

APPENDIX S: SOCIO-ECONOMIC STUDY

JINDAL MELMOTH IRON ORE MINE SOCIO ECONOMIC IMPACT ASSESSMENT REPORT

MARCH 2023

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DOCUMENT INFORMATION

Document title: JINDAL MELMOTH IRON ORE PROJECT:
SOCIO-ECONOMIC SPECIALIST IMPACT ASSESSMENT REPORT

Your/ our project reference: 720.10023.0001 Phase 0016/ N19199

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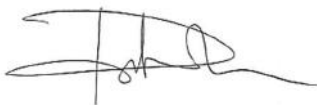
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I, Paul Daniel van Heerden, declare that:

- I act as the independent specialist in this application.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, regulations and all other applicable legislation.
- I have no, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority.
- All the particulars furnished by me in this form are true and correct.
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature:



Date: 04 October 2022

SPECIALIST REPORT REQUIREMENTS IN TERMS OF APPENDIX 6 OF THE EIA REGULATIONS (2014), AS AMENDED IN 2017

Table 0-1 Specialist report requirements in terms of Appendix 6 of the EIA Regulations (2014), as amended in 2017

A specialist report prepared in terms of the Environmental Impact Regulations of 2014 (as amended in 2017) must contain:	Relevant section in report
Details of the specialist who prepared the report	Pg ii
The expertise of that person to compile a specialist report including a curriculum vitae	Pg ii
A declaration that the person is independent in a form as may be specified by the competent authority	Pg ii
An indication of the scope of, and the purpose for which, the report was prepared	1
An indication of the quality and age of base data used for the specialist report	1
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	1
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	N/A
A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	1
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 alternative	1
An identification of any areas to be avoided, including buffers	N/A
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	1
A description of any assumptions made and any uncertainties or gaps in knowledge	1
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	5
Any mitigation measures for inclusion in the EMPr	5
Any conditions for inclusion in the environmental authorisation	N/A
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	5
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	7
Regarding the acceptability of the proposed activity or activities; and	N/A
If the opinion is that the proposed activity 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	6 & 7
A description of any consultation process that was undertaken during the course of carrying out the study	4
A summary and copies if any comments that were received during any consultation process	N/A
Any other information requested by the competent authority.	N/A

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ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
AA SA	Automobile Association of South Africa
ABET	Adult Basic Education and Training
AOI	Area of Impact
B-BBEE	Broad-based Black Economic Empowerment
BCI	Business Confidence Index
BFS	Bankable Feasibility Study
BIF	Banded Iron Formations
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CIESIN	Center for International Earth Science Information Network
Covid-19	Coronavirus Disease of 2019 (caused by the novel coronavirus SARS-CoV2)
Co _{2e}	Carbon Dioxide Equivalent
CPI	Consumer Price Index
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DTIC	Department of Trade, Industry and Competition
EAP	Environmental Assessment Practitioner
EAPo	Economically Active Persons
EDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
EE	Employment Equity
EIA	Environmental Impact Assessment
ELAW	Environmental Law Alliance Worldwide
ESD	Enterprise and Supplier Development
ESIA	Environmental and Social Impact Assessment
Fe	Iron
GDP	Gross Domestic Product
GDP-R	Gross Domestic Product of Region
GFC	Global Financial Crisis
GHG	Greenhouse Gas
GN	Government Notice
GRDP	Gross Regional Domestic Product
GVA	Gross Value Added
HDP	Historically Disadvantaged Persons
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HPGR	High Pressure Grinding Roll

Acronym / Abbreviation	Definition
HRD	Human Resource Development
HSRC	Human Sciences Research Council
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IO	Input-Output
IPCC	Intergovernmental Panel on Climate Change
IPSED	Inclusive Procurement, Supplier and Enterprise Development
LED	Local Economic Development
km	kilometres
KZN	KwaZulu-Natal
LM	Local Municipality
m	metres
MCD	Mine Community Development
MDGs	Millennium Development Goals
MIOP	Melmoth Iron Ore Project
MRA	Mining Right Application
MPRDA	Mineral and Petroleum Resources Development Act
mtpa	million tonnes per annum
MW	Megawatts
NB	Important
NAEIS	National Atmospheric Emissions Inventory System
NDP	National Development Plan
NEMA	National Environmental Management Act
NGP	New Growth Path
OPEX	Operational Expenditure
PDGS	Provincial Growth and Development Strategy (of KwaZulu-Natal)
PDGP	Provincial Growth and Development Plan (of KwaZulu-Natal)
PPE	Personal Protective Equipment
PSDF	Provincial Spatial Development Framework (of KwaZulu-Natal)
PP	Public Participation
QLFS	Quarterly Labour Force Survey
RC	Reverse Circulation
ROM	Run-of-Mine
SA	South Africa
SACCI	South Africa Chamber of Commerce and Industry
SARB	South African Reserve Bank
SAM	Social Accounting Matrix
SDF	Spatial Development Framework

Acronym / Abbreviation	Definition
SEIA	Socio-economic Impact Assessment
SIA	Social Impact Assessment
SLA	Service Level Agreement
SLP	Social and Labour Plan
SMME	Small, Medium and Micro Enterprises
SP	Sub-places
StatsSA	Statistics South Africa
TB	Tuberculosis
TSF	Tailings Storage Facility
USA	United States of America
USD	United States Dollar
WRD	Waste Rock Dump

1 INTRODUCTION

Urban-Econ Development Economists has been appointed by SLR Consulting South Africa (Pty) Ltd (SLR) to undertake a Socio-economic Impact Assessment (SEIA) for the proposed Jindal Melmoth Iron Ore Project (MIOP).

This study forms part of the legally mandated Environmental and Social Impact Assessment (ESIA) which is required to inform Environmental Authorisation (EA) process as part of a Mining Rights Application (MRA). The requirements of Specialists Reports are defined in Appendix 6 of the EIA Regulations, 2014 (as amended in 2017). An overview of these requirements can be found in Table 0-1 (page iii) of this document.

1.1 PURPOSE OF THIS REPORT

This SEIA specialist study is conducted as part of the ESIA process that is being managed by SLR. This document undertakes to identify, quantify (where possible) and assess the anticipated socio-economic impacts of the proposed Jindal MIOP on the receiving environment, as well as provide suggestions on measures that could mitigate negative impacts and enhance positive impacts. It further provides a reasoned opinion on the need and desirability of the proposed project from a socio-economic perspective and provides a summary of all consultation and engagement undertaken to inform the anticipated impacts and opinion. Finally, this report provides a recommendation on whether the project should be pursued from a socio-economic perspective.

1.2 PROJECT DESCRIPTION

The Melmoth Iron Ore Project (MIOP/ the project) is a proposed open pit iron ore mining operation and includes associated infrastructure. The sub-sections which follow provide a background to the project and key information on its location, characteristics, and alternatives.

1.2.1 Background to the project

Jindal Iron Ore (Pty) Ltd, is owned by Jindal Steel and Power (Mauritius) Limited (74%) and South African BEE partner Mr Thabang Khomo (26%). Jindal holds two Prospecting Rights (PR) over the project site. The prospecting rights are referred to as North Block (PR 10644) and South Block (PR 10652) and have a total combined area of 20 170 ha. The ownership structure is indicated in Figure 1 below.

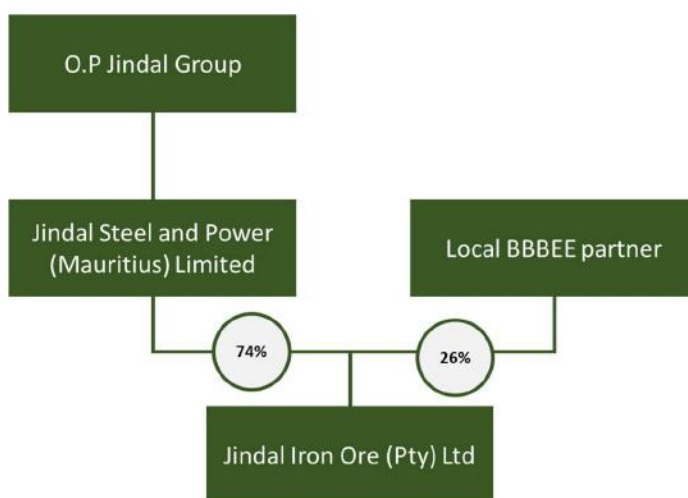


Figure 1: Jindal Iron Ore (Pty) Ltd Ownership Structure

The areas of interest contain banded iron formations (BIF) and were investigated by Premier Zululand Zinc in 1908 followed by Union Carbide Prospecting SA in 1969 and Iscor (Pty) Ltd in the 1980s. The investigations indicated that iron ore was present as magnetite, a magnetically recoverable mineral of high iron content, and as amphibole grunerite, a mineral of low iron content that is not recoverable. These early investigations did not result in project development because the magnetite content was too low to compete with the more attractive hematite iron mineralisation in the Northern Cape and the prevailing iron ore price could not support feasible mining of the magnetite BIF.

The iron ore price started increasing in 2007 generating renewed interest in iron ore in the Melmoth district. In 2011 Sungu Sungu (Pty) Ltd (later renamed to Jindal Iron Ore (Pty) Ltd.) was issued Prospecting Rights for the two concessions which are the subject of this report.

In 2012, Jindal commenced the following work program which was completed in early 2016:

- An airborne geophysical survey of the North and South blocks.
- A Lidar topographic survey.
- Regional and local geological mapping.
- The identification of a priority area (the South-East).
- An extensive diamond drilling (89 holes) and more limited (7 drillholes) reverse circulation (RC) programme in the South-East.
- A regional drilling programme of 34 diamond holes in the remainder of the South Block and North Block.
- An in-house Scoping Study, focussed on the South-East area of the South Block.
- An Environmental / Social Impact Assessment; and
- A Pre-feasibility Study focused on the South-East area of the South Block.

In 2013, Jindal appointed Golder Associates Africa (Pty) Ltd. (Golder) as the independent Environmental Assessment Practitioner (EAP) responsible for managing the ESIA and the supporting Public Participation Process (PPP). Golder submitted a Final Scoping Report to the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) under both Jindal Iron Ore (for the mining ESIA) and Jindal Processing KZN (for the Processing Plant ESIA) in March 2015.

In June 2015, both Scoping Reports (mining and processing) were returned to Jindal with comments from the EDTEA requesting more clarity on various aspects of the project, company structure and further engagement with Interested and Affected Parties (I&APs).

In the interim the iron ore price declined from a high of \$130 per tonne in January 2014 to a low of \$47 per tonne in December 2015. The decline in the iron ore and steel prices worldwide resulted in reduced funding from Jindal for the project and it was not possible to complete an amended Scoping Report.

In 2019 through 2020 the iron ore price steadily recovered and the first quarter of 2021 averaged \$160 per tonne. The improved iron ore price has encouraged Jindal to increase the rate of development of the MIOP.

In January 2021, Jindal appointed SLR as the independent EAP to undertake a new ESIA and PPP and prepare all documentation for a Mining Right Application (MRA). Jindal has also appointed consultants to produce a Bankable Feasibility Study for the envisioned Melmoth Iron Ore Mine.

1.2.2 Project location

The project site is located approximately 25km southeast of Melmoth Town, in the Mthonjaneni Local Municipality (LM), in KwaZulu-Natal (KZN) Province. The map below indicates the project location.

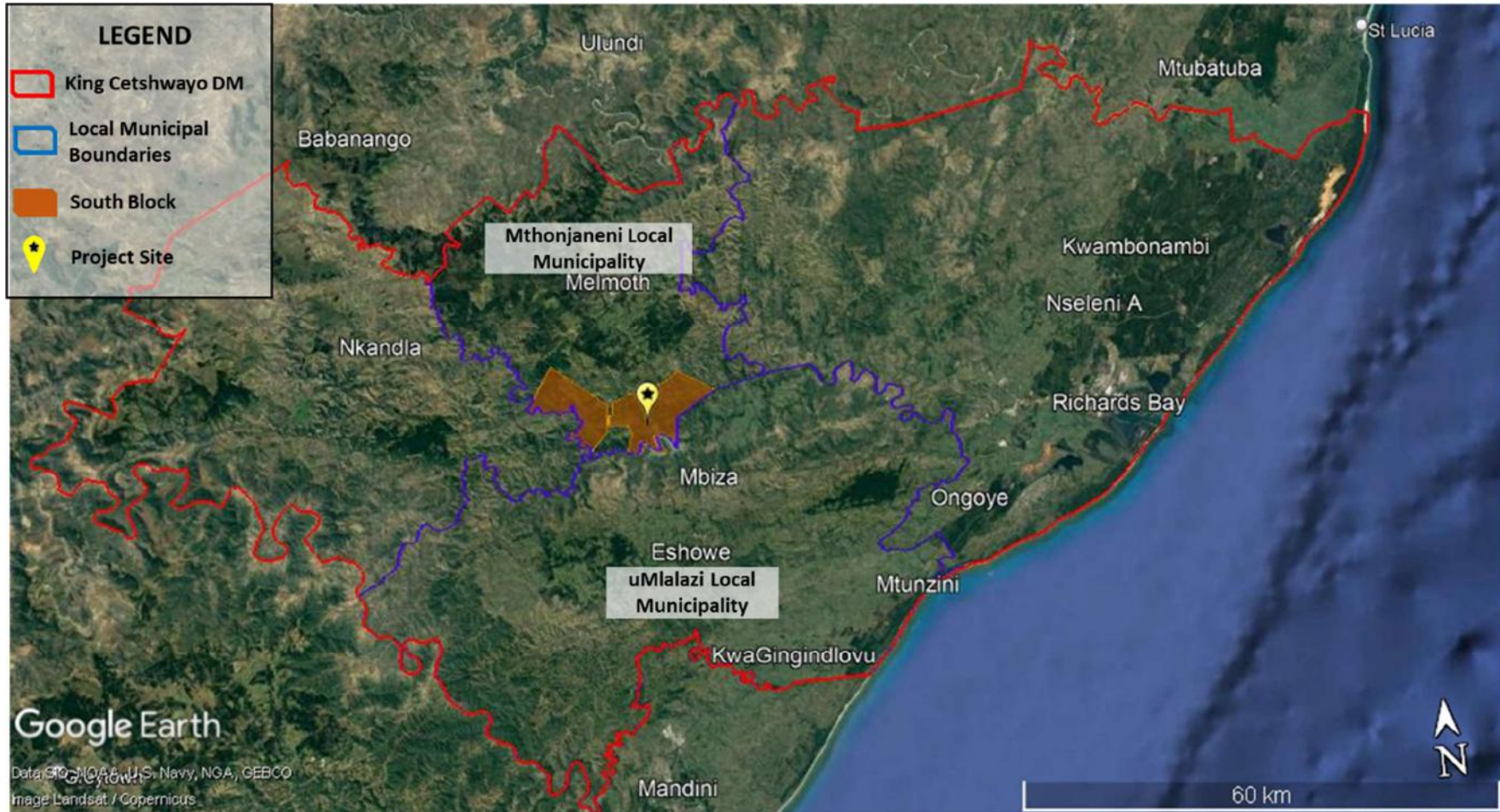


Figure 2 Project locality

Source: Google Earth & Urban-Econ, 2022

The proposed MIOP site is located 25 km southeast of Melmoth, within the Mthonjaneni LM in the KwaZulu-Natal Province. The MIOP site comprises the area around the proposed mine and processing plant. The MIOP site includes properties belonging to both public and private entities as per Table 1-1.

Table 1-1 Detail of properties within the project site

Farm name	Project component	Relevant farm and portion	
Ntembeni 16921	North Block	Portion 0	
Reserve No.11 15831	North Block	Portion 3 and 4	
Kromdraai 6110	South Block	Remaining Extent.	
Black Eyes 13385		Portion 1,2,3,4 and the Remaining Extent	
Wilderness 6107		Portion 3,4,5,6,7,8,12,13,14,15,16	
Goedgeloof 6106		Portion 1,2,3 and the Remaining Extent.	
Goedertrow 89 No. 7806		-	
Reserve No.11 15831		Portion 0	
Vergelegen 6104		Portion 0	
Application area (ha)		20 170 ha (both North and South Blocks)	
21-digit Surveyor General code for each farm portion		NOGU00000001692100003 NOGU00000001692100004 NOGU00000000611000000 NOGU00000001692100000 NOGU00000000610600001 NOGU00000000610600002 NOGU00000000610600003 NOGU00000001338500000 NOGU00000001338500001 NOGU00000001338500002 NOGU00000001338500003 NOGU00000001338500004 NOGU00000000610600000 NOGU00000000610700003 NOGU00000000610700004 NOGU00000000610700005 NOGU00000000610700006 NOGU00000000610700007 NOGU00000000610700008 NOGU00000000610700012 NOGU00000000610700013 NOGU00000000610700014 NOGU00000000610700015 NOGU00000000610700016 NOGU00000000610400000 NOGU00000001583100000 NOGU00000001583100003 NOGU00000001583100004 NOGU00000000610400000	

The main access to the MIOP site is provided by the R34, which runs east of the MIOP and connects Eshowe in the south with Melmoth in the north. Several gravel access roads currently provide access within the MIOP site.

1.2.3 Project activities

Jindal's intent with this MRA is to consolidate the Prospecting Rights for the North and South blocks into a single Mining Right. However, development of the mine and mining infrastructure would be undertaken in a phased approach with mining currently only proposed to be undertaken in the south-eastern section of the South Block (as per Figure 2), where the iron ore resource has been defined through previous prospecting. Infrastructure would be developed to support this mining operation. The MRA and ESIA will consider the entire extent of the MRA area, but with a specific focus on Phase 1 of the MIOP as described in this section.

1.2.3.1 Phase 1: Conceptual design

An open pit mining operation is proposed to be developed in the south-eastern section of the South Block known as the Southeast Pit. Approximately 800 million tonnes of ore are expected to be mined from the pit over the Life of Mine (approximately 25 years). Waste rock will be stripped from the pit at a ratio of approximately 0.5 tonnes of waste rock per 1 tonne of ore. The waste rock will be disposed of on a Waste Rock Dump (WRD) proposed within the Mining Right Area.

Drilling and blasting techniques will be used to excavate the iron ore (proposed to be 32 million tonnes per annum (mtpa)) which will then be loaded onto trucks and transported to the Run-of-Mine (ROM) ore stockpile area where it will be stored and subsequently transferred to the processing plant for milling and magnetic separation. The processing plant will produce iron ore concentrate and a tailings slurry.

The approximately 7.5 mtpa of iron ore concentrate consisting of 67% Fe will be transported 80km to the Richards Bay Port via either rail (the preferred option under study) or pipeline (still to be determined as per Section 1.2.5). The concentrate will be exported as there are limited local markets. The tailings will be disposed of to a tailings storage facility (TSF) located outside the concession area and the subject of a separate ESIA process.

Associated infrastructure to support the mine will include access and haul roads, electrical transmission line and sub-stations, raw water abstraction and pipelines, stormwater management infrastructure, tailings pipelines, concentrate pipelines, offices, change house, workshops, and perimeter fencing (amongst others). Some of the infrastructure required for the mine (e.g., the access road, pipelines and TSF) will be located outside of the Mining Right Area. While the access road and water supply pipelines are part of this application to the DMRE, certain other infrastructure will be subject to separate application, assessment, and approval processes, as required by the applicable legislation (see section 2).

The conceptual layout of the South Block, as described above, is illustrated in Figure 3, with additional detail on the major infrastructure, provided thereafter, where information is available.

Southeast Pit

The general outline as conceptually shown as this is the defined resource area. The Southeast Pit as shown is approximately 4km east to west and approximately 1km north to south at its widest point and about 200mSL in depth.

Waste Rock Dump

A WRD is required to accommodate overburden and waste rock excavated as part of the mining process. The WRD would be designed to fit into the existing contours to the extent practical for stability and ultimate closure rehabilitation. The conceptual position is included in Figure 3 and will also be defined as part of the BFS.

Crushing and Screening

ROM ore will be transported via haul truck to a semi-mobile in pit primary crusher. Primary crushed ore will be transported from the in pit primary crusher to the ROM stockpile via overland conveyor. ROM ore will be reclaimed from the ROM stockpile for further crushing before being deposited onto the crushed ore stockpile.

Processing Plant

Ore from the crushed ore stockpile will be fed into the processing plant. It is anticipated that the proposed processing plant would be designed to process 32 mtpa of iron ore. The plant will produce wet iron ore concentrate (upgraded from 30% Fe in feed to 67% Fe in concentrate) which will be exported.

The plant will also produce thickened wet tailings slurry which will be deposited on a TSF as discussed in Section 1.2.5). The following standard activities are proposed as part the processing operations:

- Crushing and Screening.
- High Pressure Grinding Roll (HPGR) and ball/pebble milling.
- Magnetic separation and concentrate re-grind.
- Tailings disposal.
- Concentrate Dewatering and Filtration; and
- Transport, storage, and shipment of concentrate.

Water Infrastructure

The mining operations will require water for the processing plant, dust control, for vehicle wash down and for the change house and office use. The conceptual design is for water to be recycled from the TSF and the concentrate filters thereby minimising daily water usage. There will be a need for makeup water to replace water losses from seepage, evaporation, and interstitial. It is anticipated that the makeup water would be acquired from the KZN bulk water supply authority. However, a water supply analysis will be undertaken as part of this Project which will determine water demand and where water would come from. Water requirements are likely to reduce as the pit deepens due to the reuse of water that collects within the pit.

Office Complex

An office complex is required to accommodate all management, technical, and administration staff for the mine. The office complex will include a car park, canteen, meeting rooms, hall, training complex, security and first aid station. The site will have a dedicated sewerage treatment plant the detail of which is to be considered as part of the BFS.

Workshops

Engineering and vehicle workshops, tyre shops, wash down areas, garages, fuel depots and explosive magazines will be located at the centre of the activity that the facility services for ease of access. The detail will be considered as part of the BFS.

Access Road

A conceptual access road has been indicated in Figure 3 (for illustration only at this stage). Further studies will be undertaken during the BFS, and enquiries with landowners about potential route planning, to identify possible access routes for the transport of labour, equipment, and materials to the Project site during the construction phase and for other activities during the operational, decommissioning and closure phases.

Power Supply

Existing 400 kV transmission lines owned by Eskom run through the South Block to a point approximately 700 m from the envisioned main plant intake substation. The lines are relatively new and have adequate installed capacity for the mine requirements. Connecting distribution lines and a substation will be required for the mining operations. This would likely be adjacent to the processing plant as per Figure 3.

Non-mineralised waste

A storage area for the temporary storage of all non-mineralised waste including domestic waste and various hazardous waste streams will be constructed. Waste will be removed from site on a regular basis by a licensed contractor for recycling (where appropriate) or to be disposed of at a licensed facility.

Construction phase laydown area and camp

The construction phase is expected to involve up to 700 contractors at peak with an average of 350 employees. There will be no on-site construction camp. Non-local construction contractors will be accommodated in surrounding towns and communities. The construction contractors' offices, locker and washroom facilities and dining facilities will be within a fenced off area adjacent to the plant construction site. A laydown area and staging area will be located mostly within and adjacent to the plant footprint. Construction facilities such as yards and buildings as well as power, water and fuel infrastructure will become part of the plant operating facilities when construction is complete. Licensed waste contractor companies will provide waste management services from the commencement of construction. Safety, health, environment and community engagement officers will be appointed to monitor and control performance in these areas during the construction period. Construction site preparation will commence with provision of upgraded road access, and water and power services. Construction contractors will be on site for up to five years.

Nkwalini siding

Upgrade of the Nkwalini siding is required to include a covered area for storage of filtered iron ore concentrate which would have a low moisture content of 9%. Concentrate slurry will be pumped from the plant to the dewatering and train loading facility which will be located outside the concession area at Nkwalini rail terminal approximately 12km from the plant. The dewatered concentrate will be railed to Richards Bay Port for export. Water from the dewatering facility will be recycled to the plant.

Possible Future Phases

Prospecting, including drilling programmes, will be undertaken in parallel with the Phase 1 mining. This would generate additional iron ore resources in the North and balance of the South block and will be used to inform planning of possible future mining phases with increased life of the mine.

The likely concept for future phases of the Jindal MIOP would be to increase the life of mine and production rate by accessing iron ore from additional mine pits and/or increasing the capacity of the primary processing plant.

Any future development phases of the MIOP would need to be subject to the requisite regulatory application, assessment, and approval processes.

1.2.4 Proposed project schedule

The following high-level schedule is proposed:

- 2022/2023: MR application and ESIA submission. Bankable Feasibility Study.
- 2023/2024: MR and EIA licenses Competent Authority decision making.
- 2023/ 2024 Water Use Licence completed and submitted.
- 2025/2027 financing, relocation, detailed design
- 2028/ 2031: Complete construction
- 2031: First production
- 2031/2034: Ramp up to 100% total production capacity.

1.2.5 Proposed activities to be authorised separately.

There are a number of processes/ infrastructures that are integral to a mining operation that have not yet been finally decided on in terms of locality etc. but will be required for the proposed phase 1 operations and would have to be approved through an EA before any development could take place. These are discussed in this section.

1.2.5.1 Tailings Storage Facility and associated infrastructure

A TSF Site Selection Study was undertaken in 2014/2015 by tailings specialists to ascertain where possible suitable sites would be for the TSF. It is anticipated that the land area required for the TSF would be between 300 and 600 hectares depending on the topography.

In 2014/2015 two consulting firms identified 14 possible TSF sites. The TSF location study has since been further refined by Epoch for the current proposed Project and, pending discussions with landowner(s), the preferred site will be assessed under a separate EA.. No development of the mining operation will go ahead until an EA has been issued.

1.2.5.2 Transport of concentrate to Richard's Bay for export

The final mode of transportation of the concentrate from the processing plant to the Richards Bay Port for export will be by rail 80km to Richards Bay.

A separate ESIA process will be required for this.

1.3 SCOPE OF THE STUDY

This investigation forms part of the broader ESIA which is required as part of the EA process. The scope of the study is to undertake a full SEIA of the proposed project, across its various life cycles, including identification of direct, indirect and cumulative impacts, as part of the ESIA phase of the project. This necessitates a comprehensive Social Impact Assessment (SIA) since SIA considers both the social and economic components of the environment. The investigations are focused on phase 1 of the project, for which the EA and MRA is required, as described in section 1.2.3.

The SEIA contains information that, together with other specialists, allows for the assessment of the project from a sustainable development perspective and assists in identifying “the most practicable environmental option” that provides the “most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society”, in the long term and the short term. In light of the above, and in line with the Environmental Impact Assessment (EIA) Regulations of 2014, the purpose of the SEIA is to assess the need and desirability of the project. It specifically aims to ensure that the project, if approved, provides for justifiable social and economic development outcomes. As such, it aims to:

- Identify, predict, and evaluate geographical, social, economic, and cultural aspects of the environment that may be affected by the project activities and associated infrastructure.

The specific objectives of the study include:

- Engage with the environmental practitioner, other specialists on the team, and the client to gain necessary background on the project.
- Delineate the zone of influence based on the feedback received from various I&APs and the information concerning the project.
- Determine the affected communities and economies located in the zone of influence and identify sensitive receptors within the delineated study area; i.e. communities, land uses and economic activities that could be directly or indirectly negatively affected by the proposed project or benefit from it.
- Determine the data required to assess potential impacts and respond to the questions outlined in the guidelines related to the needs and desirability assessment.
- Review secondary data and assess data gaps.
- Conduct a site visit and collect primary social and economic data of the parties that may be directly or indirectly affected (positively or negatively) by the proposed project to address data gaps.
- Create profiles for the communities and economies representing the study areas and the environmentally affected zone.
- Assess the need and desirability of the project in line with the specified guidelines.
- Identify, predict, and evaluate the potential positive and negative impacts associated with the project following the environmental specialist's methodology.
- Develop a mitigation plan by proposing mitigation measures for negative effects and enhancement measures for positive impacts.
- Provide a recommendation from a socio-economic perspective.

1.4 STUDY AREA

The Area of Impact (AOI) of the proposed project is separated according to specific sensitivities in the surrounding area, namely:

- Households and communities (directly affected community).
- Business and enterprises.
- Tourism sector
- Agricultural sector
- Businesses and enterprises (primarily tourism and agriculture).

Each of these groupings of stakeholders will be affected by the project, either directly or indirectly. Figure 4 provides a conceptual overview of the sensitivity receptors upon which the assessment of impacts is based.

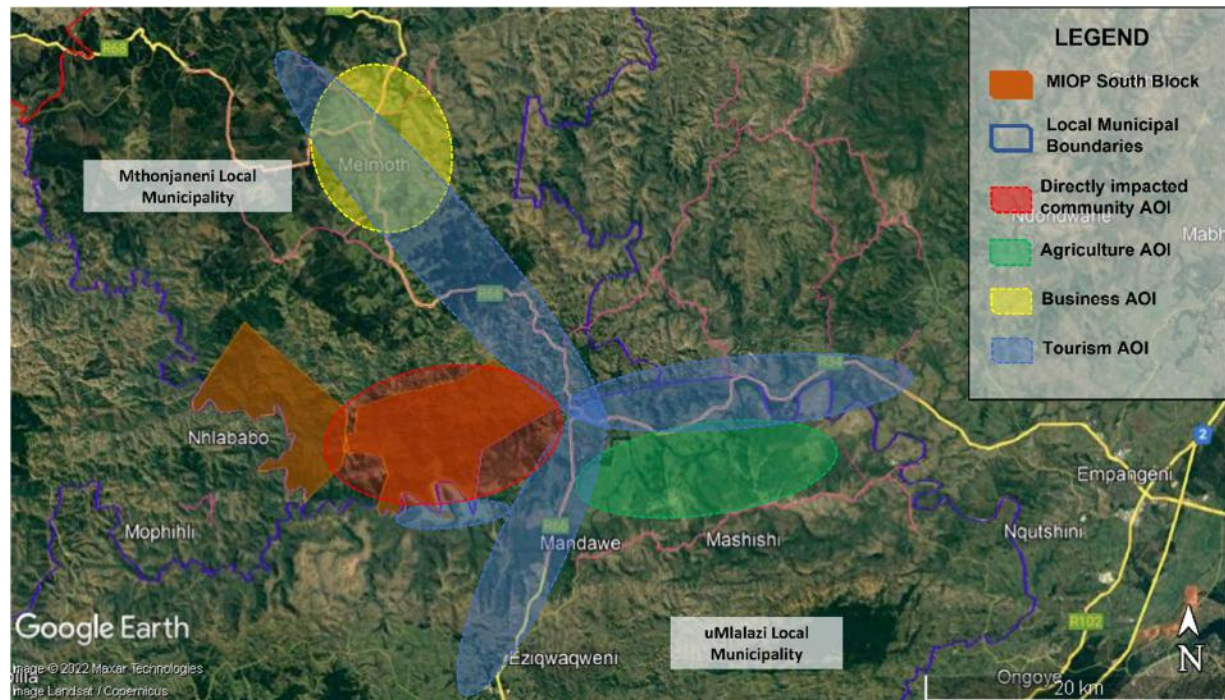


Figure 4 Conceptual overview of sensitivity receptors (AOI)

Source: Google Earth & Urban-Econ, 2022

1.5 METHODOLOGY

This study utilised both primary and secondary research techniques. The methodology used in this study is primarily that of a technical methodology with a large-scale engagement approach with respective local stakeholders. The research process for the SEIA study utilised both qualitative and quantitative data analysis techniques. Data and information collection includes discussions with stakeholders as well as secondary data sources, which were used to provide a description of the receiving environment.

The secondary research component of this study included a location assessment of the proposed site and its relative proximity to the surrounding community and local businesses within the vicinity. This assessment highlighted the potential socio-economic impacts that may arise from the proposed project. Several secondary research documents have been considered as they relate to the proposed project. The information was collected using different sources such as municipal, district and private sector reports.

1.5.1 Research Methodology

The following methodology was followed in completing the study:

- **Inception:** The study started with gaining an understanding of the proposed project during various stages of its lifecycle and understanding the progress made, and challenges encountered in the previous EA process which was embarked upon in 2012 and withdrawn in 2015. Review of various data, including feedback received from various I&APs during the previous EA public participation meetings, and maps provided for the project as well as discussions with the project team, informed the delineation of the potential area of impact (AOI) associated with each component of the project (the next phase of the project).
- **Defining the area of impact:** The delineated AOI defined the spatial boundaries of the study area to be included in the assessment and assisted in identifying likely impacted and beneficiary

communities and economic activities as well as other stakeholders of the project. This also informed the stakeholder consultation and the design, formulation and roll-out of community surveys and interview structures.

- **Consultation:** A broad stakeholder consultation process was followed, with the formal I&AP database for the project used as a starting point for identification of stakeholders that should be consulted. Stakeholder interest groups, based on the spatial delineation of the AOI were developed. A combination of in-person and virtual engagements were undertaken, and action-based minutes captured for record-keeping and analysis. A large-scale community survey was rolled out at the household level, with all authority structures approached to provide gatekeeper access. The roll out of stakeholder consultation was aligned with the formal PPP to ensure that relevant I&APs had been formally sensitised to the project prior to specific engagement on the socio-economic context of the project.
- **Data and information gathering:** Secondary data was gathered to inform the primary data gathering activities (consultation), and to develop a socio-economic baseline of the receiving environment in the study area. A policy review was undertaken to determine the alignment of the proposed project with the strategic plans of various government spheres and to highlight any potential red flags, if such exist.
- **Identification of impacts:** Derived from the review of the project, the concerns raised during the PP meeting, and the feedback received from various parties during data collection, the list of most pertinent negative and positive socio-economic impacts that can ensue as a result of the proposed activity during various stages of its life cycle was drawn. These were then assessed in greater detail.
- **Impact assessment:** Prior to assessing the impact, a status quo profile of the socio-economic environment that is expected to be affected by the proposed project was firstly compiled. Thereafter, the project information was presented and the impact that is expected to ensue as a result of the project's development either during construction or during operation within the context of the analysed socio-economic environment was analysed.
- **Impact evaluation and mitigations:** All identified socio-economic impacts were assessed and categorised in line with the rating provided by the independent environmental specialist. Mitigation measures to reduce the negative effects and enhancement measures to increase the positive impacts were also identified and recommended.

1.5.2 Information sources and baseline information

The investigation and assessment utilised both secondary and primary data.

1.5.2.1 Secondary data gathering

Data and background information utilised in this study includes, inter alia, the secondary data sources included in the table below.

Table 1-2 Information sources

Information required	Source of information
Legislation guiding developments	Constitution of South Africa, Minerals and Petroleum Development Act, National Development Plan, Broad-based Socio-economic Empowerment Charter for the Mining and Minerals Industry, NEMA, Carbon Tax Act, Provincial Growth and Development Strategy and Plan, Provincial Spatial development Framework Local Integrated Development Plans, Spatial Development Frameworks, Local

Information required	Source of information
	Agricultural Plan
Demographics of the impact area	CIESIN, Statistics South Africa Census 2001 and 2011 ¹ , Easy Data – Quantec Standardised Regional Data
Economic profile	Easy Data – Quantec Standardised Regional Data
Economic Impact analysis	Urban-Econ Social Accounting Matrix (SAM)
Locating the site and surrounding environment	GIS Mapping, Google Earth Mapping

Secondary data sources also included academic journals and studies available on the internet or print media. It is intended that these documents substantiate this study while at the same time providing context to the project.

1.5.2.2 Primary data gathering

The purpose of gathering primary data was to gain insight into the socio-economic characteristics of the Area of Impact (AOI), to better understand the aspirations and fears/ anxieties/ concerns of I&APs. Primary data collection took two main forms:

1. **Stakeholder engagement:** Stakeholders were engaged between June 2021 and November 2021, primarily through virtual platforms due to the dynamic Covid-19 situation which created challenges for in-person engagement. A summary of the discussions can be found in section 4.3.2, page 54, and a framework for the discussions can be found in Annexure B: Discussion guidelines for stakeholder interviews.
2. **Fieldwork and community surveying:** The area in which the MIOP is to be located was visited from 6-10 December 2021, with the primary objective of undertaking a community household survey in the area surrounding the project site². In addition to the surveying, the fieldwork provided an opportunity to better understand the socio-economic conditions in the area. A summary of the survey findings can be found in section 4.3.3.

The research methodology makes provision for addressing the following components of the impact assessment investigations:

- A socio-economic assessment of the geographic area impacted by the Jindal MIOP (referred hereafter as the Area of Impact – (AOI))
- Developing a demographic and economic profile of the community within the AOI.
- Perceptions of households, businesses and stakeholders about the Jindal MIOP

¹ 2001 and 2011 Census Data was utilised since it provides comparable information at the sub-place scale. The Standardised Regional Data and the Community Survey provides data only at the Local Municipal and District Municipal scale, respectively.

² The communities in the resettlement zone were not surveyed directly by the socio-economic specialist but were surveyed by the Resettlement Action Plan (RAP) specialist team. There was coordination in the planning and execution of the surveys undertaken by both teams.

- A need and desirability, and socio-economic impact assessment of the Jindal MIOP from a socio-economic perspective.
- Mitigation measures for the Jindal MIOP.
- Recommendations and the way forward.

1.6 ETHICAL CONSIDERATIONS

The following ethical considerations were applied in this specialist investigation, specifically in relation to the primary research which involved interacting with people:

1. **Voluntary participation:** All participants participated willingly and were free to opt in or out of the investigation at any point in time, with no negative consequences or repercussions.
2. **Informed consent:** All participants were informed of the purpose of the interaction and provided with appropriate background information to the project before agreeing or declining to participate.
3. **Anonymity and Confidentiality:** Participants in the study were offered the opportunity to remain anonymous. Where personal identifiers were collected, participants were duly informed and consented, but the information will be kept confidential and will not be shared with any other parties.
4. **Potential for harm:** Given the social sensitivities associated with this investigation, utmost care was given to ensure the safety of fieldworkers and survey participants. This is especially important given the pre-existing social conditions in which the project is proposed:
 - i. Allegations of misrepresentation by traditional authorities.
 - ii. The possibility of violence and other intimidation tactics being meted out against community members perceived to be against the mine's establishment and operations.

1.7 ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

The following section outlines the key assumptions that form the basis of the investigation and discussions of the study.

- Project-related information supplied by the broader specialist team involved in the project for the purpose of the analysis is assumed to be reasonably accurate. Thus, all impacts are analysed based on this information. Any changes therein cannot be accounted for in the analysis.
- Secondary data used was sourced from Stats SA and Quantec, which may include data from the 2011 Census that may not have been updated since.
- The secondary data sources used to compile the economic baseline (dynamics of the economy and labour force), although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- The identification of possible impacts was based on the project team's experience with similar studies in the past and the existing desktop-level knowledge of the socio-economic environment.
- Possible impacts, as well as stakeholder responses to these impacts, cannot be predicted with complete accuracy, even when circumstances are similar, and these predictions are based on research and years of experience, taking the specific set of circumstances into account.
- It is believed that the data gathered from various I&APs (through interviews and documented responses of I&APs) is sufficient to confidently predict the potential impacts of the proposed project and objectively evaluate their significance. This is assuming that:

- Questions asked during the interviews were answered accurately and truthfully by respondents and to the best of their abilities and knowledge.
- That the attitudes of the respondents towards the project remain reasonably stable over the short to medium term.
- The focus on the primary data collection was on those parties that were perceived to be most sensitive to the proposed project. As such, it is believed that the study was able to identify the most significant impacts and assess the most pertinent issues.
- All engineering and technical work related to the construction and operations of the proposed MIOP will comply fully with statutory obligations required to ensure the health and safety of people and the environment.

The following considerations related to the community household survey must be noted:

- The potential for selection bias in community surveying due to being facilitated by a local community liaison with familial links to the Nkosi of the Zulu-Ntembeni Traditional Authority.
- The data obtained during community surveying was done by local unemployed youth who were provided with training on the survey and the tools and platforms to conduct the survey. This could have created challenges in data quality, although no red flags were discovered in the quality assurance process.

The following critical information gap must be noted:

- As of the date of this report, the other specialists in the broader team have been unable to confirm the likely extent and significance of impacts on the commercial agriculture sector, with specific attention placed on the Nkwalini Valley.

1.8 REPORT STRUCTURE

The remainder of the report is structured in the following way:

- **Section 2:** Includes a review of relevant national, provincial, regional and local legislative, strategic and policy documentation and aims to determine the alignment of the proposed MIP to the objectives of these documents.
- **Section 3:** Provides a baseline analysis of the socio-economic status quo of the receiving environment, which includes a demographic profile of the communities likely to be directly and indirectly affected by the proposed project, as well as an analysis of the study area's local economic development climate and other site-related information.
- **Section 4:** Includes a summary analysis of the various forms of stakeholder engagement, namely, the Public Participation Process (PPP), stakeholder interviews and engagement, and community household surveys.
- **Section 5:** Includes the identification and assessment of anticipated socio-economic impacts and the proposed mitigation measures to limit, reduce and/ or avoid negative impacts and enhance positive impacts.
- **Section 6:** Contains a need and desirability determination based on the identified socio-economic impacts and a review of the relevant legislative, strategy and policy texts. The aim of this section is to provide an assessment regarding whether the proposed MIOP is both needed and desirable based on socio-economic considerations alone.

- **Section 7:** Summarises and consolidates the key findings of the investigation and assessment and provides a reasoned opinion on whether the proposed MIOP should or should not proceed from a socio-economic perspective.
- **References:** Contains a full reference list of all sources that were referenced in the investigation.
- **Annexures and Appendices:** includes information which is relevant to the investigation and assessment and which provides additional context and detail on which the assessment relied.

2 POLICY AND PLANNING ENVIRONMENT

The legislative, policy and planning context of mining in South Africa is multi-faceted and is informed by the relevant laws, policies, and plans that are in place in all three spheres of government, namely, at a national, provincial, and local municipal level. This context plays an important role in identifying and assessing the potential social impacts associated with the project and a key component of the SIA process is to assess the proposed development in terms of its suitability with regards to the planning and policy context.

The following legal, strategic and policy documents were examined as part of this review:

National policy and planning context

- The Constitution of the Republic of South Africa (1996)
- The National Environmental Management Act (No. 107 of 1998) (NEMA)
- Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)
- Minerals and Petroleum Resources Development Regulations (GN R466, 3 June 2015)
- Mineral and Petroleum Resources Royalty Act (2008) and Mineral and Petroleum Royalty Administration Act (2008)
- Broad-based Socio-economic Empowerment Charter for the Mining and Minerals Industry (2018) (The Mining Charter)
- National Development Plan 2030 (2012) (NDP)
- Carbon Tax Act (No. 15 of 2019)

Provincial policy and planning context

- KwaZulu-Natal Provincial Growth and Development Strategy (PDGS) (2021 Draft for public consultation)
- KwaZulu-Natal Provincial Growth and Development Plan (PDGP) (2019)
- KwaZulu-Natal Provincial Spatial Development Framework (PSDF) (2021)

Local policy and planning context

- Mthonjaneni LM Integrated Development Plan, 2016-2021, (2019/2020 review) (IDP)
- uMlalazi LM IDP, 2016-2021 (2020/21 review)
- uMlalazi LM Spatial Development Framework (2019) (SDF)
- uMlalazi LM Agricultural Development Strategy (2019)

2.1 NATIONAL POLICY AND PLANNING CONTEXT

Projects that contribute positively towards the objectives of the national legislative, policy and planning framework could be considered strategically important for the country. A review of the national policy and planning context suggests that large-scale extraction of mineral commodities is strategically important to the country's economic development and ambitions of promoting and enhancing socio-economic transformation.

A brief review of the most relevant national legal, policy and planning texts is provided in the following sub-sections.

2.1.1 The Constitution of the Republic of South Africa

All legislation and policy in South Africa takes its lead from The Constitution of the Republic of South Africa, 1996 (hereafter referred to as the Constitution), which provides a legal and moral framework for the new democratic dispensation in the country. Chapter Two of The Constitution contains the Bill of Rights, which is considered “a cornerstone of democracy in South Africa. It enshrines the rights of all people in our country and affirms the democratic values of human dignity, equality and freedom” (Republic of South Africa , 1996).

Section 24 of The Constitution pertains specifically to the environment and states that:

24. *Everyone has the right –*

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

It outlines the need for promoting social and economic development and therefore requires that development be conducted in a manner that it does not infringe an individual’s rights to health, well-being, and a safe environment (Republic of South Africa , 1996). Specific attention must be given to previously disadvantaged and vulnerable individuals who are considered most at risk to environmental impacts.

2.1.2 The National Environmental Management Act

The National Environmental Management Act (No. 107 of 1998) (NEMA) is South Africa’s apex environmental legislation and sets the framework for environmental management in South Africa. It provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment. The Act is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights (Republic of South Africa, 1998). It therefore states that:

- *The State must respect, protect, promote, and fulfil the social, economic, and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities.*
- *Sustainable development requires the integration of social, economic, and environmental factors in the planning, implementation, and evaluation of decisions to ensure that development serves present and future generations.*
- *Everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

In addition, the national environmental management principles contained within NEMA state that:

- *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural, and social interests equitably.*
- *Development must be socially, environmentally, and economically sustainable.*

- *The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment*

NEMA therefore enshrines the need for government to ensure that its decision-making on the acceptability of environmental impacts is both informed and responsible.

2.1.3 The Mineral and Petroleum Resources Development Act and associated Regulations

The primary statute governing mining in South Africa is the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA), which must be read with the Mineral and Petroleum Resources Development Regulations (2015) (MPRD Regulations) and considered in conjunction with the NEMA, which is the primary statute regulating the environmental aspects of mining.

The MPRDA vests all mineral rights in the state and aims to ensure the sustainable utilisation of South Africa's mineral and petroleum resources within a national environmental framework policy which protects sensitive environments and the interested of affected communities, organisations, and individuals, while promoting socio-economic development (Republic of South Africa, 2002).

The MPRDA provides a regulatory framework governing the acquisition of mining and exploration rights, which is framed by the requirements of the Broad-based Socio-economic Empowerment Charter for the Mining and Minerals Industry (Mining Charter III) (described in more detail in section 2.1.5).

The MPRDA requires mines to develop and implement a Social and Labour Plan (SLP) that includes developing and implementing a Local Economic Development (LED) plan that contains programmes and projects within the surrounding and labour-sending communities which are aligned to the Integrated Development Plans (IDPs) of the local municipality in which they are based. The MPRDA requires prospective mining rights holders to undertake socio-economic studies to identify the needs of the surrounding and labour-sending communities to identify appropriate project opportunities. The SLP must be reviewed every five years as a condition of the mining rights license (Republic of South Africa, 2002).

2.1.4 The National Development Plan

The National Development Plan (NDP) 2030 is aimed at eliminating poverty and reducing inequality by 2030. The NDP aims to achieve this by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. While the achievement of the objectives of the NDP requires progress on a broad front, three priorities stand out, namely:

- Raising employment through faster economic growth.
- Improving the quality of education, skills development, and innovation.
- Building the capability of the state to play a developmental, transformative role.

In relation to mining, the NDP acknowledges that South Africa has a comparative advantage in mineral and natural resource endowments, including, amongst other commodities, iron ore, yet the domestic mining sector has "failed to match the global growth trend in mineral exports due to poor infrastructure, alongside regulatory and policy frameworks that hinder investment" (National Planning Commission, 2017, p. 43).

Importantly, the NDP notes that while minerals beneficiation is a good way to increase productivity and export revenues and stimulate the development of a larger manufacturing sector, it is neither necessary nor essential to beneficiate all the country's mineral resources and selectivity should be based on competitive

advantage. Additionally, as the country's bulk energy provider, Eskom, works to alleviate its energy generation challenges, it is necessary to consider ways to improve the energy efficiency of mining and minerals processing.

Mining is seen as a critical activity for economic participation in the rural parts of the country, with human development considered an essential part of an inclusive economy. Mining and minerals processing provides both direct and indirect employment, and through social investment which is regulated through the Mining Charter III.

The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy (National Planning Commission, 2017). The proposed MIOP can contribute towards the realisation of economic development and inclusive growth through revenue and tax generation and the creation of employment opportunities. Through the social interventions contained in the associated SLP, the proposed project can positively contribute to the LED interventions of the Mthonjaneni LM, which in turn should deliver benefit to the communities directly affected by the establishment of the project.

2.1.5 The Broad-based Socio-economic Empowerment Charter for the Mining and Minerals Industry

The Mining Charter, 2018, was gazetted in September 2018, after lengthy consultation and collaboration between stakeholders across the mining industry. The Mining Charter III is envisaged as a tool for driving transformation of the mining and minerals industry while providing policy certainty. At its core, the Mining Charter is premised on the conviction that the mineral wealth of the country belongs to all citizens and those that are located close to the mineral resources should derive socio-economic benefit from extraction and processing. The Mining Charter's vision is to "facilitate sustainable transformation, growth and development of the mining industry" (Republic of South Africa, 2018).

The Mining Charter III uses a scorecard to support transformation while providing policy certainty (Republic of South Africa, 2018). The scorecard includes six elements, with Ownership and Mine Community Development (MCD) considered as 'ring-fenced' elements that require 100% compliance provides a high-level overview of the Mining Charter III scorecard and the relative weighting of the various elements.

Table 2-1 Overview of the Mining Charter III Scorecard

Scorecard element	Objective and compliance target	Weighting
Ownership	To enable effective mineral resource ownership by Historically Disadvantaged Persons (HDP) via meaningful economic emancipation Compliance: - 30% B-BBEE shareholding to be distributed in a specific manner (new mining rights)	Ring-fenced Y/N
Mine Community Development (MCD)	A meaningful contribution towards Mine Community Development with bias towards mine communities both in terms of impact and in keeping with the principles of the social license to operate. Compliance target: - 100% compliant with approved SLP commitments	
Employment Equity (EE)	To attain fairness in the workplace by promoting fair treatment and equal opportunity. Compliance target: - Board: 50% HDP, of which 20% women - Executive management: 50% HDP, of which 20% women - Senior management: 60% HDP, of which 25% women	30%

Scorecard element	Objective and compliance target	Weighting
	<ul style="list-style-type: none"> - Middle management: 60% HDP, of which 25% women - Junior management: 70% HDP, of which 30% women - Employees with disabilities: 1.5% of total workforce - Core and critical skills: 60% HDP 	
Human Resource Development (HRD)	<p>To play an important role in educating and developing mine employees and communities.</p> <p>Compliance target:</p> <ul style="list-style-type: none"> - 5% of leviable amount spent on HRD expenditure, for employees and non-employees, in proportion to applicable demographics 	30%
Inclusive Procurement, Supplier and Enterprise Development (IPSED)	<p>To promote the development of local empowered businesses through targeted procurement and Enterprise and Supplier Development (ESD) spend.</p> <p>Compliance target:</p> <ul style="list-style-type: none"> - 70% procurement of locally manufactured mining goods with 60% local content - 80% procurement of local services from HDP, women-owned, youth-owned, black-owned companies - 70% of total Research & Development spend on South African based entities - 100% of mineral sample analysis spend on South African based facilities 	40%
Housing and Living Conditions	<p>To provide decent housing and living conditions intended to improve employee wellness through ensuring good living standards.</p> <p>Compliance target:</p> <ul style="list-style-type: none"> - 100% compliance with Housing and Living Conditions Standard commitments (convert/ upgrade hostels into family units, occupancy rate of one person per room, facilitate home ownership options for all mine employees in consultation with organised labour) 	Y/N

Source: (Deloitte Touche Tohmatsu, 2019)

The scorecard approach adopted by the Mining Charter III is similar to the approach adopted by the Department of Trade, Industry and Cooperation (DTIC); however, the alignment is imperfect and compliance with the Mining Charter III does not give mining rights holders a corresponding DTIC Broad-Based Black Economic Empowerment (B-BBEE) recognition level, as depicted in Table 2-2.

Table 2-2 DTIC B-BBEE recognition levels and the DMRE scorecard

B-BBEE levels (Per DTIC)	Mining Charter scorecard	Ring-fenced elements + % weighting
Level 1	Ring-fenced elements + 100%	Compliant
Level 2	Ring-fenced elements + 80% to 100%	
Level 3	Ring-fenced elements + 70% to 80%	
Level 4	Ring-fenced elements + 60% to 70%	
Level 5	Ring-fenced elements + 50% to 60%	
Level 6	Ring-fenced elements + 40% to 50%	Non-compliant
Level 7	Ring-fenced elements + 30% to 40%	
Level 8	Ring-fenced elements + 20% to 30%	
Non-compliant	Ring-fenced elements + <20%	

B-BBEE levels (Per DTIC)	Mining Charter scorecard	Ring-fenced elements + % weighting
Non-compliant	Ring-fenced elements not met + weighted element score	

Source: (Deloitte Touche Tohmatsu, 2019)

A product of lengthy collaboration amongst stakeholders across the mining and minerals value chain, the Mining Charter III is considered an improvement on the previous versions, with more reasonable compliance targets for rights holders, while still supporting government's transformation objectives (Deloitte Touche Tohmatsu, 2019). With greater emphasis placed on ownership, MCD, and IPESD, EE, and the implementation of SLP commitments, the Mining Charter III gives mining rights holders a considerable and important role to play in contributing towards transformation and promoting inclusive economic development.

2.1.6 The Carbon Tax Act

The Carbon Tax Act (No. 15 of 2019) came into effect on 1 June 2019 and is built on the 'polluter pays' principle. It is widely considered as South Africa's most far-reaching response to climate change (Strydom & Bradfield, 2019). The Act establishes a new tax regime aimed at supporting the transition to a low carbon economy. This regime is administered in phases, with phase 1 covering the period 1 June 2019 to 31 December 2022. Under this tax regime, a carbon tax is levied on a combination of combustion emissions, fugitive emissions and process emissions, less any tax allowances (Republic of South Africa, 2019).

During phase 1, a carbon tax is levied at a rate of R120 per tonne of carbon dioxide equivalent (Co₂e) of greenhouse gas (GHG) emissions. During phase 1, the tax levied will be adjusted annually by consumer price index (CPI) plus 2%. In phase 2 (from 1 January 2023), the tax rate will be annually adjusted by CPI.

A taxpayer will be liable for carbon tax where it conducts activities set out in Schedule 2 of the Act and emits GHG above the specified thresholds. The Carbon Tax Act recognises six main GHGs that are emitted from industrial processes, each of which has an emission factor which was developed by the Intergovernmental Panel on Climate Change (IPCC) (Zireva, 2020).

The applicable threshold and tax allowances for the mining and quarrying sector are indicated in Table 2-3.

Table 2-3 Schedule 2 allowances and thresholds for the mining and quarrying sector

Description	Value
IPCC code	1A2i
Threshold	10 MW
Basic tax-free allowance for fossil fuel combustion emissions	60%
Basic tax-free allowance for process emissions	0%
Fugitive emissions allowance	0%
Trae exposure allowance	10%
Performance allowance	5%
Carbon budget allowance	5%
Offsets allowance	10%
Maximum total allowances	90%

Source: (Republic of South Africa, 2019)

With the likely operations of the proposed MIOP due to commence during phase 2 of the carbon tax regime, the mine will be required to self-report through the Department of Forestry, Fisheries and Environment

(DFFE) National Atmospheric Emissions Inventory System (NAEIS), with the National GHG Emissions Reporting Regulations of the DFFE providing for emission reporting by taxpayers. Additionally, the tax levy is likely to be in the order of R150 per tonne of CO_2e^3 for all GHG emissions above 10MW, energy efficiency in mine processes will be an important consideration.

2.2 PROVINCIAL POLICY AND PLANNING CONTEXT

As with the national legislative, policy and planning framework, a project's alignment with the provincial policy and planning context is an indication of its strategic importance in supporting the province's development objectives. A review of this provincial context suggests that the proposed MIOP is strategically important to the provincial objectives of creating employment, supporting the development of communities and the people that reside there, developing strategic infrastructure, and delivering spatial equity.

A brief review of the most relevant provincial policy and planning texts is provided below.

2.2.1 The Draft Provincial Growth Development Strategy, 2021

The Provincial Growth Development Strategy (PGDS) provides KwaZulu-Natal with a reasoned strategic framework for accelerated and shared economic growth through catalytic and developmental interventions, within a coherent equitable spatial development architecture, putting people first, particularly the poor and vulnerable, and building sustainable communities, livelihoods and living environments (KwaZulu-Natal Provincial Planning Commission, 2021).

The PGDS vision is for KZN to be "a prosperous Province by 2035 with healthy, secure and skilled population, living in dignity and harmony acting as a gateway for Africa and the World". In support of the vision, KZN's mission is to strive for the following:

- *Maximise its position as a gateway to South and Southern Africa, as well as its human and natural resources, to create a safe, healthy, dignified, and sustainable living environment;*
- *Radically transform its socio-economic landscape, eradicate abject poverty, inequality, unemployment and the burden of disease, basic services have reached all of its people, domestic and foreign investors are attracted to our world class infrastructure and a skilled labour force; and*
- *Deliver an environment where people have healthy and sustainable options on where and how they opt to live, work and play, where the principle of putting people first, living together in dignity and harmony, and where leadership, partnership, and prosperity in action, has become a normal way of life.*

The three pillars of South Africa's national development priorities, which underpin the strategic priorities of KZN, are: a strong and inclusive economy; capable South Africans, and a capable developmental state. The strategic pillars of the KZN PDGS are:

- Building a capable, ethical, and developmental state.
- Economic transformation and job creation.
- Education, skills, and health.
- Consolidating the social wage through reliable and quality basic services.
- Spatial integration, human settlements, and local government.
- Social cohesion and safe communities.

³ Annual price inflation calculated as follows: 2020 = 6.1% (2019 average CPI of 4.1% + 2%); 2021 = 5.3% (2020 average CPI of 3.3% + 2%); 2022 and 2023 = 4.5% (CPI projection)

- Better Africa and Better world.

In addition, other cross cutting goals and objectives relate to prioritising the significant role of women, youth, and people with disabilities in our society. It is believed that if these three groups are strong, the whole society will be strong. These are cross-cutting focus areas that need to be mainstreamed into all elements of South Africa's developmental future and all programmes of government. They will inform interventions across the three pillars.

Through its operations, the proposed MIOP can positively contribute towards the aims of the PDGS through creating employment opportunities, supporting the economic development of the province, enhancing the inclusion of vulnerable groups in the economic activity of the province, and through spatial integration.

2.2.2 The Provincial Growth and Development Plan 2035

The main purpose of the Provincial Growth and Development Plan (PGDP) is to translate the PGDS into an implementation plan which will provide a sound platform for departmental, sectoral, and stakeholder annual performance planning and therefore to guide resource allocation. This document is a strategic management tool to ensure that as a province, there is a concerted and measured effort to achieve the 2035 Vision of the PGDS (Provincial Planning Commission, 2019).

To realise the vision, seven strategic goals and 31 strategic objectives have been identified to guide policy making, programme prioritisation, and resource allocation. The objectives relevant to this project are listed in Table 2-4, below.

Table 2-4 PDGP objectives of relevance to the proposed MIOP

Strategic Goals	Strategic objectives
Inclusive economic growth	<ul style="list-style-type: none"> • Develop and promote agricultural potential in KZN • Promote SMME and entrepreneurial development. • Enhance knowledge economy.
Human resource development	<ul style="list-style-type: none"> • Support skills development to economic growth. • Enhance youth and adult skills development and life-long learning.
Human community development	<ul style="list-style-type: none"> • Eradicate poverty and improve social welfare. • Enhance health of communities and citizens. • Safeguard and enhance sustainable livelihoods and food security. • Promote sustainable human settlements. • Enhance safety and security. • Advance social cohesion and social capital. • Promote youth, gender and disability advocacy and the advancement of women.
Strategic infrastructure	<ul style="list-style-type: none"> • Ensure availability and sustainable management of water and sanitation for all. • Ensure access to affordable, reliable, sustainable, and modern energy for all.
Environmental sustainability	<ul style="list-style-type: none"> • Enhance resilience of ecosystem services. • Expand application of green technologies.
Governance and policy	<ul style="list-style-type: none"> • Eradicate fraud and corruption. • Promote participative, facilitative, and accountable governance.
Spatial equity	<ul style="list-style-type: none"> • Enhance the resilience of new and existing cities, towns, and rural nodes, ensuring equitable access to resources, and social and economic opportunities. • Ensure integrated land management use across the province, ensuring equitable access to goods and services, attracting social and financial investment.

Source: (Provincial Planning Commission, 2019)

The proposed MIOP should be aligned to the objectives of the province to ensure that the 2035 vision is achieved. The spatial marginalisation from economic opportunities of most of the population needs to be addressed to reduce poverty and inequality and ensure shared growth and the protection of vulnerable bio-resources and supporting the inclusion of these marginalised groups in the economy is a likely outcome of the MIOP's operations.

2.2.3 Provincial Spatial Development Framework (PSDF)

The KZN Provincial Spatial Development Framework (PSDF) vision is to utilise physical and environmental resources toward greater spatial integration and sustainability. The envisaged provincial spatial development outcomes include an integrated and inclusive province, sustainable province, resilient province, productive and efficient province, and well managed province (KZN CoGTA, 2021).

The strategic goals and objectives relevant to this project are indicated in Table 2-5, below.

Table 2-5 PSDF objectives of relevance to the proposed MIOP

Strategic Goal	Strategic objectives
Integrated and inclusive land development	<ul style="list-style-type: none"> Improved integration between urban/ rural opportunities and needs. Actively create more inclusive settlement in especially Traditional Authority areas.
Sustainable use of resources	<ul style="list-style-type: none"> Sustainable use and protection of critical natural resources needed as basis for health and development. Sustainable land use management and spatial planning towards sustainable settlements.
Establishing a resilient province	<ul style="list-style-type: none"> Reduce environmental degradation and loss which increases human vulnerability. Create social, economic, and ecological resilience in spatial planning and land use management.
Productive and efficient development of the spatial economy	<ul style="list-style-type: none"> Develop and promote the agricultural potential of KZN. Develop and promote the biodiversity economy in KZN. Provide regional infrastructure networks to support economic production. Focus spatial economic development in strategic areas

Source: (KZN CoGTA, 2021)

Implications of the PSDF to mining, is to ensure that sustainability is achieved. Spatial sustainability of the province is based on the spatial structuring and development of the province in a manner which will maintain the bio-physical environment while providing the social and economic opportunities required within settlements and communities. The following intended outcomes will contribute to the development of a sustainable province and will need to be observed by the mine:

- Protection and sustainable development of land and water resources towards an integrative economic structure.
- Water resources are protected, used sustainably and well-managed by both authorities and communities.
- Increased air quality monitoring and management in both urban and rural production areas.

2.3 LOCAL POLICY AND PLANNING CONTEXT

The national policy and legislative framework require that the EA of mine operations consider the local policy framework through the inclusion of a SLP that is cognisant of, and contributes towards, the local

municipal IDP’s LED objectives and interventions. A review of the relevant policy and planning documents for Mthonjaneni LM and uMlalazi LM is included in the sub-sections that follow.

2.3.1 Mthonjaneni Municipality Local Economic Development Strategy review

Mthonjaneni Municipality LED Strategy (Mthonjaneni Municipality, 2021/2022) aims to achieve the following objectives.

- Reduction in income leakage – ensure spendable income is utilised within itself.
- To increase investment (local and external) – investment in tourism, agriculture and business is to be promoted.
- To promote local business development and business interaction – interaction between businesses will contribute to countering income leakage and establishing a new vibrancy in the economy.
- Increase entrepreneurial opportunities and employment – all the objectives need to be supported by a strong focus on entrepreneurial development, micro and small business establishment, and employment creation through appropriate support mechanisms.

The key strategies of Mthonjaneni Municipality relevant to the proposed development include:

Table 2-6 Mthonjaneni LM LED Sector strategies of relevance to the proposed MIOP

Sectors	Strategies
Business Sector	<ul style="list-style-type: none"> • Institutional structuring for delivery. • Capacity building and training. • Establishing/building agri-industries. • Establishing small scale mining. • Municipal business strategies.
Agriculture Sector	<ul style="list-style-type: none"> • Institutional structuring for agricultural delivery. • Sustainable land reform. • Improved market access for agricultural produce. • Visible delivery in agricultural sector. • Municipal agricultural strategies.
Tourism Sector	<ul style="list-style-type: none"> • Institutional structuring for tourism • Tourist information inside the district. • Tourist information outside the district. • Making tourists feel safe and welcome. • Community tourism. • Visible tourism delivery. • Municipal tourism strategies.

Source: (Mthonjaneni Municipality, 2021/2022)

Considering the above, the proposed MIOP has a responsibility to respond to or to align itself with the objectives of the municipality. It should promote local business development and business interaction by supporting local businesses, giving priority to existing businesses when outsourcing work which will encourage interaction between businesses and will contribute to countering income leakage and establishing a new vibrancy in the economy. Through capacity building and training interventions, the proposed project will also contribute meaningfully to the upskilling of the community. Importantly, the proposed MIOP must take measures to limit any negative impacts on agriculture and tourism development, as these are both considered vital sectors of the municipal economy.

2.3.2 Mthonjaneni Municipality Integrated Development Plan review

According to the Mthonjaneni IDP, Mthonjaneni's vision is to excel in service delivery and good governance to all their communities, building the trust between the communities and the municipality (Mthonjaneni Municipality, 2021/2022). The municipal mission is committed in creating a stable and secure environment, and deliver quality services to residents.

Some of the key challenges facing the municipality include the following:

- Limited job opportunities for the population, with dependency on the agricultural sector for employment opportunities. There is, however, an opportunity to develop other development sectors including the service sector, and industrial and commercial sectors.
- Unresolved land claims that impact on future development.
- Limited access to basic household and community services.
- Increased incidents of Human immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) and communicable diseases.
- High rate of unemployment which leads to poverty and low economic growth.
- Depletion of infrastructure due to variations in climatic conditions.
- High rate of illiteracy resulting in a diminished ability for high-skilled, well-paid employment.
- The projections indicate that approximately 3.1 % of households (317) within the municipal area, are in the homeless and informal dwelling/shack category.

Through the implementation of the IDP the Municipality wants to:

- Improve livelihoods of communities through the following programmes:
- Implement the Expanded Public Works Programme (EPWP) and the food for waste programme.
- Implement Operation Sukuma Sakhe.⁴
- Provide educational support to youth at tertiary level.
- Implement skills development programmes.
- Youth empowerment through Local Economic Development.
- Focus will be made on labour intensive capital projects

The municipality intends to provide quality services to all residents through:

- Enhancing communication channels between the municipality and the community through Public Participation and IDP review processes.
- Improving and maintaining infrastructure.
- Maintaining financial viability.
- Strengthening public consultation.
- Providing infrastructure in rural wards by allocating 60% of the Municipal Infrastructure Grant to projects that support infrastructure provision.

The proposed MIOP can help mitigate some of the challenges that the municipality is currently facing by creating employment opportunities for the resident population. The mine will bring new job opportunities that require various skills from unskilled labour, semi-skilled and skilled labour. This will shift the dependence of the community on the agricultural sector for employment opportunities and provide the community with in-demand skills. An effective SLP will support the municipality in tackling some of the

⁴ This refers to the integrated service delivery model of the KwaZulu Nata Government that seeks to bringing together all service delivery stakeholders to provide services in an integrated manner

challenges such as the high rate of illiteracy through investment in Adult Basic Education and Training (ABET) and investment in municipal infrastructure, amongst others.

2.3.3 uMlalazi Municipality Integrated Development Plan

The uMlalazi LM IDP states that the municipal vision is to model the municipality for community empowerment and provision of services by a transformed institution in an area where everyone lives in harmony, by 2035 (uMlalazi Local Municipality, 2021/2022).

The uMlalazi LM, in partnership with its community, will strive to:

- Create sustainable and better services for all.
- Ensure a skilled, motivated and committed workforce.
- Create mutual trust and understanding between the municipality and the community through effective communication.
- Emphasise better usage of resources.
- Provide infrastructure and build investor confidence.
- Enhance Batho - Pele principles and Business-to-Business pillars.
- Create a safe environment for all.
- Improve the Green Economy of our community by partnering with all stakeholders to create a clean and safe place where people live and work.
- Ensure effective land use management that take cognisance of sound environmental practices.
- Enhance good governance through leadership excellence and community participation.
- Facilitate institutional transformation.
- Ensure continued sound financial management.
- Provide services to the entire community with diligence and empathy.
- Apply good and transparent corporate governance to promote community prosperity.

In uMlalazi Municipality, mining is considered as a competitive advantage, with various types of mining activities possible throughout the municipal area. Mining is also used as a mechanism aimed at expanding employment opportunities through direct employment and the development of small, medium, and micro-enterprises (SMMEs). The IDP highlights that the municipality still has untapped opportunities in the mining sector; although, there is an existing operational mine in the municipal area, the mining sector is underdeveloped, additional studies are required to determine the extent of mineral deposits

2.3.4 uMlalazi Municipality Spatial Development Framework

The SDF is the spatial representation of uMlalazi IDP and is intended to guide decision-making related to the development of land or planning for the future use and development of land. The SDF vision for uMlalazi is that by 2035, uMlalazi Municipality will be a socially inclusive, economically viable, environmentally friendly, and spatially resilient Municipality where its people enjoy living (uMlalazi Local Municipality, 2019a).

The key strategic goals and objectives which have been identified in line with the key issues include:

- Goal 1: Promote a uniform land use management system,
- Goal 2: Promote economic and social development,
- Goal 3: Promote accessibility to sustainable services and facilities,
- Goal 4: Protection of High Agriculture potential areas and Natural Environment, and
- Goal 5: Promote sustainable human settlements and safer communities.

These objectives will need to be taken to account in the development of the proposed MIOP, which although not located within uMlalazi LM, could have spill-over effects into the municipal area due to its location on the municipality's border.

2.3.5 uMlalazi Agricultural Plan

Agriculture in uMlalazi LM is the second largest contributor to the municipal economy and the number one employer of all economic sectors. This strategic plan is designed to grow the agriculture sector so that it becomes a sustainable economic sector that continues to contribute positively to the Gross Regional Domestic Product (GRDP)⁵ while responding unequivocally to the challenges of unemployment, inequality, and poverty. The focus of this strategic framework is on developing local emerging farmers into commercial farmers through the implementation of agricultural practise that is sustainable, innovative and responds to the challenges of climate change.

uMlalazi Agriculture Sector Vision Statement is: "To be a leading economic sector in the municipality through exponentially increasing GDP-R [Gross Domestic Product of Region] contribution, decent work creation, community livelihood improvement and farmer capacity building while employing massive production and sustainable agriculture practise at the behest of modern technology and innovation" (uMlalazi Local Municipality, 2019b).

The Mission Statement that accompanies the Municipal Agriculture Sector Vision is as follows:

"Continuously subject local farmers to various forms of training, mentorship and capacity development initiatives that will render the farmers with the inclination to be market oriented in their farming practise, adaptive to inclement weather patterns, using scarce resources sparingly and have sound and sustainable business management practise" (uMlalazi Local Municipality, 2019b).

These vision and mission statements guide the strategic development framework, which is based on the following five strategic pillars:

- Strategy 1 – Infrastructure Development.
- Strategy 2 – Optimum Production.
- Strategy 3 – Market Penetration.
- Strategy 4 – Institutional Support and Initiatives.
- Strategy 5 - Capacity Building and Organisation of Farmers.

Agriculture is one of the leading sectors in uMlalazi LM, with the Nkwalini Valley being classified as a CLASS A High Potential Agricultural Area (HPAA) which should be preserved for agricultural production (uMlalazi Local Municipality, 2021/2022). Therefore, any negative impact that can threaten this sector can have devastating consequences for the municipal economy, the individuals that are dependent on this sector for employment, and the enterprises and businesses in the agricultural value chain. Mining operations have the potential to negatively impact the sustainability and success of the agricultural sector through direct impacts to water, soil, and air quality. These negative impacts can be permanent and render previously fertile agricultural land unusable and any associated development that occurs within CLASS A HPAA should immediately raise a red flag.

⁵ Gross Regional Domestic Product (GRDP), Gross Domestic Product of Region (GDP-R) and Gross Value Added (GVA) are all terms which are used to indicate the production output and size of an economy of a region that is smaller than a country.

2.4 SYNOPSIS OF THE POLICY AND LEGISLATIVE FRAMEWORK

The review of relevant legislation, policies and strategic planning documentation related to the mining sector indicates that large-scale mining and minerals processing, and therefore the establishment of the proposed MIOP, is strategically supported at a national, provincial, and local level. However, while this is an indication that the project could contribute meaningfully towards various policy objectives and targets, specifically those related to job creation, local economic development, social upliftment and transformation, and spatial equity, there is a need to consider and mitigate unintended impacts on other economic sectors, in particular tourism and agriculture, to ensure that the MIOP's establishment does not give rise to a 'zero-sum-game' in which benefits of the MIOP come at the expense other economic sectors.

It is therefore clear that the proposed project does not directly contradict any of the spatial development plans or strategic development objectives of the local and provincial government. However, should associated infrastructure be located within high potential agricultural land in the Nkwadini Valley, this would, likely, be objected to by parties within both the private and public spheres. Moreover, any impacts which may negatively impact the commercial agriculture's productivity and sustainability would likely have a detrimental effect on employment due to the labour intensity of the agricultural sector and the strong backward and forward linkages which create considerable multiplier effects.

Mitigation measures would be required to limit or avoid negative impacts on agricultural productivity in the Nkwadini Valley which may arise from changes in air quality and water quality (and quantity).

3 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The baseline profiles which follow are provided for the two LMs that are likely to be most impacted by the proposed MIOP, namely, Mthonjaneni LM and uMlalazi LM, with more detailed profiles provided for the directly affected community (depicted as the red shaded area in Figure 4, on page 5).

3.1 ECONOMIC PROFILE

Data on the economic structure and sectoral contribution are not collected at a sub-municipal level in South Africa for non-metropolitan municipalities and, as such, it is not possible to determine the structure of the economy of the directly impacted community, however, it is considered to be broadly similar to the economic structure of Mthonjaneni LM.

To contextualise the economic profile of Mthonjaneni LM and uMlalazi LM, it is important to first understand the macroeconomic context of the country. Therefore, the following sub-sections first provide a snapshot of the South African economy, and thereafter focuses on the economic structure and profile of the municipal economies.

3.1.1 Snapshot of the South African Economy

After five consecutive quarters of contraction, from the third quarter of 2019, the South African economy has turned a corner and has seen three consecutive quarters of growth in real Gross Domestic Product (GDP) output⁶⁶, with a 13.5% increase in the third quarter of 2020 (annualised: 66.1%), a 1.4% increase in the further quarter of 2020 (annualised: 5.8%) and a 1.1% increase in the first quarter of 2021 (annualised: 4.6%) (StatsSA, 2021a). However, these gains come off the back of a significant slump in real GDP output in the second quarter of 2020, during the most restrictive months of the nationally imposed Covid-19 lockdown, which severely curtailed both economic activity and the movement of people (StatsSA, 2020a).

Whilst the consecutive quarterly increases in real GDP output seem impressive, it comes off the significant contraction experienced in the first half of 2020. Despite the rebound, South African industries still have a long way to go to reach pre-pandemic production levels with the economy currently 2.7% smaller than it was in first quarter of 2020 (StatsSA, 2021a).

3.1.2 Sectoral overview

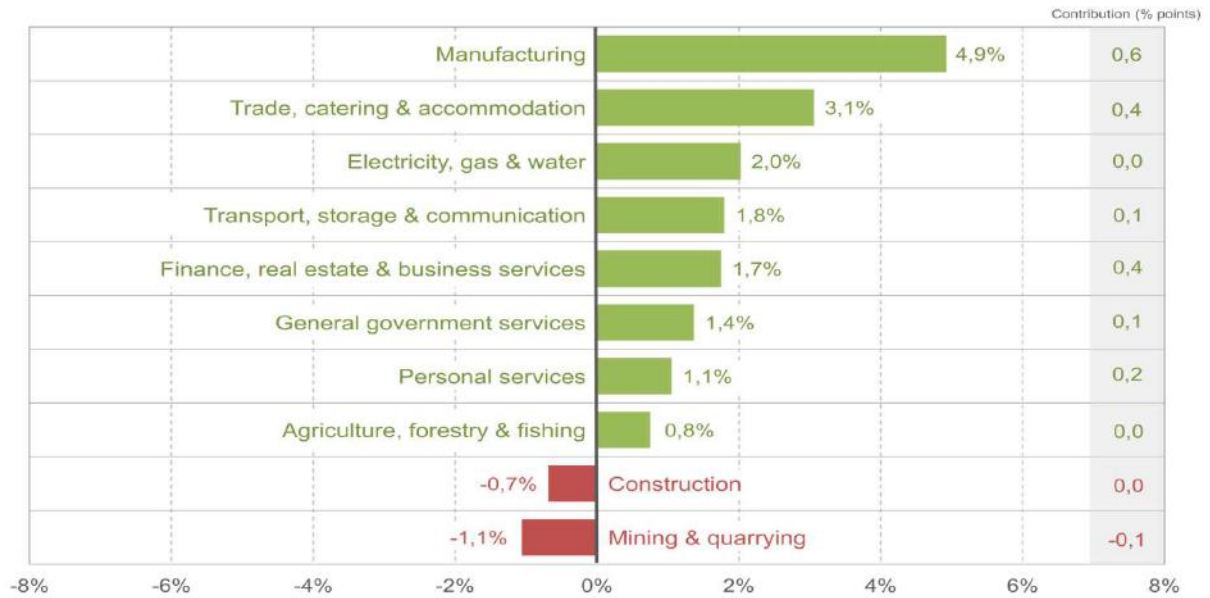
After a significant slump in the first half of 2020, due in large part to the Covid-19 pandemic which dented both the supply side (production) and demand side (consumption) of the South African economy, the country's economy rebounded in the second half of 2020 as lockdown restrictions eased. Despite this strong rebound, the country's economy contracted by 7% in 2020 (Quantec, 2021a).

Recent statistical releases from StatsSA point to a continuation of the positive trend of economic growth at a national level, with the economy now considered to be back to pre-pandemic levels in terms of GDP (StatsSA, 2022). Figure 5, on the following page, provides an overview of the sectoral performance of the South African economy in the first quarter of 2022.

⁶⁶ Real GDP output is considered a more accurate reflection of the change in productivity levels in an economy because it considers the market price of goods and services produced and then adjust for inflation, also known as a GDP deflator. Nominal GDP, on the other hand, is the market value of goods and services produced in an economy, unadjusted for inflation, and can be used to gauge consumer purchasing power.

Eight of the ten industries recorded a rise in economic activity in Q1: 2022

Industry growth rates. Q1: 2022 compared with Q4: 2021 (constant 2015 prices, seasonally adjusted)



Taxes less subsidies on products (contribution: 0,2 of a percentage point) Source: Gross domestic product (GDP), 1st quarter 2022

Figure 5 South Africa's sectoral performance in 2022: Q1

Source: (StatsSA, 2022)

Originally based around the primary sector owing to an abundance of mineral wealth and favourable agricultural conditions, South Africa’s economy has undergone structural shifts over the last three decades, driven primarily by the tertiary sector. The economic structure is now considered to be diversified, with strong contributions from the secondary, and tertiary sectors.

Figure 6 below, provides an overview of the economic structure of the economy in 2019, with no profound structural changes occurring in the last two years.

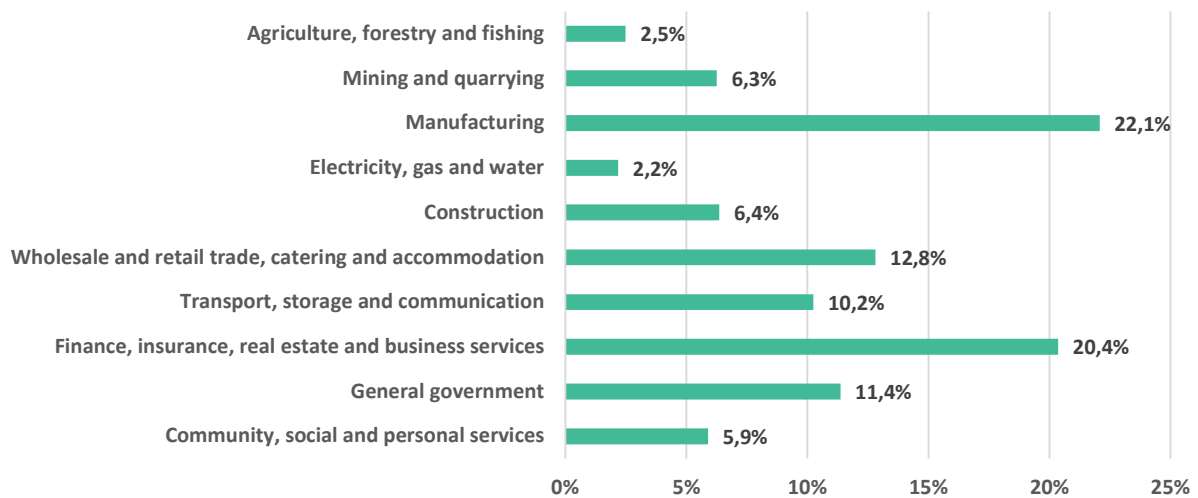


Figure 6 Structure of the South African economy (2019) (Quantec, 2021b)

The following can be understood from the figure above:

- The primary sector, comprising agriculture and mining, accounts for 8.7% of economic activity, with the lion's share contributed by the mining sector.
- The secondary sector, comprising manufacturing, electricity, gas, and water, and construction, accounts for 30.6% of the country's economy, with the manufacturing sector driving this contribution.
- The tertiary sector, which comprises trade, transportation, finance and business services, general government, and community, social, and personal services, accounts for 60.7% of the economic activity in the country, with the finance and trade sectors considered the engines of growth in this sector.

The composition and structure of the economy indicates that South Africa is moving towards a knowledge-based economy, with a greater focus being placed on technology, e-commerce, and financial and business services. Nevertheless, while there is a shift towards a tertiary economy, the productive economic sectors, viz. the primary and secondary sectors, are considered important drivers of GDP and are critical to generating economic activity, creating employment opportunities, and securing much-needed export revenue.

3.1.3 Other key national indicators

3.1.3.1 Inflation rate

Annual CPI inflation averaged 3.1% in the third quarter of 2020 as lockdown restrictions continued to ease, a jump up from the 2.4% recorded in the previous quarter, but still down on the first quarter number of 4.4% as well as the 4.1% recorded a year ago. The first quarter of 2021 saw a 3.2% increase in headline CPI, a 0.7% month-on-month increase from February 2021 (StatsSA, 2021d). This increase in inflation was driven by the following price movements:

- The main drivers of inflation were food and non-alcoholic alcoholic beverages (5.7%), followed by education (4.1%), miscellaneous goods and services (4%), transport (3.8%), and alcoholic beverages and tobacco (3.7%).
- Below average rates of price increase were recorded by health (3.1%), housing and utilities (2.2%), and recreation and culture (1.8%).
- Insignificant price increases were recorded by household equipment (0.7%), clothing and footwear (0.3%), and restaurants and hotels (0.1%).
- Communication prices showed slight deflation (-0.5%).

Projections suggest that inflation risks appear to be strongly biased to the upside in the short- to medium term, with utilities (water, electricity, and municipal rates) and fuel expected to be the main drivers in the second half of 2021. In 2022, the upside inflation risk has materialised, with China's response to the omicron variant of Covid-19 outbreak, the continuing conflict in Ukraine, and renewed load shedding by Eskom all weighing heavily on the South African economy. Inflation has pushed past the midpoint of the South African Reserve Bank's (SARB) inflation range and is projected to be 5.9% for 2022. As a result, the SARB is now in a rate hiking cycle in an attempt to tame inflation. The SARB Monetary Policy Committee (MPC) has hiked rates by 1.25% since the start of the year, to 4.75%, with economists forecasting at least another 50 basis points increase by the end of 2022 (South African Reserve Bank, 2022).

3.1.3.2 Fuel prices

South African fuel is generally considered expensive, especially in comparison to neighbouring countries to which South Africa exports with prices influenced by the global oil market, the exchange rate and South African fuel levies (general fuel levy and the road accident fund levy). Fuel levies account for almost 40% of

the fuel price (R6.11/ litre), with the latest fuel levies being implemented in April 2021, pushing the price of fuel to all-time highs (AA SA, 2021b).

Figure 7 depicts the South African coastal fuel prices over the last 18 months, January 2019 to June 2021.

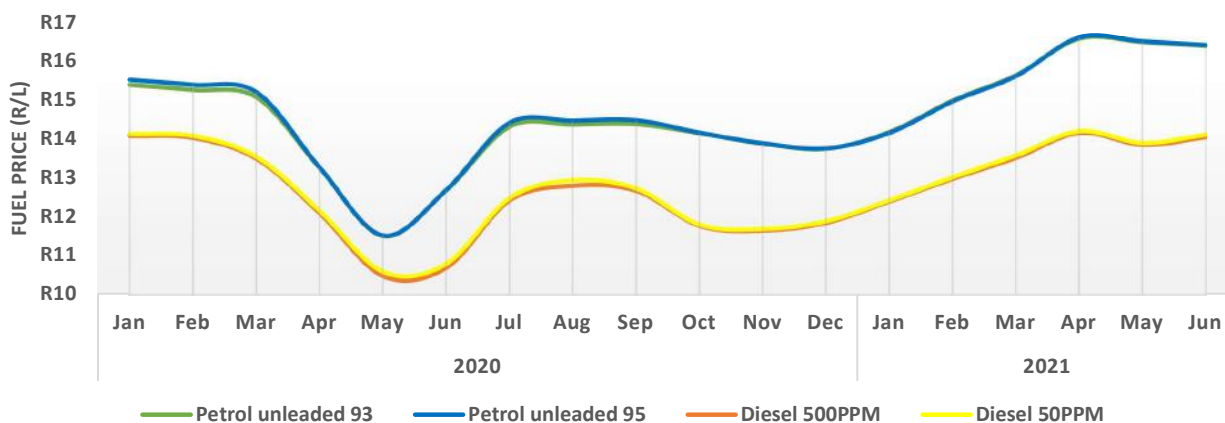


Figure 7 Coastal fuel prices, January 2020-June 2021 (AA SA, 2021a)

Fuel prices for 2020 were particularly low, dropping to 2016 levels at R11.51 for Unleaded Petrol and R10.48 for Diesel in May 2020 (AA SA, 2021a), with fuel users now paying around R5 per litre more than they were a year ago. It must be noted, however, that the dramatic drop in fuel prices in April and May were record decreases, and will unlikely occur again soon, if ever. With global economic activity slowly improving, the cost of international petroleum is expected to also increase slowly resulting in steadily increasing local fuel prices.

Following month-on-month increases in the fuel price since July 2021, petrol (95 unleaded) is currently (as at 6 June 2022) priced at R23.42 per litre, a 24% increase since the start of 2022 and 103% since the low of R11.51 in May 2020 (AA SA, 2021b).

3.1.3.3 Exchange rates

The global Covid-19 pandemic caused heightened volatility in financial markets throughout 2020 with fluctuations in currency markets having largely followed the spread of the pandemic. The United States Dollar (USD) currency depreciated drastically against the euro between late May and early September 2020.

In the second quarter of 2021, the South African Rand has surprised on the upside, rebounding from the lows of 2021 and rallying to its strongest level against the USD in almost three years (R13.43/ USD), due to a rebound in commodity prices, a global economic recovery, and loose monetary policy in the United States of America, which has seen nearly \$5.2 trillion worth of quantitative easing since the start of the Covid-19 pandemic, and pushed up inflation (Cox, 2021).

Recent announcements by the United States Federal Reserve about slowing down the rate of easing and hiking interest rates in the short- to medium-term, have caused the South Africa currency to retreat to R14.40/ USD and placed it last amongst its emerging market peers (Naidoo, 2021). Increasing interest rates in the USA make the US economy more investment-friendly and tend to drive a risk-off market sentiment in emerging markets. Continuing depreciation in the local currency relative to the USD is likely to drive inflation higher through increased fuel prices. Conversely, a weaker local currency is normally seen as a positive for commodity exporters.

3.1.3.4 Trade

South Africa's trade surplus more than halved from R202 billion in the first quarter of 2020 to R91.5 billion in the second quarter. The reduction in the trade surplus resulted from a larger contraction in the value of net gold and merchandise exports than merchandise imports. The decline in the value of both exports and imports reflected lower volumes. However, since May 2020, monthly trade statistics have reflected a significant improvement in the trade account, with the trade surplus amounting to R39 billion in August 2020.

Following from strong export performance linked to surging commodity prices, and muted import demand, South Africa's trade surplus remains substantial, at R425 billion in the fourth quarter of 2020 (Quantec, 2021a). In April 2021, the trade balance was R51.24 billion, bringing the cumulative surplus for 2021 (January to April) to R147.83 billion, a notable improvement from the trade deficit of R4.41 billion in the same period in 2020 (Stoddard, 2021).

Year-to-date exports are now close to their levels recorded during the same period in 2019 (0.4%), although this is partly owing to some elevated export prices. The year-to-date increase in exports is mainly owing to a large increase in precious metals and stones exports, which overshadows the weakness in other export categories (vegetable products and animal and vegetable fats).

Total imports increased 7.4% month-on-month, but on a year-to-date basis, were still 15.9% lower than in the corresponding period in 2019. More than a quarter of this year-to-date, year-on-year decline is owing to a smaller oil imports bill which in turn is mainly because of lower oil prices. The broad-based increase in imports is consistent with the general economic recovery envisaged, although the numbers are still well below their pre-pandemic peaks and consistent with the weakness in domestic demand.

3.1.3.5 Business confidence overview

In South Africa, the South Africa Chamber of Commerce and Industry (SACCI) Business Confidence Index (BCI) reflects the neutral sentiment in the marketplace, as it captures the prevailing business climate and what businesses are experiencing. The index is composed of thirteen sub-indices, including energy supply, manufacturing, exports, imports, vehicle and retail sales, construction, inflation, share prices, private sector borrowing, financing cost, precious metal prices and exchange rate.

South Africa's SACCI BCI rose above pre-pandemic levels to 93.4 in November 2020 from 92 in October (Trading Economics, 2021). November's reading marks the highest reading since April 2019, driven by low inflation and the resumption of trade, amid the easing of lockdown restrictions. Still, "confidence remains plagued by poor economic performance, high unemployment, and the government's rapidly rising debt levels", stated SACCI. Figure 8 reflects the BCI forecast to July 2022.

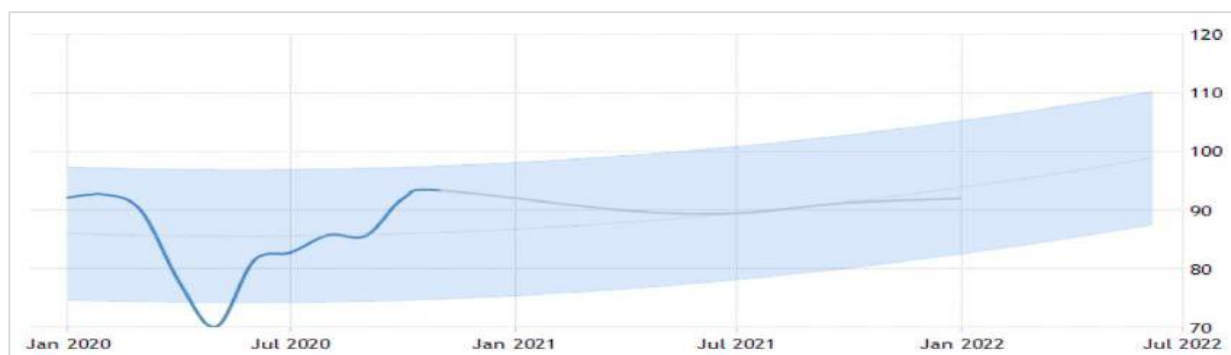


Figure 8 Business Confidence Index Forecast 2020 – 2022 (Trading Economics, 2021)

The SACCI BCI in South Africa is expected to be 93.00 points by the end of 2020, according to Trading Economics global macro models and analysts’ expectations. In the longer-term, the South Africa SACCI BCI is projected to trend around 91.30 in 12 months’ time, 92.00 points in 2021 and 92.50 points in 2022 according to Trading Economics’ econometric models.

3.1.4 Regional economic profile

The regional economic structure of both Mthonjaneni LM and uMlalazi LM is dominated by the primary and secondary sectors, with a reliance on the agriculture and manufacturing sectors to support economic growth in both municipal economies. Combined, the primary and secondary sectors account for 59.3% and 47.4% of economic activity in Mthonjaneni LM and uMlalazi LM, respectively. uMlalazi LM exhibits signs of a move towards a tertiary based economy, with this sector accounting for 52.5% of economic activity, driven by a comparatively more advanced finance and business services sector. Figure 9 provides a snapshot of the structure of the municipal economies in 2019.

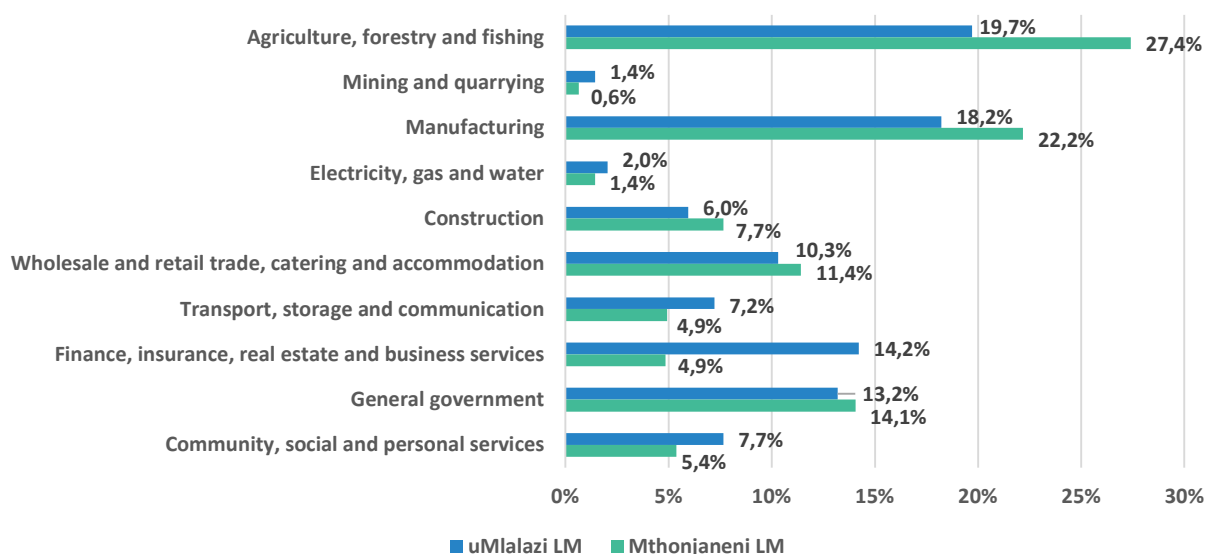


Figure 9 Mthonjaneni LM and uMlalazi LM economic profile, 2019 (Quantec, 2021b), Urban-Econ, 2021

In both municipal economies, agriculture and mining are the engines of economic productivity, although Mthonjaneni LM is more reliant on these sectors than uMlalazi LM. In the tertiary sector, general government is a notable sector in both economies; for Mthonjaneni LM it is the third largest sector, while for uMlalazi it is the fourth largest. Trade also plays a notable role in both economies, while uMlalazi LM has a more advanced finance and business services sector (the third largest economic contributor).

At a scale smaller than a country, Gross Value Added (GVA) is used as a measure of GDP⁷. Considering the economy as whole, both Mthonjaneni LM and uMlalazi LM followed a similar growth trajectory between 2009 and 2019, as illustrated in Figure 10, on the following page.

⁷ The relationship between GDP and GVA is defined as: $GDP = GVA + Taxes - Subsidies$. Given that the total aggregates of taxes and subsidies are available only at the scale of the whole economy, GVA is used to measure GRDP. GVA is the difference between output and intermediate consumption for any given sector/ industry.

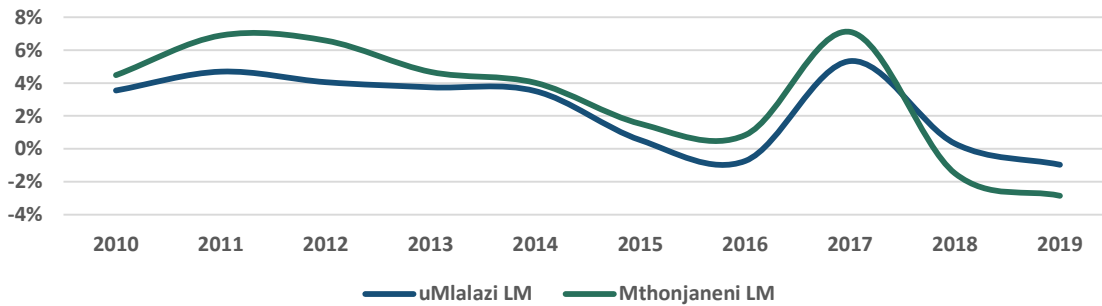


Figure 10 Year-on-year change in GVA in Mthonjaneni LM and uMlalazi LM, 2009-2019 (Quantec, 2021b), Urban-Econ, 2021

After a period of positive and improving growth, from 2011, both economies began a slow downward trend, with growth in uMlalazi LM falling flat in 2015 (0.5%) and dipping into recession in 2016 (-0.7%). Mthonjaneni LM on the other hand narrowly escaped recessionary territory, with insignificant but positive growth in 2016 (0.8%). Both economies experienced a notable rebound in 2017, recording growth of 5.3% (uMlalazi LM) and 7.1%, before plummeting back into recession in 2018 and 2019.

The reliance on the primary and secondary sectors and the impacts of these sectors on overall changes in GVA is evident in Figure 11.

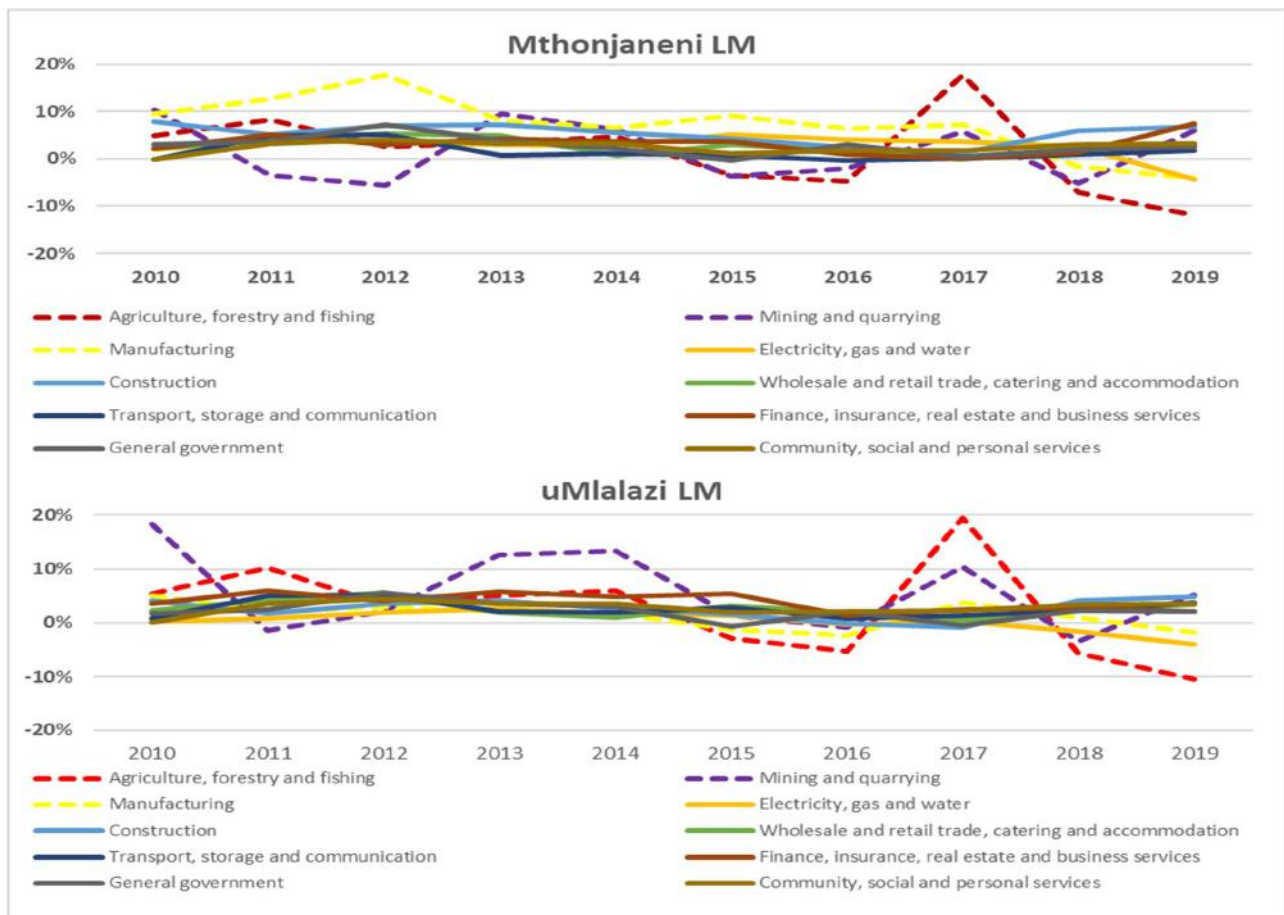


Figure 11 Year-on-year change in sector GVA in Mthonjaneni and uMlalazi LM, 2009-2019 (Quantec, 2021b), Urban-Econ, 2021

3.2 DEMOGRAPHIC AND SOCIO-ECONOMIC PROFILE

This section analyses the socio-economic and demographic profiles of the two local municipalities that are most likely to be affected by the proposed MIOP, namely: uMlalazi LM, and Mthonjaneni LM.

In developing demographic profiles, the research team has relied on the most comprehensive statistical source available at the spatial scale of LMs: namely the Census 2011. Where possible, this has been augmented with data obtained from the Community Survey 2016, however, as a derived dataset, caution is necessary when utilising this data. For population projections specifically, the data has been augmented with information obtained from the Center for International Earth Science Information Network (CIESIN), which contains some of the mostly widely accepted projections of global population.

Table 3-1 provides a summary of the demographic profile of Mthonjaneni LM and uMlalazi LM, which is thereafter explored in more detail.

Table 3-1 Summary of the demographic profile of Mthonjaneni LM and uMlalazi LM

Area	Mthonjaneni LM	uMlalazi LM	Unit
Category			
Population	42 599	207 251	Persons
Households	9 956	47 995	Households
Average household size	4.3	4.3	Persons per household
Area	1 086	2 214	Square kilometres (km ²)
Household density	9.2	21.7	Households per square kilometre
Age profile	40%	35%	Younger than 15
	55%	58%	Working Age (15-64)
	5%	8%	Elderly (older than 65)
Age dependency ratio	83%	73%	Per 100 persons
Education profile	12.9%	10.7%	No schooling
	16.1%	12.4%	Some primary
	4.6%	3.2%	Complete primary
	28.9%	28.3%	Some secondary
	33.0%	38.7%	Grade 12/ National Senior Certificate
	4.4%	6.8%	Higher
Employment profile	69.8%	59.9%	Employed
	11.4%	15.3%	Unemployed
	18.8%	24.8%	Discouraged work-seeker
Household income profile	2.3%	3.7%	No income
	61.3%	54.4%	Low income
	18.7%	20.1%	Low/ Middle income
	16.5%	19.1%	Middle/ high income
	1.1%	2.7%	High income

Source: StatsSA: Census 2001 & 2011, Urban-Econ, 2021

3.2.1 Population, households, and age distribution profile

When analysing the population of the two LMs, a consistent trend of population contraction emerges in both uMlalazi LM and Mthonjaneni LM. The predominantly rural nature of these LMs suggests that population contraction could be driven by an outflow of people searching for economic opportunities in the nearby urban centres of Empangeni and Richards Bay, in the City of uMhlatuze LM.

Table 3-2 provides a snapshot of population projections for uMlalazi LM and Mthonjaneni LM and includes the City of uMhlatuze LM for contextual purposes. This supports the view of out-migration from uMlalazi and Mthonjaneni LMs and in-migration to the City of uMhlatuze LM.

Table 3-2 Population profile, 2020-2050

Area	Year				Compound Annual Growth Rate (CAGR)
	2020	2030	2040	2050	
Mthonjaneni LM	43 119	43 710	39 666	34 304	-0.76%
uMlalazi LM	195 692	202 657	189 275	170 514	-0.46%
The City of uMhlatuze LM	360 270	450 345	515 346	581 295	1.61%

Source: (Center for International Earth Science Information Network (CIESIN), Columbia University, 2018)

According to the CIESIN dataset, which includes population projections for the period 2010 to 2050, in 2020, the population of Mthonjaneni LM is projected to be 43 119, while that of uMlalazi LM is projected to be 195 692. Over the next 30 years, these two areas are projected to experience a net population contraction of 0.76% and 0.46% per year. This contrasts with the City of uMhlatuze, which is projected to experience a net growth in population of 1.61% per year for the next three decades, which is above the national average growth rate of the South African population experienced in the period 2001 to 2011 which sits at approximately 1.2% per year.

Considering the household profile of the two LMs, a divergent trend is evident, with Mthonjaneni LM experiencing a contraction in the number of households and uMlalazi experiencing a growth in households, as indicated in Table 3-3.

Table 3-3 Household profile, 2021*

Area	Years		10-year CAGR	2021 projection
	2001	2011		
Mthonjaneni LM	12 658	11 226	-1.19%	9 956
uMlalazi LM	44 611	46 272	0.37%	47 995

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011) & Urban-Econ, 2021

Using data obtained from Census 2001 and Census 2011, Mthonjaneni LM has experienced an average annual contraction of 1.19% over the last decade, with a projected 9 956 households in the local area in 2021. uMlalazi LM on the other hand, has seen average annual growth in households of approximately 0.37%, with a projected 47 995 households in the local area in 2021. The divergent trend in household growth in the face of contracting population in both municipal areas suggests that people are leaving Mthonjaneni LM in search of economic opportunities and better services. Another possible reason behind

the trend could lie in improving education levels and a growing cohort of young professionals who have moved out of the family home but chosen to continue residing in the area.

Population distribution according to age plays an important role in an economy since it provides an indication of the size of the labour pool. The economically active persons (EAPo) are defined as those that fall into the 15-64 age bracket and is the proportion of the population that has the potential to perform labour. This definition excludes the youth (below 15 years of age) and elderly (above 65 years of age). Understanding the relative distribution of these three broad groupings provides insight into the relative dependency in any particular area. Figure 12 illustrates the population distribution in terms of age and gender.

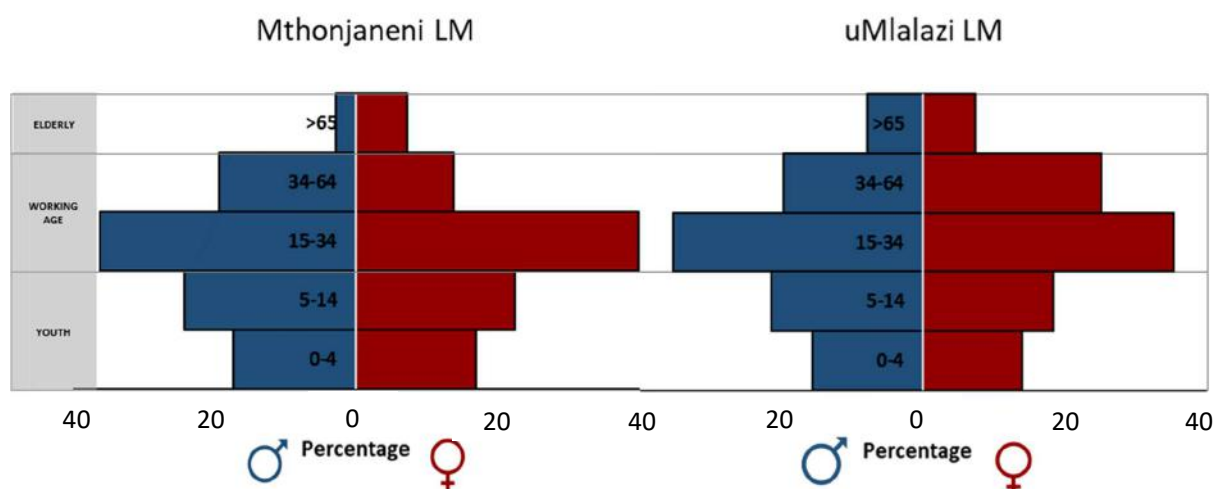


Figure 12 Population pyramid for Mthonjaneni LM and uMlalazi LM, 2021*

*Extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

The age dependency ratio is a measure of the degree to which the EAPo is relied upon to provide for and support the youth and elderly segments of the population. The higher the ratio, the greater the level of dependency and burden placed on the EAPo. Table 3-4 provides an overview of the population distribution per segment and the resulting dependency ratio.

Table 3-4 Population distribution, 2021*

Population segment	Mthonjaneni LM	uMlalazi LM
Youth	35%	40%
EAPo	58%	55%
Elderly	8%	5%
Age dependency ratio	73	83

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

While it is encouraging to see that the bulk of the population falls into the working age/ EAPo segment, 58% in Mthonjaneni LM and 55% in uMlalazi LM, this is still a relatively low proportion and creates a significant dependency burden in both areas. By way of contextualisation, the StatsSA mid-year population estimates for 2020 (StatsSA, 2020c), indicated that the country’s age dependency ratio is around 50, which suggests

that there is a considerably greater dependency burden in Mthonjaneni LM and uMlalazi LM than elsewhere in the country and points to potentially greater levels of poverty as potential income earners must support a large proportion of the population.

3.2.2 Education profile

Between 2001 and 2011, in both uMlalazi LM and Mthonjaneni LM, there was a notable decline in the proportion of the adult population over the age of 20 with no access to formal education, and a corresponding significant increase in the population with at least a National Senior Certificate (Grade 12). Table 3-5 shows the highest level of education in the population over the age of 20, between 2001 and 2011.

Table 3-5 Highest level of education of the population over the age of 20, 2001 - 2011

Highest Level of Education	Mthonjaneni LM		uMlalazi LM	
	2001	2011	2001	2011
No Schooling	37.5%	23.3%	39.1%	22.6%
Grade 12 / National Senior Certificate	13.2%	22.2%	11.5%	23.3%
Higher	3.9%	4.4%	3.7%	5.5%

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

The trend of better access to education is promising as an indicator of potential for economic growth since higher education levels, in theory, equate to better employment prospects. This is also evident in the modest growth in the population over the age of 20 reporting to have received some form of tertiary education, which in South Africa, typically means that they have passed through the formal primary and secondary education systems and attained a National Senior Certificate.

Deeper analysis of education levels in Mthonjaneni LM and uMlalazi LM between 2001 and 2011, with extrapolations to 2021 based on historical trends, indicates that there has been a continual steady decline in the population over the age of 20 without access to formal education:

- Mthonjaneni LM: 37.5% in 2001, to 23.3% in 2011, and 12.9% in 2021, representing an average annual decline of 5.1%
- uMlalazi LM: 39.1% in 2001, to 22.6% in 2011, and 10.7% in 2021, representing an average annual decline of 4.9%.

Similarly, a generally improving trend in the proportion of the population that has received a National Senior Certificate or higher education at tertiary level is also discernible in both LMs. Table 3-6 provides details of these changes⁸.

Table 3-6 Summary of education profile, 2021

Highest Level of Education	Mthonjaneni LM		uMlalazi LM	
	2021	CAGR 2001-2011	2021	CAGR 2001-2011
No schooling	12.9%	-5.1%	10.7%	-4.9%

⁸ These figures have been calculated using the compound annual growth rate (CAGR) formula to determine an increase/ reduction in absolute terms, which is then expressed as a percentage of the whole.

Highest Level of Education	Mthonjaneni LM		uMlalazi LM	
Some primary	16.1%	-1.0%	12.4%	-0.6%
Complete primary	4.6%	-1.3%	3.2%	-0.2%
Some secondary	28.9%	2.8%	28.3%	1.9%
Grade 12/ National Senior Certificate	33.0%	7.6%	38.7%	5.0%
Higher	4.4%	4.3%	6.8%	0.9%

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

Although it is encouraging to see the improvements in education levels in both LMs, the relatively low base from which these gains have been achieved means that there are still large swathes of the population that have not completed secondary school, 62.6% in Mthonjaneni LM, and 54.5% in uMlalazi LM. Of particular concern is the relatively low percentage of the population that has not moved into tertiary education following attainment of the National Senior Certificate, only 4.4% in Mthonjaneni LM, and 6.8% in uMlalazi LM.

3.2.3 Household income profile

In consumption-driven economic paradigm, household income and expenditure, and economic growth have a direct relationship. Higher levels of income translate into increased demand for goods and services, which, in turn, drive expenditure higher. This, in turn, drives production, economic growth and the size of the economy.

A summary of household income levels in Mthonjaneni LM and uMlalazi LM in 2021, extrapolated from the Census 2001 and Census 2011 datasets, is presented in Table 3-7, below.

Table 3-7 Household income profile, 2021*

Income category	Annual income	Mthonjaneni LM		uMlalazi LM	
		% households	CAGR 2001-2011	% households	CAGR 2001-2011
No income	R0	2.34%	-9.0%	3.67%	-5.6%
Low income	R1 – R38 400	61.28%	-2.1%	54.40%	-0.6%
Low/middle income	R38 401 – R153 600	18.74%	9.5%	20.14%	8.7%
Middle/high income	R153 601 – R614 400	16.54%	15.1%	19.14%	18.35
High income	R614 401+	1.09%	10.1%	2.65%	11.5%

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

Encouragingly, the proportion of households with no formal income decreased in both uMlalazi LM and Mthonjaneni LM between 2001 and 2011, with average annual declines of 5.6% and 9.0%, respectively. Similarly, the proportion of low-income households also declined in both areas over this period, by 0.6% per year, and 2.1% per year, respectively. However, while there has been positive growth in all other income categories, the high proportion of households in the low-income category, with annual incomes of R38 400 or less, indicates that both LMs are classified as low-income areas.

Deeper analysis of this income bracket shows that in both areas, almost half of the households have an annual income of less than R19 200. This suggests the presence of high levels of poverty and deprivation and is a worrying indicator of a lack of economic growth prospects for these municipalities.

3.2.4 Employment profile

Unemployment levels are an important indicator of socio-economic well-being, as formal employment indicates access to income and the ability to provide for basic needs. It is well known that South Africa is battling with stubbornly high levels of unemployment, which have been exacerbated by the global Covid-19 pandemic and the ensuing government-enforced lockdowns which have curtailed economic activity. When considering the unemployment profiles of uMlalazi LM and Mthonjaneni LM, it is important to understand that up-to-date employment data is not available at a sub-national scale, with the Quarterly Labour Force Survey (QLFS) only providing a snapshot of the national unemployment profile.

According to the QLFS for the first quarter of 2021, the official unemployment rate in South Africa was 32.6%, which is the highest level since the start of the QLFS in 2008. When using the expanded definition of unemployment which considers that discouraged work-seekers⁹ are also unemployed, the unemployment rate is a staggering 43.2%. Amongst the youth (defined as the age cohort between 15 and 34 years of age), the official unemployment rate is 46.3%, with the unemployment rate amongst university graduates sitting at 9.3% (StatsSA, 2021b). Table 3-8 highlights some key employment indicators for South Africa, based on the QLFS Q1:2021 data.

Table 3-8 Key employment statistics for South Africa, Q1:2021

Indicator	Measure
Unemployment rate ¹⁰	32.6%
Labour force absorption rate ¹¹	42.4%
Labour force participation rate ¹²	59.9%

Source: (StatsSA, 2021b)

According to the data obtained from the census, between 2001 and 2011, employment levels in Mthonjaneni and uMlalazi increased, by an average of 1.2% and 1% per year. There was also a significant decrease in the number of unemployed persons, by 7.5% and 6.3% per year, respectively. However, it is important to note that data collection process between these two time periods changed, with the inclusion of discouraged work-seekers in the 2011 census. Using the expanded definition of unemployment, the inclusion of the discouraged work seekers results in a more modest decline in the unemployment rate in both areas, by 2.1% per year in Mthonjaneni LM and only 0.4% in uMlalazi LM. Table 3-9 details the employment profile for Mthonjaneni LM and uMlalazi LM.

⁹ Discouraged work-seekers are defined as the portion of the working age population that is not actively searching for employment. It is, therefore, a component, or proportion, of the not economically active population.

¹⁰ This is the restricted definition of unemployment, which does not include discouraged work-seekers. This is the accepted way unemployment rates are reported in South Africa.

¹¹ The labour force participation rate is defined as the active proportion of an economy's labour force, i.e., the portion of the potential labour force that is employed.

¹² The labour absorption rate is defined as the proportion of the entire population, including the not economically active population, in a given economy, that is employed.

Table 3-9 Employment profile for Mthonjaneni LM and uMlalazi LM, 2011

Indicator	Mthonjaneni LM	uMlalazi LM
Employed	69.9%	59.9%
Unemployed	15.3%	11.4%
Discouraged work-seeker	18.8%	24.8%
Labour force participation rate	41.0%	33.3%
Labour absorption rate	28.6%	19.9%

Source: Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

In comparison to the employment profile of South Africa, the data extrapolations for Mthonjaneni LM and uMlalazi LM suggest that there is lower unemployment than the national average, even under the expanded definition, 30.2% and 40.1%, respectively. However, this is an extremely unlikely scenario since both municipal areas lack the economic activity concentration that would be found in major urban areas. Additionally, as previously mentioned, the Covid-19 pandemic has resulted in a significant deterioration in the unemployment rate in the last 12 months, a factor which is not considered in the data extrapolations. It is anticipated that the actual unemployment rate in both municipalities would mirror that of the national average, especially when one considers the worryingly low labour force absorption rates.

To better understand the likely unemployment profile in uMlalazi LM and Mthonjaneni LM, it may be better to consider the rate of unemployment in these areas in comparison to the official rate of unemployment in the country (see Table 3-10).

Table 3-10 Unemployment rate in relation to national unemployment rate

Area	2001	2011	As % of national average	2021
South Africa	41.4%	27.0%	100%	32.6%
Mthonjaneni LM	49.6%	23.5%	89.7%	29.2%
uMlalazi LM	53.5%	27.1%	114.8%	37.4%

Source: (StatsSA, 2001) (StatsSA, 2011) (StatsSA, 2021b), Urban-Econ, 2021

The unemployment rates above, while imperfect, provide a clearer indication of the likely unemployment rate in each municipal area and suggest that uMlalazi LM is comparatively worse off than the national average and Mthonjaneni LM in terms of unemployment. It is noteworthy that between 2001 and 2011, the unemployment rate more than halved between 2001 and 2011 (a 52.6% decline) and by almost half in uMlalazi LM (a 49.3% decline).

3.2.5 Access to basic services

The provision of basic services such as water and sanitation, electricity, and refuse and waste removal is a critical function of municipalities as these services are considered fundamental to the improvement of people's quality of life, with adequate supply of basic services being critical enablers of life, well-being, and human dignity (StatsSA, 2017).

Individuals' rights to basic services are enshrined in Section 24 of the Constitution, which states that everyone has the right to an environment that is not harmful to their health or well-being. Accessibility to basic services is closely related to social inclusion and social capital, and the failure of municipalities to deliver services can have a detrimental impact on social and economic development (StatsSA, 2017). In terms of Section 73 of the Local Government Municipal Systems Act (No. 32 of 2000), municipalities have a

general duty to give effect to the provisions of the Constitution and give priority to the basic needs of the local community, promote the development of the local community, and ensure that all members of the local community have access to at least the minimum level of basic municipal services. In addition, municipal services must: be equitable and accessible; be provided in a manner that is conducive to the prudent, economic, efficient, and effective use of available resources, and the improvement of standards of quality over time; be financially sustainable; be environmentally sustainable; and be regularly reviewed with a view to upgrading, extension and improvement.

Table 3-11 provides the classification of infrastructure quality and different levels of service provision developed by StatsSA.

Table 3-11 Classification of infrastructure quality

Service Level	Water	Sanitation	Solid Waste	Electricity
None	No access to piped water	No sanitation	No facilities/ dump anywhere	No access to electricity
Minimal	Communal standpipe > 200m	Bucket toilets	Communal/ own refuse dump	Generator / solar
Basic	Communal standpipe < 200m	Pit toilet without ventilation pipe	Communal container/ collection point	Access to electricity do not pay for
Intermediate	Piped water in the yard	VIP, Chemical, or ecological toilets	Removed less than once/ week	Connected to source and paid for
Full	Piped water in dwelling	Conventional waterborne	Removed once/ week	In-house pre- and post-paid meters

Source: (StatsSA, 2017, p. 9)

Data on basic service provision is collected at a municipal household level.

3.2.5.1 Access to water

When considering the range of water supply sources, the biggest single source of water in both municipal areas is from a regional/ local water scheme (operated by the municipality/ other water services provider), a standard which is considered above basic level service provision. However, while this is the main single water source used by households, it amounts to less than half of the households; by implication therefore, more than half of households in each municipality area receive below a basic level of service. The profile of access to water is illustrated in Figure 13¹³.

¹³ These figures have been calculated using the compound annual growth rate formula to determine an increase/ reduction in absolute terms, which is then expressed as a percentage of the whole.

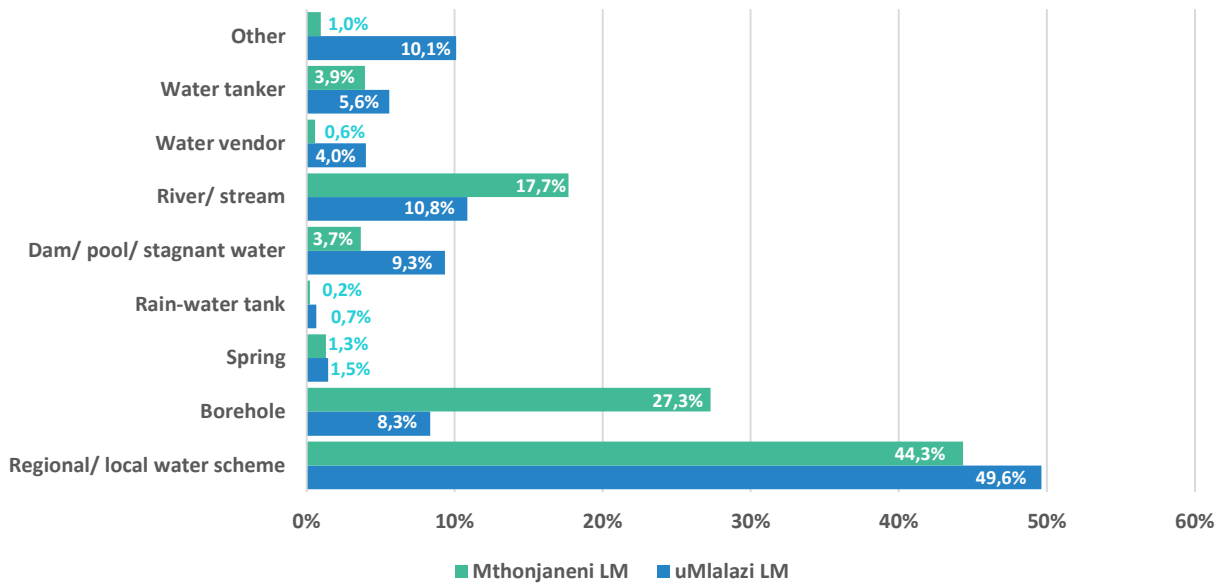


Figure 13 Access to water in Mthonjaneni LM and uMlalazi LM, 2021* (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

*extrapolated based on historical trends

Poor levels of access to safe and clean potable water, for drinking, cooking, and cleaning, has the potential to create a health burden and the proportion of households accessing water via rivers/ streams, and stagnant sources is cause for concern.

3.2.5.2 Access to sanitation

Access to basic levels of sanitation is poor in both municipal areas, with more than half of the households in uMlalazi LM (52.9%) reliant on a combination of pit latrines without ventilation, bucket latrines, or with no access to a toilet. In Mthonjaneni LM, the situation is a little better, with almost one third (29.8%) of households in a similar situation. Conversely, only one fifth (20%) of uMlalazi LM households are receiving what is considered above a basic level of service, while in Mthonjaneni LM the proportion is a little higher, with almost one third (31%) of households receiving this level of service provision. Figure 14 provides an overview of the profile of access to sanitation.

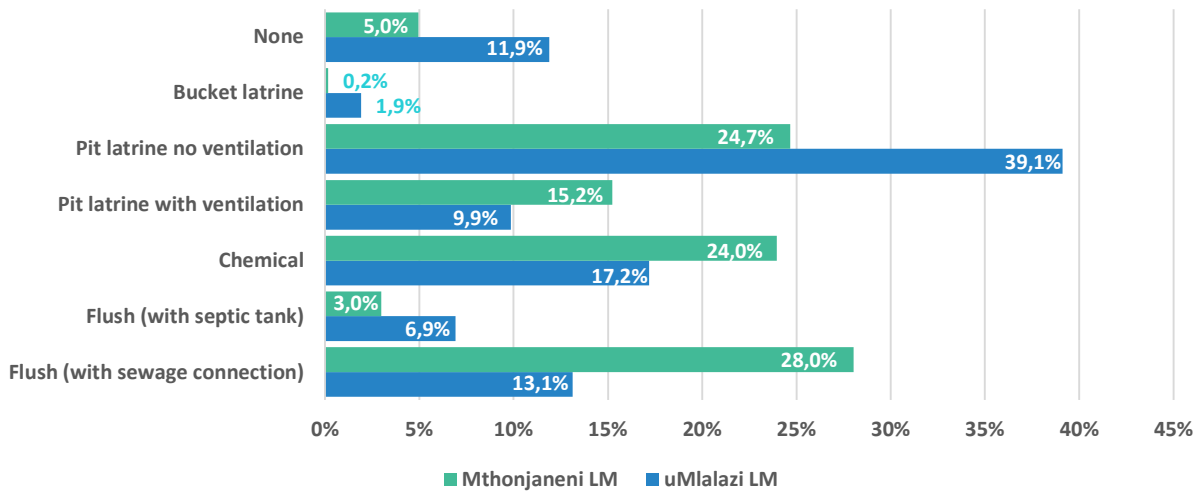


Figure 14 Access to sanitation services in Mthonjaneni LM and uMlalazi LM, 2021* (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

*extrapolated based on historical trends

The high dependence on pit latrines, both with and without ventilation, in both municipalities is worrying since poor sanitation can be a vector of disease. However, given the topography and settlement patterns in the area, universal waterborne sewerage coverage is probably an unrealistic expectation.

3.2.5.3 Access to electricity

Energy is required for cooking, heating and lighting purposes, with lighting being arguably the most important use of electricity in a household. The various different sources of energy, such as burning of wood, coal, and/ or animal dung, can have a significant impact on the health of household members, especially those from vulnerable groups, such as young children, pregnant women, and the elderly. Figure 15 provides a profile of access to various energy sources for lighting purposes.

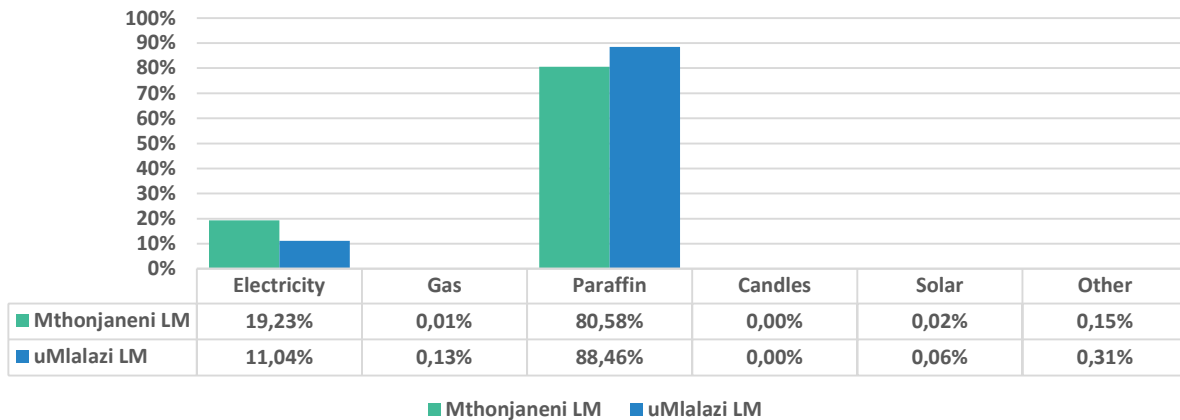


Figure 15 Access to electricity in Mthonjaneni LM and uMlalazi LM, 2021* (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

*extrapolated based on historical trends

The primary source of energy for lighting in both Mthonjaneni LM and Umlalazi LM is paraffin, with more than 80% of households reliant on it for lighting. Less than 20% of Mthonjaneni LM households use electricity for lighting, while just 11% of uMlalazi LM households have access to electricity. Other sources of energy for lighting are negligible, with fewer than 1% of households making use of them.

Worryingly, the reliance on paraffin has potentially significant health consequences, including respiratory related impacts resulting from poor ventilation and the risk of injury or even death due to burns and fires. According to the Human Sciences Research Council (HSRC), a poorly regulated supply chain, the failure to pre-package paraffin, and the absence of safety related information poses a significant poisoning risk to children (Panday & Mafu, 2007).

3.2.5.4 Access to refuse removal

The provision of refuse removal services by the local municipal authorities only reaches just over one third of households (34.5%) in Mthonjaneni LM and only 22.4% of households in uMlalazi LM. Most households are receiving what would be considered sub-basic service levels in relation to refuse removal since they are overwhelmingly reliant on their own refuse dumps, as indicated in Figure 16.

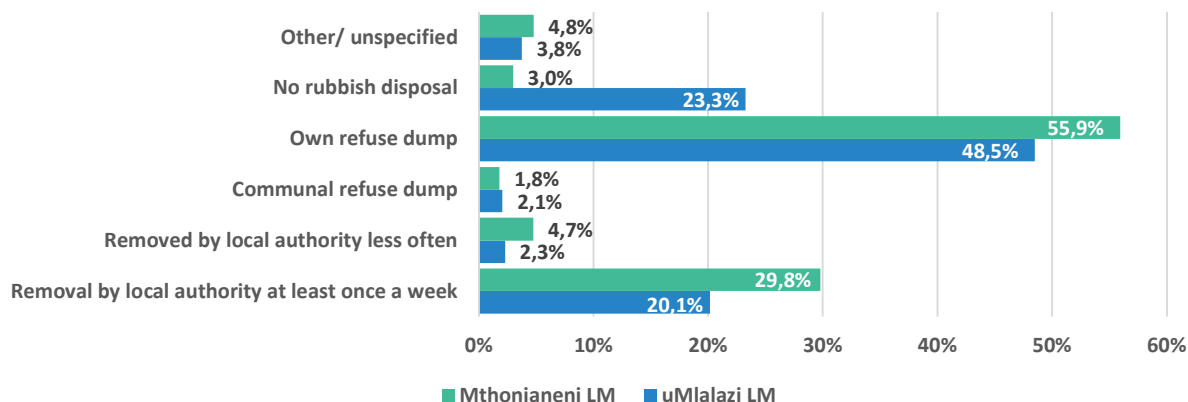


Figure 16 Access to refuse removal services in Mthonjaneni LM and uMlalazi LM* (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

*extrapolated based on historical trends

Poor service delivery with refuse removal can have serious environmental and health impacts; unregulated dumping can create a disease burden as an attractor of vermin and pests, while simultaneously being hazardous for young children who may inadvertently encounter contaminated refuse.

3.3 PROFILE OF DIRECTLY AFFECTED COMMUNITIES

This sub-section provides an overview of the demographic and socio-economic profile of the communities that are likely to be directly affected by the proposed MIOP project. Figure 4 (Page 5) displays the AOI/ project-affected area. The communities in this area are those that will be directly affected by the proposed MIOP as they are located within the boundary of the South Block, and are within the SE portion of the block, which, as indicated in Figure 3 (page 0) is where the majority of mine operations will be concentrated in the first phase. The AOI contains Wards 6 and 8 in Mthonjaneni LM, with Ward 5 also located within the boundary of the South Block.

Table 3-12 Wards and sub-places within the proposed MIOP AOI

Ward	Sub-place within AOI	Ward	Sub-place within AOI
Mthonjaneni Ward 5	<ul style="list-style-type: none"> • KwaMazulu SP¹⁴ • Magbhi SP • Mthonjaneni NU (non-urban)¹⁵ 	Mthonjaneni Ward 8	<ul style="list-style-type: none"> • Edubeni SP • Mbangu SP • Nduro SP
Mthonjaneni Ward 6	<ul style="list-style-type: none"> • Bedlane SP • Isibaya Esikhulu SP • Mehlamasha SP • Mthonjaneni NU • Zigagayi SP 		

Source: (Municipal Demarcation Board, 2021)

The following sub-sections present a consolidated demographic and socio-economic profile for the above-mentioned sub-places (SP) (which includes non-urban areas) based on the StatsSA Census 2001 and 2011. Table 3-13 provides a summary of the demographic profile of the sub-places in the AOI, which is thereafter explored in more detail.

Table 3-13 Summary of the demographic profile of sub-places within the AOI

Category	Value	Unit
Population	8 195	Persons
Population group profile	93.9%	Black African
	4.9%	Coloured
	0.3%	Indian/ Asian
	0.5%	White
	0.5%	Other
Households	2 118	Households
Average household size	3.9	Persons per household
Area	837	Square kilometres (km ²)
Household density	2.5	Households per square kilometre (km)
Land use pattern	70.8%	Tribal/ traditional authority
	29.2%	Farm
Age profile	45%	Younger than 15
	39%	Working Age/ EAPo
	16%	Elderly
Age dependency ratio	156%	Per 100 persons
Education profile	18.5%	No schooling
	19.1%	Some primary
	4.3%	Complete primary

¹⁴ StatsSA collects demographic and economic data at the place level. A place name is defined as a civic entity below the level of the municipality in the census geography hierarchy **Invalid source specified..** A sub-place is therefore considered to be the "second (lowest) level of place names and could "be a suburb, section of a township, smallholding, village, sub-village, ward or informal settlement"**Invalid source specified..**

¹⁵ In the StatsSA census geography, areas are defined by geography type, which is a classification according to settlement characteristics. Under this definition, a non-urban (NU) area is "any area not classified as urban"

Category	Value	Unit
	34.0%	Some secondary
	23.0%	Grade 12/ Std 10
	1.1%	Higher
Employment profile	24.8%	Employed
	86.1%	Unemployed
	89.1%	Discouraged work-seeker
Household income profile	7%	No income
	80%	Low income
	10%	Low/ Middle income
	2%	Middle/ high income
	1%	High income

Source: StatsSA: Census 2001 & 2011, Urban-Econ, 2021

3.3.1 Settlement and land use profile

Data on settlement and land use patterns was not captured in the 2001 population Census but was captured in the 2011 population Census. A trend analysis is therefore not possible, however, change in these patterns is unlikely, as the land is completely rural/ non-urban, with Tribal/ Traditional Authority land being the dominant land type (70.8%) and farmland accounting for the remaining land (29.2%).

3.3.2 Population, households, and age distribution profile

When homing in on the AOI, a similar trend emerges to the broader municipal trend: both population and households experienced a notable contraction between 2001 and 2011, as illustrated in Table 3-14.

Table 3-14 Change in population and households in AOI, 2001-2011

Category	2001	2011	10 year CAGR	2021
Population total	19 933	12 781	-4.3%	8 195
Households total	6 302	3 653	-5.3%	2 118
Average household size	3.2	3.5	1.0%	3.9
Area (square km)	836.6	836.6	0.0%	836.6
Household density (persons/ household)	7.5	4.4	-5.3%	2.5
Population density (persons per square km)	23.8	15.3	-4.3%	9.8

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

A sustained contraction in population and household numbers appears to have altered the settlement densities and if the trend is extrapolated to 2021, the population density (i.e., persons per square km) has more than halved, from 23.8 to 9.8, while housing densities (i.e., households per square km) have fallen even further. As a result of household numbers contracting at a faster rate than the population, the average household occupancy increased between 2001 and 2011, from 3.2 to 3.5 persons per household. Extrapolation of the trend suggests that there are around 3.9 people living in each of the 2 118 households in the AOI.

Given the dominance of tribal land, it is unsurprising that 93.9% of the population identifies as Black African. The next largest population group is Coloured, accounting for 4.9% of the population, followed by White (0.5%), and Indian/ Asian individuals (0.3%). 0.5% of the population did not specify their population group, identifying themselves as 'other'.

The age and gender distribution profile is depicted in Figure 17.

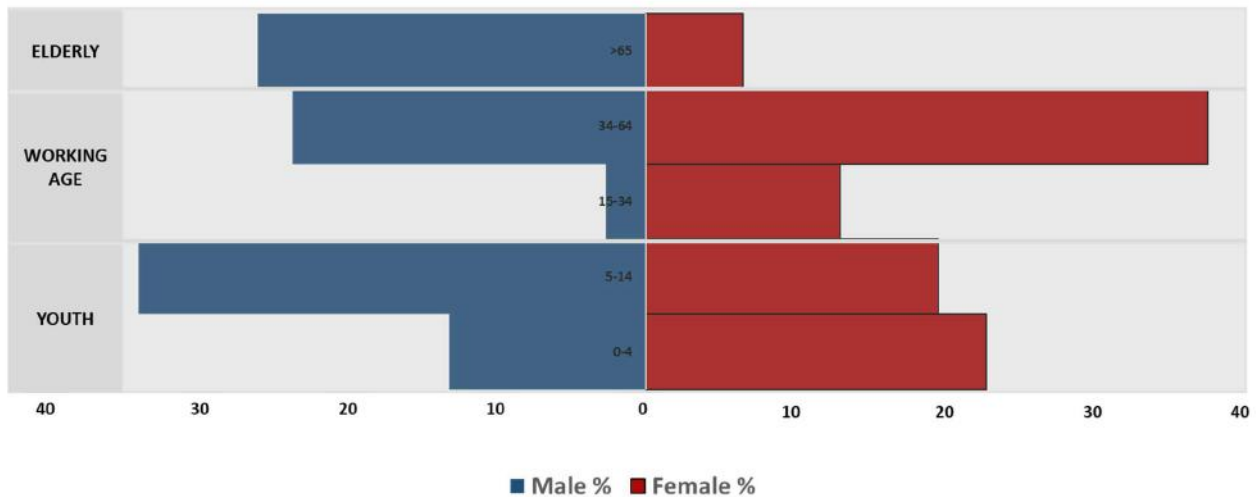


Figure 17 Population pyramid for the AOI (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

The population is relatively even split in terms of gender, with 51% of the population female, and 49% of the population male. However, within the working age cohort, there are notably more females than males, with 50.9% of the female population falling in this age group, and only 26.5% of the male population in the same age group. Table 3-15 shows the population distribution and age dependency ratio for the AOI.

Table 3-15 Population distribution in the AOI, 2021

Population segment	%
Youth	45%
EAPo	39%
Elderly	16%
Age dependency ratio	156

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

The population distribution profile above is alarming as only 39% of the population falls into the working age cohort, which is smaller than the under 15 years of age cohort that is typically not economically active. When combined with the 16% of the population that falls into the elderly age cohort, the age dependency ratio is worrying at 156. This means that every person of working age is supporting another 1.5 people, a situation which places a significant burden on those that are employed. In the next five to ten years, the age dependency ratio looks likely to undergo some positive shifts as the 34.7% of the male population and 19.7% of the female population in the 5-14 years age grouping becomes part of the economically active cohort.

3.3.3 Housing profile

Access to decent housing is an important indicator of well-being and an enabler of the right to human dignity, which is enshrined in the Constitution. An analysis of the housing profile in the AOI in terms of the type of dwelling that the resident population resides in indicates that most of the population lives in a formal brick/ concrete block house, flat/ apartment, townhouse, or house/ flat/ room in a backyard (granny flat), with approximately 64% of the population living in these structures. The rest of the population lives in traditional housing, such as hut or structure made of traditional materials (17.5%), with only an insignificant part of the population residing in informal dwellings.

Table 3-16 provides an overview of the housing profile in the AOI in terms of dwelling type.

Table 3-16 Housing profile in the AOI, 2021*

Dwelling type	%
House or brick/ concrete block structure on a separate stand or yard or on a farm	56.7%
Flat or apartment in a block of flats	0.6%
Town/cluster/semi-detached house (simplex; duplex; triplex)	2.9%
House/ flat/ room in backyard	3.8%
Traditional dwelling/ hut/ structure made of traditional materials	17.5%
Informal dwelling (shack; in backyard)	0.2%
Informal dwelling (shack; not in backyard; e.g., in an informal/ squatter settlement or on a farm)	0.0%
Room/ flatlet on a property or larger dwelling/ servants quarters/ granny flat	0.0%
Caravan/ tent	0.0%
Other	18.3%

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

Tenure status is an important indicator of economic prospects and relative wealth, with property ownership being one of the cornerstones of the neoliberal economic system. Individual property ownership is a key enabler of access to finance through commercial banking institutions. Table 3-17 shows the tenure status in the AOI.

Table 3-17 Tenure status in the AOI, 2021*

Tenure status	%
Owned and fully paid off	39.9%
Owned but not yet paid off	8.2%
Rented	37.5%
Occupied rent-free	14.4%
Not applicable/ Not specified	0.1%

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

Almost half of residents in the AOI indicate that they own the house that they live in, with just short of 40% having paid their property off in full, and another 8.2% working towards repaying their home loan. Just over one third of residents are renting the house that they live in, while 14.4% are living rent-free.

3.3.4 Education profile

Between 2001 and 2011 there was a notable decline in the proportion of the adult population over the age of 20 with no access to formal education, and an increase in the population with at least a National Senior Certificate (Grade 12). Table 3-18 shows the highest level of education in the population over the age of 20, between 2001 and 2011.

Table 3-18 Highest Level of Education, 2001-2011

Highest Level of Education	2001	2011
No Schooling	42.2%	29.6%
Complete primary	5.5%	5.1%
Grade 12 / National Senior Certificate	8.6%	15.0%
Higher	1.9%	1.5%

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

While the decrease in the proportion of the population with no formal education is a positive sign of improving employment prospects, unfortunately, there is a poor conversion from secondary education to tertiary education, with a decrease in the proportion of the population over the age of 20 that has received a higher education qualification.

Digging deeper into the education profile and extrapolating the trend, suggests that there should be a continual decline in the proportion of the population without access to formal education, from 42.2% in 2001, to 29.6% in 2011 and to 18.5% in 2021, representing an average annual decrease of 7.1%. Similarly, a generally improving trend in the proportion of the population that has received a National Senior Certificate is also evident, as illustrated in Table 3-19.

Table 3-19 Summary of education profile in the AOI

Highest level of education	2021	CAGR 2001-2011
No schooling	18.5%	-7.1%
Some primary	19.1%	-4.4%
Complete primary	4.3%	-4.5%
Some secondary	34.0%	0.1%
Grade 12/ Std 10	23.0%	1.6%
Higher	1.1%	-6.0%
Unspecified	0.1%	

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

The poor progression from the secondary to tertiary education system is likely to create a blockage to economic growth as residents in the AOI will not be adequately equipped with the advanced skillsets

required for the fourth industrial revolution, with career progression opportunities likely to be limited to elementary occupations.

3.3.5 Household income profile

The household income profile of the AOI reveals that the area is classified as a low-income area. When one considers the alarmingly high age dependency ratio (156%), and the low levels of access to higher education, economic growth prospects appear limited.

A summary of household income levels in the AOI in 2021, extrapolated from the Census 2011 and Census 2011 datasets, is presented in Table 3-20, below.

Table 3-20 Household income profile in the AOI, 2021*

Income category	Annual income	% households	CAGR 2001-2011
No income	R0	6.5%	-17.2%
Low income	R1 – R38 400	80.2%	-7.1%
Low/middle income	R38 401 – R153 600	10.4%	5.5%
Middle/high income	R153 601 – R614 400	2.3%	8.1%
High income	R614 401+	0.6%	13.1%

*extrapolated based on historical trends

Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

Positively, a significant reduction in the proportion of households with no formal income is evident between 2001 and 2011, with a similar but less pronounced decline in the number of low-income households. However, 80.2% of households earn less than R38 400 a year. Digging deeper into this income bracket reveals that 68.3% of the households in the low-income bracket (equivalent to 54.3% of all households in the AOI), have an annual income of less than R19 200, which suggest high levels of poverty when one considers that the average household houses four people and every person of working age is supporting 1.56 people that are not able to work. This paints a picture of very limited future growth prospects in this area.

3.3.6 Employment profile

According to the data obtained from the census, between 2001 and 2011, employment levels in the AOI decreased by an average of 1.4% per year. Interestingly, there was a significant decrease in the number of unemployed persons during this period, by an average rate of 12.6% per year, although the inclusion of discouraged work seekers in the 2011 Census creates challenges in a direct comparison. When considering the discouraged work seekers as part of the unemployed, viz, the expanded definition of unemployment, the decline in unemployment is more moderate, at 7.5% per year. Table 3-21 details the employment profile for the AOI.

Table 3-21 Employment profile in the AOI, 2011

Indicator	%
Employed	75.2%
Unemployed	13.9%
Discouraged work-seeker	10.9%

Indicator	%
Labour force participation rate	49.9%
Labour absorption rate	37.3%

Source: Source: (StatsSA, 2001) (StatsSA, 2011), Urban-Econ, 2021

As with the unemployment profiles for Mthonjaneni LM and uMlalazi LM, the data extrapolation for the AOI suggest that the unemployment rate is lower than the South African average rate of unemployment (32.6% under the restricted definition). However, extrapolating unemployment data based on historical trends is fraught with complication as it does not make provision for changes in the macroeconomic conditions of the country since 2011, including the economic devastation unfolding at present due to the Covid-19 pandemic. While there are likely to be few employment opportunities in the AOI, almost 50% of the working age population is either employed or actively looking for employment (labour force participation rate), although only 37% have found employment.

3.4 SUMMARY OF DEMOGRAPHIC AND SOCIO-ECONOMIC BASELINE

In summary, the area was found to have the following socio-economic characteristics:

- The proposed MIOP is situated within the administrative boundaries of the Mthonjaneni LM, with the uMlalazi LM bordering it on the south.
- Between 2001 and 2011, the population in both municipalities experienced an average annual decline of almost 1%.
- The household income profile of these municipal areas suggests that they are low-income areas, with approximately one fifth of all households in the combined area earning less than R38 400 a year.
- The area in which the project is proposed is fully rural/ non-urban, with 70.8% of the land under tribal/ traditional authority administration.
- The Area of Impact of the proposed project includes almost all of Ward 6 and part of Wards 5 and 8 of Mthonjaneni LM, which is home to an estimated population of 9 195, however, the population contracted by 4.3% per year between 2001 and 2011.
- The AOI is classified as low income, with 80% of households earning less than R38 400 per year.
- The AOI is female dominated and is characterised as having a very high age dependency ratio (156), with every person of working age supporting 1.56 non-economically active people.
- In terms of population dynamics, Black Africans are the dominant population group, accounting for over 90% of the population.
- Education levels within the AOI are low, with approximately 75.8% of the population over 20 years of age not having completed Grade 12 / National Senior Certificate. This means that most of the population can be expected to have a relatively low-skill level and would either require employment in low-skill sectors, or skills development opportunities to improve the skills level of the area.
- Although unemployment levels appear low in the AOI (13.9%), the recent influence of the Covid-19 pandemic has not been included in the calculations since current data on unemployment is only available at a national level. However, considering that the national unemployment rate is the highest it has ever been (32.6%), and that the AOI is characterised as rural/ non-urban, it is realistic to assume that a similar or possibly worse unemployment rate will be found in the area. The income

profile of the AOI also suggests high levels of poverty, which are typically also associated with high levels of unemployment. When considering the ratio of unemployment in each LM in 2001 and 2011 in relation to the national unemployment rate, a slightly different picture is evident, with at least 29.2% unemployment in Mthonjaneni LM and 37.4% unemployment in uMlalazi LM.

- The primary economic activities within the Mthonjaneni and uMlalazi LM comprise agriculture and manufacturing, with the overall economic growth trend in the area being tied to the growth and contraction of these sectors.
- Most households within the AOI comprise formal brick dwellings, and traditional housing and are mostly owned (either paid in full or in the process of being paid off). A large proportion of the population is living in rented accommodation.
- Apart from access to water, access to basic services are considered basic: most households do not use electricity for lighting, only have access to pit latrines with no ventilation, and have poor refuse removal services.

3.5 NOTES ON THE DEMOGRAPHIC AND SOCIO-ECONOMIC PROFILE OF THE NORTH BLOCK

While an in-depth review of the demographic and socio-economic profile of the communities in the North Block has not been undertaken, it is reasonable to consider that they share similar characteristics as those in the South-east block. The wards that fall within parts of the North Block are:

- Mthonjaneni Ward 1
- Mthonjaneni Ward 3
- Mthonjaneni Ward 7
- Mthonjaneni Ward 10

According to the Census 2011, the above wards contain 30 264 people living in 6 235 households, which suggests a household density of approximately 4.9 persons per household. The four wards cover around 560 km² which suggests an average population density of 53.9 people per km² and 11.1 households per km².

It is worth noting that the above wards do not fit neatly inside the boundaries of the North Block and therefore the households and people affected in the North Block would, in all likelihood, be lower than the figures provided above. It is also likely that the same trend of population contraction experienced in the Mthonjaneni LM in general would be applicable to these wards, which would in turn also result in fewer households and people.

4 STAKEHOLDER IDENTIFICATION, CONSULTATION AND ANALYSIS

This section provides an overview of the stakeholder consultation process and a summary analysis thereof, including an overview of formal Public Participation Process (PPP).

4.1 APPROACH

The approach followed in the identification of, and consultation with stakeholders, is informed by the understanding that the socio-economic specialist is required to consult with key stakeholders that are anticipated to be affected (either directly and indirectly) by the proposed project, but that the formal PPP is the primary mechanism through which the public is sensitised to the project and can engage with it. Therefore, in this SEIA investigation, care has been taken to:

- I. Identify the study area/s (AOI).
- II. Consider the stakeholder interest groups likely to be impacted.
- III. Identify the relevant stakeholders within each stakeholder grouping.
- IV. Engage with stakeholders in each interest grouping to ensure sufficient understanding of the interest group perspective or viewpoint.

The three specialist teams involved in the social disciplines of the project, namely, the PPP team, The Resettlement Action Plan (RAP) team and the SEIA team, planned engagements to ensure a coordinated approach was followed, especially with regards to community level engagement.

The formal PPP was allowed to run its course prior to any community-level engagement. This was necessary to provide sufficient opportunity for project sensitisation and alignment in messaging between the PPP team and the socio-economic specialist team.

The I&AP database for the project was considered the initial departure point in identification of stakeholders. Where gaps in the I&AP database were identified, relevant stakeholders were identified, approached for engagement, and the project EAP was informed so that the I&AP database could be updated.

4.2 STAKEHOLDER INTEREST GROUPINGS

Stakeholders were categorised into the following interest groups¹⁶:

Table 4-1 Stakeholder interest groupings

Stakeholder Interest Group	Stakeholder identifier
Provincial government	Ezemvelo KZN Wildlife
	KZN Department of Environmental Affairs and Tourism
	KZN Department of Agriculture, Land Reform and Rural Development
	Ingonyama Trust Board
	Department of Cooperative Governance and Traditional Affairs

¹⁶ This is not an exhaustive list of stakeholders and not all stakeholders included in this list were engaged by the socio-economic specialist.

Stakeholder Interest Group	Stakeholder identifier
Local Government	King Cetshwayo District Municipality
	Mthonjaneni LM
	uMlalazi LM
	Zulu-Ntembeni Traditional Authority
Water Users	Mhlatuze Water Board Information Meeting
	Nkwalini Water Users Association
Business Community	Transnet National Ports Authority
	Zululand Chamber of Commerce and Industry
Tourism Sector	Tourism KwaZulu-Natal
	Umlalazi Tourism Publicity Office
	Route 66 Zulu Heritage Route
	Tourism products owners
Agricultural Sector	Nkwalini Farmers Association
	Melmoth Farmers Association
	Mthonjaneni Farmers Association
	South African Farmers Development Association (SAFDA)
Communities	Labour-sending areas
	Immediately affected communities
	Landowners

Source: Urban-Econ, 2022

4.3 SUMMARY OF CONSULTATIONS UNDERTAKEN

Engagement with relevant stakeholders from the above-mentioned stakeholder groupings occurred in three main ways:

1. Public Participation Process;
2. Direct engagement with stakeholders from government and organised business (agriculture, tourism, and business fora); and
3. A community survey undertaken at the household level in the areas to be directly impacted by the establishment and operations of the proposed project.

A summary of these consultations is included in the following sub-sections.

4.3.1 Public Participation Process

An extensive PPP was undertaken, in full compliance with Chapter 6 of the EIA Regulations, as amended (Republic of South Africa, 2014). The purpose of the PPP is to inform and engage with I&APs, in sufficient detail, so that they may contribute meaningfully to the ESIA process. A summary of the activities undertaken in the PPP is included in the project Draft Scoping Report (SLR Consulting (South Africa) Pty Ltd, 2022).

The PPP was managed by SLR, in its capacity as the project EAP and Stakeholder Engagement Management team. It was undertaken from June 2021 to October 2021 and where possible and appropriate, virtual electronic platforms such as Zoom, MS Teams, email, WhatsApp and telephonic communication were utilised to mitigate the limitations placed on gathering sizes as part of the government's response to the Covid-19 pandemic. However, the process did experience some delays which also impacted the stakeholder

engagement process, creating challenges in ensuring all stakeholders engaged in the SEIA possessed a similar level of prior sensitisation to the project.

A review of the detailed Comments and Responses Report (CRR) was undertaken and stakeholder comments with relevance to the SEIA investigation have been considered. The CRR was made available for public comment as an Annexure to the project Draft Scoping Report (DSR). It is available on request from the EAP. A summary overview of the PPP meetings is included in Table 4-2.

Table 4-2 Summary of formal consultation undertaken in the Public Participation Process

Date	Stakeholder grouping	Mode of engagement	
		In-person	Virtual
15-06-2021	Traditional authority/community: Zulu-Ntembeni Traditional Court Meeting	✓	
17-06-2021	Local government: Mthonjaneni LM		✓
18-06-2021	Provincial government: KZN Department of Agriculture and Rural Development (DARD)		✓
21-06-2021	Community: Mxosheni Combined School Community Meeting	✓	
22-06-2021	Traditional authority/ community: Obuka Traditional Court Meeting	✓	
22-06-2021	Provincial government: KZN Department of Cooperative Governance and Traditional Affairs (CoGTA)		✓
23-06-2021	Traditional authority/ community: Yanguye Traditional Court Meeting	✓	
24-06-2021	Business sector: Ubumbano Business Forum Meeting	✓	
24-06-2021	Agricultural sector: South African Farmers Development Association (SAFDA)		✓
25-06-2021	Traditional authority/ community: Nogajuka Primary School Community Meeting	✓	
29-06-2021	Provincial government: KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA)		✓
02-07-2021	Landowner		✓
06-07-2021	Public meeting		✓
11-08-2021	Provincial government: KZN Department of Rural Development and Land Reform (DRDLR)		✓
16-08-2021	Traditional authority/ community: Siyavuna Community Meeting		✓
17-08-2021	Traditional authority/ community: Entembeni Community Trust Meeting	✓	
18-08-2021	Community: Melmoth Unemployment Forum Meeting	✓	
18-08-2021	Public meeting	✓	
19-08-2021	Agriculture: Nkwalini Farmers' Association Meeting	✓	
20-08-2021	Community: Sgubude Hall (Dlamini Store) Community Meeting	✓	
22-08-2021	Community: Mehlamasha Combined School Community Meeting	✓	
22-08-2021	Community: Dlozeyane Primary School Community Meeting	✓	
20-09-2021	Business: Transnet Ports Authority Information Meeting		✓
21-09-2021	Local government: King Cetshwayo District Municipality Information Meeting		✓
12-10-2021	Water users: Mhlatuze Water Board Information Meeting		✓

Source: (SLR Consulting (South Africa) Pty Ltd, 2022)

Additional to the above, virtual platforms and points of contact were established for I&APs to engage with the project. All comments received through the formal PPP and via the platforms were recorded, responded to, and included in the CRR (SLR Consulting (South Africa) Pty Ltd, 2022). As far as possible, all comments with relevance to this SEIA study have been addressed, with specific reference to the potential impacts on the agricultural sector and value chain.

4.3.2 Stakeholder Interviews and Engagement

As part of the SEIA investigation, separate engagements were undertaken with key stakeholders across the interest groupings identified in section 4.2. A hybrid approach employing physical, in-person engagements, and virtual engagements (MS Teams, email, telephone calls) was implemented. A summary of the consultations undertaken is included below.

Table 4-3 Summary of interviews and engagements

Organisation	Summary of engagement/ issues raised	Mode of engagement
AGRICULTURE		
Agri-business Development Agency (ADA)	Did not engage with specialist	Email
KZN Department of Agriculture, Land Reform and Rural Development (DALRRD)	<ul style="list-style-type: none"> • Main commodities produced in the area were noted as sugar cane, forestry/ timber, and citrus. • The main concern is the potential for land claims to impact the establishment of the mine. • Another concern is land rights for those that are resettled and whether access to grazing land for livestock (the main form of wealth in the area) will be considered/ restored. • Within mine site, the agricultural impacts appear limited, however, the mine could affect commercial agricultural activities in the Nkwalini Valley, which is high potential agricultural land. • The general consensus from all meeting participants is that the project is desirable and should go ahead for the following reasons: <ul style="list-style-type: none"> ○ The area is beset by extremely high unemployment and poverty. ○ There is very little economic development in the area and agriculture is the only sector that provides significant employment. ○ There are no significant agricultural projects in the Melmoth area. No vegetable production projects. DALRRD is supporting a few small livestock projects only. ○ The nature, scale and location of the project is likely to create benefit for both Mthonjaneni LM and Umlalazi LM and could lead to some form of economic revitalisation for both Melmoth and Eshowe. It would create employment which would stimulate consumption-based activities in the economy. Any project that can create significant employment opportunities should be considered and welcomed, provided the negative impacts can be managed and compensation is fair. 	MS Teams
Nkwalini Farmers Association (NFA)	<ul style="list-style-type: none"> • Objections to the development raised from a number of farmers that are part of the NFA. • Concerned about the impact on operations due to contamination of 	Email

Organisation	Summary of engagement/ issues raised	Mode of engagement
	<p>products and arable land due to water quality and air quality changes.</p> <ul style="list-style-type: none"> Major concern is the potential risk to export requirements, which would jeopardise the commodity value chains and prevent export earnings. Potential for significant job losses should productivity and/ or the ability to maintain export standards be impacted. Concerned about the skill levels in the resident population and the ability to take up job opportunities. Availability of water from the Goudertrouw Dam is already constrained due to supply side constraints coupled with demand side pressures. Most agricultural water users are unable to utilise their full quota and the concern is that any additional abstraction and utilisation of the scarce water resources will have significant impacts on all farmers in the Nkwalini Valley. 	
<p>SA Farmers Development Agency (SA-FDA)</p>	<ul style="list-style-type: none"> Melmoth area is high potential agricultural land and highly suited to sugar cane and avocado (for export market). Impacts on soil, water quality and water quantity, and dust/ air quality issues, are all likely to negatively impact on agricultural production. The requirements and standards for agricultural commodity exports are stringent and anything that jeopardises the ability to maintain these standards is a major risk. Particularly concerned about the loss of high potential agricultural land and the displacement of communities. Interested in understanding what long-term opportunities exist for communities in the mining value chain. 	<p>MS Teams</p>
<p>Melmoth Farmers Association</p>	<ul style="list-style-type: none"> Primary concern is the potential impact on farms, which may be located within the project site and in the surrounding areas. Numerous efforts to secure additional input and arrange a meeting were unsuccessful. 	<p>Email</p>
<p>TOURISM</p>		
<p>King Cetshwayo District Municipality: Tourism</p>	<ul style="list-style-type: none"> Primary form of tourism in the area is focused on Zulu Heritage site and avi-tourism. Most tourism accommodation products are situated in Eshowe (uMlalazi) or north of Melmoth towards Pongola. Very little in Melmoth town. Lake Phobane (Goudertrouw Dam) has considerable tourism potential that would be lost if the mine proceeds. Major concerns relate to the impact of the project on already strained and poor bulk infrastructure, including roads, which will have an impact on tourists that visit the area. Importantly, what are the closure impacts and what does the area look like after closure? Suggested that as a mitigation measure for the tourism industry, a tourism levy could be considered to assist the preservation of the heritage sites in the District Municipality and Province of KZN. 	<p>MS Teams</p>
<p>Tourism KwaZulu-Natal (TKZN)</p>	<ul style="list-style-type: none"> TKZN does not have an anti-mining stance and understands the contribution mining makes to the country's economy. Primarily concerned about the incompatibility between mining operations and tourism activities, especially within a 5-10km buffer, 	<p>MS Teams</p>

Organisation	Summary of engagement/ issues raised	Mode of engagement
	<p>or further depending on degree to which noise, vibration and visual impact extend.</p> <ul style="list-style-type: none"> Rich Zulu heritage and culture in the area surrounding the mine and tourism stakeholders have been packaging the area as a tourism destination (R66 Zululand Heritage Route). Concerned that negative perception of mining activities could deter heritage tourists due to sense of place transformations, which could impact the R66 tourism value chain. Concern also noted degrading the increased traffic on what is already a dangerous transport route. 	
Route 66 Zululand Heritage Route Association	Did not engage with specialist	Email
uMlalazi Tourism Publicity Office	Did not engage with specialist	Email
aha Shakaland Hotel & Zulu Cultural Village	Did not engage with specialist	Email
ORGANISED BUSINESS		
Zululand Chamber of Commerce and Industry	<ul style="list-style-type: none"> Generally supportive of the project and the potential economic and social contributions it can make The main interest is ensuring long-term benefits and ownership for and by the community. Issues of local procurement and Enterprise and Supplier Development. Noted the need for the mine to ensure protection of Lake Phobane, which is a critical water source for Mthonjaneni, uMlalazi and uMhlatuze Local Municipalities. 	MS Teams
Zululand Chamber of Commerce and Industry: Eshowe	<ul style="list-style-type: none"> Agriculture is the primary employer in the Eshowe area and the main commodities are sugar cane, citrus, timber, avocados and macadamia nuts (recent diversification). Primary source of consumption expenditure is pension payments due to high unemployment which is likely to cause long-term social conflicts. Tourism product owners are likely to significantly benefit from the establishment of the mine as the influx of people would be good for business. In particular, Shakaland is well positioned to take advantage of the increased business tourism that would be likely. The mine should support proposed efforts to provide training and extension services to emerging agricultural enterprises in the area, on a long-term basis. The overall sentiment towards the proposed project is that it is necessary and desirable for the area as it will provide jobs and a much-needed injection of money into the economy, which will benefit all businesses currently operating in the area, while creating opportunities or more businesses to establish themselves, with residents ultimately benefiting from this. 	In-person
GOVERNMENT (local and provincial)		
Mthonjaneni LM	Did not engage with specialist	Email
uMlalazi LM	<ul style="list-style-type: none"> There are communities that fall outside the project affected area, within the uMlalazi LM, that would be impacted by the project. The associated, supporting infrastructure appears to mainly be 	MS Teams

Organisation	Summary of engagement/ issues raised	Mode of engagement
	<p>located on land within the administrative jurisdiction of the uMlalazi LM.</p> <ul style="list-style-type: none"> There is a likelihood of increased traffic flows on the R66 and it was noted that this could present enterprise development opportunities but also has implications for infrastructure management, congestion and traffic related impacts. 	
King Cetshwayo District Municipality	<ul style="list-style-type: none"> The primary concern, expressed by representatives of the Mthonjaneni LM who were present in the meeting, was that the traditional authorities in Mthonjaneni LM should set the tone for the entire engagement process. Their buy-in to the project was noted as being critical to its success. 	MS Teams
KZN Department of Cooperative Government and Traditional Affairs (CoGTA)	Did not engage with specialist	Email
Ezemvelo KZN Wildlife	Did not engage with specialist	Email

Source: Urban-Econ, 2021

It should be noted that despite best efforts, which have been documented, the following stakeholders have not engaged with the specialists in relation to the socio-economic impacts of the proposed project:

- Agribusiness Development Agency
- Mthonjaneni LM
- Melmoth Farmers Association
- KZN Department of Cooperative Government and Traditional Affairs (CoGTA)
- aha Shakaland Hotel & Zulu Cultural Village
- Route 66 Zululand Heritage Route Association
- Umlalazi Tourism Publicity Office
- Ezemvelo KZN Wildlife

4.3.3 Community Household Surveys

To provide community members with an opportunity to engage with the project, and to inform the specialist's assessment of anticipated socio-economic (social and economic) impacts, an in-person household-level survey was administered from 6 to 10 December 2021.

To support coordination amongst the specialist teams that needed to consult and engage at a community level, it was agreed that both the socio-economic specialist team and resettlement specialist team would adopt a common approach to the survey work. In consultation with the Jindal Africa Community Liaison Officer, local unemployed youth were identified and recruited from the Mthonjaneni LM wards closest to the SE block. To support quality outcomes, the following selection was applied in the identification of candidate fieldworkers:

- ✓ Must be a local resident, with fluency in isiZulu spoken in the area.
- ✓ Must be in possession of a National Senior Certificate.
- ✓ Should have strong Mathematical and English marks.

A local community member was appointed to support with fieldworker management, navigation around the area, access to communities, and to inform the specialists' understanding of the social and economic dynamics of the area.

To participate in the survey, respondents must be over 18 years of age and have authority to speak on behalf of the household.

4.3.3.1 Summary analysis

The following section presents results of the surveys undertaken between 6-10 December 2021. A total of 220 surveys were conducted on areas that will potentially be impacted by the development and operation of the proposed mine. Fieldworkers captured GPS locational data using their own smartphone devices as well as handheld tablets which were supplied. A GPS device was also utilised to mitigate for in-field challenges in capturing GPS locational data using smartphones and handheld tablets. Figure 18 displays an overview of the survey site locations, while Figure 19 provides a close-up of the survey sites in the south block, and Figure 20 shows the surveys administered within Melmoth town.

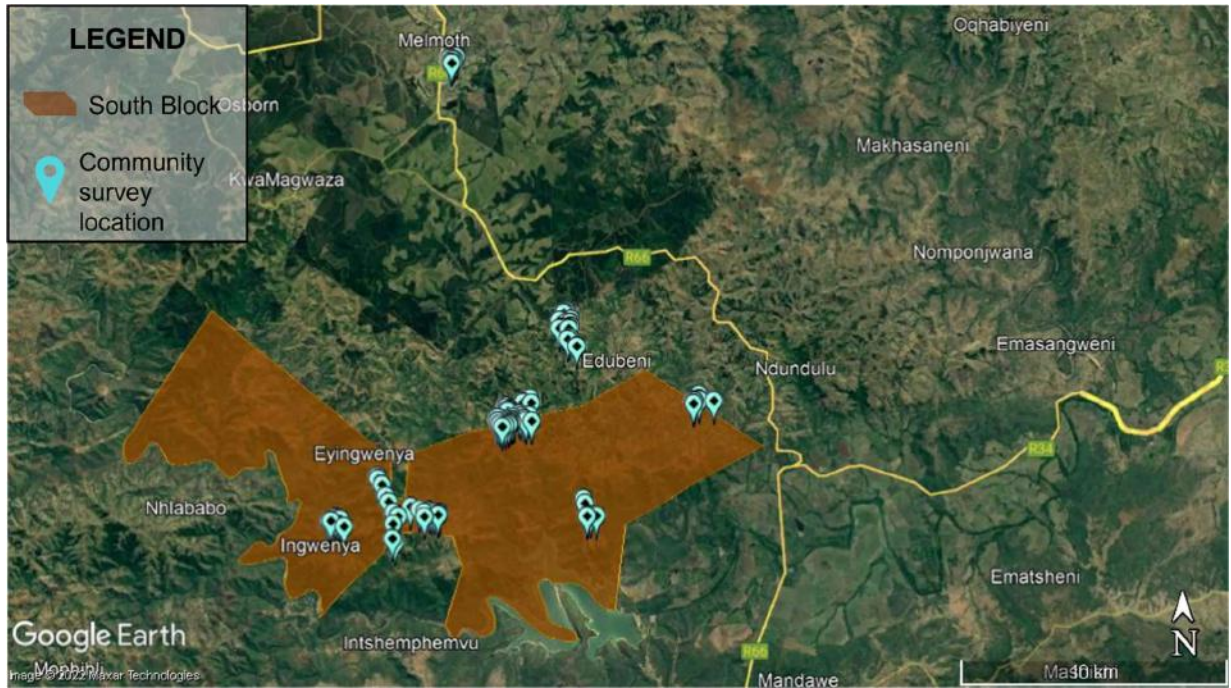


Figure 18 Community household survey sites

Source: Google Earth & Urban-Econ, 2022

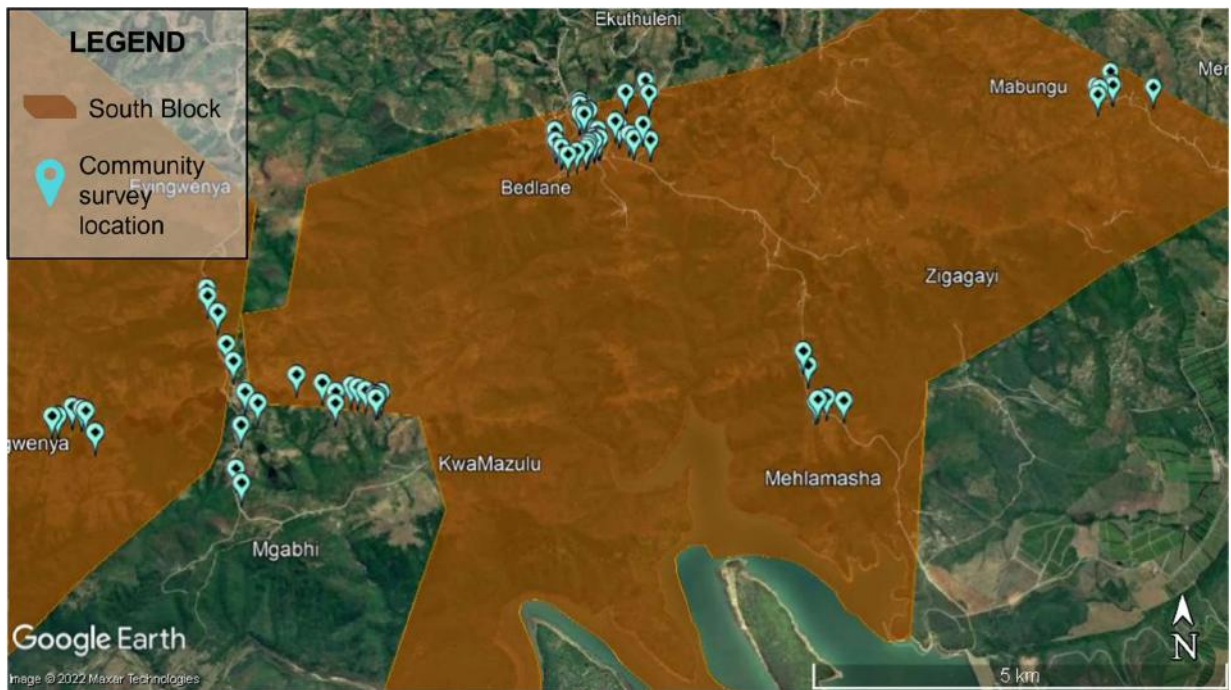


Figure 19 Community household survey sites around south block

Source: Google Earth & Urban-Econ, 2022

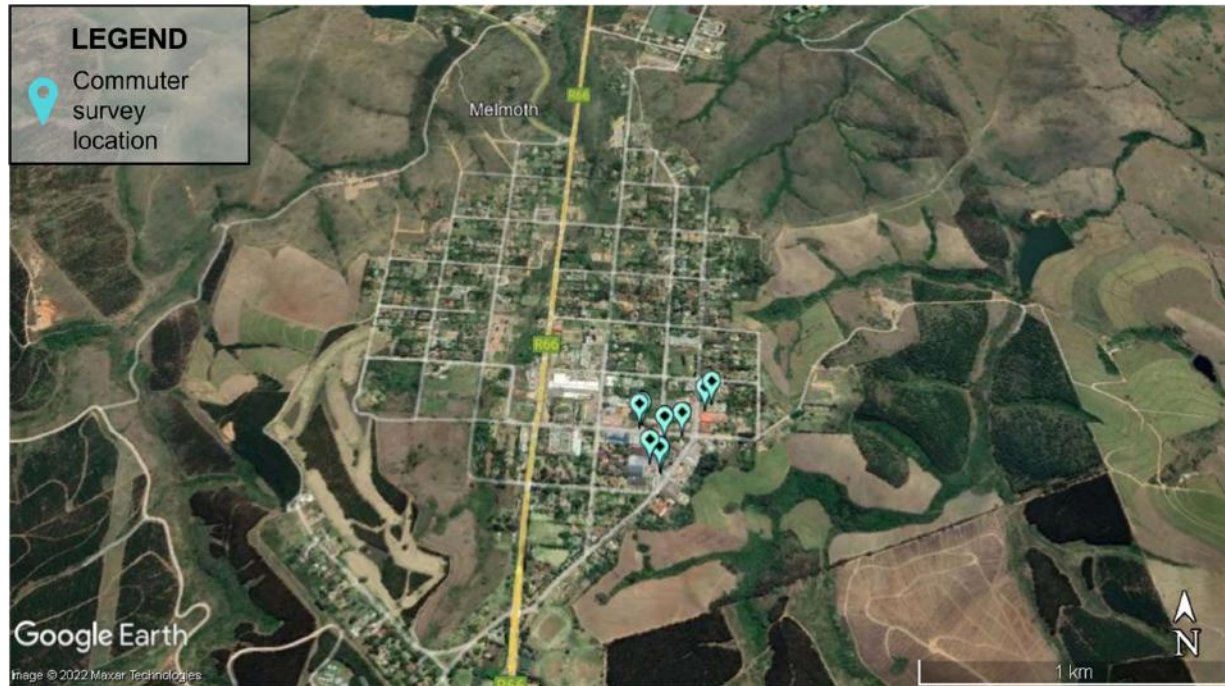


Figure 20 Commuter survey sites in Melmoth Town

Source: Google Earth & Urban-Econ, 2022

Household profile

Based on the survey analysis, the majority of households have been living in the area for more than 15 years. Many were born in the area or grew up in the area. More than half of the respondents interviewed indicated that their households have 10 or more people permanently residing in the household. Many of these people are family members or relatives, not tenants.

We understand that many households have more than five structures on site to accommodate the large household numbers. This might pose a challenge when the community must be relocated, and the resettlement plan will have to clearly indicate how compensation will be applied in this case.

Employment profile

From the surveys undertaken, it is understood that the unemployment rate is very high, which corresponds with what is stated in the Mthonjaneni LM IDP. The majority of those who are employed are low-income earners. A high percentage of the households depend on government social grants as a means of poverty alleviation. There is a large labour force employed in the agricultural sector but there are complaints of poor wages and salaries being offered. All respondents indicated they are willing to work but that lack of opportunities is preventing them from being economically active.

Majority of the employed individuals are either employed permanently or on a casual basis. A few are employed on contract basis.

Many households have no permanently employed members. For the households that do have permanently employed members, they are either farm workers or employed in the police service, healthcare, and education sectors. Self-employment as an artisan is a common livelihood practice.

Income and expenditure profile

Poverty is prevalent throughout the area, with the majority of households indicating a total monthly household income of less than R5 000. Almost a fifth of households surveyed indicated they have no monthly income. Consequently, there is a high dependence on social welfare grants, primarily the old age

pension grant, and the child support grant which is the main form of income for many households. From an expenditure perspective, the following is understood:

- No households are paying for water.
- Majority of the household’s income is spent on basic needs such as food and personal items.
- No tuition or school fees are paid.
- Many households rely on free medical care because of affordability issues, a handful of households have medical aid.
- Majority of households do not spend their income on furniture or household equipment. The current financial situation only allows them to afford basic needs. They cannot afford to spend on luxury items.
- Only a few households have enough money to save through stokvels (R150-R1 000).

Healthcare perceptions and concerns

Many respondents expressed that they are satisfied with the healthcare facilities they use but believe there is need for more healthcare facilities (clinics) and better transportation services. There is a general concern about health-related complications arising due to air and water pollution from the mine’s activities. Additionally, concerns were noted regarding the risk of injury to community members, with concerns about children in particular.

Traditional agrarian lifestyles

The rearing and herding of livestock (mainly cattle and goats) is a common practice in the area, with the majority of households having access to grazing land. A notable concern is the impact of the mine on the health of the livestock due to loss of safe grazing land and drinking water.

Subsistence agriculture is also commonly practised, with the majority of households indicating access to sufficient land and water to grow their own crops. For many of the households, subsistence agriculture is the main way in which household nutritional needs are met and similar concerns were shared about the possible loss of safe land and water for crop production. Most households travel at least 3-5km (up to 45 minutes) to buy food.

Anticipated impacts

A number of impacts were identified during the surveys that the community is concerned about if the mine is established. In the table below, the key negative impacts refer to the predominant impacts that were identified and other impacts refer to impacts that were mentioned as concerns during the surveys.

Table 4-4 Anticipated negative impacts identified by community members

Key negative impacts	
• Air and water pollution related health issues	• Loss of water
• Cracking of homes due to blasting	• Employment of outsiders
• Limited access to land and loss of agricultural/ farming/ grazing land	• Loss of protected areas
Other negative impacts	
• Disruption of life and population in-migration	• Increased pressure on healthcare facilities
• Increased car accidents and traffic	• Loss of soil fertility
• Loss of ties to ancestral land	• Environmental damage
• Political interference and corruption	• The mine renegeing on promises

Key negative impacts

- Unfair compensation for relocation

The following positive impacts are anticipated by community members.

- Job opportunities
- Poverty reduction
- Improved standard of living
- Training and skills development
- Improved clinics and schools
- Improvement of schools and training on computers
- Improved infrastructure
- Business opportunities
- Proper roads and transport
- Increased investment in the area
- Formal housing (RDP)
- Water tanks installation
- Improved creche and high schools' parks and tuck shops

Priorities and expectations

The community identified the following development priorities from Jindal should it establish and operate a mine in the area:

- Priority 1: Job creation
- Priority 2: Provision of more clinics
- Priority 3: Provision of formal housing
- Priority 4: Provision of water storage tanks for households
- Priority 5: Improvement of roads and transportation services
- Priority 6: Training and capacity building to take advantage of procurement opportunities in the value chain

Other expectations identified by community members should the mine proceed are:

- Improved educational facilities, including more classrooms, a high school, and support with purchasing school uniforms.
- Development of community services infrastructure, including healthcare facilities, community centres, business centres, and sports fields.
- Economic development and growth in Melmoth town which will create job opportunities/.
- Improved accessibility to bulk service provision, including roads, sanitation services (ablution facilities), electricity, and water.
- Training and capacity building in personal computer utilisation.
- Prospects of a better future for the youth, including bursaries and support for tertiary level education.

4.4 SUMMARY ANALYSIS

Generally, the proposed Jindal MIOP is perceived in a positive light, with most community members highly supportive of the project due to the anticipated employment that will be created. The community is also anticipating considerable support from Jindal in attaining socio-economic improvements in their life and improving the prospects of youth that reside in the area.

For the most part, fears and concerns revolve around the potential health impacts (air and water pollution) on both human and animal (livestock) life and the infrastructural damage resulting from blasting. Other

concerns relate to loss of ancestral land, exhumation of the deceased, unfair compensation being offered for relocation, an increased strain on public services, and disruptions to life due to an influx of jobseekers.

From engagement with stakeholders, the main concerns have been raised by stakeholders in the agricultural and tourism sectors. For these stakeholders, the mine is viewed as an existential threat due to the anticipated negative impacts (direct and indirect) of its operational activities on agricultural and tourism activities. Of particular concern is the Nkwadini Valley and the possible loss of agricultural potential and the ability to meet stringent export requirements for the commodities produced. There is concern that the establishment and operation of the mine will not only impact productivity on farms, which will result in job losses, but that the education and skill requirements of the mine will mean that many that lose jobs in the agricultural sector and not all will be absorbed or find employment in the mine. There may be some unskilled job opportunities that may arise in the mine.

For tourism stakeholders, the major concerns relate to the likely impacts that mining activities will have on the sense of place and on impeded accessibility to site of Zulu cultural significance. As a values-based sector, changes in tourists' perception regarding an area or region can negatively impact the appeal of the area or region.

Almost all stakeholders expressed concern about the potential for mining operations to contaminate the Goudertrouw Dam, which is the main water source for all water users from the dam to Richards Bay. Other concerns relate to impacts on infrastructure, such as an already congested and poorly maintained road transportation network.

5 DESCRIPTION AND ASSESSMENT OF ANTICIPATED IMPACTS

Mining has a substantial influence on several parts of society, in part by providing economic and social development, but also through negative environmental and social impacts connected to its operation. This combination of both positive and negative effects induces a complex planning process concerning conflicting interests, difficult trade-offs, long time spans and a number of actors.

This section describes and assesses the anticipated socioeconomic impacts of the MIOP. Potential impacts have been identified based on the specialist’s understanding of the specific project and of the social and economic impacts associated with large-scale open pit mining operations (informed by the literature review), and the socio-economic context of the receiving environment.

The anticipated impacts have been categorised as either economic or social impacts and for the construction and operations phase of the mine lifecycle. Each potential impact has been assessed and migration/enhancement measures, and monitoring and reporting suggestions have been included.

5.1 IMPACT ASSESSMENT CRITERIA

The method used for the assessment of impacts is set out in Table 5-1. This assessment methodology enables the assessment of environmental impacts including cumulative impacts, the intensity 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 5-1 SLR EIA Methodology

PART A: DEFINITIONS AND CRITERIA*		
Definition of SIGNIFICANCE		Significance = consequence x probability
Definition of CONSEQUENCE		Consequence is a function of intensity, spatial extent and duration
Criteria for ranking of the INTENSITY of environmental impacts	VH	Severe change, disturbance, or degradation. Associated with severe consequences. May result in severe illness, injury or death. Targets, limits and thresholds of concern continually exceeded. Substantial intervention will be required. Vigorous/widespread community mobilisation against project can be expected. May result in legal action if impact occurs.
	H	Prominent change, disturbance, or degradation. Associated with real and substantial consequences. May result in illness or injury. Targets, limits and thresholds of concern regularly exceeded. Will definitely require intervention. Threats of community action. Regular complaints can be expected when the impact takes place.
	M	Moderate change, disturbance or discomfort. Associated with real but not substantial consequences. Targets, limits and thresholds of concern may occasionally be exceeded. Likely to require some intervention. Occasional complaints can be expected.
	L	Minor (Slight) change, disturbance or nuisance. Associated with minor consequences or deterioration. Targets, limits and thresholds of concern rarely exceeded. Require only minor interventions or clean-up actions. Sporadic complaints could be expected.
	VL	Negligible change, disturbance or nuisance. Associated with very minor consequences or deterioration. Targets, limits and thresholds of concern never exceeded. No interventions or clean-up actions required. No complaints anticipated.
	VL+	Negligible change or improvement. Almost no benefits. Change not measurable/will remain in the current range.

PART A: DEFINITIONS AND CRITERIA*		
	L+	Minor change or improvement. Minor benefits. Change not measurable/will remain in the current range. Few people will experience benefits.
	M+	Moderate change or improvement. Real but not substantial benefits. Will be within or marginally better than the current conditions. Small number of people will experience benefits.
	H+	Prominent change or improvement. Real and substantial benefits. Will be better than current conditions. Many people will experience benefits. General community support.
	VH+	Substantial, large-scale change or improvement. Considerable and widespread benefit. Will be much better than the current conditions. Favourable publicity and/or widespread support expected.
Criteria for ranking the DURATION of impacts	VL	Very short, always less than a year. Quickly reversible
	L	Short-term, occurs for more than 1 but less than 5 years. Reversible over time.
	M	Medium-term, 5 to 10 years.
	H	Long term, between 10 and 20 years. (Likely to cease at the end of the operational life of the activity)
	VH	Very long, permanent, +20 years (Irreversible. Beyond closure)
Criteria for ranking the EXTENT of impacts	VL	A part of the site/property.
	L	Whole site.
	M	Beyond the site boundary, affecting immediate neighbours
	H	Local area, extending far beyond site boundary.
	VH	Regional/National

PART B: DETERMINING CONSEQUENCE							
			EXTENT				
			A part of the site/property	Whole site	Beyond the site, affecting neighbours	Local area, extending far beyond site.	Regional/ National
			VL	L	M	H	VH
INTENSITY = VL							
DURATION	Very long	VH	Low	Low	Medium	Medium	High
	Long term	H	Low	Low	Low	Medium	Medium
	Medium term	M	Very Low	Low	Low	Low	Medium
	Short term	L	Very low	Very Low	Low	Low	Low
	Very short	VL	Very low	Very Low	Very Low	Low	Low
INTENSITY = L							
DURATION	Very long	VH	Medium	Medium	Medium	High	High
	Long term	H	Low	Medium	Medium	Medium	High
	Medium term	M	Low	Low	Medium	Medium	Medium
	Short term	L	Low	Low	Low	Medium	Medium
	Very short	VL	Very low	Low	Low	Low	Medium
INTENSITY = M							
DURATION	Very long	VH	Medium	High	High	High	Very High
	Long term	H	Medium	Medium	Medium	High	High

PART B: DETERMINING CONSEQUENCE

	Medium term	M	Medium	Medium	Medium	High	High
	Short term	L	Low	Medium	Medium	Medium	High
	Very short	VL	Low	Low	Low	Medium	Medium

INTENSITY = H

DURATION	Very long	VH	High	High	High	Very High	Very High
	Long term	H	Medium	High	High	High	Very High
	Medium term	M	Medium	Medium	High	High	High
	Short term	L	Medium	Medium	Medium	High	High
	Very short	VL	Low	Medium	Medium	Medium	High

INTENSITY = VH

DURATION	Very long	VH	High	High	Very High	Very High	Very High
	Long term	H	High	High	High	Very High	Very High
	Medium term	M	Medium	High	High	High	Very High
	Short term	L	Medium	Medium	High	High	High
	Very short	VL	Low	Medium	Medium	High	High

PART C: DETERMINING SIGNIFICANCE

PROBABILITY (of exposure to impacts)	Definite/ Continuous	VH	Very Low	Low	Medium	High	Very High
	Probable	H	Very Low	Low	Medium	High	Very High
	Possible/ frequent	M	Very Low	Very Low	Low	Medium	High
	Conceivable	L	Insignificant	Very Low	Low	Medium	High
	Unlikely/ improbable	VL	Insignificant	Insignificant	Very Low	Low	Medium
			VL	L	M	H	VVH
CONSEQUENCE							

PART D: INTERPRETATION OF SIGNIFICANCE

Significance	Decision guideline
Very High	Potential fatal flaw unless mitigated to lower significance.
High	It must have an influence on the decision. Substantial mitigation will be required.
Medium	It should have an influence on the decision. Mitigation will be required.
Low	Unlikely that it will have a real influence on the decision. Limited mitigation is likely to be required.
Very Low	It will not have an influence on the decision. Does not require any mitigation
Insignificant	Inconsequential, not requiring any consideration.

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

5.2 SOCIAL IMPACTS

Social impacts refer to the impacts that the construction and operational phases of the proposed MIOP will have on the local population and the social circumstances of the local communities within which the mine is proposed to be located. The impacts are considered for the construction and operational phases, and also as either positive or negative impacts to the receiving socio-economic environment. This component of the impact assessment is derived by identifying and assessing the impact of the development on the people, households, communities, businesses, and other stakeholders. Detailed analysis of social impacts is also found in the other specialist studies forming part of the project's ESIA Report.

The social impacts should be understood within the socio-political context of the receiving environment and the directly impacted communities. The risk of social and political interference in the construction and operation of the MIOP remains high within the AOI given the social unrest and 'localised' political instability¹⁷. (Yeni, 2019) argues that rural citizens may show little or no interest in the accountability of traditional leaders in their advisory or ceremonial role in the community, when their land rights are threatened, they demand accountability and resist. In response to this push back from the affected citizens, those in traditional leadership positions often use coercion and apply divisive tactics to weaken resistance. This creates a volatile political environment that poses several risks to the development and operation of the MIOP.

In addition, any perceived or real failure to properly address social concerns can exacerbate tensions within local communities and put pressure on the sustainability of the MIOP. The perception of a lack of (or inadequate) progress is often met with vocal opposition, strikes, and unrest. This can have a significant impact on project development through costly operational delays and reputational damage to mining companies.

These social and political risks need to be carefully considered and adequately mitigated if the proposed MIOP is to be successfully rolled out.

5.2.1 Community Impacts

5.2.1.1 Labour influx/ in-migration of jobseekers

The scale of the proposed MIOP means that it is likely to attract people from outside the area looking for employment opportunities. An increase in the population will increase the demand for basic services in an environment that is already suffering from low levels of service delivery, thus placing an increasing service delivery burden on the local government authorities.

Further to this, with high levels of poverty in the receiving environment, employment opportunities being offered to outsiders has a high propensity to create social tension and conflict between the resident population and outsiders.

¹⁷ Timse, T. 2016. Mail & Guardian. *Choose between mining and bloodshed*. Online. Available: <https://mg.co.za/article/2016-05-03-choose-between-mining-and-bloodshed/> [Accessed 17 May 2023].

Dladla, S. 2016. GroundUp. *Community celebrates as iron mine plan shelved*. Online. Available: <https://www.groundup.org.za/article/kwazulu-natal-community-celebrates-mining-companys-withdrawal/> [Accessed 17 May 2023].

Construction phase

The 5-year construction phase is anticipated to require in the order of 26 437 Full Time Employment (FTE) personnel, or around 8 800 persons per year. It is unlikely that the labour pool is large enough to provide all these persons and therefore there is bound to be an influx of people into the area.

Social conditions outside the mines have historically been major drivers of epidemics, starting in the past with the “circular transmission” of sexually transmitted diseases (STDs) between rural areas and the mines, and now driving HIV/AIDS and tuberculosis (TB). The labour migration system creates a mechanism to spread miners’ HIV and TB risks to their families and home communities, in turn placing an increased burden on healthcare facilities, both in the mine communities and in their home communities (Stuckler, Steele, Lurie, & Basu, 2013).

Growth in the resident population in Mthonjaneni and Umlalazi LMs is also likely to place an increased burden on bulk public service infrastructure such as water, electricity, and housing.

There is a potential risk of an escalation in crime within the surrounding communities. Such crime could be petty in nature, such as pick-pocketing and theft, or more serious contact crimes, such as mugging, carjackings and home invasions. This is likely to place an increased burden on the community police services and create dangers for the surrounding communities.

This negative impact is assessed to have a medium intensity and is likely to extend beyond the site boundaries into the surrounding communities in both Mthonjaneni and Umlalazi LM. The significance of the impact is assessed as LOW, with mitigation measures this could be reduced to VERY LOW. Table 5-2 provides a summary of the impact.

Table 5-2 Impact Summary - Labour influx / in-migration of jobseekers in Construction Phase

Issue: Labour influx/ in-migration of jobseekers		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	Medium
Duration	Short-term	Short-term
Extent	Local	Local
Consequence	Low	Low
Probability	Probable	Possible / frequent
Significance	Low -	Very Low -
Degree to which impact can be reversed	<i>Following the construction phase, jobseekers who arrived in search of employment opportunities will in all likelihood leave and seek out opportunities elsewhere.</i>	
Degree to which impact may cause irreplaceable loss of resources	<i>No irreplaceable loss is likely due to the temporary nature of the impact.</i>	

Mitigation/ enhancement measures

The following mitigation measures are recommended to ensure this impact is reduced to a VERY LOW significance:

- Effective implementation of the SLP, including the ring-fencing of a portion of procurement to locally empowered suppliers and a stipulation for them to employ local residents. Providing opportunities

for local residents to take up construction jobs is likely to mitigate potential conflict arising from the influx of outsiders.

- Increased security and proactive policing to prevent and combat escalation in crime within the surrounding communities.
- Continual engagement with local community and labour representatives, including traditional leadership and ward committees.

Monitoring

The following monitoring is recommended:

- Procurement of goods and services for the establishment of the MIOP should be monitored to ensure ring-fenced procurement is implemented and that local empowered suppliers fulfil their contractual obligations of hiring local residents.
- A database of all labourers in the construction companies should be compiled and submitted to Jindal, including proof of residence.
- This should be done on a continual basis throughout the construction phase to ensure compliance.

Reporting

Reporting on the above monitoring should be as follows:

- Internal reporting – monthly for:
 - Procurement appointments
 - Tracking of Historically Disadvantaged South Africans (HDSA) as part of the construction labour force with an emphasis on local resident population
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of composition of construction labour force.

Operational phase

The operational phase of the MIOP is projected to create and sustain around 800 FTE employment opportunities per year. The technical skill and education requirements of the MIOP mean that the absorption of the local labour force to fulfil all functions is unlikely and some skills would be brought into the local economy.

This negative impact is assessed to have a low intensity and is likely to extend beyond the site boundaries into the surrounding communities in Mthonjaneni LM. The significance of the impact is assessed as MEDIUM, with mitigation measures this could be reduced to LOW. A summary of the impact is included in Table 5-3.

Table 5-3 Impact Summary - Labour Influx/ In-migration of Jobseekers During Operations

Issue: Labour influx		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	Low	Very low
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	Medium	Low

Probability	Probable	Probable
Significance	Medium -	Low -
Degree to which impact can be reversed	<i>Given the long-term nature of the mine's operations, the negative impact of labour influx associated with the operational phase would be challenging to reverse.</i>	
Degree to which impact may cause irreplaceable loss of resources	<i>Unlikely to cause irreplaceable loss of resources, however, some level of destabilisation of the community is likely as a result of outsiders taking up residence in the community.</i>	

Mitigation/ enhancement measures

The following mitigation measures are recommended to ensure this impact is reduced to LOW significance:

- Effective implementation of the SLP, including the ring-fencing of a portion of procurement to locally empowered suppliers and a stipulation for them to employ local residents. Providing opportunities for local residents to take up operational jobs is likely to mitigate potential conflict arising from the influx of outsiders.
- Implementation of the SLP Skills Development Plan (SDP), including undertaking a skills audit in the local population to identify skill deficits which need to be addressed based on operational requirements.

Monitoring

The following monitoring is recommended:

- Procurement of goods and services for the establishment of the MIOP should be monitored to ensure ring-fenced procurement is implemented and that local empowered suppliers fulfil their contractual obligations of hiring local residents.
- A database of all labourers in the construction companies should be compiled and submitted to Jindal, including proof of residence.
- This should be done on a continual basis throughout the operational phase to ensure compliance.

Reporting

Reporting on the above monitoring should be as follows:

- Internal reporting – monthly for:
 - Procurement appointments
 - Tracking of Historically Disadvantaged South Africans (HDSA) as part of the operational labour force with an emphasis on local resident population
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of composition of labour force.
- External reporting – annual for:
 - DMRE on SLP compliance

5.2.1.2 Resettlement and relocation

The establishment of the proposed MIOP will require resettlement of households and community facilities, such as schools, clinics and places of worship. Forced resettlement can be particularly disastrous for indigenous communities who have strong cultural and spiritual ties to the lands of their ancestors and who

may find it difficult to survive when these are broken. In traditional or rural areas, communities bury their loved ones in their yards. Therefore, losing their land or being forced to resettle elsewhere will mean that the graveyards/ burial sites will need to be relocated as well (Environmental Law Alliance Worldwide (ELAW), 2010).

The displacement of settled communities is likely to cause resentment towards and conflict with the mine. The removal of communities to elsewhere, often into purpose-built settlements not necessarily of their own choosing, may cause a significant disruption to their lives. Besides losing their homes, communities lose their land, and thus their livelihoods. Community institutions and power relations may also be disrupted. Displaced communities are often settled in areas without adequate resources or are left near the mine, where they may bear the brunt of pollution and contamination.

Construction phase

During the construction phase, there is a likelihood that family and community bonds will be stretched and broken as those family members that fall outside of the demarcated resettlement zone are relocated, while others are left behind. Physical and emotional isolation from relatives, friends, and social support networks can have an enormous psychological toll on families and communities.

Being predominantly Zulu tribal land under the authority of the Ingonyama Trust Board and other traditional authorities, the relocation and exhumation of graves is likely to be a source of contention for the local community in the receiving environment. Conflicts and disagreements are likely to arise as this type of activity affronts most people's beliefs and cultural practices.

Religious, customary, and spiritual practices could be interrupted because of household and community resettlement. Resettlement is likely to strain or possibly sever people's customary and religious networks by moving them away from their places of worship and practice, with ancestral connections to the land being lost.

This impact is considered to have a high intensity which will persist over the medium-term but is localised, extending to those directly affected by the mine's establishment, viz, those communities currently living in the SE block, where mining activities will be concentrated. The significance is assessed as MEDIUM and mitigation measures are unlikely to reduce this.

Table 5-4 provides a summary of the impact.

Table 5-4 Impact Summary – Resettlement and Relocation During Construction Phase

Issue: Resettlement and relocation		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	High	Medium
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Probable	Probable
Significance	High -	Medium -
Degree to which impact can be reversed	<i>From a physical location perspective, this impact cannot be reversed. However, in time, a new dynamic will emerge as residents get used to the new normal. There is a potential for medium-term psychological distress and trauma</i>	
Degree to which impact may cause irreplaceable loss of resources	N/A	

Mitigation/ enhancement measures

The resettlement mitigation measures should be developed by qualified resettlement specialists and should be included as part of a Resettlement Action Plan (RAP). This may include the following suggested mitigations:

- Jindal must engage in open and transparent discussions with community members, through the mandated channels, to effectively manage community expectations.
- Fair and just compensation must be provided to any relocated community members and all lost infrastructure must be replaced to a similar or better standard.
- Continual engagement with local community and labour representatives, including traditional leadership and ward committees.

Monitoring

The monitoring of the resettlement mitigation measures should be developed by qualified social monitoring specialists and should be included as part of a Resettlement Action Plan (RAP). This may include following monitoring indicators:

- Restoration of livelihoods and assets including type of assistance and compensation paid such as :
 - Condition and quality of livestock owned
 - Condition and quantity of grazing land accessible
 - Access to water, sanitation and electricity
- Grievance management including number of grievances received and promptly resolved
- The monitoring and evaluation should be done before the relocation, during compensation and post relocation using specific indicators.

More specific monitoring to understand the success of the RAP would need to be developed by qualified social monitoring specialists.

Reporting

The reporting of the resettlement mitigation measures should be developed by qualified social monitoring specialists and should be included as part of a Resettlement Action Plan (RAP). This may include following reporting indicators:

- Internal reporting – monthly for:
 - Restoration of livelihoods
 - Grievance management
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of progress on the RAP.
- External reporting – annual for:
 - DMRE on SLP compliance

The relocation and resettlement of community households, schools and other facilities will only occur in the construction phase although the impacts may persist into the operational phase.

5.2.1.3 Community development and lifestyle

The establishment of the proposed MIOP could have both positive and negative impacts on the lifestyle of communities in the receiving environment. Large scale construction projects and, later, the presence of a mine in the area is likely to result in negative changes to the sense of place and aesthetic qualities of what is a tranquil, rural landscape set amongst rolling green hills. Uncertainty over the future can result in fear and anxiety within the community, with negative consequences for community development. Additionally, as is common with large-scale mining projects, misrepresentation of the community by their traditional leadership has the potential to negatively influence community development, while fraud, corruption and political interference in employment and procurement can negatively impact public service delivery for residents.

Construction phase

During the construction phase, a range of potential negative impacts affecting community development are anticipated. Misrepresentation of community members by traditional leadership and the use of violence, fear and intimidation to secure support for the MIOP amongst the community are possible, with numerous instances of this having occurred in other mining projects in South Africa, often with fatal consequences, such as the Xolobeni Sands Mineral Project in the Eastern Cape (Steyn & Damba-Hendrik, 2021), and the Somkhele Mine in Northern KZN (Kockott & Hattingh, 2020).

There are three Traditional Authority areas within the Mthonjaneni LM:

1. Biyela KwaYanguye Traditional Authority is located to the north-east of the municipality and incorporating the KwaYanguye area and surrounding settlements.
2. Zulu-Entembeni Traditional Authority is located to the south-east of the municipality and incorporates Makasaneni and Ndundulu and surrounding settlements.
3. Biyela-Obuka Traditional Authority is located towards the East of the municipality and incorporates areas like Sqhomaneni, Upper Nseleni and other surrounding rural settlements.

All these Traditional Authority areas are solely owned by Ingonyama Trust. Failure to secure the support and buy-in of these Traditional Authorities regarding the planned developments could potentially frustrate the process and create discord within the resident communities.

South Africa is also well-versed in the way projects of this magnitude are capitalised on by nefarious interests in both the private and public sector to secure political influence through patronage. The impacts of such activities can be potentially disastrous for surrounding communities and the economic development and growth of the country. Vote-buying through promises of employment and removal of bureaucratic red-tape to secure favourable decisions is a risk that must be mitigated.

The intensity of this impact is assessed to be HIGH due to the risk of serious injury or fatalities. However, it is a short-term impact that is likely to subside post- construction activities and is considered localised, affecting those in relative proximity to the site. Therefore, significance is assessed as MEDIUM prior to mitigation measures, and LOW following mitigation.

Table 5-5 Impact Summary – Community Development During Construction Phase

Issue: Community development and lifestyle		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	High	High
Duration	Short-term	Short-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Probable	Conceivable
Significance	Medium -	Low -
Degree to which impact can be reversed	<i>Impacts may be difficult to reverse</i>	
Degree to which impact may cause irreplaceable loss of resources	<i>Goodwill amongst community members and between community members and traditional authority structures may result in a medium-term loss in social resources/ capital in the community.</i>	

Mitigation measures

The following mitigation measures are recommended to reduce the significance of this:

- Jindal must engage in early and ongoing open and transparent discussions with community members, through the mandated channels to effectively manage community expectations.
- Continual engagement with local community and labour representatives, including traditional leadership and ward committees.
- At the pre-construction phase, Jindal should undertake a skills audit in the labour-sending communities with the objective of identifying skills development interventions necessary for community members to take up the employment opportunities on offer.
- Effective implementation of the SLP, especially in relation to the skills development plan.
- Establishment and implementation of effective governance controls to reduce or avoid opportunities for political influence.

Monitoring

The following monitoring is recommended:

- Ongoing engagements with community and labour representatives should be monitored.

- An annual skills audit should be undertaken in the community and in the labour force to identify skills deficits against the mine’s operational requirements.
- Implementation of all skills development interventions must be monitored against Jindal’s commitments as articulated in the SLP.

Reporting

Reporting on the above monitoring should be as follows:

- Internal reporting – quarterly for:
 - Skills development interventions
 - Tracking of Historically Disadvantaged South Africans (HDSA) as part of the construction labour force with an emphasis on local resident population
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of composition of labour force and skills requirements and opportunities for community development.

Operational phase

Through the SLP, the proposed MIOP can potentially positively support the general upskilling of the community and especially of community members that are employed by the mine. Inclusion of skills and capacity building programmes that focus on ABET, learnerships/ apprenticeships, driver’s licensing, and bursaries for higher education degrees that are related to the skills requirements of the mine’s operations. Such programmes can empower the community, reduce poverty by equipping community members with skills that will improve their economic development prospects, and support the strengthening of social inclusion.

The positive impact is considered to be of MEDIUM intensity and will occur over the long-term. It is likely to extend beyond the site boundaries and into the LM and is therefore assessed to have a MEDIUM positive significance prior to enhancement measures being implemented. With enhancement the impact could extend beyond the Mthonjaneni and uMlalazi LM as the skills developed could be transferrable to other sectors and geographic locations and could be improved to HIGH positive significance.

Table 5-6 Impact Summary – Community Development During Operational Phase

Type of Impact	Direct	
Nature of Impact	Positive	
Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	High
Duration	Long-term	Long-term
Extent	Local	Regional
Consequence	Medium	High
Probability	Probable	Probable
Significance	Medium +	High +
Degree to which impact can be reversed	<i>No need to reverse a positive impact</i>	
Degree to which impact may cause irreplaceable loss of resources	<i>Very low as skills development and training will increase the knowledge and skills resource base</i>	

Enhancement measures

The following enhancement measures are recommended to ensure this impact becomes of HIGH significance:

- Effective implementation of the SLP, especially in relation to the skills development plan.
- Jindal should undertake a skills audit in the labour-sending communities with the objective of identifying skills development intervention necessary for community members to take up the employment opportunities on offer.
- Jindal must engage in open and transparent discussions with community members, through the mandated channels to effectively manage community expectations.
- Continual engagement with local community and labour representatives, including traditional leadership and ward committees.

Monitoring

The following monitoring is recommended:

- Monitoring of annual skills audit should be undertaken in the community and in the labour force to identify skills deficits against the mine's future operational requirements.
- Monitoring of implementation of all skills development interventions must be monitored against Jindal's commitments as articulated in the SLP.

Reporting

Reporting on the above monitoring should be as follows:

- Internal reporting – quarterly for:
 - Skills development interventions
 - Tracking of Historically Disadvantaged South Africans (HDSA) as part of the construction labour force with an emphasis on local resident population
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of composition of labour force.
 - DMRE regarding SLP skills development plan interventions.

5.2.1.4 Employment creation and livelihood support

Arguably, one of the most significant positive impacts of the establishment and operations of the proposed MIOP is job creation. Given the nature and scale of the project, many opportunities would be created and through the SLP, many of these opportunities could theoretically be ring-fenced for the local communities in the receiving environment. Given the high age dependency ratio (156), dependency on social welfare, and a reliance on the agricultural sector to provide employment opportunities, this impact is likely to be significant.

The scale of employment creation potential has been quantified and thereafter assessed in section 5.3.

5.2.2 Business and enterprise impacts

5.2.2.1 Agriculture

The Nkwalini Valley is a highly productive bio-resource zone, with high-value export commodities such as citrus and avocado being commercially produced in the area. The nature of the mine's construction and operations could impact commercial and subsistence agricultural operations through the introduction of contaminated windblown dust. Depending on the contaminants, the possibility exists of soil contamination over a potentially significant area which extends far beyond the mine's borders. Impeding the citrus growing areas would have dire consequences for their operations, which in turn may result in job losses along the value chain, and loss of valuable export earnings.

Additionally, changes in both the quantity and quality of water available for agricultural operations could place these operations in jeopardy. It is understood that water-users downstream of the Goudertrouw Dam have, in recent years, been unable to use their full water allocations due to drought-induced water shortages. There is a risk that actual allocations will be further reduced should the MIOP be granted a Water Use License.

It is estimated, through correspondence with the Nkwalini Farmers Association (NFA), that the agricultural operations in the Nkwalini Valley provide direct employment for at least 2 000 people. Further investigations by an agricultural specialist would be necessary to confirm direct employment. Employment multipliers within the agricultural sector average around 1.13, meaning that for every 10 direct on-farm FTE jobs, another 11.33 FTE jobs are created throughout the value chain. The agricultural operations in Nkwalini therefore potentially support 4 266 FTE jobs and sustain them on an ongoing basis. It is reasonably safe to suggest that these jobs will be supported on a long-term or even permanent basis.

Mining activity in some cases comes into direct competition with another predominant means of economic development in rural areas: agriculture (both small scale and large commercial farms). As shown in the economic profile of the AOI, agriculture is one of the driver economic sectors in the region. Farming is the traditional source of livelihood in the AOI, but mining has emerged as a lucrative activity. This is because of its remarkable income-generating potential. Although mining and agriculture can co-exist, generating economic and social benefits, there are some inherent tensions between the two as they compete for resources.

People in the AOI depend on agriculture to sustain their livelihoods; however, the mines have also become important because they create better employment opportunities. The agricultural sector may lose labour to the mine, as the mine is assumed to pay more for labour than the farming areas. Research shows that tensions over control of land and labour have led to community protests and violent conflict in some cases. However, mining and agriculture are not necessarily incompatible economic activities. Mining can generate money that supplements the income of farmers this allows them to improve their farms' productivity through buying inputs like fertilisers and hiring labour. Finding ways to reconcile these two important development drivers is a critical governance issue for the MIOP to reduce conflicts and ensure that mining's benefits contribute to long-term sustainable development in the economy of the AOI. Improved planning, dialogue and social compacts are required to optimise the relationship and ensure a balanced coexistence that will produce social and economic development without disrupting the livelihoods of rural people whose lives are tied to farming.

Construction phase

Construction activities will require the loosening and removal of significant volumes of overburden and the clearing of swathes of land to create platforms required for construction of the mine. Construction activities typically also require a significant amount of water and have the potential to contaminate ground water

sources through the run-off of contaminated liquids into the water system, which would have negative consequences for agricultural activities downstream of the MIOP.

The possible loss of agricultural potential is assessed to have a VERY HIGH intensity and could persist over the long-term depending on the extent of the change in environmental quality. Given the importance of the agricultural sector for the region, the impacts could extend well beyond the site boundary. Unmitigated, the impact is considered to have a HIGH significance, but effective mitigation measures aimed at reducing the probability of occurrence could reduce it to MEDIUM.

Table 5-7 Impact Summary - Agricultural Sector Impacts During Construction Phase

Issue: Agricultural sector impacts		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	Very high	Very high
Duration	Long-term	Medium-term
Extent	Regional	Regional
Consequence	High	High
Probability	Probable	Possible / frequent
Significance	High -	Medium -
Degree to which impact can be reversed	<i>Low reversibility once carrying capacity lost but agriculturalist specialist to advise</i>	
Degree to which impact may cause irreplaceable loss of resources	<i>Agricultural specialist to advise</i>	

Mitigation measures:

Mitigation measures would be required to limit changes in air and water quality and also in water quantity. These specialists in the team will need to determine what measures are taken to reduce the significance of the associated impacts.

Operational phase

Mining activity may compete for resources with agricultural activity in the area (both small scale and large commercial farms). People in the AOI depend on agriculture to sustain their livelihoods; however, the mines have also become important because they create better employment opportunities. The agricultural sector may lose labour to the mine, as the mine is assumed to pay more for labour than the farming areas.

Mitigation measures:

Improved planning, dialogue and social compacts are required to optimise the relationship and ensure a balanced coexistence that will produce social and economic development without disrupting the livelihoods of rural people whose lives are tied to farming.

5.2.2.2 Tourism

Tourism products within proximity to the site are most likely to be affected if the visual aesthetics of the area are altered, while increased noise and dust pollution can make the area undesirable for tourists which may lead to closure of tourism related products and activities if not well managed and controlled. The tourism industry in South Africa has been particularly hard hit by the curtailment of economic activity

because of the Covid-19 pandemic and any further disruptions to their activities could be detrimental to their survival and their ability to provide employment opportunities in the communities they are located in. As an industry with a relatively high economic multiplier effect, through its indirect and induced effects, any loss of tourism products could have long-lasting social consequences for the Mthonjaneni LM population and economy. The impacts could extend beyond the Mthonjaneni LM and into uMlalazi LM where Eshowe is home to a number of tourism products and sites, as well as north on the R66 towards Ulundi as the road is home to the Route 66 Zululand Heritage Route. Changes in sense of place could negatively impact the perceptions of tourists along this route.

Tourism interest in northern KZN has been increasing, particularly from overseas visitors. New identified markets include bird watching, cruise tourism, and educational tourism. Mthonjaneni LM has, amongst others, the following key tourism areas:

- Phobane lake (also known as Goudertrouw Dam) in ward 6.
- The home to Queen Nandi family in ward 5.
- Mthonjaneni cultural museum in ward 4.

For those tourism product owners targeting the business tourism sector, the establishment and operations of the mine could be beneficial to their operations due to the increased economic activity resulting from those enterprises that engage in business activities with the MIOP.

Construction phase

In the construction phase, increased traffic on the roads is likely as materials, equipment and construction crew are brought onto site. The R66 is a tourism route known as the R66 Zululand Tourism Heritage Route. It connects Amatikulu on the east coast, to Pongola in the north and passes through Eshowe, Melmoth, and Ulundi. Tourism KwaZulu-Natal (TKZN) and various tourism stakeholders consider this route a strategic route for international tourists who are attracted to the rich Zulu heritage and history contained in the region.

The impact is assessed as having MEDIUM intensity for those tourism establishments that are focused on culture, heritage, avi-tourism (mainly Eshowe), and adventure tourism, and will persist over the short-term. There is however a possibility that the construction phase activities will send a signal to tourists and alter their perceptions of the region for the long-term. The impacts are likely to extend beyond the site boundary and into the whole region, with tourists potentially discouraged from travelling along the whole route, especially from the Amatikulu side of the route. Unmitigated, the impact is assessed as having a HIGH significance.

Table 5-8 Impact summary - Impacts on the Tourism Sector During Construction Phase

Issue: Impact on tourism sector		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	Low
Duration	Short-term	Short-term
Extent	Regional	Regional
Consequence	High	High
Probability	Probable	Possible / frequent
Significance	High -	Medium -

Issue: Impact on tourism sector	
Degree to which impact can be reversed	<i>Low. The changing perceptions of tourists which are based on values could be difficult to reverse after the construction phase.</i>
Degree to which impact may cause irreplaceable loss of resources	<i>Tourism establishments that are forced to close will be difficult to replace.</i>

Mitigation/ enhancement measures

The following mitigation measures are recommended to ensure this impact is reduced to MEDIUM significance:

- Apply mitigations aimed at limiting the visual impact, as recommended by the visual specialist
- Apply mitigations aimed at reducing the impact of blasting, as recommended by the blasting specialist
- Apply mitigations aimed at reducing traffic impacts, as recommended by the traffic specialist.

Operational phase

Mine and tourism activities are typically incompatible with each other and for those tourism establishments focused on Zulu culture and nature-based tourism such as avi-tourism and adventure tourism, as well as those venues catering for weddings and social functions, there is a possibility of disruptions to business activities. Most visitors are attracted by the undisturbed nature of an area and mining activities are physically not pleasing to tourists due to the associated noise, waste and open air working landscape.

Table 5-9 Impact summary - Impacts on the Tourism Sector During the Operational Phase

Issue: Impact on tourism sector		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	Medium
Duration	Long-term	Long-term
Extent	Regional	Regional
Consequence	High	High
Probability	Probable	Possible / frequent
Significance	Medium -	Medium -
Degree to which impact can be reversed	<i>Low. Tourism activities and establishments not focused on business tourism could be forced to close.</i>	
Degree to which impact may cause irreplaceable loss of resources	<i>Tourism establishments that are forced to close will be difficult to replace.</i>	

Mitigation/ enhancement measures

- Tourism establishments focussed on business activities are likely to see a boost in business as people travel to the area to do business with the mine. Those tourism establishments that can shift their business model to capture a new market could see success. The mine should actively promote and

encourage its visitors to utilise the tourism products that are present in the area, especially those offering board and lodging.

- The mine must work with tourism product owners to understand if there are opportunities for collaborating around mine tourism, which is becoming a popular attraction in other parts of the world.
- The mine should participate in the R66 Zululand Heritage Route as well as engage with the tourism and LED officers at the King Cetshwayo District Municipality to understand ways in which it can support the sector.

Monitoring

The following monitoring is recommended:

- Regular monitoring of the impacts of the mine on tourism sector through engagement with tourism product owners, associations, and municipal tourism officers.
- If impacts are discovered, then appropriate actions to address those impacts will need to be undertaken with interested and affected parties involved in the process.

5.2.2.3 Businesses

In terms of the Mining Charter III, the proposed MIOP will be required, through the development and implementation of an appropriate SLP, to support new and existing Black-owned businesses through targeted procurement and ESD.

Additionally, businesses and enterprises operating in Melmoth Town are likely to experience an increase in business sales and income levels as a result of the increased economic activity resulting from the mine's operations. These impacts could extend even to Eshowe Town, in uMlalazi. These impacts are quantified and assessed in section 5.3.

5.3 ECONOMIC IMPACTS

The establishment and operations phase of the MIOP are likely to impart several macro-economic impacts that can be quantified and then assessed against the baseline to determine their likely significance on the receiving environment. A detailed overview of the approach to quantifying economic impacts is contained in Annexure A: Economic impact assessment approach: Measuring economic impacts.

5.3.1 Construction phase

Construction phase economic impacts are determined through modelling the stimulation of the economy through the injection of CAPEX. Any imported content (machinery, materials, goods service) is not considered as imported goods and services do not benefit the community / regional economy. They are temporary in nature and typically last for the duration of the construction phase, which in this case is estimated to be 5 years. The estimated CAPEX requirement for the project is indicated in the following table.

Table 5-10 Project CAPEX Profile

Item	Capital Cost	Local content ZAR	Local content %
Mining	R2 658 613 482	R797 584 045	30%
Services (plant)	R308 669 836	R246 935 868	80%
Services (Port)	R142 316 924	R113 853 540	80%
Ore crushing	R3 097 393 387	R929 218 016	30%

Ore Milling	R1 016 506 058	R304 951 818	30%
Magnetic Separation	R2 971 628 780	R1 485 814 390	50%
Concentrate handling phase 1	R283 363 718	R198 354 603	70%
Concentrate handling phase 2	R538 926 772	R161 678 031	30%
Tailings disposal	R612 916 542	R612 916 542	100%
Reagents	R37 005 923	R29 604 738	80%
Tailings Storage Facility	R1 607 439 834	R1 607 439 834	100%
Ship Loading	R764 406 166	R229 321 850	30%
Infrastructure 1	R2 427 084 400	R728 125 320	30%
Infrastructure 2	R12 657 532	R3 797 259	30%
Total Direct Fixed Costs	R16 478 929 354	R7 449 595 854	
Contractor P&Gs	R3 777 224 447	R3 399 502 002	90%
ÉPCM costs	R2 641 823 755	R2 377 641 380	90%
Other Costs	R271 272 355	R244 145 120	90%
Contingency (15%)	R3 491 899 967	R3 142 709 970	90%
Sub Total Project costs	R26 661 149 878	R16 613 594 326	90%
Eskom Connection	R1 830 207 028	R1 647 186 325	90%
Total Costs	R28 491 356 905	R18 260 780 651	

Source: Patrick Donlon (email: Jindal MIOP SLP Discussion). 21/01/2022, and (ABGM, 2021)

Using the CAPEX as an input variable, the following macro-economic benefits are anticipated.

Table 5-11 Economic impacts of CAPEX injection (Rand Millions)

CAPEX IMPACTS	Direct	Indirect	Induced	Total
Production	R18 260.78	R8 608.96	R11 043.60	R37 913.33
GDP/ GVA	R11 830.99	R3 273.10	R4 227.63	R19 331.72
Income	R4 338.31	R1 394.51	R1 692.25	R7 425.07
Employment (FTE)	26 437	14 438	17 064	57 939
Taxes	R1 490.76	R447.40	R558.26	R2 496.42

Source Urban-Econ Modelling, 2022

5.3.1.1 Production/ New Business Sales

The impact of the CAPEX investment can be used to determine the economic value of additional business opportunities created upstream and downstream of the contractors who secure work in constructing the proposed development. The localisation of these opportunities will be dependent on the localisation of the supply chain for the construction of the proposed development.

Through forward and backward linkages into the regional economy, the CAPEX is anticipated to support new business sales opportunities worth **R37.91 billion**, a significant boost for the regional economy.

5.3.1.2 GDP/ GVA

The development's positive socio-economic impact on the regional economy can be measured via its contribution to GVA, which is a proxy for Gross Domestic Product (GDP) at a scale smaller than a whole country. GVA provides a Rand value for the amount of goods and services that have been produced, less the cost of all inputs and raw materials that are directly attributable to that production.

The development is expected to inject an additional total of **R19.33 billion** into the regional economy (GVA). The economic scale at which the GVA impact will be felt is, however, a function of the geographic location of the companies appointed as service providers to undertake the required construction and engineering services.

5.3.1.3 Income Contribution

Another positive socio-economic impact which is anticipated to result from the input CAPEX investment during the construction of the proposed development is the contribution to improving the income levels of businesses (and households) who benefit from the increased business sales stimulation.

The stimulation of business activity is anticipated to generate improvements in income levels for those businesses (and households) that are able to benefit from supply contracts, both to undertake the construction, as well as to supply the required goods and specialist services. This cumulative impact in their income levels is expected to be **R7.43 billion**. Again, the scale of the economic impact could extend beyond the regional economy as it is based on the geographic extent of the supply chain, which could reach all over South Africa.

5.3.1.4 Employment Creation

The nature and scale of the proposed development is likely to positively impact the socio-economic environment through the creation of employment opportunities.

It should be noted that these opportunities will be created only for the duration of construction (approximately 5 years) and, therefore, should be considered temporary in nature. Also, it should be noted that the geographic spread of these employment opportunities will be a function of the location of the companies appointed as service providers to undertake the required construction work. While a project of this nature is anticipated to create employment opportunities in the local area and surrounding communities, the supply chains of the service providers and the skill levels of the community members will determine the localisation of these opportunities. Finally, it should be understood that the employment opportunities created are considered full time equivalent (FTE) employment opportunities. This means, for example, one full-time job for one person for 10 years or 10 full-time jobs for 10 people for one year.

The construction phase will create an estimated **57 939 jobs, 26 437 of which are expected to be direct jobs**. Direct jobs relate to the individuals employed by the construction companies, research specialists, and equipment suppliers commissioned to undertake the required work and supply the required services and equipment.

A further 14 438 jobs are expected to materialise through second round suppliers. This occurs when suppliers of new goods and services to the appointed contractors (first round suppliers) experience larger markets and potential to expand.

Lastly it is expected that the increased income in these households employed directly or indirectly through the construction of the proposed development will result in additional expenditure in the economy which stimulates growth and spurs additional employment. It is estimated that 17 064 jobs will be induced through the input CAPEX injection.

This positive impact is assessed to have a high intensity in terms of employment and would occur over the short-term. Local community will be prioritized as far as possible for employment opportunities. This could impact the socio-economic environment in the Region (District Municipality/ Province) and is considered to be a definite/ continuous impact over the duration of the construction phase. The impact is therefore assessed to be of MEDIUM significance. Enhancement measures are unlikely to change the significance, however, some management measures will still be required.

5.3.1.5 Taxes

It is well known that the mining sector contributes considerably to the national fiscus through tax receipts. The CAPEX injection is anticipated to generate a total of **R2.5 billion** in tax receipts, with R1.49 billion being a direct result of the CAPEX injection.

Assessment of construction phase economic impacts

The table below provides a summary of the assessment of direct, indirect and cumulative economic impacts resulting from the capital expenditure in the construction phase. The temporary economic impacts are assessed as having a HIGH intensity that will persist only for the short-term and are likely to extend beyond the site boundaries and into the whole region which will experience an increase in economic activity. The significance is assessed as being HIGH and enhancement measures are suggested to ensure this is realised.

Table 5-12 Impact Summary - Temporary Economic Stimulation During the Construction Phase

Issue: Temporary economic stimulation from capital expenditure		
Direct Impacts	Temporary increase in production and GDP in the local economy	
Indirect Impacts	Improved household income and increased business sales in the local economy	
Cumulative Impacts	Temporary increase in production, GDP, and tax contributions in the regional economy	
Nature of Impact	Positive	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	High	High
Duration	Short-term	Short-term
Extent	Regional	Local
Consequence	High	High
Probability	Definite / Continuous	Definite / Continuous
Significance	High +	High +
Degree to which impact can be reversed	N/A	
Degree to which impact may cause irreplaceable loss of resources	N/A	

Mitigation/ enhancement measures

The following enhancement measure is recommended to ensure this impact remains of HIGH significance:

- Effective implementation of the SLP, including the ring-fencing of a portion of procurement to locally empowered suppliers and a stipulation for them to employ local residents.

Monitoring

The following monitoring is recommended:

- Procurement of goods and services for the establishment of the MIOP should be monitored to ensure ring-fenced procurement is implemented and that local empowered suppliers fulfil their contractual obligations of hiring local residents.
- A database of all labourers in the construction companies should be compiled and submitted to Jindal, including proof of residence.
- This should be done on a continual basis throughout the construction phase to ensure compliance.

Reporting

Reporting on the above monitoring should be as follows:

- Internal reporting – monthly for:
 - Procurement appointments

- Tracking of Historically Disadvantaged South Africans (HDSA) as part of the construction labour force with an emphasis on local resident population
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of composition of construction labour force.

5.3.2 Operational phase

Operational phase impacts are determined through modelling the stimulation of the economy through the estimated annual OPEX of the Jindal MIOP, which has been provided for a period of 25 years. The project OPEX profile is indicated in Table 5-13.

Table 5-13 Project OPEX profile (25 years)

Item	Operating Cost
Total Operating Cost - Weathered Ore Mining	R3 181 632 572
Total Operating Cost - Fresh Ore Mining	R29 858 126 473
Total Operating Cost - Waste Mining	R3 613 650 605
Total Operating Cost - Mining	R36 653 409 650
Total Operating Cost - Melmoth Process Plant	R45 162 271 960
Total Operating Cost - TSF	R963 028 637
Total Operating Cost - Filtration at Plant (Rail)	R5 474 072 354
Total Operating Cost - Rail	R12 853 231 923
Total - Operating Costs	R101 106 014 524

Source: (ABGM, 2021)

Using the OPEX as an input variable, the following macro-economic benefits are anticipated.

Table 5-14 Economic impacts of OPEX profile (Rand Millions) for 25 years, in present values

OPEX IMPACTS (25 YEARS)	Direct	Indirect	Induced	Total
Production	R101 106.01	R70 616.07	R53 602.36	R225 324.45
GDP/ GVA	R45 144.68	R27 155.28	R20 458.82	R92 758.78
Income	R16 335.93	R11 506.08	R8 192.50	R36 034.51
Employment (FTE) ¹⁸	20 073	24 262	16 777	61 111
Taxes	R5 649.15	R3 700.41	R2 702.18	R12 051.74

Source: Urban-Econ Modelling, 2022

5.3.2.1 Production/ New Business Sales

Over a 25-year operational period, the proposed development is anticipated to support **R225.32 billion** in new business sales, or just over **R15 billion a year**. Since some of the goods and services required for effective management and functioning of the proposed development are likely to be secured locally (in

¹⁸ Operational phase FTE employment for mining activities and processing activities was provided to the specialist and has been utilised in place of the SAM IO model outputs. The estimates provided did not include administrative/ support staff, health and safety personnel etc. FTE employment will gradually increase from year 1 to year 4, by which time the mine will be fully operational. Average annual FTE employment is 803.

accordance with the SLP), this portion of the enhanced business activity should be secured within the regional economy.

5.3.2.2 Gross Value Added

Over a 25-year period, the operational phase of the proposed development is expected to inject an additional total of **R92.76 billion** into the regional economy, effectively **R6.18 billion a year** without escalations or financial charges, such as interest or taxes. As with the construction phase impacts, the economic scale of the GVA impact is determined by the location of companies appointed as services providers for the effective functioning of each component of the development.

5.3.2.3 Income Contribution

Enhanced business activity will generate income level improvements for the businesses (and households) that provide the necessary goods and services for the effective functioning of the proposed development. The cumulative impact on their income levels over a 25-year period is expected to be **R36.03 billion**, which equates to around **R2.4 billion a year**. With the requirements for local expenditure outlined in the SLP, this portion of the impact is anticipated to be felt by the regional economy.

5.3.2.4 Employment Creation

The operational nature and scale of Jindal MIOP will positively impact the socio-economic environment through creating employment opportunities, which will be sustained over the operational phase, if OPEX levels remain as projected in the financial modelling. Direct employment opportunities were identified in the financial modelling. Over a 25-year operational period, the proposed developed is expected to create **36 666 FTE jobs, 12 044 of which are expected to be direct jobs**.

This equates to an average of **803 direct FTE job opportunities** sustained each year over the 15-year period. Direct jobs relate to the individuals working in mining and processing activities.

A further **14 557 FTE jobs** are expected to materialise through second round suppliers. This occurs when suppliers of new goods and services to the appointed companies (first round suppliers) experience larger markets and potential to expand.

Lastly it is expected that the increased income in these households employed directly or indirectly through the operations of the proposed development will result in additional expenditure in the economy which stimulates growth and spurs additional employment. It is estimated that **10 066 FTE jobs** will be induced through the OPEX of the proposed development.

5.3.2.5 Taxes

In addition to the above economic impacts, the operational phase of the project is also likely to generate tax benefits for the national fiscus in the form of VAT (15%) and Company Income Tax (CIT), which will be lowered from 28% at present, to 27% for financial years ending on or after 31 March 2023.

Over a 25-year operational period, the Jindal MIOP is anticipated to contribute R12.05 billion in tax revenue for the national fiscus, with R5.65 billion of this being direct expenditure from the MIOP, equivalent to an annual tax bill of around R376.61 million.

Assessment of operational phase economic impacts

The table below provides a summary of the assessment of direct, indirect and cumulative economic impacts resulting from the expenditure in the operational phase. The economic impacts are assessed as having a HIGH intensity that will persist for the long-term and are likely to extend beyond the site boundaries and into the whole region which will experience an increase in economic activity. The significance is assessed as being HIGH and enhancement measures are suggested to ensure this is realised.

Table 5-15 Impact Summary - Stimulation of the Economy During the Operational Phase

Issue: Temporary economic stimulation from capital expenditure		
Direct Impacts	Increase in production and GDP in the local economy	
Indirect Impacts	Improved household income and increased business sales in the local economy	
Cumulative Impacts	Increase in production, GDP, and tax contributions in the regional economy	
Nature of Impact	Positive	
Phases	Operations	
Criteria	Without Mitigation	With Mitigation
Intensity	High	High
Duration	Long-term	Long-term
Extent	Regional	Local
Consequence	High	High
Probability	Definite / Continuous	Definite / Continuous
Significance	High +	High +
Degree to which impact can be reversed	N/A	
Degree to which impact may cause irreplaceable loss of resources	N/A	

Mitigation/ enhancement measures

The following enhancement measure is recommended to ensure this impact remains of HIGH significance:

- Provision of relevant and effective training and skills development initiatives to residents of the local community to provide them with the skills to take up employment opportunities in the MIOP.
- Effective implementation of the SLP, including the ring-fencing of a portion of procurement to locally empowered suppliers and a stipulation for them to employ local residents.

Monitoring

The following monitoring is recommended:

- Procurement of goods and services for the establishment of the MIOP should be monitored to ensure ring-fenced procurement is implemented and that local empowered suppliers fulfil their contractual obligations of hiring local residents.
- Jindal to report annually to the DMRE.
- This should be done on a continual basis throughout the construction phase to ensure compliance.

Reporting

Reporting on the above monitoring should be as follows:

- Internal reporting – monthly for:
 - Procurement appointments
 - Tracking of Historically Disadvantaged South Africans (HDSA) as part of the construction labour force with an emphasis on local resident population
- External reporting – quarterly for:
 - Apprising local authorities, including municipal government, traditional leadership, and ward councillors, of composition of construction labour force and quarterly reporting to DMRE.

5.3.3 Summary of Economic Impacts

To understand the full scale of the economic impacts of the proposed project, impacts from the CAPEX and OPEX injection are summed, with the results indicated in Table 5-16.

Table 5-16 Composite economic impacts (Rand millions) for 25 years, in present values

COMPOSITE IMPACTS (15 YEARS)	Direct	Indirect	Induced	Total
Production	R119 366.80	R79 225.03	R64 645.95	R263 237.78
GDP/ GVA	R56 975.67	R30 428.38	R24 686.45	R112 090.50
Income	R20 674.25	R12 900.58	R9 884.75	R43 459.58
Employment	38 480	28 995	27 130	94 606
Taxes	R7 139.90	R4 147.81	R3 260.44	R14 548.15

Source: Urban-Econ Modelling, 2022

In summary, the establishment and operations (for a 25-year period) of the proposed MIOP are anticipated to result in the following economic impacts:

- The generation or attraction of new business sales opportunities of R263.23 billion.
- An injection of R112.09 billion into the regional economy.
- An improvement in business incomes levels in the order of almost R43.46 billion.
- The creation of 94 606 FTE job opportunities, 38 480 of which will be direct opportunities.
- A tax injection to the national fiscus in the order of R14.55 billion.

5.4 DECOMMISSIONING/ CLOSURE IMPACTS

A decommissioning/ closure specialist is investigating the closure impacts that the mine will have after 25 years of the mine operation. After the 25 years life span, should Mining Rights for the North block and additional mining of the south block is not yet secured, the decommissioning of the mine will be required. During the decommissioning phase the majority of the infrastructure will be removed, and the area will be rehabilitated. The sense of place created by the mine will still remain during this period. Once all of the infrastructure is removed, the lack of vegetation cover will still impact the visual quality of the rehabilitated site. The agricultural capabilities of the land may be altered through the long-term mining process. The groundwater management during the decommissioning phase is important and it should be monitored to ensure that contamination is limited. A rehabilitation plan must be implemented, and the plan should be done in the line with the contents of National Water Act (Act No 36 of 1998), to avoid subsequent negative environmental impacts that may occur. Rehabilitation should consist of re-vegetating the site using appropriately chosen indigenous grasses. Various economically sustainable land use alternatives need to be considered to offset the impact of the closure of the mine. This could include the use of the existing infrastructure to create new businesses or the transfer of the existing infrastructure to existing businesses.

The major social implication associated with the decommissioning phase is linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. The downscaling and retrenchment will be required in full consultation with recognised organised labour. The Company will follow the procedures for downscaling and retrenchment as set out by the Department of Labour (DoL) and the Labour Relations Act.

A decommissioning/ closure specialist is investigating the closure impacts.

5.5 IMPACTS OF OTHER DEVELOPMENTS IN PLANNING/ PROGRESS STAGE

Known developments in the area, which could add to the identified impacts are discussed in the following sub-sections.

5.5.1.1 Tailings Storage Facility and associated infrastructure

A TSF Site Selection Study was undertaken in 2014/2015 by tailings specialists to ascertain where possible suitable sites would be for the TSF. It is anticipated the land area required for the TSF will be between 300 and 600 hectares depending on the topography.

A separate EIA and WULA process is underway for the TSF site, which has the potential to sterilise high potential agricultural land in the Nkwadini Valley through its placement. Should a failure of the TSF occur, the sterilisation of agricultural land and the potential for loss of life create significant cumulative impacts. In addition, there may be potential social impacts due to the additional employees moving into the area in search of employment however the TSF is not likely to generate significant jobs. These will be assessed in the EIA and WULA that is underway.

5.5.1.2 Transport of concentrate to Richard's Bay for export

The final mode of transportation of the concentrate from the processing plant to the Richards Bay Port for export would likely be by rail 80km to Richards Bay.

6 NEED AND DESIRABILITY: SOCIO-ECONOMIC IMPACT ASSESSMENT

The “need and desirability” is considered as part of an EIA process, the content of the IDPs, SDFs, EMFs and other relevant plans, frameworks and strategies are taken into account when considering the merits of proposed project’s application for approval. An important aspect of looking at the need and desirability process is the ecological, social and economic impacts that will result because of the alignment or deviation of the proposed development to the strategies and plans of government. As such, the EIA has to specifically provide information on these impacts in order to be able to consider the merits of the project application. The “need and desirability” is therefore determined by benchmarking the proposed project against the interest as reflected in the IDP, SDF for Msunduzi, and as determined by the EIA and SEIA.

The feasibility and socio-economic viability of the proposed project should be considered within the context of justifiable economic development, measured against the broader societal short-term and long-term needs. While the viability considerations of the private developer might indicate if a development is “do-able”, the “need and desirability” will be determined by considering the broader community’s needs and interests as reflected in an IDP, SDF and EMF for the area, and as determined by the EIA.

While the importance of job creation and economic growth for South Africa cannot be denied, the Constitution calls for justifiable economic development. The specific needs of the broader community should therefore be considered together with the opportunity costs and distributional consequences in order to determine whether or not the development will result in the securing of ecological sustainable development and the promotion of justifiable social and economic development – in other words to ensure that the development will be socially, economically and environmentally sustainable.

The table below provides a Need and Desirability Assessment.

Table 6-1 Need and Desirability Assessment

Aspect	Comment
Socio-economic context of the area based on strategic documents.	The strategic documents on a national, provincial, and local level focus on improving the lives of communities by promoting decent work and economic development, improving, and expanding infrastructure and prioritising environmental concerns. At a local level, both Mthonjaneni and uMlalazi LM promote sustainable land use management through the agricultural sector. This is due to its high contribution to the employment of low skilled and unskilled workers in the region and its high contribution to the LM’s GVA. Due to its potential to boost employment, the proposed Jindal MIOP, is, on face value, in line with the national strategy documents; however, it is not in line with the objectives of the province and local strategic documents.
Spatial priorities and desired spatial patterns	Agriculture is recognized as an economic driver in the region, which has a large amount of moderate and high value agricultural land. While the mine itself is not located on high value agricultural land, the proposed TSF, for which a separate EA process is being followed, will likely be located on agricultural land thus not aligning with the spatial priorities.
Equitable impacts in the short and long term, as well as social and economically sustainable considerations	The proposed MIOP is expected to be operational for minimum -25 years. It is expected to have both short- and long-term impacts socially and economically. One of the positive identified impacts includes the potential to provide short-term employment opportunities during construction as

Aspect	Comment
	well as long-term employment opportunities during operations for some of the region's households. However, it is also expected to have the potential to fundamentally alter the sense of place and cause irrevocable damage to agricultural land.
Creation of residential and employment opportunities nearby or amongst the different communities.	The proposed project is expected to create employment opportunities at all skill levels allowing the local communities to work closer to their homes in the short and long term.
Complimenting other uses in the area	The proposed mine does not compliment the uses in surrounding areas which include residential areas, commercial areas, bushland, and cultivated land used for temporary or commercial farming. This is due to the environmental and health risks associated with the mine and its operations.
Discouragement of "urban sprawl" and contribution to compaction/ densification	The project will potentially create jobs for the local people and therefore will discourage emigration from the local municipalities to urban areas. However, because of the health dangers and possible undesirable changes it could bring about, it could encourage out-migration.
Encouragement of environmentally sustainable land development practices and processes	Open-pit mines and their associated infrastructure are often associated with air pollution, water pollution and land use conflicts such as agriculture and tourism. Environmental experts may advise on what steps to take to ensure the environment's long-term viability for the MIOP activities on the environment and the environment within its proximity.
Consideration of special locational factors that might favour the specific location	The proposed MIOP has identified a considerable ore body which it intends to mine. Alternative locations are not viable due to the position of the ore body.
Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area	<p>Given that the proposed MIOP will be visible for at least 3km (as per the VIA) it is likely to have a negative influence on the sense of place in the area, with negative impacts on communities, households, businesses and the tourism sector. The operations of the mine also could lead to an influx of people into the area, in search of economic opportunities which may also lead to increased crime in the area.</p> <p>To limit the hazards of air and water pollution that could occur from the mine's operation, extensive mitigation measures will be required; by the various environmental specialists.</p>
Availability of labour relevant to take up the job opportunities from the development of the landfill	The MIOP will require at least 800 direct employees within the first 10 years of operations. These positions will require people with various skills levels, and it is doubtful whether the highly skilled positions would be filled by the surrounding communities which have a relatively low skills base. However, through the implementation of the Mine's SLP, the community should receive the necessary training and skills development support to enhance their capacity to take up many of the available opportunities. The employment opportunities will be for people of various skills levels during both the construction and the operation of the proposed mine.
The location of job opportunities versus the location of impacts	Positive socio-economic outcomes will be generated, some of which will be localised (such as the employment generation) and others will be spread all over the country resulting in the distribution of benefits to

Aspect	Comment
	other communities. Negative impacts will be primarily localized within the site and local communities.
Socio-economic impacts of the development based on the socio-economic context	The expected socio-economic impacts of the proposed development will be both positive and negative. The building of the MIOP and its operations will stimulate the economy, resulting in gains in household income and tax revenue as well as the creation of temporary (during construction) and long-term (for up to 20-25 years) sustainable employment. The MIOP is also likely to contribute to skills development and local economic development through the implementation of the SLP. At the same time, due to the nature of the area where the proposed mine and especially the TSF is to be located, some losses in the commercial tourism sector (due to change in sense of place) and agricultural sector (due to land sterilization) will be experienced.

6.1 NEEDS AND DESIRABILITY CONCLUSION

The below table illustrates the summary findings of the Needs and Desirability analysis to establish if the proposed development can be considered desirable for the suggested region.

Table 6-2 Need and Desirability Summary

No	Needs and Desirable Questions: SEIA	Assessment	
		Need	Desirable
1	Is the development permitted in terms of the property's existing land use rights?		Yes
2	Will the development be in line with the various planning and strategy documents?	Partially	Yes
3	Should development occur on the proposed site at this point in time?	Yes	
4	Should development, or if applicable, expansion of the area concerned in terms of this land use (associated with the activity being applied for) occur on the proposed site at this point in time?	Yes	No
5	Does the community/area need the project and the associated land use concerned (is it a societal priority)?	Yes	Yes
6	Are the necessary services available together with adequate unallocated municipal capacity (at the time of application), or must additional capacity be created to cater for the project?		Yes
7	Is this project part of a national programme to address an issue of national concern or importance?	Yes	
8	Do location factors favour this land use (associated with the development proposal and associated listed activity(ies) applied for) at this place?	Yes	No
9	Will the development proposal or the land use associated with the development proposal applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	Yes	
10	Will the development impact on people's health and well-being (e.g., in terms of noise, odours, visual character and 'sense of place', etc.)?		No
11	Will the proposed development or the land use associated with the proposed development applied for, result in unacceptable opportunity costs?	Possibly	Possibly

12	What will the cumulative impacts (positive and negative) of the proposed land use associated with the development proposal and associated listed activity(ies) applied for, be?	Detailed in the assessment	Detailed in the assessment
13	Is the development the best practicable environmental option for this land/site?	No	No

7 CONCLUSION AND RECOMMENDATION

7.1 SUMMARY OF ASSESSMENT

The planned Jindal MIOP operations are proposed to be located in the Mthonjaneni LM, in the King Cetshwayo District Municipality, in KwaZulu-Natal Province. The proposed site is about 25km west-north-west of Burgersfort and about 25km southeast of Melmoth Town. The national and local levels of government policy acknowledge the need to develop the mining sector and promote private investment to stimulate growth in the area but also seek to promote and enhance sustainable land use practices, which the agricultural and tourism sector play significant roles in terms of economic activity and job creation in the region. Considering the impact of mining activities on the environment, they also underscore the necessity to protect the ecosystem and use water resources efficiently and sustainably. Furthermore, mining should contribute to the socio-economic development of the communities in the area, especially through local enterprise development and local procurement.

The planned mining activities should further promote the development of an area with a small economy, a high unemployment rate, and a largely rural population with limited economic opportunities. A portion of the labour for the proposed project is planned to be sourced from the local community. In addition, the mine intends to promote local economic development through various skills and career programmes intended to contribute to the development within the local economy.

The assessment of the current socio-economic situation in the local municipality, the profile of the zone of influence, and the project itself revealed that the proposed mining activity will create numerous positive impacts and will likely stimulate the local economy. The stimulation of the national economy will occur as a result of the increase in production. This has numerous benefits, such as employment creation, a rise in consumption levels, new business sales and a contribution to GDP.

The economic baseline revealed that the agricultural sector is one of the largest contributors to GDP within the region, thus creating a potential conflict with the pre-existing economic conditions in the region. The total of number of jobs to be created is estimated to be 57 939 FTE jobs spread over the duration of construction activities. During the operational phase, the mine's activities will sustain at least 803 direct FTE jobs per year, with an additional 1 643 FTE jobs created through indirect and induced economic effects. Over a 25-year period, this equates to an estimated 36 666 FTE jobs as a result of sustained operational activity and expenditure. FTE jobs will also be created during the decommissioning of the mine once the Life of Mine is reached. The mine will create sustainable employment opportunities on-site that will consist of people coming from the local communities and will increase government revenue. The salaries paid out to local employees will increase the average household income. Given the population is characterised by those that are relatively poor, an elevated household income will improve their standard of living and reduce poverty. Also, as income increases, the consumption levels increase and consequently boost the local economy. However, due to the nature of the area where the proposed mine is established, some negative socio-economic impacts can also be created as a result of the mine's development.

- The mine is likely to fundamentally alter the sense of place in the area, which is characterised by undulating green hills and traditional rural lifestyles.
- This change in sense of place could result in a loss of economic activity, especially in the tourism sector for those establishments that target nature-based and cultural tourists, while those establishments catering to business tourism would likely see a boost in custom and turnover.
- The population influx and related social ills are regarded as major impacts of the proposed development.

- The major concern is the potential impact on the agricultural sector through, amongst other factors, changes in water quality and quantity, and loss of labour.

7.2 RECOMMENDATIONS

On the basis of this socio-economic impact assessment investigation, it is suggested that although there are many drawbacks to establishing and operating the proposed Jindal MIOP, the socio-economic benefits that are likely to materialise would outweigh many of the potentially negative impacts. Significant and meaningful mitigation measures which aim to localise as many of the positive benefits as possible while limiting or even avoiding some of the potentially negative impacts that would be felt at a local level, would be necessary. It is therefore suggested that the mine's establishment and operations can proceed from a socio-economic perspective, subject to all mitigation measures recommended by the various specialists being strictly applied and implemented, as well as the securing of all necessary permits and rights.

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ANNEXURES AND APPENDICES

ANNEXURE A: ECONOMIC IMPACT ASSESSMENT APPROACH: MEASURING ECONOMIC IMPACTS

The establishment and operations phase are likely to impart several purely economic impacts that can be quantified and then assessed against the baseline to determine their likely significance on the receiving environment.

Economic impacts refer to the effects on the level of economic activity in a given area because of some form of external intervention in the economy. Quantification of economic impacts is undertaken through application of a Social Accounting Matrix (SAM) which models the relationships between economic sectors and labour. A SAM is a type of input-output (IO) model that utilises inputs in the form of capital and operational expenditure to determine the effects on a given economy.

IO models are a class of general equilibrium macroeconomic models that can be used to measure the 'ripple' (secondary and tertiary market) effects of an intervention on the local or regional economy. These models characterise the interdependence of sectors within the economy by generating data on multipliers and leakages. Multipliers show that the impact of a shock or financial injection in a particular sector, can be larger than the impact associated solely with that sector's output. Leakages indicate where economic impacts, such as project revenues, are accumulated in another region.

To quantify the effects of the most likely economic impacts of the proposed MIOP, three types of economic impact can be measured, viz. direct, indirect, and induced (multiplicative) impacts.

Direct impacts

The **direct impacts** are the changes in the economy occurring as a direct result or consequence of public or private sector capital expenditure. This impact would be felt by first round contractors (first round suppliers) for the proposed MIOP.

Multiplicative impacts

The multiplicative effects can be grouped into two distinct categories, indirect and induced.

The **indirect** economic effects occur when the suppliers of new goods and services to the MIOP contractors (first round suppliers) experience larger markets and potential to expand. Both the direct and indirect effects result in an increase in economic value, job creation, business turnover and income, and increases in tax income.

Induced economic spending results in the impacts on goods and services demanded due to increased expenditure by households from income earned due to the proposed development of the MIOP. Examples include the income of employees, as well as the income arising through the backward linkages of this spending in the economy.

Economic effects

Four different impacts can be measured in this analysis, as described below.

Gross Value-Added (GVA) Multiplier Effect, which provides a measure of the total, sectoral economic activity happening on an annual basis within a particular area. It reflects the market value in Rands of all final goods and services produced and sold within the economy.

New Business Sales Multiplier Effect (business output), which indicates the number of additional sales or transactions which occur directly because of the assessed factor. This includes new sales by businesses, new sales by linked businesses as a result, new sales by businesses linked to these, and all new business sales continually as a result.

Income¹⁹ Multiplier Effect, which tabulates the total income increase because of the capital expenditure on the businesses and households that receive either employment opportunities, or who benefit from the increased business sales stimulation. Direct income is the total income generated because of expenditure in the supplying businesses, and indirect income reflects secondary income generated by secondary expenditure of households and businesses having benefited from the proposed development's capital expenditure.

Employment Multiplier Effect, which measures the number of job opportunities (full time equivalent opportunities²⁰) created from the impacting factor. Where this is calculated through the IO Model, it is based on a typical average number of jobs created in each sector, because of every Rand spent in the applicable sectors. These could be casual, part time, temporary or permanent opportunities, although for Capital Expenditure (CAPEX), the jobs created tend to represent short-term employment opportunities only available during the construction phase, whereas for operational expenditure (OPEX), the jobs created tend to present more long-term employment opportunities as these reflect ongoing operations.

The above-mentioned effects can be determined for the establishment (construction) and operational phase of the project, with the establishment phase effects determined through undertaking the multiplier analysis utilising the CAPEX estimate (less any imported machinery equipment/ services), and the operational phase effects determined through utilisation of the OPEX estimate figures. Establishment phase effects are typically temporary in nature, lasting the duration of the construction period, while the operational phase effects are sustained through the proposed development's operational life cycle.

There are overlaps between economic and socio-economic impacts and they are not mutually exclusive. Socio-economic impact assessment is largely an interpretation of the significance of the economic impact on local communities.

¹⁹ Aggregate personal income rises as pay levels rise and/or additional workers are hired. Either or both conditions can occur because of business revenue growth. If nearly all the affected workers live in the Study Area and sub-region, this is a reasonable measure of the personal income benefit of a project or programme.

²⁰ This means, for example, one full-time job for one person for 10 years or 10 full-time jobs for 10 people for one year.

ANNEXURE B: DISCUSSION GUIDELINES FOR STAKEHOLDER INTERVIEWS

The following discussion guideline framework was shared with all stakeholders prior to interviews and engagement and was intended to guide the discussions. The framework was not rigidly applied in all engagements. Minutes of all interviews and discussion were captured and shared with participants for confirmation that they captured the essence of the discussion.

Project proposal

Urban-Econ Development Economists has been appointed to undertake a Socio-economic Impact Assessment (SEIA) as part of the Social and Environmental Impact Assessment (S&EIA) process that is required for EA for a Mining Right.

The proposed project is an open-cast iron ore mine and associated processing facility to produce iron ore concentrate for export. Development of the mine and mining infrastructure would be phased. Currently mining is only proposed to be undertaken in specific areas where the iron ore resource has been defined. Infrastructure would be developed to support this mining operation. The proposed project would entail production of up to 20 million tonnes per annum (Mtpa) of iron ore, with production possibly being increased in future.

Purpose of the SEIA study ²¹

To identify and assess the socio-economic impacts of the establishment and operations of the Jindal Melmoth Iron Ore Mine.

Guidelines to the discussion

Taking into consideration that the SEIA looks at both the operational phase and construction/establishment phase of the proposed MIOP, the key discussion points are categorised into the following main themes:

Theme	Discussion
Population and Demographics	<ul style="list-style-type: none"> • Age • Gender • Population Size • Household Size • Household Income • Employment/Unemployment
Culture and Religious	<ul style="list-style-type: none"> • Cultural aspects • Religious aspects
Livelihood	<ul style="list-style-type: none"> • Population and demographic changes • Family dynamics • Food Security (livestock, grazing, agriculture) • Social (general) • Uncertainties and fear of the local community • Health impact • Informal settlements • Recreation, leisure and entertainment
Community Development	<ul style="list-style-type: none"> • Training and Capacity Building • Health Facilities

²¹ Additional information on the project, in the form of the project Background Information Document (BID) and a stakeholder presentation delivered at public meetings and workshops, was shared with all participants via a download link.

Theme	Discussion
	<ul style="list-style-type: none"> • Housing • Population displacement and re-settlement • Schools and Day care facilities • Community Dynamics • Community and the mine relationships • Leadership
Economic Aspects	<ul style="list-style-type: none"> • Income (household and personal) • Entrepreneurship and business • Tourism • Employment Sustainability
Security	<ul style="list-style-type: none"> • Crime • Accidents • Police Services
Infrastructure	<ul style="list-style-type: none"> • Land use and access to land • Quality of Water • Quality of Roads • Police Station • Traffic Congestion • Protected Areas • Noise • Visual • Dust (air pollution)
Rights	<ul style="list-style-type: none"> • Gender • Youth • Disability • Children • Employment
Political	<ul style="list-style-type: none"> • Governance • Institutional • Democratisation • Social organisation
Positive Impacts	All above aspects with positive impacts

ANNEXURE C: LITERATURE REVIEW ON IMPACTS ASSOCIATED WITH MINING

Introduction

Mining has had a considerable role in shaping human development not only from a technological perspective, but it has also significantly impacted on neighbouring and hosting communities where its operations have been carried out. Mining provides inputs for other industrial sectors that are vital for sustaining population wellbeing and the functioning of global economies. At the same time, it can generate social and environmental impacts which could compromise public acceptance of the sector. Given this twofold role in human society, the attention towards these issues has increased significantly in recent years with the way the mining industry impacts on local communities where it operates and how communities see these impacts being seriously challenged.

Impacts in the context of this literature review are understood as “the consequences to human populations from any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society” (Petrova & Marinova, 2012). They can be both positive and negative and occur throughout the entire lifespan of a mining project – from the time it is proposed, throughout its different phases and after its completion or the close down of any operations.

Negative impacts are those that limit or retard human development (including long and healthy life, acquiring knowledge and sufficient access to resources to ensure a basic standard of living) while positive impacts are those that further social and sustainable development (Petrova & Marinova, 2012). These have been well documented and ample literature exists on this topic.

This section will review the associated literature and identify typical economic and social impacts occurring in the sector. The main aim is not to comprehensively cover the literature in the field but to describe the most frequent economic and social impacts occurring in the mining sector. The following discussion summarises those impacts.

Gains and Losses for Local Communities

Positive Impacts

There are a number of socio-economic benefits that can accrue to local communities as a result of mining activities. These include the development of social and economic infrastructure, manufacturing and construction industries, commercial and public sector activities.

In a 2019 article, the World Bank asserts that mining has been central to the social and economic narrative of Southern Africa, and has been a key provider of investment, employment, government revenue and infrastructure in the region (World Bank, *Digging Beneath the Surface: An Exploration of the Net Benefits of Mining in Southern Africa*, 2019). According to the World Bank, in South Africa, for example, the Johannesburg-Pretoria metropolitan area, which serves as the region’s economic and financial hub, developed because of the local gold supply (World Bank, *Digging Beneath the Surface: An Exploration of the Net Benefits of Mining in Southern Africa*, 2019).

Sub-soil assets are sources of national wealth. Extracting them from the ground can unlock their value for societies. This requires that “rents” (i.e., income beyond commercial returns from the mining process) are captured and used for socially desirable ends - which includes investment in other national assets. This is largely the responsibility of the government. Other benefits from mining derive from the production process itself which generates returns to the factors of production (especially capital and labour). Mining is becoming

an increasingly capital-intensive process and thus, larger returns tend to accrue to capital. (World Bank, *Digging Beneath the Surface: An Exploration of the Net Benefits of Mining in Southern Africa*, 2019)

Mining is often defended on the grounds that there are important economic benefits that accrue to local communities. Mining provides local communities with jobs, which may enable those in subsistence to join the cash economy (TMRA, 2015). Others who already had paid work may find themselves better off, since in many countries mining pays relatively higher wages. Particularly in developing countries, wages may increase through localization schemes or through moving local employees into higher positions within a company by way of corporate training.

The potential positive impacts which could arise as a result of the construction activities include increase in job opportunities both for skilled and non-skilled. During construction, jobs for the nonskilled are likely to be filled by the local community and the skilled personnel likely to be drawn around South Africa. Mining also brings with it an opportunity for training and capacity building of personnel that will be recruited and could assist them in obtaining transferable skills (IIED, 2002).

In some regions, mining provides the bulk of job opportunities. For example, the (IIED, 2002) notes the Grasberg copper and gold mine in West Papua, employing 14,000 people, while the number of indirect jobs created as a result of Freeport's mining activities in Arizona USA is estimated at 75,000. Counter to this, however, modern mines tend to have much higher levels of productivity than older mines, employing small but highly skilled work forces. Except for the construction phase, many mines no longer generate significant numbers of local jobs. In Peru, a study conducted by (World Bank, *Wealth and Sustainability: The Environmental and Social Dimensions of the Mining*, 2006) showed that the local sources of employment are very limited, and that much labour is imported. A smaller number of employees means that the multiplier effect has declined relative to historical levels. Additionally, retrenchment is a current concern for mines all over the world, and some regions have been severely hit.

Another important source of economic benefits to communities, particularly where mining is the main activity, is the input services provided to mining operations. Companies are increasingly required to assist local business development, to outsource services, and to give preference to local businesses (IIED, 2002). Local procurement for general materials, goods, and services (e.g., transport, catering (local women may get the opportunity to sell food to mine workers) and security) and other spin-off benefits could materialise (SMMEs support) (Umsizi, 2018).

However, increased demand may cause the prices of goods and services to rise locally. Moreover, the concentration of economic activity centred around the mine often increases the community's dependence on the mining operation, making it vulnerable to downsizing or other changes and exacerbating the power imbalance. On the other hand, since the company may also depend on the community for employees and services, a well-organized community can potentially make numerous demands on the company.

Mining companies are also often involved in the provision of educational facilities either directly or indirectly through the redistribution of revenues by the state or through innovative means. Other increases in educational opportunities come through scholarships. These can come in the form of corporate support or through Trust Funds or foundations. Even though the opportunity to receive income through direct or indirect employment in the mine can act as a disincentive for schooling, education is one of the most significant and lasting benefits that a community can derive from a large mine.

There can be significant infrastructure improvements with the construction of a large mine. Most mining operations of any size are served by airstrips, roads, water supplies, sanitation systems, and electricity. If these are restricted to use by the company, and designed solely for company objectives, they may be of little relevance to anyone else. With some advance planning and a willingness to consult with the community,

however, these can bring lasting benefits at little or no added cost. And the development of infrastructure may facilitate other forms of economic activity, such as tourism. The presence of permanent security personnel at the mine could also be beneficial to the overall security measures implemented in the area. (Umsizi, 2018)

Negative Impacts

The economic and social benefits of minerals development must be seen in the context of the many social problems associated with large-scale mining operations. Mineral development can create new communities and bring wealth to those already in existence, but it can also cause considerable disruption. New projects can bring jobs, business activities, roads, schools, and health clinics to remote and previously impoverished areas, but the benefits may be unevenly shared, and for some they may be poor compensation for the loss of existing livelihoods and the damage to their environment and culture (Asare & Darkoh, 2001). Communities may also experience social disruption in the form of increased crime, for example or socio-demographic changes that lead to tensions over natural resources (CER, 2016).

Even when mineral development results in national economic growth, the benefits are not always equitably shared, and local communities closest to the source of mineral development can suffer the most. If the revenues from mining are not equitably shared, this aggravates inequalities within communities. For example, (IIED, 2002) notes, through a social audit of the Grasberg mine in Indonesia, showed that the worsening inequalities in income distribution favour young adults, modifying their position and prestige vis-à-vis their elders and affecting traditional social structures. If people in a community perceive the revenues of mining to be unfairly shared, this can result in social tension and even violent conflict within the community or between the community and the mining company or government.

Further, although mineral exports may make up a significant share of a country's exports, mineral development does not always boost a country's economic growth and may, in some cases, contribute to increased poverty. In addition, lack of full cost accounting could result in overestimating the benefits if subsidies offered to the mining sector are not taken into account.

Although mining can create employment opportunities, (Mancini & Sala, 2018) note that typically these jobs are limited in number and duration with much of the employment being in the construction phase of mining operations. Larger mines are employing increased technology thus limiting the job creation during the operational phases of the mine. In some cases, mining has provided jobs in an otherwise economically marginal area (CER, 2016).

Importantly, mines have a finite life span, and it is difficult to sustain the direct benefits they bring to communities in terms of wages and improved welfare after mine closure. The infrastructure that develops with a mine may be scaled down or neglected when the mine closes unless provision has been made for maintenance and upkeep well in advance. Communities are particularly vulnerable where linkages with other sectors of the economy are weak. Communities that come to depend on mining to sustain their economies are especially vulnerable to negative social impacts, especially when the mine closes (World Bank, Digging Beneath the Surface: An Exploration of the Net Benefits of Mining in Southern Africa, 2019).

Mining activities often involve social tension within affected existing communities. There can be differences of opinion within a community about a whole range of issues. While some welcome a new mine, others may oppose it. While some are satisfied with compensation packages on offer, others will wish for more. While some are reluctant to countenance any change, others will eagerly embrace new business opportunities.

A significant negative impact of mining operations is the displacement of some community residents and existing businesses. The displacement of settled communities can be a significant cause of resentment and conflict associated with large-scale mineral development (Mancini & Sala, 2018). Displacement may result in

serious social problems including marginalisation, food security, loss of access to common resources and public services and social breakdown. Communities may lose their land, and thus their livelihoods, disrupting also community institutions and power relations. Entire communities may be forced to shift into purpose-built settlements, into areas without adequate resources. They may be left near the mine, where they may bear the brunt of pollution and contamination. Involuntary resettlement can be particularly disastrous for indigenous communities with strong cultural and spiritual ties to the lands who may find it difficult to survive when these are broken (CER, 2016).

As with compensation payments, some of the issues associated with relocation may take years to surface. Where houses built with permanent materials replace traditional homes, for instance, communities may not have the skills required to maintain them, and companies may be reluctant to become involved in the process. Increasing household sizes may place pressure on relocation housing; young people may demand an equivalent dwelling when they marry (CER, 2016).

Mineral development often changes the balance of power within communities. This can be exacerbated by mining companies being unaware of or choosing to ignore traditional decision-making bodies and negotiating with individuals who do not have the trust or support of their own community. Companies have been criticized for using 'divide and rule' tactics, which can seriously undermine the social cohesion of indigenous and other communities (Petrova & Marinova, 2012).

Large flows of money at the local level can encourage bribery and other forms of corruption, undermining the potential for communities to receive a fair share of the revenues from mining for longer-term investment. This may damage the social fabric and lead to conflicts (Asare & Darkoh, 2001).

Conflict in and around mining operations usually stems from poor governance. It is also more likely to take place where the distribution of mineral revenues and benefits are non-existent or perceived to be unjust, or where the community opposes and actively resists any mining activity on their land. Companies or even central governments may have little understanding of the customs and traditions of those living in and around the mines and may therefore be insensitive in their dealings with local communities, potentially fuelling further conflict (Petrova & Marinova, 2012).

A related cultural issue is that of geographic boundaries between groups. Borders that may have been fluid may become more precise and fixed as they become critical to obtaining benefits from a development. This can lead to the recognition of some rights to the exclusion of others (CER, 2016).

One of the most significant impacts of mining activity is the migration of people into a mine area, particularly where the mine represents the single most important economic activity. The major findings of a study by (Asare & Darkoh, 2001) show that the presence of the mine has led to a rapid growth of the population through migration, which has outstripped the ability and capacity of social services such as housing, to cope with the surging tide of migrants. The result has been the proliferation of squatter settlements at the periphery of the mining town.

(Dubey, 2017) notes that with the influx of newcomers, disputes may arise over land and the sharing of benefits. Sudden increases in population can also lead to pressures on land, water, and other resources as well as bringing problems of sanitation and waste disposal. From a social perspective, such an influx can lead to the build-up of a large mass of people with weak links into society as a whole and a disruptive influence on local social control, leadership, and lifestyles. From the corporate and state perspective, these migrants may be seen as representing an increased security risk and may effectively dilute the value of benefits provided to the host communities (Asare & Darkoh, 2001).

Mining may also trigger indirect negative social impacts, such as alcoholism, prostitution, and sexually transmitted diseases. The existence of a mine may be accompanied by the widespread availability and consumption of alcohol, an increase in gambling, the introduction of or increase in prostitution, and a widely perceived breakdown in law and order. Violence, alcohol-induced and domestic, may increase. Of course, many of these processes of social change may be under way already and mining may simply accelerate them. These problems are not restricted to pre-existing communities. Male-dominated mining camps, such as those found in South Africa, often attract prostitutes and may lead to high levels of sexually transmitted diseases. In an effort to overcome some of these problems, mine accommodations are being improved. In South Africa, in areas where the work force can be drawn locally, there is a trend away from single-sex hostels to family accommodation.

In terms of community health, a basic paradox arises. Resources available locally for health services typically increase markedly with the advent of mine development as companies develop facilities for employees and their families. Moreover, employment and increased living standards can bring important nutritional and psychological benefits, and hence better health standards. But these may not necessarily translate into overall improvements in community health if the facilities are not made available to the broader community or if the introduction of new diseases and health risks associated with the mine are taken into account. Relatively isolated communities, including indigenous peoples, may be particularly vulnerable to diseases brought by miners, such as influenza, malaria, and HIV/AIDS. Abandoning traditional subsistence lifestyles of hunting and fishing, and instead buying food from outside, could lead to a nutritionally poorer diet.

The detrimental impacts of mining on the health and well-being of communities are well-established. These pernicious consequences lead to a poorer quality of life, and many persist long after mines have been closed or abandoned. Surrounding communities are exposed to water, soil, noise and dust pollution causing ill health. Environmental health problems may become evident not just close to the mine, but some distance away. The impacts are often more pronounced for open pit mines than for underground mines.

People face significant health risks from exposure to such pollution. The toxins can be ingested by drinking water, eating contaminated food, or even absorbed through the skin. Mining as a result leads to many chronic health problems and premature deaths, particularly among children, pregnant women, and those with pre-existing health conditions and compromised immune systems (CER, 2016).

The Centre of Environmental Rights (CER, 2016) reports that mining is a destructive activity that produces large amounts of toxic waste and water, sterilises land, and destroys biodiversity. Some of its impacts only appear decades after operations have ceased, and many are cumulative.

The most obvious impact to biodiversity from mining is the removal of vegetation, which in turn, alters the availability of food and shelter for wildlife. At a broader scale, mining may impact biodiversity by changing species composition and structure.

Mining also threatens sensitive ecosystems by stimulating additional migration. Overburden, waste rock, tailings dams, buildings, roads, airstrips, and so on – as well as immigration of population and increased human activity – all create considerable change in local environments. This may lead to loss of biological diversity, including plants and animals important to peoples' livelihoods, such as cultivated land or pasture for livestock.

The changes may affect land used by indigenous people for hunting and gathering, shift cultivation, or adversely affect forests that yield timber and a wide range of non-timber forest products such as game, resins, dyes, vegetables, and medicinal plants. Soils can never be rehabilitated back to their full potential after they have been mined. The mining social and environmental impact of mining activities are in many

cases so severe that farming activities cannot be sustained on the land that is left between the mining activities.

The destruction of habitats fostering traditional herbal and medicinal plants can also weaken indigenous people's autonomy and identity, not to mention their health. Noise from mining operations can be a problem for nearby settlements. For example, the heavy vehicle traffic around mining operations can also disturb surrounding ecosystems and climates.

In dry climates, dust from mining operations, traffic, and waste impoundments can be extremely problematic. If dust suppression methods are not rigorously applied, fine particles can easily be inhaled. At times the dust may contain deleterious substances, such as metals. Problems caused by dust pollution are also of concern in the smelting phase of mining. Air pollution from mining can be caused by particle emissions from activities such as processing, blasting, wind erosion of overburden and dust entrainment from haul trucks (CER, 2016). The dust from mines contains enough silt that covers the nearby croplands forming silt coating thus affecting soil life system and crop productivity (Dubey, 2017).

In addition, settlements are frequently located near mines; houses may crack from blasting operations; and some settlements are perilously situated above or close to abandoned mines and collapse when subsidence occurs. With environmental noncompliance, left unchecked, mines can continuously leak toxic water into ground and surface water which many depend on in the absence of piped water (CER, 2016). Carbon-dioxide (CO²) and other emissions can have localized effects and create global externalities such as the acceleration of climate-change.

Conclusion

From the literature review, trade-offs among positive and negative impacts emerged. In particular, benefits from income and employment are the main positive impacts identified in the screened literature. Positive income and employment effects were reported at national level while negative social ills, land use related environmental and health impacts occur at local level (Mancini & Sala, 2018). Moreover, demographically related impacts emerged especially in terms of migration and gender imbalance in the mining communities (Mancini & Sala, 2018).

It is difficult to separate the economic impacts of mining operations from the social impacts. Many social problems are direct consequences of poverty, and if mining helps a community become prosperous, it may also help it tackle social ills such as malnutrition, illiteracy, and poor health. On the other hand, mining activities may cause economic hardship – by polluting rivers and damaging fish stocks, for instance, or by appropriating grazing land and forestry resources. This, in turn, may exacerbate existing social problems or create new ones.

The actual impacts experienced, and the perceptions of the community will depend on the pre-existing situation, the process of community engagement and capacity-building, the role of governments, and other social changes.