south. Land-use to the north is a mix of residential, Education, Commercial and Industrial within a 100 m of the open pit. Within 500 m these land use activities also extend to the south including a large part of the residential area and religious sites to the south.



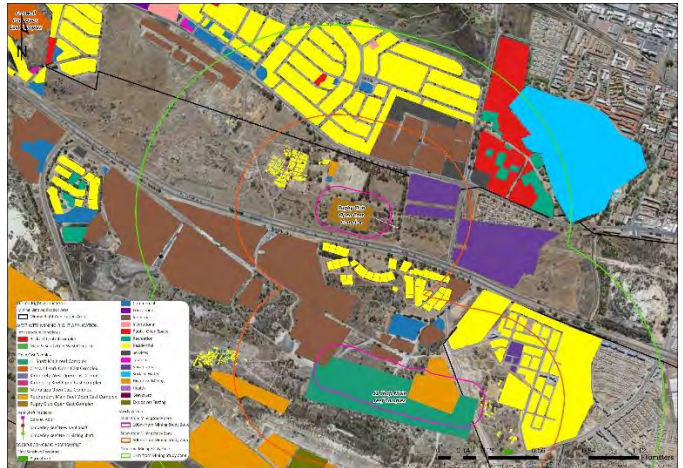
### 6.3.2 Mona Lisa Bird Reef Opencast Operational Area

The Mona Lisa Bird Reef opencast area is just south of Matholesville and north, north-west of the Sol Plaaaitjie settlement. No specific land-use except historical mine areas are within a 100 m from the open pit. Within 500 m, land use activities to the north include a substation, residential and industrial land uses, and to the south mostly subsistence agricultural activities.



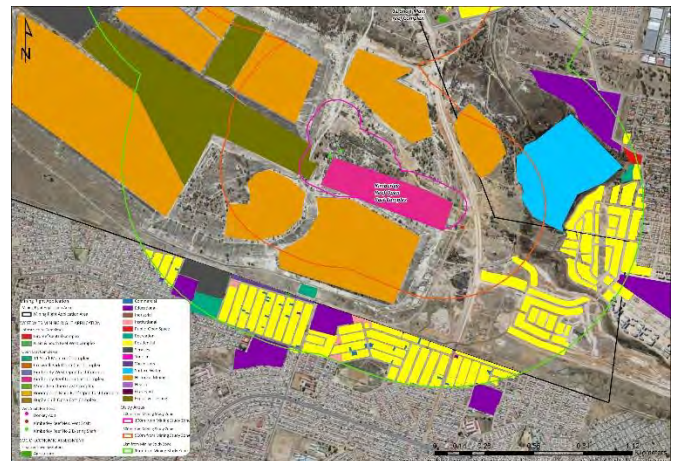
### 6.3.3 Rugby Club Main Reef Opencast Operational Area

The Rugby Club Main Reef opencast area is located south of Florida/Florida Lake and north of the Rand Leases Area. No specific land-use activities are taking place within a 100 m from the open pit. Within 500 m, to the north there are Industrial and residential land-uses, and to the south the old mining town houses and industrial areas. To the north-west there are an informal settlement that are expanding.



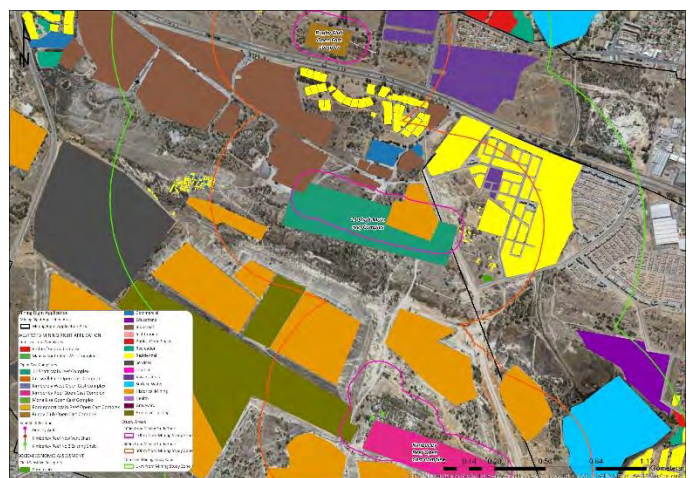
### 6.3.4 Kimberley Reef East Opencast Operational Area

The Kimberley Reef East opencast area is located on the Rand Leases Area and north of the Meadowlands East Zone. No specific land use activities are within the 100 m zone, and within the 500m zone the activities are mainly historical mining and the current Explosive testing that is taking place.



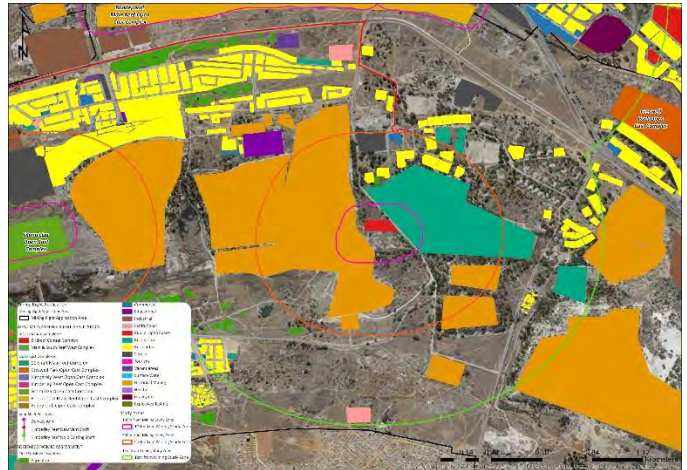
### 6.3.5 11 Shaft Main Reef Opencast Operational Area

The 11 Shaft Main Reef opencast area is located on the Rand Leases Area just south of the old mining town infrastructure, and west of Fleurhof Dale. Within 100 m the land use activities are mostly industrial. Residential areas of Fleurhof Dale is within 500 m from the mining operations.



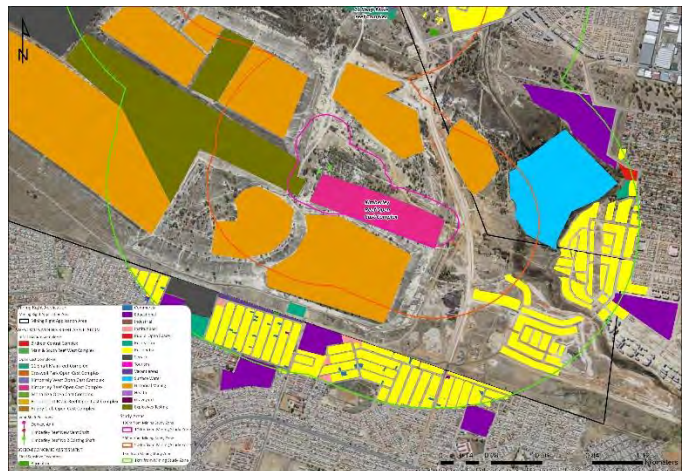
### 6.3.6 Bird Reef Central Infrastructure Complex & Underground Mining Extent

The Bird Reef Central Infrastructure Complex is located on the Durban Roodepoort Deep area, just west of the old DRD Golfcourse. Land use activities within 100 m is mostly historical mining activities and infrastructure. Within 500 m there are residential land use to the north/north-east and the south-west (Sol Plaatjie)



### 6.3.7 Kimberley Reef East Infrastructure Complex & Underground Mining Extent

The Kimberley Reef East Infrastructure Complex is located on the Rand Leases Area and north of the Meadowlands East Zone and west of Fleurhof. No specific land use activities are within the 100 m zone, and within the 500 m zone the activities are mainly historical mining and the current Explosive testing that is taking place.



## 6.4 Unlicensed Artisanal Miners



Figure 41: Illegal / Artisanal miners

Hundreds of out-of-work miners and desperate immigrants from Lesotho, Mozambique, Malawi and Zimbabwe try to make a living through unlicensed artisanal mining of the old underground mining shafts and tunnels. The miners, or zama-zamas (take a chance) work shallow portions of mines, specifically at the Durban Roodepoort Deep sites. It is believed that there are as much as 350 unlicensed artisanal miners in this area, supporting approximately 10 dependents each. It is believed that the zama-zamas live close to the mine areas, and it is expected most likely in either abandoned housing or backyard rooms / shacks.

Most concerning of this type of mining, is the limited safety and environmental management practiced. The artisanal mining forms part of a value chain of people involved and benefitting from the mining, which further encourages the mining to continue and causing competition between miners. According to interviews done by



Roodepoort Record in 2015, unlicensed artisanal miners explain that there are 4 phases to extract gold. The first phase, volunteers go down makeshift shafts as deep as 400-500 m to collect as many rocks as possible. This may involve homemade explosives to loosen the rocks. During the second phase, the women working above ground break up the rocks into smaller pieces and then grind it by hand to a fine dust. In the third phase the dust is handed to the men who work on the James Table (long tables covered in towels that slant forward). Water is brought in and the dust is washed, as the water wash down the table, the gold sticks to the towels.



In the last phase the clay-like substance is treated with mercury and burned to extract the gold from the sand in the form of golden nuggets, which is then sold.

There have been many arguments for the legalizing of the unlicensed artisanal mining, to ensure regulation, control, and safety measures and manage environmental effects. In August 2017, the miners protested at the Department of Mineral Resources (DMR), for the legalizing of the artisanal mining and to stop persecuting these miners. DMR has recently confirmed a process of handing mining permits to previously unlicensed artisanal miners, which commenced in the diamond sector in June 2018. Miners are structured into a Cooperative, in collaboration with the mining company (who made land available for the artisanal mining operations) and provincial government, to ensure safety and environmental management requirements are adhered to. At this stage DMR has said no permits would be provided for underground mining. City of Joburg has also engaged DMR and various other Departments on the matter.

## **6.5 Cumulative Mining Development**

### **6.5.1 Existing Mine Tailings**

An existing large Tailings Storage Facility (TSF) is located approximately 1 km to the south of the Mining Right Application area. The TSF has been partly rehabilitated, but needs urgent attention due to the residual impacts on the adjacent communities especially in terms of air quality, surface water and health.

### **6.5.2 Sol Plaatjies Mining**

It should be noted that there is an existing opencast mining operation underway in the Sol Plaatjies area. The Sol Plaatjies area is being mined under a directive from Department of Mineral Resources. The minimum monthly ore tonnage planned for the Sol Plaatjie project is 10 000 tons per month with a target maximum of 15 000 tons. The current mine plan for the Sol Plaatjie project indicates production capacity for a further 210 000 to 220 000 tonnes of high grade ore over a period of 15 to 18 months.

### **6.5.3 Kimberley West Mining Permit**

An application for a Mining Permit for the Kimberley West pit has been submitted. The timeframe of the Kimberley West Mining Permit is 4 to 5 months of mining and 8 – 9 months of rehabilitation, in total 8 - 9 months.

### **6.5.4 Creswell Park Mining Permit**

An application for a Mining Permit for the Creswell Park pit has been submitted. The timeframe of the Creswell Park Mining Permit is 3 to 4 months of mining and 5 – 6 months of rehabilitation, in total 8 – 10 months.

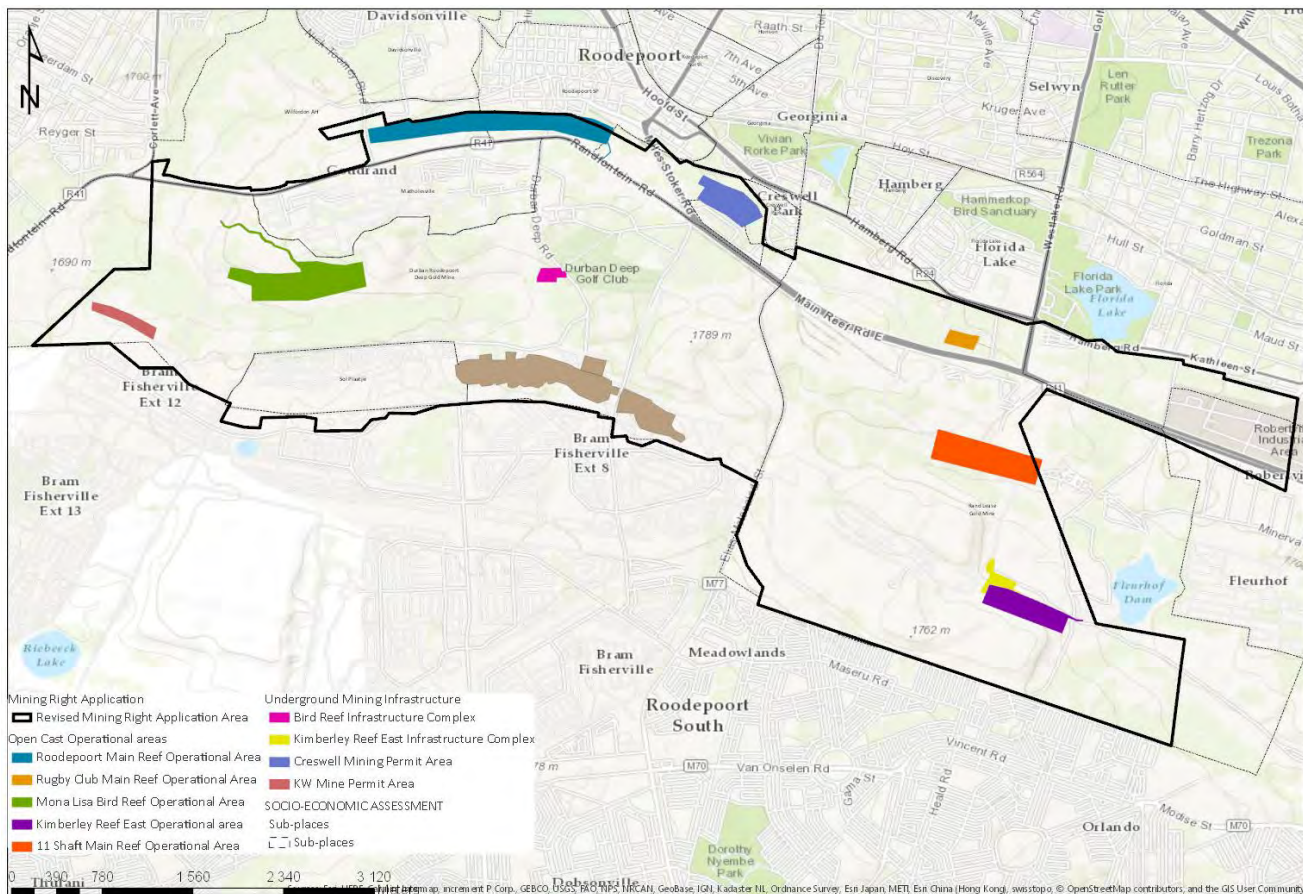


Figure 42: Cumulative Mining Development

## 6.6 Planned Housing Development Initiatives

In terms of available information there are initiatives for the improvement and expansion of housing development and integrated mixed housing programmes in the area within the Mining Right Application Area. The figure below indicates the housing developments that are at various stages.



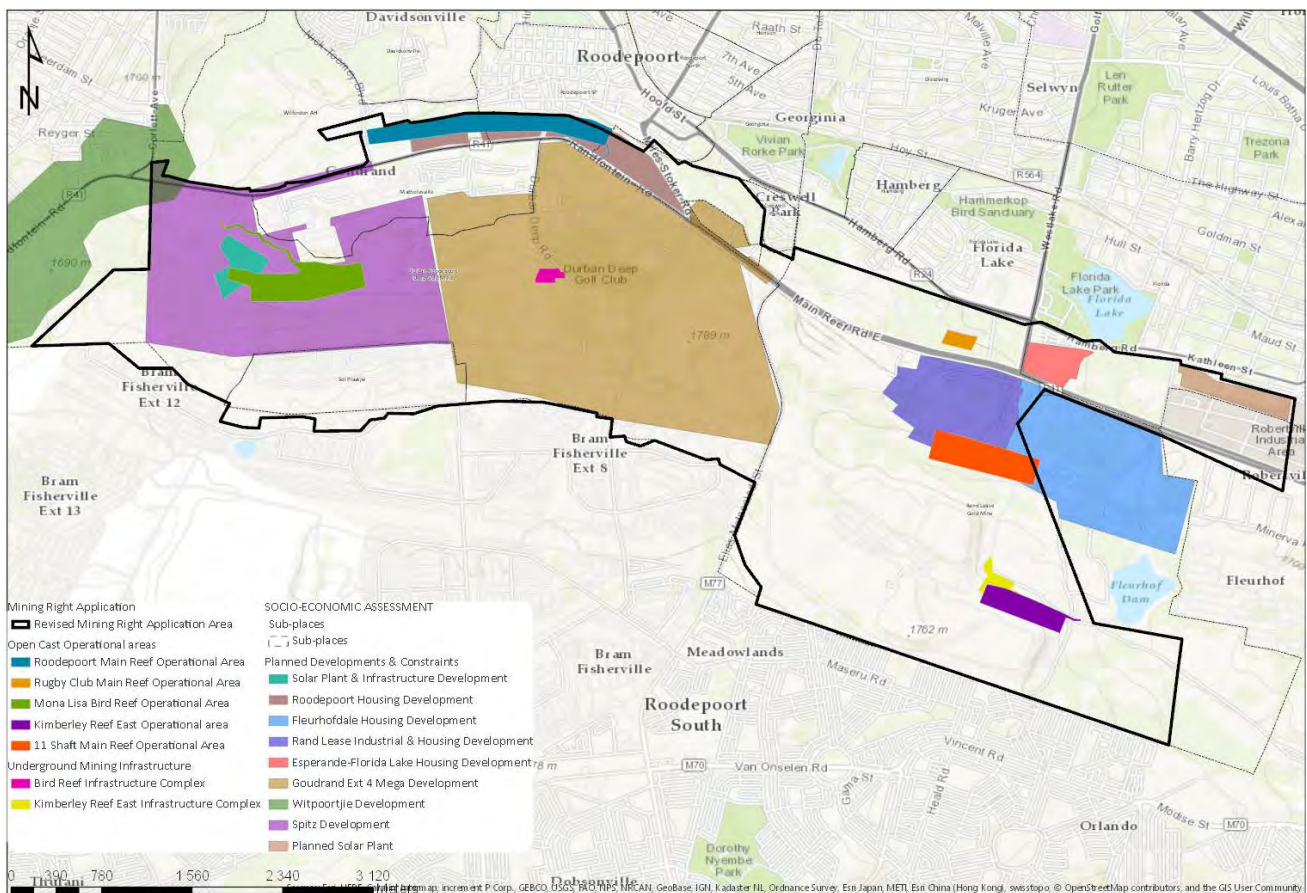


Figure 43: Cumulative Activities

The company has engaged or is in the process of engaging with the developers and several agreements have already been reached in terms of mining and the mixed housing development initiatives.

Priority mining	Planned Land use	Settlement date
Rugby Club Main Reef pit	The landowner is currently in a planning phase and is considering either residential or mixed industrial development	None yet
Roodepoort Main Reef pit	The landowner has planned public open or green belt spaces	June 2020
Mona Lisa Bird Reef pit	The landowners plan to construct mixed residential developments	End 2019
11 Shaft Main Reef pit	the landowners have earmarked these areas for mixed industrial, residential developments and the construction of bulk service infrastructure	Mid 2020
Kimberley East pit	part of the area would be used to access the surface infrastructure planned to service the proposed underground operation which would continue beyond the opencast mining operations	None

### 6.6.1 Goudrand Extensions 4-18 Development

A mixed-use residential and commercial development, known as the Goudrand Mega City is planned to be developed by Dino Properties (Pty) Ltd on Portions of the Remainder of Portion 1 and Portions of the Remainder of Portion 5 and Portion 404 (a portion of Portion 1 of the Farm Roodepoort 2371Q). Currently the whole township is known as Goudrand Ext 4 and it would be subdivided into 15 different phases to be known as Goudrand Ext 5 to 19. The proposed Goudrand Ext 4 development is an integrated development consisting of 13 000 plus potential housing opportunities. The first phase of the development is a mixed use project comprising of 13 197 housing opportunities in a mix of 1 204 Residential 1 bonded units, 1 325 Residential 1 FLISP units, 10 668 Residential 3 units, 5 educational sites, 3 shopping Centre sites, 7 crèche sites, 8 worship sites, a hospital site, a cemetery and municipal sites.

The proposed Goudrand Mega City is planned to comprise a total of 20 000 to 25 000 housing units.

It is important to take note that the proposed Goudrand Mega City is only planned to take place after the rehabilitation of the open cast operations and is therefore not envisaged to have an impact on the proposed mining development.

**Table 14: Planned Goudrand land use parcels**

land use	no of stands	area (ha)
Residential (bonded, credit linked, cluster & high density)	2661	93.26
Commercial	4	9.7
Industrial	7	5.2
Educational	3	9.9
Institutional (church, crèche, hospital)	15	7.9
Cemetery	1	2.6
Special	6	16.67
Public Open Space	64	17.81
Public Streets		44.25

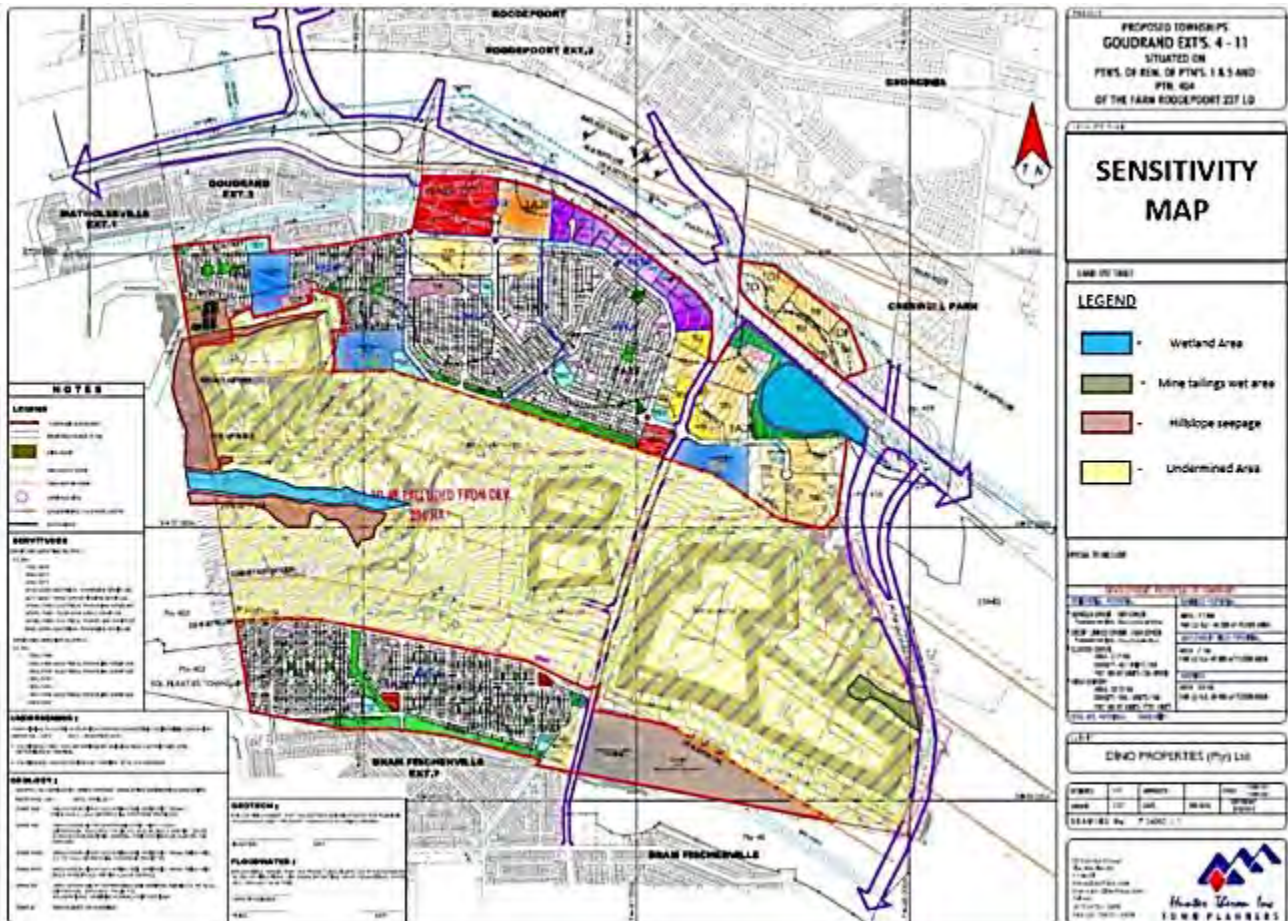


Figure 44: Goudrand Ext 4 Development Plan

## 6.6.2 Witpoortjie Development

Calgro M3 acquired 148 hectares of land directly South of the existing Witpoortjie Township. The land falls within the City of Johannesburg Urban Boundary but forms part of the bigger Leratong Development Node.

The project has mixed housing typologies that concentrate on high densities of up to 190 units per hectare, therefore efficient use of land. Internal services are installed, roads are tarred and the construction of top structures has commenced. The project was initially planned for bonded affordable housing. It would now be a mixed-use development consisting of 5 300 units. The project is an infill and integrated housing development between the existing Witpoortjie, Leratong and Bram Fischer townships. Phase one of the proposed project consists of 645 units. The project commenced with the first two phases, which are Extension 52 and 64. Extension 71 will form part of the third phase.



Figure 45: Witpoortjie Development Plan

### 6.6.3 Spitz Development

The applicant and project proponent is Copper Moon Trading 631 (Pty) Ltd, who, on analysis of the housing market has identified the need for the proposed development. The proposed project is located on the Remaining Extent of Portion 14 of the farm Roodepoort 237 IQ with an extent of approximately 300 hectares (ha). At present, the site constitutes defunct mining land located within the Main Reef Mining Belt and was historically mined by DRD Gold.

The proposed project aims to develop the site as a mixed use, residential township in the affordable to middle income bonded housing market. The proposed development would include a residential component of varying market and density ranges including educational, commercial and social land uses.

The project is currently still in permitting stage and is awaiting a final record of decision from GDARD.

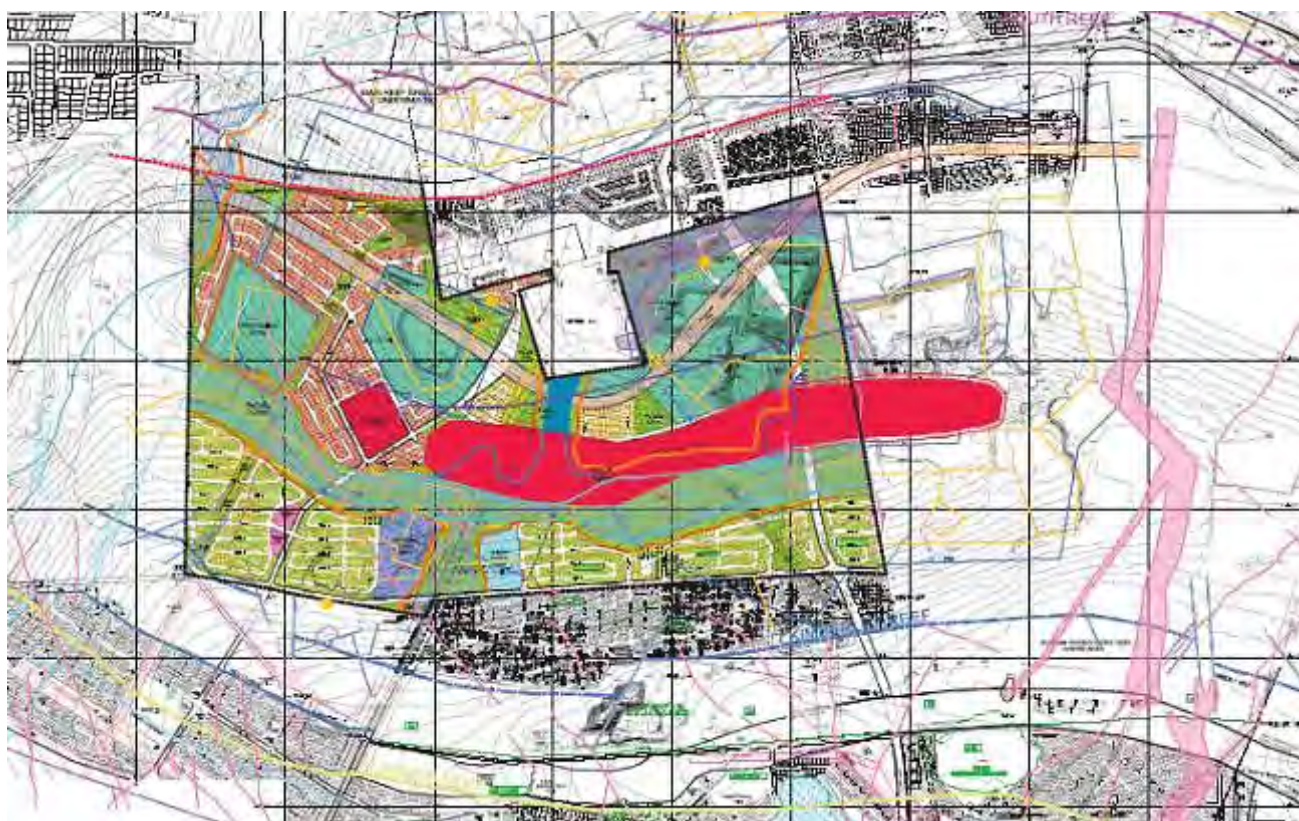


Figure 46: Spitz Development Plan

## 7 SOCIAL IMPACT ASSESSMENT

The impacts identified have been grouped according to the cause of the impact, or the driver. The impact drivers are discussed below:

### 7.1 Interaction between Environmental and Social Change Drivers

It is often the case that one type of impact (for example an environmental impact) can lead to a different type of impact (for example a social impact). An example is air pollution (environmental impact) due to a new factory that can result in impacts on the health of surrounding communities (social impact). Therefore, it is important, when conducting a SIA, to consider all the impacts identified by the other studies conducted for the same development, such as impacts identified in an EIA Report, Traffic Impact Assessment, Noise Impact Assessment and Air Quality Assessment.

#### 7.1.1 Traffic

The traffic impact assessment estimates additional heavy vehicle trips per peak hour would be generated during the open cast and underground mining activities.

Table 15: Peak hour trip generation (Traffic Impact Assessment, 2019)

Trip Generation during Peak hour (In & Out)	Open Cast Operations (SRs within 500m)					Infrastructure Complex & Underground Mining Extent (SRs within 500m)	
	Rugby Club Main Reef	Roodepoort Main Reef	11 Shaft Main Reef	Mona Lisa Bird Reef	Kimberley Reef East	Bird Reef Central	Kimberley Reef East
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
<b>AM Peak hour</b>							
Staff transport	8	8	8	8	8	82	82
Delivery transport	2	2	2	2	2	2	2
Product Transport	4	16	12	6	8	8	8
<b>Total</b>	<b>14</b>	<b>26</b>	<b>22</b>	<b>16</b>	<b>18</b>	<b>92</b>	<b>92</b>
<b>PM Peak hour</b>							
Staff transport	8	8	8	8	8	82	82
Delivery transport	2	2	2	2	2	2	2
Product Transport	4	16	12	6	8	8	8
<b>Total</b>	<b>14</b>	<b>26</b>	<b>22</b>	<b>16</b>	<b>18</b>	<b>92</b>	<b>92</b>

Trip generation is at its highest for product transport in Phase 2 and 3, which would generate between 12 – 16 product transport trips per peak hour. This however only lasts about 1 – 2 years. The rest of the life of the development product transport is on average 8 trips per peak hour.

Staff transport is lower during the first few years when the Open cast operations are active and then increases in Year 5 when underground mining is at steady state.

It could be expected that most proposed heavy vehicles transporting excavated ore as part of the proposed mining development would transport ore via R41 (Randfontein Road), joining the R558 towards the south. The following intersections were identified and investigated for potential impacts:

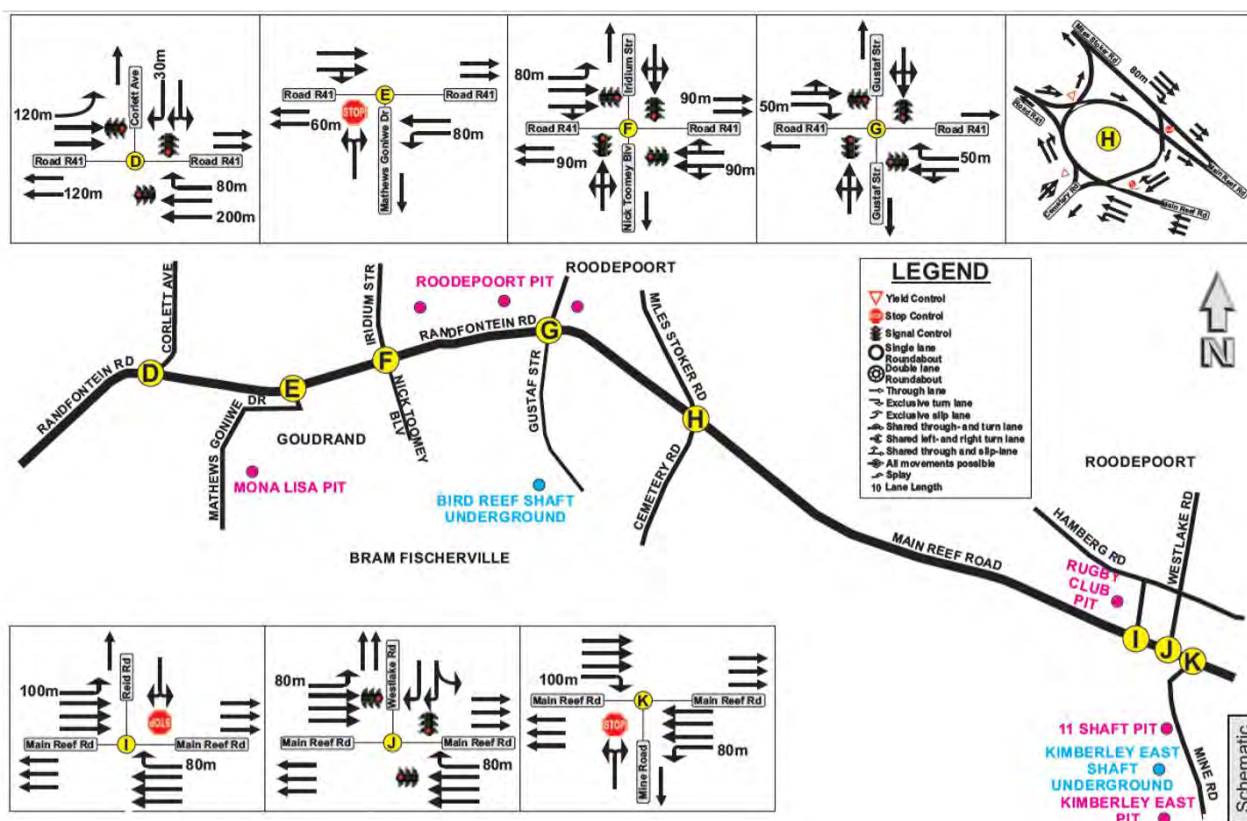


Figure 47: Roads and intersections (Traffic Impact Assessment, 2019)

Impacts include intersection performance, road safety impacts, impact on pedestrian activity, and impact on public transport activity. Recommendations to address these impacts include:

- Construction of two new intersections would be required for the mine development; a) From Gustav str to the Roodepoort Main Reef Open Pit and b) From Gustav str past the Bird Reef Infrastructure Complex to the Mona Lisa Open pit.
- Improvements at intersections is limited and mostly focussed on improving the performance and safety of the intersections, by adding at some slip lanes and dedicated turn lanes and traffic lights

- Collaborate with the relevant road authority to ensure that the road maintenance plan to maintain the relevant road network on which heavy vehicle movement is anticipated incorporates the necessary measures to support road safety conditions;
- Provide reflective road studs at strategic points (LED if possible) to ensure the safe operation of the relevant intersections under investigation at night-time at strategic points;
- Provide required road traffic signs for the relevant intersections;
- Provide relevant road markings at relevant intersections under investigation (highway paint recommended);
- Provide mine and contractor workers with training on road safety; and
- Road safety and awareness campaigns should be run at the mine.
- Provide paved pedestrian walkways to create a safe environment for pedestrians to move around within the relevant intersections.
- Provide pedestrian crossings at the relevant intersection under investigation.

Further details are contained in the Traffic Impact Assessment report (2019).

### **7.1.2 Air Quality**

The flow field is dominated by winds from the north-north-east. During day-time conditions, winds from the north increase in frequency, with winds from the north-north-east sector increasing at night. Existing sources of emissions in the study area include vehicle exhaust and entrainment on paved and unpaved roads, household fuel burning, biomass burning (veld fires), industrial activities, mining operations and wind erosion from exposed areas and tailings storage facilities.

The main sources of dust emissions from the opencast mining operations are likely to be materials handling of ROM and waste rock in the pit and of waste rock at the WRD and vehicle entrainment emissions from haul trucks and other mobile equipment. The main sources of dust emissions from the underground mining operations are the ventilation shafts and the aboveground handling of ROM.

With no mitigation measures applied, simulated highest daily PM<sub>10</sub> concentrations exceed the NAAQS at the closest receptor locations to the east, north and south of each of the open cast operations (with the exception of the Mona Lisa pit). With simple mitigation measures such as wet suppression of dust at material handling points and regular water sprays on haul roads, simulated incremental PM<sub>10</sub> concentrations due to the opencast mining operations are mostly compliance with the SA NAAQS. Depending on the proximity of



receptors to operational impacts, the significance ranges from high to low. More detail may be found in the air quality report.

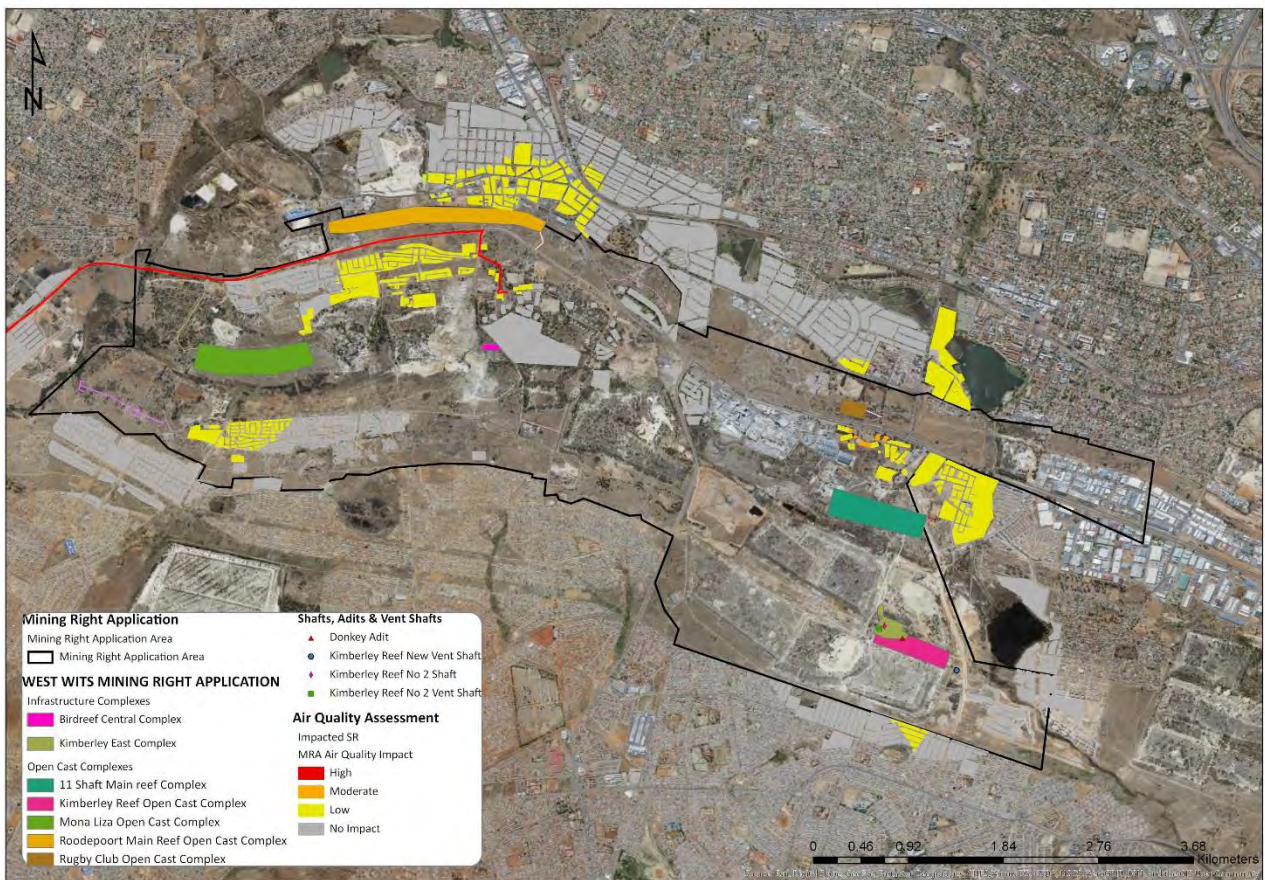


Figure 48: Air quality sensitivity map of Open Cast Areas (mitigated)

It should however be noted that open cast operation would be limited to day-time hours and the duration of mining at these points are short term (1 – 2 years)

### 7.1.3 Noise (Airshed, 2019)

The baseline acoustic environment was described in terms of the location of Noise Sensitive Receptors (NSRs), the ability of the environment to attenuate noise over long distances, as well as existing background and baseline noise levels.

The main findings of the impact assessment are:

- A management and mitigation plan is recommended to minimise noise impacts from the project on the surrounding area.

- The noise levels from the project operations exceed the selected noise criteria at the closest NSRs surrounding the project site.
- Construction and closure phase impacts are expected to be similar or slightly lower than simulated noise impacts of the operational phase.



Figure 49: Noise sensitivity map (Airshed, 2019)

According to the Noise Impact Assessment compiled by Airshed (2019) the proposed project activities were found to be medium at all unmitigated opencast mining operations with the exception of operations at the Kimberly Reef East Pit which was low. Assuming the adoption of good practice noise mitigation and management measures as recommended, the significance of project noise impacts may be reduced in frequency and severity and reduces to low significance. For underground mining activities, the significance was low for unmitigated and mitigated operations (Airshed, 2019).

#### **7.1.4 Blasting Evaluation (Kohler, 2019)**

The proposed project would make use of open pit mining methods as well as underground mining methods. The open pits would be mined by making use of Xcentric rippers. No drilling and blasting would be required. The underground mining method would make use of conventional drill and blast breast mining methods. Small diameter holes and light charge masses would be used for the blasting operations. The ground vibration levels caused by the blasting would be low. If any vibrations are felt on surface, the levels would be far too low to cause damage to structures. Airblast would have no effect on surface as it would be confined to the underground workings (Kohler, 2019).

#### **7.1.5 Radiological Public Safety Assessment**

In the Witwatersrand basin Uranium, sometimes in enhanced levels, exists alongside the gold. Besides being a heavy metal and chemically toxic, Uranium is also radioactive. The people living and working in the areas surrounding the proposed West Wits operations may therefore be exposed to the radiation from the ore. This exposure stems from the dust, radon and effluents released from the mining operations. Radionuclide analysis results of the ore and waste rock indicated that all the individual radionuclides are below the regulatory limit of 0.5 Bq/g. This means that the proposed operations of the West Wits do not fall under the NNR Act, hence not a radiological concern. The associated risks are therefore very low. No measures are therefore recommended to safeguard the public from either external exposure due to dust deposition, dust inhalation or Radon inhalation.

It can be concluded that the proposed West Wits Mining operations do not warrant any concern regarding the radiological impacts to the public. (De Villiers, 2019).

#### **7.1.6 Health Assessment (EnviroSim Consulting, 2019)**

A hazard assessment was conducted to identify potential contaminants suspected to pose a hazard to human health and a description of the type of health hazard they may produce. The health risks posed to members of the public by the activities planned as part of the proposed Project, was evaluated using a source-pathway-receptor analysis approach. It was indicated that members of the public living in close vicinity of the proposed Project would be exposed to concentrations of airborne contaminants, originating from the proposed Project. The significance of the impacts associated with these exposures is medium pre-mitigation and low with mitigation. Non-cancer risk values calculated for exposure to diesel particulate matter and arsenic associated with airborne particulate matter, show that the risk of health effects is low. The risks calculated as part of this

assessment indicate that for exposure to particulate matter associated arsenic, cancer risks are within acceptable levels even if mitigation is not applied (EnvirSim Consulting, 2019).

#### **7.1.7 Visual Impact Assessment (Scientific Terrestrial Services, 2019)**

Several potential risks to the receiving aesthetic and visual environment as a result of the proposed project have been identified, relating to impacts on visual character and sense of place, visual intrusion and visual exposure and visibility, as well as night-time lighting impacts. The significance of these impacts may be reduced should appropriate and effective mitigation measures be implemented. Mitigation measures that would have to be implemented in order to minimise the visual impact on the local and sub regional area, including dust control and management, prevention of damage to visual resources, making use of screening opportunities where possible and implementing good housekeeping measures.

It is the opinion of the specialist that the due to location of the Roodepoort Main Reef Pit, the Rugby Club Main Reef Pit and the Mona Lisa Bird Reef Pit it would have the most significant visual impact on the receiving environment. Ensuring that vegetation clearance is limited to the proposed mining pit and infrastructure footprint, the areas fenced with a clearVU fence or, equally approved, and no mining activities taking place 24-hours 7 days a week, the significance of the mining impact may be reduced. Concurrent rehabilitation, and the short period of mining at each pit (5 years for open pits) would reduce the duration of the impact in the area. The landscape character, quality and value have already been altered significantly by historic and current ongoing mining activities. The proposed West Wit Mining Project would therefore not have a detrimental visual impact on the receiving environment and is thus not fatally flawed from a visual impact perspective (Scientific Terrestrial Services, 2019).

## **7.2 Change in Land use, Cover and Ownership**

### **7.2.1 Loss of access to land use and livelihood activities due to high cumulative impact from Environmental Impact Interactions**

In terms of the socio-economic sensitivity mapping there is a potential for sensitive receptors, namely residential, educational, institutional or tourism activities that may experience a high impact if specifically, air quality and noise impacts cannot be effectively mitigated. If effectively mitigated this can be reduced to moderate.

### **7.2.2 Changes in Settlement & Housing Patterns**

Influx of job seekers and workers for the development and associated economic activities would have a direct impact on the supply and demand of affordable housing. The ability of the local environment to supply housing to these job seekers and employees are influenced by various factors such as availability of land, township planning, timeframe and magnitude of demand. It is already known that housing supply in Gauteng and in the local area is very low, and there is already a backlog in affordable housing supply.

It is anticipated that some employees would be sourced locally and from existing towns and suburbs. If local employment is maximised this could reduce the impact to low. It is, however, anticipated that the suburbs and towns closest to the mine site would still experience an influx due to job seekers still entering the area regardless of the fact that local employment is prioritized, which would increase the demand for housing within the informal and formal supply.

Backyard shack develop creates an income base for residents with formal housing, but the level of housing provided to backyard shack dwellers are below the National Standards. Some areas to the south of the Roodepoort Main reef open cast areas already have backyard shack development that is seen as a challenge by the City of Joburg (IDP, 2018/2019).

## **7.3 Resource Consumption & Ecosystem Services**

### **7.3.1 Impact on Aesthetic Value and Sense of Place due to Visual intrusions and increase Nuisance Noise**

Social impacts experienced in the physical environment relates to exposure to dust, noise, risk, odour, vibration, artificial light etc. It is anticipated that there would be a decrease in the quality of the physical environment over the short term as the Open cast operations complete within the first 4-5 years. The visual impact due to long term underground mining impacts is low if mitigated effectively.

Noise levels and traffic in and around the affected communities would increase as result of the mining activities. Although these impacts are within national standards, it is anticipated that it would still create a nuisance impact to local communities.

Sense of place is an important consideration before any development, since sprawl development tends to eliminate unique features of the landscape. The notion that places are more than just locations is at the core of ideas about place and sense of place. In its simplest form, sense of place encompasses the idea that each person forms close relationships with the spaces and settings in which he or she interacts. As they work, play, spend time with their families and friends, travel in their neighbourhoods and immediate environments individuals have positive and negative experiences in, and of, places and as a result ascribe meaning to them.

Although the project and surrounding area has been exposed to mining in the past and the current aesthetic environment is largely already altered, new commencement and increase in activities may still impact on the area. It is anticipated that there would be:

- Visual impact on the landscape character and Sense of Place associated with the MRA area and surrounding area during operations, due to noise, dust, and increased traffic.
- Visual intrusion of mining activities on visual receptors during operations, due to presence of mining infrastructure, increased traffic and increased presence of mining vehicles on the local roads, ongoing loss of vegetation, and alteration of landforms and contours.

### **7.3.2 Impact on the availability of natural resources such as firewood, small mammals for hunting, medicinal plants and subsistence grazing**

The project area is currently primarily utilised for residential and associated development, there are, however, open areas with limited vegetation that may be utilised for a) firewood collection; b) hunting small animals (if any); c) gathering plants; and d) subsistence gardening or grazing. It is estimated that the use is very limited and that the impact would be low, but due to the poverty in the area, it is necessary to include the impact.

### **7.3.3 Loss of livelihoods for those dependent on illegal mining activities**

Although currently the artisanal miners are illegal, it must be acknowledged that they support an extended household and connections with other households that benefit from the illegal mining value chain. In many other countries artisanal mining has been legalised in an attempt to boost the economy. Therefore, an impact would be felt by these miners if areas that they utilised as resources are closed off or access is prohibited. This may have secondary impacts on household income, education, and poverty.

## **7.4 Potential Pollution**

### **7.4.1 Impact on health, well-being and livelihoods of the public due to risk exposure from Potential Pollution**

The Health Impact and Risk Assessment has been conducted, and typically would consider a number of potential health hazards to the public, these can be summarized as follows:

- Dust exposure from mine sites and transport routes.
- Fumes including diesel fumes, which may cause respiratory irritation especially in those with a compromised immune system.
- Increased irritability and annoyance due to continuous nuisance noise.
- Social diseases such as human immunodeficiency virus (HIV), Herpes, Hepatitis B and sexually transmitted diseases (STDs), as a secondary impact caused by an influx of job seekers

During the Public Participation, dust exposure was raised as a primary concern. In the Air Quality Impact Assessment, the area below within the orange line is the area where the exposure limit may exceed standards if not mitigated.

### **7.4.2 Impact on well-being and livelihoods due to dust generation along transport routes**

The road network to be utilised for Construction, Supplies, Staff and Production involves new access roads to link the various opencast operations with the R41, and thereafter south via the R558. Largely due to the short timeframe of the opencast activities, it is not envisaged to tar the various linked access roads. These link roads may contribute further to dust fall-out and degradation of the air quality in the short term during the opencast operations and would be limited to day-time.

## **7.5 Goods, staff and transport**

### **7.5.1 Disruption of daily living and movement patterns and safety of road users**

In terms of impacts on daily movement patterns, the main transport road to be used is the R41 which is already congested during peak hours. Therefore, it is expected that there would be an increase in traffic on the R41 as well as the planned transport route the R558. It is the traffic specialist's opinion that the road network, would be able to handle the traffic. Improvements recommended at intersections are focussed on increasing the effectiveness and safety of these intersections. The traffic impacts assessment has determined that there

would be low detrimental impacts on the roads and traffic. From a social perspective, there may be a change to the current status resulting from both construction and operational vehicles accessing, crossing and using roads for the proposed project. These impacts would potentially manifest in: (1) the general population, e.g. individuals on their way to work; parents taking children to school; people on their way to local suburbs and beyond; (2) businesses. Impacts would present differentially for these groups, ranging potentially from a mere nuisance factor giving rise to frustration, to more serious ramifications where activities are impeded; 3) pedestrian traffic; and 4) public transport pick-up and drop-off. These have been identified as part of the Traffic Impact Assessment and mitigation measures have been proposed.

## **7.6 Need of Human Resources and Recruitment**

### **7.6.1 Influx of job seekers and population growth pressures**

Previous studies and experience in the field indicated that, in South Africa with its high levels of unemployment, with any new development or rumour of a new development, people are prone to move in search of employment opportunities, which when considered against the trends in population growth rates in the individual municipalities would have a definitive impact. It is thus anticipated that potential job seekers would start moving to areas specifically near the proposed open cast operational areas and the infrastructure complexes (targeting open uncontrolled areas), in an attempt to secure employment. The potential influx of job seekers and their anticipated settlement in the uncontrolled and or low-income areas are likely to lead to direct, indirect and cumulative social impacts, for example, conflict amongst local communities and job seekers, social disintegration, pressures on existing infrastructure and services, housing, etc.

Even if it is the intent of West Wits to source workers locally, it may reduce but not entirely discourage people from elsewhere entering the area in seek of employment. It is this perceived prospect of employment opportunities, fuelled by potential rumours about the number of jobs to be created, that would attract outsiders. Furthermore, introducing job opportunities into a resource-starved environment (see unemployment figures) is a potential source of competition between unemployed locals - a situation that would be exacerbated by outsiders, potentially resulting in conflict. This process of potential in-migration is likely to affect all neighbouring suburbs, but specifically those areas already occupied by informal settlers, and those suburbs where backyard shack development is prevalent. Backyard shack development creates an income base for residents with formal housing, but the level of housing provided to backyard shack dwellers are below the National Standards, and is seen as a developmental challenge by the City of Joburg (IDP, 2018/2019).



### 7.6.2 Increase in social pathologies and crime

The presence of construction and mine workers poses a potential risk to social practices, family structures and social networks in the area. While the presence of construction and mine workers does not in itself constitute a social impact, the manner in which workers may conduct themselves can impact on the local community. In this regard the most significant negative impact is associated with the disruption of existing social practices, family structures and social networks. This risk is linked to the potential behaviour of workers, including:

- An increase in alcohol and drug use
- An increase in crime levels
- The loss of girlfriends and / or wives to construction workers
- An increase in teenage and unwanted pregnancies
- An increase in prostitution
- An increase in sexually transmitted diseases (STDs)

The above interference and resulting impacts manifesting would depend on a number of factors, including whether newcomers:

- Are foreigners or S.A. nationals from elsewhere. As noted previously, research shows that foreigners exist as discrete networks and don't readily assimilate into local communities. If this research is correct, interference and impacts on social networks would therefore be more readily attributable to foreigners than S.A. nationals (newcomers) from elsewhere.
- Would be able to secure employment or are already employed by West Wits or its contractor(s), thus being able to meet their primary needs, e.g. shelter and food, thus not needing to interfere in existing social networks with the objective to secure instrumental support.
- Would be in the area only to secure employment at the proposed West Wits project (in the case of job-seekers) and leave if they are unsuccessful in doing so. (Construction workers who are part of a stable, permanent contractor workforce are expected to vacate the area following completion of the construction phase).

Employing members from the local community to fill the medium to low-skilled job categories would assist to reduce the risk and mitigate the potential impacts on the local communities. These workers would be from the local community and form part of the local family and social network and, as such, the potential impact would be low. The use of local residents to fill the medium to low skilled job categories would also reduce the demand placed on local services (housing etc.) by workers. However, due to the potential mismatch of skills

and low education levels, the potential employment opportunities for the members from these local communities may be low.

### **7.6.3 Creation of employment**

During the Opencast mining operations there would be approximately 40 to 50 employees. Once the construction commence on the surface infrastructure for underground mining operations, approximately 50 to 100 staff would be employed. Once construction is complete and at full production employees would be increased to approximately 1 105 employees. West Wits has committed that local people would be prioritized to participate in employment opportunities that would become available during construction and operational phase of the mine.

### **7.6.4 Opportunities in local skills development**

The Social and Labour Plan provides for skills development, bursaries, internships, and learnerships to employees and the local community. As part of the implementation of the Social and Labour Plan processes would be put in place to identify candidates especially amongst the youth that meet the requirements and can participate in these opportunities.

### **7.6.5 Opportunities in local small, medium and micro-enterprises (SMME) development and procurement**

West Wits has committed that opportunities would be provided for local SMMEs to participate in contracts that would become available during construction and operational phase of the mine.

### **7.6.6 Loss of job opportunities due to downscaling of the mine employment**

During downscaling, employment would be lost by those that were employed during the operational phase, due to take place towards the end of the opencast activities (4-5 years) and then again during downscaling of the underground mining (15 to 25 years).

This may have an impoverishment effect on the local communities and those households that are dependent on the mining sector and income generated by the employment.

### **7.6.7 Enabling Mixed housing development through mining and rehabilitation of resource rich areas**

Housing availability in the project area is limited primarily due to land availability. Currently the land under application cannot be developed until such time as viable minerals have been extracted and the area rehabilitated. Therefore, the mining development would be able to fast track mixed housing development currently being planned, especially in the open cast operational areas. Agreements have been reached with developers to enable post land use that is acceptable for the local planning initiatives. Therefore the development facilitates improved land use in the area.

## **7.7 Cumulative Impacts**

### **7.7.1 Delay in housing development over mine area**

Housing developments planned at opencast operational areas may be delayed with 4 – 5 years in those specific areas. Except for Rugby Club and Kimberley Reef East, all other developments impact on planned housing development. There are two main areas of concern from the developers:

- The environmental impact (air quality, noise, water, vibration, health) that the opencast operations may have on the housing developments surrounding the open cast area, during operations and immediately post operations.
- The economic impact on the developer taking into consideration that some buyers may disinvest due to the mine being in close proximity.

The company therefore engaged the housing developers to reach agreement on settlement dates. This agreement provides for the scheduling of each open pit mining area in such a way that it limits any delay on the development. The opencast operations will be developed in series, and as soon as the first area has been mined and rehabilitated, it will be made available for the housing development.

### **7.7.2 Increase influx, housing demand and land use management issues**

Due to the proximity of other mine developments in the area, it is anticipated that influx would be amplified within the broader area. The cumulative influx would be focused on formal towns and unoccupied areas close to the mine development.

An increase in development projects in the region affecting similar geographical areas can cause an increase in pressures on the availability of housing. The participation in regional development planning forums may be able to foresee potential impacts and manage those appropriately.

### **7.7.3 Increase in environmental interactions causing further socio-economic impacts**

Stakeholders stated during public participation that old mining activities as well as the planned additional mining activities may increase the impact in terms of environmental and socio-economic interactions. An increase in development projects in the region affecting similar geographical areas can also cause an increase in the intrusion to sense of place.

### **7.7.4 Increase in local disruption and traffic congestion**

Existing limited road access into the area would be further impacted if more development is initiated that would utilise the same roads. The industrial and commercial activities also utilise the same roads for product transport and therefore the development would intensify the impact. All development applications would need to consider this impact and implement mitigation measures to improve capacity, performance and safety of the roads.

### **7.7.5 Improved skills development and employment**

If all planned developments take place within the broader project area, the anticipated benefits would be intensified, causing an increase in skill levels as well as employment. The secondary effect is more disposable income which would lead to a higher standard of living in communities surrounding these developments.

### **7.7.6 Improved local business development through procurement opportunities within the mining and construction industries**

If all planned developments take place within the broader project area, the anticipated benefits would be intensified, causing an increase in entrepreneurs and growth in local businesses. The secondary effect is more indirect employment and spend, which provides employment to communities surrounding these developments.

## 8 SUMMARY OF IMPACT ASSESSMENT

The social impacts discussed above have been rated utilising the SLR impact assessment methodology as detailed in chapter 4.

Table 16: Impact Assessment Table

ID	Potential Impact	Phase	Nature of Impact	Extent	Duration	Severity	Consequence	Probability	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
1	Loss of access to land use and livelihood activities due to high cumulative impact from Environmental Impact Interactions	Operational	Negative	L	M	H	M	H	M-	M	L-
2	Impact on health, well-being and livelihoods of the public due to risk exposure from Potential Pollution	Operational	Negative	L	M	M	M	M	M-	M	L-
3	Impact on Aesthetic Value and Sense of Place due to Visual intrusions and increase Nuisance Noise	Operational	Negative	L	L	L	L	M	L-	M	L-
4	Impact on well-being and livelihoods due to dust generation along transport routes	Operational	Negative	L	H	M	M	H	M-	M	L-
5	Impact on the availability of natural resources such as firewood, small mammals for hunting, medicinal plants and subsistence grazing	Operational	Negative	L	M	L	M	M	M-	M	L-
6	Disruption of daily living and movement patterns and safety of road users	Operational	Negative	L	H	M	M	H	M-	M	L-
7	Influx of Job seekers and Population growth pressures	Operational	Negative	M	M	M	M	H	M-	M	L-
8	Changes in Settlement & Housing Patterns	Operational	Negative	L	M	H	M	H	M-	M	L-
9	Increase in Social Pathologies and Crime	Operational	Negative	L	M	M	M	H	M-	M	L-
10	Creation of employment	Operational	Positive	L	H	M	M	H	M+	H	H+
11	Loss of livelihoods for those dependent on illegal mining activities	Operational	Negative	L	H	H	H	H	H-	M	M-
12	Opportunities in local Skills Development	Operational	Positive	L	M	H	M	H	M+	H	H+
13	Opportunities in local SMME Development and Procurement	Operational	Positive	L	M	H	M	H	M+	H	H+

ID	Potential Impact	Phase	Nature of Impact	Extent	Duration	Severity	Consequence	Probability	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
14	Loss of job opportunities due to downscaling of the mine employment	Decommissioning	Negative	L	H	H	H	M	M-	M	L-
15	Enabling Mixed housing development through mining and rehabilitation of resource rich areas	Cumulative	Positive	L	M	H	M	H	M+	M	H+
16	Delay in housing development over mine area	Cumulative	Negative	L	M	H	M	H	M-	M	L-
17	Increase influx, housing demand and land use management issues	Cumulative	Negative	L	M	H	M	H	M-	M	L-
18	Increase in environmental interactions causing further socio-economic impacts	Cumulative	Negative	L	M	H	M	M	M-	M	L-
19	Increase in local disruption and traffic congestion	Cumulative	Negative	M	H	M	H	M	M-	M	L-
20	Improved Skills Development and Employment	Cumulative	Positive	M	H	H	H	H	H+	M	H+
21	Improved local business development through procurement opportunities within the mining and construction industries	Cumulative	Positive	M	H	H	H	H	H+	M	H+

## 9 SUMMARY OF MITIGATION MEASURES

Mitigation efficiency have been applied as per the methodology discussed in chapter 4.

Table 17: Mitigation measure table

ID	Potential Impact	Significance Rating (WOM)	Mitigation measures	Mitigation Efficiency	Significance Rating (WMM)
1	Loss of access to land use and livelihood activities due to high cumulative impact from Environmental Impact Interactions	M-	<ul style="list-style-type: none"> <li>Implementation of air quality and noise monitoring</li> <li>If noise and air quality impacts cannot be effectively mitigated, and it's determined that an adverse impact exists, then parties affected must be engaged and agreement must be reached on the method of mitigation required.</li> <li>Establish complaints and grievance procedure.</li> </ul>	M	L-
2	Impact on health, well-being and livelihoods of the public due to risk exposure from Potential Pollution	M-	<ul style="list-style-type: none"> <li>Majority of the health impacts related to pollution can be effectively mitigated by reduction of air quality impacts.</li> <li>Implementation of air quality monitoring</li> <li>If air quality impacts cannot be effectively mitigated, then parties affected must be engaged and agreement must be reached on the method of mitigation required.</li> <li>Development and implementation of dust abatement measures for material handling and management of uncovered stockpiles of overburden material and ore</li> </ul>	M	L-
3	Impact on Aesthetic Value and Sense of Place due to Visual intrusions and increase Nuisance Noise	L-	<ul style="list-style-type: none"> <li>Implementation of mitigation measures as contained in the Air Quality and Noise Impact Assessment</li> <li>Rehabilitation and Closure Planning to coordinate with future planning of the area.</li> <li>Establish a complaint and grievance procedure.</li> </ul>	M	L-
4	Impact on well-being and livelihoods due to dust generation along transport routes	M-	<ul style="list-style-type: none"> <li>Implementation of the management and mitigation measures of the Air Quality Impact Assessment</li> <li>Implementation of the design, management and mitigation measures of the Traffic Impact Assessment</li> <li>Establishment of a Complaint and Grievance Procedure</li> </ul>	M	L-
5	Impact on the availability of natural resources such as firewood, small mammals for hunting, medicinal plants and subsistence grazing	M-	<ul style="list-style-type: none"> <li>Allow local occupants to gather natural resources from specific areas that is earmarked for vegetation clearance (such as firewood).</li> </ul>	M	L-

ID	Potential Impact	Significance Rating (WOM)	Mitigation measures	Mitigation Efficiency	Significance Rating (WM)
6	Disruption of daily living and movement patterns and safety of road users	M-	<ul style="list-style-type: none"> <li>• Implementation of the recommendations and mitigation measures as contained in the Traffic Impact Assessment</li> <li>• Establishment of a complaint and grievance procedure</li> </ul>	M	L-
7	Influx of Job seekers and Population growth pressures	M-	<ul style="list-style-type: none"> <li>• Development and implementation of an Influx and Land use Management Plan in collaboration with CoJ and the current landowners.</li> <li>• Prioritise employment from local communities with the development of recruitment procedures</li> <li>• Implementation of practical skills programmes</li> <li>• Induction of contractors and workforce with regard to their code of conduct in the local area.</li> </ul>	M	L-
8	Changes in Settlement & Housing Patterns	M-	<ul style="list-style-type: none"> <li>• Implement mitigation measures defined to manage influx of job seekers (as above).</li> </ul>	M	L-
9	Increase in Social Pathologies and Crime	M-	<ul style="list-style-type: none"> <li>• Implement health awareness programmes for workers and communities including education programmes on sexually transmitted diseases and HIV/AIDS and other illnesses such as TB.</li> <li>• Increased security on mine premises: Properly constructed and secured fences can control access to mine site. Implementing strict access control to the project site.</li> <li>• Employment of local people on the mine to improve the poverty levels in the neighbouring towns and suburbs.</li> <li>• Code of Conduct to form part of induction of new workers with a clear statement and procedure regarding access, conduct and identification.</li> <li>• Workers should be urged to recognize and report suspicious activity and signs of burglary and be informed of crime prevention measures that they themselves can take.</li> <li>• Grievance Procedure within the local area.</li> <li>• Liaison with existing community policing forums and project security to properly secure the project area and surrounding area.</li> </ul>	M	L-
10	Creation of employment	M+	<ul style="list-style-type: none"> <li>• Prioritize people residing in local area.</li> <li>• Implementation of practical skills programmes.</li> </ul>	H	H+
11	Loss of livelihoods for those dependent on illegal mining activities	H-	<ul style="list-style-type: none"> <li>• Collaborating with Department of Mineral Resources, City of Joburg and Civil Rights Organisations to find solutions to the illegal miner dilemma.</li> <li>• Where possible, and where candidates are suitable, consider the further development and employment of these parties</li> </ul>	M	M-



ID	Potential Impact	Significance Rating (WOM)	Mitigation measures	Mitigation Efficiency	Significance Rating (WM)
12	Opportunities in local Skills Development	M+	<ul style="list-style-type: none"> <li>Implementation of practical skills programmes.</li> </ul>	H	H+
13	Opportunities in local SMME Development and Procurement	M+	<ul style="list-style-type: none"> <li>Establishment of a vendor database and assessment of business aptitude and skill.</li> <li>Identification of procurement opportunities that can be ring-fenced for local businesses.</li> </ul>	H	H+
14	Loss of job opportunities due to downscaling of the mine employment	M-	<ul style="list-style-type: none"> <li>Establish a future forum with representation from the workforce to discuss potential difficulties and solutions.</li> <li>Implementation of programmes to minimize and mitigate the impact of downscaling and retrenchment.</li> <li>Implementation of portable skills programmes to assist employees, especially those from the local area, to re-enter the agricultural and other sectors prevalent in the Municipal area.</li> </ul>	M	L-
15	Enabling Mixed housing development through mining and rehabilitation of resource rich areas	M+	<ul style="list-style-type: none"> <li>Agreements with developers to schedule implementation of mining and availability of land for development</li> </ul>	M	H+
16	Delay in housing development over mine area	M-	<ul style="list-style-type: none"> <li>Agreements with developers to schedule implementation of mining and availability of land for development</li> </ul>	M	L-
17	Increase influx, housing demand and land use management issues	M-	<ul style="list-style-type: none"> <li>Secure mine areas to discourage influx into the area</li> <li>Work closely with developers so that land that have been rehabilitated come be developed without delay</li> <li>Work with local organisations and community groups to monitor influx into the area</li> </ul>	M	L-
18	Increase in environmental interactions causing further socio-economic impacts	M-	<ul style="list-style-type: none"> <li>The placement of monitoring points for both noise and air quality levels must be done taking into consideration the cumulative impact and other developments in the area.</li> <li>Establishing and Environmental Monitoring Committee during the Mine Permits and extends its role into the Mining Right</li> </ul>	M	L-
19	Increase in local disruption and traffic congestion	M-	<ul style="list-style-type: none"> <li>Ensure cumulative effects are considered in the final planning of the road mitigation measures</li> <li>Work closely with Roads agencies and developers to coordinate planning and investment</li> </ul>	M	L-
20	Improved Skills Development and Employment	H+	None	M	H+
21	Improved local business development through	H+	None	M	H+

ID	Potential Impact	Significance Rating (WOM)	Mitigation measures	Mitigation Efficiency	Significance Rating (WM)
	procurement opportunities within the mining and construction industries				

## 10 SOCIAL MONITORING AND MANAGEMENT PLANS

### 10.1 Introduction

This section presents the proposed social management and monitoring strategies that should be considered to ensure that all identified impacts are addressed and managed accordingly. The main aim of the strategies is to minimize negative impacts and maximize positive impacts by means of effective mitigation measures. Logical Framework Matrix (LFM) methodology was used to develop the strategies listed below.

- Communication, Consultation and Awareness Management Plan: Ensuring continuous engagement with project affected parties and stakeholders.
- Issue and Grievance Management Strategy: To ensure the appropriate management of issues and grievances.
- Influx and Land Use Management Strategy: To manage the influx of job seekers.
- Social Monitoring and Evaluation Strategy: To ensure that the project intervention process is monitored with the aim of implementing corrective measures if and when required.

In the following sections, the proposed strategies would be discussed in terms of a hierarchy of objectives, outputs and activities and targets.

- Objectives – objectives of strategy / policy which highlight the motivation behind each strategy.
- Outputs – the expected deliverables for the objectives to be achieved.
- Activities - actions that should be undertaken to ensure the expected deliverables. These activities are referenced against the timeframe within which they should be undertaken and the parties that would take responsibility for carrying out the activities.
- Targets – probable key success factors / performance indicators by which implementation success of strategy should be monitored. In a significant number of cases, specific targets would only be set in the process of implementing the strategies.

## 10.2 Strategies and Management Plans

### 10.2.1 Communication, Consultation and Awareness Strategy

#### 10.2.1.1 Objective

- To develop and maintain an ongoing process of public participation (refer Public Participation Programme Section of the report) to ensure the continued involvement of interested and affected parties in the project in a meaningful and responsible way.
- To establish an Environmental Monitoring Committee (EMC) to inform and monitor the environmental and social planning and implementation processes.

#### 10.2.1.2 Outputs

- An EMC comprising of representatives from community stakeholder sectors, the mining company and relevant national, provincial and local authorities.
- A database of project interested and affected parties, stakeholder groups and stakeholder sectors.

#### 10.2.1.3 Activities

ACTIVITY	TIMEFRAME	RESPONSIBLE PARTIES
Consult and constitute an EMC.	Before Construction	Mining Right Holder
Develop a constitution for the EMC to guide its operations.	Before Construction	Mining Right Holder EMC

#### 10.2.1.4 Targets

- Annual EMC meetings. To be effective must meet much more often – especially during the open cast phase
- EMC minutes

### 10.2.2 Issue and Grievance Management Strategy

#### 10.2.2.1 Objective

- Ensure the management and address of complaints and grievances through a well defined procedure

**10.2.2.2 Outputs**

- Ensure communities and stakeholders are aware of the opportunity to express grievances and complaints.
- Ensure communities and stakeholders feel free to express their complaints / grievances.
- Encourage communities and stakeholders to use the procedure, but also warn not to abuse it with false grievances.
- Ensure sensitive grievances are dealt with privately, and confidentiality if information is maintained.

**10.2.2.3 Activities**

ACTIVITY	TIMEFRAME	RESPONSIBLE PARTIES
Development of a Grievance Procedure that is accessible and effective	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer
The existence and conditions of access to this procedure and avenue shall be widely disseminated within the stakeholder environment and affected parties as part of the consultation undertaken for the development in general.	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer
If the response to the grievance has not been accepted or resolved the mine management would enter a mediation phase, where a meeting would be held with the party that submitted the grievance in an attempt to resolve.	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer
If grievance is not resolved through mediation the grieving party are open to take up any of the formal avenues available in terms of South African Legislation.	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer

**10.2.2.4 Targets**

- Registration and resolving of grievances.
- Amicable mediation and settlement.

**10.2.3 Influx Management Plan****10.2.3.1 Objective**

- Define the scope and dimensions of mine-related influx and its management, and set out applicable management interfaces.

- Define roles and responsibilities for influx management.
- Outline the applicable project standards relevant to this management plan.
- Define suitable mitigation measures for the direct and indirect negative impacts associated with population influx to the MRA Area of influence, by people seeking employment or moving to the area in expectation of other benefits.
- Define effective plans and procedures for managing potential influx impacts in MRA Area of Influence.
- Define monitoring and reporting procedures, including key performance indicators.
- Define training requirements associated with influx management.

### 10.2.3.2 Outputs

- Mitigation and minimizing the effect of influx.
- Development of capacity of local authorities in land use management.
- Monitoring influx and the effectiveness of the influx management strategies.

### 10.2.3.3 Activities

ACTIVITY	TIMEFRAME	RESPONSIBLE PARTIES
Allocate Influx Monitoring responsibilities to a staff member, who must work closely with CoJ.	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer Municipal officials
Influx Monitoring to develop a Influx Management Plan and Monitoring Programme.	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer Municipal officials
Manage expectations for opportunities: Communicate policy on procurement & recruitment Notice of opportunities Briefing on labour and procurement statistics Improve communication to communities	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer
Updated the full census of the local informal settlements within 12 months of construction commencing and thereafter every 2 years	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer Local Municipality
Monitoring Influx risks at existing informal settlements as well as vacant uncontrolled land surrounding the mine area	Before & during construction, before and during operations	Mining Right Holder Contractor Engagement Officer

**10.2.3.4 Targets**

- Identification of influx influence zone and implementation of influx management strategies at these areas.
- Create capacity and awareness in the management of influx.
- Reduce secondary impacts due to influx.

**10.2.4 Community Health and Welfare Programme****10.2.4.1 Objectives**

- To ensure that community health and welfare issues are addressed in an integrated and coordinated fashion with existing health and welfare facilities and infrastructure.

**10.2.4.2 Outputs**

- Community Health and Welfare Strategy.
- Community health awareness workshops.

**10.2.4.3 Activities**

ACTIVITIES	TIMEFRAME	RESPONSIBLE PARTIES
Facilitate the development of a Community Health and Welfare Programme in consultation with health and welfare authorities in the project area, both governmental and non-governmental. Facilitate presentation of Community Awareness Programmes on STDs and HIV/Aids, unwanted pregnancies. Ensuring the availability of applicable birth control measures.	Before and during construction / operations	Mining Right Holder Local Health Services Dept. of Health Contractor
Implementing appropriate noise and dust monitoring equipment. Monitoring of noise and dust levels during the construction and operational phases. Implementation of appropriate mitigation measures to curb noise and dust pollution impact on the local settlements and land occupants.	During Construction and Operations	Mining Right Holder Contractor Environmental Manager Health Facilities
Implement a Medical Surveillance Programme with identified community members.	During Construction and Operations	Mining Right Holder Dept. of Health

**10.2.4.4 Targets**

- Appropriate support and assistance to local health facilities impacted by the project.

- Hand-over of support measures (if applicable) to the relevant role-players.
- Community Health and Welfare Awareness Programmes in co-ordination and with the guidance of local health staff and facility requirements.

## 10.2.5 Traffic Safety and Awareness Strategy

### 10.2.5.1 Objectives

- To undertake a road safety audit for all road infrastructure that would be directly affected by the movement of construction vehicles, product transport vehicles and other related traffic.
- To further evaluate existing traffic patterns and road conditions in the project area.
- To further evaluate the condition and suitability of proposed access roads to the project site.
- To ensure that adequate traffic management tools are employed for the duration of the project duration.

### 10.2.5.2 Outputs

- A traffic monitoring strategy.
- A Road Safety Plan for implementation in consultation with local government traffic authorities
- A road safety awareness campaign.

### 10.2.5.3 Activities

ACTIVITIES	TIMEFRAME	RESPONSIBLE PARTIES
Compile a Traffic Safety and Awareness Plan. This may need to inform the tender process with regards to scheduling of construction material deliveries, product transport, mining contractor, etc.	Before and during construction / operations	Mining Right Holder Contractor Dept. Of Transport
Present Traffic Management and Safety Plan to Dept. of Transport for input and support.	Before and during construction / operations	Mining Right Holder Contractor Dept. Of Transport
Upgrading of roads and construction of new roads if required for the project implementation process.	Before and during construction / operations	Mining Right Holder Engineer Contractor Dept. Of Transport
Drafting of hand-over agreements between Mining Right Holder and relevant authorities, provincial and or local regarding maintenance of road infrastructure.		Legal Counsel
Implementation of Traffic Safety and Awareness Plan and Monitoring Programme.	Before and during construction / operations	Mining Right Holder Engineer Contractor



Dept. Of Transport

**Targets**

- Completion of the road safety audit before construction commences.
- Completion of the Traffic Safety and Awareness Plan before construction commences.

**10.2.6 Social Monitoring and Evaluation Strategy****10.2.6.1 Objectives**

- To ensure that all the activities listed in the social strategies are implemented to support the achievement thereof.
- To monitor, review and adapt social implementation strategies if and when required.
- To ensure that the monitoring information is captured in a structured and organised fashion, according to an agreed system by responsible parties, in order to ensure post mining and benefit implementation analysis of the data.
- Integration with Environmental Control Officer (ECO) monitoring functions of the bio-physical environment.

**10.2.6.2 Outputs**

- Drafting of Monitoring and Evaluation Policy.
- Implementation and or adapting corrective measures.
- Compilation of monitoring reports to EMC and project proponent.

**10.2.6.3 Activities**

ACTIVITIES	TIMEFRAME	RESPONSIBLE PARTIES
Compile Monitoring and Evaluation Policy and Procedures Definition of Conflict Resolution Procedure	Before construction	Mining Right Holder, Social Scientist, EMC, Engineer, Contractor
Define monitoring role and functions of the EMC with regards to various project components, e.g. social aspects, bio-physical environmental aspects, construction and operational issues etc.	Before and during construction	Mining Right Holder, EMC
Design and implementation of monitoring and evaluation methodologies (e.g. checklists, Participatory Rural Appraisal etc.)	Before and during construction	Mining Right Holder, Social Scientist, EMC

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Drafting of regular process and compliance monitoring reports Timeous implementation of corrective measures based on recommendations from process and compliance monitoring reports	During and after construction	Mining Right Holder, Social Scientist, EMC
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#### **10.2.6.4 Targets**

- Efficient and effective project management.
- Timeous information flow to support decision-making processes.
- Integration of monitoring data between biophysical and socio-economic impacts.

## 11 CONCLUSION

A total of 21 social impacts were identified for the proposed project, 6 impacts are positive in nature and 4 impacts are secondary in nature and caused by interaction between social and environmental aspects. Although some of the social impacts may be high in severity due to the proximity of potential sensitive receptors to the opencast operations, it is the specialists opinion that due to their temporary and short term duration, the impacts are determined to be moderate, and with effective mitigation these impacts would be low.

At the underground operations and specifically around the infrastructure complexes impact severity may be low, but due to the impact duration being over a longer period, the specialist evaluates these impacts as moderate.

The highest significant social impact, is the loss of livelihoods for those dependent on illegal mining activities. Although the reduction of illegal activities from a regulatory and criminal point of view is positive, from a social point of view this loss would further increase poverty in the area.

Adequate mitigation measures are expected to reduce the significance of almost all negative impacts albeit not always to baseline levels, while positive impacts would on average be significantly enhanced to maximise benefits to surrounding communities.

Consequently, it is recommended from a social perspective that the proposed Mining Right Application can proceed. This recommendation is based on the following conditions

- Mitigation measures outlined in this report would be given effect through the social management plan outlined in Section 8 & 10,
- Measures to monitor and assess implementation of these mitigation measures and to take corrective action where necessary (as is outlined in the social monitoring plan outlined in Section 10) would be implemented; and
- Impacts pertaining to other specialist disciplines that could have indirect socio-economic repercussions (e.g. impacts on air quality, noise, health etc.) would be effectively addressed as per the mitigation measures recommended in those specialist reports
- West Wits must also establish continuous communication channels as well as complaints and grievance procedures with the affected parties.

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  - Project Classification
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  - Subdivision of Agricultural Land Act 70 of 1970
  - Housing Act No 107 of 1997
  - National Land Transport Act 5 of 2009

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- Provincial Growth and Economic Development Strategies for Mpumalanga
- Provincial and Metro Spatial Development Framework
- District and Local Integrated Development Plan
- Census 2011 data
- Community survey 2016
- Quarterly Employment Statistics, 2016
- General household survey, 2011
- Income and Expenditure survey 2010/2011
- Mortality and causes of death survey, 2010



# **APPENDIX A: CV**

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	First Name: Lizinda
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	Gender: Female
<b>Profession</b>	Specialist: Social Assessment, Management and Facilitation Specialist: Resettlement Planning, Implementation, Evaluation and Review
<b>Education</b>	BA Degree specialising in Geography / GIS; University of Stellenbosch; 1994 – 1996 BA (Hons) specialising in Environmental Management & Analysis; University of Pretoria; 1997 – 1998 Masters specialising in Environment and Society; University of Pretoria; commenced 2017, still in progress
<b>Other Formal Training / Education</b>	Certificate in Database management; Microsoft Accredited Certificate in Geographic Information Systems: ArcGIS; ESRI Accredited Certificate in Geographic Information Systems: PlanetGIS; PlanetGIS Accredited HIV/AIDS Peer educator; SETA Accredited Certificate
<b>Professional Societies</b>	Member of the International Association of Impact Assessments Member of the International Resettlement Specialist Association
<b>Publications</b>	van Koppen, B., Joubert, C. & Grobbelaar(Dickson), L (2000). Gender and Irrigation in Mathabatha Land. South Africa Working Paper. Colombo, Sri Lanka: International Water Management Institute (IWMI)
<b>Employment Record</b>	University of Pretoria; Research Assistant; 1996 – 1997 Naledi Development; Project Assistant; 1998 – 2000 Naledi Development; Project Leader / Manager; 2000 – 2012 Diphoro Development; Director / Owner; 2004 – 2019
<b>Language Proficiency</b>	English – excellent
<b>Computer Aptitude</b>	Windows 8, 10; Adobe Acrobat Reader / Writer 2017 Microsoft Office 2003, 2007, 2010, 2016; Microsoft Project 2003, 2007, 2010 Microsoft Access 2003, 2007, 2010, 2016 Corel Office and Corel Draw Mapping: ESRI ArcGIS; Planet GIS; QGIS; Global Mapper SAS Statistical analysis (database management)

Client	Project	Environmental Assessment / Management	Social Assessment / Management	Resettlement / Planning / Implementation	Stakeholder Engagement / Management	Geographic Information Systems	Social Development and labour Plans	Land access / acquisition facilitation
BHP Billiton / South 32	Leandra Underground Coal Project		X		X	X	X	
BHP Billiton / South 32	Khutala Life Extension Project		X	X		X		
Taung Gold	Evander Project		X			X		
Coal of Africa Limited	Greater Soutpansberg Mining Right Applications		X		X	X	X	X
Urban Dynamics / West Rand DM	Bekkersdal Urban Renewal		X	X	X		X	X
Coal of Africa Limited	Makhado Colliery		X	X	X	X	X	X
Coal of Africa Limited	Vele Colliery		X		X			
Glencore	Goedgevonden Colliery Expansion		X		X	X		
Sefateng Chrome	Sefateng Chrome Mine		X	X	X	X	X	X
Ergosat	Ergosat Project	X	X	X	X	X	X	X
Tivani (Pty) Ltd	Tivani Project	X	X	X	X	X	X	X
Coal of Africa Limited	Mooiplaats Colliery / Vuna Colliery						X	
Impala Platinum	OR Tambo Essential Oil Project	X	X			X	X	X
Impala Platinum	Marula Platinum		X	X	X	X		
Glencore	Vlakfontein Colliery		X		X		X	
Tivani (Pty) Ltd	Mohlabas Localtion	X	X	X	X	X	X	X
Bengwenyama Minerals	Eerstegeeluk Project	X	X		X		X	X
Anglo American	Twickenham Platinum Mine	X	X	X	X	X	X	X
Anglo American	Brakfontein Project		X	X	X	X	X	X
Barrick Gold	Sedibelo project		X	X	X	X		X
Magalies Water	Drought relief programme	X			X			
Sekhukhune District Municipality	Mooihoek Burgersfort Bulk Water Scheme	X	X		X			X
Lebalelo Water User Association	Lebalelo Bulk Water Scheme		X		X	X	X	X
VILDEV	Taung Commercial Project	X	X		X			
Tip Trans Resources	Sand mining projects	X	X		X			
SAMREC (Pty) Ltd	Annesley Andulsite Mine Development		X	X	X	X		
Boitumelo Diamonds	Boitumelo Diamonds			X	X		X	

Client	Project	Environmental Assessment / Management	Social Assessment / Management	Resettlement / Planning / Implementation	Stakeholder Engagement / Management	Geographic Information Systems	Social Development and labour Plans	Land access / acquisition facilitation
Peermont Global Resort	Limpopo Casino Development	X	X		X	X		
Mbombela Local Municipality	Mbombela Sport Stadium		X		X	X		
NWPTB	Taung Dam Protected Area development	X	X		X	X	X	
Desert Charm Trading	Giyani Mining Development	X			X			X
Great Basin Gold	Burnstone Mine Development				X		X	
Wandma Consulting	Lothlokwane Power line		X		X			
Department of Water Affairs	Rooipoort Dam Development	X	X	X	X	X		X
Department of Water Affairs	Flag Boshielo Dam Development		X	X	X	X		X
Mbombela Local Municipality	Mbombela Sport Stadium		X				X	
Grant Thornton	Polokwane Stadium		X				X	
Department of Water Affairs	Crocodile-West Catchment Management Agency		X		X		X	
Department of Water Affairs	Letaba / Luvuvhu Catchment Management Agency		X		X		X	
Mvula Trust	Seroka / Rapitsi Upgrading of Water Supply		X		X		X	
Mvula Trust	Sanitation Awareness & Education in Schools		X		X		X	
National Road Agency	Capricorn Toll Plaza		X		X			X
Margate Local Municipality	Margate Landfil Site Rehabilitation	X	X		X			
Mini-Waste	Mooiplaats Landfill Site	X	X		X			
Department of Water Affairs	Olifants River In stream Flow Requirements		X		X			
Department of Water Affairs	Nondweni Weir		X		X			X
Department of Water Affairs	Lebowakgomo Water "Turnaround" Projects -		X		X	X		X
Department of Housing	Affordable Rental Accommodation / Hostel regen		X		X		X	
National Road Agency	Baobab Toll Plaza		X		X			X
Lefika	Coronation Park Development		X			X		
National Road Agency	Diamond Hill Toll Plaza		X		X			X



## **Economic assessment report for the proposed West Wits mining project**

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

**West Wits MLI (Pty) Ltd**

Report No.: 1/1

May 2019



**West Wits MLI (Pty) Ltd -**  
**Economic assessment report for the proposed West Wits**  
**mining project**

**PROJECT MANAGER:** Werner Neethling  
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**MERCURY PROJECT NUMBER:** SLR-028  
**DATE:** May 2019  
**REPORT STATUS:** FINAL REPORT

**REPORT DISTRIBUTION:**

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# WEST WITS MLI (PTY) LTD - ECONOMIC ASSESSMENT REPORT FOR THE PROPOSED WEST WITS MINING PROJECT

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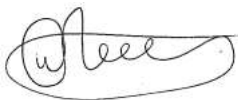
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## DECLARATION OF INDEPENDENCE

Mercury Financial Consultants (Pty) Ltd (Mercury) was established in 2013 and primarily undertakes economic impact assessments in support of environmental impact assessments. The company also provides business development and support services to SMMEs (Small, Medium and Micro-sized Enterprises). Mercury comprises of a small team of professionals, which focusses on delivering strategic and sustainable solutions to its clients. Mercury, in its dynamic approach to an ever-changing business environment has established strategic partnerships with key environmental and social consultants.

Werner Neethling is a senior consultant at Mercury and is a qualified management accountant with over 15 years' experience. Werner Neethling, the primary author of this report, hereby declares that he is an independent economic assessment specialist. Werner Neethling's CV is attached as Annexure A.

Mercury compiled the Economic assessment report for the proposed West Wits mining project based on independent research and analysis. I hereby confirm that I have no business, financial, personal or other interest in the activity proceeding other than remuneration for work performed as defined under "independent" in Chapter 1 of the Environmental Impact Assessment Regulations, 2014.



17 May 2019

**WERNER NEETHLING (ACMA)**

**DATE**

**(Author)**

## ACRONYMS AND ABBREVIATIONS

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

ACRONYMS / ABBREVIATIONS	DEFINITION
BAR	Basic assessment report
ASX	Australian Securities Exchange
DMR	Department of Mineral Resources
EIA	Environmental impact assessment
EMP	Environmental management plan
EMPr	Environmental management programme
GDP	Gross Domestic Product is defined by the Organisation for Economic Co-operation and Development (OECD) as an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs).
GEGDS	Gauteng Employment and Growth Strategy (GEGDS)
GSDF	Gauteng Spatial Development Framework (GSDF)
IDP	Integrated Development Plan
IRR	Internal Rate Of Return is the discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project.
LED	Local economic development
Mercury	Mercury Financial Consultants (Pty) Ltd
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
NEMA	National Environmental Management Act 108 of 1998
NPV	Net present value is difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyse the profitability of an investment or project.
PV	Present value
SLP	Social and labour plan
SLR	SLR Consulting (South Africa) Pty Ltd
West Wits	West Wits MLI (Pty) Ltd

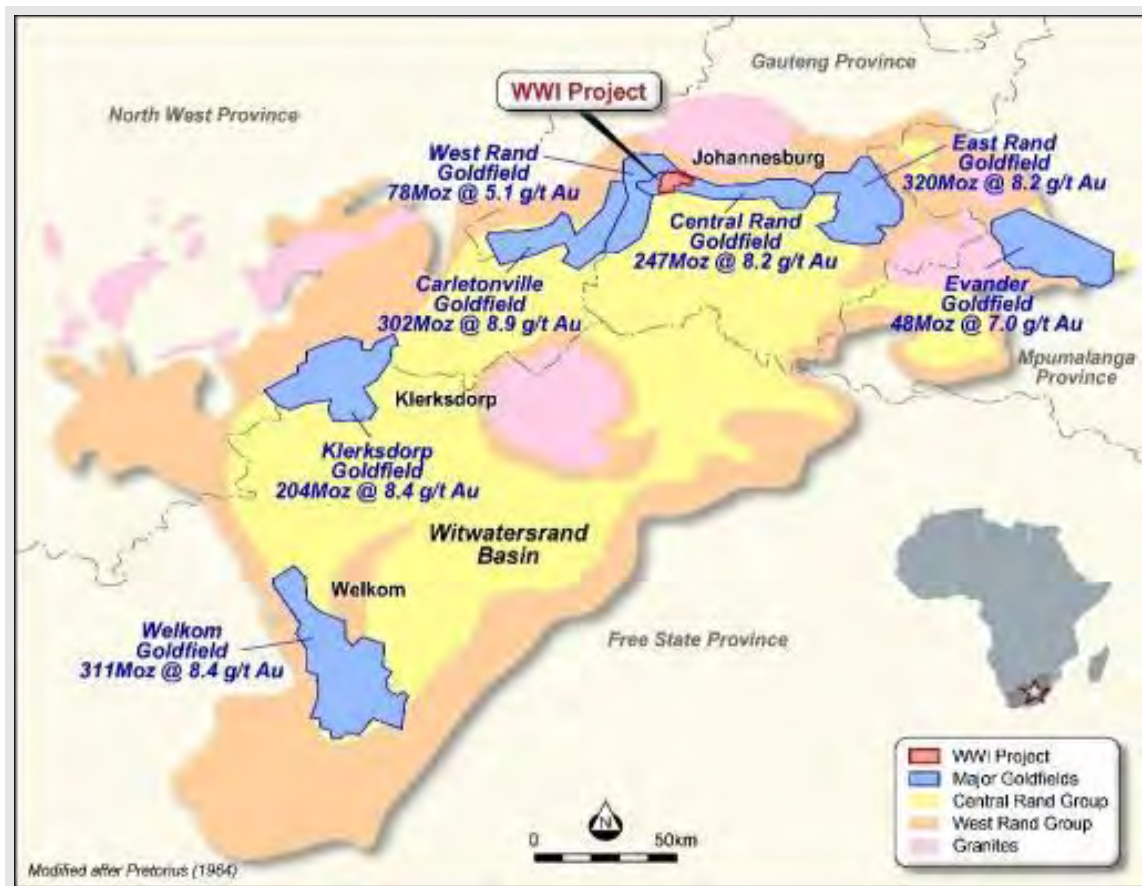
# WEST WITS MLI (PTY) LTD - ECONOMIC ASSESSMENT REPORT FOR THE PROPOSED WEST WITS MINING PROJECT

## 1 INTRODUCTION

SLR Consulting (South Africa) (Pty) Ltd (SLR), has been appointed by West Wits MLI (Pty) Ltd (West Wits) as the independent environmental consultant responsible for facilitating the environmental impact assessment (EIA) process in support of the West Wits mining right application. West Wits is a subsidiary of West Wits Mining Limited, which is an Australian Securities Exchange (ASX) listed exploration and development company with a focus on conglomerate gold in two premier regions, Pilbara (Western Australia) and the Witwatersrand.

West Wits, the applicant, is proposing to establish a mining operation in an area located south of Roodepoort and to the north of Soweto in the City of Johannesburg Metropolitan Municipality, Gauteng (Figure 1). West Wits intends to apply for a mining right and mining permits in terms of the Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002) for gold, uranium and silver over their current prospecting right area (GP 30/5/1/1/2/10035 PR). Consent in terms of Section 11(2) of the MPRDA to cede a renewed prospecting right MPT No. 29/2016 from Mintails SA Soweto Cluster (Pty) Ltd (Mintails) to West Wits was granted by the Department of Mineral Resources (DMR) in 2018.

The West Wits Mining Project comprises two historic mining centres known as the Durban Roodepoort Deep and the Rand Leases, both located on the northern edge of the Witwatersrand Basin, southwest of the city of Johannesburg on various portions of the farms Vogelstruisfontein 231 IQ, Vogelstruisfontein 233 IQ, Vlakfontein 238 IQ, Farm Roodepoort 236 IQ, Roodepoort 237 IQ, Witpoortjie 245 IQ, Uitval 677 IQ, Tshekisho 710 IQ, and Glenlea 228 IQ. West Wits intends to establish open pit and underground gold mining operations. Initial operational activities will be focussed on open pit mining activities, specifically the Kimberley West and Creswell Park open pit areas for which separate mining permit applications were submitted in 2018. Upon near depletion of resources at the open pit targets, underground resources will be targeted. The activities required to enable extraction of the underground resources include re-establishment of existing incline shafts and related infrastructure as well as rehabilitation of the existing workings.



**FIGURE 1: WEST WITS (WWI) PROJECT LOCATION WITHIN WITWATERSRAND BASIN (West, Wits, 2018a)**

SLR Consulting (South Africa) (Pty) Ltd (SLR), the independent environmental assessment practitioner (EAP) responsible for undertaking the Scoping and Environmental Impact Assessment (EIA) process for Mining Right application, has appointed Mercury Financial Consultants (Pty) Ltd (Mercury) to undertake the Economic Impact Assessment for the proposed West Wits Mining Project.

As part of the EIA, an Economic Impact Assessment was commissioned to satisfy the requirements for the following legal processes:

- The Mining Right Application (MRA) to the Department of Mineral Resources (DMR) in terms of the MPRDA;
- The Integrated Environmental Authorisation Application to the DMR in terms of the NEMA and the 2014 Environmental Impact Assessment (EIA) regulations; and
- The Waste Management License Application to DMR in terms of the NEMWA and its regulations.

## 2 STUDY OBJECTIVES AND METHODOLOGY

### 2.1 Objective of this report

The objectives of this specialist investigation were to determine the following in support of undertaking the EIA and the compilation of the Environmental Management Programme (EMPr), primarily focusing on alternative land use:

- undertake a baseline assessment to determine property value or infrastructure assets, to determine current commercial and economic contributions of potentially directly affected persons and to identify and quantify potential alternative land use activities;
- determine the impact on economic conditions of directly affected persons by determining the potential impact, in financial terms, of the loss in property value or infrastructure assets and determining the economic loss, in terms of net present value, of commercial, economic or as a result of the proposed mining activity; and
- undertake a comparative assessment of the identified land use and development alternatives and their potential on the environment, social and cultural impacts in view of generally accepted sustainable development principles, which consider the costs and benefits of social, environmental and economic factors.

### 2.2 Proposed Approach and Methodology

The following approach and methodologies were applied in the process of identifying and evaluating potential economic impacts:

- during the project initiation and scoping process, Mercury undertook a preliminary analysis to identify and prioritise economic impact considerations and to identify the information requirements;
- profiling baseline conditions focused on the gathering of information about the economic environment and context of the proposed development;
- predicting impacts, quantifying impacts and model development: This step involved the analysis of the information which was collected, baseline profiling and past experiences to predict possible economic impacts. Trade-offs between the adverse and beneficial impacts of a proposed development were determined;
- where applicable, issues raised by interested and affected parties were taken into consideration in the process of identifying and evaluating potential economic impacts;

- by using various assumptions and financial modelling techniques the possible outcomes was quantified in financial terms, incorporating economic risk factors;
- the impact assessment methodology as prescribed and outlined in Section 6 was utilised; and
- mitigation plan and recommendations were defined to ensure potential risks are adequately mitigated.

### 2.3 Requirements for specialist reports

This economic impact assessment report was compiled in compliance with the requirements specified in Appendix 6 of the Environmental Impact Assessment Regulations (R982 of 2014, as amended) published in terms of the National Environmental Management Act, 107 of 1998 as outlined in Table 1.

**TABLE 1: APPENDIX 6 REQUIREMENTS**

REQUIREMENT	REFERENCE IN BASELINE REPORT, IF APPLICABLE
1.(1) A specialist report must contain:	
(a) details of- (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	A declaration of independence is included in the beginning of the report.  Curriculum vitae included as Appendix A
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix B
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 3 and 7
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Sections 6 and 7
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	No site visit was undertaken
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 2
(f) details of an assessment of the specific identified sensitivities of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Not applicable
(g) an identification of any areas to be avoided, including buffers;	Not applicable
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Not applicable
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 9
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Sections 7 and 10

REQUIREMENT	REFERENCE IN BASELINE REPORT, IF APPLICABLE
1.(1) A specialist report must contain:	
(k) any mitigation measures for inclusion in the EMPr;	Section 8
(l) any conditions for inclusion in the environmental authorisation;	None identified
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	None identified
(n) a reasoned opinion- (i) as to whether the proposed activity or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; And (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Sections 10
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 2.4
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 2.4
(q) any other information requested by the competent authority.	None requested

## 2.4 Issues raised during public consultation

Public consultation forms part of the EIA process. The consultation process has included interested and affected parties. Limited socio-economic issues were raised by interested and affected parties. The following list is a summary of the issues/concerns raised during the public meetings:

- Illegal mining
  - Safety concern
  - How will illegal mining be stopped by the legal mining
- Health issues
  - Air Pollution from dumps/ stockpiles
  - Air pollution from mining – dust
  - Noise impact
  - Radiation concerns
  - Water Quality – pollution of resource
- Jobs creation
  - Benefit to the community, Skills development
  - Employment and number of employees (Empowerment)
- Safety concern with mining
  - Open pits
  - Sink holes (not applicable to the area)
- Damage to Houses – Cracks



- Relocation of communities
- Rehabilitation of pits - Loss of biodiversity
- Traffic impacts
  - Capacity of roads
- Logistics (transportation, electrical, plumbing and building infrastructure).
- Procurement requirements of West Wits

### **3 PROJECT OVERVIEW**

West Wits currently holds a prospecting right for the proposed mining rights area. West Wits has recently applied for a mining right application and this report has been compiled for the EIA in support of a mining right application process.

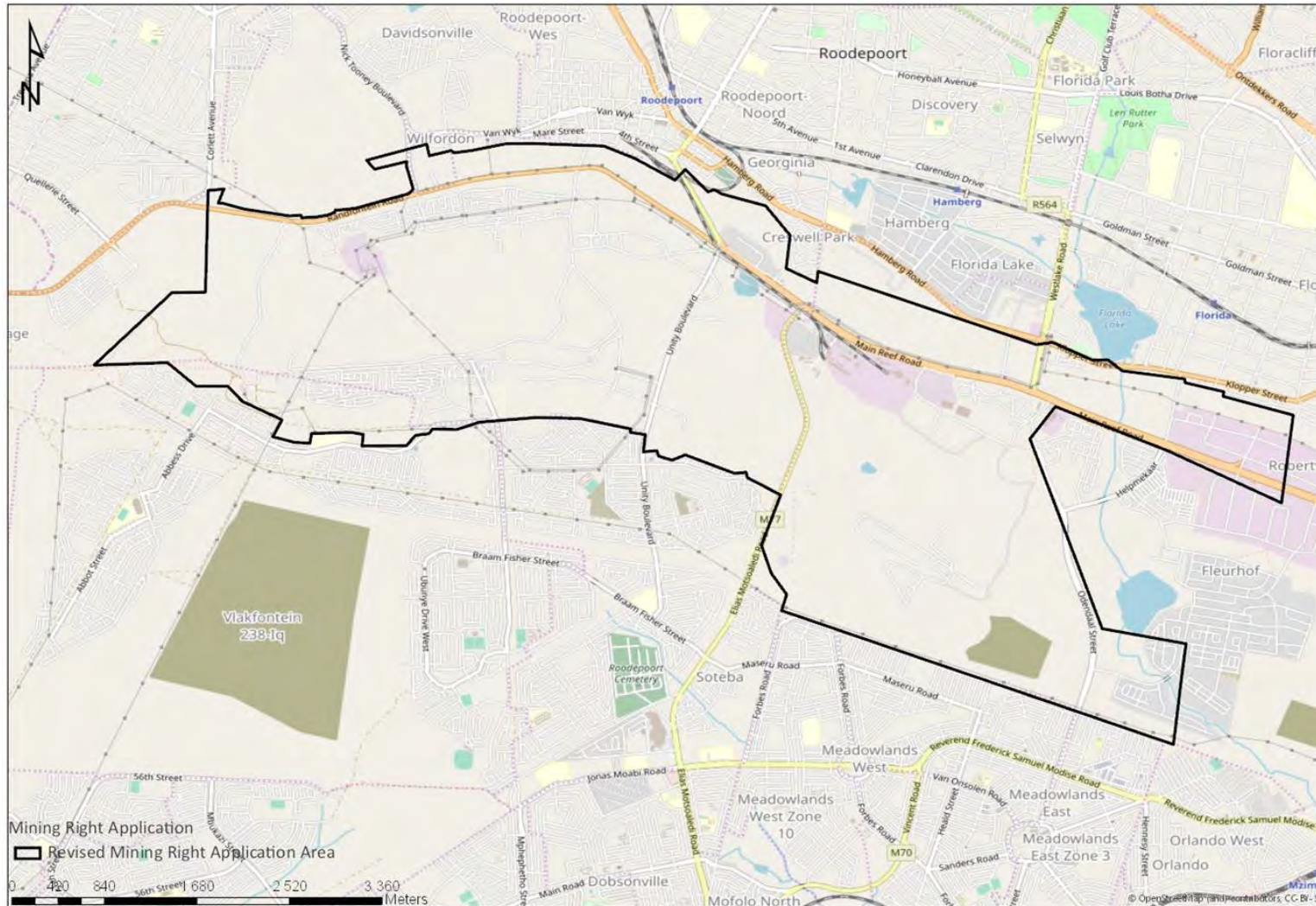
#### **3.1 Company overview**

West Wits Mining Limited is an Australian Securities Exchange (ASX) listed exploration and development company with a focus on conglomerate gold in two premier regions, Pilbara (Western Australia) and the Witwatersrand.

West Wits is the South African subsidiary of West Wits Mining Limited. The directors of West Wits Mining Limited include the Executive Chairman (Michael Quinert) and Non-executive Directors Hulme Scholes, Daniel Pretorius, Vincent Savage, Dr Andrew Tunks). Through its listing, it is owned by a number of shareholders across the globe. West Wits is 33.3% empowered. The empowerment company is Lilitha Resources Proprietary Limited, previously referred to as Witpoortjie Resources Investments Proprietary Limited.

#### **3.2 Project location**

The proposed West Wits Mining Project comprises two historic mining centres known as the Durban Roodepoort Deep and the Rand Leases, both located on the northern edge of the Witwatersrand Basin, southwest of the city of Johannesburg as indicated in Figure 1. The proposed Mining Right Application area will be located on various portions of farms Vogelstruisfontein 231 IQ, Vogelstruisfontein 233 IQ, Vlakkfontein 238 IQ, Farm Roodepoort 236 IQ, Roodepoort 237 IQ, Witpoortjie 245 IQ, Uitval 677 IQ, Tshekiso 710 IQ, and Glenlea 228 IQ, Gauteng. The minerals to be mined are gold, uranium and silver with a mineable resource of approximately 9 million tonnes. The extent of the proposed mining right area is outlined in Figure 2 below.



**FIGURE 2: WEST WITS MINING RIGHT APPLICATION AREA**

### 3.3 Project description

The proposed project would include:

- five open pit mining areas and associated topsoil stockpiles, run-of-mine ore stockpiles and crusher areas, waste rock dumps and haul roads; and
- an underground mine comprised of two surface infrastructure complexes, underground mine workings and access roads.

With reference to Figure 3 the proposed project would involve the development of five open pit mining areas (referred to as the Mona Lisa Bird Reef Pit, Roodepoort Main Reef Pit, Rugby Club Main Reef Pit, 11 Shaft Main Reef Pit and Kimberley Reef East Pit) and refurbishment of two existing infrastructure complexes (referred to as the Bird Reef Central Infrastructure Complex and Kimberley Reef East Infrastructure Complex) to access the existing underground mine workings.

The project would also include the establishment of run of mine (ROM) ore stockpiles, topsoil stockpiles and waste rock dumps as well as supporting infrastructure including material storage and handling facilities (for fuel, lubricants, general and hazardous substances), general and hazardous waste management facilities, sewage management facilities, water management infrastructure, communication and lighting facilities, centralised and satellite offices, workshops, washbays, stores, change houses, lamprooms, vent fans and security facilities.

Although the Mining Right Application area is 2 072 ha in size the actual surface disturbance area is only approximately 80 ha comprising opencast pit areas of 73 ha and infrastructure complex areas of 6 ha. Primary mineral processing will take place on site, where ore will be crushed prior to transportation off-site. All run-of mine material will be transported to an existing processing plant off-site for concentrating of minerals.

The ore from mining operations will be processed through a toll treating agreement with a local processing plant, which is owned by Sibanye Gold. Processing of ore will take place through a typical crush, mill, floatation, elution, electro-winning and filtration process. Tailings will be transferred to an existing tailings associated with the third party operations.

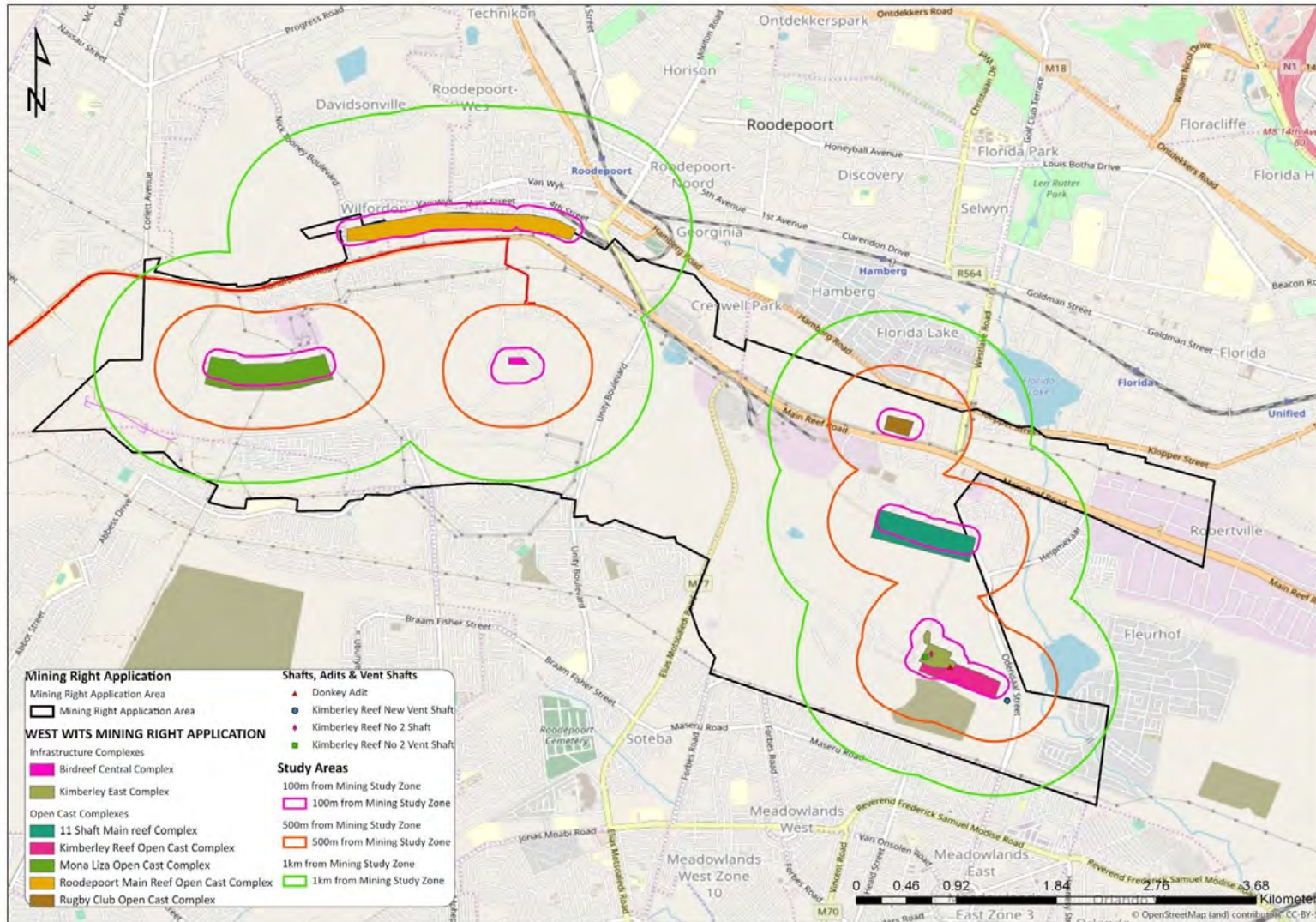


FIGURE 3: OPEN CAST AND UNDERGROUND OPERATIONAL AREAS WITHIN THE MINING RIGHT APPLICATION AREA

### 3.3.1 Open cast activities

Initially, near surface resources will be targeted for mining through means of open pit methods. The resources at the open pit targets are generally outcropping and production would commence at the onset of mining activities. No construction activities, as such, are associated with the open pit sites.

Opencast mining activities would include a conventional excavate, load and haul mining cycle. Once the topsoil and waste rock have been removed and stockpiled, an Xcentric ripper would be used to break the ground. This equipment replaces the need to conduct blasting. This is both for safety reasons and to minimise impacts on the surrounding environment. Ore would then be excavated and hauled to an ore stockpile for crushing before transportation off-site. The five proposed opencast mining areas would be developed in a phased approach. In this regard, once an opencast area has been mined, backfilled using waste rock and rehabilitated, the next opencast area would be targeted. Following final rehabilitation and adequate stabilisation, each of the areas would be made available in line with post- closure land use objectives. No waste rock dumps would remain. It is anticipated that up to 180 000 tonnes of ore would be mined per annum from the opencast resources.

**TABLE 2: DETAIL OF THE OPENCAST MINING OPERATIONS**

OPEN PITS	RUGBY CLUB	ROODEPOORT	11 SHAFT	MONA LISA	KIMBERLEY EAST
Mining sequence	1	2	3	4	5
Mining direction	East to West	West to East	East to West	West to East	West to East
Size of mining area	~ 2.6 ha	~ 26.5 ha	~ 15 ha	~ 20 ha	~ 9.2 ha
Mining rate (per month)	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes	15 000 tonnes
Pit depth	7 to 10 m	7 to 10 m	20 to 30 m	20 to 30 m	20 to 30 m
Mineable resource (tonnes)	30 212	179 290	117 631	34 351	62 917
Mining duration (including concurrent rehabilitation, season dependent)	~ 6 months	~ 6 months	~ 6 months	~ 3 months	~ 5 months
Final rehabilitation duration	~ 3 months	~ 2 months	~ 2 months	~ 2 months	~ 2 months
Temporary waste rock dump volume	260 288 m <sup>3</sup>	1 103 323 m <sup>3</sup>	1 013 436 m <sup>3</sup>	295 947 m <sup>3</sup>	503 336 m <sup>3</sup>
Temporary waste rock dump height	10 m	10 m	20 to 30 m	20 to 30 m	20 to 30 m

### 3.3.2 Underground Mining

When the resources at the open pit targets near depletion, the underground mining operations would commence. The activities required to enable extraction of these resources include re-establishment of existing incline, circular and vertical shafts and related infrastructure as well as rehabilitation of the existing workings.

<b>INFRASTRUCTURE COMPLEXES</b>	<b>KIMBERLEY REEF EAST</b>	<b>BIRD REEF CENTRAL</b>
Mining sequence	1	2
Infrastructure complex size	~ 3.5 ha	2.19 ha
Size of mining area	~ 100 ha	~ 52 ha
Mining rate (per month)	15 000 tonnes	15 000 tonnes
Workings depth	100 m to interception of reef (up 3 km below surface)	100 m to interception of reef (up 3 km below surface)
Mining duration	20 years	10 years
Waste rock	All waste rock will remain in the underground workings.	All waste rock will remain in the underground workings.

The underground mining method would be conventional drill and blast breast mining methods. The incline shafts, equipped with a winder house, would provide means for movement of men, material and rock to and from the underground workings. Ore drives would be developed on reef with raises developed from the drives. Loading boxes would be constructed and winches would be installed on the down-dip side of the raise to remove the broken rock from the stopes. Ore would be transported to the incline shafts by means of conventional track bound equipment. Ore would be stored for initial crushing before transportation off-site. Any waste rock produced by the underground mining operations would remain underground. It is anticipated that up to 360 000 tonnes of ore would be mined per annum from the underground resources.

### 3.4 **Project schedule**

The expected life of mine for the open pit operations (inclusive of rehabilitation) is three (3) to five (5) years and 20 years for the underground operations (see diagram below). The Kimberley East underground workings would be 20 years, while the Bird Reef Central underground workings would be 10 years. It is expected that construction to enable the underground targets will take approximately two years.

**TABLE 3: THE TIMING ASSOCIATED WITH THE IMPLEMENTATION OF THE PROPOSED PROJECT IS OUTLINED BELOW**

ACTIVITY		TIMELINE								
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6 -25	YEAR 26	YEAR 27 - 28	
Opencast mining and concurrent rehabilitation										
Rugby Club Main Reef Pit	Mining									
	Rehabilitation									
Roodepoort Main Reef Pit	Mining									
	Rehabilitation									
11 Shaft Main Reef Pit	Mining									
	Rehabilitation									
Mona Lisa Bird Reef Pit	Mining									
	Rehabilitation									
Kimberley Reef East Pit	Mining									
	Rehabilitation									
Continued opencast rehabilitation and construction of infrastructure complexes										
Underground mining operations										
Steady state production achieved										
Decommissioning and closure										
Aftercare and maintenance										

It should be noted that the potential exists for the current life of mine of 25 years to be extended for another 30 years due to the availability of resources. This would require an application for the renewal of the mining right.

### 3.5 Employment opportunities

It is expected that the opencast mining operations would require between 40 and 50 employees.

During the construction phase for the underground mining operations it is expected that a contractor would require up to a maximum of 50 staff. The operational phase would require approximately 1 105 full-time employees (at peak production). Local labour would be sourced where possible. No project or mine housing would be provided during construction and operational phases.

As housing areas are situated within close proximity to the areas of operation employees would be sourced from the local communities and the greater Johannesburg area.

### 3.6 Decommissioning and Closure

The conceptual closure plan objectives are aligned with a rehabilitation plan that supports a post-closure land use of a residential and/or agriculture. The key closure objectives are as follows (Golder, 2019):

- Create a physically stable, safe, rehabilitated landscape that limits long-term environmental degradation, thus enabling the successful establishment of the planned post-mining land use;
- Ensure that local environmental quality is not adversely affected by possible physical effects and chemical contamination arising from the mine site or individual facilities, as well as to sustain catchment yield as far as possible after closure;
- Limit the possible health and safety threats to humans and animals using the rehabilitated mine site as it becomes available;
- Re-instate a suitable land capability over the mine site to facilitate the progressive implementation of the planned post-mining land use;
- Create a landscape that is self-sustaining and over time would converge to the desired ecosystem structure, function and composition;
- Encourage, where appropriate and as aligned to the planned post-mining land use, the re-establishment of native vegetation on the rehabilitated mine site such that the terrestrial biodiversity is largely re-instated over time; and
- Ensure that there is constructive engagement and alignment with local communities and regulatory authorities regarding the proposed end land use.

Broadly speaking, the decommissioning phase would include the removal of infrastructure from site and the final rehabilitation of areas. In consultation with I&APs (especially landowners), the final post closure land use has been identified.

The post-mining land uses related to the proposed five opencast pits are described in the Golder rehabilitation and closure report as follows (Golder, 2019):

- Rugby Club Main Reef pit: the landowner is currently in a planning phase and is considering either residential or mixed industrial development;
- Roodepoort Main Reef pit: the landowner has planned public open or green belt spaces;



- 11 Shaft Main Reef pit: the landowners have earmarked these areas for mixed industrial, residential developments and the construction of bulk service infrastructure;
- Mona Lisa Bird Reef pit: the landowners plan to construct mixed residential developments post closure; and
- Kimberley East pit: part of the area would be used to access the surface infrastructure planned to service the proposed underground operation which would continue beyond the opencast mining operations.

### 3.7 Need and Desirability

The main benefits associated with the proposed project are:

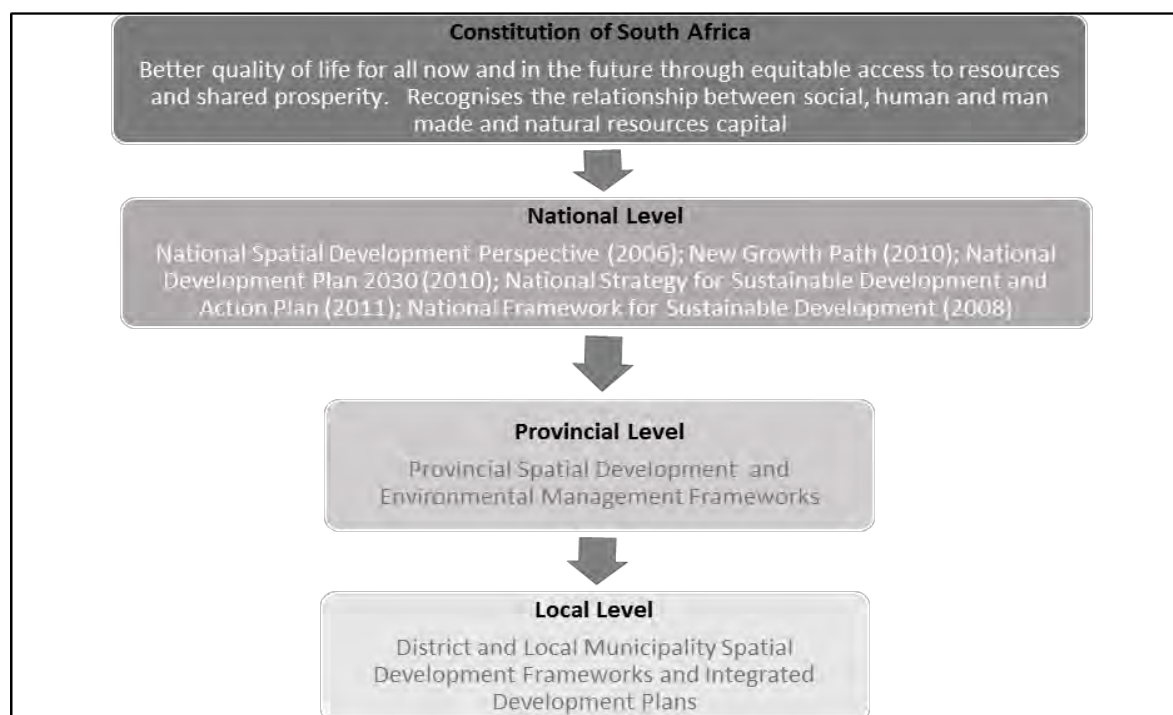
- Direct economic benefits derived from wages, taxes and profits. Indirect economic benefits include the procurement of goods and services and the spending power of employees;
- Implementation of the proposed project resulting in skills development associated with the mining method;
- To mine an existing reserve resource and to thereafter rehabilitate;
- The improvement of historically impacted land and newly impacted areas through rehabilitation and removal of rubble and illegally dumped rubbish.
- The availability of the economically mined and rehabilitated land being freed up for housing developments earmarked for the area, that aims to reduce the housing backlog experienced by the City of Johannesburg, while at the same time creating employment and extracting mineral resources for the benefit of the economy;
- Mined and rehabilitation land holding opportunity for spatial integration by decreasing fragmentation and unlocking development potential in large areas;
- The eradication of access to dangerous historic workings targeted by informal miners (Zama Zama's), which are mainly illegal immigrants that pose a threat to the health and safety of the communities and to themselves while mining illegally.

## 4 PROVINCIAL, REGIONAL AND LOCAL SOCIO-ECONOMIC FRAMEWORK

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

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

Essentially, these imperatives are embedded in the concept of sustainable development, which is commonly defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Several national, provincial and local policies, strategies and plans have been developed in view of sustainable development in South Africa, of which the most pertinent ones are outlined in Figure 4 and discussed in the sections below.



**FIGURE 4: NATIONAL, PROVINCIAL AND LOCAL CONSIDERATIONS**

#### **4.1 National policies and strategies**

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

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

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

- enhance systems for integrated planning and implementation;
- sustain ecosystems and use natural resources efficiently;
- move towards a green economy;
- build sustainable communities; and
- respond effectively to climate change.

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

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

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

#### 4.1.3 New Growth Path (2010)

South Africa has embarked on a new economic growth path in a bid to create 5 million jobs and reduce unemployment from 25% to 15% over the next ten (10) years. The plan aims to address unemployment, inequality and poverty by unlocking employment opportunities in South Africa's private sector and identifies seven job drivers. These job drivers have the responsibility to create jobs on a large scale. The seven key economic sectors or “job drivers” for job creation are listed below:

- infrastructure development and extension: Public works and housing projects;
- agricultural development with a focus on rural development and specifically;
- “Agro-Processing”;
- mining value chains;
- manufacturing and industrial development (IPAP);

- knowledge and green economy;
- tourism and services; and
- informal sector of economy.

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

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

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

#### 4.1.5 Industrial Policy Action Plan (IPAP2) (DTI)

The overall focus of the Industrial Policy Action Plan is to create jobs in the manufacturing sector and has three focus areas:

- to promote labour intensive industries,
- to broaden participation in economic transformation,
- and to raise competitiveness in manufacturing.

IPAP focus areas are exports, industrial capacity, technology, skills development, and employment.

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

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

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

## 4.2 Provincial and local strategies

### 4.2.1 Gauteng Employment and Growth Strategy (GEGDS) (2009 to 2014)

The strategy was formulated by the Department Economic Development. The strategy is based on innovation, green growth and an inclusive economy. The five strategic pillars are:

- Improved economic efficiency: logistics, electricity supply, information and communications technology, sectoral focus on automotive industry, tourism, clothing, textile, footwear, heavy metals, furniture, construction, mining, agriculture, petro-chemicals, services and transport.
- Employment creation: Prevent job losses in distressed sectors, utilize the community work programme with a focus on food security, youth development, environmental quality, housing upgrades, partnerships with schools, utilise the Extended Public Works Programme, in collaboration with the private sector, promotion of youth employment and entrepreneurship, focus on labour intensive sectors such as construction, transport, tourism, agriculture, food, manufacturing, green economy.
- Increased economic equity and ownership: Small, Medium and Micro-sized Enterprises (SMMEs) development, access to quality education, support cooperatives, procurement support.
- Putting people first, invest in local people: Safety nets, basic needs, education, health care, social security.
- Sustainable communities and social cohesion: Rural and agricultural development, food security, safe communities, mobility.

### 4.2.2 Gauteng Spatial Development Framework (GSDF)

The Gauteng Spatial Development Framework (GSDF) 2011 was the first attempt at an integrated, coherent vision of settlement form, transportation and economic development for the province. However, it was not implemented as intended, resulting in a slow pace of spatial, economic and

social transformation in the province. In 2015, the Gauteng Provincial Government decided to review the GSDP 2011, a decision that was also prompted by the Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013), which came into force on 1 July 2015. This resulted in the GSDP 2030, which seeks to direct, guide, focus as well as align, coordinate and harmonise all development spending in the province, to ensure rapid, sustainable and inclusive provincial economic growth and township redevelopment, therefore enabling decisive spatial transformation.

Towards the realisation of the above and beyond, the GSDP 2030 puts forward a spatial development logic based on five focus areas:

- Focus Area 1 – Shared Economic Prosperity: Maintaining and deepening the economic productive capacity of those areas where a large part of the provincial economy is concentrated.
- Focus Area 2 – Socio-economic Integration: Pursuing densification, diversification and integration in areas where a significant part of the provincial economy is concentrated, where the State owns significant tracts of land, and land prices are not as prohibitive as in the economic core areas.
- Focus Area 3 – Economic Consolidation: Focusing township redevelopment, including nodal and corridor development, in townships where most people live, that are most accessible and connected via public transport to the economic core areas and similar township areas, and could develop diverse economic activities.
- Focus Area 4 – Social and Local Economic Support: Enhancing public transport connections with townships where fewer people live and hence economic accessibility is poorer, while at the same time focusing on skills development and supporting local economic development initiatives.
- Focus Area 5 – Rural Enterprise Support: Protecting those parts of the province that provide key environmental support services, are environmentally sensitive, have been formally demarcated as conservation areas, have high agricultural potential, or are used as or have the potential for eco-tourism and rural economic activities.

The sections of proposed West Wits project area either falls or is in close proximity to areas identified for focus on Shared Economic Prosperity, focus on Socio-economic Integration or focus on Social and Local Economic Support.

One of the challenges, the Gauteng government faces is the fact that mining, including the area in which the proposed West Wits project is located, has fragmented urban areas. Therefore one of the objectives of the GDSF 2030 is to utilise the mining belt to re-shape the Apartheid city structure by developing these areas and linking outlying areas such as Soweto to their surroundings.

According to the GDSF 2030, some areas associated with historical mining are regarded as polluted and will require significant rehabilitation before they can be utilised for redevelopment purposes. This being said, a rehabilitated mining belt holds many opportunities for spatial integration

#### 4.2.3 Gauteng Province Environmental Management Framework, 2014 (GPEMF)

The study area where the mining activity is proposed is located within Control Zone 1 of the GPEMF. The General Guidelines for these zones should be applied to the proposed mining activity. The guidelines should be implemented through the EIA process. According to the GEMF, the proposed activity or land use is in line with Zone 1. The intention with this zone is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.

#### 4.2.4 City of Johannesburg Metropolitan Municipality Spatial Development Framework 2040

The SDF for Johannesburg 2040 is a city-wide spatial policy document that identifies the main challenges and opportunities in the city, sets a spatial vision for the future city, and outlines a set of strategies to achieve that vision.

The core objective of the SDF 2040 is to create a spatially just world class African city. The SDF 2040 is premised on spatial transformation, defined through the principles of equity, justice, resilience, sustainability and urban efficiency which it seeks to translate into a development policy.

The Spatial Development Framework thus seeks to address five major issues in Johannesburg's spatial and social landscape:

- Increasing pressure on the natural environment and green infrastructure.
- Urban sprawl and fragmentation.
- Spatial inequalities and the job-housing mismatch.
- Exclusion and disconnection emanating from:
  - high potential underused areas (the mining belt and the Modderfontein area);

- securitisation and gated developments, and disconnected street networks (high cul-de-sac ratios and low intersection densities).
- Inefficient residential densities and land use diversity.

### 4.3 Conclusion

Therefore, although the growth of the South African, Gauteng province and the City of Johannesburg economies are of strategic importance, consideration should be given to social and natural resources when considering proposed developments. In view of the concept of sustainability, the proposed project would have to contribute towards achieving sustainable development whilst contributing towards achieving these higher-level national, provincial and regional objectives.

Furthermore, the proposed mining project falls within an area which has been identified in the Gauteng Spatial Development Framework (GSDF) and the Gauteng Provincial Environmental Management Framework (GPEMF). One of the opportunities as identified in the GSDF 2030 is that a rehabilitated mining belt holds opportunity for spatial integration. Mined and rehabilitated land being freed up for housing developments will improve fragmentation, unlocking development potential in large areas that can be used for future urban development and infill.

## 5 LAND USE

This section is based on information contained in the Social Impact Assessment, *Proposed West Wits Mining Right Application: Social Impact Assessment* compiled by Mercury, dated May 2019.

The greater Roodepoort region has been extensively altered by historical mining activities since the farms Vogelstruisfontein, Roodepoort, Langlaagte and the two portions comprising Paardekraal (in Krugersdorp) were proclaimed as public diggings by the then Zuid-Afrikaansche Republiek (ZAR) government in 1886. Present land uses associated with the general surrounds include a combination of informal settlements, low-cost and high-cost residential areas, industrial areas, manufacturing and distribution facilities, historical mine housing and historical mine infrastructure (tailings dams, shafts, derelict/abandoned buildings and water dams), bulk service infrastructure, power lines and road infrastructure.

The Mining Right application area consists of relatively flat terrain covered with secondary grassland. Historical mining activities and recent illegal informal mining activities have altered the natural



topography of the area. The entire footprint area is also covered by extensive dumping of building rubble and general waste.

**TABLE 4: NUMBER OF LAND USE ACTIVITY IN STUDY AREA**

	Agriculture	Agriculture	146
	Commercial	Commercial	658
	Educational	Educational	78
	Explosives Testing	Explosives Testing	2
	Graveyard	Graveyard	2
	Health	Health	2
	Historical Mining	Historical Mining	34
	Industrial	Industrial	187
	Institutional	Institutional	39
	Public Open Sp...	Public Open Sp...	20
	Recreation	Recreation	36
	Residential	Residential	11825
	Services	Services	56
	Surface Water	Surface Water	2
	Tourism	Tourism	3
	Vacant areas	Vacant areas	138

### 5.1 Roodepoort Main Reef Opencast Operational Area

The suburbs of Roodepoort and Matholesville straddle the open cast area to the north and south, respectively. Land-use to the north is a mix of residential, Education, Commercial and Industrial some located within a 100 m of the proposed open pit areas. Within 500m these land use activities also extend to the south including a large part of the residential area and religious sites.

### 5.2 Mona Lisa Bird Reef Opencast Operational Area

The Mona Lisa Bird Reef opencast area is located just south of Matholesville and north, north-west of the Sol Plaatjie settlement. No specific land-use except historical mine areas are within a 100 m from the open pit. Within 500 m, land use activities to the north include a substation, residential and industrial land uses, and to the south mostly subsistence agricultural activities.

### **5.3 Rugby Club Opencast Operational Area**

The Rugby Club Main Reef opencast area is located south of Florida/Florida Lake and north of the Rand Leases Area. No specific land-use activities are taking place within a 100 m from the open pit. Within 500 m, to the north there are Industrial and residential land-uses, and to the south the old Mining town houses and industrial areas. To the north-west, there are informal settlements that are expanding.

### **5.4 Kimberley Reef East Opencast Operational Area**

The Kimberley Reef East opencast area is located on the Rand Leases Area and north of the Meadowlands East Zone. No specific land use activities occur within the 100 m zone, and within the 500 m zone the activities are mainly historical mining and the current explosive testing that is taking place.

### **5.5 11 Shaft Opencast Operational Area**

The 11 Shaft Main Reef opencast area is located on the Rand Leases Area just south of the old mining town infrastructure, and west of Fleurhof Dale. Within 100m the land use activities are mostly industrial. Residential areas of Fleurhof Dale are located within 500 m from the mining operations.

### **5.6 Bird Reef Infrastructure Complex & Underground Mining Extent**

The Bird Reef Central Infrastructure Complex is located on the Durban Roodepoort Deep area, just west of the old DRD Golf course. Land use activities within 100 m are mostly historical mining activities and infrastructure. Within 500 m there are residential land uses to the north/north-east and the south-west (Sol Plaatjie).

### **5.7 Kimberley Reef East Infrastructure Complex & Underground Mining Extent**

The Kimberley Reef East Infrastructure Complex is located on the Rand Leases Area and north of the Meadowlands East Zone and west of Fleurhof. No specific land use activities are located within the 100 m zone, and within the 500 m zone the activities are mainly historical mining and the current explosive testing that is taking place.

### **5.8 Current/planned mining activities**

#### **5.8.1 Existing Mine Tailings**

An existing large Tailings Storage Facility (TSF) is located approximately 1 km to the south of the Mining Right Application area. The TSF has been partly rehabilitated, but needs urgent attention due

to the residual impacts on the adjacent communities especially in terms of air quality, surface water and health.

#### 5.8.2 Sol Plaatjies Mining

It should be noted that there is an existing opencast mining operation underway in the Sol Plaatjies area. The Sol Plaatjies area is being mined under a directive from Department of Mineral Resources. The minimum monthly ore tonnage planned for the Sol Plaatjie project is 10 000 tons per month with a target maximum of 15 000 tons. The current mine plan for the Sol Plaatjie project indicates production capacity for a further 210 000 to 220 000 tonnes of high-grade ore over a period of 15 to 18 months.

#### 5.8.3 Kimberley West Mining Permit

An application for a Mining Permit for the Kimberley West pit has been submitted. The timeframe of the Kimberley West Mining Permit is 4 to 5 months of mining and 8 – 9 months of rehabilitation, in total 8 - 9 months.

#### 5.8.4 Creswell Park Mine Permit

An application for a Mining Permit for the Creswell Park pit has been submitted. The timeframe of the Creswell Park Mining Permit is 3 to 4 months of mining and 5 – 6 months of rehabilitation, in total 8 – 10 months.

#### 5.8.5 Illegal mining activities

Certain areas within the mining right application area are degraded to the extent that they are not currently economically being utilised and illegal mining activity is taking place. The open pit and surrounding area has been associated with historical mining activities and is in need of rehabilitation.

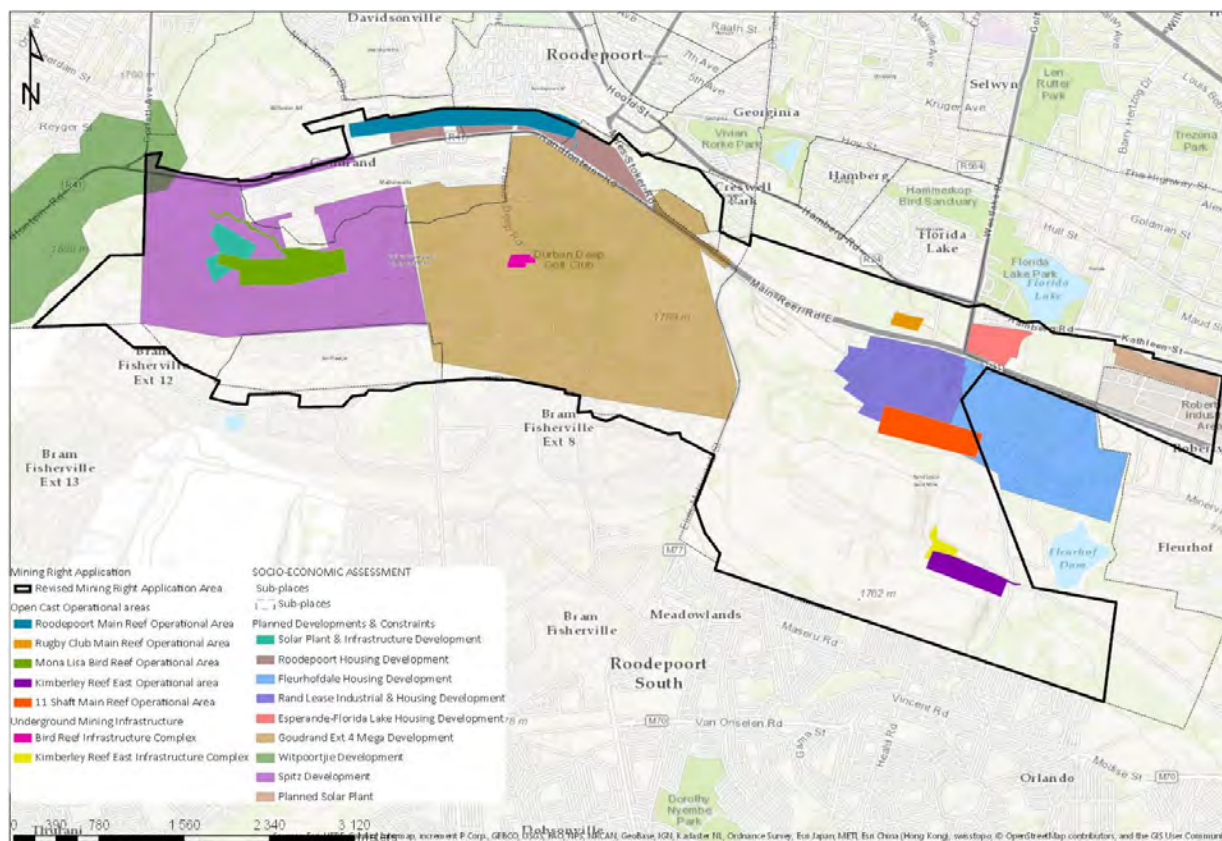
Hundreds of out-of-work miners and desperate immigrants from Lesotho, Mozambique, Malawi and Zimbabwe try to make a living through illegal mining of the old underground mining shafts and tunnels. The miners or zama-zama (take a chance) work shallow portions of mines, specifically at the Durban Roodepoort Deep sites. The zama-zamas are part of a network in the area. It is believed that

there is a whole hierarchy involved in their activities, and that the mining is supported and encouraged by syndicates.

There have been many arguments for the legalizing of the illegal artisanal mining, to ensure regulation, control, and safety measures and manage environmental effects. In August 2017, the illegal miners protested at the Department of Mineral Resources (DMR), for the legalizing of the artisanal mining and to stop persecuting these miners. DMR has recently confirmed a process of handing mining permits to previously illegal artisanal miners, which commenced in the diamond sector in June 2018. Miners are structured into a Cooperative, in collaboration with the mining company (who made land available for the artisanal mining operations) and provincial government, to ensure safety and environmental management requirements are adhered to. At this stage, DMR has indicated that no permits will be provided for underground mining. City of Johannesburg has also engaged DMR and various other Departments on the matter.

## **5.9 Planned Housing Development Initiatives**

In terms of available information, there are initiatives for the improvement and expansion of housing development and integrated mixed housing programmes in the area within the Mining Right Application Area. The figure below indicates the housing developments that are at various stages of implementation.



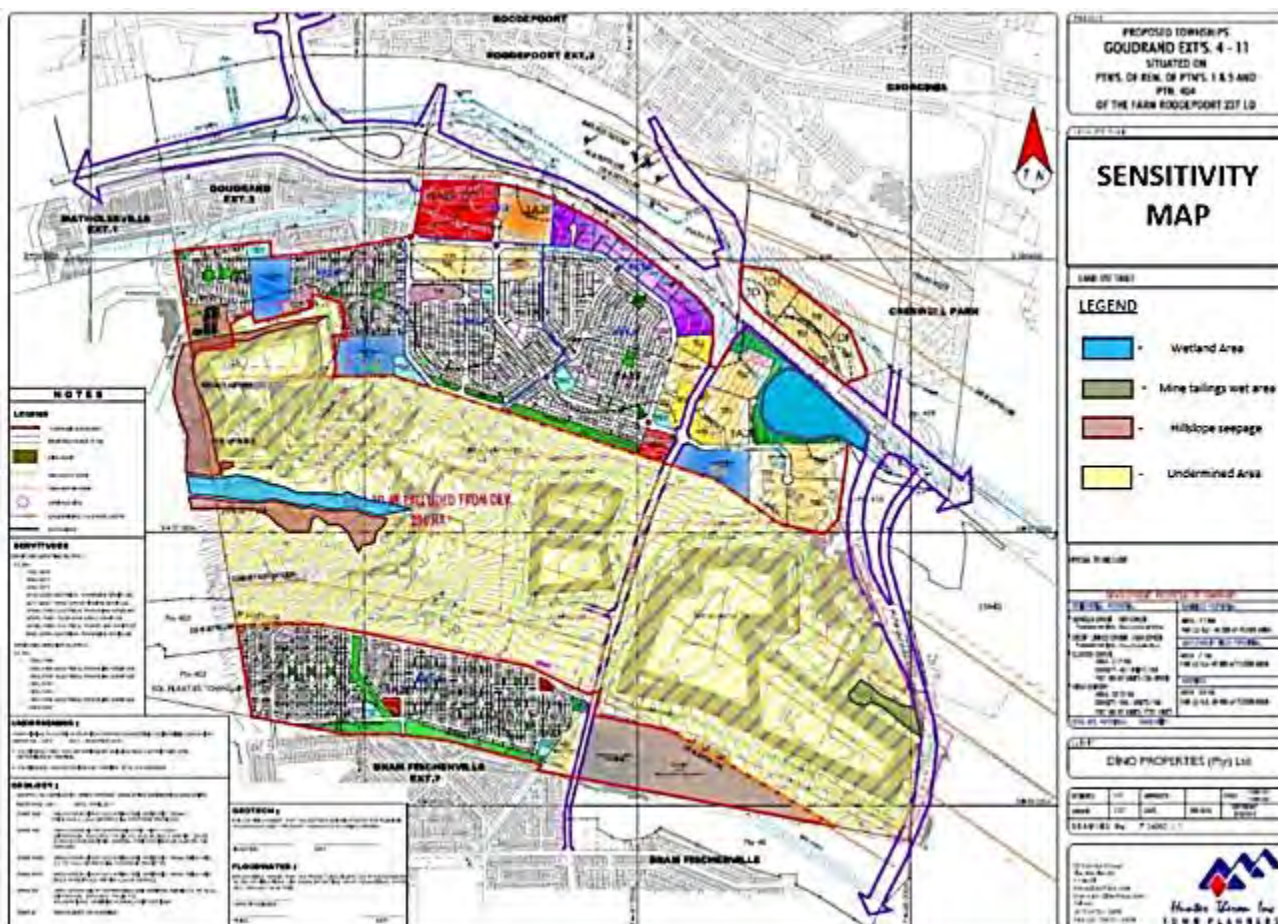
**FIGURE 5: PLANNED DEVELOPMENT IN THE MINING RIGHT APPLICATION AREA**

**5.9.1 Goudrand Extensions 4-18 Development**

A mixed-use residential and commercial development, known as the Goudrand Mega City is planned to be developed by Dino Properties (Pty) Ltd on Portions of the Remainder of Portion 1 and Portions of the Remainder of Portion 5 and Portion 404 (a portion of Portion 1 of the Farm Roodepoort 2371Q). Currently the whole township is known as Goudrand Ext 4 and it will be subdivided into 15 different phases to be known as Goudrand Ext 5 to 19. The proposed Goudrand Ext 4 development is an integrated development consisting of 13 000 plus potential housing opportunities. The first phase of the development is a mixed use project comprising of 13 197 housing opportunities in a mix of 1 204 Residential 1 bonded units, 1 325 Residential 1 FLISP units, 10 668 Residential 3 units, 5 educational sites, 3 shopping Centre sites, 7 crèche sites, 8 worship sites, a hospital site, a cemetery and municipal sites. The proposed Goudrand Mega City is planned to comprise a total of 20 000 to 25 000 housing units.

**TABLE 5: PLANNED GOUDRAND LAND USE PARCELS**

LAND USE	NO OF STANDS	AREA (HA)
Residential (bonded, credit linked, cluster & high density)	2661	93.26
Commercial	4	9.7
Industrial	7	5.2
Educational	3	9.9
Institutional (church, crèche, hospital)	15	7.9
Cemetery	1	2.6
Special	6	16.67
Public Open Space	64	17.81
Public Streets		44.25



**FIGURE 6: GOUDRAND EXT 4 DEVELOPMENT PLAN**

It is important to take note that the proposed Goudrand Mega City is only planned to take place after the rehabilitation of the open cast operations and is therefore not envisaged to have an impact on the proposed mining development.

### 5.9.2 Witpoortjie Development

Calgro M3 acquired 148 hectares of land directly South of the existing Witpoortjie Township. The land falls within the City of Johannesburg Urban Boundary but forms part of the bigger Leratong Development Node.

The project has mixed housing typologies that concentrate on high densities of up to 190 units per hectare, therefore efficient use of land. Internal services are installed, roads are tarred and the construction of top structures has commenced. The project was initially planned for bonded affordable housing. It will now be a mixed-use development consisting of 5 300 units. The project is an infill and integrated housing development between the existing Witpoortjie, Leratong and Bram Fischerville townships. Phase one of the proposed project consist of 645 units. The project commenced with the first two phases, Extension 52 and 64.

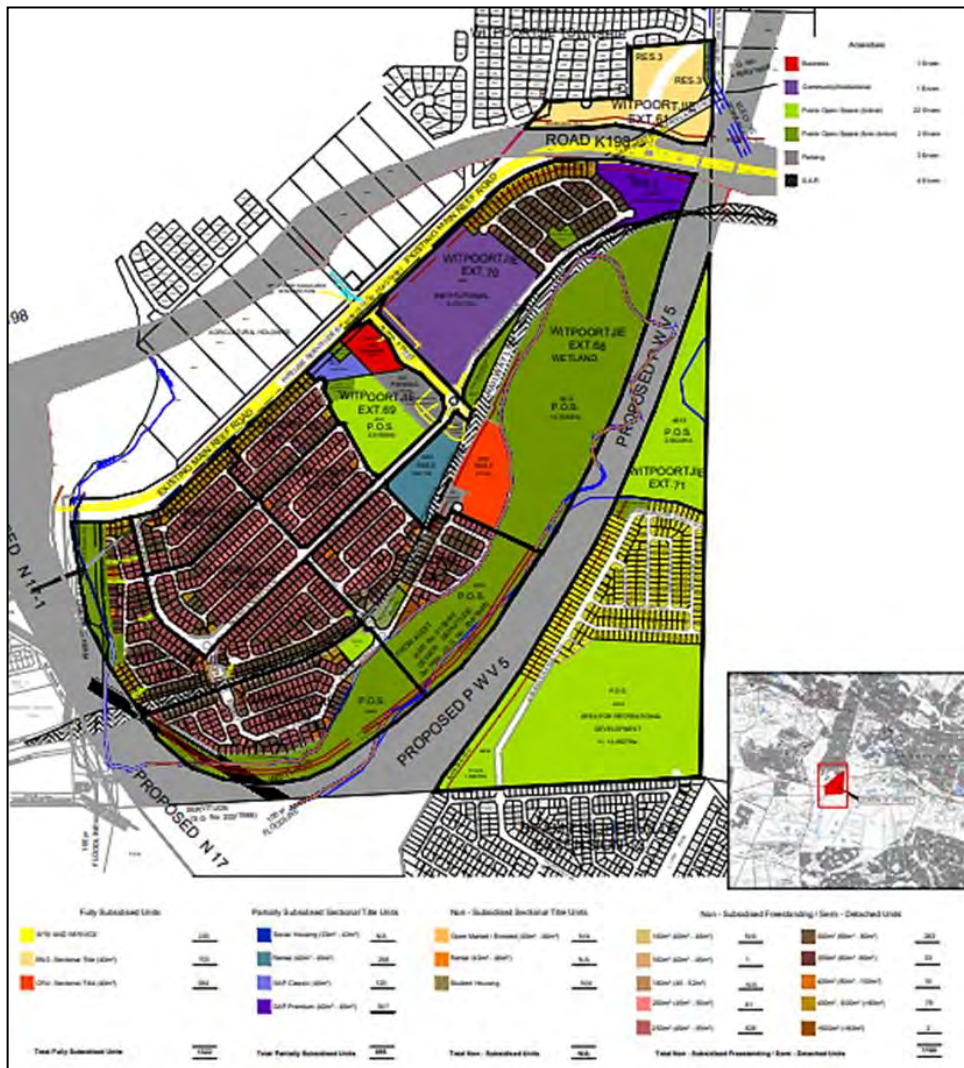
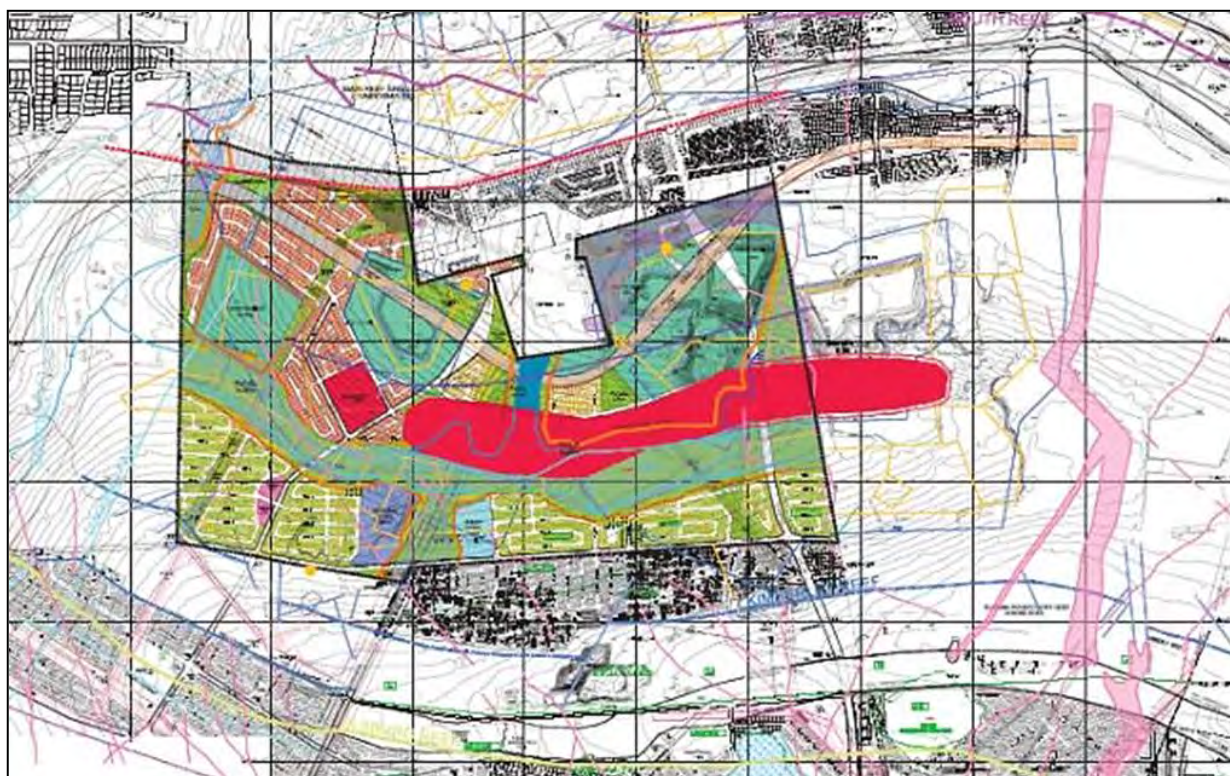


FIGURE 7: WITPOORTJIE DEVELOPMENT PLAN

### 5.9.3 Spitz Development

The applicant and project proponent is Copper Moon Trading 631 (Pty) Ltd, who, on analysis of the housing market has identified the need for the proposed development. The proposed project is located on the Remaining Extent of Portion 14 of the farm Roodepoort 237 IQ with an extent of approximately 300 hectares (ha). At present, the site constitutes defunct mining land located within the Main Reef Mining Belt and was historically mined by DRD Gold.

The proposed project aims to develop the site as a mixed use, residential township in the affordable to middle income bonded housing market. The proposed development will include a residential component of varying market and density ranges including educational, commercial and social land uses.



**FIGURE 8: SPITZ DEVELOPMENT PLAN**

The project is currently still in permitting stage and is awaiting a final record of decision from GDARD.



## **6 IMPACT ASSESSMENT METHODOLOGY**

Various direct and indirect factors may influence the macro and micro economic environment because of the current land use as well as proposed manufacturing activities. The extent, to which these factors are influenced, will depend on the nature and scale of current and proposed land use activities. It is therefore important to understand and assess the economic footprint of the proposed development in comparison to the alternative land use. Factors considered during an economic assessment, include various economic, social and environmental indicators, broadly illustrated in Figure 9. These factors may have a potential impact, in various degrees of significance, on the local, regional, provincial or national environment during the various phases of the project life cycle.

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

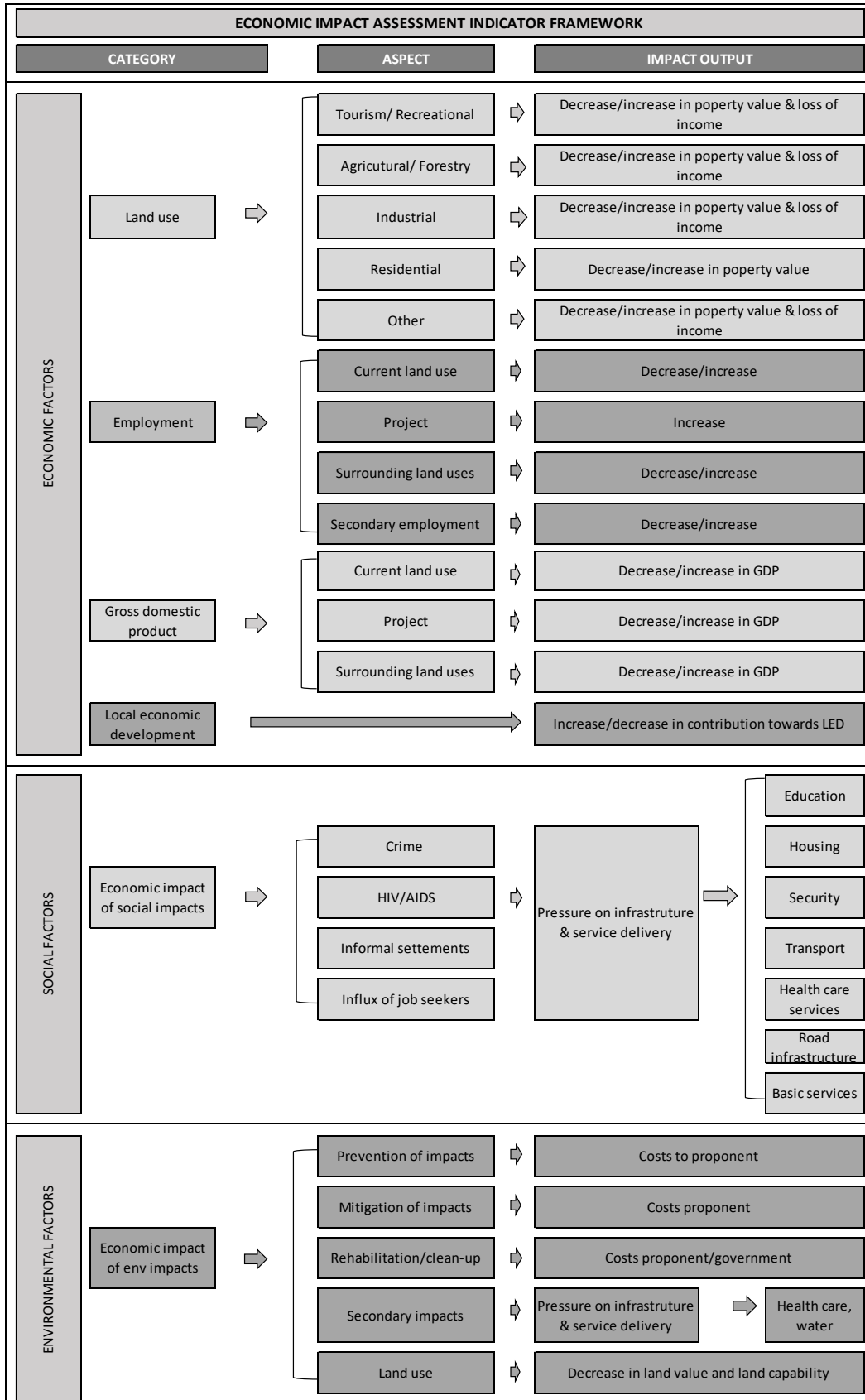


FIGURE 9: ECONOMIC IMPACT FRAMEWORK

Typical external factors (externalities) associated with the establishment of new developments will include social aspects such as additional pressures on infrastructure (housing, road network) and basic services (education, health care, transport, security, municipal services) due to an influx of people and additional demand to meet the basic services requirements to sustain the manufacturing process. In addition, there is the potential for an increase in social ills (crime, HIV/AIDS); health related impacts as a result of environmental pollution; and the general degradation of an area. External environmental factors include pollution; cost of environmental management and rehabilitation; increase in water demand; and the change in post closure land use potential. Depending on the nature and scale of the proposed development, additional pressures may be placed on existing manufacturers to secure and sustain a cost effective share in the market. Positive externalities arise from taxes being paid to the South African government. These include personal income tax, value added tax (VAT) and corporation tax, which will contribute towards the economic and social development of the country.

The potential social and environmental impacts, which may result from the proposed development, have been investigated and assessed by various specialists as part of the environmental impact assessment process.

The impact assessment methodology was prescribed by SLR and is tabulated in Table 6 below. This assessment methodology enables the assessment of environmental issues including cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

#### TABLE 6: CRITERIA FOR ASSESSING IMPACTS (PROVIDED BY SLR)

*Note: Part A provides the definition for determining impact consequence (combining intensity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D.*

PART A: DEFINITION AND CRITERIA*		
Definition of SIGNIFICANCE		Significance = consequence x probability
Definition of CONSEQUENCE		Consequence is a function of severity, spatial extent and duration
Criteria for ranking of the SEVERITY of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.

	<b>L</b>	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>L+</b>	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>M+</b>	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	<b>H+</b>	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
<b>Criteria for ranking the DURATION of impacts</b>	<b>L</b>	Quickly reversible. Less than the project life. Short term
	<b>M</b>	Reversible over time. Life of the project. Medium term
	<b>H</b>	Permanent. Beyond closure. Long term.
<b>Criteria for ranking the SPATIAL SCALE of impacts</b>	<b>L</b>	Localised - Within the site boundary.
	<b>M</b>	Fairly widespread – Beyond the site boundary. Local
	<b>H</b>	Widespread – Far beyond site boundary. Regional/ national

**PART B: DETERMINING CONSEQUENCE**

SEVERITY = L					
<b>DURATION</b>	Long term	<b>H</b>	<b>Medium</b>	<b>Medium</b>	<b>Medium</b>
	Medium term	<b>M</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>
	Short term	<b>L</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>
SEVERITY = M					
<b>DURATION</b>	Long term	<b>H</b>	<b>Medium</b>	<b>High</b>	<b>High</b>
	Medium term	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Short term	<b>L</b>	<b>Low</b>	<b>Medium</b>	<b>Medium</b>
SEVERITY = H					
<b>DURATION</b>	Long term	<b>H</b>	<b>High</b>	<b>High</b>	<b>High</b>
	Medium term	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Short term	<b>L</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
			<b>L</b>	<b>M</b>	<b>H</b>
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
SPATIAL SCALE					

PART C: DETERMINING SIGNIFICANCE					
<b>PROBABILITY (of exposure to impacts)</b>	Definite/ Continuous	<b>H</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Possible/ frequent	<b>M</b>	<b>Medium</b>	<b>Medium</b>	<b>High</b>
	Unlikely/ seldom	<b>L</b>	<b>Low</b>	<b>Low</b>	<b>Medium</b>
			<b>L</b>	<b>M</b>	<b>H</b>
CONSEQUENCE					

PART D: INTERPRETATION OF SIGNIFICANCE	
<b>Significance</b>	<b>Decision guideline</b>
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

\*H = high, M= medium and L= low and + denotes a positive impact.

## 7 ECONOMIC IMPACT ASSESSMENT

As indicated in Section 5, the greater Roodepoort region has been extensively altered by historical mining activities. Present land uses associated with the general surrounds include a combination of informal settlements, low-cost and high-cost residential areas, industrial areas, manufacturing and distribution facilities, historical mine housing and historical mine infrastructure (tailings dams, shafts, derelict/abandoned buildings and water dams), bulk service infrastructure, power lines and road infrastructure. Several housing developments have been identified which are at different stages of implementation. The proposed project activities will take place in close proximity to built-up residential and commercial business areas, third party service infrastructure and along main transport routes.

The proposed mining right area consists of relatively flat terrain covered with secondary grassland. Historical mining activities and recent illegal informal mining activities have altered the natural topography of the area. The entire footprint area is also covered by extensive dumping of building rubble and general waste. Some of the open areas pit and surrounding area has been associated with historical mining activities and is in need of rehabilitation.

Hundreds of out-of-work miners and desperate immigrants from Lesotho, Mozambique, Malawi and Zimbabwe try to make a living through illegal mining of the old underground mining shafts and tunnels. The miners or zama-zama (take a chance) work shallow portions of mines, specifically at the Durban Roodepoort Deep sites. The zama-zamas are part of a network in the area. It is assumed that there is a hierarchy involved in their activities, and that the mining is supported and encouraged by syndicates.

There have been many arguments for the legalizing of the illegal artisanal mining, to ensure regulation, control, and safety measures and manage environmental effects. In August 2017, the illegal miners protested at Department of Mineral Resources (DMR), for the legalising of the artisanal mining and to stop persecuting these miners. DMR has recently confirmed a process of handing mining permits to previously illegal artisanal miners, which commenced in the diamond sector in June 2018. Miners are structured into a Cooperative, in collaboration with the mining company (who made land available for the artisanal mining operations) and provincial government, to ensure safety and environmental management requirements are adhered to. At this stage, the DMR has indicated

that no permits will be provided for underground mining. City of Johannesburg has also engaged DMR and various other Departments on the matter.

The proposed project involve the development of five open pit mining areas (referred to as the Mona Lisa Bird Reef Pit, Roodepoort Main Reef Pit, Rugby Club Main Reef Pit, 11 Shaft Main Reef Pit and Kimberley Reef East Pit) and refurbishment of two existing infrastructure complexes (referred to as the Bird Reef Central Infrastructure Complex and Kimberley Reef East Infrastructure Complex) to access the existing underground mine workings. It should be noted that information in this section was based on information contained in the Mine Works Programme (MWP) for West Wits MLI (Pty) Ltd: GP 10073 MR (version 2019/01/17). The MWP however makes provision for the development of seven pits as Creswell Park and Kimberley West was included in the capital and revenue numbers.

The project life is an important consideration when assessing the potential economic impacts of the open pit operations as the duration of the mining and associated rehabilitation of the various pits will be for a relatively short period, which will last for a few months. The underground mining operations associated with the Bird Reef Central Infrastructure Complex and Kimberley Reef East Complex will however have a much longer duration of 20 years, which could potentially be extended.

Furthermore, the project falls within an area which has been identified in the Gauteng Spatial Development Framework (GSDF) and the Gauteng Provincial Environmental Management Framework (GPEMF). One of the opportunities as identified in the GSDF 2030 is that a rehabilitated mining belt holds opportunity for spatial integration. Mined and rehabilitated land being freed up for housing developments will improve fragmentation, unlocking development potential in large areas that can be used for future urban development and infill. However, it should be noted that significant mineral reserves are located within the West Wits project area and DMR will most likely not allow development that could result in sterilisation of these minerals.

## **7.1 Current land use activities: economic impact**

### **7.1.1 Land value: Current land use activities**

The mining right application area is dominated by historical mining activities, alien vegetation and illegal waste dumping and has been degraded to a certain extent. Some illegal mining has taken place within and surrounding the mining rights area. Mintails holds the historical rehabilitation liability for the area, however due to liquidation proceedings against Mintails, it is highly unlikely that

the area will be rehabilitated. The environmental degradation of the area is further exacerbated by the illegal mining activities and is expected to continue until formal mining practices are established and/or the area rehabilitated.

There is a certain degree of value attached to the land due to the presence of mineable minerals, although the surrounding land value may have been negatively impacted upon by previous historical and current mining activities.

In terms of available information, there are a number of initiatives for the improvement and expansion of housing development and integrated mixed housing programmes in the area within and surrounding the proposed Mining Rights Area.

#### 7.1.2 Direct employment: Current and approved land use activities

No formal employment is current being generated from the illegal mining activities. However, a certain degree of income is generated for individuals involved in the illegal activities. It is believed that there are as many as 350 illegal miners in this area, which support approximately 10 dependents each. It is further believed that the zama-zamas live close to the mine areas, and it is expected most likely in either abandoned housing or backyard rooms / shacks. Due to the nature of the activity, it is however not possible to assign a value to the wages generated by the zama zama's.

The approved housing developments, some of which are in progress, in the area will provide employment opportunities to individuals residing in the area. It is uncertain how many job opportunities will be created by the development of these housing projects. Furthermore, the planned mixed-use residential and commercial development projects will also create employment opportunities in the area.

#### 7.1.3 Economic impact: Current land use activities

Illegal mining of gold resources is of significant concern and presents a risk to the economy of the country and local area as no formal wages, taxes or socio-economic benefits are generated. The illegal mining presents a security, safety and environmental risk to the communities, which come at a cost to the South African, provincial and local governments. The actual impact, in monetary terms, to the economy could not be determined, as it will require a significant amount of research and mathematical modelling.

Blasting, used as a mining method by the illegal mines, furthermore presents the potential for damage to infrastructure and fuel/gas pipelines located in the area, which comes at a costs to individuals and organisations. It can therefore be concluded that the illegal mining activities has a marginal or insignificant contribution towards the local, regional and local economies. It should rather be regarded as a burden to the local and provincial governments.

The approved housing developments, mix-use developments, industrial areas, manufacturing and distribution facilities stimulate the local and regional economy from money spent to pay for salaries, supplies, raw materials, operating expenses and taxes. These activities further contribute positively towards the indirect and induced economic impacts on a local, regional and national scale.

## **7.2 Proposed mining operation: potential economic impact**

Production build-up occurs over a three to four-year period, with resources immediately available for extraction during the initial years. Open pit targets maintain a production rate of approximately 15 000 tonnes ore per month over a three-year period, after which underground targets assume production at a targeted rate of 30 000 tonnes ore per month. This production rate is achieved after approximately year 5.

The economic evaluation was based on information contained in the Mining Work Programme (MWP), which only provided financial data for the first 10 years of the operations. The information covers the five open pit operations that are the subject of the mining right application; the Creswell Park and Kimberley West open pit operations for which separate Mining Permit applications were submitted in 2018; the re-establishment of the underground operations at the Bird Reef Central (Circular Shaft) infrastructure complex and Kimberley Reed East infrastructure complex that are the subject of the mining right application and the Main/South Reef West complex which has now been excluded from the mining right application.

The revenue and capital forecasts as include in the MWP (West Wits, 2019) made provision for the first ten years of operation, although the potential exist for a life of mine of 25 years, which can be extended, with the renewal of the Mining Right as outlined in Table 7 below.



**TABLE 7: LIFE OF MINE CALCULATION (West Wits, MWP 2019)**

DESCRIPTION	OPEN PIT TARGETS	UNDERGROUND TARGETS	TOTAL	UNITS
Total Resource Tonnes	0.5	21.3	21.8	Mt
Total Reserve Tonnes	0.52	20.70	21.21	Mt
Production Rate	15 000	30 000	30 000	tpm
<b>Life of Mine (LOM)</b>	<b>3</b>	<b>57</b>	<b>60</b>	<b>years</b>

The proposed project will involve the rehabilitation of the open cast areas. Degraded land would be restored and illegal mining activities in the immediate area should come to halt once the open cast areas have been completely rehabilitated. Land will be made available for housing and industrial developments earmarked for the area.

Current industries, manufacturing and distribution facilities surrounding the proposed mining right area are not expected to be influenced by the establishment of an active mining operation in the area. Instead, depending on the nature of the services and products provided, the proposed mining development could potentially stimulate the growth of these businesses.

#### 7.2.1 Land value: Proposed mining development

Mined and rehabilitation land holds opportunity for spatial integration by improving fragmentation, unlocking development potential in large areas, which should enhance the value of land in the area. Settlement deadlines as outlined in the table below have been agreed to with the various housing developers. The open cast activities will have a minimal impact on the programme of these projects.

**TABLE 8: SETTLEMENT DEADLINES AS AGREED WITH VARIOUS DEVELOPERS**

PRIORITY MINING	DURATION OF MINING (MONTHS)	REHABILITATION (MONTHS)	SETTLEMENT DEADLINES
Rugby Field	3	5	None yet
Roodepoort Pit	12	6	June 2020
Mona Lisa	3	5	End 2019
11 Shaft	8	5	Mid 2020
Kimberley East	5	5	None

The following potential impacts arising from the proposed mining activities could have a negative effect on housing developments and property values: vibration, air, noise, traffic and water quality. These potential impacts can however not be quantified in economic terms.

### 7.2.2 Direct employment

During the opencast mining operations, it was assumed that there would be approximately 50 employees. Once the construction commences on the surface infrastructure for underground mining operations, approximately 100 staff will be employed. Once construction is complete and at full production, employees will be increased to approximately 1105.

Utilising information obtained from [payscale.com](https://www.payscale.com), the average wage for a miner is R219 405 per annum. To determine the employment value for the opencast activities, the average wages for a dump truck driver was utilised; [Indeed.co.za](https://www.indeed.co.za) provided a number of R153 768 per annum. Construction worker wages was calculated as an annual figure of R9 979 200 per annum based on wage figures obtained from Bowker Greaves Quantity Surveyors.

The total value of the employment potential for the first 10 years life of mine, which includes the two years of construction work associated with the refurbishment of the underground operations, equates to R772.3 million in present value. This value could potentially increase to R1.48 billion in present value should the underground operational employment opportunities be maintained for the anticipated life of mine.

As housing areas are situated within close proximity to the areas of operation employees would be sourced from the local communities and the greater Johannesburg area. Over the life of the mining operations, which could potentially be in excess of 25 years, this will amount to a significant contribution towards wages, which will result in a significant economic injection in the local, regional and national economies.

In addition, the proposed mining development could stimulate current industries, manufacturing and distribution facilities, which could create additional employment opportunities. The proposed project will furthermore potentially create additional revenue for the off-site processing facility in the short term. In the long term, the life of the processing facility could extend, which in return will increase revenue potential and employment opportunities.

### 7.2.3 Economic impact: Proposed mining development

#### **Capital investment**

The information in this section was based on information contained in the Mine Works Programme for West Wits MLI (Pty) Ltd: GP 10073 MR (version 2019/01/17). The full-scale mining will have an impact on the local, regional and national economy with a capital injection of R613 million in present value terms over the first ten years of the project as outline in the table below. The initial capital expenditure of R250 000 is the cost related to mobilisation of the mining contractor at the open pit targets. The local and regional economy will benefit from the employment value created during capital investment and operational period.

**TABLE 9: CAPITAL EXPENDITURE (MPW, 2019)**

CAPITAL EXPENDITURE		
YEAR	CAPEX	PRESENT VALUE
	ZAR	10% DISCOUNT RATE
1	R 250 000	R 250 000
2	R 105 053 000	R 95 502 727
3	R 154 515 000	R 127 698 347
4	R 310 501 000	R 233 283 997
5	R 51 417 000	R 35 118 503
6	R 54 036 000	R 33 552 105
7	R 51 660 000	R 29 160 723
8	R 43 854 000	R 22 504 036
9	R 40 243 000	R 18 773 657
10	R 40 484 000	R 17 169 168
<b>Total</b>	<b>R 852 013 000</b>	<b>R 613 013 263</b>

Ongoing capital expenditure relates to the cost of capital items used to increase or maintain production. In this case, it is related to commissioning of the Kimberly Reef East and Bird Reef Central infrastructure complexes. In addition, ongoing underground development at the underground targets has been included under ongoing capital expenses.

It should be noted that the capital investment number, which were provided, only made provision for the first eight years, but the potential exist for additional capital investment to fully develop the mine to deliver the production targets over the 25 year life of mine.

## Revenue

The information in this section was based on information contained in the Mine Works Programme (MWP) for West Wits MLI (Pty) Ltd: GP 10073 MR (version 2019/01/17). The MWP makes provision for the Creswell Park, Kimberly West, Kimberly East, 11 Shaft - Bird Reef, Roodepoort Rugby Club - Main Reef, Mona Lisa - Bird Reef, and Roodepoort Main Reef open pit targets. THE MWP provided a revenue forecast for the first ten years of the proposed West Wits operations and made provision for seven open pit targets and underground targets. The revenue forecast for the first ten years is illustrated in Table 10.

**TABLE 10: REVENUE FORECAST YEAR 1-10 (2019 GOLD PRICE AND EXCHANGE RATE)**

REVENUE FORECAST						
YEAR	GOLD PRICE	EXCHANGE RATE	GOLD PRICE	OUNCES GOLD	REVENUE	PRESENT VALUE
	USD/OZ	USD/ZAR	ZAR/OZ	OZ	ZAR'000	10% Discount Rate
1	\$1 286,35	R14.29	R 18 381,94	18108	R 332 860 197	R 302 569 919
2	\$1 286,35	R14.29	R 18 381,94	18108	R 332 860 197	R 274 942 522
3	\$1 286,35	R14.29	R 18 381,94	18108	R 332 860 197	R 249 978 008
4	\$1 286,35	R14.29	R 18 381,94	21083	R 387 546 473	R 264 694 241
5	\$1 286,35	R14.29	R 18 381,94	23313	R 428 538 202	R 266 122 224
6	\$1 286,35	R14.29	R 18 381,94	25382	R 466 570 439	R 263 145 728
7	\$1 286,35	R14.29	R 18 381,94	25892	R 475 945 229	R 244 159 903
8	\$1 286,35	R14.29	R 18 381,94	27033	R 496 919 025	R 232 061 184
9	\$1 286,35	R14.29	R 18 381,94	26950	R 495 393 323	R 210 046 769
10	\$1 286,35	R14.29	R 18 381,94	24411	R 448 721 574	R 173 206 528
<b>TOTAL</b>					<b>R 4 198 214 855</b>	<b>R 2 480 927 025</b>

It should be noted that at the time of compiling the MWP, a gold price of \$ 1320 per troy ounce and an exchange rate of R11.80 per US\$ was used. For the purposes of this report, a more recent (17 May 2019) gold price of USD 1296.35 per ounce and an exchange rate of R14.29 per US\$, which equates to R18 381 per troy ounce of gold, was utilised. This equates to a revenue of R4.2billion (before applying a discounting factor) over the first ten years. Utilising a discount factor of 10%, this equates to R2.5 billion in present value as outlined in Table 10. The first three years constitutes the mining of the open pit targets, whilst underground mining targets are only from year four.

Mercury utilised available information provided for the first ten years to estimate a life of mine, over 25 years, revenue number. The total potential revenue that the operation could generate over a 25-

year life of mine, applying an estimated production rate of 15000 ounces for year 11 to 25 and at an exchange rate of R14.29/USD could amount to a value of R3.3 billion in present value terms over the full life of mine of 25 years.

If approved, this project could contribute significantly to the national, regional and local economy.

### **Direct impacts**

Direct effects are the results of the money initially spent in the study region by the business or organisation being studied. This includes money spent to pay for salaries, supplies, raw materials, and operating expenses.

The short-term nature of the open pit project will have less significant impacts on direct economic impacts than the potential long-term mining project, which may have a duration in excess of 25 years.

The proposed project will furthermore potentially create additional revenue for the off-site processing facility in the short term. In the long term, the life of the processing facility could potentially be extended in line with the life of mine of the proposed full-scale West Wits mining operation, which in return will increase revenue potential and employment opportunities.

### **Indirect effects**

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

### **Induced Effects**

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

#### 7.2.4 Contribution towards socio-economic development

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

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

#### **7.3 Alternative land-use: Potential economic impact**

Housing and mix-use housing and commercial development are regarded as the only feasible alternative. These are however already approved and/or in progress. However, the fact that mineral resources are still present may make it difficult to obtain permission to establish the housing development in the area as it could result in sterilisation of these minerals. The property developers may be required to first remove mineral reserves and rehabilitate the areas in order to prevent the risk of illegal mining and exposure to potential health, safety and environmental risks. This will come at a cost to the developer and will require the necessary authorisations from the DMR, i.e. a mining permit.

Should the proposed mining development not proceed, the potential opportunity to development and grow existing industries, manufacturing and distribution facilities surrounding the proposed mining rights area may not take place.

Should the mining right application be approved, the potential negative environmental and social impacts associated with a long term full scale mining operations may however impact on alternative land use such as residential development. However, it is possible for mining and residential areas to co-exist and consideration for this be made in the EMPr and Social and Labour Plan.

#### **7.4 “No-go” Alternative: Potential economic impact**

The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. Proceeding with the project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the

project leaves the status quo, but with potential loss in employment opportunities and revenue generation which will be created from proceeding with the development.

In the “no-go” scenario, the current land use activities will remain in force and illegal mining will continue without formal economic benefit to the local, regional and national economy. The area will furthermore not be rehabilitated. Housing developments will however be able to proceed, but not without removing available minerals resources and rehabilitating the area first. This will however require the necessary authorisations from the DMR.

Should the proposed development not proceed the potential opportunity to development and grow existing industries, manufacturing and distribution facilities surrounding the proposed mining right area may not take place.

## **7.5 Economic Impact Assessment**

The various economic considerations have been discussed in Section 7 and are assessed in Table 11 below.

**TABLE 11: ECONOMIC IMPACT ASSESSMENT ANALYSIS**

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Land value – open pit activities	<p>The proposed open cast activities will involve the rehabilitation of the area and spans a relatively short life and will have a positive impact on land value. Degraded land will be restored and illegal mining activities in the immediate area should come to halt. Land will be made available for housing developments earmarked for the area. Mined and rehabilitated land holds opportunity for spatial integration by improving fragmentation, unlocking development potential in large areas, which should enhance the value of land in the area.</p> <p>Mined and rehabilitated land holds opportunity for spatial integration by improving fragmentation, unlocking development potential in large areas, which should enhance the value of land in the area. Housing developments planned at opencast operational areas may however be delayed.</p> <p>In the mitigated scenario the duration of the open cast mining activities will be kept to a minimum and rehabilitation objectives will be achieved and post rehabilitation land value will be enhanced.</p>	All phases	M	L	L	L	H	M	H+	H	L	M+	H	M+
Land value – underground mining	Underground mining activities may influence the desirability of planned housing developments, which could potentially affect the value of these properties. Impacts such as vibration, air, noise, traffic and water quality arising from the proposed mining activities could have a negative impact on housing developments and property values. In the mitigated	All phases	H	H	M	H	H	H	M	M	M	M	M	M



ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>scenario, the environmental impacts could be mitigated to a more acceptable level.</p> <p>In the unmanaged scenario it is possible that land surrounding the project will experience some degree of additional negative social and environmental impacts, which could impact on current land use values. In the scenario where the project successfully implements the stipulated environmental and social management measures, these impacts can be managed to acceptable levels which should not reduce surrounding land value.</p> <p>The area will however be rehabilitated in the decommissioning and closure phase in the mitigated scenario, which will enable alternative land uses to continue.</p>													
Employment	<p>During the opencast mining operations there will be approximately 50 employees. Once the construction commence on the surface infrastructure for underground mining operations, approximately 100 staff will be employed. Once construction is complete and at full production employees will be increased to approximately 1105 employees.</p> <p>The total value of the employment potential for the first 10 years life of mine equates to R772.3 million in present value. This value could potentially increase to R1.48 billion in present value should the underground operational employment opportunities be maintained for the anticipated life of mine of 25 years.</p>	Construction Operational	L+	M	M	L+	M	M+	H+	H	M	H+	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>In addition, the proposed mining development could stimulate current industries, manufacturing and distribution facilities, which could create additional employment opportunities.</p> <p>Once the area has been restored, employment opportunities will be limited to that associated with alternative land uses. With mitigation, West Wits could create opportunities beyond the life of operations.</p>													
Impact on economy	<p>The economic contribution as a result of the proposed mining development will have a positive impact on direct, indirect and induced effects from money spent to pay for salaries, supplies, raw materials, operating expenses and taxes on the local, regional and national economy with a capital injection over the first ten years of R613 million (PV) and a potential revenue generation of R3.3 billion (PV) for the life of mine. The revenue potential for the first ten years is R2.5 billion in present value.</p> <p>Without mitigation, the local and regional economy may not fully benefit from the proposed project. With mitigation through local economic development plans, it will be possible to enhance the contribution the mine will have on a local and regional economic scale. With mitigation, some initiatives will be able to be sustained post closure.</p>	Construction Operational	H+	M	H	H+	M	H+	H+	H	H	H+	H	H+
Secondary impact on	The proposed development will assist towards the eradication of illegal mining in the area. Illegal mining is currently a		M+	M	M	M+	M	M+	H+	H	H	H+	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
economy	<p>burden to the economy. The project therefore reduces the burden illegal mining currently has on the local, regional and national economy and state.</p> <p>Current industries, manufacturing and distribution facilities surrounding the proposed mining rights area is not expected to be influenced by the establishment of an active mining operation in the area. Instead, depending on the nature of the services and products provided, the proposed mining development could potentially stimulate the growth of these businesses.</p> <p>The proposed project will furthermore potentially create additional revenue and employment opportunities.</p> <p>In the unmitigated scenario, some of these positive impacts may not take place or may happen to a lesser extent. In the mitigated scenario the economic impacts will reach its maximum potential.</p>													
Socio-economic benefits	<p>In addition to the direct and indirect economic impacts discussed above, the mine through its corporate social investments and social and labour plan, contributes towards the local economic development in the area. The operation of the proposed mine has following positive socio-economic benefits to its employees and surrounding communities:</p> <ul style="list-style-type: none"> <li>development of skills through its skills development plan;</li> <li>learnership programmes to provide learners with an</li> </ul>		M+	M	M	M+	M	M+	H+	H	H	H+	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>occupational qualification; and</p> <ul style="list-style-type: none"> <li>investment in infrastructure development through local economic development and integrated development programmes.</li> </ul> <p>In the unmitigated scenario, some of these positive impacts may not take place or may happen to a lesser extent. In the mitigated scenario the economic impacts will reach its maximum potential, some of which may continue beyond the life of mine.</p>													
No go alternative	<p>The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. Proceeding with the project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the project leaves the status quo, but with potential loss in employment opportunities and revenue generation, which could potentially be generated by the development.</p> <p>In the “no-go” scenario, the current land use activities will remain in force and illegal mining will continue without formal economic benefit to the local, regional and national economy. The area will furthermore not be rehabilitated. Housing development will however be able to proceed, but not without removing available mineral resources and rehabilitating the area first for some of the developments. The status quo may have some economic benefit, but it will be limited for the duration of the housing developments and to the current illegal mining activities.</p>		L+	M	M	L+	M	M+	H+	H	H	H+	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	SEVERITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>There is no mitigation option available to the proponent to avoid the “no-go” alternative, as proceeding with the development is at the discretion of the decision-makers.</p> <p>For the purpose of this assessment, the status quo was considered as the unmitigated scenario (a negative impact) in comparison to establishing the proposed development, with the mitigation measures as outlined in the EMP, as the mitigated scenario.</p>													

## 8 MITIGATION MEASURES

It is assumed that West Wits will implement the commitments detailed in the EMPr to avoid/mitigate/manage all environmental, social and economic impacts. More specifically, during all project phases, the operation must ensure the following mitigation measures are implemented to minimise potential negative economic impacts and to optimise positive economic impact that may result from the proposed project to ensure that mining and residential land-uses can co-exist sustainably in the same area:

- hire people from the surrounding area as far as is possible;
- introduce formal bursary and skills development programmes to the closest communities to increase the number of local skilled people and thereby increase the potential local employee base;
- where possible, procure local goods and services from the closest communities;
- facilitate local involvement in indirect business and service opportunities;
- implement a procurement mentorship programme which provides support to local and black owned businesses during the construction and operational phases; and
- identify and develop sustainable business opportunities and skills, independent from the project for members of the local communities to ensure continued economic prosperity beyond the life of the project.

## 9 ASSUMPTIONS AND LIMITATIONS

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

- the information supplied by the client or obtained in the MWP in relation to employment opportunities, income generation, life of mine was assumed to be an accurate reflection;
- information in the MWP related to the Creswell Park and Kimberley West mining permit applications are considered to be immaterial to the overall mining project;
- labour value for mine workers was based on the average wage for a mine worker as obtained from payscale.com. This may result in an inaccurate wage number;
- the labour component for the opencast activities was calculated utilising the average wages for a dump truck driver as provided by Indeed.co.za;
- construction worker wages was calculated as an annual figure of R9 979 200 per annum based on wage figures obtained from Bowker Greaves Quantity Surveyors;
- the economic benefit of the illegal mining activities, in monetary terms, was not determined;

- no average income is available for zama zama's and the financial contribution of their wages could therefore not be determined;
- a discount factor (a financial factor which, when multiplied by a predicted future cash flow from a loan or some other form of debt, gives its present value) of 10% was used to calculate the present value calculations;
- present value calculations were applied over periods as indicated in the report.

Revenue and capital investment numbers were based on information obtained from the MWP, which includes the Kimberley West and Creswell Park open cast areas. The MWP project scope incorporated the re-establishment of the underground operations with new central infrastructure to be constructed at the Bird Reef Central (Circular Shaft) complex. In addition to the central infrastructure complex, the MWP includes two satellite infrastructure facilities (Kimberley Reef East and Main/South Reef West), which will service the supervisory and operational requirements of the underground targets.

At the time of compiling the MWP, a gold price of \$ 1320 per troy ounce and an exchange rate of R11.80 per US\$ was used. This equates to R15 576 per troy ounce. For the purposes of this report, a more recent (17 May 2019) gold price of USD 1296.35 per ounce and an exchange rate of R14.29 per US\$, which equates to R18 381 per troy ounce of gold, was utilised.

## 10 CONCLUSION

From an economic perspective, it is recommended that the project proceed. The revenue generated from the project has the potential to significantly contribute towards the local, regional and national economy through its capital investment, creation of employment opportunities and revenue generation over the life of mine and potentially beyond the 25 years life of mine, should the mining right be renewed.

Current industries, manufacturing and distribution facilities surrounding the proposed mining right area are not expected to be influenced by the establishment of an active mining operation in the area. Instead, depending on the nature of the services and products provided, the proposed mining development could potentially stimulate the growth of these businesses. The proposed project would furthermore potentially create additional revenue and employment opportunities or sustain existing opportunities for the off-site processing facility, which will be treating the ore. Underground

mining activities may influence the desirability of planned housing developments and existing property values due to potential environmental impacts.

The proposed development will however assist towards the eradication of illegal mining in the area. Illegal mining is currently a burden to the economy. The project will therefore reduce the burden illegal mining currently has on the local, regional and national economy and state. The open pit activities specifically, will lead the way for residential property development opportunities, which will significantly contribute towards the local, regional and national economy.

Implementing management measures and commitments as outlined in the EMPr will ensure that the project is executed within the framework of sustainable development, which will ensure that potential negative impacts are minimised and positive impacts enhanced.

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