

## **DMR REFERENCE: NW 30/5/1/1/2/10180 MR**

**ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT PROGRAMME  
REPORT - PROPOSED MINING OF CLAY, LIMESTONE, SHALE AND QUARTZ ON  
THE FARM BAST PLAATS 802 HN, BIESJESDAL 799 HN, CHOGA AMOET 869  
HN, KANG 796 HN, KGANTSANG 797 HN, LETSILABELUNG 794 HN,  
GLADDEFONTEIN 798 HN, UITEND 793 HN, KANKARO 921 HN, KLIP PLAATS  
801 HN, MAPANA 795 HN, REMAINING EXTENT OF FARM MAREA AMOET 895  
HN, MIDDLEPLAATS 801 HN, SALPETRE PAN 800 HN, AND A PORTION OF  
FARM TAUNG 894 WITHIN TAUNG MUNICIPALITY, NORTHWEST PROVINCE**

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**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

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**ENVIRONMENTAL IMPACT ASSESSMENT REPORT  
AND  
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT  
FOR GILMOE MINING ON FARM BAST PLAATS 802 HN, BIESJESDAL 799 HN, CHOGA  
AMOET 869 HN, KANG 796 HN, KGANTSANG 797 HN, LETSILABELUNG 794 HN,  
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MIDDLEPLAATS 801 HN, SALPETRE PAN 800 HN, AND A PORTION OF FARM TAUNG  
894 WITHIN TAUNG LOCAL MUNICIPALITY, NORTHWEST PROVINCE**

**DOCUMENT APPROVAL RECORD**

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**FEBRUARY 2022**



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT  
AND  
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT  
FOR MINING RIGHT**

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

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<b>FILE REFERENCE NUMBER SAMRAD</b>	NW 30/5/1/1/2/10180 MR

## 1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

**It is therefore an instruction that** the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

**It is furthermore an instruction that** the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

## 2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the activity is located and document how the Gilmoie Mining activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the Gilmoie Mining activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

- (d) determine the—
  - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
  - (ii) degree to which these impacts—
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources, and
    - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to manage, avoid or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

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## DISCLAIMER:

The opinions expressed in this Report have been based on the information supplied to Gudani Consulting by **Gilmoe Mining (Pty) Ltd.** All due care was undertaken in reviewing the supplied information. Whilst Gudani has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Gudani does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of Gudani's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which Gudani had no prior knowledge nor had the opportunity to evaluate.

## LIST OF ABBREVIATIONS:

ACRONYM	DESCRIPTION
AEL	Atmospheric Emissions License
AMD	Acid Mine Drainage
CARA	Conservation of Agriculture Resources Act, 1983
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
Dr RSMD	Dr Ruth Segomotsi Mompati District Municipality
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Environmental Integrity System
EMF	Environmental Management Framework
EMP	Environmental Management Report
GC	Gudani Consulting
I&APs	Interested and Affected Parties
IFR	In-stream Flow Requirements
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
LOM	Life of Mine
LV	Low Voltage
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
MAR	Mean Annual Run-Off
MPRDA	Minerals and Petroleum Resources Development Act, 2002
MV	Medium Voltage
NEMA	National Environmental Management Act, 1998
NHRA	National Heritage Resources Act, 1999
NWA	National Water Act, 1998
NWHRA	North West Heritage Resource Agency
NWRS	National Water Resource Strategy
PCD	Pollution Control Dam
PES	Present Environmental Status
PFD	Process Flow Diagram
PM <sub>10</sub>	Particulate Matter (with diameter of 10 micrometers or less)
PPP	Public Participation Process
REC	Recommended Ecological Class
ROM	Run of Mine
RQO	Resource Quality Objectives
SAHRA	South Africa Heritage Resource Agency
SANAS	South Africa National Standard
SANBI	South Africa National Bio-Diversity Institute
SDF	Spatial Development Framework
SEA	Socio-Economic Assessment
TLM	Taung Local Municipality
WMA	Water Management Area

## GLOSSARY OF TERMS

<b><i>Aeromagnetic Survey</i></b>	Surveys flown by helicopter or fixed wing aircraft to measure the magnetic susceptibility of rocks at or near the earth's surface
<b><i>Alien species</i></b>	A plant or animal species introduced from elsewhere: neither endemic nor indigenous.
<b><i>Alternatives</i></b>	A possible course of action, in place of another, that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following but are not limited hereto: alternative sites for development, alternative site layouts, alternative designs, alternative processes and materials. In Integrated Environmental Management the so-called "no go" alternative refers to the option of not allowing the development and may also require investigation in certain circumstances.
<b><i>Ambient</i></b>	The conditions surrounding an organism or area.
<b><i>Archaean</i></b>	The oldest rocks of the Precambrian era, older than about 2 500 Ma
<b><i>Assessment</i></b>	The process of collecting, organising, analysing, interpreting and communicating data that is relevant to some decision.
<b><i>Basement</i></b>	The igneous and metamorphic crust of the earth, underlying sedimentary deposits
<b><i>Biodiversity</i></b>	Measure of the number and relative abundance of biological species. The variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.
<b><i>Climate</i></b>	A measure of the long-term averages, i.e., normal, of key atmospheric variables such as temperature, precipitation and wind.
<b><i>Dip and dip direction</i></b>	The dip direction is the azimuth of the direction of the dip as operational to the horizontal, which is 90° off the strike angle
<b><i>Dyke</i></b>	A vertical or near vertical sheet of igneous rock, the widths of which may range from centimetres to hundreds of meters
<b><i>Ecology</i></b>	The study of the interrelationships between organisms and their environments.
<b><i>Effluent</i></b>	Effluent is an out flowing of water from a man-made structure such as a process plant or tailings facility.
<b><i>Environment</i></b>	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group; these circumstances include biophysical, social, economic, historical, cultural and political aspects.
<b><i>Environmental impact</i></b>	A change resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation's activities or may be indirectly caused by them.
<b><i>Environmental Impact Assessment</i></b>	An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of any proposed operations, plan, programme or policy which requires authorisation of permission by law and which may significantly affect the environment. The EIA includes an evaluation of alternatives, as well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures for enhancing the positive aspects of the proposal, and environmental management and monitoring measures.
<b><i>Environmental Management Plan</i></b>	A legally binding working document, which stipulates environmental and socio-economic mitigation measures which must be implemented by several responsible parties throughout the duration of the proposed operations.
<b><i>Fault</i></b>	A fracture or fracture zone, along which displacement of opposing sides has occurred
<b><i>Gabbro</i></b>	Belongs to a group of dark, coarse-grained, intrusive mafic igneous rocks chemically equivalent to basalt.
<b><i>Groundwater</i></b>	Water which occurs below the surface of the Earth, where it occupies spaces in soils or geologic strata.
<b><i>Industry</i></b>	The use of land or a building for a factory, distributing depot, wholesale, storage, warehouse for the storage of wholesale merchandise, carting and transport services, laboratories, workshop and vehicle workshop and may also include offices which are normally associated with or which are reasonably essential for the main use as well as the sale of goods wholly or partially manufactured, processed or packed on the property.

<b>Integrated environmental management</b>	IEM provides an integrated approach for environmental assessment, management, and decision-making and to promote sustainable development and the equitable use of resources. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.
<b>Interested and affected parties</b>	Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.
<b>Intrusion</b>	Liquid rock (magma) which forms below the surface of earth and slowly cools into a solid rock mass
<b>Key issue</b>	An issue raised during the Scoping process which has not received an adequate response and which requires further investigation before it can be resolved.
<b>Layered complex</b>	A body of igneous rock which exhibits vertical layering or differences in composition and texture and shows evidence of fractional crystallisation. Ideally, the stratigraphic sequence of an ultramafic intrusive complex consists of ultramafic peridotites and pyroxenites toward the base with more mafic norites, gabbros and anorthosites in the upper layers
<b>Listed activities</b>	Development actions which are likely to result in significant environmental impacts as identified by the Minister of Environmental Affairs and Tourism in terms of Section 21 of the Environment Conservation Act.
<b>Mitigation</b>	To cause to become less harsh or hostile.
<b>Negative impact</b>	A change which reduces the quality of the environment (for example, by reducing species diversity and the reproductive capacity of the ecosystem, by damaging health, or by causing nuisance).
<b>Positive impact</b>	A change which improves the quality of life of affected people or the quality of the environment.
<b>Property</b>	Any piece of land indicated on a diagram or general plan approved by the Surveyor-General intended for registration as a separate unit in terms of the Deeds Registries Act and shall include an erf, a site and a farm portion as well as the buildings erected thereon
<b>Public Participation Process</b>	A process of involving the public in order to identify needs, address concerns, choose options, plan and monitor in terms of a proposed operations, programme or development
<b>Relevant authority</b>	The environmental authority on national, provincial or local level entrusted in terms of the Constitution and in terms of the designation of powers in Notice No. R. 1184 of 5 September 1997 with the responsibility for granting approval to a proposal or allocating resources.
<b>Scoping</b>	This refers to the process of determining the spatial and temporal boundaries (the extent) for the EIA and key issues to be addressed in an environmental assessment.
<b>Scoping Report</b>	A report describing the issues identified.
<b>Study area</b>	Refers to the entire study area encompassing all the alternative routes as indicated on the study area map.
<b>Surrounding Owners</b>	The registered owners of the properties directly bordering the property or across the road / street and also such owners that the Local Authority may specify.



## EXECUTIVE SUMMARY

### BRIEF INTRODUCTION

This document contains the Scoping Report - which forms part of the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) for the Gilmoie Mining (Pty) Ltd operation. Gilmoie Mining wants to mine Gypsum, Limestone, Clay, Shale and Quartz on the farm Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelung 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, and A Portion of farm Taung 894 HN within Taung Local Municipality in North West Province. They are applying for mining right on 59365, 9935 ha on the above mentioned farms. Gilmoie Mining (Pty) Ltd has an existing prospecting right and approved EMP with reference number **NW 30/5/1/1/2/11507PR** and **NW 30/5/1/1/2/11508PR** respectively. They do not have an existing mining right, as such, they are applying for a mining right for the above mentioned farms. This study was undertaken by Gudani Consulting in conjunction with various environmental specialists in their role as independent environmental assessment practitioners (EAPs) to Gilmoie Mining for the proposed mining development.

### GENERAL PROJECT DESCRIPTION

Gilmoie Mining propose to apply for mining right to mine Gypsum, Limestone, Clay, Shale and Quartz on the farm Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelung 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, and A Portion of farm Taung 894 HN within Taung Local Municipality in North West Province. They are applying for mining right on 59365, 9935 ha on the above mentioned farms. They want to mine Gypsum, Limestone, Clay, Shale and Quartz mineral which will be sold locally or exported to other markets. They have an existing prospecting right and approved EMP with reference number **NW 30/5/1/1/2/11507PR** and **NW 30/5/1/1/2/11508PR** respectively. The said prospecting right is still valid, and subject to further renewals. They do not have an existing mining right, as such, they are applying for a mining right for the above mentioned farm. They are applying for the mining right in terms of NEMA, 1998 and MPRDA, 2002. The proposed Gypsum, Limestone, Clay, Shale and Quartz mining project will be an open pit mine to a depth of not more than 50m. Blasting will also be done occasionally as and when required. These minerals will be mined and stockpiled, then prepared for hauling and transporting to local markets via trucks and to international and local markets via train and then shipment. The mining equipment:

- 4- Front-end loaders
- 3 -Excavators
- 10-Tipper trucks
- 1- Hydraulic hammer
- 1- Water truck

- 1-Processing plant

Water supply will be from 3 sources including:

- Borehole.
- Storage tanks.
- Onsite site dams.

The borehole will supply potable water for use in offices and ablution facilities. The storage and return water dams will be used solely for mineral processing and dust suppression. Gilmoie Mining appointed Gudani Consulting as an independent environmental consulting entity to undertake the SEIR and EMP processes, Public Participation processes and co-ordinate the specialist investigations which form part of the EMP.

Gudani Consulting has relied on the specialist opinion of the technical experts in their field to assist with the quantification of the baseline environmental conditions within the mining area, potential impacts of the Gilmoie Mining activities and operations, and compilation of the requisite environmental impact assessment (EIA) and management programme (EMP) reports. Gudani Consulting worked closely with interested and affected parties and the Taung Local Municipality to obtain inputs into the EIA/EMP process. A meeting was held with ward councilor and his committee on the **17<sup>th</sup> August 2020**. BIDs were also distributed in the meeting as well as among the people of the township. Site notices were also placed on the **30<sup>th</sup> August 2020**.

#### **ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS**

The mining right application and Environmental Management Programme (EMP) alignment for the Gilmoie Mining mining project is undertaken in accordance with the Mineral and Petroleum Resources Development Act (Act 28 of 2002). The act stipulates the responsibilities of Gilmoie Mining (as the applicant) in terms of environmental and social aspects, as well as the requirements of the management of impacts generated by the mining operations.

#### **ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS**

The application of the mining right and the Environmental Management Programme (EMP) for the Gilmoie Mining mining operations is undertaken in accordance with the Mineral and Petroleum Resources Development Act (Act 28 of 2002) and EIA Regulations 2014. These acts stipulate the responsibilities of Gilmoie Mining as the applicant in terms of environmental and social aspects, as well as the requirements of the management of impacts generated by the mining operations.

#### **APPROACH TO THE OPERATIONS**

The operations has undergone both the scoping and EIA/EMP phases of the Integrated Environmental Management (IEM) process as per the EIA Regulations, 2014. The Scoping phase mainly pertained to the identification of anticipated impacts as a result of the mining operations considering the prevailing or baseline conditions. The scoping process was undertaken during April- August 2021 with interested and

affected parties, and comments obtained therefrom have been incorporated in this EIA/EMP Report.

The EIA/EMP phase and report (this document) has assessed and documented the impacts and specialist investigations for the Gilmoie Mining mining operations. Impacts have been evaluated on standard impact assessment criteria, which assisted with the determination of the significance of the impacts.

The No-Go option is the only other alternative identified and has been discussed as part of the EIA/EMP phase. During both the Scoping and EIA/EMP phases, public participation played a key role and is a vital part of the IEM process.

### **PUBLIC PARTICIPATION**

Public participation plays an important role in the compilation of an EIA/EMP, as well as the planning, design and implementation of the operations. Public participation is a process leading to informed decision-making, through joint effort by the:

- Proponent;
- Technical experts;
- Governmental authorities; and
- Interested and Affected Parties (I&APs).

Public participation is a vehicle for public input, which achieves the following:

- Facilitates negotiated outcomes;
- Creates trust and partnership;
- Minimises negative effects;
- Maximises positive effects;
- Provides an indication of issues;
- Prevents the operations continuing;
- Cause costly delays later; and
- Results in enhanced and shared benefits.

The public were informed about the proposed mining activity by means of the following:

### **SCOPING PHASE:**

Stakeholders, including adjacent landowners and the relevant authorities, were notified of the Gilmoie Mining operations and EMP application of the mining right and the process by means of consultation letters and pamphlets distributed within the months of **August 2020**.

Various Site Notice boards advertising the Gilmoie Mining operations and the EMP application of the mining right and the process and informing interested and affected parties were placed at visible locations on the site, as well as in close proximity to the site on **30 August 2020**.

Consultation concerning the Gilmoie Mining with the respective community committees, ward councillor, municipality, and I&APs were undertaken through door-to-door background information document (BID) and pamphlet distribution within the adjacent farming homesteads.

The comments received from I&APs have been included in this EIA/EMP Report and are captured in a Comments and Response table in the Public Participation Report (Appendix 4).

The focus of the scoping/consultation process was to re-assess the impacts on bio-physical and socio-economic site elements resultant from the operations and to assign suitable management measures, where possible, to abate the identified impacts to within acceptable levels. The scoping phase, as the name implies, has scoped/identified the more pertinent of the impacts on the environment as follows and these have been taken to the EIA/EMP phases for more comprehensive assessment:

- Impacts on surface and groundwater resources through the mining operations and methods to be used including the related infrastructure;
- Impacts on fauna and flora due to vegetation clearance and topsoil stripping, as well as the proximity to water channel and any possible impacts on aquatic biodiversity;
- Impacts on the air quality which may result during windy periods, and providing problems related to dust and other particulate matter;
- Impacts on the visual and aesthetic character of the region due to the waste dumps within the area;
- Possibility of impacts on cultural or heritage resources, should any be within the vicinity of the mining site;
- Mining operation has a definite impact on the noise levels within the area and the impacts thereof have been assessed.

The above impacts, as well as many others, have been comprehensively re-evaluated in this EIA/EMP application of the mining right and the impact significance assessment supplemented with specialists inputs where necessary. No environmental or socio-economic fatal flaws have been identified for the Gilmoie Mining operations to date.

## **IDENTIFICATION OF KEY ENVIRONMENTAL ISSUES**

A baseline description of the environment was gathered through visual inspections of the site and its surroundings, desktop studies as well as specialist recommendations. This aforementioned information was used to assess the existing and potential areas affected by the existing Gilmoie Mining operations.

Risks and key issues were identified and addressed through the following:

- Consultation with the Interested and Affected Parties;
- Through an internal process based on similar mining operations;
- Identification of environmental impacts; and
- Various site visits.

## ALTERNATIVE ANALYSES

The inclusion of an alternative analysis is a specific requirement of the Integrated Environmental Management (IEM) procedure as underlined by the NEMA. The IEM procedure stipulates that the environmental investigation needs to consider feasible alternatives for any development. Mining can only take place where viable minerals are found, and for Gilmoie Mining the operation has not yet commenced. For this reason the No-Go alternative, various mining and mineral processing technologies will be the only alternatives considered for the Gilmoie Mining operations.

## EIA/EMP PHASE:

This EIA/EMP report provides the findings of the detailed assessment of identified environmental impacts from the Gilmoie Mining operations and consultation with Interested and Affected Parties (I&As) and comprise of the following:

- Environmental Impact Assessment Report, Gilmoie Mining.
- Environmental Management Programme Report, Gilmoie Mining.

The EIA process consists of the following phases:

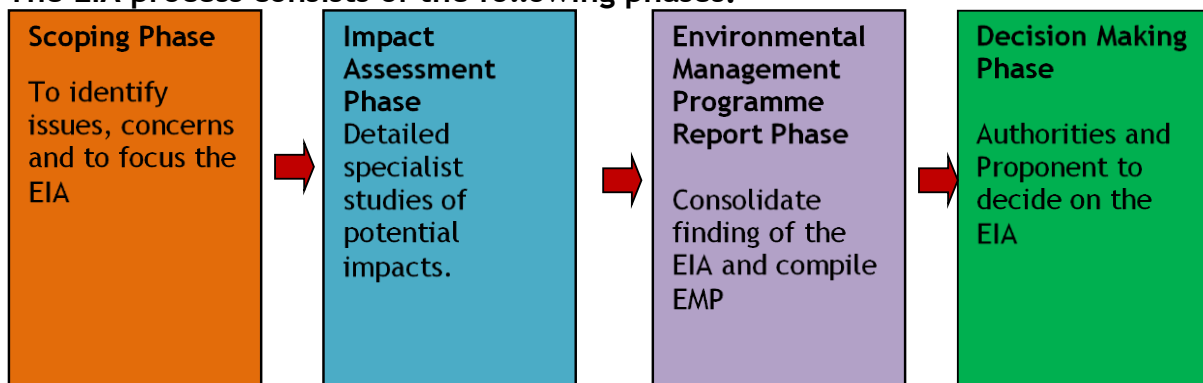
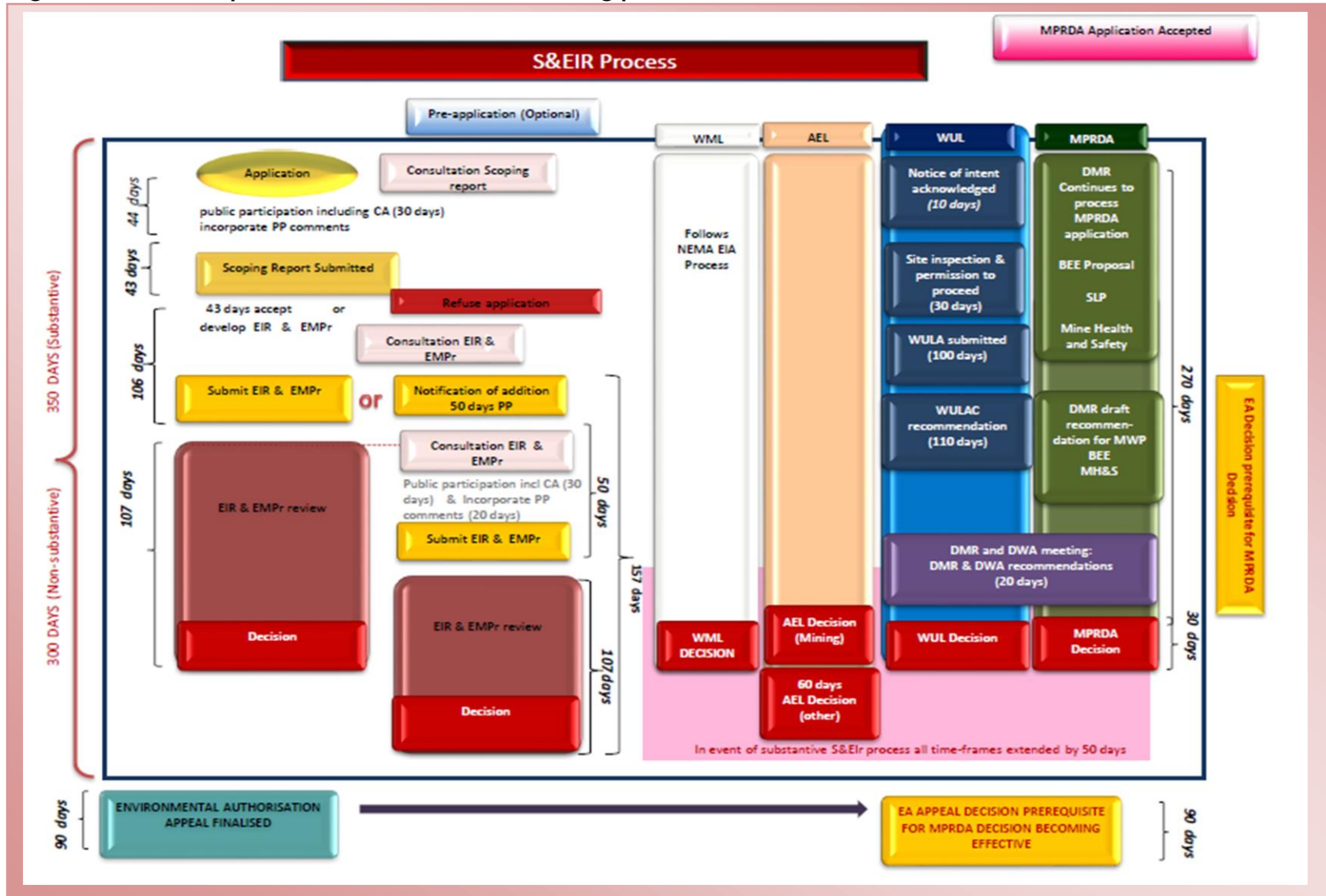


Figure 1: The EMP process consists of the following phases:



## PUBLIC PARTICIPATION PROCESS FOR EIA/EMP PHASE:

The aligned EIA/EMP reports for the Gilmoie Mining will be submitted for authority and public review as follows:

- a) NorthWest Department of Economic, Development, Environment and Tourism;
- b) Taung Local Municipality;
- c) Department of Water Affairs;
- d) Department of Agriculture Forestry and Fisheries;
- e) North West Heritage Resource Agency
- f) Department of Mineral Resources.

## ENVIRONMENTAL IMPACT ASSESSMENT FINDINGS:

The impacts will emanate from the construction and operational activities on the receiving environment due to the Gilmoie Mining operations during various phases of the Life of Mine. These potential impacts have been assessed, quantified and are described in greater detail in the Impact Assessment Sections 5.

Extent		Duration		Intensity		Probability		Significance Rating	
Footprint	1	Temporary	1	Insignifi- cant	2	Probable	1	Insignificant	0-19
Site	2	Short	2	Low	4	Possible	2	Low	20-39
Regional	3	Medium	3	Medium	6	Likely	3	Medium	40-59
National	4	Long	4	High	8	Highly Likely	4	High	60-89
Inter- national	5	Permanent	5	Very High	10	Definite	5	Very High	90 <

### Topography

- Change in the natural topography.
- Disturbance to geophysical and landscape features.
- Impacts of increasing land elevation after mining in the waste dumps (possible impact on streams, wetlands and drainage).

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	Significant	-Ve High	-Ve Med	-Ve High	-Ve Med	Significant
Operational		-Ve High	-Ve Med	-Ve High	-Ve Med	
Closure		-Ve Med	-Ve Low	-Ve Med	-Ve Low	

### Climate

- Greenhouse gas emissions.
- Creation of microclimates.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Low	-Ve Med	-Ve Low	-Ve Med	-Ve Low	-Ve Low
Operational		-Ve Med	-Ve Low	-Ve Med	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Geology

- Subsidence and development of surface cracks.
- Sterilisation of dimension stone ore resources.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve High	-Ve High	-Ve Med	-Ve Med	-Ve Low	-Ve High
Operational		-Ve High	-Ve Med	-Ve Med	-Ve Low	
Closure		-Ve High	-Ve Med	-Ve Med	-Ve Low	

### Soils

- Loss of soil as vegetation growth medium. Loss of soil productivity.
- Erosion.
- Contamination of soils.
- Potential deficit of available soil to act as growth medium after rehabilitation (due losses of soil associated with past and current mining activities within the Gilmoie Mining mining footprint area).

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Med	-Ve High	-Ve Med	-Ve Med	-Ve Low	-Ve Med
Operational		-Ve High	-Ve Med	-Ve Med	-Ve Low	
Closure		-Ve High	-Ve Med	-Ve Med	-Ve Low	

### Surface water resources

- Changes in natural surface water flow parameters.
- Disruption stream banks and wetlands.
- Reduced catchment yield and water available to downstream users and environments.
- Flooding.
- Changes to water regime of pans, wetlands and affected streams.
- Contamination of surface water.
- Acid rock drainage.
- Changes to water quality.
- Sedimentation of downstream areas.
- Decant / release of contaminated water to the environment

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Low	-Ve Med	-Ve Med	-Ve Med	-Ve Med	-Ve Low
Operational		-Ve Med	-Ve Med	-Ve Med	-Ve Med	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Groundwater

- Contamination of groundwater.
- Lowering of groundwater levels.
- Impact on boreholes in area affected by dewatering.
- Restricted access to boreholes and livestock watering points.



Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Low	-Ve Low	-Ve Low	-Ve Low	-Ve Low	-Ve Low
Operational		-Ve Low	-Ve Low	-Ve Low	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Air quality

Increase in dust levels.

- Fallout dust nuisances.
- Air quality impacts on fauna and flora.
- Health impacts due to fine particulate emissions and gaseous emissions.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Med	-Ve Med	-Ve Med	-Ve Med	-Ve Med	-Ve Med
Operational		-Ve Med	-Ve Med	-Ve Med	-Ve Med	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Noise

- Increase in ambient noise levels.
- Disturbances to sensitive receptors.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Med	-Ve Med	-Ve Med	-Ve Med	-Ve Med	-Ve Med
Operational		-Ve Med	-Ve Med	-Ve Med	-Ve Med	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Ecology and biodiversity

- Disturbance of sites of conservation importance.
- Loss of species of conservation importance.
- Fragmentation and loss of habitats.
- Restriction on animal movement patterns.
- Loss of migration corridors, and access to nesting and refuge areas, watering points, food supplies.
- Displacement of animal species, increased competition in areas where carrying capacity is already compromised.
- Biodiversity impacts.
- Spreading of invasive species.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Low	-Ve Low	-Ve Low	-Ve Low	-Ve Low	-Ve Low
Operational		-Ve Low	-Ve Low	-Ve Low	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Land use and land capability

- Loss of agricultural land.
- Disruption of land uses.
- Damage to and disruption of existing services and infrastructure.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Med	-Ve Med	-Ve Low	-Ve Med	-Ve Low	-Ve Med
Operational		-Ve Med	-Ve Low	-Ve Med	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Heritage resources

- Disturbance of graves, stone-age sites, and other heritage sites and artefacts.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	No Impact	-Ve Low	-Ve Low	-Ve Low	-Ve Low	No Impact
Operational		-Ve Low	-Ve Low	-Ve Low	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Social & economic environment

- Economic benefits and risks.
- Increased theft risk and potential for damage to private property during the operational phase.
- Impacts on neighbours and landowners.
- Impact on property values.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Med	+ Med	+ High	+ Med	+ High	-Ve High
Operational		+ Med	+ High	+ Med	+ High	
Closure		-Ve High	- Low	-Ve High	- Low	

### Visual environment and sense of place

- Changes to landscape character, visual appeal and sense of place of the area.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Construction	-Ve Med	-Ve High	-Ve Med	-Ve Med	-Ve Low	-Ve Med
Operational		-Ve High	-Ve Med	-Ve Med	-Ve Low	
Closure		-Ve Med	-Ve Low	-Ve Low	-Ve Low	

## SECTION 1 - INTRODUCTION

### 1.1 Details of the Applicant

<b>Name of Applicant</b>	<b>GILMOE MINING ( PTY) LTD</b>
<b>Address</b>	118 Strydom Road, The Orchards, Akasia, Pretoria
<b>Contact Person</b>	Neville Moeng
<b>Phone</b>	+27 79 775 5317
<b>Fax</b>	+27 86 235 9820
<b>Email</b>	nevillemoeng@gmail.com
<b>Details of the Land</b>	Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelura 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, A portion of farm Taung 894 HN.
<b>Surface Rights Holder</b>	Republic of South Africa

### 1.2 Details of the Environmental Assessment Practitioner (EAP) and Specialists

<b>Name of Environmental Assessment Practitioner (EAP)</b>	<b>GUDANI CONSULTING</b>
<b>Contact Person</b>	Mulanga Sikhitha- <i>Cand. Nat. Sci</i> Setenane Nkopane- <i>Pr. Nat. Sci</i>
<b>Postal and Physical Address</b>	P. O. Box 714 37A Voortrekker Street Faunapark Polokwane Polokwane 0699 0787
<b>Contact details</b>	Tel 015 291 3620 Cell: 082 828 3412/ 0766138404 Fax: 086 235 9820 Email: <a href="mailto:mulanga@gudaniconsulting.co.za">mulanga@gudaniconsulting.co.za</a> <a href="mailto:setenane@gudaniconsulting.co.za">setenane@gudaniconsulting.co.za</a> Website: <a href="http://www.gudaniconsulting.co.za">www.gudaniconsulting.co.za</a>
<b>Professional Affiliation Professional Registration</b>	SACNASP 119514
<b>Qualifications of the EAP to carry out the EIA/EMP process</b>	BSc Degree- Environmental Sciences BSc Honours - Geography

## 1.3 Expertise of the EAP and CV

### 1.3.1 Qualifications of the EAP

*Attach Proof of Qualification in Appendix 1.*

Expertise- Environmental Management and Assessments.

### 1.3.2 Summary of the EAP's Past Experience *Attach CV and past experience in Appendix 2.*

**Mulanga Sikhitha** has BSc. Degree in Life and Environmental Sciences from the University of Johannesburg and BSc. Honours Degree in Geography from the University of Limpopo. Currently, she is enrolled for MSc in Environmental Management (with specialisation in Social and Environmental Impact Assessment) with the University of Johannesburg. She worked with Roads Agency Limpopo from 2017 - 2018 as an Environmental Management Intern. Her responsibility included: Water use applications, Tree permit applications, Compiling site inspection reports, Monitoring environmental compliance and non-compliance for various projects, Liaising with stakeholder departments, Conducting environmental awareness, Environmental risk reports, Keeping records for financial provisions. She is currently an Environmental Officer at Gudani Consulting (Environmental and Social Scientists), and has undertaken several environmental assessment projects in South Africa.

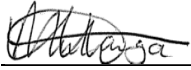
Mulanga is a registered Candidate Environmental Assessment Practitioner - (SACNASP No: 119514).

## 1.4 Undertaking by the EAP

I Mulanga Sikhitha as the Environmental Assessment Practitioner declare that:

- i) The information provided in the reports is correct as per the field investigations undertaken;
- ii) Interested and Affected Parties (I&As) were duly consulted about the operations and their comments and inputs have been included in the assessment;
- iii) The inputs and recommendations from the specialist reports were included in the assessment where relevant;

- iv) The responses to I&A's comments and inputs have been included in the response table of the Public Participation Report - Appendix 4



Signature of the environmental assessment practitioner:

**GUDANI CONSULTING**

Name of company:

**21 FEBRUARY 2022**

Date:

## 1.5 Details of the Environmental Specialists

Specialist Study	Appendix	Specialist
Public Participation Process	4	Gudani Consulting
Heritage Impact Assessment	5	Apelser

## 1.6 Operations Background

This document contains the contents from the Scoping Report - which forms part of the environmental impact assessment and Environmental Management Programme (EMP) for the Gilmoie Mining operation on the farms Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelura 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, A portion of farm Taung 894 HN, within Taung Local Municipality of the Dr Ruth Segomotsi Mampati District in Northwest Province. They are applying for mining right on 59365, 9935 ha on the above mentioned farms. Gilmoie Mining (Pty) Ltd has an existing prospecting right and approved EMP with reference number **NW 30/5/1/1/2/11507PR** and **NW 30/5/1/1/2/11508PR** respectively. The said prospecting right is still valid, and subject to further renewals. This study was undertaken by Gudani Consulting in conjunction with various environmental specialists in their role as independent environmental assessment practitioners (EAPs) to Gilmoie Mining for this particular project.

### GENERAL PROJECT DESCRIPTION

Gilmoie Mining propose to apply for mining right to mine Clay, Shale, Limestone, Gypsum and Quartz on the above mentioned farms, within Taung Local Municipality of the Dr Ruth Segomotsi Mampati District in Northwest Province. They are applying

for the mining right in terms of NEMA, 1998 and MPRDA, 2002. Gilmoie Mining to the locals. The proposed mining of the minerals will be an open pit mine to a depth of 50m. The equipment that will be used for the mining include excavators, front end loader and tipper trucks. The mined materials will be processed and loaded into 10-32 cubic meter tipper trucks for transportation to the markets and industries. The equipment used for Clay, Shale, Limestone, Gypsum and Quartz mining include:

- 4- Front-end loaders
- 3 -Excavators
- 10-Tipper trucks
- 1- Hydraulic hammer
- 1- Water truck
- 1- Processing plant

Water Supply will come from 3 sources including:

- Borehole.
- Storage tanks.
- Onsite site dams.

The boreholes will supply potable water used in offices and ablution facilities. The storage and return water dams water will be used solely for mineral processing and dust suppression. Gilmoie Mining appointed Gudani Consulting as an independent environmental consulting to undertake the SEIR and EMP processes, Public Participation processes and co-ordinate the specialist investigations which form part of the EMP.

Gudani Consulting has relied on the specialist opinion of the technical experts in their field to assist with the quantification of the baseline environmental conditions within the mining area, potential impacts of the Gilmoie Mining for the project activities and operations, and compilation of the requisite environmental impact assessment (EIA) and management programme (EMP) reports. Gudani Consulting worked closely with interested and affected parties and the Taung Local Municipality to obtain inputs into the EIA/EMP process. A meeting was held with ward councilor and his committee on the **17<sup>th</sup> August 2020**. BIDs were also distributed in the meeting as well as among the people in surround farm homesteads. Site notices were also placed at various sites in Taung.

## 1.7 Operations Locality

Gilmoie Mining is located in the Northwest Province about 20kms from Taung CBD on the farms Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelura 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, A portion of farm Taung 894 HN in the Dr Ruth Mompati District Municipality. (See Fig 2: Locality Map). The mining area covers an area of 59365.9935 hectares.

<b>Farm Name and No:</b>	Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelura 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, A portion of farm Taung 894 HN.
<b>Application Area (Ha):</b>	59365.9935 Ha
<b>Magisterial District:</b>	Dr Ruth Segomotsi Mompati District
<b>Distance and Direction from Nearest Town:</b>	Approximately 20km from Taung CBD
<b>21 Digit Surveyor General Code for Each Farm/ERF Portion:</b>	
	TOHN00000000079300000 TOHN00000000079400000 TOHN00000000079500000 TOHN00000000079600000 TOHN00000000079700000 TOHN00000000079800000 TOHN00000000079900000 TOHN00000000080000000 TOHN00000000080100000 TOHN00000000080200000 TOHN00000000086900000 TOHN00000000089400000 TOHN00000000089500000 TOHN00000000092100000
<b>Local Municipality</b>	Taung Local Municipality
<b>Communities</b>	Vaaltyn and Mokgareng
<b>Nearest town</b>	Taung

**1.8 Plan Showing the Location and Aerial Extent of Mining Activities**

Figure 2(a): Locality Map: 1:250 000

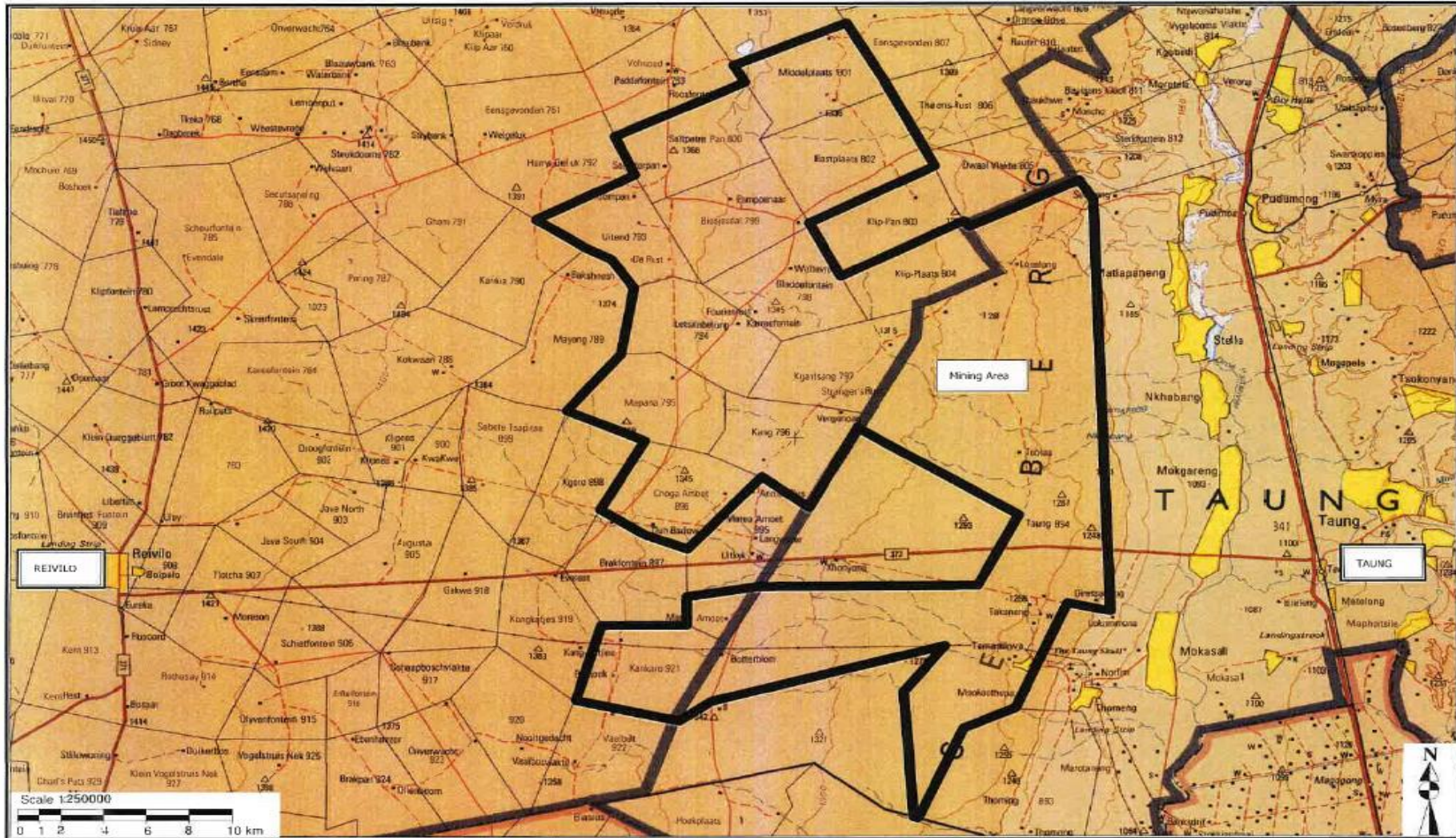




Figure 2(b): Locality Map: 1:250 000

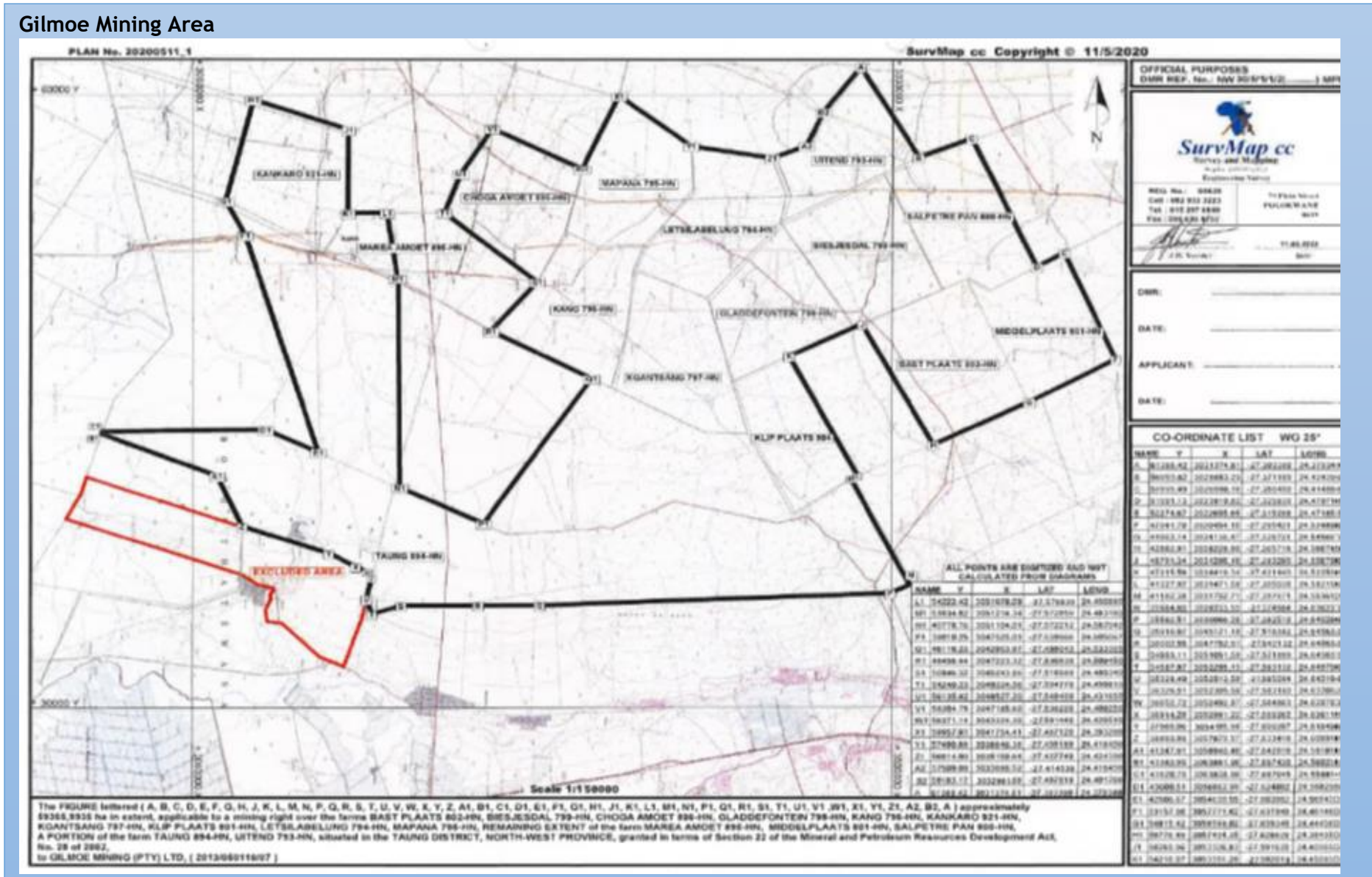


Figure 2c: Plan Showing the Location and Aerial Extent of the Main Mining Activities



## 1.9 Description of the scope of the proposed overall activity.

### i) Listed and Specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and the area (hectares) of all the aforesaid main and listed activities.

**Table 1: Listed and Specified Activities**

Relevant Government Notice	Listing Notice and Activity No:	Listing Activity Description:	Description	Applicability and Area Extend - Ha/m <sup>2</sup>
GNR.984 December 2014	Listing Notice 2, Activity 15	<i>Clearance of an area 20 hectares or more of indigenous vegetation.</i>	Vegetation Clearance for Establishment of Gilmore mining and associated infrastructure	200 Hectares
GNR.984 December 2014	Listing Notice 2, Activity 17	<i>An activity which requires a mining right or renewal thereof as contemplated in sections 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)- including associated infrastructure, structures and earthworks related to the extraction of the mineral resource.</i>	Gilmore mining activities- Including opencast	200 Hectares
GNR.984 December 2014	Listing Notice 2, Activity 21		Primary processing of Gypsum, Clay, Shale and Quartz mineral resource	50 Hectares

## 1.10 Policy and Legislative Framework

The following laws, regulations and documents in the table below have relevance to this Gilmore Mining project:

**Table 2: Legislative Framework**

Name	Overview	Permits/ Licenses		Administering Authority
Minerals and Petroleum Resources Development Act, (Act 28 of 2002)	<p>This Act regulates the prospecting for and optimal exploitation, processing and utilization of minerals. The Act provides for the safety and health of persons concerned in mines and works.</p> <p>The Act also regulates the orderly utilization and the rehabilitation of the surface of land during and after prospecting and mining operations.</p>	Mining Right	Complied with in terms of this of this EIA/EMP submission	National and Provincial
Environmental Conservation Act (Act No. 73 of 1989)	<p>This Act was superseded by NEMA as the primary environmental framework Act. The purpose of the Act is to provide for effective protection and controlled utilisation of the environment.</p>		Complied with in terms of this of this EIA/EMP submission	National and Provincial
National Environmental Management: Biodiversity Act (Act 10 of 2004)	<p>This Act controls the management and conservation of South African biodiversity within the framework of NEMA. The Act lists species that are threatened or require protection to ensure their survival in the wild, while requesting the activities, which may involve such listed threatened or protected species and</p>	<p>A list has been published under Section 56 (1) of critically endangered, vulnerable and protected species and as such a permit is required prior to undertaking restricted activities in areas with the species.</p>	Complied with in terms of this of this EIA/EMP submission	National and Provincial

	activities which may have a potential impact on their long-term survival. The Act has listed flora and Fauna species.			
National Spatial Biodiversity Assessment, 2004	The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.		Complied with in terms of this of this EIA/EMP submission	National and Provincial
National Forest Act	This provides for the management, utilisation and protection of forests through the enforcement of permitting requirements associated with the removal of protected tree species, as indicated in a list of protected trees.		No authorisation is required	National and Provincial
National Environmental Management: Protected Area Act (Act No.57 of 2003)	The Act makes provision for the protection and conservation of ecologically viable areas that show the country's biodiversity, natural landscapes. It also takes into account the declaration of the various categories of protected areas and envisages a national register of protected areas, with a simplified classification system of Special Nature Reserves, National Parks, Nature Reserves and Protected Environments. In addition, the Act brings in the concept of biological diversity protection and ecosystem management.		Complied with in terms of this of this EIA/EMP submission	National and Provincial

National Water Act (Act No 36 of 1998)	This Act aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. Section 21 states the water uses that require a license or authorisation.		Complied with in terms of this of this EIA/EMP submission	National and Provincial
The National Environmental Management: Waste Act (Act No.59 of 2008)	In terms of the Waste Act, no person may commence, undertake or conduct a waste management activity except in accordance with: <ul style="list-style-type: none"> <li>□ The requirements or standards determined in terms of the Waste Act for that activity; and</li> <li>□ A waste management license issued in respect of the activity, if a license is required.</li> </ul>	The waste produced during the construction and handled during operations and storage thereof is within the minimum threshold specified in the listed activities Category B.	Complied with in terms of this of this EIA/EMP submission	National and Provincial
The National Environmental Management: Air Quality Act (Act No.39 of 2004)	The main objective of the Air Quality Act (NEMAQA) is the protection of the environment and human health, in a sustainable (economic, social and ecological) development framework, through reasonable measures of air pollution control.	Schedule of activities that require and atmospheric emission license has been published. The proposed activity is not listed as having detrimental impact on air quality.	Complied with in terms of this of this EIA/EMP submission	National and Provincial
The National Heritage Act (Act No. 25 of 1999)	Section 34 (1): No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the South African Heritage Resources Agency (SAHRA), or the responsible provincial resources authority. Sections 35 (4): No person may, without a permit issued by the SAHRA or the responsible heritage resources authority,	Permits are required for any development that may affect heritage resources such as graves and old buildings.	Complied with in terms of this of this EIA/EMP submission	Provincial

	<p>destroy or damage, excavate, alter or remove from its original position, or collect, any archaeological material or object.</p> <p>Section 36 (3) No person may, without a permit issued SAHRA or a provincial heritage authority, destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal area administered by a local authority.</p>			
Mine Health and Safety Act 29 of 1996	The act aims to provide for the health and safety of persons at work and for the health and safety of persons about the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or about the activities of persons at work.		Complied with in terms of this of this EIA/EMP submission	National and Provincial

## 1.11 Mining Right Application Area

Table 3: Mining Right Application Areas

FARM	PORTION	Area (Ha)	OWNER
Bast Plaats 802 HN, Biesjesdal 799 HN, Choga Amoet 869 HN, Kang 796 HN, Kgantsang 797 HN, Letsilabelura 794 HN, Gladdefontein 798 HN, Uitend 793 HN, Kankaro 921 HN, Klip Plaats 801 HN, Mapana 795 HN, Remaining extent of farm Marea Amoet 895 HN, Middleplaats 801 HN, Salpetre Pan 800 HN, a Portion of Farm Taung 894 HN	Entire Farm	59365.9935 ha	GILMOE MINING
<b>*MA - Mining Area = 59365.9935 ha</b>			

## 1.12 Study Assumptions

This EIA/EMP Report has been prepared on the strengths of the information available to the team at the time of the assessment and in accordance with the principles of Integrated Environmental Management (IEM). Care has been taken to provide an objective document, which will ensure the decision-making authority is in a position to make an informed decision.

## 1.13 Environmental Assessment Study Objectives

The objectives of the EIA/EMP process are to:

- Consult with interested and affected parties concerning the existing Gilmoie Mining operations through scoping process. The specific objectives for the scoping phase of the EIA/EMP process were to:
  - ❖ Collate operations and baseline environmental information;
  - ❖ Identify landowners, adjacent landowners, local authorities, environmental authorities, as well as other stakeholders which may be affected by the operations, or that may have an interest in the environmental impacts of the operations;
  - ❖ Inform interested and affected parties (I&APs) about the Gilmoie Mining operations;
  - ❖ Engage with I&APs and identify their issues and concerns;



- ❖ Document key I&AP issues and concerns for consideration in the EIA/EMP phase;
  - ❖ Engage with environmental authorities and confirm legal and administrative requirements;
  - ❖ Identify existing and potential environmental issues associated with the operations of the Gilmoie Mining and associated activities;
  - ❖ Introduce and evaluate the alternative operational options at desktop level;
  - ❖ Identify the nature and extent of further investigations and specialist input required in the EIA phase.
- Identify and re-evaluate impacts associated with Gilmoie Mining operations;
  - Give input to the Gilmoie Mining operations for mining and processing of minerals with specific reference to environmental and operational management;
  - Identify management options that can be implemented in order to reduce or minimise the predicted environmental impacts;
  - Assess the significance of the predicted impacts in terms of nature, probability of occurrence, extent, and duration before and after implementation of mitigation measures;
  - Document the findings of the EIA/EMP application of the mining right and the process as a basis for mining operations at Gilmoie Mining to provide the regulating authorities with sufficient information upon which to base a decision regarding authorizing the EIA/EMP alignment.

#### 1.14 Consideration of Alternatives

The site for the Gilmoie Mining mining operations was selected based on availability of Clay, Shale, Limestone, Gypsum and Quartz minerals. Minerals can only be mined where identified and verified, therefore it was not practical to select any other site. The No-Go option is the only other alternative identified during the scoping phase, which has been discussed in detail as part of the EIA/EMP application of the mining right .

#### 1.15 Policy and Legislative Framework

Based on the potential significance of impacts, the EIA Regulations, 2014 identify specific activities that are either subject to a Basic Assessment process, or more comprehensive Scoping and EIA process. The existing Gilmoie Mining and related infrastructure operations includes several activities which require a scoping and full EIA, however some activities only require a Basic Assessment. All activities are however included in the scoping and EIA assessments approach.

The EIA/EMP application for the mining right and the process followed for the Gilmoie Mining has been designed to meet the requirements of both the National

Environmental Management Act (Act 107 of 1998; amended 2006) and Minerals and Petroleum Resources Development Act 28 of 2002; amended 2008).

This EIA/EMP Report includes a description of the Gilmoie Mining operations and its specific activities, a list of identified environmental aspects that will potentially be impacted upon by the mining operations, and environmental impact assessment for these aspects, and environmental management programme for the mitigation and management of the identified impacts.

The following activities will be applicable to the Gilmoie Mining and will therefore require a full environmental management programme process:

**Table 4: Gilmoie Mining Operations**

**Detailed description of listed activities as described in NEMA Regulations GN R. 982, 983 and 984 and Section 19 of the Waste Management Act, 2008 associated with the project:**

Establishment of Gilmoie Mining processing plant and associated infrastructure	X	<b>Listing notice 2-(21)</b>
Mining of Clay, Shale, Limestone, Gypsum and Quartz by open- pit mining on 59365.9935hectares farm/land	X	<b>Listing notice 2-(17)</b>
The clearance of an area of 20 hectares or more	X	<b>Listing Notice 2- (15)</b>

The NEMA is enforced by the Department of Environment Affairs. In the Northwest Province this delegated role is fulfilled by the Northwest Department of Economic Development, Environment and Tourism. Regulations 983 and 984, 2014 promulgated under NEMA the following activities require an Environmental Impact Assessment or Basic Environmental Assessment:

- Reconnaissance, prospecting, mining or retention operations as provided for in the MPRDA (Act 28 of 2002), in respect of such permissions, rights, permits and renewals thereof;
- The construction of facilities or infrastructure, including associated structures or infrastructure, for any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste;
- The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2001 (Act No. 10 of 2004).

The following water use application requirements will be applicable to the Gilmoie Mining and will be subject to a separate water use license application process and documentation:

**Table 5: Gilmoie Mining Water Use Application Requirements**

<b>Detailed description of activities as described in Section 21 of National Water Act, 1998, associated with the project:</b>	
<i>Section 21 (a) - Taking water from a water resource (Forms - DW760 and DW773)</i>	<i>Water use for mining purposes</i>
<i>Section 21c - Impeding or diverting the flow of water in watercourse (Forms DW775 and DW763);</i>	<i>Impeding any water resource and flow channels due to mining activities</i>
<i>Section 21 (g) Disposing of waste in a manner which may detrimentally impact on a water resource</i>	<i>Waste water run-off from ore processing, waste dumps, and stockpiles</i>
<i>Section 21 (h) - Disposing in any manner of water which contains waste from any industrial process</i>	<i>Waste water run-off from ore processing, waste dumps, and stockpiles</i>

## SECTION 2 - DESCRIPTION OF THE MINING OPERATION

### 2.1 The Minerals to be Mined

#### 2.1.1 Clay

The clay material on site is a soft, highly weathered rock that consists of clay sized clay minerals.

#### 2.1.2 Shale

Shale is a black, fine grained sedimentary rock made up of clay to silt sized particles. It is a soft, highly compacted rock with a slaty texture. The shale on site is relatively thin compared to the other rock units encountered.

#### 2.1.3 Limestone

Limestone consists of coarse to very coarse, organic minerals. It is composed mostly of the minerals calcite and aragonite. Limestone forms when these minerals precipitate out of water containing dissolved calcium. This can take place through both biological and nonbiological processes, though biological processes like the accumulation of corals and shells in the sea.

#### 2.1.4 Gypsum

Gypsum is a soft sulfate mineral composed of calcium sulfate dihydrate. It is widely mined and is used as a fertilizer and as the main constituent in many forms of plaster, blackboard/sidewalk chalk, and drywall.

#### 2.15 Quartz

Quartz is a hard, crystalline mineral composed of silica. It is the second most abundant mineral in Earth's continental crust, behind feldspar. Quartz crystals are used to make oscillators for watches, clocks, radios, televisions, electronic games, computers, cell phones, electronic meters, and GPS equipment. A wide variety of uses have also been developed for optical-grade quartz crystals.

### MINING METHOD

The proposed mining of Clay, Shale, Limestone, Gypsum and Quartz will be an open pit mine to a depth of 50m. The equipment that will be used for the mining of Clay, Shale, Limestone, Gypsum and Quartz includes excavators, front end loader, tipper trucks and the mined materials will be processed and stockpiled on site then loaded onto 10-32 cubic meter tipper trucks, then processed, stockpiled or transported to the markets and industries. The mining area covers an area of 59365.9935 hectares in extent. They will also blast occasionally where necessary. Before blasting they will notify all the affected and interested parties.

The opencast mining involves the stripping of usable soil and soft overburden material using a fleet of diesel trucks and shovels, with the topsoil stored separately from any overburden, to be used in the rehabilitation of the area once the mining is completed. The harder overburden is drilled and blasted to break the rock, which is removed as waste rock and stored separately. This waste rock will be returned to the mined area as part of a concurrent rehabilitation process. Once the hard rock overburden has been removed, the exposed desired mineral reserves are drilled, buffer blasted and taken to the processing.

The continuous backfilling of the open pit with discard material, as well as planned rehabilitation activities will ensure that the visual impact resulting from the proposed mining activity is of a temporary nature, apart from structures which may remain on site beyond mine closure, but which are to be suitably rehabilitated.

## **MINING PROCESS**

Once the Gypsum, Limestone, Clay, Shale, and Quartz containing rocks formed within the earth's crust have been discovered, they are carefully dug from the ground by method of open pit mining. The soil on top of the rocks, called the overburden, is removed with power shovels or earth scrapers. The exposed rock layers are then drilled with large pneumatic or hydraulic drills, and the holes are filled with explosive charges. When all personnel and equipment have been moved out of the area, the explosive charges are detonated. The resulting heap of loose rocks are scooped up with power shovels and dumped into trucks or train cars, which carry the mineral rocks to a processing plant. The equipment/ machinery used in the mining and described in detail below:

### ▫ Hydraulic Drills

A deep hole is drilled in the stone by a drill to break or separate the Gypsum, Limestone, Clay, Shale, and Quartz rock. This process is staged and controlled.



□ Explosive charges/ blasting

An explosive is a reactive substance that contains a great amount of potential energy that can produce an explosion if released suddenly, usually accompanied by the production of light, heat, sound, and pressure.



□ Power Shovels

Power shovel is a bucket equipped construction equipment used for excavating and transporting all classes of earth to nearby trucks or other hauling equipments.



□ Haul Trucks

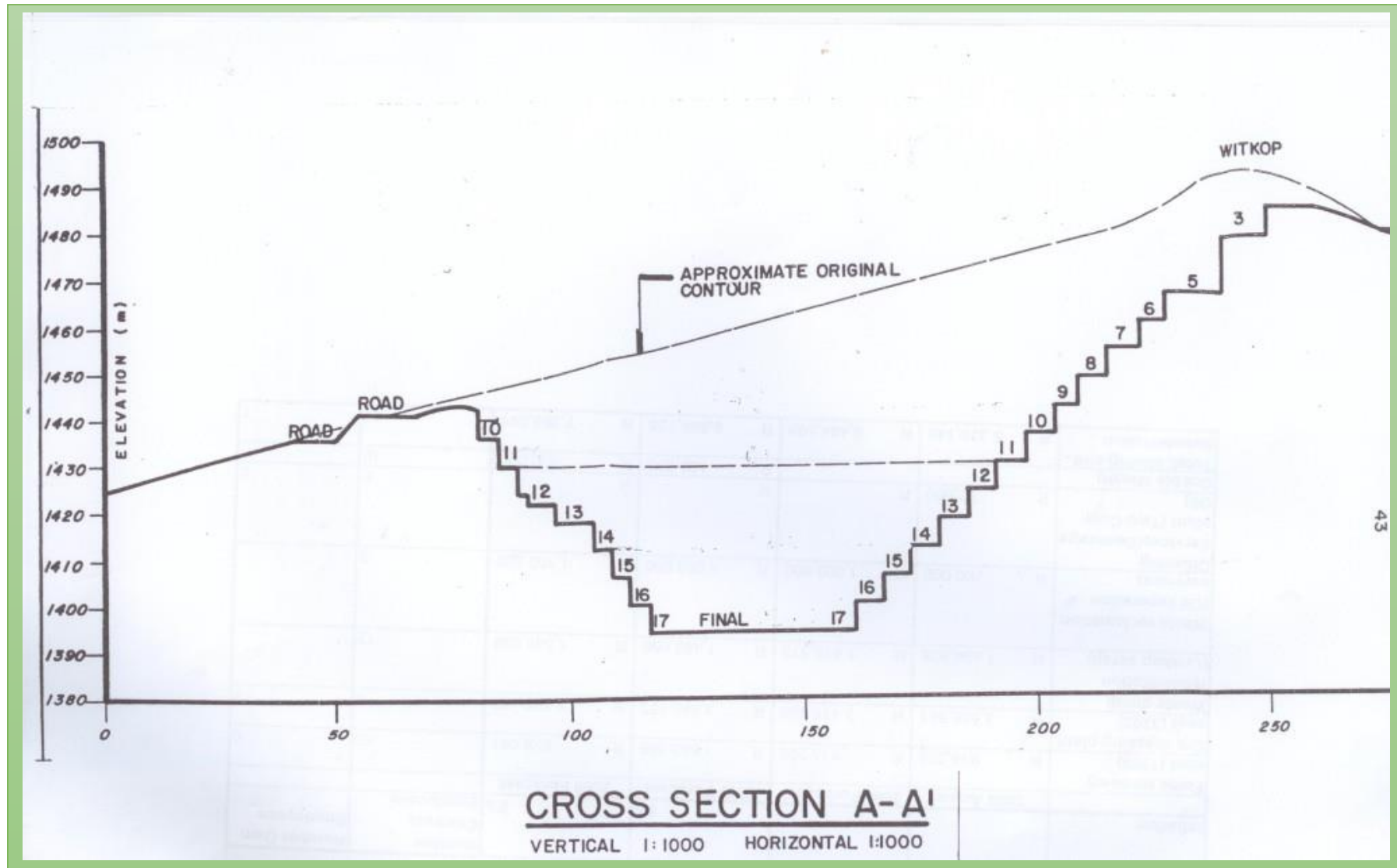
Haul trucks can transport extraordinary amount of material in a relatively short period of time. These vehicles are an important part in the transportation of Gypsum, Limestone, Clay, Shale, and Quartz containing rocks to the processing plant.



## 2.2 PROSPECTING RIGHT

Gilmoie Mining does have existing prospecting right and approved EMP with reference number **NW 30/5/1/1/2/11507PR** and **NW 30/5/1/1/2/11508PR** respectively. The said prospecting right is still valid, and subject to further renewals. Sufficient Clay, Shale Limestone, Gypsum and Quartz occur in the site, which is sufficient to mine for 25- 30 years hence they are applying for mining right.

Figure 3: Typical Cross-Section Demonstration of Operational Open Pit/Quarry





## 2.2.1 Gilmoie Mining- Other Mine Infrastructure

### 2.2.1.1 Mine Planning and Scheduling

The Life of Mine (LOM) base case schedule will be run from 30 000 tons per month over the next five years. The LOM of 30 years is estimated for Gilmoie Mining operations.

### 2.2.1.2 Raw material processing

The processing plant is split in two sections, the primary crusher and the main plant. The Primary Crusher consists of a Feed Bin, Vibrating Feeder, Jaw Crusher and Conveyor Belt.

The dump trucks will discharge their load into a bin. The bin feeder moves the material into the jaw crusher opening to be crushed to -100mm in size. A conveyor belt then dumps the crushed material onto the intermediate stockpile. Processing and handling plant will be installed to effectively process Clay, Shale, Limestone, Gypsum and Quartz ore at the Gilmoie Mining site. The mine will produce saleable grade mineral products.

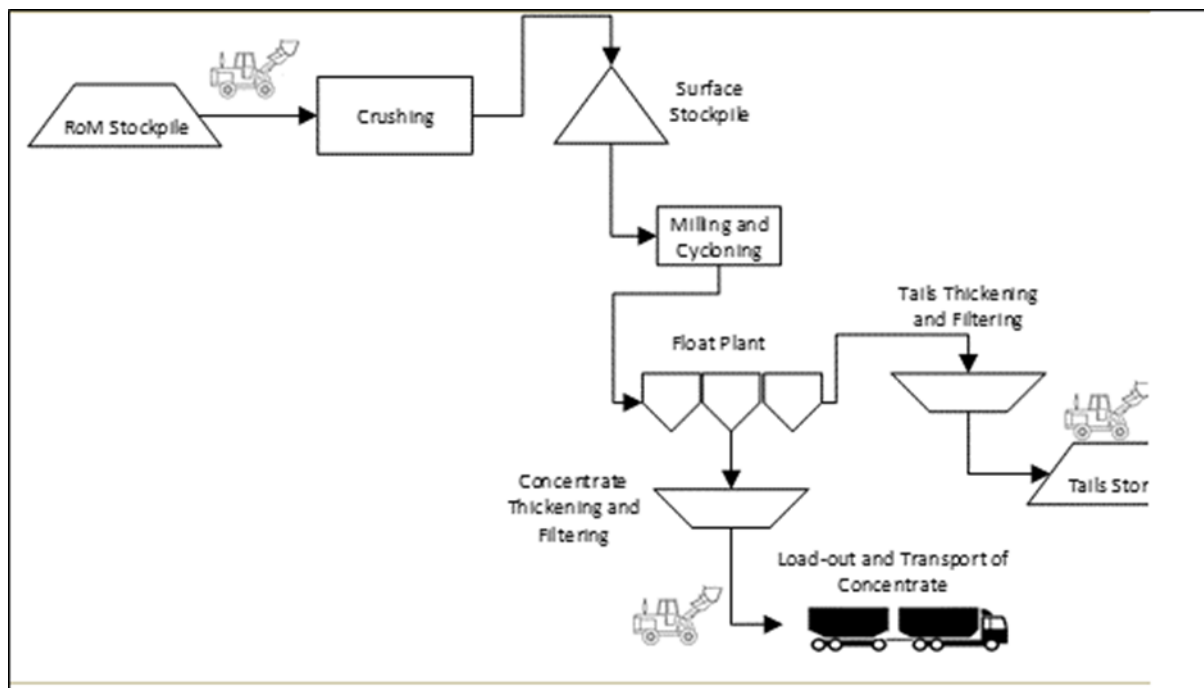


Figure 4: Main processing plant

### 2.2.1.3 Storm Water Management and Drainage Facilities

Separation of clean and dirty waters will be achieved by placing earth berms such that clean water may by-pass the dirty water areas whilst the dirty water will be intercepted by engineered concrete-lined drains.

The drainage system will be designed to separate the contaminated water from the uncontaminated water. Cut-off drains will direct the clean run-off water around the

contamination area. The clean water cut-off drains will be along the haul roads. The clean water will be directed into the natural storm water courses.

#### **2.2.1.4 Fencing**

The entire Gilmoie Mining operations will be completely fenced off by a 1.8m high barb wire fence. A single entrance for both employee vehicles, mine owned LDVs and raw materials transporter trucks will be allowed for. Pedestrians will use the same gate for entrance to the Gilmoie Mining Site.

#### **2.2.2 Access and Haul Roads**

By road, the site is located 20 kilometres from Taung CBD, which falls under the jurisdiction of the Dr Ruth Mompati District. Access to the site is via the gravel road with the nearest villages being Vaaltyn and Mokgereng. Within the mining site gravel roads will be constructed to give access various working areas including the mine pit and storage areas. Where applicable the roads will be paved with concrete to minimize and control dust and for safety requirements. There will be no conflict envisaged between the mine vehicles and private vehicles along the main tar access road to the site because the exiting road is wide enough to accommodate haul trucks and private vehicles at the entrance into Gilmoie Mining.

#### **2.2.3 Electricity Supply**

Electricity/Power will be obtained from nearby Eskom 11KVA powerline. From there power will be distributed to all points requiring electricity within the Gilmoie Mining site.

#### **2.2.4 Offices and Workshop.**

Initially there will be masonry office building, 160m<sup>2</sup> in size close to the entrance, consisting of a reception area, 10 offices, 2 boardrooms, 2 kitchens, store room and ablution facilities.

The 480m<sup>2</sup> workshop will consist of open work area, service bay, 3 offices, kitchen, store rooms and ablution facilities.

Lockers, canteen rest area and additional ablution facilities will also be available and is located next to the plant.

#### **2.2.5 Waste Management**

General waste will be collected weekly and disposed of at the municipal landfill site. The floors will be concreted and the sides bunded to prevent any polluted substances leaving the site. All waste, both domestic and hazardous will be taken from where it is generated and stored within the waste disposal handling area. The domestic waste will be separated and sorted into colour coded bins, from where it will be removed to the municipal waste disposal site.

Other hazardous waste, (such as used oils, lubricants and grease), light bulbs (including fluorescent tubes which are regarded as hazardous) and electronic waste will be transported from where it will be generated in areas such as the workshops and wash bays to the hazardous waste handling area. The waste will be stored in drums or other suitable containers and removed by a competent contractor to a licensed hazardous waste disposal facility - the closest being Johannesburg Hazardous Waste Site. The hazardous waste handling area is equipped with an oil sump and separator to separate oil from oil polluted water.

Waste tyres will be stored in a designated area, and where required second-hand tyres will be used for road demarcation. Removal of waste tyres from site will be done by a competent contractor and disposed at a licensed disposal site.

Gilmoe Mining will have a waste management strategy which addresses all aspects of waste storage, handling, recycling and reuse.

The types of waste that will be generated by the operations include:

- Waste Dumps;
- Hazardous industrial waste such as packaging for hazardous materials, used oil, grease; paste bags, kiln shells, rags, PPE, fluorescent tubes
- General industrial waste such as scrap metal; and
- General and Domestic waste - paper, plastic, tins, glass

The recyclable wastes will be temporarily handled and stored on site before being removed for recycling by suppliers, re-used by scrap dealers or final disposal at permitted waste disposal facilities. No on-site landfill (waste disposal) facilities will exist on the mining area. There will be a waste management procedure at Gilmoe Mining for these wastes that addresses all aspects of waste storage, handling, recycling and reuse.

Any waste material from the Clay, Shale, Limestone, Gypsum and Quartz extraction process such as dust/mircrosil have other uses, therefore the operation can be regarded as zero waste.

Waste generated by the operation will be disposed of as follows:

- Scrap metal- removed and sold to scrap dealers;
- Used and old oil removed monthly for recycling by competent contractor;
- Domestic waste is disposed-off at the municipal dumping area;
- Old planks are removed and sold.

#### **2.2.5.1 Topsoil Stockpiling**

During any future construction phase topsoil stripping will occur for the purpose of construction of new haul roads and stockpile areas. The soils that are found below any future development area footprint within the Gilmoe Mining site will be stripped ahead of any such construction to a minimum depth of 600 mm of soil so that this material can be replaced at the end of the life of the operation. In order to ensure that soil stockpiles are not re-handled the soil stockpiles will be located in positions where they are unlikely to be moved until the soil is required for rehabilitation at the end of the life of operations.

Topsoil stockpiles will not exceed 5m in height and will be vegetated with appropriate indigenous vegetation to avoid erosion and dust.

## 2.2.6 Water Supply and Sanitation

### Bulk Water Supply

Gilmoe Mining will utilise potable water from three sources (i.e borehole, storage tanks, onsite dam). The water from the boreholes owned by Gilmoe Mining will be pumped and stored in a reservoir and then distributed to various facilities. The storage and return water dams will be used solely for mineral processing and dust suppression. To sustain its production requirements the Gilmoe Mining per annum water volume will be determined at a later stage during operation of the mine. Use of water will include; drinking, hygiene purposes, emergency showers in production, ablutions, dust suppression, and mineral processing .

### Potable Water

Potable water will be used for offices and ablution facilities, as well as dust suppression.

#### 2.2.6.1 Sanitation

There will be water borne ablution and sanitation facilities through out the entire Gilmoe Mining site. All sewage from the mining site will be transferred to the on-site sewage facility.

## 2.2.7 Dust Management

Dust emissions around the mine site will be measured from various points to ensure that the operation complies with the minimum dust levels - taking cognizance of the settlements and farming homesteads around the mine. There will be high levels of dust emission when the mine becomes operational (but still below the 600 mg/m<sup>2</sup>/day minimum limit).

Figure 5: Site Pictures- Gilmoie Mining



## 2.2.8 Employment

Gilmoie Mining will employ approximately 36 permanent staff.

## 2.3 List of the Main Mining Actions, Activities and Process per Phase

Table 6 lists the infrastructure and activities required for the operation and decommissioning phases of the Gilmoie Mining operations. Each of the activities and processes are described in detail in the relevant section as outlined in the table.

**Table 6: Summary of Mining Activities and Infrastructure**

Key activities and infrastructure	Reference to Section of the Report
<b>Operations</b>	
Haul and access roads	2.2.2
Raw material processing	2.2.1.2
Raw material stockpiles	2.2
Transport of raw materials on site	2.2.2
Transport of minerals offsite	
Storm water management	2.2.1.3
Topsoil handling and rehabilitation	2.2.5.1
Waste management	2.2.5
Water supply	2.2.6
Workforce	2.2.8
<b>Decommissioning and closure</b>	
Rehabilitation	2.3.1
Workforce	2.2.8

### 2.3.1 Decommissioning and Closure Activities

#### Final Waste Dump Configuration

The grading down and sloping of waste dumps constitutes concurrent reduction and rehabilitation as the mine progresses. It is planned that instead of leaving huge waste dumps which may have inherent safety risks as well as potential water management issues, any available left-over waste material will be spread over the entire area to conform to the surrounding horizontal/sloping configuration.

The final design of the landscape can however, only be determined once the detailed rehabilitation plan has been completed. This planning will need to address surface drainage and the maintenance of wet areas as any change to the topography could affect drainage to and from the wet areas. No wet areas have however been identified in the vicinity of the Gilmoie Mining area.

#### Rehabilitation

The open pit and waste dumps will be rehabilitated as the mine operations progresses. Rehabilitation and re-vegetation of disturbed areas such as the workshops and haul roads will be treated as follows:

- Compaction of soil will be mitigated by deep ripping (minimum depth 500mm) the

footprint and introducing both organic (compost, mulch etc) and inorganic ameliorants (fertilisers).

- Soil testing will be undertaken to determine the fertility status of the soils, which will then be compared to the baseline levels to determine ameliorant requirements.
- Topsoil will be replaced, ameliorants added and shaped and planted with an appropriate seed mix.

### **Removal infrastructure**

All mining infrastructure will be removed and sold for re-use or disposed of as scrap. Waste rubble will be graded down to conform to the surrounding configuration. Electrical and water supplies to the mining area will be terminated and made safe. Surface haul roads will be ripped and re-vegetated.

### **Workforce**

Prior to decommissioning and closure it is expected that the mining and Gilmoie Mining workforce will gradually be reduced in proportion with the requirements of mining/ Gilmoie Mining, processing and final rehabilitation of the Gilmoie Mining site. Decommissioning and closure will still require staff to manage the process of removing plant, and infrastructure, shaping waste dumps, rehabilitating and re-vegetating roads and other surface areas and undertaking any other necessary actions to facilitate the decommissioning and closure of the mine/ Gilmoie Mining. Predominantly engineering and environmental staff will be required for this function and some of the functions will be outsourced to specialist contractors and service providers. It is expected that Gilmoie Mining permanent staff will be reallocated to other operations within the group that may be in place at that stage.

## **2.4 Plan Showing Location and Aerial Extent of Mining Activities or Processes for Calculation of Financial Provision**

All Gilmoie Mining operations will take place within the approved mining right area. The surface infrastructure is indicated in Appendix 3. Refer to Appendix 3 for a map indicating the extent of the main mining/ Gilmoie Mining activities.

## **2.5 Listed Activities in terms of NEMA EIA Regulations 2014 occurring within the Operations**

The following NEMA, 1998 listed activities are applicable to the Gilmoie Mining operations:

**Table 7: Description of Listed Activities in Terms of NEMA**

<b>Detailed description of listed activities as described in NEMA Regulations GN R.982, 983 and 984 and Section 19 of the Waste Management Act, 2008 associated with the project:</b>	
<i>GN R.984 - Activity 17: Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</i>	<i>Gilmoe mining application for mining right</i>
<i>GN R.984 - Activity 17: Any activity which requires a mining right or renewal thereof as contemplated in sections 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002 - including associated infrastructure, structures and earthworks related to the extraction of the mineral resource.</i>	<i>Gilmoe mining Operations and associated infrastructure, and Overburden stockpiles.</i>
<i>GN R.984 - Activity 21: Any activity including the operation of that activity associated with the primary processing of a mineral resource including wining, extraction, classifying, concentrating, Cutting, screening and washing.</i>	<i>Extraction and Processing of Clay, Limestone, Shale, Gypsum and Quartz on 59365.9935 hectares farm/land</i>

## 2.6 Operations Motivation, Need and Desirability

### 2.6.1 Operations Motivation

Gilmoe Mining has a capital investment of over R 1 969 225 per annum- (one million nine hundred and sixty nine thousand two hundred and twenty five rands) into the proposed mining area. A high percentage of residents around the mine/ Gilmoe Mining are unemployed. Gilmoe Mining will alleviate the unemployment problem to some extent, though it will not eradicate it completely. Approximately 36 people will be employed permanently at the Gilmoe Mining operations.

Secondary industries are also likely to develop due the existence of Gilmoe Mining. The life of mine (LOM) for Gilmoe Mining is expected to be over 25 years, which translate to a definite 25 years and more of economic activity in the region.

### 2.6.2 Operations Need and Desirability

One of the fundamental purposes of the Gilmoe Mining is to supply Clay, Shale, Limestone, Gypsum and Quartz to the regional/national and international markets. Gilmoe Mining maintains that it's continued existence is needed to:

- Ensure the supply of a secure, long-term supply of Clay, Shale, Limestone, Gypsum and Quartz to regional/national and international markets.
- Avoid negative impacts of minerals shortages on national economic growth and development.
- Contribute to the economic upliftment of local people and region.



### 2.6.3 The No-Go Option

Gilmoe Mining is not an existing operation since mining has not commence at the site. Mineral resources can only be mined where they exist, which limits feasible alternative sites for mining. The location for the mining operation is therefore dictated by the presence and minable mineral guided by the area applicable for the mining right application with DMR. The site for the Gilmoe Mining operations was initially selected based on availability of Clay, Shale, Limestone, Gypsum and Quartz containing ore to be mined. Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites.

The No-Go Option is the only other alternative considered in the impact assessment phase.

## 2.7 Indication of the Phases (Operational, Decommissioning) and Estimated Timeframes for Implementation of these Actions, Activities or Processes and Infrastructure

Table 8 below outlines the Gilmoe Mining operations phases (operational, and decommissioning) and the estimated time-frames in relation to the actions, activities or processes and infrastructure. Since the operations are not yet in existence, the feasibility and construction phases are also applicable.

**Table 8: Operations Phasing - Gilmoe Mining Operations**

Phase	Time Frame	Activity	
Feasibility Phase	Operation Existing. This Phase Does Not Apply to Gilmoe Mining	1	Appoint Mining Contractor
		2	Procurement
		3	Fabrication and Delivery
		4	Contractor Mobilization
		5	Mine Infrastructure Establishment
		6	Contract Work
Construction Phase	Operation Existing. This Phase Does Not Apply to Gilmoe Mining	1	Vegetation Removal and Topsoil Stripping
		2	Construction of Internal and Access Road
		3	Activities Related to Deployment and Implementation of Services
		4	Excavation of Building Foundations and Services Trenches. Blasting may be Required.
		5	Piling Operations for Large Building and Structures
		6	General Movement of Heavy Vehicles Around Site
		7	Construction Material and Equipment Delivery Vehicles In/Out
Operational		1	Surface Preparation for Raw Materials Stockpiles - Vegetation Removal and Topsoil Stripping
		2	Raw Material Handling and Processing

	20-30 Years	3	Raw Material Stockpiling
		4	Gilmoie Mining /Production
		5	ROM Stockpile and Material Loading
		6	Waste Dump Rehabilitation
		7	Open Pit Rehabilitation
Decommissioning	2 Years	1	Demolition and Removal of All Infrastructure
		2	Rehabilitation (spreading of soil, re-vegetation, profiling/contouring)
		3	Storage, Handling and Treatment of Hazardous Products (fuels, oils and waste activities)
Post Closure Phase	3 Years	1	Post - Closure Monitoring and Rehabilitation

## 2.8 Confirmation if any other Information is attached as Appendices

The following specialist studies are attached to this document:

Table 9: Specialists Studies

Specialist Study	Appendix	Specialist
Public Participation Process	4	Gudani Consulting
Hertiage Impact Assessment	5	Apelser

## SECTION 3 - PUBLIC PARTICIPATION PROCESS

Public participation is a continuous two-way communication process aimed at promoting full public understanding of the processes and mechanisms through which environmental problems and needs are investigated and solved by the responsible agency. It is aimed at keeping the public informed about the status and progress of the studies conducted and the implications of the operations thereof as well as to document all issues, comments and concerns voiced by the public and their preferences regarding resource use and alternative development or management strategies and any other information and assistance relative to the operations decisions.

The Stakeholder Engagement Process as it is referred to by the Department of Environmental Affairs (DEA) is a “*process leading to a joint effort by stakeholders, technical specialists, the authorities and the proponent who work together to produce better decisions than if they had acted independently*”. The process aims at improving “*communication between stakeholders - including the proponent - in the interest of facilitating better decision-making and or sustainable development*”.

Sustainable development requires some level of trade-off between economic growth, social equity and ecological integrity. The stakeholder engagement process provides an opportunity for Interested and Affected Parties (I&APs) to participate in an informed bases and ensure their needs and requirements are considered and allows the decision-making authority to understand to what degree stakeholders are willing to accept and live with the trade-offs involved.

### 3.1 Identification of Interested and Affected Parties

Stakeholder engagement varies given the technical nature of the proposed activity, the geographical location, extent, duration, intensity and frequency of potential impacts associated with the activity in question, as well as the capacity of the receptive community to participate in the proposed project. The processes outlined below are specific to the proposed Gilmoie project.

I&APs were identified through several mechanisms. These include:

Meetings with non-governmental agencies, community based organisations, local council representatives, and municipality;

Placement of community notices, and distribution of background information documents (discussed separately).

All I&AP identified were registered on the stakeholder database. The public participation process endeavoured to ensure that individuals / organisations from referrals and networking were notified of the proposed Gilmoie mining project, in addition to efforts to notify and identify stakeholders at a geographical level.

### 3.2 Approach to Stakeholder Engagement

Our approach to stakeholder engagement was based on the following principles outlined by the Department of Environmental Affairs:

Undertake meaningful and timely participation of I&APs;

Focus on important issues during the scoping and stakeholder engagement phases;

Due consideration of alternatives (where applicable) were undertaken;

Accountability for information used for decision-making should be provided;

Encouragement of co-regulation, shared responsibility and a sense of ownership should be developed over the project lifecycle;

Application of "due process" particularly with regard to public participation in environmental governance as provided for in the Constitution is essential; and the needs, interests and values of I&APs must be considered in the decision-making process.

### 3.3 Advertisements

The newspaper advert was placed on the following newspaper informing and inviting members of the public and any other interested and affected parties (I&APs) about the environmental impact assessment process underway and to comment on the proposed Gilmoie mining project:

a) Taung Daily News of **Friday 30<sup>th</sup> July 2021**;

**July 2021 Edition** **Taung Daily News** 4

## Five North West municipalities to be dissolved

The North West provincial government says five of the province's municipalities are among 40 municipalities countrywide that the national cabinet has resolved to dissolve. The affected municipalities are reported to have been under administration of various occasions, but seem not to be improving. Some have been marred by political squabbles which led to them having two mayors and two municipal managers at the same time. This is reported to have impacted negatively on the provision of services. In the North West province, reasons advanced for dissolving the affected municipalities are among others, their failure to execute their constitutional obligations, delays in providing services, and the presence of political squabbles which have led to the municipalities being unable to execute their administrative capacity and service delivery. ANC for Cooperative Governance, Mmusisi Cwaile, says they will implement the decision of national government soon. "Decision at the level of the national cabinet is made, and it is only for the province to implement. The decision is that we would have five of our municipalities dissolved. Municipalities that are candidates for dissolution are Hlabisa, Mankweng, Maseru, Mmase, Mmofeng and Kgatla. The consideration is being made to include Maseru Municipality," explains Cwaile. Cwaile says they will also intervene in six other municipalities. "Other municipalities would be subject to business rescue. Those municipalities might include, Maseru."

**Usage of drugs among children 'rife' in North West**

By OBAKENG MAJE

North West MEC for Social Development, Bontlewe Moloto said that the province has long been plagued by the rising tide of drug abuse, especially among the children and youth. This startling revelation was revealed during Moloto's visit to Mosamaria C. Maseru on an outreach campaign to close the child abuse, protection week campaign and to address the plight of children that have been caused by poor parenting, alcohol abuse, and negligence during COVID-19 pandemic. "The usage of drugs is a challenge in the province and we have realised that the increase of drug abuse is prompted by a high rate of unemployment. Some learners dropped out of school after their parents or guardians lost their jobs. Another challenge is that some school children are according to the scheduled timetable, so the girls have more time to experiment with wrong things. However, as the department, we have our social workers across the province working tirelessly to address this matter," Moloto said. She further urged all community members to inform them about anyone who is experiencing drug abuse. Moloto said they have a rehabilitation centre in Polchetstroom that gives assist all drug addicts and give counselling to the family of relative of the victim. "We encourage all those who are taking care of street children to notify us so that they can be rescued. Our department has not worked more than 100 million to empower and fund those who run anti-drug organisations (ENPCs) especially the youth."

She is urging to have awareness campaigns across the province to encourage the youth to register ENPCs and create job opportunities for others. She also encourage them to volunteer in various organizations to assist in curbing drug abuse, especially among the youth and children," said Moloto. Mmusisi Cwaile, the Chairperson of the Select Committee on Health and Social Services, Maseru, said: "As the country commemorates child protection week under the theme, 'Let us protect children during COVID-19', it is important to remember the impact the pandemic has had on the lives of children. "Children need to be protected at all times as they are amongst the vulnerable groups in society. This week the rights of children are placed under the spotlight to create awareness about their rights. Children need to be protected against any form of abuse and as a country and society we need to ensure maximum protection of safe physical, emotional and mental well-being of our children."

Cwaile further said the recent reports in the public domain of children committing suicide is an indication that more needs to be done for children in ensuring their safety at home and schools. South African Community Epidemiology Network on Drug Use (SACENEDU) shows that an alarming 21-26% of patients treated for substance abuse in 2016-7 were under the age of 20 years old – and these are merely the figures of people who have undergone treatment, not taking into account the many who never make it to this point. According to the reports, South Africans are among the top 10 countries and alcohol abusers in the world. SACENEDU report said that the average age of experimentation in South Africa is 12 years old.

taungdailynews@gmail.com

**GREATER TAUNG LOCAL MUNICIPALITY**

## PUBLIC NOTICE

### APPROVAL OF THE 2021/22 SERVICE DELIVERY AND BUDGET IMPLEMENTATION PLAN (SDBIP) AND PERFORMANCE AGREEMENTS FOR SENIOR MANAGERS

In terms of Section 53(1) (c) (ii) (iii) and subsection 3 (b) and section 75(1) (d) of Local Government Municipal Finance Management Act (MFMA) No 56 of 2003 read with section 21A (1) of Local Government Municipal Systems Act, No 32 of 2000, the Mayor of a municipality must take all reasonable steps to ensure that the Municipality's Service Delivery and Budget Implementation Plan (SDBIP), is approved by the Mayor within 28 days after the approval of the budget and that Performance Agreements for the Municipal Manager and Senior Managers are concluded and made public no later than 14 days after approval of the SDBIP.

Greater Taung Local Municipality hereby notifies the public that the Mayor, Cllr D.G. Tshing has approved the SDBIP for 2021/22 financial year. The copies of the approved 2021/22 SDBIP and Performance Agreements are available for public inspection in the Municipality website: [www.gtlim.gov.za](http://www.gtlim.gov.za) or visit municipal offices (Admin Block) in Taung.

For more information, please contact: PMS OFFICE during office hours from 08H00 to 16H00 Monday to Friday or email: [malokgale@gtlim.gov.za](mailto:malokgale@gtlim.gov.za)  
Contact Person: Tshepo Malokgale Tel: 053 994 9450

**Duly Signed**  
MR KATLEDO GARONAKOSI  
MUNICIPAL MANAGER

**Garona ka Rona - Kgato-ka-Kgato**

## NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT AND PUBLIC PARTICIPATION PROCESS

**Notice:**  
Notice is hereby given in terms of Regulation 50 of the Minerals and Petroleum Resource Development Act (MPRDA, Act 28 of 2002) and Regulation 41(c)(1) of the EIA Regulations, 2014 of the intention of Gilmoie Mining (Pty) Ltd to apply for a mining right to mine Limestone, Shale, Clay, Dolomite, and Quartzite on the farms Taung 894 HN, Kang 796 HN, Kgantsang 707 HN, Letsilababing 704 HN, Claddefontein 706 HN, Uitenh 700 HN and others within Taung Local Municipality in North-West Province. Department of Mineral Resources and Energy (DMRE) Mining Right Reference: MP 30/5/1/2/10180 MR

**Project Description:**  
The life of mine will be approximately 30 years, and will include the following mining equipment and infrastructure: opencast pits; crushing and screening/processing plant; excavators, ADT trucks, stockpiles; access and haul roads; workshop areas; administration buildings. The resultant ore will be transported to the local users/industries and markets within the Municipal area, Province and Nationally.

Gudani Consulting has been appointed as the Environmental Assessment Practitioner (EAP) to undertake the public participation processes as part of the environmental impact assessment process for the proposed mining right and water use applications. Comments on the proposed project can be submitted in writing to Gudani Consulting via email, fax or post. In this regard please contact: Setenane Nkopane at:  
P.O. Box 714,  
Famapark,  
Polekwane,  
0787

**gudani consulting**  
ENVIRONMENTAL & SOCIAL SCIENTISTS

Tel: 015 291 3620  
Cell: 082 828 3412  
Fax: 086 235 9820  
Email: [setenane@gudaniconsulting.co.za](mailto:setenane@gudaniconsulting.co.za)  
Website: [www.gudaniconsulting.co.za](http://www.gudaniconsulting.co.za)

In order to ensure that you are identified as an interested and/or affected party (I &AP), only in terms of the Environmental Impact Assessment, Water Use and Management Programme processes, or if you have comments or concerns towards the proposed mining project, please submit your name, contact information and comments to the details given above on or before 31<sup>st</sup> August 2021.

In addition, pamphlet notices and background information documents (BID) were distributed for various stakeholders and I&APs around the proposed mining area. Distribution was done on the 17th August 2020.

The purpose of a BID was to provide stakeholders and I&APs with introductory information on the proposed mining development, the environmental impact assessment and management plan (EIA/EMP) being compiled and the stakeholder engagement process. The BID also provided stakeholders who are interested in the proposed mining development with the opportunity to register as stakeholders by way of requesting and completing the registration sheet distributed with the BID. Information on the registration sheet has been used to register stakeholders on a database to receive all project-related information and invitations to any meetings (if required). The registration sheet included a section for comments and issues, which allows stakeholders an opportunity to provide the consultants with written comments and feedback.

Pamphlets, consultation letters and BIDs were distributed at the following sites notifying/informing interested and affected parties about the EIA/EMP process.

- Settlement Areas( Mokgareng and Vaaltyn) and;
- BIDs were also handed over to residents and commercial entities;
- Ward Councillors and Committees.

### 3.4 Contents of the Advertisements and Site Notices

Advertisements and notices indicated the public participation (PP) process being undertaken, the proposed mining development, explanation of the EIA/EMP process, where further information on the project could be obtained and the manner in which representations in respect of the project can be made:

See the following sub-appendices of the Public Participation Report (Appendix 4 in this Report) for the contents of adverts and site notices:

- a) Sub-Appendix 1 - Site Notices
- b) Sub-Appendix 2 - Newspaper Adverts
- c) Sub-Appendix 3- Background Information Document (BID)

### 3.5 Placement of Advertisement and Site Notices

To inform the surrounding public, I&APs, communities and immediately adjacent landowners to the proposed project site about the EIA/EMP process, site notices were placed at various places and locations which are visible and accessible within project site and business premises on the 30<sup>th</sup> August 2020. Site notices were placed at the following points/sites:

Table 10: Site Notice Placements

	Town	Strategic Places
A3 Posters placed within the mining area	Taung Area (30/08/2020)	<ul style="list-style-type: none"> <li>Greater Taung Local Municipality</li> <li>Shoprite Taung</li> <li>Boxer- Taung Mall</li> <li>Boxer- Taung Forum</li> <li>Vaaltyn Shop 1</li> <li>Vaaltyn Shop 2</li> <li>Main Road Mokgareng Shop</li> <li>Main Road Mokgareng Shop 2</li> </ul>

Figure 6: Site Notices Placed at Various Sites Around the Project Area



### 3.6 Consultation Meeting

Due to Covid-19 Regulations and Restrictions, consultation concerning the Gilmoie Mining Project with the respective community committees, ward councillor, municipality, farmers, members of the public/community and I&APs were undertaken through a series of limited meetings, distribution of BIDs and site notices. The comments received from I&APs thus far have been included in this Report (Appendix 7).

Consultation with the ward committee and ward councillor on the 15<sup>th</sup> July 2020 at 12h00 at Mokgareng Village and 13h30 at Vaaltyn Village.

The concept of open meetings is normally adopted to allow more interaction between project proponent and members of the public and entail one to one discussions and small group discussions, pictures and map illustrations about the proposed project and the EIA/EMP process in pursuit of full comprehension by I&APs about the proposed project. The meeting minutes and comments from the councillor meetings are attached in Appendix 4 as an appendix to the Public Participation Report.

### 3.7 Summary of Issues Raised by Interested and Affected Parties

(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 11- Sheet Used to Record Issues Raised by I&APS

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those must be consulted were in fact consulted	Date Comments Received	Commentator and Issues Raised	EAPs response to the applicant
<b>AFFECTED PARTIES</b>			
<b>Landowner/s</b>			
<b>Lawful occupier/s of the land</b>			
<b>Landowner or lawful occupiers on adjacent properties</b>			
<b>Municipality Councillor</b>			
<b>Municipality</b>			
<b>Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, Transnet, SANRAL</b>			

Communities				
Dept. Land Affairs				
Traditional Leaders				
Dept. Environmental Affairs				
Other Competent Authorities affected				
OTHER AFFECTED PARTIES				
INTERESTED PARTIES				

### 3.8 Authority Participation

Authorities consultation was undertaken during August 2021 as part of the consultation process with interested and affected parties. The following authorities were consulted:

- a)North West Department of Mineral Resources and Energy;
- b)Department of Water and Sanitation(DWS);
- c)Department of Agriculture - North West
- d)North West Heritage Resources Authority (NWHRA)
- e)Greater Taung Local Municipality
- f)Department of Public Works Roads and Transport
- g)Dr Ruth Segomotsi Mompoti District Municipality

The site inspection will be undertaken with the North West Department of Mineral Resources and Energy at a date to be determined by the Department.

### 3.9 Document Review

The Report (this report) was made available at public places for review prior to finalisation. Stakeholders on the database were notified of the availability of the reports via any of the following methods: telephone, email, fax and post. The reports were also be made available at the DMRE, Greater Taung Local Municipality and other relevant authorities. The document review period for the Report is for a period of 30 days.



### 3.10 Continuous Communication

Throughout the process the consultant has communicated with registered stakeholders by means of telephone conversations, email correspondences, faxes, and registered mail. All comments received through the process were documented in the Issues Register. This method of communication will continue throughout the process until a decision is reached by relevant authorities

## SECTION 4 - DESCRIPTION OF THE BASELINE ENVIRONMENT

### 4.1 Description of the Environment on the Site and Surrounding Area

#### 4.1.1 Topography and Soils

The project area is characterised by a uniform terrain and the topography range is 920 mamsl. The North West Province is indicated to have one of the most uniform terrains of all the provinces within South Africa. The topography of the eastern region is more variable than that of the southern and western regions.

<b>Features requiring protection, remediation or management</b>	There are no topographical features requiring protection. The undulating slope of the site contributes to drainage.
<b>Closure Objectives</b>	<ul style="list-style-type: none"> <li>Reshape the mined out landscape to a gently undulating landscape that supports pre mining land capability or as close to that as possible.</li> <li>Ensure the site is free draining with no unnatural ponding.</li> <li>The waste dumps will be sloped to conform to the surrounding topography. Safety signs placed around the site.</li> <li>Demolition and removal of all when mining ceases. Any structure not demolished in terms of section 44 of MPRDA, will be done in consultation and approval of the DMR Regional Manager.</li> <li>Topsoil stockpiles removed and used in various rehabilitation purposes.</li> </ul>

<b>Features requiring protection, remediation or management</b>	Soils with agricultural potential should be managed and stockpiled separately.
<b>Closure Objectives</b>	<ul style="list-style-type: none"> <li>Ensure restoration of pre mining soil nutrient levels or better.</li> <li>Minimise the loss of soil resources</li> <li>Achieve land capability post mining which is not significantly different from that which existed pre-mining.</li> <li>Achieve a sustainable vegetation cover, where the rehabilitated land is not to be used for agricultural purposes.</li> <li>Allow a sustainable post closure land use.</li> </ul>

#### 4.1.2 Climate

The site experiences a typical Savannah climate with late summer rains and cold, dry winters. Savannah systems do not typically experience frost. However, the Ghaap Plateau shows the longest period of the year (> 120 days) in South African savannas when frosts can occur, a feature that certainly makes the climate here rather distinct from other places where savannah occurs. Mean annual precipitation is about 418 mm, with peaks of rainfall in summer and autumn. Winters are very dry and cold. Annual rainfall is typically variable (usually between about 250 and 500 mm per annum) but tends to have a few years of below average rainfall followed by a single year of above average rainfall. For example, Taung experienced devastating floods in 2006 when about 1380 mm of rain fell between January and June.

<b>Features requiring protection, remediation or management</b>	No aspects of climate can be managed. This section is included because it provides baseline data that affects other aspects such as air quality and water.
<b>Closure Objectives</b>	Management of greenhouse gas emissions and prevention of climate change

#### 4.1.3 Geology and Geography

The North West Province is underlain by some of the more economically valuable geological formations in the world, including the Witwatersrand Supergroup (gold ore resources) and Bushveld Complex (platinum group of minerals). The ancient sediments of the Kraaipan and Witwatersrand Supergroup contain significant micro-fossil remains that should be recorded when electron microscope work is done on these units. The Transvaal Supergroup contains very well defined Stromatolite structures associated with ancient life forms. The fossils are of significant importance to the understanding of the development of life and it is essential that good examples of the structures be recorded and, if possible, be preserved as part of the palaeontological heritage of South Africa. The Olifantshoek Supergroup contains important continental “red beds” with evidence of the development of an early oxygen-rich atmosphere.

<b>Features requiring protection, remediation or management</b>	Any potential acid generating nature of the rock at Gilmoie Mining must be managed. The laboratory analysis of both the waste dumps indicates that both entities are non-acid generating.
<b>Closure Objectives</b>	The following objectives will guide closure planning: <ul style="list-style-type: none"> <li>• Maintain the area in a condition where the health and safety of land users is not significantly compromised.</li> <li>• Achieve physical stability of mined out areas.</li> <li>• Achieve chemical stability of residues and overburden.</li> </ul>

#### 4.1.4 Surface Water

##### 4.1.4.1 Quaternary Catchments

The proposed mining area falls within the Middle Vaal Water Management Area (WMA). The Middle Vaal is part of the Vaal River System. The Vaal River forms the main tributary to the Orange River and originates on the plateau west of the Drakensberg escarpment and drains much of the central highveld of South Africa. Within South Africa, the Orange/Vaal River Basin includes 5 of the 19 Water Management Areas (WMA). These are the Upper Vaal, Middle Vaal, Lower Vaal, Upper Orange and Lower Orange WMAs. The Middle Vaal WMA lies between the Upper and Lower Vaal WMA's, with the Crocodile West and Marico WMA to the north and the Upper Orange WMA to the south of the Middle Vaal WMA. Major rivers in the Middle Vaal Water Management Area include the Schoonspruit, Rhenoster, Vals, Vet and Vaal rivers.

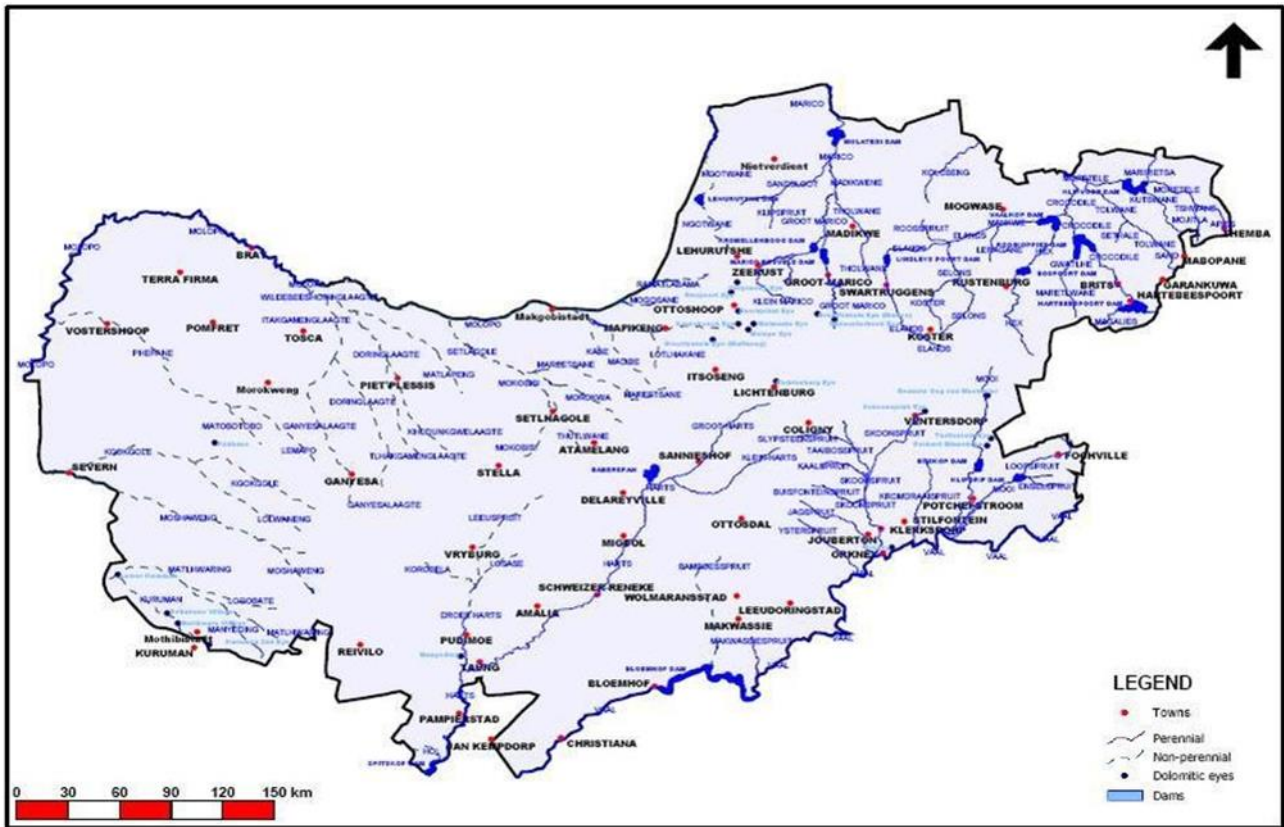


Figure 7: Secondary, tertiary and quaternary catchments in the North-West Province (De Villiers and Mangold, 2002).

#### 4.1.4.2 River Resource Classification

The ecological status (EcoStatus) of a river refers to its overall condition or health, i.e. the totality of the features and characteristics of the river and its riparian areas, which manifests in its ability to support a natural array of species. This ability relates directly to the capacity of the system to provide a variety of goods and services. The Minister of Water and Sanitation is required to establish a classification system, and to determine the class and resource quality objectives for all or part of the resources considered to be significant. Following a desktop assessment, it can be deduced that the Present Ecological Status for both the rivers have deteriorated from the 1999 assessment to the 2018 assessment from Class C to Class D. The Ecological Importance and Sensitivity Class (EI and ES) of the rivers in the applicable reaches are High and Moderate respectively.

#### 4.1.4.3 Aquatic ecosystem types

Aquatic ecosystems can be classified into two types namely:

- Lentic Ecosystems, and
- Lotic Ecosystems.

#### 4.1.4.3.1. Lentic Ecosystems

Lentic ecosystems refer to standing or basin ecosystems and include lakes, impoundments and wetlands.

##### Lakes

Generally, lakes are formed in basins created by geological activities e.g. warping and faulting of the earth's crust or as a result of glacial activities. There are no lakes at the Gilmoie Mining site.

##### Impoundments

Impoundments, or dams are manmade infrastructures and can be onstem (i.e. the watercourse itself is dammed) or offstem (i.e. the dam is located a distance from the watercourse and water is pumped from the watercourse / underground reservoir to the dam). With regards to the greater catchment, there are no onstem dams at the proposed mining area.

##### Wetlands

A wetland as defined by the NWA means “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil”. As described by (DWAF, 2005) the word “wetland” refers to ecosystems of which the primary driving force is water. Its prolonged presence in wetlands is a fundamental determinant of soil characteristics and plant and animal species composition. Any part of the landscape where water accumulates for long enough and often enough to influence the plants, animals and soils occurring in that area, is thus a wetland. The objective of the delineation procedure is to identify the outer edge of the temporary zone. This outer edge marks the boundary between the wetland and adjacent terrestrial areas.

Wetlands must have one or more of the following indicators:

- Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation;
- The presence, at least occasionally, of water loving plants (hydrophytes);
- A high-water table that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil; and
- Terrain Unit indicator to identify the locality of the wetland within the landscape.

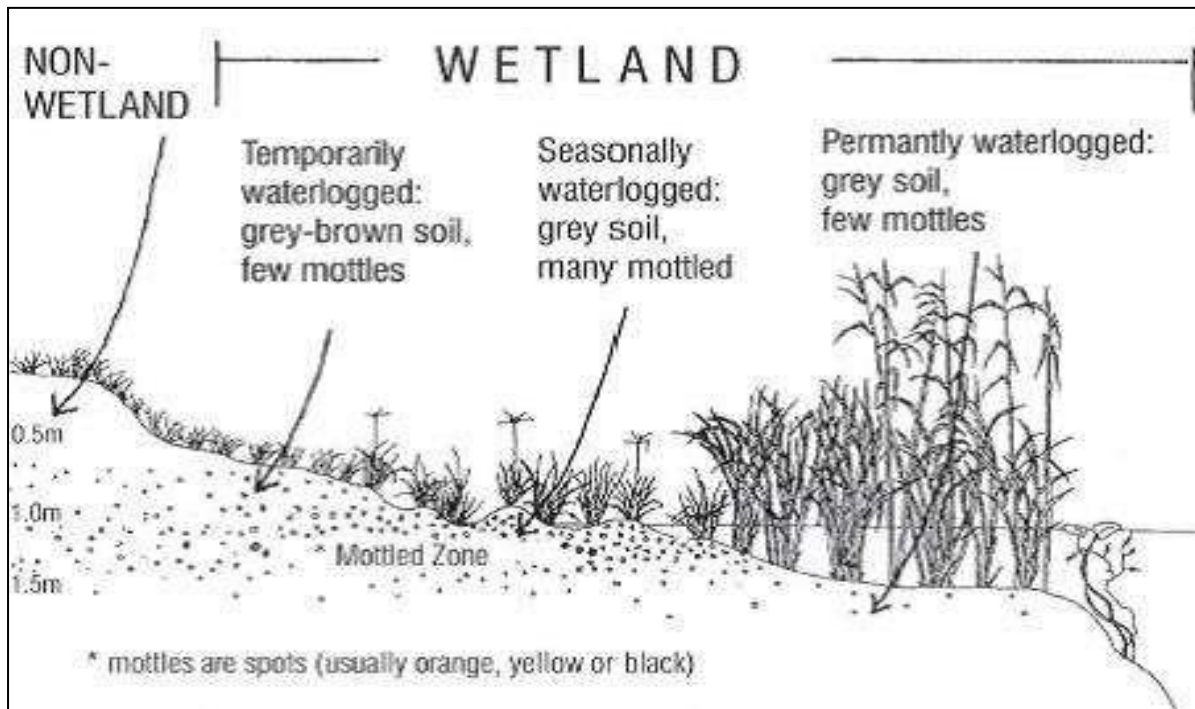


Figure 8: Cross section through a wetland (DWAF, 2005)

From the NFEPA database no natural wetlands were identified at the Gilmoie Mining right area. The 2018 Wetlands database did not show any wetlands within the boundaries or the 500 m buffer zone (CSIR, 2018).

#### 4.1.4.3.2. Lotic ecosystems

Lotic systems include rivers and the most outstanding feature of such habitats are flowing water which moulds the characteristics of the water bed and influences the distribution of the organisms therein.

A water course is defined by the NWA as:

- River or spring;
- A Natural channel in which water flows regularly, or intermittently;
- A Wetland, lake or dam into which, or from which water flows (refer to Section 5.3.1.1); and
- Any collection of water that the Minister may, by notice in the Gazette, declare to be a water course, and a reference to a watercourse includes where relevant, its bed and banks.

For the purpose of this assessment, the applicable river / watercourse reaches was classified according to the guidelines by DHSWS in "*A practical field procedure for identification and delineation of wetlands and riparian areas*". Using this classification, three sections along the length of a watercourse are defined based on their position relative to the zone of saturation in the riparian area:

- Section “A” is defined as being above the zone of saturation and it therefore does not carry baseflow. They are mostly too steep to be associated with alluvial deposits and are not flooded with sufficient frequency to support riparian habitat or wetlands. This type does however carry storm runoff during fairly extreme rainfall events, but the flow is of short duration, in the absence of baseflow. The “A” watercourse sections are the least sensitive watercourses in terms of impacts on water yield from the catchment.
- Section B reaches are in the zone of the fluctuating water table, baseflow is intermittent and dependant on the current height of the water table and as the channel bed is in contact with or in close proximity to the water table residual pools are often observed when flow ceases. The top end of the B Section is marked by the most headward extent of base flow in the channel during wet periods, when the water table is high, and the bottom end of the B Section is marked by the most downstream extent of zero flow during dry periods (when the water table is low). With regards to slope, the channel bed is flat enough to allow for the deposition of material and initial signs of flood plain development may be observed.
- Section C streams are perennial streams and thus always have contact with the zone of saturation (except during extreme drought conditions). These sections are very flat and a flood plain is usually present.

No watercourses traverse the Gilmoie Mining proposed mining right application area.

#### 4.1.4.4 Drainage Density

The drainage density for the mining right area inclusive of the exclusion area was calculated as 0.996 km/km<sup>2</sup> and the total length of the drainage lines across the study area is 14.562 km.

#### 4.1.4.5 Flood Lines

No flood lines were determined or available for inclusion into this report.

#### 4.1.4.6 Surface Water Uses

The surface water uses in the study area comprises of the Ecological Reserve, agricultural activities (informal irrigation, livestock watering), informal domestic use (washing of clothes and dishes), recreational use (swimming) and potable water supply to communities as per the applicable schemes.

#### 4.1.4.7 Precipitation and Evaporation

Rainfall is strongly seasonal and occurs mainly during the summer months (i.e. October to March). The North West Province has an above average rainfall of 300 to 700 mm annually. The peak rainfall months are January and February. The mean annual precipitation varies from less than 450mm on the low lying plains ranges between 1 800mm in the extreme western mountainous region to 2 400mm in the northern and eastern areas. The highest A-pan evaporation occurs in the period October to January and the lowest is in June.

Factors such as soil type, land use and topography can affect runoff. Where the volumes of runoff are high, soil erosion can result and flooding can occur. Runoff can influence the rate of flow in the river as water comes gushing from land. It must however be noted that increased runoff does not necessarily translate to more water as some water may infiltrate into the ground, evaporate in areas where there is high evaporation rate or discharge into sea. Increased run-off could damage areas with shallow water tables.

#### 4.1.4.8 Water Quality

The objective with regard to water quality is to have the surface water qualities remain largely unaffected by the activities on site. Surface water quality should meet as a minimum drinking water standards or the DWA Water Quality Threshold (WQT) guideline until catchment-specific water quality objectives are developed. Water quality objectives will be reached by monitoring monthly water quality data for surface water with associated interventions as and when required. Water quality monitoring must be undertaken periodically from various points within Gilmoie Mining site.

Water quality monitoring will be undertaken periodically from various points within and around Gilmoie Mining site to ensure that water quality remains neutral. The water should always be of good quality based on the salinity constituents. The main concerns are the elevated nutrients and ammonia downstream of urban areas, as well as associated bacteriological contamination that can be expected( Department of Water Affairs, 2013).

#### 4.1.4.9 Wetlands

Natural wetlands were identified at the Gilmoie Mining mining right area and one natural wetland within 500 m from the application boundary. However, the 2018 wetlands database did not show any wetlands within the boundaries or the 500 m buffer zone.

#### Present Ecological Status

Wetland functionality is defined as a measure of the deviation of wetland structure and function from its natural reference condition. In the current assessment the hydrological, geomorphological and vegetation integrity was assessed for the riparian zones in the vicinity of Gilmoie Mining operations in order to provide a Present Ecological Status (PES) score The health categories used to describe the integrity of wetlands/riparian zones are contained in Table 12.



**Table 12: Health Categories used for Describing Wetlands (WET-Health)**

Description	Class Boundary	Health Status
Unmodified natural	>4	A
Largely natural with few modifications. A slight change in ecosystem processes is discernable and a small loss of natural habitats and biota may have taken place	>3 and ≤4	B
Moderately modified. A moderate change in ecosystem and loss of natural habitats has taken place but the natural habitat remains predominantly intact	>2 and ≤3	C
Largely modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred	2	D
The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.	>0 and <2	E
Modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota	0	F

The present Ecological status (PES) method (DWAF, 1995) was used to establish the integrity of the riparian zones in the vicinity of Gilmoie Mining operations. This method is based on the modified Habitat Integrity Approach developed by Kleynhans (DWAF, 2005). Anthropogenic modification of the criteria and its attributes can have an impact on the ecological integrity of the wetland/riparian zone as contained in Table 13.

**Table 13: Habitat Integrity Assessment Criteria for Wetlands**

Criteria and Attributes	Relevance
<b>Hydrological</b>	
Flow modification	Consequence of abstraction, regulation by impoundments or increased runoff from human settlements or agricultural land. Changes in flow regime, volumes, velocity which affect inundation of wetland habitats resulting in floristic changes or incorrect cues to biota. Abstraction of groundwater flows to or from a wetland.
Permanent Inundation	Consequence of impoundment resulting in destruction of natural wetland habitat and cues for wetland biota.
<b>Water Quality</b>	
Water quality modification	From point or diffuse sources. Measured directly by lab analysis or assessed indirectly from upstream agricultural activities, human settlements and industrial activities.
Sediment load modification	Consequence of reduction due to entrapment by impoundments or increase due to land use practices such as overgrazing. Cause of unnatural rates of erosion, accretion or infilling of wetlands and change in habitats.
<b>Hydraulic/Geomorphic</b>	

Canalization	Results in desiccation or changes to inundation patterns of wetland and thus changes in habitat. River diversions or drainage.				
Topographic alteration	Consequence of infilling, ploughing, dykes, trampling, bridges, roads, railway lines and other substrate disruptive activities which reduce or change wetland habitat.				
<b>Biota</b>					
Terrestrial encroachment	Consequence of desiccation of wetland and encroachment of terrestrial plant species due to changes in hydrology or geomorphology. Change from wetland to terrestrial habitat and loss of wetland function.				
Indigenous vegetation removal	Direct destruction of habitat through farming activities, grazing or firewood collection affecting wildlife habitat and flow attenuation functions, organic matter input and increase in potential for erosion.				
Invasive plant encroachment	Affects habitat characteristics through changes in community structure and water quality (oxygen reduction and shading)				
Over utilization of biota	Overgrazing and over fishing				
<b>Attributes above are rated and scored as one of the following:</b>					
Natural/unmodified	5	Largely natural	4	Moderately modified	3
Largely modified	2	Seriously modified	1	Critical modified	0

#### 4.1.4.10 Aquifer Recharge and Discharge

There are fractured and weathered aquifers in the mining area which are thought to be fractured and storage is estimated to be about 0.001. Recharge is at 14mm.

<b>Features requiring protection, remediation or management</b>	It is unlikely that the waste dumps will generate any acid which will result in poor quality water. Any potential pollution source will have to be managed to ensure there is no pollution to sensitive environments or impact on adjacent groundwater users.
<b>Closure Objectives</b>	<p>Conserve and re-use water resources in the mining operation.</p> <p>To contain any oil, fuel or chemical pollution and the spread of such pollution into the soil and underground and surface water structures.</p> <p>Water quality management and pollution prevention.</p> <p>Compliance with water resource use legal requirements</p>

#### 4.1.4.11 Ambient Air Quality

The ambient air quality is within allowable standard. There are a number of possible air pollution risks and sources in the vicinity of the proposed mining area and in surrounding farm homesteads. They include:

- Gilmoie Mining (SiO<sub>x</sub> dust and CO<sub>2</sub>);
- Settlements around Gilmoie Mining (SO<sub>x</sub>, solid particulates, NO<sub>x</sub>);
- Informal Landfill (odours, carbon monoxide, methane, particulates);
- Industrial Activities (Filling station);
- Ready-mix Materials;

Source of air pollution from Gilmoie Mining will include point sources with periodic emissions of dust into the atmosphere, and area sources (mineral reclaiming area, unpaved haul roads, and handling areas).

#### 4.1.4.12 Fugitive Dust Sources

These sources are termed fugitive because they are not discharged to the atmosphere in a confined flow stream. Sources of fugitive dust in the Clay, Shale, Limestone, Gypsum and Quartz mining area will include paved and unpaved roads, raw materials handling areas (dimension stone and aggregate) and wind erosion of sparsely vegetated surfaces.

#### 4.1.4.13 Unpaved and Paved Roads

Emissions from unpaved roads may constitute a significance source of emissions to ambient air. When a vehicle travels on an unpaved road the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong turbulent air shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed. Dust emissions from unpaved roads vary in relation to the vehicle traffic and the silt loading on the roads. Unpaved roads within Gilmoie Mining will mainly be mine haul roads for raw materials.

Emission from paved roads will be significantly less than those originating from unpaved roads, however they will contribute to the particulate load of the atmosphere. Particulate emissions occur whenever vehicles travel over a paved surface. The fugitive dust emissions will be due to the re-suspension of loose material on the road surface. Most access and haul roads will be paved within Gilmoie Mining footprint.

**4.1.4.14 Wind Erosion of Open Areas**

Windblown dust originates from natural and anthropogenic sources. For wind erosion to occur, the wind speed needs to exceed a certain threshold, called the threshold velocity. This relates to gravity and the inter-particle cohesion that resists removal. Surface properties such as soil texture, soil moisture and vegetation cover influence the removal potential. Conversely, the friction velocity or wind shear at the surface is related to atmospheric flow conditions and surface aerodynamic properties. Thus, for particles to become airborne, its erosion potential has to be restored; that is, the wind shear at the surface must exceed the gravitational and cohesive forces acting upon them, called the threshold friction velocity. Every time a surface is disturbed, its erosion potential is restored (US EPA, 2004). Erodible surfaces may occur as a result of earth-moving machinery and other vehicles with Gilmoie Mining site.

**4.1.4.15 Vehicle Tailpipe Emissions**

Emissions resulting from motor vehicles can be grouped into primary and secondary pollutants. While primary pollutants are emitted directly into the atmosphere, secondary pollutants form in the atmosphere as a result of chemical reactions. Significant primary pollutants emitted by combustion engines include CO<sub>2</sub>, carbon (C), SO<sub>2</sub>, NO<sub>x</sub> (mainly NO), PM and lead. Secondary pollutants include NO<sub>2</sub>, photochemical oxidants such as ozone, sulphur acid, sulphates, nitric acid, and nitrate aerosols (particulate matter). Vehicle type (i.e. model-year, fuel delivery system), fuel (i.e. oxygen content), operating (i.e. vehicle speed, load) and environmental parameters (i.e. altitude, humidity) influence vehicle exhaust emission rates.

Both small and heavy private and industrial vehicles travelling within Gilmoie Mining, along tar road, as well as unpaved public and private roads, are notable sources of vehicle tailpipe emissions in the vicinity of Gilmoie Mining area and surrounding community.

**4.1.4.16 Domestic Fuel Combustion**

Domestic households are known to have the potential to be one the most significant sources that contribute to poor air quality within residential areas. Individual households are low volume emitters, but their cumulative impact is significant. It is likely that households within the local communities or settlements utilize coal and/or wood for space heating (mainly during winter) purposes. Pollutants arising from the combustion of wood/coal include respirable particulates, CO and SO<sub>2</sub> with trace amounts of polycyclic aromatic hydrocarbons (PAHs), in particular benzo(a)pyrene and formaldehyde. Particulate emissions from wood burning have been found to contain about 50% elemental carbon and about 50% condensed hydrocarbons.

<p><b>Features requiring protection, remediation or management</b></p>	<p>Fugitive dust and PM<sub>10</sub> must be managed. Sensitive land users which will require appropriate protection are all landowners and land users, in particular: <b>homesteads, farm holdings and business premises</b></p>
<p><b>Closure Objectives</b></p>	<p>Protect and maintain the health and welfare of employees against dust and other are pollutants.</p> <p>Minimize smoke and dust pollution on the mine/ Gilmoie Mining and the surrounding settlement areas.</p> <p>Keep records of pollution levels to inform adequate impact management and minimization measures.</p>

#### 4.1.5 Noise

Noise levels from 75% of the various sources on site at Gilmoie Mining will not exceed 85 dBA. The noise levels however will have an impact beyond the boundaries of the site. As it stands Gilmoie Mining activities have not yet started.

Ambient (background) noise levels were assessed at appropriate times in accordance with the South Africa National Standard SANS 10103:2008 "*The assessment and rating of environmental noise with respect to land use, health, annoyance and to speech communication*". The standard specifies the acceptable techniques for sound measurements including:

- type of equipment (Class 1);
- minimum duration of assessment;
- microphone positions and height above ground level;
- calibration procedures and instrument checks; and
- supplementary weather assessments and observations.

##### 4.1.5.1 Baseline Noise Sources

There are various significant calculable noise sources in respect to the existing baseline, these are:

- The access gravel road;
- Trucks and other operation vehicles;
- Crushing/ processing plant;
- Raw material handling areas.

The natural ambient noise levels in the area are largely determined by natural sounds, i.e. birds, insects and the wind in the foliage of plants. The estimated noise levels are comparative (80 - 100 dBA during the day and 50 - 70 dBA during the night) to those listed in the revised SABS 0103 standard, where the typical ambient noise level for an urban area is given as 80 - 100 dBA and 40 - 50 dBA during the day and night respectively. The mining activities will raise noise levels significantly. Movement of tipper and haul trucks, excavators and other mining equipment/machinery creates some noise - when operations are active.

##### 4.1.5.2 Delivery/Access Roads

The main source of traffic noise during the Gilmoie Mining will be from traffic around the operations due to material delivery as well operational crew vehicle movement. The access routes acoustical contribution to the surrounding sound environment will depend on a host of factors ranging from road traffic volumes, vehicle specifications (tyre design, light or heavy etc.), road tyre interaction specifications (including road paving design such as surface porosity, surface texture etc.), road traffic speeds and a host of other considerations. Noise levels associated with traffic inside the Gilmoie Mining boundary would have a minor impact considering other industrial/commercial sounds in the area, and will not be discussed or considered further.

<b>Features requiring protection, remediation or management</b>	Noise levels need to be managed during all phase of the life of mine/Gilmoe Mining. Sensitive land users which will require appropriate protection and management are all landowners and land users, in particular: <b>homesteads and businesses</b>
<b>Closure Objectives</b>	Record and maintain the records on the health of in-coming and out-going employees.  Noise will cease on closure.

#### 4.1.6 Flora

##### 4.1.6.1 General Description

The development site lies within the Savanna biome which is the largest biome in Southern Africa. A biome is a broad ecological unit that represents a major life zone extending over a large natural area (Rutherford & Westfall 1994). It is the largest land community unit recognised at a continental or sub-continental level and mapable at a scale no larger than about 1:10 million (Rutherford & Westfall 1994).

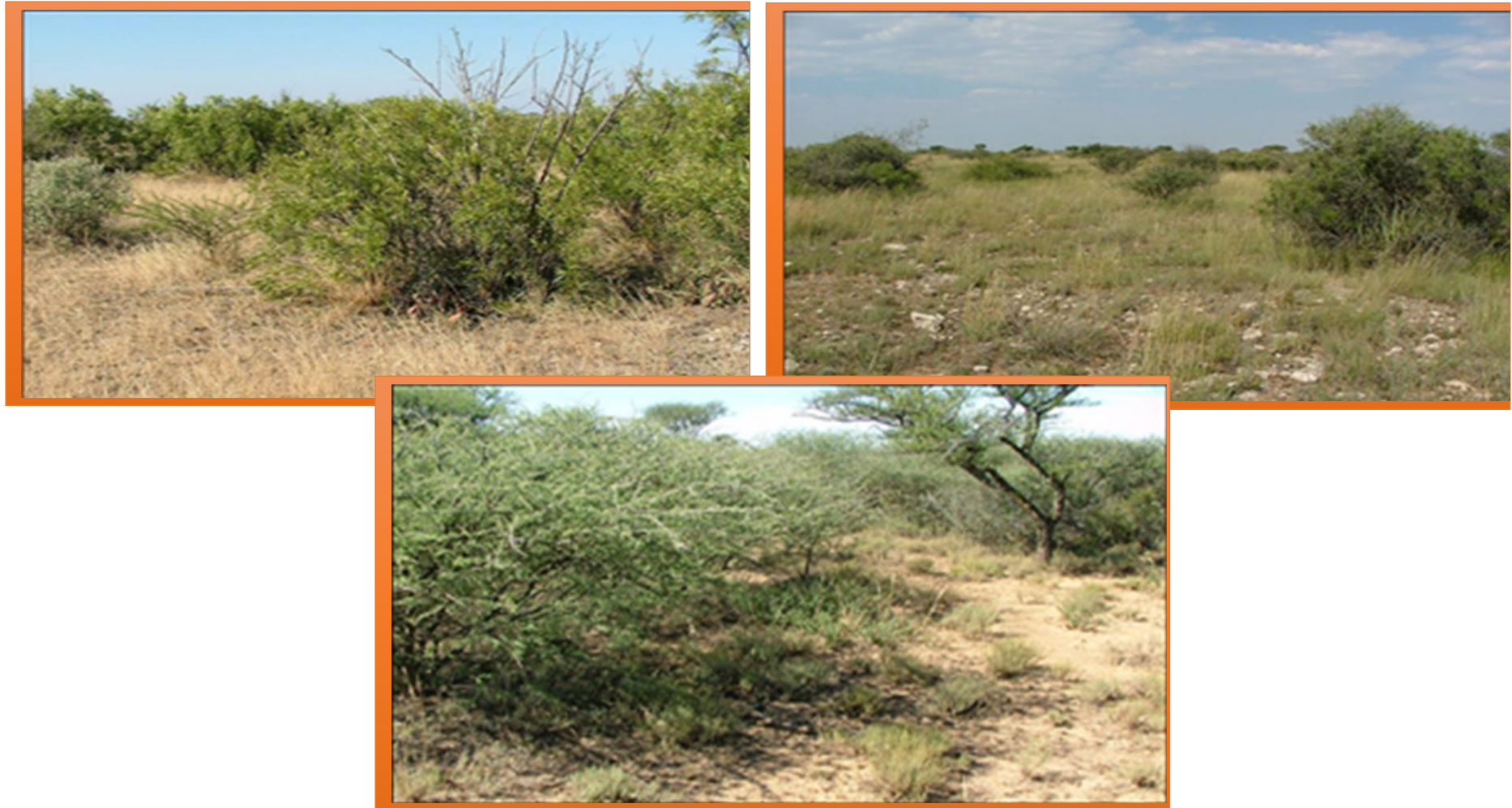
##### 4.1.6.2 Floristic Diversity

Most regions in the North West Province fall within the savannah biome which is the largest biome in Southern Africa. The vegetation of the arid and semi-arid western region largely comprises Kalahari thornveld and shrub bushveld, while the central region is dominated by dry Cymbopogon-Themeda veld and the eastern region is characterized by a number of mixed bushveld types (Davoren, 2009). North West Province has a wide array of plant species, ecosystem, and habitats due to the diverse nature of the Province's landscapes and variations in climate (Kruger and Nxumalo, 2017).

##### 4.1.6.3 Floristic Diversity

The most obvious faunal activity at the proposed mining site is the local inhabitant's livestock. Numerous bird species and cattle were noted on and around the proposed mining area.

Figure 9: Vegetation Around Gilmoie Mining Site



#### 4.1.7 Fauna

The most obvious faunal activity is the local inhabitant's livestock. Numerous bird species and cattle were noted on and around the proposed site. The mountain ranges provide habitat for numerous small to medium sized mammals including smaller predators and scavengers.

#### 4.1.8 Landuse Patterns

Land development is regarded as one of the most important facets which will contribute towards the growth of Taung Municipal area into a world class African city with a prosperous community. The usage and management of land in the municipal area is important to eradicate poverty, develop local economy and ensure sustainability.

The municipality owns a large number of properties, some of them are strategically located. Disposal of owned land and immovable assets is still a challenge as the municipality does not have a coherent policy. Land use around Gilmoie Mining include - farm homesteads, agricultural and grazing land. Other main land uses include CBD, townships, residential, commercial and open spaces around Taung Municipal area.

##### 4.1.8.1 Agriculture

Agriculture is the only sector apart from mining in which the North West is acknowledged to have a comparative advantage over the other provinces. The agricultural sector produces 13% of provincial GDP and provides jobs for 18% of the labour force in the province. The main crops are sunflower seeds, groundnuts, maize, wheat and cattle. The eastern part of the province has a higher rainfall so it produces vegetables, flowers and poultry. Horticulture and bio-fuels show particular promise for expansion and the North West already has several bio-fuel initiatives underway. The province is an important food basket in South Africa. Maize and sunflowers are the most important crops and the North West Province is the major producer of white maize in the country. The North West Province produced 22 % of all the commercial maize grown in South Africa, of which 78 % was white maize and 22 % yellow maize (Provincial Gazette for North West No 7443, May 2015).

##### 4.1.8.2 Mining

There are nearly 300 active mines in the North West and the sector contributes 31.3% of regional gross domestic product. A large number of families rely on the income earned on mines, with about 18% of total employment in the province coming from mining.

The Northwest Province is aligned with the Western Limb of the Bushveld Igneous Complex, a remarkably rich mineral formation. Mines in the province produce 50% of the platinum produced in the world, and 65% of South Africa's platinum group metals. Existing mining operations are mainly for chromite, gold and uranium and other small commodities. Although a great economic asset to the Local Municipality and country, the mines pose substantial threats to the successful further development of the region. The threats are, in part, related to the impacts on the local environment from dust, air pollution, water usage and pollution and waste generation.



The positive impact of mining in the project area include increased business opportunities, greater demand for goods and services, pressures for housing (ability to own houses), etc. The opportunities lie in making the boom contribute to the development of a more sustainable municipality through the appropriate placement of services and facilities and the establishment of new residential areas.

#### 4.1.8.3 Tourism

The North West Province provides attractive tourism and eco-tourism. There are over sixteen parks and nature and game reserves that boast the presence of the big five (lion, elephant, leopard, buffalo and rhino), diverse and prolific bird species population and heritage sites. The parks, game and nature reserves are characterised by hills and open plains. Pilanesberg has a 1 200 million year old extinct alkaline volcanic crater, one of only three in the world. Woodland and rich riverine forest at Borakalalo, the bird watcher's paradise at Barberspan, and the numerous hiking trails traversing the reserves present pristine and scenic sites for tourism. Cultural villages, heritage sites, casino gambling, theme parks, water sports, hiking, horse back riding and the unique vegetation of the area present unique attractions for tourism (Provincial Gazette for North West No 7443, May 2015).

<b>Features requiring protection, remediation or management</b>	Protection of grazing land, farming land and game reserve. Impacts to the land, homesteads, business premises and informal settlements associated with the properties
<b>Closure Objectives</b>	Revert back the land use to as close as possible to what existing prior to mining operations.  Rehabilitate the land and minimize visual impact during and after mining

#### 4.1.9 Heritage and Cultural Aspects

It is clear from the desktop study (Appendix 5) that the area has not been researched in much depth from an archaeological and historical point of view, with most of the work having focused around the Taung Fossil and related sites area. Very few Impact Assessment studies seems to have been done in the mining right area and study area region, with only some reports lodged in SAHRA's sahris database. It is highly likely that the following types of cultural heritage resources could be present:

Palaeo-archaeology sites

2. Stone Age Archaeological sites and scatters of open-air material
3. Possible Late Iron Age remnants although this is less likely
4. Historical farmsteads and related structures
5. Both formal and informal graveyards and graves
6. Possible rock art sites including engravings
7. Historical refuse middens

However, it is important to note that no sites of Heritage significance were identified at the mining site.

## HISTORICAL CONTEXT

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools. In South Africa the Stone Age can be divided in basically into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. A basic sequence for the South African Stone Age (Lombard et.al 2012) is as follows:

Earlier Stone Age (ESA) up to 2 million - more than 200 000 years ago

Middle Stone Age (MSA) less than 300 000 - 20 000 years ago

Later Stone Age (LSA) 40 000 years ago - 2000 years ago

It should also be noted that these dates are not a neat fit because of variability and overlapping ages between sites (Lombard et.al 2012: 125).

In terms of known Stone Age sites located in the larger geographical area, some rock engravings have been found near Taung (Bergh 1999: 5), while of course the famous Taung fossil skull site is also located near Taung (Pelser et.al. 2010: 11). Wonderwerk cave near Kuruman retain evidence of early peoples in its 6 meter midden deposit, especially in the rear portions of the cave. Towards the front rock-art from later Stone Age peoples are also preserved. Furthermore the engraving sites Wildebeestkuil, Driekopseiland and Nooitgedacht near Kimberly confirm a continued presence of Later Stone Age peoples in the general region (Miller 2016: 14). During a 2017 assessment in the Taung-Buxton area, Mlilo recorded some scatters of ESA & MSA artifacts (Mlilo 2017: 53-55).

The Taung Fossil Site is not located close to the Mining Right area (it is around 14km to the west of the area, but the location of the site in the general area should be taken into account and the possibility of similar sites in the study area should be noted as well. The Taung Skull Fossil Site was designated as a National Heritage Site in 2002. It is also inscribed on the World Heritage List (WHL) forming part of serial World Heritage Site (WHS), together with Sterkfontein, Swartkrans, Kromdraai and Environs, and Makapan Valley fossil hominid sites in South Africa, together named the Fossil Hominid-bearing Sites of South Africa (FHSSA) (EcoAfrica: 2015.1).

The Taung Skull Fossil Site at the Buxton Lime Works is best known for the 1924 discovery of the type specimen of *Australopithecus africanus*. The tufa accretions of the Buxton Lime Works are riddled with fossil sites sampling the Pliocene and Pleistocene fauna, dating back several million and hundreds of thousands of years. Most of these sites have not been excavated, and thus have potential for future research to investigate long term ecological changes in an area at the edge of the Ghaap Escarpment. The main palaeontological sites are Hrdlička Deposits, Dart Deposits, Tobias Pinnacle Deposit, Berger Cave Complex, Lucky Moon Cave, LSN Cave, Innominate Cave, Quinney Cave, Cut-Through Alley, Black Earth Cave, Peabody's Equus Site, Equus Cave, Blom Cave, Satan Cave, Alcove Cave, Oxland Large Mammal Site and Acacia Cave.

<b>Features requiring protection, remediation or management</b>	The sites of heritage or cultural resources identified and must be preserved.
<b>Closure Objectives</b>	<p>Avoid long terms impacts to archaeological and cultural heritage sties in the affected area and investigate cultural heritage and artifacts before they are destroyed.</p> <p>To protect and conserve any artefacts or finds of archaeological, cultural, historic or pre-historic significance for the present and future generations.</p> <p>Educate and sensitize staff on the importance of the archaeological, cultural, historic or pre-historic artefacts or structures and preservation thereof to the affected communities and region.</p>

#### 4.1.10 Socio-Economic Aspects

##### 4.1.10.1 Population

According to StatsSA Community survey 2016, Taung Municipality youth population has increased from 77 863 (36.61%) in 2011 to 85 749 (39.3%) in 2016. From the Pyramid below, it is evident that, in the age group 15-34 has more females (44 735) as compared to males (41 015). While in the age group 35-64 there is high percentage of females than males. Young people between the ages of 14 - 35 constitute over 40% (156 900) of the total population of the municipality.

##### 4.1.10.2 Living Conditions

Between 2011 and 2016 there has been an increase in the number of households that have income from 77% to 86%. Provision of household services has increased between 2011 and 2016. The municipality has health facilities in the form of hospitals and clinics, excluding private hospitals.

##### 4.1.10.3 Employment and Income

The unemployment rate at Taung Local Municipality stands at approximately 40.3%, with the highest percentage at 49.9% amongst the youth aged from 15 years to 19 years and declining with age. This means that the LED projects for Gilmoie Mining should focus on providing employment for the youth.

The average income for all members of community within Taung can be categorized as presented in Table 15. The percentage of people earning no income decreased from 82.34% in 2007 to 78.04% in 2011. The percentage of people earning less than R400 per month did increase tremendously (the number of persons doubled from 5764 in 2007 to 18631 in 2011) and there was a decline in those earning between R401 and R800 per month. The high statistic of low earning people may be in relation to the employment industry. Agriculture in general, employs more people, but with the lower wages. People that are earning higher incomes are professionals which are usually fewer in number.

**Table 14: Employment Status in Taung Municipal area**

	Male	Female
Employed	16206	17360
Unemployed	10919	16178
Not economically active	31701	44720
Not applicable	2247	1833

**Table 15: Population Montly income in Taung Municipal area**

Persons	2011	2016
None	185284	130,547
R1 - 400	19631	62076
R401 - 800	18131	9968
R801 - 1600	4668	24584
R1601 - 3200	4867	5010
R3201 - 6400	3216	5586
R6401 - 12800	1257	4280
R12801 - 25600	143	773
R25601 - 51200	76	56

#### 4.1.10.4 Housing

Taung Municipal area, as a growing economic hub of the region is experiencing population growth which results in the influx of people from other rural areas into the urban parts of the municipality. According to the Statistics South Africa Census 2011, the municipality comprises of 58 262 households (Stats Census 2001, 89,831) this represents an increase of 8 805. Males constitute the highest number in terms of heads of households whereas female constitute the smallest number. The above information shows a shift of gender heads of households to males from females.

This influx has necessitated an increase in the provision of housing and other basic services that promote integrated sustainable human settlement. The housing problem is not confined to the municipal and surrounding areas only. The need for housing development has reached crisis proportions while the provision of the basic commodity is manageable in other areas.

It is evident that housing is a problem throughout the municipal area. All areas are affected by an increased demand of houses and all associated services to ensure

sustainable delivery. Other factors that result in the high demand of housing include growing informal settlements, informal dwelling/backyard shacks, and illegal occupation of completed low-cost houses and blocked projects.

#### 4.1.10.5 Water Supply

The number of households with piped water inside their house have increased from 45 001 in 1996 to 126 866 in 2015 while households with piped water on communal stand has increased from 22 629 to 44 188.

**Table 16: Taung Local Municipality Sanitation Facility Provision**

Households	2011	2016
Flush Toilet (connected to sewerage system)	7222	7222
Flush septic tank (with septic tank)	311	
Chemical toilet	1305	0
Pit Latrine with ventilation (VIP)	2921	18 123
Pit latrine without ventilation	11908	0
None	29050	
<b>Total</b>	<b>63 867</b>	

Most of the people within the municipal jurisdiction area use pit latrines (22.5% in 2011) without ventilation while others have no sanitation facilities at all (54.9% in 2011). 22.2% of Households had RDP standard sanitation in 2011 with 41 108 (77.8%) households still below the RDP standard. The department of water and sanitation is in the planning process of constructing new sewer treatment works to augment the existing plant.

#### 4.1.10.6 Energy

Electricity is largely generated by ESKOM and distributed by ESKOM around the municipality. Electricity and energy is provided by means of the following sources;

- Grid electricity, which is supplied from power stations. Non-grid electricity which basically includes petrol and diesel generators; and
- Other alternative sources of energy, which amongst others includes batteries, paraffin, coal, wood, candles, gas, etc.

**Table 19: Energy Sources in Taung Municipal area**

Energy Source	Cooking	Heating	Lighting
Electricity	70,9%	60,8%	83%
Gas	2,7%	1,4%	0,1%
Paraffin	11,3%	5%	1,6%
Solar	0,1%	0,1%	0,6%
Candles	0%	0%	14,4%

Wood	14,6%	18%	0%
Coal	0,1%	0,2%	0%
Animal Dung	0,2%	0,2%	0%
Other	0,1%	0%	0%
None	0,1%	14,1%	0,2%

#### 4.1.10.7 Economic Benefits of Gilmoie Mining

Gilmoie Mining will have a capital investment of over R 1 969 225 per annum- (one million nine hundred and sixty nine thousand two hundred and twenty five rands) into the proposed mining area. A high percentage of residents around the mine/ Gilmoie Mining are unemployed. Gilmoie Mining alleviates the unemployment problem to some extent, though it does not eradicate it completely. Approximately 36 people will be employed permanently at the Gilmoie Mining.

Secondary industries are also likely to develop due the existence of Gilmoie Mining. The life of mine (LOM) for Gilmoie Mining is expected to be over 25 years, which translate to a definite 25 years and more of economic activity in the region.

#### 4.1.10.8 Access Roads

Taung Local municipality is characterised by radial road network of approximately 4 200 km covering its area of jurisdiction. It is situated at the point where national and provincial roads provide good regional accessibility. However access to the mining site is via gravel road.

#### 4.1.10.9 Visual Aspects

The mining site is situated on low ground however not visible from the secondary road. The site is however visible from neighbouring farmsteads in the area.

Features requiring protection, remediation or management	Livelihood strategies must not be affected negatively by the Gilmoie Mining operations specifically with respect to Concordia and nearby businesses.
Closure Objectives	Contribute meaningfully towards sustainable local economic development to the operations area.

## SECTION 5 - LIST OF POTENTIAL IMPACTS

### 5.1 List of the Potential Impacts, on Environmental Aspects Separately in Respect of each of the Aforesaid Main Mining Actions, Processes and Activities Listed in the NEMA EIA Regulations

This section describes the potential impacts that may emanate from the operational activities on the receiving environment due to the activities from the Gilmoie Mining operations during the Life of Mine. Linkages to the NEMA regulations, if applicable have been provided. These potential impacts were then assessed and quantified and are described in greater detail in the Impact Assessment Section 6.

#### 5.1.1 Operational Phase

OPERATIONAL PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	NEMA Regs 2014
Topography	Excavations	Trenches and foundations for any surface infrastructure.	
Soil	Soil Compaction	Machinery and vehicle usage; Stockpiling;	983 - 6
	Soil Erosion	Stockpiles; Vehicle movements;	
	Sterilization of topsoil layer	Stripping of topsoil during operations will remove this fertile layer;	
	Chemical soil pollution	Oil and fuel spills from vehicles; Waste generation; Leakage from waste storage facilities; Dirty water run-off; Vehicle movement; Road wetting (dust suppression) Irrigation of the stockpile vegetation; Emissions fall-out;	983 - 14 984 - 6
Flora	Impact on Habitat for Floral species	Operational activities; Proliferation of alien plant species; Transformation of natural habitat; Discharge and contamination from all operational facilities; Runoff and seepage from operational facilities;	984 - 6
	Impact of Floral Diversity	Increase in alien plant species; Operational activities; Ongoing edge effects from mining; Increased vehicular and pedestrian movement; Increased fire frequency and intensity; Uncontrolled fires.	984 - 6

	Impact on important species	Increase in alien plant species; Erosion and sedimentation; Operational activities;	
Fauna	Loss of faunal habitat and ecological structure	General operational activities; Increase of alien plant species Transformation of natural faunal habitat; Discharge from operational return water dam; Collision of operational vehicles with faunal species; Runoff and potential sewage discharge from the mine Fire hazards; Dewatering of wetlands;	
	Loss of faunal diversity and community integrity	On-going operations; Collision of operational vehicles with faunal species; Vehicles accessing site through sensitive faunal habitat areas; Poaching;	

OPERATIONAL PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	NEMA Regs 2014
Wetlands	Loss of wetland habitat and ecological structure	Ongoing disturbance of soils; Spillages and seepage of hazardous waste material; Discharge from the mining; Contamination from mining/Saw Cutting and Hammering infrastructure; Runoff, seepage and discharge from the waste dump and other mining infrastructure; Dumping of hazardous and non-hazardous waste into the wetland areas; Erosion and sedimentation of wetlands;	983 - 14 984 - 6
	Changes to wetland ecological and socio-cultural service Provision	Ongoing disturbance of soils with general operational activities; Spillages and seepage of hazardous waste material; Discharge and contamination from the mining/Saw Cutting and Hammering infrastructure; Runoff, seepage and discharge from the waste dump and other mining infrastructure; Dumping of hazardous and non-hazardous waste into the wetland areas; Erosion and sedimentation of wetlands/surface water resources;	



	Impacts on Wetland Hydrological Function	Ongoing disturbance of soils with general operational activities; Topsoil stockpiling adjacent to wetlands; Runoff from stockpiles; Movement of vehicles within wetlands; Stormwater channels and dams; Increased runoff volumes; Dewatering of wetlands; Loss of habitat;	
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OPERATIONAL PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	NEMA Regs 2014
Surface water	Less water reaching the surface water resources	Containment and use of precipitation; General infrastructure on mining/Saw Cutting and Hammering site;	983 - 14 984 - 6 983 - 12
	Contamination of surface Water/ deterioration of surface water quality	Storm water runoff and drainage; Return water dams; Increased erosion, dust generation and potential chemical contaminants; Vehicle wash bays and workshop; Spillages from sanitary conveniences, fuel deposits or storage facilities; Cutting and Screening; Processes, Raw material stockpiles, Beneficiation;	
		Land clearance; Stockpile areas; Waste dump; Pumping and discharging of poor quality water;	
	Alteration of drainage patterns	Permanent River diversions/drainage;	
	Deterioration in water quality	River/drainage diversions; Spilled materials such as cement, paint, fuel and oil;	
	Reduction in surface water quantity	River diversions; Saw Cutting and Hammering operation activities at tributaries;	
	Reduction in resources	Use of Potable water;	

OPERATIONAL PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	NEMA Regs 2014
Ground water	Acid Mine Drainage	Waste dumps and raw material storage areas;	983 - 14 984 - 6
	Impact on external users' boreholes	Waste dumps and raw material storage areas;	
	Impact on mine water quality		
	Impact of sources on surface	Pollution control facilities; Workshop and fuel storage; Overburden stockpiles; Raw material stockpiles;	
Air Quality	Reduction in air quality	The dust and vehicle emissions generated by the mining/Saw Cutting and Hammering activities; Atmospheric emissions.	
Noise	Day and night-time noise impact	Plant activities; Material handling;	
	Noise above ambient noise levels in the surrounding settlements and farm holdings	Cutting and screening - ODP; Loading of material (Clay, Shale, Limestone, Gypsum and Quartz); Excavator and Trucks; Trucks dumping material at stockpiles (topsoil / softs / overburden).	

OPERATIONAL PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	NEMA Regs 2014
Visuals	Alter the overall landscape character and sense of place of the region	Dimension stone Cutting and screening; Creation of discard dumps and temporary stockpiles; Ongoing mining/Cutting activities; Raw material handling.	
	Dust generated during the operational phase may cause a negative visual impact and altered visibility	Dust generation during mining and Cutting activities; Dust generation due to movement of vehicles;	
	Operational machinery and earthworks may cause a negative visual impact	Presence and movement of vehicles; Ongoing mining/Cutting activities and earthworks;	
	The mining and Gilmoie Mining facilities may impact negatively on receptors (residents	ODP - Cutting and screening; Creation of surface dumps and temporary stockpiles; Ongoing mining/Cutting; Atmospheric emissions.	

	and motorists) situated in or utilising the identified receptor sites		
	Lighting during night time may impact negatively on receptors situated in the identified receptor site	Additional lighting during night-time;	
Cultural and Heritage Aspects	Destruction of heritage or cultural aspects	Dimension Stone Cutting activities	
Social Aspects	Crime, Health and HIV	Influx of foreigners and job seekers and increase in disposable income for local people may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area;	
	Economic Opportunities, Infrastructure Development and Employment	Increase in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area;	
	Loss of current land capability	Change of land use from natural vegetation and agriculture (livestock grazing and commercial) to industrial.	

### 5.1.2 Decommissioning Phase

DECOMMISSIONING AND CLOSURE PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	
Topography	Waste Dumps, Raw material storage areas	Rehabilitation of waste dumps; Trenches and foundations for demolition of infrastructure.	
Flora	Impact on Habitat for Floral species	Ineffective rehabilitation of exposed and impacted areas; Failure to implement a comprehensive alien floral control plan; Disturbance of soils; Ongoing seepage and runoff; Ongoing risk of discharge; Contamination from decommissioning of the plant and other mining facilities; Insufficient aftercare and maintenance; Ineffective monitoring of rehabilitation;	
	Impact of Floral Diversity	Ineffective rehabilitation of exposed and impacted areas; Failure to implement a comprehensive alien floral control plan; Erosion and sedimentation; New disturbances during decommissioning and closure; Failure to monitor rehabilitation efforts and	

		implement the alien floral control plan Increased fire frequency and intensity Uncontrolled fires.	
	Impact on important species	Ineffective rehabilitation of exposed and impacted areas; Failure to implement a comprehensive alien floral control plan; Continued erosion and sedimentation;	
Fauna	Loss of faunal habitat and ecological structure	Disturbance of faunal habitat; Seepage and runoff from decommissioned mining areas; Discharge from the dirty water systems; Insufficient aftercare and maintenance; Ineffective monitoring of rehabilitation; Continued dewatering of wetlands;	
	Loss of faunal diversity and community integrity	Insufficient aftercare and maintenance; Disturbance of faunal habitat; Ineffective monitoring of rehabilitation;	

DECOMMISSIONING AND CLOSURE PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	
Wetlands	Loss of wetland habitat and ecological structure	Disturbance of soils; Ongoing seepage and runoff from mining infrastructure; Discharge from mining infrastructure; Decommissioning of the plant and mining and Cutting Infrastructure; Alien plant species proliferation; Ineffective rehabilitation; Erosion and sedimentation of wetlands;	
	Changes to wetland ecological and socio-cultural service Provision	Disturbance of soils; Ongoing seepage and runoff from mining and Cutting Infrastructure; Discharge from mining infrastructure; Decommissioning of the plant and mining Infrastructure; Decommissioning activities;	
	Impacts on Wetland Hydrological Function	Demolition activities; Movement of rehabilitation vehicles within wetlands;	

DECOMMISSIONING AND CLOSURE PHASE			
Environmental Aspects	Potential Impacts List	Actions/Activities	
Surface water	Less water reaching the surface water resources	Gilmoe Mining decommissioning; Containment and use of precipitation;	
	Contamination of surface Water/ deterioration of surface water quality	Storm water runoff and drainage; Increased erosion, dust generation and potential chemical contaminants; Vehicle wash bays and workshop; Spillages from sanitary conveniences, fuel deposits or storage facilities;	
		Stockpile areas; Pumping and discharging of poor quality water;	

	Alteration of drainage patterns	Permanent River/Drainage diversions;	
	Deterioration in water quality	River/drainage diversions Spilled materials such as cement, paint, fuel and oil;	
	Reduction in surface water quantity	Gilmoe Mining	
	Reduction in resources	Use of Potable water.	

### DECOMMISSIONING AND CLOSURE PHASE

Environmental Aspects	Potential Impacts List	Actions/Activities	
Ground water	Acid Mine Drainage	Stop mining, Gilmoe Mining and borehole pumping	
	Impact on mine water quality		
	Impact of sources on surface		
Air Quality	Reduction in air quality	The dust and vehicle emissions generated by the decommissioning activities;	

### DECOMMISSIONING AND CLOSURE PHASE

Environmental Aspects	Potential Impacts List	Actions/Activities	
Visuals	Alter the overall landscape character and sense of place of the region	Ineffective rehabilitation; Poor vegetation cover; Infrastructure remaining;	
	Dust generated during the decommissioning phase may cause a negative visual impact and altered visibility	Ineffective rehabilitation including poor vegetation cover which will contribute to dust generation;	
	Decommissioning machinery and earthworks may cause a negative visual impact		
	The mining and Saw Cutting and Hammering facilities may impact negatively on receptors (residents and motorists) situated in or utilising the identified receptor sites		
	Lighting during night time may impact negatively on receptors situated in the identified receptor site	Lighting during decommissioning and rehabilitation phase;	
Cultural and Heritage Aspects	Destruction of heritage or cultural aspects	Decommissioning and rehabilitation phase;	

Social Aspects	Crime, Health and HIV	Influx of foreigners and job seekers and increase in disposable income for local people may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area;	
	Economic Opportunities, Infrastructure Development and Employment	Decrease in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area;	
	Loss of current land capability	Change of land use from industrial back to natural vegetation and agriculture (livestock grazing).	

## 5.2 List of All Potential Cumulative Impacts

- **Topography:** The topography of a wider Gilmoie Mining area may be affected by surface infrastructure development (flattening of area and artificial “hills” as a result of soil stockpiles, raw materials, and waste dumps;
- **Land use and land capability:** as the Gilmoie Mining and mining activity continues and other developments occur in the area less space will be available for agricultural purposes and residential development;
- **Soil:** as a result of increased topsoil removal to allow for the development of infrastructure and mining/ Gilmoie Mining activities, the soil resource in the area may become less and as a result of the impact on the viability of soils due to stockpiling/waste dumps the impact will increase;
- **Fauna and Flora:** as Gilmoie Mining infrastructure increases less natural area will be available resulting in greater impoverished natural environment;
- **Surface water** - Deterioration in water quality as a result of discharge (not only from the Gilmoie Mining operations, but also upstream discharges from other commercial and agricultural activities taking place within the area and potential increased erosion as a result of agricultural activities) does collect and concentrate in the environment and ultimately impact on downstream water users;
- **Ground water** -surface infiltration may have detrimental effect on the ground water resources.
- **Air Quality** - Emissions into the environment is cumulative with the emissions from other commercial and industrial operations, erosive dust sources and household air emissions;
- **Noise** - Operational noise is cumulative with existing noises as well as other noisy activities taking place in the area (such as traffic on the nearby roads and commercial activities).
- **Visual aspects** - The visibility of the Gilmoie Mining infrastructure cumulative with the visuals of other commercial and industrial activities will create a

cumulative impression of the area for visitors and users of main roads around Taung ;

- **Socio-economic** - Influx of job-seekers and squatter settlements as a result of cumulative impacts due to mining/ Gilmoie Mining and other developments in Taung;
- **Archaeological and cultural:** More archaeological findings may be made and where possible identified for conservation.

### 5.3 Potential for Acid Mine Drainage and Ground Water Contamination

Acid rock drainage occurs naturally within some environments as part of the rock weathering process but is exacerbated by large-scale earth disturbances characteristic of mining and other large construction activities, usually within rocks containing an abundance of sulfide minerals. Areas where the earth has been disturbed (e.g. construction sites, subdivisions, and transportation corridors) may create acid rock drainage. The liquid that drains from raw material stockpiles and handling facilities, and Gilmoie Mining operations may be highly acidic, and in such cases it is treated as acid rock drainage.

Samples are considered acid generating if the sulphide-sulphide (total sulphur) concentration is greater than 0.3%, and the NP/AP is less than 2. The Gilmoie Mining ore total sulphur concentration is estimated at less than 0.3% and NP/AP greater than 2 (NP/AP > 2) and therefore can be classified as potentially NOT acid generating (non-PAG).

## SECTION 6 - ASSESSMENT AND EVALUATION OF IMPACTS

This section outlines the assessment of the nature, extent, duration, probability and significance of the identified potential environmental impacts of the Gilmoie Mining operation, including the cumulative environmental impacts.

This section therefore provides:

- Details of the potential **environmental impacts** that were identified;
- A list of the potential impacts of the aforesaid Gilmoie Mining activities;
- An assessment of all the potential impacts in terms of their significance;

The assessment of impacts must also adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties are also addressed in the assessment of impacts.

### 6.1 List of Potential Impacts Identified

This section summarises and lists the potential impacts that may emanate from the operations activities on the receiving environment due to the Gilmoie Mining operations during various phases of the Life of Mine. These potential impacts have been assessed, quantified and are described in greater detail in the Impact Assessment Sections 6.3 below.

Extent	Duration	Intensity	Probability	Significance Rating
Footprint	1 Temporary	1 Insignifi- cant	2 Probable	Insignificant 0-19
Site	2 Short	2 Low	4 Possible	Low 20-39
Regional	3 Medium	3 Medium	6 Likely	Medium 40-59
National	4 Long	4 High	8 Highly Likely	High 60-89
Inter- national	5 Permanent	5 Very High	10 Definite	Very High 90 <

#### Topography

- The existing above surface waste dumps, raw materials stockpiles. Change in the natural topography.
- Disturbance of geophysical and landscape features.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve High	-Ve Med	-Ve High	-Ve Med	
Closure		-Ve Med	-Ve Low	-Ve Med	-Ve Low	

#### Climate

- Greenhouse gas emissions.
- Creation of microclimates.



Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Med	-Ve Low	-Ve Med	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Geology

- Sterilisation of geological resources due to positioning of infrastructure, overburden and waste dumps and other structures.
- Use and loss of non-renewable dimension stone resource.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve High	-Ve Med	-Ve Med	-Ve Low	
Closure		-Ve High	-Ve Med	-Ve Med	-Ve Low	

### Soils

- Loss of soil as vegetation growth medium. Loss of soil productivity.
- Erosion.
- Contamination of soils.
- Potential deficit of available soil to act as growth medium after rehabilitation (due to losses of soil associated with past and current activities within the Gilmoie Mining mining footprint area).

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve High	-Ve Med	-Ve Med	-Ve Low	
Closure		-Ve High	-Ve Med	-Ve Med	-Ve Low	

### Surface water resources

- Changes in natural surface water flow parameters.
- Reduced catchment yield and water available to downstream users and environments.
- Flooding.
- Changes to water regime of pans, and affected streams.
- Contamination of surface water.
- Changes to water quality.
- Sedimentation of downstream areas.
- Decant / release of contaminated water to the environment

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Med	-Ve Med	-Ve Med	-Ve Med	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Groundwater

- Contamination of groundwater.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Low	-Ve Low	-Ve Low	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

**Air quality**

Increase in dust and emissions levels.

- Fallout dust nuisances.
- Air quality impacts on fauna and flora.
- Health impacts due to fine particulate emissions.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Med	-Ve Med	-Ve Med	-Ve Med	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

**Noise**

- Increase in ambient noise levels.
- Disturbances to sensitive receptors.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Med	-Ve Med	-Ve Med	-Ve Med	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

**Ecology and biodiversity**

- Loss of species of conservation importance.
- Fragmentation and loss of habitats.
- Restriction on animal movement patterns.
- Loss of migration corridors, and access to nesting and refuge areas, watering points, food supplies.
- Displacement of animal species, increased competition in areas where carrying capacity is already compromised.
- Biodiversity impacts.
- Spreading of invasive species.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Low	-Ve Low	-Ve Low	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

**Land use and land capability**

- Loss of agricultural land.
- Disruption of land uses.
- Damage to and disruption of existing services and infrastructure.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Med	-Ve Low	-Ve Med	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

**Heritage resources**

- Disturbance of graves, stone-age sites, and other heritage sites and artefacts.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve Med	-Ve Low	-Ve Med	-Ve Low	
Closure		-Ve Low	-Ve Low	-Ve Low	-Ve Low	

### Social & economic environment

- Economic benefits and risks.
- Increased theft risk and potential for damage to private/commercial property during the operational phase.
- Impacts on neighbours and landowners.
- Impact on property values.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		+ Med	+ High	+ Med	+ High	
Closure		-Ve High	- Low	-Ve High	- Low	

### Visual environment and sense of place

- Changes to landscape character, visual appeal and sense of place of the area.

Mine Phase	Existing Impact	Operations Impact		Cumulative Impacts		No-Go Option
		No mitigate	Mitigate	No mitigate	Mitigate	
Operational		-Ve High	-Ve Med	-Ve Med	-Ve Low	
Closure		-Ve Med	-Ve Low	-Ve Med	-Ve Low	

## 6.2 Impact Rating and Assessment Methodology

### 6.2.1 Environmental Impact Assessment Methodology

#### Identification and Description of Impacts

The purpose of undertaking an impact assessment is to ensure that the operations proactively considers environmental issues as part of the operations planning and decision-making processes throughout the operations life cycle.

For each environmental component (i.e. visual, air quality, water, soils), impacts were identified and described in terms of: detectability / visibility of the impact, exposure of receptors to the impact, compliance with legislation and standards, other applicable targets, limits or thresholds of concern, the level of change / intrusion imposed, and receptor sensitivity. This impact assessment considered:

- Physical, biological, social and economic components of the environment and their interrelationships.
- The ability of receptors and affected parties to adapt to changes and thus maintain livelihoods after the operation has closed.
- The effects of all stages of the operations life cycle, including planning, construction (not applicable for Gilmoie Mining since this is an existing operation), operation, decommissioning and post closure have been considered.
- Positive and negative environmental and social impacts.
- Direct, indirect and cumulative impacts.
- Short- and long-duration impacts within the zone(s) of influence, and extreme events.

- Potential trans-boundary effects and global impacts (e.g. air pollution, withdrawal of water from an inter-provincial waterway and emission of greenhouse gasses).
- Potential impacts on local communities and/or other vulnerable individuals or groups.

### **Existing Impacts**

The Gilmoie Mining operation is located in an area affected by various historical and existing activities including mining, commercial, residential, major roads and other linear infrastructure.

The assessment of existing impacts considered the current level of environmental degradation associated with existing activities for which the impacts have been defined.

### **Direct Impacts**

Direct impacts refer to the impacts of an activity looked at in isolation (impacts of an individual activity), thus not considering the combined, cumulative or synergistic impacts of the activity, or the cumulative impacts of the activity with other activities or the existing impacts.

### **No-Go Development Impacts**

The no-go development is considered as an alternative in the environmental impact assessment and impacts of not developing/decommissioning the operation at Gilmoie Mining have been discussed in the environmental impact report.

### **Cumulative Impacts**

In terms of regulatory requirements and the principles of integrated environmental management, the EIA/EMP application of the mining right and the process for the Gilmoie Mining operations must consider cumulative impacts. For this operations, cumulative impacts will be determined as:

$$\text{Existing Impacts} + \text{Direct Impacts} = \text{Cumulative Impacts}$$

### **Impact Mitigation**

The significance of environmental impacts has been rated before and after the implementation of mitigation measures. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation

#### **6.2.2 Environmental Impact Rating Measurement Rating and Criteria**

The environmental impact assessment (EIA) was conducted taking cognizance of the provisions of section 2 and Chapter 5 of the NEMA, 1998, and the relevant EIA Regulations (2014). The criteria followed to measure each impact is outlined below:

### Impact Rating Matrix

<b>NATURE:</b> The character of the impact			
<b>EXTENT</b>	<b>DURATION</b>	<b>PROBABILITY</b>	<b>MAGNITUDE</b>
Area	Time Frame	Likelihood	Intensity of impact to destroy or alter the environment.
<b>SIGNIFICANCE:</b> Implication of the impact both with or without mitigation			
<b>TYPE:</b> Description as to whether the impact is negative or positive or neutral.			
<b>MITIGATION:</b> Possible impact management, minimization and mitigation of the identified impacts.			
<b>NO GO OPTION:</b> Evaluation of the no-go-option			

### Nature of Impact

Nature of impact describes the character of the impact in terms of the effect on the relevant environmental aspect.

### Spatial Extent of Impact

Measures the area extent, physical and spatial scale over which the impact will occur. This implies the scale limited to the Gilmoie Mining operations (footprint), entire mining right area, including adjacent residential areas (localized), or the Local Municipality area (regional) or the entire Province (Provincial), or the entire country (National) or beyond the borders of South Africa.

Criteria	Footprint (F)	Site/Local (S-L)	Regional (R)	National (N)	International (I)
Rating	1	2	3	4	5

### Duration of Impact

Duration measures the timeframe of the impact in relation to the lifetime of the Gilmoie Mining operations activities under application. It gives an assessment of whether the impact will disappear with mitigation immediately (0-1), after a short time (1-5 years), medium term (5-10 years), long term (11- 30 years of the Gilmoie Mining activities), or permanent (persists beyond life) due to the Gilmoie Mining activities.

Criteria	Temporary (T)	Short Term (ST)	Medium Term (MT)	Long Term (LT)	Permanent (P)
Rating	1	2	3	4	5

### Probability of Impact

Probability measures the probability or likelihood of the impact actually occurring, as either probable, possible, likely, highly likely or definite (impact will occur regardless of preventative measures).

Criteria	Probable (PR) (0-10%)	Possible (PO) (10-25%)	Likely (L) (25-50%)	Highly Likely (HL) (50-75%)	Definite (D) (100%)
Rating	1	2	3	4	5

### Magnitude/Intensity of Impact

Magnitude or intensity of the impact measures whether the impact is destructive or benign, whether it destroys, alters the functioning of the impacted environment, or alters the environment itself. It is rated as insignificant, low, medium, high or very high.

Criteria	Insignificant (I)	Low (L)	Medium (M)	High (H)	Very High (VH)
Rating	2	4	6	8	10

### Significance of Impact

Significance measures the foreseeable significance of the impacts of the Gilmoie Mining operations both with and without mitigation measures. The significance on the aspects of the environment is classified as:

<b>Significance Rating (SR) =</b>	<b>(Extent + Intensity + Duration) x Probability</b>
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Extent	Duration	Intensity	Probability	Significance Rating
Footprint	1 Temporary	1 Insignificant	1 Probable	Insignificant 0-19
Site	2 Short	2 Low	2 Possible	Low 20-39
Regional	3 Medium	3 Medium	3 Likely	Medium 40-59
National	4 Long	4 High	4 Highly Likely	High 60-89
International	5 Permanent	5 Very High	5 Definite	Very High 90 <

The following is a guide to interpreting the final scores of an impact (for negative impacts):

**INSIGNIFICANT:** the impact should cause no real damage to the environment, except where it has the opportunity to contribute to cumulative impacts.

**LOW:** the impact will be noticeable but should be localised or occur over a limited time period and not cause permanent or unacceptable changes; it should be addressed in an EMP and managed appropriately.

**MEDIUM:** the impact is significant and will affect the integrity of the environment; effort must be made to mitigate and reverse this impact; in addition the operations benefits must be shown to outweigh the impact.

**HIGH:** the impact will affect the environment to such an extent that permanent damage is likely and recovery will be slow and difficult; the impact is unacceptable without real mitigation or reversal plans; operations benefits must be proven to be

very substantial; the approval of the operations will be in jeopardy if this impact cannot be addressed.

**VERY HIGH** the impact will result in large, permanent and severe impacts, such as local species extinction, minor human migrations or local economic collapses; even operations with major benefits may not go ahead with this level of impact; operations alternatives which are substantially different should be looked at.

### Status of Impact

Status of impact describes whether the impact is positive (beneficial) on the affected environment (social) or negative (detrimental) or neutral.

## 6.3 Operations Phases and Estimated Timeframes in Relation to the Potential Impacts

The section outlines the identification and assessment of potential environmental impacts (physical, biological, social and economic) associated with the Gilmoie Mining operations for the operational and decommissioning phases. These impacts include:

### 6.3.1 Topography

#### NATURE:

The mine infrastructure, temporary raw material stockpiles and topsoil will alter the existing topographic configuration of the flat surface on which the Gilmoie Mining operations propose to mine. The said waste dumps and raw material stockpiles will naturally be graded down/sloped and cleared.

There will be physical change in landforms from the mining leaving an excavation and possibly stepped terrain where the mineral has been mined.

The access road to the Gilmoie Mining operations and working areas is by gravel tracks/unpaved roads. The access and haul roads will not alter the road or horizontal configuration and alignment. The road base and foundation will be aligned with the existing ground level.

#### STATUS OF IMPACT:

##### **Operational Phase:**

The topographic configuration around the opencast pit will be altered and create permanent depressions/excavation. The impact is of high negative significance to the physical environment as far as topography is concerned.

The mine infrastructure and waste dumps- The topographic configuration around the waste dumps and quarry will be altered and create long term to permanent dumps and excavation. The impact is of **high negative significance** to the physical environment as far as topography is concerned. The Gilmoie Mining operations will

in the long term reduce the sizes of the waste dumps by grading and sloping to conform to the surrounding configuration, removal of all raw material stockpiles. The impact will therefore become of **low significance** in the long term.

The impact will be of **high negative** significance since the access roads, waste dumps and raw material stockpiles will result in impacts on topography. Drainage and storm water management structures must be constructed to ensure and maintain the existing natural flow of surface water.

Drainage and storm water management structures will be constructed to ensure and maintain the existing natural flow of surface water.

#### **Decommissioning and Closure Phase:**

All raw material stockpiles will be removed and sold to the secondary markets. Any remaining waste will be graded to suitable slopes and progressively rehabilitate the mining site and the overall effect of the waste dumps will be reduced. The impact will be reduced from **high to low** negative significance.

Mining infrastructure not usable for secondary use by the community or land surface owners will be demolished and removed. Some over-burden material will be used to backfill the opencast pits and the overall effect of the excavations will be reduced. The impact will be reduced from **high to moderate** negative significance.

#### **OPERATIONAL PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Confined to the waste dumps, Gilmoie Mining area / footprint	2	High	8	Long Term	4	Definite	5
<b>SIGNIFICANCE RATING (SR) - High</b>							<b>70</b>

#### **DECOMMISSIONING PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Confined to the waste dumps and Gilmoie Mining area / footprint	2	Medium	6	Permanent	5	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>							<b>39</b>

#### **NO GO OPTION:**

The existing Gilmoie Mining operations and adjacent area is currently used for grazing by livestock and agriculture. The existing status quo, and landuse will remain should the Gilmoie Mining operations not proceed further.

#### **CUMULATIVE IMPACTS:**

As development and other commercial activities in the area increase the topography of a wider area may be affected by surface infrastructure development (flattening of area) and the artificial "hills" as a result of landfill deposition, soil stockpiles, waste dumps and access roads will either diminish or be completely removed due to Gilmoie Mining operations.



### 6.3.2 Climate

<p><b><u>NATURE:</u></b> The key land use in the Gilmoie Mining operations area is commercial activities.</p> <p>The Gilmoie Mining operations area is surrounded by farms, main roads, business/commercial and other secondary activities. These all have an existing negative impact on local, regional and national climatic conditions due to release of greenhouse gas emissions into the atmosphere and removal of the carbon sink.</p>							
<p><b><u>STATUS OF IMPACT:</u></b></p> <p><b>Operational Phase:</b> The impact on climate due to greenhouse gas emissions from the Gilmoie Mining operations will take place during operational phase. Emissions will result from:</p> <ul style="list-style-type: none"> <li>▪ Use of fossil fuels (diesel and petrol)</li> <li>▪ Grid electricity consumption</li> <li>▪ Fugitive dust emissions from raw material handling areas</li> <li>▪ Clearing of vegetation</li> </ul> <p>The above activities will increase in greenhouse gases such as carbon dioxide, and a decrease in the carbon sink. The impact will be of <b>low to moderate</b> negative significance since Gilmoie Mining operations will add to an existing negative impact on local and regional climate conditions.</p> <p><b>Decommissioning and Closure Phase:</b> Greenhouse gas emissions as result of the operations will decrease. Rehabilitation will increase the vegetation area within the operations area. Post closure, the establishment of a vegetation cover will have a positive impact.</p>							
<b>OPERATIONAL PHASE:</b>							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Local and Regional	3	Medium	6	Long Term	4	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>						<b>39</b>	
<b>DECOMMISSIONING PHASE:</b>							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Local and Regional	3	Low	4	Medium	3	Possible	2
<b>SIGNIFICANCE RATING (SR) - Low</b>						<b>20</b>	
<p><b>NO GO OPTION:</b> The mining area is surrounded by commercial activities, roads, and farms. These all have an existing negative impact on local, regional and national climatic conditions. The existing impacts on climate change will continue.</p>							
<b>CUMULATIVE IMPACTS:</b>							

Effects of climate change result in increased temperature, dynamic weather patterns, acid rain, and extensive droughts occurrences.

### 6.3.3 Geology and Soils

#### **NATURE:**

In general the soils around the mining site vary in depth from a few centimetres (20cm) to depths of between 100-150cm, however, the general depths to hard rock, or unconsolidated material are considered restrictive on irrigation potential and arable crop production, with the average effective rooting depth not exceeding (100-120cm) for a significant portion of the site.

Soils and soft overburden will be stripped prior to excavation of the opencast pit and waste dump areas and stored separately for subsequent rehabilitation of the mined-out areas. Hard overburden will be stored for later replacements into the final voids. Surfaces where mining infrastructure will be constructed will disturb the soils, and similarly the soil will be stripped and stored separately.

Disturbance caused by mining and infrastructure development will result in higher permeability within the Gilmoie Mining footprint, allowing for greater flow of groundwater into and through disturbed mine surfaces.

There is possible contamination of soil due to fuel, lubricants and other chemical spills (accidental) from the various vehicles and machinery used for mining/ Gilmoie Mining activities. Erosion is also likely due to runoff from storm water, because soil would have been disturbed by mining.

Soils will be stripped prior to any infrastructure development or demarcation of new stockpile areas and stored separately for subsequent rehabilitation of the disturbed areas. All surfaces where mining/ Gilmoie Mining infrastructure will be constructed, will disturb the soil, and similarly the soil will be stripped and stored. The soil beneath the access road base will be mixed with gravel, and compacted. Movement of vehicles on the roads will result in compaction of soil structure. The following activities will impact on soil during operational phases:

- The stripping of all utilisable soil (top 150mm to 500mm depending on activity);
- The preparation (levelling and compaction) of lay-down areas, foundations, and pad footprint areas for stockpiling of utilisable soil removed from the footprint of the planned stockpile area, the construction of the storm water control facility(s) inclusive of berms and trenches to divert clean water around the mine workings;
- The clearing, stripping and stockpiling from the construction of all access and haulage roads, Gilmoie Mining infrastructure, water supply, and electrical power supply servitudes (linear infrastructure);
- The use of heavy machinery over unprotected soils;
- The creation of dust and loss of materials to wind and water erosion (loss of resource), and

- The possible contamination of the soils by chemical and hydrocarbons spills (dust and dirty water runoff).
- The sterilisation of the soil resource under which the waste dumps and raw material stockpiles are situated and where the support facilities are constructed. This will be an on-going loss for the duration of the operation;
- The creation of dust and the possible loss (erosion) of utilisable soil down-wind and/or downstream, and the siltation of the local streams and waterways;
- The compaction of the in-situ and stored soils and the potential loss of utilisable materials from the system;
- The contamination of the in-situ and stored soils by dirty water run-off and or spillage of hydrocarbons, lubricants and other chemicals from vehicle and machinery or from dust and emissions from the process of mining/ Gilmoie Mining and hauling of raw material and minerals;
- The contamination and impact of sensitive materials located on or in close proximity (bordering) to the Gilmoie Mining operations and their loss from the system;
- Contamination of soils through the use of dirty water for road wetting (dust suppression) and irrigation of the stockpile vegetation.

#### **STATUS OF IMPACT:**

##### **Operational Phase:**

Disturbance of in-situ geology is of **high negative** significance during the operations at Gilmoie Mining. The said mining of minerals will be removed permanently. But this will translate to high positive economic gains through-out the life of mine.

Soils will only be stripped where practicably possible. Stripping of soil for use in rehabilitation will reduce the duration of the impact. Soil is a vital resource for the successful rehabilitation of the mining area, therefore, the conservation of soils will be managed carefully. Soil stockpiles will be constructed and maintained to preserve the viability and fertility of the soil - however these two characteristics will be reduced overtime. The impact will therefore be of **moderate to high negative** significance.

It is furthermore proposed that any important vegetation species occurring within Gilmoie Mining site be relocated to similar habitats and soils similar to those where they occurred naturally. This will reduce the severity of the impact and the post mitigation significance.

The impact is **high negative** significance and permanent for the soil beneath the access roads base and waste dumps. The impact is negative on the bio-physical environment and soil aspects. With the daily mining/ Gilmoie Mining activities - including vehicular movements, there is a possibility of fuel and oil spillages. Strict management procedures will be put in place to control such accidental spillages.

The impact is negative on the opencast pits, waste dumps and ODP plant surface areas. The in situ availability of these soils and their current potential to sustain vegetation and human land use will be lost for a long duration. The frequency of the

activity, frequency of the impact and duration of the impact will all be definite and of long term duration, as the opencast pit will be long term to permanent features, causing permanent un-usability and a definite loss of the soils below it.

Fuel, oils and lubricants will be stored at the designated and sealed surfaces and appropriate containment structures. However accidental spillages on soil surfaces from machinery and mining equipment will result in **low to moderate** negative significance on the soil. If, however, unlikely incidents of major spillages from fuel storage tanks occur during mining operations, the impact will be of **high** negative significance.

#### Decommissioning and Closure Phase:

All soil stripped and stockpiled separately for rehabilitation purposes will be used for such purpose. The rehabilitated surfaces will be re-vegetated to minimize and prevent soil erosion. Contaminated soil will be bio-remediated to make it re-usable as a medium of plant growth. The long length of time for topsoil storage will impact on the physical and chemical characteristics of the stockpiled soil.

The waste dumps sites area will be disturbed for a long time to permanently. The overall impact will therefore remain high negative on soil over the mining area. The following soil impact will be evident during this phase:

- The loss of the soils' original nutrient store and organic carbon by leaching of the soils' while in storage;
- Erosion and de-oxygenation of materials while stockpiled;
- Compaction and dust contamination due to vehicle movement while rehabilitating the area;
- Erosion due to the lack of slope stabilization and re-vegetation of disturbed areas.

#### OPERATIONAL PHASE:

EXTENT		INTENSITY		DURATION		PROBABILITY	
Mining/ Gilmoie Mining Footprint Area	2	High for both soil and geology	10	Permanent for geology	5	Definite	5
			8	Long Term for soil	4		
SIGNIFICANCE RATING (SR) High for Geology						85	
SIGNIFICANCE RATING (SR) High for Soil						70	

#### DECOMMISSIONING PHASE:

EXTENT		INTENSITY		DURATION		PROBABILITY	
Mining/ Gilmoie Mining Footprint Area	1	High	10	Permanent	5	Definite	5
		Medium	6	Medium	3	Likely	3
SIGNIFICANCE RATING (SR) High for Geology						80	
SIGNIFICANCE RATING (SR) Low for Soil						30	

#### NO GO OPTION:

Gilmoie Mining operations will not have new impacts on geological aspects of the site due to the closure of the Gilmoie mine. If the operations cease, the impact on

geology will not be an issue - Since Clay, Shale, Limestone, Gypsum and Quartz will be sourced from external areas. The proposed Gilmoie Mine is not an existing operation. The current status quo will remain around the area if authorisation is not granted. Storm-water management structures and drains will be constructed to prevent and control soil erosion around the Gilmoie Mining area. Improved storm water containment structures will be required- around the return water dam.

**CUMULATIVE IMPACTS:**

Transportation of minerals from Gilmoie Mining to the market will add to traffic volume on the main roads. There are positive economic impacts to be derived from the Clay, Shale, Limestone, Gypsum and Quartz mining activities.

The cumulative impacts on the soils and land capability are confined mainly to the overall reduction in the availability of the resource and the potential loss of utilisable materials that have the ability to produce agricultural products. The overall loss of resource due to erosion, compaction and contamination is unlikely to be an issue in terms of cumulative effects as these constraints are site specific.

#### 6.3.4 Surface Water

**NATURE:**

**STATUS OF IMPACT:**

**Operational Phase:**

The following potentially negative impacts on the surface water associated with the operational phase have been identified:

- Potential contaminated storm water run-off from the raw materials storage stockyard.
- Contaminated runoff from the waste dumps.
- Possible impact on the aquatic biodiversity and ecology of the drainage systems.

**Regional Water Demands**

As with most rivers in the Northwest Province, catchment pressure and limited water resources are causing reduced flows, which in turn are limiting the ability of the rivers to sustainably meet environmental (reserve) requirements. However, there is an on-going demand for development within the region that further stresses the available water resources. It is important for water reconciliation studies that these future developments be recognised and incorporated in the regional demand for the proposed mining area.

Water for mineral processing and potable use will be obtained from Taung Local Municipality and from borehole. None will be extracted from the surrounding rivers.

A water use or water wastage minimization plan will be implemented. It will include:

- Monitoring surface and groundwater quality and water levels as well as monitoring neighbouring boreholes
- Surface water controls to be installed and maintained
- Monitoring the water quality in the surrounding water resources
- Monitoring groundwater levels and quality
- Implementing a water use or water wastage minimization plan

### **Water Resources**

Water for mineral processing and potable use are obtained from boreholes. None will be extracted from the surrounding rivers.

### **Water Quality**

Several activities during the operational phase could contribute towards water quality deterioration. These impacts may stem from contaminated runoff from the waste dumps as well as the raw material stockyard. In the event that pollution control facilities fail to contain poor quality water, spillages to the environment will cause negative impacts on the water quality and aquatic ecology of the area. The impact will be **significant** and **long-term** and will extend beyond the boundaries of the operations area. With the implementation of mitigation measures the impact could be rated **low to moderate negative**.

### **Storm Water Impacts**

The management of storm water runoff is required to avoid spillage of contaminated water, reuse and recycling water and storm water wherever possible, treatment of water for reuse or discharge, and as a last resort, discharging storm water in compliance with Department of Water Affairs' limits. The Gilmoie Mining operations, waste dumps and hardened surfaces on the site would lead to an increase in runoff. Some of this runoff may be contaminated with oils or grease, or chemicals used on the mining/ Gilmoie Mining site.

### **Waste Dumps**

Waste dumps have the potential to pollute water resources which is generally associated with the change of pH of the water body. With the change of pH caused by the dumps, salts and metals are mobilised that could leach into ground and surface water bodies. The rate at which elements are leached from dumps depends on the form in which the element is present, as well as whether the pollutant has been absorbed onto the particle surface or not. Elements or pollutants in a chemically stable matrix are less readily available to be leached from the dumps.

The above ground storage of the dumps will result in impacts on ground and surface water. Due to rainwater seepage into the dump an initial high seepage rate could be expected causing a rapid increase in water quality degradation. High level of pollution on the long-term with the impact rated as being of **medium** magnitude could be expected.

### **Raw Material Stockyards**

The minerals to be mined at the Gilmoie Mining operations will immediately be loaded onto tipper/haul trucks for the market. However, depending on the market

fluctuations some may be temporarily stockpiled at the site after the processing and screening processes.

The hazard associated with the stockyard areas is considered low to medium mainly due to the low acid mine drainage potential of the raw materials. There is however still some limited risk of contamination of the immediate vicinity due to ingress to groundwater from run-off from this area. The severity of a pollution event in this area is judged as **low to medium** because the runoff may contaminate storm water arising from polluted areas at Gilmoie Mining.

The frequency of such an event is considered low since large runoff volumes will only be released to a natural watercourse during an exceptional rain event. The sensitivity of the receiving environment is judged moderate because there are no perennial water resources entities in the immediate periphery of Gilmoie Mining area.

#### **Decommissioning and Closure Phase:**

Drainage characteristics over the Gilmoie Mining site will be altered permanently due to the opencast pit created over the mine area. These will however not alter the overall catchment drainage patterns. Once rehabilitated, surface erosion and sediment transfer from the mine/ Gilmoie Mining site will be significantly reduced and revert to existing erosion or sediment transfer patterns to pre-mining conditions. Impacts on the surrounding regional rivers will therefore discontinue.

The entire mine site is on sloping ground, and will have a significant area disturbed that will require to be scarified and re-vegetated to prevent soil erosion.

Waste dumps will be the major activity considered to have a post closure impact. The above ground nature of the waste dumps could have direct and indirect impacts on the aquatic environment (both surface and groundwater). The dumps would have a direct footprint impact on the surface water environment. It is envisaged that all waste dumps will be rehabilitated - including revegetation to prevent erosion.

Indirect on-going impacts associated with an above ground dumps on the aquatic ecological environment include the impacts of dust blown from the dumps increasing sediment levels of aquatic systems, resulting in loss of habitat due to smothering, increased turbidity, decreased photosynthesis and physiological stress on organisms. The impact at the site would have a low magnitude and long term duration. Accordingly, a **low to medium** negative significance impact on groundwater is anticipated.

The micro drainage characteristics over the Gilmoie Mining area will be altered due to the waste dumps and open-pit created over the mine area. These will however not alter the overall catchment drainage patterns. Once re-worked and rehabilitated, surface erosion and sediment transfer from the mine site will be significantly reduced and revert to existing erosion or sediment transfer patterns to pre-mining conditions. Impacts on the surrounding regional water channels will therefore discontinue.

OPERATIONAL PHASE:							
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site, Local and Regional	3	Medium	6	Long Term	4	Likely	3
SIGNIFICANCE RATING (SR) - Low							39
DECOMMISSIONING PHASE:							
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Medium	3	Possible	2
SIGNIFICANCE RATING (SR) - Very Low							18
<b>NO GO OPTION:</b>							
If the Gilmoie Mining operations do not commence, the anticipated impacts from the surrounding settlement, farming and commercial operations will not continue on the surface water resources of the area.							
<b>CUMULATIVE IMPACTS:</b>							
Due to the existing settlement and commercial activities in the area, the surface water quality is already impacted to some extent. However, containment of dirty water within the mine/ Gilmoie Mining footprint will ensure that the impact is reduced.							
Any clearing of vegetation during operational phase may lead to some soil erosion, which will, in-turn result in increased sediment load into surface water resources. Such vegetation clearance will ONLY be limited to the sites required for mine infrastructure, access road and stockpile areas.							

### 6.3.5 Ground Water

<b><u>NATURE:</u></b>
<p>Groundwater level in the vicinity of Gilmoie Mining varies from approximately 6 to 50 meters below surface. The water table in the area is generally expected to follow the surface topography, and typical of hilly outcrops areas where usually water level can be expected to be much deeper. The opencast pits will be at least 50m in depth and will not intersect groundwater. Water may flow into the open-pit, and unless removed will accumulate.</p> <p>Consideration of the shallow aquifer system becomes important during seepage estimations from pollution sources to receiving groundwater and surface water systems. The shallow weathered zone aquifer plays the most important role in mass transport simulations from process and mine induced contamination sources because the lateral seepage component in the shallow weathered aquifer often dominates the flow. However, these waters are susceptible to contamination from surface sources.</p> <p>The main aquifers in the area are thought to be fractured and weathered aquifers. The aquifer storage is estimated to be 0.001. The static water is relatively shallow(20 - 30 metres below surface) in the borehole sites around the mining area. The natural piezometric gradient is thought to follow a subdued form of the surface topography.</p>



The acid generation capacity of the waste dumps material sampled was determined by acid-base accounting. The waste dump samples have a total sulphur concentration less than 0.3% and NP/AP greater than 2 (NP/AP > 2) and therefore can be classified as potentially not acid generating (non-PAG).

If fuel, oil or chemical leakages occur (unattended over a long time) this may lead to underground water pollution.

### **STATUS OF IMPACT:**

#### **Operational Phase:**

The defunct open-pit mining operations has the potential to impact on the re-charge of an aquifer in various ways. If final depth of the quarry is deeper than the static water level, dewatering of the aquifer occurs and the natural aquifer discharge will decrease by the volume of groundwater removed by dewatering. After the completion of the pit mining operations, dewatering ceases and aquifer re-charge level changes as per the final pit depth and normalise. The impact will therefore change from **high** during pit mining to **moderate/low** after cessation of mine.

Lowering of the groundwater levels due to the pit will NOT affect availability of groundwater for domestic and stock watering use to the groundwater users within  $\pm 1$  km radius from the mine. No large scale irrigation occurs within the direct vicinity of the Gilmoie Mining area and no significant impact on any such user is expected.

Other factors that may decrease the aquifer recharge are compacted surfaces, haul roads and concrete surfaces that prevent infiltration to the aquifer and decrease groundwater recharge, although increasing surface runoff. This impact is countered by the fact that the runoff water can contribute to the catchment yield. Some groundwater impacts are therefore expected to occur as a result of the mine surface infrastructure. The impact will be of **low negative** significance.

The extraction of underground water from the boreholes will be for both domestic and operational requirements. Gilmoie Mining water requirements will be supplemented by the said boreholes. There is no potential lowering of the water table and drying out of water boreholes as a result of Gilmoie Mining operations. There will therefore be NO complaints about ground water shortages or depletion due to the Gilmoie Mining.

The potential impact on stream base flow reduction is currently very low since the Gilmoie Mining operations and the boreholes will be outside the 1: 100 floodline or a horizontal distance of 100m from the surrounding water channels (if any) - as required by GN 704.

Mokgareng and Vaaltryn communities are not located in the immediate vicinity of the Gilmoie Mining site, but does not depend on underground water for domestic and other use. The said settlements and residential activities are connected to the Taung Local Municipality water reticulation system. The impact in this regard is therefore of **low to insignificant negative** significance.

In general, pollution migration will be slow because of low transmissivity.

Poor quality seepage emanating from the dirty water within Gilmoie Mining footprint is inevitable and will have the following consequences on the local groundwater regime:

- Groundwater mounding directly underneath the Gilmoie Mining footprint;
- Possible downstream movement of a pollution plume within the weathered zone aquifer.

#### **Decommission and Closure Phase:**

During this phase of mining it is assumed that the groundwater regime will return to a state of equilibrium once borehole pumping has stopped and the Gilmoie Mining footprint loosened and scarified for more surface infiltration and re-vegetation.

Following rehabilitation and closure of the Gilmoie Mining site - including the mentioned scarification, the soil will have increased permeability and have greater infiltration. Water falling on the rehabilitated sites will tend to accumulate faster that it can flow out of the site. This will result in a higher water level within the rehabilitated sites than the surrounding rock.

In the rehabilitated open-pit the groundwater level is thus expected to attain a new equilibrium after closure. Although the transmissivity and storativity are higher after rehabilitation, the effective recharge percentage to the rehabilitated opencast pits is also expected to be higher in spite of compaction practices and creation of a free runoff surface profile.

#### **OPERATIONAL PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Long Term	4	Possible	2
<b>SIGNIFICANCE RATING (SR) - Low</b>							<b>20</b>

#### **DECOMMISSIONING PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Medium	3	Probable	1
<b>SIGNIFICANCE RATING (SR) - Insignificant</b>							<b>9</b>

#### **NO GO OPTION:**

The existing impacts on ground water due to existing nature reserve, commercial and residential activities will remain.

#### **CUMULATIVE IMPACTS:**

Increase surface flows and low infiltration of water will cause low recharge and reduction of water availability for domestic and other uses. Any potential for agricultural produce may be subsequently decreased due to limitations in water availability as a result of the Gilmoie Mining and other nearby commercial activities.

### 6.3.6 Flora

<b><u>NATURE:</u></b>							
Any clearing of vegetation on areas to be developed for any new surface infrastructure - including additional access roads, and any new stockpile areas will result in a negative impact on flora. However, the area to be used for the Gilmoie Mining activities will be confined to the one approved by the DMR under the existing mining right area - which is the subject of this EMP.							
<b><u>STATUS OF IMPACT:</u></b>							
<b>Operational Phase:</b>							
The impact is of <b>high negative significance</b> since clearing of vegetation will take place where the mineral will be mined through opencast pit. Surface infrastructure, waste dumps and access road construction will also take place. Any clearing will be confined <b>ONLY</b> to the area necessary for open pits, access roads and mine infrastructure development. No unnecessary clearing of vegetation or veld burning will take place on the mining site.							
During the short site visit, no exotic plant were recorded in the study area. According to the Conservation of Agricultural Resources Act - CARA (Act No. 43 of 1983) in Henderson (2001) and the National Environmental Management Biodiversity Act's 2014 list of proposed weeds and invaders (NEMBA, 2014). No species listed as threatened or protected by the National Environmental Management: Biodiversity Act's (Act No. 10 of 2004) list of Threatened or Protected Species as published in the Government Gazette of No. 36375 of 16 April 2013 (TOPS, 2014), were recorded.							
<b>Decommissioning and Closure Phase:</b>							
Any waste dumps will be graded and sloped to angle of 18° or less where possible to enable natural re-vegetation to re-establish after the completion of Gilmoie Mining activities. The said natural vegetation is expected to establish within the first or second year and rain seasons after the mining operations. The impact will therefore be of low significance in this phase. Rehabilitation measures will revert the site to as close as possible to its original conditions.							
<b>OPERATIONAL PHASE:</b>							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Mine Footprint	1	Low	4	Long Term	4	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>						<b>27</b>	
<b>DECOMMISSIONING PHASE:</b>							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Mine Footprint	1	Low	4	Short-Term	2	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>						<b>21</b>	
<b>NO GO OPTION:</b>							

Vegetation around the Gilmoie Mining site is in its natural state and untransformed. There is rich vegetation diversity within the proposed mining site. The Gilmoie Mining activities are unlikely to alter the existing vegetation of the broader area.

**CUMULATIVE IMPACTS:**

Gilmoie Mining activities will not transform the vegetation of the area any worse than it already is. Implementation of indigenous vegetation as part of progressive rehabilitation of the site will result in positive impact on vegetation for the mining/ Gilmoie Mining site.

### 6.3.7 Fauna

**NATURE:**

Typical mammals found in the area include bats, rats, snakes such as the Southern African python, Rinkhals, Black mamba, Puff Adder, Brown House snake, Common Egg eater, Spotted Buch snake, Mole snake, Common Tiger snake, Stiped Skaapsteker, Boomslang and certain lizard and gecko species, tortoises and the water monitor.

Avifauna is in the form of various doves, francolin, guinea fowl, korhaan, plovers, night-jars, and an assortment of smaller species which can be easily observed within Gilmoie Mining site.

Amphibians include frogs, toad species like pygmy, Guttural and Olive toads. Type of frogs occurring in the area include dwarf Puddle frog, Grass frogs, Common River frog, Sand frog, Ornate frog, African bullfrog, Bushveld Rain frog, Bubbling Cassina, Mottled Shovel nosed frog, Banded Rubber frog, Foam nest frog and the common Platanna.

There are no endemic or red data mammals recorded within Gilmoie Mining footprint. The entire mining work areas will be fenced-off to ensure restricted access to livestock and wild animals. There is however sufficient surrounding land available for grazing.

Most areas within Gilmoie Mining site are undisturbed, and with exception of avifauna and microfauna, very few mammals, insects, reptiles and amphibians are available. Some wildlife may still be surviving in the region (nearby nature reserve), but this will be restricted to areas where mining is not taking place.

Micro-habitats will be destroyed on areas excavated for surface infrastructure, access roads, stockpiles and opencast pit. However, in this case, a significant area of the surrounding habitat will be left intact which will provide sufficient habitat for the fauna and micro-fauna to migrate to during and after the mining operational phase. The surrounding undulating plains will provide adequate refuge to the displaced fauna.

The animals observed during the field assessments, mainly domestic livestock - cattle, goats, sheep and donkeys. However, these were very few.

**STATUS OF IMPACT:**

**Operational Phase:**

The status of the impact is regarded as **moderate negative** significance for fauna since the mine site will be disturbed to a certain extent and larger animals will have migrated to the surrounding area. Open pit mining is very destructive, but this impact can be lowered if attention is given to the layout of the areas to be mined avoiding the areas where remaining wildlife still finds shelter. No evidence of larger wildlife (e.g. kudu, antelopes, elephants, zebras etc.) was encountered during the various site visits conducted on the proposed mining area for the purposes of this EMP application of the mining right and the report.

The rock buttresses with numerous crevices, overhangs and small caves provide shelter for many species, particularly bats, birds, lizards and snakes. No signs of brown hyena or wild dogs (listed as rare in the red data book) or other threatened species were recorded. This does not conclude 100% that rare species are not present, but indicates that numbers are very low, if any.

**Decommissioning and Closure Phase:**

The opencast pit void will remain, and where practical some back-filling with waste or overburden material may occur, the waste dumps will be graded and sloped to angle of 18° or less where possible to enable natural re-vegetation to re-establish after the completion mining/ Gilmoie Mining activities. The said natural vegetation is expected to establish within the first or second year and rain seasons after the mining operations.

The Gilmoie Mining operation will displace some micro-fauna. There is however adequate for the surrounding area to re-establish respective habitats. The said micro-fauna may move back into the mining/ Gilmoie Mining area after rehabilitation and removal of all surface infrastructure.

**OPERATIONAL PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Mine/ Gilmoie Mining Footprint	1	Low	4	Long Term	4	Possible	2
<b>SIGNIFICANCE RATING (SR) - Insignificant</b>							<b>18</b>

**DECOMMISSIONING PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Mine/ Gilmoie Mining Footprint	1	Low	4	Medium Term	3	Possible	2
<b>SIGNIFICANCE RATING (SR) - Insignificant</b>							<b>16</b>

**NO GO OPTION:**

No additional impact on fauna, micro-fauna and avifauna. Current status quo remains.

**CUMULATIVE IMPACTS:**

The terrestrial flora and fauna, whether domestic or game, are integrally linked and the destruction or removal of the one will have a negative impact on the other. The vegetation provides food and protection to the fauna, while the fauna contributes to the pollination and dispersal of the vegetation. Any loss of - especially the large remaining patches - of natural vegetation will have a domino/ knock on effect, with

the fragmentation of other larger natural vegetation areas for cultivation and the increase in grazing pressure on those areas not suitable for cultivation. The genetic composition of the remaining species will also change due to the loss of meta-populations or the isolation of populations resulting in inbreeding.

### 6.3.8 Air Quality

#### **NATURE:**

Air pollutants are traditionally classified into suspended particulate matter (dusts, mists and smokes), gaseous pollutants (gases and vapours) and odours.

Source of air pollution from the proposed mining area include point with periodic emissions of Clay, Limestone, Shale and Quartz dust into the atmosphere, and area sources (mineral reclaiming area, and unpaved haul roads).

Sources of fugitive dust identified will include paved and unpaved roads, raw materials handling areas and wind erosion of sparsely vegetated surfaces.

Emission from paved roads are significantly less than those originating from unpaved roads, however they do contribute to the particulate load of the atmosphere. Particulate emissions occur whenever vehicles travel over a paved surface. The fugitive dust emissions are due to the re-suspension of loose material on the road surface. Most access and haul roads are paved within Gilmoie Mining footprint.

Both small and heavy private and industrial vehicles travelling within Gilmoie Mining, long gravel and tar road, as well as unpaved public and private roads, are notable sources of vehicle tailpipe emissions in the vicinity of Gilmoie Mining and surrounding area.

The Gilmoie Mining operation is located in an area currently affected by air pollution sources such as unpaved roads, wind-erodible areas household coal fire place (winter seasons), biomass burning and vehicle exhaust emissions. Pollutants released include but are not limited to fugitive PM<sub>10</sub> and TSP and gaseous pollutants as products of the combustion of petrol and diesel.

Extraction of the minerals and raw material activities are associated with noticeable dust emissions, sources of which include land clearing, vehicle entrainment, and screening/ processing.

Raw materials handling operations at Gilmoie Mining include the transfer of the minerals by means of tipping, loading and off-loading of trucks. The quantity of dust that is generated from such loading and off-loading operations will depend on various climatic parameters, such as wind speed and precipitation, in addition to non-climatic parameters such as the nature (i.e. moisture content) and volume of the material handled.

Vehicle movements in and around Gilmoie Mining and surrounding commercial activities generate some nuisance dust into the atmosphere. Although accurate

vehicular movements is unknown, making conservative assumptions the baseline dust concentrations are generally moderate with the 24 hour TSP (total suspended particles) average over the entire area of about 100 mg/m<sup>2</sup>/day. The typical ambient dust levels around urban areas ranges between 50 - 100 mg/m<sup>2</sup>/day TSP depending on daily wind speed and direction, and movement of vehicles. It is estimated that the said vehicle movements increase the dust levels to approximately 100 - 200 mg/m<sup>2</sup>/day during day time on unpaved roads. This is, however, well within the maximum allowable guidelines set by SANS 1929:2005 for both residential and industrial areas, which are as follows:

Residential =  $D < 600 \text{ mg/m}^2/\text{day}$  - over 30 day average

Industrial =  $600 < D < 1200 \text{ mg/m}^2/\text{day}$  - over 30 day average

Moderate deposition rates (i.e. approximately 400mg/m<sup>2</sup>/day) are predicted onsite, near major transport haul/access routes and material handling operations, during extreme pollution episodes associated with dry and windy spells.

The residential standard of 600mg/m<sup>2</sup>/day is therefore unlikely to be contravened.

Dust will be generated from the mineral processing plant and handling areas, access roads and the stockpile deposition sites. Dust pollution will be high during dry winter months and windy autumn season. The effect however will be localised and mainly confined to within the working areas.

Annual PM<sub>10</sub> concentrations, as a result of this operations, do not exceed current background levels beyond the mining/ Gilmoie Mining boundary. Predicted PM<sub>10</sub> concentrations associated with the Gilmoie Mining operations are expected to be slightly above the lowest level at which statistically significant health effects have been noted to occur (i.e. 20 to 25µg/m<sup>3</sup>).

### **STATUS OF IMPACT:**

#### **Operational Phase:**

The impact is considered **moderate to high negative** significance. The dust released from mining of the minerals , and fall-out dust generated during the operational phase due to the Gilmoie Mining will reduce the air quality of the local area immediately adjacent to the mining/ Gilmoie Mining works. The ore processing activities also generate dust.

The impact is considered negative. The dust and vehicle emissions generated by the mining activities will reduce the air quality of the immediate local area. Conditions will render the impact to be of **high** negative significance.

#### **Decommissioning and Closure:**

Once the mining activities, rehabilitation and re-vegetation are over the entire surface are complete no further dust dust will emanate from the mining/ Gilmoie Mining site. Dust will however be generated from the existing gravel access road if used for other purposes subsequent to Gilmoie Mining access - if these are not upgraded to tar. This will however conform to the surrounding ambient levels. The impact will therefore be reduced to **low** significance.

<b>OPERATIONAL PHASE:</b>							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Site and Local	2	High	8	Long Term	4	Highly Likely	4
<b>SIGNIFICANCE RATING (SR) - Medium</b>						<b>56</b>	
<b>DECOMMISSIONING PHASE:</b>							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Site and Local	2	Low	4	Short-Term	2	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>						<b>24</b>	
<b>NO GO OPTION:</b>							
The current ambient dust levels around the area of between 100 - 200 mg/m <sup>2</sup> /day TSP depending on daily wind speed and direction, movement of vehicles, landfill and commercial activities will remain.							
<b>CUMULATIVE IMPACTS:</b>							
Gilmoie Mining operations will add to the annual PM <sub>10</sub> concentrations in the area. Sensitive receptors for PM <sub>10</sub> will be the commercial and business entities and surrounding homesteads. Monitoring programme must be put in place at the sensitive sites.							
Predicted dust fall-out impacts will be below the residential standard of 600mg/m <sup>2</sup> /day, therefore no impacts are anticipated in the sensitive receptors - such as the residential area.							

### 6.3.9 Noise

<b><u>NATURE:</u></b>
Noise levels anticipated to be from 75% of the various sources on site at Gilmoie Mining and will exceed 85 dBA. The noise levels however will not impact beyond the boundaries of the site but only significant in the vicinity of the mine and plant operations. However there may be complaints that may emanate from the communities regarding the noise levels.
There various significant calculable noise sources in respect to the existing baseline, these are:
<ul style="list-style-type: none"> <li>• The access gravel and tar road;</li> <li>• The existing ore saw cutter plant and processing plant;</li> <li>• Raw material handling areas.</li> </ul>
The natural ambient noise levels in the area are largely determined by natural sounds, i.e. birds, insects and the wind in the foliage of plants. The estimated noise levels are comparative (80 - 100 dBA during the day and 40 - 50 dBA during the night) to those listed in the revised SABS 0103 standard, where the typical ambient noise level for an urban area is given as 80 - 100 dBA and 40 - 50 dBA during the day and night respectively. The mining activities will not raise noise levels significantly.



Processing plant, movement of tipper and haul trucks, excavators and other mining equipment/machinery creates some noise - when operations are active.

### **Regional Roads (By-Pass)**

There are a host of noise generating mechanism in vehicle movement, the most important factor above 50 - 60 km/h is the road and tyre interaction between pavement and the vehicle (rolling noise).

The most important road noise/sound contributors include:

- Road traffic volume and speeds (most significant);
- Other road noise contributors (maintenance conditions, modifications etc.);
- Road vehicle type (trucks, busses, cars, motorbikes, etc.);
- Road/tyre interaction which includes:
  - Vehicle tyre design;
  - Stick-slip, stick-snap and air pumping;
  - Horn amplification;
  - Sub-grade, sub-base (or granular/cemented sub-base) and base course of road pavement material - Hot-mix, cold-mix, synthetic binder, resin modified, asphalt, portland cement concrete, unpaved roads;
  - Surface texture;
  - Surface porosity; and
- Single maximum noise events - magnitude and occurrences (LAmax).

The level and character of the operational noise will be highly variable as different activities with different equipment take place at different times, for different periods of time (operating cycles), in different combinations/sequences and on different parts of Gilmoie Mining site.

The Gilmoie Mining operational activities will not raise noise levels significantly - since there are other existing commercial activities in the area. Movement of tipper and haul trucks, front-end loaders and other mining/ Gilmoie Mining equipment/machinery will create some noise - especially during day time when operations are active. The noise levels are expected to increase to 80 - 100 dBA during day time. There are no settlements within the immediate proximity to the Gilmoie Mining site.

Complaints can be expected if the difference between neighbourhood noise levels and the ambient noise levels are more than 10dB. Alternatively, noise levels in excess of 50dB would be a nuisance especially during the night when neighbourhood noise levels are low.

### **STATUS OF IMPACT:**

#### **Operational Phase:**

Noise emitted by Gilmoie Mining activities will be associated with various types of noises and noise sources. These include mechanical sources due to operation of processing plant, earth-moving and ore dressing plant (ODP), material impact noises (such as the noise made when materials are dropped at a height to ground level)

and electrical noise (reverse hooters from mining equipment). The impact is therefore of **moderate negative** significance. There are no immediate settlements or farm homesteads within 1 km from the Gilmoie Mining therefore the impact becomes of low significance.

**Haul and Access Road Traffic**

A source of noise during the operational phase is additional traffic to and from Gilmoie Mining site.

**Decommissioning and Closure Phase:**

In general, closure activities have a significant lower noise impact than both the operational and construction phases. The closure phase will have a significantly **low negative** impacts for the following reasons:

- Closure activities are generally less intense than operational activities. Noise levels are lower and frequently limited to daylight hours. This reduces the significance of the noise impact;
- Most rehabilitation takes place concurrently with mining. It is therefore just another activity generating noise that could be considered as part of the operational phase; and
- A closure EMP will be developed by the mining operation at the end of the mining operation, which will be more specific and accurate.

**OPERATIONAL PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Medium	6	Long Term	4	Highly Likely	4
<b>SIGNIFICANCE RATING (SR) - Medium</b>							<b>48</b>

**DECOMMISSIONING PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Short-Term	2	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>							<b>24</b>

**NO GO OPTION:**

If the Gilmoie Mining operations do not commence, there will be no noise generated.

**CUMULATIVE IMPACTS:**

The noise impacts of the Gilmoie Mining operations and exiting commercial and industrial activities in the area will not overlap, therefore the cumulative impacts to noise sensitive areas are negligible.

**6.3.10 Landuse and Capability**

**NATURE:**

The majority of the land around where the Gilmoie Mining operations are situated can be considered to be commercial land given industrial activities in the area, conservation, and farming homesteads. Small areas, north and eastern sites can be classified as wilderness land.

The municipality owns a large number of properties, some of them are strategically located. Disposal of owned land and immovable assets is still a challenge as the municipality does not have a coherent policy. Land use around Gilmoie Mining include - farm homesteads, agricultural and grazing land. Other main land uses include CBD, townships, residential, commercial and open spaces around the area.

There is one main access tar and gravel road to Gilmoie Mining site. There are active and existing commercial activities in the area.

Due to the proposed Gilmoie Mining operations, surface infrastructure, overburden and topsoil dumps, access roads and clearing of vegetation, the inherent land capability will be lost below the footprint of the Gilmoie Mining footprint and the frequency of the Gilmoie Mining activities and duration of the impact will be long term. The severity of the impact is considered to be of **moderate to high** significance.

Land around the Gilmoie Mining area is predominantly used for conservation, Agriculture, commercial, and settlements. Settlement types are rural. The climate of the area appears to impose limitations on the ability to cultivate the available land. During the field investigations, much of the open plain, although some demarcated as agricultural land and used as such in the past, did not appear to have been under active agriculture in the recent past. Lack of agriculture can also be linked to the low amounts of rainfall received.

The farms proposed for mining by Gilmoie is currently used for grazing by livestock and zoned as industrial due to the mining activities taking place in the larger area. There are no major impacts on the land use since the area is already zoned for industrial use. There is a negative impact on the bio-physical aspects of the land. The impact is therefore of **moderate negative** significance.

The **positive impact** of the Gilmoie Mining operations in the area include increased business opportunities, employment, greater demand for goods and services - including pressures for housing (ability to own houses), etc.

#### **STATUS OF IMPACT:**

##### **Operational Phase:**

The Gilmoie Mining operational activities will have negative impacts of air pollution due to dust, visual impacts due to mining, restricted access, loss of grazing land, and loss of land for cultural or traditional practices. There is a **moderate to high negative** impact on the bio-physical aspects of the land on farms where the Gilmoie Mining is situated. The land may revert to grazing purposes after mining. Proximity of the Gilmoie Mining to also adds to negative impact and sentiments.

The mining areas will be fenced-off and access to the land will be restricted due to safety reasons during the entire life of mine. The communities( Vaaltyn and Mokgareng) will therefore be deprived of the notion of “the sense of place” and their respective sentimental attachments to their land.

The positive impact of mining in the area includes increased business opportunities, greater demand for goods and services. The economic benefits will therefore be of high positive significance.

**Decommissioning and Closure:**

The land where Gilmoie Mining proposes to mine will be rehabilitated to as close as practically possible to its pre-mining/ conditions. The opencast void will remain a permanent depression and any backfilling with over-burden material will be applied where practical subject to availability of the said over-burden. The waste dumps may be re-processed to reclaim any material of value, and sold to the open market. The net effect is that eventually the waste dumps will be significantly reduced in size and graded to conform to the surrounding slope configuration and the land reverted to grazing and wilderness.

All surface infrastructure will be removed from site - unless re-used for secondary purposes such as tourism but within the limitations of health and safety requirements.

**OPERATIONAL PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Medium	6	Long Term	4	Highly Likely	4
<b>SIGNIFICANCE RATING (SR) - Medium</b>							<b>48</b>

**DECOMMISSIONING PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Medium Term	3	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low</b>							<b>27</b>

**NO GO OPTION:**

If the Gilmoie Mining proposed activity does not commence, the current landuse will remain with no change.

**CUMULATIVE IMPACTS:**

Potential secondary industries and the need for housing development for workers will further alter the existing landuse within the proposed mining area. The area is used for grazing by livestock and agricultural activities. The industrial landuse will continue to transform the way of life for the local communities.

**6.3.11 Heritage and Cultural Aspects**

**NATURE:**

There has been no record of any archaeological or heritage sites identified within the proposed Gilmoie Mining footprint. Open pit mining and earth-moving machinery disturbs and destroys the surface and sub-surface components of the earth crust. These are the two areas where cultural or archaeological resources can exist if present. In the unlikely event that some cultural, heritage or archaeological resources are encountered during any future construction of associated surface infrastructure, these may be destroyed by the earth moving machinery used in both activities. The Gilmoie Mining footprint consists mostly of flat undisturbed landscape.

**Stone Age**

No Stone Age material was found within the Gilmoie Mining operations site. No natural shelters were seen during the field survey and therefore it is possible that no people stayed within the area. It is assumed that Stone Age people probably would have moved through the area, but it is unlikely that they settled here.

**Iron Age**

No Iron Age occurrences were identified. Isolated potsherds may however be unearthed during mining/earth-moving activities.

**Historical Age**

The historical age started with the first recorded oral histories in the area. It includes the moving into the area of people that were able to read and write. This era is sometimes called the Colonial era or the recent past. It is important to note that all cultural resources older than 60 years are potentially regarded as part of the heritage. Historical artifacts, sites or material are likely to be found within the vicinity of Gilmoie Mining operations, BUT NOT within the mine footprint itself.

No graves were identified within the Gilmoie Mining right application site.

**STATUS OF IMPACT:**

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, hence they can be avoided or cared for in the future.

**Operational Phase:**

The status of the impact is considered as **low negative** significance since no cultural and heritage resources have been encountered during and within the proposed Gilmoie Mining site.

The cultural and historic remains are area specific and very important to the cultural and values of the area. In the unlikely event that some resources are encountered during operations of the mining/ Gilmoie Mining activities, the impact will become of **moderate negative** significance since the earth moving equipment will destroy such resources to the detriment of the local people or inhabitants - especially the descendants of the people living in and around the area of the proposed mining like the Mokgareng and Vaaltyn communities.

**Decommissioning and Closure Phase:**

Gilmoie Mining will form part of the history of the local area. Some mine infrastructure may be preserved as local heritage resources.

OPERATIONAL PHASE:							
EXTENT		INTENSITY		DURATION		PROBABILITY	
Footprint and Site	2	Low	4	Long Term	4	Possible	2
SIGNIFICANCE RATING (SR) - Low						20	
DECOMMISSIONING PHASE:							
EXTENT		INTENSITY		DURATION		PROBABILITY	
Footprint and Site	2	Low	4	Medium Term	3	Probable	1
SIGNIFICANCE RATING (SR) - Insignificant						9	
NO GO OPTION:							
The Gilmoie Mining operations area is pristine piece of land as no communities and businesses have live in the proposed site.							
CUMULATIVE IMPACTS:							
Any mine infrastructure preserved after closure will form part of the history of the local area. No other cumulative impacts are anticipated.							

### 6.3.12 Socio-Economic Aspects

#### NATURE:

The Gilmoie Mining has a continual beneficial input to the region - local and district municipalities - providing direct employment with well-planned training and the ongoing upgrading of skills. A large number of people will also indirectly employed providing supplies and services.

Gilmoie Mining has a capital investment into the Municipal area. The monthly production costs are approximately **R1 million** into the local economy of the area. A high percentage of residents around the proposed mine are unemployed. Gilmoie Mining will alleviate the unemployment problem to some extent, though it does not eradicate it completely. Approximately 36 people will be employed permanently at the Gilmoie Mining with an estimated annual salary and labour costs of just over **R480 thousand**.

The monthly production costs are approximately **R1 million**. Local business will benefit by providing supplies and services to the mine. Secondary industries are also likely to develop due the existence of Gilmoie Mining. The life of mine (LOM) for Gilmoie Mining is expected to be over 25 years, which translate to a definite 25 years and more of economic activity in the region.

The Gilmoie Mining operations will contribute to the massive employment in the adjacent area, but not the bigger region. Figure 10 outlines the various possible social change paths that can emanate from the Gilmoie Mining operations.

The social and labour plan to be implemented by Gilmoie Mining will also contribute to the development of the adjacent communities in terms of skills training, local economic development operations, and improved infrastructure.

**STATUS OF IMPACT:****Operational Phase:**

The impact will be positive to the local and regional economy and those who will get jobs at the Gilmoie Mining operations. The number of actual jobs and contracts that have been created render the Gilmoie Mining operation to be of **high positive** significance. This will further be enhanced by the possible secondary economic activities that may arise within Taung Local Municipality.

Increase in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around Gilmoie Mining area.

**Decommissioning and Closure:**

Gilmoie Mining will inject revenue and income to the Taung Municipal area and local residents during the 25-30 year life of mine (LOM). In addition, due to raw material being sourced outside the existing mine premises the LOM of mine for Gilmoie Mining may go beyond the envisaged 25 years. Skilling and training of local people will make them more marketable to other industries in the region. LED projects will continue to sustain economic activity post Gilmoie Mining .

**OPERATIONAL PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Local and Regional	3	Very High	10	Long Term	4	Definite	5
<b>SIGNIFICANCE RATING (SR) - High (+ve)</b>							<b>85</b>

**DECOMMISSIONING PHASE:**

EXTENT		INTENSITY		DURATION		PROBABILITY	
Local and Regional	3	Medium	6	Medium Term	3	Likely	3
<b>SIGNIFICANCE RATING (SR) - Low (+ve)</b>							<b>36</b>

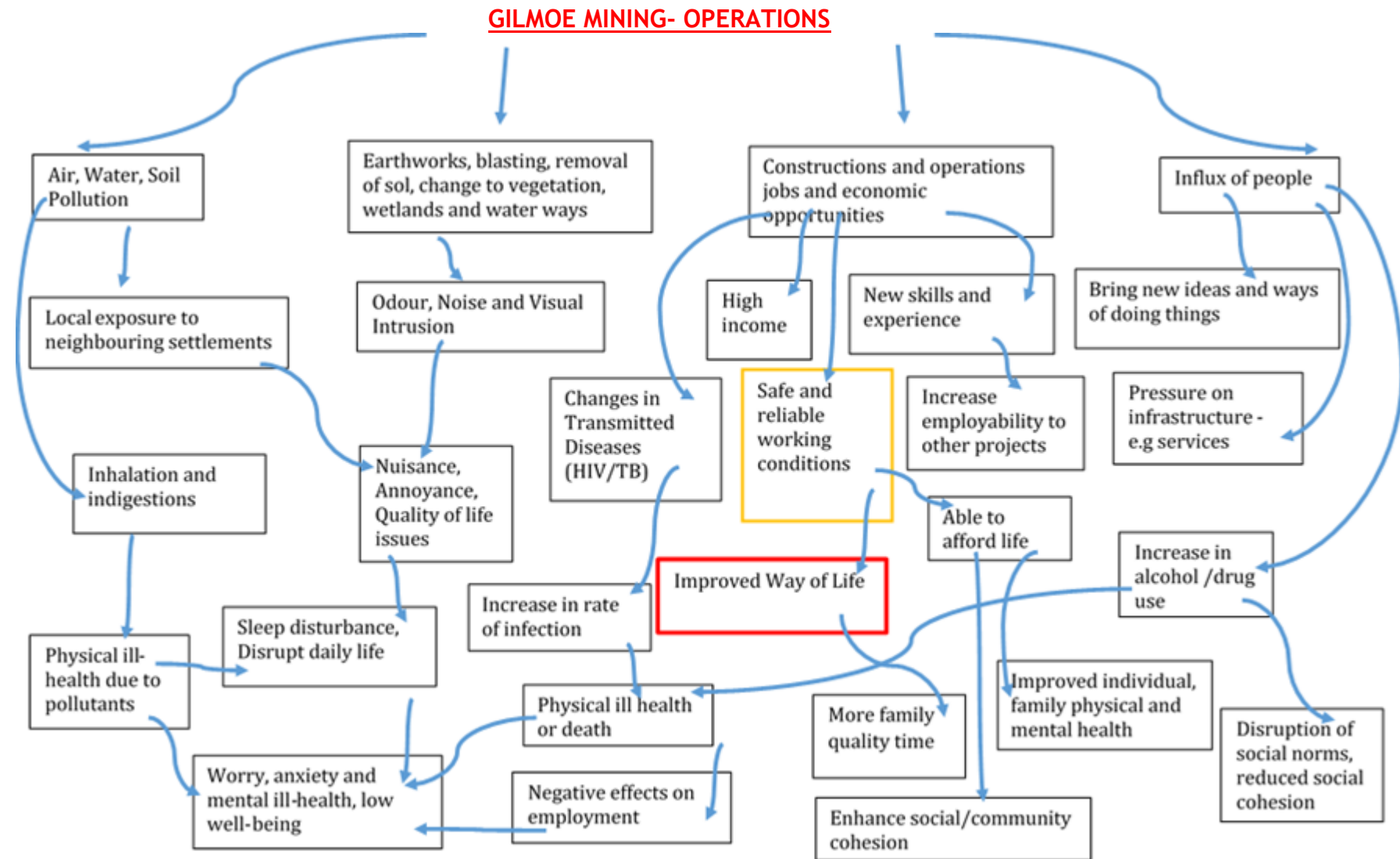
**NO GO OPTION:**

The current high levels of employment and moderate economic empowerment will remain in the adjacent communities.

**CUMULATIVE IMPACTS:**

Cumulative impacts of socio-economic change include increase in crime, alcohol abuse, prostitutions, HIV and AIDS, other transmitted diseases, influx of foreign people and change in social fabric of the community, and improved quality of life.

Figure 10: Potential Social Change Paths due to Gilmoie Mining Operations





### 6.3.13 Visual Aspects

#### NATURE:

The Gilmoie Mining site is not visible from the main tarred road. The site is visible to some settlements situated on the eastern side of the mining site.

The visual impact of the Gilmoie Mining operations is of **moderate to high negative** significance to the local residents and road users. The proposed Gilmoie Mining operations will however remain of high negative significance due to the following factors:

- The vertical configuration and elevation of the site will create a high visual contrast with the surrounding areas, which are somewhat greener and less uniform. Therefore, this aspect must be addressed by eventually restoring the average natural level of the site with grading and sloping of any remaining waste dump material to conform to the surrounding horizontal configuration. In the first phase of rehabilitation, topsoil dumps, trees and natural vegetation may be used to disguise the Gilmoie Mining operations as far as possible and provide some degree of stabilization of the substrate;
- The proposed Gilmoie Mining activity will add the presence of man-made infrastructure and man-made forms (straight lines, bold colours, etc.)

The proposed mining and its surface infrastructure will change the aesthetic character of surrounding area by permanently changing the landscape. Proposed Gilmoie Mining activities and waste dumps will be visible to some parts of residential areas.

#### STATUS OF IMPACT:

##### **Operational Phase:**

The visual impact is **negative and of high** significance. The mine/ Gilmoie Mining is not visible to most communities in the area. The impact is **highly negative** from a residential point of view since the mine/ Gilmoie Mining is not entirely visible to the communities in the area.

##### **Decommissioning and Closure Phase:**

Progressive rehabilitation will be implemented throughout the life of the Gilmoie mine, such that as closure approaches a significant portion of the Gilmoie Mining site would have been rehabilitated to conform to surrounding environmental characteristics and topographic features. This is subject to strict implementation and compliance with this EMP report. Over time and towards closure the visual impact should gradually change from high to moderate and low after final rehabilitation is complete.

#### OPERATIONAL PHASE:

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	High	8	Long Term	4	Definite	5
<b>SIGNIFICANCE RATING (SR) - Medium</b>						<b>70</b>	

DECOMMISSIONING PHASE:							
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Medium	6	Medium Term	3	Likely	3
<b>SIGNIFICANCE RATING (SR)</b>							<b>33</b>
<p><b>NO GO OPTION:</b>            The communities around Gilmoie mine may have come to terms with views/visuals of existing mining and Gilmoie Mining infrastructure and changes in landscape. They will unlikely be affected in any way if the Gilmoie Mining activity does not commence.</p>							
<p><b>CUMULATIVE IMPACTS:</b>            Continued loss of the “sense of place”.</p>							

## SECTION 7 - ENVIRONMENTAL MANAGEMENT PROGRAMME

### DESCRIPTION OF ENVIRONMENTAL OBJECTIVES AND SPECIFIC GOALS FOR MINE CLOSURE

#### 7.1 Environmental Aspects that Describe the Pre-Mining Environment

The detailed description of the environmental aspects is outlined in Section 4 under the description of the baseline environment.

#### 7.2 Measures Required to Contain/Remedy Causes of Pollution/Degradation or the Mitigation of Pollutants for Closure of Mine and Post Closure

##### 7.2.1 Topography

###### **CLOSURE OBJECTIVE:**

The waste dumps will be created over the life of mine/ Gilmoie Mine. If any are left behind at the time of closure, these will be sloped and graded to an angle suitable for application of topsoil, and re-vegetated, where practical. The slope will conform to the surrounding topography. Safety signs will be placed around the mine site.

Sloped configuration must conform to the surrounding topography.

Demolition and removal of all structures - including all the product and raw material stockpiles, dumps, surface infrastructure (buildings, workshops etc), and access roads when Gilmoie Mine ceases. Any structure not demolished in terms of section 44 of MPRDA, will be done in consultation and approval of the DMR Regional Manager.

Topsoil stockpiles will be removed and used in various rehabilitation purposes.

Prevention of storm water pollution from any remaining waste dump.

<p><b><u>IMPACT:</u></b> The waste created areas of elevated topography that rises above the natural horizontal configuration.</p> <p>Excavation created by the open pit mine.</p>	<p><b><u>MITIGATION:</u></b> Some waste will be reclaimed. Where practical, if any are still left at the time of closure, these will be sloped to resemble the surrounding land configuration / landscape and rehabilitated with indigenous vegetation. It is expected that no mining/ Gilmoie Mining operations will take place after the rehabilitation.</p> <p>End use of any remaining waste should be discussed and agreed with the surface owners and adjacent communities well in advance so that the mining method and progressive rehabilitation conducted is done in line with the agreed closure objectives and targets. The Principal Inspector of Mines and Regional Manager must be consulted in the regard.</p> <p>Waste and inert raw materials must be collected and re-deposited in the mined out pit areas as backfill material. While every effort will be made to backfill the open-pit where practical, it will however not be possible to completely backfill the mined open-pit. Some resultant excavation or depression will remain permanently.</p>
<p><b><u>IMPACT:</u></b> Removal and stockpiling of topsoil for subsequent rehabilitation.</p>	<p><b><u>MITIGATION:</u></b> Natural weathered rock and topsoil will be removed from the areas to be developed for any infrastructure, raw material stockpile and/or access roads prior to the commencement of such activities, and stored separately for later use in rehabilitation.</p>
<p><b><u>IMPACT:</u></b> Permanent dumps after mining.</p>	<p><b><u>MITIGATION:</u></b> Some temporary waste dumps/raw material stockpiles may be created as mining progresses, and not at the designated waste dump/stockpile areas. It is planned that all such dumps/stockpiles will be collected and transferred to the designated waste dump sites, sloped and re-vegetated as part of the overall waste dump rehabilitation.</p> <p>Care must be enforced not to scatter waste and over-burden all over the mine/ Gilmoie Mining working sites at the site as this will be unsightly and difficult to rehabilitate.</p>
<p><b><u>IMPACT:</u></b> Construction of access roads and mine surface infrastructure. Stockpiling of raw materials.</p>	<p><b><u>MITIGATION:</u></b> All buildings and surface infrastructure will be demolished and removed when mining activities cease. This process will be in consultation with the Regional Manager in terms of Section 44 of the MPRDA, 2002.</p>

		All stockpiles of the minerals and any unused raw materials will be removed and sold for various markets in the region, nationally and internationally. All the processed minerals will be loaded onto tipper trucks and transferred to the market area.					
		Surface or storm water control structures (berms or trenches) will be constructed around high pollution areas such as waste dumps in line with the prevailing contours and drainage patterns.					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Confined to the openpit, waste dumps and Gilmoie Mining area	2	Low	4	Long Term	4	Definite	5
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>50</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
Progressive rehabilitation and sloping of used-up/completed waste dumps - (annual).							
Demolition of any unused or defunct surface infrastructure during mining operations - (annual).							

### 7.2.2 Climate

<b><u>CLOSURE OBJECTIVE:</u></b> Management of greenhouse gas emissions and prevention of climate change	
<b><u>IMPACT:</u></b> Use of natural resources and fossil fuels, emission of greenhouse gases (CO <sub>2</sub> , NO <sub>x</sub> ) and clearance of vegetation.  Emissions from furnace, baghouse, machinery and use of fuel.	<b><u>MITIGATION:</u></b> Use of cleaner technologies to prevent greenhouse emissions; Setting objectives and target to reduce use of fossil fuels, and other natural resources in the mining/ Gilmoie Mining operations; Determination of the Gilmoie Mining Carbon Footprint, and reduction thereof; Off-setting of the environmental impacts from the mine with some rehabilitation programmes/operations within the area - including outside the mine/ Gilmoie Mining (such as working for wetlands or for waste); Re-vegetation and rehabilitation programme to replace removed vegetation.

EXTENT		INTENSITY		DURATION		PROBABILITY	
Local and Regional	3	Medium	6	Long Term	4	Likely	3
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>39</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
Carbon Footprint - (annual);							
Objectives and targets to reduce use of fossil fuel - (quarterly);							
Objectives and targets to reduce dust into the atmosphere - (quarterly);							
Progressive rehabilitation and re-vegetation - (annual).							

### 7.2.3 Soils and Geology

#### **CLOSURE OBJECTIVE:**

To conserve topsoil that will be used in various rehabilitation and re-vegetation programmes when mining/ Gilmoie Mining.

To ensure rapid and easy establishment of vegetation over rehabilitated areas.

Progressive rehabilitation and re-vegetation.

To prevent and minimize soil erosion, which is crucial in rehabilitation.

To minimize wind erosion, and loss of soil needed for rehabilitation.

To contain any oil, fuel or chemical pollution and the spread of such pollution into the soil and underground and surface water structures.

To clean any oil contaminated soil for reuse during rehabilitation.

Optimal exploitation of the mineral (dimension stone) as per the approved mining right and EMP.

<p><b><u>IMPACT:</u></b> Vegetation clearance, removal and stripping of topsoil prior to development and construction of surface infrastructure and waste/overburden dumps, raw material stockpiles, access/haul roads and storage for later rehabilitation.</p> <p>Topsoil management and protection during mining operations.</p>	<p><b><u>MITIGATION:</u></b> Topsoil (top 200mm layer minimum) must be removed prior to the commencement of construction/development of any new Surface Infrastructure - Access Roads, Waste and Over-Burden Dumps, Raw Stockpile Areas - by earthmoving equipment. Topsoil must be stored in heaps of not higher than 3m in the designated stockpile areas, and in a way that prevents damming. Storm water control structures should be constructed to preserve the soil and prevent erosion. The soil stockpiles should be vegetated to maintain soil ecology and micro-organism life. Stored topsoil must not be compacted.</p> <p>Prior to topsoil stripping any large trees or obstacles will be removed to ensure a safe and efficient topsoil stripping operation. Any rare species of trees will be transplanted. All grasses and organic material will be left in-situ to be stripped with the general topsoil horizon. This will have the effect of preserving the seed content of the soil horizon.</p> <p>Topsoil must not be used as fill material for backfilling of any excavations on site. Over-burden material must be used for such purposes.</p>
<p><b><u>IMPACT:</u></b> Topsoil compaction by heavy vehicles and machinery.</p>	<p><b><u>MITIGATION:</u></b> Compacted soils on the mining site will during operations and after Gilmoie Mining closure be loosened to a depth of 300mm, scarified and stabilized. The soil will then be shaped according to the prevailing contours, fertilized and re-seeded with indigenous vegetation seeds.</p>
<p><b><u>IMPACT:</u></b> Erosion of bare and exposed areas and other disturbed places as result of storm water run-off and wind.</p>	<p><b><u>MITIGATION:</u></b> Monitoring of the success of the re-vegetation programme will form part of the concurrent rehabilitation and EMP performance assessment during the operational phase of the mine.</p> <p>All surface infrastructure, access and haul roads, waste and over-burden dumps will be equipped with storm water control structures such as culverts, and drainage trenches to minimize erosion.</p> <p>Access Roads will be wetted periodically with a water-truck/sprinklers to suppress dust and minimize wind based soil erosion.</p>

<b><u>IMPACT:</u></b>		<b><u>MITIGATION:</u></b>					
Diesel and fuel storage tanks and chemical storage.		All fuel, oils and chemical storage and use areas must be paved with concrete floors and bunded with at least a 50cm wall around to contain any spillages. Workshop areas must be equipped with properly designed and installed concrete sump systems to contain all the waste grease, oil and the chemicals during vehicle and machinery maintenance and repairs. These buildings must have storm water control structure around their entire perimeter to prevent surface runoff from coming into contact with contaminated areas.					
Possible contamination by fuel, oil and chemical spillages.		All heavy machinery and other vehicles must be checked regularly and maintained for leakages.					
		In the event of accidental/emergency spillages (e.g. puncture of a diesel tank or breaking of the containment wall) a competent industrial hazardous waste collection consultant/company must be contacted immediately for cleanup operations.					
		Where minor spillages do occur, the contaminated soil must be removed and collected into bags/bins for disposal at the hazardous waste disposal site by the appointed competent contractor.					
		Another measure that can be employed to deal with oil and fuel spillages is application of bio-remediation process to clean the contaminated soil, and re-use the treated soil for rehabilitation purposes.					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Footprint and Site	2	Low	4	Long Term	4	Definite	5
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>50</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
Topsoil stockpiles to manage incidents of erosion - (quarterly);							
Hydro-carbon spillages - (monthly);							
Topsoil stripping for new and expansion developments - (annual);							
Soil bio-remediation - (Ongoing).							



### 7.2.4 Surface Water

**CLOSURE OBJECTIVE:**

To conserve water resources, optimize water use and prevent pollution.

To prevent and minimize soil erosion and conserve vegetation.

Separation of clean and dirty water and compliance with Regulation 704.

Compliance with water resource use legal requirements.

**IMPACT:**

Water use and management

**MITIGATION:**

The Gilmoie Mining follows a zero discharge policy and the pollution control facilities and associated water management infrastructure is designed in accordance with the requirements as contained in GN 704 Regulations. Ore dressing process is a wet process and does require water use. The said ore dressing water is contained and re-used in the process.

In this instance clean water separation from dirty water on the mining/ Gilmoie Mining footprint is induced allowing direct runoff of clean water towards natural watercourses and containment of dirty water. Surfaces within the dirty areas will be kept to a minimum to reduce the volume of dirty runoff generated by Gilmoie Mining activities.

Existing storm water control structures will have to be upgraded to properly contain run-off from the site - especially the channels to the return water dams down-slope of the mine/ Gilmoie Mining site. All ponds and small pools must be de-watered immediately following rains or storms. The said water must be pumped into the on-mine water reservoir or used as process water for dust control on the mining access roads and mineral processing.

**IMPACT:**

Construction of Future/New Gilmoie Mining Infrastructure:

**MITIGATION:**

Water quality (for surface and groundwater) should adhere and comply with the Resource Quality Objectives set for the catchment.

<ul style="list-style-type: none"> <li>• Clearance of operations foot print could lead to increased sedimentation and siltation;</li> <li>• Haul road construction will alter the natural characteristics of the drainage system;</li> <li>• Accidental spills could lead to water pollution.</li> </ul>	<p>Eco-classification for the affected catchment in terms of PES and EISC shall be maintained at <b>Class C</b>.</p> <p>In the event of new/future construction of pipelines, haul roads and road servitudes (disturbance zones) in or adjacent to riparian zone is to be managed and strictly controlled to minimize damage to the impoundment, rivers and wetlands (none identified within the vicinity of Gilmoie Mining).</p> <p>In-stream habitat conditions (with regard to the river's morphology) should be recreated as far as possible; this pertains to those areas where construction activities will disturb the in-stream habitat beyond the operational footprint of the haul road crossings, culverts or bridges. Gilmoie Mining operations does not affect any of the surrounding rivers or drainage channels as there is no river within or close to the site.</p>
<p><b><u>IMPACT:</u></b></p> <p>Clay, Shale, Limestone and Quartz mining activities:</p> <ul style="list-style-type: none"> <li>• Accidental fuel, oil and chemical spills could lead to water pollution;</li> <li>• Runoff from raw material stockpiles, plant area and other surface infrastructure to pollute water resources.</li> </ul>	<p><b><u>MITIGATION:</u></b></p> <p>Obtain IWULA for all water uses at Gilmoie Mining.</p> <p>Operate a Zero Effluent Discharge Facility - Contain and reuse all process water.</p> <p>Dirty and clean storm-water should be separated systems. Dirty storm-water to be contained.</p> <p>The erosion down verges on the approach to a water course should be minimised by including frequent discharge points with energy dissipaters before discharging storm water into the adjacent grasslands (where applicable).</p> <p>Infiltration down the verges of the roads rather than surface runoff should be encouraged (this could for example include the use of grassed swales, Hyson Cells or grass blocks). The construction of small detention ponds filled with <i>Phragmites</i> reeds would allow sediment and debris/litter to be trapped before entering the main drainage lines.</p> <p>Where storm water enters the water resource sediment and debris trapping, as well as energy dissipation control structures should be put in place.</p>

		<p>Litter traps should be incorporated into the storm-water designs to ensure that litter runoff from the site cannot enter catchments or other tributaries directly.</p> <p>Turbidity, sedimentation and chemical changes to the composition of the water must be limited.</p> <p>Storm water systems to be designed in such a way that it can be easily sealed off after the occurrence of a spill. If a spill occurs during the operational phase of the water use, a qualified team of experts will need to be consulted, rehabilitation plan drawn up and implemented and the Regional DWS Office should be informed immediately.</p> <p><b>General Management Actions:</b></p> <ul style="list-style-type: none"> <li>▪ Clean water diversion (bunds/ canals).</li> <li>▪ Good housekeeping (clean-up of spills and minimise informal storage of materials).</li> <li>▪ Leak detection through inspection.</li> <li>▪ Good housekeeping (maintenance of equipment).</li> <li>▪ Storm water diversion upstream of the mining/ Gilmoie Mining facilities.</li> <li>▪ Isolate pollution sources with roofs, concrete bases, traps, sumps and bund walls (e.g. diesel/petrol storage, wash bays and workshops).</li> <li>▪ Roads will be maintained.</li> <li>▪ Vehicle maintenance will be conducted on bunded concrete surfaces/workshops.</li> </ul>					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Long Term	4	Likely	3
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>30</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
<p>Surface water monitoring program - (Monthly);</p> <p>Ground water monitoring program - (Bi-Annually);</p> <p>Where vegetation removal has occurred within the mining/ Gilmoie Mining area, monitoring should take place to ensure successful re-establishment of natural vegetation - (Ongoing);</p> <p>Alien vegetation should be removed from these disturbed areas on an ongoing basis to ensure the successful re-vegetation by indigenous species - (Ongoing).</p>							

### 7.2.5 Ground Water

<p><b><u>CLOSURE OBJECTIVE:</u></b></p> <p>Conserve and re-use water resources in the mining/ Gilmoie Mining operations.</p> <p>To contain any oil, fuel or chemical pollution and the spread of such pollution into the soil and underground and surface water structures.</p> <p>Water quality management and pollution prevention.</p> <p>Compliance with water resource use legal requirements.</p>	
<p><b><u>IMPACT:</u></b></p> <p>Abstraction of ground water. Over extraction of borehole water for domestic and operational requirements.</p>	<p><b><u>MITIGATION:</u></b></p> <p>Obtain IWULA for all water uses at Gilmoie Mining.</p> <p>The development of the on-mine reservoirs to store and recycle water for mining/ Gilmoie Mining processes (mainly dust suppression, cooling and ore dressing) will greatly reduce the need to pump ground water for operational purposes.</p>
<p><b><u>IMPACT:</u></b></p> <p>Effect of open pit mining and waste dumps on the surrounding water table levels and ground water quality.</p>	<p><b><u>MITIGATION:</u></b></p> <p>Ground water will be routinely monitored at dedicated boreholes around the mine site to test and determine the water quality and table levels.</p> <p>Identify and where possible, maximise areas of the mine that will result in clean storm water runoff (for example open veld areas) as well as infrastructure associated with the mine/ Gilmoie Mining (for example haul/access roads) and ensure that runoff from these areas is routed directly to natural watercourses and not contained or contaminated.</p> <p>Prevent the erosion or leaching of materials from any residue deposit or stockpile from any area and contain material or substances so eroded or leached in such area by providing suitable barrier dams, evaporation dams or any other effective measures to prevent this material or substance from entering and polluting any water resources.</p>

	<p>Water quantity and quality data should be collected on a regular, ongoing basis during Gilmoie Mining operations. These data will be used to recalibrate and update the Gilmoie Mining water management model, to prepare monitoring and audit reports, to report to the regulatory authorities against the requirements of the IWMP and other authorisations and as feedback to stakeholders in the catchment.</p> <p>Water that has been in contact with residue/waste dumps, and must therefore be considered polluted, must be kept within the confines of the mine/ Gilmoie Mining waste dumps until evaporated, treated or rendered acceptable for release, or re-used in some other way.</p> <p>In the unlikely event that any surrounding boreholes decrease in yield, Gilmoie Mining may be to supply the owners with a volume of water as agreed upon between the parties involved - should the said decrease be attributed to the Gilmoie Mining operations.</p> <p>Separate any future acid generating material and non-acid generating material, as may be characterised by geochemical sampling and analyses, during mining/ Gilmoie Mining operations.</p>
<p><b><u>IMPACT:</u></b> Ground water pollution as a result of fuel, oil, and chemicals contamination.</p>	<p><b><u>MITIGATION:</u></b> Gilmoie Mining operations will follow a zero discharge policy and the pollution control facilities and associated water management infrastructure will be designed in accordance with the requirements as contained in GN 704 Regulations.</p> <p>Water quality (for surface and groundwater) should adhere and comply with the Resource Quality Objectives set for the catchment.</p> <p>All workshops and fuel, oil and chemical storage area must be properly constructed and maintained, and must have emergency procedures in place to deal with accidental spillages to avoid underground water contamination.</p> <p>All spillages (fuel, oil, chemicals) should be immediately removed and stored in designated area - such as bunded wall waste oil storage areas to prevent possible contamination of ground water. These spillages must be properly disposed-off to the hazardous waste site by the appointed competent contractor.</p>

				Monitoring boreholes around the waste/overburden dumps, and near water resource entities are in place to continuously monitor the ground water regime, water table levels and quality alterations and detection of any pollution that may result from mining/ Gilmoie Mining operations and deposition of waste/stockpiles on the surface.			
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Long Term	4	Highly Likely	4
<b>SIGNIFICANCE RATING (SR)</b>							<b>40</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b> Surface water monitoring program - (Monthly); Ground water monitoring program - (Quarterly);							

### 7.2.6 Air Quality

#### **CLOSURE OBJECTIVE:**

Protect and maintain the health and welfare of employees against dust and other air pollutants.

Minimize smoke, emissions and dust pollution on the mine/ Gilmoie Mining and the surrounding settlement areas.

Keep records of pollution levels to inform adequate impact management and minimization measures.

Minimize and prevent greenhouse gas emissions into the atmosphere.

#### **IMPACT:**

Smoke and dust pollution due to use of earth moving equipment (bulldozers and front-end loaders).

#### **MITIGATION:**

Repair and maintenance of vehicles and machinery to prevent exhaust emissions. Use of clear and greener technologies and fuel.

Smoke and dust from plant		Dust monitoring will be conducted during the life of mine to determine the prominent wind directions and dust / dust levels at various points around the mining site. The bag-house system must be maintained regularly to work at 96% efficiency as per the existing air quality permit conditions to avoid Clay, Limestone, Shale and Quartz dust emissions onto the atmosphere.					
Dust generated by stockpiling, ore dressing processing and handling and dust generated from vehicles transporting materials via haul roads crossing the mine/ Gilmoie Mining site.		In terms of the requirements of the Mine Health and Safety Act, 1996, Gilmoie Mining (or its appointed contractor) must provide protective clothing and equipment for all its employees, and must periodically conduct risk assessments and medical check-ups to analyse and monitor the effects of dust and smoke on the staff members and the surrounding receiving environment.					
In windy conditions dust/ dust from Clay, Limestone, Shale and Quartz mining may be blown into the residential area close to the mine/ Gilmoie Mining.		Wetting of the access roads to Gilmoie Mining operations with water periodically to suppress the dust will greatly reduce the impact of dust. This wetting with water must be done daily during dry and windy seasons.					
Dust generated by ore dressing activities.		Dust and air quality monitoring will be conducted during the life of mine to determine the prominent wind directions and dust/emissions levels at various points around the Gilmoie Mining site.					
		Progressive re-vegetation of the mine site to minimize and prevent wind-blown dust pollution.					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Medium	6	Long Term	4	Highly Likely	4
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>48</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
Dust Monitoring - (Monthly);							
Air Quality and Emissions Monitoring - (Bi-Annual)							

### 7.2.7 Noise

**CLOSURE OBJECTIVE:**

Keep noise pollution as low as possible, and minimize disturbance to the surrounding settlements/businesses during mining/ Gilmoie Mining operations. Minimize disruptions of the daily practices and social fabric.

Protect the health of the employees and surrounding communities during mining/ Gilmoie Mining operations.

Record and maintain the records on the health of in-coming and out-going employees.

**IMPACT:**

Noise pollution generated from the plant ,haul roads and surface infrastructure operations working sites.

**MITIGATION:**

Waste dumps and stockpiles can act as a noise barrier/berm for both daytime, and night-time activities - should the need arise. However, this aspect is not applicable to Gilmoie Mining. Gilmoie Mining will operate both daytime and night-time shifts. As a guideline night-time work should be limited to localities that are further than:

- 2,000 m from a noise-sensitive community when there is a direct line of sight (no barrier between the activity and receptor);
- 1,000 m from a noise-sensitive community when there exists a barrier (waste dumps/stockpiles) between the activity and receptor.

The following factors/specifications should be considered when implementing a berm as an acoustical screen:

- It is recommended that the barrier be built as close as feasibly possible to the mining operations or receptor;
- It is recommended that the height of the berms/barriers be at least 2 - 3 m higher than the line of sight to the highest noise source from operational areas, although the higher the berm/barrier the better acoustical screen tool it will be<sup>1</sup>. Certain heavy vehicles have their exhaust ports above the cabin of the vehicle and needs to be considered as the noise source point. Barriers must also be sufficiently dense



	<p>(at least <math>10 \text{ kg/m}^2</math>)<sup>2</sup> and sufficient in thickness. A brick wall provides a surface density of <math>244 \text{ kg/m}^2</math> at thickness of <math>150 \text{ mm}^3</math> and is considered as a typically good acoustical barrier. Certain metrological conditions (particularly during night-times) can see refraction of noise over the barriers due to the various temperature inversion layers. This means that noise levels from a mine/ Gilmoie Mining may propagate back down to the ground at a receptors dwelling due to the curvature of sound in the warmer upper night-time atmosphere. Barrier height cannot effect this propagation;</p> <ul style="list-style-type: none"> <li>➤ The barrier should be sufficiently long to block the line of sight from receptors to the sides of the mining/ Gilmoie Mining operations;</li> <li>➤ No apertures (gaps, entrances) should be implemented at berms/high-walls and facing a receptors dwelling. This is due to security points and berm entrances where haul trucks need to stop and make use of air brakes and reverse alarms, which may cause a noise annoyance at a receptors property;</li> </ul> <p>The use the smaller/quieter equipment when operating near receptors;</p> <p>Ensuring that equipment is well maintained and fitted with the correct and appropriate noise abatement measures. Acoustical mufflers (or silencers) should be considered on equipment exhausts at the ODP/waste and stockpile areas. A noise absorption braid could be mounted on the front of heavy equipment radiators (ADT's, FEL's etc.) to prevent excess mechanical fan noise into the surrounding environment. Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised;</p> <p>Gilmoie Mining should investigate the use of white-noise generators instead of tonal reverse alarms on heavy vehicles operating on roads, waste dumps and at raw material stockpile areas. This option is highly recommended although it must be noted that reverse alarms is exempt from an acoustical assessment due to Government Notice R154 of 1992 (Noise Control</p>
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Regulations) - Clause 7(1) - *“the emission of sound is for the purposes of warning people of a dangerous situation”*; and

When noisy processes are to take place very close to potentially sensitive receptors (this could include smaller scale construction activities such as construction of boundary fencing, digging of trenches for cabling or development of access routes within 500 meters from a receptor), co-ordinate the working time with periods when the receptors are likely not at home. An example would be to work within the 8 am to 2 pm time-slot to minimise the significance of the impact due to:

- Potentially receptors are most likely at school or at work, minimizing the probability of an impact happening; and
- Normal daily activities will generate other noises that would most likely mask construction noises, minimizing the probability of an impact happening.

Ensure a good working relationship between the mining environmental representative and all potentially sensitive receptors. Communication channels should be established to ensure prior notice to the sensitive receptor if work is to take place close to them. Information that should be provided to the potentially sensitive receptor(s) include:

- Proposed working times;
- How long the activity is anticipated to take place;
- What is being done, or why the activity is taking place; and
- Contact details of a responsible person where any complaints can be lodged should there be an issue of concern.

In term of the requirements of the Mine Health and Safety Act, 1996 Gilmoie Mining (or its appointed contractor) must provide protective clothing and equipment for all its employees, and must periodically conduct risk assessments and medical check-ups to analyse and monitor the effects of noise on the staff members and the surrounding environment. Medical check-ups must be conducted by external specialists. All staff must have an exit medical check-up when leaving the employ of Gilmoie Mining.

Environmental awareness training should include a noise component, allowing employees and contractors to realize the potential noise risks that activities (especially night-time activities - if any) pose to the surrounding environment. All employees and contractors should receive this training.

				<p>Minimize equipment or processes at high levels, such as the development of the material tip being significantly higher than the surrounding landscape. It limits the mitigation of this noise using berms/high-walls. The mine/ Gilmoie Mining may consider keeping the material tip at ground height or even slightly below ground level.</p> <p>Ensuring that equipment is well maintained and fitted with the correct and appropriate noise abatement measures.</p> <p>Limit the maximum speed on the haul roads to 40 km/h or less. Road speeds should be kept as consistent as is feasibly possible between the various working areas/sites within Gilmoie Mining (i.e. no speed bumps to reduce noise or stop junctions). This would help in keeping road traffic noise more “linear” opposed to hearing different noise contributors from heavy vehicles (i.e. no ADT air brakes on long stretches of roads, no acceleration of vehicles from a stop junction using maximum capacity of engine in lower gears for pulling power etc.).</p> <p>If feasible road shoulders facing receptors should incorporate a kerb roughly half or more than the height of road vehicle tyres. The kerb could be constructed from any soil (likely the quickest and most feasible material option). The kerb could likely help in reducing noise from vehicle tyre and road interaction.</p>			
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Medium	6	Long Term	4	Highly Likely	4
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>48</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
Noise Monitoring - (Bi-Annual);							

### 7.2.8 Flora

#### **CLOSURE OBJECTIVE:**

Disturb and destroy as little as possible of the vegetation around the mine site.

Progressively re-establish the destroyed vegetation.

<p>Conserve vegetation.</p> <p>Enable successful re-establishment of the vegetation.</p> <p>Limit the areas (habitats) disturbed or destroyed.</p> <p>Demolition and removal of all structures when mining ceases. Any structure not demolished as per section 44 of MPRDA, will be done in consultation with Regional Manager.</p> <p>Rehabilitation of disturbed land surfaces.</p>	
<p><b><u>IMPACT:</u></b></p> <p>Clearing of vegetation for any new developments/expansion, stockpile areas, and mine surface infrastructure.</p> <p>Loss of habitat for vegetation.</p>	<p><b><u>MITIGATION:</u></b></p> <p>Wherever possible, any soil that can serve as a growth medium for plants must be stripped and stockpiled for future landscaping or rehabilitation after or during the operational phase and should be used as soon as possible after “harvesting” to ensure that seed sources does not become worthless due to decomposition of the seed over time.</p> <p>Water control structures should be constructed and well maintained to minimize erosion and to create a favorable habitat for the establishment of vegetation during and after rehabilitation/landscaping.</p> <p>Further destruction, pollution or any form of degradation of natural watercourses areas as well as their immediate catchment areas should be avoided as far as possible.</p> <p>Eradication and control of declared weed and invader populations in Gilmoie Mining operations area must take place as part of the ongoing environmental management of the mine.</p> <p>According to law in South Africa all natural wetlands are to be delineated and protected. There are no wetlands within Gilmoie Mining site and in the vicinity.</p> <p>A legitimate and well-designed rehabilitation plan must be set in place and be strictly enforced during the rehabilitation phase.</p>

		<p>Clearing of vegetation should be confined to the areas necessary for any future developments/expansions at Gilmoie Mining and associated infrastructure establishments.</p> <p>All the cleared areas will be re-vegetated, where possible, concurrent with and following the mining activities as outlined in this report.</p> <p>Waste dumps should be graded down and sloped - in such a way that slopes with a maximum of - but preferably 18° or less 18° - are constructed in order to minimize the negative effects of steep slopes. Water control structures should be constructed on rehabilitation areas to minimize erosion and to create a favourable habitat for the establishment of vegetation during rehabilitation.</p> <p>If any protected or medicinal plant species are identified during mining/ Gilmoie Mining operations, a plant nursery will be established through the mine Environmental Section, under the auspices of a qualified Botanist, to confirm the species and conserve the said protected species to maintain bio-diversity within the mining site. Medicinal plants will be made available to local users from the nursery.</p> <p>Waste dumps and overburden material will be sloped to resemble the surrounding land configuration/landscape and rehabilitated with indigenous vegetation where it is expected that no further deposition will take place after the rehabilitation. Plant species should be cultured in and around the un-disturbed mining area.</p>					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Mine/ Gilmoie Mining Footprint	1	Low	4	Long Term	4	Likely	3
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>27</b>
<b>ENVIRONMENTAL MONITORING:</b>							
Progressive Rehabilitation - (Annual).							
Monitoring and eradication of alien plant vegetation (Annual).							

## 7.2.9 Fauna

<b><u>CLOSURE OBJECTIVE:</u></b>							
Protect and conserve any faunal life in and around the mining area.							
Maintain safety and protection of animals and persons.							
Re-create the disturbed or destroyed micro habitats.							
<b><u>IMPACT:</u></b>				<b><u>MITIGATION:</u></b>			
Loss of faunal habitat,				The sites for Gilmoie Mining operations - including Waste dumps and surface infrastructure should be properly fenced to prevent trespassing and uncontrolled entry into the dangerous mining site by both wild and domestic animals.			
Displacement of fauna.				No hunting, snaring or trapping of any kind and of any animal or bird should be allowed on the mining area and the surrounding property. All animals - both wild and domestic that become trapped as a result of mining activities must be assisted and released into the surrounding area again. Should the animal or bird be of a species that cannot be caught by hand the matter must be immediately report to the local Department of Nature Conservation for assistance and involvement.			
Some of the waste/overburden dumps will add to the habitat of the area, and will contribute to the re-establishment of the species (both flora and fauna) during/after the mining activity is complete. The rock buttresses with numerous crevices, and overhangs will provide shelter for many species, particularly bats, lizards and snakes.							
<b>EXTENT</b>		<b>INTENSITY</b>		<b>DURATION</b>		<b>PROBABILITY</b>	
Mine/ Gilmoie Mining Footprint	1	Insignificant	2	Long Term	4	Possible	2
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>14</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b>							
Progressive rehabilitation and stray animals trapped within the mining/ Gilmoie Mining site - (Ongoing).							

## 7.2.10 Heritage and Cultural Aspects

### **CLOSURE OBJECTIVE:**

To protect and conserve any artefacts or finds of cultural, historic or pre-historic significance for the present and future generations.

Educate and sensitize staff on the importance of the historical/heritage artefacts or structures and preservation thereof.

Demolition and removal of all structures when mining ceases. Any structure not demolished in terms of Section 44 of MPRDA, will be done in consultation with the Regional Manager.

### **IMPACT:**

Destruction of possible historical, heritage and cultural artefacts and resources

Destruction of possible archaeological late iron age resources.

### **MITIGATION:**

All archaeological, paleontological, and heritage sites and resources must be preserved if they are of cultural, historic or pre-historic significance. This must be done under the auspices of a competent and qualified person. Some sites of historical significance were identified within the vicinity of Gilmoie Mining, but not within the Gilmoie Mining footprint.

Finds, if encountered during operations of Gilmoie Mining, must be reported to the NWHRA and responsible Mine Manager who will decide, after consultation with authorities, company representatives and local communities whether work may go ahead. Special precautions may be instituted to enable the operations or work to proceed.

Workers and staff must be made aware of the different aspects of the mine and how their specific job functions may affect historical artefacts if encountered via the environmental awareness plan and must report any findings immediately to the mine manager, who must in turn contact NWHRA.

When mining activities are completed, all buildings and structures will be demolished and removed. This process will be in consultation with local communities and the Regional Manager in terms of Section 44 of the MPRDA, 2002. Any building structures identified and agreed upon with local authorities and communities to have heritage/historic/cultural value will be preserved and protected, taking cognizance of the health and safety requirements.

		The local authorities/communities will assume responsibility for any such structures after mine closure.					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Low	4	Long Term	4	Possible	2
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>20</b>
<b><u>ENVIRONMENTAL MONITORING:</u></b> Ongoing awareness to possible heritage/historical/cultural finds.							

### 7.2.11 Socio-Economic Aspects

<b><u>CLOSURE OBJECTIVE:</u></b>	
Create economic activity, job market around area, and in turn poverty alleviation.	
Improved economic activity and opportunities and creation of multiplier economic effects due to the mine/ Gilmoie Mining around the area.	
Provincial and Local economic growth and improved way of life within the area.	
Prevention and minimization of social impacts such as alcoholism, crime, prostitution and teenage pregnancies.	
<b><u>IMPACT:</u></b>	<b><u>MITIGATION:</u></b>
Create economic activity, job market around the area, and in turn poverty alleviation.	Gilmoie Mining operations has resulted in some limited direct and indirect employment and training opportunities with improved standard of living for local communities as labour is sort locally.
Improved economic activity and opportunities and creation of multiplier	The Gilmoie Mining operation may contribute to improved road infrastructure and other services in and around Taung Local Municipality. The mine/ Gilmoie Mining will create



<p>economic effects due to the mine around the area.</p> <p>Provincial and Local economic growth and improved way of life within the area.</p> <p>Prevention and minimization of social impacts such as alcoholism, crime, prostitution and teenage pregnancies.</p>		<p>opportunities for the local suppliers to become part of the procurement process, and thus stimulate the local business and services.</p> <p>The mine has developed a Social and Labour Plan (SLP) in terms of Regulations 42-46 of the MPRDA, including a human resource development programme, a Local Economic Development Programme (LEDP), in line with the local and provincial authorities' initiatives and the municipal Integrated Development Plan (IDP), and processes pertaining to management of downscaling and retrenchment.</p> <p>Labour will continually be sort from the local settlement areas to prevent influx of foreign people and job seekers who are likely to disrupt the social fabric, values and norms of the local people.</p> <p>Reduced influx of foreigners will reduce other negative social issues such as crime, prostitution, and disruption of local values and cultural norms.</p> <p>Socio-economic opportunities should be enhanced, and local procurement for supplies and services should be implemented to ensure full economic benefit to the local communities - including surrounding communities and adjacent businesses.</p> <p>Agreed and market related compensation for loss of private and communal property.</p> <p>Housing and school developments within the local area will improve and enhance local property values.</p>					
EXTENT		INTENSITY		DURATION		PROBABILITY	
Local and Regional	3	Very High	10	Long Term	4	Definite	5
<b>SIGNIFICANCE RATING (SR) WITH ENHANCEMENT</b>							<b>85</b>
<p><b>ENVIRONMENTAL MONITORING:</b>  Local Economic Development - Ongoing  Social and Labour Plan - Ongoing</p>							

## 7.2.12 Visual Aspects

### **CLOSURE OBJECTIVE:**

Rehabilitate the land and minimize visual impact during and after mining/ Gilmoie Mining operations.

Revert back the land to as much as possible the original status before mining/ Gilmoie Mining operations.

Rehabilitate the land and minimize visual impact during and after mining/ Gilmoie Mining operations.

Demolition and removal of all structures when mining/ Gilmoie Mining ceases. Any structure not demolished in terms of Section 44 of MPRDA, will be done in consultation with the Regional Manager.

### **IMPACT:**

Visual impacts of the Gilmoie Mining Surface Infrastructure, Access Roads, Waste dumps, Open Pit Quarry.

### **MITIGATION:**

Open-pit and Waste dumps at Gilmoie Mining will be, where practical, sloped to resemble the surrounding land configuration/landscape and rehabilitated with indigenous vegetation where it is expected that no further operations/deposition will take place after the rehabilitation. Plant species should be cultured in and around the mine site.

The open-pit will be screened with vegetation to reduce the visual intrusion from adjacent communities.

Progressive rehabilitation must be implemented on the mining site. Overburden and Waste dumps side slopes will be graded to an angle suitable for plant growth and re-vegetated to blend and mask the visual intrusion.

When mining activities are completed, all buildings and structures will be demolished and removed. This process will be in consultation with local communities and the Regional Manager in terms of Section 44 of the MPRDA, 2002. The surface and soil area where these structures were must be scarified, leveled according to the prevailing contours and re-vegetated with indigenous plant species.

EXTENT		INTENSITY		DURATION		PROBABILITY	
Site and Local	2	Medium	6	Long Term	4	Likely	3
<b>SIGNIFICANCE RATING (SR) WITH MITIGATION</b>							<b>36</b>
<b>ENVIRONMENTAL MONITORING:</b>							
Progressive rehabilitation and re-vegetation of the mining site.							

## SECTION 8 - ENVIRONMENTAL OBJECTIVES AND SPECIFIC GOALS FOR MANAGEMENT OF IDENTIFIED ENVIRONMENTAL IMPACTS AND MONITORING ARRANGEMENTS

Regular monitoring of all the environmental management measures and components shall be carried out by the holder of the mining right, in order to ensure that the provisions of this programme are adhered to.

Ongoing and regular reporting of the progress of implementation of this programme will be done. Various points of compliance have been identified with regard to the various impacts that the operations will have on the environment. Inspections and monitoring shall be carried out on both the implementation of the programme and the impact on the social and environmental components.

### 8.1 List of Identified Impacts that Require Monitoring Programme

Aspect	Monitoring Required
Surface Water	Water Quality Monitoring at Identified Points
	Water Quality - River/Stream
	Water Quantity Monitoring
	Bio-Monitoring
Ground Water Monitoring	Impact on Water Levels - Boreholes
	Groundwater Quality - Boreholes
Air Quality Monitoring	Increase in Dust - Dust Buckets at Selected Sites
Noise Monitoring	Noise Measurements
Waste Monitoring	Waste Quantities Disposed

### 8.2 Functional Requirements for the Monitoring Programme

Aspect	Monitoring Required	Functional Requirements
Surface Water	Surface Water Quality - River / Streams	There is a legal obligation on the water user to establish a monitoring programme on site, which needs to be registered on the National Monitoring System administered by D: RQS. Water can only be monitored if there is water flow within the river / stream / treatment works / treatment unit.
	Surface Water Quantity	
	Surface Water Quality	
	Biodiversity	
Ground Water Monitoring	Ground Water Levels - Boreholes	The boreholes need to be accessible. These holes can be monitored on discretion of the mine and in relation to the requirements of the DWS and or water use licence depending on the locality of the mining/ Gilmoie Mining operations.

	Groundwater Quality and Levels - Boreholes	Boreholes in the area are used for operational and domestic water requirements.
Air Quality Monitoring	Dust and PM10 Dust from Clay , Shale, Limestone, Gypsum and Quartz mining	The monitoring data will be analysed and interpreted on a quarterly basis from the approval of the EMPR. This will enable verification of the information contained in regard to pre-operations ambient concentrations.  An annual air quality report may be produced and presented to both landowners and relevant Departments as required.  The positioning of the buckets and the PM <sub>10</sub> sampler will be done in conjunction with the landowners that reside around the Gilmoie Mining operations site.
Noise Monitoring	Noise Levels	Quarterly noise monitoring by an Acoustic Consultant as well as when noise complaints are registered. If no noise complaints or issues are registered or noise monitoring registers compliance with the National Noise Control Regulations, the frequency of the noise monitoring can be reduced.
Waste Monitoring	Waste Quantities	Volumes of waste removed and/or stored on site to be recorded.

### 8.3 Roles and Responsibilities for the Execution of the Monitoring Programme

Aspect	Monitoring Required	Roles and Responsibilities
Surface Water	Surface Water Quality - River / Streams	Environmental Manager/Officer
	Surface Water Quantity	
	Surface Water Quality	
	Biodiversity	
Ground Water Monitoring	Ground Water Levels - Boreholes	Environmental Manager/Officer
	Groundwater Quality and Levels - Boreholes	
Air Quality Monitoring	Dust and PM10 Dust from Clay, Shale, Limestone, Gypsum and Quartz mining	Independent Specialist Environmental Manager/Officer
Noise Monitoring	Noise Levels	Acoustic Specialist
Waste Monitoring	Waste Quantities	Environmental Manager/Officer

### 8.4 Time Frames for Monitoring and Reporting

Aspect	Monitoring Required	Time Frames
Surface Water	Surface Water Quality - River / Streams	Monthly Quarterly Reporting
	Surface Water Quantity	
	Surface Water Quality	
	Biodiversity	
	Ground Water Levels - Boreholes	Monthly Quarterly Reporting

Ground Water Monitoring	Groundwater Quality and Levels - Boreholes	
Air Quality Monitoring	Dust and PM10 Dust from Clay , Shale, Limestone, Gypsum and Quartz mining	Quarterly Bi-Annual
Noise Monitoring	Noise Levels	Monthly As per complaints
Waste Monitoring	Waste Quantities	Weekly Recording Monthly Reporting

## 8.5 List of Source Activities that may cause Impacts that Require Management

The list is comprehensive and some of the activities (marked\*\*) may not be applicable to Gilmoie Mining operations.

### Operational Phase

- River crossings\*\*
- Bridges\*\*
- Additional lighting during night-time
- Change of land use from natural vegetation and agriculture (livestock grazing) to industrial\*\*
- Collision of operational vehicles with faunal species\*\*
- Containment and use of precipitation
- Contamination from mining infrastructure
- Creation of dumps and temporary stockpiles
- Cutting and Screening Processes, Beneficiation
- Dirty water run-off
- Discharge and contamination from all operational facilities and mining infrastructure
- Drilling, Bulldozing, Excavator and Trucks.
- Dumping of hazardous and non-hazardous waste into the wetland areas\*\*
- Dust generation due to movement of vehicles and mining activities
- Emission fallout
- Erosion and sedimentation
- General operational activities
- Increase of alien plant species
- Increased erosion, dust generation and potential chemical contaminants
- Increased fire frequency and intensity
- Increased runoff volumes
- Increased vehicular and pedestrian movement
- Influx of foreigners and job seekers and increase in disposable income for local people may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area.
- Irrigation of the stockpile vegetation
- Land clearance
- Leakage from waste storage facilities.

- Loading of material (raw material);
- Loss of habitat
- Material handling
- Oil and fuel spills from vehicles
- Ongoing disturbance of soils
- Ongoing edge effects from mining operations
- Permanent River diversions\*\*
- Poaching\*\*
- Presence and movement of vehicles
- Proliferation of alien plant species
- Pumping and discharging of poor quality water
- River diversions\*\*
- Road wetting (dust suppression)
- Runoff and potential sewage discharge from the mine
- Runoff and seepage from operational facilities
- Runoff from stockpiles
- Runoff, seepage and discharge from the waste dump and other mining infrastructure
- Spillages and seepage of hazardous waste material
- Spillages from sanitary conveniences, fuel deposits or storage facilities
- Stockpiling
- Return water dams
- Stormwater channels and dams
- The dust and vehicle emissions generated by the mining activities
- Transformation of natural faunal habitat
- Trenches for the laying of pipelines
- Trucks dumping material at stockpiles (topsoil / softs / overburden).
- Uncontrolled fires
- Use of Potable water
- Vehicle movement
- Vehicle wash bays and workshop
- Vehicles accessing site through sensitive faunal habitat areas
- Waste generation

#### **Decommissioning and Closure Phase**

- Alien plant species proliferation
- Change of land use from industrial back to natural vegetation and agriculture (livestock grazing).
- Containment and use of precipitation
- Continued erosion and sedimentation
- Decommissioning activities
- Decommissioning of the plant and mining/ Gilmoie Mining Demolition activities
- Discharge from mining infrastructure
- Discharge from the dirty water systems
- Disturbance of faunal habitat
- Disturbance of soils

- Erosion and sedimentation
- Failure to implement a comprehensive alien floral control plan
- Failure to monitor rehabilitation efforts and implement the alien floral control plan
- Fire hazards
- Ineffective monitoring of rehabilitation
- Ineffective rehabilitation and monitoring
- Ineffective rehabilitation of exposed and impacted areas
- Insufficient aftercare and maintenance
- Lighting during the decommissioning and rehabilitation phase
- Mining/ Gilmoie Mining Operations Cease
- New disturbances during decommissioning and closure
- Ongoing risk of discharge
- Ongoing seepage and runoff from mining infrastructure
- Permanent River diversions\*\*
- Poor rehabilitation planning
- Poor vegetation cover,
- Pumping and discharging of poor quality water
- Seepage and runoff from decommissioned mining areas
- Spillages from sanitary conveniences, fuel deposits or storage facilities
- Stockpile areas
- The dust and vehicle emissions generated by the decommissioning activities
- Trenches for the laying of pipelines
- Uncontrolled fires
- Vehicle wash bays and workshop

#### **8.6 Description of How the Implementation of Action Plans will be Monitored**

Due to the extreme importance of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002): Minerals and Petroleum Resources Development Regulations, and to ensure that the Gilmoie Mining operations are in accordance with current legislation, (Mining Right Holder) will audit the EMPR and environmental performance in accordance with regulation 55 on an annual basis.

In addition, the requirements of the Environmental Authorisation, Waste and Water Use License will require additional internal and external audits to be conducted for the period of which the license is valid.

#### **8.7 Frequency of Proposed Reporting for EMP Performance Assessment**

A performance audit report will be submitted to the DMR after the audit done every one year.

Generally, the Environmental Authorisation, Waste and Water Use License require that an internal and external audit be conducted on an annual basis and the external audit report will be forwarded to the relevant authority as specified within the authorisation or licence.



## **8.8 Management Activities which, where applicable, will be Conducted Daily, Monthly, Quarterly, Annually or Periodically to Pollution or Environmental Degradation**

Management Activities which, where applicable, will be Conducted Daily, Weekly, Monthly, Quarterly, Annually or Periodically to Control any Action, Activity or Process which causes Pollution or Environmental Degradation.

### ***Soil Management***

#### ***Background information***

The Guidelines for the Rehabilitation of Mined Land (as provided by the South Africa Chamber of Mines) states that soil management during construction/expansion is the key process in determining rehabilitation effectiveness and that soil stripping guidelines should be developed for the construction crews which clearly defines the soil horizons to be removed and where and how to store them.

Stripping and stockpiling of topsoil is usually executed before the waste dumps are created in order to preserve topsoil for re-vegetation of the waste dumps. The aim of the soil management plan is to provide guidelines that should be followed during any phase of land preparation, clearing of vegetation or general construction activities.

#### ***Strip a suitable distance ahead of the (disturbance) at all times, to avoid loss and contamination***

Do not strip too large an area ahead of any construction/expansion, because this exposes the stripped surface to the risk of water and wind erosion, with the associated dust and water sediment pollution problems. However, if the stripping face is too close to the intended activity, it will result in the loss of valuable soil material. Contamination by overburden materials as well as chemical soil pollution by oil and fuel spills, etc. will occur.

#### ***Supervise stripping to ensure soils are stripped correctly***

Close supervision and monitoring of the stripping process is required to ensure that soils are stripped correctly for common failings are stripping too little or too much. When too little, valuable rehabilitation materials are lost, when too much, good quality soil is contaminated with poorer quality and unsuitable materials which are frequently highly compactable and tend to cement when exposed at surface. Risks of soil loss or contamination are particularly high when soil stripping contracts are purely issued on volume stripped, rather than on volume and quality. Monitoring requires assessment of the depth stripped, the degree of mixing of soil materials and the volumes of material replaced directly or placed on stockpiles.

#### ***Avoid vegetation clearance and earthworks during the rainy season when chances of runoff and water erosion are highest.***

The indigenous vegetation currently protects the highly erodible soil profiles of the Gilmoie Mining site. The A-horizon is also the most fertile horizon that stabilises plant roots and contains sufficient organic material to allow good water infiltration in the rainy season. This horizon will most likely be stripped and once this layer is removed, the rest of the profile will be extremely susceptible to water erosion.

***Strip soils only when moisture content will minimise compaction risk***

Most soils are highly susceptible to compaction. Compaction is usually greatest when soils are moist, so soils should be stripped when moisture content is as low as possible. Stripping and replacement of soil should be done during the dry season when rainfall is at its lowest and soils are driest. When not practical, every effort must be made to minimise compaction by the methods used for soil stripping, stockpiling and replacement.

***Strip and replace in one action wherever possible***

Wherever possible, stripping and replacing of soils should be done in a single action. This is both to reduce compaction and also to increase the viability of the seed bank contained in the stripped surface soil horizons. Stockpiling both increases compaction and decreases the viability of the seed bank, and should only be done when no areas of reshaped impacted land are available for direct placement.

***Locate soil stockpiles so that re-handling of soil is minimised***

Soil stockpiles should not be moved after initial stripping unless the soil is being replaced in its final location in the rehabilitated profile. This is because each re-handling damages soil structure and increases compaction. Soil losses occur with each re-handling and additional cost is considerable. While it may cost more initially, it is better to place stockpiles in areas where they will not have to be moved. There will always be some soil that has to be stripped before any rehabilitated areas are available for direct placement (for example, soils stripped for roads infrastructure and stockpile area development during operations), but these materials should be stockpiled as close as possible to where they are going to be ultimately used.

***Ensure free draining location***

Placing soil stockpiles in drainage lines has two major harmful effects: the soils become waterlogged and lose desirable physical and chemical characteristics and the risk of loss of soil materials due to erosion in directions. Alternatively, a side-slope location with suitable cut-off berm construction upslope is acceptable and with a down gradient berm to prevent sedimentation of the surrounding receiving environment.

***Minimise compaction during stockpile creation***

Soils should be stockpiled loosely. The degree to which soils become compacted during stripping is largely dependent on the equipment used. If shovel and truck are used, the ideal is for soils to be dumped in a single lift. The use of heavy equipment over soil piles results in soil structure damage. If direct dumped soil piles are too low, then it is possible to increase stockpile height using a dozer blade or back-actor bucket to raise the materials.

Running trucks over the piles or using bowl scrapers or graders to level and shape stockpiles, is not recommended. When the only alternative to losing soil material is the use of unsatisfactory (i.e. bowl scraper) equipment, compaction damage can be reduced to some extent by stripping as thick a cut as possible and by dumping it as thickly as possible. In addition, deposition in a single track line may reduce to some extent the overall compaction of the dumped or replaced soil through the minimisation of the footprint area of disturbance.

### ***Fauna Management***

Mining footprint should remain as small as possible and should not encroach on wetland areas(if any) and associated buffers. This can be achieved by fencing footprint areas to contain all activities within designated areas. No wetlands were identified at the Gilmoie Mining site.

During operation it is advised to 'flush out' and help warn faunal species to move and relocate naturally due to mining activities.

It is recommended that a speed limit of 40-60km/h is implemented on all roads running through the footprint area in order to minimise risk to owls and other fauna from vehicles. Speed humps must be constructed to help slow vehicles. However this must be done taking cognizance of the noise impact mitigation requirements.

Special care and thought when designing any future infrastructure should be taken into account to decrease the footprint left behind after decommissioning and closure.

Demarcate all open veld areas and ensure that these areas are off-limits to vehicles and personnel.

Educate mining/ Gilmoie Mining personnel about the importance of the natural faunal species and biodiversity of the natural surroundings.

All informal fires on the property should be prohibited. Where a burning regime is implemented, it should be overseen by a qualified and experienced professional.

No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place.

Ensure that migratory connectivity is maintained between open veld and drainage channels. Education on identification for any RDL faunal species that may be found within the Gilmoie Mining site.

All unauthorised poaching and trapping must be prohibited.

No dumping of waste should take place within the subject property. If any spills or waste deposits occur, they should be immediately cleaned up.

### ***Flora Management***

The footprint of the Gilmoie Mining mining activities to occur on surface should be confined to transformed areas and which are of low ecological importance. Mining and related activities must be avoided within the riparian and their associated buffer zones.

The existing integrity of flora surrounding the mining site should be upheld and no activities be carried out outside the footprint of the designated mining areas.

Disturbance of the trees must be avoided as far as possible. If no option other than destruction of the trees remains, the necessary permits must be applied for in terms of the National Forest Act (NFA) of 1998.

Furthermore, it is recommended that a nursery is developed which focuses on the propagation of these protected species. The seedlings of these species can then be utilised during rehabilitation and closure for landscaping purposes.

Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the Gilmoie Mining activities.

All development footprint areas should remain as small as possible and should not encroach onto surrounding more sensitive areas - eg. Nature Reserves.

Proliferation of alien and invasive species is expected within disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the site boundary. Alien plant seed dispersal within the top layers of the soil and within footprint areas that will have an impact on rehabilitation in the future, have to be controlled.

All soils compacted as a result of operational activities falling outside the mine/ Gilmoie Mining footprint areas should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas. Alien and invasive vegetation control should take place throughout all phases of the Gilmoie Mining and beyond decommissioning.

A detailed alien invader control plan should be developed during the operations in order to ensure that timeous control of alien vegetation takes place throughout the subject property and taking into account priority areas, areas of high recruitment and sensitive habitats. A detailed breakdown of control substances should be developed as part of the process. All Gilmoie Mining footprint areas should remain as small as possible and should not encroach onto more sensitive riparian areas. This can be achieved by considering the sensitivity map during the planning phases.

Proliferation and a further increase of alien and invasive floral species are expected within disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the site boundary. Seed dispersal within the top layers of the soil within footprint areas, will have an impact on rehabilitation in the future and also needs to be controlled.

Removal of the alien and weed species encountered on the property in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998).

Removal of species should take place throughout the operational, and rehabilitation/maintenance phases. Species specific and area specific eradication recommendations:

- Care should be taken within riparian areas with the choice of herbicide to ensure no additional impact on aquatic resources due to the herbicide used.
- Footprint areas should be kept as small as possible when removing large trees and the natural drainage patterns in these areas should be re-instated,
- No vehicles should be allowed to drive through designated sensitive areas during eradication of alien and weed species.

Ensure that all roads and operational areas are regularly sprayed with water or treated with other dust suppressants in order to curb dust generation. This is particularly necessary during the dry season when increased levels of dust generation can be expected. These areas should not be over-sprayed causing water run-off and subsequent sediment loss into adjacent waterways.

Planning of temporary roads and access routes that will be utilised during the operational phase should take the site sensitivity plan into consideration. If possible, such roads should be constructed a distance from the more sensitive areas and not directly adjacent thereto.

Ensure that all topsoil stockpiles and all waste dumps are re-vegetated by utilizing indigenous/endemic grass mixtures.

Ensure that sufficient rehabilitation takes place to ensure that post closure land cover is re-instated to levels that will prevent dust generation. No informal fires whatsoever should be allowed on the Gilmoie Mining site.

Ensure that all hazardous storage containers comply with the relevant SABS standards to prevent leakage.

Regularly inspect all mining/ Gilmoie Mining vehicles for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil.

Development of a rehabilitation plan by a suitably qualified specialist. This plan should emphasize rehabilitation throughout all phases of the operations.

The plan must not only ensure structural rehabilitation but must also ensure that the functional attributes of the landscape are re-instated.

Once functional status has been re-instated, measures to ensure that biodiversity is reinstated.

Particular mention is made here of reseedling and re-vegetation programs which must be undertaken in such a way as to ensure that the post closure land use objectives are supported and in any areas to be returned to open veld that the re-vegetation of these areas will afford the natural climax vegetation communities to become re-established.

Ensure that all disturbed and exposed areas are rehabilitated and covered with indigenous vegetation to prevent post-closure dust generation.

Development of a terrestrial monitoring plan to ensure the effectivity of the rehabilitation plan.

Ensure that funds and management measures are in place to ensure that post decommissioning monitoring and management take place in the aftercare and maintenance phase of the operations.

During the operational phases of the Gilmoie Mining erosion berms should be installed to prevent gully formation and siltation of the surface water resources.

The following points should serve to guide the placement of erosion berms:

- Where the track has slope of less than 2%, berms every 50m should be installed.
- Where the track slopes between 2% and 10%, berms every 25m should be installed.
- Where the track slopes between 10%-15%, berms every 20m should be installed.
- Where the track has slope greater than 15%, berms every 10m should be installed.

As much vegetation growth as possible should be promoted within the Gilmoie Mining area in order to protect soils and to reduce the percentage of the surface area which is paved. In this regard special mention is made of the need to use indigenous vegetation species as the first choice during landscaping.

No dumping of waste should take place within the sensitive and associated buffer zone. If any spills occur, they should be immediately cleaned up.

### ***Surface Water***

Quantitative and qualitative assessment of the water resources on the Gilmoie Mining property to effectively conduct Integrated Water Resource Management. Optimise water use by means of waste minimisation, re-use and recycling

- Effective and efficient use of the existing available water resources in all water use sectors within the mine (Water Conservation and Demand Management: WCDM)
- Responsible development in a sensitive environment (drainage lines / Rivers)
- Minimisation and where possible prevention of water pollution stemming from mining/ activities by compliance with and adherence to management commitments as specified in the EMP(R)
- Appropriate storm water management over the entire footprint of the operations area to ensure reduction in pollution of surface water quality; and
- Assessment of the cumulative impacts from nearby commercial activities with the implementation of appropriate management measures to ensure sensitive downstream water users are not detrimentally impacted. In terms of the Gilmoie Mining operations, the following management measures are essential in implementing mitigation measures to prevent and/or reduce environmental impacts:
  - Development of an Integrated Water Resource Management Plan
  - Separation of clean and dirty water systems as part of a Storm Water Management Plan
  - Reducing the catchment of dirty areas

- Diversion of drainage lines and release of diverted water in a responsible manner
- Containment of all contaminated water in dedicated design facilities; and
- Re-use, recycle and minimise or reduce all waste water generated on the site

### **Noise Management**

- Design a noise monitoring programme.
- Implement a noise monitoring programme.
- Establish a line of communication and notify all stakeholders of the means of registering any issues, complaints or comments.
- Notify potentially sensitive receptors about work to take place at least 2 days before the activity in the vicinity (within 500 meters) is to start. Following information to be presented in writing:
  - Description of Activity to take place;
  - Estimated duration of activity;
  - Working hours;
  - Contact details of responsible party.
- Ensure that all equipment is maintained and fitted with the required noise abatement equipment.
- When any noise complaints are received, noise monitoring should be conducted at the complainant, followed by feedback regarding noise levels measured.

The Gilmoie Mining operations must abide by the local by-laws regarding noise. Where possible work should be undertaken during normal working hours (06H00 - 18H00), from Monday to Saturday; If agreements can be reached (in writing) with all the surrounding (within a 1000m distance) potentially sensitive receptors, these working hours can be extended. Gilmoie Mining will be a 24-hour operation.

Establish a line of communication and notify all stakeholders of the means of registering any issues, complaints or comments.

## **8.9 The Roles and Responsibilities for the Execution of the Monitoring and Management Programme**

The applicant/holder of the mining right remains ultimately responsible for ensuring that the mining/ Gilmoie Mining operation is implemented according to the requirements of the EMP. Although the applicant/holder appoints specific role players to perform functions on their behalf, the responsibility is up to the role player to ensure compliance with the EMP. The applicant/holder is ultimately responsible for ensuring that sufficient resources (time, financial, capacity, equipment) are available to the role players to efficiently perform their tasks in terms of the EMP.

**Gilmoe Mining Responsibility for EMP Implementation:**

- Responsibility for implementation of the EMP rests with the General Manager.
- The General Manager needs to appoint an Environmental Control Officer (ECO), who will be based on site. The environmental control officer will report directly to the SHEQ Manager.
- The ECO will ensure that all environmental activities delegated to contractors operating on site are implemented.
- Similarly, the ECO will ensure that all conditions of the EMP are implemented.
- It will be the responsibility of the ECO to resolve any conflicts that may arise between Gilmoe Mining and contracting parties regarding implementation of the EMP.
- Gilmoe Mining will ensure that all contracting companies tendering for work, receive a copy of summary and key points of the EMP and understand their responsibility to operate within the framework of the measures defined in this EMP. When adjudicating tenders (Gilmoe Mining) will ensure that contractors have made appropriate allowance for management of environmental matters.
- Gilmoe Mining will ensure that, on appointment, all contracting companies operating on the site receive a copy of the summary and key points of the EMP and understand their responsibility to operate within the framework of the measures defined in the EMP.
- Gilmoe Mining will ensure that contractor SHE induction to site includes environmental and social issues and awareness training to build capacity of staff and contract staff regarding management of the environment.
- Gilmoe Mining to ensure that the responsibility for implementing and adhering to the conditions of the EMP will form part of the conditions of appointment of all contractors.
- The ECO will brief contractors about no development / no go areas. These to include:
  - No access to neighbouring properties without prior approval Gilmoe Mining to inform land owners of need for access and secure approval to access site.
  - No access to fenced-off sensitive areas.
  - Gilmoe Mining to appoint a responsible person to audit the implementation of, and adherence to, the EMP. This party will be an independent environmental practitioner.
  - The Gilmoe Mining ECO will bring to the attention of the mine/general manager any environmental incident or breach of the conditions of the EMP, within 8 hours of occurrence of such event.
- The mine/general manager will notify the controlling authority within 48 hours of such an incident, if the environmental incident constitutes a breach of any permit or licence condition.

**Contractors**

The contractors, as the applicant/holder's implementing agents on site, are bound to the conditions as stipulated in the EMP through contractual agreements and are therefore responsible for ensuring that they adhere to all the conditions of the EMP. The contractors must thoroughly familiarise themselves with the EMP requirements



prior to commencing with work on site. Furthermore, the contractors must request clarification on any aspect of the EMP, where required. The contractors must ensure that all workers undergo an environmental induction in terms of the EMP. The contractors must ensure that they provide sufficient budget for complying with all the EMP conditions at the tender stage.

### **Responsibility of Contractors**

All contracting companies will receive a copy of the EMP at time of tender. Each contractor is to familiarise himself with the environmental management framework for the site and ensure that contracting prices allow for environmental costs.

At appointment the appointed contractor will receive a copy of the EMP. It is the responsibility of the contractor to ensure that all of their staff is aware of the measures applicable to their area of work on site.

It is the responsibility of the contractor to bring to the attention of the ECO any environmental incident or breach of the conditions of the EMP, within 8 hours of occurrence of such event.

### **Environmental Control Officer (ECO)**

A fulltime ECO will be appointed during the Operational Phase. The responsibilities of the ECO will be transferred to the SHEQ Department. The ECO employed during the operational phase must attend relevant operations meetings, conduct inspections to assess compliance with the EMP and be responsible for providing feedback on potential environmental problems associated with the Gilmoie Mining operations. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertake routine monitoring.

The ECO has the right to enter the site and undertake monitoring and auditing at any time, subject to compliance with all environmental requirements applicable to the site.

## SECTION 9 - MANAGEMENT OPTIONS FOR EACH ENVIRONMENTAL IMPACT, SOCIO-ECONOMIC CONDITION AND HISTORICAL/CULTURAL ASPECT FOR EACH PHASE OF THE MINING/GILMOE MINING OPERATION

### 9.1 Actions, Activities or Processes Including NEMA EIA Regulations Listed Activities which cause Pollution or Environmental Degradation

Below is a list of all the significant impacts as part of the various phases and covers only impacts of medium or high impact:

Environmental Aspects	Potential Impact List	Action, Activities, Processes			Significance Rating		
			Operation	Decommission	C	O	D
<b>Topography</b>	Waste dumps and Stockpiles, Open Pit Mine.		Waste dump and Open pit quarrying	Grading and sloping of waste dumps to slopes suitable for re-vegetation and rehabilitation. Backfilling into the open pit where practical.		70	39
<b>Geology</b>	Dimension stone Mining Reclamation of Dimension stone Mineral		Reclamation from waste dumps has ceased and mining from the open pit has been discontinued. Dimension stone is obtained from external sources.	Decommissioning of all mining.		85	80
<b>Soil</b>	Soil Compaction		Stockpiles; Access and haul roads;	Rehabilitation and scarification of all disturbed soils; Use of topsoil stockpiles for rehabilitation purposes;		70	30
	Soil Erosion		Storm water management; Vehicle movement;				
	Sterilization of Topsoil Layer		Vehicle movement; Stockpiling;				
	Chemical Soil Pollution		Oil and fuel spills from vehicles; Waste generation; Leakage from waste storage facilities;	Oil and fuel spills from decommissioning vehicles; No more waste generation as the mine decommissions.			

			Dirty water run-off; Vehicle movement; Road wetting (dust suppression); Irrigation of the stockpile vegetation; Emission fallout;			
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Environmental Aspects	Potential Impact List	Action, Activities, Processes			Significance Rating	
			Operation	Decommission	O	D
Surface Water	Less water reaching the surface water resources		Gilmoe Mining operations; Raw material handling and storage; Containment and use of precipitation; General infrastructure on mining/ Gilmoe Mining site;	Grading and sloping of waste dumps to slopes suitable for re-vegetation and rehabilitation. Containment and use of precipitation; Removal of infrastructure on mining/ Gilmoe Mining site;		
	Contamination of surface water / deterioration of surface water quality (General)		Storm water runoff and drainage; Increased erosion, dust generation and potential chemical contaminants Vehicle wash bays and workshop; Spillages from sanitary conveniences, fuel deposits or storage facilities; Mineral Dressing Processes, Beneficiation; Land clearance; Stockpile areas;	Storm water runoff and drainage; Increased erosion, dust generation and potential chemical contaminants; Vehicle wash bays and workshop; Spillages from sanitary conveniences, fuel deposits or storage facilities;	39	18

	Alteration of drainage patterns		Permanent drainage diversions (return water dams)	Permanent drainage diversions - return water dams			
	Reduction in surface water quantity		Drainage diversions; Operational activities at tributaries;	Drainage diversions; Operational activities at tributaries;		39	18
<b>Ground Water</b>							
	Groundwater: Water extraction from boreholes		Gilmoie Mining Operations and Clay, Shale , Limestone, Gypsum and Quartz mining processes;	Mining/ Gilmoie Mining operations cease;		20	9
	Infiltration into ground water resources.						

Environmental Aspects	Potential Impact List	Action, Activities, Processes			Significance Rating		
			Operation	Decommission	O	D	
<b>Air Quality</b>	Reduction in the air quality		The dust, Clay, Limestone, Shale and Quartz dust and vehicle emissions generated by the mining/ Gilmoie Mining activities	The dust and vehicle emissions generated by the decommissioning activities.		56	24
<b>Noise</b>	Day and night time noise impact -		Furnace and baghouses; Ore dressing and raw material handling; Loading of material (Clay, Limestone, Shale and Quartz /raw materials); Bulldozing; Front-end loader and Trucks; Trucks dumping material at stockpiles (topsoil/raw material);	Vehicle noise generated by the decommissioning activities.		48	24
	Noise above ambient noise levels in the surrounding communities			Mining/ Gilmoie Mining operations cease.			

Environmental Aspects	Potential Impact List	Action, Activities, Processes			Significance Rating	
			Operation	Decommission	O	D
<b>Landuse</b>	Loss of current land capability		The current land use was already industrial due to previous mining activities. Change of land use from natural vegetation to industrial.	Change of land use from industrial to natural vegetation and agriculture.	48	27
<b>Heritage</b>	Impact of cultural and heritage entities		Gilmoe Mining operations; Excavations for any new haul roads and clearance for new stockpile area.	Mining/ Gilmoe Mining operations cease; Any mining/ Gilmoe Mining infrastructure and entities become part of the local history and heritage.	20	9

Environmental Aspects	Potential Impact List	Action, Activities, Processes			Significance Rating	
			Operation	Decommission	O	D
<b>Socio-Economic</b>	Crime, Health and HIV		Influx of foreigners and job seekers and increase in disposable income for local people may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area	Decrease in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the operations area.	85	36
<b>Visual</b>	Alter the overall landscape character and sense of place of the region		The existing waste dumps and open pit quarry; Creation of topsoil dumps and temporary stockpiles;	Ineffective rehabilitation Poor vegetation cover, Infrastructure and waste dump and open pit remaining.		

	The mining/ Gilmoie Mining facilities may impact negatively on receptors (residents and motorists) situated in or utilising the identified receptor sites		Ongoing mining/ Gilmoie Mining activities;			70	33
	Dust and smoke generated during the operational phase may cause a negative visual impact and altered visibility		Dust and smoke generation during mining/ Gilmoie Mining activities; Dust generation due to movement of vehicles;	Ineffective rehabilitation including poor vegetation cover which will contribute to dust generation			
	Operational machinery and earthworks may cause a negative visual impact		Presence and movement of vehicles; Ongoing mining/ Gilmoie Mining activities and earthworks;			70	33

## 9.2 Management Options to Modify, Remedy, Control any Action, Activity or Process which will cause Significant Socio-Economic Conditions, and Historical Aspects

### 9.2.1 Historical and Cultural Impacts on Aspects Identified

**Impact description:**

Loss of sites of cultural heritage significance.

**Mitigation:**

No site of cultural and heritage significance was identified within the Gilmoie Mining operations area.

**Impact description:**

Loss of as yet unidentified archaeological and cultural heritage.

**Mitigation:**

- It should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts is always a distinct possibility. Care should therefore be taken when any further excavations/earth-moving are done at Gilmoie Mining that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence.
- All Archaeological, palaeontological and heritage sites and resources must be preserved if they are of cultural, historic or pre-historic significance. This must be done in conjunction with an expert or competent person.
- Monitor for chance finds (e.g. burial sites, old waste disposal sites, ruins, foundations etc). Demarcate, document and fence graves (if to be preserved).

### 9.2.2 Socio-Economic Impacts - Operational Phase

Actions/Activities/Processes	Technical / Management Options <b>OPERATIONAL PHASE</b>
Creation of new employment opportunities	Gilmoie Mining is well aware of the socio-economic pressure an influx of people in the urban area has on the hosting communities as well as the additional need for Municipal service delivery and infrastructure development. In order to curb the negative impact of the mining operation on the area, the mine/ Gilmoie Mining has a strong focus on local recruitment.
Increase in criminal activities	<p>Whilst the mine/ Gilmoie Mining has a finite life and therefore will not be a sustainable economic activity for the region, it will create an economic ‘window of opportunity’, and financial resources generated through the mine can be harnessed to the development of alternative forms of income generation in the area of operation and the region as a whole. A significant portion of the mine operating costs will flow into the local economy.</p> <p>Gilmoie Mining will initiate and maintain close communications and liaisons with the local Police Station in respect of the timing of their operations and recruitment activities in order to keep the Police abreast of progress and potential influx of people into the area. Further, a good working relationship with the Police force will help to manage any incidents as and when they arise.</p> <p>Gilmoie Mining (in association with other existing businesses nearby) will contribute towards the establishment of Community Policing Forums (CPFs), if not already established, within the communities immediately adjacent to the mining/ Gilmoie Mining operation. Stakeholders should include, but not limited to, the local youth, police, local businesses, local landowners and mine security.</p>
Increased spending power into the local economy	<p>Gilmoie Mining will facilitate opportunities for local retail and service industries to establish themselves or expand current services to meet the needs of the mine and its employees.</p> <p>The mine will support and enhance this positive impact by encouraging and supporting life skills education programmes which focus on responsible personal financial management.</p>
Social infrastructure to support the influx of people	<p>Infrastructure and Poverty Eradication Operations: Gilmoie Mining will endeavour to participate in the local upliftment of the surrounding community. To this end, Gilmoie Mining proposes to investigate the potential for investment into infrastructure and poverty eradication operations.</p> <p>In addition, one of the strategies for meeting this objective is to create Public Private Partnerships in order to accelerate implementation and investment in infrastructural development operations.</p>



Actions/Activities/Processes	Technical / Management Options
	OPERATIONAL PHASE
Transfer of skills to local people	<p><b>Skills Development Plan:</b>                      Gilmoie Mining recognizes the importance of employees in the achievement of its business objectives and that skills development is the foundation for developing competent and productive employees who are able to participate in meeting the mine business objectives. The following objectives have been identified to support the Gilmoie Mining skills development drive:</p> <ul style="list-style-type: none"> <li>▪ Assess employees’ skills and qualities as and when required;</li> <li>▪ Provide training that is accessible to all employees;</li> <li>▪ Invest in training interventions and assessments that will promote productivity and employability as dictated by economic conditions and within the mine financial ability;</li> <li>▪ Implement an internship programme on different levels of the prevailing National Qualification Framework and to train new entrants to the labour market, as well as those with working experience;</li> <li>▪ Establish a mentorship programme designed to address the operation’s developmental needs, whilst facilitating the transferral of skills, knowledge and competence to employees;</li> <li>▪ Establish a Leadership scheme that will enable employees to receive the necessary support and assistance needed to complete their qualifications in line with operational requirements;</li> <li>▪ Re-skill employees if feasible and economically viable when contemplating retrenchments; and</li> <li>▪ Utilise the Work Place Skills Plan as a vehicle to align skills development with both business growth strategies and employment equity plans.</li> </ul>

**9.2.3 Socio-Economic Impacts - Decommissioning Phases**

Actions/Activities/Processes	Technical / Management Options <b>DECOMMISSIONING PHASE</b>
<p>Loss of jobs following mine/ Gilmoie Mining closure</p>	<p>At least five (5) year before decommissioning a closure plan will be developed and reviewed annually which will address planned and unplanned closure (or care and maintenance) from a social perspective including loss of jobs, reduced contributions to local economic development, termination of contracts with service providers and suppliers, and adequate notification of mine closure:</p> <ul style="list-style-type: none"> <li>▪ Gilmoie Mining must consider whether employees can be employed in other operations that Gilmoie Mining may have at the time of closure;</li> <li>▪ Retrenchment packages will need to be provided to all employees;</li> <li>▪ Training of staff during the life of the operation including portable skills to be encouraged so as to facilitate their remaining employment in this sector or ability to find jobs as a result of alternative skills.</li> </ul> <p>Gilmoie Mining recognises the fact that at some stage it may have to retrench some or all of its employees. Unforeseen circumstances, such as external forces which result in reduced profitability, technical innovation, the need to remain globally/regionally competitive or changes to the mine strategic business plan, may necessitate downscaling or total closure of the operation. It is therefore vital to have in place creative closure management programmes including mechanisms to avoid job losses. Mechanisms anticipated by Gilmoie Mining to ameliorate the impact of retrenchments will be in line within the framework of the Social and Labour Plan (SLP) and the requirements of relevant legislation. If the retrenchment of more than 500 people or 10% of the labour force of an organisation (whichever is the greater) is contemplated within a period of one year, the Company will notify the Minister of Labour and apply for assistance.</p> <p>The main objectives of the Management of Downscaling and Retrenchment Programmes will be:</p> <ul style="list-style-type: none"> <li>▪ To minimize the effects of retrenchments;</li> <li>▪ To assist as far as possible those employees who will be affected by the retrenchment process;</li> <li>▪ To facilitate training programmes to ensure acquisition of additional skills that will assist in the access to alternative employment either within or outside the mine;</li> <li>▪ To ensure proper planning with regards to the downscaling and/or retrenchment;</li> <li>▪ To ameliorate the social and economic impacts on local and regional economies and other labour sending areas; and</li> <li>▪ To communicate with the workforce on all Social and Labour Plan matters timeously.</li> </ul> <p>Gilmoie Mining undertakes to inform, in line with Section 52(1) of the MPRDA, the Minerals and Mining Development Board of any possible retrenchments as and when required during the life of the mine and within three (3) to five (5) years prior to the end of the life of the mine. Such notice will include the timeframes for the closure process. Other interested parties that would be informed would be the DoL, the Taung Local Municipality and the relevant authorities of any major sending areas as determined by the mine labour-sending records.</p>

<p>Negative local economic impacts as a result of mine Gilmoie Mining closure</p>	<p>A closure plan should be developed and updated annually which addresses planned and unplanned closure (or care and maintenance) from a social perspective including loss of jobs, reduced contributions to local economic development, termination of contracts with service providers and suppliers, adequate notification of mine/ Gilmoie Mining closure.</p> <p>Comprehensive and sensitive consultation with stakeholder groups from the local communities, government departments and other identified groups.</p> <p>Comprehensive and sensitive consultation with local businesses that are reliant on the mine/ Gilmoie Mining and those who are independent thereof.</p> <p>Capacity building to assist retrenched employees to set up their own businesses or assist local business to expand their operations including but not limited to:</p> <ul style="list-style-type: none"> <li>▪ Making available support, guidance and assistance to relevant parties during the life of the mine/ Gilmoie Mining and at the time of retrenchment;</li> <li>▪ Fostering a spirit of entrepreneurship among local businesses and interested employees; and</li> <li>▪ Providing support to local businesses and entrepreneurs through supportive ad-hoc mentoring mechanisms grounded in the needs of the protégés;</li> </ul> <p>Continued mentorship of empowerment groups and local community structures started during the life of the mine/ Gilmoie Mining in line with the needs of these groups/structures using ad-hoc mechanisms already in place.</p> <p>Development support for empowerment groups and local community structures through experiential learning that focuses providing competencies to meet identifiable needs and building on existing skills and knowledge.</p> <p>Provision of portable skills to employees facing retrenchment (in addition to those provided during the life of the mine/ Gilmoie Mining in accordance with the skills development plans and workforce planning; particularly non-mining Gilmoie Mining related skills. Such portable skills must have an impact beyond the company and provide for sustained employability and will, wherever feasible:</p> <ul style="list-style-type: none"> <li>▪ Build on employees' existing skills and be recognized nationally;</li> <li>▪ Enable employees to manage their careers by addressing identified skills gaps; and Supplement existing skills with business-related training where appropriate.</li> </ul>
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## SECTION 10 - ACTION PLANS TO ACHIEVE THE OBJECTIVES AND SPECIFIC CLOSURE GOALS

### 10.1 Time Schedules for Each Action to be undertaken to Implement Each Management Option

Phases	Construction	C	Operational	O	Decommissioning	D	All	A
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Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Geology	Extraction of mineral	Limit the area of impact to resource and best practicable mining technology.	O	Mining Engineer	On-going through life of mine / Gilmoie Mining
Topography	Dangerous high open pit side walls, waste dumps	To ensure that humans and large animals do not climb the high waste dumps and open pit side walls and endanger themselves.	O, D	Environmental Manager Contractor SHEQ Manager Mining Engineer	
Soil	Soil Compaction	To conserve soil resources disturbed by operations of the mine/ Gilmoie Mining	C, O	Environmental Manager Mine Manager	On-going through life of mine / Gilmoie Mining
	Soil Erosion	To prevent erosion	A	Environmental Manager Mine Manager	
	Sterilization of topsoil layer	To conserve soil resources disturbed by operations of the mine / Gilmoie Mining	O, D	Environmental Manager Soil Specialist	
	Chemical soil pollution	To prevent contamination of soils	O, D	Environmental Manager Mine Manager All employees	

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Flora	Impact on Habitat for Floral species	To minimise the area of disturbance	A	Environmental Manager Mine Manager	On-going through life of mine / Gilmoie Mining
	Impact of Floral Diversity	To rehabilitate disturbed land to a stable physical state and prevent proliferation of invasive plants	O, D	Environmental Manager Civil engineer	
	Impact on important species	To remove, protect and conserve any red data species, as well as any other species with conservation value	O, D	Environmental Manager Specialist	
Fauna	Loss of faunal habitat and ecological structure	To prevent unnecessary disturbance of animal habitats	O, D	Environmental Manager Mine Manager	On-going through life of mine / Gilmoie Mining
	Loss of faunal diversity and community integrity	To rehabilitate disturbed land to a stable physical state	O, D	Environmental Manager Mine Manager	

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Wetlands	Loss of wetland habitat and ecological structure	To minimise the area of disturbance and avoid wetland areas by including a buffer zone.	O, D	Environmental Manager Engineer	On-going through life of mine / Gilmoie Mining
	Impacts on Wetland Hydrological Function		O, D	Environmental Manager Engineer	On-going through life of mine / Gilmoie Mining
Surface Water	Less water reaching the surface water resources	To reduce the impact on catchment yield; To return the post mining/ Gilmoie Mining topography to Pre-mining situations as far as possible;	O, D	Environmental Manager Mine Manager Civil Engineer	On-going through life of

		To return surface water flow to original flow areas as far as possible; To design culverts and bridges in such a way that flood times and water retention do not impact on the mining / Gilmoie Mining infrastructure.		Surface Water Specialist /engineer	mine / GILMOE MINING
Contamination of surface water / deterioration of surface water quality (General)		To ensure compliance with GN 704 Regulations (or latest publication); To prevent discharges of contaminated water to the environment; To prevent pollution of water resources in the vicinity of the mining/ Gilmoie Mining operations; To recycle and reuse water where possible; To ensure that storm water design complies with DWS regulations and has sufficient capacity; To monitor on site surface water quality and quantity;			
			O, D	Environmental Manager Mine Manager Civil Engineer Surface Water Specialist /engineer	On-going through life of mine / Gilmoie Mining.
Alteration of Drainage patterns		To minimize the impacts on the environment (ecological, economical, and social) due to the alteration of drainage patterns in the operations area.	O, D	Environmental Manager Mine Manager Civil Engineer Surface Water Specialist /engineer	On-going through life of mine / Gilmoie Mining
		To minimize the impact on riparian habitat and restore once mining/ Gilmoie Mining has finalised.	O, D	Environmental Manager Mine Manager Civil Engineer Surface Water Specialist /engineer SASS Specialist	On-going through life of mine / Gilmoie Mining
Deterioration in water quality		Dirty storm water designs to be compliant with environmental legislation.			
			O, D	Environmental Manager Contractor ECO Civil Engineer	On-going through life of mine / Gilmoie Mining

				Surface Water Specialist /engineer Laboratory	
	Reduction in surface water quantity	To implement the selected drainage diversion strategies so that surface water	<b>O, D</b>	Environmental Manager Contractor ECO Civil Engineer Surface Water Specialist /engineer	On-going through life of mine / Gilmoie Mining
	Reduction in resources	To reduce the volume of potable water used.	<b>O, D</b>	All Managers Civil Engineer	On-going through life of mine / Gilmoie Mining

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Ground Water	Impact on the availability of groundwater	To prevent unacceptable negative impacts on surrounding groundwater users.	<b>O</b>	Environmental Manager Contractor ECO	On-going through life of mine / Gilmoie Mining
	Impact on the quality of groundwater	To limit the impact of infiltration of Potentially contaminated leachate to the Underlying aquifers.	<b>O</b>	Environmental Manager Contractor ECO	On-going through life of mine / Gilmoie Mining
	Impact on external users' boreholes	To prevent unacceptable negative impacts on surrounding groundwater users.	<b>O, D</b>	Environmental Manager	On-going through life of mine / Gilmoie Mining
	Impact on mine water quality Impact of sources on surface	To limit the impact of infiltration of Potentially contaminated leachate to the Underlying aquifers.	<b>O, D</b>	Environmental Manager Civil Engineer	On-going through life of mine / Gilmoie Mining

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Air Quality	Reduction in the air quality	To limit public exposure to unacceptable health risks.			
			O, D	Environmental Manager Specialist Laboratory	On-going through life of mine / Gilmoie Mining

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Noise	Day and Night time noise impact	Control noise pollution stemming from operational activities			
	Noise above ambient noise levels in the Surrounding settlements/businesses		O, D	Environmental Manager Acoustic Consultant	On-going through life of mine / Gilmoie Mining
Heritage and Cultural Aspects	Destruction of heritage or cultural aspects	To avoid disturbing sites of archaeological and cultural interest. Where disturbance of sites of archaeological and cultural interest, is unavoidable, the objective is to ensure that adequate measures are taken to conserve the information held within the sites. This must be done in accordance with legal requirements.			
			O, D	Environmental Manager Heritage Consultant (if required)	On-going through life of mine / Gilmoie Mining

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Visual Aspects	Alter the overall Landscape character and sense of place of the region.	To limit the visual impact of the operations on the surrounding landowners.			On-going through life of mine / Gilmoie Mining
	Dust and smoke generated during the operational phase may cause a negative		O, D	Environmental Manager Engineer	



	visual impact and altered visibility	To limit the visual impact of the operations on the surrounding landowners.		Environmental Manager Engineer	On-going through life of mine / Gilmoie Mining
	Machinery and earthworks may cause a negative visual impact.				
	The mining/ Gilmoie Mining facilities may impact negatively on receptors (residents and motorists) situated in or utilising the identified receptor sites.				

Environmental Aspects	Potential Impacts	Objective	Phase	Roles and Responsibility	Time Frame
Socio-Economic Aspects	Crime, Health and HIV	To mitigate the negative social impacts of the operations.	O, D	CEO SHE Manager	On-going through life of mine / Gilmoie Mining
	Economic Opportunities, Infrastructure Development And Employment.	To enhance the socio-economic benefits of the operations	O, D	CEO SHE Manager	
	Loss of current land capability.	Rehabilitate the land to as close as possible to its wilderness and grazing state during and after the mining/ Gilmoie Mining activities are concluded. Re-vegetation should be with indigenous plant species that are able to sustain the regional climate and soil conditions.	O, D	Environmental Manager ECO Contractor	

## SECTION 11 - PROCEDURES FOR ENVIRONMENTALLY RELATED EMERGENCIES AND REMEDIATION

### Environmental Risks

The following incidents will be *classified as an emergency*:

- Natural Disasters
- Strikes, protest or unrest
- Information Management System Failure
- Health and Disease Outbreaks
- Serious Incident or Fatality
- High Potential Risk Incidents (Fatality, serious environmental pollution e.g. spillages of water containment structures i.e. storm water dams, etc)
- Other emergencies

Gilmoe Mining needs to establish plans and procedures to identify the potential for, and response to, incidents and emergency situations and for preventing and mitigating the illness, injury or environmental hazard that may be associated with their operations. Gilmoe Mining needs to review its emergency preparedness and response plans and procedures, in particular, after the occurrence of incidents or emergency situations. Gilmoe Mining shall also periodically test such procedures where and when practicable.

### General Monitoring and Management Measures

The following is thus general monitoring and management measures that needs to be implemented for the above identified Environmental Incidents:

- It must be ensured that all water/chemical/fuel containment structures are operated at a minimum level to allow for sufficient capacity should a 1:50 year rainfall event occur in the area.
- As per Regulation 704 (R37 of 2010) the storm water system will be designed to cater for a 1:50 year flood event without spilling.
- Daily level monitoring will be conducted to ensure that the system is managed in such a manner to ensure sufficient capacity.

### Emergency Procedure

An environmental emergency is defined as an unplanned situation or event resulting in potential pollution of the environment. A pollution incident means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur.

### *Response to environmental emergencies*

An *emergency plan* must be developed for each potential environmental emergency situation. The emergency plan must give information on:

- Description of the emergency;
- Reference to relevant material safety data sheets;
- Responsibilities for management of emergencies;

- Contact telephone numbers (on-site & off-site);
- Equipment required (including locations); and
- Site plan where applicable.

### ***Environmental Impact Register***

All non-conformances pertaining to safety, health, environmental, quality of operations activities and employees shall be documented according to documented procedures.

### ***Records***

As required by ISO14001, records must be kept of all environmental emergencies and non-conformances.

### **Technical, Management and Financial options**

All employees of Gilmoie Mining and contractors working for the mine/ Gilmoie Mining are responsible for reporting any accident/emergency to their supervisor immediately, and if required notifying the emergency response teams. Personnel must be nominated as response team members and must receive appropriate training to manage emergencies. All other personnel must be made aware of potential emergencies and trained in emergency response. Management must be aware of their responsibilities in case of emergency.

There will be an environmental budget, which includes the provision for possible emergency situations and the relevant additional management measures required.

## SECTION 12 - FINANCIAL PROVISION IN RELATION TO THE EXECUTION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

### 12.1 Plan Showing the Location and Aerial Extent of the Main Mining Action, Activities and Processes

Please refer to Appendix 3 for the plans showing the layout of main mining/ Gilmoie Mining activities at Gilmoie Mining area.

### 12.2 Annual Forecasted Financial Provision Calculation

Subject to approval by the DMR, the amount provided with be increased by 6% annually in line with the DMR inflation rate. Any amount proposed for Gilmoie Mining will be added to the overall Gilmoie Mining financial provision.

### 12.3 Confirmation of the Amount to be Provided

The life of mine (LOM) closure cost estimate for Gilmoie Mining is based on the principles described in the environmental management programme (EMP) report and rates will be calculated at 6% inflation rate. It is important to study this EMP in order to understand the closure objectives and the proposed route the mine/ Gilmoie Mining is going to follow to reach the objectives.

The following mine/ Gilmoie Mining working areas and infrastructure have been included in this closure costing calculation:

- Waste Dumps;
- Open Pit Quarry;
- Access and Haul Roads;
- Raw Materials Stockpiles; and
- Topsoil Storage Area.

The estimated closure costs are as follows:

Life of Mine (LOM) Closure liability estimate	<b>R506 694.88</b>
Amount currently available for rehabilitation at the time of application for mining right	

Some infrastructure may be handed over to third parties such as the surrounding communities and land owners. However, this requires consent for the said acquisition from the mentioned third parties which is subject to thorough and inclusive consultation. A detailed closure plan will also be imperative to outline which infrastructure will be handed over and for what secondary use. The process

of handing over infrastructure is applicable approximately 3 (three) to five (5) years prior to closure/decommissioning of the mine/ Gilmoie Mining .

All rates used in the estimation were according to the 2020 DMR approved rates. The demolition quantities for the mine/ Gilmoie Mining infrastructure must be estimated by an independent quantity surveyor. The detailed closure costing is attached in Appendix 6.

## 12.4 Life of Mine Cost Estimate

**Table 18: Estimated closure costs calculations**

No.	Description	Unit	(A) Quantity	(B) Rate	(C) Weighting factor 1	Amount (AxBxC)
1	Dismantling of <b>processing plant and related structures</b> (including overland conveyors and powerlines)	m <sup>3</sup>	300	R 17.33	1	R 5 199.00
2(A)	Demolition of <b>steel buildings and structures</b>	m <sup>2</sup>	0	R 241.33	1	R 0.00
2(B)	Demolition of <b>reinforced concrete buildings and structures</b>	m <sup>2</sup>	0	R 355.65	1	R 0.00
3	Rehabilitation of <b>access roads</b>	m <sup>2</sup>	500	R 43.19	1	R 21 595.00
5	Demolition of <b>housing and facilities</b>	m <sup>2</sup>	0	R 482.67	1	R 0.00
6	<b>Opencast rehabilitation</b> including final voids and ramps	ha	7	R 245 652.01	0.1	R 171 956.41
8(A)	Rehabilitation of <b>overburden and spoils</b>	ha	2.5	R 168 679.35	0.1	R 42 169.84
8(B)	Rehabilitation of <b>processing waste deposits and evaporation ponds (basic, salt producing waste - Fine Residue Deposit and Course Residue Deposit)</b>	ha	0	R 210 087.08	0	R 0.00
10	<b>General surface rehabilitation</b> , including grassing of all denuded areas	5Ha	5	R 133 622.50	0.01	R 6 681.13
12	<b>Fencing</b>	m	500	R 152.42	1	R 76 210.00
13	<b>Water management</b> (seperating clean and dirty water, managing polluted water and managing the impact on groundwater)	ha	5	R 50 807.03	0.1	R 25 403.52
14	<b>2 to 3 years of maintenance and aftercare</b>	5Ha	10	R 17 782.46	0.1	R 17 782.46
					<b>SUBTOTAL 1:</b>	<b>R 366 997.34</b>
1	Preliminary & General	12.5% of subtotal 1			Weighting Factor 2 = 1.1	R 50 462.13
2	Administration and supervision costs	6% of subtotal 1				R 24 221.82
3	Engineering drawings and specifications	2% of subtotal 1				R 0.00
4	Engineering and procurement of specialist work	2.5% of subtotal 1				R 0.00
5	Development of a closure plan	2.5% of subtotal 1				R 10 092.43
6	Final ground water modelling					
					<b>SUBTOTAL 2:</b>	<b>R 84 776.39</b>
7	Contingency	10% of subtotal 1				R 36 699.73
					<b>SUBTOTAL 3:</b>	<b>R 36 699.73</b>
					<b>15% Vat on subtotal 2&amp;3</b>	<b>R 18 221.42</b>
					<b>GRAND TOTAL</b>	<b>R 506 694.88</b>

## 12.5 The Method of Providing Financial Provision - Regulation 53

The financial provision will be provided by means of a fund and/or bank guarantee.

## SECTION 13 - ENVIRONMENTAL AWARENESS PLAN

### 13.1 Introduction

In terms of Section 39 (c) of the Mineral and Petroleum Resources Development Act (MPRDA), 2002 (Act No. 28 of 2002) as well as Regulation 51 (b) (vi) of the Act, Gilmoie Mining operations is required to submit an Environmental Awareness Plan (EAP) as part of the Environmental Impact Assessment (EIA) and Management Programme (EMP) for the its operations.

The EAP must describe the following:

- The manner in which the Gilmoie Mining intends to inform it's employees of any environmental risks, which may result from their work; and
- The manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment.

Gilmoie Mining operations will aim to implement the ISO14001 Environmental Management System (EMS), even though Gilmoie Mining is currently not certified. As a result, the EAP is based on the ISO14001 requirements.

### 13.2 Implementing Environmental Awareness

#### *Roles and Responsibilities*

The first step in the implementation of an EAP is to identify roles and responsibilities of individuals within the mine/ Gilmoie Mining. The responsibility lies with the management of Gilmoie Mining operations to establish an Environmental Department within the Safety Health Environment and Quality (SHEQ) department. It is the responsibility of the Environmental Department / Environmental Manager to implement the Environmental Awareness Plan, and to identify training and awareness needs on a continual basis. Specialists may be contracted in by Gilmoie Mining operations where required for specialised environmental training.

#### *Objectives*

The objectives of the Environmental Awareness Plan are as follows in terms of competence, training and awareness:

1. The organisation shall ensure that any person(s) performing tasks for it or on its behalf that have the potential to cause a significant environmental impact(s) identified by the organisation is (are) competent on the basis of appropriate education, training or experience, and shall retain associated records.
2. The organisation shall identify training needs associated with its environmental aspects and its environmental management system. It shall provide training or take other action to meet these needs, and shall retain associated records.
3. The organisation shall establish, implement and maintain a procedure(s) to make persons working for it or on its behalf aware of:

- The importance of conformity with the environmental policy and procedures and with the requirements of the environmental management system;
- The significant environmental aspects and related actual or potential impacts associated with their work, and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformity with the requirements of the environmental management system, and
- The potential consequences of departure from specified procedures.

Gilmoe Mining operations is committed to identifying training needs and ensuring that all personnel whose work may create a significant impact upon the environment receive appropriate training.

### ***Identification of Training Needs***

An employee's job description will be used to identify the activities that the individual undertakes. Impacts and environmental aspects as described in the EMP are specific to each activity, and will be used in the identification of the environmental risks associated with each job description.

The following training needs will be required: -

- General Environmental Awareness Training;
- Understanding of the Environmental policy;
- Awareness of environmental legislation that the Gilmoe Mining subscribes to;
- Awareness of significant environmental aspects associated with their work activities;
- Awareness of environmentally related operational procedures that need to be followed when conducting work activities; and
- Awareness of the potential consequences of not following environmentally related operational procedures.

### ***Training Methods***

Training methods should be developed to suit the requirements of Gilmoe Mining operations. Training could take the form of:

- Environmental awareness training as part of the induction training.
- A job specific training program for the operational areas based on the significant environmental aspects and associated impacts as specified in the EMP. Training topics could include: -
  - □ No development zones;
  - □ Protected trees;
  - □ Waste prevention and control;
  - □ Waste sorting and handling;
  - □ Resource consumption;
  - □ Storing and handling of petroleum hydrocarbons;
  - □ Storing and handling of chemicals;
  - □ Rehabilitation/Housekeeping; and
  - □ Spills prevention/clean up.

Training on environmental legislation; and  
 Training of Management specific to the Environmental Policy and the EMS.

The following training programs will be put into place:

- Induction Training
- On-The-Job Training
- Internal Training
- External Training
- Educational Assistance
- Skills Promotion

### ***Training Record***

Training records must be kept of the training undertaken by each individual.

## **13.3 Dealing with Environmental Risks and Emergencies**

### ***Objectives***

The following requirements of ISO14001 are relevant:

- The organisation shall establish, implement and maintain a procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and how it will respond to them.
- The organisation shall respond to actual emergency situations and accidents and prevent or mitigate associated adverse environmental impacts.
- The organisation shall periodically review and, where necessary, revise its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations.
- The organisation shall also periodically test such procedures where practicable.

### ***Identification of environmental risks***

Environmental risks must be identified and procedures will be set in place by the Gilmoie Mining operations to deal with potential environmental risks, which could include:

- Environmental emergency situations;
- Potential accidents that can have an impact on the environment; and
- General environmental ignorance that could lead to unnecessary pollution or disturbance to the environment.

## **13.4 Environmental Non-Conformances**

A non-conformance is specific to an EMS and is interpreted to include legal non-compliance, deviations from policy, accidents, near misses where damage or injury could have occurred, ineffective procedures, and deviations from specified conditions and from other requirements of the EMS.

### ***Response to environmental non-conformances***

The following requirement of ISO14001 is relevant:



- The organisation shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity/(ies) and for taking corrective action and preventative action.

### ***General Responsibilities***

All the employees of Gilmoie Mining operations and contractors must report non-conformances. Reporting of non-conformances must take place according to the procedure as outlines in the EMS. This will involve:

- Reporting to the relevant manager;
- Investigation of the incident (including details of the incident);
- Recording of the incident;
- Reporting to the relevant authorities if necessary;
- Identifying corrective actions;
- Follow up on the corrective actions;
- Drafting of progress reports; and
- Keeping of records.

## SECTION 14 - CAPACITY TO MANAGE AND REHABILITATE THE ENVIRONMENT

### 14.1 Capacity to Manage and Rehabilitate the Environment

The cost capacities outlined below are based on the current rates for implementation of environmental management and mitigation measures by Gilmoie Mining :

Environmental Management Aspect	Capacity Cost Per Annum	Classification of Measures	Summary of the Cost Per Month		
Water Quality Monitoring	R36 000	Prevention, Control, Remedy	R1000	R1000	R1000
Dust Monitoring	R12 000	Prevention, Control, Remedy	R300	R400	R300
Dust Suppression	R24 000	Prevention, Control	R1000		R1000
Waste Removal	R24 000	Control, Remedy	R1000		R1000
EMP Performance Assessment	R30 000	Control, Remedy	Once-off per year		
Environmental Awareness	R12 000	Prevention	R1 000		
Storm Water Management Structures	R 100 000 (once-off construction cost)	Control	n/a		
Plan for Control and Removal of Invader Species and Weeds	R 20 000 (once off) to be reviewed every 5 years	Control, Remedy	n/a		
Removal of Invader Species and Weeds	R 12 000	Control, Remedy	R500		R500
Chemicals for Sewage Treatment	R 12 000	Control	R1000		
Absorbents for Spillage Treatment	R 12 000	Remedy	R1000		
Annual Rehabilitation - Approximately 0.5 Hectares	R 24 000	Modify, Remedy	R2 000		

## SECTION 15 - ENVIRONMENTAL IMPACT STATEMENT

The purpose of this report is to provide the relevant authority (DMR) with sufficient information to make an informed decision regarding the potential/current impacts of the proposed Gilmoie Mining operations. Current and potential impacts were identified primarily through the technical expertise of the experience of Gudani Consulting and the specialist team, as well as in consultation with IAPs.

### 15.1 Key Environmental Findings

The proposed Gilmoie Mining activity will be located in the Northwest Province, and within the Taung Local Municipality, situated within the Dr Ruth Segomotsi Mompati District. The predicted life of the Gilmoie Mining operation is 25 to 30 years.

The main impacts associated with the Gilmoie Mining operations and related infrastructure will include impacts on the geology, topography, soils, land use, air quality, noise, visual impact and socio-economic impacts. All of these impacts identified are significant without mitigation measures; however, with the implementation of appropriate mitigation measures as outlined in the EMP (Section 7, Sub-Section 7.2), the impacts significance will be reduced. Impacts on the topography, soils, land use, flora, air quality, noise, visual impact and socio-economic conditions will be reduced to “low” and / or medium” with the implementation of appropriate mitigation measures. The most significant impacts, which will still be of significance after mitigation will be in terms of:

- **The sterilization of the topsoil layer**  
will have negative impacts on the fertility and nutrient levels of the topsoil layer;
- **Disturbing noise, air quality and visual**  
will continue during the operational phase and will be seen as a nuisance especially for people living in close proximity to the operations. The mitigation measure proposed will minimise the impact, to a level of medium significance;
- **Enhancement of socio-economic benefits**  
This will be in terms of job creation and supply of goods and services to the Gilmoie Mining .

### 15.2 Recommendations

The mitigation measures proposed by Gudani and the specialists were incorporated into the Environmental Management Programme and must be adhered to by Gilmoie Mining. Roles and Responsibilities were assigned to each mitigation measure. Monitoring must take place for the surface water, groundwater, noise and atmospheric emissions (from mining). Monitoring measures were included in the EMP (Section 8)

The proponent will comply with any additional conditions of authorisation / approval by the respective competent authorities, and other reasonable measures that may

be stipulated by authorities that have jurisdiction in the matters relevant to the Gilmoie Mining operations and update the EMP accordingly (if and when required).

### 15.3 Conclusion

It is recommended that the mining right application and EMP application of the mining right for Gilmoie Mining operations and associated infrastructure be authorised to proceed for the following reasons:

- A Biodiversity Action Plan (BAP) should be developed to guide the management of the ecological resources in the operations area throughout the entire life-cycle of the operations in line with the requirements of NEMBA;
- In addition to the attached rehabilitation plan, development of the Gilmoie Mining rehabilitation plan by a suitably qualified specialist and specific input by a suitably qualified ecologist must be provided into the rehabilitation plan by providing methods of rehabilitation and the required design criteria and closure objectives. This plan should emphasise rehabilitation throughout all phases of the operations and concurrent rehabilitation needs to take place as far as possible;
- Ensure that funds and management measures are in place to ensure that post decommissioning monitoring and management take place in the aftercare and maintenance phase of the operations.

**SECTION 16 - UNDERTAKING AND APPROVAL**

**16.1 Undertaking**

I, **Neville Moeng** ID No:.....**7505085422088**..... (on behalf of **GILMOE MINING (Pty) Ltd** the holder for the mining right for **GILMOE MINING** operations, hereby declare that the above information is true, complete and correct. I undertake to implement the measures as described in Sections 7 hereof. I understand that this undertaking is legally binding and that failure to give effect hereto will render me liable for prosecution in terms of Section 98 (b) and 99 (1)(g) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). I am also aware that the Regional Manager may, at any time but after consultation with me, make such changes to this programme as he/she may deem necessary.

I have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager.

Signed at ..... this.....day of.....2021

.....  
**Signature of applicant**

.....  
**Designation**

**Agency declaration:** This document was completed by **GUDANI CONSULTING** on behalf of **GILMOE MINING(Pty) Ltd**

**16.2 Approval**

**REGIONAL MANAGER APPROVAL**

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 29 of 2002)

Signed at.....this.....day of.....2022

.....  
**REGIONAL MANAGER**  
**REGION: LIMPOPO PROVINCE**

## **SECTION 17 - LIST OF APPENDICES**

### **LIST OF APPENDICES:**

- APPENDIX 1: EAP QUALIFICATIONS**
- APPENDIX 2: EAP PAST EXPERIENCE(CV)**
- APPENDIX 3: LOCALITY MAPS**
- APPENDIX 4: PUBLIC PARTICIPATION REPORT**
- APPENDIX 5: HERITAGE IMPACT ASSESSMENT REPORT**
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- APPENDIX 7: COMMENTS AND RESPONSES**
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**APPENDIX 1:  
EAP QUALIFICATIONS**

**APPENDIX 2:  
EAP PAST EXPERIENCE**



**APPENDIX 3:  
LOCALITY MAPS**

**APPENDIX 4:  
PUBLIC PARTICIPATION PROCESS AND REPORTING**

**APPENDIX 5:  
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COMMENTS AND RESPONSES**

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CORRESPONDENCE WITH DMR**